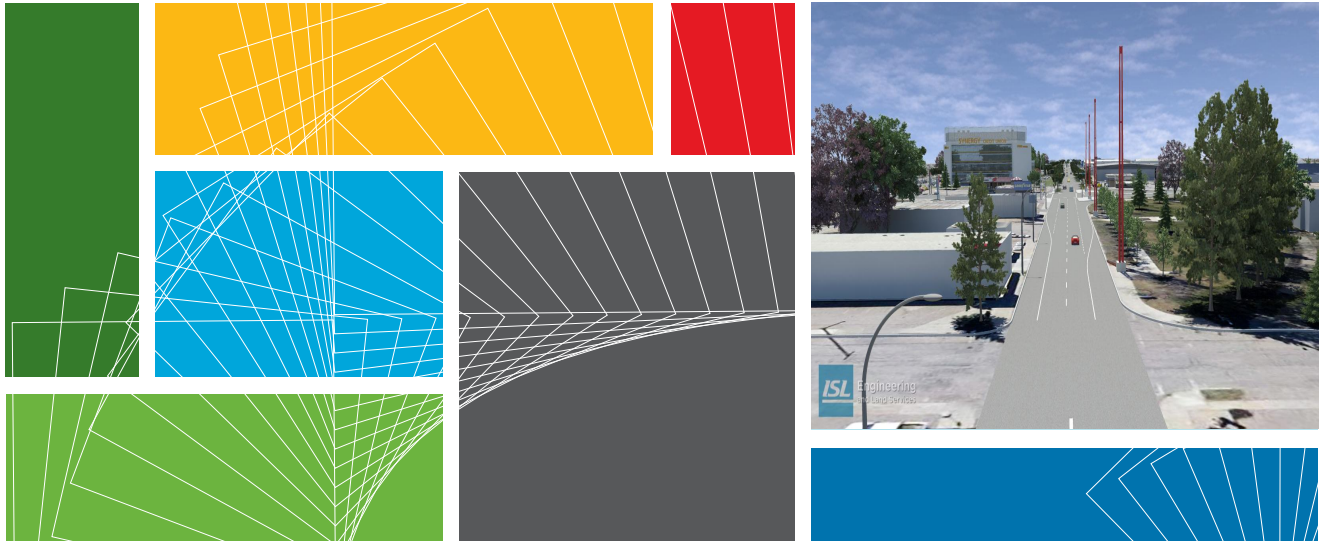




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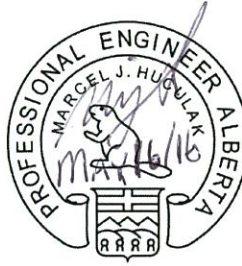


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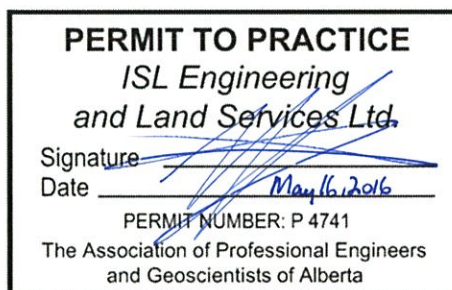


Corporate Authorization

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Marcel Huculak, P.Eng.
Senior Transportation Engineer





Executive Summary

Lloydminster's Transportation Master Plan (TMP) supports the City's growth by directing orderly implementation of transportation infrastructure improvements. It also supports the City's strategic priority of Sustainable Infrastructure by contributing to the strategic objective of Transportation Systems. This is important for the rapidly growing city of over 31,000 that services a trading area of some 150,000 people.

Developing Lloydminster's TMP required both public consultation and technical analysis. On the public consultation side, ISL and the City worked together using a multi-faceted public engagement process. We held stakeholder workshops in May 2015 where we conducted in-depth information gathering from 30 stakeholders. They expressed concerns with traffic safety, traffic congestion, pedestrian and cyclist movements, dangerous goods movement, and road circulation. The stakeholders told us their key priority areas were:

- Complete Highway 16 bypass;
- Improve pedestrian and cyclist facilities;
- Upgrade arterials;
- Create a north/south corridor; and
- Identify a Dangerous Goods Route.

We had a strong response to the online survey. There were a total of 587 participants generating 218 general comments and 1425 improvement suggestions. The key themes we extracted centered on a truck traffic bypass, pedestrians and cyclists, railway track crossings, traffic signals, transit, maintenance, congestion, and traffic routes. We also learned about some location specific themes at:

- Highway 17 (50 Avenue);
- Highway 16 (44 Street);
- College Drive (59 Avenue / 25 Street);
- Downtown; and
- 36 Street.

Our final point of public engagement was at "Your Voice" on November 3, 2015. This innovative event initiated by the City was an open house for several Lloydminster projects including the TMP. The 40 to 50 people who attended the TMP booth gave the TMP more feedback on the draft plan than a traditional stand-alone Open House. We gathered feedback on the Sidewalk and Multi-Use Trail plan as well as the proposed roadway improvement plan. We also heard from residents about banning trucks in certain areas, that 47 Avenue may be a candidate for a traffic calming study, and some opposition to the North/South corridor project (one-way couplet).

ISL conducted a major traffic analysis exercise. We built a travel demand model and calibrated it to existing traffic counts and validated it to Household Travel Survey data. The model forecasted future traffic flows and congestion for three land use horizons (short, medium, and long term). The model identified road improvements for each land use horizon.

We used the model results along with public feedback to identify a long range road network. Key elements of the network are:

1. A strong arterial grid – this was an issue often identified by the public
2. The north/south corridor – in addition to creating more capacity phase 1 of this project supports Lloydminster's desire for a stronger downtown. Since phase 2 may take a longer time to complete, the City should implement turn bays as necessary for the interim. This responds to public concerns and will provide significant benefit for relatively small cost.
3. The Highway 16 Bypass – In the medium term the model forecasts that volumes will be about 700 vehicles per hour, relieving potential congestion on 44 Street and providing an alternate route for trucks and hazardous goods. These are all issues that were important during public consultation. Given the

time frame to implement the bypass, property acquisition should start soon in order to build the bypass in the medium term.

4. Rail Crossings – In response to public feedback, the City should investigate the following:
 - a. The benefits and feasibility of a real time train crossing information system for drivers, especially for the downtown crossings.
 - b. Which arterial rail crossing ranks the highest in terms of technical need for grade separation.
Crossings to evaluate are 40 Avenue, 62 Avenue and 75 Avenue.

It is to be noted that ISL is making an assumption for the location and cost of the grade separated railway crossing.

We also used the model results, a review of the City's pedestrian and cyclist circulation system, and public feedback to create comprehensive transportation capital plans for the 3 year, 5 year, 10 year, and 20 year time frames. We also identify capital projects that are just beyond the City's current limits, as these were identified by ISL's travel demand model. The timelines for the sidewalk and trail connectivity are based on brood assumptions, but some projects may be required sooner due to adjacent development.

Recommended capital plans are as follows (recommended sidewalk and trail improvement locations are in Exhibits 5.1):

#	3 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
1	52 Street extension to 75 Avenue	1163.0	4800.00	5.58
2	North-South Corridor Phase - 1 (35 Street to 62 Street)	5863.0		32.67
3	Improve Sidewalk Connectivity	1214.5	144.29	0.18
4	Improve Trail Connectivity	4309.8	171.33	0.74
			Total =	39.16

#	5 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
5	North-South Corridor Phase - 2 (12 Street to 35 Street)	2414.0	3200.00	7.72
6	25 Street Extension to 40 Avenue from 47 Avenue	1171.0	4800.00	5.62
7	College Drive Twinning from 36 Street to 53 Avenue	2000.0	3200.00	10.43
8	Rail Grade Separation (Subject to further Study)			35.00 to 45.00
9	Improve Sidewalk Connectivity	809.7	144.29	0.12
10	Improve Trail Connectivity	2873.2	171.33	0.49
			Total =	59.38 with 35 and, 69.38 with 45.00



#	10 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
11	12 Street Twinning from 40 Avenue to 75 Avenue	4971.0	3200.00	15.91
12	40 Avenue Twinning from 52 Street to 62 Street	1650.0	3200.00	5.28
13	40 Avenue Twinning from 12 Street to 44 Street	3240.0		6.80
14	75 Avenue Twinning from 12 Street to 44 Street	3273.0		7.27
16	50 Avenue Twinning from 12 Street to City's Southern Boundary	814.0	3200.00	2.6
17	Improve Sidewalk Connectivity	4263.9	144.29	0.62
Total =				70.72

#	20 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
18	62 Street extension from 40 Avenue to 49 Avenue	1625.0	4800.00	7.80
19	6 - Lanes of 62 Avenue from 36 Street to 44 Street	834.0	4000.00	3.34
20	6 - Lanes of 59 Avenue from 25 Street to 36 Street	1111.0	4000.00	4.44
21	59 Avenue twinning from 12 Street to 25 Street	1327.0	3200.00	4.25
22	75 Avenue twinning from 44 Street to 52 Street	900.0	3200.00	2.88
23	Improve Sidewalk Connectivity	7200.1	144.29	1.04
24	Improve Trail Connectivity	36785.0	171.33	6.30
Total =				30.05

#	Projects Outside City Limits	Time Frame	Jurisdiction
A	Range Road 13 Twinning from 44 Street to Spruce Hill Road	Short Term	County of Vermillion River
B	50 Avenue Twinning from City's Southern Boundary to Highway 16 Bypass	Medium Term	County of Vermillion River
C	Highway 16 Bypass	Medium Term	Provinces of Alberta and Saskatchewan
D	35 Street extension to Range Road 13	Medium Term	County of Vermillion River
E	Range Road 13 Twinning from 44 Street to 52 Street	Long Term	County of Vermillion River
F	52 Street extension from City's Western Boundary to Range Road 13	Long Term	County of Vermillion River

ISL reviewed goods movement throughout the City of Lloydminster and separated them into two categories; regular truck routes and secondary Dangerous Goods Routes (DGR). Figure 7.1 shows the recommended truck route network. It includes all roads in industrial areas.

For the DGR's we identified a number of guidelines to develop a DGR. The City will finalise a DGR by working with stakeholders.

ISL conducted a comprehensive collision data analysis. Our analysis included increased focus on injury collisions, which is a practice done by jurisdictions following a Safe System approach. Under such an approach there is more emphasis placed on collisions that result in injury or fatality. The top four most severe collision causes accounting for about 75% of all severe collisions were:

1. Left Turn Across Path;
2. Fixed / Movable Object;
3. Left Turn-Straight – Opposite Direction ;
4. Right Angle.

Finally, ISL conducted a functional review of 44 Street through the City, and the five areas with significant recommendations are as follows:

1. Based on a corridor collision review we recommend rumble strips and improved skid resistance to reduce rear end collisions. To reduce left turn collisions we recommend protected-only left turn signals. This is where left turns are only allowed during a green arrow phase, not the solid green ball phase for the concurrent through movement;
2. In terms in speed limits on 44 Street, ISL recommends increasing the speed limits along 44 Street once the following are in place:
 - a. Update signal coordination and inter-green intervals;
 - b. Install deceleration/acceleration lanes as per Exhibit 9.2;
 - c. Protected only left turn phases (before implementing this phase, a detailed assessment needs to be done including a check on the queue lengths and available length of turn bays.)
3. In terms of access management, ISL recommends that the City strive to reduce the number of accesses along the corridor. Ideally accesses should be spaced at about 250m;
4. In terms of capacity issues, ISL recommends changes at two corridor intersections:
 - a. At 75 Avenue – 44 Street add a second northbound to westbound left turn lane and then retime the traffic signal to add more green time to 44 Street. This will require reconstruction of both the north and south approaches;
 - b. At 62 Avenue – 44 Street add right turn lanes for the southbound to westbound and the eastbound to southbound movements. For the eastbound to southbound movement, the City may need to ban the U-turn to the service road for large vehicles.
5. In terms of right of way requirements, it will depend on the need for service roads. If service roads remain or the road widens to six lanes, the required right of way is about 70.5m. However, in sections without a service road the required right of way is about 50m.



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1.0 Project Background

1.1 Introduction

Lloydminster is a unique border city whose economy is based on natural resource extraction and processing, which is additionally supplemented with agriculture and manufacturing. The combination of these industries and Highways 16 and 17 meeting within city limits requires Lloydminster to support a large trade area of some 150,000 people. Consequently, Lloydminster has significant transportation, warehousing, and distribution opportunities.

The City of Lloydminster's Transportation Master Plan (TMP) supports these opportunities by directing an implementation of transportation facilities. It also supports the City's strategic priority of Sustainable Infrastructure by contributing to the strategic objective of Transportation Systems. Creating a functional and strategic implementation is of fundamental importance at this critical juncture of Lloydminster's rapid growth.

The extent of this rapid growth is highlighted in the population increases that have been observed from 2009 to 2013. In 2009 the City's population was at 26,502 and had increased by 19% in 2013 to 31,486. The growth rate in the last 4 years equates to an average of approximately 5% per year.

Another consequence of the strong economy and growth is that the City of Lloydminster is rapidly running out of developable land. In response, the City initiated an annexation process with its neighbouring rural municipalities. The Comprehensive Growth Strategy and Servicing Assessment completed in 2013 identified spatial, servicing opportunities and constraints with respect to growth. This document formed the basis for the early stages of negotiation and serves as a useful resource in planning City of Lloydminster's transportation network beyond its current borders.

Lloydminster's economy and growth, together with the emerging significant transportation issues, mandates the City's new Transportation Master Plan (TMP). This new plan must reflect current realities as a baseline, but also refresh the future outlook and projections based on a solid and more recent data foundation.

Specific issues included are:

- Significant congestion and operational problems along 44 Street (Highway 16);
- Heavy vehicles and their operational impacts on 44 Street (Highway 16) and other city corridors;
- Operation and access issues along Highway 17, south of the proposed couplet;
- Capacity issues, network deficiencies and arterial twinning requirements;
- Heavy vehicle goods movement and route compliance;
- Railway crossing impacts on the City's arterial grid;
- Emerging residential shortcutting; and
- Pedestrian and cyclist accessibility needs.

1.2 Study Scope

This Transportation Master Plan document will serve as a basis for determining the future upgrades to the City of Lloydminster's transportation network. This TMP includes the following tasks as part of the study scope:

- Build, calibrate and validate the travel demand model incorporating the future growth areas;
- Define the City's transportation needs in terms of transportation network improvements for short term, medium term and long term horizons;
- Estimate the costs for the required transportation network improvements; and
- Recommended short, medium and long term capital plans.

In addition to looking at the transportation network as a whole for future planning horizons, the TMP includes a number of additional tasks:

- Analyze traffic collision database to identify collision hot spots;
- Review City's "Truck Route" and "Dangerous Goods Route" network;
- Undertake an "Origin – Destination" (OD) Survey;
- Evaluate the City's major pedestrian / cyclist circulation system and identify gaps, continuity issues and requirements for new links;
- Complete a functional review of 44 Street (Highway 16) through the City ; and
- Engage the Public Regarding the TMP.

1.3 Study Objectives

The City of Lloydminster launched its Transportation Master Plan (TMP) process in early 2015. The key objectives of this TMP are as follows:

- Complete a new TMP that supports the City's Growth and its broader strategic objectives as expressed in The Municipal Development Plan and Integrated Community Sustainability Plan;
- Complete an Origin – Destination (OD) survey and development of a travel demand forecasting model for population horizons of 38,000 (5 year – short term model), 43,000 (10 year – medium term model), and 54,000 people (20 year – long term model);
- Develop and analyse alternative roadway networks including those needed to support future annexation and the proposed Highway 16 realignment;
- Develop a long range transportation network and related capital costs;
- Develop recommended Capital Plans for 3, 5, 10 and 20 year timeframes;
- Review and update the City's goods movement network;
- Analyse traffic collisions on Lloydminster's roadway network;
- Review and Identify a city-wide pedestrian and bicycle circulation system;
- Complete a Functional Review of 44 Street (Highway 16); and
- Implement a Public and Stakeholder Consultation Program.

1.4 Study Methodology

ISL's work proceeded in two streams for Lloydminster's TMP:

1. Technical Stream
2. Public Consultation Stream

Technical Stream

The technical stream started by collecting background data, primarily to build the travel demand model. The model, using population and employment forecasts, along with a starting road network, analysed the road network and evaluated how effective alternative networks would perform. This model was calibrated using existing traffic and land use data and then providing a future forecast of 5, 10 and 20 year time frames.

The solution networks for each time frame informed the 3, 5, 10 and 20 year capital plans. This also guided the long range plan and provided a basis for cost estimates for each capital plan.

While the model proceeded, ISL was able to review the city wide pedestrian and bicycle circulation system as well as complete a Functional Review of 44 Street (Highway 16).



Public Consultation Stream

The public consultation stream required a different means of gathering public feedback, which was then added for consideration in the technical stream. At the beginning the public consultation focused on both new and known issues. ISL used an online survey tool to identify issues, while the City drove traffic to the online survey through advertising by various means. We also hosted a meeting with stakeholders regarding overall issues, as well as truck and dangerous goods issues.

As the plan evolved based on both technical work and public input, a final open house allowed for feedback on the preliminary plan. The final open house was at “Your Voice”, a comprehensive open house that held under one roof several city projects. This allowed for stronger attendance and more feedback.

2.0 Public Engagement Process Overview

2.1 Introduction

The consulting team designed a public engagement process to support the update to the Lloydminster Transportation Master Plan by involving the public and stakeholders in the planning process. The goal was to inform the plan with local knowledge to ensure it meets the needs of City residents.

The process included a number of opportunities to engage the public and stakeholders. Two workshops were held with area stakeholders (one with community groups and one with commercial/industrial roadway users), an online survey provided the opportunity for residents to inform the development of the plan, and design options were presented at the Lloydminster Open House – “Your Voice” - for public feedback.

Based on the IAP2 Public Participation Spectrum, stakeholders were engaged at the following levels of public engagement:

- **Inform** – To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions. The engagement activities included: project communications, stakeholder workshops and the online survey; and
- **Consult** – To obtain public feedback on analysis alternatives and/or decisions. This included the Lloydminster Open House.

2.2 Stakeholder Workshops

Two stakeholder workshops were held on July 6, 2015 in the City’s Training Room located at the Operations Centre to inform the development of the plan. One workshop was held with industry and the other with community representatives. Participants provided input on what’s currently working well with the transportation network and should be capitalized on and what are the major concerns in each of the following areas: Traffic Safety, Traffic Congestion, Pedestrian and Cyclist Circulation, Goods Movement and Road Circulation, as well as where the City should focus its resources in the future.

A total of 30 stakeholders attended the two sessions, with two participants attending both sessions. Appendix A provides a summary report of the stakeholder workshops. The most frequently mentioned major concerns are listed below:

Traffic Safety

- High volume on Highway 17 – safety of both pedestrians and vehicles; and
- Lack of sidewalks.

Traffic Congestion

- Highway 17; and
- Rail Crossings.

Pedestrians and Cyclist Movement

- Bicycle lanes lacking; and
- Sidewalks along arterials lacking.

Dangerous Goods Movement

- Dangerous Goods Route lacking.



Road Circulation

- 52 Street connection to 75 Avenue needed; and
- 25 Street (47 Avenue to 40 Avenue) needed.

Stakeholders identified many areas where the City should focus its transportation efforts and specified the following key priorities:

- Complete Highway 16 bypass;
- Improve pedestrian and cyclist facilities;
- Upgrade arterials;
- Create a north/south corridor; and
- Identify a Dangerous Goods Route.

2.3 Online Survey

An online survey was conducted to provide the opportunity for the public to identify issues and concerns with the region's transportation network, including everything from highways and roadways, to walking trails, sidewalks and bicycle paths. The survey was available online from June 24 to July 31, 2015. The City implemented a communications/advertising campaign to create awareness and encourage residents to complete the survey.

The survey asked respondents to identify areas of concern on a map and provide suggestions for improvement. Survey response was strong. A total of 587 respondents participated. Two hundred and twenty-two (222) general comments were received, as well as 1417 improvement suggestions.

Appendix B provides a summary of the online survey. The key themes extracted from the survey were as follows (the numbers in brackets are from the 1417 improvement suggestions and the 222 general comments respectively):

Truck Traffic/Bypass (167) (13)

Respondents indicated a concern with high volumes of truck traffic coming through their downtown core and suggest a bypass/truck route/dangerous goods route is greatly needed.

Pedestrian Cyclist (150) (25)

Respondents suggest the City provide more and safer crosswalks for both pedestrians and cyclists, especially on high traffic streets. They indicate that pedestrian controlled flashing or full signaled lights are desired. They also suggest additional, safer and better connected bike paths, sidewalks and multi-use paths are needed throughout the city.

Railway Tracks (102) (12)

Respondents indicated a concern with the wait times associated with the train traffic and indicate a great desire to see grade separations to alleviate congestion.

Traffic signals (lights) (78) (7)

Respondents suggested that the traffic lights within the city need to be better synced to improve traffic flow and congestion. They also suggest more traffic lights throughout the city at busy intersections are required.

Transit (75) (31)

Respondents indicated a desire for a public transit system.

Maintenance (46) (7)

Respondents indicated a concern with the maintenance of the city's roads, mainly with potholes and snow removal.

Congestion (35) (15)

Respondents indicated a desire for less congestion on their roadways and would like to see an improvement in congestion management.

Traffic routes (41)

Respondents, in general, desired more alternative routes to get to their desired destinations and suggest more arterial roads and more north/south corridors be developed.

In addition to the key areas of concerns, we also extracted the following location specific themes (the numbers in brackets are from the 1414 improvement suggestions and the 222 general comments respectively):

Highway 17 (50 Avenue) (171) (13)

Respondents indicated a concern with high volumes of traffic on this two-lane road which causes congestion and traffic flow issues. They suggest twinning this highway and adding turning lanes and traffic signals, with more left turn signals onto Highway 17. They also indicated an area of concern being the intersection at Highway 17 and 36 Street.

Highway 16 (44 Street) (110) (14)

Respondents indicated a concern with high volumes of traffic and truck traffic causing congestion and traffic flow issues. Suggestions provided for improvement include a bypass around the city, the addition of 6 additional lanes, the addition of traffic signals (better synced), and the addition of turning lanes.

College Drive (59 Avenue/25 Street) (53) (3)

Respondents indicated a desire to add lanes to College Drive (complete the twinning). They also suggest a need for traffic lights at the entrance to Bud Miller Park and a connection from 25 Street through to 40 Avenue.

Downtown (19)

Respondents indicated general traffic concerns in the downtown core, along with the desire for additional parking.

36 Street (16) (1)

Respondents indicated general traffic concerns with 36 Street, including traffic flow and congestion, and the suggestions to add lanes and improve traffic signals.

2.4 “Your Voice” - Lloydminster Open House

The City of Lloydminster created a multi-faceted open house opportunity for residents called “Your Voice”. Several projects were available under one roof for public review and comment, including the Transportation Master Plan. This format likely provided more public feedback than if a stand-alone TMP Open House was held. We estimate about 40 to 50 people attended the TMP booth.

“Your Voice” was held on Tuesday November 3, 2015. Appendix C provides a summary of the event, including the five boards displayed as well as the comments received. The boards included a sidewalk and multi-use trail priorities plan, a proposed roadway improvement plan, and a proposed truck route plan.



Attendees were asked to provide their priorities on the sidewalk and multi-use trail plan, as well as the roadway improvement plan. Key findings were:

1. Sidewalk and Multi-Use Trail Priorities plan
 - a. There are missing sidewalks along 53 Avenue from 46 to 51 Street on both sides, and from 45 to 46 Street on the west side;
 - b. The highest concentration of comments were along 25 Street.
2. Proposed Roadway Improvements plan
 - a. The highest concentration of comments were along 50 Avenue, especially south of 25 Street;
 - b. Some people wanted a rail grade separation on 62 Avenue.

Other prominent messages heard were:

1. Sentiments to ban trucks from Highways 16 and 17;
2. 47 Avenue may be a candidate for a traffic calming study;
3. Some residents spoke passionately against the one-way couplet because:
 - a. It is expensive;
 - b. It has been planned for a long time, but nothing has been done;
 - c. There was a similar one-way couplet in Lloydminster before, but it did not last.

3.0 Household Travel Survey Summary

To help validate the results of the Travel Demand Model, the team conducted a PM Peak period household travel survey. This entailed collecting data for trips to, from and within the City of Lloydminster.

The survey methodology used households as the sampling instrument. This captured most kinds of trips in the PM Peak hour, but there were some trips not captured, including business trips (such as courier and trucking) and trips through the survey area (meaning the origin household is outside of our survey area).

3.1 Study Area

Although the TMP pertained to the City of Lloydminster, we recognize that the City attracts trips from surrounding areas. To minimize missing data from these areas the survey included the following surrounding municipalities:

1. County of Vermillion River;
2. Village of Kitscoty;
3. Town of Lashburn;
4. Town of Maidstone;
5. Town of Marshall;
6. Regional Municipality of Britania;
7. Regional Municipality of Wilton.

3.2 Survey Methodology Overview

The survey used a trip diary method to record descriptions of household travel. Once recruited, survey participants were sent a diary (either hard copy by mail or online link version – see Appendix D). The diary was to be completed on a pre-designated day, covering peak PM travel (i.e. 16:00 to 20:00) including trips for all household members.

The survey was kept simple, focusing on trips made by vehicle. It also requested the start and end location of each trip. Additionally, to improve survey returns, the City promoted the survey publicly and informed adjacent municipalities. Thus residents were typically aware that the survey was ongoing and more willing to help collect data.

Shortly following the designated day, the travel information was retrieved by telephone or respondents entered the data in a web-based portal. Call backs were made to clarify data if necessary.

Households were randomly assigned different days of the week, covering each of the 5 weekdays. Recruiting began in mid-May and ended June 23, 2015. Because the amount of travel in a household depends strongly on the number of household members, we controlled the sample by household size. The basis for household sizes for each municipality was the most recent census data.

In terms of overall sample size, we aimed-for, and achieved the following number of completed surveys from households in the following areas:

1. Alberta municipalities: aim-for 100, achieved 104;
2. Saskatchewan Municipalities: aim-for 100, achieved 82;
3. City of Lloydminster: aim-for 400, achieved 514.



Appendix E summarizes the breakdown of surveyed households by municipality, household size, desired completed surveys for recruitment (household agrees to complete survey), and desired completed surveys retrieved (household collects and submits data). The summary also shows the number of households that did not generate any trips during their assigned travel period.

Existing Travel Patterns

The collected data were processed to determine travel patterns. One of the biggest processing challenges was geo-coding the data. We used the City of Lloydminster's data base to match addresses, and assign coordinates to addresses (origins or destinations).

The data base had a total of 496 trips. Of these 306 had valid origin and destination addresses inside the City. These could be mapped. Of the remaining 190 trips, 151 did not have an address matching the address data base from the City. Of these 151 trips, 12 had addresses outside the City (either origin or destination). Therefore the trips within the City had sufficient sample for analysis, but outside the City the sample was too small.

Figure 3.1 shows an origin-destination plot of the trips. Surprisingly there seems to be a low number of trips to/from zones north of the east/west rails paralleling 52 Street. Although the survey methodology includes trips from these zones that were made by people from surveyed households, it excludes trips due to delivery vehicles or with a work vehicle that is not taken home. There may be more of these kinds of trips in Lloydminster than would be typically expected for other kinds of municipalities.

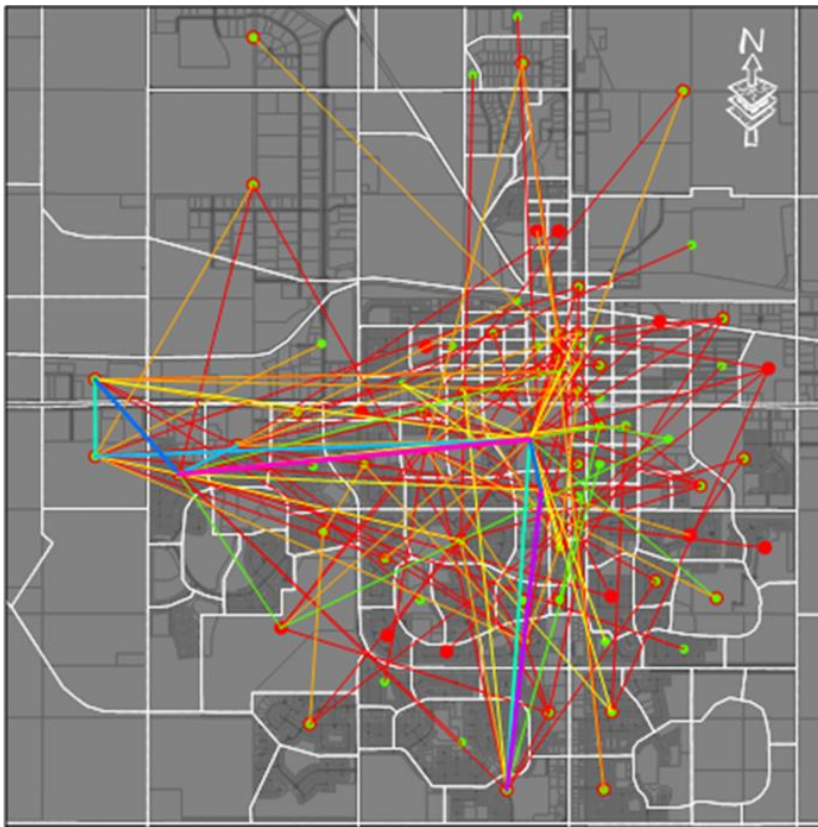


Figure 3.1: Origin-Destination Plot of 306 Valid Trips from Household Travel Survey

4.0 Travel Demand Modeling

4.1 Introduction

In order to test and determine the optimal transportation networks for the City of Lloydminster, ISL used a software driven travel demand forecasting model. We developed the model for a 2015 base year and three defined population horizons, incorporating weekday PM peak hour models for each analysis horizons. To have a region wide transportation perspective and to ensure good traffic forecasts at the City boundaries the model includes the City of Lloydminster as well as the lands surrounding the City in all directions. The areas close to the model boundaries are less reliable for predicting volumes because these are heavily influenced by flows input into the model at the boundaries and thus not truly predicted by the model. Therefore, including the lands surrounding the City allows more accurate prediction of volumes near the City's boundaries.

ISL used the Visum 14.00-16 transportation planning software developed by PTV America for the travel demand model. This GIS based travel demand model is a state-of-the-art transportation planning tool that can efficiently estimate changes in travel patterns and utilization of transportation systems in response to changes in land use, population, employment, and transportation infrastructure. It integrates mapping, land use planning, development projections, future traffic demand, and transportation networks to produce reliable traffic forecasts that can be interpreted easily and presented in effective visual formats.

After setting up the travel demand model and calibrating it for the current ~33,000 population, ISL used the model to test different roadway networks for three population horizons (38,000, 44,000 and 56,000 people).

4.2 Road Network

ISL created and refined a roadway network in the travel demand model to represent the current 2015 base year road network. Besides providing a graphical representation of the road network layout, the model structure also included detailed road characteristics for each road link within the study area, including number of lanes, link capacity, link length, free-flow speed, intersection configuration and intersection control. These road characteristics enabled a travel demand model to differentiate between different road links, thereby determining the attractiveness of one travel route relative to another.

4.3 Traffic Analysis Zones

Traffic Analysis Zones (TAZ) are the fundamental building blocks of a travel demand model. As the travel demand is generated based on the land use and demographic characteristics of the population, the study area was subdivided into smaller areas (or zones) which represent the origins and destinations of all the travel activities. Each zone was connected to one or several road links by means of zone connectors, which allowed traffic to be assigned onto the road network.

The size and shape of individual zones were developed using three guidelines, as follows:

- Establish the smallest zones possible within which accurate data is obtained;
- Maintain a homogenous land use within each zone; and
- Follow natural or man-made transportation barriers, e.g. lakes, creeks, railway lines, major roadways, etc.



The development of the zone system was based on the previous work carried out by ISL (Transportation Infrastructure Master Plan, 2010). The TAZs are built upon the previous work by adding the future growth areas that were not previously included. The TAZs inside the City of Lloydminster were refined by splitting them into smaller zones. This was done to increase the number of loading points on the road network and to contain the homogeneous land use in single zones. This allowed zones to represent individual neighbourhoods or specific components of planned development areas.

External zones represented vehicular trips into, out of, and passing through the study area. These external zones did not contain any land use information, but represented the traffic volumes on the individual road links entering or exiting the study area.

Each zone was assigned a unique identity number (ID) based on the neighbourhood boundary data supplied by the City. The traffic analysis zone system is shown in Appendix F (the first page zooms in to show more detail of the City while the second page zooms out to show areas surrounding the City). The zone system has 218 TAZs and 24 external zones.

4.4 Land Use

The City's 2013 census data was used as a basis to estimate the number of people and households in each traffic analysis zone within the City and the region. Population and employment estimates were determined for the base year (2015) and three population horizon scenarios were developed based on City population and employment forecasts.

The population levels for each horizon were 38,000 residents for the short term, 44,000 residents for the medium term and 56,000 residents for the long term. For each model horizon the zone population numbers were classified into single family, multiple family, high density and seniors categories. Employment numbers were classified into retail and non-retail categories. Table 3.1 shows the population and employment levels assumed for the study area as a whole (City and Region).

Table 4.1: Population and Employment Levels assumed for each model scenarios

Model	Population	Retail Employment	Non-Retail Employment
Base (2015)	33,000	3,424	17,690
Short Tem Model (2020)	38,000	4,299	19,455
Medium Tem Model (2025)	44,000	4,998	22,225
Long Tem Model (2035)	56,000	5,852	27,817

The 2015 base year land use data was based on 2013 census data, onto which known growth and development was added. Growth estimates for the three model horizons were developed for each zone, and were based on a review of approved area structure plans and outline plans. Assumptions were made with respect to phasing of developments in consultation with City engineering and planning staff.

Appendix G shows land use changes between the forecast horizons. The short-term land use change from the base year of 33,000 population to a 38,000 population horizon is in Exhibits 1 and 2 of Appendix G (Exhibit 1 shows population changes, while Exhibit 2 shows employment changes). The medium-term land use change (between the 38,000 to 44,000 population horizons) is in Exhibits 3 and 4 of Appendix G.

Finally, the long-term land use change (between the 44,000 to 56,000 population horizons) is in Exhibits 5 and 6 of Appendix G. The allocation of the land use to traffic zones was based on growth projections discussed with the City of Lloydminster on May 1, 2015. Exhibit 7 of Appendix G shows the staging of the growth projections.

4.5 Base Year Model Development Process

A travel demand model uses land-use information to determine how much traffic can be expected on a road network for a horizon year. The forecast traffic volumes help identify the effectiveness of the associated road network, which in turn determines the extent of road network improvements required.

The following traditional four-step travel demand modeling process was applied in this study:

- **Trip Generation:** The Institute of Transportation Engineers Trip Generation Manual was used to ascertain the number of peak hour trips would be generated by each Traffic Analysis Zone within the study area, including residential, commercial, and industrial land uses;
- **Trip Distribution:** The Origin-Destination (O-D) trip matrix is created when the model matches trip origins with destinations, taking into consideration road network impedance;
- **Mode Split:** This module is incorporated in the modeling process to split the O-D trip matrix into various travel modes. As this model does not represent a separate transit network, and trip generation rates represent vehicular trips, this model structure does not contain a mode split module; and
- **Traffic Assignment:** The estimated O-D trip matrix was assigned onto the road network to generate link volumes for each of the travel demand models.

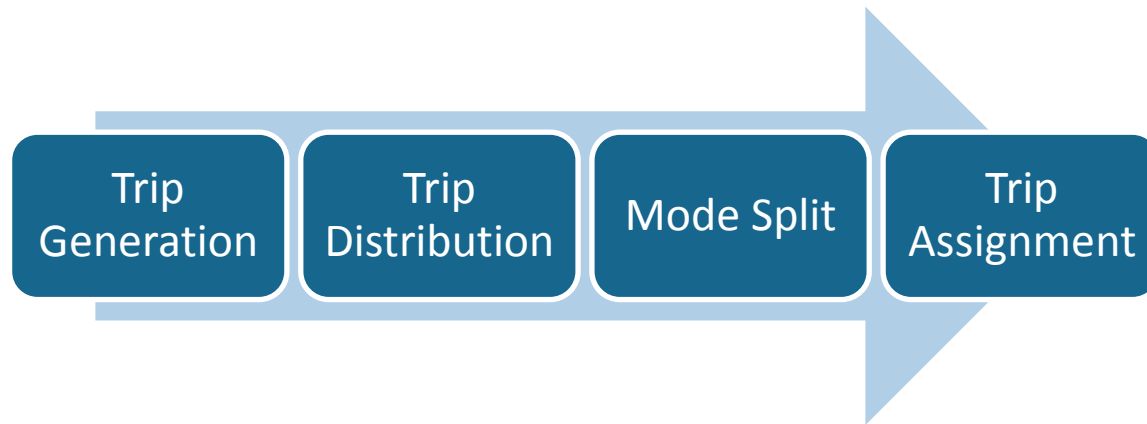


Figure 4.1: Traditional Four Step Travel Demand Modelling Process

The following flow chart shows a general representation of our technical approach for the 2015 base year model development.

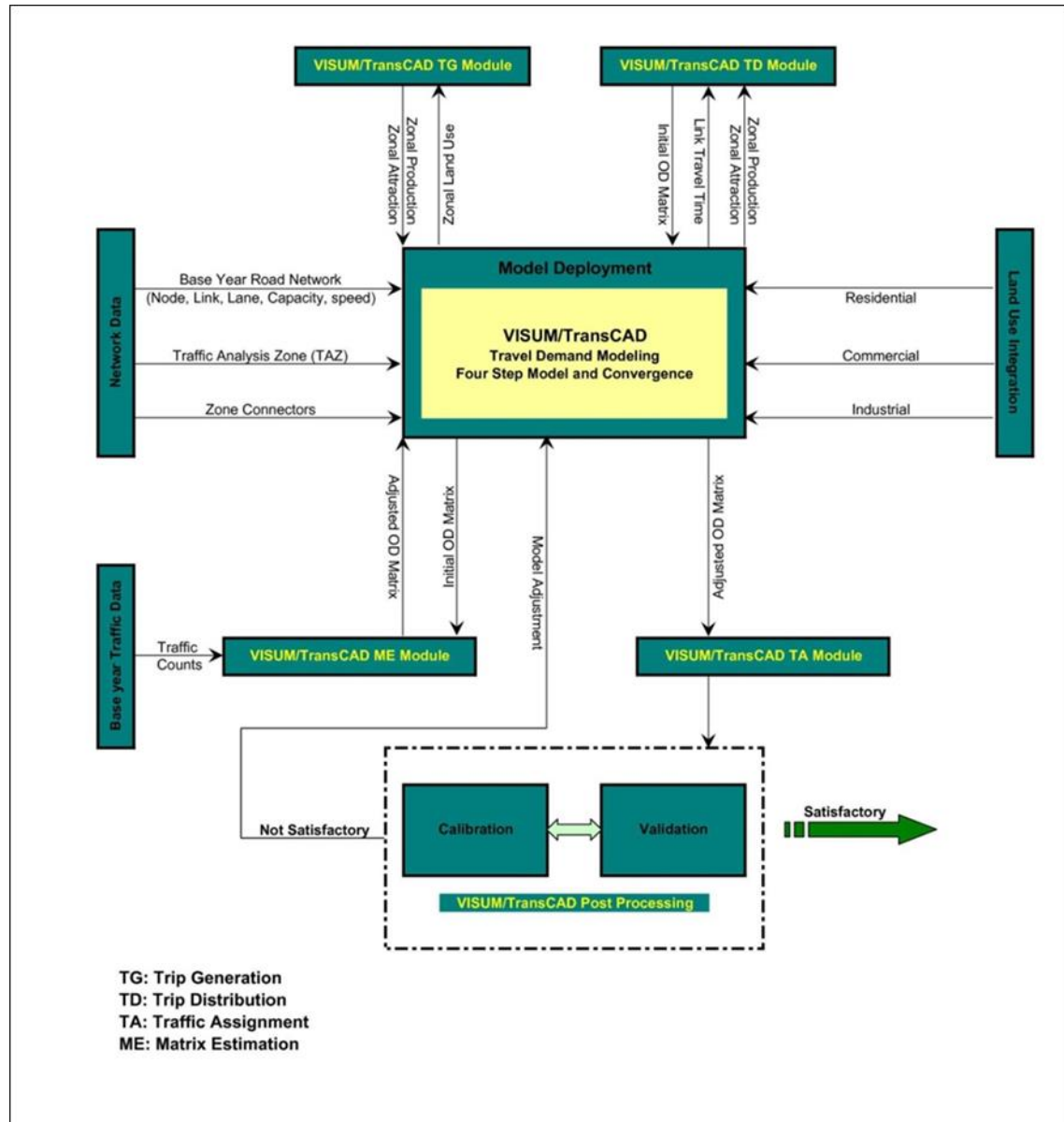


Figure 4.2: Flow chart showing a general representation of base year model development

Once the base model was calibrated and validated, the models for the future population horizons were constructed and run.

4.6 Base Year Model Calibration and Validation

Model calibration is as an iterative process that adjusts model parameters until the model approximates known traffic patterns and traffic counts within acceptable tolerances. The 2015 base year model was calibrated according to the guidelines as recommended in *“Model Validation and Reasonableness Checking Manual”*, available from the Travel Model Improvement Program (TMIP) of Federal Highway Administration (FHWA) and Model Data Comparison Criteria document prepared by New Zealand Modeling User Group (NZMUG).

These resources provide extensive guidance on acceptable methods of demonstrating the validity of a model's outputs compared to real-world information, and suggests acceptable tolerance ranges for the inevitable calibration errors that remain. The following statistical criteria were used for the model calibration and validation:

- Coefficient of Determination (R^2): This measure was determined as part of the XY scatterplot to show how well the modelled counts represent the observed counts;
 - Criteria for R^2 is > 0.9 (This indicates strong correlation between the model output and existing traffic counts).
- Root Mean Square Error (RMSE): This is a measure of the predictive success of the model and is a commonly referenced as providing an indication of the error of a model. The estimated trend line of the scatter plot is a good measure of the spread of the model volumes around observed counts.
 - Criteria for RMSE is $>20\%$ ~ 35% .

Appendix H shows the regression analysis of the base year PM peak hour model output and 2015 traffic counts. Our model achieved an R^2 value of 0.87 and an RMSE of 38%. Given the RMSE criteria is met and the R^2 value is nearly met, we deemed this performance acceptable. It is possible to further improve the model performance, however it requires increasing effort for a small improvement, and may cause the model to predict traffic based on forced manipulation.

The validity of the model was also checked by the following post-processing analysis:

- Select Zone Analysis: To check the zonal trip production and attraction (validate the trip generation rate); and
- Screen Line Analysis: To compare the base year observed volume against the model volume along a screen line. Figure 4.3 shows the screen lines assumed in this study for the model validation.

For the screen line analysis we defined two screen lines:

1. East/west – following the rails that roughly parallel 52 Street;
2. North/south – following roughly 62 Avenue.

We selected these screen lines as they are near the middle of the model area and are coincident with model traffic zone boundaries. These boundaries segregate the major industrial area in the northwest, helping to ensure trips in and out of this area are largely correct. Finally, the rail crossing is a major barrier to cars and thus it is important to accurately reflect flows across it.

Figure 4.3 shows both screen lines.

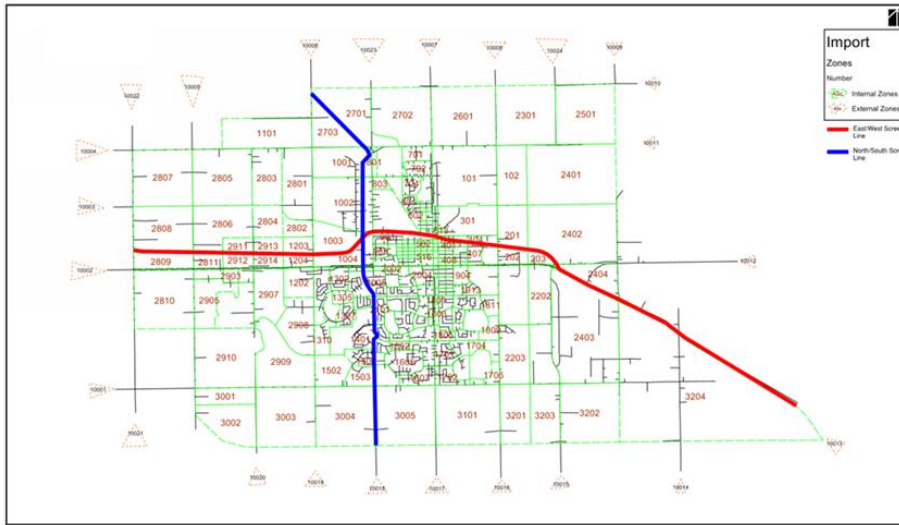


Figure 4.3: Travel Demand Model Screen Lines

We then plotted the Household Travel Survey origin-destinations against these screen lines, and counted the proportion of all trips that cross each screen line. Figures 4.4 and 4.5 show the resulting plots for the east/west and north/south screen lines respectively.

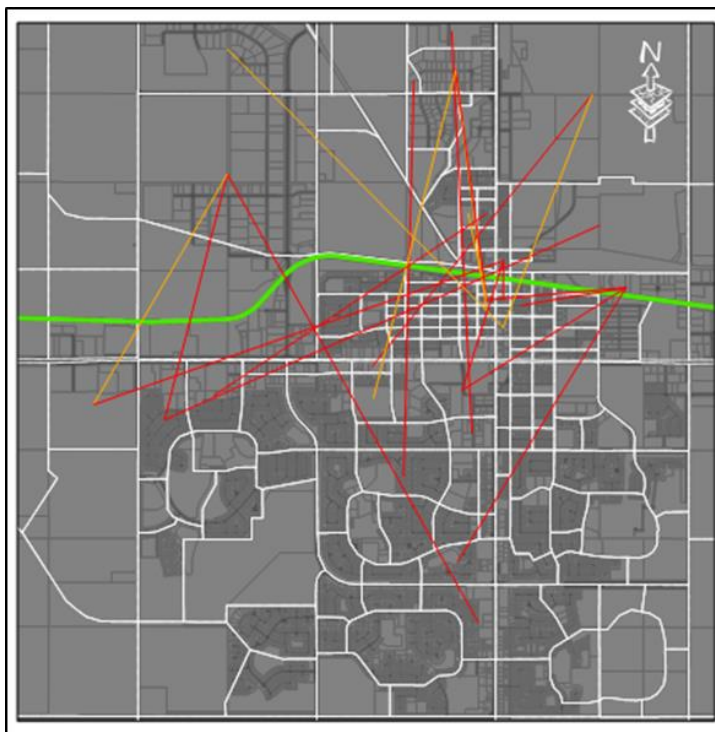


Figure 4.4: East/West screen line with Household Travel Survey Origin-Destination Data

Of the 306 valid trips in the survey, 21 crossed the east/west screen line, or about 7%.

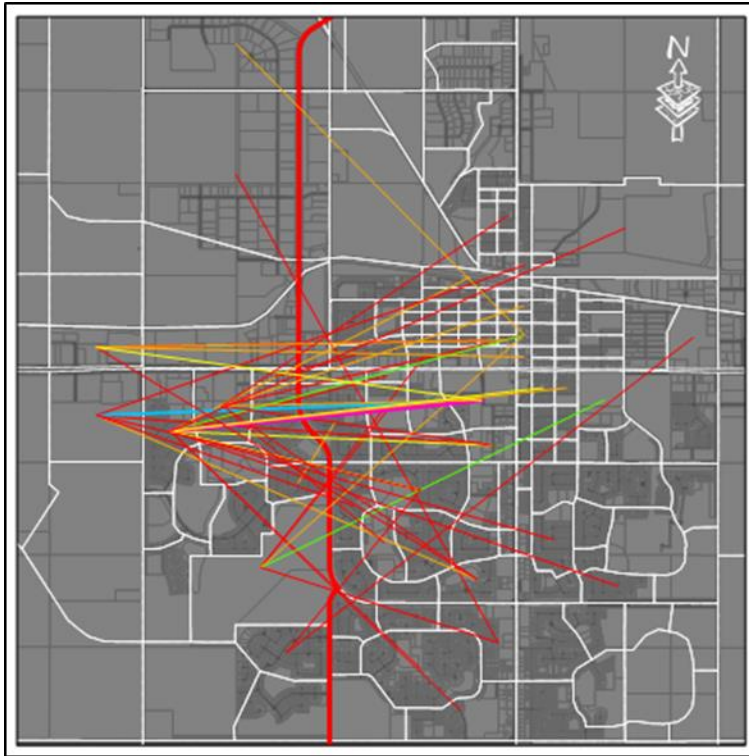


Figure 4.5: North/South screen line with Household Travel Survey Origin-Destination Data

Of the 306 valid trips in the survey, 78 crossed the north/south screen line, or about 26%.

Similar calculations were made from the calibrated model for both screen lines. Table 4.2 below compares the results of the Household Travel Survey screen lines to the model screen lines.

Table 4.2: Result comparison of Household Travel Survey Screen Lines to Model Screen Lines

Status	Household Travel Survey		Calibrated Model	
	Trips	Percent Trips	Trips	Percent Trips
Not Crossing	183	59.8	13,710	56.8
Crossing East/west	27	8.8	5,231	21.7
Crossing North/south	84	27.5	7,162	29.7
Intra-Zone	18	5.9	52	0.2

Note:

1. There are 6 trips from the Household Travel Survey that cross both screen lines. Therefore the total number of trips in the table adds to 312, instead of the 306 that were surveyed (that is, we count 6 trips twice);
2. The total of the Percent Trips is more than 100. This is also true for the calibrated model data.

The calibrated model matches well with the Household Travel Survey with regard to the north/south screen line. The east/west screen line is less accurate, but it is a relatively small amount of the overall trips. This may lead to the model predicting slightly higher north/south flows.



4.7 Analysis Results

For each model horizon we provide exhibits as follows:

- Land Use (Both Population and Employment);
- PM Peak Hour Traffic Volume;
- PM Peak Hour Level of Congestion (Volume to Capacity Ratio); and
- PM Peak Hour Desire Lines for selected zones.

Model outputs are primarily assessed on a visual and relative basis. This is achieved by using graphical parameters to display certain data onto the road network, such as traffic volumes and congestion levels. The model structure does, however, contain an extensive database with detailed data used to generate these map-based outputs.

The nature of a travel demand model used for transportation master planning is that capacity is based on a generalized link capacity considering the road classification. The congestion output plots do not reflect site specific issues such as friction caused by numerous accesses or lack of intersection turning bays. The output data from a travel demand model is not absolute, but rather to indicate relative change in traffic characteristics as a result of land use or road network changes.

With reference to the congestion plots included in this report, road links are represented by coloured bars which indicate the relative measure of traffic congestion on the roadway, i.e. volume-to-capacity (v/c) ratio. Colors were assigned to the level of congestion as follows:

Table 4.3: Description of Level of Congestion

Level of Congestion	Volume to Capacity (v/c) Ratio	Color
Low	≤ 0.5	Green
Slight	> 0.5 and ≤ 0.6	Blue
Fair	> 0.6 and ≤ 0.7	Yellow
Moderate	> 0.7 and ≤ 0.8	Orange
High	> 0.8	Brown

The model for each population horizon was developed in two separate and distinct stages. The first stage, “No Improvements” analysis reflects the traffic from the future land use assigned on the road network of the previous horizon (thus the “No Improvements” name). This determines the network impact resulting from the changed land use.

The second stage, “With Improvements” analysis, follows an iterative process of adding road improvements onto the road network until we accommodate the forecasted traffic at an acceptable v/c ratio. The “With Improvements” road network for the first population horizon was then used as the “No Improvements” road network for the following population horizon, and so forth.

It should be noted that the intent of the horizon-specific road network improvements was to reduce the network-wide traffic impacts, not only to address isolated congestion constraints. The emphasis of recommended network improvements therefore was to manage demand by diverting traffic to new alternate

routes rather than adding capacity to existing corridors. Generally, when a congestion plot shows a link with a v/c ratio of 0.80 or higher (Brown), reasonable improvements were sought to reduce the congestion. The analysis results are included in the Appendices listed in the next section that includes both City wide perspective and a region wide perspective of the following for each scenario analyzed:

1. Population and Households;
2. Employment Zones;
3. Traffic Volumes;
4. PM Peak Hour Volume to Capacity Ratio.

4.8 2015 Base Year Model

The 2015 base year model represents the existing traffic conditions on the existing road network of the City of Lloydminster. Model calibration was completed based on the 2013 peak hour traffic volume data, after which the base year model was used to forecast the horizon model travel patterns.

Existing Road Network Analysis (2015)

The model input land use and output traffic results showing the 2015 PM peak hour traffic volumes and congestion on the base year road network are in the attached exhibits (Note that model outputs are best viewed electronically; as such the paper plots in the printed version of this report might not be fully legible). The volume plots show counted volumes ("PM Counts") and modelled volumes ("Volume PrT").

Exhibits 4.1 through 4.4 show the land use in the 2015 model. Exhibits 4.5 and 4.6 show volumes (both the counted volumes at "PM Counts" and the modelled volumes as "Volume PrT" in the legend). In our review with the City, the traffic assignment results from the calibrated base year model was deemed to realistically replicate current operating conditions.

Exhibits 4.7 and 4.8 show volume to capacity ratios for each road segment. Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are as follows:

1. Southbound 62 Avenue between 36 Street and 52 Street;
2. Southbound 59 Avenue between 25 Street and 36 Street;
3. Northbound 59 Avenue between 29 Street and 36 Street;
4. Southbound 50 Avenue between 36 Street and 40 Street;
5. Southbound 50 Avenue between 27 Street and 200 m (approximately) south of 27 Street;
6. Southbound 50 Avenue between 25 Street and 150 m (approximately) north of 25 Street;
7. Southbound 57 Avenue between 36 Street and 34 Street.

There are some dead ends identified in the network that are zone feeds (where traffic uses a theoretical link to and from a zone to feed onto the network). The rest of the road network operates at better volume to capacity ratios.

