



Dangerous Goods Route and Truck Routes Establishment

City of Lloydminster
City Project Number: 1913624

FINAL REPORT

April 2020





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.

Integrated Expertise. Locally Delivered. 

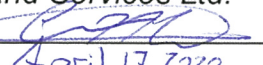


Corporate Authorization

This document entitled "Dangerous Goods Route and Truck Routes Establishment" 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.



Cameron Matwie, MBA, M.Sc., P.Eng., ENV SP
Manager, Transportation Planning

PERMIT TO PRACTICE	
<i>ISL Engineering and Land Services Ltd.</i>	
Signature	
Date	<u>April 17, 2020</u>
PERMIT NUMBER: P 4741	
The Association of Professional Engineers and Geoscientists of Alberta	

Executive Summary

ES 1.0 Introduction

The City of Lloydminster is centered along the Trans-Canada Highway (Highway 16) and straddles the Alberta/Saskatchewan interprovincial border along Highway 17. As an economic centre along major highways, the City attracts, and is impacted by, the movement and transport of goods and dangerous goods. The City has expressed concern over the movement of dangerous goods through the heart of the City along the major highways and has explored options to alter the truck routes and dangerous goods routes.

A June 2017 report presented to the Governance and Priorities committee offered options for the alteration and amendment of the truck routes and dangerous goods routes. The report proposed adding truck routes within the City along with some deletions, but also proposed rerouting dangerous goods traffic around the periphery of the City. City Council recognized that changes to the truck routes and dangerous goods routes would require discussion between the City and stakeholders.

In July, 2019, The City retained ISL to complete a study of the truck routes and dangerous goods routes (City Project #1913624). The purpose of the project was to further review and refine options for alternate truck routes and dangerous goods routes within the City of Lloydminster and to consult with industry, emergency services, carriers, local business owners, other community stakeholders, and the general public. In addition to route option development the project provided a comprehensive signage plan and cost estimate associated with the signage plan.

ES 2.0 Background Conditions Review

Information was collected from the City of Lloydminster, other municipalities, Alberta Transportation and the Saskatchewan government to better understand truck routes and dangerous goods routes. All of the information collected was grouped into four areas for review: data review, jurisdiction review, current trends review, and a network review.

1. The **data review** was conducted to gain a better understanding of the context of existing dangerous goods routes and truck routes and how the City's current policies and practices relate to dangerous goods routes and truck routes.
2. The **jurisdiction review** of six cities in Alberta and two in Saskatchewan was completed to help the City of Lloydminster understand how other cities of similar size with bisecting highways identify and address dangerous goods routes and truck routes.
3. The **current trucking patterns** in and through the City of Lloydminster was completed to aid in the identification and evaluation of truck routes and dangerous goods routes by considering population and economic trends, which influence trucking and goods movement.
4. The **network review** was completed of the existing truck routes and dangerous goods routes within the City of Lloydminster to better understand how the existing routes function within the context of the data review and jurisdiction review.

ES 3.0 Evaluation Framework Development

In order to objectively evaluate all of the potential truck routes and dangerous goods routes that could be identified in Lloydminster evaluation frameworks were developed. The objective of the evaluation frameworks was to ensure the City of Lloydminster could apply a consistent methodology for designating truck routes and dangerous goods routes. Having evaluation frameworks will allow future reviews of possible truck routes and dangerous goods routes to use the same process and logic that was used in the creation of the network which helps ensure that all potential routes are assessed consistently and fairly every time. The truck route evaluation framework was created separately from the dangerous goods route framework to allow a review of each network individually.

ES 3.1 Truck Route Evaluation Framework Development

To initiate the creation of the truck routes, a best practice review was completed. Based on the criteria found in the review a preliminary list of route evaluation criteria for truck routes was created and assessed for their applicability to the City. After the assessment, a focused list of criteria was proposed and used in Phase One engagement with stakeholders and the general public.

Based on feedback received, a two-step process was suggested for the City of Lloydminster truck route evaluation framework with a network functionality assessment and a route performance assessment. Both assessments use criteria applicable to the City of Lloydminster and identified as important by industry stakeholders, the general public, and the City.

ES 3.2 Dangerous Goods Route Evaluation framework Development

Similar to truck routes, a best practice review was conducted for the dangerous goods routes evaluation criteria, with the proposed evaluation criteria used in Phase One engagement with stakeholders and the general public.

The dangerous goods route evaluation framework for Lloydminster was also established as a two-step process, with a dangerous goods route functionality assessment and a safety assessment. The functional assessment uses similar criteria to the truck routes functionality assessment with minor modifications. With the new evaluation framework any dangerous goods route must be located on an approved truck route. The second component of the dangerous goods route evaluation framework is the safety assessment which is separated into a probability and significance assessment to assess the probability of an incident occurring and the significance of the incident. The additional assessment is required for dangerous goods routes as dangerous goods pose a higher risk than regular goods transported by truck.

ES 4.0 Route Options Development

Phase One of the stakeholder and public engagement was completed during the initial stages of the project to receive feedback on how the existing truck route and dangerous goods route networks currently function. Once feedback was received from stakeholders and the public on the routes the potential route options were created. Stakeholder feedback included that most of the dangerous goods and truck traffic is local and concentrated in the northwest corner of the City. The public online feedback included concerns around public safety and truck traffic on current routes in or near residential areas as well as truck traffic within the city centre.

ES 4.1 Truck Route Options

For the purpose of this study the assessment of truck routes was completed in sections of the city based on the north sector, the southwest quadrant and the southeast quadrant. All of the options were created using the feedback from the City, stakeholders, and the public in regards to how the network currently functions as well as where the trucks and dangerous goods movement is concentrated today. In all cases the existing truck routes were presented as the “do nothing” option as it was acknowledged that the “do nothing” option is an option that could be considered if no other option were deemed preferable.

ES 4.2 Dangerous Goods Route Options

For the dangerous goods routes the assessment of options was completed on a City wide basis as there are fewer dangerous goods routes options than there are truck route options. All of the dangerous goods routes options were created based on the feedback received by the City, stakeholders, and the public during Phase One of engagement. The existing dangerous goods were presented as the “do nothing” option as it was acknowledged that the “do nothing” option is an option that could be considered if no other option were deemed preferable. Four alternate options were created which use different dangerous goods routes throughout the City.

ES 4.3 Restricted Roadways

While developing the truck route and dangerous goods route options it was noted that there were some roadways that received conflicting feedback from the public and industry stakeholders and a restricted route was a potential solution. During the stakeholder meetings, industry representatives noted that industry works seven days a week thus a day of the week restriction may not work as intended. Additional feedback received from stakeholders indicated a desire to restrict the time of day and not day of the week. The restrictions were proposed to be 06:00 to 22:00 for any restricted routes within the City to ensure standardization from a connectivity and enforcement perspective. These hours were proposed to provide maximum flexibility during business hours while restricting truck activity during the late evening and overnight hours.

ES 5.0 Route Option Evaluation and Recommendations

Phase Two of the stakeholder and public engagement was completed to receive feedback on how the potential options would impact users and residents. The feedback received from stakeholders and the public on the potential options was influential in their evaluation. The public’s feedback included the preference for options that kept trucks and dangerous goods out of the city centre.

To develop the recommended truck routes and dangerous goods routes, the project team reviewed the stakeholder input and feedback from both Phase One and Phase Two engagement as well as input from City staff on the potential operational and enforcement issues and challenges with the proposed truck route and dangerous goods route networks. In addition, the technical evaluations of the candidate truck routes and dangerous goods routes were also used to support the recommendations. This thorough city-wide assessment was completed to support the recommendations for the inclusion and exclusion of roadways as truck routes and dangerous goods routes.

ES 5.1 Truck Route Evaluation and Recommendations

The potential truck routes identified were separated into smaller segments for assessment based on network linkage and cross street connectivity. The technical assessment considered the following for potential truck route candidates:

- 36 segments of roadway were evaluated along roadways identified as highways and arterials
- 6 segments of roadway were evaluated along four roadways identified as collectors
- 16 segments of roadway were evaluated along 13 roadways identified as local roads
- 51 Street from 50 Avenue to 55 Avenue was evaluated as an alternative to the existing truck route along 55 Avenue to serve the business area along 51 Street

Stakeholders identified Option three for the north sector, Option two for the southeast quadrant, and Option four for the southwest quadrant as the preferred route options. The recommended truck routes for the City of Lloydminster, based on stakeholder, public and staff input along with the technical evaluation which are represented in Exhibit ES1.

On a city-wide basis only three roadways were recommended for the designation of restricted truck routes. These roadways were recognized as important components to the overall truck route network with the correlated recognition that these roadways may not be required on a 24 hr. basis. As such the following three routes have been recommended as restricted truck routes due to the adjacent residential developments:

- College Drive from 50 Avenue to 44 Street
- 51 Street from 50 Avenue to 55 Avenue
- 50 Avenue from 51 Street to 62 Street

ES 5.2 Dangerous Goods Route Evaluation and Recommendations

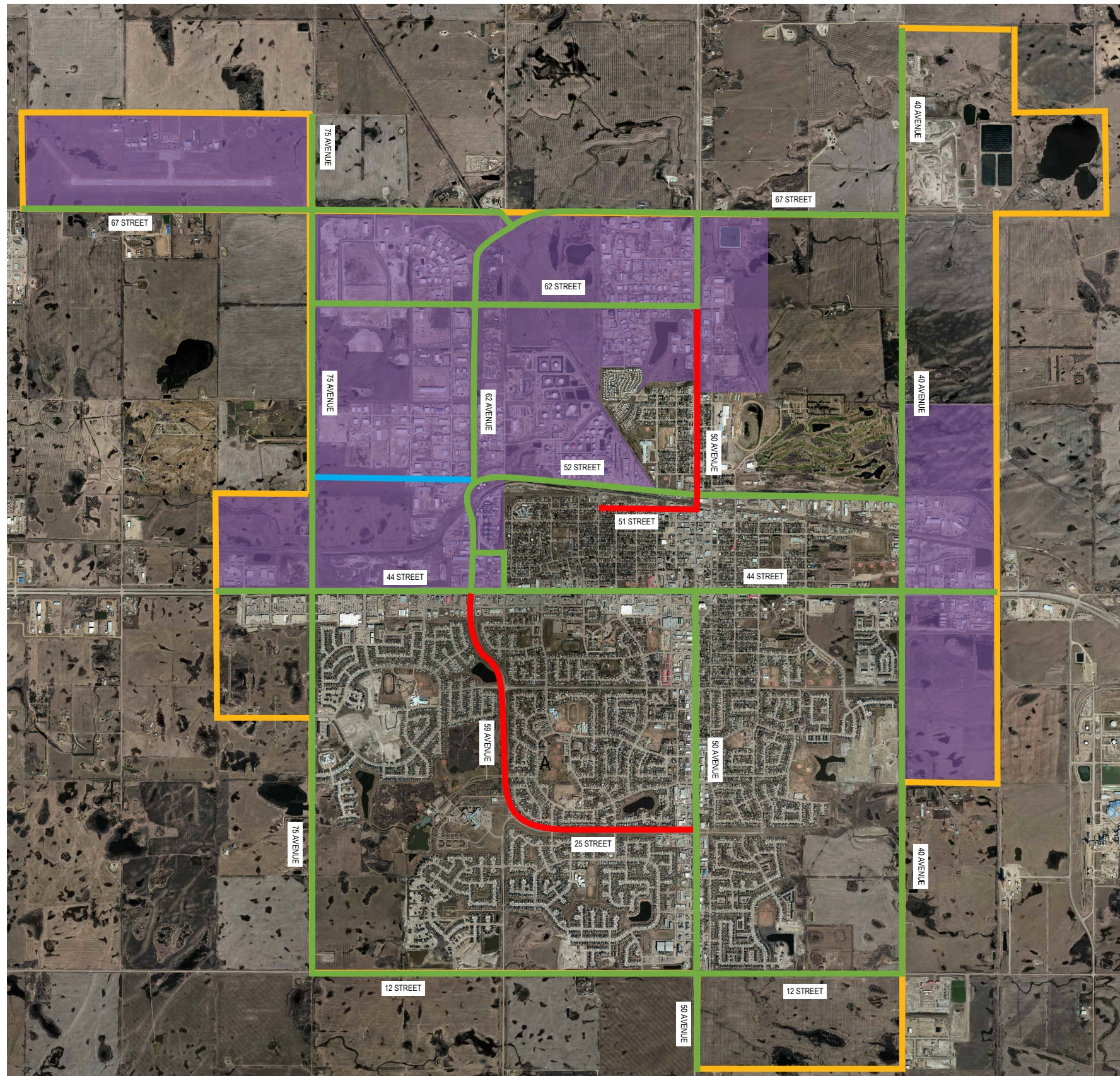
The potential dangerous goods routes identified were separated into smaller segments for assessment based on network linkage and cross street connectivity. The technical assessment considered 27 segments of roadway were evaluated along roadways identified as highways and arterials.

The dangerous goods route options were developed and presented as city-wide options. The route recommendations that were developed considered the stakeholder input from Phase Two engagement as well as the technical assessment. The stakeholders identified sections of Option three and Option four as the preferred dangerous goods route network. The recommended truck routes for the city of Lloydminster, based on stakeholder, public and staff input along with the technical evaluation which are represented in Exhibit ES2.

ES 6.3 Recommended Signage Plan

As part of the recommendations for truck routes and dangerous goods route, a regulatory and directional wayfinding signage plan was developed to support the implementation of the recommended truck route and dangerous goods routes. The recommended truck route and dangerous goods route networks were used as the base of the signage plan to determine potential signage locations along all routes.

Exhibit ES3 and ES4 illustrate the recommended signage plan for the City of Lloydminster.

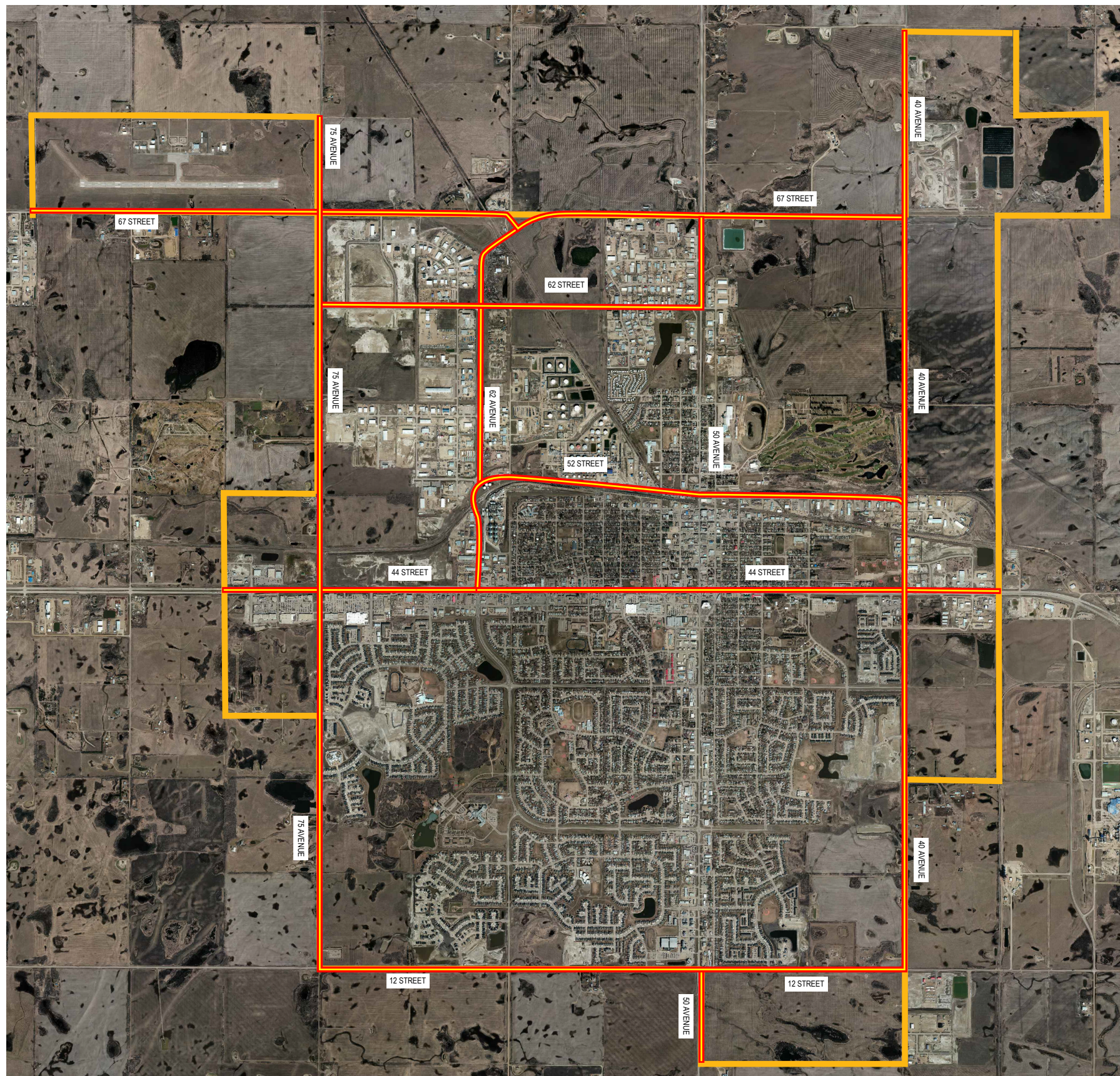


LEGEND

- 24 HOUR TRUCK ROUTE
- RESTRICTED TRUCK ROUTE - 06:00 - 22:00
- FUTURE TRUCK ROUTE
- CITY LIMITS
- TRUCK ROUTE AREAS

DANGEROUS GOODS ROUTES AND TRUCK ROUTES
EXHIBIT ES 1 - RECOMMENDED TRUCK ROUTE NETWORK

NOT TO SCALE
FEBRUARY 28, 2020



LEGEND

-  DANGEROUS GOODS ROUTE
-  CITY LIMITS

DANGEROUS GOODS ROUTES AND TRUCK ROUTES
EXHIBIT ES 2 - RECOMMENDED DANGEROUS GOODS ROUTE NETWORK

NOT TO SCALE
APRIL 8, 2020

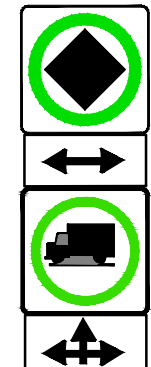


NAME/DATE/FILENAME

EXAMPLE OF CA# SIGNS
CA2

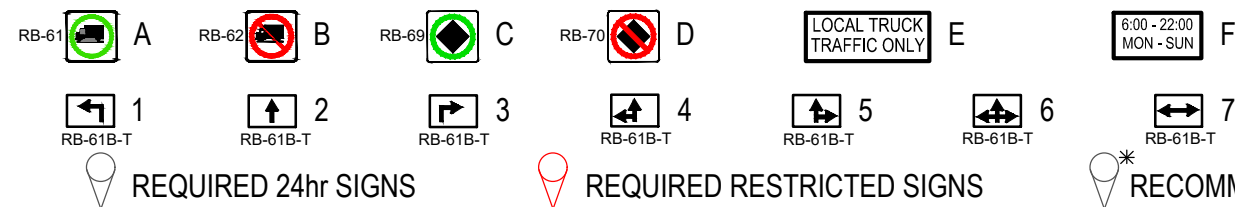


EXAMPLE OF C# AND A# SIGNS
C7 A6



ROUTE LEGEND
— CITY LIMITS
— 24 HOUR ROUTES
— RESTRICTED ROUTES
— FUTURE ROUTES

LEGEND



DANGEROUS GOODS ROUTES AND TRUCK ROUTES
EXHIBIT ES 3 - CITY-WIDE SIGNAGE PLAN

NOT TO SCALE
MARCH 19, 2020



LEGEND

RB-61 A	RB-62 B	RB-69 C	RB-70 D	E	F	G
1	2	3	4	5	6	7
RB-61B-T	RB-61B-T	RB-61B-T	RB-61B-T	RB-61B-T	RB-61B-T	RB-61B-T

REQUIRED SIGNS RESTRICTED SIGNS

DANGEROUS GOODS ROUTES AND TRUCK ROUTES EXHIBIT ES 4 - CITY-WIDE SIGNAGE PLAN - DETAIL A

NOT TO SCALE
FEBRUARY 24, 2020



Table of Contents

Corporate Authorization

Executive Summary

1.0	Introduction	1
1.1	Background	2
1.2	Project Purpose	2
1.3	Study Methodology	2
2.0	Background Conditions Review	3
2.1	Legislature and Data Review	4
2.2	Jurisdiction Review	12
2.3	Current Conditions Review	28
2.4	Network Review	41
3.0	Evaluation Framework Development.....	48
3.1	Truck Route Evaluation Framework Development	49
3.2	Dangerous Goods Route Evaluation Framework Development	53
4.0	Route Options Development	59
4.1	Phase One Engagement	60
4.2	Truck Route Options	64
4.3	Dangerous Goods Route Options	67
4.4	Restricted Roadways and Potential Storage Locations	68
5.0	Route Options Evaluation	71
5.1	Phase Two Engagement	72
5.2	Truck Route Evaluation	75
5.3	Dangerous Goods Route Evaluation	81
6.0	Recommendations	91
6.1	Truck Route Recommendations	92
6.2	Dangerous Goods Route Recommendations	97
6.3	Recommended Signage Plan	99
7.0	References	113

APPENDICES

Appendix A DKCI Memo

Appendix B Public Engagement Information

TABLES

Table 2.1:	Population Trends, 1996 – 2016	29
Table 2.2:	Population forecasts.....	30
Table 2.3:	Truck Volumes at Selected Intersections, 2018	33
Table 2.4:	Breakdown of Vehicle Types at Selected Locations, 2018.....	35
Table 3.1:	Truck Route Network Criteria from Oakville	49
Table 3.2:	Truck Route Evaluation Framework	52
Table 3.3:	Dangerous Goods Route Evaluation Framework.....	56
Table 4.1:	Level of Engagement	60
Table 4.2:	Engagement Summary	61
Table 5.1:	Level of Engagement	72
Table 5.2:	Engagement Summary	73
Table 5.3:	Route Performance Criteria Outcomes.	78
Table 5.4:	Dangerous Goods Route Safety Assessment Criteria Outcomes.	88
Table 6.1:	Recommended Truck Routes for the City of Lloydminster	96
Table 6.2:	Recommended Truck Routes for the City of Lloydminster	99
Table 6.3:	Costs Associated with Required Recommended and Optional Signs	109
Table 6.4:	Costs for Optional Truck Route and Dangerous Goods Route Label Signs.....	110
Table 6.5:	Costs for Potential Posts	110
Table 6.6:	Cost Associated with Future Sign Requirements	112

FIGURES

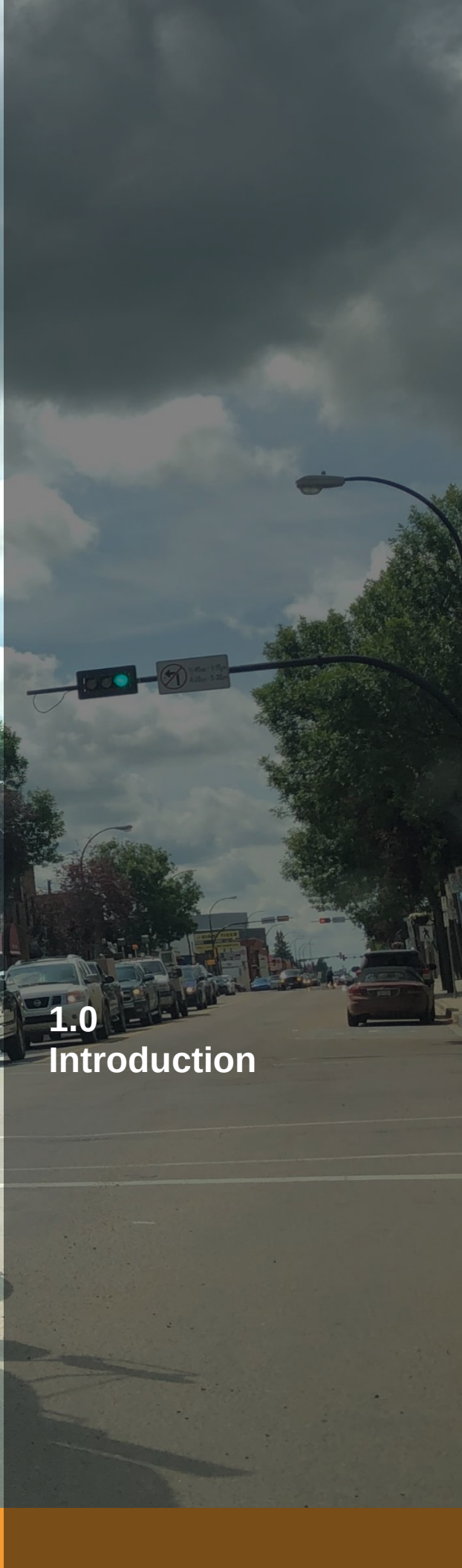
Figure 2.1:	Existing Truck Routes in the City of Lloydminster	7
Figure 2.2:	Existing Dangerous Goods Routes in the City of Lloydminster	8
Figure 2.3:	Truck Routes in Grande Prairie (from Grande Prairie Open Data Catalogue, retrieved August 2019).....	13
Figure 2.4:	Dangerous Goods Routes in Grande Prairie (from Grande Prairie Open Data Catalogue, retrieved, August 2019).....	14
Figure 2.5:	Heavy Truck Routes in Medicine Hat (from www.medicinehat.ca, updated 2017).....	15
Figure 2.6:	Dangerous Goods Routes in Medicine Hat (from Bylaw 2759, the Transportation of Dangerous Goods Bylaw, 2016.....	16
Figure 2.7:	City of Camrose Truck Routes (from the City of Camrose Truck Route Map, January 30, 2014) ..	18
Figure 2.8:	City of Camrose Dangerous Goods Routes (from Schedule A of the Dangerous Goods Bylaw, 2018).....	19
Figure 2.9:	Truck Routes in the City of Red Deer (from www.reddeer.ca, updated November 2017)	21
Figure 2.10:	City of Red Deer Dangerous Goods Routes (from www.reddeer.ca, updated June 2002)	22
Figure 2.11:	Truck Routes and Dangerous Goods Routes in Moose Jaw (from www.citymj.arcgis.com, retrieved August 2019).....	24
Figure 2.12:	Heavy Vehicle and Dangerous Goods Routes in Yorkton (form Bylaw 18/2016, Traffic Bylaw, 2016).....	25
Figure 2.13:	GDP all industries – Alberta and Saskatchewan, 1997-2018.....	31
Figure 2.14:	GDP by sector – Alberta, 1997-2018	31
Figure 2.15:	GDP by sector – Saskatchewan, 1997-2018	32
Figure 2.16:	AADT and TAADT – Highway 16, 2004-2018.....	37
Figure 2.17:	Truck and Dangerous Goods Traffic – Highway 16 at Eastern City Limit.....	39
Figure 2.18:	Through Trucks as % of Total Truck Traffic – Highway 16 at Eastern City Limit.....	39
Figure 2.19:	Dangerous Goods as % Total Through Trucks – Highway 16 at Eastern City Limit.....	40
Figure 2.20:	Lloydminster Neighbourhoods Map (retrieved from www.lloydminster.ca September 2019)	42
Figure 2.21:	Lloydminster Land Use Districts and Overlay Map (retrieved from www.lloydminster.ca September 2019	43
Figure 3.1:	Dangerous Goods Routes Considerations used in New South Wales	55
Figure 4.1:	Potential Truck Storage Locations	70
Figure 5.1:	Potential East/West Dangerous Goods Routes through the City.	83
Figure 5.2:	Potential North/South Dangerous Goods Routes through the City.	84
Figure 5.3:	Key Destinations within the City that Require Dangerous Goods.....	85

Figure 6.1:	Truck Route and Dangerous Goods Route Sign Configurations	105
Figure 6.2:	Letter and Number Symbols for Signage	107
Figure 6.3:	Large Dangerous Goods Route Information Signs in the City of Edmonton (taken west of 17 Street on Whitemud Westbound).....	109
Figure 6.4:	Large Dangerous Goods Route Information Signs in the City of Calgary (retrieved from Google Earth Pro Streetview north of 144 Avenue NE on Deerfoot Trail Southbound)	109
Figure 6.5:	Truck Route and Dangerous Goods Route Permissive and Prohibitive Labels	110
Figure 6.6:	Sign Reconfiguration to Accommodate Future Routes	112

EXHIBITS

[following page](#)

Exhibit 5.1:	Truck Route Assessment Results	80
Exhibit 5.2:	Dangerous Goods Route Functionality	90
Exhibit 5.3:	Safety Assessment Results	90
Exhibit 6.1:	Truck Route Network	96
Exhibit 6.2:	Recommended Dangerous Goods Route Network	100
Exhibit 6.3:	City-Wide Signage Plan	106
Exhibit 6.4:	City-Wide Signage Plan – Detail A.....	106
Exhibit 6.5:	Location of Large DGR Information Signs.....	108
Exhibit 6.6:	Future Signage Required Along 52 Street	108



1.0 Introduction



1.1 Background

The City of Lloydminster is centered along the Trans-Canada Highway (Highway 16) and straddles the Alberta/Saskatchewan interprovincial border along Highway 17. As an economic centre along major highways, the City attracts, and is impacted by, the movement and transport of goods and dangerous goods. Both goods and dangerous goods pass through the City to/from many places both east and west of Lloydminster as well as being destined to and generated from sites within the City limits and in neighbouring municipalities. The City's current Traffic Bylaw (09-2018) which came into effect on January 1, 2019 outlines the existing truck routes and dangerous goods routes as well as the penalties to both persons and corporations for non-compliance.

The City has expressed concern over the movement of dangerous goods through the heart of the City along the major highways and has explored options to alter the truck routes and dangerous good routes. A June 2017 report presented to the Governance and Priorities committee offered options for the alteration and amendment of the truck routes and the dangerous goods routes. The report proposed adding truck routes within the City along with some deletions, but also proposed rerouting dangerous goods traffic around the periphery of the City. At that time City Council recognized that changes to the truck routes and dangerous goods routes would require a lot of discussion between the City and stakeholders.

1.2 Project Purpose

The purpose of this project was to further review and refine options for alternate truck routes and dangerous goods routes within the City of Lloydminster and to consult with industry (including agriculture, heavy oil and gas, and manufacturing), emergency services (including the fire department, RCMP and bylaw enforcement), carriers, local business owners, other community stakeholders, and the general public. In addition to route option development the project provided a comprehensive signage plan and cost estimate associated with the signage plan.

1.3 Study Methodology

This study followed a six step process to identify and review the need for, location, placement and evaluation of both truck routes and dangerous goods routes within the City of Lloydminster. The general methodology for the project is shown below as:

- Gather and review background conditions documentation and information
- Creation of an evaluation framework
- Development of route options
- Gather feedback from key stakeholders and the public
- Comparative analysis of route options
- Selection of recommended routes



62 Av



INTERSECTION
PHOTO ENFORCED

2.0 Background Conditions Review



Information was collected from the City of Lloydminster, other municipalities, Alberta Transportation and the Saskatchewan government to gather more information on truck routes and dangerous goods routes. All of the information collected was grouped into four reviews: data review, jurisdiction review, current trends review, and a network review. The information found in these reviews is summarized in the sections below.

2.1 Legislature and Data Review

A desktop background review was conducted to gain a better understanding of the context of existing dangerous goods routes and truck routes. It was important to understand the City's current policies and practices in order to determine how potential dangerous goods routes and truck routes could benefit the City. Documents received from the City and found online were reviewed and relevant information for this project was summarized and noted.

Data Sources

Below is a list of the data that was received from the City and reviewed. Online information reviewed included Provincial Acts, Federal Acts, and municipal plans.

- Road Matrix – City of Lloydminster Roadways
- City of Lloydminster Traffic Report 2018
- Bylaw 09-2018
- Bylaw 002-1995

Policy Context

As a border City, there are Acts and Regulations, from both provinces that allow Lloydminster to create bylaws and policies for highways within their jurisdiction to ensure the safety of road users and maintenance of roadways while providing guidance on, but not limited to, traffic monitoring, violation penalties, and snow/ice removal.

2.1.1 Municipal Policies and Plans

The municipal policies and plans that the City of Lloydminster has published were reviewed to determine what information about dangerous goods routes and truck routes was available.

Municipal Development Plan

The Municipal Development Plan (MDP) was created to provide guidance over a 20 year planning time frame on the City of Lloydminster's growth and development. Policy 13.1.5 in the MDP stated that the City of Lloydminster "should establish a Dangerous Goods Routes" (p. 105) but does not specify where the routes should be located within the City. Public engagement was completed as part of the MDP and the stakeholders and public expressed a desire to "re-route industrial operation trucks outside of the City since truck traffic along Highway 16 is creating significant issues" (p.22).

Official Community Plan

The Official Community Plan (OCP) was created for the City of Lloydminster, the Rural Municipality of Wilton No. 472, and the Rural Municipality of Britannia No. 502. The Official Community plan was reviewed, and it contained no information about truck routes or dangerous goods routes. The OCP focuses on land use planning in the area for future developments.

Transportation Master Plan

The Transportation Master Plan (TMP) was completed in 2016 and provided clear information on when transportation infrastructure should be improved and how the improvements should be prioritized. While the TMP does not list proposed dangerous goods routes, it does list guidelines for selecting routes which are as follows:

- Select routes that avoid large numbers of people.
- Select routes where buildings and people are well set-back from the road.
- Consider restrictions based on time of day.

The TMP also noted that a strong arterial grid is important for a long range network. A strong arterial grid network would provide trucks containing dangerous goods with alternative route options that avoid the downtown core or other sensitive areas. The City noted in the background information that 52 Street (between 62 Avenue and 75 Avenue) and 25 Street (between 47 Avenue and 40 Avenue) would be completed within the next three to five years and should be included for consideration as part of the network review.

Truck routes were reviewed as part of the TMP where it was noted that the current truck routes were selected for their pavement structure, turning radius, and reduced noise levels. The TMP suggests that the downtown routes remain truck routes and that parallel routes on either side of the downtown core be created for both Highway 16 and 17. The additional routes would provide trucks with an alternative route and relieve some of the downtown truck volumes.

During the public engagement portion of the TMP people provided comments with their concerns regarding goods movement on specific roadways. Many indicated there was too much truck traffic on Highway 16 and Highway 17. Some comments indicated that 40 Avenue should be considered a future truck route and that 75 Avenue could be considered a future truck route. Additionally, the public engagement found that dangerous goods routes were one of the main concerns the public and private sector had with transportation in Lloydminster.

Land Use District and Overlay Map

The City of Lloydminster is divided into 4 quadrants by 44 Street and 50 Avenue which run east/west and north/south respectively. Both roadways have segments with commercial use that require deliveries from trucks and potentially dangerous goods. The commercial area along for 44 Street is concentrated from the West City limits to 50 Avenue and a small portion continuing from 50 Avenue to 40 Avenue. The commercial area along 50 Avenue is located between 12 Street and 52 Street. The northern half, and more specifically the northwest portion, of the City is where the majority of the industrial sector is located. The downtown core of the City of Lloydminster is located between 52 Avenue and 48 Avenue and 44 Street and 52 Street.



2.1.2 Municipal Bylaws

Two municipal bylaws were reviewed for the information on the City of Lloydminster's current dangerous goods routes and truck routes.

Bylaw 09-2018 – City of Lloydminster Traffic Bylaw

The City of Lloydminster Traffic Bylaw stated that all dangerous goods shall be transported on a dangerous goods route unless an off-route permit was authorized. The Fire Chief may issue the off-route permits if the delivery on the proposed route can be conducted safely. The bylaw noted that the drivers of dangerous goods that originate or are destined outside the City shall take the shortest combination of dangerous goods routes through the City. Additionally, all drivers shall remain on a dangerous goods route at all times, except as permitted under the bylaw. The dangerous goods routes are listed as 44 Street (Highway 16) and 50 Avenue (Highway 17). Any truck or truck and trailer with a combined maximum gross weight over 7,500 kilograms or longer than 11 meters in length needs to use a truck route. Loading and unloading may be done off the truck route given that the shortest distance to and from the truck route is used.

Bylaw 002-1995 – Transportation Systems Bylaw

The Transportation Systems Bylaw provided a list of truck routes and future truck routes in the City of Lloydminster. It is important to note that the routes listed in Bylaw 002-1995 differ from the ones listed in Bylaw 09-2018. The future truck routes listed in the Transportation Systems Bylaw are 52 Street from 63 Avenue to 75 Avenue and 25 Street from 40 Avenue to 50 Avenue which the City has noted as will be completed within the next three to five years.

2.1.3 Existing Truck Routes and Dangerous Goods Routes Networks

Maps of the existing truck routes and dangerous goods routes were created to visually represent the routes throughout the City. The maps also illustrated sensitive areas and major industrial areas which provided some clarity as to how the existing dangerous goods route and truck route network functions.

Figure 2.1 below is a map of the existing truck routes in the City of Lloydminster based on Bylaw 09-2018.

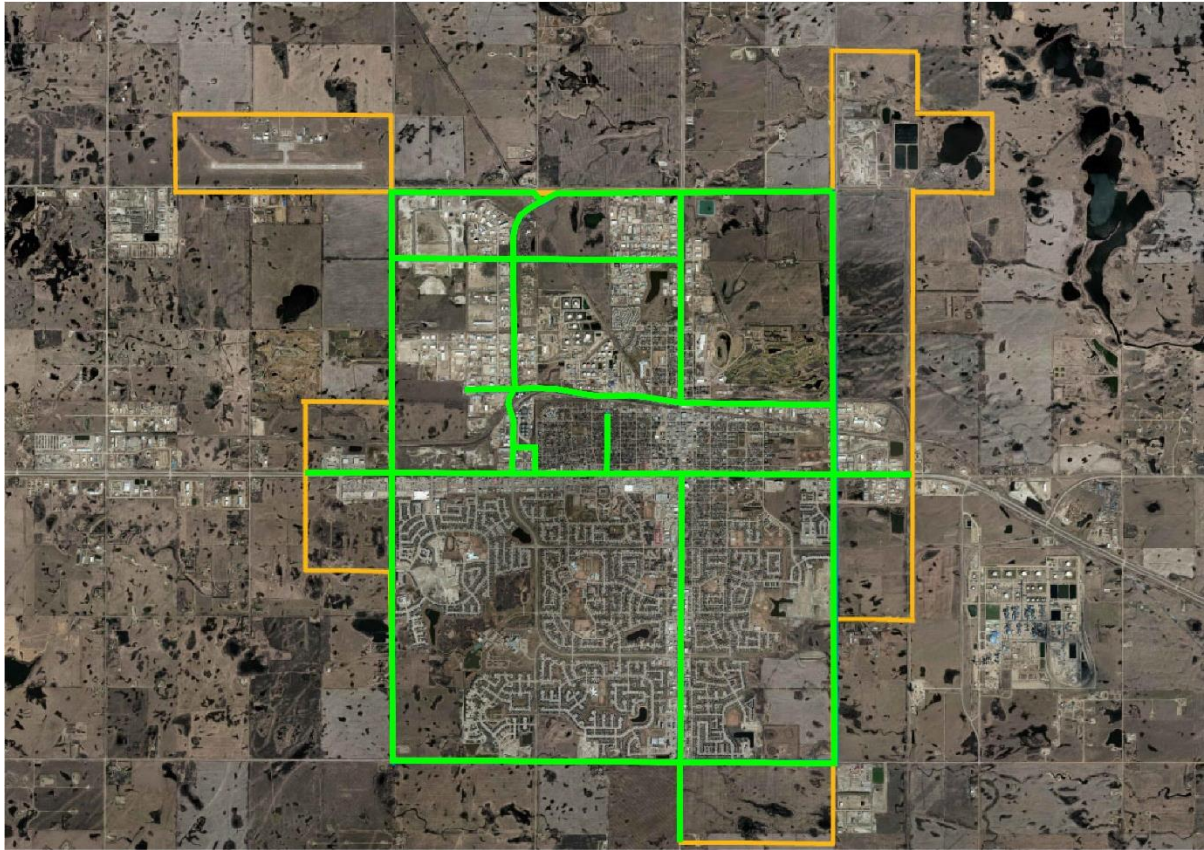


Figure 2.1: Existing Truck Routes in the City of Lloydminster

Figure 2.2 below shows a map of the existing Dangerous Goods Routes through the City of Lloydminster based on Bylaw 09-2018.

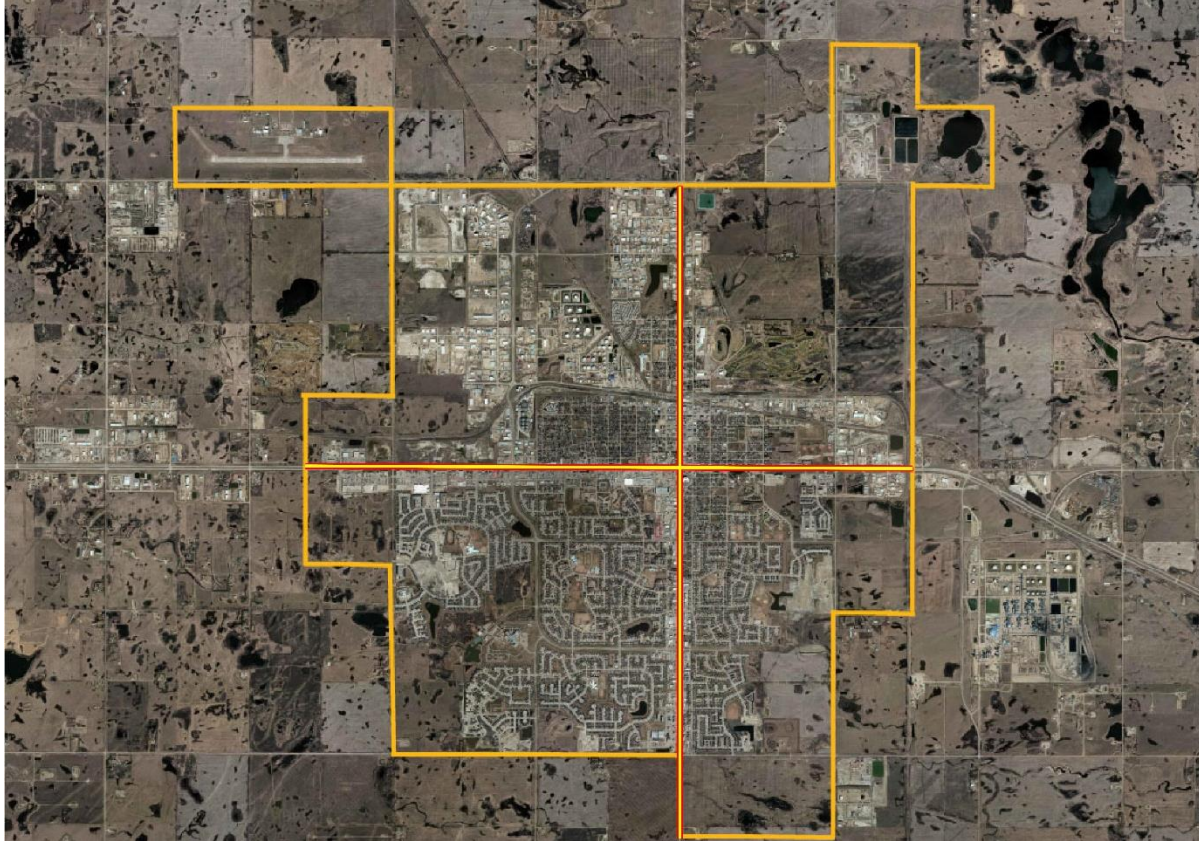


Figure 2.2: Existing Dangerous Goods Routes in the City of Lloydminster

In 2017 the City of Lloydminster proposed changes to their dangerous goods routes and truck routes. The proposed routes were taken to City Council where direction was provided that meaningful public engagement needed to be completed as part of the proposed changes. Public engagement was thusly an integral part of this project which informed the creation of route options and recommendations.

2.1.4 Surrounding County and RM Policies

As a City on the Trans-Canada Highway and a regional centre, the City of Lloydminster is host to many pass through trips for truck and dangerous goods that are not destined to locations within Lloydminster. In order to understand how Lloydminster connects existing routes to the region, policies from all three neighbouring Rural Municipalities were reviewed to determine if there were any major truck and/or dangerous goods routes, or generators, in the area.

County of Vermilion MDP and TMP

The County of Vermilion MDP stated an objective of having cost-effective transportation and infrastructure. Policy 5.6.2.b under that objective was to reduce and mitigate conflicts between transportation, communications or utility facilities and other land uses and noted to consider establishing a dangerous goods route. However, the route should be established when the quantities of dangerous goods being transported pose a significant hazard to the travelling public. Policy 5.6.3.g in the MDP noted heavy trucks and explained that heavy trucks “will be directed to those roads that are designed and constructed to accommodate such development” (p.57).

A TMP for the County of Vermilion River was completed in February 2017. The TMP stated that truck routes should be monitored for adequate gravel and ensure trucks stay on the proper truck routes. There was no specific information about the establishment of truck routes and dangerous goods routes in the TMP.

Lloydminster Planning District Commission (RM Britannia 502 and RM Wilton 472)

The Lloydminster Planning District Commission is a joint committee with the City of Lloydminster, the Rural Municipality of Britannia No. 502 and the Rural Municipality of Wilton No. 472. The purpose of the Planning District is to allow the three municipalities to coordinate their growth and development. The Lloydminster Planning District Zoning Bylaw is more focused on development permits and regulations related to construction and contains no information specific to truck routes and dangerous goods routes.

2.1.5 Provincial Acts

The City of Lloydminster must adhere to the Provincial Acts from both Alberta and Saskatchewan as it is located along and across the interprovincial boarder. As such, the Acts from both provinces were reviewed as municipalities may make bylaws for highways under their direction, control, and management as long as they were consistent with the Acts.

Alberta Traffic Safety Act

The Alberta Traffic Safety Act promotes safety on provincial highways. Within the Act it is stated that municipalities may make bylaws restricting the weight of a truck and/or truck and trailer to a weight that is less than the weight noted in the Act.

Saskatchewan Traffic Safety Act

The Saskatchewan Traffic Safety Act was reviewed and contains no specific information on truck routes or dangerous goods routes.



Alberta Dangerous Goods Transportation and Handling Act

The Alberta Dangerous Goods Transportation and Handling Act sets safety standards and shipping requirements for dangerous goods. The Act allows municipalities to create their own bylaws. It notes that in doing so, municipalities have the opportunity to designate routes and time of travel for dangerous goods routes, prohibit dangerous goods from being transported on highways specified in the bylaw, and can specify restrictions and conditions to ensure the safe transportation of dangerous goods. Additionally, the Lieutenant Governor in Council may make regulations about the route and time of travel for transporting dangerous goods.

Saskatchewan Highways and Transportation Act 1997

The 1997 Highways and Transportation Act lists the requirements in regard to the appropriate use of the highways within the province. The Act stated that the Province can prohibit or restrict trucks on any part of a provincial highway. The gross weight of the vehicle, type/ configuration of the vehicle, or simply the vehicle itself can be prohibited from using the highway as a truck route. The gross weight that can be transmitted to the roadway through points of contact can also cause restrictions from the province. The province can designate another public highway as a truck route. The province can only designate a public highway that is under the direction, control or management of a municipality as a truck route if that municipality agrees. If any changes are made to the Act a notice of change will be published.

Alberta Dangerous Guidelines for the Establishment of Dangerous Goods Routes in Alberta Municipalities

This Act lists the steps to create an appropriate bylaw for dangerous goods. To start, the Municipality should determine what quantities and commodities are going to be considered dangerous goods. Once it is clear what is considered a dangerous good, the where, why, and when the goods are being transported will need to be established. Another important item to note is what dangerous goods are originating, destined, and passing through the municipality when creating the bylaw. Provincial highways must remain dangerous goods routes unless it can be shown that in the interest of public or environmental safety a different route should be used. Restrictions on time of day could be used to reduce dangerous goods moving through areas with large numbers of people. Parking can be dealt with by having vehicle storage locations or specifying a required minimum distance from residences. It may be useful to have a well-designed awareness program to give industry and businesses a better idea of how the bylaws work / where the routes are.

Saskatchewan Dangerous Goods Transportation Act

The Saskatchewan Dangerous Goods Transportation Act was reviewed and provides information on the penalties and requirements for carriers to transport dangerous goods. No specific information was found on dangerous goods routes.

2.1.6 Oversized Guidelines

Trucks can transport goods and dangerous goods that are over the regular dimensions allowed as per provincial Acts and are considered oversized. A permit is usually required when trucks are oversized. Below is the information found from both provinces on their oversized guidelines.

Alberta (TRAVIS)

The province of Alberta uses an automated online permit system called TRAVIS for their overweight and over dimensional loads. Oversized and overweight loads are required to obtain permits for the proposed route of travel on provincial and municipal highways around Alberta. TRAVIS has a subsystem called TRAVIS MJ that allows municipalities to approve permits in their area. The TRAVIS MJ system helps in reducing the inconsistencies and inefficiencies in regulations around the movement of oversized and overweight loads. The City of Lloydminster could specify roadways where oversized and overweight loads are permitted.

Saskatchewan

As per the Highways and Transportation Act, 1997, if a vehicle intends to go on a public road a permit is required if that vehicle exceeds the prescribed or ordered weight. The operator of the permitted vehicle is allowed to use any reasonable alternate route that is necessary to avoid an obstruction. The province of Saskatchewan does allow municipalities grant permits under section 36.1(1). The fee set by the council of the municipalities for a permit cannot exceed the amount determined by the Province.

2.1.7 Federal Acts

While the City of Lloydminster is located along a provincial boarder and must comply with the Acts from both provinces, it is important to also consider the Federal Acts as well. Two Federal Acts that provided information on dangerous goods routes or truck routes were reviewed.

Transportation of Dangerous Goods Act

The Canadian Government has the Transportation of Dangerous Goods Act, 1992 which “promotes public safety in the transportation of dangerous goods” (<https://www.tc.gc.ca/eng/acts-regulations/acts-1992c34.htm>). The document was reviewed and no specific information regarding route selection was found. Transport Canada has agreements with individual provinces and territories to administer the Federal Transportation of Dangerous Goods Act.

Railway Safety Act

The Railway Safety Act was created to ensure railways were operated safely. In reviewing the document it was found to contain no references to dangerous goods route or truck routes.

2.1.8 Key Summary Items

The two bylaws from the City of Lloydminster list different truck route networks and contain conflicting information on a segment that is a dangerous goods route but not a truck route. These discrepancies were noted by the City as causing confusion for the public as well as trucks trying to obey the laws.

The City of Lloydminster must ensure that they adhere to all Alberta and Saskatchewan Acts when establishing their dangerous goods routes and truck routes. The Provincial Acts that were reviewed and all stated that municipalities are able to make bylaws and policies about the highways that are in their jurisdiction.



2.2 Jurisdiction Review

The City of Lloydminster was seeking to understand how other comparable cities of similar size and configuration around highways identify and address their truck routes and dangerous goods routes. The jurisdiction review component of the project was used to gain an understanding of the truck and dangerous goods routes of eight different comparable cities identified by the City. The review began by searching the publicly available information on the cities' websites.

Based on population size and geographic location around major highways in Alberta and Saskatchewan, the following cities were identified by the City for review:

- Grande Prairie
- Regional Municipality of Wood Buffalo
- Medicine Hat
- Camrose
- Red Deer
- Fort Saskatchewan
- Moose Jaw
- Yorkton

2.2.1 Documents Reviewed

To initiate the jurisdiction review, a desktop study was completed by reviewing the publicly available documents from each of the cities. The focus of the review was on relevant plans, policy and bylaws that addressed or spoke to the inclusion, and or management of either truck routes or dangerous goods routes. The documents available from each city are listed below and the relevant information summarized.

Grande Prairie

Transportation Master Plan (2009)

The Transportation Master Plan (2009) (TMP) for the City of Grande Prairie included a goods movement review as part of that plan. Within the TMP the dangerous goods routes follow the existing Provincial Highway network in the city (except for Highway 760). In addition, 84 Avenue and 116 Street are also listed as dangerous goods routes due to their location around the industrial area on the west side of the city. The TMP recommends that 116 Street from 84 Avenue to the north city limits be an additional dangerous goods route because it connects the industrial areas south of 100 Avenue to the Highway 43 bypass.

The existing truck routes within the city were found to provide more coverage of the city but do not use every arterial roadway. The TMP lists 116 Street from 84 Avenue to the north city limits, and 84 Street from the south city limits to the north city limits as additional truck routes that should be added to the network. Over-dimensional vehicles were also reviewed as part of the goods movement review. The TMP notes that the City requested over-weight and over-dimensional loads use Highway 43 eastbound to 116 Street and 116 Street southbound to the City limits.

Bylaw C-1166 – The Traffic Bylaw

The Bylaw stated that any trucks and/or trucks and trailers over 11,794 kgs maximum gross weight or over 8 meters long shall use a truck route. All dangerous goods that are transported through the city of Grande Prairie must use a designated dangerous goods route. Any truck and/or truck and trailer transporting dangerous goods is not permitted to park or stop within fifteen meters of an above ground electrical transmission line.

The City of Grande Prairie Open Data Catalogue

The City of Grande Prairie has an open data catalogue that contains maps of the existing truck routes and dangerous goods routes within the city limits. Figures 2.3 and 2.4 below contain the maps of the existing truck routes and dangerous goods routes from the open data catalogue.

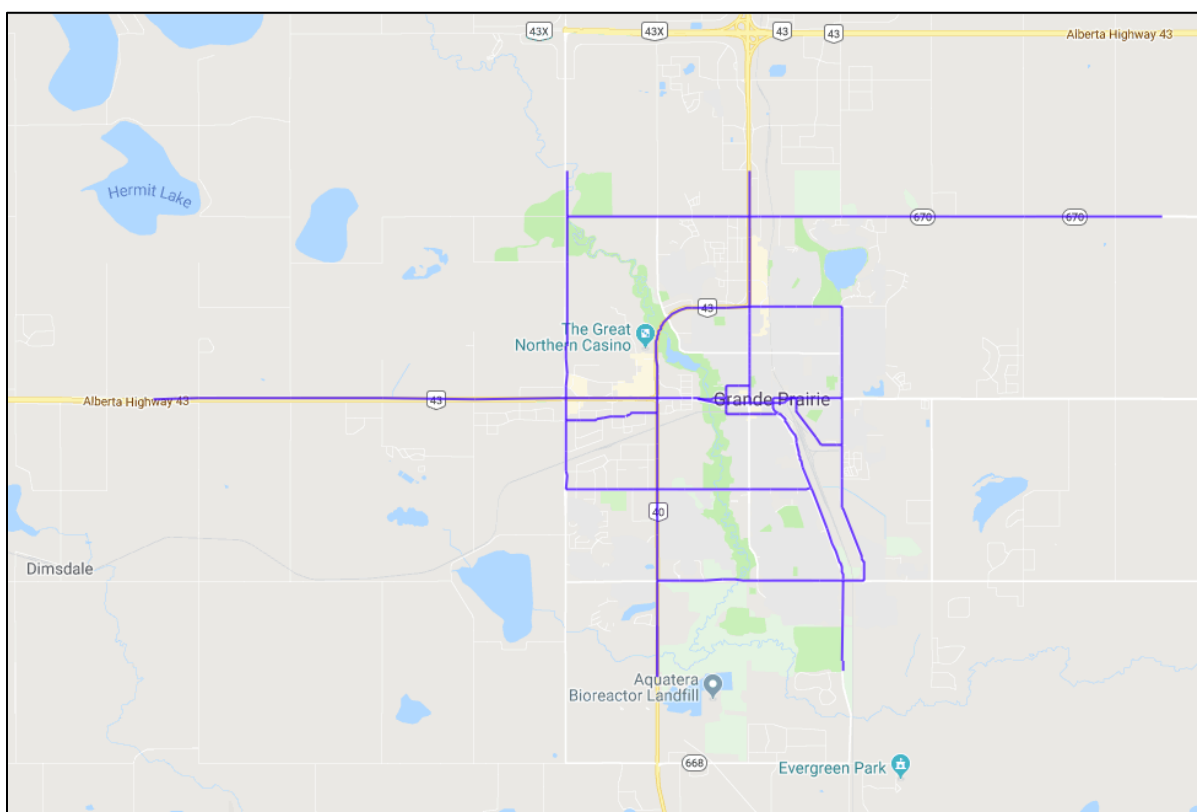


Figure 2.3: Truck Routes in Grande Prairie (from Grande Prairie Open Data Catalogue, retrieved August 2019)

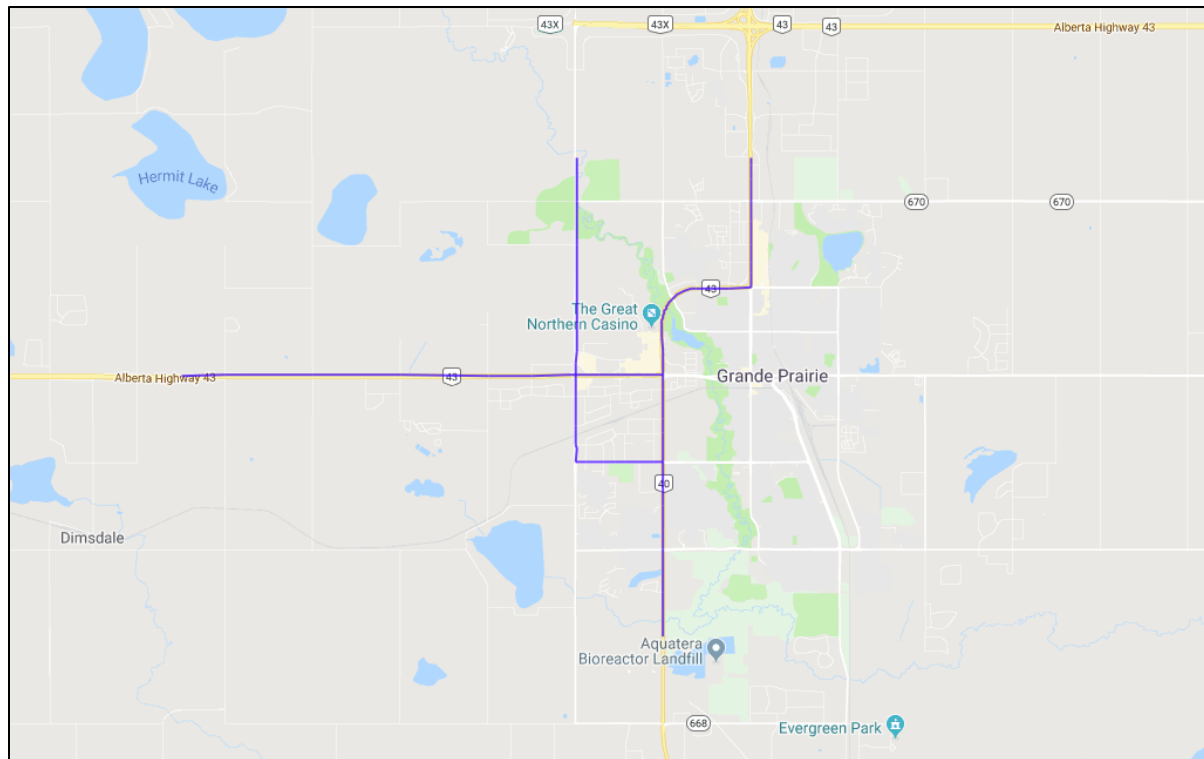


Figure 2.4: Dangerous Goods Routes in Grande Prairie (from Grande Prairie Open Data Catalogue, retrieved, August 2019)

Regional Municipality of Wood Buffalo

Regional Municipality of Wood Buffalo Roads and Transportation Bylaw

The Roads and Transportation Bylaw lists Tolen Drive from the traffic circle to King Street and King Street from Tolen Drive to Clearwater River as the dangerous goods route. Schedule 2 of the Roads and Transportation Bylaw lists all the truck routes in the Regional Municipality of Wood Buffalo. Operators are to use the most direct and practicable route between the location concerned and the nearest truck route. Permits are required for any hauling on roadways that are not listed as truck routes.