Appendix I shows the road type for each model horizon.

4.8.1 Short Term Population Horizon – 38,000 Population

The purpose of the short term population horizon model was to analyze the traffic condition expected with a City population of 38,000 residents and to identify the road network improvements required to maintain an acceptable Level of Service. The model was also meant to help develop a three and five year capital plan to accommodate the change in travel patterns due to residential and employment growth.



“No Improvements” Road Network Analysis

In order to identify the network deficiencies of the 38,000 population horizon, the anticipated traffic generation was assigned onto the 2015 base year road network. The model outputs showing the expected PM peak hour traffic volumes and congestion for the 38,000 population horizon are in attached exhibits.

Exhibits 4.9 through 4.12 show the land use in the short term model. Exhibits 4.13 and 4.14 show volumes (both the counted volumes at “PM Counts” and the modelled volumes as “Volume PvT” in the legend).

Exhibits 4.15 and 4.16 show volume to capacity ratios for each road segment. Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are listed in Table 5. There are some dead ends identified in the network that are basically zone feeds. The rest of the road network is operating at better volume to capacity ratios.

“With Improvement” Road Network Analysis

Based on the capacity analysis “With Improvements” road network, the road improvements shown in Exhibit 4.17 and 4.18 (Highlighted links only) are deemed necessary to accommodate the 38,000 population horizon. Exhibits 4.19 and 4.20 show volumes (both the counted volumes at “PM Counts” and the modelled volumes as “Volume PvT” in the legend).

Exhibits 4.21 and 4.22 show volume to capacity ratios for each road segment. Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are shown in Table 4.4 below. The rest of the road network is operating at better volume to capacity ratios.

Appendix I shows the road type for each model horizon.

Table 4.4: v/c Ratios of Congested Roadway Sections in Short Term Scenario before and after Improvements

Congested Roadway Section - Short Term Horizon		Volume To Capacity Ratio	
(38,000 Population)		No Improvements	With Improvements
1	Southbound 62 Avenue between 36 Street and 52 Street.		
2	Southbound 59 Avenue between 25 Street and 36 Street.		
3	Northbound 59 Avenue between 29 Street and 36 Street.		
4	Southbound 50 Avenue between 36 Street and 40 Street.		
5	Southbound 50 Avenue between 27 Street and 200 m (approximately) south of 27 Street.		
6	Southbound 50 Avenue between 25 Street and 150 m (approximately) north of 25 Street.		
7	Southbound 57 Avenue between 36 Street and 34 Street.		

Congested Roadway Section - Short Term Horizon		Volume To Capacity Ratio	
(38,000 Population)		No Improvements	With Improvements
8	Westbound 44 Street from 170 m (approximately) west of 75 Avenue to 670 m (approximately) west of 75 Avenue.		
9	Southbound 63 Avenue from 62 Street and 200 m north of 62 Street		
10	Westbound 36 street from 57 Avenue to 200 m (approximately) west of 57 Avenue.		
11	Southbound Range Road 13 from 44 Street to approximately 1 Km South of 44 Street. <i>(Out of City Limits)</i>		
12	Northbound Range Road 13 between 44 street and Spruce Hill Road. <i>(Out of City Limits)</i>		

We note that 62 Avenue congestion from 36 Street to 52 Street does not change. In our analysis the volumes on 62 Avenue did not increase significantly, even with the model slightly over-predicting north/south volumes. We believe a better strategy is to strengthen the surrounding grid by improving parallel roads such as 50 Avenue, where the City is planning improvements to flow and to the downtown streetscape.

4.8.2 Medium Term Population Horizon – 44,000 Population

The purpose of the medium term population horizon model was to analyze the traffic condition expected with a City population of 44,000 residents and to identify the road network improvements required to maintain an acceptable Level of Service. The model was also meant to help develop a ten year capital plan to accommodate the change in travel patterns due to residential and employment growth.

“No Improvements” Network Analysis

In order to identify the network deficiencies by the 44,000 population horizon, the anticipated traffic generation was assigned onto the 38,000 population “With Improvements” road network. The model outputs showing the expected PM peak hour traffic volumes and congestion for the 44,000 population horizon are in attached exhibits.

Exhibits 4.23 through 4.26 show the land use in the medium term model. Exhibits 4.27 and 4.28 show volumes (both the counted volumes at “PM Counts” and the modelled volumes as “Volume PvT” in the legend).

Exhibits 4.29 and 4.30 show volume to capacity ratios for each road segment. Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are listed in Table 4.5. There are some dead ends identified in the network that are basically zone feeds. The rest of the road network is operating at better volume to capacity ratios.

“With Improvement” Road Network Analysis

Based on the capacity analysis of the “No Improvements” road network, the additional road improvements shown in Exhibits 4.31 and 4.32 (blue links only) are deemed necessary to accommodate the 44,000 population horizon.

Exhibit 4.33 and 4.34 show volumes (both the counted volumes at “PM Counts” and the modelled volumes as “Volume PvT” in the legend). Exhibits 35 and 36 show volume to capacity ratios for each road segment.



Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are listed in Table 4.5 below. There are some dead ends identified in the network that are basically zone feeds. The rest of the road network is operating at better volume to capacity ratios.

Appendix I shows the road type for each model horizon.

Table 4.5: v/c Ratios of Congested Roadway Sections in Medium Term Scenario before and after Improvements

Congested Roadway Section - Medium Term Horizon		Volume To Capacity Ratio	
(44,000 Population)		No Improvements	With Improvements
1	Southbound 62 Avenue between 36 Street and 52 Street.		
2	Southbound 59 Avenue between 29 street and 36 Street.		
3	Southbound 59 Avenue between 25 street and 29 Street.		
4	Southbound 59 Avenue between 23 street and 25 Street.		
5	Southbound 40 Avenue between 400 m (approximately) south of 36 Street and 44 street.		
6	Southbound 40 Avenue between 400 m (approximately) south of 36 Street and 850 m (approximately) south of 36 street.		
7	Southbound 40 Avenue between 52 Street and 62 Street.		
8	Eastbound 12 Street between 75 avenue and 59 Avenue.		
9	Eastbound 12 Street from 450 m (approximately) west of 52 B Avenue to 49 Avenue.		
10	Westbound 12 Street from 47 A Avenue to 450 m (approximately) west of 52 B Avenue.		
11	Southbound 75 Avenue between 42 street and 52 Street.		
12	Southbound 75 Avenue from 500 m (approximately) south of 44 Street to 29 Street.		
13	Westbound 44 Street from 66 Avenue to 670 m (approximately) west of 75 Avenue.		
14	Eastbound 44 Street from 800 m (approximately) west of 75 Avenue to 600 m (approximately) west of 75 Avenue.		

Congested Roadway Section - Medium Term Horizon		Volume To Capacity Ratio	
(44,000 Population)		No Improvements	With Improvements
15	Eastbound 44 Street from 600 m (approximately) west of 75 Avenue to 350 m (approximately) west of 75 Avenue.		
16	Westbound 36 street from 57 Avenue to 200 m (approximately) west of 57 Avenue.		
17	Westbound 51 Street between 50 Avenue and 51 Avenue.		
18	Southbound 48 Avenue between 50 Street and 52 Street.		
19	Southbound 63 Avenue from 56 Street and 200 m (approximately) north of 56 Street		
20	Southbound 63 Avenue from 62 Street and 200 m (approximately) north of 62 Street		
21	Eastbound 56 Street between 62 Avenue and 63 Avenue.		
22	Southbound 50 Avenue between 100 m (approximately) north and south of 67 Street.		
23	Southbound 40 Avenue between 44 Street and 500 m (approximately) north of 44 Street.		
24	Southbound 40 Avenue between 400 m (approximately) north of 25 Street and 25 street. (<i>Out of City Limits</i>)		
25	Westbound 44 Street from 400 m (approximately) east of Range Road 13 to Range Road 13. (<i>Out of City Limits</i>)		

We note again that 62 / 59 Avenue congestion does not change. In our analysis the volumes on 62 Avenue did not increase significantly, even with the model slightly over-predicting north/south volumes. We believe a better strategy is to strengthen the surrounding grid by improving parallel roads such as 40 and 75 Avenues, where stronger growth occurs.

4.8.3 Long Term Population Horizon – 56,000 Population

The purpose of the long term population horizon model was to analyze the traffic condition expected with a City population of 56,000 residents and to identify the road network improvements required to maintain an acceptable Level of Service. The model was also meant to analyze the change in travel patterns due to residential and employment growth.

“No Improvements” Road Network Analysis

In order to identify the network deficiencies by the 56,000 population horizon, the anticipated traffic generation was assigned onto the 44,000 population “With Improvements” road network. The model outputs showing the expected PM peak hour volume and traffic congestion for the 56,000 population horizon are in attached exhibits.



Exhibits 4.37 through 4.40 show the land use in the long term model. Exhibits 4.41 and 4.42 show volumes (both the counted volumes at “PM Counts” and the modelled volumes as “Volume PvT” in the legend).

Exhibits 4.43 and 4.44 show volume to capacity ratios for each road segment. Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are listed in Table 4.6. The 41 Street stub located east of 40 Avenue that connects to 44 Street shows a high v/c ratio. This road connects to 40 Avenue now so the actual v/c ratio will be less. There are some dead ends identified in the network that are basically zone feeds. The rest of the road network is operating at better volume to capacity ratios.

“With Improvement” Road Network Analysis

Based on the capacity analysis of the “No Improvements” road network, the additional road improvements shown in Exhibits 4.45 and 4.46 (green links only) are deemed necessary to accommodate the 56,000 population horizon. Exhibits 4.47 and 4.48 show volumes (both the counted volumes at “PM Counts” and the modelled volumes as “Volume PvT” in the legend).

Exhibits 4.49 and 4.50 show volume to capacity ratios for each road segment. Road sections experiencing noticeable congestion in the PM peak due to high traffic volumes (v/c ratio > 0.8, brown links) are shown in Table 4.6. There are some dead ends identified in the network that are basically zone feeds. Rest of the road network is operating at better volume to capacity ratios.

Appendix I shows the road type for each model horizon.

Table 4.6: v/c Ratios of Congested Roadway Sections in Long Term Scenario before and after Improvements

Congested Roadway Section - Long Term Horizon		Volume To Capacity Ratio	
(56,000 Population)		No Improvements	With Improvements
1	Southbound 62 Avenue between 44 Street and 52 Street.		
2	Southbound 62 Avenue between 36 Street and 44 Street.		
3	Southbound 59 Avenue between 29 Street and 36 Street.		
4	Southbound 59 Avenue between 25 Street and 29 Street.		
5	Southbound 59 Avenue between 23 Street and 25 Street.		
6	Southbound 59 Avenue between 20 Street and 23 Street.		
7	Southbound 59 Avenue between 12 Street and 20 Street.		
8	Southbound 40 Avenue between 400 m north of 25 Street and 52 Street.		
9	Southbound 75 Avenue between 44 Street and approximately 200 m south of 44 street.		

Congested Roadway Section - Long Term Horizon		Volume To Capacity Ratio	
(56,000 Population)		No Improvements	With Improvements
10	Southbound 75 Avenue between 29 street and 35 Street.		
11	Southbound 75 Avenue from 52 Street to 600 m (approximately) north of 44 Street		
12	Southbound 75 Avenue from 600 m (approximately) north of 44 Street to 44 Street.		
13	Westbound 44 Street from 75 Avenue to 670 m (approximately) west of 75 Avenue.		
14	Eastbound 44 Street from 800 m (approximately) west of 75 Avenue to 350 m (approximately) west of 75 Avenue.		
15	Westbound 36 street from 57 Avenue to 200 m (approximately) west of 57 Avenue.		
16	Westbound 51 Street between 50 Avenue and 51 Avenue.		
17	Southbound 48 Avenue between 50 Street and 52 Street.		
18	Eastbound 62 Street from 500 m (approximately) west of 40 Avenue to 40 Avenue.		
19	Southbound 63 Avenue from 56 Street and 200 m (approximately) north of 56 Street		
20	Southbound 63 Avenue from 62 Street and 200 m (approximately) north of 62 Street		
21	Eastbound 56 Street between 62 Avenue and 63 Avenue.		
22	Southbound 50 Avenue between 100 m (approximately) north and south of 67 Street.		
23	Eastbound 67 Street from 250 m (approximately) west of 50 Avenue to 500 m (approximately) east of 50 Avenue.		
24	Westbound 67 Avenue from 50 Avenue to 250 m (approximately) east of 50 Avenue.		
25	Westbound 67 Avenue from 250 m (approximately) east of 50 Avenue to 500 m (approximately) east of 50 Avenue.		
26	Westbound 12 Street from 52 B Avenue to 450 m (approximately) west of 52 B Avenue.		
27	Southbound 40 Avenue from 12 Street to approximately 1.0 Km south of 12 Street. (Out of City Limits)		
28	Southbound 40 Avenue between 400 m south of 25 Street and 25 Street. (Out of City Limits)		



Congested Roadway Section - Long Term Horizon		Volume To Capacity Ratio	
(56,000 Population)		No Improvements	With Improvements
29	Southbound 40 Avenue between 400 m north of 25 Street and 25 Street. (Out of City Limits)		

In this model we increased capacity on 59/62 Avenue from a four lane to a six lane section. This increase reduced congestion but the corridor remains relatively congested. It also signaled a trend in Lloydminster that is common to many cities; that widening roads will not eliminate congestion. Other solutions should be considered, including Transportation Demand Management as well as land use changes coupled with encouraging shifts to other modes (walking, transit, and cycling).

4.9 Long Range Roadway Network

The first key elements of the long range network is a strong arterial road grid. The grid is roughly one mile square and all arterials are at least four lanes wide. The only six lane section is 59/62 Avenue from 44 Street to 25 Street, in part due to the missing link at 25 Street west of 59 Avenue. The grid provides flexibility for routing, which is important when capacity temporarily reduces, for example due to collisions or road construction. The grid also gives the City options to route trucks or dangerous goods around high risk or sensitive areas, such as the downtown core. This was a concern expressed by stakeholders and residents.

The second key element is the north-south corridor projects (phase 1 and phase 2). Phase 1 (35 Street to 62 Street) should be coordinated and implemented with the downtown plan. There will be synergies to integrate the two projects, making Lloydminster's downtown a viable place for citizens to live.

Phase 2 (35 Street to 12 Street) – widening to four lanes - could take a longer time to complete. In the interim the City should investigate installing turn bays at intersections with operational problems. Although these improvements will require reconstruction, once the City builds phase 2, this will alleviate numerous concerns residents expressed through online forums and the "Your Voice" event.

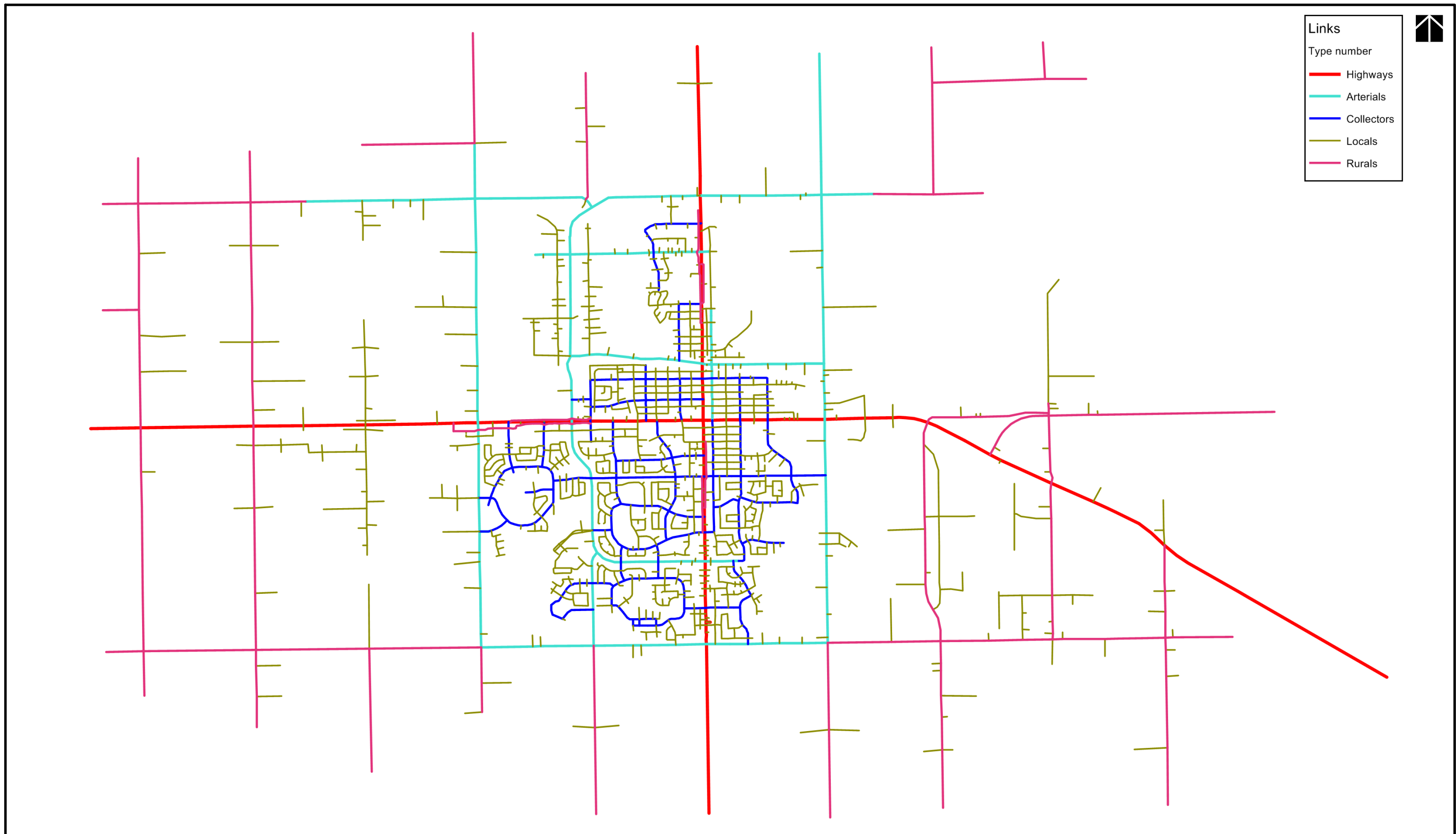
Another important element to the long range network is the Highway 16 bypass. The model predicts a well-used bypass in the medium term, with about 700 vehicles per hour in the peak direction. This relieves potential congestion on 44 Street, which has limited options to widen or improve highway flow through the City. This provides a convenient route for traffic bypassing the City, as well as a high quality route for commuting traffic from the surrounding areas. It also reduces risks by providing an alternate route for the transportation of hazardous goods. The bypass responds well to resident concerns about trucks and hazardous goods in the City's core, as well as relief from congestion on 44 Street. All these factors reinforce the need for the bypass in the medium term.

During stakeholder workshops it was found that different provincial regulations are in place to protect the bypass right of way. On the Alberta side there are regulations that require provincial review of development permit applications to prevent building construction in the future right of way. This is fortuitous step to take prior to acquiring the lands. On the Saskatchewan side, development permit applications do not require provincial review.

A necessary first step to building the bypass will be to acquire the road right of way. This protects the project from unnecessary future expenses, ensuring it will be implemented in the planned right of way. Right of way acquisition can take two to five years, and ensuing design and construction another two to four years. Given that demonstrated bypass need in the medium term and the timelines to implement it, the City should begin discussions with both provinces to secure the bypass right of way.

Finally, during public consultation we heard how challenging rail crossings are in Lloydminster. We considered both grade separation and real time information systems telling drivers which crossing are open and which are not available. The latter would be useful in the downtown area where there is a tighter grid of rail crossings, train shunting is common, and grade separation costs are prohibitive. Outside the downtown grade separations are more feasible. Not only are there obvious traffic congestion benefits, but they also reduce emergency response risks for the City. Therefore we recommend the city investigate the following:

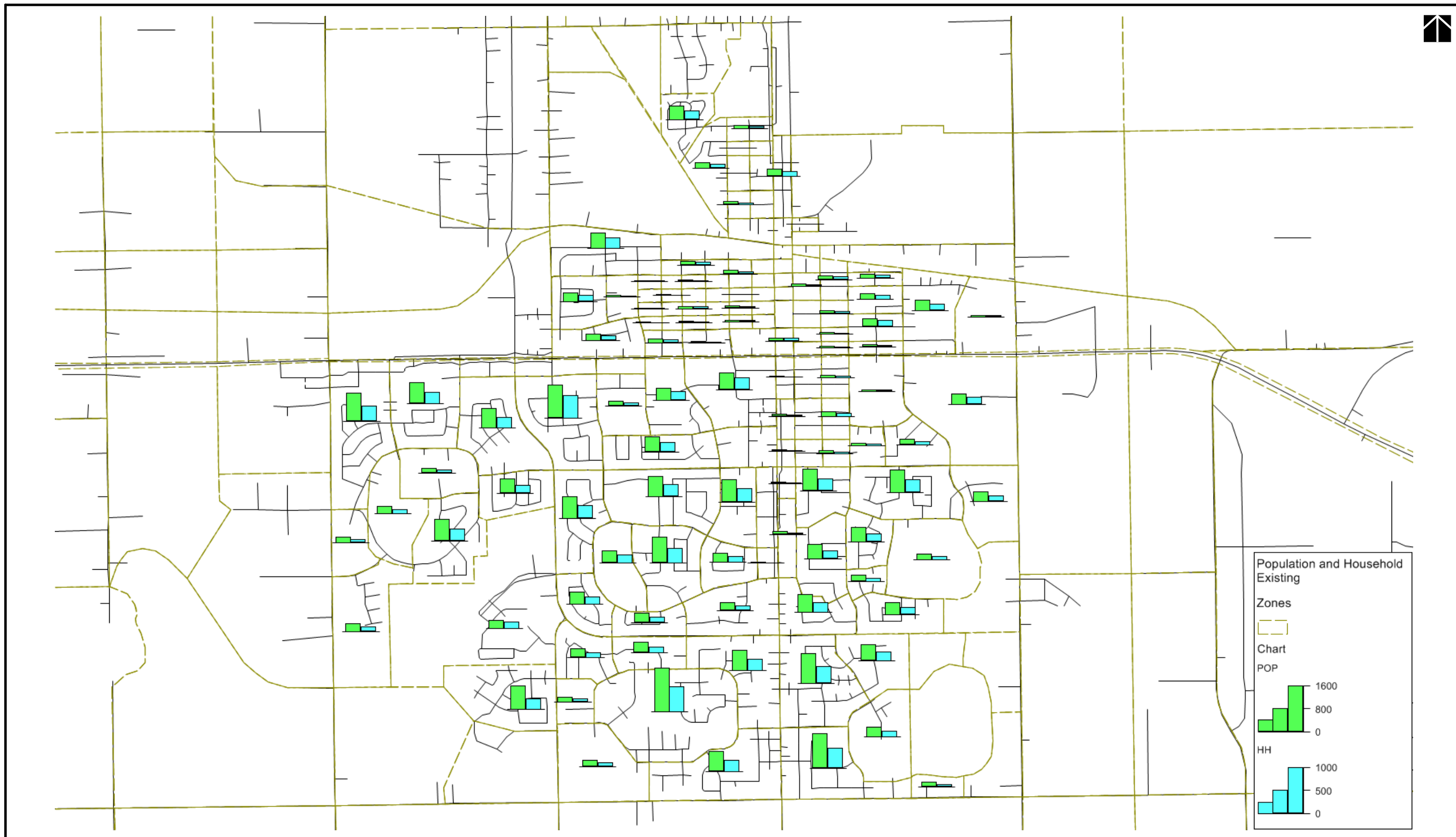
1. The benefits and feasibility of a real time train crossing information system for drivers, especially for the downtown crossings;
2. Which arterial rail crossing ranks the highest in terms of technical need for grade separation. Crossings to evaluate are 40 Avenue, 62 Avenue and 75 Avenue.



City of Lloydminster

Existing Road Network

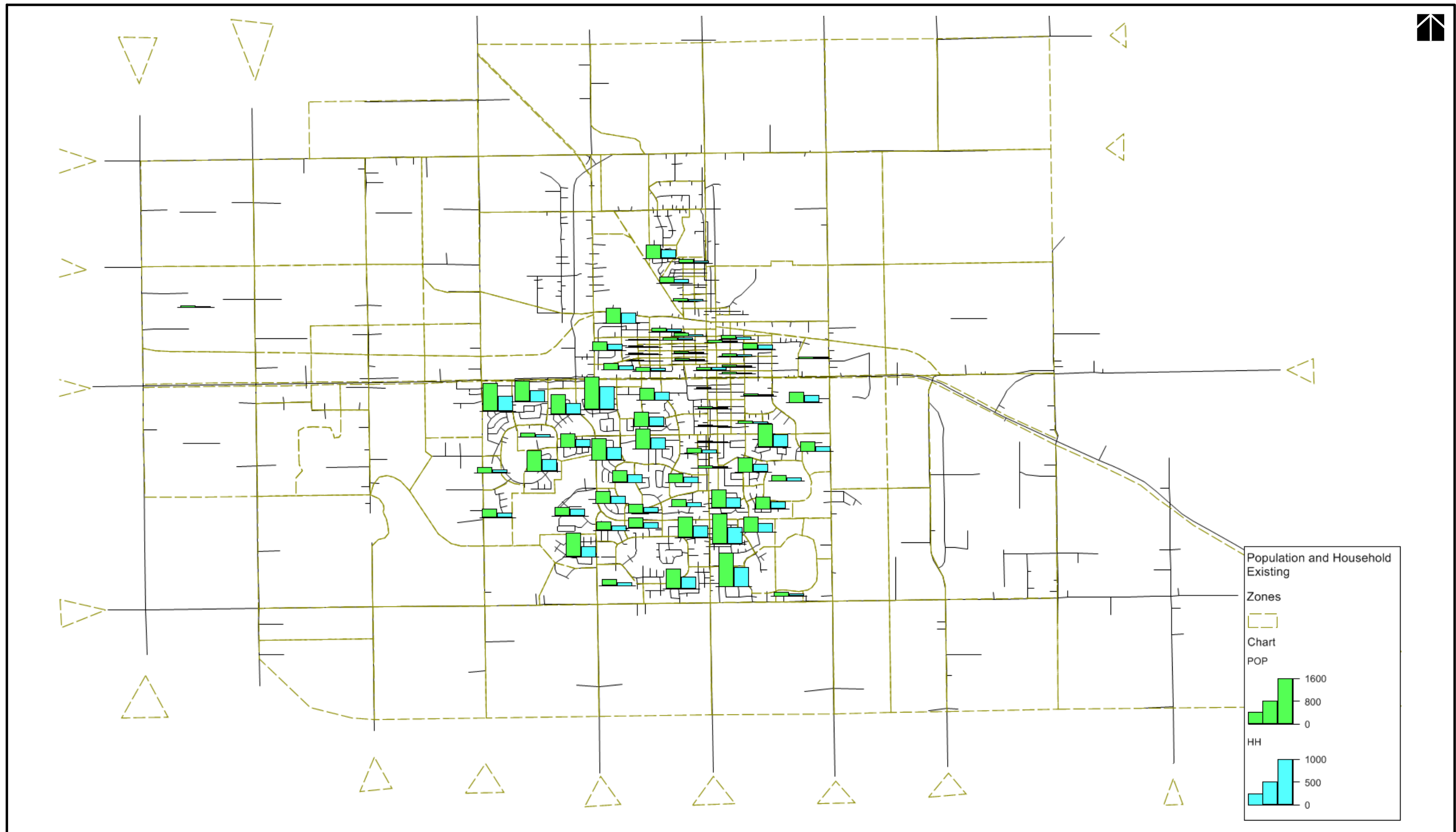
EXHIBIT_4.1A

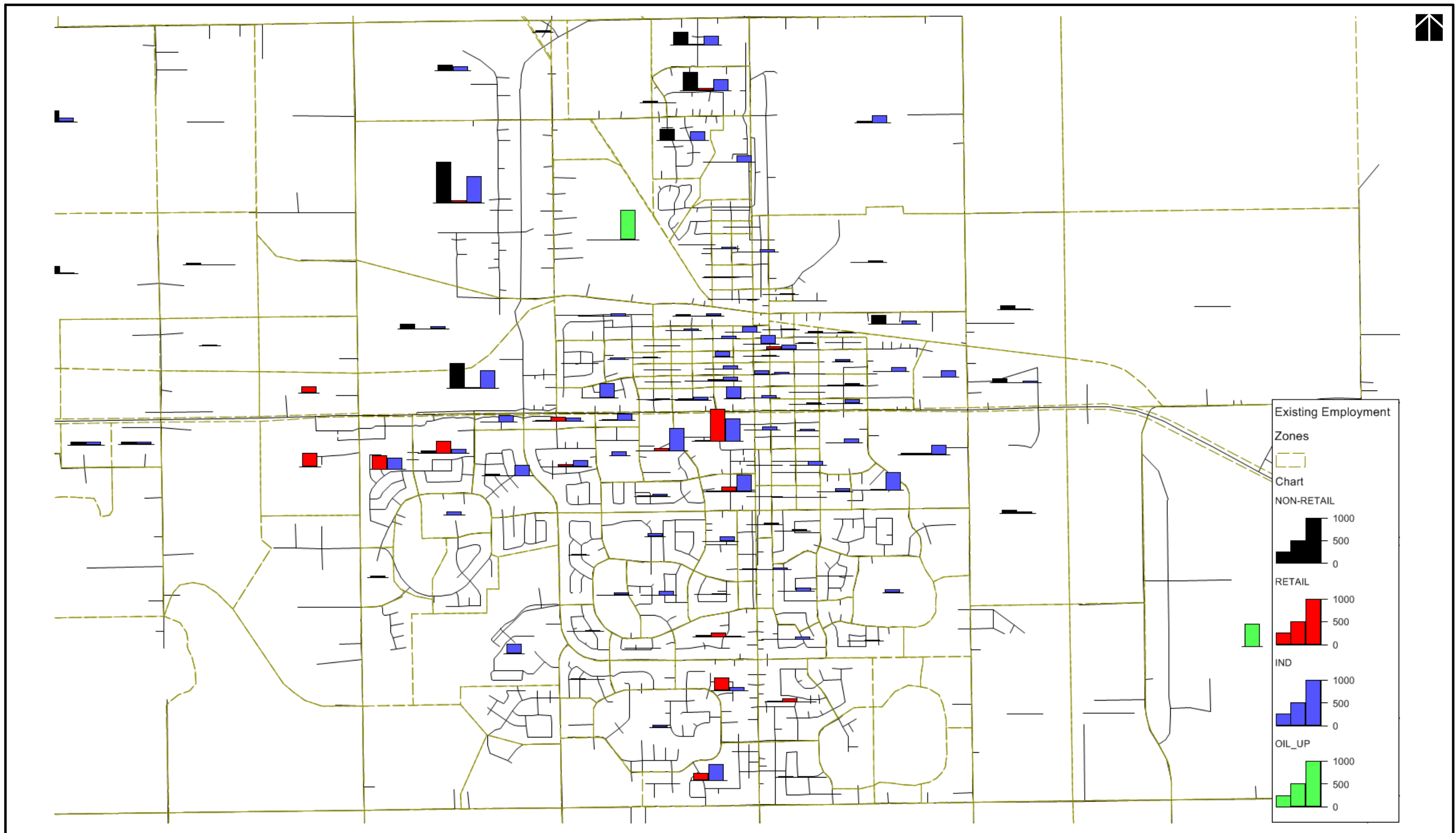


City of Lloydminster

Existing Household Population - City Wide

EXHIBIT_4.1

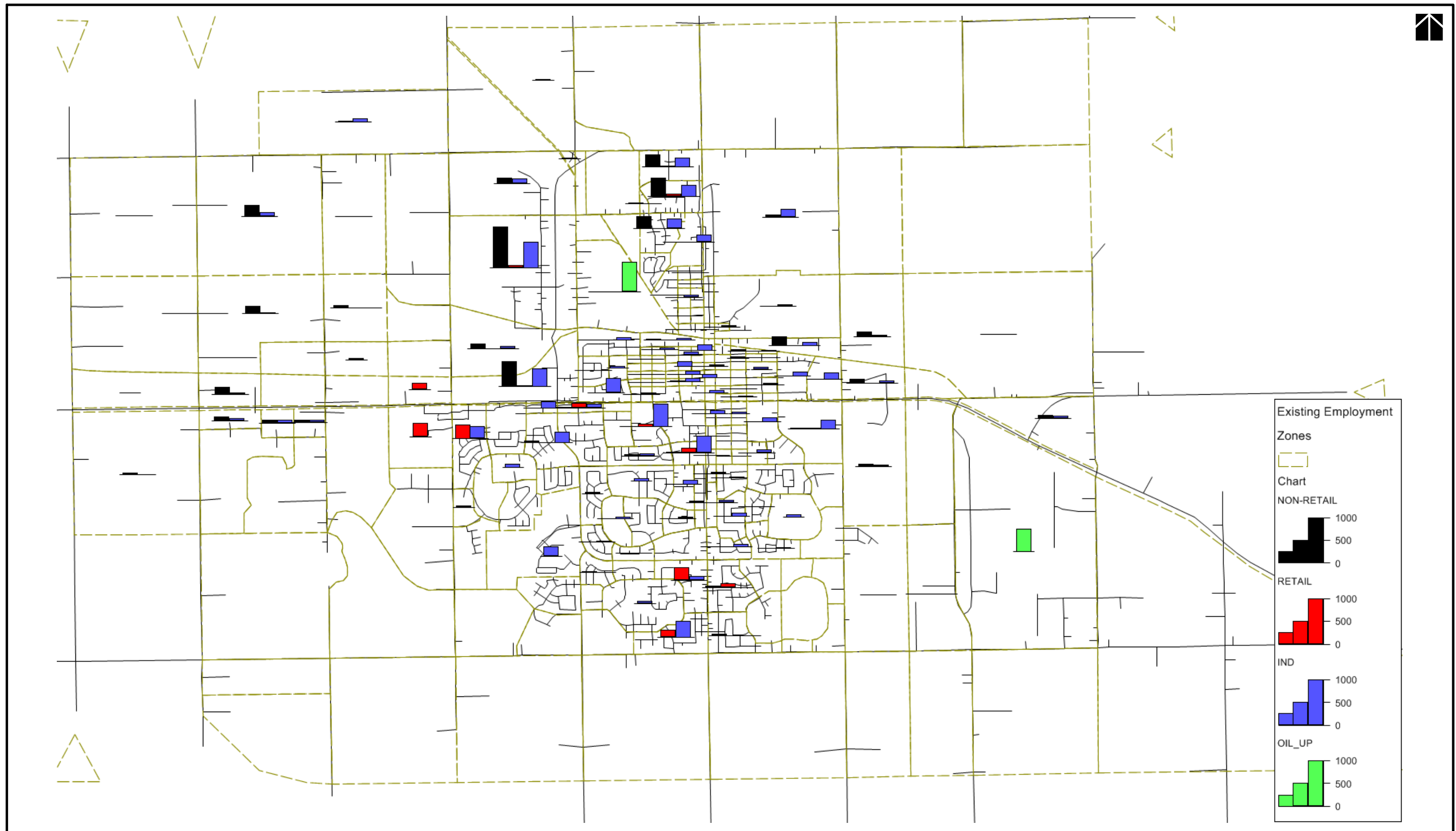


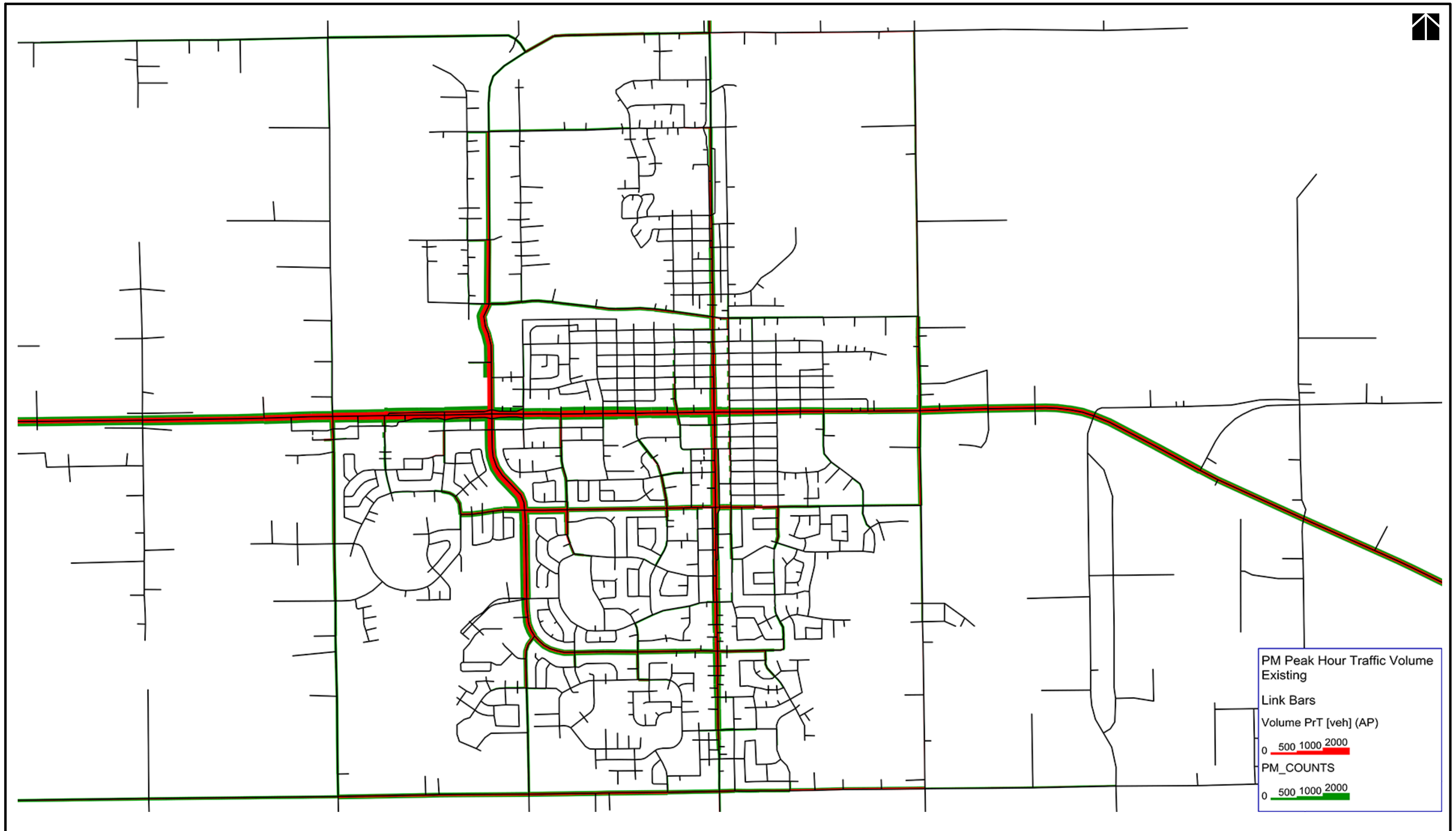


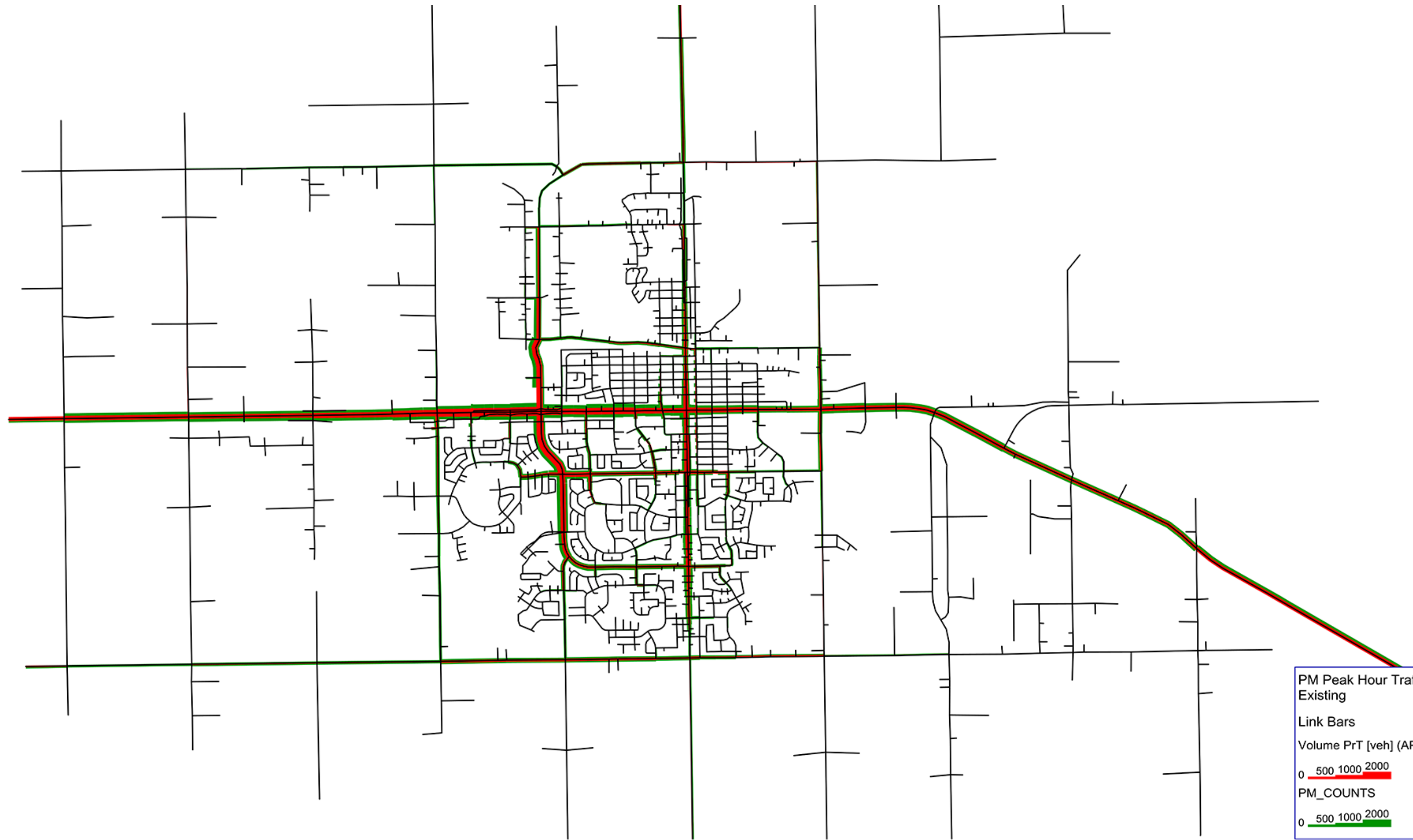
City of Lloydminster

Existing Employment - City Wide

EXHIBIT_4.3







PM Peak Hour Traffic Volume
Existing

Link Bars

Volume PrT [veh] (AP)

0 500 1000 2000

PM_COUNTS

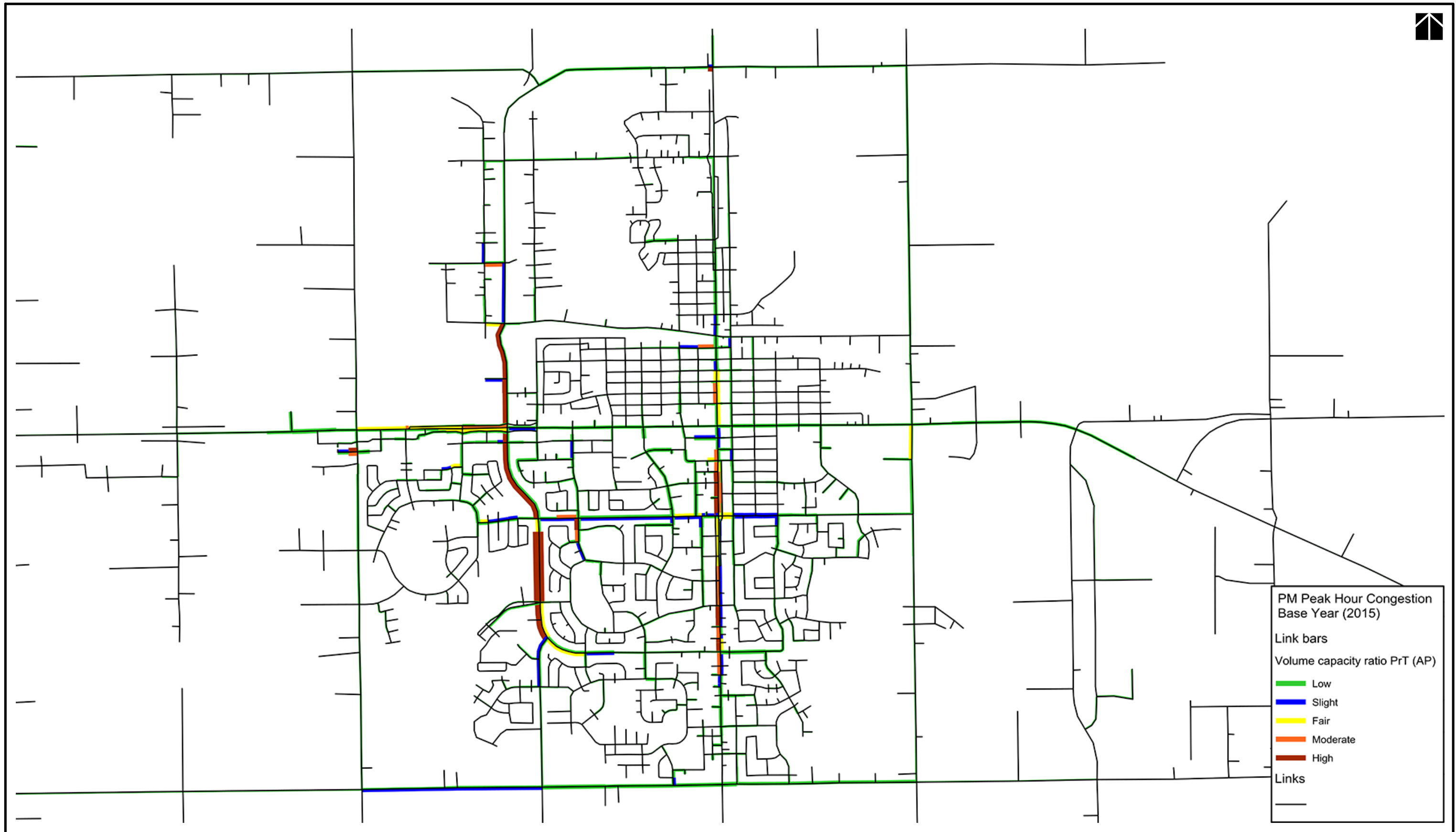
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City of Lloydminster

EXHIBIT_4.6

Existing Traffic Volumes - Region Wide

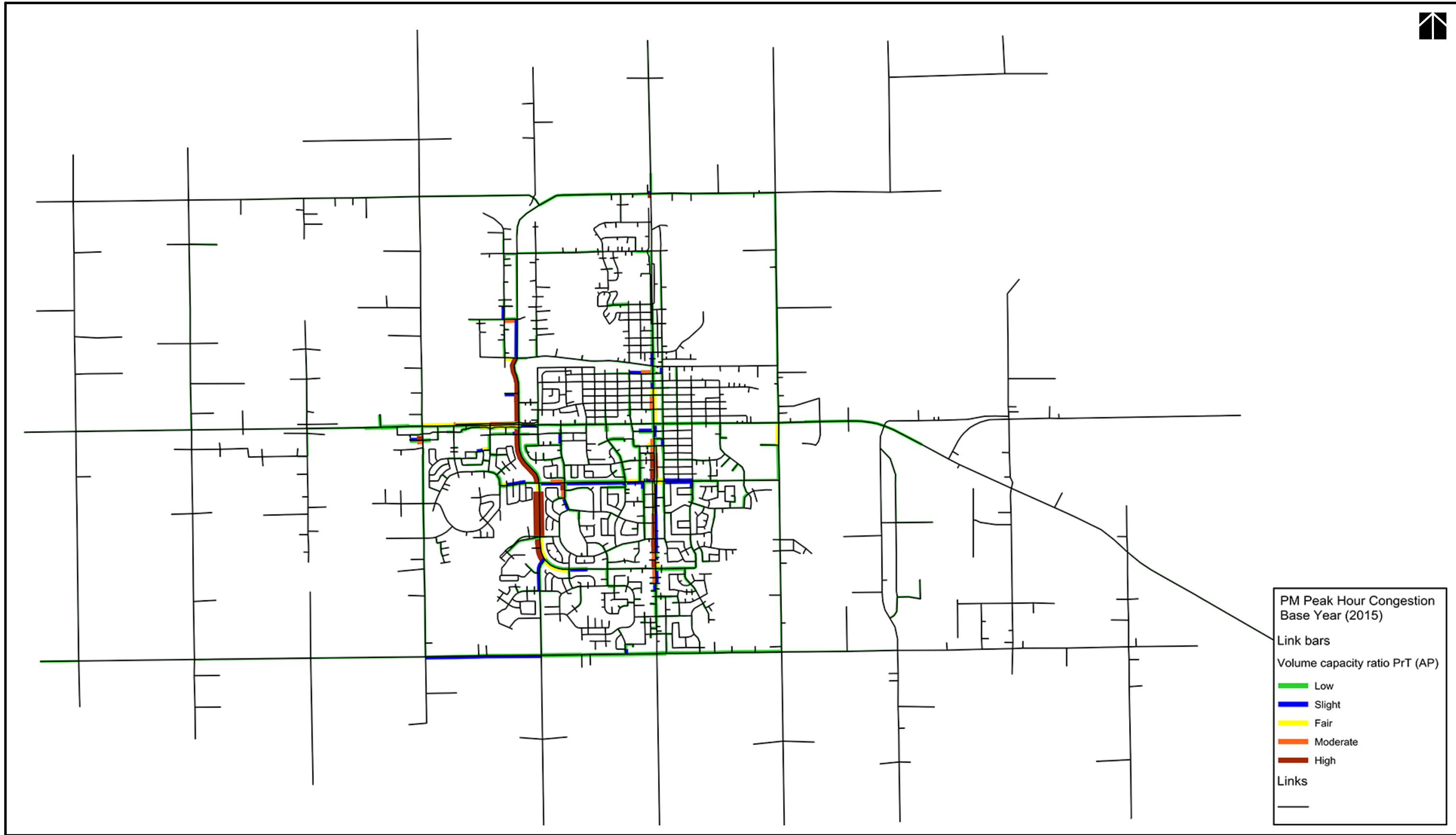




City of Lloydminster

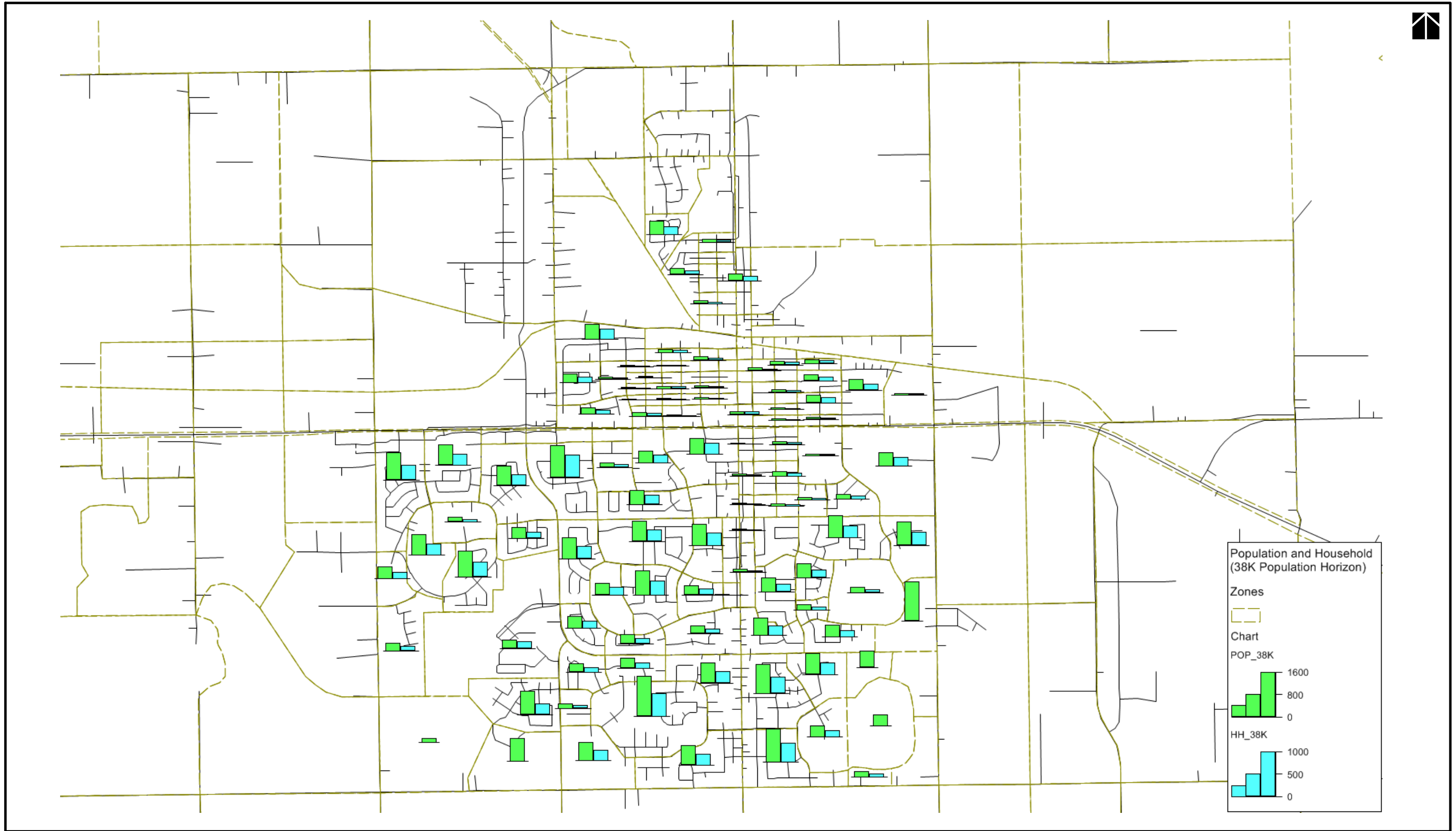
EXHIBIT_4.7

Existing Volume To Capacity Ratio - City Wide



City of Lloydminster

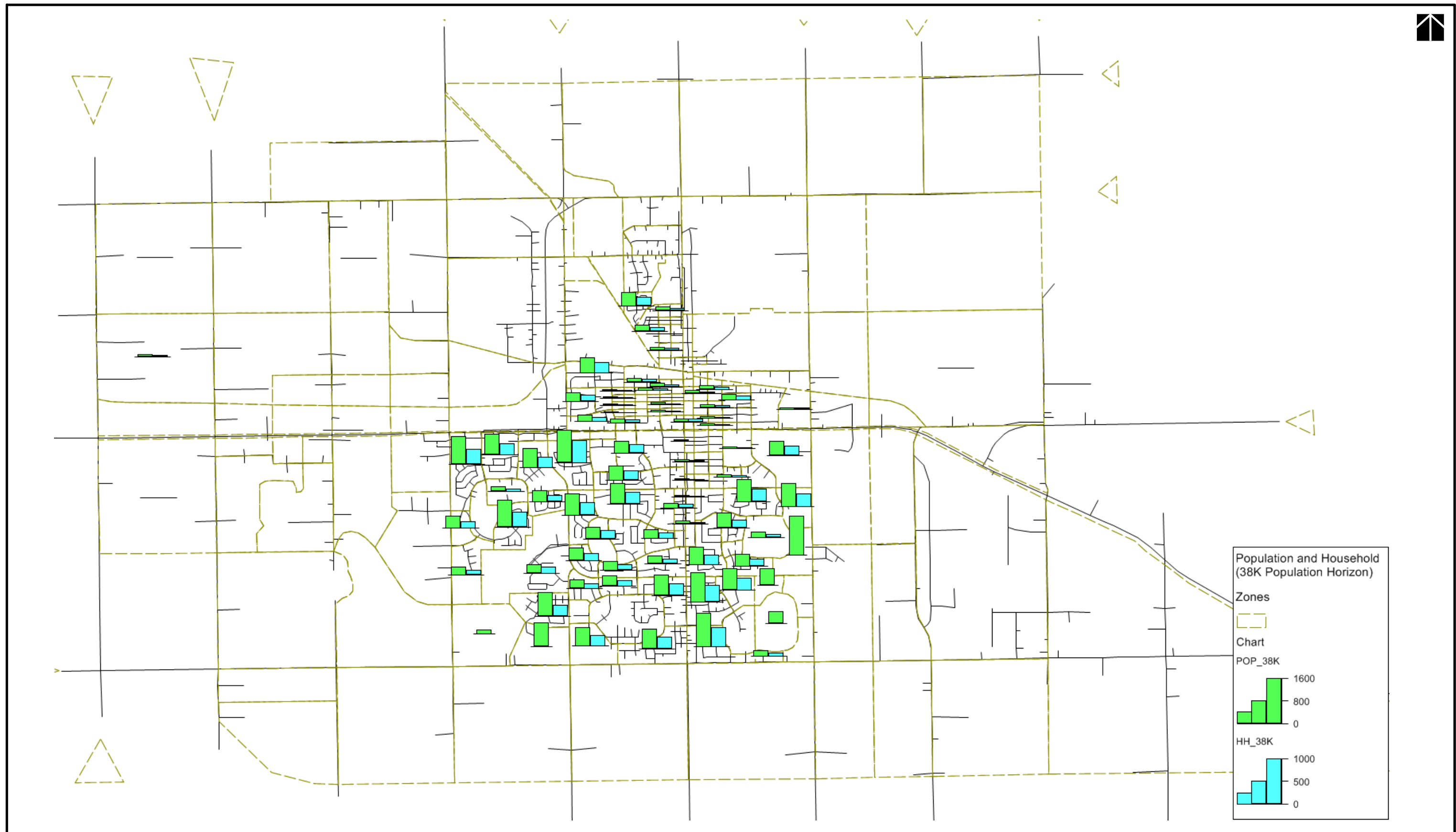
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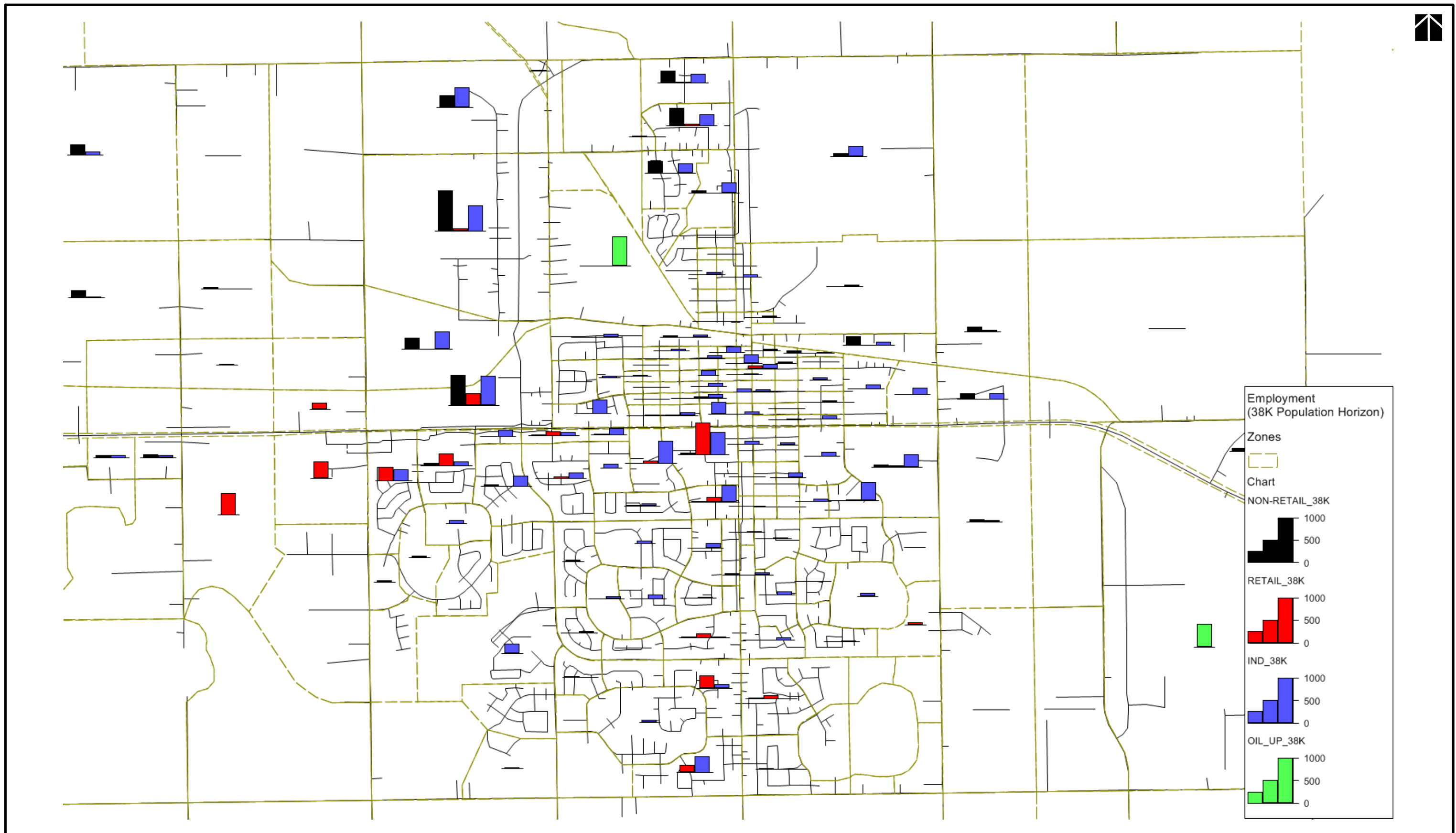


City of Lloydminster

38,000 Household Population - City Wide

EXHIBIT_4.9

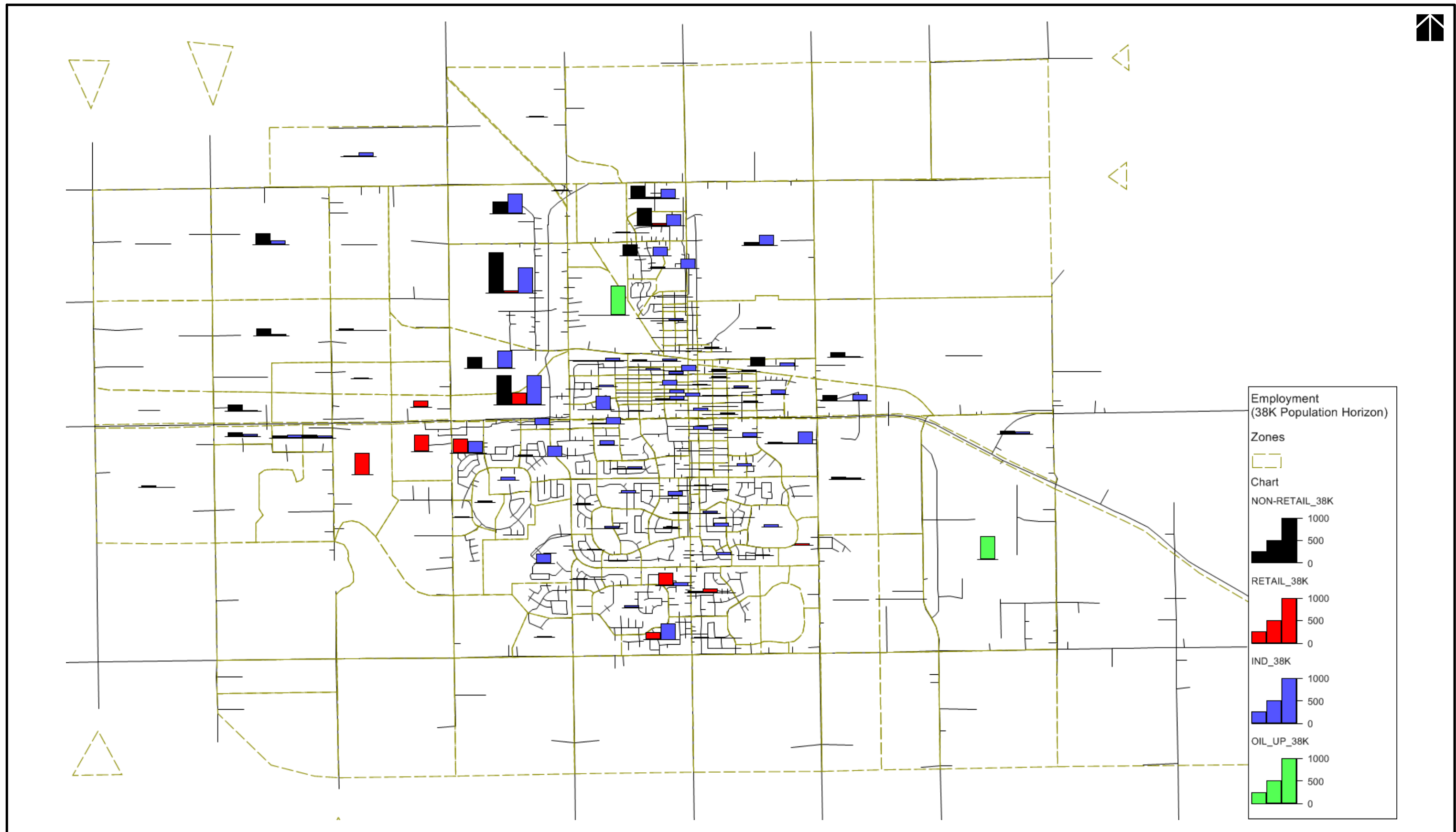


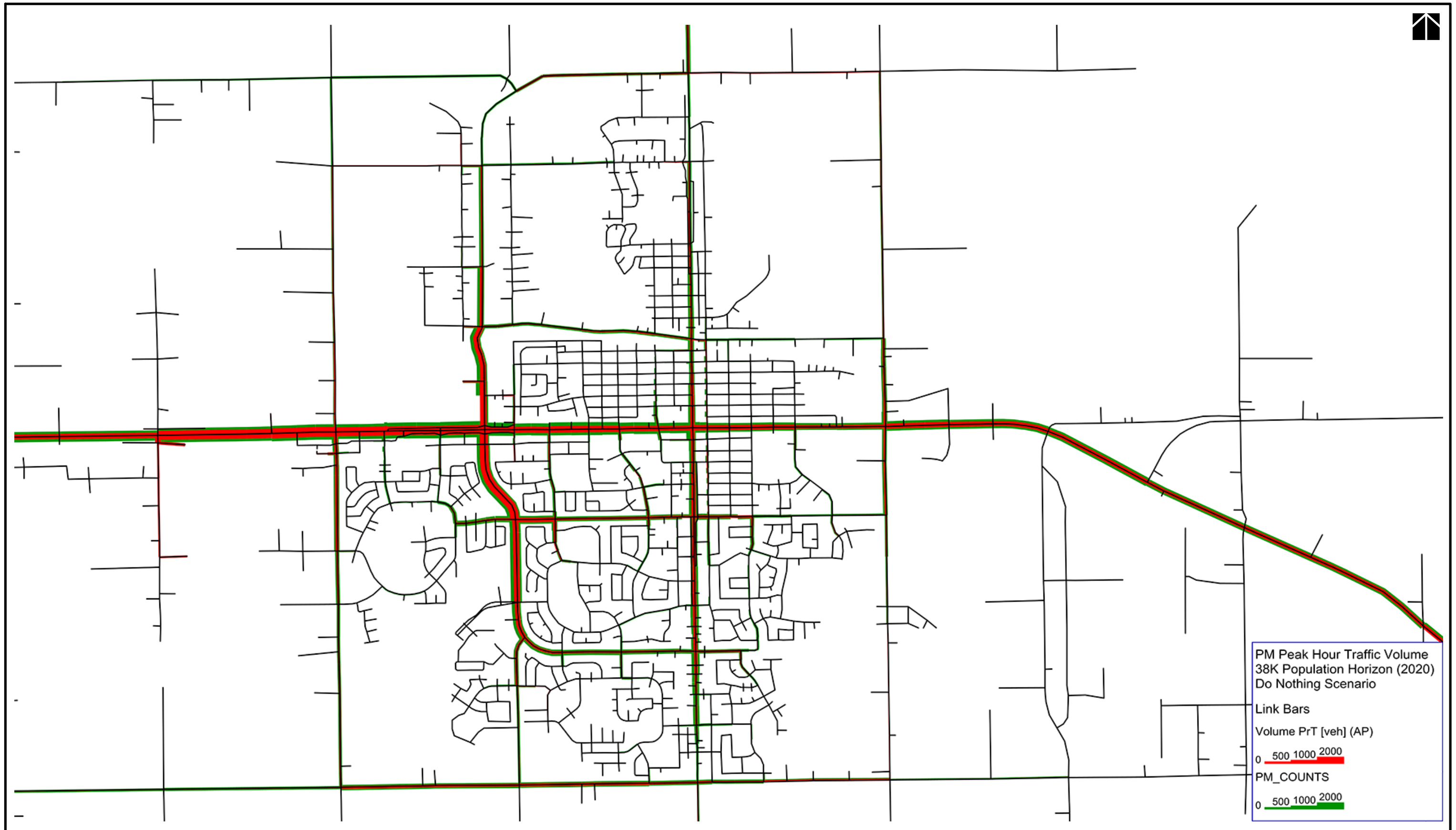


City of Lloydminster

38,000 Population's Employment - City Wide

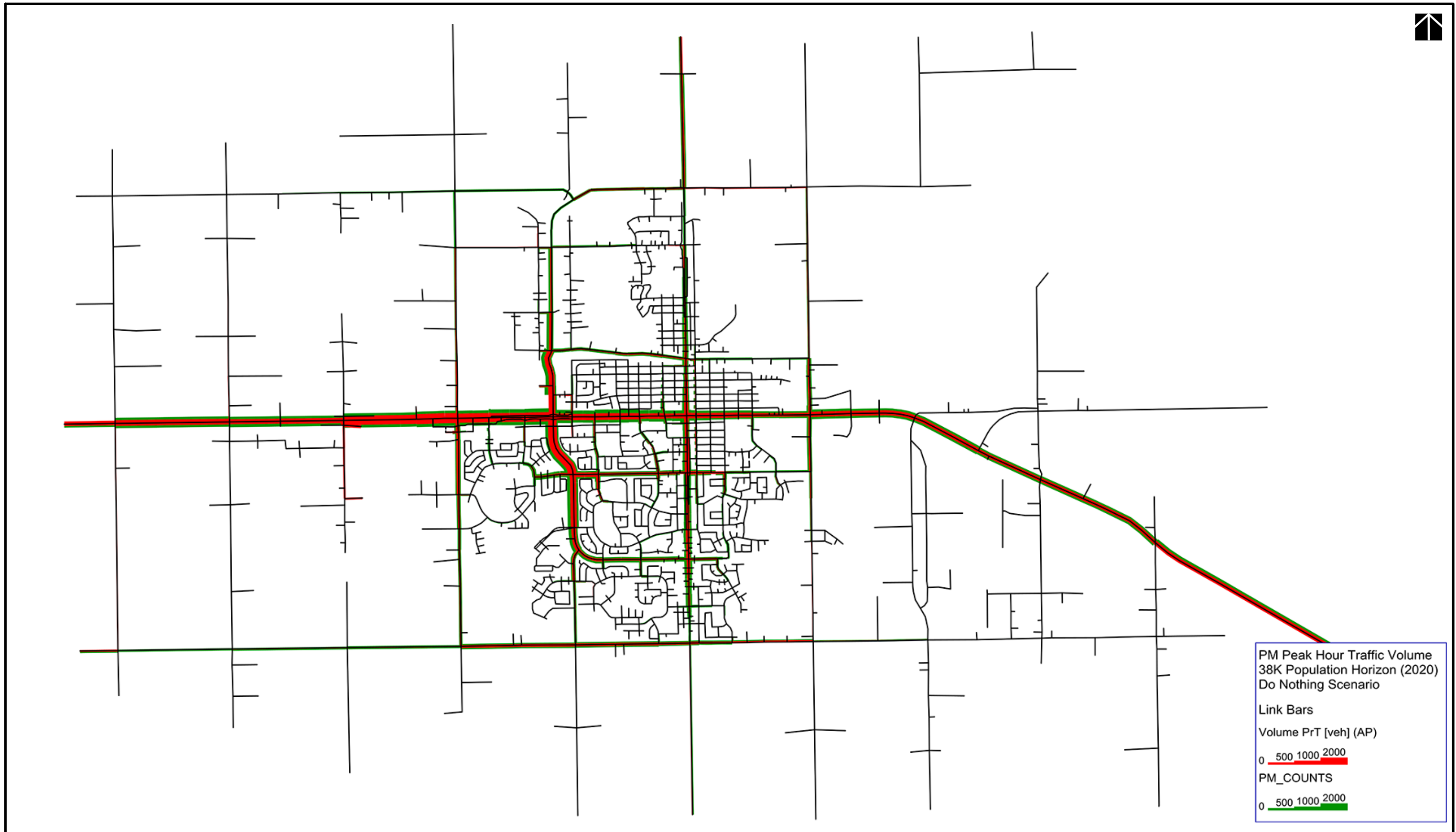
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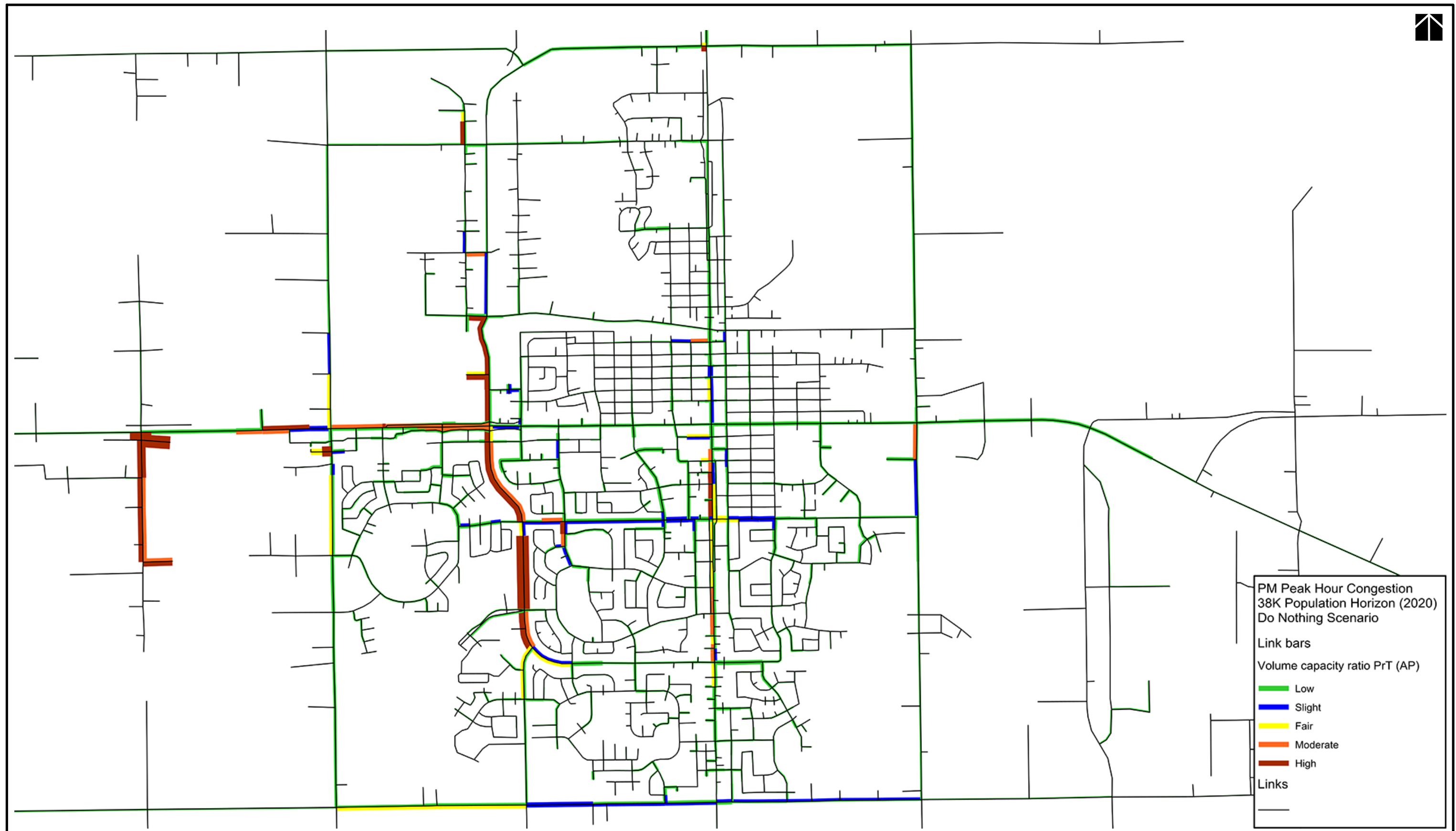
City of Lloydminster

EXHIBIT_4.13



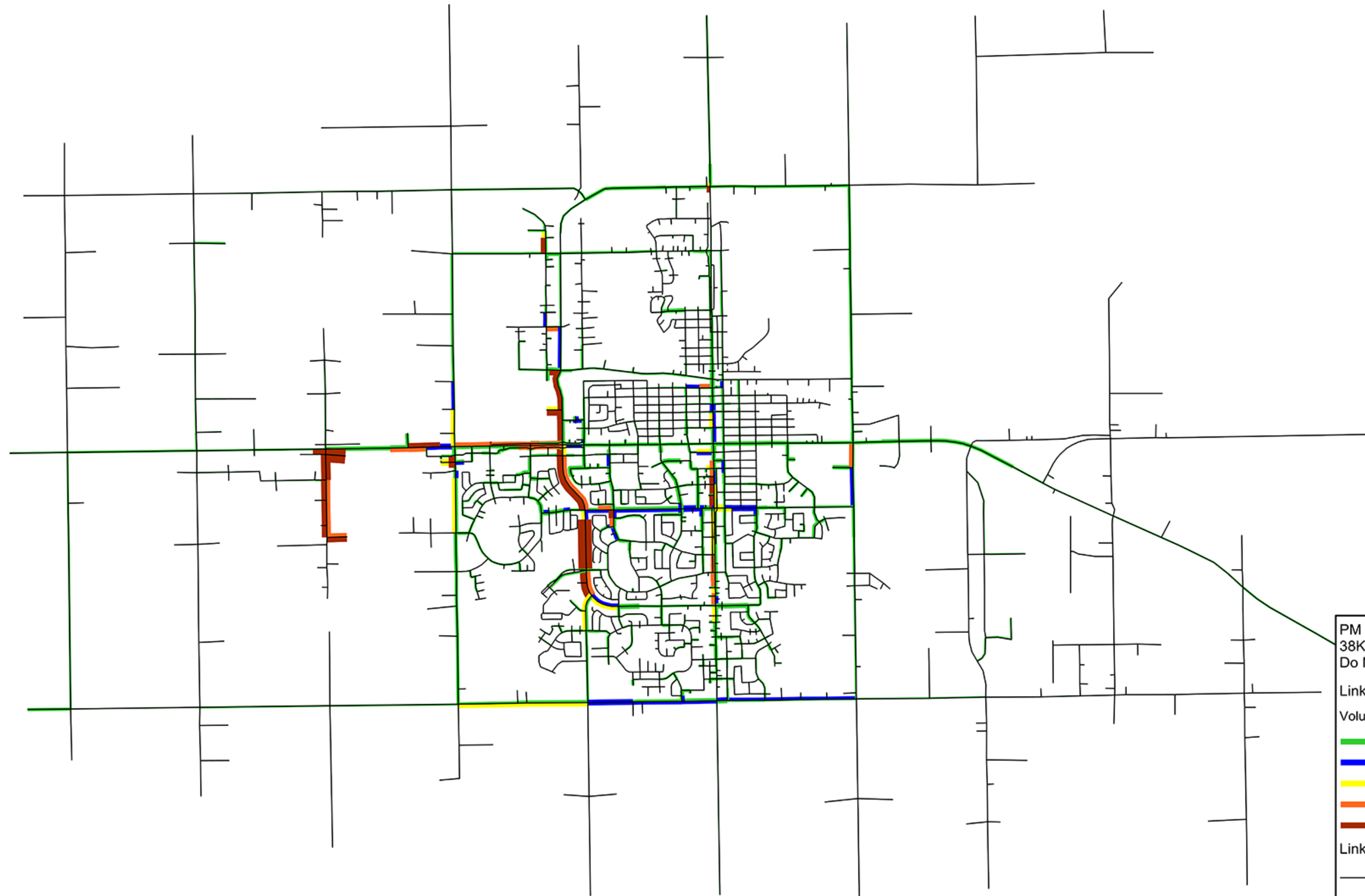
City of Lloydminster

EXHIBIT_4.14



City of Lloydminster

EXHIBIT_4.15



PM Peak Hour Congestion
38K Population Horizon (2020)
Do Nothing Scenario

Link bars

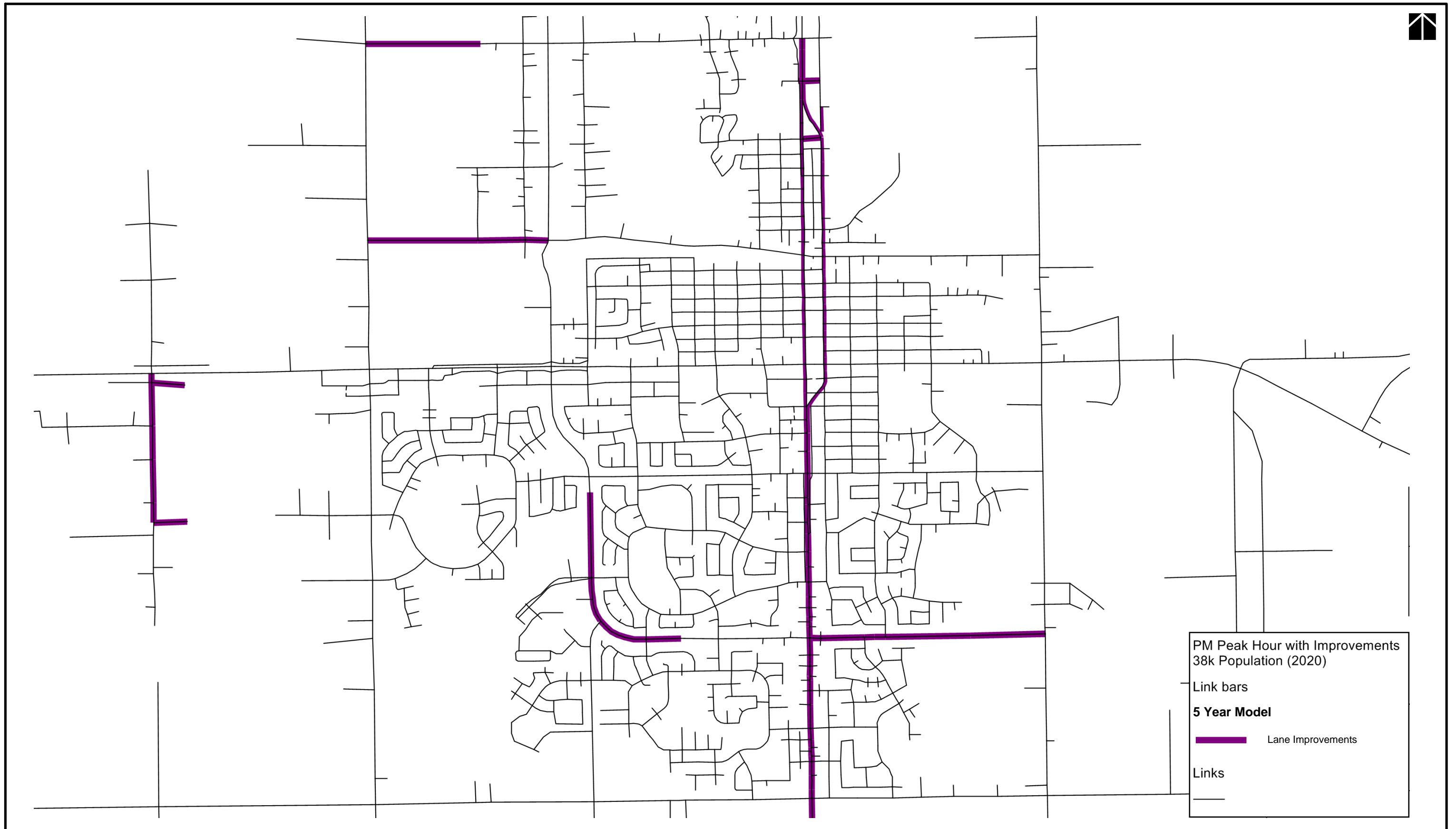
Volume capacity ratio PrT (AP)

- Low
- Slight
- Fair
- Moderate
- High

Links

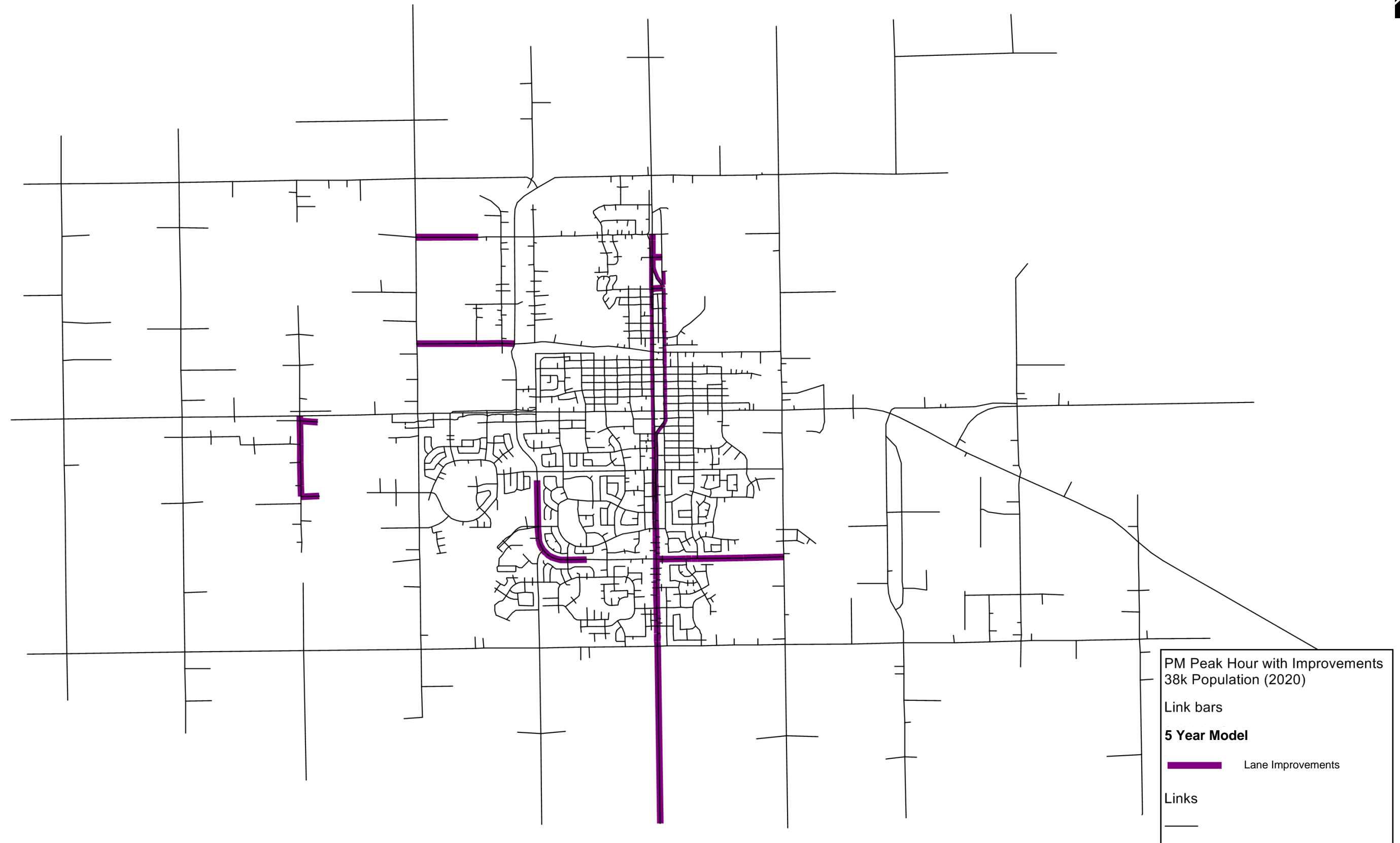
City of Lloydminster

EXHIBIT_4.16



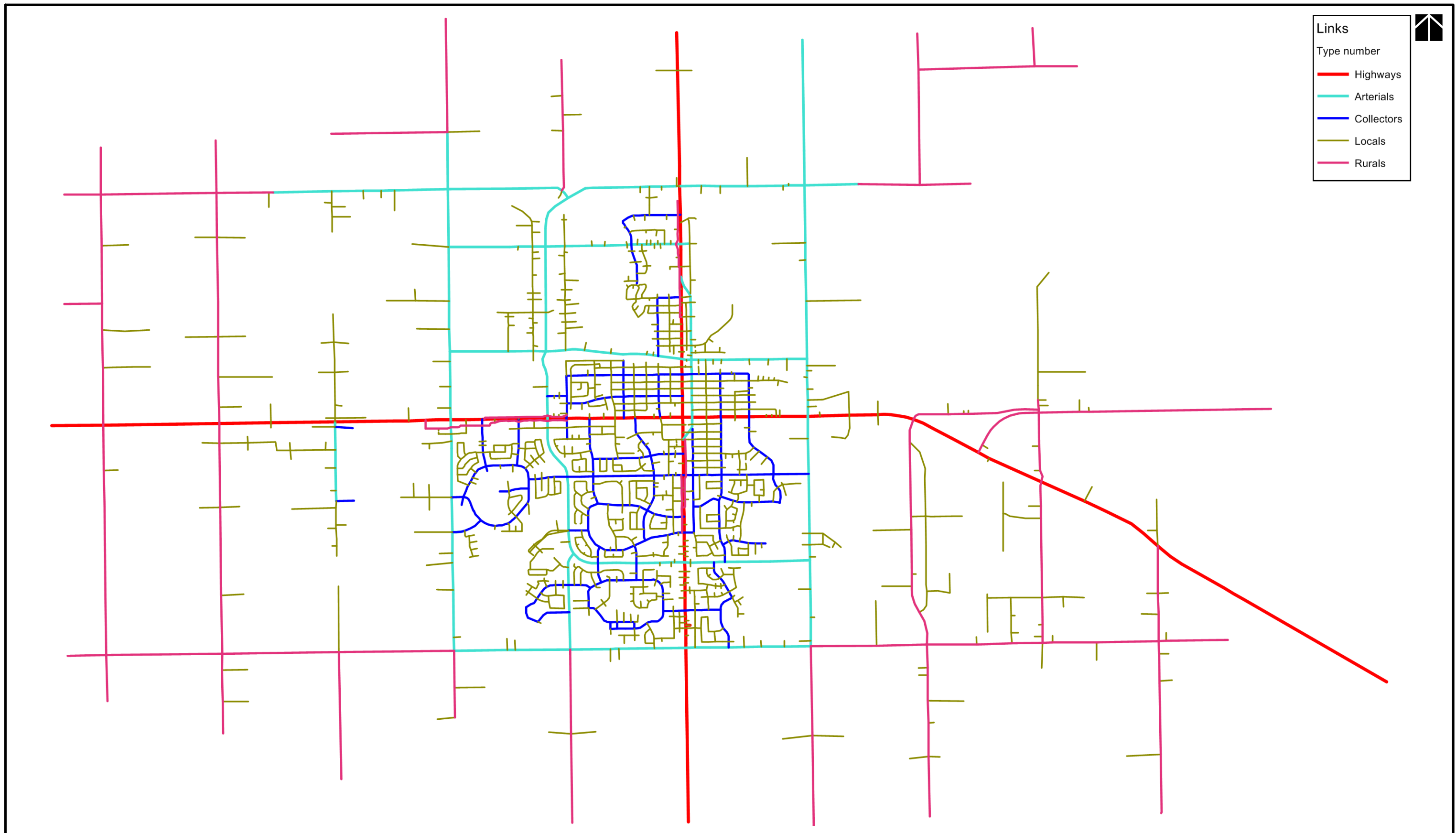
City of Lloydminster

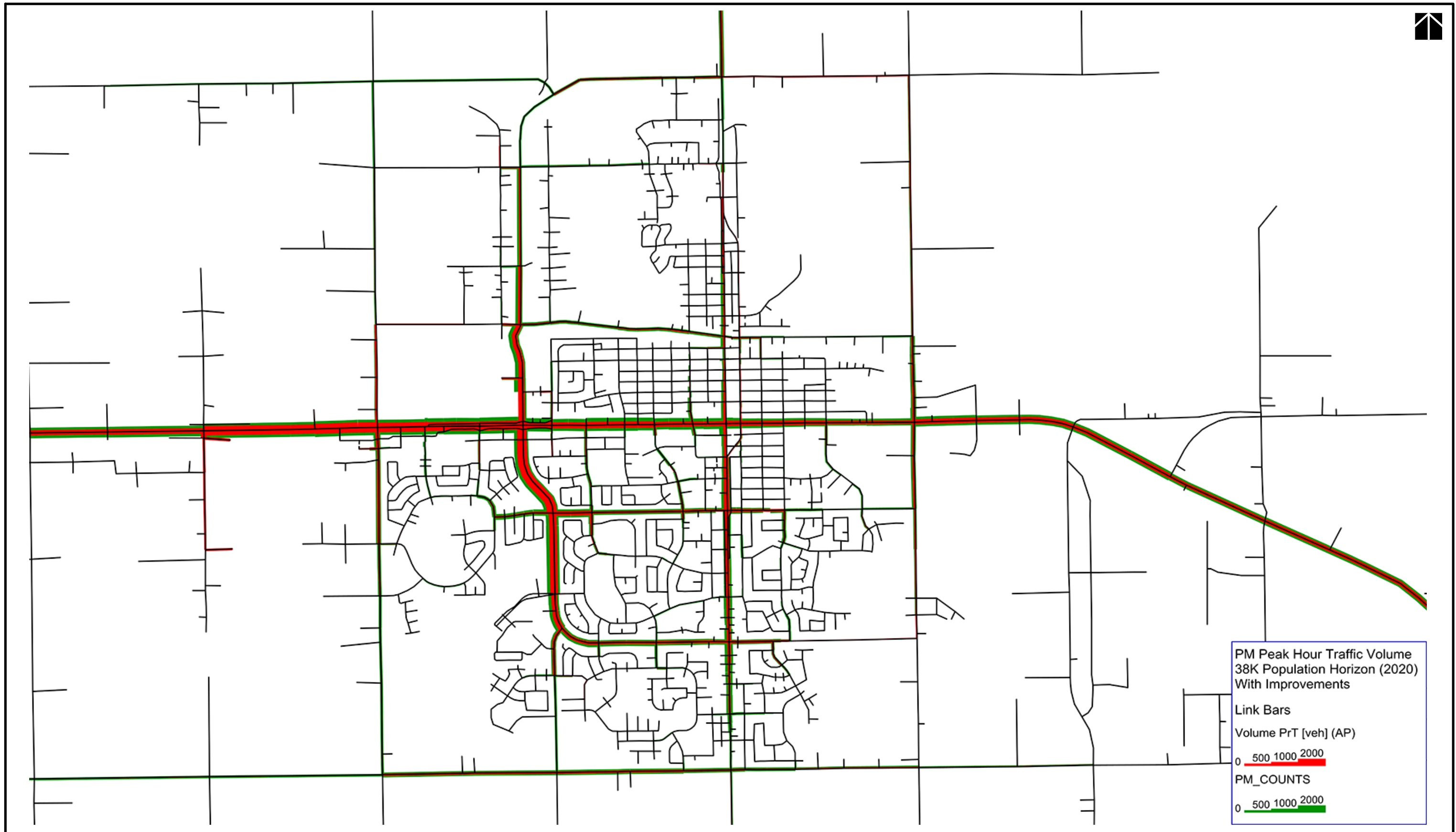
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City of Lloydminster

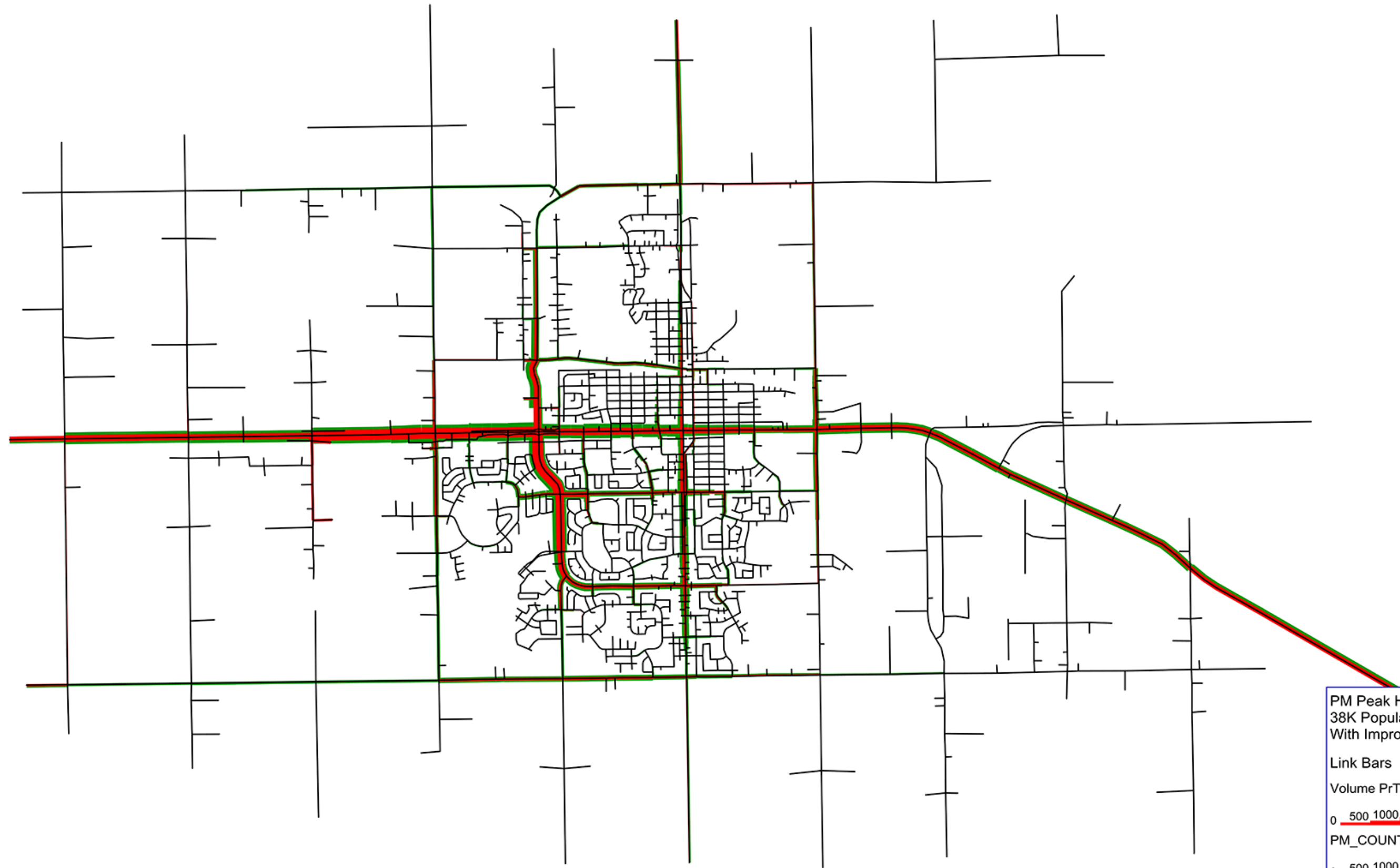
EXHIBIT_4.18





City of Lloydminster

EXHIBIT_4.19



PM Peak Hour Traffic Volume
38K Population Horizon (2020)
With Improvements

Link Bars

Volume PrT [veh] (AP)

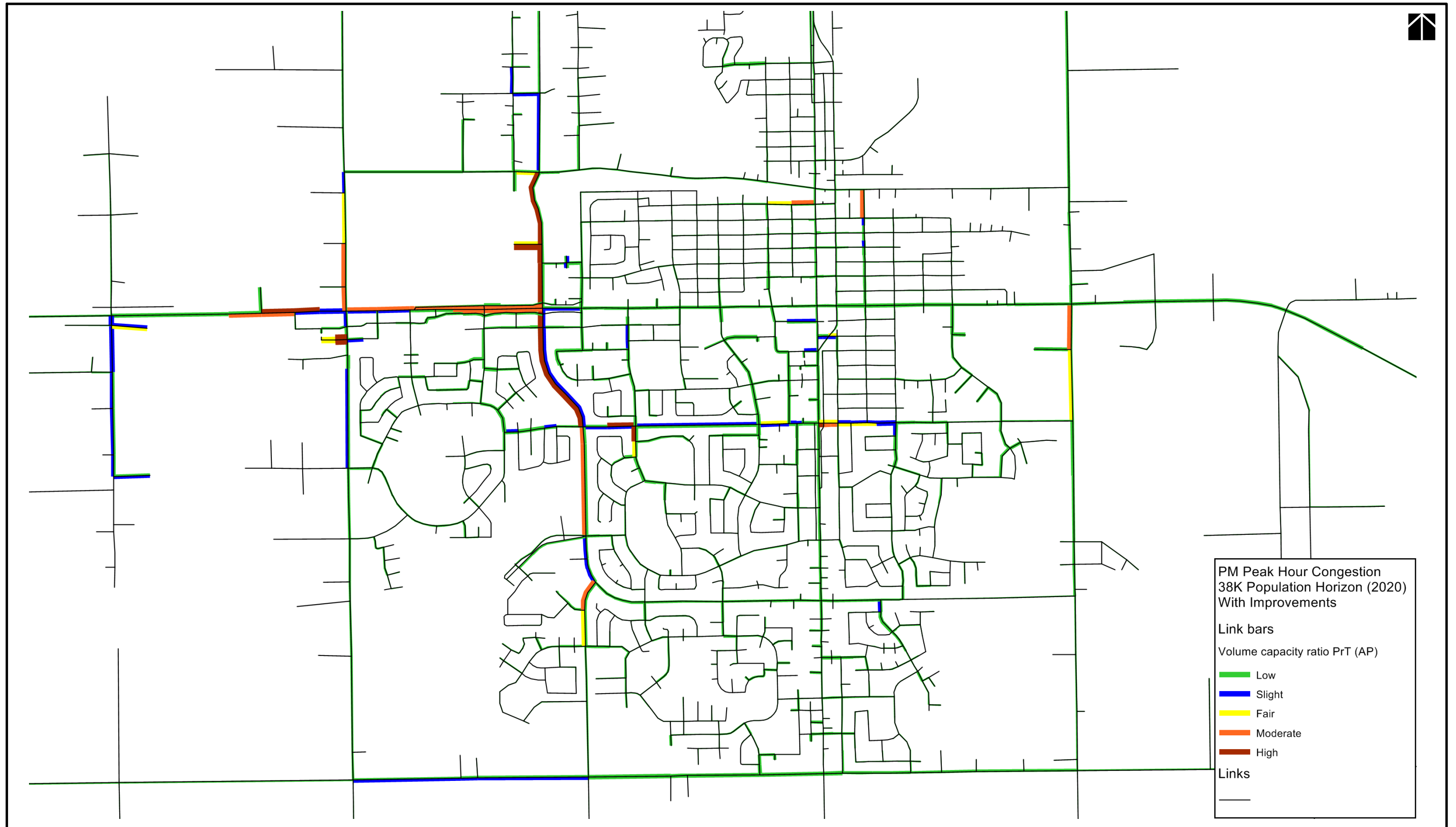
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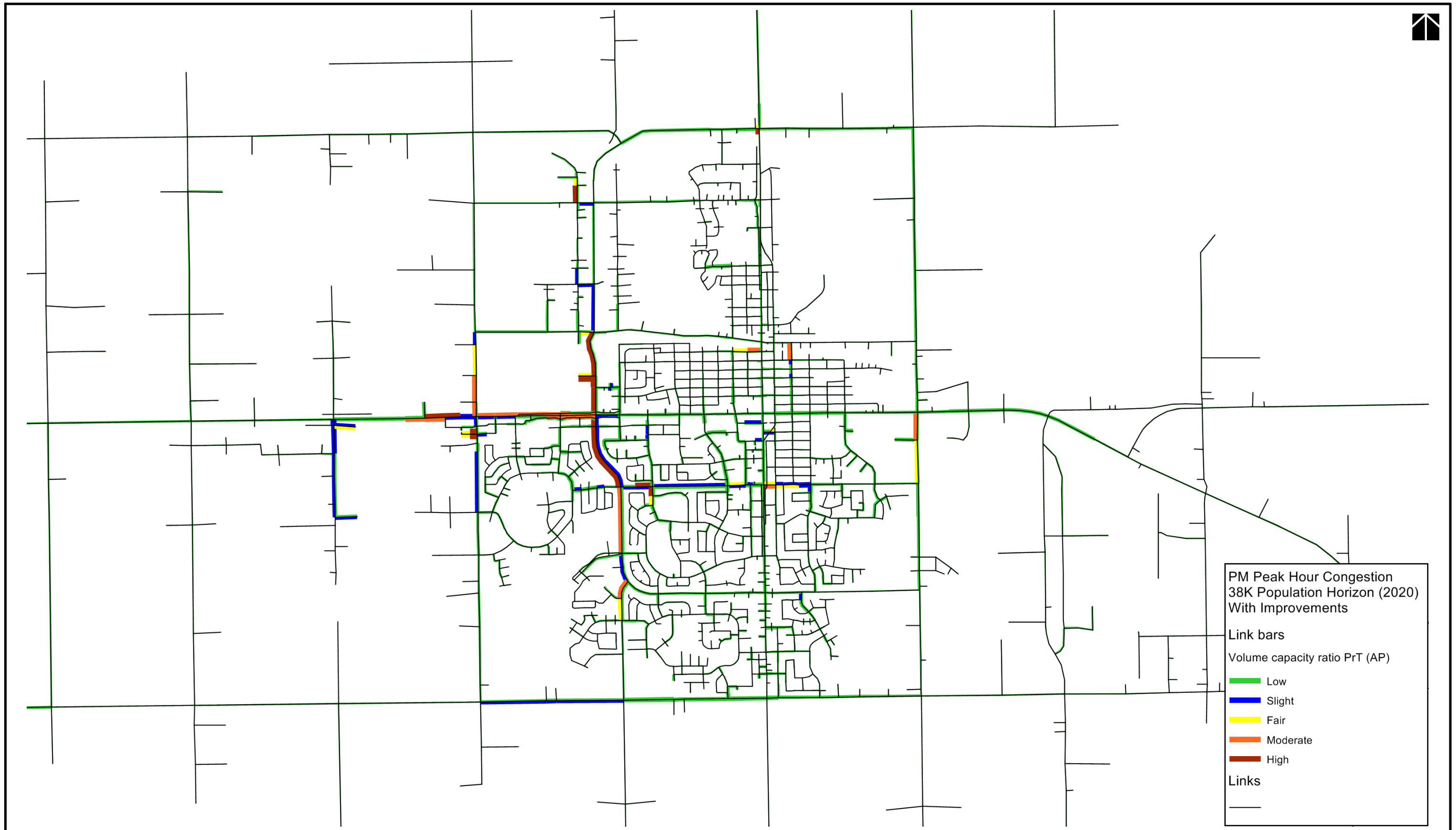
PM_COUNTS