Transportation Master Plan

The Transportation Master Plan was reviewed and provided no additional information on truck routes and dangerous goods routes.

Medicine Hat

City of Medicine Hat Municipal Works Website

The City of Medicine Hat considers trucks and/or trucks and trailers over gross weight of 6,500 kgs or longer than 11 meters in length as heavy trucks, as per the website. The network of truck routes in Medicine Hat has some restricted heavy truck routes which are restricted to the hours of 07:00 to 23:00. Over dimensional loads are considered vehicles that are greater than 2.60 meters in width, 4.15 meters in height, and 23 meters in length. Medicine Hat uses TRAVIS permits for over

dimensional loads. All of this information can also be found in Bylaw 4346, the Public Roads Bylaw. Figure 2.5 below shows a map of the heavy truck routes within the City of Medicine Hat.

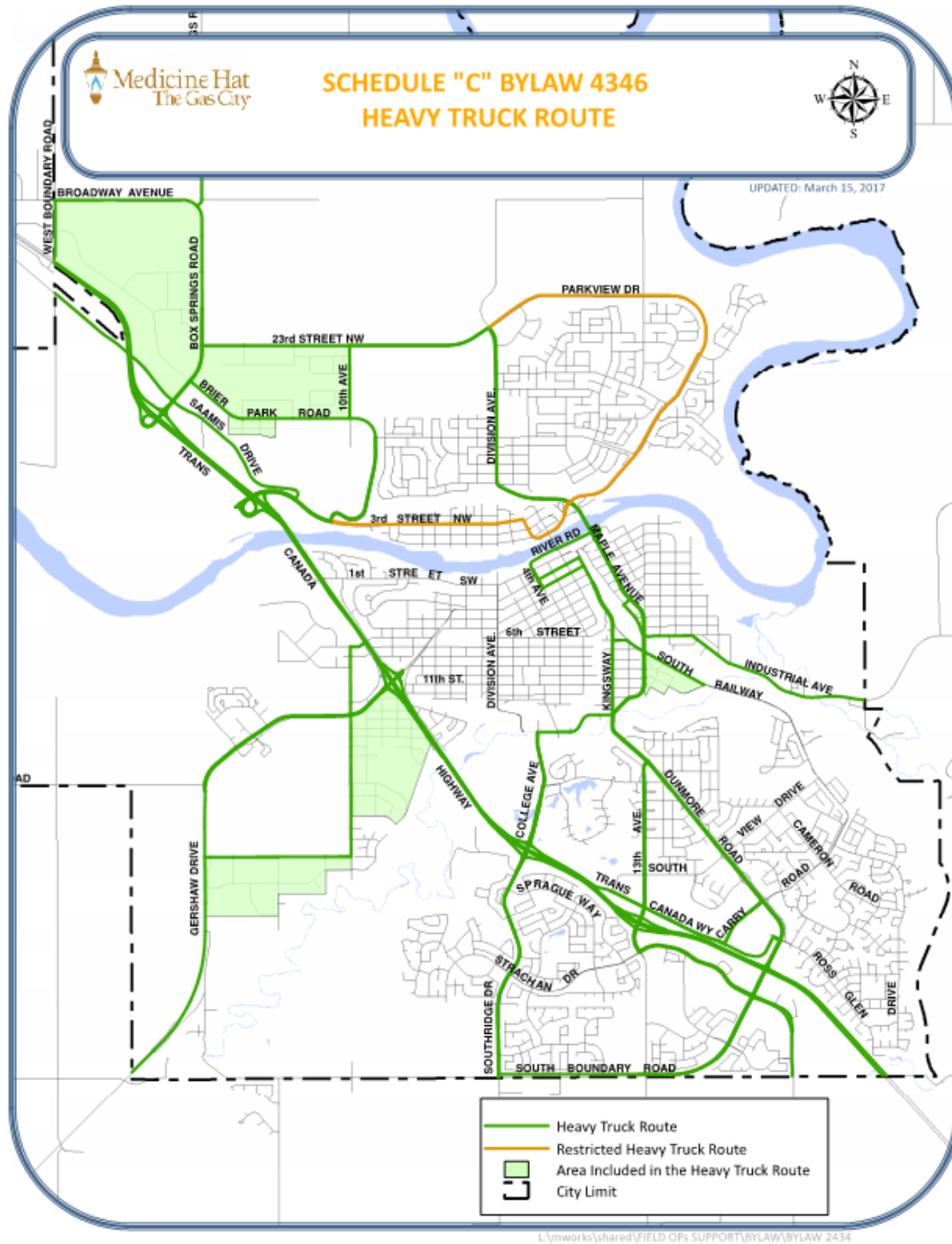


Figure 2.5: Heavy Truck Routes in Medicine Hat (from www.medicinehat.ca, updated 2017)

Bylaw 2759 – The Transportation of Dangerous Goods

This Bylaw noted that restricted dangerous goods routes can only be used if the vehicle (including trailer or other form of payload) has less than six axles, is transporting a dangerous good listed in Schedule B, and must occur between 10:00 p.m. and 7:00 a.m. the following day. Permits are required for use of roadways other than dangerous goods routes, and the Fire Chief may issue the permits. The Bylaw states that vehicles transporting dangerous goods that stop within the City must stop at a designated dangerous goods vehicle storage area.

Figure 2.6 below is the map of dangerous goods routes in Medicine Hat as per Bylaw 2759. The bylaw also contains a list of roadways that are considered dangerous goods routes. As noted in the Bylaw, if there are discrepancies between the map and the text, the text governs. In the review it was noted that the City of Medicine Hat website provided information on their dangerous goods routes in an easy to access and comprehensible manner.

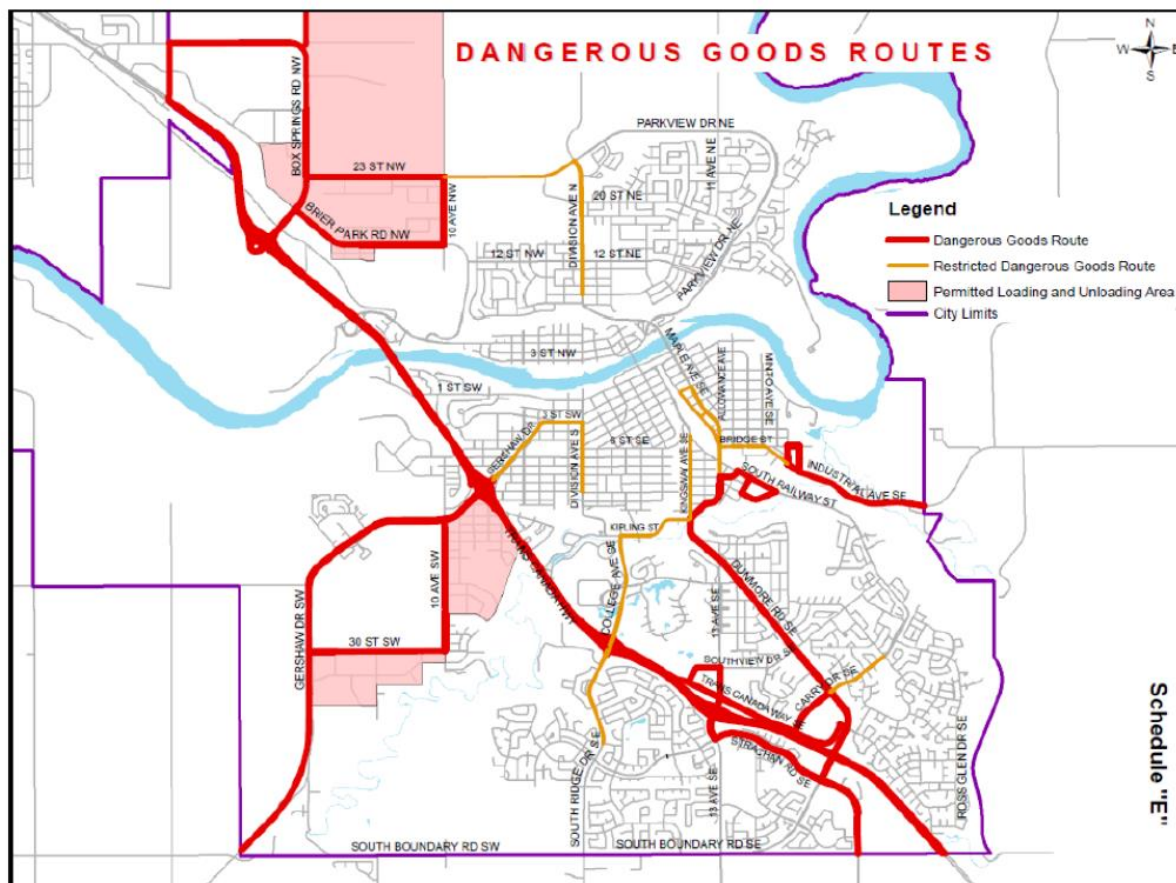


Figure 2.6: Dangerous Goods Routes in Medicine Hat (from Bylaw 2759, the Transportation of Dangerous Goods Bylaw, 2016)

Roadway Systems Master Plan Road Network Plan Update

The City of Medicine Hat Roadway Systems Master Plan Road Network Plan Update from April 2013 was reviewed and contained no relevant information.

Camrose

Bylaw 2966-17 – The Traffic Bylaw

The Traffic Bylaw defines a heavy vehicle as a truck and/or truck and trailer with a maximum gross vehicle weight of 4,500kg or longer than 10.7 meters in length. Similar to other cities with truck routes, heavy vehicles require a permit to use roads that are not designated as truck routes. The Bylaw noted that the General Manager of Infrastructure and Planning may issue off-route permits. If the deliveries are to a residential area, they should be done between the hours of 7:00 a.m. and 11:00 p.m. Bylaw 2966-17 noted that overweight vehicles are to only use 48 Avenue (Highway 13), 68 Street and Camrose Drive (Provincial Highway 13A) or the Camrose Industrial Zone within the City and are required to obtain an overweight permit from the City. The General Manager of Infrastructure and Planning may issue overweight permits. The Bylaw separates over dimensioned vehicles into over-width and over-height/over-length categories and describes what roads each category can use. Over-width vehicles can use 48 Avenue (Provincial Highway 13) or within the Camrose Industrial Zone. Over-height/over-length vehicles shall use 68 Street and Camrose Drive (Provincial Highway 13A) or within the Camrose Industrial Zone. Figure 2.7 below shows a map of the City of Camrose Truck Routes.

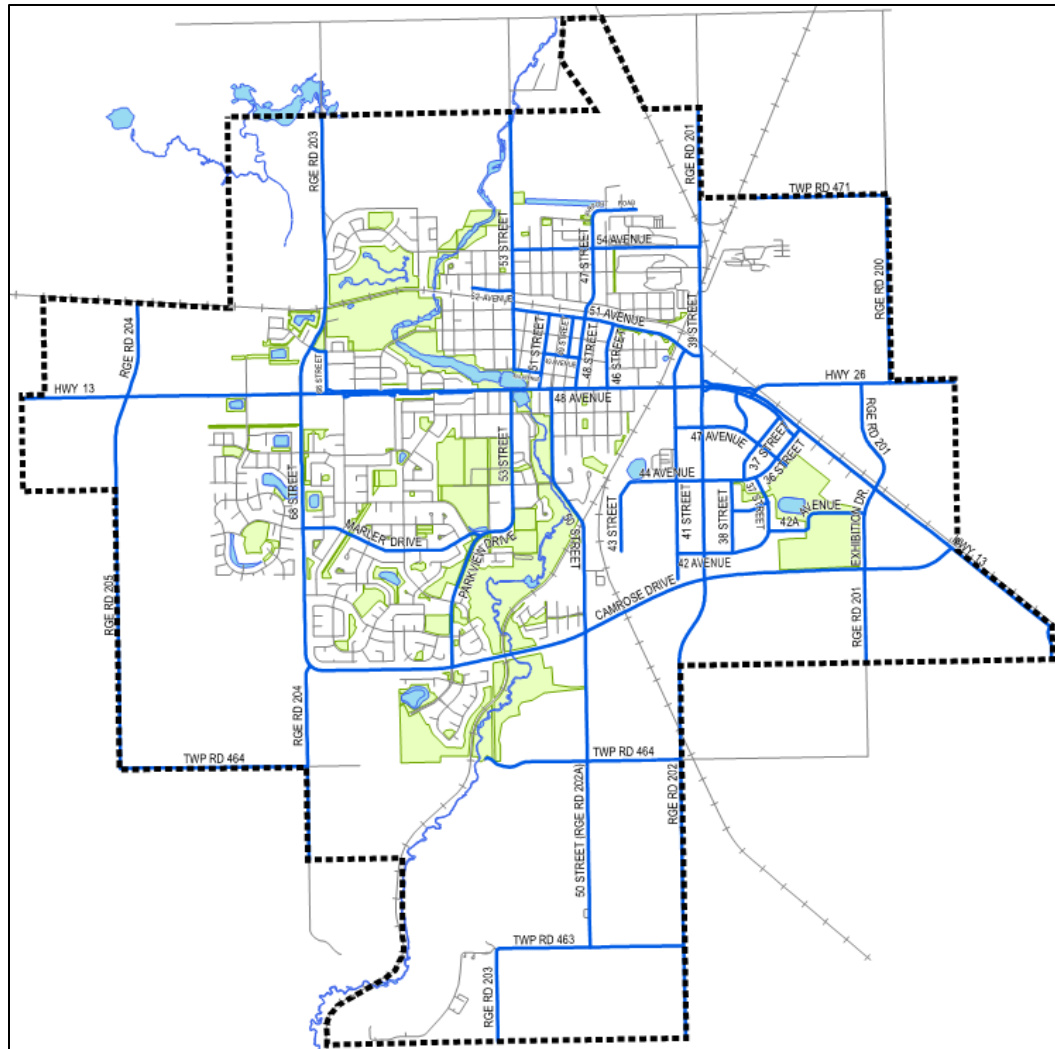


Figure 2.7: City of Camrose Truck Routes (from the City of Camrose Truck Route Map, January 30, 2014)

Bylaw 2963-17 – Dangerous Goods Bylaw

The City of Camrose also has Bylaw 2963-17, their Dangerous Goods Bylaw. This Bylaw notes the Camrose Fire Department as the issuing party for off route permits for dangerous goods transportation. One of the policies listed in the Bylaw is that no vehicles with a length of more than 19.8 meters is permitted to unload dangerous goods at a service station. Figure 2.8 below is a map of the City of Camrose Dangerous Goods Routes.

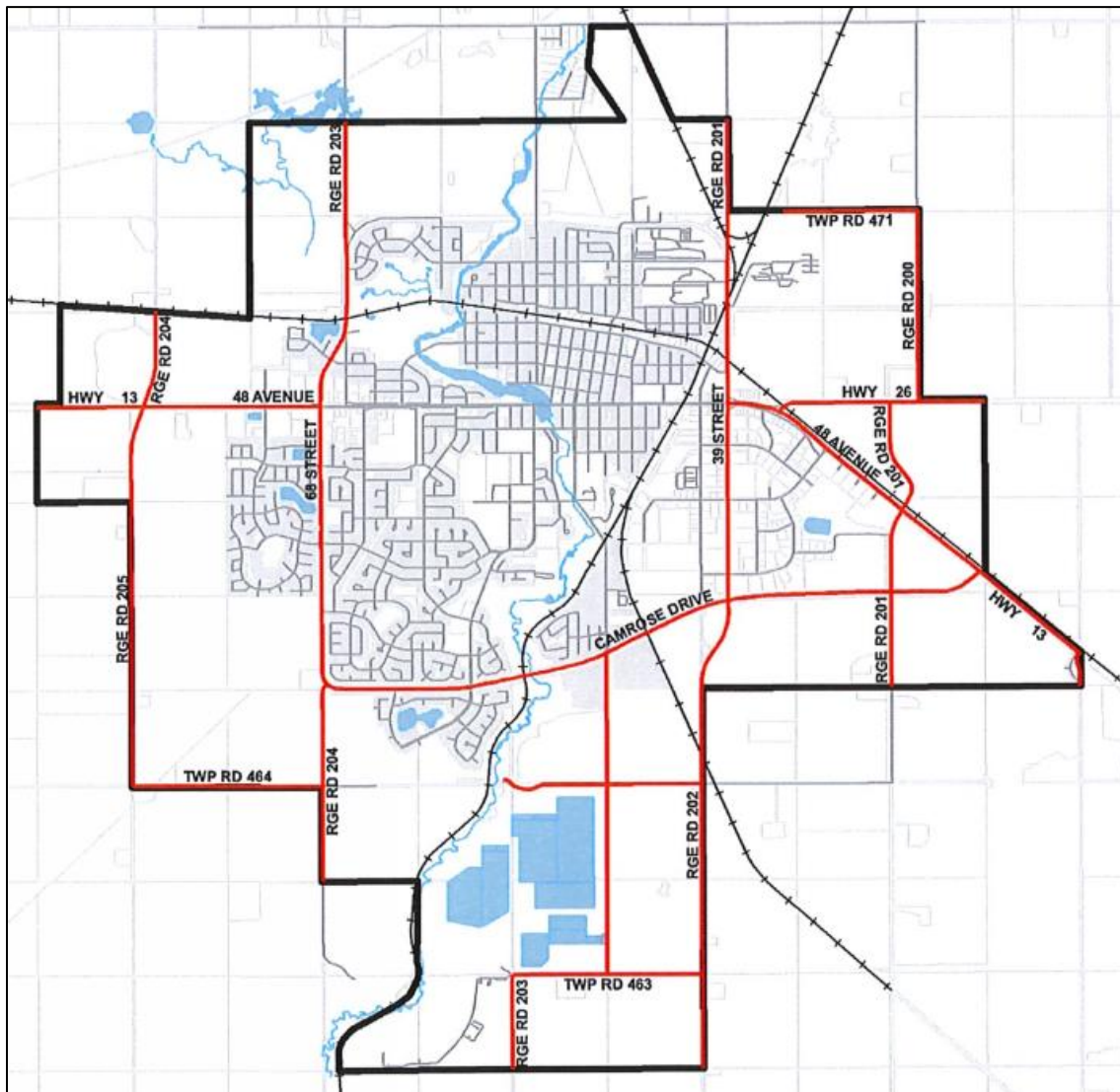


Figure 2.8: City of Camrose Dangerous Goods Routes (from Schedule A of the Dangerous Goods Bylaw, 2018)



Red Deer

Bylaw 3186/97 – Traffic Bylaw

The City of Red Deer established Bylaw 3186/97, the Traffic Bylaw, which defines a heavy vehicle as a truck and/or truck and trailer with or without a load that has more than 2 axils, is longer than 11 meters long, or has a licensed gross weight of 7,500kg. Additionally, oversized loads or oversized vehicles are defined as trucks and/or trucks and trailers that are over the dimensions specified in the Alberta Traffic Safety Act or exceeds a length of 23 meters, height of 4.15 m and a width of 2.6 meters. The City of Red Deer has a high and wide load corridor which vehicles exceeding 27.7 meters in length, 5.4 meters in height, 4.45 meters in width, and 90,000kg in weight must use. The City Engineer may issue a move approval permit to change the route of oversized vehicles to a roadway other than the high and wide corridor, provided that the move can be made safely and does not damage any municipal infrastructure.

Trucks are to use the specified truck routes within the City unless they fall under the exemptions in section 64 and 66 of the Traffic Bylaw. Figure 2.9 below is a map of the truck routes in the City of Red Deer.

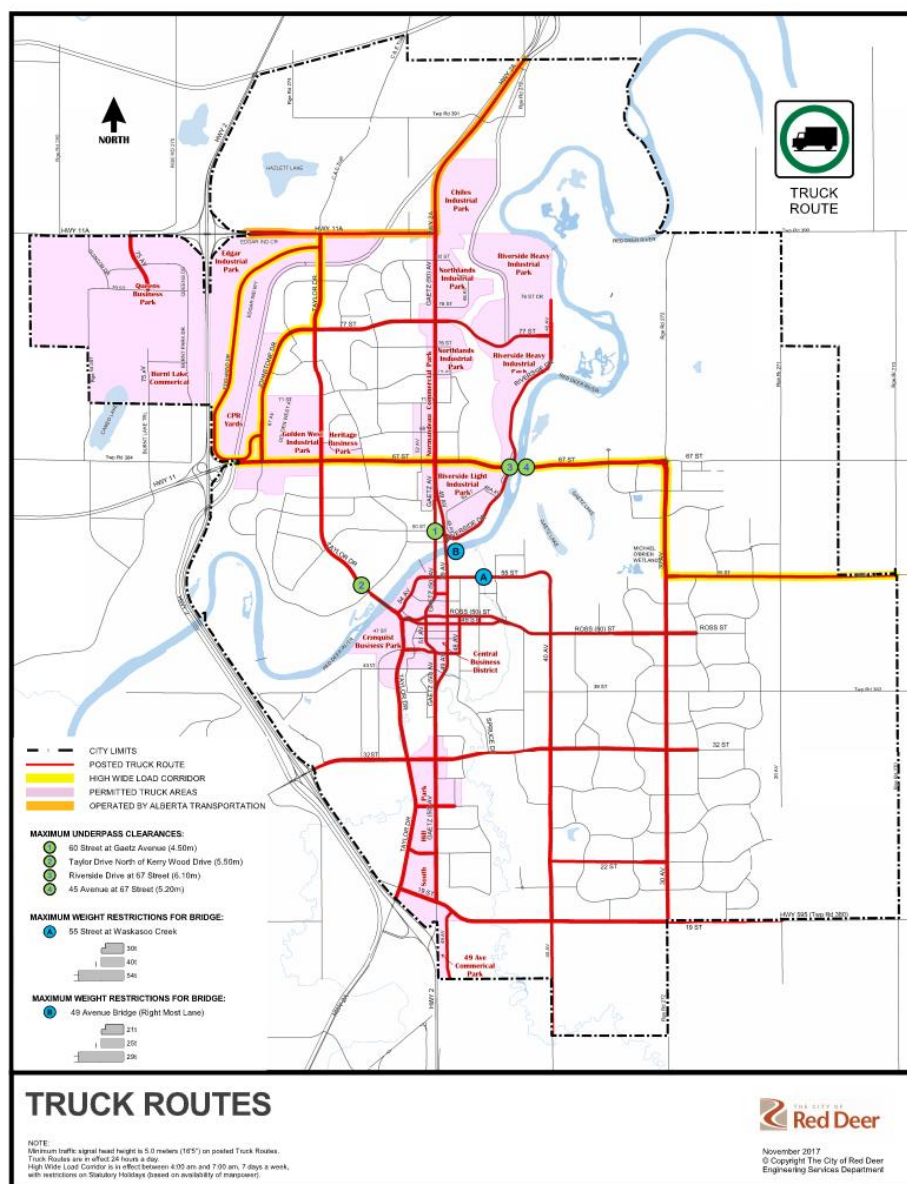


Figure 2.9: Truck Routes in the City of Red Deer (from www.reddeer.ca, updated November 2017)

Bylaw 3152/95 – Dangerous Goods Route Bylaw

The City of Red Deer also has Bylaw 3152/95 the Dangerous Goods Route Bylaw. Similar to other cities, all dangerous goods must be transported on designated dangerous goods routes and the Fire Chief may issue off-route permits as required. The City has identified “supplemental routes” within the City that are local access routes where an off-route permit is not required, but there is no parking or stopping along the supplemental routes. If dangerous goods are passing through the City the truck and/or truck and trailer are to use the shortest path from entering to exiting the City while staying on a designated route. Vehicles transporting dangerous goods are only to stop at permitted storage locations within the City, and if a repair is required and the vehicle is unable to stop or park at a

storage location a permit is required from the Emergency Services Department which authorizes the repair of the vehicle at the specific location. Figure 2.10 below is a map of the Dangerous Goods Routes and Supplemental Routes in the City of Red Deer.

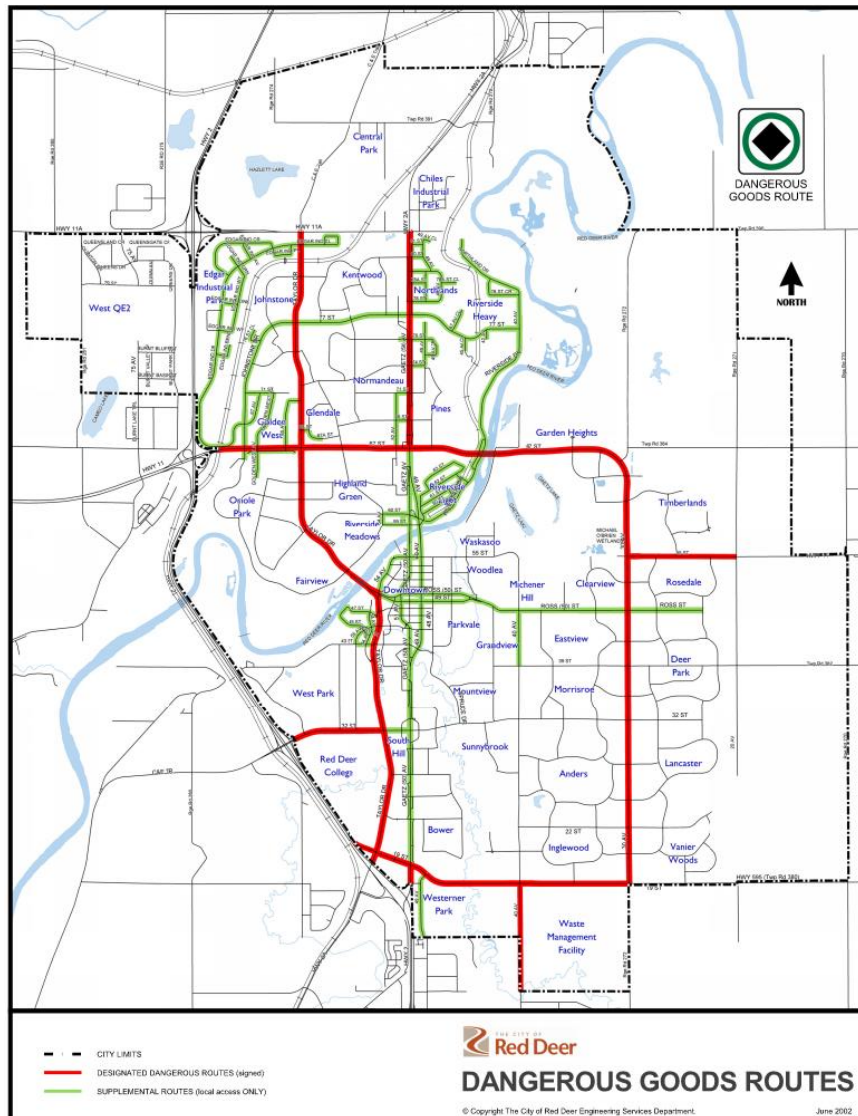


Figure 2.10: City of Red Deer Dangerous Goods Routes (from www.reddeer.ca, updated June 2002)

Fort Saskatchewan

Bylaw C7-08 – Dangerous Goods Bylaw

Bylaw C7-08, the Dangerous Goods Bylaw stated that all transportation of dangerous goods shall be on a designated Dangerous Goods Route. Off-route permits are authorized by the Director of Protective Services and are required before the goods can be transported on non-designated roadways. Additionally, the Bylaw noted that trucks and/or trucks and trailers are only allowed to stop at designated vehicle storage locations.

Bylaw C4-09 – Traffic Bylaw

The City of Fort Saskatchewan's Traffic Bylaw C4-09 noted that the City Manager has the authority to "designate Highways as dangerous goods routes, prohibited dangerous goods routes, Truck Routes, or snow routes or any combination thereof," (p.35). All highways which have been designated as truck routes can be found in Schedule B of the Bylaw. Schedule B shows Highway 21 and Highway 15 as the designated truck routes within the City.

Transportation Master Plan

The May 2018 Transportation Master Plan for the City of Fort Saskatchewan was reviewed, and no additional information was found on the dangerous goods routes or truck routes.

Moose Jaw

Bylaw 5556 – Traffic Bylaw

The City of Moose Jaw passed Bylaw 5556, the Traffic Bylaw, in 2018. The Bylaw contains maps of the truck routes and dangerous goods routes in and around the City. As per the Bylaw, trucks and/or trucks and trailers are to stay on the designated truck and/or dangerous goods routes. If there is a closure to any of the truck or dangerous goods routes, the City Engineer is authorized to provide an alternate route.

City of Moose Jaw Heavy Truck Route and Dangerous Goods Route Pamphlet

Through background research a supplementary document, an informational pamphlet, was found which highlight key bylaws such as the Heavy Vehicle Bylaw and the Dangerous Goods Route Bylaw. The pamphlet provides easy to follow information from both the Dangerous Goods Bylaw and the Heavy Vehicle Bylaw. The pamphlet describes a heavy vehicle as a truck and/or truck and trailer that weights 9,000 kg or more and is longer than 10 meters in length. The last comment from the Dangerous Goods Bylaw on the pamphlet is that no dangerous goods shall be transported into the central business district without the permission of the Fire Chief. The City of Moose Jaw was contacted to obtain a copy of the Heavy Vehicle Bylaw and stated that the Heavy Vehicle Bylaw was rendered obsolete when the most recent Traffic Bylaw was released.

City of Moose Jaw Maps Webpage

Figure 2.11 below shows the map of the truck routes, dangerous goods routes, and pickup & delivery routes. The map was obtained from the maps section of the City of Moose Jaw's website.

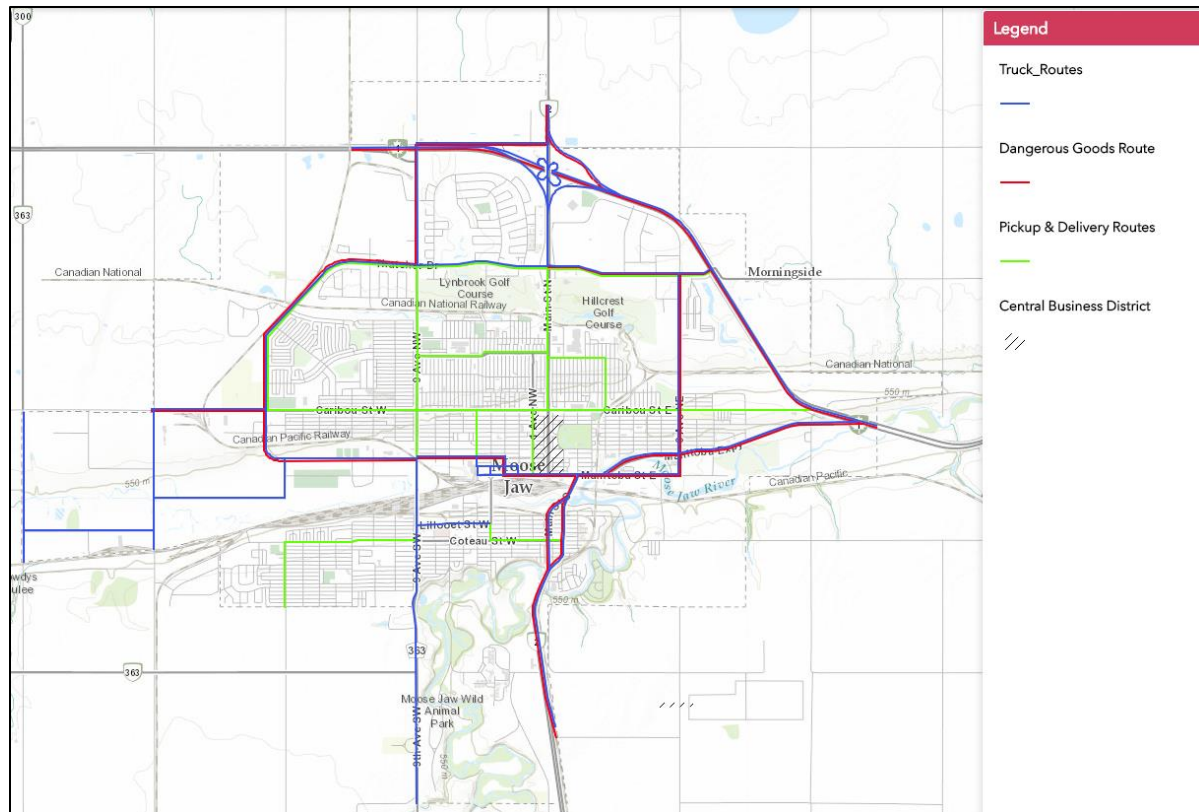


Figure 2.11: Truck Routes and Dangerous Goods Routes in Moose Jaw
(from www.citymj.arcgis.com, retrieved August 2019)

Yorkton

Bylaw 18/2016 – The Traffic Bylaw

Yorkton's Traffic Bylaw, Bylaw18/2016 noted the following about truck routes and dangerous goods routes. Any vehicles that are transporting dangerous goods and require a placard are not allowed to use the heavy vehicle training and testing routes (Gladstone Avenue and Smith Street). Any vehicles that are displaying a "Dangerous Goods" placard are not allowed to park within 150 meters of any residence, school, or public hall except for if they are loading or unloading. Figure 2.12 below is a map of the heavy goods routes and dangerous goods routes in the City of Yorkton.

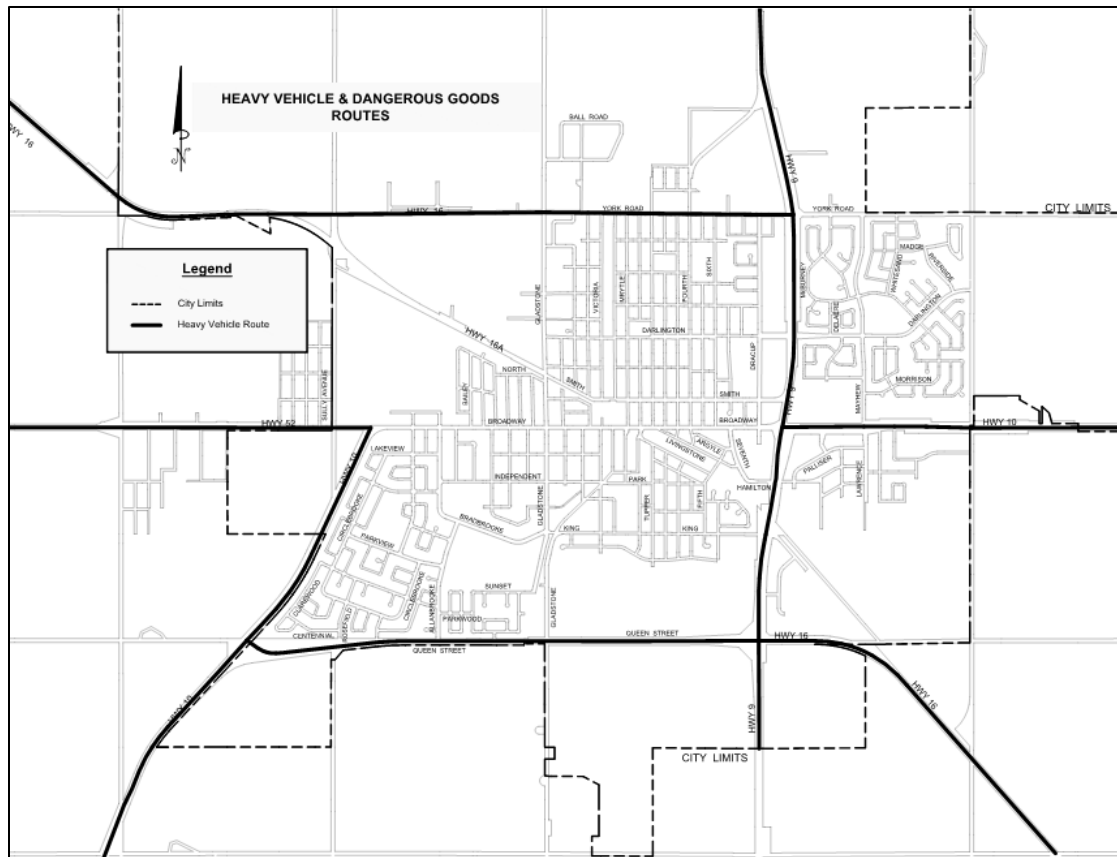


Figure 2.12: Heavy Vehicle and Dangerous Goods Routes in Yorkton (form Bylaw 18/2016, Traffic Bylaw, 2016)

The City of Yorkton considers oversized vehicles as vehicles, including the load, that exceed 2.9 meters in width, 4.5 meters in height, and the following lengths depending on the vehicle:

- 12.5 meters for a truck or single vehicle
- 23 meters for a tractor and semi-trailer or any other combination of vehicles
- 25 meters for an A train, B train, or C train.

An oversized load transport permit is required for oversized vehicles to operate on any street.

Transportation Master Plan Update

The City of Yorkton Transportation Master Plan Update (TMP Update) was also reviewed. A background review was completed as part of the TMP Update and noted that the provincial highways and secondary highways in Yorkton are listed as Dangerous Goods Routes. The TMP Update recommended maintaining the highways as the dangerous goods routes in the short term because there is no ring road system in Yorkton as alternative routes. However, the TMP Update does recommend making changes to the dangerous goods routes in the long term as other potential routes are constructed. Specifically, the TMP Update mentioned the West Truck By-Pass and upgrading Grain Millers Drive as potential improvements that could change the dangerous goods routes and truck routes network.



2.2.2 Cities Contacted

Based off the results of the desktop study, information available and established contacts, seven of the eight cities were contacted for more information on their processes and procedures used when establishing dangerous goods routes and truck routes. Of the seven cities three provided additional information. Below are the summaries of the discussions with each City.

Grande Prairie

The City of Grande Prairie established their dangerous goods routes based off discussions with stakeholders. The Fire Department and the local trucking association were the two stakeholder that the City met with. One of the main concerns for the Fire Department was the stopping and parking of dangerous goods vehicles. The Fire Department wanted to ensure that if an emergency occurred while the vehicle was stopped or parked that the response times would be appropriate. The response times played a role in determining where the storage locations would be for vehicles transporting dangerous goods. The trucking association was concerned about access for trucks to destinations and washrooms. Agreements were made between the City and the stakeholders as to where the truck routes would be. No formal criteria or factors were considered as part of the discussions.

Currently the Province of Alberta is building a bypass around the City of Grande Prairie which will allow trucks and dangerous goods to be routed around the City. As there are destinations in Grande Prairie that require dangerous goods there is still a need for dangerous goods routes within the City. However, the City is in the process of amending their bylaws to reflect the addition of the bypass as a truck and dangerous goods route.

Red Deer

The dangerous goods routes have been the historic highway truck routes within the City of Red Deer for many years. The additional routes have generally been arterial roadways with no residential frontage and there have been no recent request to change the routes. In the future if additional roadways are added to the network the dangerous goods routes and truck routes would potentially be reviewed.

Yorkton

The City of Yorkton provided information about the processes and procedures in place for dangerous goods routes and truck routes. Similar to other cities the highways are the truck routes and dangerous goods routes that have been in place for a long time and the City has not changed any of their truck routes and dangerous goods routes recently.

Unique to Yorkton is a designated truck driver training route which is one roadway in the City (Gladstone Avenue which turns into Smith Street) that has a maximum weight limit of 34,500kg and cannot be used by dangerous goods.

The City of Yorkton has recently appointed a Chief Safety Officer (CSO) who is responsible for the enforcement of dangerous goods routes and truck routes. Some feedback that the City of Yorkton received continuously was that the routes were difficult to enforce, and this was largely due to a lack of signage along the routes. The City is now updating the signage along routes to reduce trucks driving on non-designated roadways. The City of Yorkton has decided to focus on the signage on truck routes and dangerous goods routes to help with enforcement because they do not have the staff

to put a permit system in place for off-route roadway usage. By having the proper signage the CSO will be able to give tickets to trucks that are not on the proper roadways.

There is a canola crushing plant located within the City of Yorkton and one just outside the city limits. The two plants are a destination for a lot of truck traffic within the City. Due to the large amount of agricultural land surrounding Yorkton, a large amount of agricultural goods are transported to and through the City to the canola crushing plants. In 2018 the Yorkton Regional Transportation Study for the City of Yorkton, Ministry of Highways and Infrastructure, RM of Orkney, and the RM of Wallace found Yorkton had more traffic stopping within the City as opposed to traffic passing through. This indicated that in the medium to long term a by-pass may be needed. Even though Yorkton is situated along Highway 16, the percent of traffic passing through was smaller than the traffic within the City.

2.2.3 Summary

This jurisdiction review of six cities in Alberta and two in Saskatchewan was completed to help the City of Lloydminster understand how other cities of similar size with bisecting highways identify and address dangerous goods routes and truck routes. The jurisdiction review also provides the City of Lloydminster with guidance on possible options and alternatives that could be used for the truck routes and dangerous goods routes within the transportation network. The initial steps were to obtain any publicly available documents from the websites of the eight cities and review them for relevant information. The documents obtained included bylaws, transportation master plans, and maps. Once a base understanding was established for each of the cities, seven of the cities were contacted for specific information on the processes and procedures used to establish dangerous goods routes and truck routes.

The review noted that each municipality follows the appropriate provincial acts but have the flexibility to create truck routes, dangerous goods routes and bylaws that provide specific restrictions and guidelines that best fit the City's needs. During the information review, some similarities were observed between the cities; however these similarities were not common to all eight cities. The similarities included highways being designated as dangerous goods routes, the use of off-route permits, and the requirement that deliveries and pickups use the shortest route to and from the designated routes. The review also noted that there were differences between the operation of truck routes and dangerous goods routes within the cities. Below is a list of the main differences found among the cities:

- The person, and or position, designed to authorize an off-route permit
- The description of a heavy vehicle that is required to use a truck route
- The dimensions used to classify an oversized load
- The use of restrictions on truck routes (such as time of day restrictions)
- The use of designated storage areas
- The use of designated industrial areas where all roads are truck routes

2.2.4 Possible Applications for the City of Lloydminster

Off Route Permitting

Most of the cities reviewed use a permitting system for vehicles that are not going to be using the designated routes. While it was noted that from the review the larger cities authorized permits with administrative staff and smaller cities often listed the Fire Chief as the person responsible for



approving permits, it is also noted that the staffing size for each city is unique to the designation of responsibility is likely due to the availability of resources. It is also noted that each City sought to provide balance of having enough designated dangerous goods routes and truck routes to service the required areas while not designating every major roadway as a route. It is further noted that having fewer designated routes can lead to more off-route permits being requested and therefore strategic routes should be considered for designation as truck routes and dangerous goods routes based on frequency of trucks, adjacent land use and other factors.

Creation of Industrial Areas

It was noted that Camrose has created a boundary for an industrial area where all roads within the area are designated as truck routes. This allows operators to use the most convenient route while following the designated routes and bylaws. As the City of Lloydminster also has a large industrial sector in the northwest portion of the City the application of this strategy could create a similar industrial area as Camrose.

Time Specific Restrictions

Medicine Hat restricts trucks and/or trucks and trailers on routes that branch off from the Trans-Canada Highway into residential and mixed-use areas to between 7:00 and 23:00. While the City of Lloydminster does not have many truck routes that go through residential areas, but the application of time of day restrictions may reduce truck traffic in key areas.

Vehicle Dimension Characteristics

Each of the eight cities that was reviewed used a different weight and length to define a truck that is required to use a truck route. This lack of consistency in vehicle dimension characteristics indicates that the City of Lloydminster may assign the weight and length values that define which vehicles must use truck routes based on the structure of their roadways and any other locally relevant criteria.

2.3 Current Conditions Review

This section profiles current trucking patterns in and through the City of Lloydminster and was completed by David Kriger Consultants Inc. (DKCI). These patterns aided in the establishment of truck routes and dangerous goods (DG) routes in the city. Population and economic growth trends, which influence the demand for trucking, are also described.

Sources

Several sources of data were secured and used for this analysis. These are:

- Census of Canada population trends.
- Gross domestic product (GDP) trends by economic sector, from Statistics Canada.
- City of Lloydminster Traffic Volume Report, providing intersection and mid-block counts at several locations in the city.
- Saskatchewan Ministry of Highways and Infrastructure (MHI) truck origin-destination surveys, taken at the Marshall weigh station on Highway 16, just east of the city.

The use of these sources is described in the ensuing sections.

2.3.1 Population and Economic Trends

Population Trends

Population and economic activity (GDP) are key determinants of the demand for travel, for both the movement of people and the movement of goods. Table 2.1 compares the populations for the City of Lloydminster with those of Alberta and Saskatchewan.

Table 2.1: Population Trends, 1996 – 2016

	Lloydminster (City)			Alberta			Saskatchewan		
Census year	Population	5-yr growth	CAGR, 1996-2016	Population	5-yr growth	CAGR, 1996-2016	Population	5-yr growth	CAGR, 1996-2016
1996	18,953			2,696,826			990,237		
2001	20,988	10.7%		2,974,807	10.3%		978,933	-1.1%	
2006	24,028	14.5%		3,290,350	10.6%		968,157	-1.1%	
2011	27,804	15.7%		3,645,257	10.8%		1,033,381	6.7%	
2016	31,410	13.0%	2.6%	4,067,175	11.6%	2.1%	1,098,352	6.3%	0.5%

Source: Census of Population, Statistics Canada (various years). Consultant's tabulations.

The comparisons are based on the Canadian Censuses of Population through the 20-year period between 1996 and 2016. Key points to note:

- Lloydminster has been growing much faster than the two provinces as a whole. The city's compound annual growth rate (CAGR) is 2.6%, compared with 2.1% for Alberta and 0.5% for Saskatchewan. This reflects the City's role in oil and gas as well as its importance as a regional trade centre.
- Lloydminster's growth has been especially pronounced since 2001, achieving a 15.7% growth between 2006 and 2011, although growth has tapered off slightly in the five years to 2016 (13.0%).
- Lloydminster's growth is expected to continue. Table 2.2 summarizes City population forecasts through 2036. Extrapolating the 2.6% CAGR yields projections of future population of 44,750 by 2030 and 50,750 by 2035. Both projections are greater than those estimated in the City's 2013 Comprehensive Growth Strategy's medium growth scenario and slightly greater than the high growth scenario. The two projections are lower than those cited in 2016 Transportation Master Plan (TMP), noting that the figures cited in the TMP include the surrounding populations as well. The key point is that Lloydminster's population is expected to continue to grow and is consistent with other recent projections.

Table 2.2: Population forecasts

Horizon year	2013 Growth Study (Table 6) – medium scenario	2016 TMP Population (City + Region)	CAGR, 1996-2016
2020		38,000	34,749
2021	35,750		35,638
2025		44,000	39,427
2026	39,742		40,436
2030			44,734
2031	43,643		45,879
2035		56,000	50,756
2036	47,477		52,054

Sources: The City of Lloydminster, 2013 *Comprehensive Growth Strategy* and 2016 *Transportation Master Plan*, and consultant's tabulations using Census growth trends.

1. The data for Lloydminster include only the populations of City residents. Given the focus of this study on the City proper, populations in the surrounding counties and Rural Municipalities are not included.
2. It should be noted that although the consultant's projections summarized in Table 2.2 account for more recent observations (2016), those prepared for the 2013 *Comprehensive Growth Strategy* and the 2016 TMP have a much more comprehensive basis and also reflect City policy. The consultant's Table 2.2 projections are illustrative only for the purposes of this analysis.

Economic Trends

Gross domestic product is measure of economic output. GDP data are available only at the provincial level. Nonetheless some trends can be inferred for Lloydminster. Figure 2.13 shows the evolution of the two provincial economies between 1997 and 2018 – a similar period as that depicted by the Census populations in the previous section. Figure 2.14 and Figure 2.15 show the breakdown by sector for the two provinces.

Key points to note:

- Alberta's economy is much larger than that of Saskatchewan, and historically has seen faster growth rates. Following the recent dips (Alberta) and plateauing (Saskatchewan) evidenced in recent years, both economies appear to be growing again.
- Mining and oil & gas sector and services have been the dominant sectors in the two provinces. In the late 1990s, both sectors had approximately equal GDPs in each province. Since then, although both sectors have grown overall, the economic value of the services sector is now much greater than that of mining and oil & gas.
- The public service sector is next-most important in the two provinces and has grown steadily over the 21-year period.
- The other sectors (agriculture, construction and manufacturing) have exhibited varying growth rates.

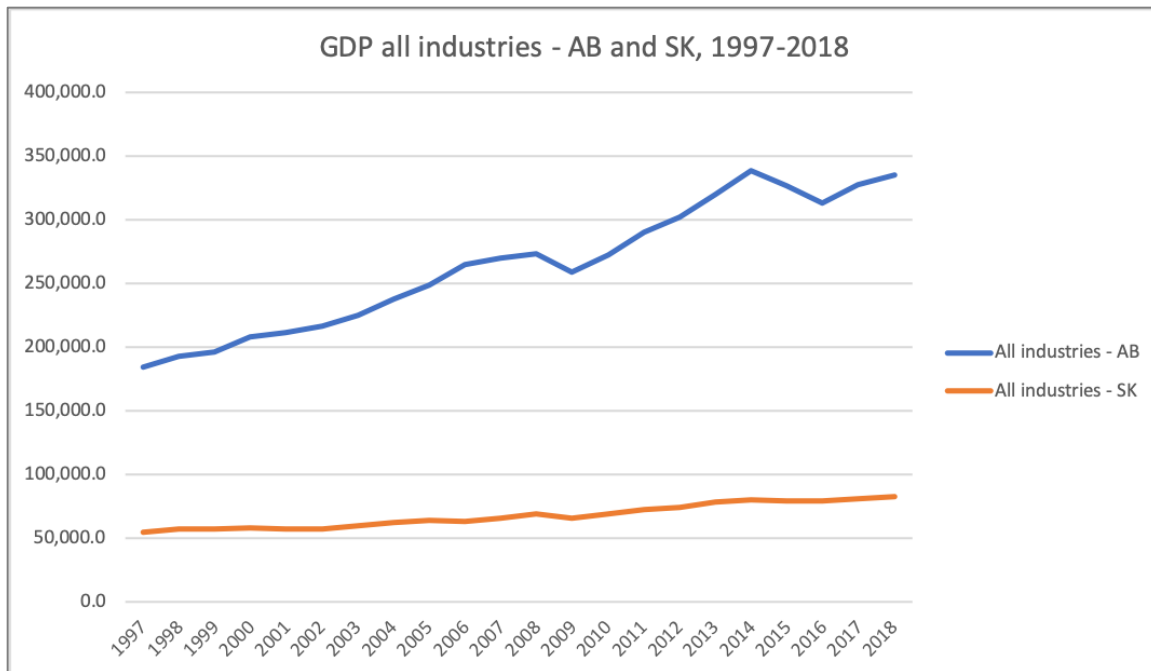


Figure 2.13: GDP all industries – Alberta and Saskatchewan, 1997-2018

Source: Saskatchewan's Dashboard – Gross Domestic Product, adapted from Statistics Canada, Table 36-10-0402-01 (Gross domestic product at basic prices).

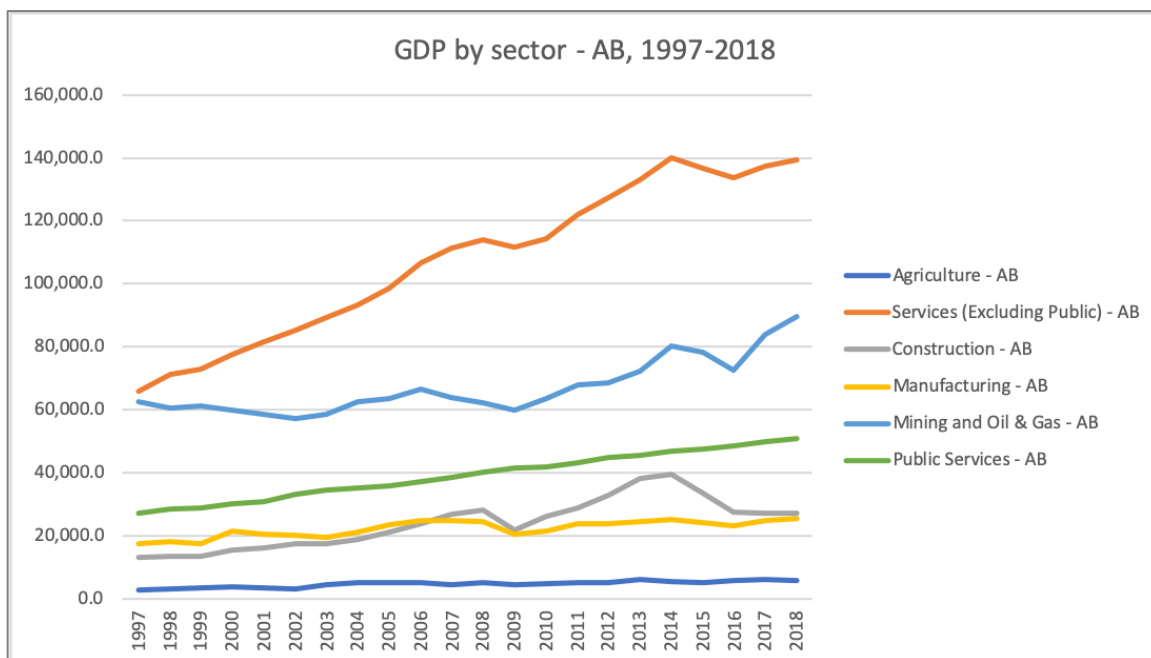


Figure 2.14: GDP by sector – Alberta, 1997-2018

Source: Saskatchewan's Dashboard – Gross Domestic Product, adapted from Statistics Canada, Table 36-10-0402-01 (Gross domestic product at basic prices).