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City of Lloydminster

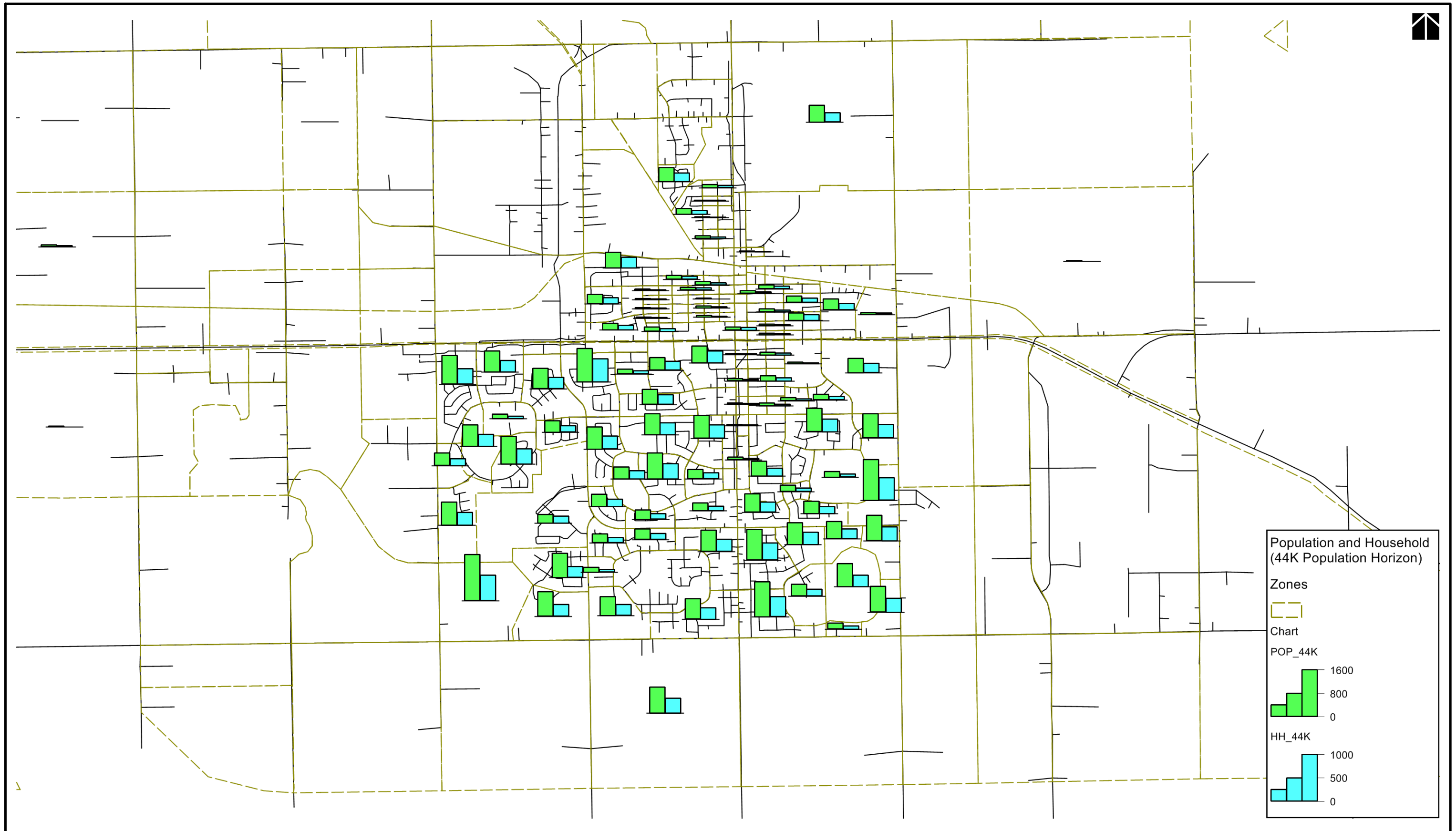
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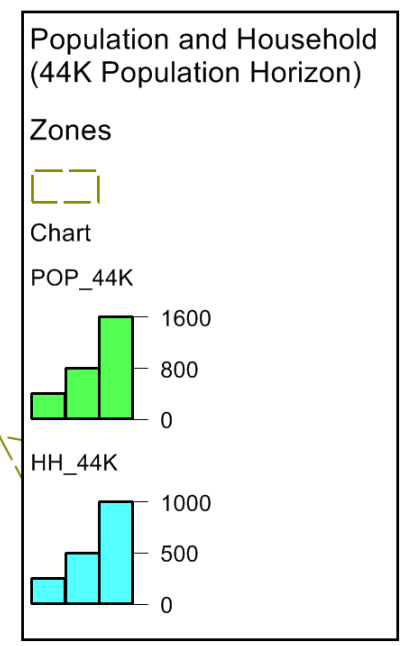
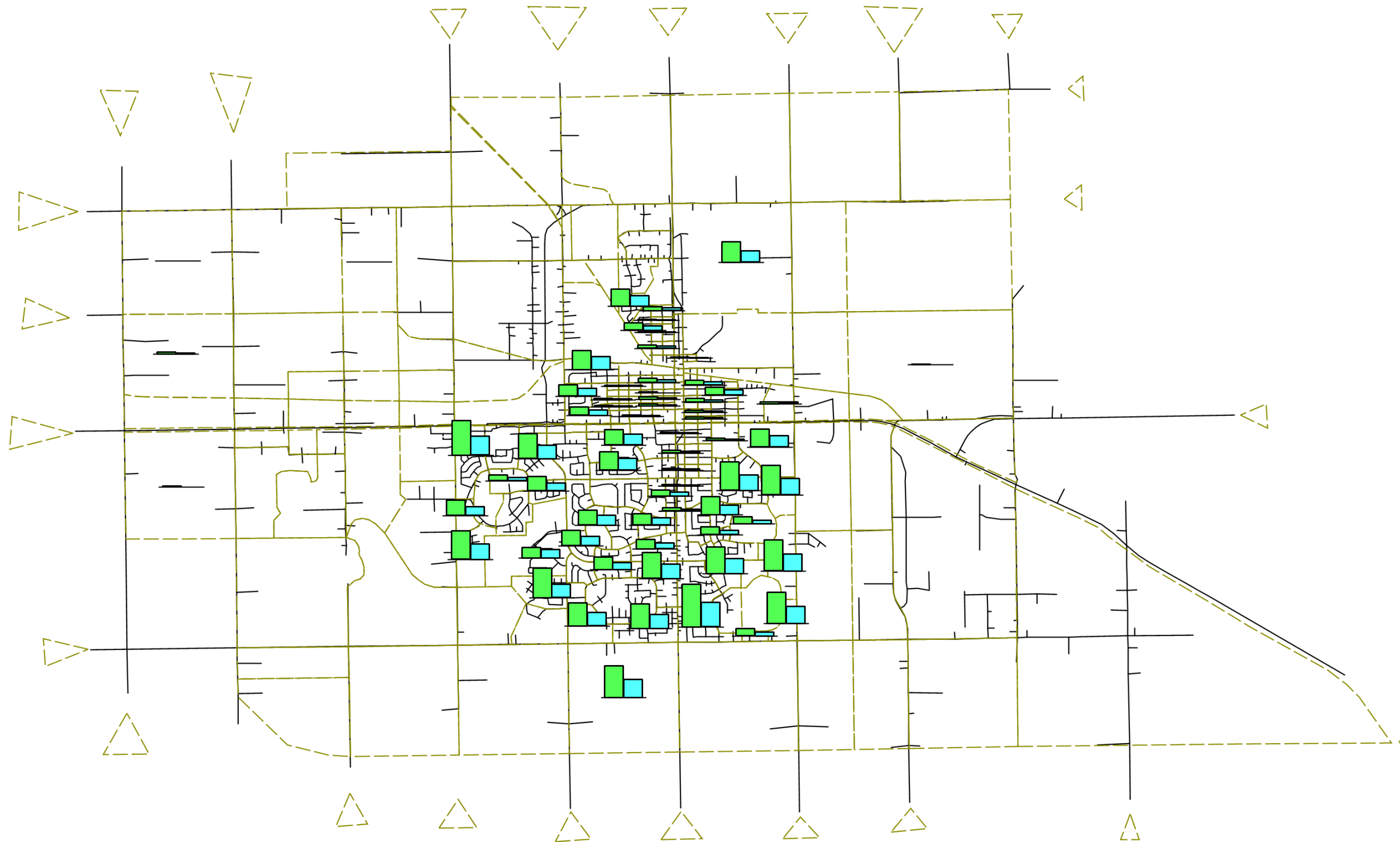


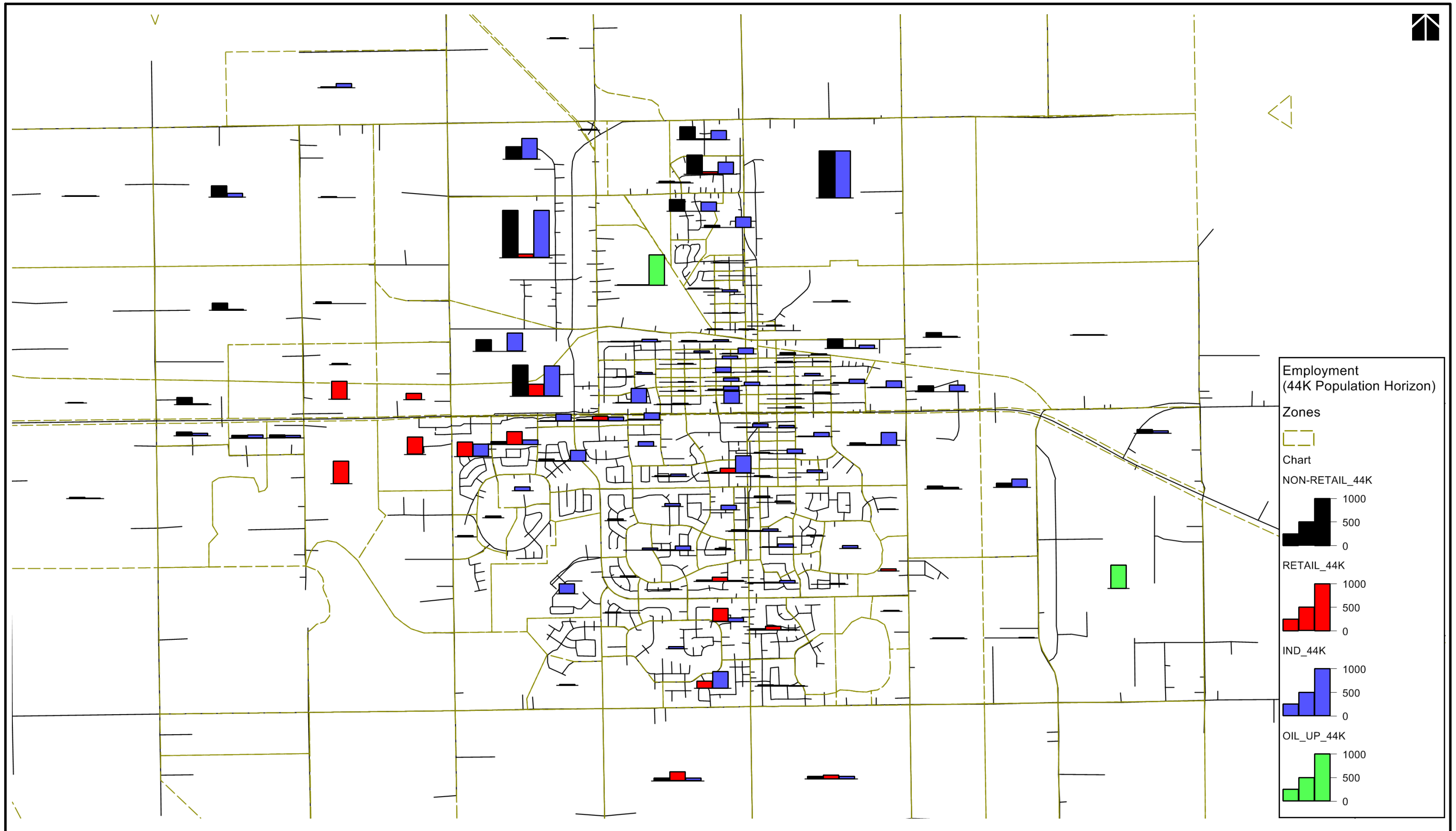


City of Lloydminster

EXHIBIT_4.22



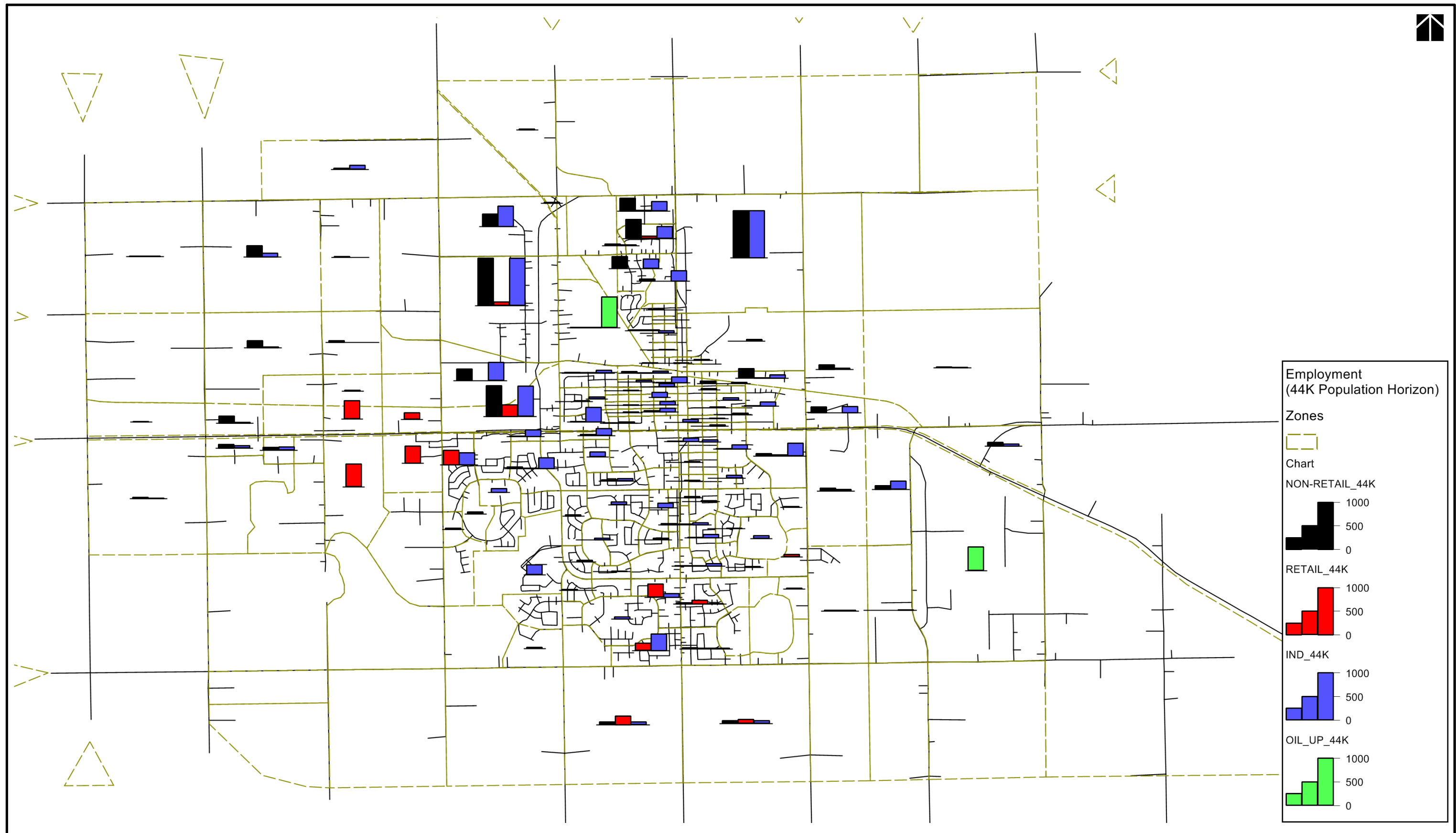


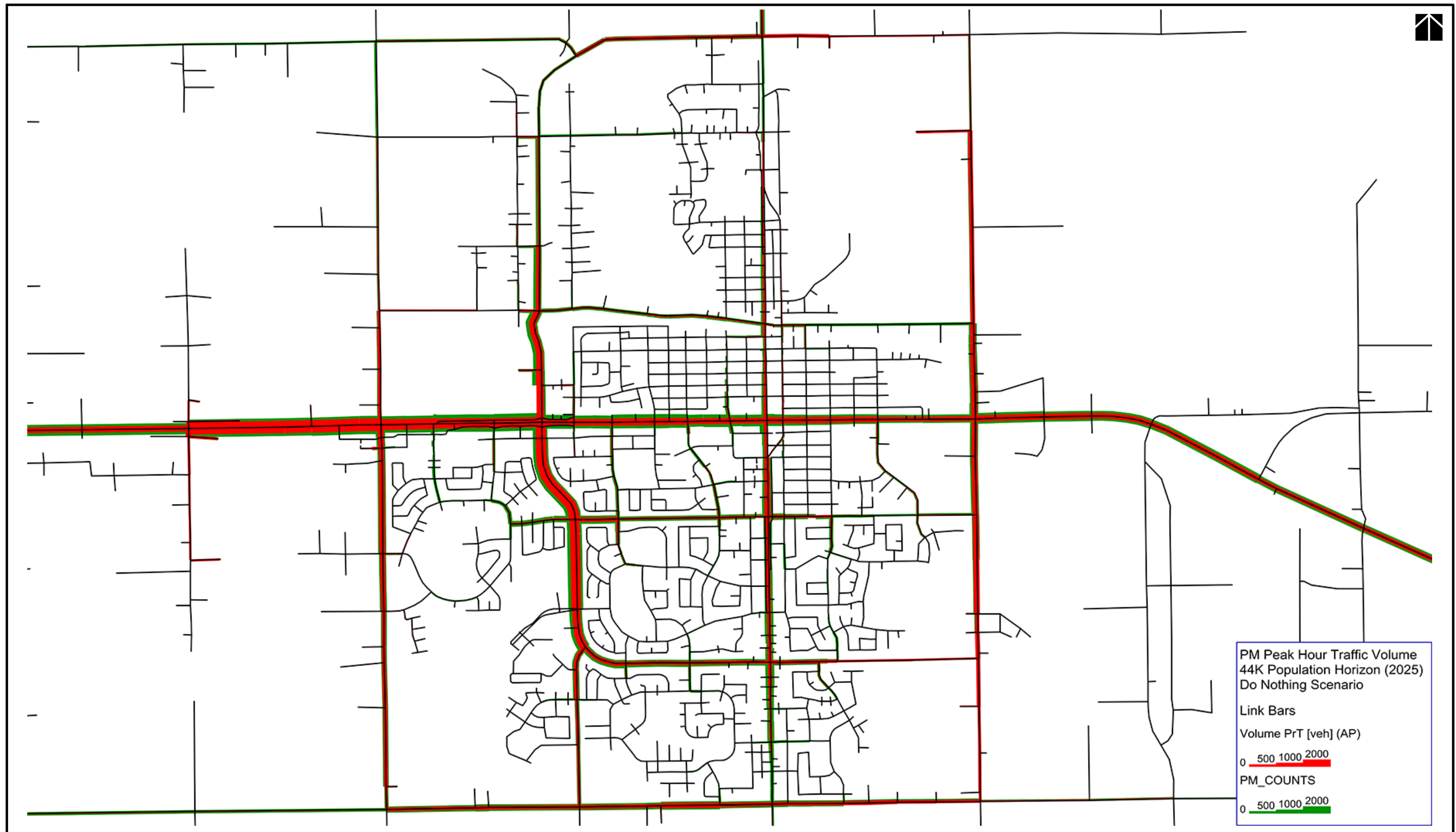


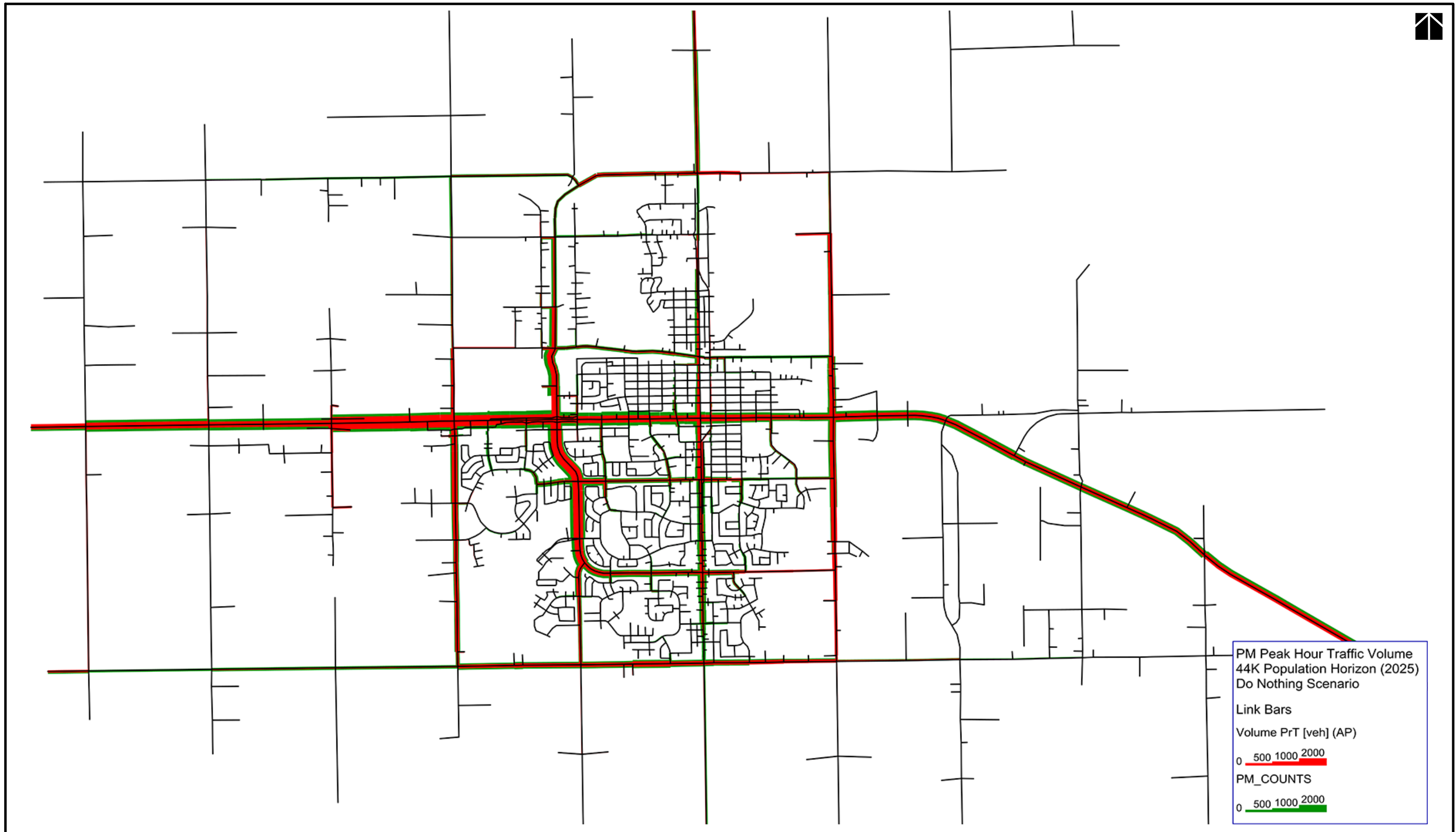
City of Lloydminster

44,000 Population's Employment - City Wide

EXHIBIT_4.25

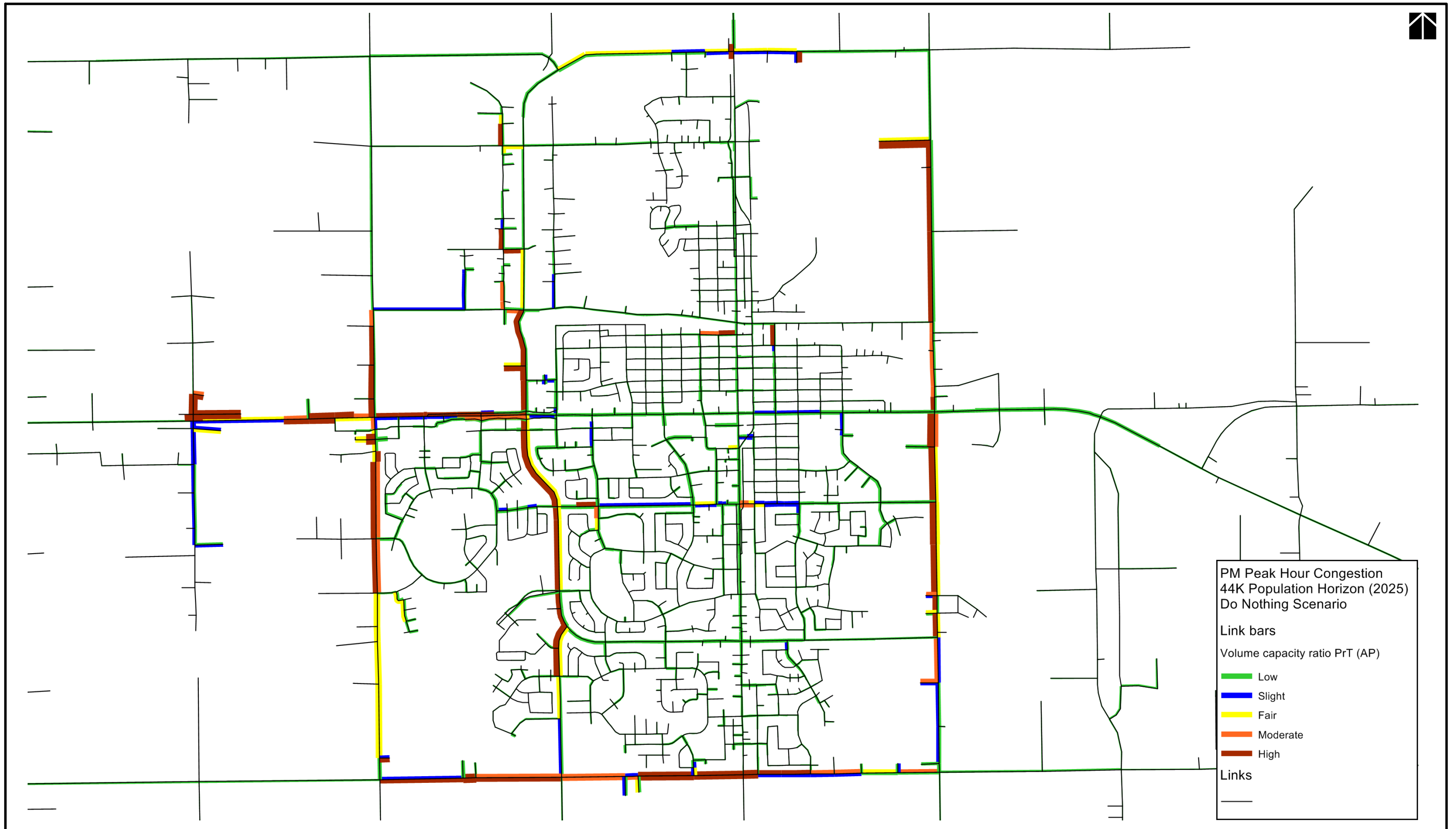






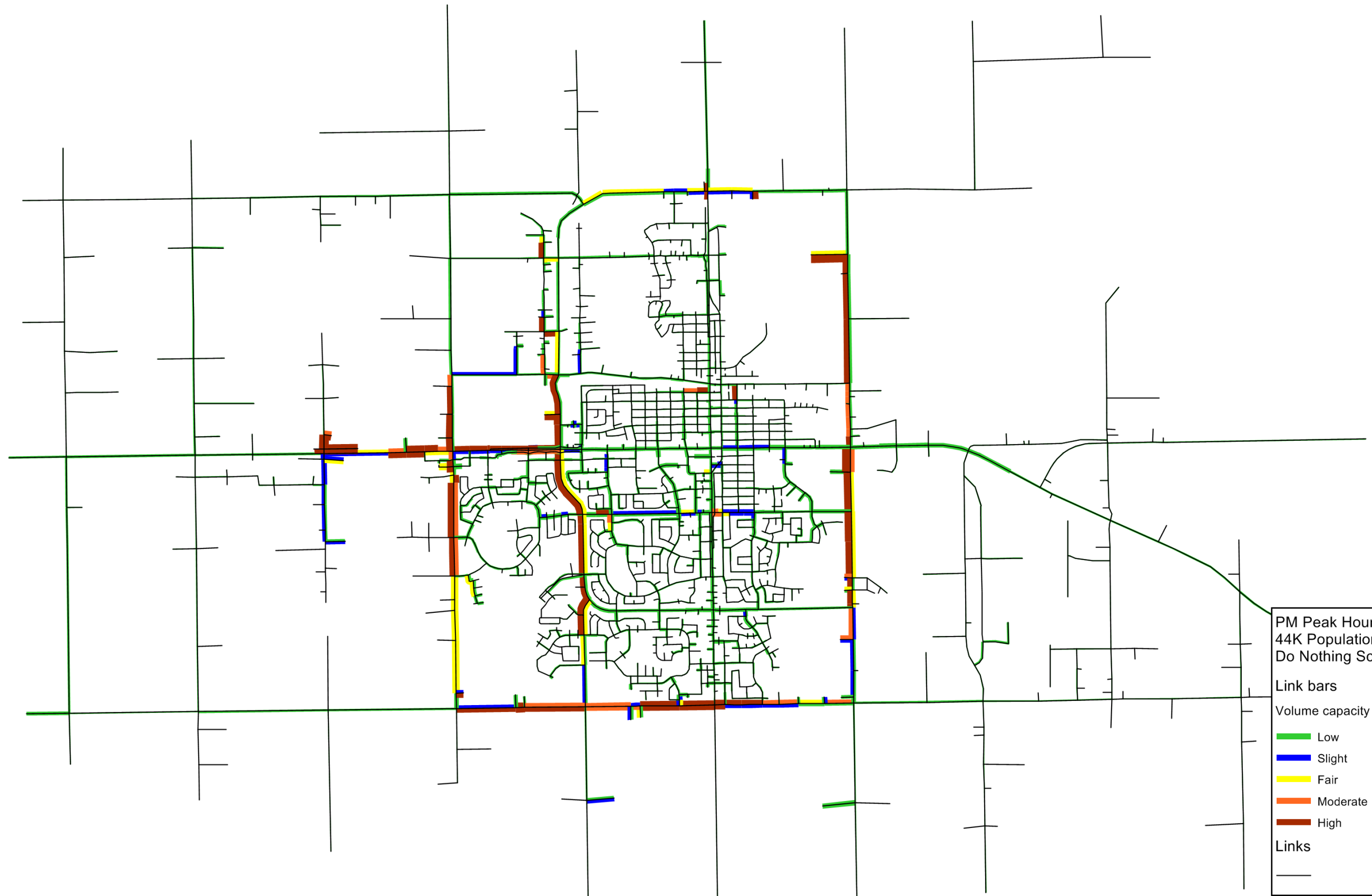
City of Lloydminster

EXHIBIT_4.28



City of Lloydminster

EXHIBIT_4.29



PM Peak Hour Congestion
44K Population Horizon (2025)
Do Nothing Scenario

Link bars

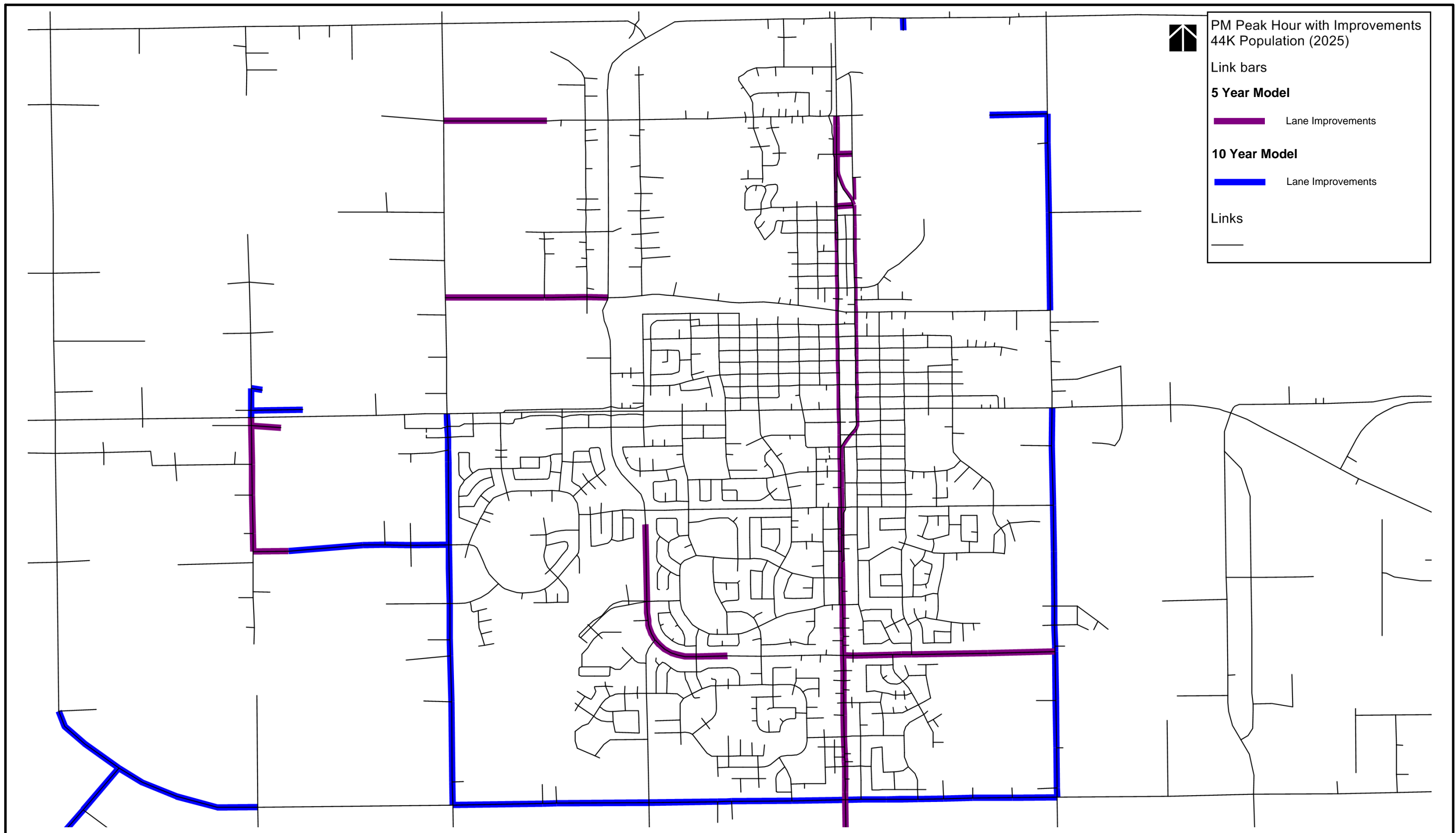
Volume capacity ratio PrT (AP)

- Low
- Slight
- Fair
- Moderate
- High

Links

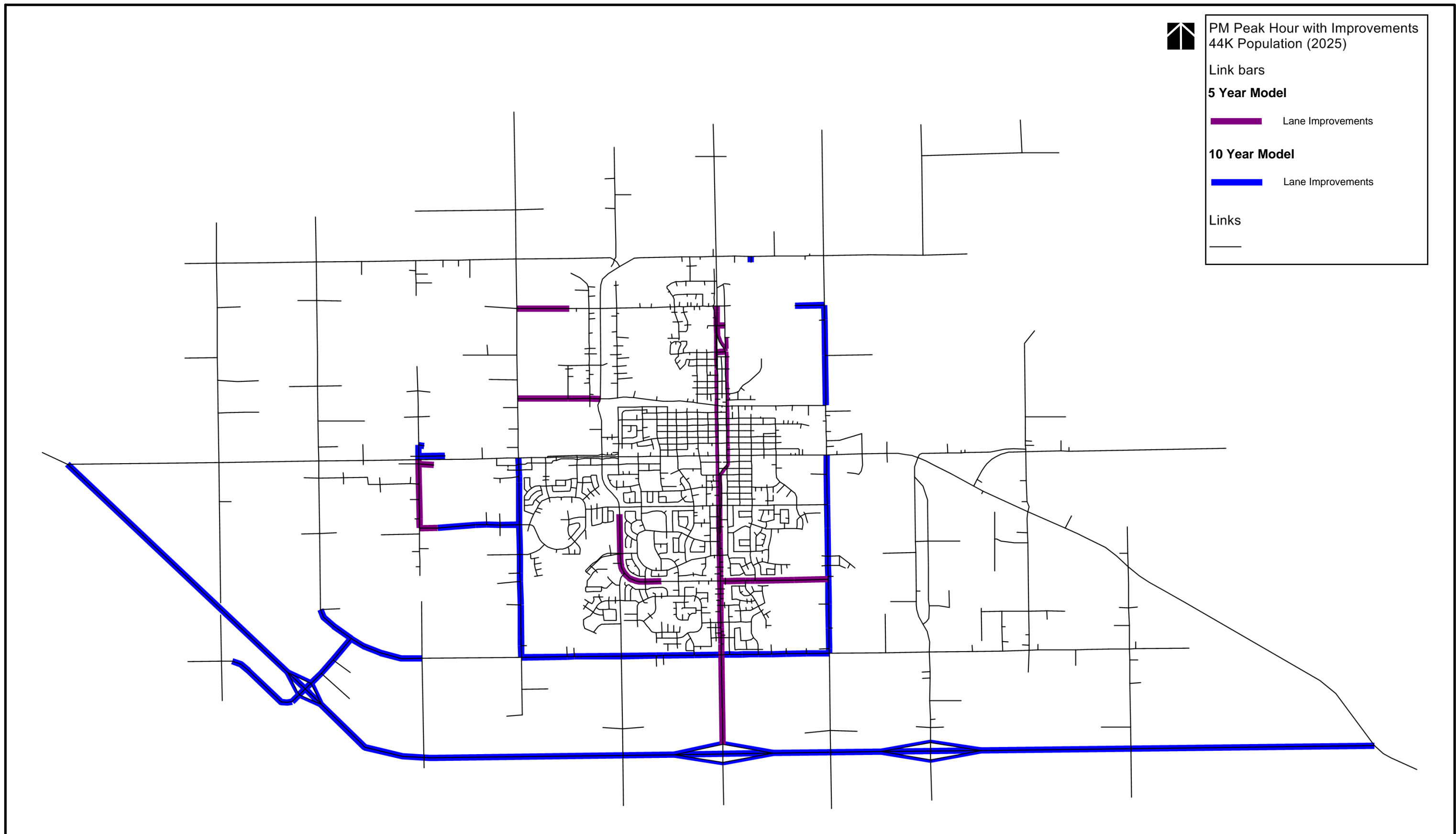
City of Lloydminster

EXHIBIT_4.30



City of Lloydminster

EXHIBIT_4.31



City of Lloydminster

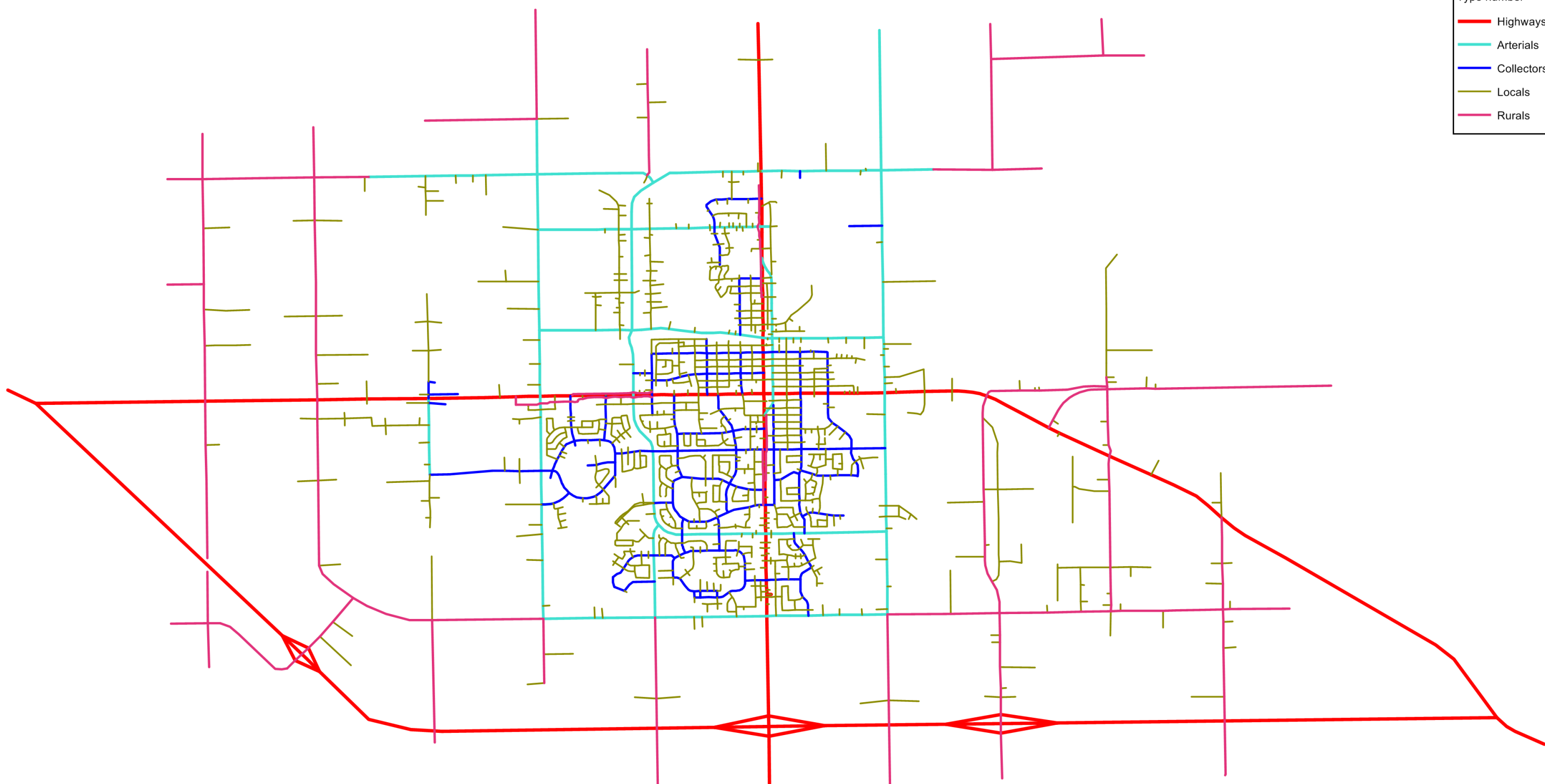
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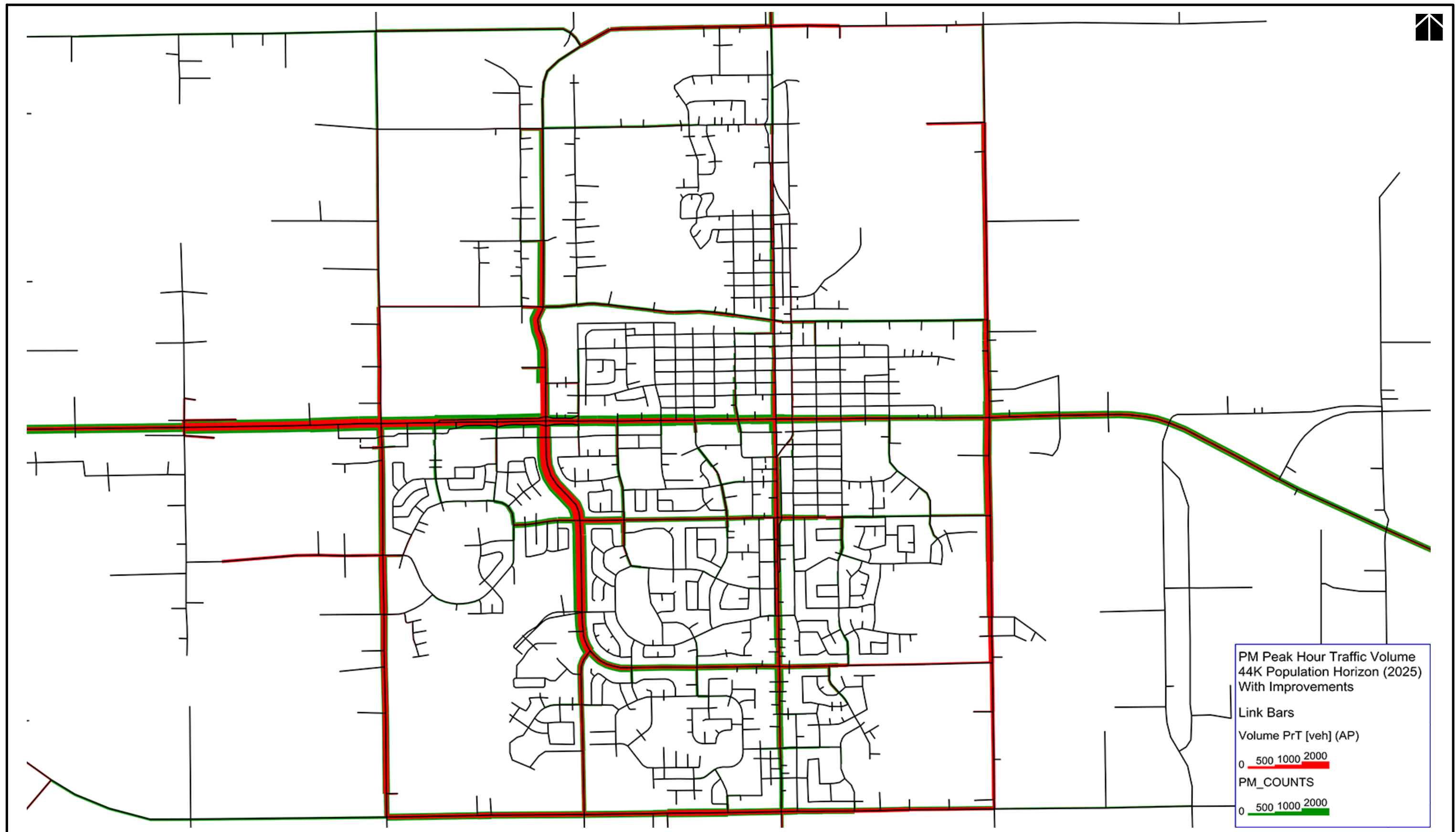