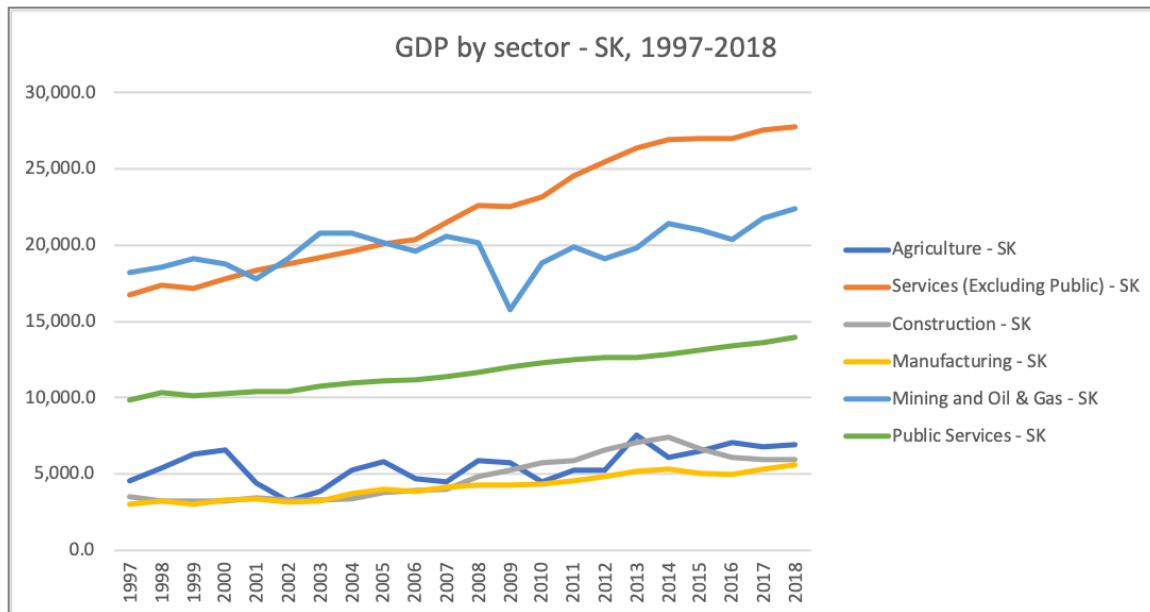


Figure 2.15: GDP by sector – Saskatchewan, 1997-2018

Source: Saskatchewan's Dashboard – Gross Domestic Product, adapted from Statistics Canada, Table 36-10-0402-01 (Gross domestic product at basic prices).

For Lloydminster, these trends suggest that the city's key industries, especially oil and gas, will continue to grow as will the associated trucking and DG activity. The city's services sector can also be expected to grow, which will also demonstrate further demands for trucking (e.g., for consumer goods) and related DG activity (e.g., fuel as gasoline stations). The city's other sectors (e.g., construction) will continue to grow as the first two grow, and Lloydminster will continue to serve as an important centre for nearby agricultural activity.

Truck Volumes

This section profiles truck volumes in Lloydminster. The purpose is to identify locations where there are high volumes of truck activity. Table 2.3 lists the volumes of medium-sized trucks (i.e., single units) and articulated trucks (i.e., tractors with one or more trailers) at several intersections throughout the city. The volumes are drawn from the City's 2018 turning movement count program, which covered all these intersections. The volumes represent the sum of all medium-sized trucks and articulated trucks entering (and exiting) the intersection from (to) all directions and for all movements (straight, left turn and right turn). The Table also shows the proportions that these trucks comprise of total traffic. Considering both the volume of truck traffic and the proportion it represents of total traffic can offer an important perspective on the relative importance of each intersection and route as a trucking route. It should also be noted that the vehicle types cannot distinguish according to the type of load being carried – hence vehicles carrying dangerous goods cannot be isolated.

Table 2.3 shows maximum, minimum and average values for the volumes and proportions. The orange-coloured cells depict the intersections where the maximum volumes and proportions occur. The green-coloured cells depict the intersections where the minimum volumes and proportions occur. Tan-coloured cells show intersections where the volumes exceed twice the average values: This is meant to provide an approximate indication of busy intersections (i.e., the 2x threshold is intended as a practical indicator, not as a statistically significant value). For the proportions, 5.0% was used as a reasonable minimum threshold. The Table also shows the proportion of articulated trucks to medium trucks at each intersection.

Key points to note:

- 44 Street (Highway 16) has the highest volumes and proportions of articulated traffic, consistent with its role as a key route for long-distance and through traffic entering and exiting the city via Highway 16.
- 52 Street and 67 Street also have high volumes of articulated and medium trucks, which also represent high proportions of the overall traffic mix.
- On average, medium trucks make up relatively small proportions of the traffic mix (2.5%) while articulated trucks have a slightly higher proportion (3.0%). Some intersections carry little or no vehicles of each type. The highest proportion of medium trucks occurs at 67 Street and 40 Avenue, at 10.9%. The highest proportion of articulated trucks occurs at 52 Street and 40 Avenue, at 9.0%.
- On average, articulated truck volumes are 20% greater than medium truck volumes.

These observations are drawn from the available provincial data. They do not constitute City economic development policy or forecasts. They are presented here only to provide a context for future growth in trucking and DG activity.

Table 2.3: Truck Volumes at Selected Intersections, 2018

Location A	Location B	Mediums	Medium %	Articulated	Articulated %	Articulated/Medium
12 St	40 Ave	84	2.9%	120	4.2%	1.43
12 St	50 Ave	130	2.7%	153	3.2%	1.18
12 St	59 Ave	48	1.3%	49	1.3%	1.02
12 St	75 Ave	85	2.3%	69	1.9%	0.81
25 St	50 Ave	122	1.3%	53	0.6%	0.43
25 St	57a Ave	73	1.6%	11	0.2%	0.15
25 St	59 Ave	113	1.7%	38	0.6%	0.34
29 St	50 Ave	91	1.2%	22	0.3%	0.24
29 St	59 Ave	109	1.6%	63	0.9%	0.58
35 St	65 Ave	37	2.1%	2	0.1%	0.05
36 St	40 Ave	120	4.2%	65	2.3%	0.54
36 St	47 Ave	72	1.7%	7	0.2%	0.10
36 St	49 Ave	80	1.5%	4	0.1%	0.05
36 St	50 Ave	107	1.0%	28	0.3%	0.26
36 St	51 Ave	66	1.4%	3	0.1%	0.05
36 St	52 Ave	84	1.3%	2	0.0%	0.02
36 St	57 Ave	138	2.0%	4	0.1%	0.03
36 St	59 Ave	174	1.7%	25	0.2%	0.14

Location A	Location B	Mediums	Medium %	Articulated	Articulated %	Articulated/Medium
36 St	65 Ave	61	1.4%	0	0.0%	0.00
41 St	50 Ave	109	1.7%	24	0.4%	0.22
44 St	40 Ave	358	4.2%	675	7.9%	1.89
44 St	45 Ave	167	2.4%	460	6.6%	2.75
44 St	47 Ave	171	2.5%	473	6.9%	2.77
44 St	50 Ave	221	1.8%	448	3.6%	2.03
44 St	54 Ave (Fri)	93	1.0%	342	3.7%	3.68
44 St	54 Ave (Sat)	114	1.1%	264	2.6%	2.32
44 St	54 Ave	210	2.1%	491	4.9%	2.34
44 St	59 Ave	230	2.2%	526	5.1%	2.29
44 St	62 Ave	471	3.0%	618	4.0%	1.31
44 St	66 Ave	249	2.0%	556	4.5%	2.23
44 St	70 Ave	226	2.0%	513	4.6%	2.27
44 St	75 Ave (Fri)	160	1.5%	462	4.4%	2.89
44 St	75 Ave (Sat)	122	1.2%	400	3.8%	3.28
44 St	75 Ave	271	2.5%	582	5.3%	2.15
44 St	80 Ave	258	3.0%	592	7.0%	2.29
50 Ave	12 St	145	3.0%	155	3.2%	1.07
52 St	50 Ave	224	3.8%	164	2.8%	0.73
52 St	40 Ave	226	7.0%	290	9.0%	1.28
52 St	62 Ave	275	4.1%	294	4.3%	1.07
62 St	50 Ave	183	4.8%	75	2.0%	0.41
67 St	40 Ave	118	10.9%	82	7.5%	0.69
67 St	50 Ave	183	5.0%	221	6.0%	1.21
Best Buy Access	75 Ave	56	1.2%	43	0.9%	0.77
	Maximum	471	10.9%	675	9.0%	3.68
	Minimum	37	1.0%	0	0.0%	0.00
	Average	154	2.5%	220	3.0%	1.19
	2x average	≥ 300	≥ 5.0%	≥ 450	≥ 5.0%	N/A
		(300 = 2x avg)		(450 = 2x avg)		

Source: City of Lloydminster, *Traffic Volume Report, 2014-2018*, February 28, 2019. Consultant's tabulations.
Note that 44 Street is Highway 16 and 50 Avenue is Highway 17.

It must be cautioned that these summaries are indicative only: they do not reflect the actual mix of traffic for a given movement at any specific intersection. Moreover, the findings reflect only the intersections where the counts were actually conducted. Note that these data reflect counts that were conducted during the daytime between the two commuter peaks – that is, they reflect no more than 12 hours of activity, and do not account for evening or night-time traffic. Nonetheless, they are indicative of roads on which high truck activity is occurring.

Table 2.4 summarizes the breakdown of vehicle types at selected intersections. These counts are derived from ATR (automatic traffic recorders) set up by the City to run for at least 24 hours – thus they include night-time activity. Most of the counts are summarized according to the leg of the intersections and by direction. The Table shows medium-sized or single unit (SU) trucks, articulated trucks and bicycles on road (i.e., not travelling on a separate pathway). Note that bicycles were not recorded at several intersections.

Key points to note:

- On average, medium / SU trucks make up 3.4% of the traffic at the counted intersections. Articulated trucks make up a greater average proportion, at 5.5% of the traffic. The highest truck proportions occur at 67 Street and 40 Avenue (west leg, westbound), with medium / SU trucks making up at 13.8% of all traffic and articulated trucks making up 19.2%.
- 44 Street (Highway 16) is prominent for articulated trucks, mostly on the eastbound and westbound legs but also northbound and southbound at 62 Avenue North.
- 44 Street (Highway 16) is important to medium / SU trucks, again mostly eastbound and westbound, although the articulated truck volumes at these intersections are up to 3 times greater.
- An average of one bicycle was recorded at each intersection leg and direction. The maximum number occurred at 36 Street and 47 Avenue, east leg westbound, with 8 observations.

Consideration was given to examining traffic volumes in the adjacent counties and rural municipalities. However, these data were not available.

Table 2.4: Breakdown of Vehicle Types at Selected Locations, 2018

Location A	Location B	Direction	SU (M) Trucks *	SU (M) Trucks % *	Articulated Trucks	Articulated %	Bicycles on Road	Bicycles %
12 St **	40 Ave **	SB	71	3.8%	225	4.0%	0	0.0%
12 St **	40 Ave **	NB	63	3.5%	109	6.1%	2	0.1%
12 St	50 Ave (West leg)	WB	50	1.6%	64	2.0%	0	0.0%
12 St	50 Ave (West leg)	EB	56	2.1%	71	2.7%	0	0.0%
12 St	59 Ave (West leg)	SB	17	1.2%	6	0.4%	0	0.0%
12 St	59 Ave (West leg)	NB	8	0.6%	0	0.0%	0	0.0%
25 St	50 Ave (North leg)	SB	67	0.8%	23	0.3%	1	0.0%
25 St	50 Ave (North leg)	NB	64	0.8%	18	0.2%	1	0.0%
25 St	50 Ave (West leg)	WB	38	0.9%	39	1.0%	1	0.0%
25 St	50 Ave (West leg)	EB	47	1.1%	37	0.9%	0	0.0%
36 St	40 Ave (South leg)	SB	67	3.3%	70	3.4%		
36 St	40 Ave (South leg)	NB	89	4.8%	104	5.6%		
36 St	47 Ave (East leg)	WB	15	0.6%	1	0.0%	8	0.3%
36 St	47 Ave (East leg)	EB	21	0.1%	1	0.0%	3	0.1%
36 St	57 Ave (West leg)	WB	55	0.9%	3	0.1%		
36 St	57 Ave (West leg)	EB	54	0.9%	4	0.1%		
36 St	59 Ave (South leg)	SB	79	1.1%	40	0.6%	0	0.0%
36 St	59 Ave (South leg)	NB	85	1.3%	29	0.4%	0	0.0%
41 St **	40 Ave **	SB	118	4.4%	80	3.0%	1	0.0%
41 St **	40 Ave **	NB	122	5.0%	108	4.4%	3	0.1%
44 St	40 Ave (East leg)	WB	217	3.0%	885	12.3%	1	0.0%

Location A	Location B	Direction	SU (M) Trucks *	SU (M) Trucks % *	Articulated Trucks	Articulated %	Bicycles on Road	Bicycles %
44 St	40 Ave (East leg)	EB	259	3.7%	898	12.9%	1	0.0%
44 St	40 Ave (West leg)	WB	140	2.1%	689	10.5%		
44 St	40 Ave (West leg)	EB	148	2.6%	665	11.6%		
44 St	50 Ave (West leg)	EB	204	2.0%	779	7.8%		
44 St	50 Ave (West leg)	WB	224	2.3%	748	7.5%		
44 St	50 Ave (East leg)	WB	152	1.7%	704	7.6%	0	0.0%
44 St	50 Ave (East leg)	EB	135	1.5%	726	8.3%	3	0.0%
44 St	62 Ave (East leg)	WB	251	2.1%	668	5.7%	0	0.0%
44 St	62 Ave (East leg)	EB	174	1.5%	753	6.4%	3	0.0%
44 St	62 Ave (North leg)	SB	179	2.8%	226	3.6%	0	0.0%
44 St	62 Ave (North leg)	NB	166	2.6%	211	3.3%	1	0.0%
44 St	62 Ave (West leg)	WB	247	1.8%	794	5.9%	0	0.0%
44 St	62 Ave (West leg)	EB	255	1.9%	876	6.5%	0	0.0%
44 St	75 Ave (East leg)	WB	247	2.7%	922	10.0%		
44 St	75 Ave (East leg)	EB	190	2.7%	803	11.6%		
52 St	40 Ave (North leg)	SB	94	7.5%	132	10.6%	0	0.0%
52 St	40 Ave (North leg)	NB	88	6.9%	137	10.7%	0	0.0%
62 St	62 Ave (North leg)	SB	127	4.6%	120	4.3%	0	0.0%
62 St	62 Ave (North leg)	NB	161	6.2%	93	3.6%	0	0.0%
67 St	40 Ave (West leg)	WB	74	13.8%	103	19.2%		
67 St	40 Ave (West leg)	EB	75	11.8%	100	15.7%		
67 St	50 Ave (South leg)	SB	116	4.3%	69	2.5%	1	0.0%
67 St	50 Ave (South leg)	NB	104	3.9%	85	3.1%	1	0.0%
67 St	75 Ave (East leg)	WB	110	13.6%	70	8.6%		
67 St	75 Ave (East leg)	EB	113	10.2%	81	7.3%		
		Maximum	259	13.8%	922	19.2%	8	0.3%
		Minimum	8	0.1%	0	0.0%	0	0.0%
		Average	118	3.4%	291	5.5%	1	0.0%

Source: City of Lloydminster, *Traffic Volume Report, 2014-2018*, February 28, 2019. Consultant's tabulations.

Note that 44 Street is Highway 16 and 50 Avenue is Highway 17.

* Described as Medium Trucks when bicycles are not counted. Otherwise, described as Single Unit (SU) Trucks.

** Counts conducted over three days. Values shown are for an average 24-hour periods

For the provincial highways, traffic volumes are available only for Highway 16 at the eastern boundary of the city. Figure 2.16 shows the trends for total traffic and for truck traffic between 2004 and 2018. The data are expressed as average annual daily traffic (AADT – i.e., normalized to account for seasonal variations) and truck AADT (TAADT). The AADT and TAADT values represent total daily values and represent a single direction – hence they are not comparable with the City's counts discussed above.

Key points to note:

- It can be seen that all traffic has increased. Growth in truck traffic has been faster than that of all traffic taken together (mainly passenger vehicles and other light vehicles). Over the 14-year period, truck traffic has increased at a CAGR of 3.5%, while total traffic has increased at a CAGR of 2.1%.
- The proportion of truck traffic has grown over time and now represents approximately 20% of total traffic.

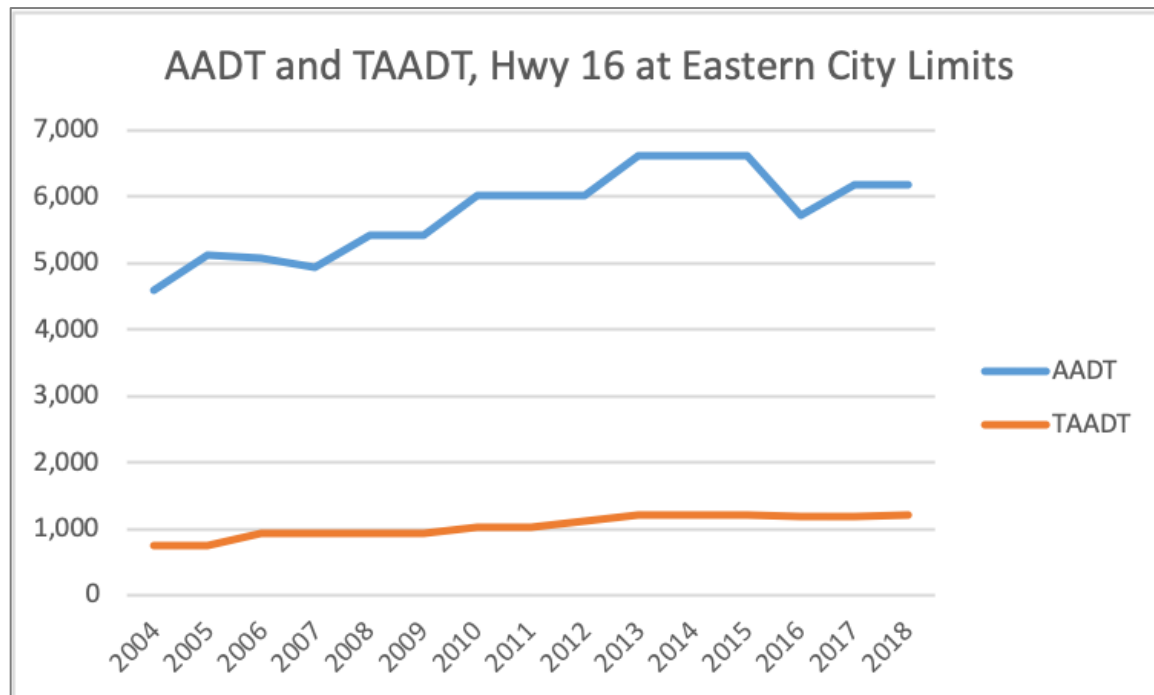


Figure 2.16: AADT and TAADT – Highway 16, 2004-2018

Source: Saskatchewan MHI. Consultant's tabulations.

Truck Origins and Destinations Approach

From time to time, Saskatchewan MHI conducts origin-destination (O-D) surveys of trucks at weigh stations along the Provincial highway network. These surveys provide information that informs transportation plans and investment studies, including the origin of the trip, its destination, the vehicle type and the commodity carried.

The nearest weigh station is located on Highway 16 at Marshall, southeast of Lloydminster. MHI provided the data for O-D surveys that had been conducted in seven years from 2003 to 2018, at 1- to 4-year intervals. The consultant used this data to estimate the proportions of long-haul truck traffic moving to, from and through Lloydminster – that is, with origins or destinations in Lloydminster or beyond (e.g., a truck originating in Edmonton and destined to Winnipeg might make a stop in Lloydminster). The proportions observed on Highway 16 at Marshall were assumed to carry through to the count location closest to Lloydminster, which is Highway 16 at the eastern city limits.

The consultant also estimated the proportions of dangerous goods traffic. For this calculation, several assumptions were required:

- Tankers were the only vehicle type assumed to carry dangerous goods.
- Three types of commodities were considered as dangerous goods carried by tankers: fuel, industrial supplies and one-half of non-fuel liquids. The remaining non-fuel liquids were assumed to be other products, such as milk.
- The survey also records empty vehicles. Empty runs make up significant proportions of truck activity. Because it is not also obvious whether a tanker is empty or not, for the purpose of this study empty tankers were assumed to be dangerous goods vehicles.

These assumptions were necessary in order to work with the available data – for example, the survey does not specifically record whether or not the vehicle is carrying dangerous goods. Nonetheless, the assumptions are considered reasonable for the purposes of this study.

Truck Origins and Destination Findings

The figures below summarize the key findings:

- Total truck traffic has grown significantly – increasing by almost two-thirds (1.63 times) between 2003 and 2018 to 1,220 TAADT. Dangerous goods vehicles also grew, by 20% westbound and 50% eastbound.
- Approximately one-quarter of total truck traffic is made up of dangerous goods vehicles eastbound – 25.6% in 2018. Westbound, the proportions have varied, but are approximately one-fifth of all truck traffic, at 18.5% in 2018.
- Through trucks – that is, trucks neither originating in nor destined to Lloydminster – make up half or more of all truck traffic. In 2018, the eastbound proportion was 52.4% and the westbound proportion was 60.5%.
- The proportion of through dangerous goods trucks of total truck traffic has remained stable westbound, at 8.9% in 2018 (i.e., less than one in ten). Eastbound, similar rates were observed through 2013; however, the rate has since risen to 17.6% in 2015 and 18.5% in 2018.
- The proportion of dangerous goods through trucks among total through truck traffic has remained relatively constant westbound, at 14.7% in 2018 (about one in seven). However, eastbound the proportion has risen steadily from about the same value, to 23.0% in 2013, 28.8% in 2015 and 35.2% in 2018 (i.e., one-third of all through traffic).

In other words, long-haul truck traffic is growing; through trucks make up significant proportions of this traffic; and dangerous goods vehicles make up important proportions of through traffic. The through proportions will have implications on the choice of drivers' routes through Lloydminster.

Something to note about Figure 2.17 is that Saskatchewan MHI divides the total two-way AADT in two, so that the total eastbound truck and dangerous goods traffic overlaps the total westbound.

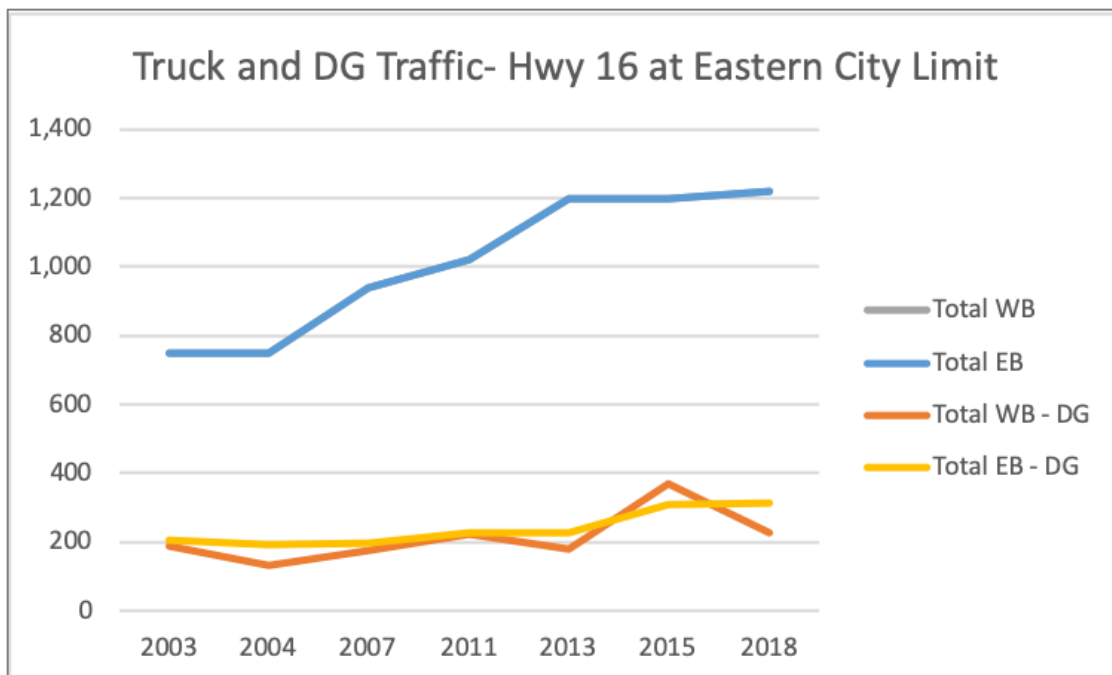


Figure 2.17: Truck and Dangerous Goods Traffic – Highway 16 at Eastern City Limit

Source: Saskatchewan MHI. Consultant's tabulations.

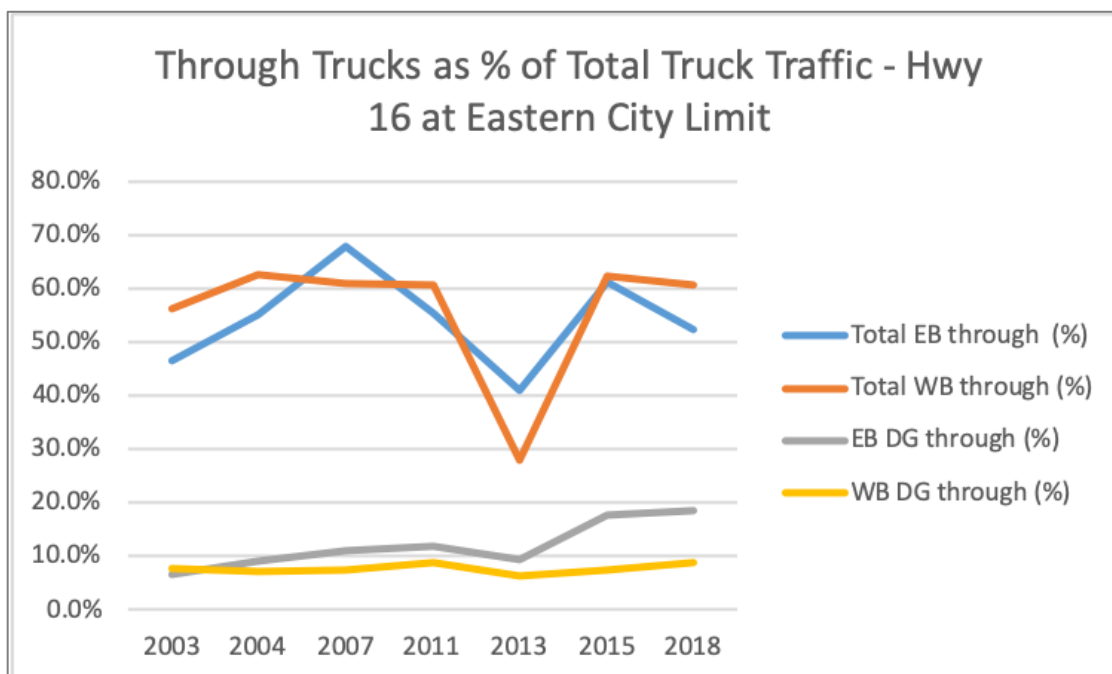


Figure 2.18: Through Trucks as % of Total Truck Traffic – Highway 16 at Eastern City Limit

Source: Saskatchewan MHI. Consultant's tabulations.

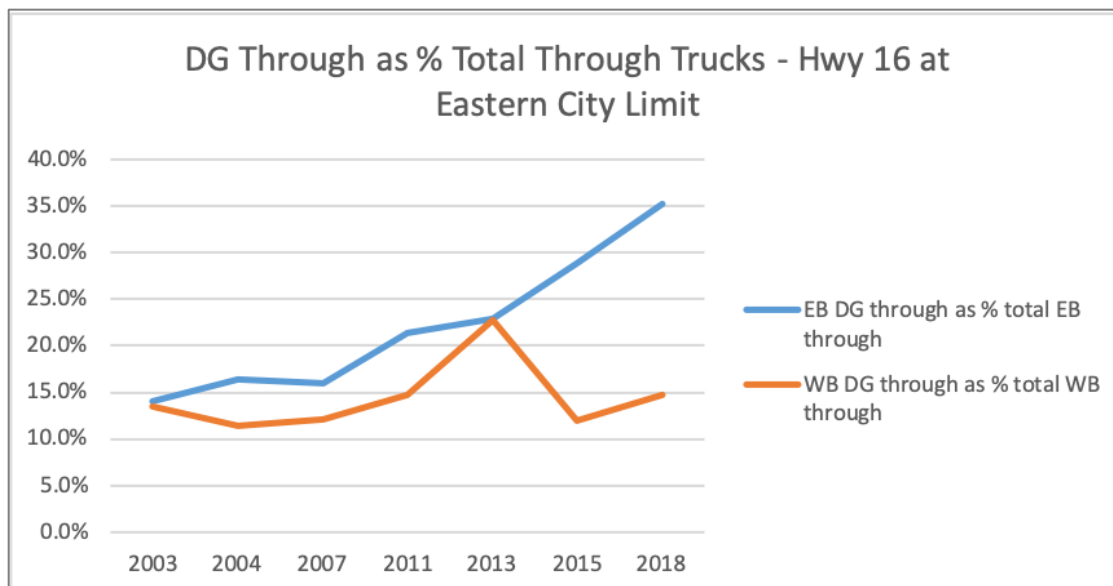


Figure 2.19: Dangerous Goods as % Total Through Trucks – Highway 16 at Eastern City Limit

Source: Saskatchewan MHI. Consultant's tabulations.

It must be noted that these findings are based on the available data and required several assumptions, as noted above. They may also reflect differing sample sizes which occurred from year to year. As a result, the findings should be used with caution, although they can be considered indicative for the purposes of this study.

Summary of Key Findings

This section of the report profiles several key trends and conditions that inform the volume and routing of trucks and dangerous goods vehicles in and through Lloydminster. In sum, the key findings are:

- **Population.** Lloydminster has been growing much faster than the two provinces as a whole, especially since 2001. This growth is expected to continue.
- **Economy.** Economic growth trends suggest that Lloydminster's key industries, especially oil and gas, will continue to grow as will the associated trucking and DG activity. The city's services sector can also be expected to grow, which will also demonstrate further demands for trucking (e.g., for consumer goods) and related DG activity (e.g., fuel as gasoline stations). The city's other sectors (e.g., construction) will continue to grow as the first two grow, and Lloydminster will continue to serve as an important centre for nearby agricultural activity.
- **Truck traffic on City streets.** Lloydminster's streets carry varying volumes of medium and articulated trucks. 44 Street (Highway 16) has the highest volumes and proportions of articulated traffic, consistent with its role as a key route for long-distance and through traffic entering and exiting the city via Highway 16. 52 Street and 67 Street also have high volumes of articulated and medium trucks, which also represent high proportions of the overall traffic mix. On average, medium trucks make up relatively small proportions of the traffic mix (2.5%) while articulated trucks have a slightly higher proportion (3.0%). Some intersections carry little or no vehicles of each type. The highest proportion of medium trucks occurs at 67 Street and 40 Avenue, at 10.9%. The highest proportion of articulated trucks occurs at 52 Street and 40 Avenue, at 9.0%.

On average, articulated truck volumes are 20% greater than medium truck volumes.

- Long-haul and through traffic on Highway 16. At the eastern City limits total traffic has increased. Growth in truck traffic has been faster than that of all traffic taken together (mainly passenger vehicles and other light vehicles). Over the 14-year period, truck traffic has increased at a CAGR of 3.5%, while total traffic has increased at a CAGR of 2.1%. The proportion of truck traffic has grown over time and now represents approximately 20% of total traffic.
Approximately one-quarter of total truck traffic is made up of dangerous goods vehicles eastbound – 25.6% in 2018. Westbound, the proportions have varied, but are approximately one-fifth of all truck traffic, at 18.5% in 2018.
Through trucks – that is, trucks neither originating in nor destined to Lloydminster – make up half or more of all truck traffic. In 2018, the eastbound proportion was 52.4% and the westbound proportion was 60.5%.
- Dangerous goods traffic on Highway 16. The proportion of through dangerous goods trucks of total truck traffic has remained stable westbound, at 8.9% in 2018 (i.e., less than one in ten). Eastbound, similar rates were observed through 2013; however, the rate has since risen to 17.6% in 2015 and 18.5% in 2018.
The proportion of dangerous goods through trucks among total through truck traffic has remained relatively constant westbound, at 14.7% in 2018 (about one in seven). However, eastbound the proportion has risen steadily from about the same value, to 23.0% in 2013, 28.8% in 2015 and 35.2% in 2018 (i.e., one-third of all through traffic).
In other words, long-haul truck traffic is growing; through trucks make up significant proportions of this traffic; and dangerous goods vehicles make up important proportions of through traffic. The through proportions will have implications on the choice of drivers' routes through Lloydminster.

2.4 Network Review

To better understand how the existing routes function, a current state network review of the existing truck routes and dangerous goods routes within the City of Lloydminster was completed. As part of the review, connectivity of existing routes, potential gaps in the network, route options/alternatives and opportunities to improve the networks were considered. In addition, the land uses that require truck routes/dangerous goods routes and the land uses around the existing routes were considered in the evaluation. All of these elements were reviewed for both the truck routes and dangerous goods routes. This review, built off of the initial work completed within the section 2.1 Legislature and Data Review.

In order to simplify the review process, the City of Lloydminster was separated into 4 quadrants whereby the east and west division was made by 50 Avenue, the Alberta/Saskatchewan border, and the north-south division is made by 44 Street. Based on these divisions, the network review was completed on a quadrant by quadrant basis. To assist with the review, the Lloydminster Neighbourhoods were referenced, as identified in the August 2018 Lloydminster Neighbourhoods Map as included as Figure 2.20. The August 2018 Land Use Districts and Overlay Map was also used to complete the network review and can be found below as Figure 2.21.

Currently 44 Street and 50 Avenue are the only roadways designated as dangerous goods routes within the City of Lloydminster. 44 Street, the Trans-Canada Highway, is a primary highway that runs east-west across the full length of the City. 44 Street serves a dual role within the City by providing local access to goods and services for citizens as well as a direct route for cross city travel as well as providing direct east-west connectivity for trucks and dangerous goods passing through the City.

In contrast, 50 Avenue runs north-south through the entire length of the City and is designated as a dangerous goods route for its entire length whereas 50 Avenue from 44 Street to 52 Street, through the Central Business District, is not designated as a truck route. This discrepancy causes a conflict for truck drivers whereby one Bylaw requires that 50 Avenue be used and another Bylaw restricts its use.

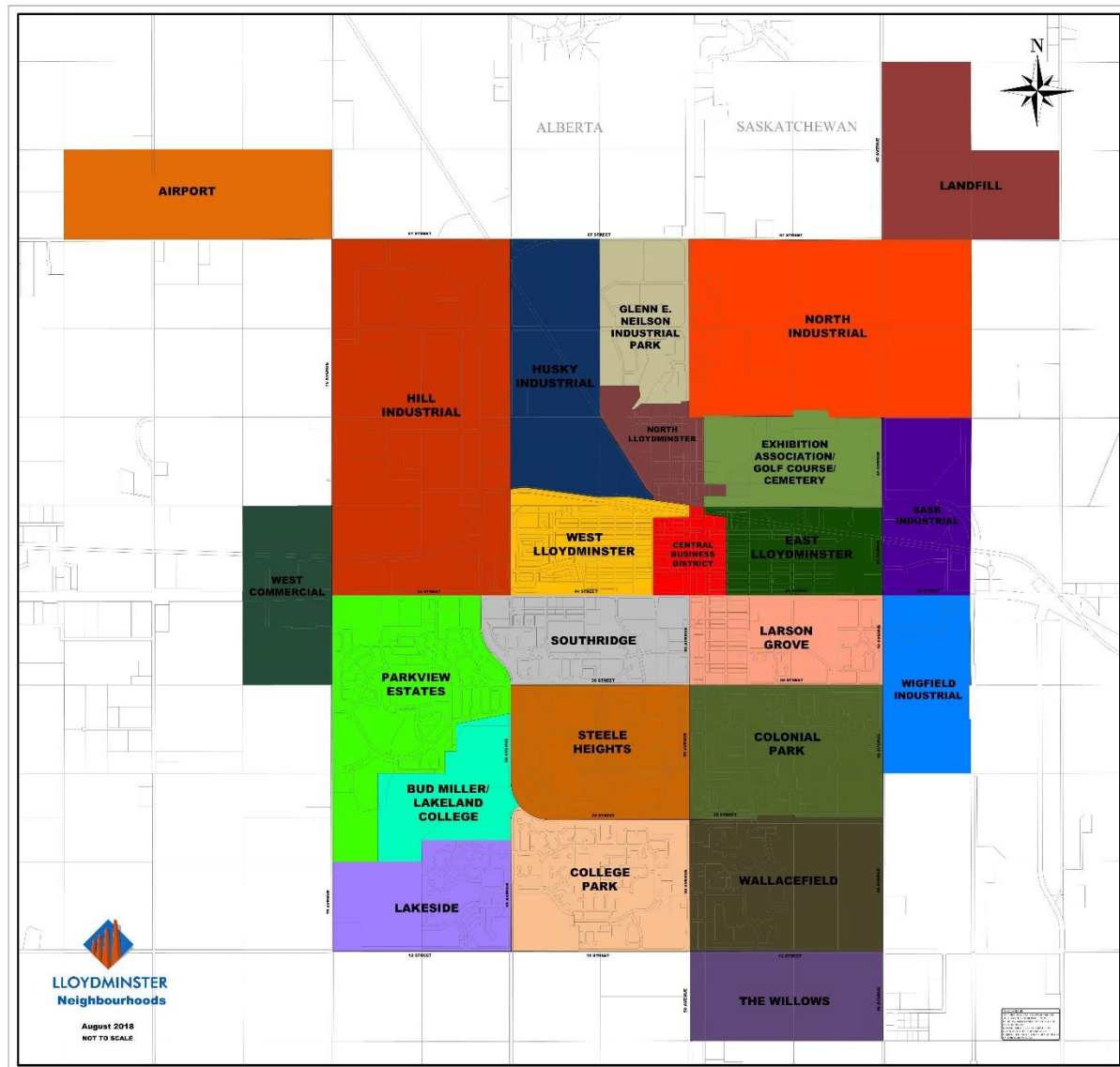


Figure 2.20: Lloydminster Neighbourhoods Map
(retrieved from www.lloydminster.ca September 2019)

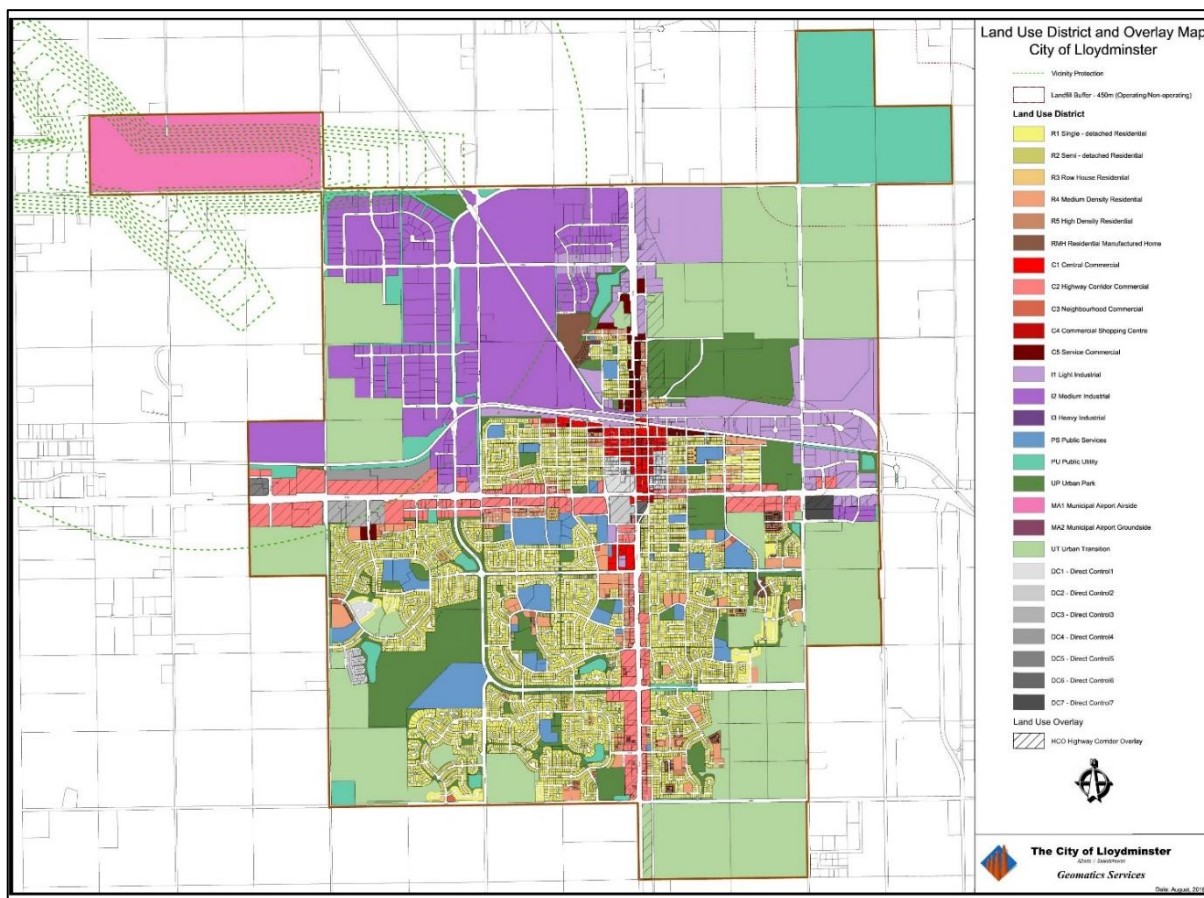


Figure 2.21: Lloydminster Land Use Districts and Overlay Map
(retrieved from www.lloydminster.ca September 2019)

2.4.1 Northwest Quadrant

Within the northwest quadrant, the highway commercial corridor in this section of the city is located along both 44 Street and 50 Avenue. As such the existing truck and dangerous goods routes are sufficient to service destinations and deliveries along those corridors. However, the northwest quadrant of the City also contains the majority of the truck routes as it currently contains the highest level of industrial land development within the City. As per the land use map, the industrial sector in Lloydminster is predominantly located within the northwest quadrant. This is also noted with the Neighbourhoods map whereby the Hill, Husky and Glenn E. Neilson industrial areas are all location within the NW quadrant. In addition to the industrial areas the northwest also contains the Airport area and the West Commercial Area. Goods movement, including dangerous goods movement, is required within these industrial areas.

In the existing dangerous goods network, both 44 Street and 50 Avenue do not provide direct access to many of the locations within the industrial areas and do not serve the Husky Industrial area. As per point 2 on page 23 of the Traffic Bylaw (No. 09-2018) an off-route permit is required if the dangerous goods routes cannot be used to reach the destination. The lack of dangerous goods routes within, to and from the industrial areas could increase the workload for the Fire Chief who, as per the Traffic



Bylaw, is the designated person to authorize these off-route permits. Dangerous goods route and truck route gaps in the network were addressed during the creation of route options.

Within the northwest quadrant an additional area identified that could benefit from additional truck routes was the Lloydminster airport. Currently there are no truck routes or dangerous goods routes from either 44 Street or 50 Avenue that enable direct on route access to the airport (via Range Road 12 (75 Avenue) north of Township Road 502 (67 Street) as well as Township Road 502A (Airport Road) from Range Road 512 (75 Avenue) to the west City limit. As such, an idea was to designate truck and/or dangerous goods routes to the airport. Aviation fuel and other potentially dangerous goods are required by the airport and depending on the frequency of the trucks a designated route would reduce the number of off-route permits required. An additional benefit to designating a dangerous goods route or truck route is consistency for drivers always being on the same route. As a key benefit of providing designated dangerous goods routes, in the event of an emergency the fire department would already know and be familiar with the routes being used.

The network review noted opportunities to improve the truck route and dangerous goods route connectivity in the northwest corner of the City. With most of the land use in the northwest quadrant being industrial, one option would be to have all roadways within the industrial area be designated as truck routes. This is consistent with other cities that have created truck areas within industrial districts and designated all roads within these areas as truck routes. As there is generally less public driving along these roads and there are generally fewer sensitive areas in these industrial areas, the truck area designation provides operators easier access to/from their destinations.

One anomaly noted within the northwest quadrant was the provision of the truck route along 55 Avenue from 44 Street to 51 Street which serves a small commercial area south of the CN railway tracks. The adjacent land use to 55 Street is residential and not ideal for a truck route, but due to the restrictions of trucks along 50 Avenue, between 44 Street and 52 Street there are limited opportunities for access routes into this small commercial area. It appeared from investigation that 55 Avenue may have extended across the CN tracks in the past from 52 Street north of the tracks to 52 Street south of the tracks, but the review noted that the link has been disconnected in the network.

To address access into this commercial area, one consideration was to enable a short extension of the 50 Avenue truck route from 52 Street to 51 Street and include 51 Street as a truck route from 50 Avenue to 55 Avenue. Trucks could alternatively use 62 Avenue or 40th Avenue and then 52 Street to reach 50 Avenue. From 50 Avenue trucks could use 51 Street to reach the commercial area south of the CN tracks. It is noted that 51 Street from 55 Avenue to 50 Avenue is commercial along the north side of the road and residential along the south side of the road. The houses that front onto 51 Street may see some truck increases associated this potential change, however a route using 51 Street would be shorter than the route using 55 Avenue which reduces the number of residences directly adjacent to a truck route.

An alternative to 44 Street could be 52 Street as a dangerous goods route. Within the next three to five years 52 Street will be extended from 67 Avenue to 75 Avenue. With the addition of this new segment, 52 Street will connect from 40 Avenue to 75 Avenue. This northern route could provide a bypass around the main commercial corridor in Lloydminster for trucks and dangerous goods passing through the City. The commercial corridor along 44 Street will always have a percentage of truck use for local access and deliveries, but providing an alternate route for trucks passing through the City would reduce the volume on 44 Street.

Based on the existing road network, most goods movement destinations appear to be within 500-800m of an existing truck route. However, based on the level of industrial development, additional truck routes could be added within the industrial areas. In addition, the existing dangerous goods routes do not directly service the Husky Industrial area.

Potential alternatives for truck routes

- All current and future streets and avenues in the Hill Industrial area
- Future roads within the West Commercial area
- All current and future streets and avenues in the Husky Industrial area
- All current and future streets and avenues in the Glenn E. Neilson Industrial park
- Alternative access to 52 Street south of CN west of Highway 17
- Future extensions of existing routes on Highway 17 north of 67 Avenue to Township Road 502A
- Future extensions of existing routes on Highway 16 west to Range Road 13
- All current and future streets and avenues in the proposed County of Vermillion River Annexation areas (9.5 quarter sections in the NW quadrant)

2.4.2 Northeast Quadrant

The northeast quadrant of the City currently contains three smaller light industrial areas as well as public utility, urban parks, and urban transition. These areas include the North Industrial area, the Sask Industrial area, as section of industrial development within the East Lloydminster area and the City utility area (landfill). Currently most businesses in the North Industrial area are located along 50 Avenue between 57 Street and 67 Street however there are six quarter sections of land available for industrial development in this area. In addition, most businesses in the Sask Industrial area are located either north of 44 Street or east of 40 Avenue. The northeast quadrant also contains the exhibition grounds, golf course and curling centre and the City cemetery.

While there are currently fewer industrial businesses located in this section of the City compared to the northwest, the existing and future businesses require delivery of goods. As previously mentioned, the dangerous goods routes do not connect well to all areas within these zoned industrial areas.

Currently the Traffic Bylaw (No. 09-2018) and the Transportation Systems Bylaw (No. 02-95) contradict each other on what roadways are designated as truck routes and/or dangerous goods routes. A section of 50 Avenue from 44 Street to 52 Street is not designated as a truck route within the Traffic Bylaw but is designated as a dangerous goods route with the Transportation Systems Bylaw. This discrepancy creates conflict as all truck routes may not be dangerous goods routes but all dangerous goods routes should be truck routes. This discrepancy will need to be corrected. To avoid the historic downtown, the dangerous goods routes could use 40 Avenue/75 Avenue and then 52 Street to travel from 44 Street to continue north on 50 Avenue.

Similarly with the northwest quadrant, the highway commercial corridor in this section of the city is located along both 44 Street and 50 Avenue. As such, the existing truck and dangerous goods routes could service destinations and deliveries along those corridors, however considerations should be given to routing and access to areas off of these two corridors.



It was noted in the review that an area in the northeast quadrant that has potential for frequent truck and/or dangerous goods deliveries is the public utilities (Landfill) area and currently there are no designated truck routes past north of 67 Street and east of 40 Avenue.

Based on the existing road network, the majority of existing industrial and commercial areas appear to be served by the existing truck routes however, based on the planned uses additional truck routes may be required.

Potential alternatives for truck routes

- All current and future streets and avenues in the North Industrial area
- All current and future streets and avenues in the Sask Industrial area
- Connectivity to the public utility (Landfill) area north of 67 Street and east of 40 Avenue
- Future extensions of existing routes on 50 Avenue north of 67 Avenue
- Address the Bylaw discrepancy and provide alternate dangerous goods route(s) off of 50 Avenue between 44 Street and 52 Street

2.4.3 Southwest Quadrant

The southwest quadrant of the City of Lloydminster has significantly less truck routes compared to the north quadrants, which appear to be proportional to the number of destinations requiring access to truck routes and/or dangerous goods routes. The land use in the southwest quadrant is predominantly residential, however the majority of the developed commercial land use within the City is also located along the southwest quadrant's north and east border. In addition, the southwest quadrant contains Bud Miller regional park and Lakeland College campus as well as the Servus Sports Centre.

Within the southwest quadrant the truck routes run along 75 Avenue, 12 Street, Highway 16, and 50 Avenue. As noted with the northwest and northeast quadrants, 44 Street and 50 Avenue are developed highway commercial corridors. The general land use in the southwest quadrant is predominantly residential. With less demand for truck routes and dangerous good routes, in this quadrant, the existing networks appear to be serving the functions required. With additional residential development occurring in the southwest quadrant of the city along 12 Street it is noted that potential conflicts with the trucks and/or trucks and trailers using 12 street as a truck route and possible dangerous goods route may exist should adjustments to the networks be considered in this quadrant.

A portion of the inner ring road runs through the southwest quadrant where 25 Street turns into 62 Avenue. This road could potentially be a truck and/or dangerous goods route, however, since there is minimal need for truck and dangerous goods deliveries in the southwest quadrant of the City a route along 25 Street/62 Avenue could lead to conflicts within residential areas.

Potential alternatives for truck routes

- Consideration for continuity of north/south and east/west extensions of the truck routes along 75 Avenue, 12 Street, 44 Street and 50 Avenue within the proposed County of Vermillion River Annexation areas (14 quarter sections in the southwest quadrant).
- Consider 25 Street and 62 Avenue from 50 Avenue to 44 Street as an alternative truck route.

2.4.4 Southeast Quadrant

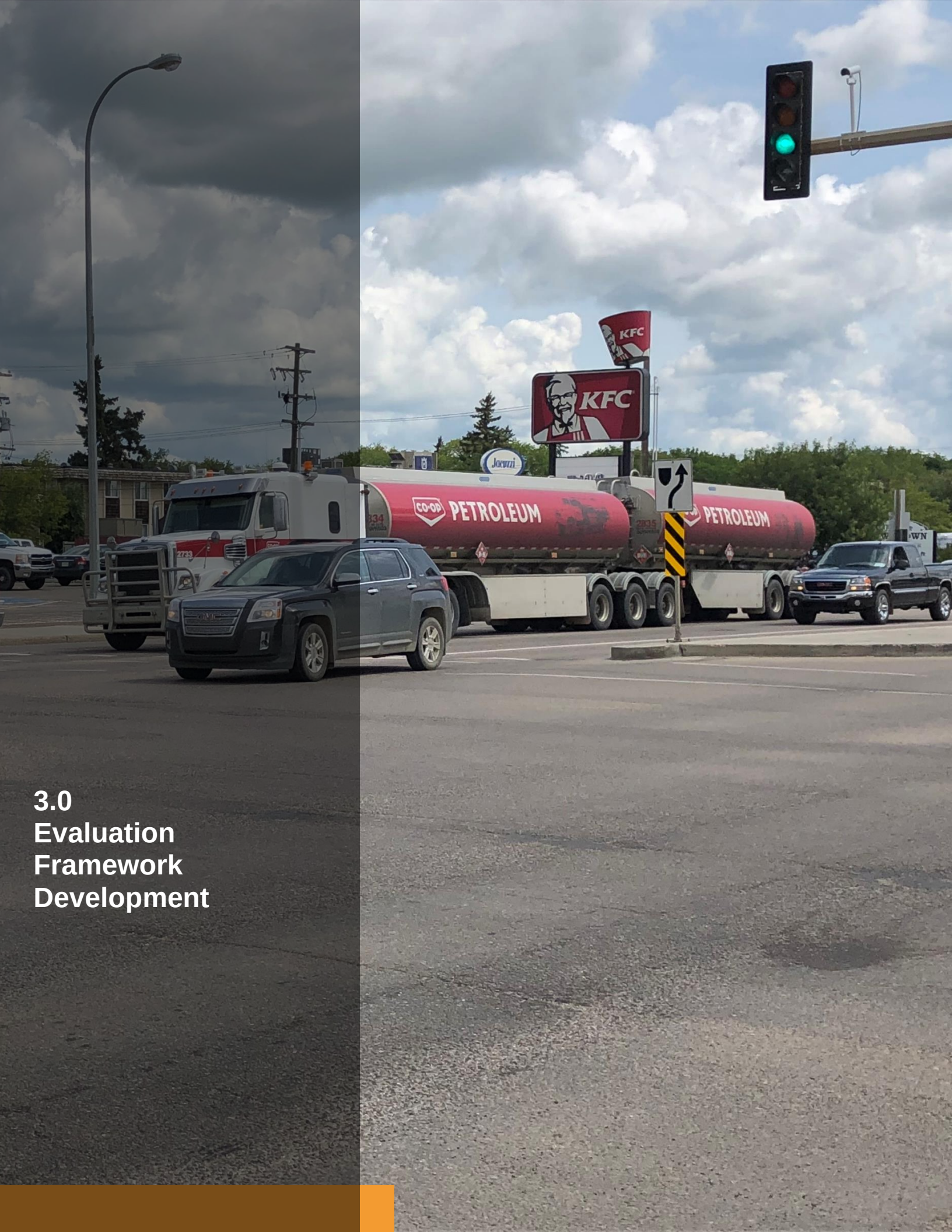
The southeast quadrant of the City is the smallest quadrant of the City. This quadrant of the City is mainly residential land use with some urban transition areas. Within the southeast quadrant the Lloydminster hospital is located in the neighbourhood of Larson Grove. In addition, a smaller industrial area, the Wigfield Industrial area, is located south of Highway 16 on the eastern boundary of the City.

Outside the east city limits in the RM of Wilton is the large Husky upgrader plant. As a major industrial petrochemical plant it is assumed, with a high probability that the plant is a producer and receiver of both trucks and dangerous goods. Based on a review of the network, an assumption can be made that trucks and dangerous goods currently arrive at/and or depart from the upgrader via either 12 Street or Highway 16.

Within the next 3 to 5 years 25 Street will be constructed from 47 Avenue to 40 Avenue. This new roadway could potentially provide an alternate truck route to avoid the congestion on Highway 16. Similar to the concerns with using 62 Avenue and 25 Street in the southwest as a truck route, the inclusion of 25 Street in the southeast would add truck and/or dangerous goods to a predominantly residential area.

Potential alternatives for truck routes

- All current and future streets and avenues in the Wigfield Industrial area
- Inclusion of 25 Street from Highway 17 to 40 Avenue as an alternative truck Route



3.0
Evaluation
Framework
Development

In order to objectively evaluate all of the potential truck routes and dangerous goods routes that could be identified in Lloydminster an evaluation framework was created. The objective of the evaluation framework was to ensure the City of Lloydminster could apply a consistent methodology for designating truck routes and dangerous goods routes. Having an evaluation framework will allow future reviews of possible truck routes and dangerous goods routes to use the same process and logic that was used in the creation of the network. Using the same logic and steps ensures that all potential routes are assessed consistently and fairly every time. The following sections outline the creation of the evaluation framework.

3.1 Truck Route Evaluation Framework Development

To initiate the creation of the truck routes, a best practice review was completed as the designation process was an important output of this study. DKCI provided Table 3.1 which indicated the criteria used by various municipalities in the Town of Oakville Goods Movement Study.

Table 3.1: Truck Route Network Criteria from Oakville

Municipality	Status	Truck AADT	Road classification	Continuity (alternatives; links to major routes, terminals, generators, external)	Connectivity	Redundancy	Fluidity (avoid congestion)	Avoid conflicts	Adequate capacity, geometries, grades	Adequate pavement	Adequate clearances	Adequate structures (weights)	Minimize intrusion in neighbourhoods, sensitive areas	Adjacent land use	Avoid heritage / weak structures	Avoid bisecting communities	Accidents	Minimum distance threshold
City of Hamilton	Plan	-	✓	✓	✓	✓	-	✓	✓	-	-	-	-	-	✓	-	-	-
Region of Waterloo	Policy	-	-	✓	-	-	-	-	-	-	-	-	-	✓	-	-	-	-
City of Oshawa	Proposed	-	✓	✓	✓	-	-	✓	-	-	-	-	✓	-	-	-	-	-
City of Ottawa	Policy	-	-	✓	-	✓	✓	✓	✓	✓	-	✓	✓	-	✓	✓	-	-
City of Abbotsford	Policy	-	✓	✓	✓	-	-	-	✓	-	-	-	✓	-	-	✓	-	-
City of Chicago	Study	✓	-	✓	-	-	-	-	-	-	✓	✓	✓	✓	-	-	-	✓
City of Tampa	Study	✓	✓	✓	-	-	-	-	✓	-	✓	-	-	✓	-	-	✓	-
Town of Oakville	Study	-	✓	✓	✓	-	-	✓	✓	-	-	-	✓	✓	-	-	-	-

Source: DKCI, *Town of Oakville Goods Movement Study*, 2016.

The Table illustrates the use of different criteria by different municipalities while highlighting the criteria often used by many of the municipalities. Of all the criteria included in the figure, route continuity is used by every municipality. Based on the criteria listed in Table 3.1 and numerous discussions with DKCI a preliminary list of route evaluation criteria was created and assessed for their applicability to this project. The initial criteria identified for truck route evaluations include the following:

- Where the trucks are going to and from
- Connectivity
- Directness
- Truck volumes
- Avoidance of sensitive areas
- Geometric and structural capacity
- Road classification
- Redundancy
- Fluidity
- Adjacent land use
- Accidents
- Route length
- Congestion
- Community impacts
- Traffic safety
- At-grade rail crossings
- New infrastructure

Assessing the criteria for applicability to the project included reviewing the intent of the criteria and determining if the criteria should be combined with similar criteria. Combining some of the criteria together would allow the City to reduce the number of assessments completed as part of the truck route evaluation. During the course of the criteria applicability assessment it was determined that directness and connectivity could be grouped together as the City's network should include routes that connect well to the network and provide direct access to destinations.

After the review of the initial list of criteria, a focused list of criteria was proposed and used in Phase One of the public engagement to ask stakeholders and the general public for feedback on the route evaluation criteria. The 10 criteria used in Phase One engagement were noted as Project Considerations and includes:

- Avoiding sensitive areas
- Direct routes
- Traffic Safety
- Community Impact
- Land use next to dangerous goods and truck routes
- Where trucks are going and where are they coming from
- Congestion issues
- Road classification
- Connections and connectivity
- Route length

The stakeholders and general public were asked to indicate which criteria from the list were important to consider when designating truck routes and dangerous goods routes. Within the Phase One engagement two other options for criteria identification were noted; "All of these" and "Other (please specify)". The feedback received from industry stakeholders was that direct and efficient routes were important and the general public was concerned about safety and the avoidance of sensitive areas.

As a third input in the identification and selection of truck route evaluation criteria the City of Calgary Truck Route Study Truck Route Framework was reviewed in conjunction with the feedback from stakeholders and the general public and the information provided by DKCI. The City of Calgary used a two-step process to evaluate potential truck routes which included a route criticality evaluation and a route priority evaluation. The route criticality was intended to be the initial check to determine the

need for route to be included within the truck route network. The second component was the prioritization of potential truck routes.

Based on the feedback received and the criteria used in the sources reviewed, a two-step process was suggested for the City of Lloydminster. The first component is the network functionality assessment, which is similar to the City of Calgary criticality assessment. The second component of the truck route framework was the route performance assessment. Both assessments use criteria that are applicable to the City of Lloydminster and identified as important by industry stakeholders, the general public, and the City.

The criteria used in the network functionality assessment includes route purpose, network connectivity, reduces trip length, and reduces off route trips. The network functionality assessment serves as an initial check to determine if a route is compatible with the existing truck route network. Route purpose and network connectivity were selected to ensure the truck routes serve a purpose by providing access through the City, or to a destination within the City, and should connect with other truck routes to ensure the network covers the City appropriately. As a second part of the functionality assessment it was noted that while it is important that potential routes benefit the network, they should also benefit the companies using them. Evaluating the reductions in trip length and off-route trips would be a comparison between the existing routes and a proposed addition and would ensure that the route users are not being impacted negatively. All four of the criteria used in the network functionality assessment are measured qualitatively to minimize the data requirements to complete this component of the evaluation.

As per the City's Traffic Bylaw (No. 09-2018) any truck and/or truck and trailer with a gross weight over 7,500 kg or longer than 11 m in length is required to use a truck route. These trucks and/or trucks and trailers are larger than a typical passenger vehicle and require certain performance from a route. The truck route performance assessment is the second component of the evaluation and reviews a specific route to ensure it would be a suitable truck route. The criteria selected for the route performance assessment include roadway classification, roadway geometrics, surface conditions, at-grade rail crossings, and land use compatibility. The criteria were selected based on the applicability to the City and type of information/data needed for assessment. An effort was made to ensure that the information/data required is readily available to the City. Assessing these criteria allows the City of Lloydminster to ensure a potential route can perform as a truck route.

The quantitative criteria selected use data already available to the City. Roadway classification can be assessed based on the classifications listed in the transportation master plan which identifies the highway, arterial, collector and local roadways within the City. The number of at-grade crossings is a quantitative assessment because the exact number of at-grade rail crossings can be counted along a potential route. The geometrics and surface conditions are qualitative criteria that require professional judgement based on a visual assessment of a route. Similarly, the land use compatibility and supports future development require professional judgement to assess the built form of a land use as per the land use map.

Table 3.2 below contains the criteria selected for the truck route evaluation framework along with the criteria descriptions and the assessment levels. An overview on the methodology used for the evaluation of potential truck routes is included in section 5.2 of this report.

Table 3.2: Truck Route Evaluation Framework

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

Route Performance Assessment			
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 of portion of a trip taken by a truck that is used to reach a delivery destination and/or pickup goods from a location that 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.

3.2 Dangerous Goods Route Evaluation Framework Development

Similar to truck routes, a best practice review was conducted for the dangerous goods routes evaluation framework. The initial reference reviewed was the Dangerous Goods Route Selection Criteria report prepared Hamilton-Finn for the Centre for Transportation Engineering and Planning (CTEP). The report uses the City of Calgary as a case study and created a dangerous goods route selection and decision support framework. The framework was comprised of two components, the functionality metrics were included in the first component. The criteria in the functionality metrics included route purpose and route continuity. The second component of the framework was the severity and probability metrics. The severity metrics included road classifications, surrounding land use, and surrounding environment. The probability metrics included road geometry, traffic efficiency, and traffic safety. The purpose of the severity and probability metrics was noted as the evaluation of the relative safety of each route in terms of the transportation of dangerous goods.



In addition, DKCI provided additional information on the dangerous goods route evaluation frameworks used by the City of Calgary, Prince George, Saskatchewan and New South Wales, included in Appendix A. The City of Calgary created a dangerous goods policy in 2006 which used the information from the C-TEP study, industry consultation and additional dangerous goods route analysis. The policy uses a four-step evaluation which involves assessing the feasibility, likelihood and impact, risk mitigation, and compatibility with Provincial Acts. The feasibility assessment used by the City of Calgary policy is similar to the C-TEP functionality metrics. The City of Calgary's approach includes the following criteria:

- Route purpose
- Part of truck route network
- Available alternative routes
- Network completion
- Route Length
- Coverage

Potential routes are rated in three ways using the feasibility assessment: no go which indicated the routes is not suitable, evaluate which indicated the route should be examined further, and go which indicated that a risk rating should be conducted for the potential route. The second step for the City of Calgary was the likelihood and impact assessment. The likelihood assessment refers to the road and its use while the impact assessment refers to the area of influence adjacent to the road. The likelihood criteria and impact criteria were compared to the research report to determine similarities and any additional criteria that the City of Calgary used. The likelihood criteria included road classification, road geometry, access control, at-grade railway crossings, road surface conditions, traffic volumes, V/C ratios, truck frequency, and collision statistics. The impact criteria included population density, land use, population responsiveness, environmental impact, drainage, emergency response, and speed limits. DKCI noted that the City of Calgary framework is detailed and methodical; however, it is considered to be too detailed for the City of Lloydminster and may require data that is not available.

The second framework reviewed by DKCI was that of Prince George which scores the criteria used to determine appropriate dangerous goods routes. The criteria used by Prince George include

- Access control
- Population evacuation potential
- Surrounding environment
- Road geometry
- Traffic efficiency
- Public emergency response
- Accommodation of pedestrians and cyclists
- Collision history

Access control, collision statistics, and population responsiveness/evaluation potential were noted as similar criteria between the Price George framework and that of the City of Calgary. The framework used by Prince George could be similar to that of the City of Lloydminster as it was designed for a smaller network in a similar community like that of Lloydminster.

The dangerous goods route evaluation framework used by New South Wales was also discussed in the memorandum from DKCI. The framework consists of three categories that contain numerous considerations. The three categories include Traffic and roads, environmental and land use safety, and transportation economics. Figure 3.2 below indicates the consideration associated with each criteria.

Generalized factor	Consideration
Traffic and roads	Road structure
	Volume and composition
	Travel time
	Level of service / traffic signals
	Alternative routes
Environmental and land use safety	Adjacent land use
	Population levels
	Sensitivity of ecosystems
	Accident and incident rates
	Potential hazards
	Risk level
	Drainage system
	Emergency access
	Driver training
	Vehicle safety design and maintenance
Transport economics	Distance
	Travel time
	Operating costs

Figure 3.1: Dangerous Goods Routes Considerations used in New South Wales

The criteria used by New South Wales was compared to those used by Calgary and Prince George and the similarities were noted. The reoccurring criteria formed the base for the dangerous goods route evaluation framework.

The dangerous goods routes evaluation framework for Lloydminster was also established as a two-step process, with a dangerous good route functionality assessment and a safety assessment. The functional assessment uses similar criteria to the truck routes functionality assessment with minor modifications. The difference between the truck route and dangerous goods route functional assessment is that the dangerous goods routes functionality assessment has an additional criteria that ensure a dangerous goods route is a part of the existing truck route network. This ensures that the networks are consistent and do not confuse users trying to reach their destination. The four other criteria in the dangerous goods route functionality assessment are identical to the truck route functionality assessment; however, when evaluating a potential dangerous goods route the functionality assessment is specifically related to its function as a dangerous goods route.

The second component of the dangerous goods route evaluation framework is the safety assessment which is separated into two subsections, the probability assessment and the significance assessment.

During the best practice review it was noted that often the criteria used were local variations of similar criteria. For example, Prince George used population exposure as a criteria while New South Wales used population levels. The identified criteria were separated into criteria that assess the probability of an emergency or incident happening and criteria that assess the significance of the emergency or incident.

The criteria used in the probability assessment include roadway geometrics, at-grade rail crossings, access control, traffic efficiency, and collisions. All of these criteria impact the likelihood of an emergency or incident happening and reflect the ability of dangerous goods to travel along the route safely. Traffic efficiency and collisions are both qualitative measures as they require professional judgement to assess route delays or and a routes frequency of collisions. Access control and at-grade rail crossings are quantitative as the number of at-grade rail crossings and the type and number of accesses along a route can be counted. Roadway geometrics such as lane width, shoulder width, and turning radii can also be measured or can be evaluated with professional judgement based on available information and field inspection. These criteria were selected as they can be assessed with minimal data and reflect both the concerns of industry and the general public.

The significance assessment is the second component of the safety assessment as dangerous goods pose a higher risk than regular items transported by truck. The significance assessment takes into consideration how the response to a potential emergency or incident would impact the City's roadways and users. The criteria used in the significance assessment include environmental impact, population exposure/land use, population responsiveness/evacuation potential, and emergency response. Environmental impact, population exposure/land use, and population responsiveness/evacuation potential can all be assessed qualitatively by evaluating the built form of the land use along the route and judgement. The City of Lloydminster Fire Department provided maps with the response times for all the roadways within the City to enable a quantitative assessment of emergency response. The criteria were selected as they can be assessed with minimal quantitative data.

Table 3.3 below contains the criteria selected for the dangerous goods route evaluation framework along with the criteria descriptions and the assessment levels. An overview on the methodology used for the evaluation of potential dangerous goods routes is included in section 5.3 of this report.

Table 3.3: Dangerous Goods Route Evaluation Framework

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

Dangerous Goods Route Functionality Assessment			
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



Probability Assessment			
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

Significance 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



4.0 Route Options Development

Phase One of the stakeholder and public engagement was completed during the initial stages of the project to receive feedback on how the existing truck route and dangerous goods route networks currently function. Once feedback was received from stakeholders and the public on the routes the potential route options were created. A summary of the public engagement process used in Phase One is included in this section.

This section also provides a brief description of the optional scenarios for truck routes and dangerous goods routes within and around Lloydminster that were developed after Phase One engagement. In all cases the existing truck routes and the dangerous goods routes are presented as Option zero as keeping the existing routes without changing them was considered the “do nothing” option. While it is acknowledged that the “do nothing” option may not be preferred, as noted by the objectives of this study, it must be also acknowledged that while likely unfavorable, the “do nothing” option is still an option that could be considered if no other option were deemed preferable.

4.1 Phase One Engagement

Phase One of engagement took place on October 17, 2019, with the focus of hearing from stakeholders and the public to understand how the current truck network functions, any challenges or concerns and their preferences for future routes within the municipal boundaries. Engagement opportunities in this phase of engagement include stakeholder meetings, a Your Voice event and an online survey.

Engagement Purpose

The overall goal for engagement in this phase was to provide opportunities for invited stakeholders and members of the public to provide feedback on the current dangerous goods routes and truck routes within the municipal boundary as well as what criteria should be considered in the selection and identification of truck routes and dangerous goods routes. Table 4.1 below describes the level of engagement used for Phase One of the project.

Table 4.1: Level of Engagement

	CONSULT	INVOLVE
Purpose	To educate and collect public/ stakeholder opinion to improve decisions	To stimulate public/ stakeholder debate, clarify values & broaden the information base to improve decisions.
Promise	We will listen, acknowledge and report concerns and aspirations about presented alternatives, and explain to the decision-maker how the public input influenced the recommendation.	We will work with the public/ stakeholders to ensure comments are directly reflected in the alternatives developed, report the comments received and explain how the input contributed to recommendation(s).

Communications for Phase One

Below are the channels the stakeholder meetings and public open house were advertised on:

- Social Media (Facebook, Twitter, LinkedIn)
- Website (youvoicelloyd.ca/DGR and lloydminster.ca)
- Newsletters (Team News- City of Lloydminster)
- Invitations (76 invitations to local businesses)
- Newspaper (Meridian Source)
- Media Release (The Goat, Prime Time News, Meridian Source)

Multiple methods of communication were used to ensure the stakeholders and public were aware of the event and could attend. By reaching out to the stakeholders and the public in advance it allowed more participation during the public event and provided the project team with a better understanding of the different routes being used by trucks and dangerous goods.

4.1.1 Engagement Process and What We Asked

Table 4.2 includes a summary of the engagement events held for the project during Phase One. The feedback gathered from the stakeholder meeting, public open house and online engagement informed the options created by the project team. More information on the process and what was asked of participants is included in the following section. A copy of the Phase One display boards can be found in Appendix B.

Table 4.2: Engagement Summary

EVENT/ACTIVITY	DATE AND TIME	LOCATION	PARTICIPANTS
Stakeholder Meetings	October 17, 2019	City of Lloydminster Operations Building	8
Public Pop-up Event	October 17, 2019 5:00 p.m. to 8:00 p.m.	Servus Sport Centre	25
Online Engagement	October 10-22	Your Voice, City of Lloydminster website	49

Stakeholder Meeting

Several key stakeholders were identified, by the project team and the City, and invited to attend one of four, 30-minute stakeholder meetings on October 17, 2019. Two maps were on display for stakeholders to use in discussions; one with the current truck routes the other with current dangerous goods routes. Stakeholders were asked to share their experiences, concerns and feedback about the current routes. They were given a chance to ask the project team questions about the study and any other concerns regarding truck routes, dangerous goods routes and permits. The stakeholders that attended the meetings included industry, emergency responders, and the City bylaw personnel.

Public Pop-up Open House

A public Your Voice event was held on October 17, 2019 at the Servus Sport Centre from 5:00 p.m. to 8:00 p.m. Stakeholders and members of the public were able to ask questions and share their thoughts on the current dangerous goods routes and truck routes.



Display boards were used at the event to show the existing truck routes and dangerous goods routes as well as ask the public what should be considered when designating routes. Project team members were available to discuss the project and answer questions related to dangerous goods and truck routes within the municipal boundary.

Online Survey

An online survey was available on the City of Lloydminster's website from October 10, 2019 to October 24, 2019. A brief overview introduced the project and the survey. Participants were asked which roads they would like to see included in the draft dangerous goods routes and truck routes, which roads they would like to see excluded from the draft dangerous goods routes and truck routes and for any additional feedback.

4.1.2 Stakeholder and Public Feedback Summary

Stakeholder Feedback Summary

The following summary includes feedback and concerns regarding existing or future Dangerous Goods Routes and Truck Routes in the municipal boundary for the City of Lloydminster:

- Most of the dangerous goods and truck traffic is local and concentrated in the northwest corner of the City
- Public safety and minimizing risk are important factors to consider
- Avoiding trucks and dangerous goods from travelling through downtown on Highway 17
- Current truck routes serve industry well, dangerous goods could be added to those routes
- The City has a long history with trucks and moving dangerous goods, there is a truck culture and trucks can often be found in residential areas
- Many stakeholders recognize and are concerned that current routes are not enforced
- Concern about permits, how they could be processed and if there is a cost, what could that mean to businesses
- Preferred routes include:
 - 40 Avenue, 75 Avenue, 62 Avenue
 - 12 Street, , 44 Street, 52 Street, 62 Street, 67 Street
- Suggestions to have a designated route going in and around the industrial area, as direct as possible, and limit trucks to these roads
- Many industries in the northwest area of the City have multiple truck per day going to and from their facilities, many of the truck are hauling dangerous goods or have dangerous goods residue
- Truck parking within or near residential areas is a concern
- With limited truck route signage and no dangerous goods route signage, drivers and industry feel like it is a "free-for-all" because there are no clear rules
- Routes should be efficient and as direct as possible

Public and Online Feedback Summary

The following summary includes feedback from the in-person event and the online engagement. Participants were asked questions about current routes, which routes should be excluded, and which routes should be considered. The prevailing themes include:

- Several participants would prefer dangerous goods and truck traffic to stay out of the City, many referencing a ring road or by-pass and just wanting all truck to go around the City
- There are a number of concerns around public safety and truck traffic on current routes in or near residential areas and the city centre
- There are concerns with a limited number of routes in case there is a need to close a route due to weather or an emergency, it leaves limited options for dangerous goods and truck traffic
- Avoiding trucks and dangerous goods from travelling through downtown on Highway 17, roads are narrow and there are lots of pedestrians in the area
- There are many suggestions to build 75 Avenue into a four-lane road to handle more truck traffic
- Many participants suggested that any future considerations should avoid residential areas whenever possible
- Concerns about the uncontrolled rail crossings along 52 Street and the risk of an incident at these locations
- Participants suggested longer turning lanes for trucks turning north off Highway 16 into the industrial area
- Several participants want routes to avoid College Drive, Bud Miller Park, 59 Avenue and 25 Street
- Trucks are perceived as not obeying traffic signals, for example running yellow or red lights on Highway 16, which is a concern for traffic and pedestrian safety
- Turning lanes and corners, specifically at 12 Street and 75 Avenue, are not sufficient for trucks with trailers (or multiple trailers) and need to be upgraded if considered in the new routes
- Many are concerned about damage to roads with heavy loads
- Many participants are concerned about dangerous goods travelling along 12 Street and 25 Street, as they are next to a residential area

Key themes

- Dangerous goods and truck routes should avoid the city centre
- Public safety and keeping dangerous goods away from residential areas, schools, recreation and the city centre were important to many participants
- Continuing 52 Street west to 75 Avenue would create a direct route for dangerous goods and trucks into the industrial area
- Avoid Highway 16 and Highway 17, they are heavily congested and should be avoided for safety reasons
- Popular suggestions for dangerous goods and truck routes include:
 - 75 Avenue, 62 Avenue, 40 Avenue
 - 67 Street, 62 Street, 52 Street, 25 Street and 12 Street
- Popular suggestions to avoid for dangerous goods and truck routes include:
 - Highway 16 and Highway 17
 - 25 Street, College Drive and 12 Street
- Many participants want to see a by-pass around the City for trucks that are passing through



4.2 Truck Route Options

Once the public engagement feedback was received, the creation of route options started. For the purposes of this study the assessment of truck routes was completed in “thirds” of the city based on the north sector, the southwest quadrant and the southeast quadrant. All of the options were created using feedback from the City, stakeholders, and the public in regards to how the network currently functions as well as where the trucks and dangerous goods movement is concentrated today. A copy of the maps and short description of the options can be found in Appendix B.

4.2.1 North Sector

The majority of the industrial sector within Lloydminster is located in the northwest portion of the City with some located in the northeast. For these reasons options were created for the entire north half of the City. Option zero, as mentioned above, is keeping the existing truck routes in place as per the current Traffic Bylaw (No. 09-2018). In all of the North Sector options, 67 Street west of 75 Avenue and east of 40 Avenue has been added as a truck route as well as 75 Avenue and 40 Avenue north of 67 Street as these routes service industrial developments.

Option One

Option one in the north is the industrial arterials only option. This option focuses the truck routes on the industrial arterial roads only. With this option some of the existing smaller truck routes have been removed (47 Street and 59 Avenue blocks, in Hill Industrial, 55 Avenue in West Lloydminster, 50 Avenue in the Central Business District as well as in North Lloydminster). In addition, the 44 Street truck route has also been removed which would require through trips to bypass/divert to other routes. The removal of this as a truck route would not mean the removal of trucks as many trucks make trips to/from businesses on or near 44 Street. It is noted that 52 Street from 62 Avenue to 75 Avenue is proposed as a future truck route and could be designated as such upon roadway completion. The stakeholder feedback received during Phase One of the engagement indicated a preference for direct routes in and around the industrial areas. This option provides fewer routes compared to existing but would limit the roads available to drivers which was also a suggestion made by stakeholders.

Option Two

Option two uses arterial and industrial roads as the truck routes. This option builds off the existing truck route network with the inclusion of more industrial roads as truck routes. In this option the 44 Street truck route has been retained which would not require through trips to bypass/divert to other routes. The 55 Avenue in West Lloydminster from 44 Street to 52 Street has been removed and replaced with a truck route along 51 Street from 50 Avenue to 55 Avenue. It is noted that this new route is recommended to be restricted. In addition, the portion of 50 Avenue from 57 Street to 52 Street has also been proposed as restricted. It is noted that 52 Street from 62 Avenue to 75 Avenue is proposed as a future truck route and could be designated as such upon roadway completion. An item to note is that restricted truck routes would have operating restrictions on them which would limit their availability as part of the truck route network. Without specifying all other truck routes would be considered 24 hr. truck routes whereas restricted truck routes may be limited from Monday to Saturday or Monday to Friday and only available from 7:00 to 23:00 or 7:00 to 19:00 or other appropriate alternative.

Option Three

Option three uses the arterial roadways as well as the industrial areas to create the truck route network in the north sector. This option combines elements of Options one and two to provide access to more routes while limiting the specific route designations. In this option only the main arterial routes would be designated as truck routes whereas all roads within the identified industrial areas would also be considered truck routes. In this option the industrial areas of West Commercial, Hill Industrial, Airport, Husky Industrial, Glenn E. Neilson Industrial Park, Sask Industrial, and the existing industrial in the Northeast ASP area have been designated for all roads to be truck routes. It would also be possible to designate areas on North Industrial and Landfill as Truck Areas, should this be considered desirable. In this option it is also noted that the segment of 50 Avenue from 57 Street to 52 Street has been proposed as restricted. During the jurisdiction review it was noted that other municipalities used areas to designate truck routes which allows the driver to decide the best route to reach the destination within the designated areas. The north half of the City contains six industrial areas and the airport all of which would require trucks and dangerous goods. Designating all roadways as truck routes within the industrial areas has not been used in the City of Lloydminster before.

4.2.2 Southwest Quadrant

The southwest quadrant is primarily residential with some commercial land use along Highway 16 and Highway 17 as well as institutional land use such as Bud Miller Park and Lakeland College. Option zero maintains the existing truck routes as per the current Traffic Bylaw (No. 09-2018). This option utilizes the full outer route of 12 Street and 75 Avenue as well as maintaining the full continuity of the 44 Street and 50 Avenue truck routes.

Option One

Option one has less truck routes than existing and utilizes only the central arterials. This option focuses the truck route on the central arterials of the southwest quadrant by removing the perimeter routes on 12 Street and 75 Avenue as well as the central portions of 44 Street and 50 Avenue. This option utilizes College Drive (25 Street/62 Avenue) between 44 Street and 50 Avenue as a means of removing trucks from the central sections of 44 Street and 50 Avenue. This option also utilizes the western portion of 44 Street from the west City limit to 62 Avenue as well as the southern portion of 50 Avenue from the south City limit to 25 Street in order to provide continuous routing. This option was created because during the first public engagement event stakeholders noted that they currently used College Drive as a truck route because it was signed as a route. The project team determined there are truck route signs on 50 Avenue northbound and southbound indicating that College Drive could be used as a truck route.

Option Two

Option two utilizes the northeast arterials as the truck routes. This option focuses the truck route on the northeastern arterials of the southwest quadrant by removing the perimeter routes on 12 Street and 75 Avenue. This option maintains the full continuity of the 44 Street and 50 Avenue truck routes but adds College Drive (25 Street/62 Avenue) between 44 Street and 50 Avenue as a restricted truck route. Some of the public feedback received during the engagement was that there were concerns around the left turn movement from 75 Avenue to 12 Street due to frequent trucks along that route. This option removed that route to minimize the impact to passenger vehicles using the route.



Option Three

Option three is similar to option two but uses the southwest arterials. This option focuses the truck route on the southeastern arterials of the southwest quadrant by utilizing the perimeter routes on 12 Street and 75 Avenue by removing the central portions of 44 Street and 50 Avenue. This option also adds College Drive (25 Street/62 Avenue) between 44 Street and 50 Avenue and 50 Avenue between 12 Street and 25 Street as restricted truck routes. Stakeholders and the public indicated that 50 Avenue between 25 Street and 44 Street and 44 Street between 62 Avenue and 40 Avenue can become congested due to the large number of trucks using the route and the frequency of the traffic lights. Option three removes the truck traffic from 50 Avenue and 44 Street to help alleviate congestion.

Option Four

Option four has more routes than existing. This option utilizes all of the arterials in the southwest quadrant of the city by utilizing the full perimeter route of 12 Street and 75 Avenue as well as maintaining the full continuity of the 44 Street and 50 Avenue truck routes. This option also adds College Drive (25 Street/62 Avenue) between 44 Street and 50 Avenue as a restricted truck route in order to provide an alternative to the existing perimeter and central routes. The public expressed concern with a limited number of routes in case there is a need to close a route due to weather or an emergency, and this option provides two alternate routes if one of the three routes is closed.

4.2.3 Southeast Quadrant

The southeast quadrant is the smallest area of the three “thirds” and is mainly residential with some commercial land use along 44 Street and 50 Avenue. Option zero keeps the existing truck routes as per the current Traffic Bylaw (No. 09-2018). This option utilizes the full outer route of 12 Street and 75 Avenue as well as maintaining the full continuity of the 44 Street and 50 Avenue truck routes.

Option One

Option one uses less routes than the existing truck routes. This option only uses the perimeter arterials in the southeast quadrant of 12 Street and 40 Avenue. This option removes the central arterials of 44 Street (Highway 16) and 50 Avenue (Highway 17) from the southwest quadrant. This option maintains the eastern portion of 44 Street (Highway 16) from 40 Avenue to the east City limit. Stakeholders listed 12 Street and 40 Avenue as preferred routes and the public expressed the preference to have the trucks routed around the City. This option takes both stakeholder and public feedback into account.

Option Two

Option two has more truck routes than the current network in the southeast. This option keeps the existing truck routes in place as per the current Traffic Bylaw (No. 09-2018). This option utilizes the full outer route of 12 Street and 75 Avenue as well as maintaining the full continuity of the 44 Street and 50 Avenue truck routes. In addition, this option adds 25 Street as a future truck route from and 50 Avenue to 40 Avenue as a connection to the optional College Drive truck route. It is noted that to compatibility the designation of 25 Street east of 50 Avenue as a truck route could be either restricted or unrestricted to be consistent with 25 Street west of 50 Avenue. This option also designates the Wigfield Industrial has been designated for all roads to be considered truck routes. Similar to option three in the north, this option allows industry direct and efficient access to destinations within and through the City.

Option Three

Option three is an adaptation of option two. This option uses the perimeter of the southeast quadrant similar to Option two but removes the segment of 50 Avenue between 25 Street and 44 Street. A connection from 50 Avenue along 25 Street would be required with this option in the southwest to allow connectivity amongst the network. Congestion was noted along 50 Avenue between 25 Street and 44 Street and this option removes trucks from that section of 50 Avenue. Trucks and dangerous goods would have to use the perimeter routes or use 50 Avenue to College Drive.

4.3 Dangerous Goods Route Options

For the dangerous goods routes the assessment of options was completed on a City wide basis as there are fewer dangerous goods routes options than there are truck route options. All of the dangerous goods routes options were created based on the feedback received by the City, stakeholders, and the public during Phase One of engagement. Option zero for the dangerous goods routes was considered maintaining the existing dangerous goods routes in place as per the current Traffic Bylaw (No. 09-2018). It is important to note that currently the Traffic Bylaw has an inconsistency along 50 Avenue from 44 Street to 52 Street whereby this segment of 50 Avenue is designated as a dangerous goods route but is not designated as a truck route. A copy of the maps and short description of the options can be found in Appendix B.

Option One

Option one provides more routes than existing, but the routes are located along the perimeter of the City. This option focused the dangerous good routes on the perimeter roads around the City. This option uses the western portion of 44 Street from the west city limit to 75 Avenue and the eastern portion of 44 Street from the east city limit to 40 Avenue. This option also only uses the southern portion of 50 Avenue from the south City limit to 12 Street. This option then uses 12 Street, 75 Avenue, 40 Avenue and 67 Street as routes around the City. This option removes all dangerous goods routes from the central parts of the City in exchange for perimeter routes around the City. This options also includes the extension of dangerous goods routes along 75 Avenue, 40 Avenue and 67 Street to the north, west and east City limits. Several participants of the public event and online survey noted that they would prefer all trucks and dangerous goods traffic stay out of the City referencing the ring road or a future bypass. As the bypass is not currently planned the City of Lloydminster would utilize the perimeter roadways as the routes around the City.

Option Two

Option two also uses more routes than existing because 50 Avenue between 44 Street and 52 Street is not a dangerous goods route and there must be a connection between 50 Avenue north and south of this section. This option focused the dangerous goods routes in the interior roads within the City. This option uses the full continuity of 44 Street from the west city limit to the east city limit and the southern half of 50 Avenue from the south City limit to 44 Street. In addition, this option uses the norther segment of 50 Avenue from the north City limit to 52 Street. This option uses segments of 62 Avenue and 40 Avenue from 44 Street to 52 Street as well as 52 Street from 62 Avenue to 40 Avenue to create a route around the central business district. This option was created as a modification of what is existing because it corrects the discrepancy along 50 Avenue between 44 Street and 52 Avenue.



Option Three

Option three uses option one and some sections of option two as more dangerous goods destinations are located in the north half of the City. This option focused the dangerous good routes on the perimeter roads around the City from Option one and utilizes the interior roads within the north sector of the City as shown in Option two. This option uses the western portion of 44 Street from the west city limit to 75 Avenue and the eastern portion of 44 Street from the east city limit to 40 Avenue. This option also only uses the southern portion of 50 Avenue from the south City limit to 12 Street. This option then uses 12 Street, 75 Avenue, 40 Avenue and 67 Street as routes around the City. In addition, this option uses the norther segment of 50 Avenue from the north City limit to 52 Street. This option uses segments of 62 Avenue and 40 Avenue from 44 Street to 52 Street as well as 52 Street from 62 Avenue to 40 Avenue to create a route around the central business district. This options also includes the extension of dangerous goods routes along 75 Avenue, 40 Avenue and 67 Street to the north, west and east City limits. This option was created to route dangerous goods around the City while providing more direct access to the northwest where the majority of the dangerous goods originate or are destined for.

Option Four

Option four uses the most routes out of the dangerous goods routes options. This option combines the dangerous good routes on the perimeter roads around the City from Option one and utilizes all the interior routes within the City from Option two. This option uses the full continuity of 44 Street (Highway 16) from the west city limit to the east city limit and the southern half of 50 Avenue (Highway 17) from the south City limit to 44 Street (Highway 16). This option then uses 12 Street, 75 Avenue, 40 Avenue and 67 Street as routes around the City. In addition, this option uses the norther segment of 50 Avenue (Highway 17) from the north City limit to 52 Street. This option uses segments of 62 Avenue and 40 Avenue from 44 Street (Highway 16) to 52 Street as well as 52 Street from 62 Avenue to 40 Avenue to create a route around the central business district. This options also includes the extension of dangerous goods routes along 75 Avenue, 40 Avenue and 67 Street to the north, west and east City limits. This option was created to allow direct access within the City and allow dangerous goods passing through to quickly enter and exit the City limits.

4.4 Restricted Roadways and Potential Storage Locations

During the development of route options additional information was required on restricted roadways and potential truck storage locations. The following section describes the process used for establishing the type of restricted roadways and locations for potential truck storage.

4.4.1 Restricted Roadways

While developing the truck route and dangerous goods route options it was noted that there were some roadways that received conflicting feedback from the public and industry stakeholders. As an example, 50 Avenue between 52 Street and 57 Street has residential houses fronting onto the roadway which industry indicated that 50 Avenue is the most direct route north from the bulk fuel station on 52 Street while residents indicated a desire to not have trucks use the roadway. A restricted route was a potential solution for this section of 50 Avenue as a restriction would limit when trucks could use the route.

The other locations where restricted truck routes were suggested are College Drive and 51 Street between 55 Avenue and 50 Avenue. 51 Street has commercial businesses along the north side and houses fronting onto the street on the south side. Providing 51 Street as a truck route limits trucks to that specific roadway instead of taking any route through the residential neighborhood to reach the commercial destinations. College Drive was suggested as a restricted route to provide an additional route in case other routes are congested or closed for a period of time. Additionally, College Drive allows northbound trucks to use that route to access the northwest and does not require them to go through the commercial area along 50 Avenue which would alleviate some of the congestion along 50 Avenue.

During the jurisdiction review it was noted that different municipalities use different time of day and day of the week restrictions. The lack of consistency among other municipalities restrictions allows the City of Lloydminster to select a restriction that best fits the industries within the City. Day of the week restrictions could exclude weekends or only Sundays and require the trucks find alternate routes Saturdays and/or Sundays. The time of day restrictions could restrict trucks to overnight, only business hours, or not in the late evening. The following restrictions are time of day restrictions that were found in other municipalities during the jurisdiction review.

- 22:00 to 07:00
- 07:00 to 19:00
- 07:00 to 23:00

During the stakeholder meetings, industry representatives were asked what type of restriction would work within the City of Lloydminster. Since industry works seven days a week it was noted that a day of the week restriction may not work within the municipal boundaries. A restriction similar to 07:00 to 23:00 would reduce the number of trucks using the roadway while residents are home in the evenings and overnight. Initially 51 Street between 50 Avenue to 55 Avenue and 50 Avenue between 57 Street and 52 Street was suggested as restricted to Monday through Saturday between 06:00 to 23:00 and College Drive as restricted to Monday through Friday between 07:00 and 19:00. The feedback received from the City indicated a desire to only restrict the time of day and not the day of the week. The restrictions were then updated to be 06:00 to 22:00 for all restricted routes within the City to ensure standardization from a connections and enforcement perspective as well as to provide maximum flexibility during business hours while restricting truck activity during the late evening and overnight hours.

4.4.2 Potential Storage Locations

Potential storage locations were also investigated as part of the project. Currently the Husky truck stop located along 44 Street is where most trucks park if they have to stay overnight in the City. During the first phase of engagement the City and the public noted that there are often trucks parked in residential neighborhoods or in alleys behind hotels (along 43 Street west of 40 and 41 Avenues). Potential storage locations would provide the City a designated area where trucks could stop and park if they need to stay overnight in Lloydminster.

As part of the second phase of engagement stakeholders were asked where a potential storage location could be. Stakeholders noted that the Husky truck stop is used frequently due to its proximity to amenities. No other locations around the City were identified by stakeholders as potential storage locations as most local businesses use their own industrial yards for truck storage.

Based on the land use, private commercial parcels in the City could be used as storage locations as well as continuing to use the Huskey Truck Stop. No alternative truck storage locations were identified at that time.

It is noted however that in the jurisdiction review other municipalities had included truck storage lots on the periphery of the City. As such should it be desired to include formal truck storage/parking location opportunities exist in the east industrial area off 47 Street as well as just east of the east city limit on 35 Avenue and 44 Street. There are locations of undeveloped land outside the east city limit on 35 Avenue and 44 Street which can be seen in Figure 4.1 below. In addition, on the west side of the City potential opportunities exist north of 44 Street between 62 Avenue and the west city limit as shown in Figure 4.1 below.

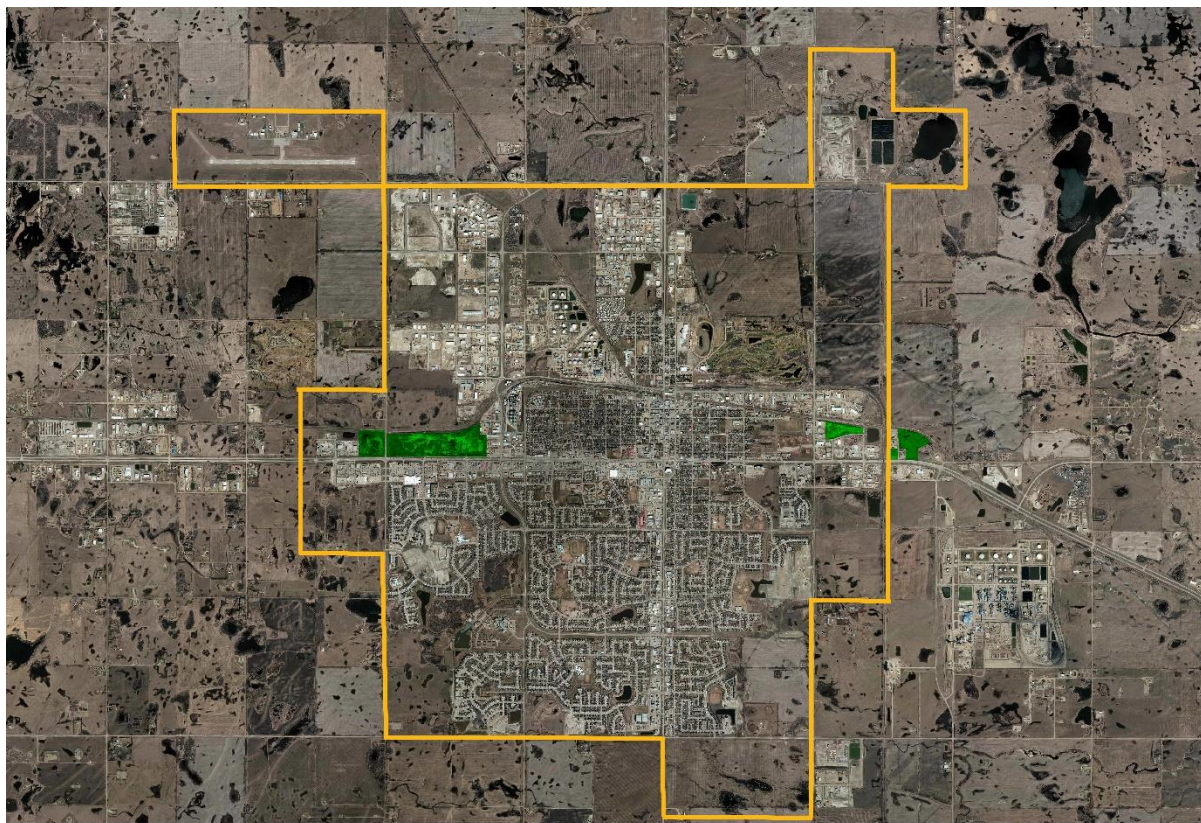


Figure 4.1: Potential Truck Storage Locations



5.0 Route Options Evaluation

As a key component of the route evaluation and assessment Phase Two of the stakeholder and public engagement was completed to receive feedback on how the potential options would impact users and residents. As such, the feedback received from stakeholders and the public on the potential options was influential in the evaluation of the options. A summary of the public engagement process used in Phase Two is included in this section. After the public engagement was completed the potential truck routes and dangerous goods routes were analysed using the evaluation framework to determine the routes with the highest potential as truck routes and dangerous goods routes. The following sections outline the analysis of the truck routes and dangerous goods routes.

5.1 Phase Two Engagement

Phase two of engagement took place December 3rd, 2019. During this phase the project team shared options for truck routes and dangerous goods routes with key stakeholders and the public at a Your Voice event. The project team shared truck route and dangerous goods route options that were created based on the feedback collected in Phase One. The focus of the engagement was to gather feedback, comments and concerns from stakeholders and the public on the options.

Engagement Purpose

The overall goal for engagement in this phase was to provide opportunities for invited stakeholders and members of the public to provide feedback on options presented for truck routes and dangerous goods routes. Table 5.1 below describes the level of engagement used for Phase Two of the project.

Table 5.1: Level of Engagement

	CONSULT	INVOLVE
Purpose	To educate and collect public/ stakeholder opinion to improve decisions	To stimulate public/ stakeholder debate, clarify values & broaden the information base to improve decisions.
Promise	We will listen, acknowledge and report concerns and aspirations about presented alternatives, and explain to the decision-maker how the public input influenced the recommendation.	We will work with the public/ stakeholders to ensure comments are directly reflected in the alternatives developed, report the comments received and explain how the input contributed to recommendation(s).

Communication for Phase Two

Below are the channels the stakeholder meetings and public open house were advertised on:

- Social Media (Facebook, Twitter, LinkedIn)
- Website (youvoicelloyd.ca/DGR and lloydminster.ca)
- Newsletters (Team News- City of Lloydminster)
- Invitations (76 invitations to local businesses)
- Newspaper (Meridian Source)
- Media Release (The Goat, Prime Time News, Meridian Source)

Using multiple methods of communications ensured that the stakeholders and public were aware of the event and could attend. By reaching out to the public in advance it allowed more participation during the public event and provided the project team with a better understanding of the concerns and issues with the proposed route options.

5.1.1 Engagement Process and What We Asked

Table 5.2 includes a summary of the engagement events held for the project during Phase Two. The feedback gathered from the stakeholder meetings and the Your Voice event will inform the recommendations created by the project team. Additional information on the engagement process and what was asked of participants is included in the following section. A copy of the display boards and engagement workbooks is included in Appendix B.

Table 5.2: Engagement Summary

EVENT/ACTIVITY	DATE AND TIME	LOCATION	LEVEL OF ENGAGEMENT
Stakeholder Meetings	December 3, 2019 1:00 – 2:00 p.m. 2:30 – 3:30 p.m.	City of Lloydminster City Hall	Involve
Public Pop-up Event	December 3, 2019 4:00 p.m. to 7:30 p.m.	Servus Sport Centre	Consult

Stakeholder Meeting

Several key stakeholders were identified and invited to attend one of two, one-hour stakeholder meetings on December 3, 2019. Each stakeholder was given a workbook that presented all the draft options. As outlined in section 4.2 of this report truck route options were presented in sections of the city as north, southwest and southeast while dangerous goods routes were presented as city-wide plans that work along with the truck routes.

Project team members went through the workbook with stakeholders discussing each option, asking questions and recording feedback. Stakeholders were able to share their concerns and feedback about each option through group discussion and making notes in the workbooks. The workbooks were collected at the end of each session for further review and analysis

Public Open House

A public Your Voice event was held on December 3, 2019 at the Servus Sport Centre from 4:00 p.m. to 7:30 p.m. that included truck routes and dangerous goods routes as a topic for feedback. All the options were presented on display boards with space for participants to leave feedback on a sticky note.

Stakeholders and members of the public were asked to share whether they support, do not support, or could support with changes all the options presented. Project team members were available to discuss the project and answer questions related to truck routes and dangerous goods routes within the municipal boundary. 29 comments were captured at the Your Voice event.



5.1.2 Stakeholder and Public Feedback Summary

Stakeholder Feedback Summary

The following summary includes feedback and concerns regarding existing or future Dangerous Goods Routes and Truck Routes in the municipal boundary for the City of Lloydminster:

- North truck route option 3 is the preferred route, it is good for future planning and development and leaves no grey areas for drivers
- Southeast truck routes option 1 is preferred but could be improved by adding an industrial area similar to the north and adding Highway 16 as a truck route
- Southwest truck routes 3 is preferred, including College Drive as a truck (restricted or not) is not critical for industry to operate as long as deliveries can still be made
- Routes with restrictions would need to be clear on what the restrictions are – time of day, type of goods, etc.
- Several participants wondered if industrial zones could be implemented for dangerous goods routes as well
- Dangerous goods route option 3 would be good if the route included all of Highway 16
- Dangerous goods route option 4 would be good if Highway 17 south of Highway 16 was removed

Public Feedback Summary

The following summary includes feedback from the in-person event. Participants were asked questions about current routes, which routes should be excluded, and which routes should be considered. The prevailing themes include:

- Several participants would prefer dangerous goods and truck traffic to stay out of the city, many referencing a ring road or by-pass and just wanting all trucks to go around the city
- Preferred options keep trucks and dangerous goods out of the city centre
- There is some concern of having truck routes through residential areas and near schools or playgrounds in the southeast and southwest areas of the city
- There are a number of concerns around public safety and truck traffic on current routes in or near residential areas and the city centre
- Participant feedback supports College Drive as a truck route if the entire road is four lanes

Key themes

- Creating industrial areas for truck routes is the preferred options for all routes
- College Drive is not critical to industry to have as a truck route as long as deliveries can be made
- Public feedback supports College Drive as a truck route if the entire road is four lanes
- Including Highway 16 for truck routes and dangerous goods routes is preferred
- Highway 17 through downtown and south of Highway 16 do not need to be included as a truck route, as long as deliveries can still be made
- Improvements to the roads and turning lanes at 75 Avenue and 12 Street

5.2 Truck Route Evaluation

Potential truck routes were assessed using the evaluation framework developed for the City of Lloydminster to facilitate systematic and objective truck route designation. The following section outlines the assessment methodology and evaluation of potential truck routes.

5.2.1 Truck Route Evaluation Methodology

As outlined in section 3.1 of this report an evaluation framework was created to ensure the City of Lloydminster can apply a consistent methodology for designating truck routes. Testing the evaluation framework on the potential truck routes allowed for any potential issues or uncertainties to be clarified. The potential truck routes identified were separated into smaller segments for assessment based on network linkage and cross street connectivity. The following sections outline the application of the network functionality assessment and the route performance assessment methodologies.

Network Functionality Assessment

The first component in the evaluation process is a network functionality assessment which acts as an initial check to determine if a route is compatible with the existing truck route network. The assessment completed for this project was a holistic review of the entire city-wide network. As such, some of the criteria noted herein have different responses due to the nature of the review. Once the project is completed and a truck route network is established for the City, it is assumed that only route additions will be assessed and not the entire city-wide network.

The network functionality assessment consists of four criteria that were addressed with questions through either a “yes” or a “no” response. The following outlines how the criteria in the network functionality assessment were considered:

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. Each route was evaluated individually and as part of the overall network. For highways and arterials, the route purpose was evaluated in terms of trips passing through the City while collectors and industrial locals were assessed based on trips within the City. The purpose of individual routes was assessed on the ability of the route to provide direct access to destinations within and passing through the City.

As a network, the purpose of the routes is to allow efficient movement of goods which is why routes along the arterial grid (12 Street, 44 Street, 67 Street, 40 Avenue, 50 Avenue, and 67 Avenue) have purpose even though they may not have direct access to destinations. As the City is located along the TransCanada Highway trucks pass through the City regularly. In addition, roadways along the boundary of the City were assessed for regional purpose.

Network Connectivity: Truck routes must provide a connection to the existing truck routes within the City or provide a connection to the regional network. A potential route was considered to have network connectivity if the route was a part of the existing truck route network or connects to the existing network. Additional routes should provide a benefit to the network, and if a potential route did not benefit the network it was considered to not connect to the network. For example, potential routes that did not provide access to destinations or were not efficient were considered to have no network connectivity. To assess boundary routes the regional connectivity was reviewed as routes along the boundary should not limit how trucks can enter or exit the City.



The potential outcomes to the network connectivity criteria are “yes”, “no”, and “yes*”. A response of “yes*” indicated that the network connectivity of that route is dependent on the inclusion of surrounding truck routes. In the future when individual route additions are assessed the network connectivity will not be dependent on other surrounding routes also being truck routes as a formal approved network will be established and in place.

Reduces or Maintains Trip Length: Truck routes add efficiencies to the network by reducing the trip length to destinations within the City or by not adding unnecessary trip length for goods moving through the City. This criteria is assessed by comparing the trip lengths of using a route or using alternate roadways if that route was not available. Trips through the City were used to assess trips along highways and arterials while destination trips within the City were used for trips along collectors and locals. If there is a specific roadway that is the only way to reach a destination it was considered to not reduce trip length since the route must be used if it is designated as a truck route or not. An example would be a local roadway that is the only road with access to the private driveway. A truck must travel from the closest truck route to that roadway whether that roadway is a truck route or not.

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. It is noted that an off-route trip is defined as a trip or portion of a trip taken by a truck that is used to reach a delivery destination and/or pick up goods from a location that 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 deliveries to the hospital is defined as an off-route trip.

This criteria is a comparative measure based if the route or an alternative roadway was used. If a potential route does not service destinations directly and alternate routes could be used in the absence of the route, then it is not considered to reduce off-route trips. Additionally, the reduction of off-route trips was assessed by determining if designating the roadway as a truck route would help reduce off-route trips. By designating routes as truck routes it forces trucks along specific routes and then reduces the options of routes available to reach a destination. For example, designating the arterial grid as a truck route limits the options available for trucks passing through the City. To reach a destination trucks must stay on a designated truck route as long as possible and designating routes that are efficient for goods movement through and within the City will reduce the number of off route trips.

Route Performance Assessment

The second component of the truck route evaluation is the route performance assessment, which reviews the specific route to ensure it will be a suitable truck route. The following outlines how the criteria in the route performance assessment were considered:

Roadway Classification: Roadway classification as defined by the City's 2016 Transportation Master Plan document and includes Highways, Arterials, Collectors, and Locals. The designation of what roadway classifications are considered “very good”, “good”, “fair”, or “poor” was based on the land use of each specific roadway classification. Industrial roadways are typically constructed differently than non-industrial roadways and that would change how truck drivers feel using the roadways. For example, an industrial local roadway would be different than a residential local roadway. In addition, residential local roadways were excluded from the route assessment. It was noted that if a route received a “poor” rating in this criteria the route should not be considered a truck route. As trucks are typically required for more industrial and commercial businesses the industrial

roadways are where the truck traffic can be focused and why those roadway classifications were considered “good”.

Roadway Geometrics: Roadway and intersection geometric factors such as lane width, available shoulders, and turning radii needs to be appropriate for the safe use by trucks. For this project Google Earth was used to view the potential routes from Street View as the assessment was completed during the winter season (post snowfall). If no Street View was available, the roadway geometrics were considered to be fair unless the route was a newly constructed road which was considered good. As trucks are wider than passenger vehicles the turning radii, lane widths, and shoulder widths of a roadway can affect the ability of trucks to move efficiently and effectively within and through the City. If a potential route receives a “poor” outcome in this criteria it should not be considered a truck route.

Surface Conditions: Existing roadway surface conditions should be capable of supporting frequent truck use. During site visits additional concrete was noted along some roadways to increase the roadways structural capacity. Some roadways were noted by the City as needing frequent construction and maintenance to account for additional truck weight. Using only the additional concrete and roadways noted by the City for structural data the surface conditions were assessed for the majority of the potential routes. Google Earth Street View also was used to assess roadway pavement cracking. Roadways with lots of cracking that are on the existing truck route network were assessed as “fair” due to the likelihood that the roadway is experiencing load related cracking. Rutting is another indication that the roadway may not have the appropriate base to handle the loads associated to trucks. If a route receives an outcome of “poor” in this criteria it does not mean it should not be a truck route. In all cases if the structural capacity and surface conditions can be improved and then the route may be more suitable for truck traffic.

At-Grade Rail Crossings: Truck Routes should 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. At-grade rail crossings were assessed along each route segment. Based on the number of rail crossings observed the route outcomes were selected. As per Table 5.3 “very good” is no rail crossings, “good” is one rail crossing, “fair” is two crossings, and “poor” is three or more crossings. Individual segments score well due to their short lengths and the rail crossings being only in the north half of the City. Ideally the whole route should cross the fewest number of rail crossings as possible to ensure the safe movement of goods within and through the City.

Land Use Compatibility: Current adjacent land use should be appropriate for frequent trucks trips. Often associated with the producing or receiving of goods which need to be transported. Industrial and commercial land uses are generally the ones that will produce goods that require trucks or require trucks to complete their business. However, not all commercial land use is the same and therefore, the development within the land use was assessed. While grocery stores and gas stations will require trucks, a small business may not. 50 Avenue between 44 Street and 52 Street has a commercial land use but the businesses along that segment are located in very close proximity to the roadway with a narrow right of way. This roadway does not have a compatible land use for a truck route. Additionally, the density of the land use and distance to the roadway also influence the assessment of the land use compatibility. Along 50 Avenue between 44 Street and 52 Street the business entrances are close to the edge of the roadway and is the historic downtown of Lloydminster which makes the land use compatibility “poor”. Considering all the different factors of land use compatibility helps assess whether or not truck traffic would be appropriate on that route.

Supports Future Development: Truck routes should be located in a manner that supports future development as the City grows and changes in terms of municipal boundaries as well as industries requiring trucks. Potential routes were assessed based on their ability to connect to future roadways as well as their ability to support an increase in trucks. For example, if a potential route is in a developed area of the City there may not be an opportunity for additional roadways to be added but the potential route may be in an industrial area and if more frequent trucks are expected the route could add benefit. In addition, the City has also noted that the arterial grid will be improved to four lanes from the current two lanes which would increase the ability to support future development. The response of “very good**” indicates a route that is currently considered good as a two lane roadway but once improved to a four lane roadway would be considered “very good”.

Routes that are used for trucks passing through the City were also assessed for the ability to support regional growth. 44 Street would be a regional roadway and while it may not directly support development within the City, it would support the regional growth of trucks through the City and receives an outcome of “good”. Local industrial routes were considered “fair” for supporting future development because of their limited catchment areas for development as the local industrial routes support the existing development and not the future development. Supporting the existing development was also captured in the route purpose criteria and should not be accounted for twice in the assessment.

The framework for route performance outlined in section 3.1 of the report and in Table 3.1 used good/very good and fair/poor as the potential outcomes of the assessment. Table 5.3 below outlines how each criteria and evaluation level were considered in the City of Lloydminster.

Table 5.3: Route Performance Criteria Outcomes.

Criteria	Very Good	Good	Fair	Poor
Roadway Classification	Highways and arterials	Industrial collectors	Non industrial collectors and industrial locals	Non industrial locals
Roadway Geometrics	Roadway has many lanes, wide lanes, wide shoulders and large turning radii.	Roadway has wide enough lanes, shoulders, and turning radii.	An aspect of the geometrics, lane width, shoulder width, turning radii, is not wide enough.	All geometrics, lane width, shoulder width, and turning radii are not wide enough.
Surface Conditions	Roadway has been improved with concrete to handle truck volumes, or is a new roadway.	Minimal cracking observed, no feedback on frequent reconstruction needs, or is an older roadway.	Extensive cracking observed, feedback received on frequent reconstruction needs.	Roadways are gravel and/or unpaved with significant rutting observed.
At-grade Rail Crossings	There are no at-grade rail crossings	There is one at-grade rail crossing	There are two at-grade rail crossings	There are more than two at-grade rail crossings
Land Use Compatibility	Land use is entirely commercial and/or industrial around route or the area surrounding the route is undeveloped.	Land use is mostly commercial and/or industrial with some residential around route	Land use is mostly residential around route	Land use is mostly residential around route and a sensitive area/institution is along route.

Criteria	Very Good	Good	Fair	Poor
Supports Future Development	Additional routes can be added and in an area that can support more truck volumes		May not allow additional routes to connect but could be in an area that supports more truck volumes	Does not allow additional routes to connect and in a developed area that will not see an increase in truck volumes

Industrial Areas

The industrial areas were assessed similarly to the route segments but some criteria did not apply. All criteria in the network functionality assessment were considered and received a “Yes” answer. In the route performance assessment two of the six criteria apply, land use compatibility and supports future development. Since an entire area is being considered the road classifications, roadway geometrics, surface conditions/structural capacity, and at-grade rail crossings would not apply as drivers may use any roadway within the industrial area to reach their destination. There are at-grade crossings in the industrial areas, but as trucks may use any route within the area, a route with fewer at-grade crossings can be selected. The land use for these areas is industrial as per the City of Lloydminster neighborhood map. Table 5.3 indicates that industrial land use is preferred due to the amount of trucks originating and destined for the area. The benefit of designating the entire area as a truck route is that any existing and future roadways within the area can be truck routes, so future development is supported. Overall, the industrial areas scored well in the assessment.

5.2.2 Truck Route Assessment

To complete the City wide truck route assessment all of the candidate truck routes were assessed for the network functionality first. The initial assessment for network functionality was based on answering “Yes” to the route purpose and network connectivity criteria. As noted the potential route should serve a purpose to the network and be a beneficial addition and may not reduce trip length or reduce off-route trips but should provide efficient movement of goods through and around the City.