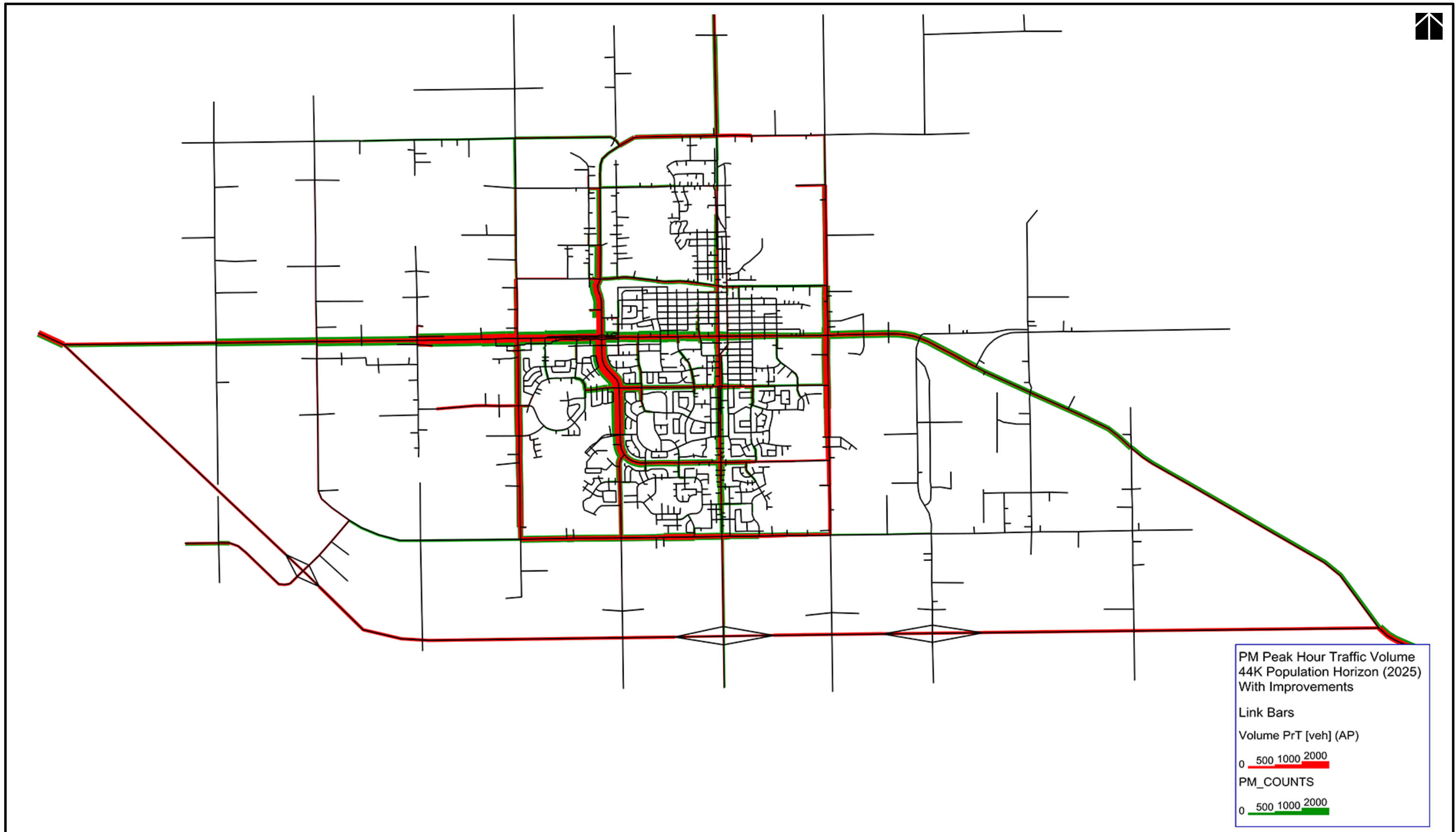
Links

Type number

- Highways
- Arterials
- Collectors
- Locals
- Rurals

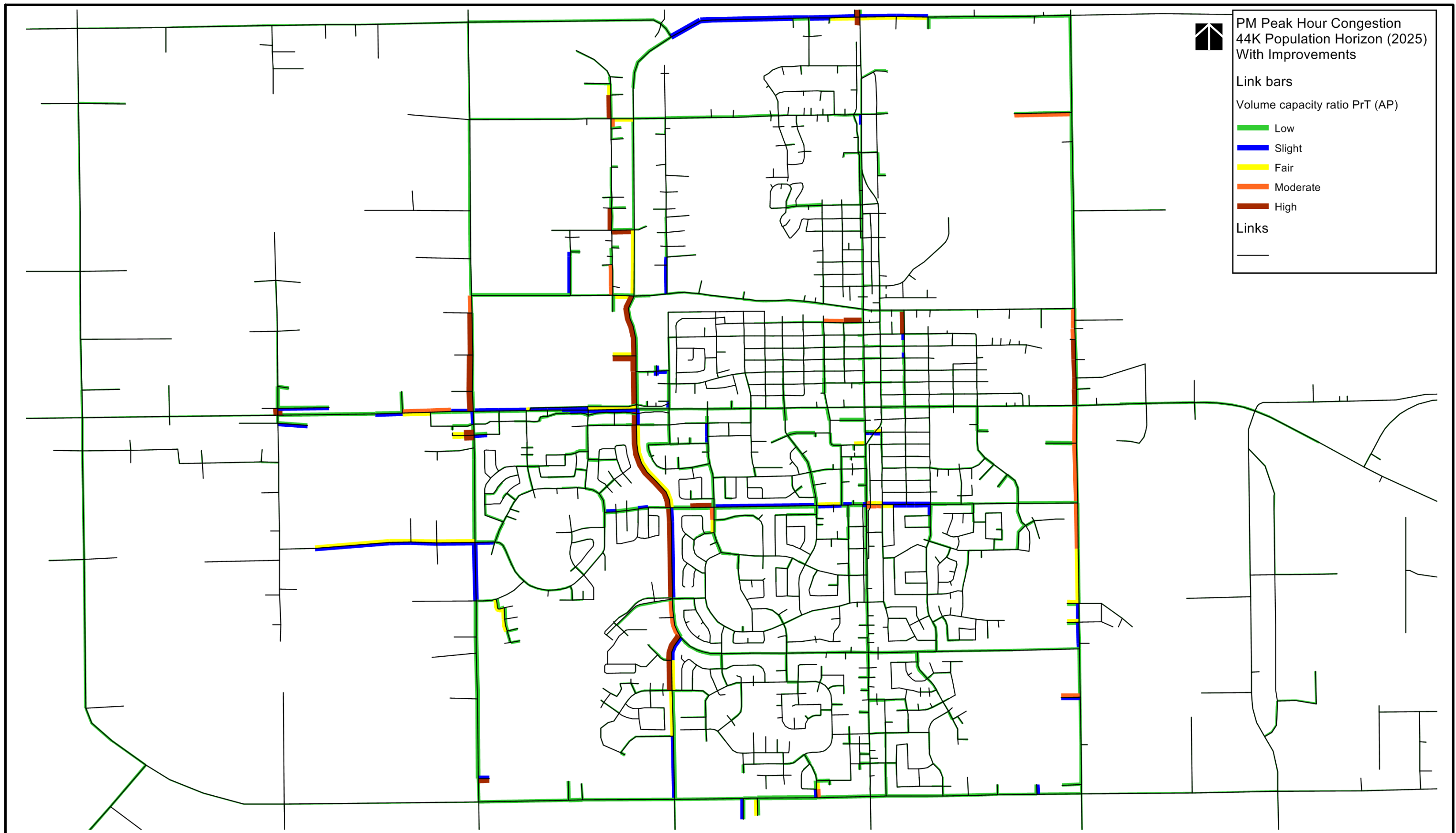






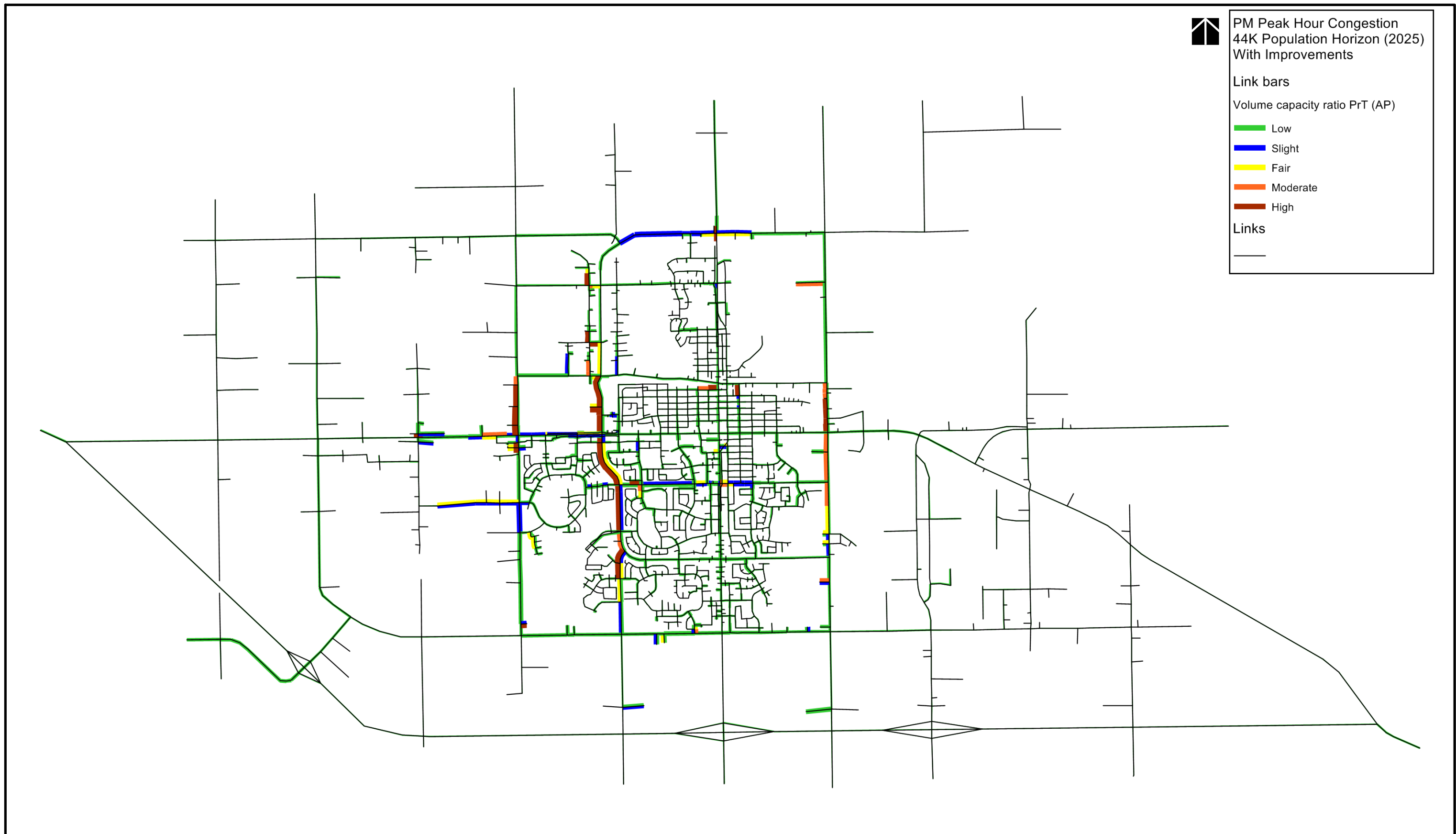
City of Lloydminster

EXHIBIT_4.34



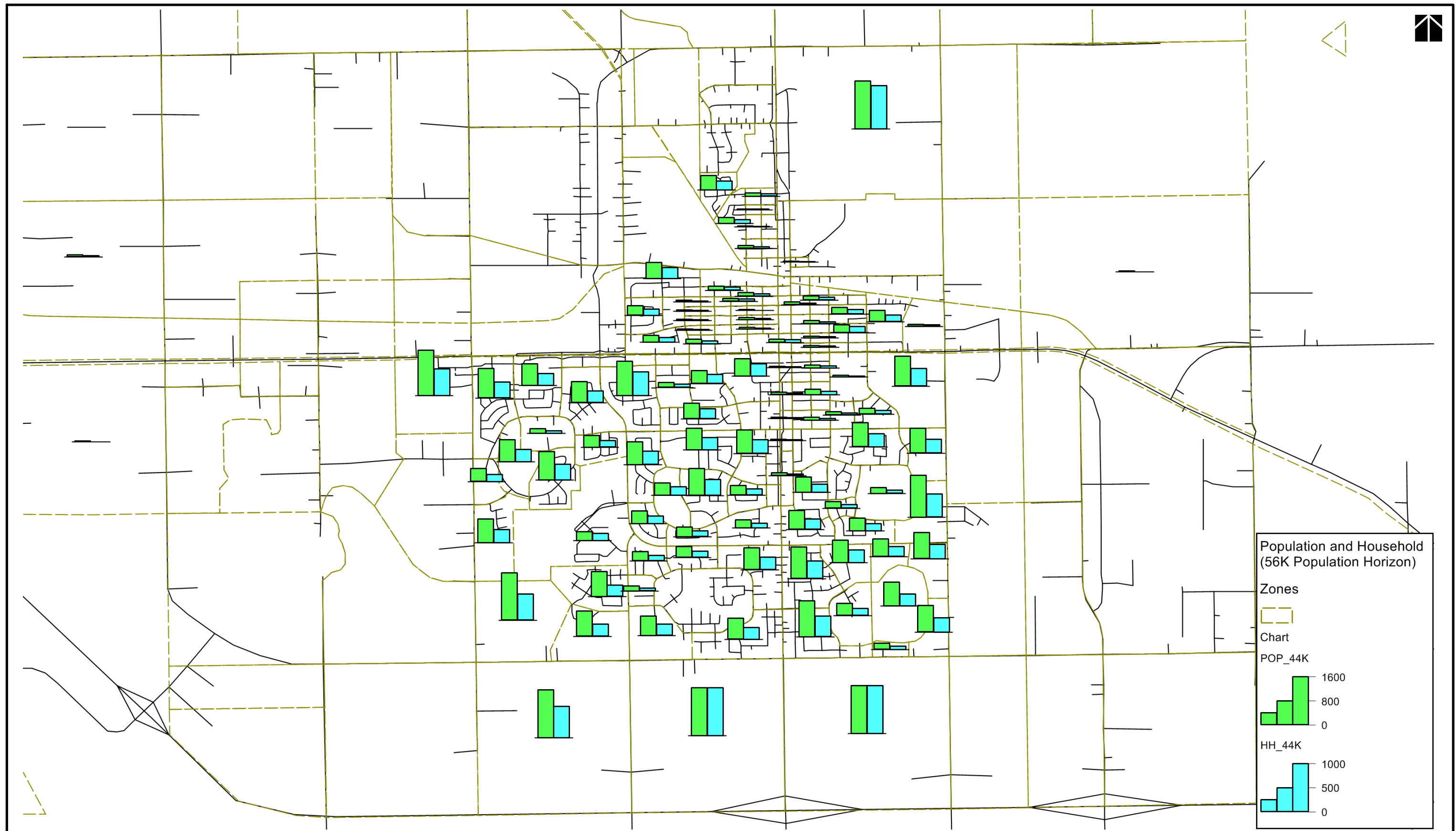
City of Lloydminster

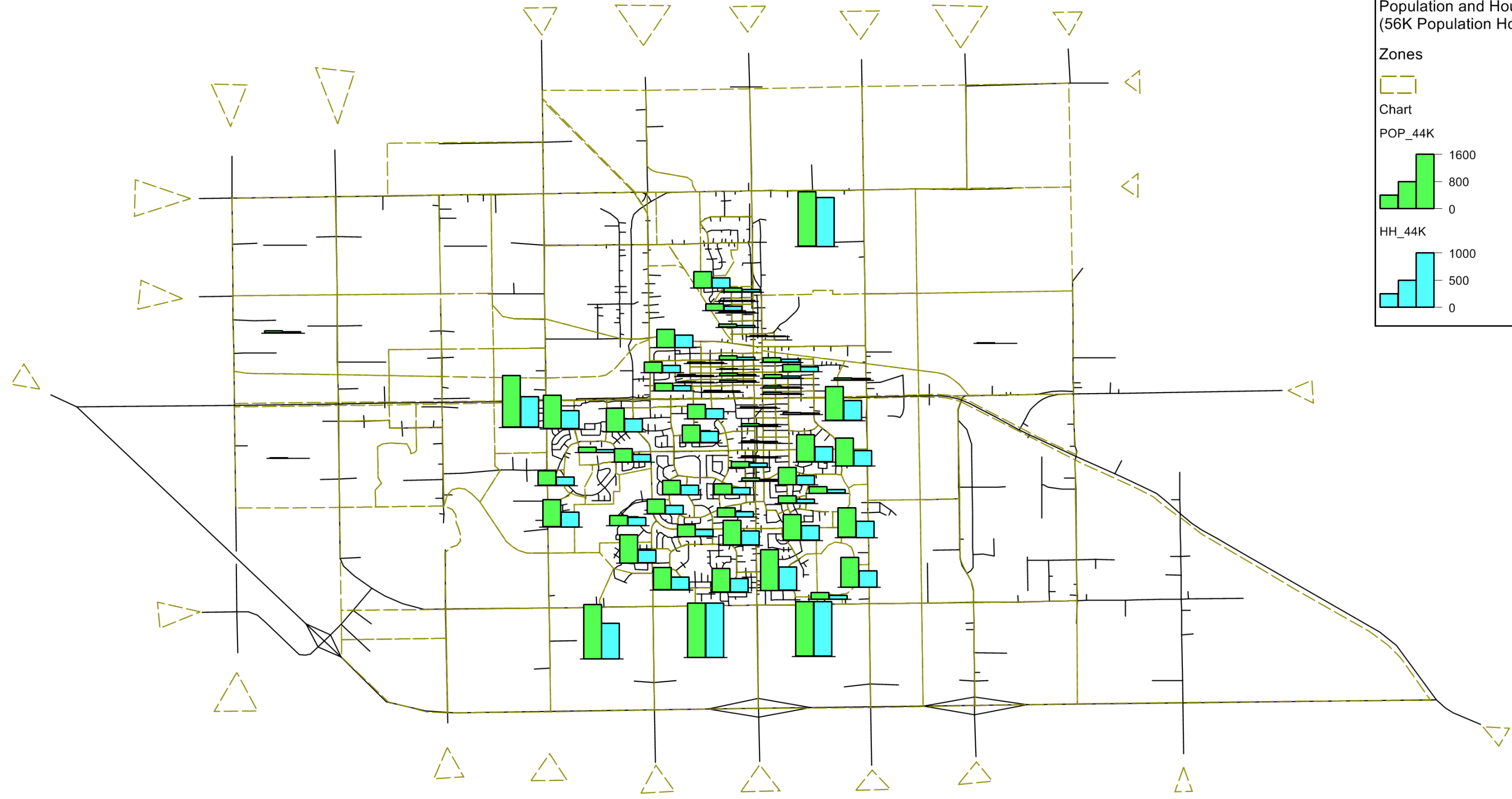
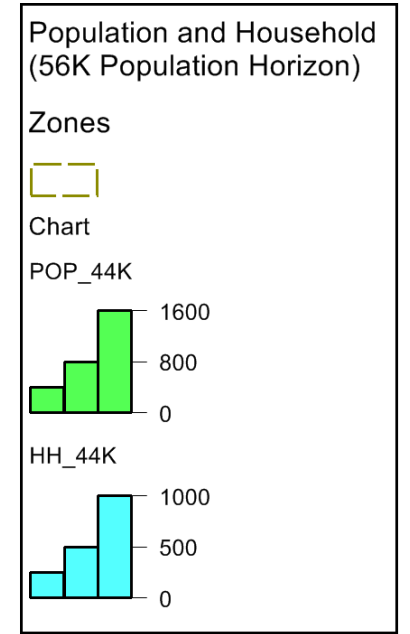
EXHIBIT_4.35



City of Lloydminster

EXHIBIT_4.36

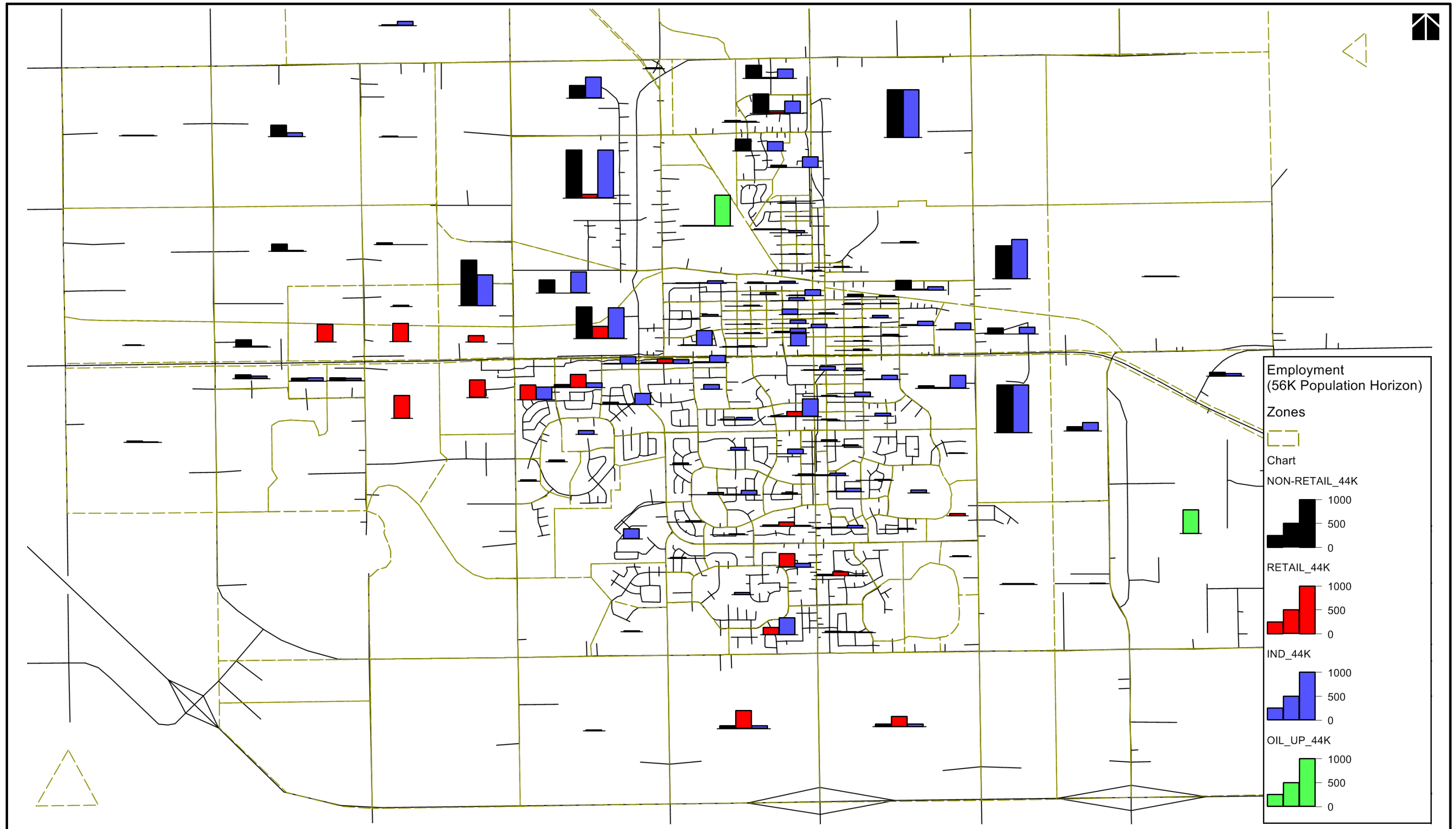


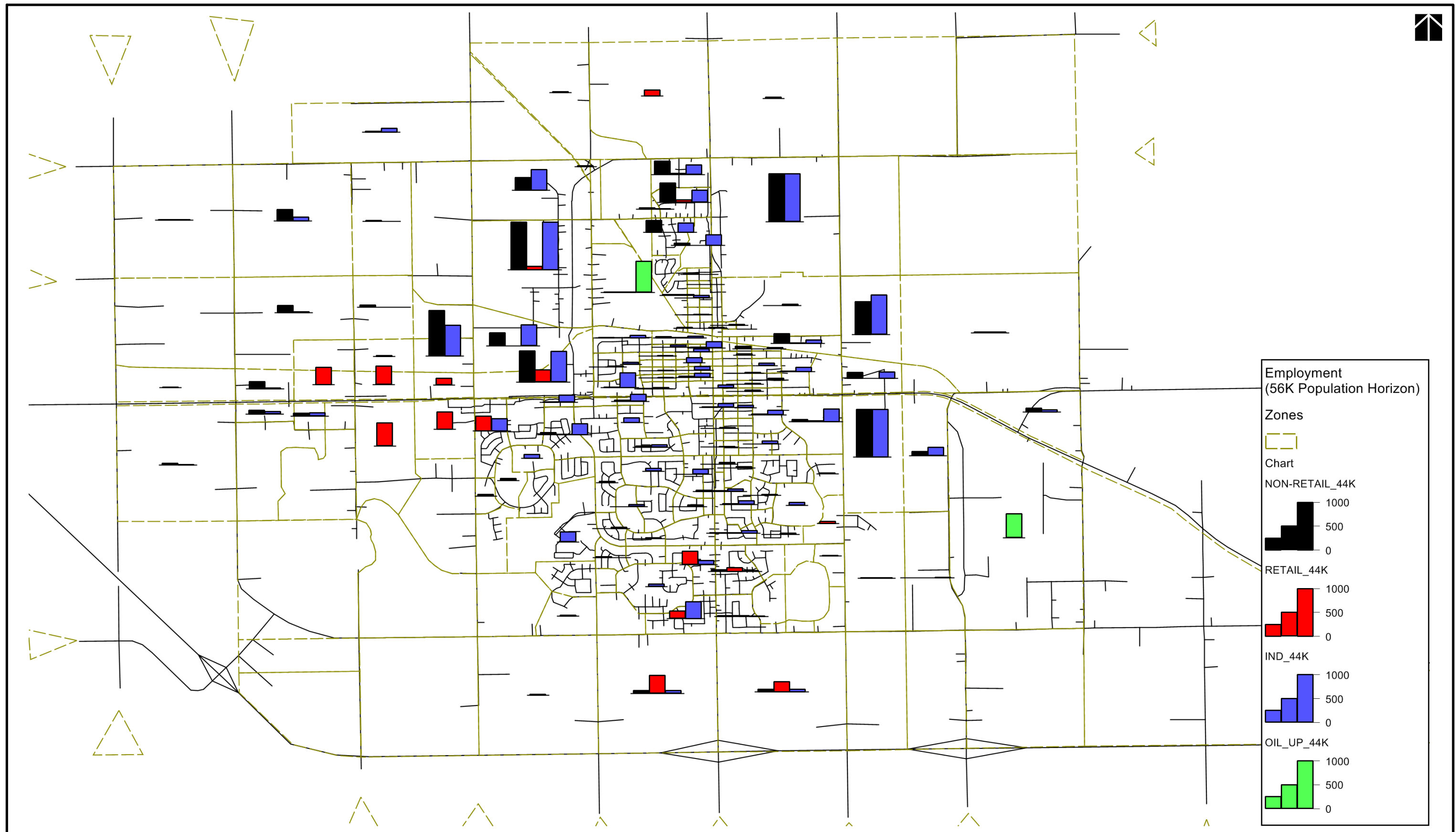


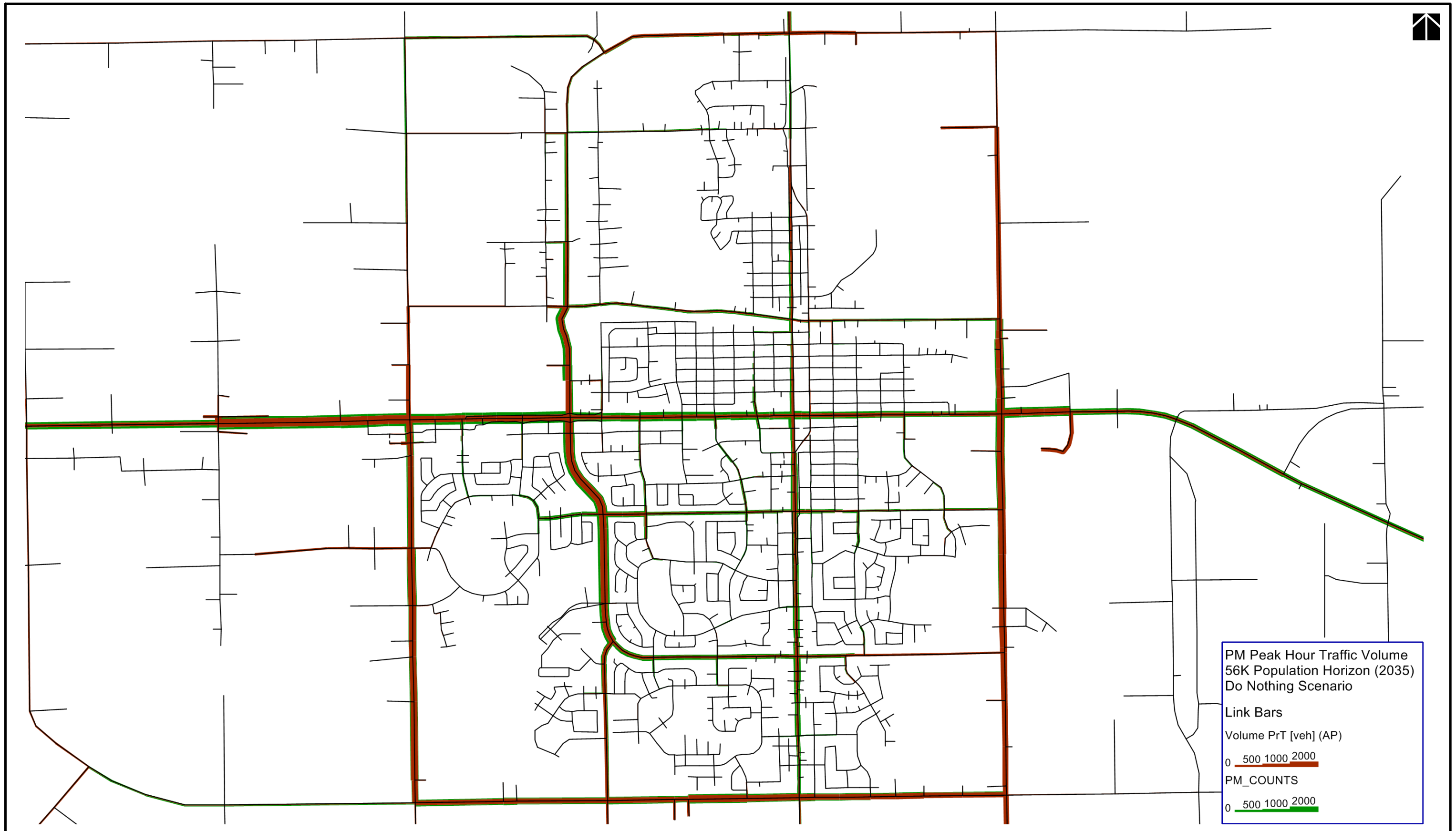
City of Lloydminster

56,000 Household Population - Region Wide

EXHIBIT_4.38

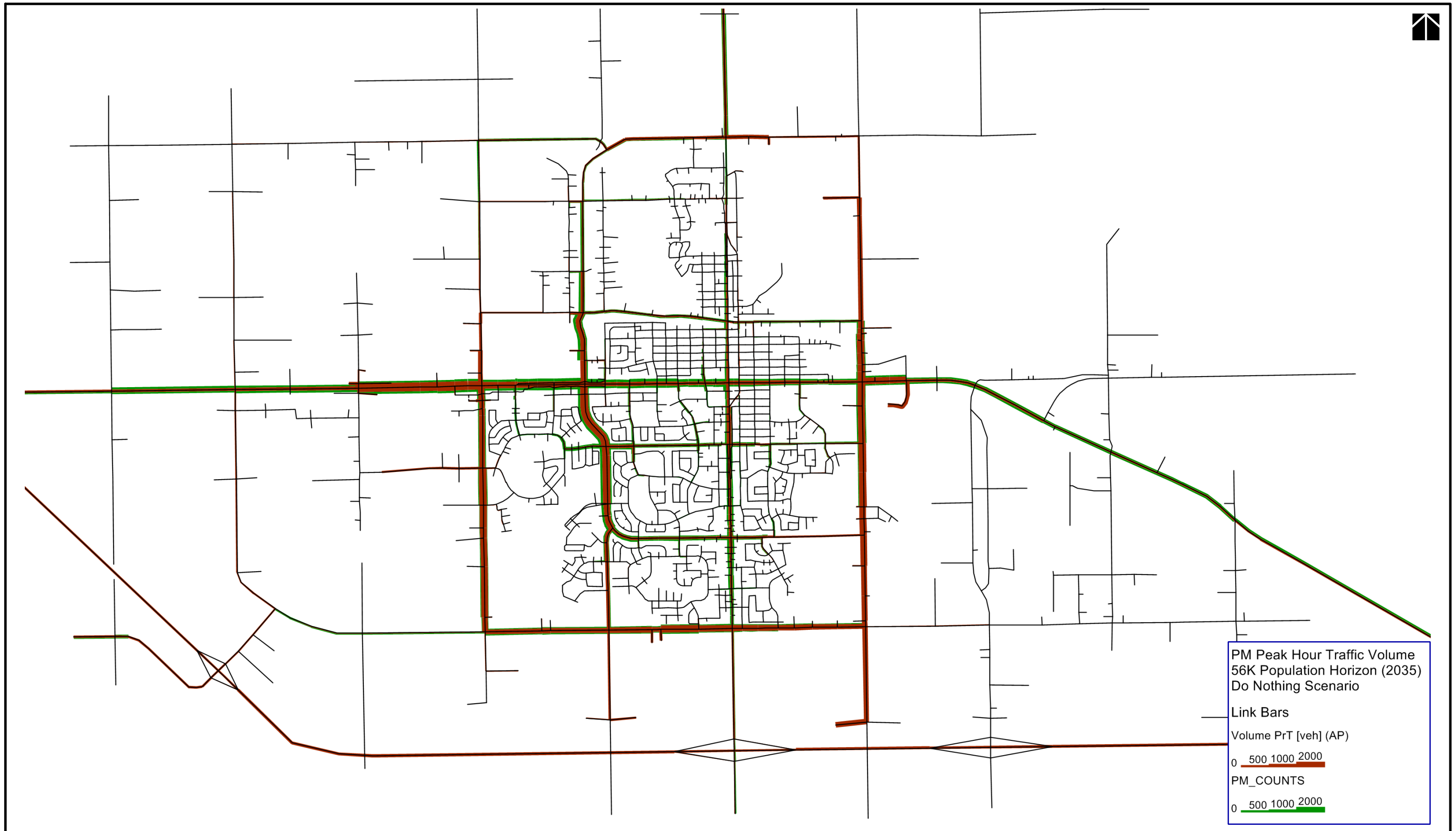






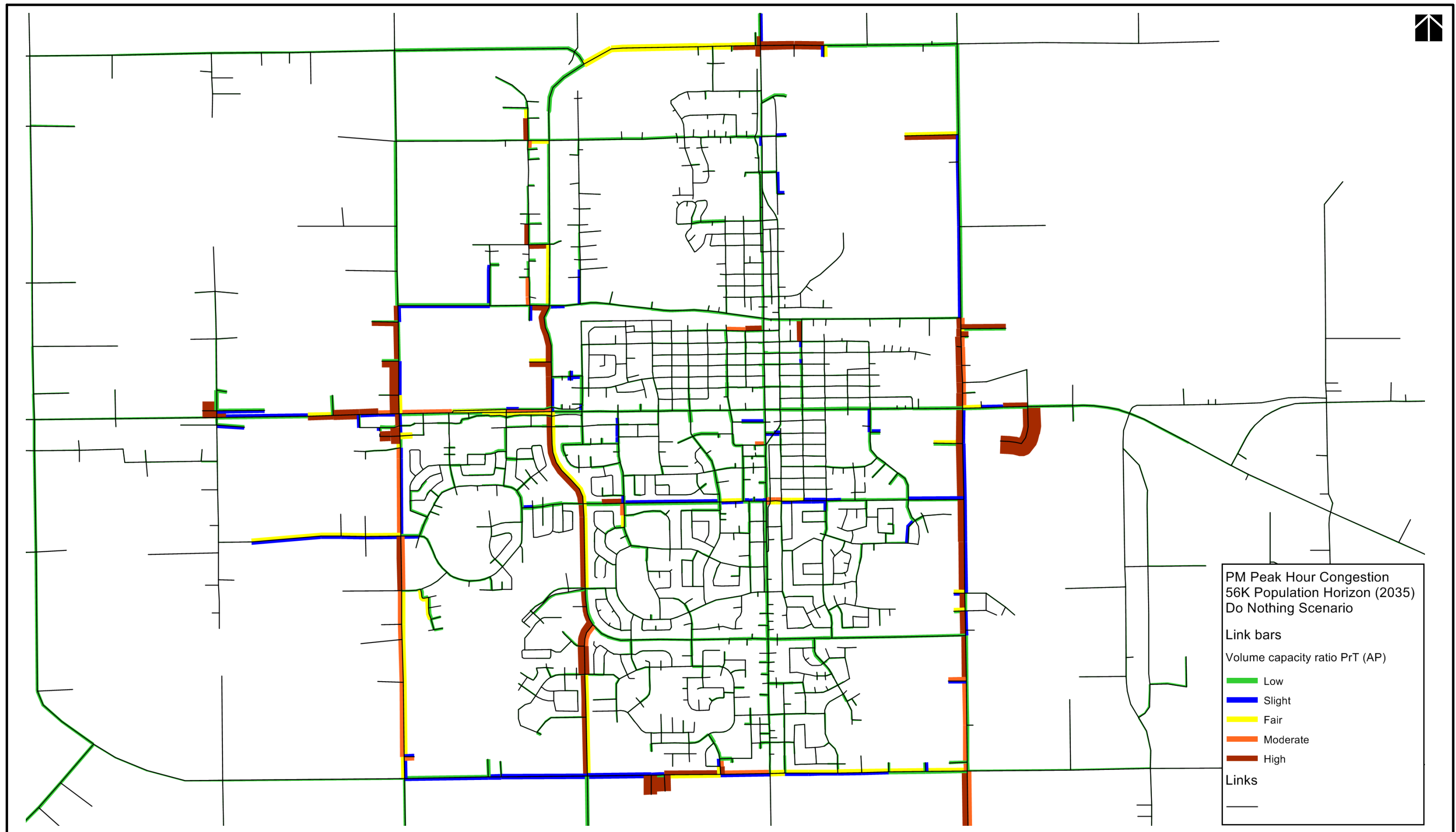
City of Lloydminster

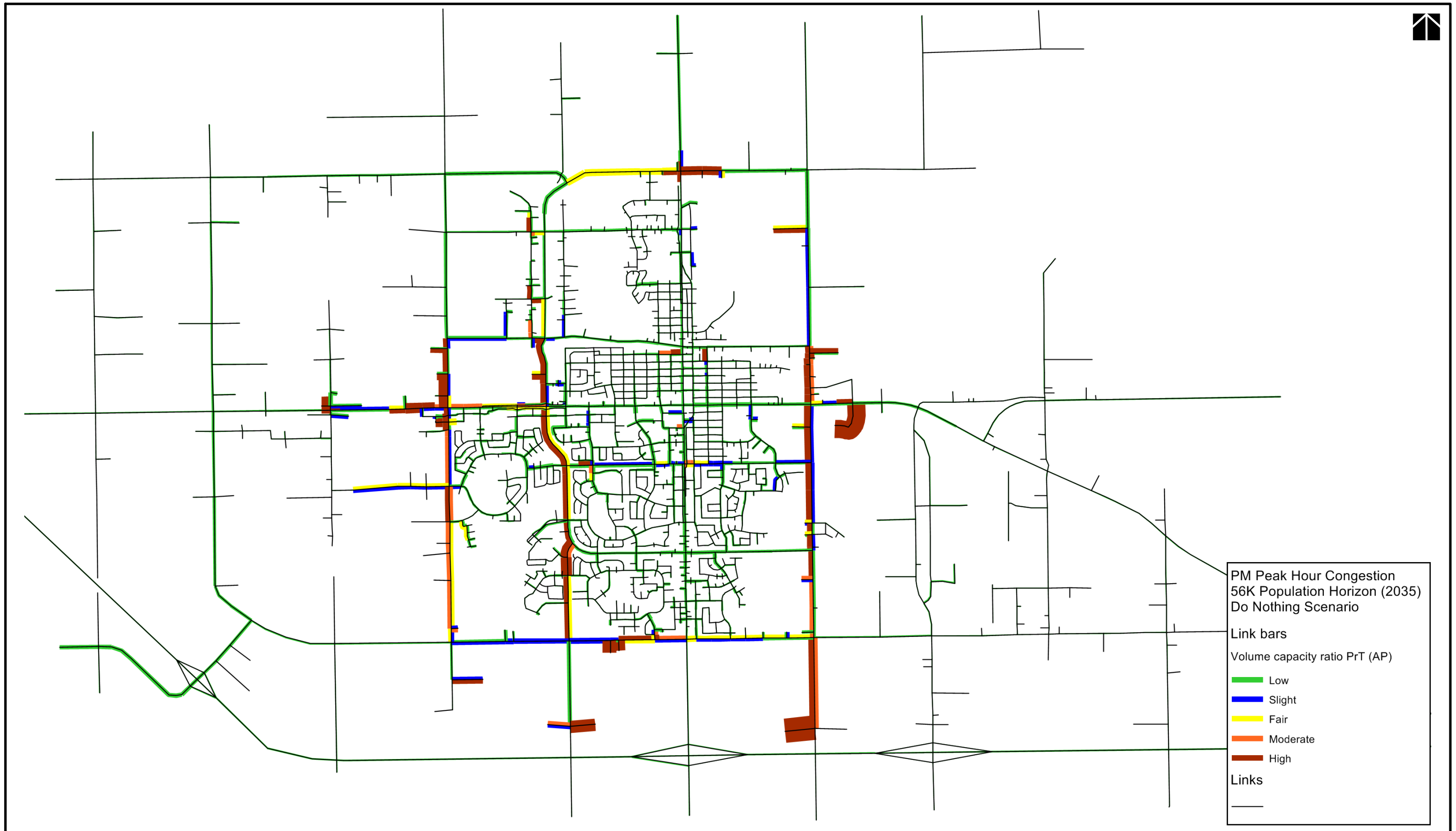
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City of Lloydminster

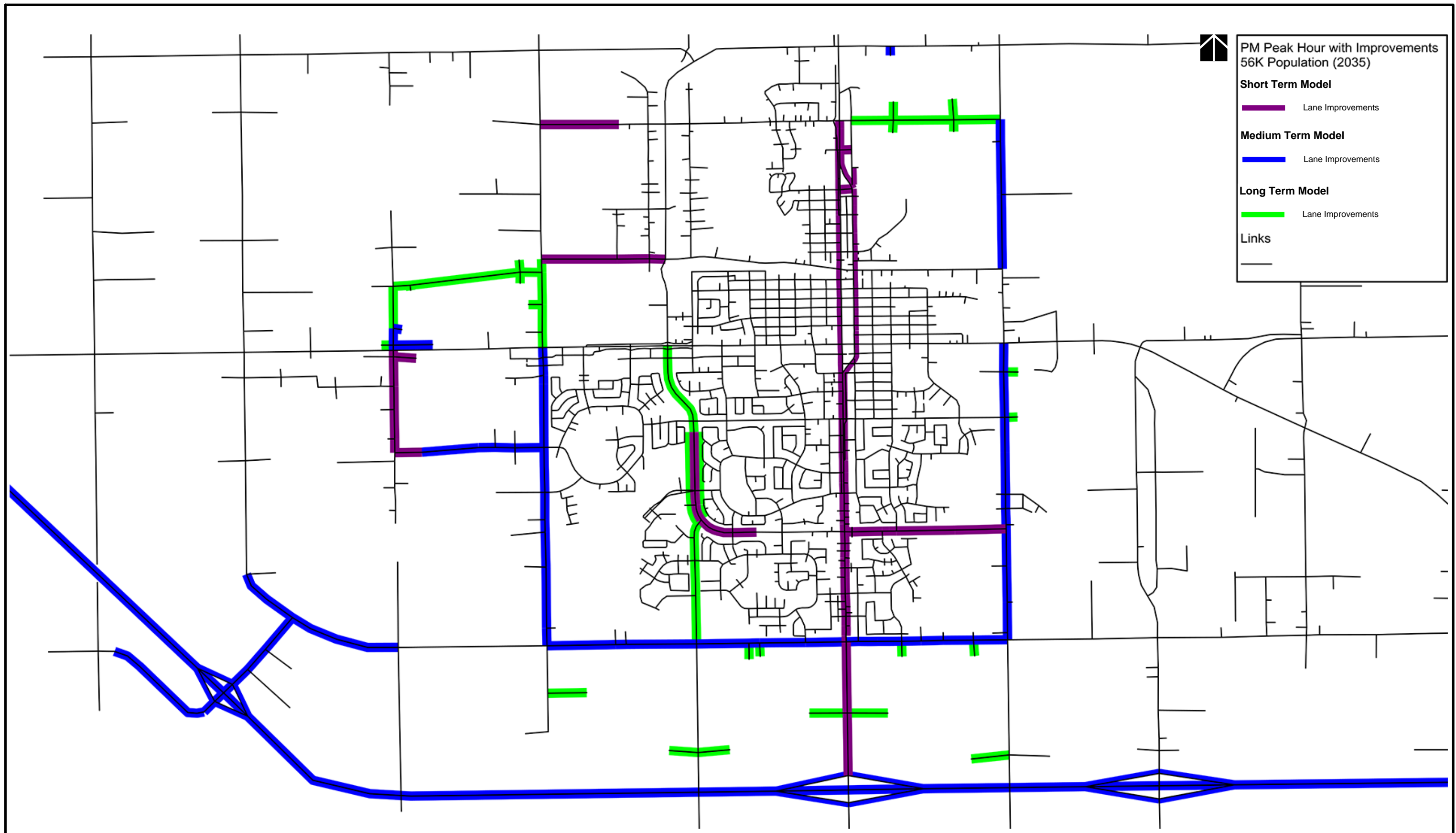
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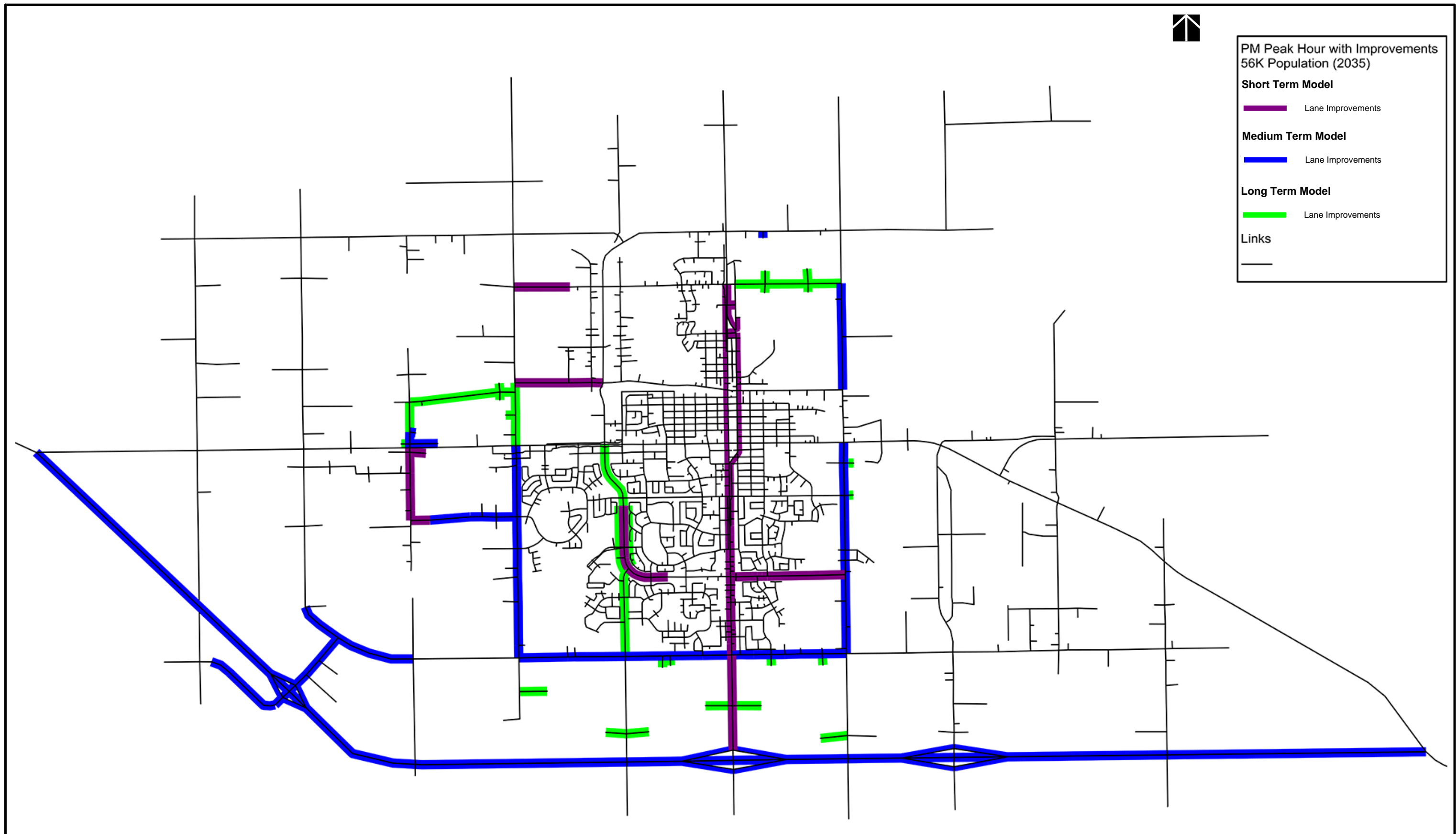
City of Lloydminster

EXHIBIT_4.44



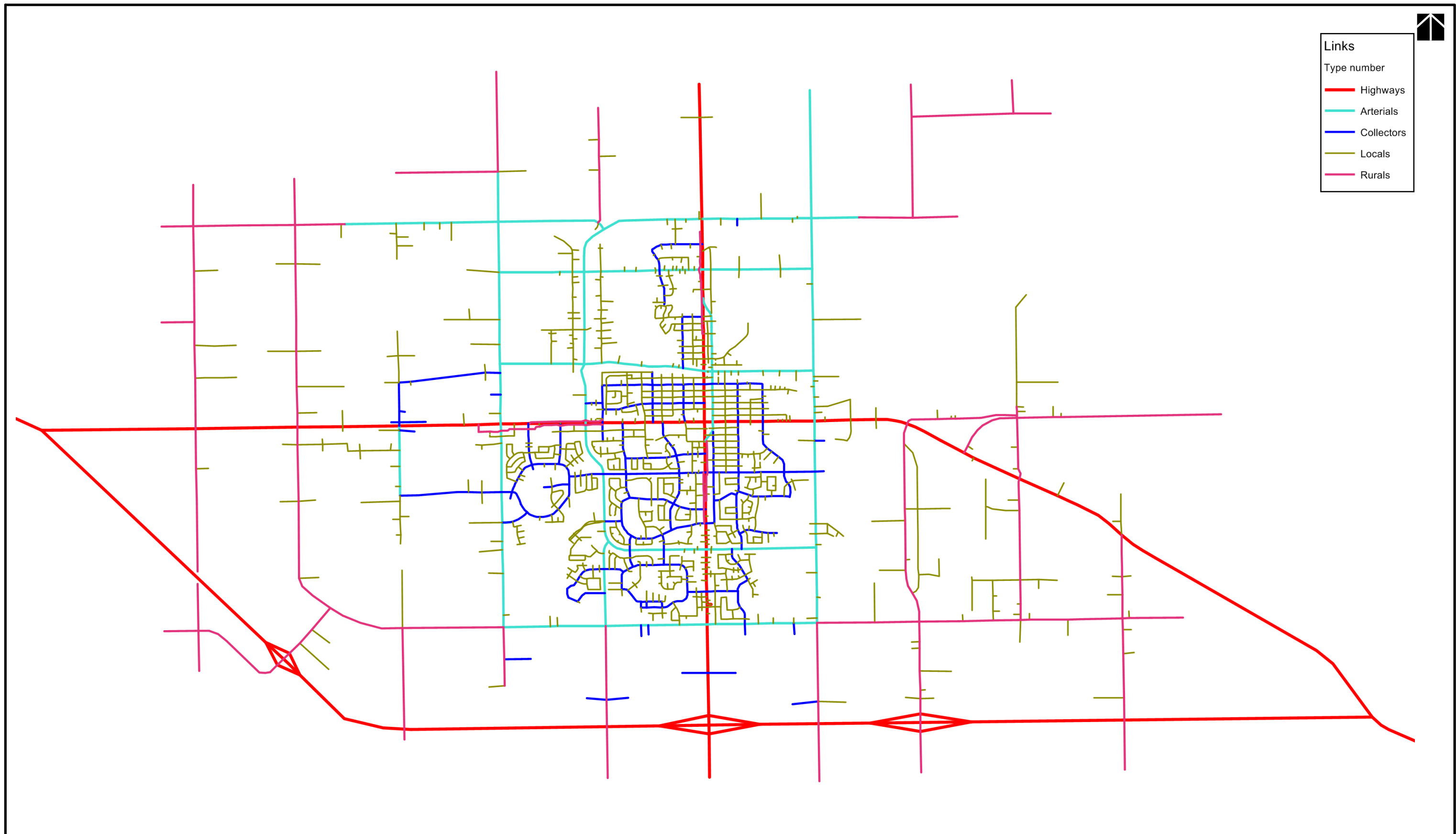
City of Lloydminster

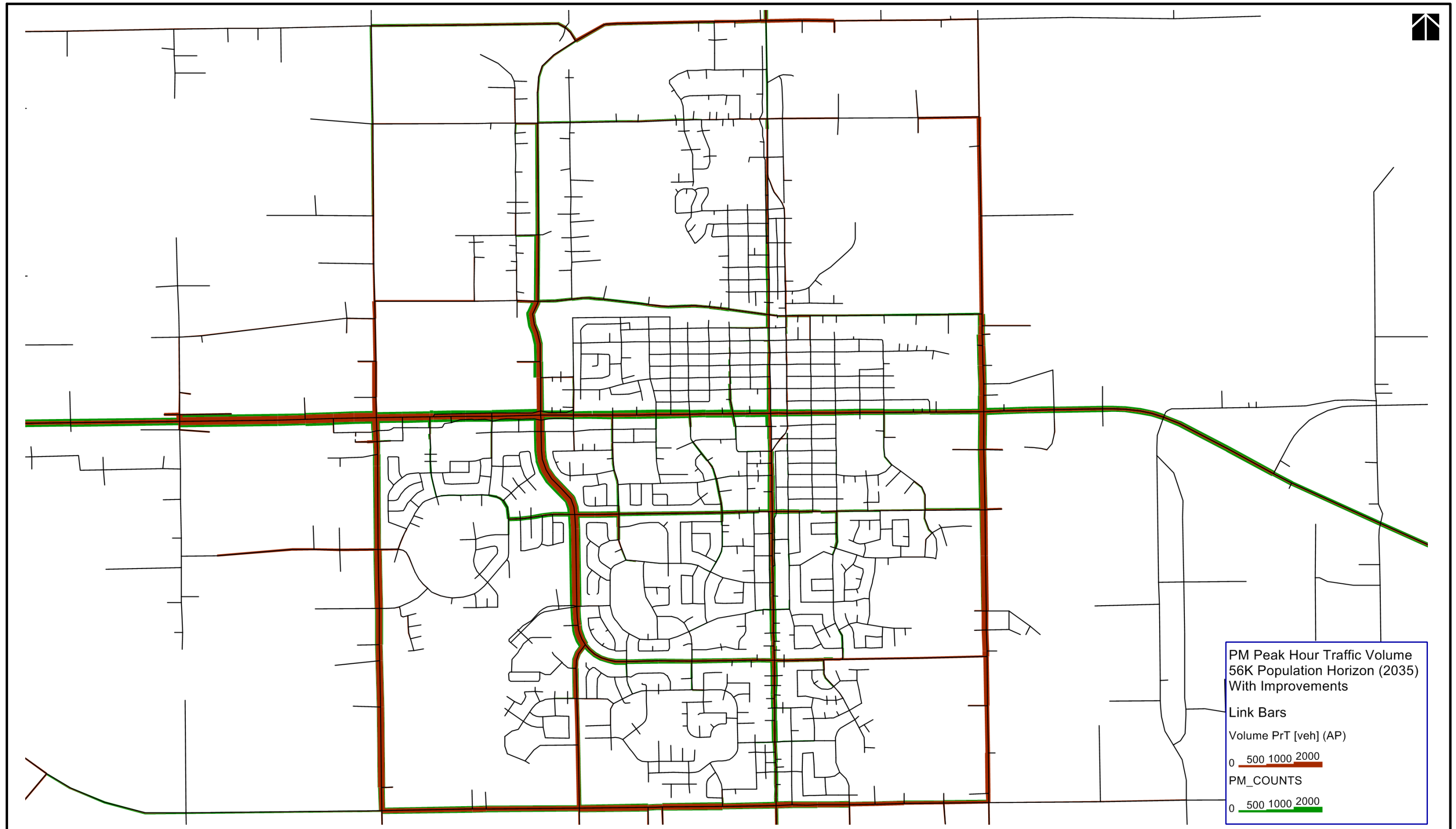
EXHIBIT_4.45



City of Lloydminster

EXHIBIT_4.46







PM Peak Hour Traffic Volume
56K Population Horizon (2035)
With Improvements

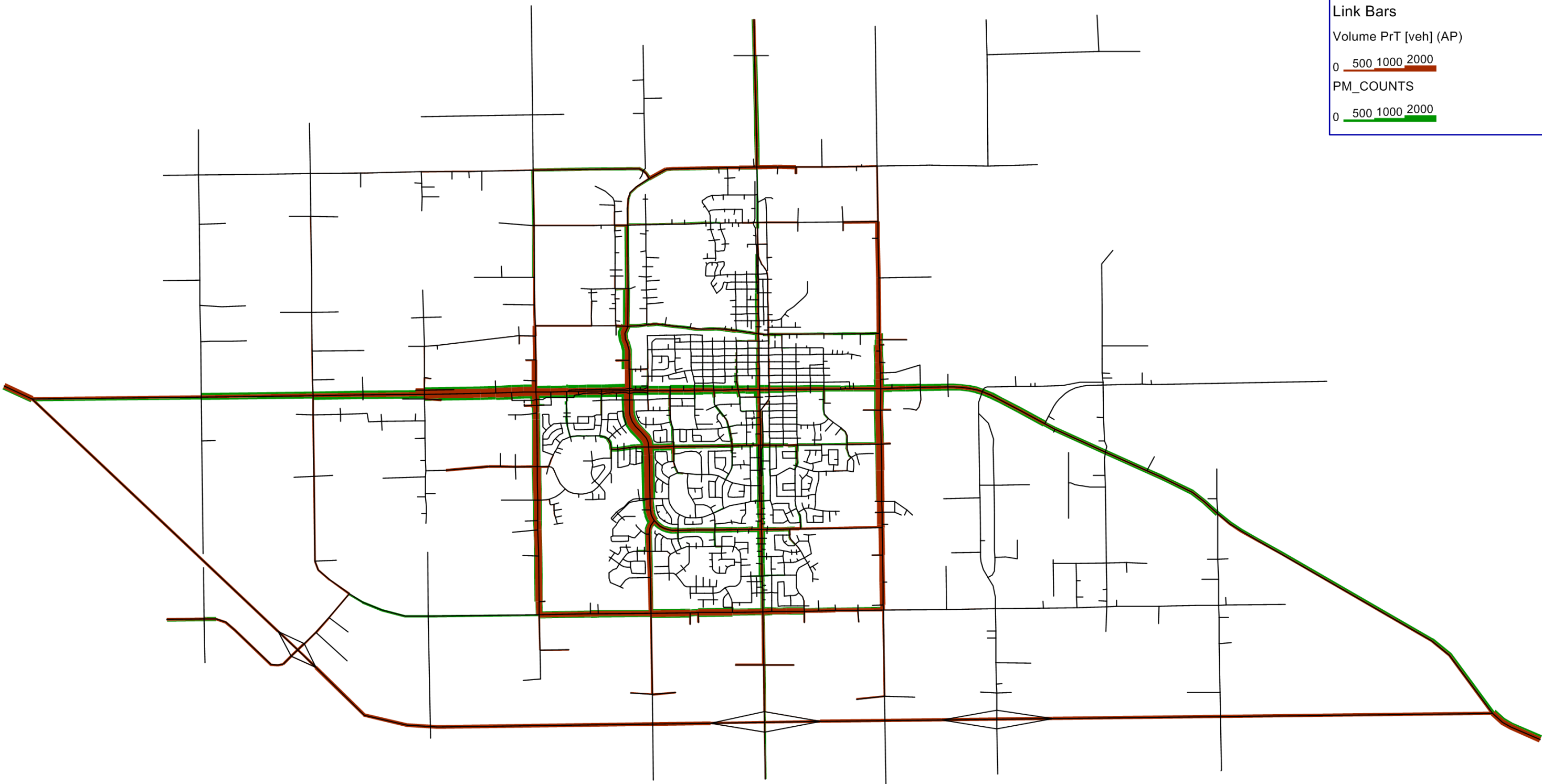
Link Bars

Volume PrT [veh] (AP)