Routes that answered “Yes” to route purpose and network connectivity were then assessed using the route performance criteria. A candidate rating recommendation was established to categorize the evaluated routes. A strong, good, or poor candidate truck route rating was based on the total number of criteria assess as “fair” as follows:

- 1-2 fair outcomes with all other outcomes assessed as “good” or “very good” is a strong candidate for a truck route
- 3-4 fair outcomes with all other outcomes assessed as “good” or “very good” is a good candidate for a truck route that may require mitigations/consideration of other routes
- >5 fair outcomes with all other outcomes assessed as “good” or “very good” is most likely a poor candidate for a truck route.

Ideally the candidate truck routes should have no “poor” rating in the evaluation; however, it was noted that this condition may not always be achievable when assessing existing roadways and networks. A “poor” rating in roadway classification and roadway geometrics indicates the route should not be a potential truck route; however surface conditions/structural capacity improvements can improve a “poor” rating of a potential truck route once improvements are completed. Land use compatibility and supports future development are assessed together with the rest of the criteria.



For example, routes that have poor land use compatibility often also have no purpose and therefore would not be good potential truck routes.

Exhibit 5.1 shows results of the truck route evaluation.

	Route				Network Functionality Assessment					Route Performance Assessment					
	Roadway	From	To	Route Purpose	Network Connectivity	Existing Truck Route	Reduces or Maintains Trip Length	Reduces Off Route Trips	Roadway Classification	Roadway Geometrics	Surface Conditions	At-Grade Rail Crossings	Land Use Compatibility	Supports Future Development	Assessment of Candidacy as a Truck Route
Arterial Grid	Highway 16 (44 Street)	West City Limits	75 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Very Good	Very Good	Very Good	Good	Strong
		75 Avenue	62 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Very Good	Very Good	Very Good	Good	Strong
		62 Avenue	Highway 17	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Very Good	Very Good	Very Good	Good	Strong
		Highway 17	40 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Very Good	Very Good	Very Good	Good	Strong
		40 Avenue	East City Limits	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Very Good	Very Good	Very Good	Good	Strong
	Highway 17 (50 Avenue)	South City Limits	12 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Very Good	Very Good	Very Good**	Strong
		12 Street	25 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Very Good	Good	Fair	Strong
		25 Street	Highway 16	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Very Good	Good	Fair	Strong
		Highway 16	52 Street	No	Yes	No	Yes	Yes	Very Good	Poor	Fair	Good	Poor	Poor	Poor
		52 Street	57 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Good	Fair	Fair	Strong
	12 Street	57 Street	67 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Fair	Very Good	Very Good	Good	Strong
		West City Limits	Highway 17	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Fair	Very Good	Very Good	Very Good**	Good
		Highway 17	40 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Good	Very Good	Very Good	Very Good**	Strong
	67 Street	West City Limits	75 Avenue	Yes	Yes	No	Yes	Yes	Very Good	Fair	Good	Very Good	Very Good	Good	Strong
		75 Avenue	62 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Fair	Good	Very Good	Very Good**	Good
		62 Avenue	Highway 17	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Fair	Very Good	Very Good	Very Good**	Good
		Highway 17	40 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Fair	Very Good	Good	Very Good**	Good
		40 Avenue	East City Limits	Yes	No	Yes	Yes	Yes	Very Good	Fair	Poor	Very Good	Very Good	Fair	Poor
	40 Avenue	12 Street	25 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Very Good	Very Good	Very Good**	Strong
		25 Street	Highway 16	Yes	Yes	Yes	Yes	Yes	Very Good	Very Good	Good	Very Good	Good	Very Good**	Strong
		Highway 16	52 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Good	Very Good	Very Good**	Strong
		52 Street	67 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Fair	Good	Very Good	Very Good**	Strong
		67 Street	North City Limits	Yes	Yes	No	Yes	Yes	Very Good	Good	Good	Very Good	Very Good	Good	Strong
	75 Avenue	12 Street	Highway 16	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Fair	Very Good	Very Good	Very Good**	Good
		Highway 16	52 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Good	Good	Very Good	Very Good**	Strong
		52 Street	67 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Fair	Good	Very Good	Very Good	Very Good**	Strong
		67 Street	North City Limits	Yes	Yes	No	Yes	Yes	Very Good	Fair	Good	Very Good	Very Good	Good	Strong
Arterials	25 Street	40 Avenue	Highway 17	No	Yes*	No	No	No	Future	Future	Future	Very Good	Poor	Poor	Poor
	52 Street	75 Avenue	62 Avenue	Yes	Yes	No	Yes	Yes	Future	Future	Future	Very Good	Very Good	Good	Strong
		62 Avenue	Highway 17	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Fair	Very Good	Good	Strong
		Highway 17	40 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Good	Very Good	Good	Strong
	62 Street	Highway 17	62 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Good	Very Good	Good	Strong
	College Drive	62 Avenue	75 Avenue	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Very Good	Very Good	Good	Strong
		Highway 17	Highway 16	Yes	Yes	No	Yes	Yes	Very Good	Good	Good	Very Good	Fair	Poor	Good
Collectors	62 Avenue	Highway 16	52 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Good	Very Good	Good	Strong
		52 Street	67 Street	Yes	Yes	Yes	Yes	Yes	Very Good	Good	Good	Good	Very Good	Good	Strong
	36 Street	40 Avenue	Highway 17	No	Yes*	No	No	No	Fair	Fair	Good	Very Good	Poor	Poor	Poor
	47 Street	Highway 17	62 Avenue	No	Yes*	No	No	No	Fair	Fair	Good	Very Good	Fair	Poor	Poor
		62 Avenue	59 Avenue	Yes	Yes	Yes	No	Yes	Good	Good	Good	Very Good	Very Good	Good	Strong
		Highway 16	51 Street	Yes	Yes	Yes	No	Yes	Fair	Fair	Fair	Very Good	Poor	Poor	Poor
	59 Avenue	Highway 16	47 Street	Yes	Yes	Yes	Yes	Yes	Good	Good	Fair	Very Good	Good	Good	Strong
Locals	51 Street	12 Street	25 Street	No	Yes*	No	No	No	Good	Fair	Good	Very Good	Fair	Poor	Poor
		Highway 17	55 Avenue	Yes	Yes	No	No	Yes	Fair	Good	Good	Very Good	Fair	Fair	Good
	56 Street	Highway 17	55 Avenue	Yes	Yes*	No	No	Yes	Fair	Good	Fair	Very Good	Very Good	Fair	Good
	60 Street	53 Avenue	52 Avenue	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
	63 Street	51 Avenue	53 Avenue	Yes	Yes*	No	No	Yes	Fair	Fair	Fair	Very Good	Very Good	Fair	Good
	65 Street	53 Avenue	Highway 17	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
	66 Street	63 Avenue	73 Avenue	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
	51 Avenue	62 Street	63 Street	Yes	Yes*	No	No	Yes	Fair	Fair	Fair	Very Good	Very Good	Fair	Good
	52 Avenue	60 Street	62 Street	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
		65 Street	67 Street	Yes	Yes*	No	No	Yes	Fair	Poor	Poor	Very Good	Very Good	Fair	Poor
	53 Avenue	60 Street	62 Street	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
		62 Street	65 Street	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
	63 Avenue	52 Street	62 Street	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
		62 Street	66 Street	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
	67 Avenue	52 Street	56 Street	Yes	Yes*	No	No	Yes	Fair	Good	Good	Very Good	Very Good	Fair	Strong
	70 Avenue	62 Street	67 Street	Yes	Yes*	No	No	Yes	Fair	Fair	Fair	Very Good	Very Good	Fair	Good
	73 Avenue	62 Street	66 Street	Yes	Yes*	No	No	Yes	Fair	Fair	Good	Very Good	Very Good	Fair	Good
Areas	Industrial Areas			Yes	Yes	No	Yes	Yes	N/A	N/A	N/A	N/A	Very Good	Very Good	Strong

NOTES:
* 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.

DANGEROUS GOODS ROUTES AND TRUCK ROUTES
EXHIBIT 5.1 - TRUCK ROUTE ASSESSMENT RESULTS



5.3 Dangerous Goods Route Evaluation

Potential dangerous goods routes were assessed using the evaluation framework developed for the City of Lloydminster to facilitate systematic and objective dangerous goods route designation. As dangerous goods routes were determined to be a subset of truck routes they are treated as part of the truck route network. However, while the truck route evaluation framework assessed the routes performance as a truck route the dangerous goods route evaluation framework assessed the risks associated with transporting dangerous goods within and around the City. Therefore, regardless of whether a potential truck route or dangerous goods route is being considered, the route is evaluated as a truck route first. The following section outlines the assessment methodology and evaluation of potential dangerous goods routes.

5.3.1 Dangerous Goods Route Evaluation Methodology

As outlined in section 3.2 of the report, an evaluation framework was created to ensure the City of Lloydminster can apply a consistent methodology for designating dangerous goods routes. Testing the evaluation framework on the potential dangerous goods routes allowed for any potential issues or uncertainties to be clarified. The following sections outline the application of the dangerous goods route functionality assessment and the route safety assessment methodologies.

Dangerous Goods Route Functionality Assessment

The functionality assessment was evaluated on a route by route basis. The routes were separated into east/west routes through the City, north/south routes through the City, and routes servicing key destinations within the City. Figures 5.1 to 5.3 show the routes that were evaluated, and the locations of the destinations considered. As noted in section 3.2 the functional assessment used similar criteria as the truck routes with an additional criteria that ensures the dangerous goods route is a part of the existing truck route network. The functionality assessment criteria were addressed with questions through either a “yes” or “no” response. The following outlines how the dangerous goods route functionality assessment criteria were considered:

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. As this project reviewed of the entire city-wide network, routes east/west and north/south through the City were used to assess the purpose of route options through the City as well as the regional purpose of the route. The four dangerous goods route network options were used to assess the routes for movement within the City. As all dangerous goods routes should be a part of the existing truck route network, a potential dangerous goods route should answer “yes” to this criteria.

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. As this project was a holistic review of the entire city-wide network, all of the routes and options assessed have network connectivity within the City and with the surrounding regions. To assess the routes that service destinations within the City each potential network option was evaluated. For assessment of the northwest industrial a representative location was selected as the destination. Each of the potential network options was evaluated using the logic that dangerous goods destined for the northwest industrial area could originate from the north, south, east, or west city limit. The assessment of network connectivity of routes within the City used an entry to destination method.



A dangerous goods route should answer “yes” to this criteria to be considered a potential dangerous goods route.

Route Compatibility: This criteria ensures that any and all proposed dangerous goods routes are part of the existing truck routes network. As dangerous goods routes are considered a subset of the truck route network, a dangerous goods route must answer “yes” to this criteria to be considered as a potential route. Dangerous goods routes are typically designated as twenty four hour routes and should be designated on twenty four hour truck routes. An alternate route should be considered if a restricted truck route is proposed or being considered as a dangerous goods route.

Reduces Trip Length: Dangerous goods routes add efficiencies to the network by reducing the trip length to destinations within the City and do not add unnecessary trip length for dangerous goods moving through the City. At a city-wide level the network should reduce trip length compared to the current network. Once the formal approved network is established this criteria will be assessed comparing the specific route to alternate routes within the existing criteria.

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. It is noted that an off-route trip is defined as a trip, or portion of a trip, taken by a truck that is used to reach a delivery destination and/or pick up goods from a location that is not located on an existing or designated truck route. This criteria did not apply when analyzing the east/west and north/south routes as shown in Figures 5.1 and 5.2 as these routes were assessed for dangerous goods passing through the city.

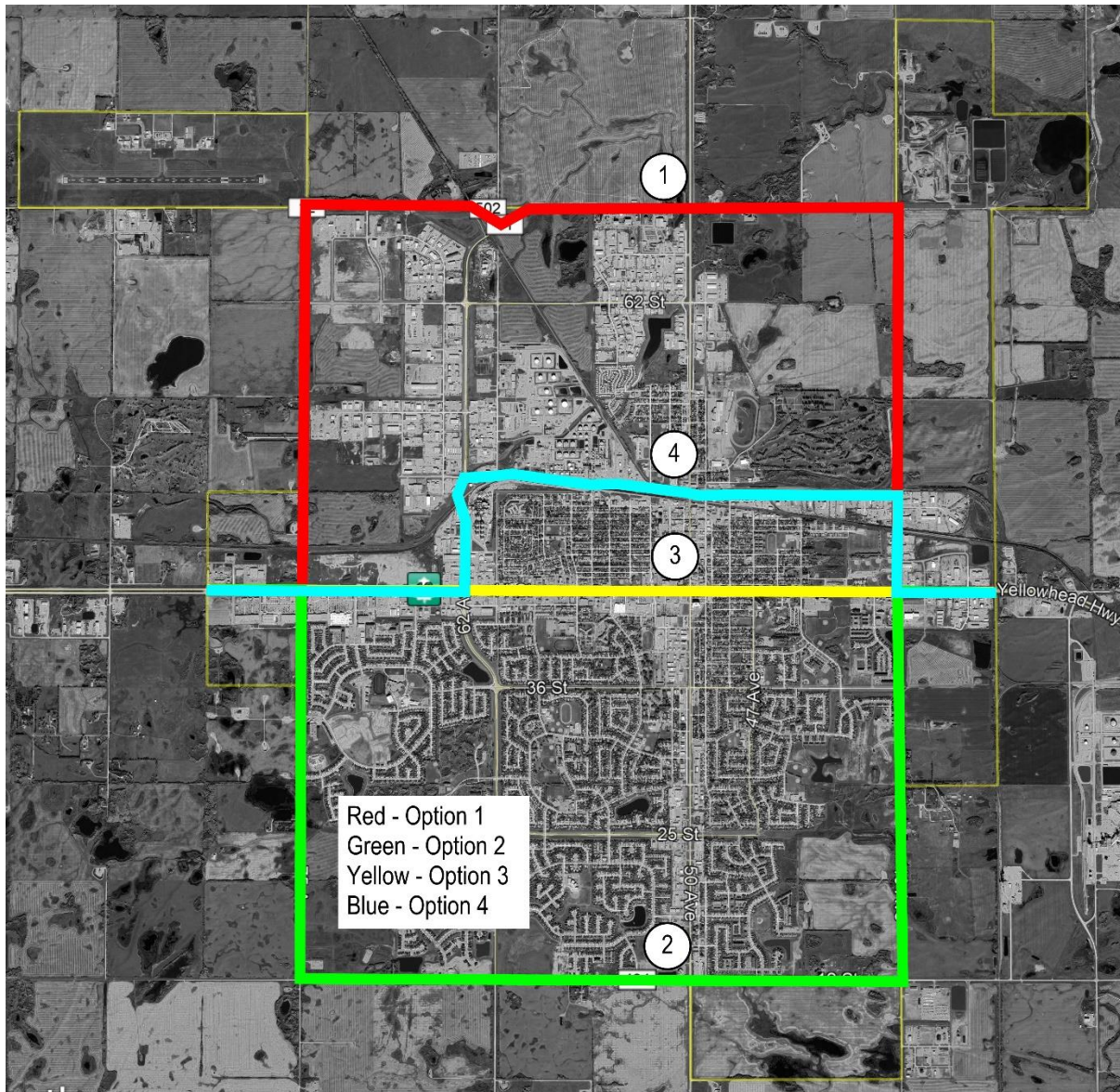


Figure 5.1: Potential East/West Dangerous Goods Routes through the City.

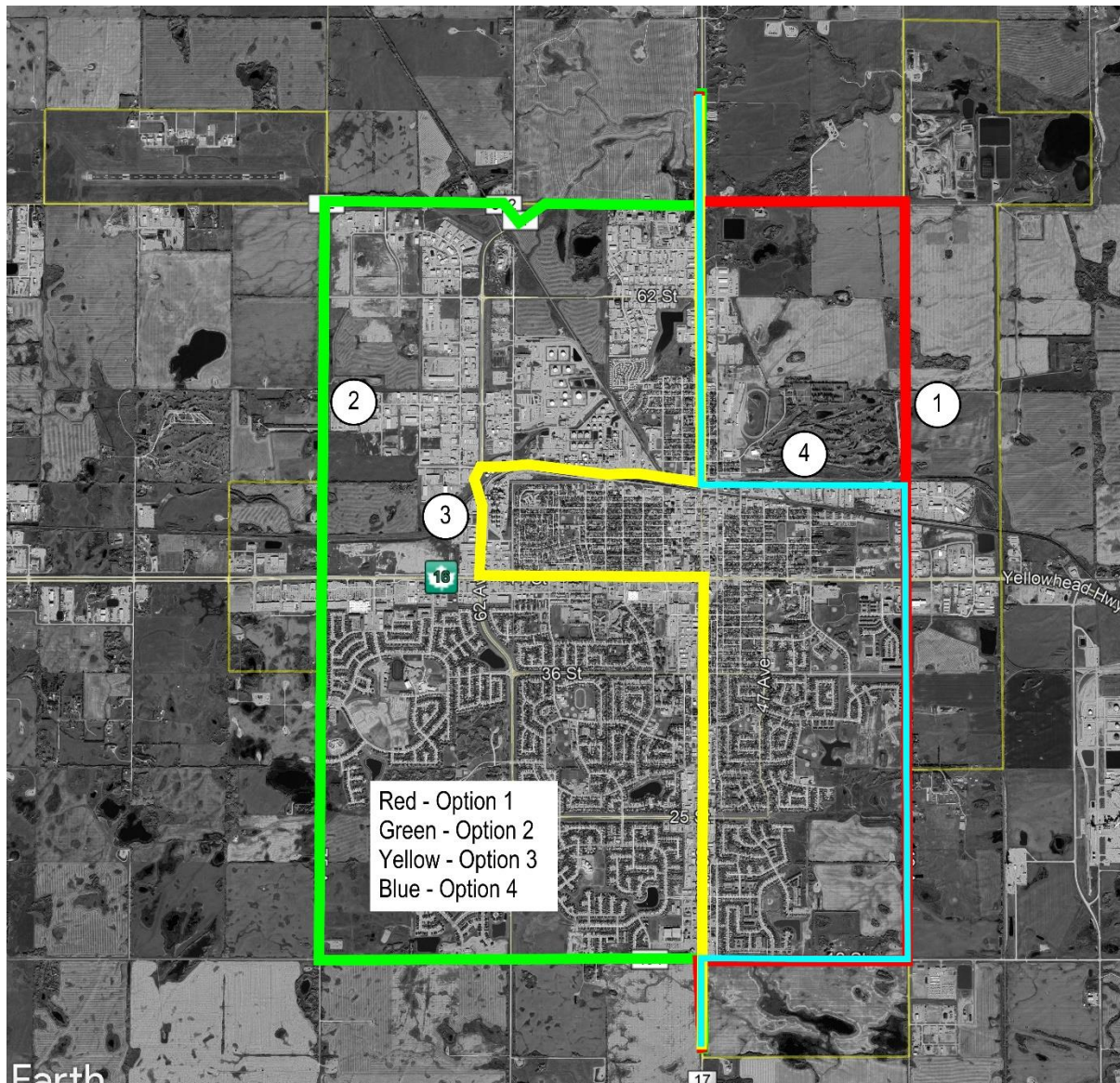


Figure 5.2: Potential North/South Dangerous Goods Routes through the City.



Figure 5.3: Key Destinations within the City that Require Dangerous Goods

Safety Assessment

The safety assessment of potential dangerous goods routes was completed on a segment by segment basis. All of the potential dangerous goods routes identified in the proposed network options were separated into smaller segments based on key network intersections. The safety assessment consists of two sub-sections, the probability assessment and the significance assessment. The following outlines how the criteria in the probability assessment were considered:



Roadway Geometrics: Roadway and intersection geometric factors such as lane width, available shoulders, and turning radii needs to be appropriate for the safe use by trucks transporting dangerous goods. For this project Google Earth was used to view the potential routes from Street View as the assessment was completed during the winter season (post snowfall). If no Street View was available, the roadway geometrics were considered to be fair unless the route was a newly constructed road which was considered good. As dangerous goods trucks are wider than passenger vehicles the turning radii, lane widths, and shoulder widths of a roadway can affect the ability of dangerous goods trucks to move efficiently and effectively within and through the City. If a potential route receives a “poor” outcome in this criteria it should not be considered a dangerous goods route.

At-grade Rail Crossings: Limiting the number of at-grade rail crossings for dangerous goods routes helps ensure safe and efficient transportation of goods around and through the City. The number of at-grade rail crossings were assessed segment by segment; however, this provided a misleading result as there were few (one or two) or no at-grade rail crossings per segment. Once each segment was assessed the whole route east/west and north/south was assessed to determine the total number of rail crossings along the entire route. All of the north/south routes have two rail crossings which makes them all relatively the same risk. The two most efficient east/west movements are 44 Street and then a north bypass using 62 Ave, 52 Street, and 40 Avenue. When comparing these two east/west routes 44 Street has no at-grade rail crossings while the north bypass has five. The risks associated with the north bypass are significantly higher than 44 Street straight through the City.

Intersection Control: As trucks typically take longer to reach travel speeds and complete turns at intersections, the level of control was assessed for intersections along the route to help reduce the risks associated with turning movement and collisions. Higher levels of control were considered as signalized or stop controlled while yield or uncontrolled intersections were considered as lower levels of control. Additionally the number of private accesses along a segment was considered when assessing this criteria. Taking the type of intersection control and the number of private accesses into account helps assess the risk along the entire segment.

Traffic Efficiency: A potential dangerous goods routes should allow for efficient transportation of dangerous goods around and through the City with few delays associated with congestion. As an initial assessment, feedback from stakeholders, the public, and the City was used to assess this criteria. Potential routes that were mentioned as congested received an outcome of “fair” while routes where no congestion was mentioned received an outcome of “good”. City staff provided feedback on this criteria to ensure traffic efficiencies and inefficiencies were appropriately captured based on complaints and day to day operational knowledge of the city road network.

Collisions: This criteria provides an assessment of the potential for frequent or severe collisions on a dangerous goods route. To test the criteria the initial assessment was completed using the traffic efficiency. If a route received a “fair” outcome in traffic efficiency it also received a “fair” in collisions due to the logic that more congestion has a higher risk of collision. If a route had no perceived congestion it was considered to have fewer collisions and received an outcome of “good”. City staff also provided feedback on this criteria to ensure the potential for collisions was appropriately captured based on day to day operational knowledge of the city road network.

The significance assessment was completed with factors that are influenced by an emergency event or incident involving a vehicle transporting dangerous goods. The following outlines how the criteria in the significance assessment were considered:

Environmental Impact: A potential dangerous goods route should have few environmental impacts in the event of an emergency or incident involving a vehicle transporting dangerous goods. This criteria assesses the 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.) which could be at risk if an incident were to occur. Dangerous goods pose a higher risk than other goods transported by truck and this criteria helps assess the risks to the environment in the event of an emergency. Industrial areas typically have fewer environmentally sensitive areas where as fields used for farming and water treatment plants could be severely affected by an emergency event with a dangerous goods. If minimal impact to the environment is expected in the event of an emergency, then a response of "very good" is received in this criteria. A response of "poor" implies that the environment may be severely impacted in the event of an emergency.

Population Exposure/Land Use: It is important to assess the land use surrounding the dangerous goods route to ensure it is appropriate and reduces the number of people exposed in the event of an emergency or incident. This criteria was assessed based on surrounding land use as per the City of Lloydminster Land Use District Map. Land uses such as residential and institutional were considered to have large populations of people and at more of a risk in the event of an emergency. The built form of the commercial land use was also taken into consideration as there are locations in the commercial sections along 44 Street with high number of people present (i.e. hotels which were considered dense in population) and resulted in an outcome of "good".

Population Responsiveness/Evacuation Potential: This criteria assessed the ability people have to evacuate an area quickly and safely in the event of an emergency. High-density buildings were considered to be hotels, nursing homes, hospitals, and Lakeland College. Evacuation potential was also assessed as part of this criteria due to the majority of the residential housing in the City of Lloydminster being single detached homes which are not high density. Evacuation potential was determined by the number of exit routes available to residents and businesses along a segment. A segment must have no high-density buildings or alternate evacuation routes available to be considered "very good" in this criteria. Alternatively, a route where all buildings are high-density or has no alternate evacuation route is considered "poor". Along 44 Street there are many hotels which have higher density of people compared to other commercial uses, but due to the presence of alternate evacuation routes segments along 44 Street with hotels were considered "good".

Emergency Response: This criteria assessed how quickly the fire department can respond in the event of an emergency or incident. This criteria was assessed based on the response time maps provided by the City of Lloydminster Fire Department. Maps for each of the two current fire halls that indicate the approximate response times throughout the City. A response time of four minutes was considered "very good" while a response time of six minutes was considered "good". The longest response time on the maps was eight minutes and was considered "fair". The evaluation levels for this criteria may require updating if locations of the fire halls change or response times change.

The framework for the safety assessment outlined in section 3.2 of the report and in Table 3.2 used good/very good and fair/poor as the potential outcomes of the assessment. Table 5.4 below outlines how each criteria and evaluation level were considered in the City-wide assessment.

Table 5.4: Dangerous Goods Route Safety Assessment Criteria Outcomes.

Criteria	Very Good	Good	Fair	Poor
Roadway Geometrics	Recently reconstructed roadway with wide enough lanes, shoulders and turning radii.	Older roadway but has wide enough lanes, shoulders, and turning radii.	An aspect of the geometrics, lane width, shoulder width, turning radii, is not wide enough.	All geometrics, lane width, shoulder width, and turning radii are not wide enough.
At-grade Rail Crossings	There are no at-grade rail crossings.	There is one at-grade rail crossing.	There are two at-grade rail crossings.	There are more than two at-grade rail crossings.
Access Control	All accesses have signals or stop signs and few to no private accesses.	Most accesses have signals or stop signs and some private accesses.	Most accesses have yield signs or are uncontrolled and many private accesses.	All accesses have yield signs or are uncontrolled and many private accesses.
Traffic Efficiency	No delay due to congestion.	Slight delay due to congestion .	Some delay due to congestion.	Significant delay due to congestion.
Collisions	No collisions reported.	Some collisions reported.	Many collisions reported.	Significant number of collisions reported.
Environmental Impact	In an industrial or commercial area.	Industrial or commercial on one side and residential or farmers fields on the other side.	Adjacent residential or farmers fields on both sides.	Adjacent to farmer's fields and sensitive areas (i.e. water treatment plant).
Population Exposure/Land Use	All surrounding land use is industrial and/or commercial.	Most surrounding land use is industrial and/or commercial.	Most surrounding land use is residential.	All surrounding land use is residential/ Institutional.
Population Responsiveness / Evacuation Potential	No high-density buildings within the surrounding area or alternate roadways available.	Some high-density buildings within the surroundings or some alternative roadways available.	Many high-density buildings within the surroundings or few alternative roadways available.	All high-density buildings within the surroundings or no alternative roadways available.
Emergency Response	4 minute response times.	6 minute response times.	8 minute response times.	Over 8 minute response times.

5.3.2 Dangerous Goods Route Assessment

To complete the City-wide dangerous goods route assessment all of the candidate routes were assessed individually for route purpose, network connectivity, and route compatibility. Each route needed to answer “yes” to these first three questions in the functionality assessment in order to be considered a strong potential route. The criteria for reduces trip length and reduces off route trips require a comparison with the current approved dangerous goods route city-wide network. Comparing to the current routes allowed a determination as to if the potential routes would add benefit to the existing network.

Routes that answered “yes” to the three initial functionality assessment criteria, were then assessed in segments for overall feasibility based on the number of criteria assess as “fair” in the safety assessment as follows:

- 1-2 fair outcomes with all other outcomes assessed as “good” or “very good” is a strong candidate for a dangerous goods route
- 3-5 fair outcomes with all other outcomes assessed as “good” or “very good” is a good candidate for a dangerous goods route that may require mitigations/consideration of other routes
- >6 fair outcomes with all other outcomes assessed as “good” or “very good” is most likely a poor candidate for a dangerous goods route and should not be considered

Ideally the candidate dangerous goods route should have no “poor” ratings in the evaluation; however, it was noted in the evaluation that this may not always be achievable when assessing existing roadways as “poor” ratings within the significance criteria can be improved with proper mitigation. In addition, the two “poor” ratings in the environmental impact criteria noted during the evaluation were for roadways that pass the water treatment plant and are also next to fields used for farming whereby the rating for the environmental impact can be improved with mitigation strategies.

For future evaluations, it is recommended that the segment of 50 Avenue between 52 Street and 67 Street be separated into smaller segments to better assess the safety criteria. Currently this long segment is adjacent to the water treatment plant and farmer’s fields, residential land use, and industrial land use. All three of the land uses are on different portions of the segment which makes it difficult to assess for environmental impact and population exposure/land use. For environmental impacts the presence of the water treatment plant and fronting residential homes caused the outcome to be poor even though the surrounding land use is also industrial. It is noted that while the evaluation of this section of 50 Avenue was completed from 52 Street to 67 Street, as the section of 50 Avenue from 52 Street to 62 Street was considered as a restricted truck route this section of 50 Avenue was thusly not recommended as a dangerous goods route.

Exhibit 5.2 and 5.3 shows the results of the dangerous goods route functionality evaluation and safety evaluation respectively.



THIS PAGE LEFT INTENTIONALLY BLANK

East-West Movement	Routes			
Criteria	Route 1	Route 2	Route 3	Route 4
Route Purpose	Yes	Yes	Yes	Yes
Network Connectivity	Yes	Yes	Yes	Yes
Route Compatibility	Yes	Yes	Yes	Yes
Reduces Trip Length Compared to Existing	No	No	Yes	No
Reduces Off Route Trips Compared to Existing	E/W would not need off route trips			
North-South Movement	Routes			
Criteria	Route 1	Route 2	Route 3	Route 4
Route Purpose	Yes	Yes	Yes	Yes
Network Connectivity	Yes	Yes	Yes	Yes
Route Compatibility	Yes	Yes	Yes	Yes
Reduces Trip Length Compared to Existing	No	No	No	No
Reduces Off Route Trips Compared to Existing	N/S would not need off route trips			
Destination - NW Industrial	Options			
Criteria	Option 1	Option 2	Option 3	Option 4
Route Purpose	Yes	Yes	Yes	Yes
Network Connectivity	Yes	Yes	Yes	Yes
Route Compatibility	Yes	Yes	Yes	Yes
Reduces Trip Length Compared to Existing	No	Yes	Yes	Yes
Reduces Off Route Trips Compared to Existing	No	No	Yes	Yes
Destination - Husky	Options			
Criteria	Option 1	Option 2	Option 3	Option 4
Route Purpose	Yes	Yes	Yes	Yes
Network Connectivity	Yes	Yes	Yes	Yes
Route Compatibility	Yes	Yes	Yes	Yes
Reduces Trip Length Compared to Existing	No	Yes	Yes	Yes
Reduces Off Route Trips Compared to Existing	No	Yes	Yes	Yes
Destination - ADM	Options			
Criteria	Option 1	Option 2	Option 3	Option 4
Route Purpose	Yes	Yes	Yes	Yes
Network Connectivity	Yes	Yes	Yes	Yes
Route Compatibility	Yes	Yes	Yes	Yes
Reduces Trip Length Compared to Existing	No	Yes	Yes	Yes
Reduces Off Route Trips Compared to Existing	No	Yes	Yes	Yes
Destination - Airport	Options			
Criteria	Option 1	Option 2	Option 3	Option 4
Route Purpose	Yes	Yes	Yes	Yes
Network Connectivity	Yes	Yes	Yes	Yes
Route Compatibility	Yes	Yes	Yes	Yes
Reduces Trip Length Compared to Existing	Yes	No	Yes	Yes
Reduces Off Route Trips Compared to Existing	Yes	No	Yes	Yes

DANGEROUS GOODS ROUTES AND TRUCK ROUTES

EXHIBIT 5.2 - DANGEROUS GOODS ROUTE NETWORK FUNCTIONALITY ASSESSMENT RESULTS

		Segment		Probability					Significance				Assessment - Based on Safety Assessment
	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	
Arterial Grid	Hwy 16 (44 Street)	West City Limits	75 Avenue	Good	Very good	Good	Fair	Fair	Very Good	Good	Good	Good	Strong
		75 Avenue	62 Avenue	Good	Very good	Good	Fair	Fair	Very Good	Good	Good	Very Good	Strong
		62 Avenue	Hwy 17	Good	Very good	Good	Fair	Fair	Very Good	Good	Good	Very Good	Strong
		Hwy 17	40 Avenue	Good	Very good	Good	Fair	Fair	Very Good	Good	Good	Very Good	Strong
		40 Avenue	East City Limits	Good	Very good	Good	Fair	Fair	Very Good	Very Good	Very Good	Very Good	Strong
	Hwy 17 (50 Avenue)	South City Limits	12 Street	Good	Very good	Very Good	Fair	Fair	Fair	Very Good	Very Good	Very Good	Good
		12 Street	Hwy 16	Good	Very good	Fair	Fair	Fair	Very Good	Very Good	Very Good	Very Good	Good
		52 Street	67 Street	Good	Very good	Good	Fair	Fair	Poor	Fair	Fair	Very Good	Good
	12 Street	West City Limits	Hwy 17	Fair	Very good	Very Good	Fair	Fair	Fair	Fair	Very Good	Very Good	Good
		Hwy 17	East City Limits	Fair	Very good	Good	Good	Good	Fair	Fair	Very Good	Good	Good
	67 Street	East City Limits	40 Avenue	Fair	Very good	Very Good	Good	Good	Good	Very Good	Good	Good	Strong
		40 Avenue	Hwy 17	Fair	Very good	Very Good	Fair	Fair	Poor	Very Good	Good	Good	Good
		Hwy 17	75 Avenue	Fair	Good	Very Good	Fair	Fair	Good	Very Good	Good	Fair	Good
		75 Avenue	West City Limits	Fair	Very good	Very Good	Good	Good	Good	Very Good	Good	Fair	Strong
	40 Avenue	12 Street	Hwy 16	Good	Very good	Very Good	Good	Good	Fair	Fair	Very Good	Good	Strong
		Hwy 16	52 Street	Good	Good	Good	Good	Good	Good	Very Good	Fair	Very Good	Strong
		52 Street	67 Street	Good	Good	Very Good	Good	Good	Fair	Good	Very Good	Very Good	Strong
		67 Street	North City Limits	Good	Good	Very Good	Good	Good	Fair	Very Good	Very Good	Good	Strong
	75 Avenue	South City Limits	Hwy 16	Fair	Very good	Very Good	Fair	Fair	Fair	Fair	Very Good	Very Good	Good
		Hwy 16	67 Street	Fair	Good	Very Good	Fair	Fair	Good	Good	Very Good	Good	Good
		67 Street	TWP 502A	Fair	Very good	Very Good	Good	Good	Good	Good	Very Good	Fair	Good
Arterials	52 Street	62 Avenue	Hwy 17	Good	Fair	Good	Good	Good	Good	Good	Good	Very Good	Strong
		Hwy 17	40 Avenue	Good	Good	Fair	Good	Good	Good	Good	Fair	Very Good	Strong
	62 Street	Hwy 17	62 Avenue	Good	Good	Good	Good	Good	Very Good	Very Good	Good	Very Good	Strong
		62 Avenue	75 Avenue	Good	Very good	Very Good	Good	Good	Very Good	Very Good	Very Good	Good	Strong
	62 Avenue	Hwy 16	52 Street	Good	Good	Fair	Good	Good	Very Good	Very Good	Fair	Very Good	Strong
		52 Street	67 Street	Good	Good	Very Good	Good	Good	Very Good	Very Good	Good	Good	Strong



DANGEROUS GOODS ROUTES AND TRUCK ROUTES

EXHIBIT 5.3 - DANGEROUS GOODS ROUTE NETWORK SAFETY ASSESSMENT RESULTS

NOT TO SCALE
JANUARY 28, 2020



6.0 Recommendations



This section of the report outlines the recommended truck routes and dangerous goods routes for the City of Lloydminster based on the comprehensive city-wide truck route and dangerous goods route review. This section also includes a preliminary recommended signage plan that could be implemented to support the identification and delineation of truck routes and dangerous goods routes.

6.1 Truck Route Recommendations

To develop the recommended truck routes, the project team reviewed the stakeholder input and feedback from both Phase One and Phase Two engagement as well as input from City staff on the potential operational and enforcement issues and challenges with the proposed truck route network. In addition, the technical evaluations of the candidate truck routes as assessed with the evaluation framework were also used to support the recommendations. This thorough city-wide assessment was completed to support the recommendations for the inclusion and exclusion of roadways as truck routes.

6.1.1 Truck Route Evaluation Input

For the technical evaluation as shown in section 5.2 and Exhibit 5.1 of this report, 28 roadways identified as highways, major arterials, supporting arterials, collector roads and local roads were evaluated with 58 individual roadway segments using the truck route evaluation framework to assess network functionality and route performance. From this assessment 38 of the roadway segments received a “strong” rating as candidate truck routes, 12 roadway segments received a “good” rating as candidate truck routes while 8 roadway segments received a “poor” rating as candidate truck routes. The following sections outline how these assessments informed the recommendations.

Highways and Arterials

36 segments of roadway were evaluated along roadways identified as highways and arterials within the Transportation Master Plan. The arterials were further broken into two smaller groups, the major arterials for those roads on the City’s arterial grid network, and the supporting arterials as outlined in truck route Options one and two. Many of these roadway segments were previously identified as truck routes within the Traffic Bylaw (No. 09-2018). Of these 36 segments, 27 were rated as “strong” candidates for truck routes, 6 roadway segments received a “good” rating as candidate truck routes while only 3 roadway segments received a “poor” rating as candidate truck routes.

From the technical assessment most of the highway and arterial routes evaluated are recommended as truck routes with the exception of the three segments that were identified as poor candidates for truck routes as follows:

- 50 Avenue from 44 Street to 51 Street
- 67 Street from the east city limit to 40 Avenue
- 25 Street (as a potential future truck route) from 40 Avenue to 50 Avenue

Collectors

6 segments of roadway were evaluated along four roadways identified as collectors within the Transportation Master Plan. These roadways included 36 Street, 47 Street, 55 Avenue and 59 Avenue where 47 Street, 55 Avenue and 59 Avenue were previously identified as truck routes. From the assessment it was shown that only 47 Street from 59 Avenue to 62 Avenue and 59 Avenue from 44 Street to 47 Street would be acceptable candidates as truck routes as these roadways received a

“strong” rating as candidate truck routes. The existing truck route on 55 Avenue received a “poor” rating as a candidate for a truck route due to low ratings in the route performance assessment while 36 Street from 40 Avenue to 62 Avenue and 59 Avenue from 12 Street to 25 Street both received “poor” ratings due to network functionality and route performance.

Locals

16 segments of roadway were evaluated along 13 roadways identified as local roads within the Transportation Master Plan. In general, only industrial locals (12 of 13) were considered in the evaluation framework as it was identified in the framework development that local residential streets are not acceptable as truck routes and would not be considered as candidate truck routes. The exception roadway that was identified for evaluation was 51 Street from 50 Avenue to 55 Avenue. This roadways was evaluated as an alternative to the existing truck route along 55 Avenue to serve the business area along 51 Street. As a comparison 51 Street received a rating of “good” while 55 Avenue received a rating of “poor”.

Within this local roadways assessment only one local roadway, 52 Avenue from 65 Street to 67 Street, received a rating of “poor” due to the roadway geomatics and surface condition. As such, this roadway may not be appropriate as a discrete signed truck route, however as a local road within an industrial area, it would be available to truck traffic making local deliveries and pickups.

Industrial Areas

As part of the route assessment the industrial areas were evaluated as an aggregate whole to determine the appropriateness of establishing these as truck areas whereby all roadways within them are truck routes, with or without discrete signage. The assessment concluded, based on the application of the evaluation framework that the industrial areas would be strong candidates for the placement of truck routes.

6.1.2 Truck Route Option and Stakeholder Input

As noted in section 4.2 of the report, the route options were developed and presented in sections of the City for the north sector, southwest quadrant and south east quadrant. The route recommendations that were developed considered the stakeholder input from Phase Two engagement within the context of the preceding technical assessment as both stakeholder input and the technical evaluation informed the recommendations. The following section outlines how the truck route recommendations were established in each of the city sections.

North Sector

For the north sector of the City, the recommended truck routes are based off of Option three which focused the truck routes on the arterial streets, identified all streets as truck routes within identified industrial areas and provided for a restricted truck route along 50 Avenue north of 52 Street to 57 Street.



As a supplement to Option three, based on the technical evaluation and stakeholder input the following recommendations have been made:

- Identify all arterial streets within the north sector as truck routes (44 Street, 52 Street, 67 Street, 40 Avenue, portions of 50 Avenue, 62 Avenue and 75 Avenue)
- Identify all industrial areas as truck route areas whereby all roadways within them are treated as truck routes.
- Include the east west arterial along 62 Street from 50 Avenue to 75 Avenue, as an existing truck route within the recommendations due to its “strong” rating in the technical evaluation, support from stakeholders and geographic location within the industrial areas.
- Include the collector roadways of only 47 Street from 59 Avenue to 62 Avenue and 59 Avenue from 44 Street to 47 Street, as existing truck routes within the recommendations due to their “strong” rating in the technical evaluation, support from stakeholders.
- Remove 55 Avenue, from 44 Street to 51 Street, from the truck route network based on the technical evaluation which received a “poor” rating
- Include 51 Street from 50 Avenue to 55 Avenue as a replacement truck route for the removal for 55 Avenue as 51 Street received a “good” rating. Due to the local land use and the adjacent residential development it is further recommended that this route be classified as a restricted truck route through the application of time of day restrictions.
- Extend 50 Avenue, as a restricted truck route south from 52 Street to 51 Street to connect with the restricted truck route along 51 Street. It is further recommended, and will be discussed in the signage plan section that both of these links be noted as local traffic only/no through route.
- Classify 50 Avenue north of 57 Street to 62 Street as a restricted truck route to ensure network compatibility and remove the “dead end” that would occur for a truck southbound on 50 Avenue at 57 Street during the restricted hours. This recommendation would note 50 Avenue as a restricted truck route from 51 Street to 62 Street.
- Exclude 67 Street east of 40 Avenue to the east city limit a truck route based on the technical evaluation.
- Include 52 Street from 62 Avenue to 75 Avenue as a recommended future truck route once this roadway is completed.

Southeast Quadrant

For the southeast quadrant the recommendations are based off of Option two which focused the truck routes on the arterial streets, identified all streets as truck routes within identified industrial areas and provided for a future truck route along 25 Street from 40 Avenue to 50 Avenue.

As a supplement to Option two, based on the technical evaluation and stakeholder input the following recommendations have been made:

- Identify all arterial streets within the southeast quadrant as truck routes (12 Street, 44 Street, 40 Avenue, and 50 Avenue)
- Identify all industrial areas as truck route areas whereby all roadways within them are treated as truck routes.
- Exclude 25 Street from 62 Avenue to 75 Avenue as a recommended future truck route once this roadway is completed based on the technical evaluation.

Southwest Quadrant

For the southwest quadrant the recommendations are based off of Option four which focused the truck routes on the arterial streets and provided a restricted truck route on College Drive.

As a supplement to Option four, based on the technical evaluation and stakeholder input the following recommendations have been made:

- Identify all arterial streets within the southwest quadrant as truck routes (12 Street, 44 Street, 50 Avenue, and 75 Avenue)
- Include College Drive from 50 Avenue to 44 Street as a restricted truck route through the application of time of day restrictions due to the adjacent residential development.

Restricted Truck Routes

On a city-wide basis only three roadways were recommended for the designation of restricted truck routes. These roadways were recognized as important components to the overall truck route network with the correlated recognition that these roadways may not be required on a 24 hr. basis. As such the following three routes have been recommended as restricted truck routes due to the adjacent residential developments:

- College Drive from 50 Avenue to 44 Street
- 51 Street from 50 Avenue to 55 Avenue
- 50 Avenue from 51 Street to 62 Street

With respect to the application of the days of the week and time of day restrictions that were discussed and considered, it was agreed that as the first restricted truck routes within the City only a time of day restriction would be applied in a standard manner and that no day of the week restrictions would be required. As such a 16 hour operational window is recommended from 06:00 – 22:00 whereby truck activity on these three routes would be permitted with the restrictions in place in the late evening and overnight hours. These restrictions reduce truck impacts to typical business hours and reduce the impacts of noise during the restricted hours.

It is noted that as initial restricted routes, the compliance with these times should be monitored and that adjustments could be made to the time restrictions should alternate scenarios for time of day and/or day of week restrictions be desired.

Truck Route Exclusions

Through the identification and assessment of potential truck routes, many roadways were discussed that would be less desirable for truck activity. While no route was identified for a truck route ban (a roadway where truck activity would not be permitted) the following two locations had been identified as locations where appropriate signage noting that the roadways are not included in the truck route network would be appropriate.

50 Avenue between 44 Street and 51 Street is a key location where “no truck route” signs would be appropriate given the “poor” rating of this roadway in the evaluation framework. While most of 50 Avenue is included in the truck route network as either a full 24 hour truck route, or a restricted truck routed, this seven block section is located in the historic downtown area of the City.



As this roadway connects to segments of the roadway that are permissible for trucks it will be important to specifically identify that this segment is not part of the truck route network through appropriate signage.

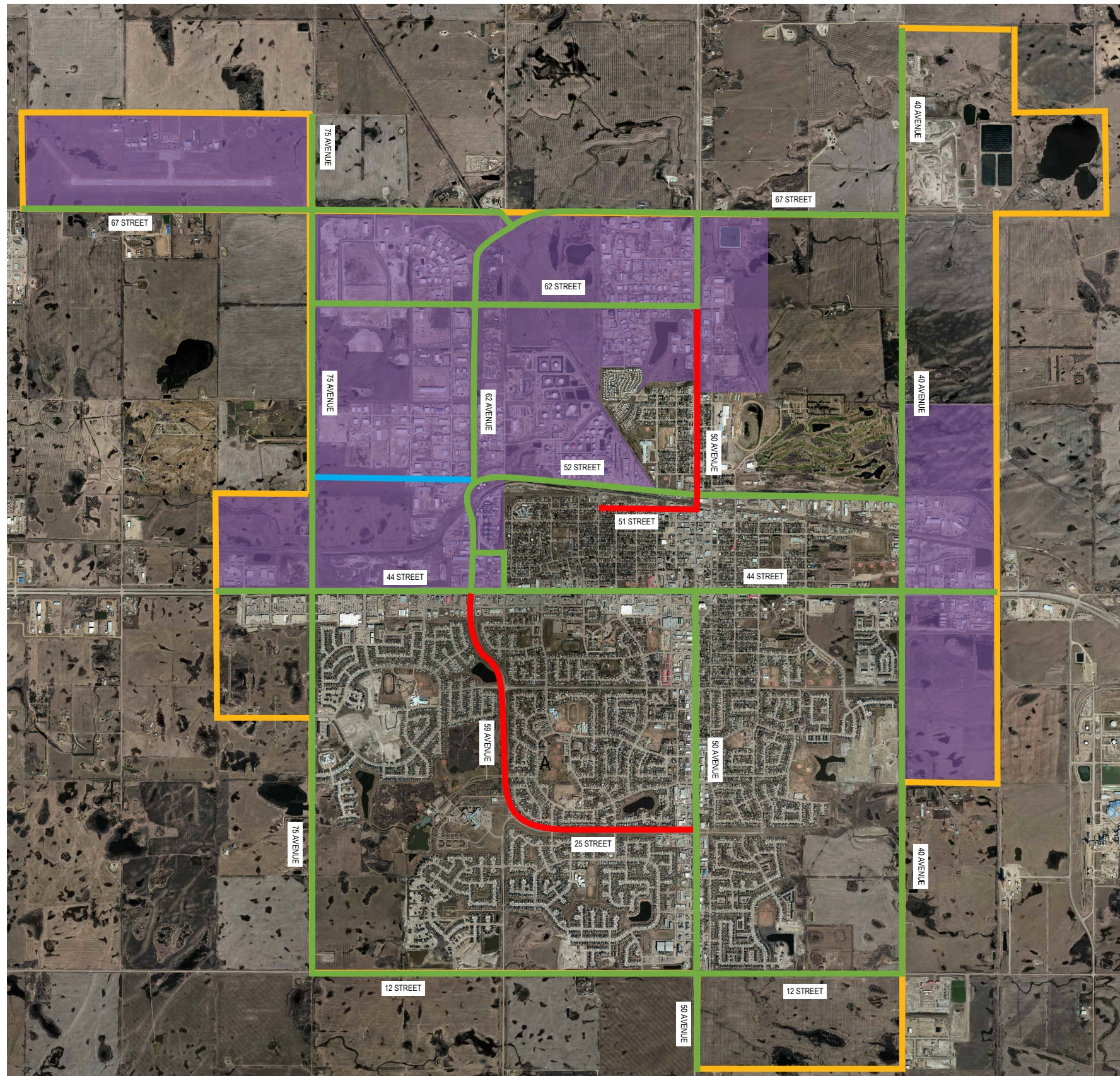
55 Avenue between 44 Street and 51 Street, as a current truck route that is recommended for removal from the truck route network would be the second location where “no truck route” signs would be appropriate given the change in designation that is recommended.

6.1.3 Recommended Truck Routes

The recommended truck routes for the City of Lloydminster, based on stakeholder, public and staff input along with a technical evaluation are represented below in Table 6.1 and in Exhibit 6.1.

Table 6.1: Recommended Truck Routes for the City of Lloydminster

24 Hour Truck Routes		
Street Name	From	To
12 Street	East City Limits	West City Limits
44 Street	East City Limits	West City Limits
47 Street	59 Avenue	62 Avenue
52 Street	40 Avenue	62 Avenue
62 Street	50 Avenue	75 Avenue
67 Street	40 Avenue	62 Street
67 Street	62 Street	West City Limits
40 Avenue	12 Street	North City Limits
50 Avenue	South City Limits	44 Street
50 Avenue	62 Street	North City Limits
59 Avenue	44 Street	47 Street
62 Avenue	44 Street	67 Street
75 Avenue	South City Limits	North City Limits
Restricted Truck Routes Between 06:00 to 22:00		
Street Name	From	To
51 Street	50 Avenue	55 Avenue
50 Avenue	51 Street	62 Street
College Drive (25 Street)	50 Avenue	59 Avenue
College Drive (59 Avenue)	25 Street	44 Street
Future Truck Routes		
Street Name	From	To
52 Street	62 Avenue	75 Avenue



LEGEND

- 24 HOUR TRUCK ROUTE
- RESTRICTED TRUCK ROUTE - 06:00 - 22:00
- FUTURE TRUCK ROUTE
- CITY LIMITS
- TRUCK ROUTE AREAS

DANGEROUS GOODS ROUTES AND TRUCK ROUTES
EXHIBIT 6.1 - RECOMMENDED TRUCK ROUTE NETWORK

NOT TO SCALE
FEBRUARY 28, 2020



Truck Route Improvement Recommendations

During Phase Two engagement frequent feedback was received on potential improvements that would increase stakeholder support in regard to truck routes. A reoccurring comment from industry stakeholders and the general public preferred truck routes to be 4-lanes and the specific roadways mentioned where four lanes would be beneficial included:

- 12 Street
- 67 Street
- 40 Avenue
- 75 Avenue
- College Drive

In addition to lane widening improvements, feedback concerning turning lanes and turning radii at the intersections of the periphery roadways was received by both industry stakeholders and the public. The intersection with the highest level of concern from industry stakeholders was the intersection of 12 Street and 75 Avenue. This concern and location was echoed by the public. The addition of turning lanes and improving the turning radii at these intersections would improve efficiency and user safety.

52 Street between 62 Avenue and 75 Avenue is proposed as a future arterial roadway. The technical assessment indicates that if 52 Street between 62 Avenue and 75 Avenue is built to an arterial roadway standard, the roadway should be a strong candidate as a truck route. As this roadway was noted by the City as being built within the three to five year time frame, this study confirms and supports the completion of this project and the inclusion of this roadway as a truck route.

6.2 Dangerous Goods Route Recommendations

To develop the recommended dangerous goods routes, the project team reviewed the stakeholder input and feedback from both Phase One and Phase Two engagement as well as input from City staff on the potential operational and enforcement issues and challenges with the proposed dangerous goods route network. In addition, the technical evaluations of the candidate dangerous goods routes as assessed with the evaluation framework were also used to support the recommendations. This thorough city-wide assessment was completed to support the recommendations for the inclusion and exclusion of roadways as dangerous goods routes.

6.2.1 Dangerous Goods Route Evaluation Input

For the technical evaluation as shown in section 5.3 and Exhibit 5.2 and 5.3 of this report, 9 roadways identified as highways, major arterials, and supporting arterials were evaluated with 27 individual roadway segments using the dangerous goods route evaluation framework to assess the route safety assessment. From this assessment 17 of the roadway segments received a “strong” rating as candidate truck routes while 10 roadway segments received a “good” rating as candidate truck routes. No roadway segments received a “poor” rating as candidate truck routes. During the dangerous goods route functionality assessment there was no indication that the routes or options evaluated would be inappropriate for the dangerous goods route network. The following sections outline how this city-wide assessment informed the recommendations.



27 segments of roadway were evaluated along roadways identified as highways and arterials within the Transportation Master Plan. The arterials were further broken into two smaller groups, the major arterials for those roads on the City's arterial grid network, and the supporting groups, the supporting arterials as outlined in dangerous goods route option four. Only segments along 44 Street and 50 Avenue were previously identified as dangerous goods routes within the Traffic Bylaw (No. 09-2018). Of the 27 segments, 17 roadway segments received a “strong” rating as candidate dangerous goods routes and 10 roadway segments received a “good” rating as candidate dangerous goods routes. No roadway segments received a “poor” rating as a candidate dangerous goods route. From the technical assessment all of the highway and arterial routes evaluated are recommended as dangerous goods routes with the exception of 50 Avenue from 12 Street to 62 Street.

6.2.2 Dangerous Goods Route Option and Stakeholder Input

As noted in section 4.3 of the report, the route options were developed and presented as city-wide options. The route recommendations that were developed considered the stakeholder input from Phase Two engagement within the context of the preceding technical assessment as both stakeholder input and the technical evaluation informed the recommendations. The following section outlines how the dangerous goods route recommendations were established for the City.

The recommended dangerous goods routes are based off of a hybrid of Option three and Option four which focuses the dangerous goods routes on the arterial roadways, removes dangerous goods from traveling along 50 Avenue between 12 Street and 62 Street, and identified all of 44 Street as well as 62 Street between 50 Avenue and 75 Avenue and 62 Avenue between 44 Street and 67 Street as a dangerous goods route.

As a supplement to Option three and Option four, based on the technical evaluation and stakeholder input the following recommendations have been made:

- Identify all roadways along the periphery of the City as dangerous goods routes (12 Street, 67 Street, 40 Avenue and 75 Avenue)
- Include 44 Street, from east City limits to west City limits as an existing dangerous goods route within the recommendations due to its “strong” rating in the technical evaluation and support from stakeholders
- Include 52 Street, from 40 Avenue to 62 Avenue due to a “strong” rating in the technical assessment and support for stakeholders
- Include 62 Street, from 50 Avenue to 75 Avenue based on a “strong” rating in the technical assessment and ensuring network connectivity.
- Remove 50 Avenue, from 12 Street to 44 Street from the dangerous goods route network based on the feedback received from industry stakeholders
- Remove 50 Avenue from 44 Street to 52 Street. The segment received a “poor” rating during the truck route evaluation and was not designated as a truck route. The segment was not evaluated as a dangerous goods route because it did not pass the dangerous goods route functionality assessment
- Remove 50 Avenue, from 52 Street to 62 Street from the dangerous goods route network based on the restriction along that route in the truck route network
- Include 50 Avenue, from 62 Street to 67 Street, as an existing dangerous goods route and a “good” rating on the technical assessment.
- Include 62 Avenue, from 44 Street to 67 Street, as dangerous goods route based on a “strong” rating in the technical assessment and to ensure network connectivity.

Dangerous Goods Route Exclusions

Through the identification and assessment of potential dangerous goods routes, 50 Avenue between 12 Street and 62 Street was discussed as a roadway that would be less desirable for dangerous goods truck activity. While 50 Avenue between 12 Street and 62 Street was not identified for a truck route ban (a roadway where truck activity would not be permitted) as a current dangerous goods route, that is recommended for removal from the dangerous goods route network, this segment of 50 Avenue would be a location where “no dangerous goods route” signs would be appropriate given the change in designation that is recommended.

6.2.3 Recommended Dangerous Goods Routes

The recommended dangerous goods routes for the City of Lloydminster, based on stakeholder, public and staff input along with a technical evaluation are represented below in Table 6.2 and in Exhibit 6.2.

Table 6.2: Recommended Truck Routes for the City of Lloydminster

Dangerous Goods Routes		
Street Name	From	To
12 Street	East City Limits	West City Limits
44 Street	East City Limits	West City Limits
52 Street	40 Avenue	62 Avenue
62 Street	50 Avenue	75 Avenue
67 Street	40 Avenue	62 Street
67 Street	62 Street	West City Limits
40 Avenue	12 Street	North City Limits
50 Avenue	South City Limit	12 Street
50 Avenue	62 Street	North City Limits
62 Avenue	44 Street	67 Street
75 Avenue	South City Limits	North City Limits

6.3 Recommended Signage Plan

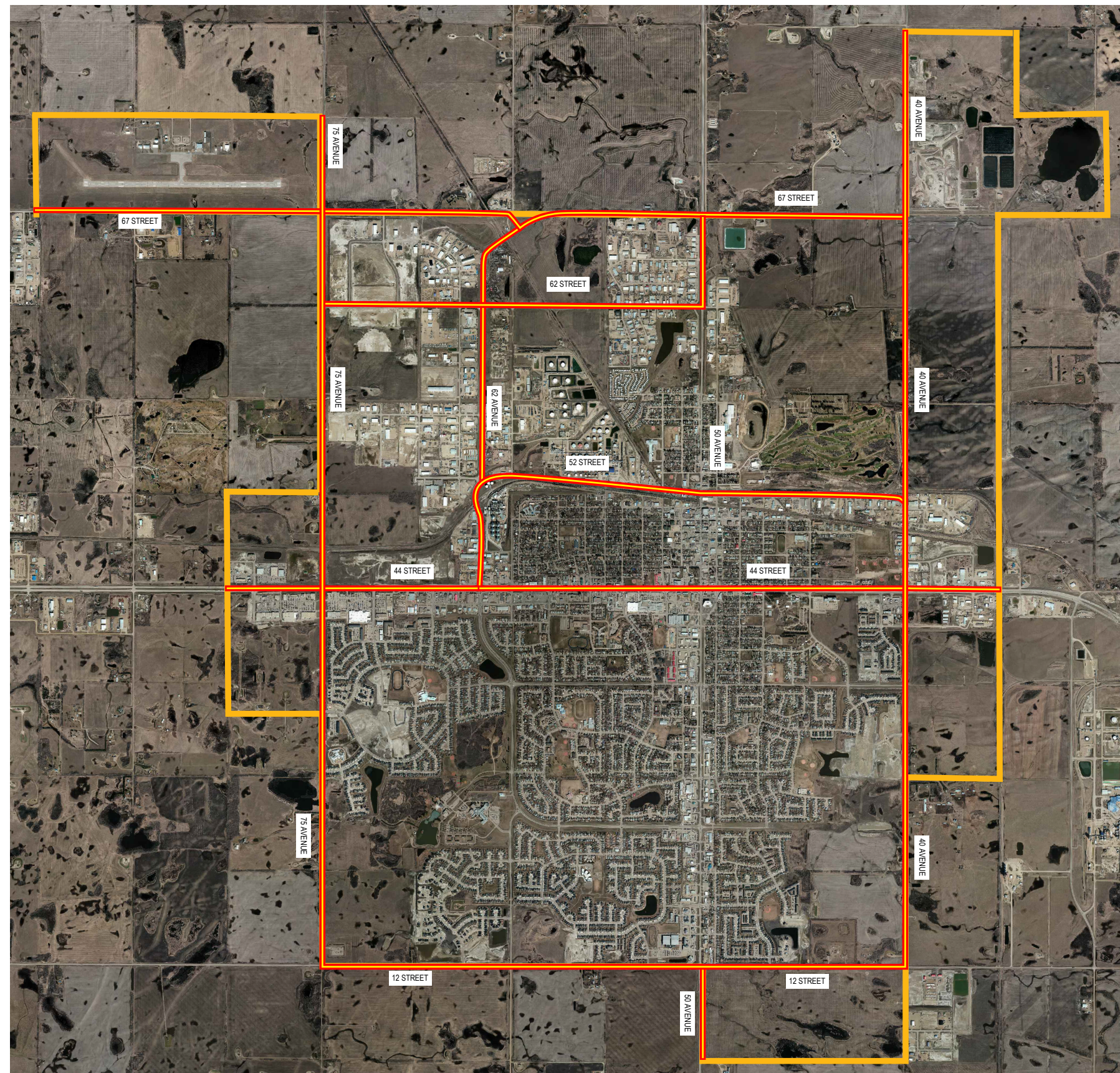
As part of the recommendations for dangerous goods routes and truck routes, ISL developed a regulatory and directional wayfinding signage plan to support the implementation of the recommended truck route and dangerous goods routes, and assist the City of Lloydminster in determining the number of signs required to accurately sign the dangerous goods route and truck route networks. The following section outlines the development of the recommended signage plan.

6.3.1 Best Practice Review

Prior to commencing the signage plan, a best practice review was conducted to determine existing best practices for dangerous goods route and truck route signage placement. The two documents that were reviewed were the Government of Alberta’s Guidelines for the Establishment of Dangerous Goods Routes in Alberta Municipalities and the Transportation Association of Canada’s Manual of Uniform Traffic Control Devices for Canada: Fifth Edition (MUTCD).



THIS PAGE LEFT INTENTIONALLY BLANK



NOT TO SCALE
APRIL 8, 2020

Guidelines for the Establishment of Dangerous Goods Routes in Alberta Municipalities

The Guidelines for the Establishment of Dangerous Goods Routes in Alberta Municipalities provides information for the establishment of dangerous goods routes with a section on route signage. The information provided in the Signs section of the guidelines informs the reader to check the MUTCD which sets out the design standards and specifications for the dangerous goods route and prohibited route signs. No information on truck route signage was provided in the guidelines.

Appendix B of the Guidelines noted that the signs must be used to indicate regulations related solely to the transportation of dangerous goods via trucks on streets and highways and have been included as part of a dangerous goods route network. The signs permitting and prohibiting the use or restriction of roadways for dangerous goods are part of the regulatory sign classification and are identified as RB-69 and RB-70 respectively. RB-69 shows dangerous goods carriers the roadways that are defined by legislation as appropriate for the transportation of dangerous goods. Directional arrows are added to the sign to indicate the directions of a designated route. Appendix B noted that the turn arrows should be placed 50 to 150 meters before an intersection where the route changes direction.

RB-70 indicates to dangerous goods carriers the roadways that are prohibited by legislation for the transportation of dangerous goods. The sign is to be placed along the roadway where dangerous goods are prohibited. If desired the sign may be lit or made reflective to allow the same colour and shape of the sign during the day and night.

Manual of Uniform Traffic Control Devices for Canada (MUTCD)

The MUTCD contains information on all of the traffic control devices used in Canada including signs, signals, and temporary conditions as well as the design standards, installation, and maintenance information. The dangerous goods routes and truck route signs are classified as RB which indicates they are regulatory signs and used to indicate the permitted and prohibited use of a roadway. The smaller directional arrows which are used with the dangerous goods route and truck route signs is classified as a tab sign. Tab signs are typically the same colour, but smaller, than the primary sign and are mounted below the primary sign.

The MUTCD explains that the standard shapes and colour are used to allow drivers to recognize the specific classes of signs. Regulatory control signs are either rectangular or square in shape and can be a white background with black text or a black background with white text. The use of a green ring or a red ring with an interdictory stroke are used to indicate permissive or prohibited respectively. If the City can demonstrate that a larger sign is required for emphasis, then a proportional increase to the dimensions listed in the MUTCD may be permitted.

The following section highlights truck route and dangerous goods route sign requirements as contained within the MUTCD.



RB-61
600 mm x 600 mm

A2.9.1 Truck Control Signs

Truck control signs indicate regulations relating solely to the movement of trucks on roads.



RB-61S
600 mm x 450 mm

A2.9.1.1 Truck Route Sign (RB-61)

The Truck Route sign indicates that trucks, as prescribed by legislation, are permitted to travel on a road.

The sign is installed along a road on which trucks are permitted to travel, at a location between 50 m to 150 m in advance of a point at which two or more truck routes intersect.

The supplementary tab sign (RB-61S) may be used to indicate the permissible movements. Other tab signs in Division A4 may also be used.



RB-62
600 mm x 600 mm

A2.9.1.2 Trucks Prohibited Signs (RB-62)

The Truck Prohibited sign indicates that trucks, as prescribed by legislation, are prohibited from travelling upon a road.

The sign is installed on the road on which the truck movements are prohibited, at the point where the road intersects a truck route. This provides an opportunity to direct truck traffic to the appropriate route.

A2.9.3 Dangerous Goods Route Signs

Dangerous goods route signs are used to indicate regulations related solely to the movement on roads of vehicles classified as dangerous goods carriers.



RB-69
600 mm x 600 mm

A2.9.3.1 Dangerous Goods Route Sign (RB-69)

The Dangerous Goods Route sign indicates that dangerous goods carriers, as prescribed by legislation, are permitted to travel along a road.

The sign must be supplemented with proper advance and directional arrows (IS-5 to IS-9) to indicate a turn or a change in direction of a designated route. Advance turn arrow tab signs should be installed at a point between 50 m and 150 m in advance of an intersection where the route changes direction.



RB-70
600 mm X 600 mm

A2.9.3.2 Dangerous Goods Prohibited Sign (RB-70)

The Dangerous Goods Prohibited sign indicates that dangerous goods carriers, as prescribed by legislation, are prohibited from travelling along a road.

The sign is installed on the road on which the dangerous goods carriers are prohibited, at the point where the road intersects a dangerous goods route. This provides an opportunity to direct dangerous goods carriers to the appropriate route.



6.3.2 Considerations

Signage Plan Location Considerations

During the creation of the signage plan for the City of Lloydminster's truck routes and dangerous goods routes the following items were considered:

- Recommended truck routes and dangerous goods routes,
- Locations of major intersections along the routes,
- Key decision points along the route,
- Locations with route changes from the previous truck route and dangerous goods route networks, and
- Distance traveled between signs.

The recommended truck route and dangerous goods route networks were used as the base of the signage plan to determine potential signage locations along all routes. Signs were initially placed at major intersections throughout the City which were designated as truck routes and dangerous goods routes. Segments of the routes were then assessed to determine if additional key decision points existed along the route where unfamiliar drivers may unknowingly stray from the designated route. Additional route signs were added to the key decision points that were identified throughout the City. Permissive truck route and dangerous goods route signs (RB61 and RB69) were used for all 24-hour truck routes and all dangerous goods routes signs used in the signage plan.

Restricted routes also use the permissive signage along with a tab sign indicating the restriction of 06:00 to 22:00 Monday through Sunday. The four locations throughout the City where the prohibited truck route signs and dangerous goods route signs were used are included below:

- 55 Avenue and 44 Street
- 50 Avenue and 44 Street
- 50 Avenue and 52 Street
- 50 Avenue and 62 Street

50 Avenue between 44 Street and 51 Street was a truck route in the previous truck route network which has since been replaced with 51 Street between 50 Avenue and 55 Avenue. The prohibited truck route sign is appropriate at this location given the change in designation. 50 Avenue between 44 Street and 52 Street is the City's historic downtown which is prohibited for trucks and dangerous goods carriers. The prohibited truck route and dangerous goods route signs at 50 Avenue and 44 Street would indicate to any northbound traffic that the roadway can not be used as a truck route or dangerous goods route. The signs at 50 Avenue and 52 Street would be facing the southbound direction and indicate to carriers that other routes must be used. 50 Avenue between 52 Street and 62 Street is a restricted truck route and an additional dangerous goods route prohibited sign is recommended at the intersection to indicate dangerous goods must not travel southbound along 50 Avenue.

Field Level Signage Placement Review

ISL completed a field level review of signage placement to gain an understanding of how the MUTCD guidelines could be applied within municipal boundaries. The field level review was conducted within the City of Edmonton and observations were made as to the order of the signs when placed on a post as well as the location of the restricted route signs in relation to the 24-hour route signage.

The field review found that when the dangerous goods routes and truck routes are the same, the dangerous goods route sign is located above the truck route sign and the directional arrow tab is located below the truck route sign. An example of this sign configuration is shown below in Figure 6.1. Signage for truck routes and dangerous goods routes that are not the same will consist of a dangerous goods sign on top, the dangerous goods directional arrow tab, the truck route sign, and the truck route directional arrow tab. An example for a C7 A6 sign configuration is also shown below.

An example sign configuration for a truck route and dangerous goods route that are the same is on the left and the example on the right is an instance where the truck route and dangerous goods route are not the same.

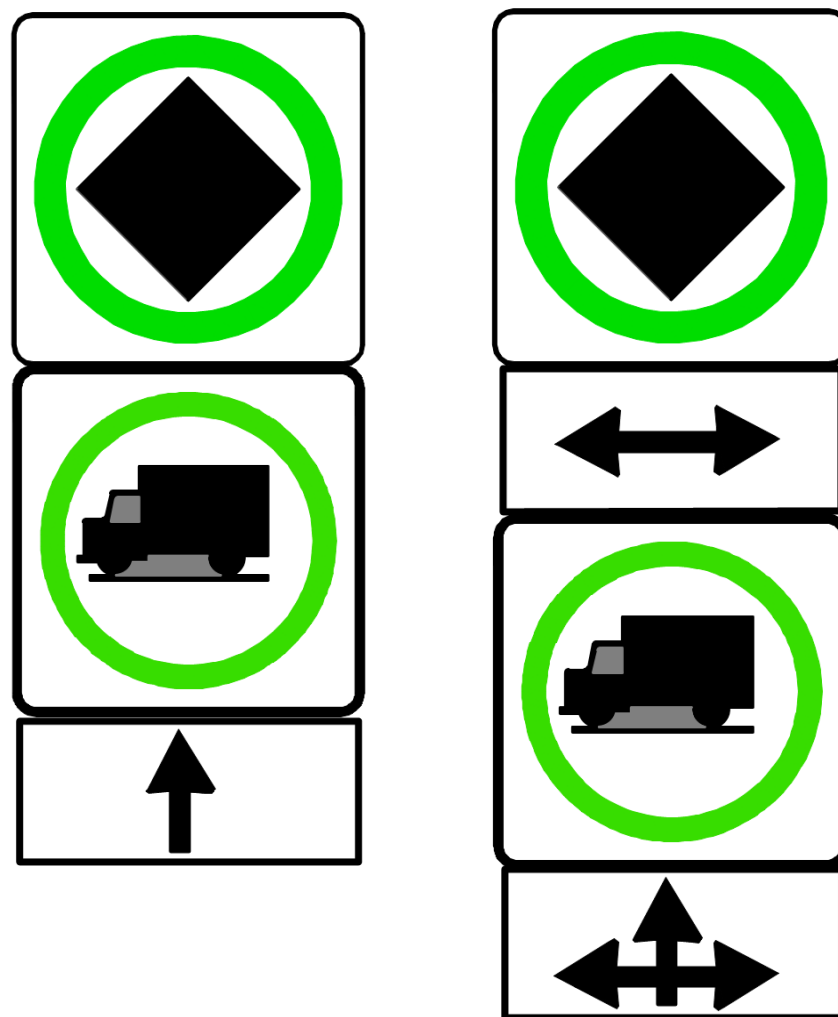


Figure 6.1: Truck Route and Dangerous Goods Route Sign Configurations

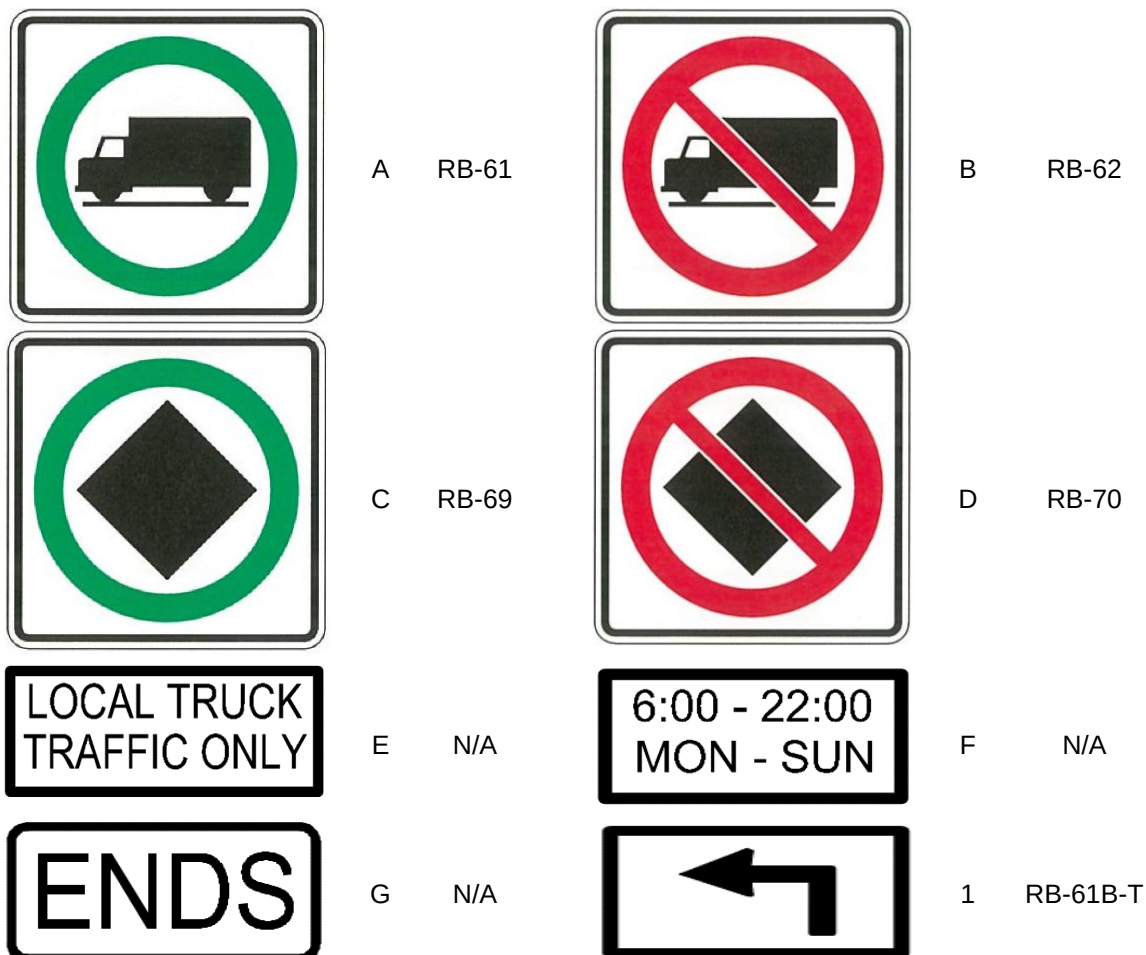
Another observation made was the placement of restricted truck route signs which are typically located closer to the intersection than the 24-hour truck route signs. The recommended signage plans use this method of offsetting the restricted truck route signs similar to the City of Edmonton. To differentiate, the restricted truck route signs have a red outline whereas the required signs have a black outline. The future signs use a blue outline and the requirement for future signs are discussed in depth in section 6.3.3.

6.3.3 Recommendations

The following sections include the recommended signage plan as well as any specific items to note. Estimated costs for the required signs are included with the recommended signage requirements.

Recommended Signage Requirements

Exhibit 6.3 and 6.4 illustrate the recommended signage plan for the City of Lloydminster. The signage plan uses visual cones to point in the direction which road users will observe the sign. The letter and number in each symbol corresponds to a specific route symbol, additional information, and directional arrow tab. Figure 6.2 below shows the definition of each sign with the letter and number code used in this signage plan.

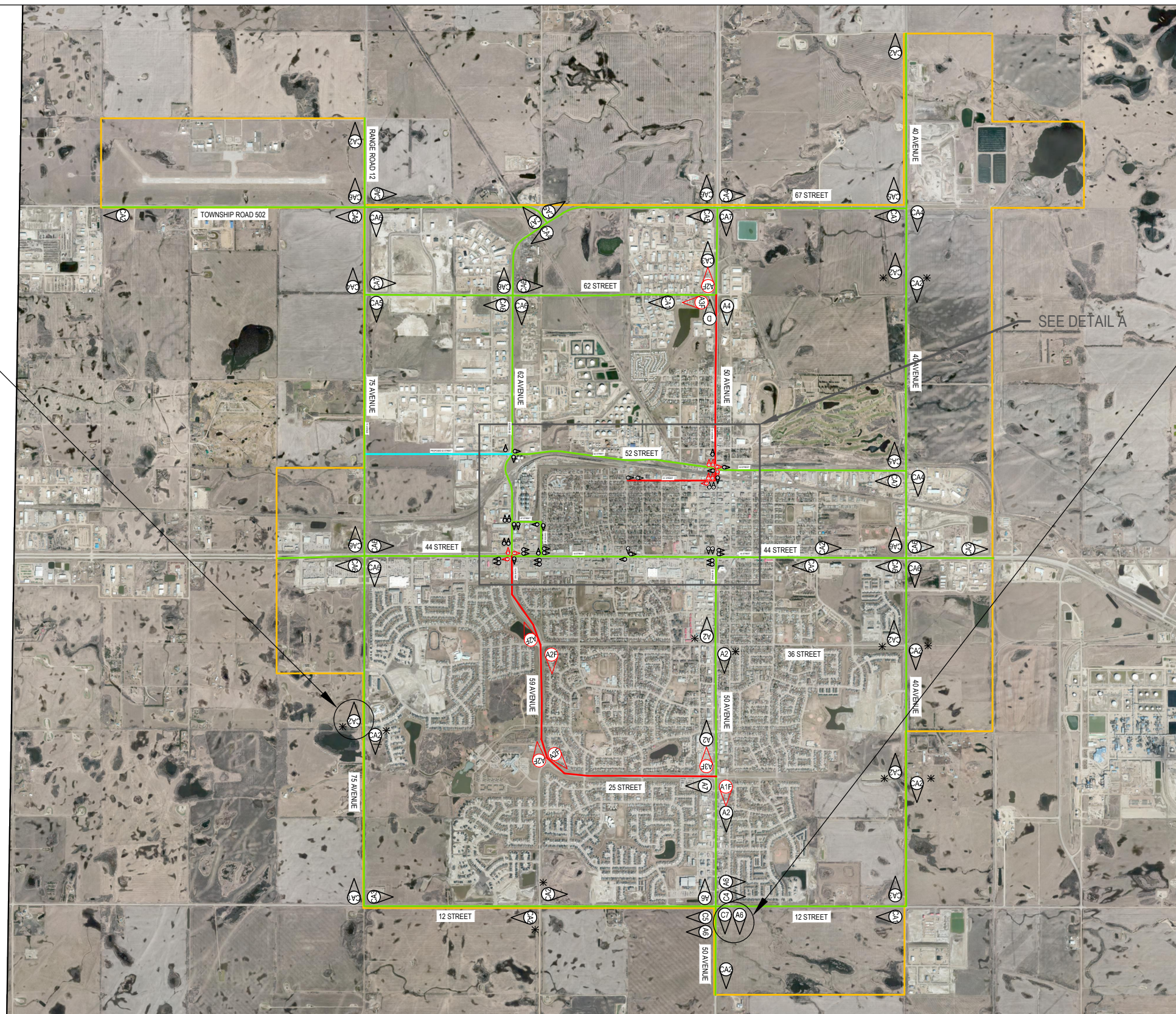
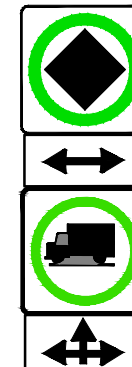


NAME/DATE/FILENAME

EXAMPLE OF CA# SIGNS
CA2



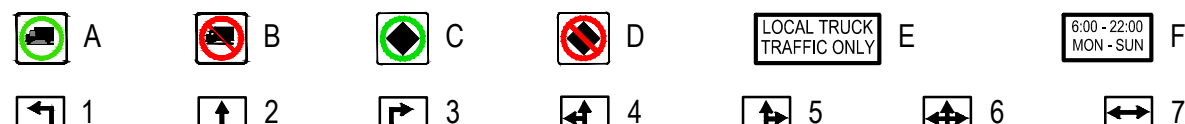
EXAMPLE OF C# AND A# SIGNS
C7 A6



SEE DETAIL A

- ROUTE LEGEND
- CITY LIMITS
 - 24 HOUR ROUTES
 - RESTRICTED ROUTES
 - FUTURE ROUTES

LEGEND



REQUIRED 24hr SIGNS

REQUIRED RESTRICTED SIGNS

RECOMMENDED 24hr SIGNS

DANGEROUS GOODS ROUTES AND TRUCK ROUTES

EXHIBIT 6.3 - CITY-WIDE SIGNAGE PLAN

NOT TO SCALE
MARCH 19, 2020



Rach Schmitz / Jan 21, 20 / G:\Projects\150001550015520_Lloydminster_DGR_and_Truck_Routes\02_CADD\03_Drafting\Signage_Plan.dwg

LEGEND

RB-61 A	RB-62 B	RB-69 C	RB-70 D	E	F	G
1	2	3	4	5	6	7
REQUIRED SIGNS			RESTRICTED SIGNS			

DANGEROUS GOODS ROUTES AND TRUCK ROUTES

EXHIBIT 6.4 - CITY-WIDE SIGNAGE PLAN - DETAIL A

NOT TO SCALE
FEBRUARY 24, 2020

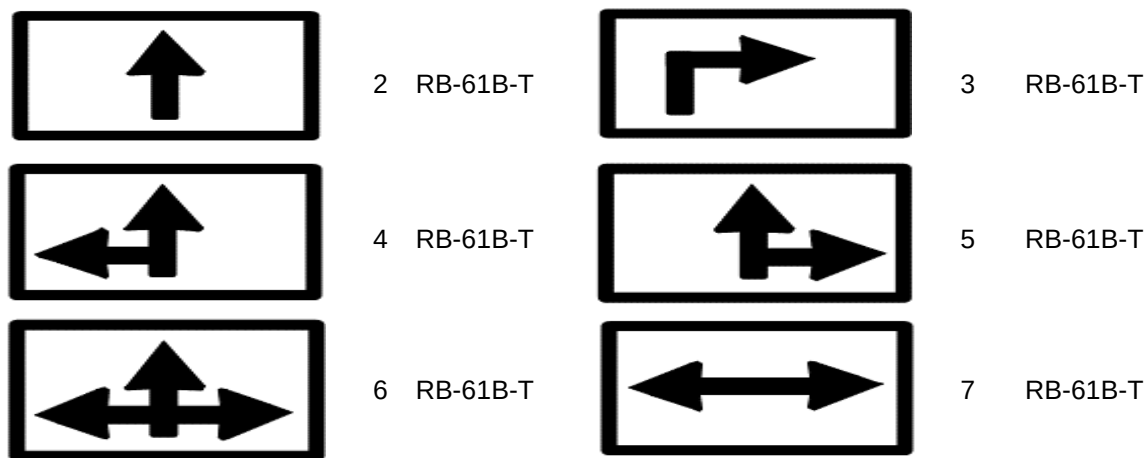


Figure 6.2: Letter and Number Symbols for Signage

The MUTCD states that signage is required at a location where there is a directional change in the route to inform the carriers of the change. During the development of the signage plan for the City of Lloydminster two of the considerations were the distance between signs as well as the key decision points along the routes which were the basis for recommending additional signage along certain routes. In addition to these considerations, additional signage was observed along Whitemud Drive during the field level review. The City of Edmonton has placed truck route signage after exit ramps to inform carriers that the route continues straight even though that is the only direction of travel along Whitemud Drive. There are six locations throughout the City where additional signage is recommended to enforce the messaging to carriers as to which roads are designated routes and they are included below:

- 12 Street and 59 Avenue
- 40 Avenue and the future alignment of 25 Street
- 40 Avenue and 36 Street
- 40 Avenue and the future alignment of 62 Street
- 50 Avenue and 36 Street
- 75 Avenue and 29 Street

While there is no directional route change at 12 Street and 59 Avenue, signage was recommended due to the distance between signage. The directional changes occur at 50 Avenue and 75 Avenue which are located approximately 3.2 km apart; therefore, the signage at 12 Street and 59 Avenue would reduce the distance between signs and provide extra guidance for unfamiliar drivers. There is approximately 2.4 km between 12 Street and 36 Street along 40 Avenue and in an effort to reduce that distance additional signage was investigated. The City noted that 25 Street between 40 Avenue and 50 Avenue will soon be completed and then the intersection of 25 Street and 40 Avenue could be considered a key decision point. For these reasons, signage at 40 Avenue and the future alignment of 25 Street is recommended. Currently the only major intersection along 40 Avenue between 12 Street and 44 Street is located at 36 Street which was considered to be a key decision point and therefore additional signage is recommended. The intersection of 40 Avenue and the future alignment of 62 Street is similar to that of 40 Avenue and 25 Street; however, there are no timelines associated with the completion of 62 Street. The intersection of 40 Avenue and 62 Street would also reduce the distance between signs and upon completion, provide signage at a key decision point; therefore, additional signage is recommended.



The locations of 50 Avenue and 36 Street as well as 75 Avenue and 29 Street were selected based on the distance between directional route changes and are recommended to reduce the distance between signs as well as ensure carriers stay on designated routes.

There is a small commercial area along 51 Street that requires carriers to deliver goods and previously 55 Avenue was used as the designated truck route to access this commercial area. The recommended truck routes used 51 Street instead of 55 Avenue due to the shorter distance and fewer residents located along the route; however by designating 51 Street as a truck route a “dead end” was created. The evaluation criteria was developed in a manner to minimize “dead end” routes in the network and therefore creates potential confusion for carriers. To help ensure proper understanding of the restricted route along 51 Street, “LOCAL TRUCK TRAFFIC ONLY” signs will be placed along 50 Avenue southbound prior to 51 Street. In addition, towards the end of the route signage stating the end of the truck route is recommended as well as a sign stating no truck routes in any direction past 51 Street and 55 Avenue as that is the end of the route.

Recommended Signage Cost Estimate

Table 6.3 below contains the costs associated with the required and optional signage. The required signs include the permissive and prohibitive truck route and dangerous goods route signs as well as the directional arrow tab, “LOCAL TRUCK TRAFFIC ONLY” signs, restricted time of day signs, and the “ENDS” sign. The cost estimate also includes optional signs such as large dangerous goods route information signs similar to those in Figure 6.3 below.

The large dangerous goods information signs could be placed at the entrances and exits of the City as shown in Exhibit 6.5. The signs provide the City with an opportunity to inform carriers entering the City about the use of dangerous goods route signage throughout the City as well as the contact for off route permitting if the City chooses to pursue a permitting system. The signs have a higher cost as they require eight extruded aluminum panels and have to be attached to Ibeam posts. The sign shown in Figure 6.3 estimated to be eight feet tall by twelve feet long and is mounted on three Ibeam posts. The large dangerous goods route signs are custom signs and quoted based on the number of extruded aluminum panels and overall size. Exhibit 6.5 shows the large dangerous goods route signs at the entrances to the City along 44 Street and 50 Avenue as they are primary routes into the City with the majority of the truck traffic. As the large dangerous goods routes signs are optional, the City of Lloydminster can place and/or add additional signs as required. Figure 6.3 is a large dangerous goods route information sign used by the City of Edmonton and can be found at major entry points to the City. The City of Calgary uses a green and white information sign to convey similar information which can be seen in Figure 6.4. A large dangerous goods route sign is not a standard Alberta Transportation regulated sign which allows the City of Lloydminster to create a sign that works best for the City which may be a green and white informational sign with the use of the dangerous goods route permissive sign.

NAME DATE FILE NAME

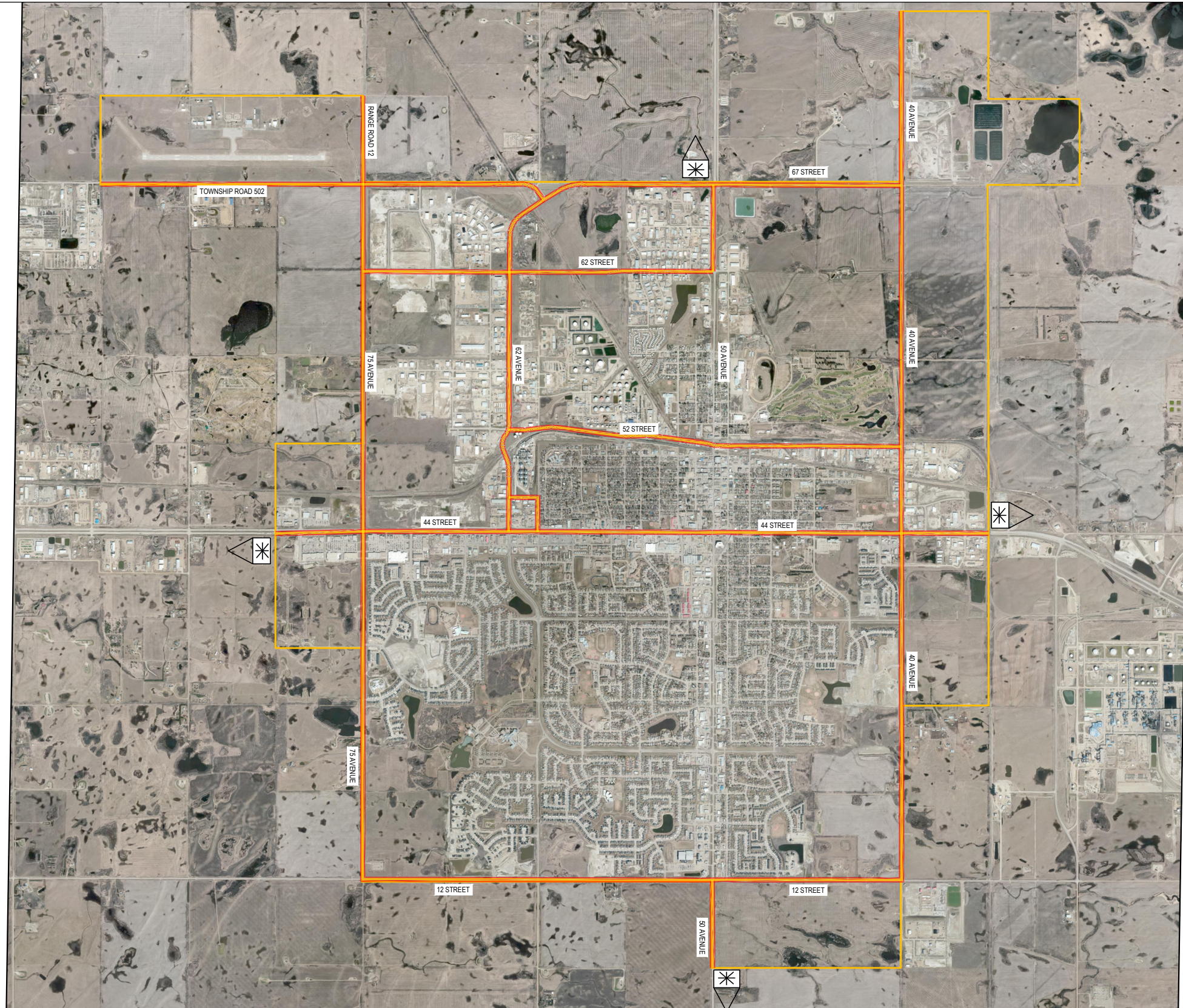


LEGEND

CITY LIMITS

DANGEROUS GOODS ROUTES

Large Dangerous Goods Route Information Signs



DANGEROUS GOODS ROUTES AND TRUCK ROUTES
EXHIBIT 6.5 - LOCATION OF LARGE DGR INFORMATION SIGNS

NOT TO SCALE
FEBRUARY 20, 2020

Radi Schmitz / Jan 21, 2018 / Projects / 150001550015520 / Lloydminster DGR and Truck Routes / 02 CAD000 Drafting / Signage Plan.dwg



LEGEND



A



C



1

RB-61B-T



2

RB-61B-T



3

RB-61B-T



4

RB-61B-T



5

RB-61B-T



6

RB-61B-T



7

RB-61B-T



FUTURE SIGNS

DANGEROUS GOODS ROUTES AND TRUCK ROUTES

EXHIBIT 6.6 - FUTURE SIGNAGE REQUIRED ALONG 52 STREET

NOT TO SCALE
FEBRUARY 18, 2020



Figure 6.3: Large Dangerous Goods Route Information Signs in the City of Edmonton (taken west of 17 Street on Whitemud Westbound)



Figure 6.4: Large Dangerous Goods Route Information Signs in the City of Calgary (retrieved from Google Earth Pro Streetview north of 144 Avenue NE on Deerfoot Trail Southbound)

Table 6.3: Costs Associated with Required Recommended and Optional Signs

Cost Item	Rate	Unit	Quantity	Cost
Required Recommended Signs				
RB-61	\$53.14	EA	115	\$6,111.10
RB-61B-T	\$40.44	EA	114	\$4,610.16
RB-62	\$53.14	EA	3	\$159.42
RB-69	\$53.14	EA	77	\$4,091.78
RB-70	\$53.14	EA	3	\$159.42
Custom Variable Message Tab (06:00 to 22:00 Mon to Sun and END)	\$38.50	EA	16	\$616.00
LOCAL TRAFFIC ONLY	\$40.44	EA	1	\$40.44
Subtotal for Required Signage				\$15,788.32
Optional Signs				
Large dangerous goods route sign	\$3,434.48	EA	4	\$13,737.92
Subtotal for Optional Large Dangerous Goods Routes Signs				\$13,737.92
Total				\$29,526.24

The permissive and prohibitive truck route and dangerous goods route signs can be accompanied by the respective label signs which are shown in Figure 6.5 below. The cost estimate has assumed that 25% of the permissive truck route and dangerous goods route signs (RB-61A-T and RB-69-T respectively) were required. The cost estimate also assumes that all of the prohibited truck route and dangerous goods route signs would be posted along with the appropriate label signs (RB-62-T and RB-70-T respectively). The locations of these label signs is left to the discretion of the City and is considered optional. Table 6.4 contains the costs associated with the optional truck route and dangerous goods route label signs.

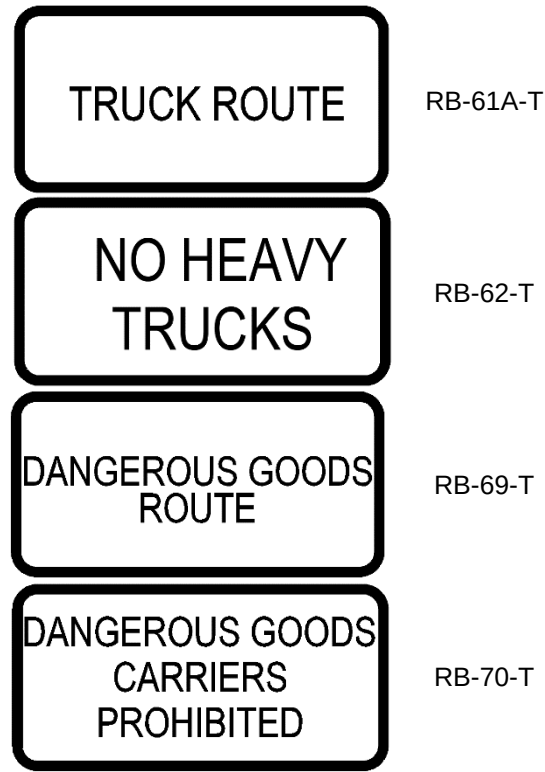


Figure 6.5: Truck Route and Dangerous Goods Route Permissive and Prohibitive Labels

Table 6.4: Costs for Optional Truck Route and Dangerous Goods Route Label Signs

Cost Item	Rate	Unit	Quantity	Cost
Optional Truck Route and Dangerous Goods Route Label Signs				
RB-61A-T	\$30.80	EA	29	\$885.50
RB-62-T	\$42.26	EA	3	\$126.78
RB-69-T	\$30.80	EA	19	\$592.90
RB-70-T	\$30.80	EA	3	\$92.40
Total				\$1,697.58

Cost for wood, Uchannel, and Ibeam posts have been included for informational purposes in Table 6.5. The City noted that internal crews will be responsible for the installation of the signs and will determine what posts are required at the time of installation.

Table 6.5: Costs for Potential Posts

Cost Item	Rate
Wood 4x6x16 Pressure Treated Post	\$60.80
12' Uchannel Post with 42" Uchannel Post Base	\$66.30
Ibeam W150x14 Post and Concrete Base	\$1,234.72

Future Signage Requirements

Future signage will be required when the section of 52 Street from 62 Avenue to 75 Avenue is completed. Currently at the intersection of 52 Street and 62 Avenue signage is required for the truck routes and dangerous goods routes along both roadways whereas no signage is required along 75 Avenue at 52 Street as there is no decision point at that location. Exhibits 6.3 and 6.4 shows the signs required based on the network at the time of writing this memo. There is no signage for trucks heading eastbound on the existing section of 52 Street as the link is not complete; however, the route is a part of the industrial area and still considered a truck route.

Once 52 Street is complete between 62 Avenue and 75 Avenue new additional signage will be required to ensure unfamiliar carriers are aware of the routes accessible from 75 Avenue. Exhibit 6.6 shows the future signs required at both intersections along 52 Street. The City of Lloydminster will be able to change the signage at this intersection of 52 Street and 62 Avenue with the reuse of recommended signs and addition of directional arrow tabs. Figure 6.6 below demonstrates how the signage for the southbound approach along 62 Avenue would be modified. The reuse of existing signs reduces the cost associated with installing signs once 52 Street is completed and is demonstrated with the use of arrows to depict where existing signs would be placed with the future sign configuration. New truck route and dangerous goods route signs as well as directional arrow tabs will be required at the intersection of 52 Street and 75 Avenue and the eastbound approach at the intersection of 52 Street and 62 Avenue. Table 6.6 includes the costs associated with the future signage requirements.

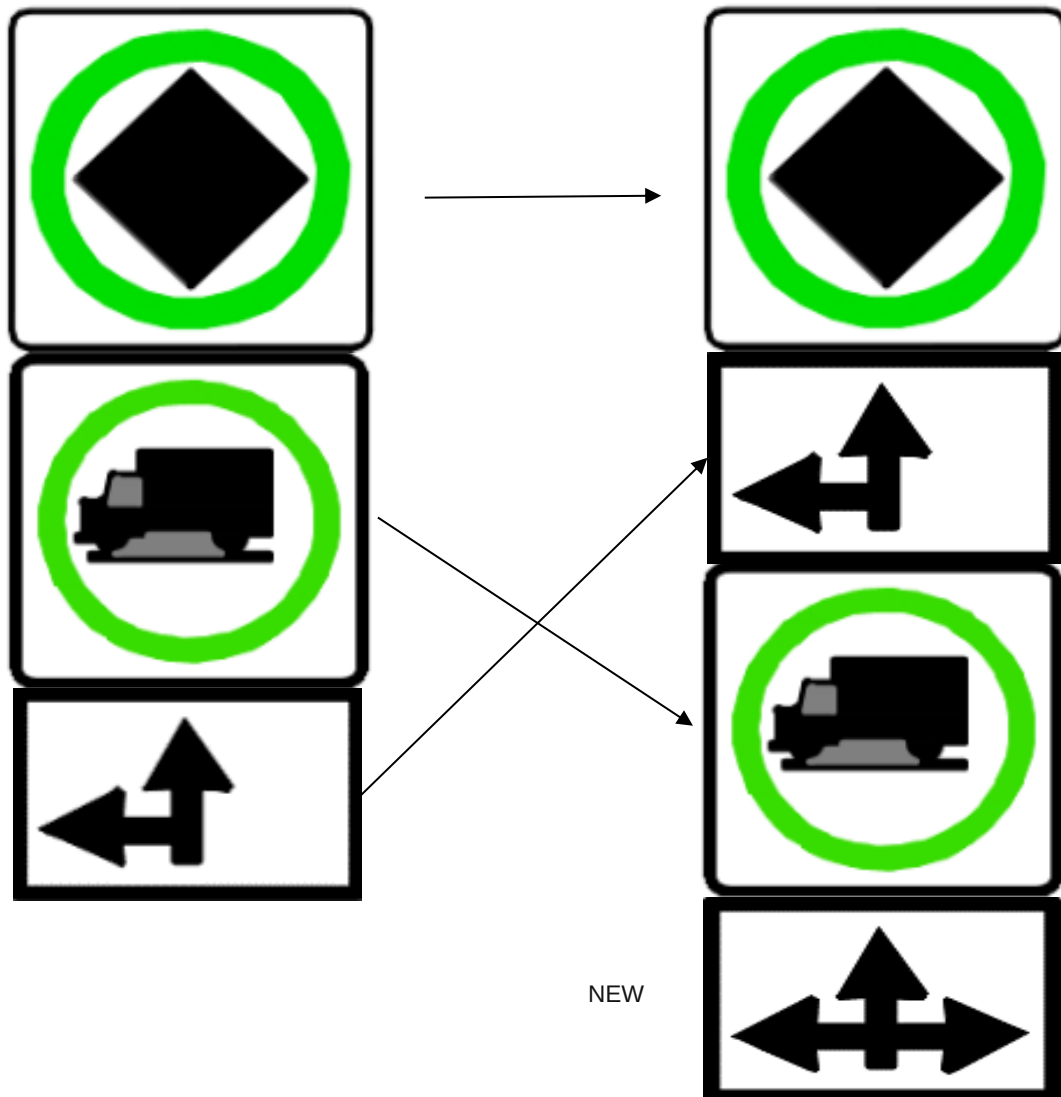


Figure 6.6: Sign Reconfiguration to Accommodate Future Routes

Table 6.6: Cost Associated with Future Sign Requirements

Cost Item	Rate	Unit	Quantity	Cost
Signs				
RB-61	\$53.14	EA	4	\$212.56
RB-61B-T	\$40.44	EA	9	\$363.96
RB-69	\$53.14	EA	2	\$106.28
Total				\$682.80



7.0 References



Centre for Transportation Engineering and Planning (C-TEP). (2003). Dangerous Goods Route Selection Criteria. Retrieved from <https://ctep.ca/wp-content/uploads/2016/11/Dangerous-Goods-Route-Selection.pdf>

City of Calgary (n.d.). Transportation of Dangerous Goods Policy and Evaluation Framework

City of Calgary (1990). Bylaw Number 60M90 Being a Bylaw of The City of Calgary Respecting Truck Routes. Retrieved from file:///C:/Users/ocraig/Downloads/60M90%20-%20Truck%20Routes%20-%20Office%20Consolidation.pdf

City of Calgary (2007). Calgary Truck Route Study Truck Route Framework.

City of Camrose (2006). City of Camrose Transportation System Bylaw. Retrieved from https://camrose.civicweb.net/filepro/document/1078/Transportation%20System%20Bylaw%202505_06.pdf

City of Camrose (2017). Dangerous Goods Bylaw 2963-17. Retrieved from <https://camrose.civicweb.net/filepro/document/35047/Dangerous%20Goods%20Bylaw%202963-17.pdf>

City of Camrose (2017). The Camrose Traffic Bylaw 2966-17. Retrieved from <https://camrose.civicweb.net/filepro/document/5849/Traffic%20Bylaw%202966-17.pdf>

City of Edmonton (2019). Traffic Bylaw 5590. Retrieved from <https://www.edmonton.ca/transportation/Bylaws/C5590.pdf>

City of Fort Saskatchewan (2008). Dangerous Goods Bylaw C7-08. Retrieved from <https://www.foresask.ca/Modules/Bylaws/Bylaw/Download/0b82d428-5e78-408a-9f67-4eff3eaf32b4>

City of Fort Saskatchewan (2009). Traffic Enforcement Bylaw C4-09. Retrieved from <https://www.foresask.ca/Modules/Bylaws/Bylaw/Download/fc364e77-03c7-496c-b0bc-7d3ce4ec611a>

City of Fort Saskatchewan (2018). Transportation Master Plan. Retrieved from <https://www.foresask.ca/en/your-city-hall/resources/Documents/Report-Plans-Studies/Transportation-Master-Plan.pdf>

City of Grande Prairie (2011). Traffic Bylaw C-1166. Retrieved from https://www.cityofgp.com/sites/default/files/uploads/bylaws/bc1166_office_consolidation.pdf

City of Grande Prairie (2011). Transportation Master Plan. Retrieved from https://www.cityofgp.com/sites/default/files/uploads/reports/2011_08_tmp_without_appendices.pdf

City of Medicine Hat (1995). Transportation of Dangerous Goods Bylaw No. 2759. Retrieved from <https://www.medicinehat.ca/home/showdocument?id=765>

City of Medicine Hat (2017). Public Roads Bylaw No. 4346. Retrieved from <https://www.medicinehat.ca/home/showdocument?id=15033>

City of Moose Jaw (2018). Traffic Bylaw No. 5556. Retrieved from <https://moosejaw.ca/wp-content/uploads/2019/12/Bylaw-No.-5556-Traffic-Bylaw.pdf>

City of Moose Jaw (n.d.). Heavy Vehicle/Truck Route Dangerous Goods Route Information Pamphlet.

City of Red Deer (1995). Dangerous Goods Route Bylaw No. 3152/95. Retrieved from <https://www.reddeer.ca/media/reddeerca/city-government/bylaws/Dangerous-Goods-Route-Bylaw-3152-95.pdf>

City of Red Deer (1997). Traffic Bylaw No. 3186/97. Retrieved from <https://www.reddeer.ca/media/reddeerca/city-government/bylaws/3186-97-Traffic-Bylaw.pdf>

City of St. Albert (2006). The Traffic Bylaw no. 18/2005. Retrieved from https://stalbert.ca/site/assets/files/1618/bylaw_18-2005_-_traffic.pdf

City of Yorkton (2012). Transportation Master Plan Update.

City of Yorkton (2017). The Yorkton Traffic Bylaw No. 18/2016. Retrieved from <https://www.yorkton.ca/dept/admin/bylaws/pdf/18-2016-traffic-bylaw.pdf>

City of Calgary (2004). Transportation of Dangerous Goods Bylaw 13M2004. Retrieved from <http://publicaccess.calgary.ca/ldm01/livelink.exe?func=ccpa.general&msgid=NyAccKgKAW&msgAction=Download>

City of Medicine Hat (2013). Roadway Systems Master Plan Road Network Plan Update. Retrieved from <https://www.medicinehat.ca/home/showdocument?id=5079>

County of Vermilion River (2017). Transportation Master Plan. Retrieved from https://vermilion-river.com/mrws/filedriver/PW_items/2017-02_AMEC_Master_Transportation_Plan_-_February_2017_-_FINAL_REPORT_severed_FOIP_ver.pdf

County of Vermilion River (n.d.). Bylaw 19-03 Municipal Development Plan. Retrieved from https://vermilion-river.com/mrws/filedriver/Bylaws/2020-JAN-14_CONSOLIDATED_MDP_WITH_AMENDMENTS.pdf

Government of Alberta (1997). Dangerous Goods Transportation and Handling Regulation. Retrieved from http://www.qp.alberta.ca/documents/Regs/1997_157.pdf

Government of Alberta (2018). A Guide to the Transportation of Dangerous Goods Regulations. Retrieved from <https://www.transportation.alberta.ca/Content/docType272/Production/guide.pdf>

Government of Alberta (2018). Guidelines for The Establishment of Dangerous Goods Routes in Alberta Municipalities. Retrieved from <https://open.alberta.ca/publications/guidelines-for-the-establishment-of-dangerous-goods-routes-in-alberta-municipalities>

Government of Alberta (2018). Traffic Safety Act. Retrieved from <http://www.qp.alberta.ca/documents/Acts/t06.pdf>



Government of Canada (1985). Railway Safety Act. Retrieved from <https://laws-lois.justice.gc.ca/eng/acts/R-4.2/page-1.html>

Government of Canada (1992). Transportation of Dangerous Goods Act. Retrieved from <https://laws-lois.justice.gc.ca/eng/acts/T-19.01/page-1.html>

Government of Saskatchewan (1985). The Dangerous Goods Transportation Act. Retrieved from <https://publications.saskatchewan.ca/api/v1/products/465/formats/571/download>

Government of Saskatchewan (1997). The Highways and Transportation Act. Retrieved from <http://www.publications.gov.sk.ca/details.cfm?p=559>

Government of Saskatchewan (2006). The Traffic Safety Act. Retrieved from <http://www.publications.gov.sk.ca/freelaw/documents/PIT/Statutes/T/T18-1-2007-02-22.pdf>

Ontario Trucking Association (2011). Local Truck Routes: A Guide for Municipal Officials

Regional Municipality of Wood Buffalo (2002). Consolidated Version of Roads and Transportation Bylaw. Retrieved from https://www.rmwb.ca/Assets/Departments/Legislative+and+Legal+Services/Bylaws/Roads-Transporation-Bylaw_No-02-079.pdf

Regional Municipality of Wood Buffalo (2011). Transportation Master Plan - Stage 2. Retrieved from <https://www.rmwb.ca/Assets/Departments/Engineering/pdf/Transportation+Master+Plan+-+Stage+2.pdf>

The Lloydminster Planning District Commission (2014). Lloydminster Planning District Official Community Plan. Retrieved from <https://www.lloydminster.ca/en/business-and-growth/resources/Documents/Official-Community-Plan-OCP.pdf>



Appendix A

DKCI Memo

Memorandum

Date: 24 October 2019
To: Cameron Matwie, Olivia Craig, ISL
From: David Kriger, DKCI

**Subject: Lloydminster Dangerous Goods Route & Truck Route Establishment
– Approach and Factors for Evaluating Dangerous Goods Routes**

1. Introduction

When we last talked a few weeks ago, we left it that I was to take a look at approaches and factors for evaluating dangerous goods (DG) routes while the initial stakeholder consultation proceeds. This note summarizes what I found from a brief review of what others have done.

Two principles were commonly cited:

1. DG routes generally should adhere to the criteria that define the overall truck route network – i.e., a DG route should always be part of (a subset of) the defined truck route network.
2. The process for developing a DG route network is largely that of minimizing risks.

2. Calgary approach as a basis

We talked about the 2003 Calgary CTEP research as a starting point. This is a sophisticated and detailed document. From what I can find, this is the most detailed study in Canada, even though it is now 15+ years old.¹ Drawing from the CTEP, consultation and further analysis, The City of Calgary's 2006 DGR policy uses a four-step evaluation.² Step 1 determines feasibility (eligibility) according to six factors:

- Route purpose – does it serve DG focal points (generators) and gateways to/from the City.
- Part of truck route network – by definition, as described above.
- Available alternative routes – use “more favourable” routes, if available, either permanently or temporarily (e.g., in the event of an incident on the DG route).

¹ S. Zein, M. Johnston, R. Dilgir and A. Popoff, *Dangerous Goods Route Selection Criteria*, Centre for Transportation Engineering & Planning, Calgary, 2003.

² C. Nelson, A. Cataford and P. Hwang, *Transportation of Dangerous Goods Policy and Evaluation Framework*, TAC Annual Conference, 2006.

- Network completion – i.e., maintain continuity; avoid dead end routes.
- Route length – minimize travel time for DG shippers and reduce costs.
- Coverage – ensure sufficient coverage of the focal points in order to reduce the need for DG shippers to travel off the DG network.

Routes are rated in three ways: no go (reject), evaluate (examine further) and go (conduct a risk rating). For example, if the route does not serve any DG focal points, it is rejected. If it serves many DG focal points, it is then subjected to a risk rating. If it is somewhere between (serves “some” DG focal points), it is subject to further evaluation. The rating is subjective but is easy to apply.

For the eligible routes, Step 2 considers a combination of likelihood criteria and impact criteria, where likelihood refers to the road and its use, and impact refers to the area of influence adjacent to the road (800m – 1600m):

Likelihood criteria are:

- Road classification
- Road geometry
- Access control
- At-grade railway crossings
- Road surface condition
- Traffic volumes
- V/C ratio
- Truck frequency
- Collision statistics

Impact criteria are:

- Population density (residential population [where people live] and employment population [where people work])
- Land use
- Population responsiveness (ability of persons to evacuate an area quickly and efficiently)
- Environmental impact (proximity of waterways, parks or sensitive habitats)
- Drainage
- Emergency response (response times of fire stations)
- Speed limits

Each criterion is assessed on a score of 0 to 100 (negligible to extreme risk, respectively). The scores are based on judgement. The scores are then assessed according to a Bell curve, to reduce large deviations among the evaluators.

Step 3 considers the mitigation of risk. If a route is found to be above the “risk tolerance line,” then some kinds of mitigation must be applied before it can be considered as a DG route. Mitigations would start with the likelihood criteria, because these are easier to apply – for example, improving the road surface, adding traffic signals or widening the road. In contrast, changing an impact criterion is much more difficult, if not at all attainable – for example, moving a hospital or changing the population density. Other mitigation measures, such as time-of-day or material (type of DGs carried) restrictions or the provision of DG escorts, also could be applied. However, these are costly to enforce, reduce carrier efficiency (hence add to transportation costs) and so are best considered as temporary measures.

Step 4 requires a regular review of the DG routes, consistent with provincial policies that require a complete review of the DG routes every five years. New construction or significant changes to existing DG routes should trigger reviews in the interim.

Applicability to Lloydminster (what this adds to the discussion):

- Pros: Detailed and methodical; proven; allows for before-and-after impact of road improvements; local (Alberta).
- Con: Too detailed for Lloydminster given the limited alternatives (sparse network); not sure if the needed data are available.

3. Other approaches

I looked at other approaches that could inform the Lloydminster DG. Many of them are variations to the same indicators identified in the Calgary work, although not as elaborate. However, three approaches offered insight, and they are outlined below.

3.1. Prince George

In 2009, Prince George developed a DG route evaluation process that looked at Calgary and other initiatives.³ Specific to Prince George, the evaluation was based on a relative comparison of route considered (not just an absolute ranking); used a transparent and repeatable process; and focused on overall route conditions. The process developed nine evaluation criteria that were each assigned weights. The criteria were grouped according to those that minimize the likelihood of a DG spill and those that minimized the consequences of a spill. The criteria reflect the various risks that are involved in moving DGs. The weights reflect the inherent difficulty in mitigating these risks.