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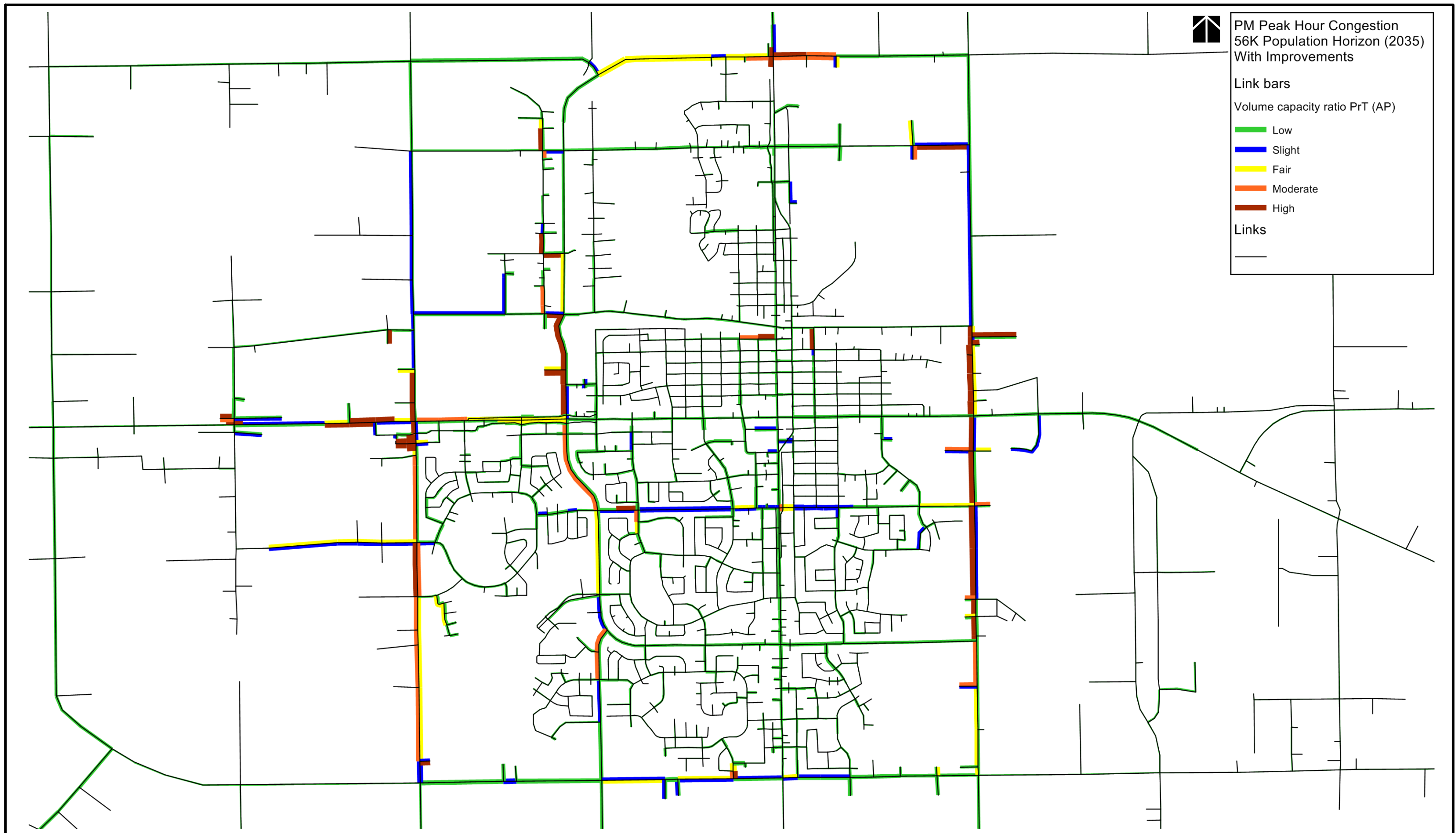
PM_COUNTS

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City of Lloydminster

EXHIBIT_4.48



City of Lloydminster

EXHIBIT_4.49



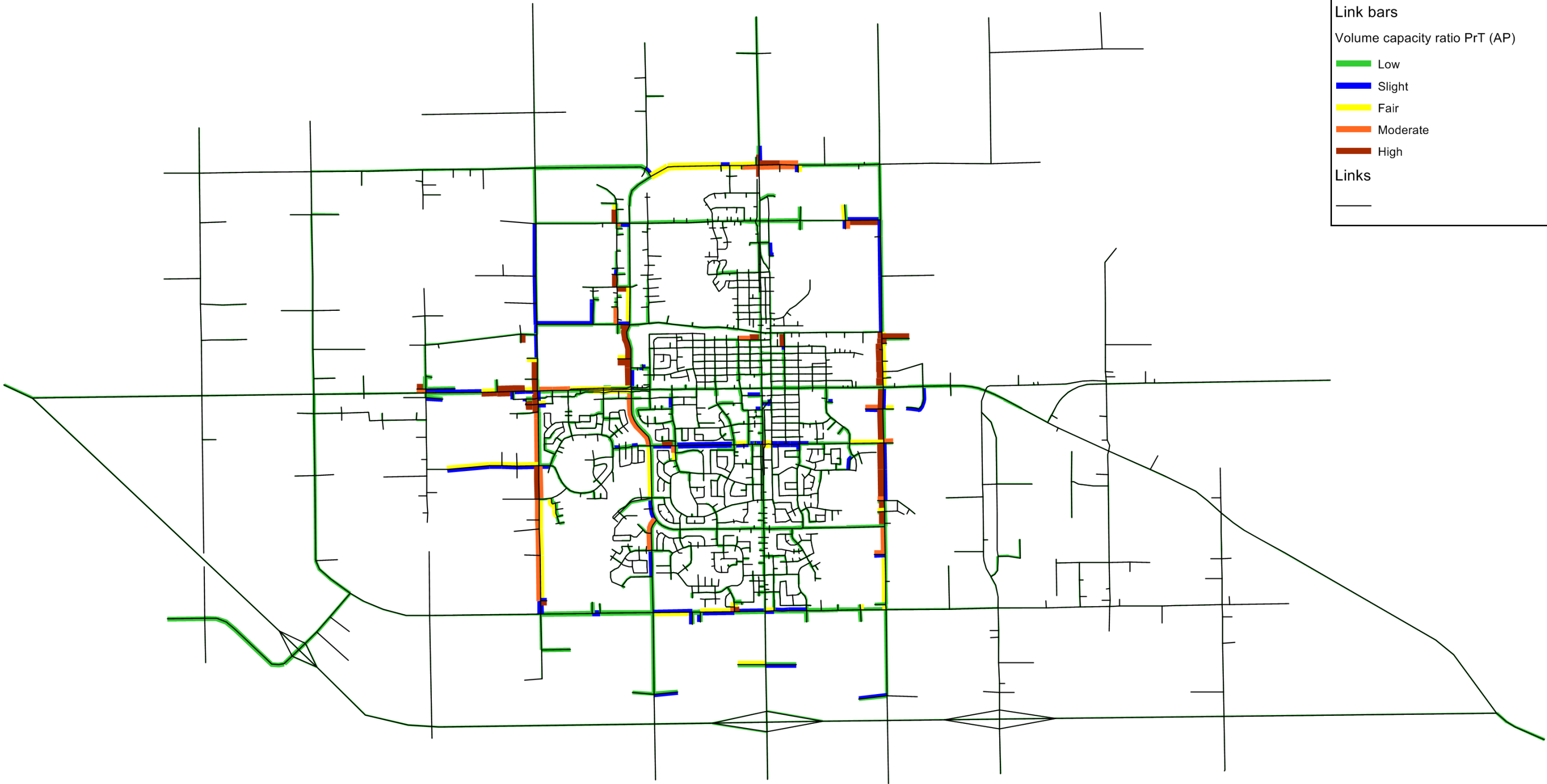
PM Peak Hour Congestion
56K Population Horizon (2035)
With Improvements

Link bars

Volume capacity ratio PrT (AP)

- Low
- Slight
- Fair
- Moderate
- High

Links



City of Lloydminster

EXHIBIT_4.50



5.0 Pedestrian / Cyclist Circulation System

Sidewalks are paths along the roadway that are separate from the major vehicular traffic, providing a safe route for pedestrians. Sidewalks encourage residents to walk and support walking as an active transportation mode. Normally sidewalks are on both sides of the roadways depending upon the requirement and connectivity on each side. Where adjacent properties front onto a road it is essential to have sidewalks on both sides of the road. This provides access to adjacent properties for pedestrians, including mobility impaired persons (As examples, people in wheel chairs, parents with strollers, and persons with crutches.)

Exhibit 5.1 shows the streets, sidewalks and trails connecting many locations in the City of Lloydminster. The street network has good coverage of the city, however, the sidewalks have some gaps in the connectivity particularly in the following areas:

1. Along 50 Avenue between 44 Street and 12 Street;
2. Along 44 street in the new commercial areas west of 59 Avenue;
3. Along 53 Avenue and 54 Avenue between 50 Street and 45 Street;
4. Along 49 Avenue between 52 Street and 57 Street.

5.1 Physical Activity Survey

The Physical Activity Survey conducted in March 2015 in the City of Lloydminster demonstrates a strong need for sidewalks. 21 % of the survey's respondents agreed that in the week prior to the survey they walked or biked to their work place and 17 % people walked or biked to school. More than 40% of respondents would like to have more year round options like trails and bike paths as an active mode of transportation.

The survey also indicated that 82 % of respondents access sidewalks within a year and approximately 50 % indicated that they access tracks and/or multi-use trail systems. The survey also described promoting the active mode of transportation to youth with a program such as Walking School Bus (*a group of children walking to school with one or more adults is known as Walking School Bus*). The survey results clearly indicated the need for more sidewalks, trails and bike paths overall in the city, including new developments. This contributes to safe transportation.

The survey's respondents noted the following information in the Physical Activity Survey:

- The trails and bike routes should be clearly mapped out with destinations;
- The existing sidewalks/trails end abruptly and need to connect throughout the city;
- Need sidewalks on both sides of the roadways in the new developments;
- Ensure city has strong connectivity; and
- Regularly maintain sidewalks/trails.

As per the Physical Activity Survey, 62 % of respondents acknowledged that it is easy to bike in their community. However 7 % of respondents objected to it. To support their objection they said that no biking trails are available, so they have to bike on the road where space is limited. They also desire designated bike lanes. The Physical Activity Survey responses indicated that there is a lack of connecting trails throughout the City of Lloydminster.

The survey highlighted the need to provide bike paths that connect to downtown and different facilities in the City. It also noted extending the bike trail network besides Bud Miller Park and to have designated bike lanes or bike paths on the streets.

5.2 Cycling Infrastructure

Cyclists are legally considered vehicles and can use all roads in Lloydminster. However, experience shows that cyclists prefer separate paths when traffic volumes exceed local residential road conditions or speeds exceed 30 km/h (a high bicycle speed). In addition, cities that have separated, meaningful (connecting differing land uses), and direct bicycle routes as part of their network experience the highest bicycle mode share.

Exhibit 5.1 shows that there are many links for cyclists in Lloydminster. However, the links are in segments and do not connect to meaningful places. As a result cyclists cannot make a meaningful trip, such as a home to shopping trip, unless they expose themselves to high traffic volumes or speeds.

The City of Lloydminster has a plan to make 50 Avenue and 49 Avenue a one way couplet between 36 street and 60 Street. The preliminary phasing plan shows a multi-use trail from 36 street to 44 street along 49 Avenue as shown in the Exhibit 5.1. Generally, the City favours using multi-use trails for cyclists because they are relatively easy facilities to implement compared to on-street bike lanes or protected bike lanes. On-street bike lanes and protected bike lanes often require taking away space for motor vehicles (parking or travel lanes). Without proper public consultation and community support they are often ill-received by the public.

The proposed cycling network therefore adds missing links, using multi-use trails. Generally the trails leverage existing trails, as well as provide new linkages beside arterial roads in the outlying areas. The cycling network is denser at the City's core. The core is more conducive to cycling trips due to the close proximity of a mixture of land uses.

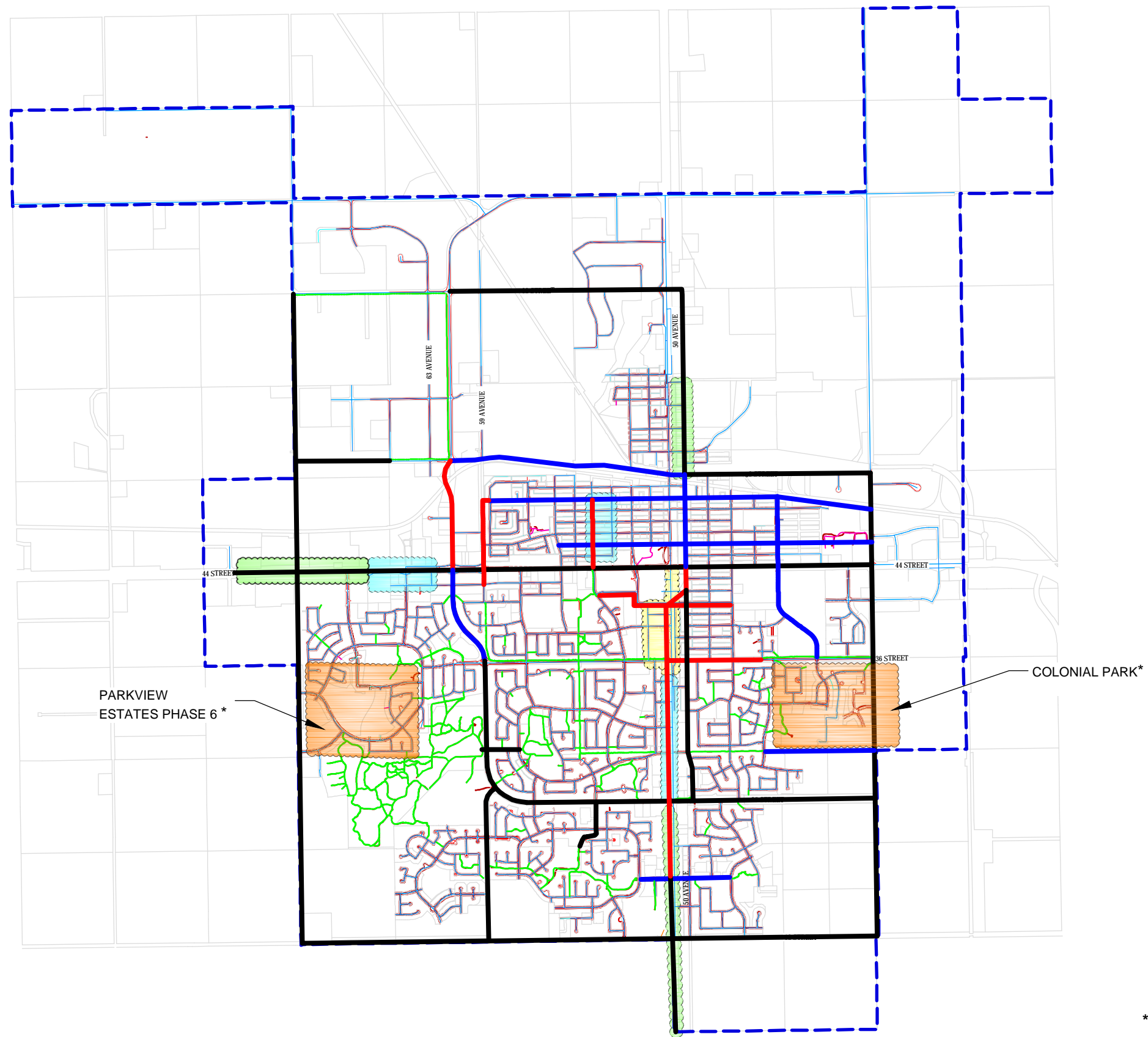
In some cases the multi-use trails in Exhibit 5.1 are along roads where there are significant numbers of driveways. These will require special planning and design, and at least two alternative concepts within the same corridor should be considered.

5.3 Priority Sidewalks and Bike Paths

Priorities for sidewalks are areas along arterial and collector roads, as well as where high levels of pedestrian traffic are anticipated. Examples are the downtown area, commercial areas, trails and residential areas near schools. Exhibit 5.1 shows the priority improvement areas for pedestrian connectivity.

To improve Lloydminster's cycling network, Exhibit 5.1 shows additional priority links to fill the gaps. These links not only fill missing gaps, but provide connectivity to key destinations such as the downtown, and the west and south side commercial areas. The exact alignment and facility type will be determined upon detailed design, but most are possible within existing rights of way on the roadside, with a width of 2.5 m to 3.0 m. In some cases public engagement may be necessary because reallocating parking or travel lanes may be an option. In addition, these priority links may be implemented through development or as part of adjacent road construction. In such cases the priority may be advanced over that shown in Exhibit 5.1.

As Lloydminster grows it will be important to link sidewalks and trails from new areas into existing areas. New developments should include sidewalks on both sides of roads. In addition to achieve walkability (connecting land uses with direct walking paths), meaningful connections between logical land uses (such as residential to commercial, recreational, and education) need to be made in a direct fashion. To this end new neighbourhoods should submit a sidewalk and trail plan showing how land uses will connect for pedestrians and cyclists.



LEGEND

- CITY OF LLOYDMINSTER BOUNDARY
- EXISTING SIDEWALK
- EXISTING ROADWAY
- EXISTING TRAILS
- SIDEWALK PRIORITY - 1 [SHORT TERM]
- SIDEWALK PRIORITY - 2 [MEDIUM TERM]
- SIDEWALK PRIORITY - 3 [LONG TERM]
- BIKE & PEDESTRIAN FACILITY PRIORITY 1 [SHORT TERM]
- BIKE & PEDESTRIAN FACILITY PRIORITY 2 [MEDIUM TERM]
- BIKE & PEDESTRIAN FACILITY PRIORITY 3 [LONG TERM]

* NOTE: CITY IS WORKING ON A TRAIL NETWORK PLAN IN THIS AREA.
DESIGN HAS STARTED SO IT WAS NOT INCLUDED IN THIS TMP

City of Lloydminster

Sidewalk and Bike & Pedestrian Facility Priorities

EXHIBIT_5.1



6.0 Recommended Transportation Capital Plans

The recommended capital plans are based on the results of the travel demand model, review of the sidewalk and trail network, and through discussions with the City. The recommended capital plans interpret our analysis and translate it into 3, 5, 10, and 20 year capital plans.

Where available, we used pricing from designs, but in most cases these were unavailable. Therefore in such cases we used the following unit prices to estimate costs.

1. First two lanes of the future 4 lane arterial = \$ 4,800.00 per meter;
2. Added two lanes of the 4 lane arterial = \$ 3,200.00 per meter;
3. Added two lanes to the existing 4 lane arterial = \$ 4,000.00 per meter;
4. Sidewalk (assumed 1.5 m wide) = \$144 per meter;
5. Multi-use trail (assume 3.0 m wide) = \$171 per meter.

The City had preliminary costs for some projects, and thus our tables do not list unit costs. For the rail grade separation costs, we provide a range because a study is necessary to determine which one of three candidate locations is suitable.

The costs do not include property costs.

Finally, the capital plans herein only consider transportation projects. The City may need to alter these plans in order to meet overall capital plans and budgeting for the City's overall capital budgets, or to meet adjacent development needs. The capital improvements are plotted on a map for each time frame within and outside the city limits and are shown in Exhibit 6.1.

6.1 3 Year Capital Plans

Table 6.1 shows the recommended 3 year capital plan. There are three projects, but one is the most costly of any transportation project (the north-south corridor phase 1). The 52 Street extension provides a missing link and alternative route relieving congestion at 62 Avenue – 44 Street. We also identify \$0.92M for sidewalk and trail projects to fill in missing gaps in the higher priority areas.

Table 6.1: 3 Year Capital Plan Projects

#	3 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
1	52 Street extension to 75 Avenue	1163.0	4800.00	5.58
2	North-South Corridor Phase - 1 (35 Street to 62 Street)	5863.0		32.67
3	Improve Sidewalk Connectivity	1214.5	144.29	0.18
4	Improve Trail Connectivity	4309.8	171.33	0.74
Total =				39.16

6.2 5 Year Capital Plans

Table 6.2 shows the recommended 5 year capital plan. We show Phase 2 of the north-south corridor in this plan. However, we note that a reasonable and much less expensive alternative is to construct spot intersection improvements at congestion points (left and right turn bays). This responds to public feedback and will improve traffic flow. If the City constructs these spot improvements, it will likely take at least 5 to 10 years for congestion to return to present levels, although further detailed analysis should be completed to better determine a timeline.

Table 6.2: 5 Year Capital Plan Projects

#	5 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
5	North-South Corridor Phase - 2 (12 Street to 35 Street)	2414.0	3200.00	7.72
6	25 Street Extension to 40 Avenue from 47 Avenue	1171.0	4800.00	5.62
7	College Drive Twinning from 36 Street to 53 Avenue	2000.0	3200.00	10.43
8	Rail Grade Separation (Subject to further Study)			35.00 to 45.00
9	Improve Sidewalk Connectivity	809.7	144.29	0.12
10	Improve Trail Connectivity	2873.2	171.33	0.49
Total =				59.38 with 35.00 and 69.38 with 45.00

6.3 10 Year Capital Plans

Table 6.3 shows the recommended 10 year capital plan. All projects are twinning of existing roads thereby strengthening the grid. The 50 Avenue twinning south of 12 Street will strengthen the City's connection to the Highway 16 bypass, which we assume will be in place in this time frame. The volume on 75 Avenue from 44 Street to 52 Street are marginal (about 13,000 ADT) in the 10 year (medium term) model. Therefore, ISL did not twin this road section in the medium term model. However, this section may need to be twinned shortly after the 10 year model scenario.

Table 6.3: 10 Year Capital Plan Projects

#	10 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
11	12 Street Twinning from 40 Avenue to 75 Avenue	4971.0	3200.00	15.91
12	40 Avenue Twinning from 52 Street to 62 Street	1650.0	3200.00	5.28
13	40 Avenue Twinning from 12 Street to 44 Street	3240.0		6.80
14	75 Avenue Twinning from 12 Street to 44 Street	3273.0		7.27
15	50 Avenue Twinning from 12 Street to City's Southern Boundary	814.0	3200.00	2.6
16	Improve Sidewalk Connectivity	4263.9	144.29	0.62
17	Improve Trail Connectivity	13072.0	171.33	2.24
Total =				70.72



6.4 20 Year Capital Plans

Table 6.4 shows the 20 year capital plan. It strengthens the City's grid through a combination of new road links and widening of existing links. The widening also includes 6-laning of 59/62 Avenue

Table 6.4: 20 Year Capital Plan Projects

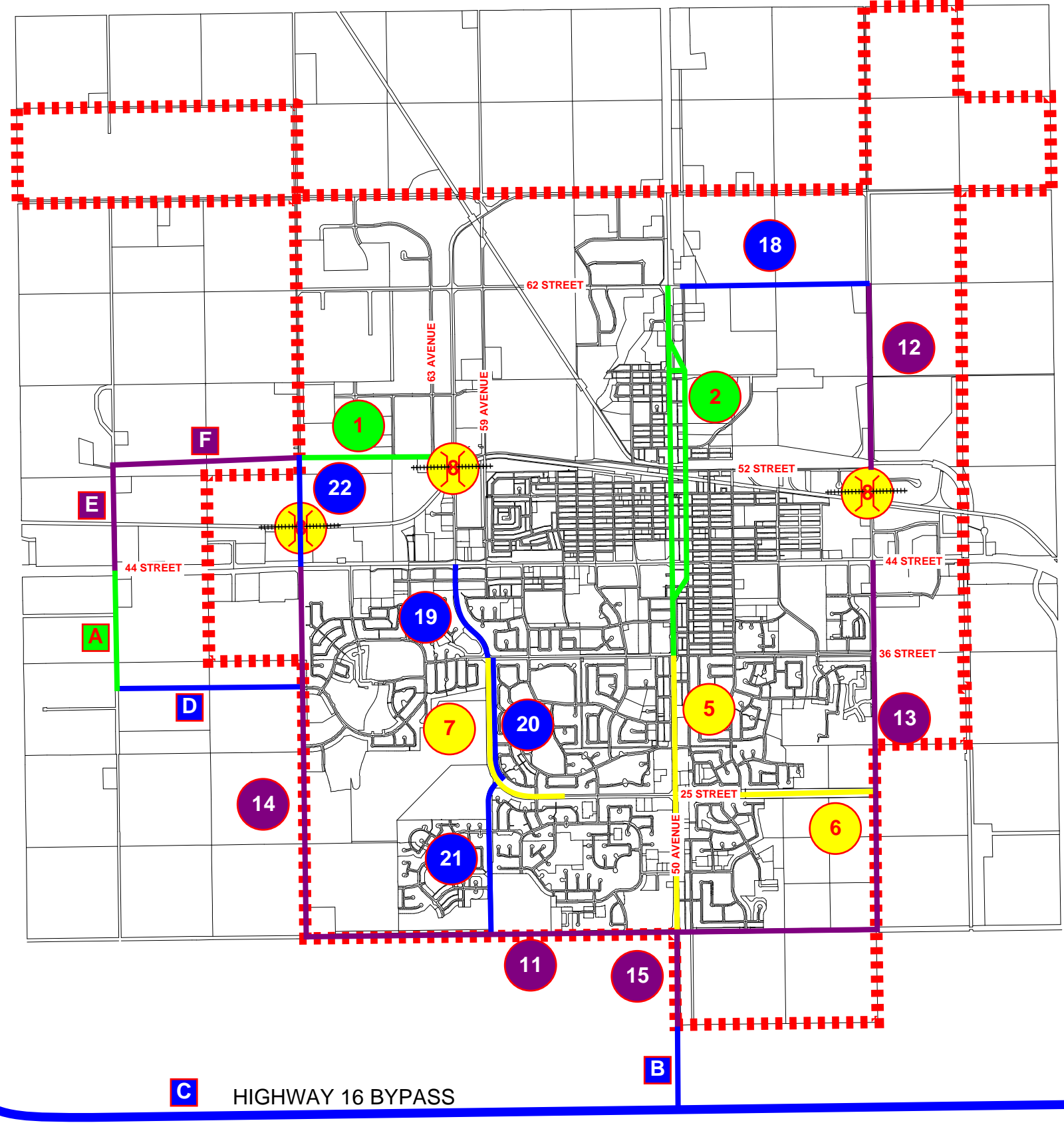
#	20 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
18	62 Street extension from 40 Avenue to 49 Avenue	1625.0	4800.00	7.80
19	6 - Lanes of 62 Avenue from 36 Street to 44 Street	834.0	4000.00	3.34
20	6 - Lanes of 59 Avenue from 25 Street to 36 Street	1111.0	4000.00	4.44
21	59 Avenue twinning from 12 Street to 25 Street	1327.0	3200.00	4.25
22	75 Avenue twinning from 44 Street to 52 Street	900.0	3200.00	2.88
23	Improve Sidewalk Connectivity	7200.1	144.29	1.04
24	Improve Trail Connectivity	36785.0	171.33	6.30
Total =				30.05

6.5 Projects outside City Limits

Table 6.5 shows projects outside the City limits. We found the need for these through our modeling exercise.

Table 6.5: Time frames of the projects outside the City limits

#	Projects Outside City Limits	Time Frame	Jurisdiction
A	Range Road 13 Twinning from 44 Street to Spruce Hill Road	Short Term	County of Vermillion River
B	50 Avenue Twinning from City's Southern Boundary to Highway 16 Bypass	Medium Term	County of Vermillion River
C	Highway 16 Bypass	Medium Term	Provinces of Alberta and Saskatchewan
D	35 Street extension to Range Road 13	Medium Term	County of Vermillion River
E	Range Road 13 Twinning from 44 Street to 52 Street	Long Term	County of Vermillion River
F	52 Street extension from City's Western Boundary to Range Road 13	Long Term	County of Vermillion River



NOTE:

1. The project numbers are for the projects within the City Limits and are matched with the project numbers in the capital plan projects in the tables of the report.
2. The project letters are for the projects outside the City Limits and are matched with the project letters in the capital plan projects in the tables of the report.
3. The project numbers 3, 4, 9, 10, 16, 17, 23, 24 are the sidewalk and trail connectivity improvements.

LEGEND

- 1 3 YEAR IMPROVEMENTS
- 1 5 YEAR IMPROVEMENTS
- 1 10 YEAR IMPROVEMENTS
- 1 20 YEAR IMPROVEMENTS
- PROSPECTIVE RAIL GRADE LOCATIONS
- X SHORT TERM IMPROVEMENT
- X MEDIUM TERM IMPROVEMENT
- X LONG TERM IMPROVEMENT
- ||||| CITY OF LLOYDMINSTER BOUNDARY



7.0 Goods Movement

In addition to meeting people's need to move, Lloydminster's road network also serves goods movement. While many goods can move in smaller vehicles, often trucks are necessary and some of the goods are hazardous.

Cities across Alberta use two separate, but often related road systems to manage goods movement. Regular truck routes manage moving larger, heavy vehicles around, while Dangerous Goods Routes manage transportation of hazardous materials. In some cases, a truck may also carry hazardous goods, in which case it is subject to both systems. In other cases, a truck may only be subject to truck routes, and yet other cases vehicles that are too small to be classed as trucks may still be subject to Dangerous Goods Routes.

The following sections discuss both systems.

7.1 Truck Routes

The City of Lloydminster required a review of its truck route system. ISL completed the review by defining the current state, examining public feedback, land use, and technical considerations, and then providing a recommended truck route network.

Current State

The purpose of truck routes is to restrict truck traffic to particular streets for the following reasons:

1. Allow heavier pavement structures on the routes, thereby saving pavement structure on non-truck routes
2. Design truck routes for the large size and turning sweeps of trucks, and conversely to avoid such large designs for non-truck routes.
3. Reduce nuisance noise from trucks by avoiding routes in residential areas and by building noise attenuating fences or berms where routes are through residential areas.

Exhibit 7.1 shows Lloydminster's current truck routes and current industrial land uses:

1. Highway 16 (44 Street);
2. Highway 17 (50 Avenue);
3. 52 Street from 40 Avenue to 62 Avenue;
4. 62 Avenue from 44 Street to 52 Street;
5. 40 Avenue from 44 Street to 52 Street;
6. 55 Avenue from 44 Street to 51 Street.

The 55 Avenue route passes through a residential area in order to reach businesses south of the rail tracks. Its designation requires trucks to use only 55 Avenue, as opposed to using any of the roads in the residential neighbourhood. All other roads are arterial roads that carry larger volumes of traffic. Adjacent land uses are mostly industrial and commercial.

Public Feedback

Although the existing truck route system is small, there was public feedback to reduce the network by eliminating truck routes in the downtown. This often included both Highways 16 and 17. The amount of feedback was small but consistent from both the online forum as well as the "Your Voice" event.

Land Use

The primary land use considerations for a truck route system are proximity to residential areas (unless mitigated with noise attenuation) and other sensitive land uses, and convenience of access to industrial areas. The existing truck routes do avoid residential areas. However, not all roads in industrial areas are designated as truck routes.

Exhibit 7.1 shows existing industrial land in Lloydminster. It is almost all north of Highway 16 (44 Street).

7.2 Technical Considerations

Except for industrial areas, where all roads may be designated as truck routes, most other areas should only consider arterial roads as possible truck route candidates. Even then there are additional considerations for arterial roads as truck routes:

1. Are there adequate existing noise attenuation facilities if the road is through a residential area (or is it possible to construct such noise attenuation);
2. Is the road also a Provincial Highway? Both Alberta Transportation and Saskatchewan Ministry of Highways and Infrastructure (MHI) expect that their highways also function as truck routes. If the City wishes to delete even a portion of a Highway, it will need to negotiate the deletion with the affected Highway agency;
3. Does the road provide a logical connection for trucks.

With regard to the last point, there are two basic trip types to consider. One is trips that start or end in Lloydminster. Such trips will likely start or end in an industrial or commercial area. There will also be a small amount of such trips to residential areas (for delivery), but we accept these as necessary and not subject to remaining on truck routes.

The second kind of trip to consider is through trips – trucks that have neither a start nor an end of their trip in Lloydminster. There is likely a great number of these on Highway 16, as evidenced by the large number of semi-trailers (suited for long-haul) and by the fact that Highway 16 is a National Highway spanning the four western provinces. However, Highway 17 likely has very few such trips because its regional connectivity is much smaller than Highway 16, and there are significantly less semi-trailers.

7.3 Recommended Truck Routes

Figure 7.2 shows the recommended truck routes (red solid line). It enhances the existing system by creating a grid of perimeter arterial roads (67 Street, 75 Avenue, 12 Street, and 40 Avenue). It also adds some commercial collector roads near the 62 Avenue – 44 Street intersection. This will allow trucks alternative routes to access businesses and to avoid congestion. Finally, it identifies industrial areas where all roads are truck routes. These industrial areas are not the same as the zoned industrial areas of Exhibit 7.1, but a subset of these zoned areas. This makes the industrial areas more continuous and avoids ambiguous routing associated with small industrial areas.

Although there was strong public feedback to eliminate trucks in the downtown, the recommended plan continues to use 50 Avenue and 44 Street as truck routes. Both these roads are provincial highways and will require negotiation with both provinces to remove. In addition, there are likely through truck volumes on both highways (going through Lloydminster without stopping). Removing the routes from the system would lengthen travel distances for all trucks. However, it might be reasonable to eliminate 44 Street once the bypass is built.



Although the downtown routes remain, we also recommend parallel routes on either side of the downtown for both Highways 16 and 17. This provides trucks with an alternative, and will provide some relief from truck volumes in the downtown.

7.4 Dangerous Goods Routes

For the purposes of this TMP the City requires a high level guideline to establish a Dangerous Goods Route (DGR).

The main purpose of establishing a DGR is to manage risks posed by the transport of hazardous materials through the City. The intent is to limit routes to reduce harm and economic losses if the materials unintentionally miscarry, such as may happen during a traffic collision. A DGR also allow emergency responders to anticipate potential problems and be better prepared to act.

Alberta publishes “Guidelines for the Establishment of Dangerous Goods Routes in Alberta Municipalities” (Oct 2015). It provides very high level advice. We did not find a similar publication for Saskatchewan.

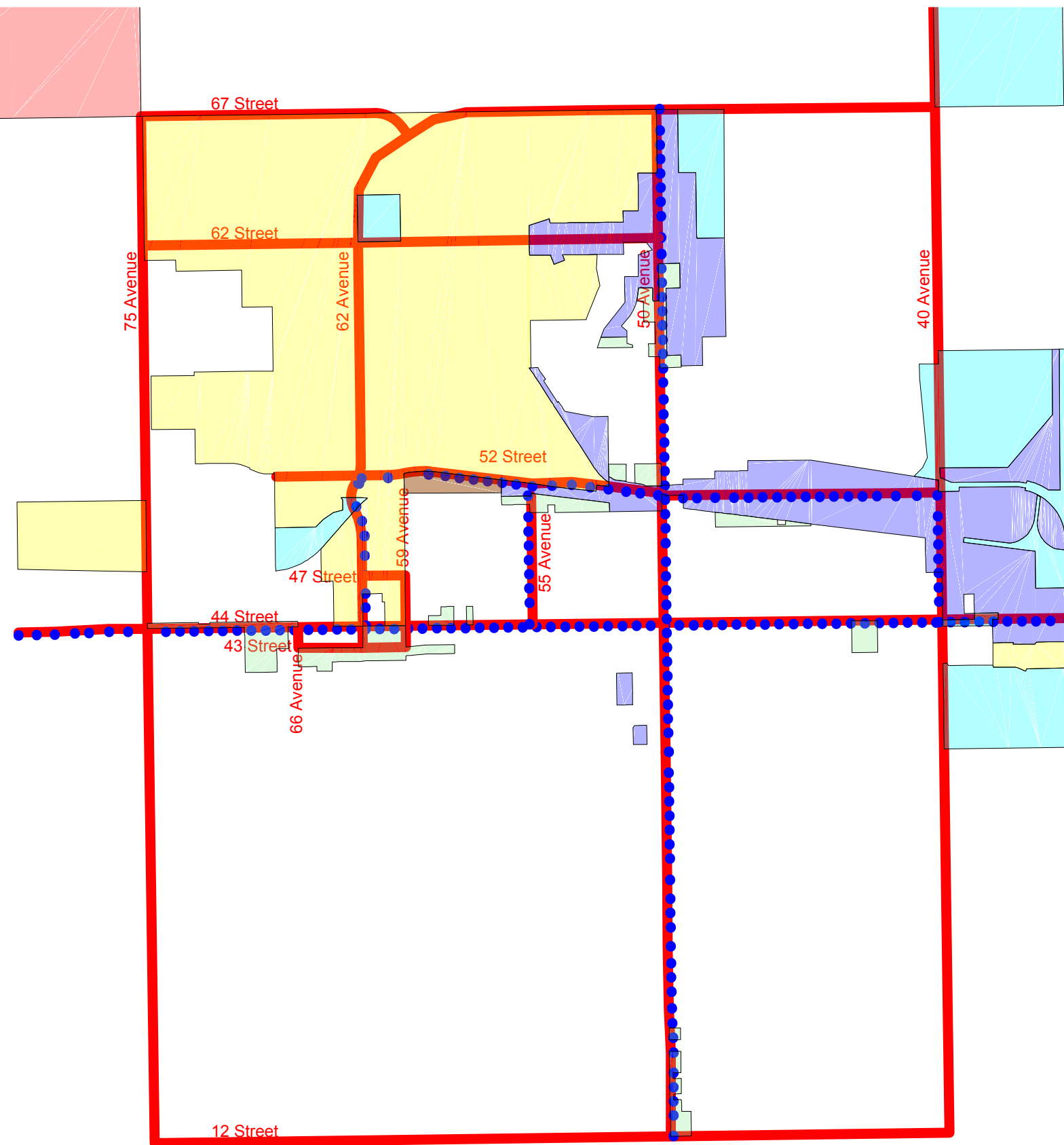
Generally, both provinces expect that provincial highways will act as dangerous goods routes. However, they are willing to consider deleting a provincial highway as a dangerous goods route if the municipality provides a reasonable alternative. It would also be advisable to work with industry carriers

The potential risks depend on the kinds of materials carried. The City’s emergency responders should therefore have input on a DGR. Following are some guidelines for designating a DGR:

1. Choose routes that avoid large numbers of people, such as residential areas or high volume commercial lands;
2. Choose routes where buildings and people are well set-back from the road, such as arterial roads;
3. Consider restrictions based on time of day. For example, if large numbers of people gather in the downtown during the day, but not at night, time restrictions might be an appropriate trade-off. Discussion with industry would also help identify the merits of time restrictions.

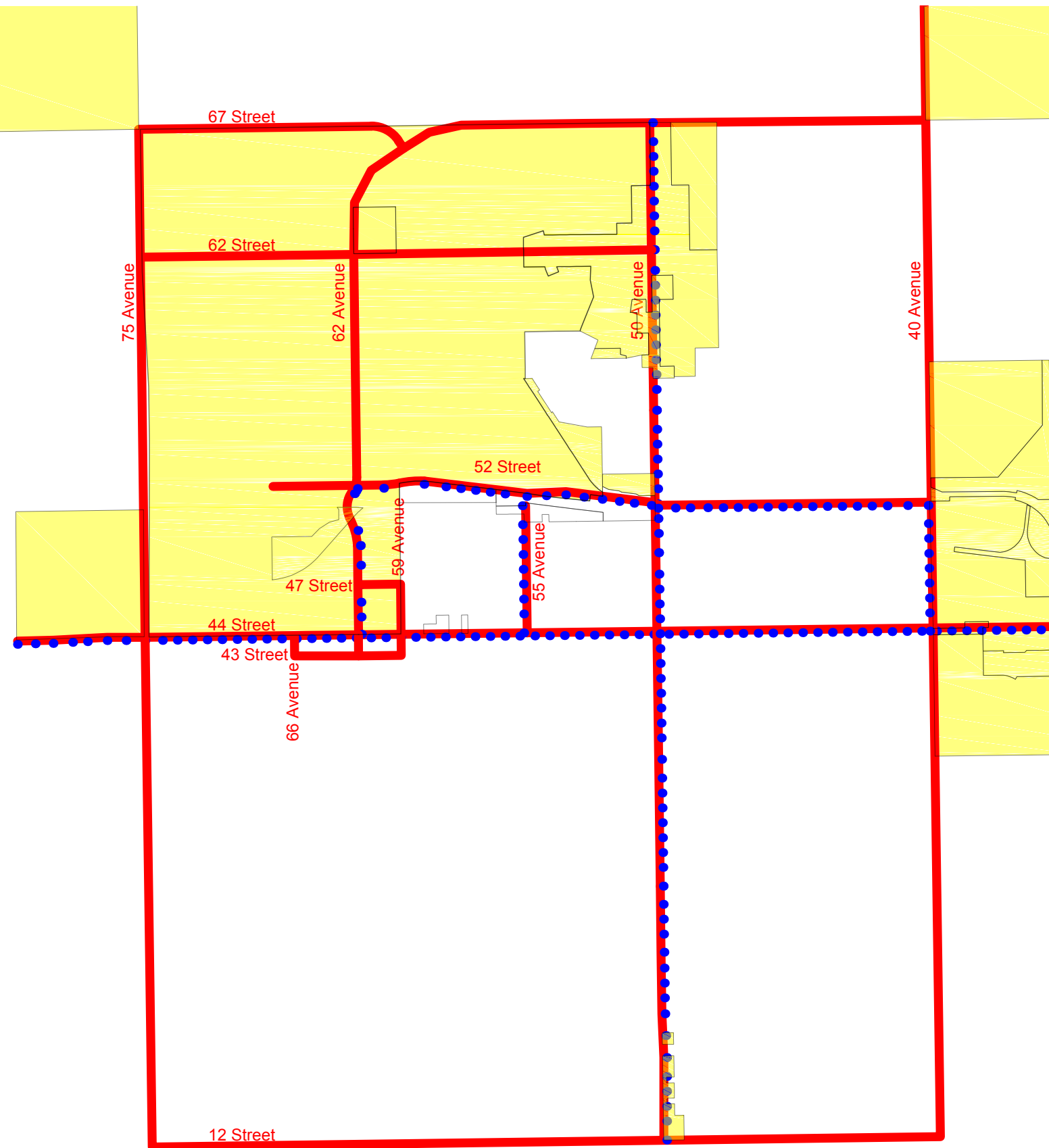
There are no published geometric standards for a DGR, although it is reasonable to use standards similar to truck routes.

To establish a DGR in Lloydminster, the City should work with its emergency responders as well as industry representatives, provincial agencies, and the general public. A bylaw will need adoption, and it should also include public hearing.



LEGEND

- EXISTING TRUCK ROUTES
- AIRPORT CONTROL
- HEAVY INDUSTRIAL
- INDUSTRIAL BUSINESS
- INDUSTRIAL RESERVE
- LIGHT INDUSTRIAL
- LIMITED LIGHT INDUSTRIAL



LEGEND

- PROPOSED TRUCK ROUTES
- EXISTING TRUCK ROUTES
- INDUSTRIAL AREA



8.0 Collision Data Analysis

8.1 Methodology

Collision analysis for Lloydminster is a unique challenge. There are two separate provincial agencies responsible for collecting collision information. While their respective data bases have common items, they do not match. Therefore, combining the data bases is impractical.

Instead, ISL analyzed each database separately, then combined the analysis results to provide a City-wide perspective. We combined only common items, and noted exceptions when combining was impractical. We believe this represents a reasonable approach to the challenge, but we caution the following:

1. Matching years – Alberta collision data were available from 2008 to 2013, while Saskatchewan data were available from 2008 to 2011. In order to best match the data we included years from 2008 to 2011 from both provinces (that is, we did not include 2012 and 2013 in the Alberta data);
2. Different collision damage values – Saskatchewan data includes collisions with a property damage of at least \$1000 or an injury. This is the same for Alberta from 2008 to 2010, but on January 1, 2011 Alberta increased its property damage limit to \$2000. This change causes two problems. The data are less comparable between the provinces for the 2011 year, and within Alberta the 2011 data is less comparable to other years. Despite these challenges we chose to keep the 2011 data rather than further reduce available data;
3. Different data base coding – There are some fundamental differences in how collisions were coded. For example, Alberta uses “Left Turn Across Path” to describe a left turn vehicle colliding with an opposing through vehicles. In Saskatchewan, these collisions are included in the “Right Angle” category, which also include collisions between two through vehicles at travelling at right angles;
4. Different Data Interpretations – during the analysis ISL noted that “unknown” results are typical in the Alberta data base; for example the hour of a collision could be unknown as it could be a parked vehicle that was struck by a run-away. In the Saskatchewan data base, there were no unknowns, suggesting Saskatchewan uses a default procedure to code these occurrences.

8.2 Safe System Approach

A growing trend in traffic safety is to use the Safe System approach. Based on Sweden’s Vision Zero, Netherlands Sustainable Safety, and New Zealand’s Safe Journey’s, the Safe System uses a holistic, systematic, and multi-disciplinary approach.

Safe System aims for a more forgiving system that accounts for human fallibility and vulnerability. Under a Safe System the whole transport system protects people from death and serious injury. Organizations using Safe System accept that:

1. People make mistakes – crashes are inevitable;
2. People are vulnerable – human bodies tolerate some crash force, beyond which serious injury or death result. Given that people make mistakes, the Safe System aims to make mistakes forgiving so that no serious injury or death will result;
3. We need to share responsibility – road system designers (engineers, law makers, law enforcers, insurers, vehicle manufacturers, and others) and road users share responsibility to create a road system where, in the event of a crash, death or serious injury are impossible;
4. We need to strengthen all parts of the system – including roads, roadsides, speeds, vehicles, and road use, such that if one part fails, other parts protect the road users.

ISL's collision analysis takes a step toward the Safe System. While we analyzed all collisions, we also included sub-set analyses that use injury collisions only. We believe this will help focus corrective actions to where and when the most harmful crashes occur. We note that the collision data base for Alberta does not distinguish the grade of injury and therefore we included all injury (and fatal) collisions. Typically in a Safe System approach a serious injury collision is one where a person is admitted to hospital for treatment.

8.3 Total Collision and Total Injury Collisions

Figure 8.1 shows total collision numbers for the combined Alberta and Saskatchewan datasets.

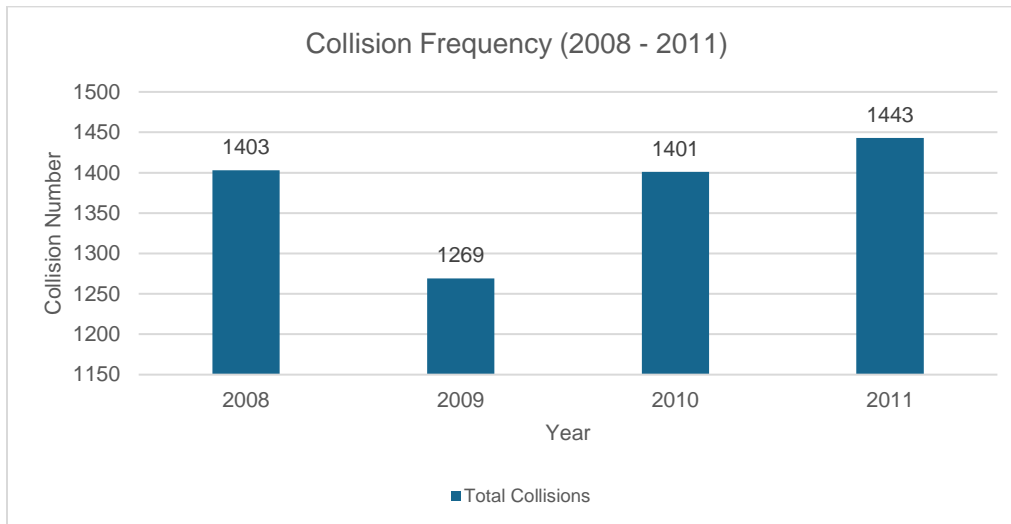


Figure 8.1: Yearly Collision Frequency

Collisions numbers noticeably drop in 2009, although we could not find a clear reason. We expected a drop in 2011 due to the reporting value increase in Alberta to \$2000. However, collisions marginally increased. It's possible that both these unexpected results relate to economic activity in Lloydminster, where the very strong 2008 economy cooled in 2009, then rebounded strongly in 2011. If this is correct, the amount of traffic often correlates with economic activity, and in turn the amount of collisions correlates with the amount of traffic.

Table 8.1 and Figure 8.2 summarize collision severity results. In total there were 6 fatal collisions, 431 injury collisions and 5079 property damage only collisions. The total fatal and injury collisions follow the overall collision trend, dipping to a low in 2009 and peaking in 2011.

Table 8.1: Yearly Collision Severity

Collision Severity	2008	2009	2010	2011	Total
Fatal	5	0	1	0	6
Injury	123	72	94	142	431
Total Fatal and Injury	128	72	95	142	437
Percent Total Injury (%)	9.12	5.67	6.78	9.84	7.92
Property Damage Only	1275	1197	1306	1301	5079
Unknowns	0	0	0	0	0
Total	1403	1269	1401	1443	5516

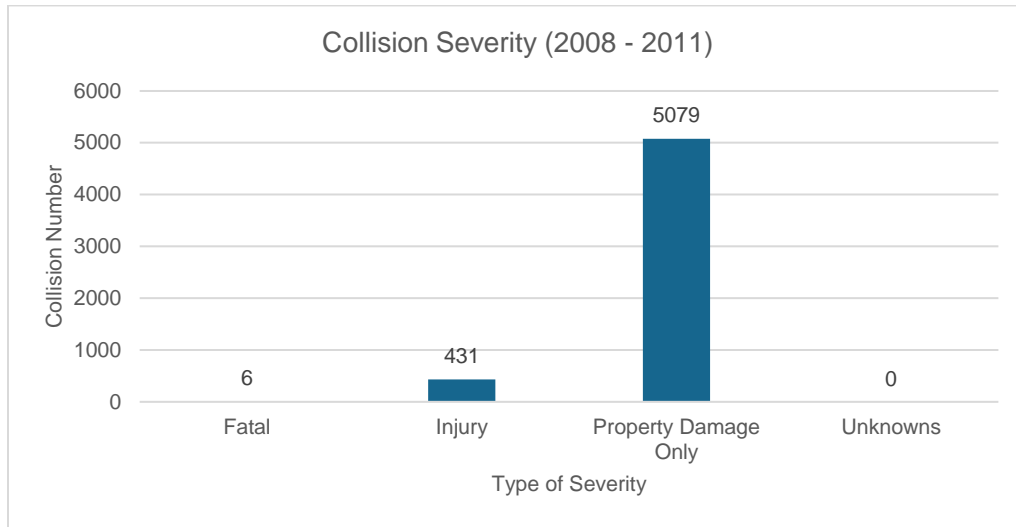


Figure 8.2: Collision Frequency by Collision Severity

Figure 8.3 compares injury collisions to total collisions. We normalized the comparison using percent total injury. This percentage follows the same trend of dipping in 2009 and peaking in 2011. The data has an unusual trend. In 2011 Alberta increased its property damage limit for reporting from \$1000 to \$2000. Therefore we expect the number of PDO collisions to decrease sharply. However, the decrease is only 5 (from 1306 to 1301).

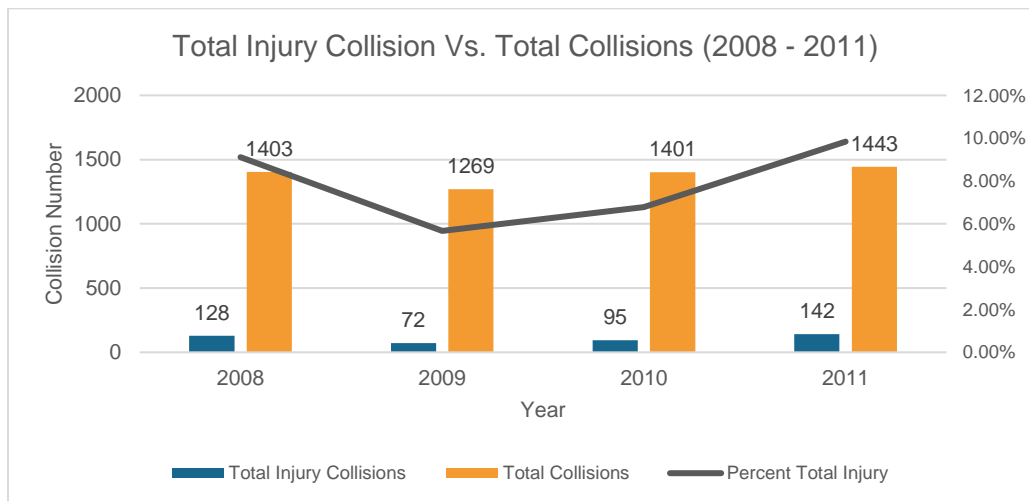


Figure 8.3: Comparison of Total Injury Collisions and Total Collisions

8.4 Collisions by Cause

ISL combined similar primary event codes which use the same description in both the Alberta and Saskatchewan datasets. In some cases we were unable to reconcile the differing codes and therefore report them separately for each province.

The following description of collision codes shown in Table 8.2 is not clear in Alberta and Saskatchewan databases for combining the collisions numbers. As these collision causes seems close enough to each other we combined the collision numbers assuming they are the same.