These are summarized in Table 1. The table also shows the “ideal characteristics” for each criterion.

The procedure has three steps:

- Divide a route into homogeneous segments with respect to land use and roadway characteristics.
- For each segment and evaluation criterion, assign a risk score (on a 0-100 scale) and multiply the risk score by the weight.
- Determine a total score for a route by adding up the segment scores weighted by their respective lengths.

Applicability to Lloydminster (what this adds to the discussion):

- Pros: Covers the Calgary level of detail but aggregates some factors; designed for a relatively sparse network in a smaller community; considers pedestrians and cyclists; identified a recommended short term DG network and a long term DG network through the evaluation of potential future routes; straightforward to explain to the public and industry.

³ S. Rocchi, V. Law and G. Stanker, *Prince George Dangerous Goods Routes – A Comprehensive Evaluation Method*, ITE Quad Conference, 2009.

- Cons: Does not account for route purpose; does not consider road surface condition, drainage or at-grade crossings.

Table 1. Prince George – DG Evaluation Criteria and Weights

Evaluation criterion	Weight	Grouping	Ideal characteristic
Access control	3	Consequences	All intersections have signals / few private accesses
Population exposure	3	Consequences	Primarily undeveloped / heavy industrial
Public evacuation potential	3	Consequences	Affected people can evacuate quickly and efficiently
Surrounding environment	3	Consequences	No sensitive natural areas along route
Road geometry	2	Likelihood	Wide, flat, straight route
Traffic efficiency	2	Likelihood	Infrequent delays [also accounts for traffic volume]
Public emergency response	2	Likelihood	Fire hall less than 2 kilometres away
Accommodation of pedestrians and cyclists	1	Likelihood	Sidewalks and bike lanes provided
Collision history	1	Likelihood	Low collision rate

3.2. Saskatchewan

This is a recent academic study that develops a site selection method for hazardous material facilities based on transportation preferences.⁴ The study inverts the DG route selection process. However, it considers rail as well as road, to account for alternative modes that are available for accessing candidate sites. It looks at road and railway type, road surface conditions, length, geometry, load-bearing capacity, lateral and vertical clearances, distance from population centres, proximity to emergency response services and connectivity to multimodal terminals.

Applicability to Lloydminster (what this adds to the discussion):

- Pros: considers conditions that are relevant to Lloydminster's topography; adds load-bearing capacities and clearances
- Cons: not a DG route evaluation framework.

⁴ B. Mehran, M.A. Khan, M. Mehran, H. Roh and S. Sharma, *Case study scenarios in site selection of hazardous material facilities based on transportation preferences*, Journal of Modern Transportation, 8 June 2019.

3.3. New South Wales

This 2011 report is a guide for the selection of DG routes across the Australian State of New South Wales.⁵ It covers a range of factors, grouped in three categories: traffic and roads, environment and land use safety, and transport economics, as listed in Table 2.

Table 2. New South Wales – generalized factors and considerations

Generalized factor	Consideration
Traffic and roads	Road structure
	Volume and composition
	Travel time
	Level of service / traffic signals
	Alternative routes
Environmental and land use safety	Adjacent land use
	Population levels
	Sensitivity of ecosystems
	Accident and incident rates
	Potential hazards
	Risk level
	Drainage system
	Emergency access
	Driver training
	Vehicle safety design and maintenance
Transport economics	Distance
	Travel time
	Operating costs

The New South Wales guidance accounts for mandatory considerations in choosing DG routes, such as weight and height restrictions, inadequate shoulders for breakdowns, extensive construction activities and inadequate parking and turning spaces. However, it also notes the importance of accounting for subjectivity in the evaluation of potential routes - that is, using judgement but also accounting for community preferences and stakeholder assessments (e.g., the opinions of emergency services on response capabilities as opposed to set proximities to fire stations or response times).

⁵ *Route Selection, Hazardous Industry Planning Advisory Paper Number 11*, Department of Planning, State of New South Wales, Sydney, 2011.

Applicability to Lloydminster (what this adds to the discussion):

- Pros: considers road hierarchy and future land use; allows for a graduated consideration of ecosystems; adds explicit understanding of subjective considerations; considers driver training and vehicle safety design and maintenance among the options for reducing risks.
- Cons: detailing; may go beyond what is feasible (e.g., wrt non-infrastructure options).

4. Proposed approach

The Calgary approach could be described as the ideal approach, given its complexity and detailed staging. However, these attributes also make it difficult to apply to a network like Lloydminster's that is relatively small and sparse, and given the dominance of two major DG generators in and adjacent to Lloydminster. The detailed ranking is also difficult to bring forward to the public (especially the Bell curve concept).

For these reasons, a simpler approach could be more suitable to the current study. This approach retains the four steps used in the Calgary study, but replaces the Step 2 evaluation measures with those developed in Prince George, which would largely address the concerns noted in the previous paragraph.

The proposed approach is outlined as follows:

Step 1 determines feasibility (eligibility - i.e., go, evaluate or reject) according to the six factors used in Calgary:

- Route purpose – does it serve DG focal points (generators) and gateways to/from the City (i.e., Highways 16 and 17 but also should consider accesses to the Husky Upgrader).
- Part of truck route network – by definition, as described above.
- Available alternative routes – use “more favourable” routes, if available, either permanently or temporarily (e.g., in the event of an incident on the DG route).
- Network completion – i.e., continuity; avoid dead end routes (including accesses to the Husky Upgrader).
- Route length – minimize travel time for DG shippers and reduce costs (given the size of the network and its grid configuration, subject to stakeholder views this might be a relatively minor consideration).
- Coverage – ensure sufficient coverage of the focal points in order to reduce the need for DG shippers to travel off the DG network.

Step 2 (evaluation) uses the Prince George evaluation criteria and weighting framework as a basis. To the nine Prince George evaluation criteria we could add road capacity and rail-road interaction (avoidance of at-grade crossings) as two additional criteria. These are listed in red in Table 3, and are organized according to the weight and grouping to which these could apply best. The table also lists qualifiers to the characteristics that are more specific to Lloydminster, also shown in red. These additions and qualifications are drawn from the examples cited above.

Independent of the proposed additions and changes, it can be noted that the weights used in Prince George appear reasonable for use in Lloydminster. Nonetheless, these weights should be reviewed with the City and with stakeholders, although the 1-2-3 scale should be retained.

The proposed framework supports Step 3 (mitigation). The examples cited above point to potential ways to consider mitigating options that would enable a route to be included in the DG route network. The examples also suggest ways for future land uses and potential transportation improvements to be included in the evaluation.

The proposed framework also supports Step 4 (review), which could be conducted at a regular interval or as specific needs arise.

Table 3. Proposed Dangerous Goods Evaluation Criteria, Weights and Groups

Evaluation criterion	Weight	Grouping	Ideal characteristic
Access control	3	Consequences	All intersections have signals / few private accesses (might require flexibility to allow for the existence of different intersection control types, not only signals)
Population exposure	3	Consequences	Primarily undeveloped / heavy industrial (might have to express this in terms of land uses)
Public evacuation potential	3	Consequences	Affected people can evacuate quickly and efficiently (might have to express this in terms of proximity to hospitals, nursing homes and other specific land uses; also in terms of the availability of alternate roads or paths that people could use as escape routes)
Surrounding environment	3	Consequences	No sensitive natural areas along route
Road geometry	2	Likelihood	Wide, flat, straight route, horizontal and vertical clearances
Road capacity	2	Likelihood	Structural and pavement capacity, road surface condition, availability of shoulders; drainage?
Traffic efficiency	2	Likelihood	Infrequent delays [also accounts for traffic volume]
Public emergency response	2	Likelihood	Fire hall less than 2 kilometres away Proximity of fire hall (distance or time, as expressed by emergency services)
Accommodation of pedestrians and cyclists	1	Likelihood	Sidewalks and bike lanes provided
Collision history	1	Likelihood	Low collision rate
Rail-road interaction	1	Likelihood	Avoidance of at-grade crossings



Appendix B

Public Engagement Information

October 2019

**Re: Stakeholder Engagement Invitation
Dangerous Goods Route and Truck Route Establishment
Project No.: 1913624**

Dear Business Owner:

The City of Lloydminster has initiated a study to update and develop the Dangerous Goods Routes (DGR) and Truck Routes within the City of Lloydminster's municipal boundaries. The purpose of this study is to provide safe and efficient options for the travel and transportation within the area.

The project team has created some options for Dangerous Goods and Truck Routes within the City of Lloydminster's municipal boundaries based on information gathered from stakeholders and the public on October 17, 2019. We want to invite you to see the options and share your perspectives and feedback on the options.

Please join us at one-of-two stakeholder workshops on:

Date: **Tuesday, December 3, 2019**

Location: **Operations Centre: Training Room (6623 52 Street)**

Times:

- **1:00 PM**
- **2:30 PM**

Please RSVP at your earliest convenience by completing the online form at lloydminster.ca/DGRWorkshop, or by contact the City of Lloydminster's Community Engagement Coordinator (780-875-6184 Ext. 2322).

For those unable to attend there will be a public facing survey at yourvoicelloyd.ca/DGR from December 3 to 17, 2019 and an Open House on December 3, 2019 at Servus Sports Centre from 4:30 – 7:00 PM.

Sincerely,

City of Lloydminster, Community Engagement

PROJECT OVERVIEW

The City of Lloydminster is completing a study to update and develop the Dangerous Good Routes (DGR) and Truck Routes within municipal boundaries.

The purpose is to provide safe and efficient options for travel and transportation within the area.

TIMELINE

PHASE 1 - PRELIMINARY ENGAGEMENT (October)

- Introduce the study
- Facilitated stakeholder meetings
- Public pop-up event
- Online engagement

PHASE 2 - PRESENTING OPTIONS (November - December)

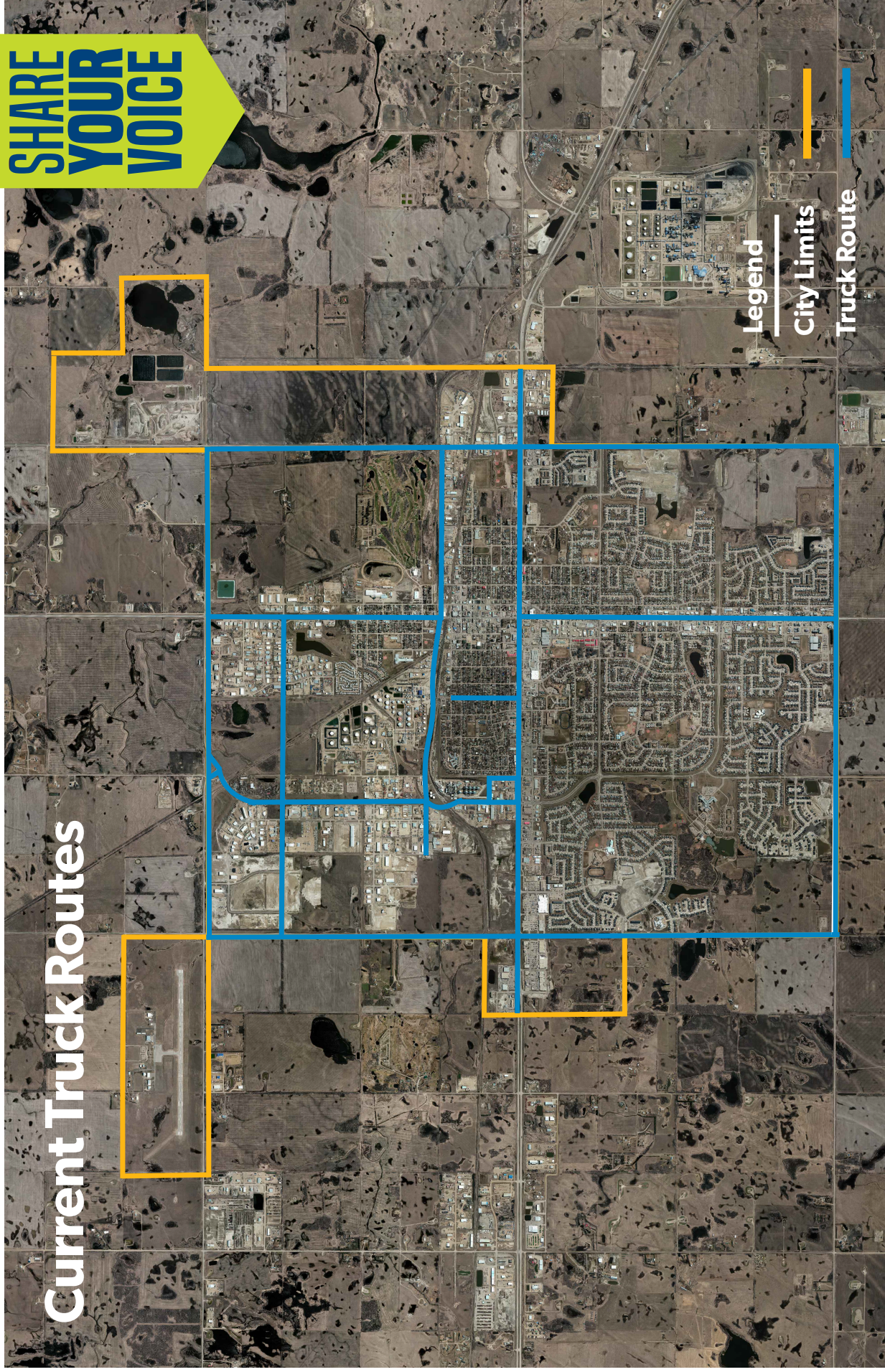
- Options developed for Dangerous Goods Routes and Truck Routes
- Share and gather feedback on the options from stakeholders
- Public pop-up event to gather feedback on the options

NEXT STEPS

- Council and Committee presentations and formal review

**SHARE
YOUR
VOICE**

Current Truck Routes



Current Dangerous Goods Routes

SHARE
YOUR
VOICE

Legend
City Limits
Dangerous
Goods Route

Where should these routes go?

SHARE
YOUR
VOICE

Legend

City Limits

PROJECT CONSIDERATIONS

SHARE
YOUR
VOICE

These are items that can be considered when choosing Dangerous Goods Routes and Truck Routes for the City of Lloydminster. Place a dot near the ones most important to you, or leave a comment:

Avoiding sensitive areas	Direct routes	Traffic Safety
Community impact	Land use next to dangerous goods routes and truck routes	Where trucks are going and where they are coming from
Congestion issues	Road classifications	All of these
Connections and connectivity	Route lengths	Other (please specify)



Dangerous Goods Route & Truck Routes

Engagement Summary

November 2019

ISL Engineering

INTRODUCTION

The City of Lloydminster has initiated a study to update and develop the Dangerous Goods Routes and Truck Routes within the municipal boundaries. The purpose of this study is to provide safe and efficient options for travel and transportation within the City.

The City of Lloydminster currently has both Truck Routes and Dangerous Goods Routes. Revising the plans for Dangerous Goods Routes and Truck Routes will lessen risks involved with the transportation of dangerous goods and hazardous materials within the municipal boundaries. These plans must take into consideration industry and agricultural needs, economic impacts, and the existing highways bisecting the City.

The City of Lloydminster wants to establish Dangerous Goods Routes and Truck Routes within the municipal boundaries that meet the needs of industry while maintaining a safe road network. The development of new Dangerous Goods Routes and Truck Routes will include studying the current conditions, reviewing existing Transportation Master Plans and reviewing the Traffic Bylaw. In order to develop comprehensive Dangerous Goods Routes and Truck Routes, stakeholder and public engagement is required.

In Phase 1 of engagement (October 2019), the focus was hearing from stakeholders and the public to understand how the current truck network is working, any challenges or concerns and their preferences for future routes within the municipal boundaries. Engagement opportunities in this phase of engagement include stakeholder meetings, a Your Voice event and an online survey.

ENGAGEMENT PURPOSE

The overall goal for engagement in this phase was to:

- Provide opportunities for invited stakeholders and members of the public to provide feedback on the current Dangerous Good Routes and Truck Routes within the municipal boundary

The feedback gathered from the stakeholder meeting, public open house and online engagement will inform the options created by the project team

Table 1: Level of Engagement

	CONSULT	INVOLVE
Purpose	To educate and collect public/ stakeholder opinion to improve decisions	To stimulate public/ stakeholder debate, clarify values & broaden the information base to improve decisions.
Promise	We will listen, acknowledge and report concerns and aspirations about presented alternatives, and explain to the decision-maker how the public input influenced the recommendation.	We will work with the public/ stakeholders to ensure comments are directly reflected in the alternatives developed, report the comments received and explain how the input contributed to recommendation(s).

COMMUNICATIONS FOR PHASE 1

Below are the channels the stakeholder meetings and public open house were advertised on:

- Social Media (Facebook, Twitter, LinkedIn)
- Website (youvoicelloyd.ca/DGR and lloydminster.ca)
- Newsletters (Team News- City of Lloydminster)
- Invitations (76 invitations to local businesses)
- Newspaper (Meridian Source)
- Media Release (The Goat, Prime Time News, Meridian Source)

Table 2: Engagement Summary

EVENT/ACTIVITY	DATE AND TIME	LOCATION	PARTICIPANTS
Stakeholder Meetings	October 17, 2019	City of Lloydminster Operations Building	8
Public Pop-up Event	October 17, 2019 5:00 p.m. to 8:00 p.m.	Servus Sport Centre	25
Online Engagement	October 10-22	Your Voice, City of Lloydminster website	49

ENGAGEMENT PROCESS AND WHAT WE ASKED

Stakeholder Meeting

Several key stakeholders were identified and invited to attend one of four, 30-minute stakeholder meetings on October 17, 2019. Two maps were on display for stakeholders to use in discussions; one with the current truck routes the other with current Dangerous Goods Routes. Stakeholders were asked to share their experiences, concerns and feedback about the current routes. They were given a chance to ask the project team questions about the study and any other concerns regarding truck routes, Dangerous Goods Routes and permits.

Public Pop-up Open House

A public Your Voice event was held on October 17, 2019 at the Servus Sport Centre from 5:00 p.m. to 8:00 p.m. Stakeholders and members of the public were able to ask questions and share their thoughts on the current Dangerous Goods Routes and Truck Routes. Project team members were available to discuss the project and answer questions related to Dangerous Goods and Truck Routes within the municipal boundary.

Online Survey

An online survey was available on the City of Lloydminster's website from October 10, 2019 to October 24, 2019. A brief overview introduced the project and the survey. Participants were asked which roads they would like to see included in the draft Dangerous Goods Routes and Truck Routes, which roads they would like to see excluded from the draft Dangerous Goods Routes and Truck Routes and for any additional feedback.

STAKEHOLDER AND PUBLIC FEEDBACK SUMMARY

Stakeholder Feedback Summary

The following summary includes feedback and concerns regarding existing or future Dangerous Goods Routes and Truck Routes in the municipal boundary for the City of Lloydminster:

- Most of the dangerous goods and truck traffic is local and concentrated in the northwest corner of the City
- Public safety and minimizing risk are important factors to consider
- Avoiding trucks and dangerous goods from travelling through downtown on Highway 17
- Current truck routes serve industry well, dangerous goods could be added to those routes
- The City has a long history with trucks and moving dangerous goods, there is a truck culture and trucks can often be found in residential areas
- Many stakeholders recognize and are concerned that current routes are not enforced
- Concern about permits, how they could be processed and if there is a cost, what could that mean to businesses
- Preferred routes include:
 - 40 Avenue, 75 Avenue, 62 Avenue
 - 12 Street, 17 Street, 44 Street, 52 Street, 62 Street, 67 Street
- Suggestions to have a designated route going in and around the industrial area, as direct as possible, and limit trucks to these roads
- Many industries in the northwest area of the City have multiple truck per day going to and from their facilities, many of the truck are hauling dangerous goods or have dangerous goods residue
- Truck parking within or near residential areas is a concern
- With limited truck route signage and no dangerous goods route signage, drivers and industry feel like it is a “free-for-all” because there are no clear rules
- Routes should be efficient and as direct as possible

Public and Online Feedback Summary

The following summary includes feedback from the in-person event and the online engagement. Participants were asked questions about current routes, which routes should be excluded, and which routes should be considered. The prevailing themes include:

- Several participants would prefer dangerous goods and truck traffic to stay out of the City, many referencing a ring road or by-pass and just wanting all truck to go around the City
- There are a number of concerns around public safety and truck traffic on current routes in or near residential areas and the city centre
- There are concerns with a limited number of routes in case there is a need to close a route due to weather or an emergency, it leaves limited options for dangerous goods and truck traffic
- Avoiding trucks and dangerous goods from travelling through downtown on Highway 17, roads are narrow and there are lots of pedestrians in the area
- There are many suggestions to build 75 Avenue into a four-lane road to handle more truck traffic
- Many participants suggested that any future considerations should avoid residential areas whenever possible
- Concerns about the uncontrolled rail crossings along 52 Street and the risk of an incident at these locations
- Participants suggested longer turning lanes for trucks turning north off Highway 16 into the industrial area
- Several participants want routes to avoid College Drive, Bud Miller Park, 59 Avenue and 25 Street
- Trucks are perceived as not obeying traffic signals, for example running yellow or red lights on Highway 16, which is a concern for traffic and pedestrian safety
- Turning lanes and corners, specifically at 12 Street and 75 Avenue, are not sufficient for trucks with trailers (or multiple trailers) and need to be upgraded if considered in the new routes
- Many are concerned about damage to roads with heavy loads
- Many participants are concerned about dangerous goods travelling along 12 Street and 25 Street, as they are next to a residential area

Key themes

- Dangerous goods and truck routes should avoid the city centre
- Public safety and keeping dangerous goods away from residential areas, schools, recreation and the city centre were important to many participants
- Continuing 52 Street west to 75 Avenue would create a direct route for dangerous goods and trucks into the industrial area
- Avoid Highway 16 and Highway 17, they are heavily congested and should be avoided for safety reasons

- Popular suggestions for dangerous goods and truck routes include:
 - 75 Avenue, 62 Avenue, 40 Avenue
 - 67 Street, 62 Street, 52 Street, 25 Street and 12 Street
- Popular suggestions to avoid for dangerous goods and truck routes include:
 - Highway 16 and Highway 17
 - 25 Street, College Drive and 12 Street
- Many participants want to see a by-pass around the City for trucks that are passing through

NEXT STEPS

The next steps for the Dangerous Goods Routes and Truck Routes project will include another Stakeholder Engagement Meeting and Public Open House on December 3, 2019. The project team will present options for the Dangerous Goods Routes and Truck Routes and gather feedback on the options.

November 2019

Business Name
Business Address

**Re: Stakeholder Engagement Invitation
Dangerous Goods Route and Truck Route Establishment
Project No.: 1913624**

Dear Business Owner:

The City of Lloydminster has initiated a study to update and develop the Dangerous Good Routes (DGR) and Truck Routes within the City of Lloydminster. The purpose of this study is to provide safe and efficient options for the movement of goods and people through the City of Lloydminster and the region.

In 2015, the Transportation Master Plan identified a need to update the Dangerous Good Routes and Truck Routes for the City of Lloydminster. The current DGR consists of 44 Street and 50 Avenue (Highway 16 and Highway 17).

As a key stakeholder, we want to understand how you currently move through the City of Lloydminster and identify your needs and perspectives for this project. Your input will be shared with the technical team for their consideration as they develop options for the proposed City of Lloydminster's Dangerous Goods Routes and Truck Routes.

We would like to invite you to a drop-in session on October 01, 2019, at the Servus Sports Centre anytime between 5:00 and 8:00 p.m.

For those unable to attend there will be a public facing survey at yourvoicelloyd.ca/DGR from October 2 to 16, 2019.

**Sincerely,
City of Lloydminster and ISL Engineering and Land Services Ltd.**

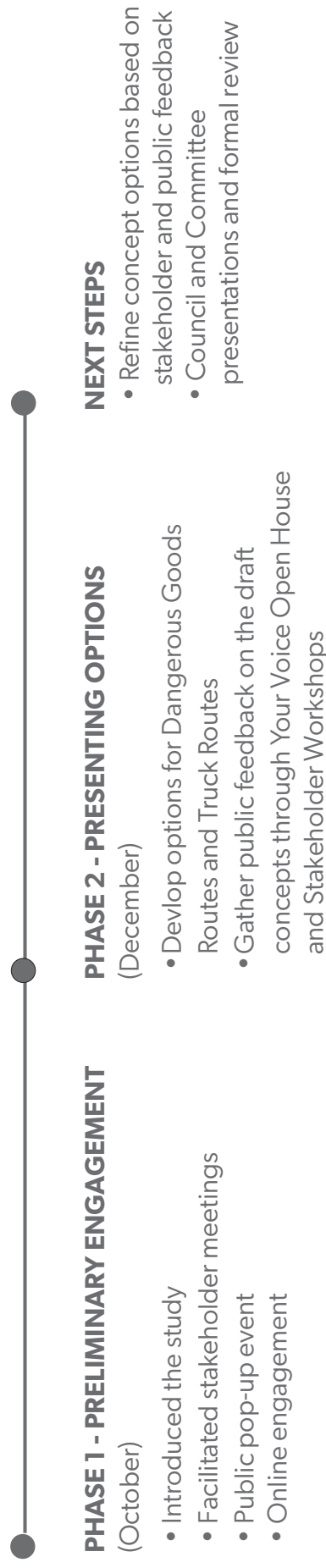
PROJECT OVERVIEW

The City of Lloydminster is completing a study to update and develop the Dangerous Good Routes (DGR) and Truck Routes within municipal boundaries.

The purpose is to provide safe and efficient options for travel and transportation within the area.

Phase 1 was completed in October and included stakeholder meetings, a Your Voice event and an online survey.

TIMELINE



WHAT WE HEARD

On October 17, 2019, we hosted stakeholder meetings and a Your Voice event to gather feedback on the current truck network, challenges, concerns and preferences for future routes within the municipal boundaries.

KEY THEMES WE HEARD

Dangerous goods routes and truck routes should avoid:

- City centre
- Recreation facilities and areas
- Schools
- Residential areas

Popular suggestions for dangerous goods and truck routes include:

- 75 Avenue, 62 Avenue and 40 Avenue
- 67 Street, 62 Street, 52 Street, 25 Street and 12 Street

Many participants were in favour of a by-pass around the city for trucks

Continuing 52 Street west to 75 Avenue would create a direct route for dangerous goods and trucks into the industrial area

Avoid Highway 16 and Highway 17, they are heavily congested and should be avoided for safety reasons

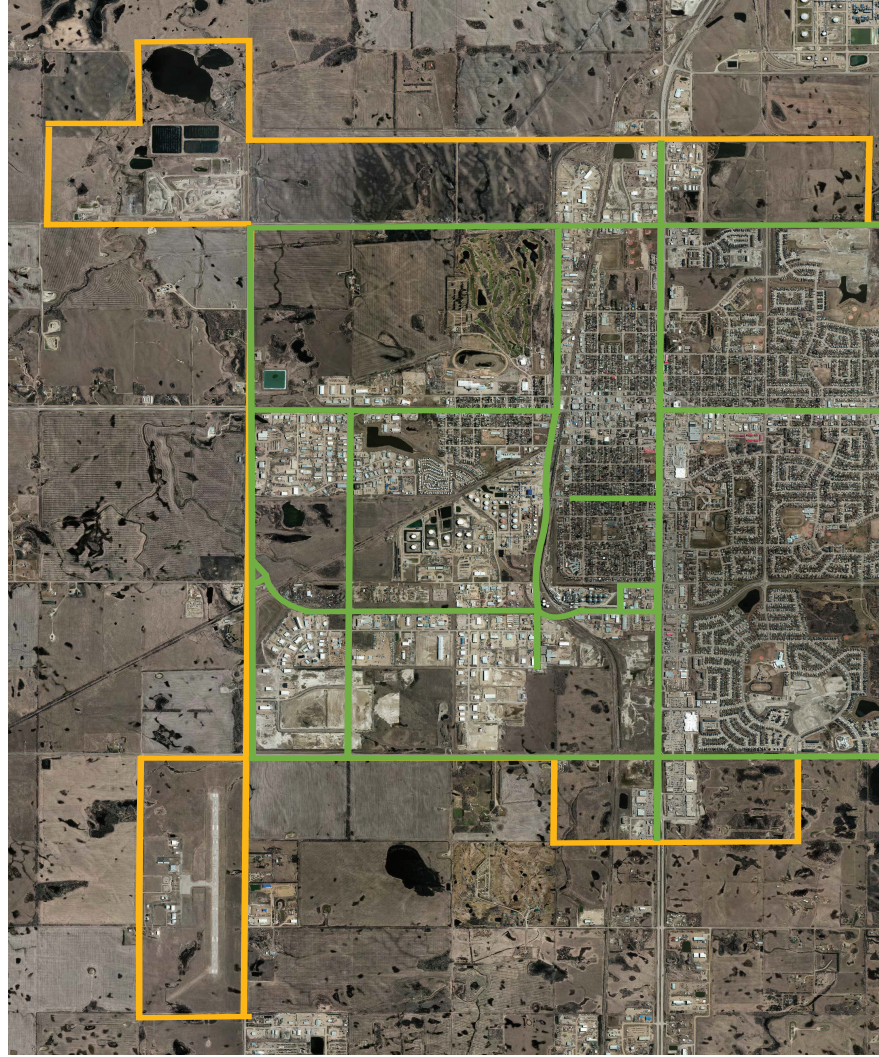
A number of participants were in favour of the established routes avoiding:

- Highway 16
- Highway 17
- 25 Street
- College Drive (ring road)
- 12 Street

SHARE
YOUR
VOICE

TRUCK ROUTES - NORTH

Existing Routes as per Traffic By-law

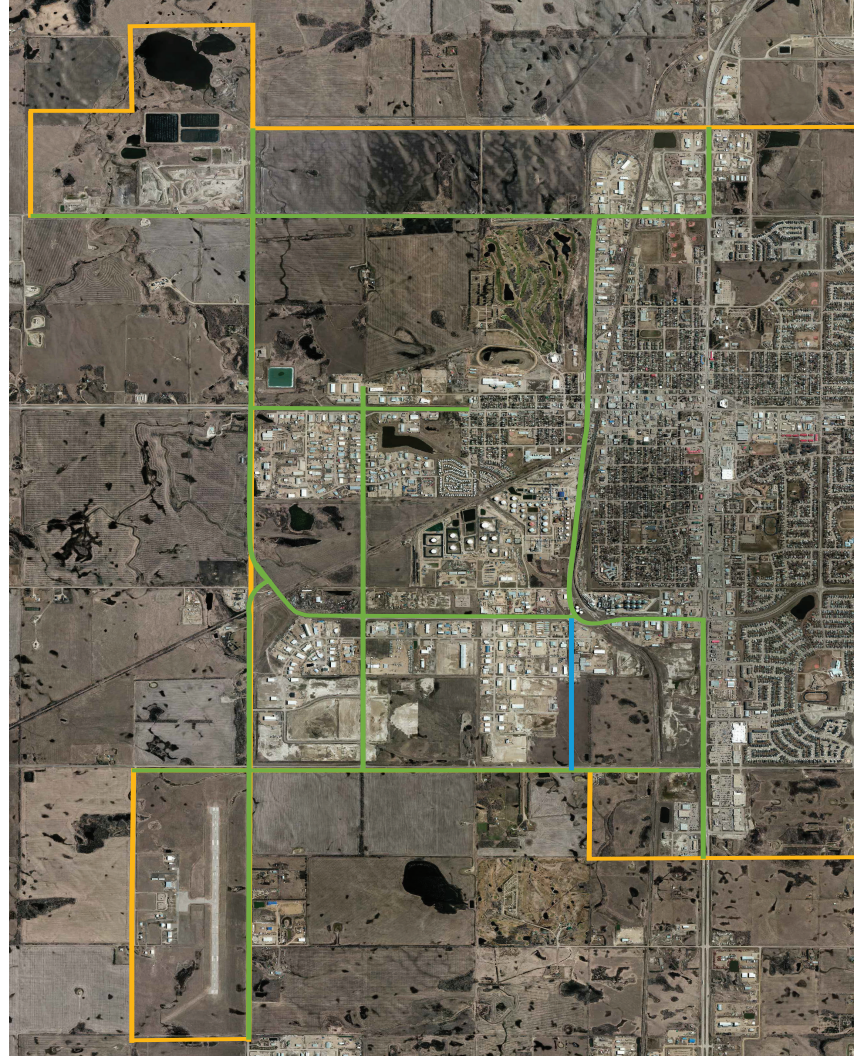


- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

In the space below, please provide your feedback for the option presented.

TRUCK ROUTES - NORTH

Option 1 - Industrial Arterials Only
This option focuses on the main arterial roads only



- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

In the space below, please provide your feedback for the option presented.

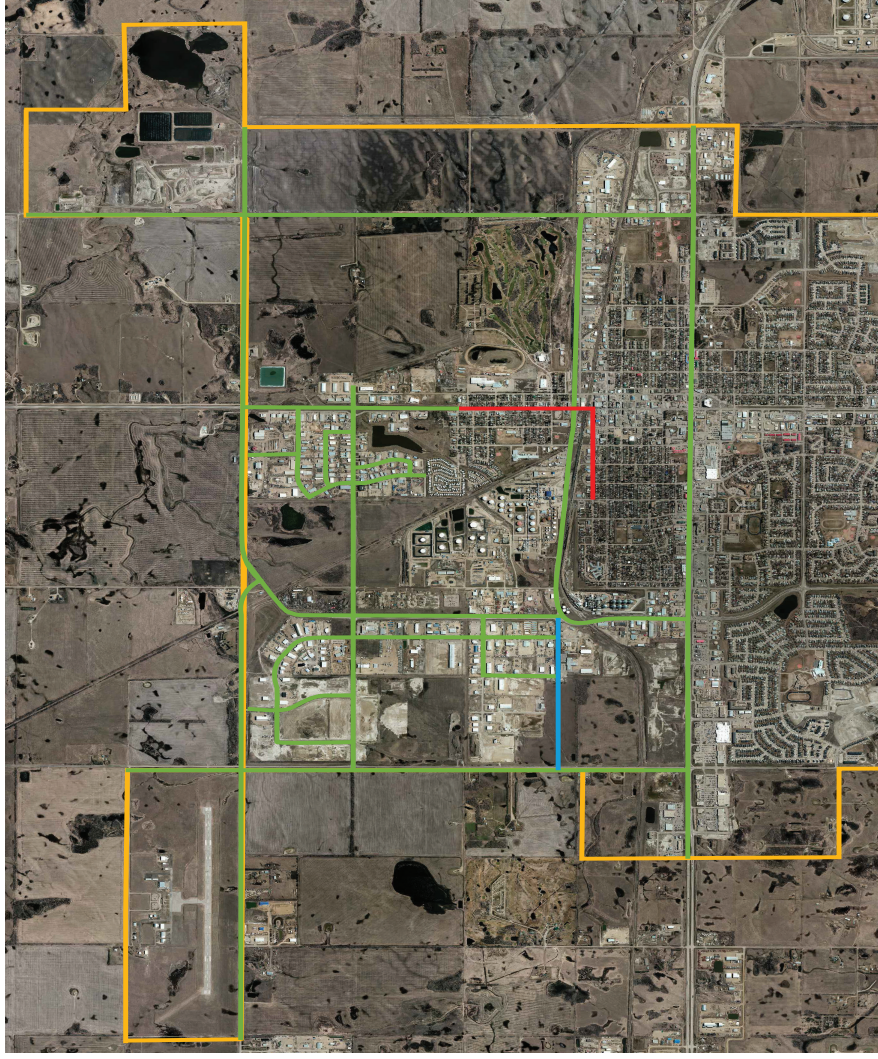
SHARE
YOUR
VOICE

SHARE YOUR VOICE

TRUCK ROUTES - NORTH

Option 2 - Arterials and Industrial Roads

This option builds on existing truck routes and includes more industrial roads.



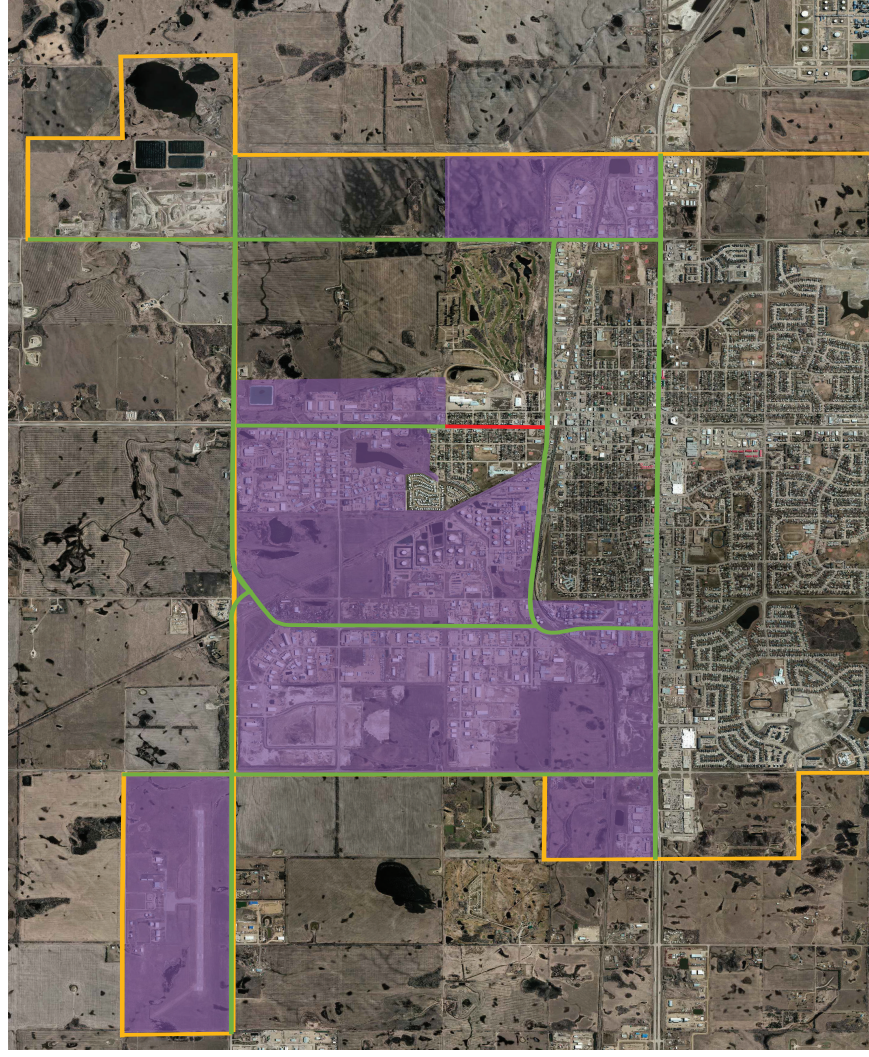
In the space below, please provide your feedback for the option presented.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits
- Industrial Areas

TRUCK ROUTES - NORTH

Option 3 - Arterials and Industrial Areas

This option combines option 1 and 2 to create industrial areas.

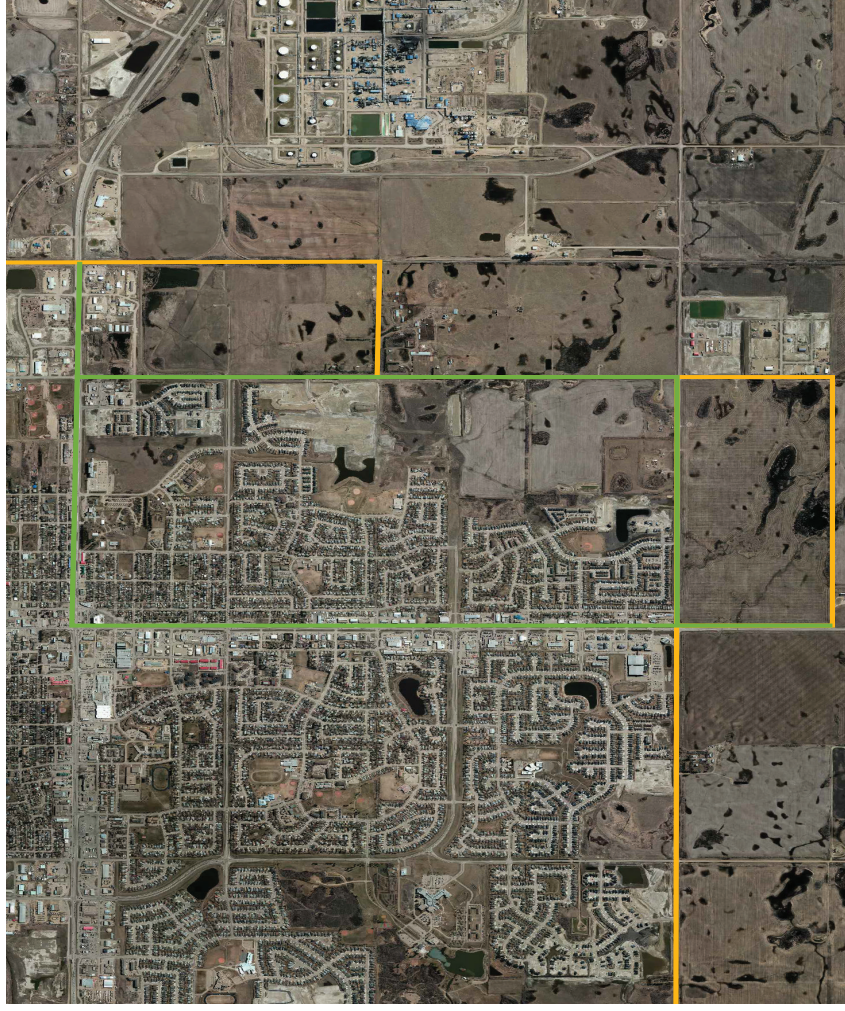


In the space below, please provide your feedback for the option presented.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits
- Industrial Areas

TRUCK ROUTES - SOUTHEAST

Existing Routes as per Traffic By-law



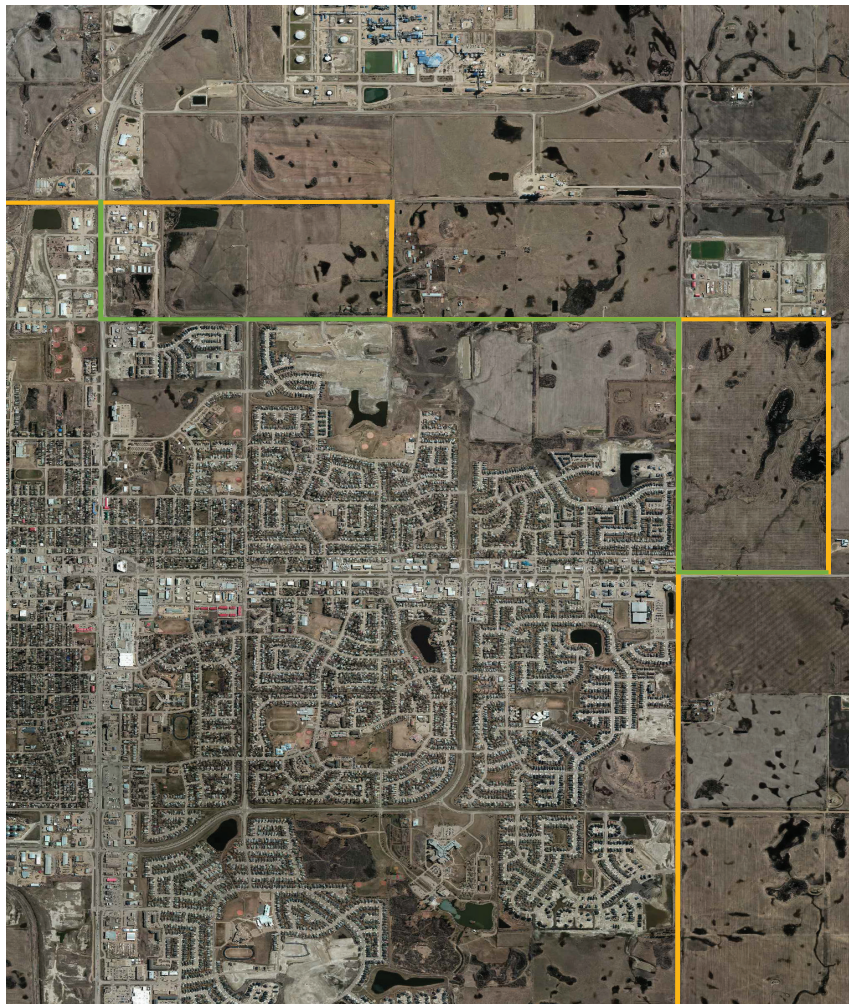
- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

SHARE
YOUR
VOICE

In the space below, please provide your feedback for the option presented.

TRUCK ROUTES - SOUTHEAST

Option 1 - Perimeter Arterials
This option only uses the roads on the perimeter of the city.



In the space below, please provide your feedback for the option presented.

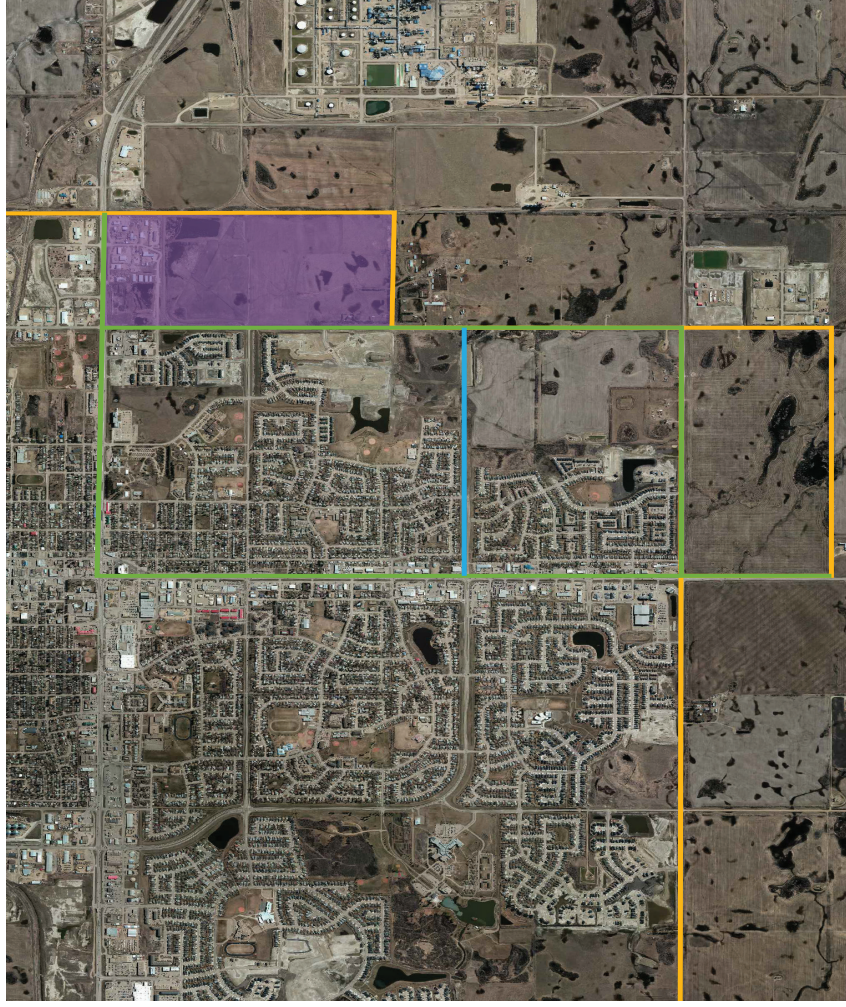
SHARE
YOUR
VOICE

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

TRUCK ROUTES - SOUTHEAST

Option 2 - Arterials and Industrial Area

This option keeps the existing truck routes and adds 25 Street as a future truck route.



In the space below, please provide your feedback for the option presented.

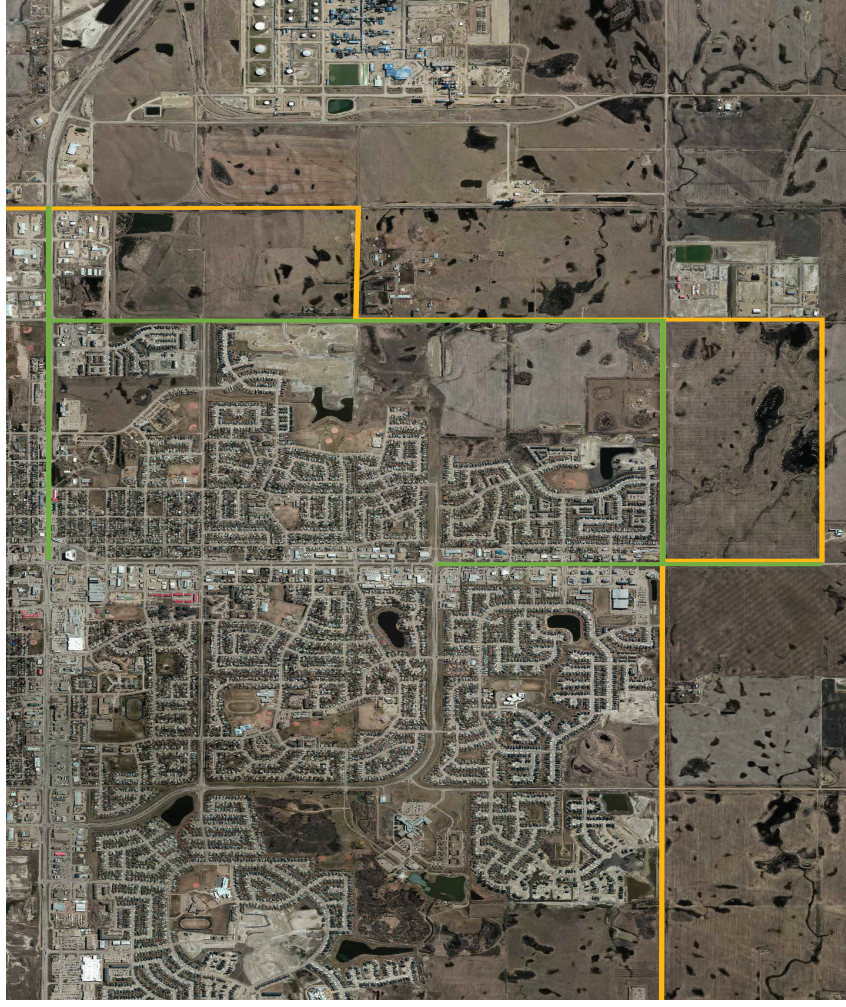
- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits
- Industrial Areas

SHARE YOUR VOICE

TRUCK ROUTES - SOUTHEAST

Option 3 - Perimeter and part of Highway 17

This is the same as option 1 and adds part of 50 Avenue from 12 Street and 25 Street and 44 Street from 40 Avenue to 50 Avenue

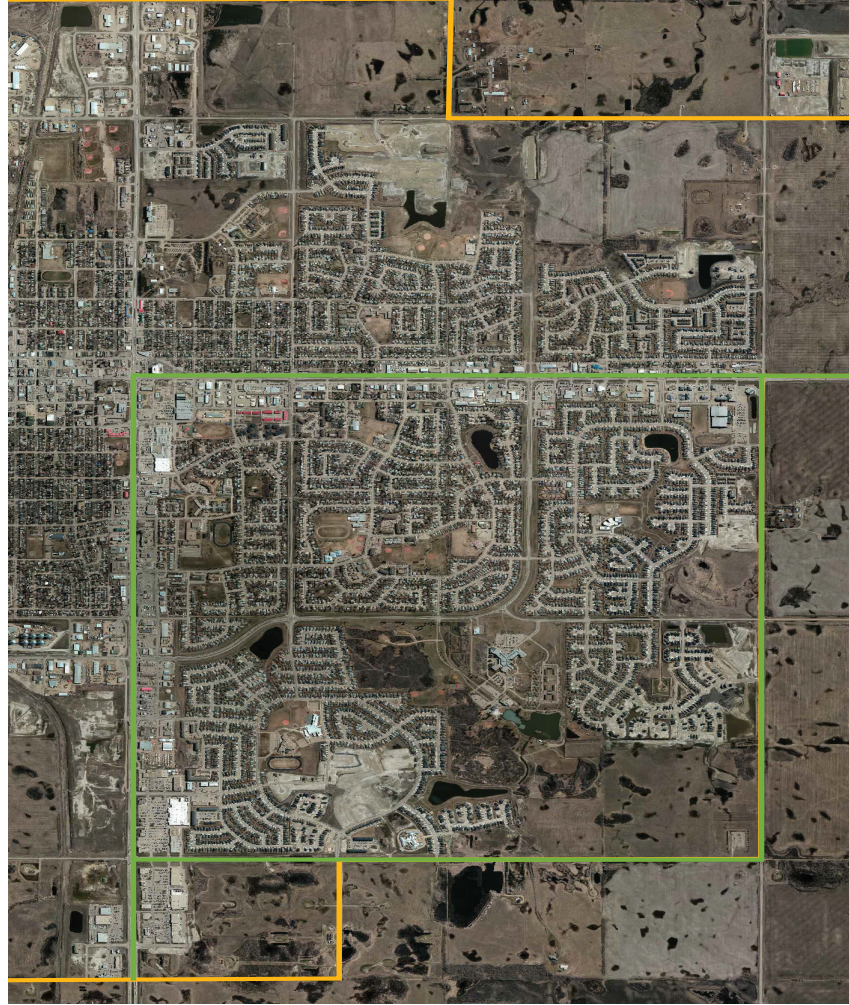


In the space below, please provide your feedback for the option presented.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits
- Industrial Areas

TRUCK ROUTES - SOUTHWEST

Existing Routes as per Traffic By-law



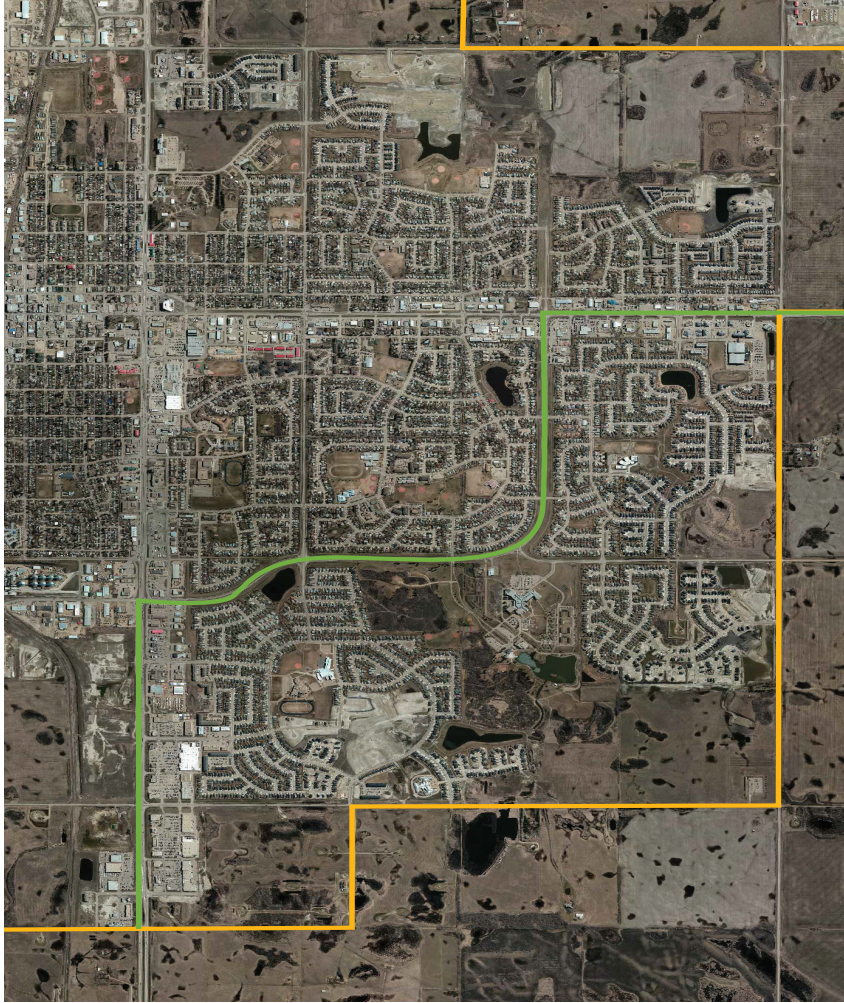
In the space below, please provide your feedback for the option presented.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

TRUCK ROUTES - SOUTHWEST

Option 1 - Central Arterials

This option focuses routes in the centre of the southwest quadrant.