Table 8.2: Collision Codes Description

Collision Description		
Alberta Database	Saskatchewan Database	Combined
Off Road Left	Lost Control – Left Ditch	Off Road Left (AB and SK)
Off Road Right	Lost Control – Right Ditch	Off Road Right (AB and SK)
Sideswipe	Sideswipe – Opposite Direction	Side Swipe Opposite Direction (AB and SK)

Table 8.3 shows the collision causes by each year. Using percentages it also compares combined fatal and injury collisions versus overall collisions for each collision cause. The table is sorted in the descending order of the number of “Fatality and Injury” collisions by causes by each year.

Table 8.3: Collision Frequency by Primary Event

Collision Cause	2008	2009	2010	2011	Total	Fatality and Injury	Percent Fatal and Injury (%)
Total	1403	1269	1401	1443	5516	437	7.92%
Rear End (AB and SK)	268	217	314	318	1117	155	13.88%
Right Angle (AB and SK)	164	105	133	156	558	102	18.28%
Struck Object (AB)	160	143	123	139	565	29	5.13%
Left Turn - Across Path (AB)	47	27	25	28	127	25	19.69%
Other (AB and SK)	231	232	283	360	1106	19	1.72%
Unknowns (AB)	103	200	153	62	518	19	3.67%
Left Turn-Straight - Opposite Direction (SK)	28	18	21	19	86	16	18.60%
Fixed / Movable Object (SK)	25	14	22	16	77	15	19.48%
Side Swipe - Same Direction (AB and SK)	79	57	72	77	285	11	3.86%
Backing (AB)	200	161	187	178	726	10	1.38%
Off Road Right (AB and SK)	14	18	14	15	61	7	11.48%
Sideswipe Opposite Direction (AB and SK)	25	26	6	23	80	7	8.75%
Head On (AB and SK)	10	8	6	16	40	5	12.50%
Left Turn-Straight (SK)	6	3	14	8	31	5	16.13%
Off Road Left (AB and SK)	12	10	5	3	30	4	13.33%
Left Turn-Straight - Same Direction (SK)	8	5	0	3	16	4	25.00%
Passing Right Turn (AB and SK)	9	9	12	8	38	2	5.26%
Lost Control - Right Ditch to Left Ditch (SK)	1	1	0	1	3	1	33.33%
Right Turn - Same Direction (SK)	6	5	6	5	22	1	4.55%



Passing - Left Turn (AB and SK)	7	10	5	8	30	0	0.00%
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Ignoring collision causes with less than 50 total collisions (for statistical reliability), the top four most severe collision causes by percent injury and fatality are:

1. Left Turn Across Path (AB) – 19.69%;
2. Fixed / Movable Object (SK) – 19.48%;
3. Left Turn-Straight – Opposite Direction (SK) – 18.60%;
4. Right Angle (AB and SK) – 18.28%.

Together these four collision causes represent 15% of the total collisions.

And ignoring collision causes with less than 50 total collisions, the top four least severe collision causes by percent injury and fatality are:

1. Backing – 1.38%;
2. Other (AB and SK) – 1.72%;
3. Unknowns (AB) – 3.67%;
4. Side Swipe Same Direction (AB and SK) – 3.86%.

Together these four collision causes represent 48% of the total collisions.

As a general rule the four collision types that are most severe should receive more attention. Conversely, the least severe collisions, although numerous in some cases, do not need as great attention.

Figure 8.4 graphically shows total collisions by cause. There are seven causes with over 200 occurrences:

1. Rear end (AB and SK) – 1117;
2. Other (AB and SK) – 1106;
3. Backing (AB) – 726;
4. Struck Object (AB) – 565;
5. Right Angle (AB and SK) – 558;
6. Unknowns (AB) – 518;
7. Sideswipe – Same Direction (AB and SK) – 285.

Together these seven causes represent 88% of the total collisions. Two are undefined (Other and unknown) and are thus meaningless for analysis. Four are minor severity (Other, backing, unknown, and side swipe – same direction). Only one – Right Angle, is in the most severe category.

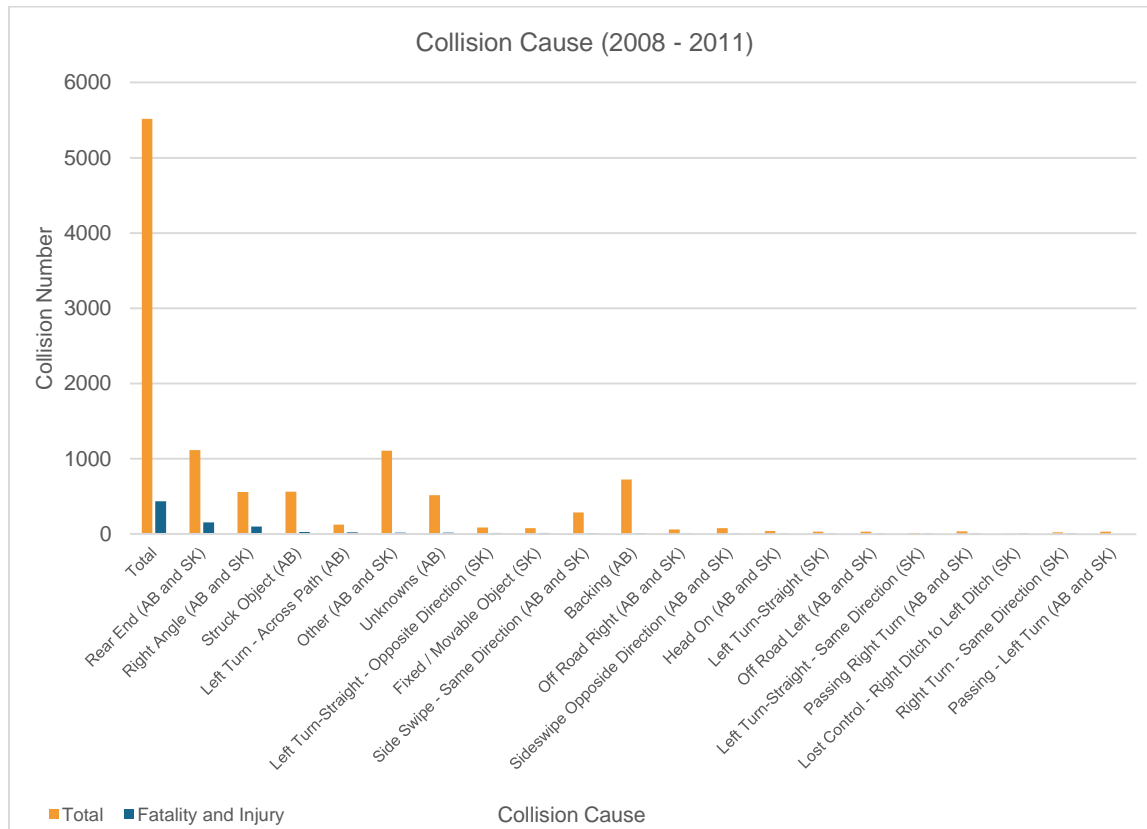


Figure 8.4: Collision Frequency by Primary Event



8.5 Monthly Collision Trend

The collision data were analyzed for variations by months. More collisions occur in the winter months mainly due to poorer weather and driving conditions. However, a larger percentage of collisions in the summer months result in an injury and/or fatality. This may be due to higher speeds being more prevalent in the summer months. Table 8.4 and Figure 8.5 show the monthly collision frequency.

Table 8.4: Monthly Collision Frequency

Month of Year	2008	2009	2010	2011	Total	Fatality and Injury	Percent fatal and injury (%)
January	131	167	111	175	584	35	5.99%
February	128	112	98	131	469	32	6.82%
March	120	126	107	162	515	36	6.99%
April	123	76	103	106	408	34	8.33%
May	86	80	118	103	387	36	9.30%
June	88	75	77	116	356	36	10.11%
July	109	95	102	133	439	41	9.34%
August	94	91	113	109	407	37	9.09%
September	95	78	122	95	390	43	11.03%
October	120	90	107	89	406	27	6.65%
November	116	94	150	127	487	41	8.42%
December	191	178	187	90	646	39	6.04%
Unknowns	2	7	6	7	22	0	0.00%
Total	1403	1269	1401	1443	5516	437	7.92%

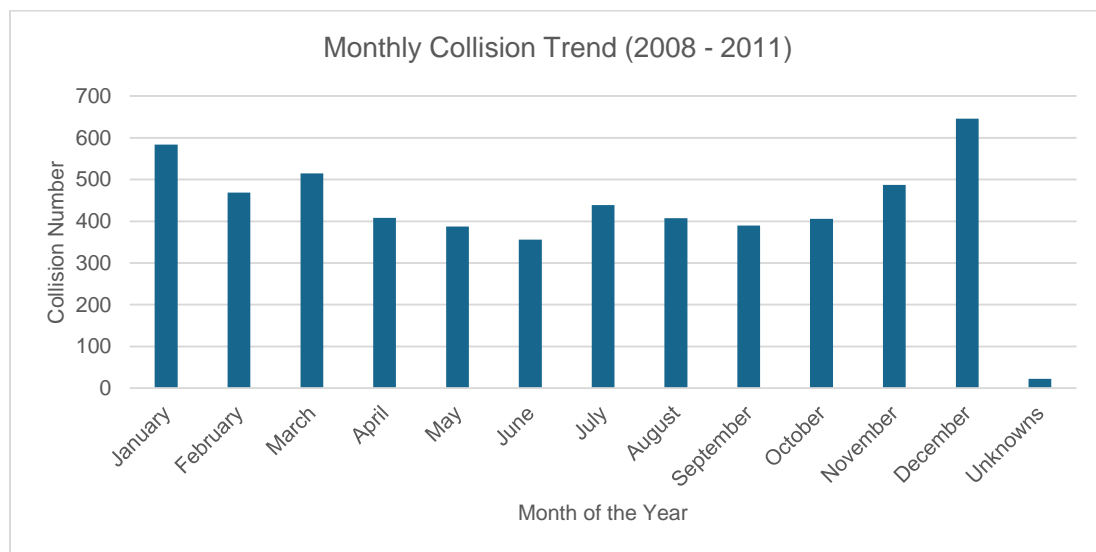


Figure 8.5: Monthly Collision Frequency

8.6 Weekly Collision Trend

ISL analyzed collisions by day of the week. Table 8.5 and Figure 8.6 show the results.

Sunday had the least amount of collisions, followed by Saturday. Fridays have the most collisions, followed by Thursdays.

In terms of severity (percentage) the weekend days were the least severe. The most severe were Wednesdays, followed closely by Tuesdays.

Table 8.5: Weekly Collision Frequency

Day of Week	2008	2009	2010	2011	Total	Fatality and Injury	Percent Fatal and injury (%)
Sunday	125	105	117	117	464	34	7.33%
Monday	200	173	198	188	759	58	7.64%
Tuesday	201	189	203	228	821	73	8.89%
Wednesday	222	187	225	213	847	76	8.97%
Thursday	227	237	220	237	921	76	8.25%
Friday	268	206	269	251	994	73	7.34%
Saturday	158	161	163	201	683	47	6.88%
Unknowns	2	11	6	8	27	0	0.00%
Total	1403	1269	1401	1443	5516	437	7.92%

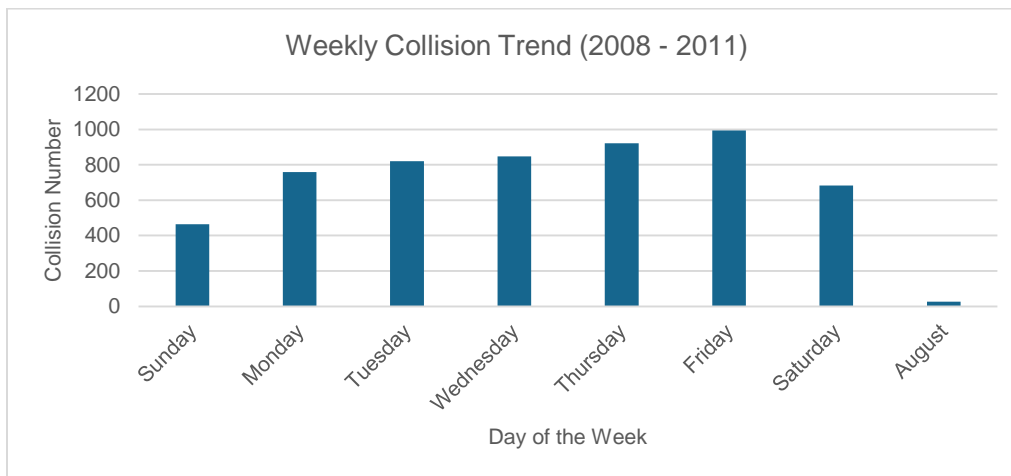


Figure 8.6: Weekly Collision Trend



8.7 Hourly Collision Trend

ISL analyzed collisions by hour of the day. Table 8.6 and Figure 8.7 show the results.

The total collisions tend to follow the volume on the roads (although for simplicity in this analysis ISL combined weekday and weekend collisions, which have differing character in terms of volumes).

In terms of severity, by far the two most severe hours are from 4 to 6 am. There is a very unusual pattern in the data for several hours. From 6am to 5pm every other hour has inexplicably very low severity. This is highly unintuitive and suggests a problem with the data.

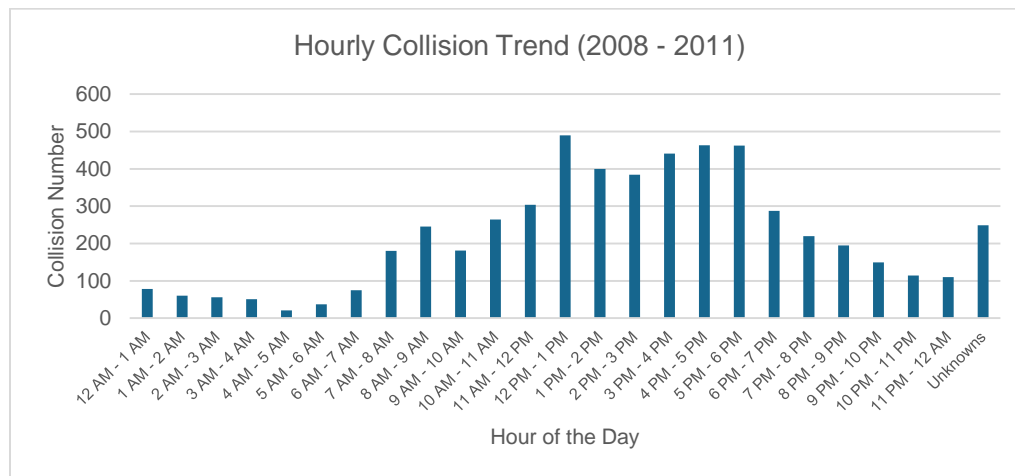


Figure 8.7: Hourly Collision Trend

Table 8.6: Hourly Collision Frequency

Hour of Day	2008	2009	2010	2011	Total	Fatality and Injury	Percent Fatal and Injury (%)
12 AM - 1 AM	31	23	14	10	78	7	8.97%
1 AM - 2 AM	13	17	14	16	60	2	3.33%
2 AM - 3 AM	19	13	6	18	56	16	28.57%
3 AM - 4 AM	17	11	7	16	51	10	19.61%
4 AM - 5 AM	3	4	5	9	21	9	42.86%
5 AM - 6 AM	12	5	8	12	37	36	97.30%
6 AM - 7 AM	18	13	32	12	75	5	6.67%
7 AM - 8 AM	46	35	45	54	180	42	23.33%
8 AM - 9 AM	56	61	50	78	245	4	1.63%
9 AM - 10 AM	38	45	46	52	181	30	16.57%
10 AM - 11 AM	63	67	66	68	264	5	1.89%
11 AM - 12 PM	79	66	73	86	304	37	12.17%
12 PM - 1 PM	130	109	110	141	490	1	0.20%
1 PM - 2 PM	110	89	113	88	400	44	11.00%

Hour of Day	2008	2009	2010	2011	Total	Fatality and Injury	Percent Fatal and Injury (%)
2 PM - 3 PM	101	103	91	89	384	3	0.78%
3 PM - 4 PM	103	99	132	107	441	50	11.34%
4 PM - 5 PM	127	110	122	104	463	6	1.30%
5 PM - 6 PM	127	110	119	106	462	23	4.98%
6 PM - 7 PM	67	67	81	72	287	14	4.88%
7 PM - 8 PM	64	57	43	56	220	16	7.27%
8 PM - 9 PM	55	36	50	54	195	21	10.77%
9 PM - 10 PM	29	35	39	46	149	17	11.41%
10 PM - 11 PM	25	29	32	28	114	19	16.67%
11 PM - 12 AM	29	28	25	28	110	12	10.91%
Unknowns	41	37	78	93	249	8	3.21%
Total	1403	1269	1401	1443	5516	437	7.92%

8.8 Intersection Collision Hot Spots

For this analysis ISL combined the number of intersection related collisions for both provincial data sets. We were then able to provide a ranking of the highest collision locations, both in terms of total collisions and in terms of injury collisions. We note that the collision data is not reliable in regards to the intersection vs. non-intersection related collisions. Due to this the Saskatchewan intersections will tend to rank higher on the lists shown in this section.



8.8.1 Total Intersection Collisions

Table 8.7 shows the top 30 collision intersections ranked by total collision frequency. Along 44 Street there are 13 locations while along 50 Avenue there are 12 locations. This shows that there are problems through both of 44 street and 50 Avenue corridors. Further evaluation and recommendations about the collision reduction strategies along 44 street was conducted as part of the 44 Street functional review.

Table 8.7: Collision Hot Spots Ranked by Collision Frequency

Rank	Street	Avenue	2008	2009	2010	2011	Total Collision Frequency (2008 – 2011)
1	44	50	37	16	34	28	115
2	36	50	16	22	22	18	78
3	44	49	9	10	16	20	55
4	44	52	7	13	6	8	34
5	50	50	10	6	5	9	30
6	25	50	7	3	10	8	28
7	42	70	11	4	5	5	25
8	44	62	15	7	2	1	25
9	29	50	5	4	6	9	24
10	44	47	6	4	8	5	23
11	39	50	4	2	5	11	22
12	44	57	10	4	2	4	20
13	44	56	6	7	4	2	19
14	46	50	6	3	6	4	19
15	18	50	1	3	6	8	18
16	52	50	7	3	4	3	17
17	44	70	10	2	2	2	16
18	48	50	2	5	4	5	16
19	44	54	3	7	1	4	15
20	51	50	4	2	3	5	14
21	36	49	3	1	2	7	13
22	44	75	1	3	3	6	13
23	46	49	3	3	4	3	13
24	52	49	2	3	7	1	13
25	44	40	1	4	5	2	12
26	44	66	10	1	1	0	12
27	50	49	4	1	5	2	12
28	44	45	1	2	8	0	11
29	28	50	3	2	4	1	10
30	43	62	5	3	1	1	10

8.8.2 Total Intersection Injury and Fatal Collisions

As observed from Table 8.8, 50 Avenue has 13 intersection collisions and 44 Street has 9 intersection collisions out of top 30 hot spots in the City of Lloydminster. This reinforces the evidence of a problem on 44 Street, and a further evaluation of 44 Street was conducted as part of the functional review in this project.

Table 8.8: Collision Hot Spots Ranked by Fatal and Injury Collision Frequency

Rank	Street	Avenue	2008	2009	2010	2011	Injury and Fatal Collision Frequency (2008 – 2011)
1	44	50	8	4	3	8	23
2	44	49	3	5	4	9	21
3	36	50	3	4	4	5	16
4	12	50	0	0	6	3	9
5	36	62	4	1	0	4	9
6	25	50	2	0	4	2	8
7	44	62	7	1	0	0	8
8	29	50	1	0	1	5	7
9	44	45	0	1	6	0	7
10	25	53	2	1	3	0	6
11	18	50	0	1	1	3	5
12	44	75	0	0	0	5	5
13	46	49	1	0	3	1	5
14	49	50	4	0	1	0	5
15	50	50	2	2	0	1	5
16	36	52	0	1	0	3	4
17	41	49	0	4	0	0	4
18	44	40	0	1	2	1	4
19	44	57	0	2	2	0	4
20	44	70	2	0	2	0	4
21	47	54	4	0	0	0	4
22	52	50	1	2	1	0	4
23	23	59	3	0	0	0	3
24	33	50	0	0	0	3	3
25	34	50	1	0	0	2	3
26	36	49	2	0	0	1	3
27	37	49	0	0	0	3	3
28	44	66	3	0	0	0	3
29	46	50	1	0	1	1	3
30	48	50	0	1	1	1	3



8.9 Collision Trend by Environmental Conditions

Environmental condition is recorded at the time and location of the collision. The majority of collisions happened in the clear environmental conditions. Of the fatal and injury collisions, 17% occurred during a cloudy environment. Drifting snow and dusty environment accounted for another 11% of the fatal and injury collisions. Snow resulted in an injury and fatality for 5.86 % of the collisions.

Table 8.9: Collision Frequency by Environmental Conditions

Environmental Conditions	2008	2009	2010	2011	Total	Fatality and Injury	Percent Fatal and Injury (%)
Clear (AB and SK)	1081	1012	1049	1143	4285	366	8.54
Raining (AB and SK)	40	28	64	32	164	14	8.54
Cloudy (SK)	14	11	10	6	41	7	17.07
Hail/Sleet (AB and SK)	6	3	6	4	19	0	0.00
Snow (AB and SK)	137	106	116	85	444	26	5.86
Fog/Smog/Smoke/Dust (AB and SK)	13	3	18	8	42	1	2.38
High Wind / Strong Wind (AB and SK)	3	3	0	0	6	0	0.00
Drifting Snow / Dust (SK)	1	0	3	5	9	1	11.11
Blank (AB)	31	42	50	81	204	8	3.92
Other (AB)	2	2	0	1	5	1	20.00
Unknowns (AB)	75	59	85	78	297	13	4.38
Total	1403	1269	1401	1443	5516	437	7.92

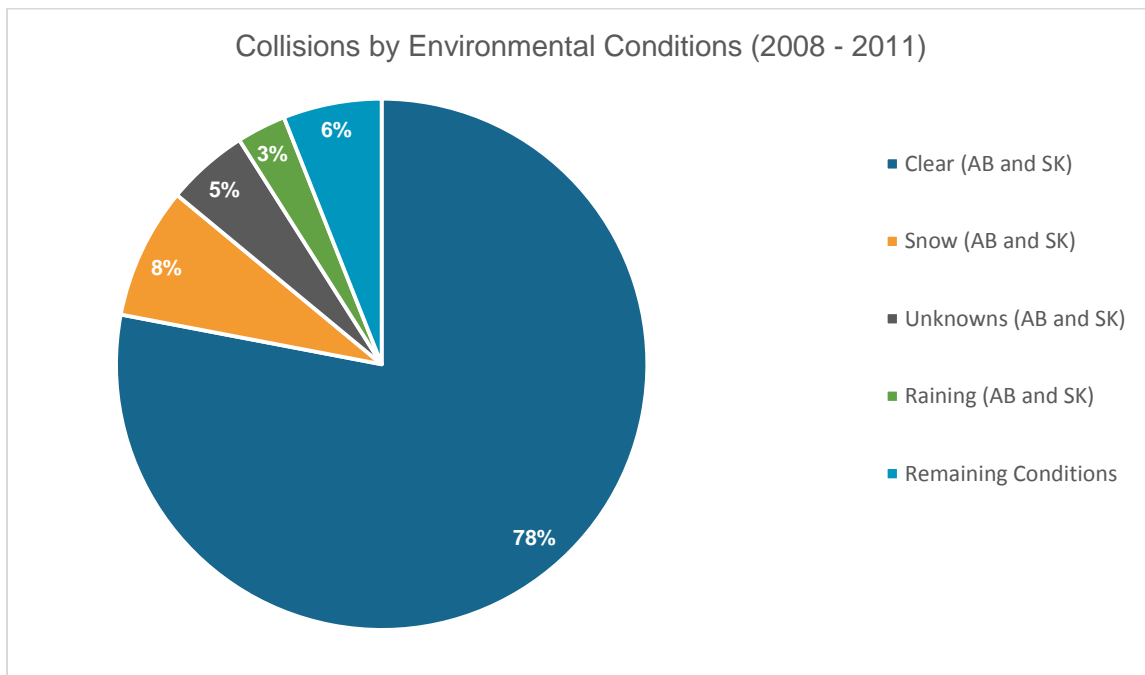


Figure 8.8: Collision Frequency by Environmental Conditions

8.10 Pedestrian and Bicycle Collisions

In four years from 2008 to 2011, there were 29 pedestrian collisions and 21 bicycle collisions in the combined Alberta and Saskatchewan datasets. Table 7.10 and Figure 7.9 provide a year by year summary. In a period of four years, 25 injury collisions and 3 property damage only (PDO) collisions occurred out of total 29 pedestrian collisions.

Table 8.10: Pedestrian Collisions

Year	Fatal	Injury	PDO	Total	Percent Fatal and Injury
2008	1	8	1	10	90 %
2009	0	7	1	8	88 %
2010	0	5	1	6	83 %
2011	0	5	0	5	100 %
Total	1	25	3	29	90 %

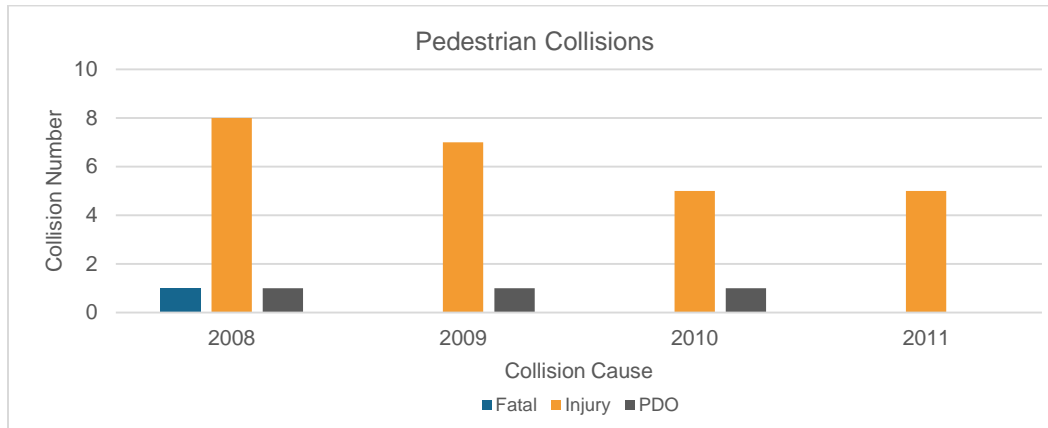


Figure 8.9: Pedestrian Collisions

For bicycle related collisions 17 collisions resulted in an injury and 4 collisions resulted in a property damage only over a period of four years (see Table 8.11 and Figure 8.10).

Table 8.11: Bicycle Collisions

Year	Fatal	Injury	PDO	Total	Percent fatal and Injury
2008	0	2	0	2	100 %
2009	0	7	3	10	70 %
2010	0	4	0	4	100 %
2011	0	4	1	5	80 %
Total	0	17	4	21	81 %

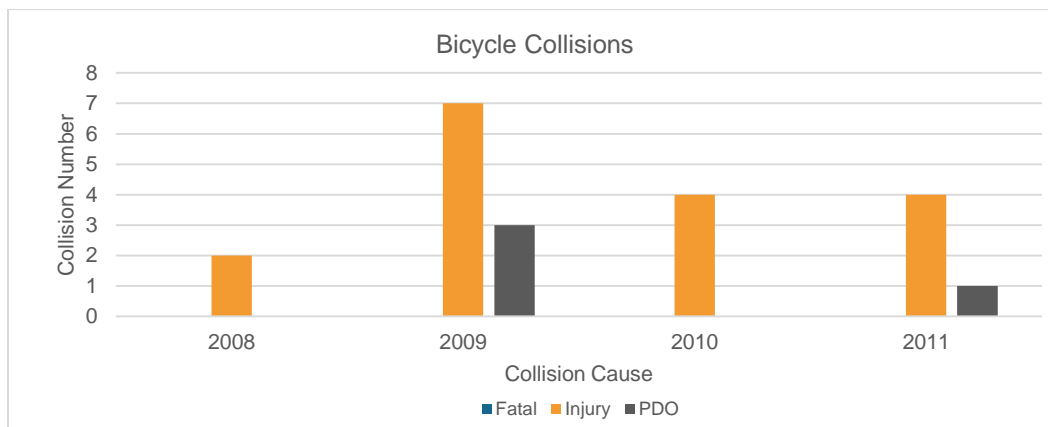


Figure 8.10: Bicycle Collisions

8.10.1 Pedestrian and Bicycle Collision Locations

The following locations are observed in the combined data for the pedestrian related collisions (See Exhibit 8.1). Of the 15 locations 8 are on arterial roads.

Table 8.12: Pedestrian Collision Locations

Street	Avenue	Fatality	Injury	PDO	Total	Percent fatal and Injury
22	51	0	1	0	1	100 %
25	50	0	1	0	1	100 %
35	53	0	2	0	2	100 %
36	47	0	1	0	1	100 %
36	50	0	1	0	1	100 %
39	57	0	0	1	1	0 %
43	62	0	0	1	1	0 %
44	45	0	1	0	1	100 %
44	50	0	2	0	2	100 %
46	47	0	1	0	1	100 %
47	48	0	1	0	1	100 %
47	51	0	1	0	1	100 %
48	50	0	1	0	1	100 %
50	49	0	1	0	1	100 %
50	55	0	1	0	1	100 %
College Drive	59	0	1	0	1	100 %
Unknowns		1	9	1	11	91 %
Total Pedestrian Collisions		1	25	3	29	90 %

The following locations are observed in the combined data for the bicycle related collisions (See Exhibit 8.1). Of the 13 locations, 9 are on arterial roads.


Table 8.13: Bicycle Collision Locations

Street	Avenue	Fatality	Injury	PDO	Total	Percent fatal and Injury
39	51	0	1	0	1	100 %
25	53	0	1	0	1	100 %
25	57A	0	1	0	1	100 %
36	51	0	1	0	1	100 %
36	52	0	1	0	1	100 %
43	55B	0	0	1	1	0 %
44	54	0	2	0	2	100 %
18	51	0	1	0	1	100 %
36	57	0	1	0	1	100 %
50	56	0	1	0	1	100 %
36	50	0	1	0	1	100 %
52	50	0	1	0	1	100 %
25	48	0	1	0	1	100 %
Unknowns		0	4	3	7	57 %
Total Bike Collisions		0	17	4	21	81 %

8.11 Collision Summary

The above collision analysis for the City of Lloydminster from 2008 to 2011 was a unique challenge due to the two collision databases from Alberta and Saskatchewan. ISL analyzed each of these datasets separately and combined the analysis results to provide a city wide perspective.

The collision analysis shows that the total number of collisions increased from 2008 to 2011. However, we observed reduced collisions in 2009 and we were unable to find out a clear reason for this reduction. A collision drop was expected in year 2011 in Alberta dataset due to the increase in the reporting value from \$ 1000 to \$ 2000. However the total number of collisions slightly increase in year 2011 compared to 2010.

Six fatal collisions were observed in the dataset with 431 injury collisions and 5079 property damage only. If we ignore the collision causes with less than 50 total collisions (for statistical reliability), the top four most severe collision causes observed are:

1. Left Turn Across Path (AB) – 19.69%;
2. Fixed / Movable Object (SK) – 19.48%;
3. Left Turn-Straight – Opposite Direction (SK) – 18.60%;
4. Right Angle (AB and SK) – 18.28%.

And ignoring collision causes with less than 50 total collisions, the top four least severe collision causes are:

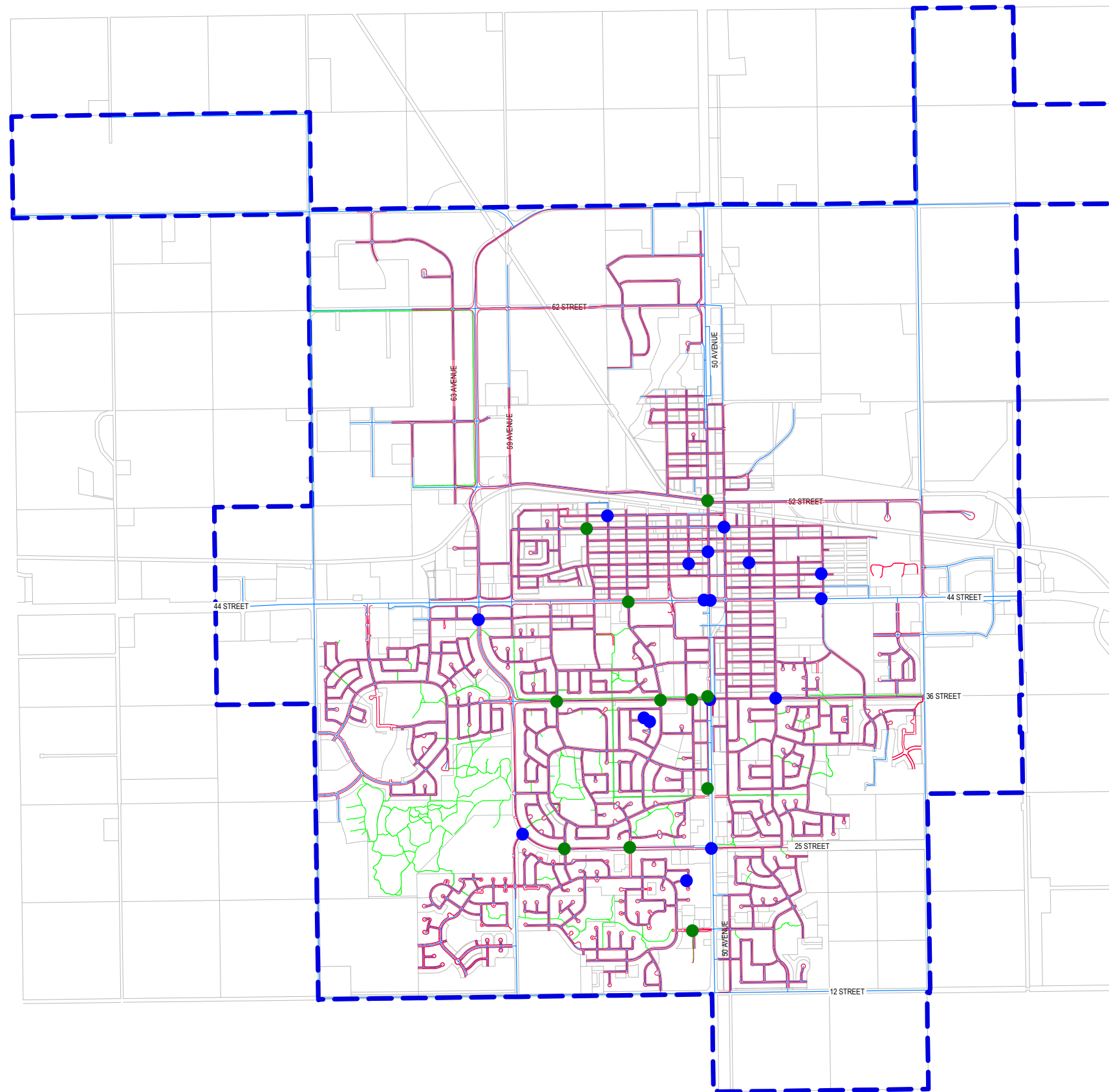
1. Backing – 1.38%;
2. Other (AB and SK) – 1.72%;
3. Unknowns (AB) – 3.67%;
4. Side Swipe Same Direction (AB and SK) – 3.86%.

Increased collisions happened more often in the winter months mainly due to the dominant weather and driving conditions. However, a larger percentage of collisions in the summer months result in an injury and/or fatality.

In terms of severity by far the most severe hours are from 4:00 am to 6:00 am. There is a very unusual pattern in the data for several hours. From 6:00 am to 5:00 pm every other hour has inexplicably very low severity. This is highly unintuitive and suggests a problem with the data.

For days of the week, the least severe were weekend days and the most severe were Wednesdays, followed closely by Tuesdays. The intersection collision analysis identifies more intersection hotspots along 44 street and 50 Avenue corridors.

The collisions on the roadways of Lloydminster occurred in different environmental conditions. The majority of collisions happened in the clear environmental conditions. The winter months have more collisions but the summer months have a higher percentage of severe collisions. From pedestrian and cyclist collision analysis, it was observed that 50% of pedestrian related collision and 64 % of cyclist related collisions are on arterial roads.



LEGEND

- CITY OF LLOYDMINSTER BOUNDARY
- EXISTING SIDEWALK
- EXISTING ROADWAY
- EXISTING TRAILS
- PEDESTRIAN COLLISION LOCATION
- BICYCLE COLLISION LOCATION

NOTE: 11 UNKNOWN PEDESTRIAN COLLISION LOCATIONS
7 UNKNOWN BICYCLE COLLISION LOCATIONS
1 COLLISION AT 43 STREET AND 55 B AVENUE (UNKNOWN)
1 COLLISION AT 25 STREET AND 48 AVENUE (UNKNOWN)

City of Lloydminster

Pedestrian and Bicycle Collision Locations

EXHIBIT_8.1



9.0 44 Street (Highway 16) Functional Review

9.1 Purpose

The current 44 Street corridor experiences noticeable congestion due to traffic volumes, a high percentage of commercial trucks, and generous access accommodation. The purpose of this study is to identify the following along the 44 Street:

1. Collect collision information along the corridor and determine the causes of the collisions. Provide options for remedial measures to reduce the amount of collisions;
2. Evaluate whether the posted speed limits are appropriate and determine whether a change in speed limits is needed;
3. Determine whether there are too many accesses on 44 Street and whether there can be modifications and/or consolidation of some of these accesses;
4. Complete an operational assessment and identify areas where additional capacity is needed;
5. Assess the right of way requirements where additional roadway is needed.

9.2 44 Street Collision Analysis

For the collision analysis along 44 Street in the City of Lloydminster, Alberta and Saskatchewan's collision databases are analyzed separately. The collision records from 2008 to 2011 in both the datasets are examined for Collisions by Causes at every intersection location along 44 Street. To identify the intersection collisions in both the datasets, it is assumed that the collisions corresponding to a particular Street and Avenue in the location columns of the data are intersection related collisions. However, collisions corresponding to detailed/exact addresses are regarded as non-intersection related collisions.

9.2.1 Alberta Side Collision Causes along 44 Street

216 total collisions are observed on the Alberta side of the City of Lloydminster. Table 9.1 shows collision numbers by causes for each interaction location in Alberta side of the City along 44 Street from 2008 to 2011. The intersection of 44 Street and 52 Avenue has observed the maximum total collisions of 34.

The second and third highest collisions are recorded at the intersections of 62 Avenue (25) and 50 Avenue (22) along 44 Street. It is observed from the table that the "Rear End" cause is dominant with 39 collisions in total and 5 injury collisions. Collision cause "Backing" has observed 29 collisions in total and is reported as the second highest of all the collisions causes. Cause of 84 collisions (39 %) are not known in the data. 7 % of the collisions are recorded as to "Struck Object" and 6 % of the collisions are recorded as the "Right Angle" collisions. 38 % of the injury collisions are "Rear End" collisions.

Table 9.1: Collision causes at the intersections along 44 Street on Alberta Side

Street	Avenue	Collision Cause															Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	97	UK	
44	50	2	0	0	0	0	0	1	1	0	0	0	0	4	3	11	22
44	51	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	4
44	52	2	1	1	0	0	0	8	6	0	0	0	1	9	5	1	34
44	54	4	0	1	0	1	0	0	5	0	0	0	0	2	0	2	15
44	55	0	0	2	0	1	0	0	2	0	0	0	0	1	1	0	7
44	56	1	0	2	0	2	0	2	3	0	0	0	0	6	1	2	19
44	57	1	0	1	0	2	0	1	3	0	0	0	0	3	1	8	20
44	59	0	0	0	0	1	0	0	2	0	0	0	0	1	0	1	5
44	62	0	0	1	0	2	0	0	6	0	0	0	1	0	0	15	25
44	63	1	0	0	0	0	0	2	1	0	0	0	0	2	2	2	10
44	65	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2
44	66	0	0	0	0	1	0	0	1	0	0	0	0	0	0	10	12
44	67	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	3
44	70	1	1	1	0	0	0	1	1	0	0	0	0	0	1	10	16
44	72	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	3
44	74	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
44	75	1	0	1	0	2	0	1	5	0	0	0	1	1	0	1	13
44	77	1	0	1	0	0	0	2	0	0	0	0	0	0	0	0	4
Total Collisions =		15	2	12	1	12	0	19	39	0	0	0	3	29	15	69	216
Percent (%) Collisions =		7	1	6	0	6	0	9	18	0	0	0	1	13	7	32	100
Total Injury Collisions =		0	2	2	0	2	0	0	5	0	0	0	0	0	2	0	13
Percent (%) Injury Collisions =		0	15	15	0	15	0	0	38	0	0	0	0	0	15	0	100


Table 9.2: Description of Collision Causes on Alberta Side

Collision Causes on Alberta Side			
Code	Description	Code	Description
1	Struck Object	9	Off Road Right
2	Off Road Left	10	Head On
3	Right Angle	11	Passing Right Turn
4	Passing - Left Turn	12	Sideswipe - Same Direction
5	Left Turn - Across Path	13	Backing
6	Sideswipe	97	Missing Information
7	Other	UK	Unknown
8	Rear End		

9.2.2 Saskatchewan Side Collision Causes along 44 Street

214 total collisions are observed on the Saskatchewan side of the City of Lloydminster. The intersection of 44 Street and 50 Avenue has observed the maximum total collisions of 93. The second and third highest collisions are recorded at the intersections of 49 Avenue (55) and 47 Avenue (22) along 44 Street.

Table 9.3 shows the collisions by causes for each interaction location in Saskatchewan side of the City along 44 Street from 2008 to 2011. The table also shows the total and percent injury collisions at each intersection location. Table 9.4 shows the description of the collisions causes used in the Table 9.3. It is observed from the table that the rear end cause is dominant with 67 collisions in total and 17 injury collisions.

“Right Angle” collisions were observed 44 times in total, and is the second highest of all the collisions causes. The third highest collision cause observed is “Left Turn/Straight - Opposite Direction” having 37 total collisions on Saskatchewan side, at the intersections along 44 Street. 31% of the injury collisions happened to be due to “Rear End” collisions. 25% and 24% of the injury collisions are “Left Turn/Straight - Opposite Direction” and “Right Angle” collisions respectively.

Table 9.3: Collision causes at the intersections along 44 Street on Saskatchewan Side

Str.	Ave.	Collision Cause																	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	UK	
44	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
44	37	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
44	39	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
44	40	1	1	0	0	6	0	0	0	2	0	0	0	1	0	0	1	0	12
44	43	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	1	0	4
44	44	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
44	45	2	0	0	0	4	0	0	0	4	0	0	0	1	0	0	0	0	11
44	46	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	4

Str.	Ave.	Collision Cause																	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	UK	
44	47	0	0	0	0	3	1	0	0	11	1	1	0	0	1	1	3	0	22
44	48	1	0	0	0	0	0	0	0	3	1	0	1	0	0	1	1	0	8
44	49	1	0	0	0	19	4	0	1	15	0	2	1	5	1	0	6	0	55
44	50	4	0	0	0	32	8	1	2	5	1	3	1	30	0	0	6	0	93
Total Collisions =		10	1	0	0	67	13	1	3	44	4	7	3	37	2	2	20	0	214
Percent (%) Collisions =		5	0	0	0	31	6	0	1	21	2	3	1	17	1	1	9	0	100
Total Injury Collisions =		5	0	0	0	17	0	0	0	13	0	0	5	14	0	0	1	0	55
Percent (%) Injury Collisions =		9	0	0	0	31	0	0	0	24	0	0	9	25	0	0	2	0	100

Table 9.4: Description of Collision Causes on Saskatchewan Side

Collision Causes on Saskatchewan Side			
Code	Description	Code	Description
1	Fixed/Movable Object	10	Right Turn - Same Direction
2	Lost Control - Left Ditch	11	Left Turn/Straight
3	Lost Control - Right Ditch to Left Ditch	12	Left Turn/Straight - Same Direction
4	Lost Control - Right Ditch	13	Left Turn/Straight - Opposite Direction
5	Rear End	14	Left Turn - Passing
6	Side Swipe - Same Direction	15	Right Turn - Passing
7	Side Swipe - Opposite Direction	16	Other
8	Head On	UK	Unknown
9	Right Angle		

9.3 Combined Alberta and Saskatchewan Collision Causes along 44 Street

The results of the separate analysis of the two datasets discussed above are combined together to deliver a City-wide perspective. Only common items are combined together and noted exceptions when combining was impractical.

The following description of collision codes is not clear in Alberta and Saskatchewan databases for combining the collisions numbers. As these collision causes seems close enough to each other, we combined the collision numbers and assumed they are the same.


Table 9.5: Collision Codes Description

Collision Description		
Alberta Database	Saskatchewan Database	Combined
Off Road Left	Lost Control – Left Ditch	Off Road Left (AB and Sask)
Off Road Right	Lost Control – Right Ditch	Off Road Right (AB and Sask)
Sideswipe	Sideswipe – Opposite Direction	Side Swipe Opposite Direction (AB and Sask)

A total of 432 collisions are observed in four years at the intersections along 44 Street. 68 collisions out of these 432 collisions are reported as injury collisions. As observed from the data analysis and the summary Table 9.6, 25% of the collision are recorded as rear end collisions at the intersections of 44 Street. Also, 13% of the collisions are found to be the right angle collisions. All left turn related collision causes both in Alberta and Saskatchewan datasets shows 14% of the total collision. 7% of the total collisions resulted due to backing up into the intersections of 44 Street. Majority of the injury collisions at 44 Street are happened to be rear end collisions (32%) and left turn related collisions (31%).

Table 9.6: Description of Collision causes along 44 Street (Combined Alberta and Saskatchewan Side)

Code	Description	Total Collision	Percent	Injury	Percent
1	Struck Object (AB)	15	3%	0	0%
2	Off Road Left (AB and Sask)	3	1%	2	3%
3	Left Turn - Across Path (AB)	12	3%	2	3%
4	Sideswipe Opposite Direction (AB and Sask)	1	0%	0	0%
5	Off Road Right (AB and Sask)	0	0%	0	0%
6	Backing (AB)	29	7%	0	0%
7	Fixed/Movable Object (Sask)	10	2%	5	7%
8	Lost Control - Right Ditch to Left Ditch (Sask)	0	0%	0	0%
9	Right Turn - Same Direction (Sask)	4	1%	0	0%
10	Left Turn/Straight (Sask)	7	2%	0	0%
11	Left Turn/Straight - Same Direction (Sask)	3	1%	5	7%
12	Left Turn/Straight - Opposite Direction (Sask)	37	9%	14	21%
13	Right Angle (AB and Sask)	56	13%	15	22%
14	Passing - Left Turn (AB and Sask)	3	1%	0	0%
15	Other (AB and Sask)	39	9%	1	1%
16	Rear End (AB and Sask)	108	25%	22	32%
17	Head On (AB and Sask)	3	1%	0	0%
18	Passing Right Turn (AB and Sask)	2	0%	0	0%
19	Sideswipe - Same Direction (AB and Sask)	16	4%	0	0%
20	Unknown (UK)	84	19%	2	3%
Total =		432	100%	68	100%

9.4 Intersection Collision Analysis

The following table shows the summary of total collisions and injury collisions at the intersection locations along 44 Street with respect to the collision causes.

Table 9.7: Collision causes at the intersections along 44 Street in the City of Lloydminster

Str.	Ave.	Collision Cause																				Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
44	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
44	37	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
44	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
44	40	0	1	0	0	0	0	1	0	0	0	0	1	2	0	1	6	0	0	0	0	12
44	43	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	4
44	44	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
44	45	0	0	0	0	0	0	2	0	0	0	0	1	4	0	0	4	0	0	0	0	11
44	46	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	4
44	47	0	0	0	0	0	0	0	0	1	1	0	0	11	1	3	3	0	1	1	0	22
44	48	0	0	0	0	0	0	1	0	1	0	1	0	3	0	1	0	0	1	0	0	8
44	49	0	0	0	0	0	0	1	0	0	2	1	5	15	1	6	19	1	0	4	0	55
44	50	2	0	0	1	0	4	4	0	1	3	1	30	5	0	7	33	2	0	8	14	115
44	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	4
44	52	2	1	0	0	0	9	0	0	0	0	0	0	1	0	8	6	0	0	1	6	34
44	54	4	0	1	0	0	2	0	0	0	0	0	0	1	0	0	5	0	0	0	2	15
44	55	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	1	7
44	56	1	0	2	0	0	6	0	0	0	0	0	0	2	0	2	3	0	0	0	3	19
44	57	1	0	2	0	0	3	0	0	0	0	0	0	1	0	1	3	0	0	0	9	20
44	59	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	1	5
44	62	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	6	0	0	1	15	25
44	63	1	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	0	0	0	4	10
44	65	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
44	66	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	10	12
44	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3
44	70	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	11	16
44	72	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	3
44	74	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2

Str.	Ave.	Collision Cause																				Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
44	75	1	0	2	0	0	1	0	0	0	0	0	0	1	0	1	5	0	0	1	1	13
44	77	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	4
44	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Total Collisions =		15	3	12	1	0	29	10	0	4	7	3	37	56	3	39	108	3	2	16	84	432
Percent (%) Collisions =		3	1	3	0	0	7	2	0	1	2	1	9	13	1	9	25	1	0	4	19	100
Total Injury Collisions =		0	2	2	0	0	0	5	0	0	0	5	14	15	0	1	22	0	0	0	2	68
Percent (%) Injury Collisions =		0	3	3	0	0	0	7	0	0	0	7	21	22	0	1	32	0	0	0	3	100

9.5 Intersection Ranking

There are 30 intersection locations at 44 Street identified in the collision analysis. The following table shows the ranking of these intersection locations based on the total collision frequency observed at each intersection location along 44 Street.

Table 9.8: Ranking of Intersections along 44 Street

Intersection Rank	Street	Avenue	Total	Intersection Rank	Street	Avenue	Total
1	44	50	115	16	44	55	7
2	44	49	55	17	44	59	5
3	44	52	34	18	44	43	4
4	44	62	25	19	44	46	4
5	44	47	22	20	44	51	4
6	44	57	20	21	44	77	4
7	44	56	19	22	44	67	3
8	44	70	16	23	44	72	3
9	44	54	15	24	44	44	2
10	44	75	13	25	44	65	2
11	44	40	12	26	44	74	2
12	44	66	12	27	44	80	2
13	44	45	11	28	44	17	1
14	44	63	10	29	44	37	1
15	44	48	8	30	44	39	1
Total = 432 Collisions							

9.5.2 Rank 1: Intersection of 44 Street and 50 Avenue

This intersection location is observed in both Alberta and Saskatchewan datasets. The collision numbers at this location are from the separate analysis of the two datasets and were combined together to get a single value for the total collisions. This intersection location has observed 115 total collisions in four years and is regarded as the highest collision location along 44 Street in the City of Lloydminster. Causes of 12% of collisions at this location were not known. Following are the top five collision causes observed at this location:

Table 9.9: Top Five Collision Causes at 44 Street and 50 Avenue

Collision Cause	Code	Percent Total Collisions
Rear End (AB and Sask)	16	29 %
Left Turn/Straight - Opposite Direction (Sask)	12	26 %
Unknown (AB and Sask)	20	12 %
Sideswipe - Same Direction (AB and Sask)	19	7 %
Other (AB and Sask)	15	6 %

9.5.3 Rank 2: Intersection of 44 Street and 49 Avenue

Causes of all the collisions at this intersection location are known in the database. Following top five collision causes are observed at this location:

Table 9.10: Top Five Collision Causes at 44 Street and 49 Avenue

Collision Cause	Code	Percent Total Collisions
Rear End (AB and Sask)	16	35 %
Right Angle (AB and Sask)	13	27 %
Other (AB and Sask)	15	11 %
Left Turn/Straight - Opposite Direction (Sask)	12	9 %
Sideswipe - Same Direction (AB and Sask)	19	7 %

9.5.4 Rank 3: Intersection of 44 Street and 52 Avenue

Causes of 18% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.11: Top Five Collision Causes at 44 Street and 52 Avenue

Collision Cause	Code	Percent Total Collisions
Backing (AB)	6	26 %
Other (AB and Sask)	15	24 %
Rear End (AB and Sask)	16	18 %
Unknown (AB and Sask)	20	18 %
Struck Object (AB)	1	6 %



9.5.5 Rank 4: Intersection of 44 Street and 62 Avenue

Causes of 60% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.12: Top Five Collision Causes at 44 Street and 62 Avenue

Collision Cause	Code	Percent Total Collisions
Unknown (AB and Sask)	20	60 %
Rear End (AB and Sask)	16	24 %
Left Turn - Across Path (AB)	3	8 %
Right Angle (AB and Sask)	13	4 %
Sideswipe - Same Direction (AB and Sask)	19	4 %

9.5.6 Rank 5: Intersection of 44 Street and 47 Avenue

Causes of all the collisions at this intersection location are known in the database. Following top five collision causes are observed at this location:

Table 9.13: Top Five Collision Causes at 44 Street and 47 Avenue

Collision Cause	Code	Percent Total Collisions
Right Angle (AB and Sask)	13	50 %
Other (AB and Sask)	15	14 %
Rear End (AB and Sask)	16	14 %
Right Turn - Same Direction (Sask)	9	5 %
Left Turn/Straight (Sask)	10	5 %

9.5.7 Rank 6: Intersection of 44 Street and 57 Avenue

Causes of 45% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.14: Top Five Collision Causes at 44 Street and 57 Avenue

Collision Cause	Code	Percent Total Collisions
Unknown (AB and Sask)	20	45 %
Backing (AB)	6	15 %
Rear End (AB and Sask)	16	15 %
Left Turn - Across Path (AB)	3	10 %
Struck Object (AB)	1	5 %

5% of the collisions at this intersection location are recorded as “Other (AB and Sask)” as a cause of the collisions.