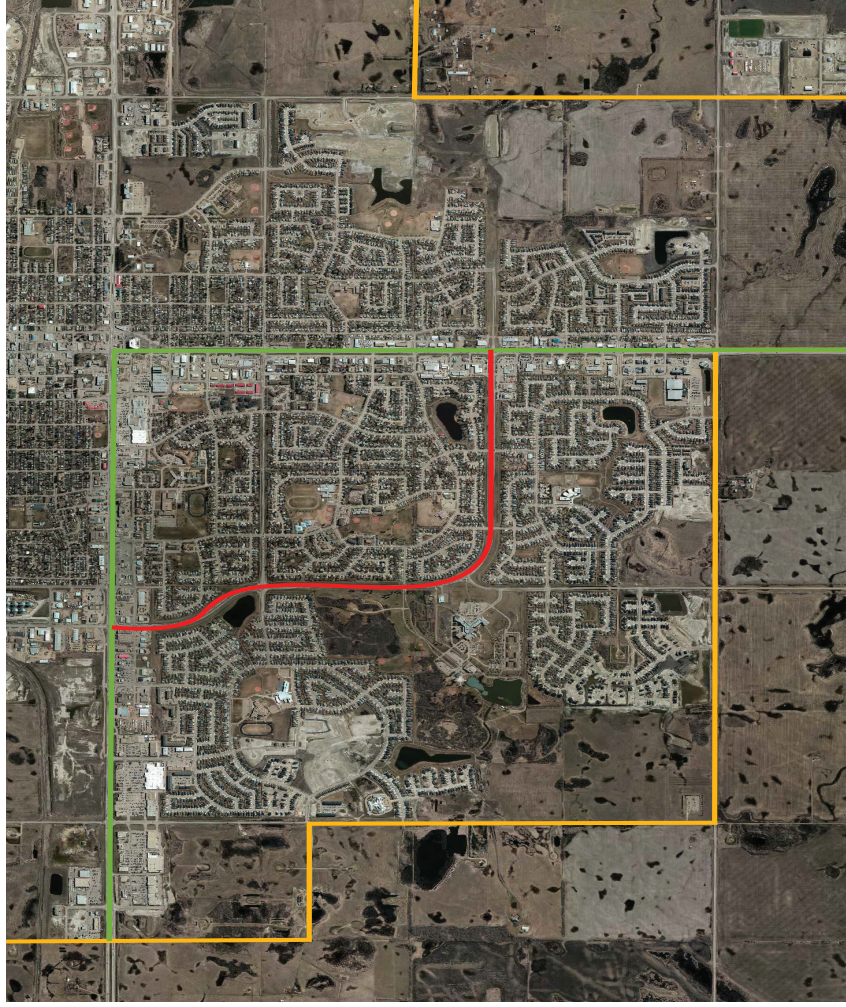
- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

In the space below, please provide your feedback for the option presented.

TRUCK ROUTES - SOUTHWEST

Option 2 - Northeast Arterials

This option keeps some existing truck routes and adds College Drive (25 Street and 62 Avenue) as a restricted truck route.



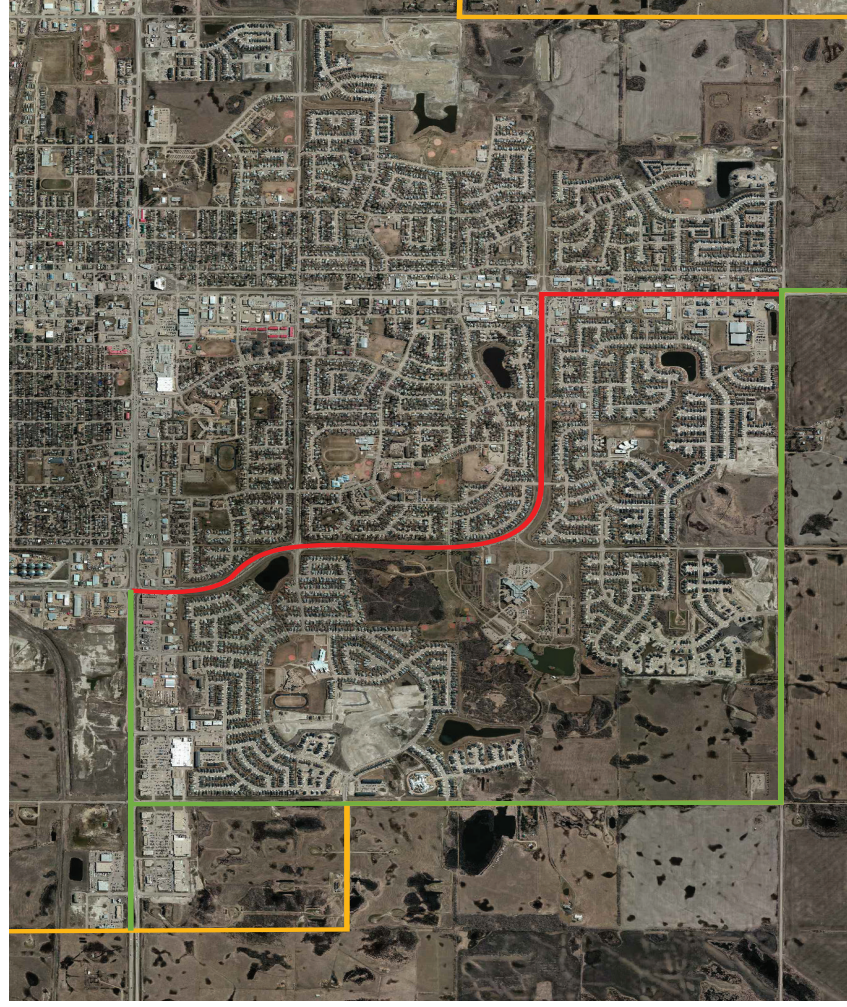
In the space below, please provide your feedback for the option presented.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

TRUCK ROUTES - SOUTHWEST

Option 3 - Southwest Arterials

This option keeps some existing truck routes and adds College Drive (25 Street routes and 62 Avenue) as a restricted truck route.



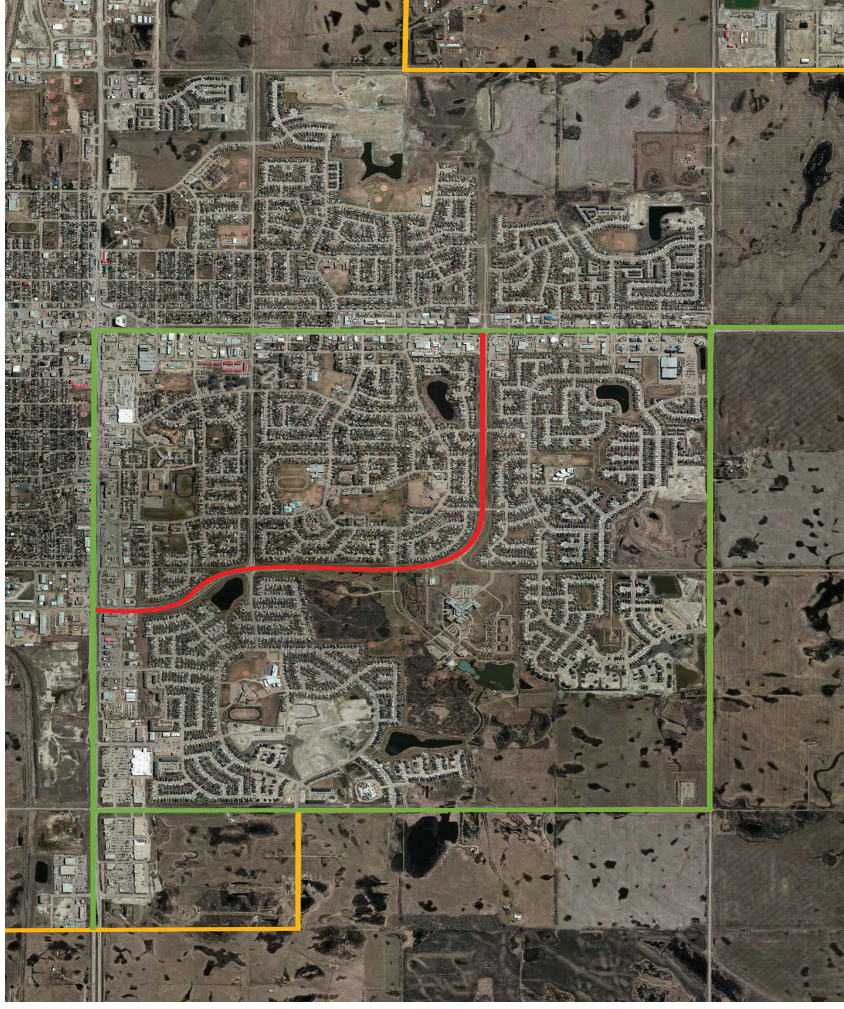
- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

In the space below, please provide your feedback for the option presented.

TRUCK ROUTES - SOUTHWEST

Option 4 - All Arterials

This option uses all the arterials in the southwest quadrant with College Drive (25 Street and 62 Avenue) added as a restricted truck route.

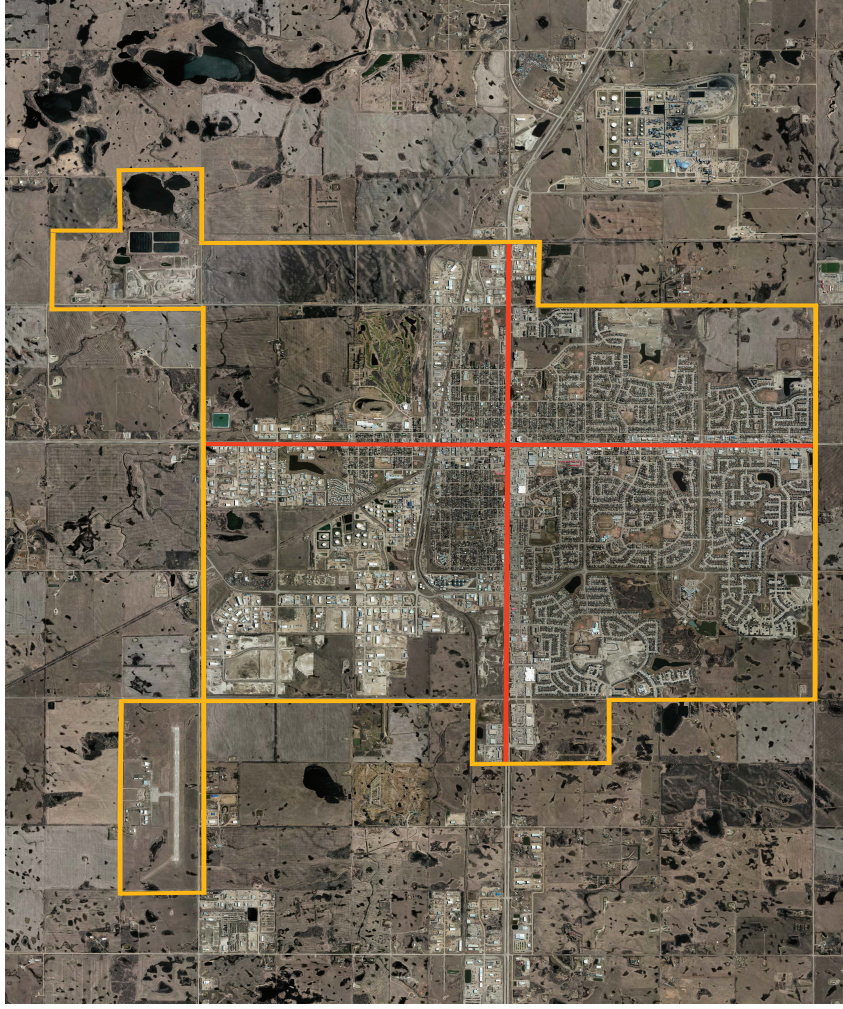


In the space below, please provide your feedback for the option presented.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

DANGEROUS GOODS ROUTES

Existing Routes as per Traffic By-law



**SHARE
YOUR
VOICE**

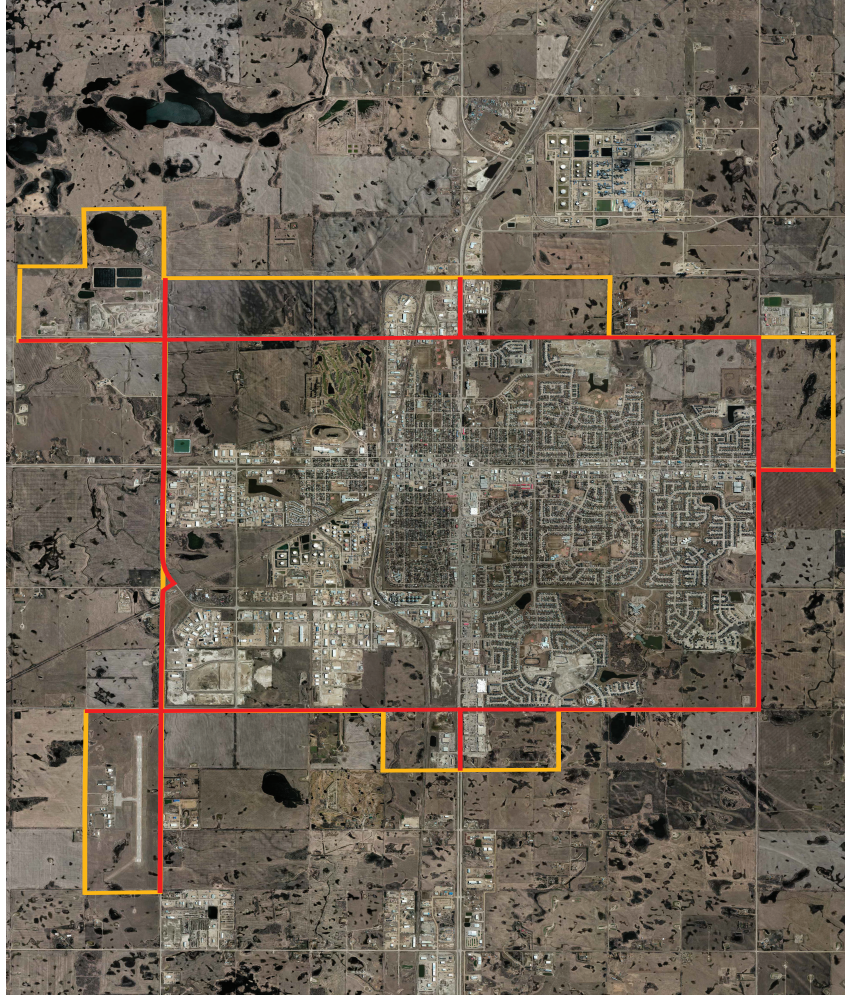
In the space below, please provide your feedback for the option presented.

 Dangerous Goods Route
 City Limits

DANGEROUS GOODS ROUTES

Option 1- Perimeter Routes

This option uses the outer roads as dangerous goods routes.

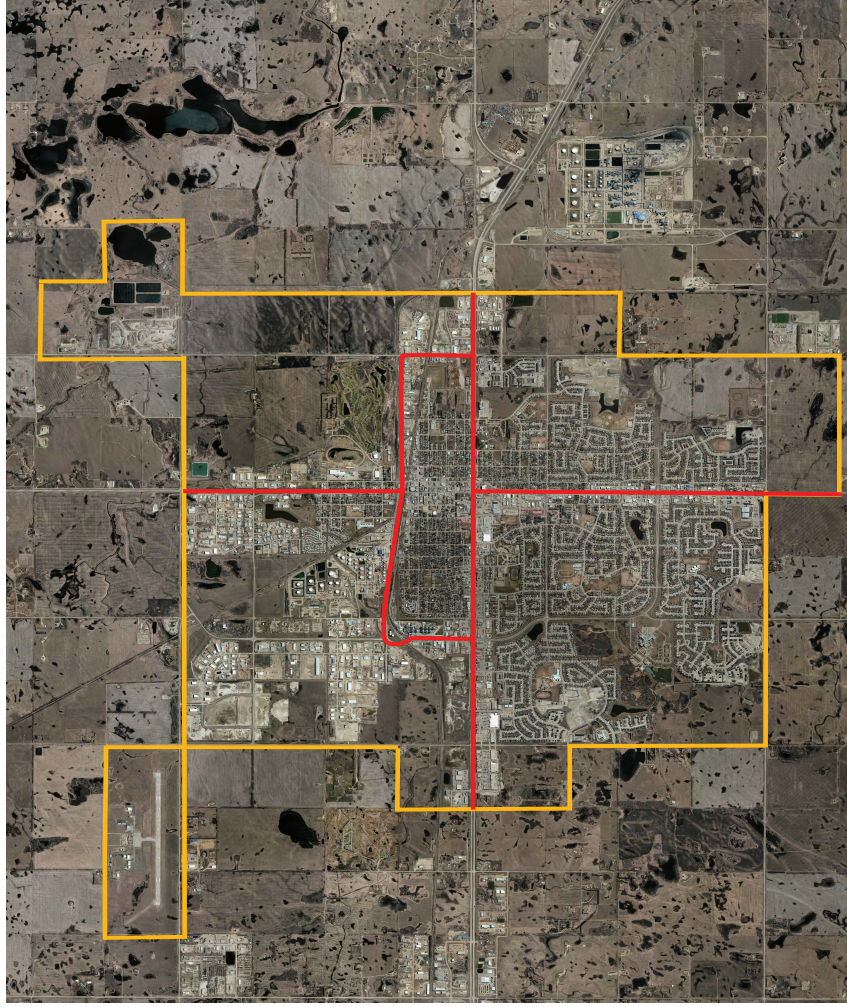


In the space below, please provide your feedback for the option presented.

DANGEROUS GOODS ROUTES

Option 2 - Interior Routes

This option only has roadways within the city designated as dangerous goods routes.



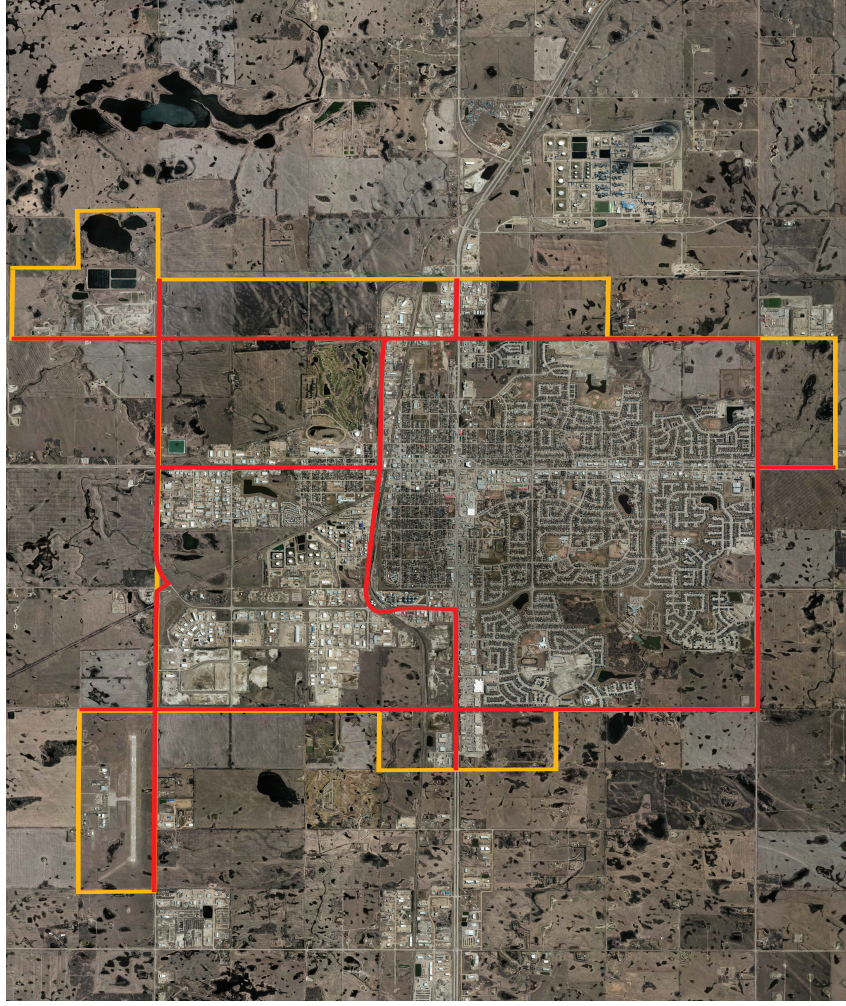
 Dangerous Goods Route
 City Limits

In the space below, please provide your feedback for the option presented.

DANGEROUS GOODS ROUTES

Option 3 - North Interior Routes

This option uses the perimeter and roadways in the north half of the city

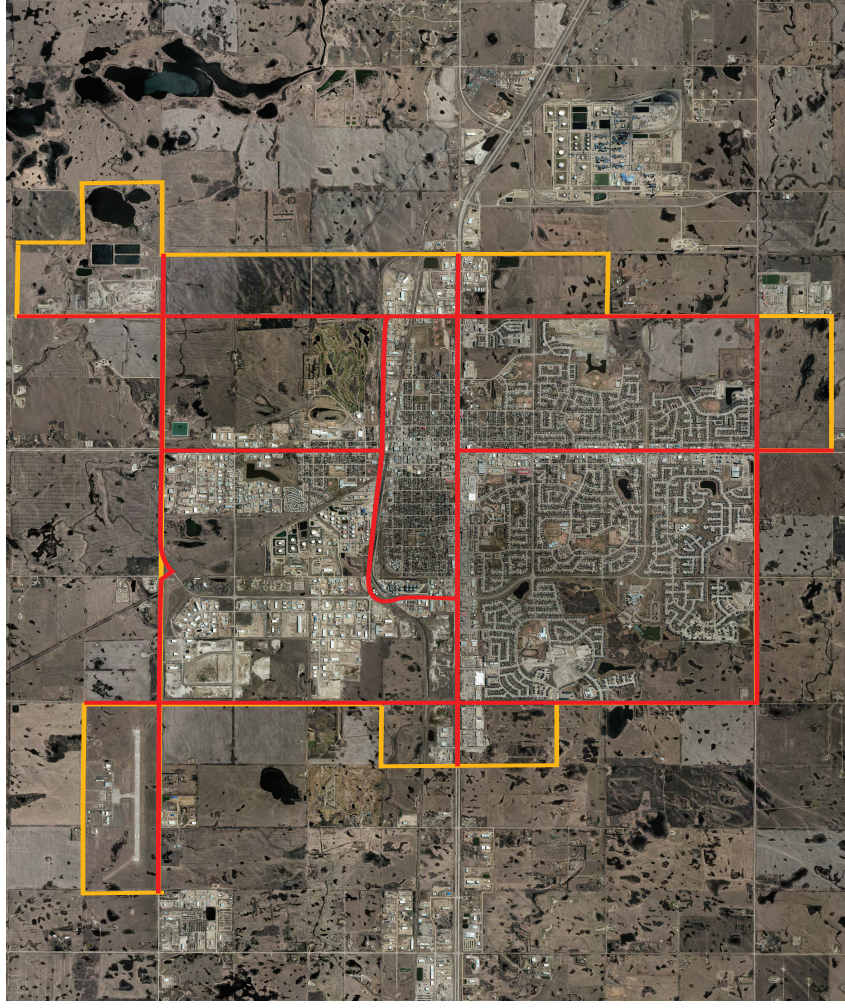


Dangerous Goods Route
City Limits

In the space below, please provide your feedback for the option presented.

DANGEROUS GOODS ROUTES

Option 4 - All Interior and Perimeter Routes
This option combines option 1 and 2.



In the space below, please provide your feedback for the option presented.

EVALUATION FACTORS

SHARE
YOUR
VOICE

These are the factors the City of Lloydminster will consider when designating truck routes and dangerous goods routes.

TRUCK ROUTES

Network Functionality	- Route Purpose - Network Connections - Reduces Trip Length - Reduces Off-Route Trips
Route Performance	- Roadway Classification - local, collector, arterial roads - Roadway Geometrics - lane width, available shoulders, intersections - Surface Conditions and Structural Capacity - At-grade Rail Crossings - Land Use Compatibility - Supports Future Development

DANGEROUS GOODS ROUTES

Route Functionality	- Route Purpose - Network Connections - Route Compatibility - Reduces Trip Length - Reduces Off-route Trips
Safety Assessment	- Roadway Geometrics - lane width, available shoulders, intersections - At-grade Rail Crossings - Access Control (signals) - Traffic Efficiency - Collisions - Environmental Impact - Population Exposure/Land Use - Population Responsiveness/Evacuation Potential - Emergency Response

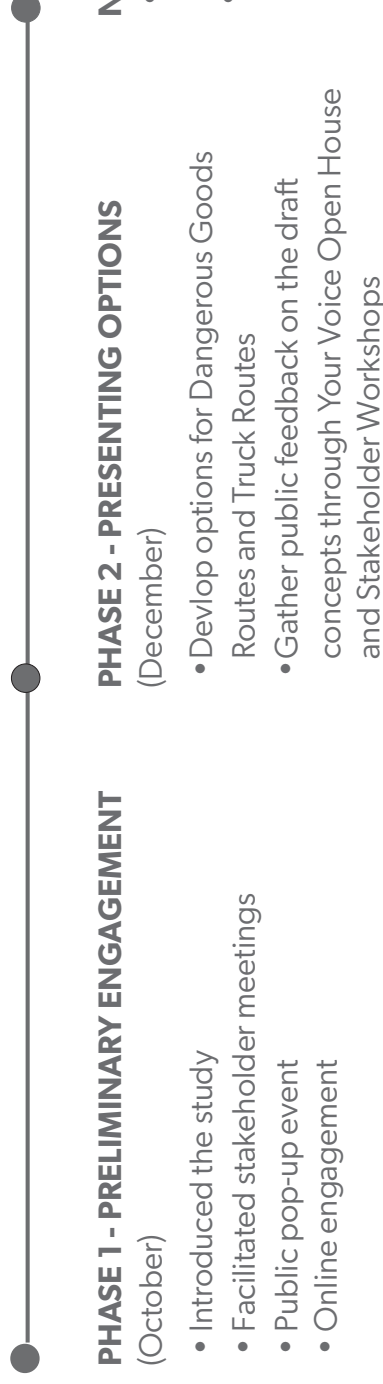
PROJECT OVERVIEW

The City of Lloydminster is completing a study to update and develop the Dangerous Good Routes (DGR) and Truck Routes within municipal boundaries.

The purpose is to provide safe and efficient options for travel and transportation within the area.

Phase 1 was completed in October and included stakeholder meetings, a Your Voice event and an online survey.

TIMELINE



WHY DO WE NEED THESE ROUTES?

The City of Lloydminster is impacted by the movement of goods and dangerous goods. These goods not only pass through the city, but are often delivered to, or generated from sites within City limits and serves as an important aspect of economic activities.

Trucking and deliveries are an essential element to almost all business operations. These businesses range in type of industry and in services. These businesses may include:

- Gas stations
- Grocery stores
- Pools
- Hospitals
- Car dealerships
- Restaurants

WHAT ARE DANGEROUS GOODS?

Dangerous goods are products which host a specific risk or safety concern. Dangerous goods may be gases, liquids or solids which could be explosive, flammable, combustible, oxidizing, poisonous, nuclear or corrosive.

When transporting, these materials must be properly identified with a placard on the shipping container or truck.

WHAT ARE TRUCK ROUTES AND DANGEROUS GOODS ROUTES?

A truck route is designated by the City of Lloydminster for vehicles over 7,500 kilograms in maximum gross weight or longer than 11 metres.

Did you know that dangerous goods routes must be a part of the designated truck routes, but not all truck routes are considered dangerous goods routes?

WHAT WE HEARD

On October 17, 2019, we hosted stakeholder meetings and a Your Voice event to gather feedback on the current truck network, challenges, concerns and preferences for future routes within the municipal boundaries.

KEY THEMES WE HEARD

Dangerous goods routes and truck routes should avoid:

- City centre
- Recreation facilities and areas
- Schools
- Residential areas

Popular suggestions for dangerous goods and truck routes include:

- 75 Avenue, 62 Avenue and 40 Avenue
- 67 Street, 62 Street, 52 Street, 25 Street and 12 Street

Many participants were in favour of a by-pass around the city for trucks

Continuing 52 Street west to 75 Avenue would create a direct route for dangerous goods and trucks into the industrial area

Avoid Highway 16 and Highway 17, they are heavily congested and should be avoided for safety reasons

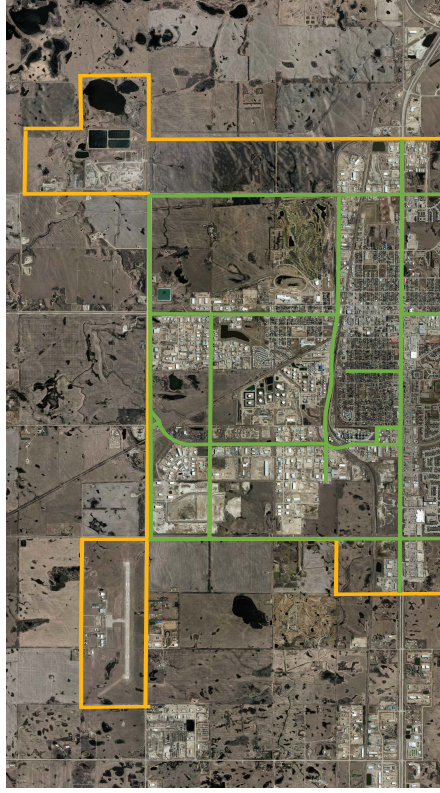
A number of participants were in favour of the established routes avoiding:

- Highway 16
- Highway 17
- 25 Street
- College Drive (ring road)
- 12 Street

**SHARE
YOUR
VOICE**

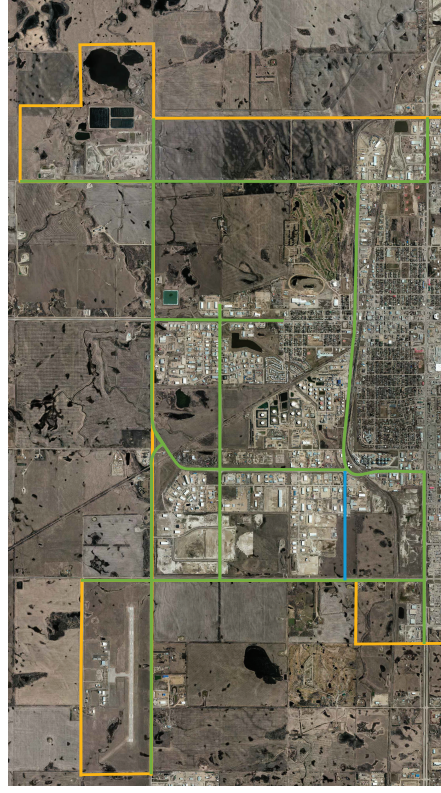
TRUCK ROUTES - NORTH

Existing Routes as per Traffic By-law



Option 1 - Industrial Arterials Only

This option focuses on the main arterial roads only



In the space below, use the sticky notes provided to describe your level of support for any or all of the options.

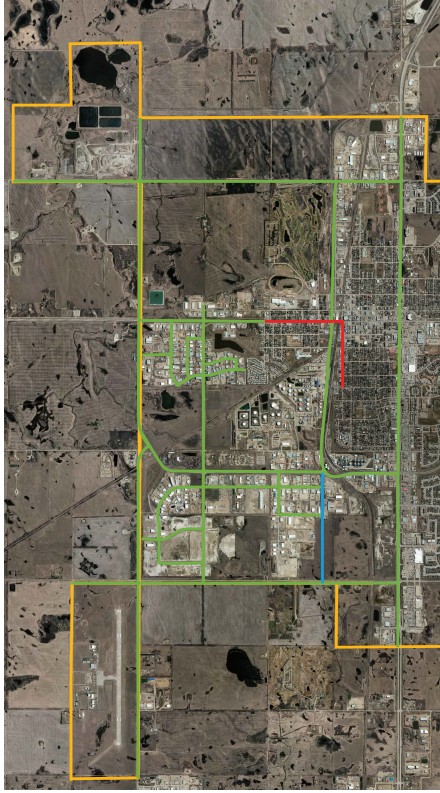
SHARE
YOUR
VOICE

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

TRUCK ROUTES - NORTH

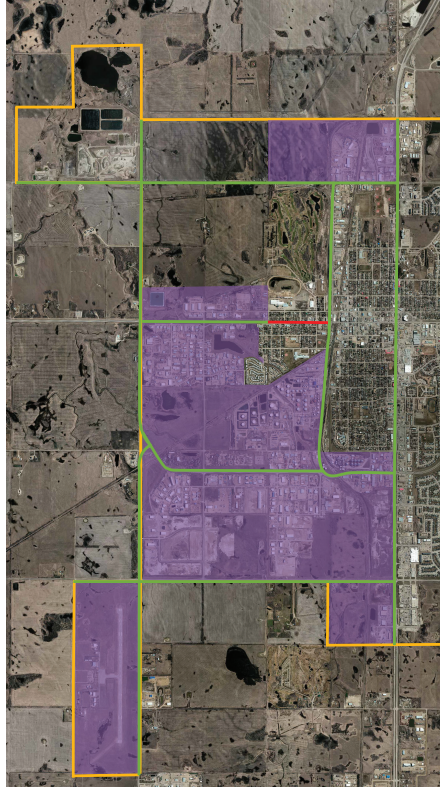
Option 2 - Arterials and Industrial Roads

This option builds on existing truck routes and includes more industrial roads.



Option 3 - Arterials and Industrial Areas

This option combines option 1 and 2 to create industrial areas.

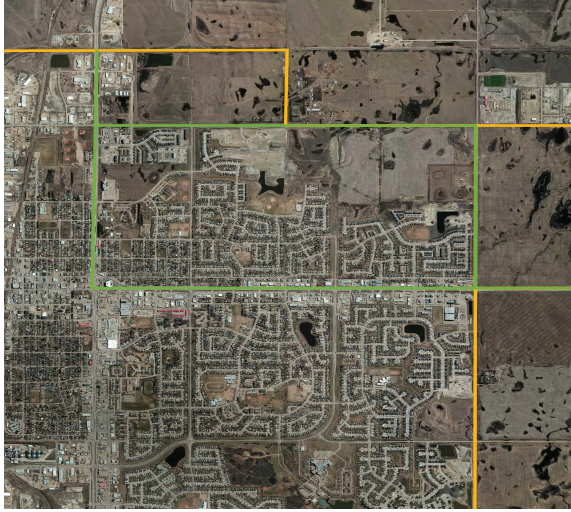


In the space below, use the sticky notes provided to describe your level of support for any or all of the options.

- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits
- Industrial Areas

TRUCK ROUTES - SOUTHEAST

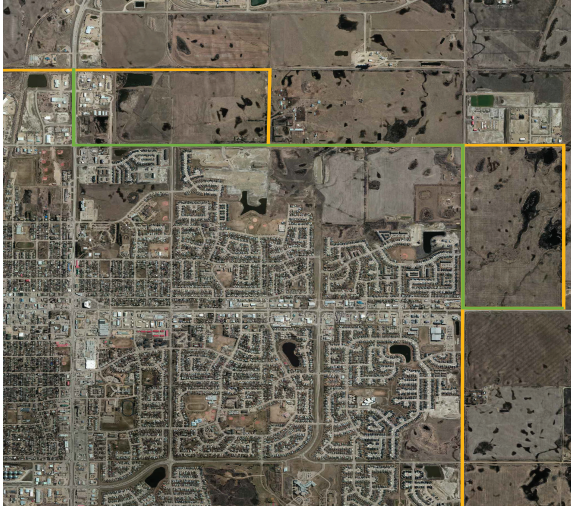
Existing Routes as per Traffic By-law



In the space below each map, use the sticky notes provided to describe your level of support for any or all of the options.

Option 1 - Perimeter Arterials

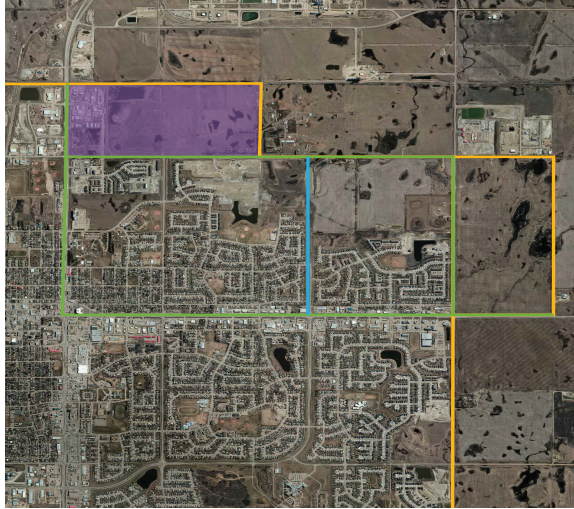
This option only uses the roads on the perimeter of the city.



- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

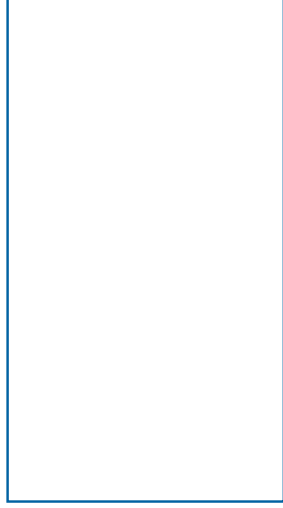
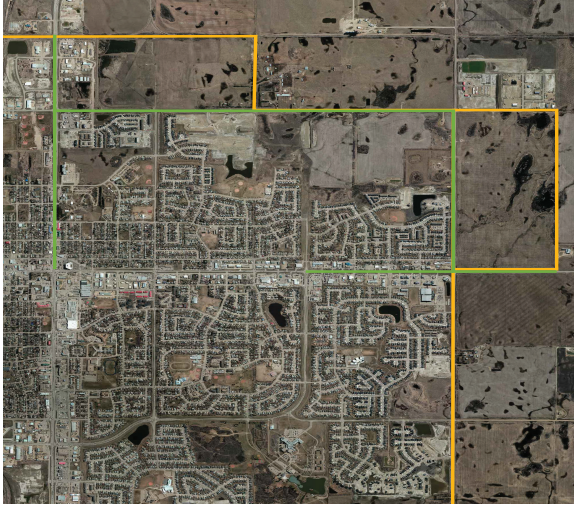
TRUCK ROUTES - SOUTHEAST

Option 2 - Arterials and Industrial Area
This option keeps the existing truck routes and adds 25 Street as a future truck route.



In the space below each map, use the sticky notes provided to describe your level of support for any or all of the options.

Option 3 - Perimeter and part of Highway 17
This is the same as option 1 and adds part of 50 Avenue from 12 Street and 25 Street and 44 Street from 40 Avenue to 50 Avenue



SHARE
YOUR
VOICE

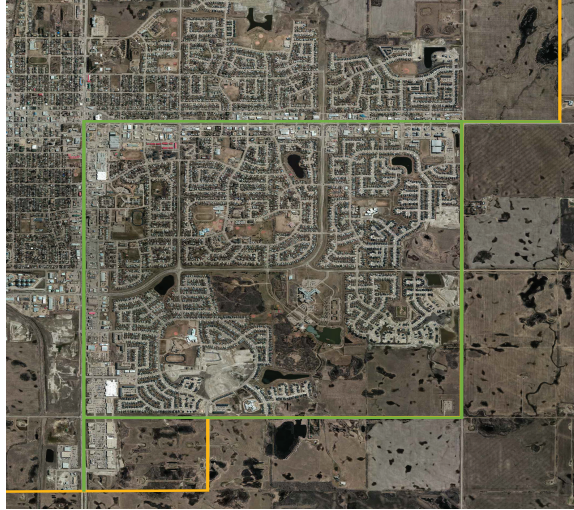
- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits
- Industrial Areas

TRUCK ROUTES - SOUTHWEST

SHARE
YOUR
VOICE

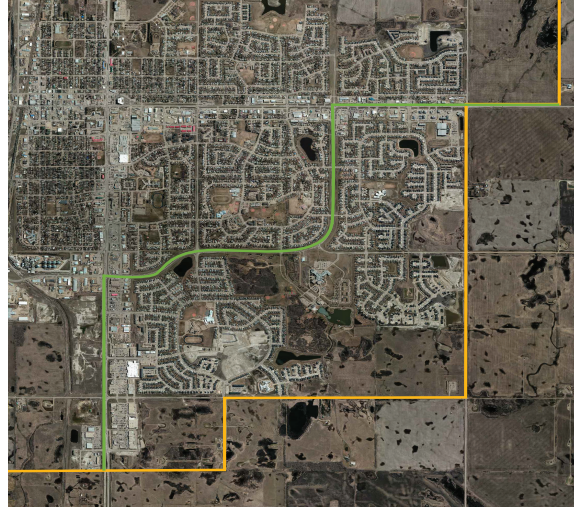
In the space below each map, use the sticky notes provided to describe your level of support for any or all of the options.

Existing Routes as per Traffic By-law



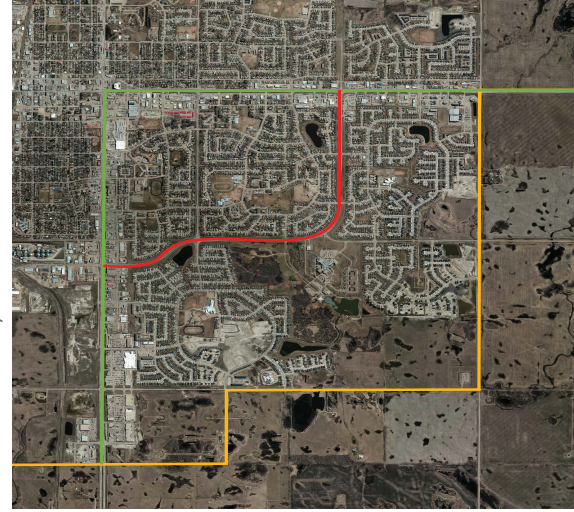
Option 1 - Central Arterials

This option focuses routes in the centre of the southwest quadrant.



Option 2 - Northeast Arterials

This option keeps some existing truck routes and adds College Drive (25 Street and 62 Avenue) as a restricted truck route.

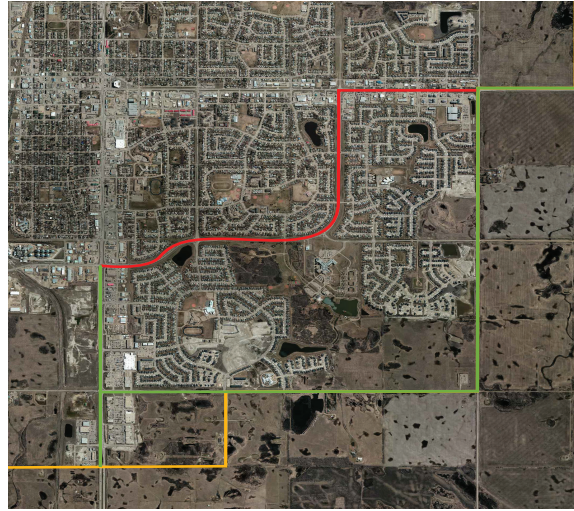


- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

TRUCK ROUTES - SOUTHWEST

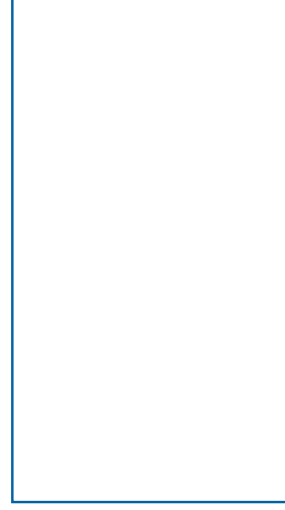
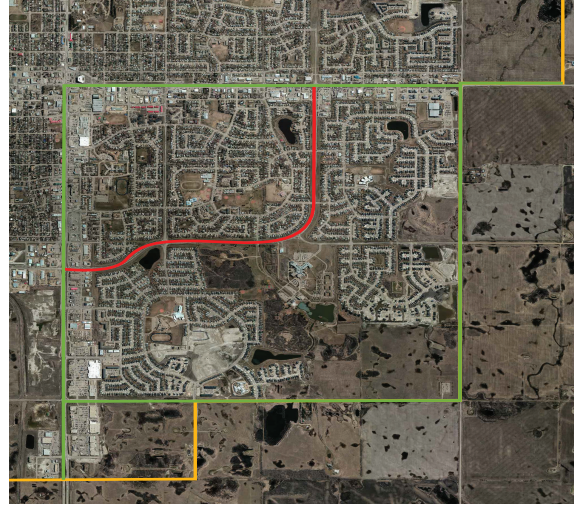
Option 3 - Southwest Arterials

This option keeps some existing truck routes and adds College Drive (25 Street and 62 Avenue) as a restricted truck route.



Option 4 - All Arterials

This option uses all the arterials in the southwest quadrant with College Drive (25 Street and 62 Avenue) added as a restricted truck route.



SHARE
YOUR
VOICE

In the space below each map, use the sticky notes provided to describe your level of support for any or all of the options.

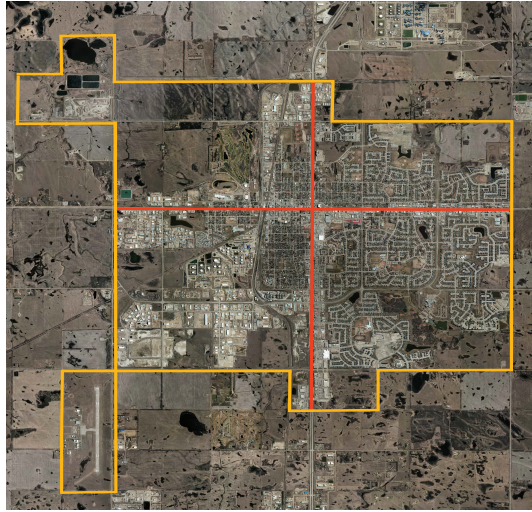
- 24 Hour Truck Route
- Restricted Truck Route
- Future Truck Route
- City Limits

DANGEROUS GOODS ROUTES

In the space below each map, use the sticky notes provided to describe your level of support for any or all of the options.

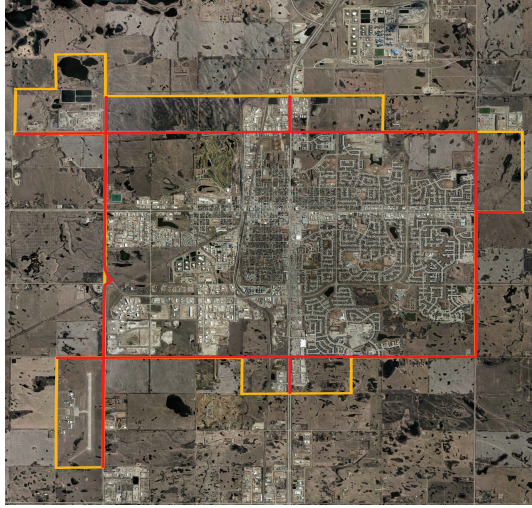
SHARE
YOUR
VOICE

Existing Routes as per Traffic By-law



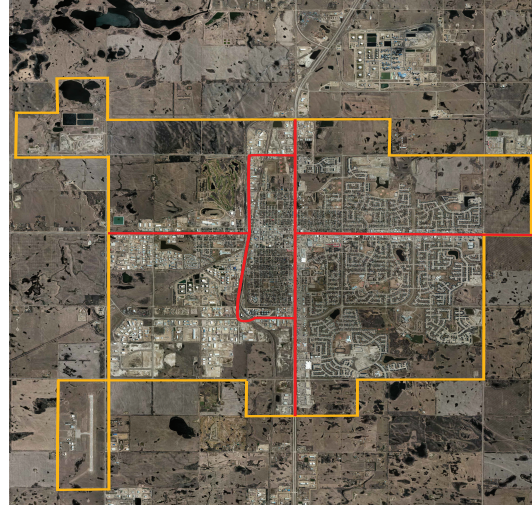
Option 1- Perimeter Routes

This option uses the outer roads as dangerous goods routes.



Option 2 - Interior Routes

This option only has roadways within the city designated as dangerous goods routes.



 Dangerous Goods Route
 City Limits

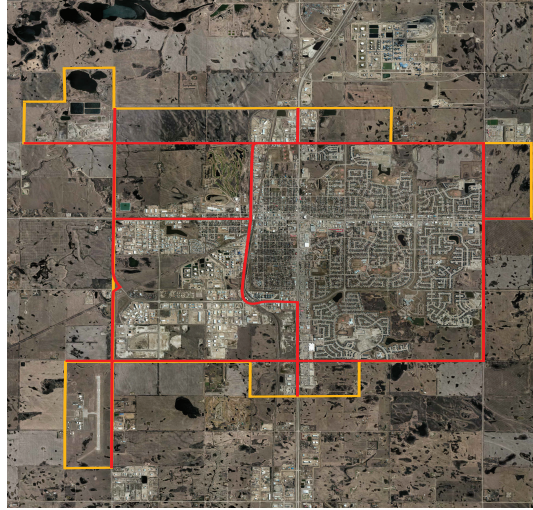
DANGEROUS GOODS ROUTES

In the space below each map, use the sticky notes provided to describe your level of support for any or all of the options.

SHARE
YOUR
VOICE

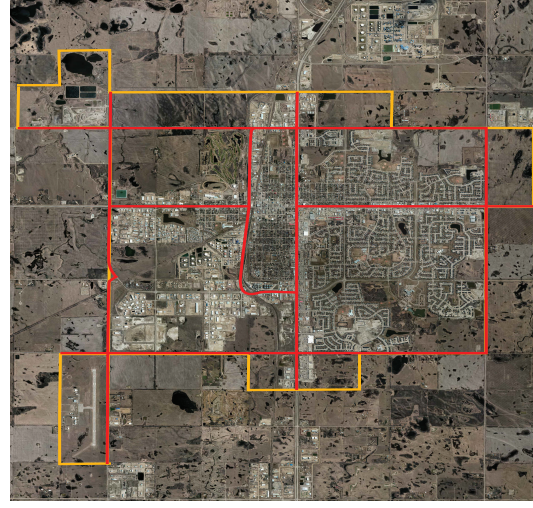
Option 3 - North Interior Routes

This option uses the perimeter and roadways in the north half of the city



Option 4 - All Interior and Perimeter Routes

This option combines option 1 and 2.



Dangerous Goods Route
City Limits

EVALUATION FACTORS

SHARE
YOUR
VOICE

These are the factors the City of Lloydminster will consider when designating truck routes and dangerous goods routes.

TRUCK ROUTES

Network Functionality	• Route Purpose • Network Connections • Reduces Trip Length • Reduces Off-Route Trips
Route Performance	• Roadway Classification - local, collector, arterial roads • Roadway Geometrics - lane width, available shoulders, intersections • Surface Conditions and Structural Capacity • At-grade Rail Crossings • Land Use Compatibility • Supports Future Development

DANGEROUS GOODS ROUTES

Route Functionality	• Route Purpose • Network Connections • Route Compatibility • Reduces Trip Length • Reduces Off-route Trips
Safety Assessment	• Roadway Geometrics - lane width, available shoulders, intersections • At-grade Rail Crossings • Access Control (signals) • Traffic Efficiency • Collisions • Environmental Impact • Population Exposure/Land Use • Population Responsiveness/Evacuation Potential • Emergency Response



Dangerous Goods Route & Truck Routes

**Engagement Summary
Phase 2**

January 2020

ISL Engineering

INTRODUCTION

The City of Lloydminster has initiated a study to update and develop the Dangerous Goods Routes and Truck Routes within the municipal boundaries. The purpose of this study is to provide safe and efficient options for travel and transportation within the municipal boundaries.

The City of Lloydminster currently has both Truck Routes and Dangerous Goods Routes. Revising the plans for Dangerous Goods Routes and Truck Routes will lessen risks involved with the transportation of dangerous goods and hazardous materials within the municipal boundaries. These plans must take into consideration industry and agricultural needs, economic impacts, and the existing highways bisecting the City.

The City of Lloydminster wants to establish Dangerous Goods Routes and Truck Routes within the municipal boundaries that meet the needs of industry while maintaining a safe road network. The development of new Dangerous Goods Routes and Truck Routes will include studying the current conditions, reviewing existing Transportation Master Plans and reviewing the Traffic Bylaw. In order to develop comprehensive Dangerous Goods Routes and Truck Routes, stakeholder and public engagement is required.

In Phase 1 of engagement (October 2019), the focus was hearing from stakeholders and the public to understand how the current truck network is working, any challenges or concerns and their preferences for future routes within the municipal boundaries. Engagement opportunities in this phase of engagement include stakeholder meetings, a Your Voice event and an online survey.

In Phase 2 of engagement (December 2019), the project team shared options for truck routes and dangerous goods routes with key stakeholders and at a Your Voice event. The project team shared truck route and dangerous goods route options that were created based on the feedback collected in Phase 1. The focus of the engagement was to gather feedback, comments and concerns from stakeholders and the public on the options.

COMMUNICATIONS FOR PHASE 2

Below are the channels the stakeholder meetings and public open house were advertised on:

- Social Media (Facebook, Twitter, LinkedIn)
- Website (youvoicelloyd.ca/DGR and lloydminster.ca)
- Newsletters (Team News- City of Lloydminster)
- Invitations (76 invitations to local businesses)
- Newspaper (Meridian Source)
- Media Release (The Goat, Prime Time News, Meridian Source)

ENGAGEMENT PURPOSE

The overall goal for engagement in this phase was to:

- Provide opportunities for invited stakeholders and members of the public to provide feedback on options presented for truck routes and dangerous goods routes

The feedback gathered from the stakeholder meetings and the Your Voice event will inform the recommendations created by the project team.

Table 1: Level of Engagement

	CONSULT	INVOLVE
Purpose	To educate and collect public/ stakeholder opinion to improve decisions	To stimulate public/ stakeholder debate, clarify values & broaden the information base to improve decisions.
Promise	We will listen, acknowledge and report concerns and aspirations about presented alternatives, and explain to the decision-maker how the public input influenced the recommendation.	We will work with the public/ stakeholders to ensure comments are directly reflected in the alternatives developed, report the comments received and explain how the input contributed to recommendation(s).

Table 2: Engagement Summary

EVENT/ACTIVITY	DATE AND TIME	LOCATION	LEVEL OF ENGAGEMENT
Stakeholder Meetings	December 3, 2019 1:00 – 2:00 p.m. 2:30 – 3:30 p.m.	City of Lloydminster City Hall	Involve
Public Pop-up Event	December 3, 2019 4:00 p.m. to 7:30 p.m.	Servus Sport Centre	Consult

ENGAGEMENT PROCESS AND WHAT WE ASKED

Stakeholder Meeting

Several key stakeholders were identified and invited to attend one of two, one-hour stakeholder meetings on December 3, 2019. Each stakeholder was given a workbook that presented all the draft options. Truck route options were presented in sections of the city – north, southwest and southeast. Dangerous goods routes were presented as city-wide plans that work along with the truck routes.

Project team members went through the workbook with stakeholders discussing each option, asking questions and recording feedback. Stakeholders were able to share their concerns and feedback about each option through group discussion and making notes in the workbooks. The workbooks were collected at the end of each session.

Public Pop-up Open House

A public Your Voice event was held on December 3, 2019 at the Servus Sport Centre from 4:00 p.m. to 7:30 p.m. that included truck routes and dangerous goods routes as a topic for feedback. All the options were presented on display boards with space for participants to leave feedback on a sticky note.

Stakeholders and members of the public were asked to share whether they support, do not support, or could support with changes all the options presented. Project team members were available to discuss the project and answer questions related to truck routes and dangerous goods routes within the municipal boundary. 29 comments were captured at the Your Voice event.

STAKEHOLDER AND PUBLIC FEEDBACK SUMMARY

Stakeholder Feedback Summary

The following summary includes feedback and concerns regarding existing or future Dangerous Goods Routes and Truck Routes in the municipal boundary for the City of Lloydminster:

- North truck route option 3 is the preferred route, it is good for future planning and development and leaves no grey areas for drivers
- Southeast truck routes option 1 is preferred but could be improved by adding an industrial area similar to the north and adding Highway 16 as a truck route
- Southwest truck routes 3 is preferred, including College Drive as a truck (restricted or not) is not critical for industry to operate as long as deliveries can still be made
- Routes with restrictions would need to be clear on what the restrictions are – time of day, type of goods, etc.
- Several participants wondered if industrial zones could be implemented for dangerous goods routes as well
- Dangerous goods route option 3 would be good if the route included all of Highway 16
- Dangerous goods route option 4 would be good if Highway 17 south of Highway 16 was removed

Public Feedback Summary

The following summary includes feedback from the in-person event. Participants were asked questions about current routes, which routes should be excluded, and which routes should be considered. The prevailing themes include:

- Several participants would prefer dangerous goods and truck traffic to stay out of the city, many referencing a ring road or by-pass and just wanting all trucks to go around the city
- Preferred options keep trucks and dangerous goods out of the city centre
- There is some concern of having truck routes through residential areas and near schools or playgrounds in the southeast and southwest areas of the city
- There are a number of concerns around public safety and truck traffic on current routes in or near residential areas and the city centre
- Participant feedback supports College Drive as a truck route if the entire road is four lanes

Key themes

- Creating industrial areas for truck routes is the preferred options for all routes
- College Drive is not critical to industry to have as a truck route as long as deliveries can be made
- Public feedback supports College Drive as a truck route if the entire road is four lanes
- Including Highway 16 for truck routes and dangerous goods routes is preferred
- Highway 17 through downtown and south of Highway 16 do not need to be included as a truck route, as long as deliveries can still be made
- Improvements to the roads and turning lanes at 75 Avenue and 12 Street

NEXT STEPS

The next steps for the Dangerous Goods Routes and Truck Routes project will be presenting recommendations to committee and council.