9.5.8 Rank 7: Intersection of 44 Street and 56 Avenue

Causes of 16% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.15: Top Five Collision Causes at 44 Street and 56 Avenue

Collision Cause	Code	Percent Total Collisions
Backing (AB)	6	32 %
Rear End (AB and Sask)	16	16 %
Unknown (AB and Sask)	20	16 %
Left Turn - Across Path (AB)	3	11 %
Right Angle (AB and Sask)	13	11 %

Cause of 5% of the collisions at this intersection location is "Struck Object (AB)".

9.5.9 Rank 8: Intersection of 44 Street and 70 Avenue

Causes of 69% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.16: Top Five Collision Causes at 44 Street and 70 Avenue

Collision Cause	Code	Percent Total Collisions
Unknown(AB and Sask)	20	69 %
Struck Object (AB)	1	6 %
Off Road Left (AB and Sask)	2	6 %
Right Angle (AB and Sask)	13	6 %
Other (AB and Sask)	15	6 %

9.5.10 Rank 9: Intersection of 44 Street and 54 Avenue

Causes of 13% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.17: Top Five Collision Causes at 44 Street and 54 Avenue

Collision Cause	Code	Percent Total Collisions
Rear End (AB and Sask)	16	33 %
Struck Object (AB)	1	27 %
Backing (AB)	6	13 %
Unknown (AB and Sask)	20	13 %
Left Turn - Across Path (AB)	3	7 %



9.5.11 Rank 10: Intersection of 44 Street and 75 Avenue

Causes of 8% of collisions at this location were not known. Following top five collision causes are observed at this location:

Table 9.18: Top Five Collision Causes at 44 Street and 75 Avenue

Collision Cause	Code	Percent Total Collisions
Rear End (AB and Sask)	16	38 %
Left Turn - Across Path (AB)	3	15 %
Struck Object (AB)	1	8 %
Backing (AB)	6	8 %
Right Angle (AB and Sask)	13	8 %

8 % of the collisions at this intersection location are recorded as “Other (AB and Sask)” and another 8 % of the collisions are recorded as “Sideswipe - Same Direction (AB and Sask)” as a cause of the collisions.

9.6 44 Street Collision Remedial Measures

It is observed from the intersection collision analysis that the rear end collisions and left turn collisions are dominating at most of the collision locations.

9.6.1 Rear End Collisions:

Rear end collisions usually happens when a vehicle is approaching an intersection at speed and the car in front stops suddenly due to the light change from green to yellow. The following driver needs to hit the brakes hard to avoid a rear end collision. Some of the possible Causes of rear end collisions are as follows:

- Following too closely;
- Improper channelization;
- Improper passing maneuvers;
- Improper speed perception of right turning vehicles;
- Large number of turning vehicles;
- Lack of adequate gaps;
- Restricted sight distance;
- Slippery pavements; and
- Yield sign control.

In A Guide to Road Safety by K. W. Ogden (1996, Safer Roads: A Guide to Road Safety Engineering by K W Ogden, Page 140 – 141) engineering countermeasures are provided with the percent collision reduction at the high speed intersections locations. The countermeasures/treatments are as follows:

Table 9.19: Rear End Collision Treatment at high speed intersection locations

Treatment Type	Percent Reduction
Channelization	20 - 40
Median with Turn Protection	20 - 30
Lighting	20 - 30
Resurfacing, reseal	30 - 40
Staggered Intersection	60 - 80
Acceleration/Deceleration Lanes	50 - 80

Following are the countermeasures/treatments with the percent collision reduction for the low speed intersections locations.

Table 9.20: Rear End Collision Treatment at low speed intersection locations

Treatment Type	Percent Reduction
Lighting	15 - 25
Resurfacing	30 - 40
Delineation Signing	10 - 20
Realignment, reconstruction	10 – 20
Improved sight distance	30 – 50
Channelization	20 – 40

A study was conducted by FHWA in 2005, to identify driver attitudes and behaviors related to intersection safety and to assess the likely impacts of new or existing infrastructure based collision countermeasures. Based on this study intersection rumble strips and improved skid resistance are identified as a recommended countermeasure to reduce the rear end collisions as shown in the figure below.

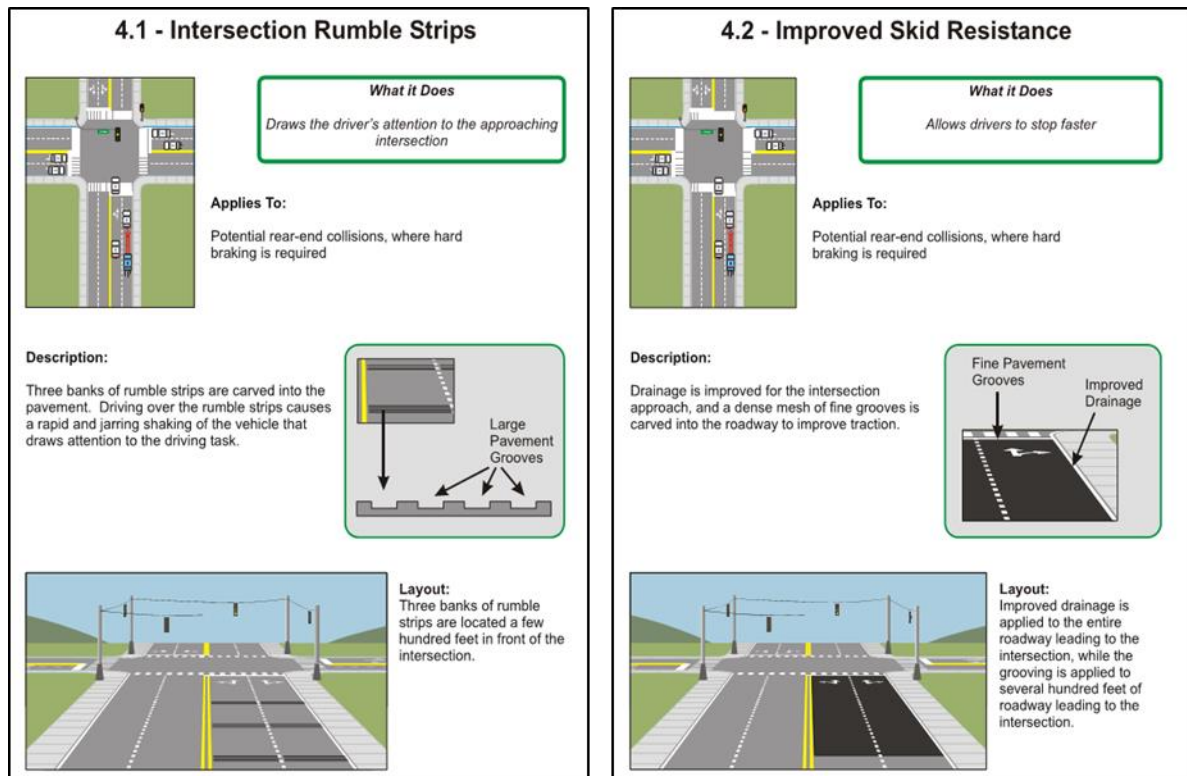


Figure 9.1: Figure 16 of FWHA Countermeasure 4.1: Intersection rumble strips and Figure 17. Countermeasure 4.2: Improved Skid Resistance

Rear end collision reduction can also be achieved by implementing following measures:

1. Increase visibility of intersection and/or traffic signals;
2. Increase awareness;
3. Improve signal coordination;
4. Install turn lanes;
5. Control approach speeds;
6. Optimize Change intervals.

9.7 Left Turn Collisions

A left-turn collision usually happens when a vehicle is stopped in the middle of an intersection waiting to make a left turn on a busy street. An oncoming vehicle is also waiting to turn left. This makes it difficult to see other vehicles approaching in the next lane. Some of the possible causes of the left turn collisions are as follows:

1. Large volume of left turns;
2. Restricted sight distance;
3. Too short yellow phase;
4. Absence of special left-turning phase;
5. Excessive speed on approaches.

In A Guide to Road Safety by K. W. Ogden engineering countermeasures for left turns are provided with the percent collision reduction at the high speed intersections locations as follows:

Table 9.21: Left turn Collision Treatments at high speed intersection locations

Treatment Type	Percent Collision Reduction
Channelization	20 - 40
Median with Turn Protection	20 - 30
Roundabout	60 - 80
Lighting	20 - 30
Resurfacing, reseal	30 - 40
Delineation Signing	20 - 30
Street Closure	50 - 80
Realignment, reconstruction	30 - 50
Staggered Intersection	40 - 60
Modified Traffic Signals	30 - 80

Following are the countermeasures/treatments with the percent collision reduction for the low speed intersection locations.

Table 9.22: Left turn Collision Treatments at low speed intersection locations

Treatment Type	Percent Collision Reduction
Roundabout	50 - 80
Delineation Signing	10 - 20
Street Closure	50 - 80
Realignment, reconstruction	40 - 60
Improved sight distance	30 - 50
Modified Traffic Signal	30 - 80
Channelization	20 - 40
Red Light Camera	20 - 30

Based on the 2005 study of FHWA mentioned previously, protected left-turn phase is identified as a recommended countermeasure to reduce the left turn collisions as shown in the figure below:

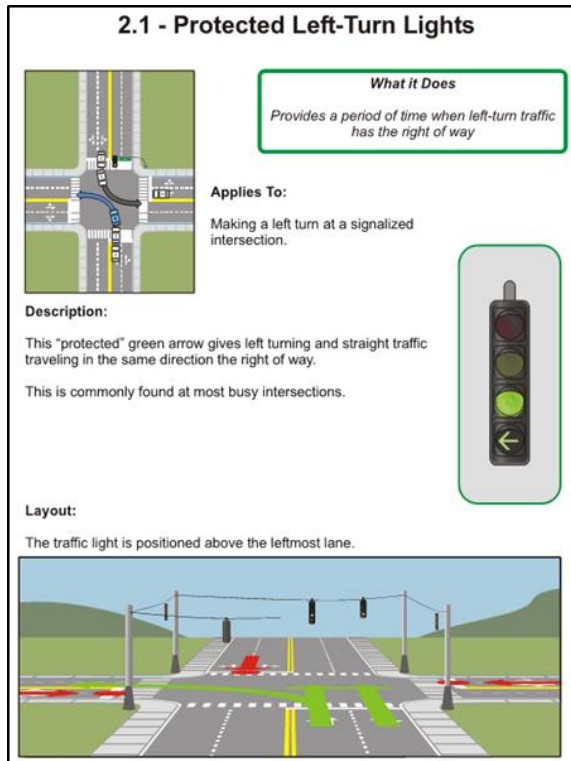


Figure 9.2: Figure 13 of 2005 FWHA Countermeasure 2.1 Protected left-turn lights

Left turn collision reduction can also be achieved by following:

1. Employ protected left turn phasing;
2. Implement turn restrictions;
3. Improve turning lane design;
4. Reconstruct approaches;
5. Improve sight distance;
6. Improve signal coordination.

9.8 44 Street Collision Summary

It is observed from the intersection collision analysis that the rear end collisions and left turn collisions are the highest collision causes along 44 Street intersections. Following is the summary of collision causes at the intersections along 44 Street:

9.8.1 Total Collisions:

- 25 % of the collisions are found to be the Rear End collisions;
- 14 % of the collisions are found to be the left Turn related collisions;
- 13 % of the collisions are found to be the right angle collisions;
- 19% of the collision causes are unknown and 9% of the collisions are due to collision cause others;
- 7 % of the collisions are found to be due to backing in the intersection; and
- Remaining 22% of the collisions are due to combination of sideswipe, striking a fixed or movable object, head-on, and lost control.

9.8.2 Injury Collisions:

- 32% of the collisions that resulted in injury are Rear End collisions;
- 31% of the collisions that resulted in an injury are Left Turn related collisions;
- 22% of the collisions that resulted in an injury are Rear End collisions;
- 7% of the collisions that resulted in injury are due to Fixed/Movable object on Saskatchewan side of the city; and
- The remaining 8% of the causes are due to the sideswipe, striking a fixed or movable object, right angle and lost control.

9.8.3 10 High Collision Locations at 44 Street

Following 10 high collision intersection locations along 44 Street are identified in the collision data analysis.

1. 44 Street and 50 Avenue (115 Collisions);
2. 44 Street and 49 Avenue (55 Collisions);
3. 44 Street and 52 Avenue (34 Collisions);
4. 44 Street and 62 Avenue (25 Collisions);
5. 44 Street and 47 Avenue (22 Collisions);
6. 44 Street and 57 Avenue (20 Collisions);
7. 44 Street and 56 Avenue (19 Collisions);
8. 44 Street and 70 Avenue (16 Collisions);
9. 44 Street and 54 Avenue (15 Collisions);
10. 44 Street and 75 Avenue (13 Collisions).

These are illustrated in Exhibit 9.1.

9.8.4 Recommended Countermeasures

As observed from the data most of the causes of the collisions are rear end and left turn. By treating the acceleration and deceleration lanes at the intersection a collision reduction of 50 to 80% can be achieved. Proposed locations for implementing acceleration and deceleration lanes are provided on Exhibit 9.2.

9.9 Speed Limit Review

9.9.1 Existing Conditions

Exhibit 9.3 shows the existing conditions. These were obtained from Lloydminster's Traffic Bylaw (29—2012) attached in Appendix J. Note that the bylaw states that Highway 16 (44 Street) within Saskatchewan falls under the Saskatchewan Highways and Transportation Deputy Minister's Order.

Starting from the west city limit the posted speed is 80 km/h. It transitions to 60 km/h 100m west of 75 Avenue (note the bylaw also states this section is 60 km/h; ISL judged the 80 km/h as correct, given that this is posted on the ground). It then drops to 50 km/h 250m east of 70 Avenue. The 50 km/h zone continues until about 130m east of 45 Avenue, where the speed increases to 60km/h. Just east of 40 Avenue the speed limit increases to 80 km/h and continues to the east City limit.

A median runs the length of 44 Street. Left turns at all private driveways and intersections are from a left turn lane – through are not shared left turns. At the City fringes access spacing is large, but toward the core spacing is much tighter.



Spacing between all turns driveways or intersections is 300m to 400m at the City fringes, and about 130m to 150m in the core. At the fringes right in/out accesses are infrequent, but within the core they are much more frequent.

Corresponding to the driveway frequency is the character of the roadside development. Where accesses are infrequent, buildings are well set-back from the road. As accesses become more frequent, buildings are closer to 44 Street. There also tends to be more pedestrian activity in these areas, likely because of the adjacent nearby residential and hotel uses.

9.9.2 Collision Analysis

In the collision analysis it is observed that compared to the rest of the City, several intersections on 44 Street are near the top of the highest frequency locations, both in terms of total collisions and of total injury collisions. Certainly this high frequency relates to the high volumes in the corridor, nevertheless this amount of harm to people is concerning.

In the context of a change to the speed limit, it is important to know how these changes impact collisions. Figure 1 shows the power model relating the percentage of speed change to the percentage of crashes. It shows that a relatively small change in speed has a disproportionately large change in crashes. This is an especially strong relation for fatal collisions

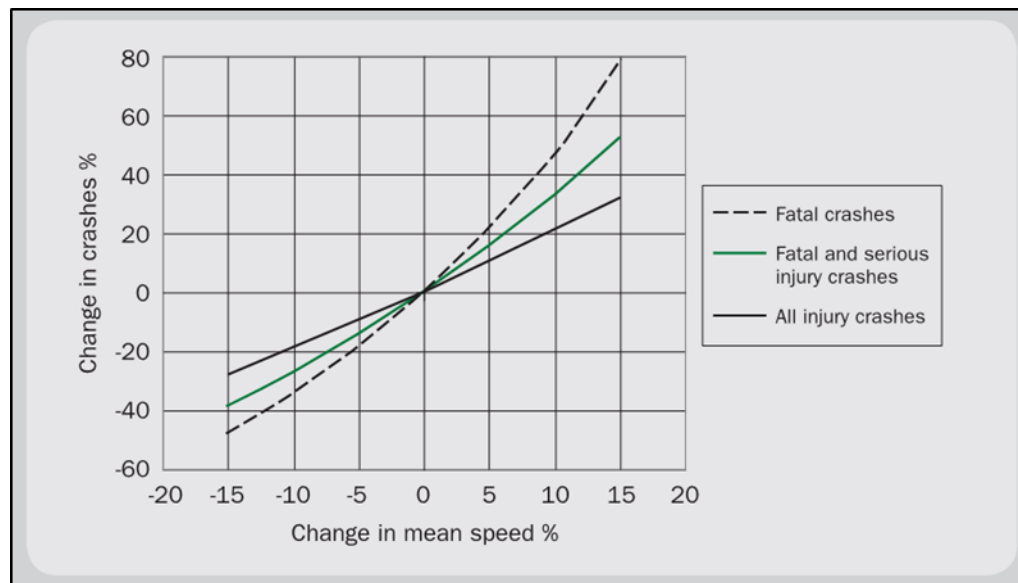


Figure 9.3: Power Model (Figure 1.4 from Speed management: a road safety manual for decision – makers and practitioners. Geneva, Global Road Safety Partnership, 2008)

9.9.3 Impact on Traffic Operations

The main impact on traffic operations is the signals along the corridor. Where the speed limit changes:

1. the signal coordination for the network requires updating for all timing plans;
2. the amber intervals for each signal require re-design;
3. The all-red intervals for each signal require re-design.

These changes should be ready for implementation in conjunction with the speed limit change.

9.9.4 Driver's Perspective

From a driver's perspective 44 Street has a relatively high standard and higher importance compared to many other roads in Lloydminster. From that perspective, 44 Street should have a higher speed limit to many other roads in Lloydminster, especially the local and collector roads. Most of 44 Street is posted at 50 km/h, as are most local and collector roads.

Creating a differential speed will encourage through traffic on 44 Street instead of shortcutting traffic. This issue was identified as a contributor to shortcutting in Parkview. There are two ways to create a differential speed limit:

1. Increase speeds on 44 Street;
2. Decrease speeds on local and collector roads.

The latter is gaining popularity internationally and even in some municipalities in Alberta. However, it is awkward within the current legislative framework in Alberta. Therefore, at this time it is more practical to consider the former method.

9.9.5 Speed Limit Summary Recommendations

Increasing the speed limits along 44 Street will create a speed differential between that and the neighbourhood speeds. However a number of tasks will need to be completed prior to this change taking into effect:

- Updating the signal coordination signal timing setting based on the new posted speed limit;
- Also need to update the all-red and amber intervals;
- Installation of deceleration/acceleration lanes based on the opportunities outlined in Exhibit 9.2; and
- Protected only left turn phases (before implementing this phase a detailed assessment needs to be done, including a check on the queue lengths and available length of turn bays.)

9.10 Access Review

Accesses on the arterial roads from the major centers of activities like retail, institutions and office or multi-unit apartment buildings are in reality the intersections of the arterial roadway. Hence it is essential to carefully control the number of access locations onto the roadway.

Due to the heavy volumes on the major urban arterial roads accesses should be discouraged as per the Geometric Design Guide for Canadian Roads by Transportation Association of Canada. Also, when an access is unavoidable, the design guide suggests to take careful considerations specifically to the design of the intersection and its spacing to adjacent signalized locations.

44 Street is a major divided arterial having accesses connecting the different activity centers both on north and south side of the roadway. Most of the accesses in the downtown area of 44 Street are right in/ right out only. For reviewing the existing accesses at 44 Street, 21 intersections were considered as shown in the Table 18. The number of accesses on north and south side at 44 Street are identified between the two consecutive intersections. Also, the distance between these intersections is measured to estimate the access rate per kilometer. The following table shows the number of accesses on north and south side of 44 Street, the distance between the intersections the access rate on north side and south side.



Table 9.23: Access Rate Calculation along 44 Street

From Avenue	To Avenue	# of Accesses on North Side	# of Accesses South Side	Distance (km)	North Access Rate per km	South Access Rate per km
80	75	0	1	0.59	0.00	1.71
75	70	1	1	0.44	2.29	2.29
70	66	0	1	0.51	0.00	1.96
66	62	1	0	0.41	2.44	0.00
62	59	0	0	0.27	0.00	0.00
59	57	7	1	0.32	22.01	3.14
57	56	10	5	0.36	27.86	13.93
56	55	3	2	0.12	24.19	16.13
55	54	0	2	0.15	0.00	13.25
54	52	0	2	0.36	0.00	5.57
52	50	1	2	0.31	3.22	6.43
50	49	1	2	0.14	7.35	14.71
49	48	5	4	0.20	24.88	19.90
48	47	6	3	0.20	29.85	14.93
47	46	3	1	0.20	15.00	5.00
46	45	5	0	0.20	25.25	0.00
45	43	3	0	0.38	8.00	0.00
43	40	1	1	0.45	2.23	2.23
40	39	2	0	0.22	9.22	0.00
39	37	0	1	0.36	0.00	2.75
Total		49	29	5.99		

In the central portion of the 44 Street corridor, there are more direct accesses to 44 Street compared to outer portion of the corridor. The average access rate on the north side from 55 Avenue to 59 Avenue is 24.68 accesses per kilometer and from 45 Avenue to 49 Avenue is 23.75 accesses per kilometer.

Whereas the average access rate on the south side from 54 Avenue to 57 Avenue is 14.44 accesses per kilometer and 47 Avenue to 50 Avenue is 16.51 accesses per kilometer. Also the average access rate on the north side. This shows that there are more accesses on the north side of the 44 Street corridor in the central area compared to the south side. On the full stretch of 44 Street corridor, the average access rate of 10.19 and 6.20 accesses per kilometer is determined on the north and south side respectively.

The locations of existing access are provided in Exhibit 9.4.

9.10.1 Ideal Access Spacing

The relationship between street classification, access and mobility is shown in Figure 9.4, below.

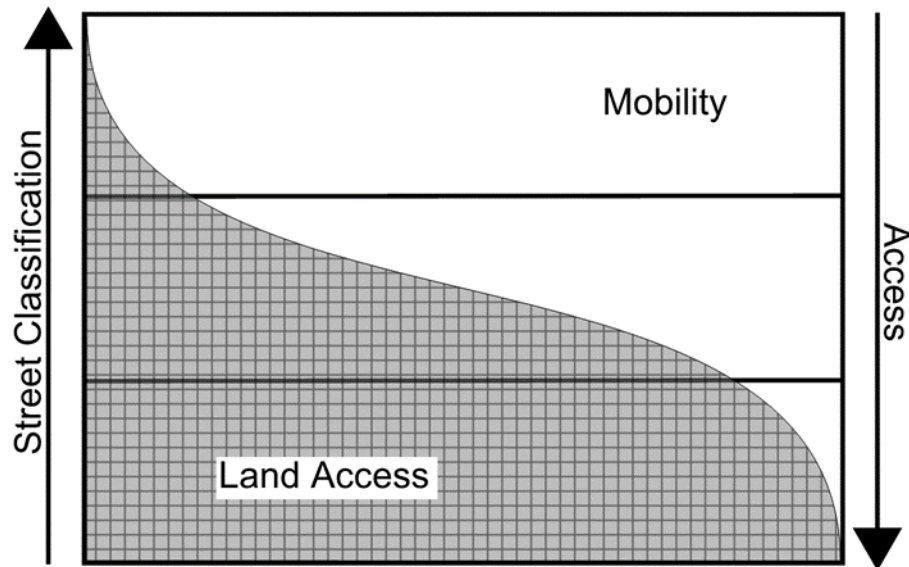


Figure 9.4: Street Classification, Access and Mobility Relationship

As shown in Figure 9.4, access is limited for higher classifications of roadways in order to provide a higher level of mobility. In order to satisfy this relationship and provide maximum mobility for vehicles on 44 Street the number of accesses should be reduced.

For this, it is recommended that the City strive to reduce the amount of accesses based on a spacing of 250 m or 4 accesses per kilometer or a total of 24 access per roadside for the entire corridor. To obtain this the total number of accesses along the entire corridor will need to be reduced by 25 on the north side and 5 on the Southside. Additional access removal may also be needed in locations where there is insufficient spacing between intersections.

Reducing the amount of accesses along this corridor will reduce the density of accelerating/decelerating vehicles. The resulting situation is one with lower driver work load and potentially less access related collisions.

9.10.2 Implementing Ideal Access Spacing

Implementation of the ideal spacing plan will required the following strategies:

- **Access Management Study:** The purpose of this study is to complete a detailed analysis of the corridor in terms of limiting access. This will also provide a formal opportunity to consult with stakeholders to determine the opportunities where access can be removed or consolidated; and
- **Development Agreements:** In the case where an access management study is not ready the City has the opportunity to negotiate with developers through development agreements during the subdivision or development permitting process

As a basis point for developing an access management plan and to help the City strive for this, a plan outlining locations where accesses could potentially be removed or consolidated in Exhibit 9.5.



9.11 Operational Review

ISL recently completed a Lloydminster Traffic Signal Review project. The Intersection Level of Service (LOS) and Intersection Capacity Utilization (ICU) are obtained from the Synchro Version 9 model which were done by our Lethbridge office for the Signal Timing Review Project along this corridor.

LOS is indicated with a letter grade from A – F, where A is the best and F constitutes an unacceptable condition. ICU is a representation of overall volume to capacity ratio for the condition.

The following Table 9.24 shows the ICU and intersection LOS (Int. LOS) in AM/PM Peak hour and the worst ICU and intersection LOS.

Table 9.24: ICU and LOS at the Signalized Intersections along 44 Street

Location		AM		PM		Collisions	Worst	
Street	Avenue	ICU	Int. LOS	ICU	Int. LOS		ICU	LOS
44	40	61%	C	72%	C	12	72%	C
44	45	52%	B	57%	C	11	57%	C
44	49	53%	C	67%	C	55	67%	C
44	50	68%	C	70%	C	115	70%	C
44	52	62%	C	66%	C	34	66%	C
44	54	80%	A	68%	B	15	80%	B
44	57	59%	C	62%	B	20	62%	C
44	62	86%	C	96%	E	25	96%	E
44	66	62%	B	68%	A	12	68%	B
44	70	50%	A	70%	B	16	70%	B
44	75	63%	B	72%	D	13	72%	D
44	80	45%	A	43%	A	2	45%	A

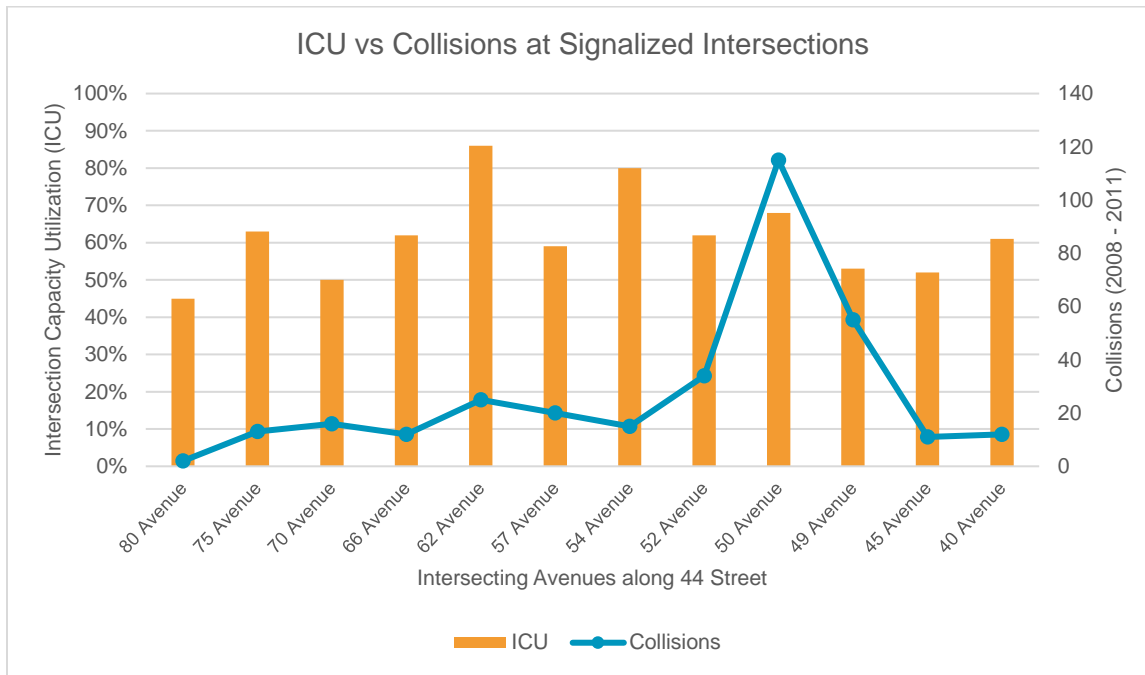


Figure 9.5: ICU and LOS at the Signalized Intersections along 44 Street

For this study, an ICU of 85 % or less and LOS D or better is considered a satisfactory operation. From the above table 9.24 and figure 9.5 we observe that all the intersections listed are operating well except the intersection of 44 Street and 62 Avenue. There is no such relation observed between the collision and ICU. With the highest ICU at this location, collisions are not observed to be following the same trend. This intersection is operating with LOS E and ICU of 96% (~ close to the capacity) in the PM peak hour. 60% of the collision causes are unknown at this location in the database and 24% of the collisions are observed to be Rear End (AB and Sask) collision. 8% of the collisions at this location are recorded to be the “Left Turn - Across Path” (AB).



9.11.1 Operational Analysis

The following table shows a comparison of the available left turn storage length at east bound and westbound directions and the operational 95 percentile queue length at the same intersection location.

Table 9.25: ICU and LOS at the Signalized Intersections along 44 Street

Location		Eastbound Left Turn		Westbound Left Turn	
Street	Avenue	Storage Available	Operational 95th Queue Length (in m)	Storage Available	Operational 95th Queue Length (in m)
44	40	125	29	100	40.9
44	45	50	12.9	150	9.6
44	49	70	24.1	60	11.9
44	50	70	47.3	70	41.7
44	52	90	63.9	90	35.1
44	54	70	2.5	70	4.8
44	57	60	0.4	70	9.5
44	62	200	76.6	85	94.1
44	66	50	2.5	85	5.8
44	70	-	-	60	60
44	75	110	16	110	121.6

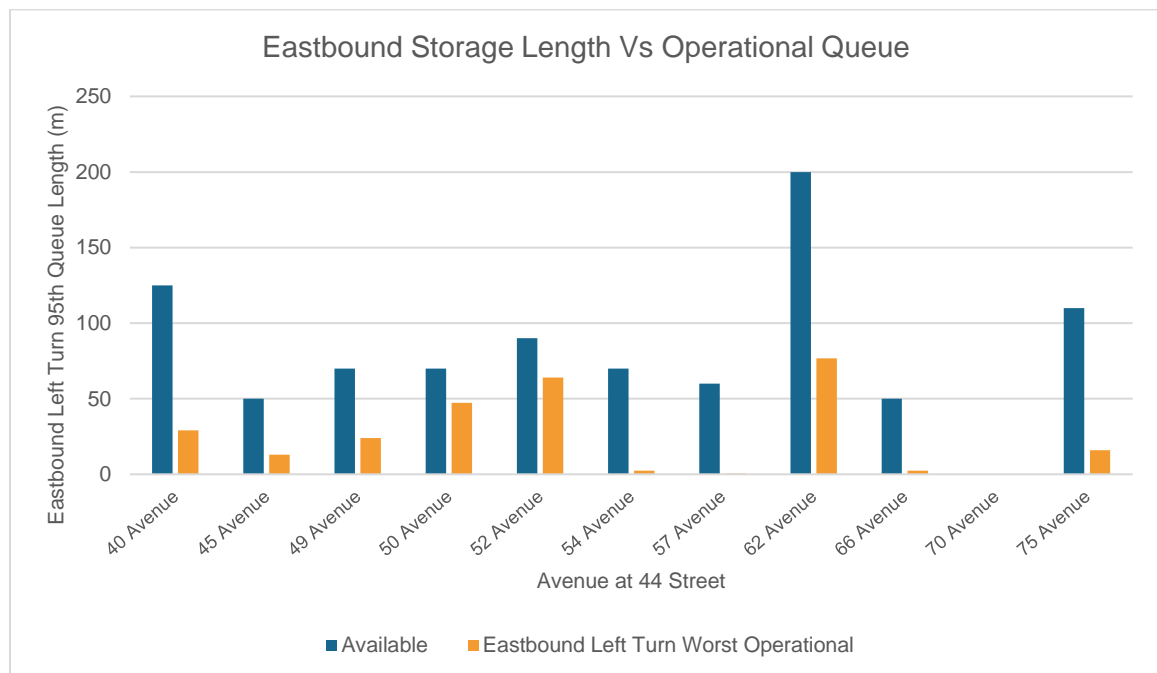


Figure 9.6: Eastbound Left Turn Storage Length Vs. 95th Operational Queue Length

The available eastbound left turn queue length is working satisfactory as observed from the Table 9.25 and figure 9.6.

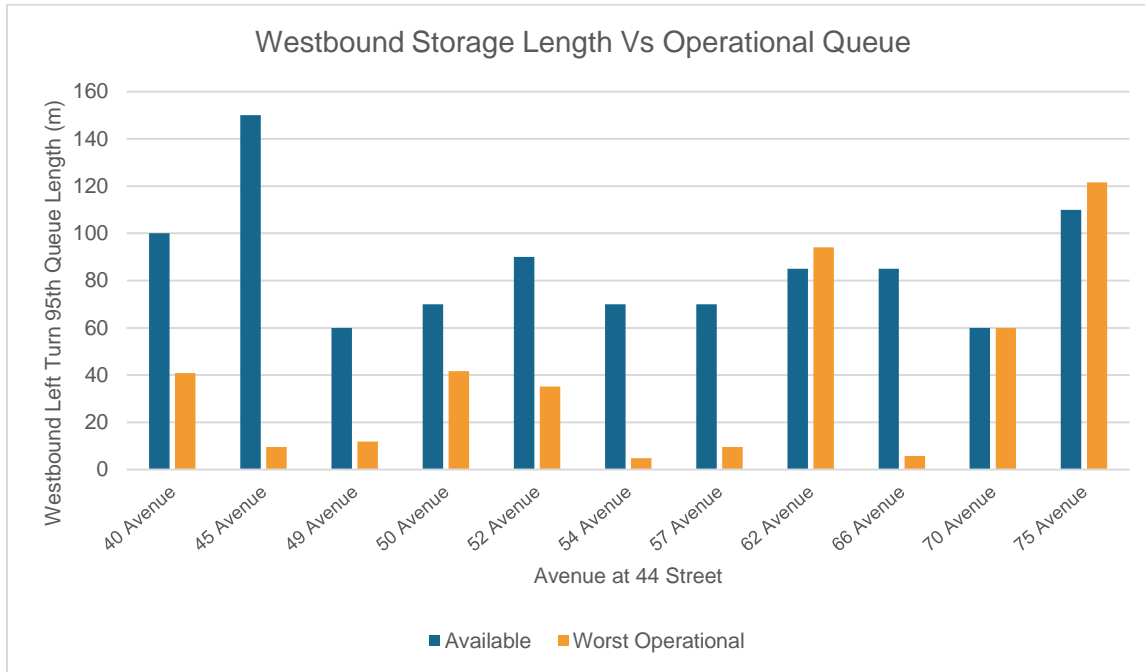


Figure 9.7: Westbound Left Turn Storage Length Vs. 95th Operational Queue Length

The available westbound left turn queue length is failing at 62 Avenue and 75 Avenue along 44 Street. The operational 95 queue length at 44 Street and 70 Avenue is hardly meeting the storage queue length available.

9.11.2 Remedial Measures

To provide additional capacity and decrease the queuing length at the 62 Avenue and 75 Avenue the following is required.

75 Avenue and 44 Street

The northbound left turn (NBLT) operates at a volume to capacity ratio (v/c) of 1.01. The current configuration for northbound movements is for a single left turn lane and a single thru lane. Given that the northbound through movements are quite low (48) there is an opportunity to support additional left turns from the thru lane. By reconfiguring this intersection to a shared thru/left turn lane the v/c reduces to 0.91. The second is to install a second left turn lane. This will reduce the v/c ratio to 0.74.

With these changes the amount of green time allocated to the north/south movements can be reduced and green time can be added to the eastbound and westbound movements. This will increase capacity and decrease queuing for these movements and reduce the westbound left turn queueing from 120 m to 105 m.

62 Avenue and 44 Street

In 2009, ISL completed a function planning study for this intersection, which provided roadway alignment for six lanes on 44 Street. While, it may not be realistic now to install additional thru lane, there is opportunity to apply some changes based on the functional plan. These include both southbound right turn lanes and eastbound rights turn lane. Both of these could be installed along the future alignment of the intersection



based on the functional plans. This will decrease in v/c ratio for southbound movements from 1.04 to 0.80, decrease in v/c ratio for eastbound thru movements from 0.96 to 0.79 and decrease the westbound left turn queue from 93 m to 80 m.

9.12 Right of Way Review

There are service roads running parallel to 44 Street which provide accesses to a major portion businesses on north and south of 44 Street, including:

1. West City Limits to 59 Avenue:
 - a. North Side = Heavy Industrial;
 - b. South Side = Industrial and Business Commercial.
2. 59 Avenue to 45 Avenue:
 - a. North Side= Business Commercial;
 - b. South Side= Business Commercial.
3. 45 avenue to East City Limits:
 - a. North Side= Industrial and Business Commercial;
 - b. South Side= Industrial and Business Commercial.

The City of Lloydminster has a long term plan to eliminate the service roads, confirmed through the completion of the Highway 16/ 62 Avenue Functional Plan. This plan recommends a six lane urban divided arterial roadway with auxiliary lanes throughout the majority of the area for traffic access to adjacent businesses. This is illustrated in Figure 9.8, below.

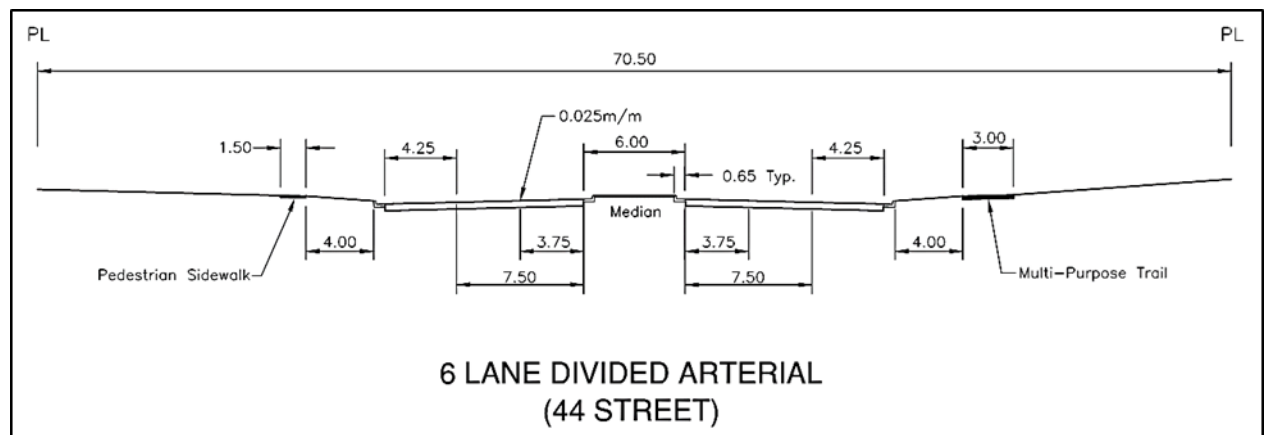


Figure 9.8: Typical Cross Section for a 6 Lane Divided Arterial (44 Street Functional Plan)

Benefits of this plan include:

1. At the intersections, slotted left – turn lanes are provided. These slotted left turn bays offset the left turn traffic such that the left turning vehicles can get past each other during the same signal phase;
2. Slotted left turn bays remove interlocking left turn movements and allow better intersection signal capacity;
3. This increases the intersection capacity by improving the sight distance and the ability for the left turns to operate during the same phase, rather than in separate phases;
4. The wider median created by slotted left turn lanes also provide an opportunity to enhance the aesthetics along the highway corridor;
5. It provides direct accesses to the businesses off the highway.

To implement the 44 Street Functional Plan as shown in Figure 8 the City must save/obtain a 70.5 m of right of way.

9.12.1 Without Service Roads

For areas which are built up and do not currently have service roads, right of way needs will be less than 70.5 as shown in Figure 9.9. In these areas a right of way between 50 - 55 m will be sufficient to fit a six lane urban divided highway. The elements of a 50 m cross section are highlighted in Figure 8.9.

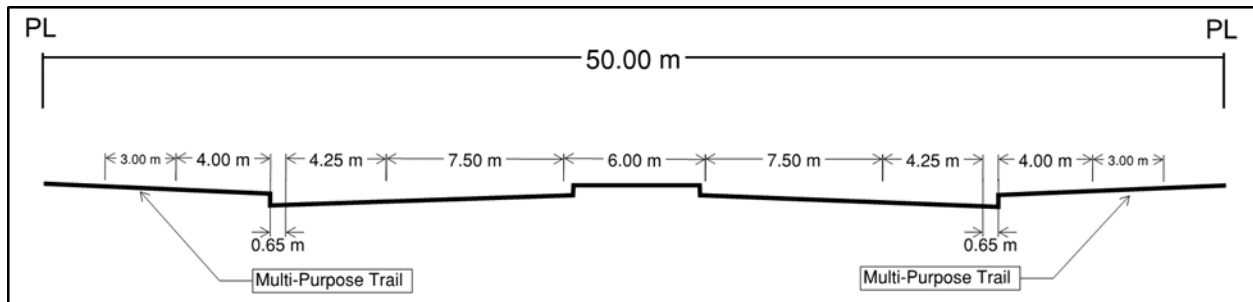


Figure 9.9: Possible Cross Section for Built Up Areas, Without Service Roads

The cross section includes a 3 m wide multipurpose trail on both sides with a 4 m boulevard. There are six lanes available with wider shoulder lane and a 6 m median to allow for left turns lanes at intersections.

Figure 9.9 is provided for informational purposes only as a more detailed analysis, through the development of a Functional Planning Study is required.

9.12.2 Right of Way Availability

West of 59 Avenue there is a significant amount of right of way available due to the presence of service roads. Through this area there is over 70 m of right of way available.

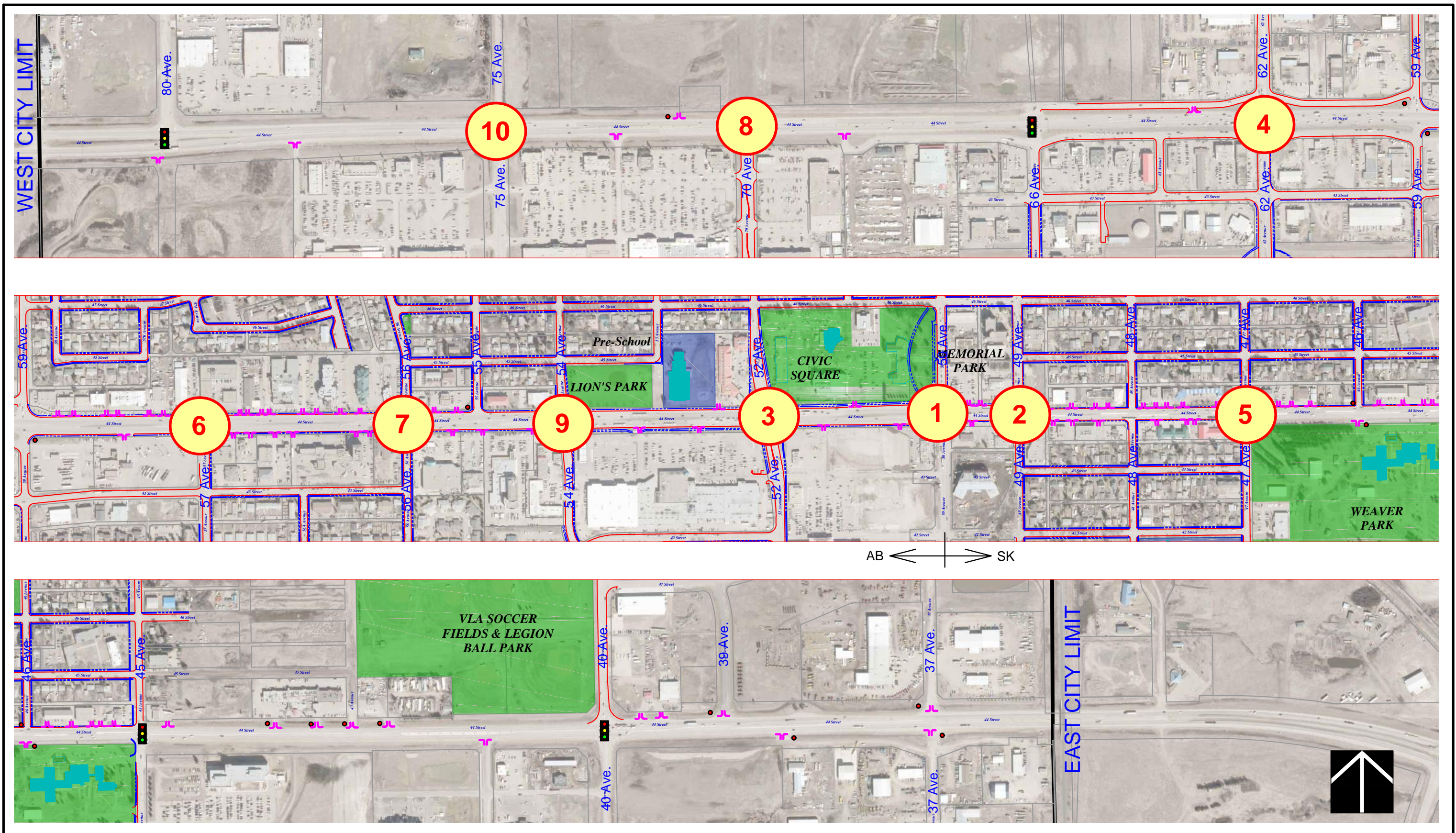
Between 59 Avenue and 49 Avenue, right of way is limited to approximately 41 – 44 m. Through this area the City will need to obtain further ROW in order to have sufficient land to implement a 50 m cross section.

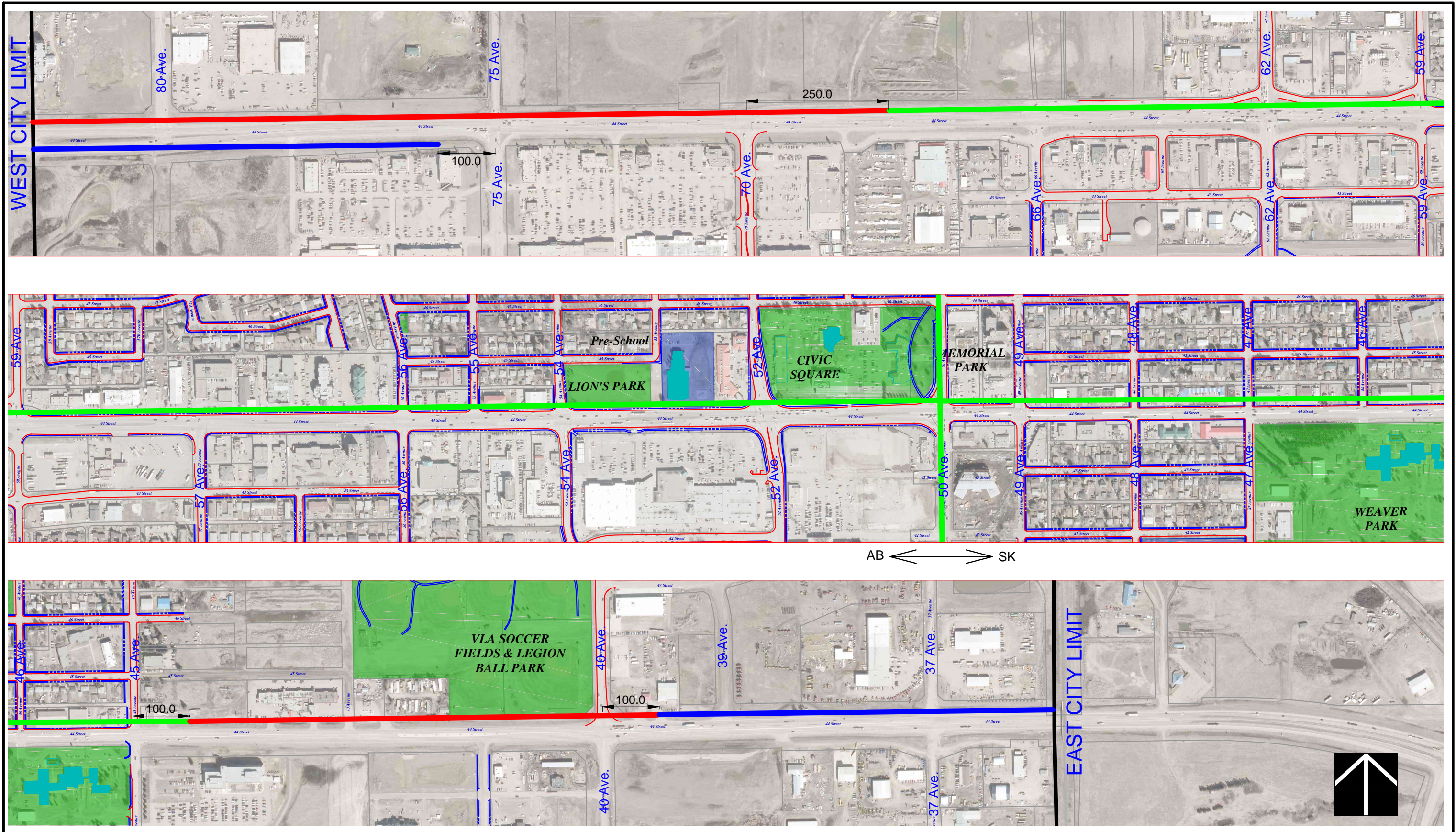
Between 50 Avenue and 45 Avenue, right of way restricted to approximately 25 m. The City will need to obtain a significant amount of ROW through this section in order to implement the six lane urban crossing provided in Figure 9.9. This will be a challenge for the City as this area has a number of established businesses.

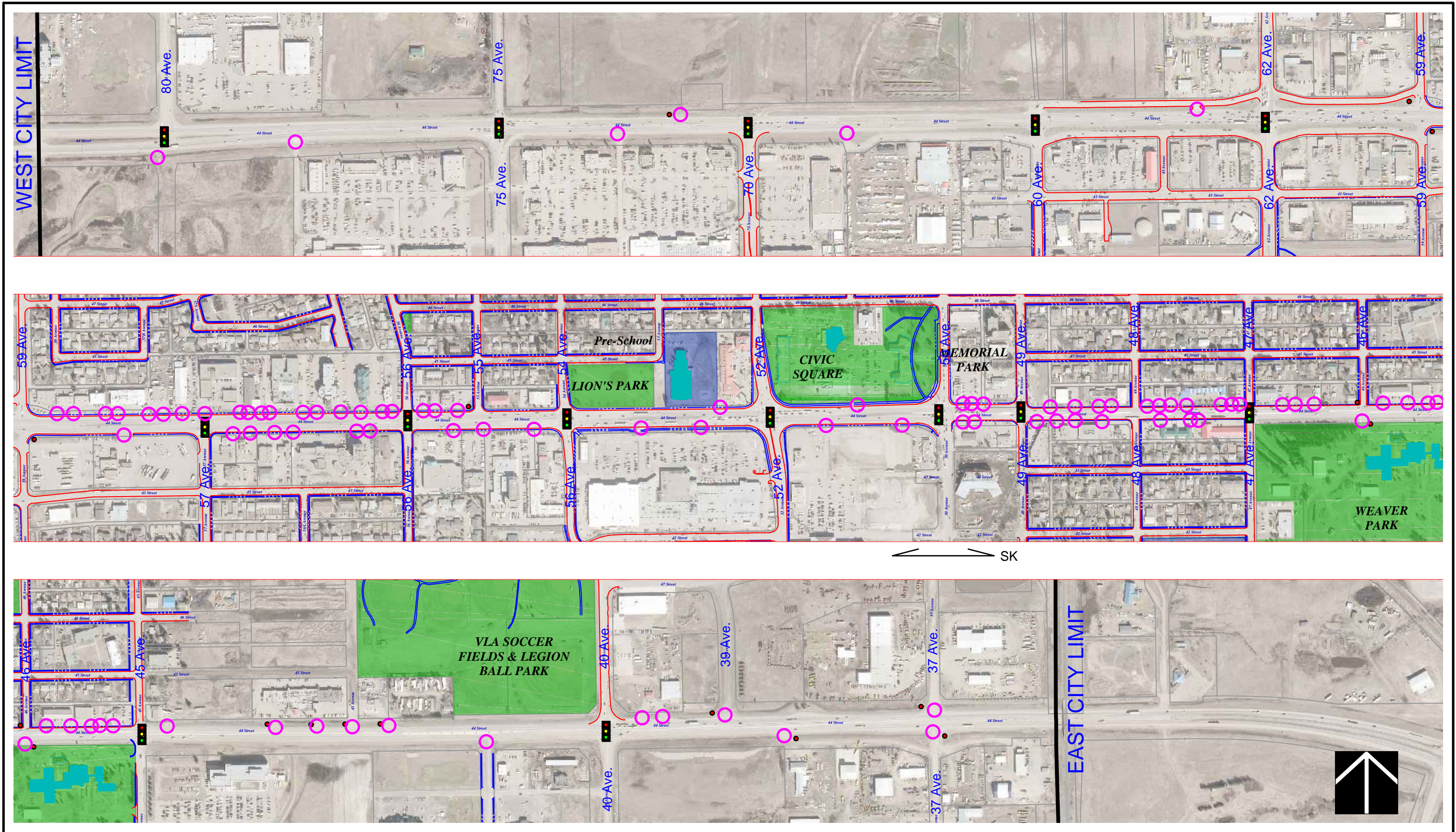
There other option is that the City reduce the cross section by removing many of the elements, including; 4 m boulevard, 3m multi-purpose trail, Buffer between trail and property line (dimension not shown, 2.6 m) and the 6 m median. The total of these removals reduce the cross section width from 50 m to 25.2 m.

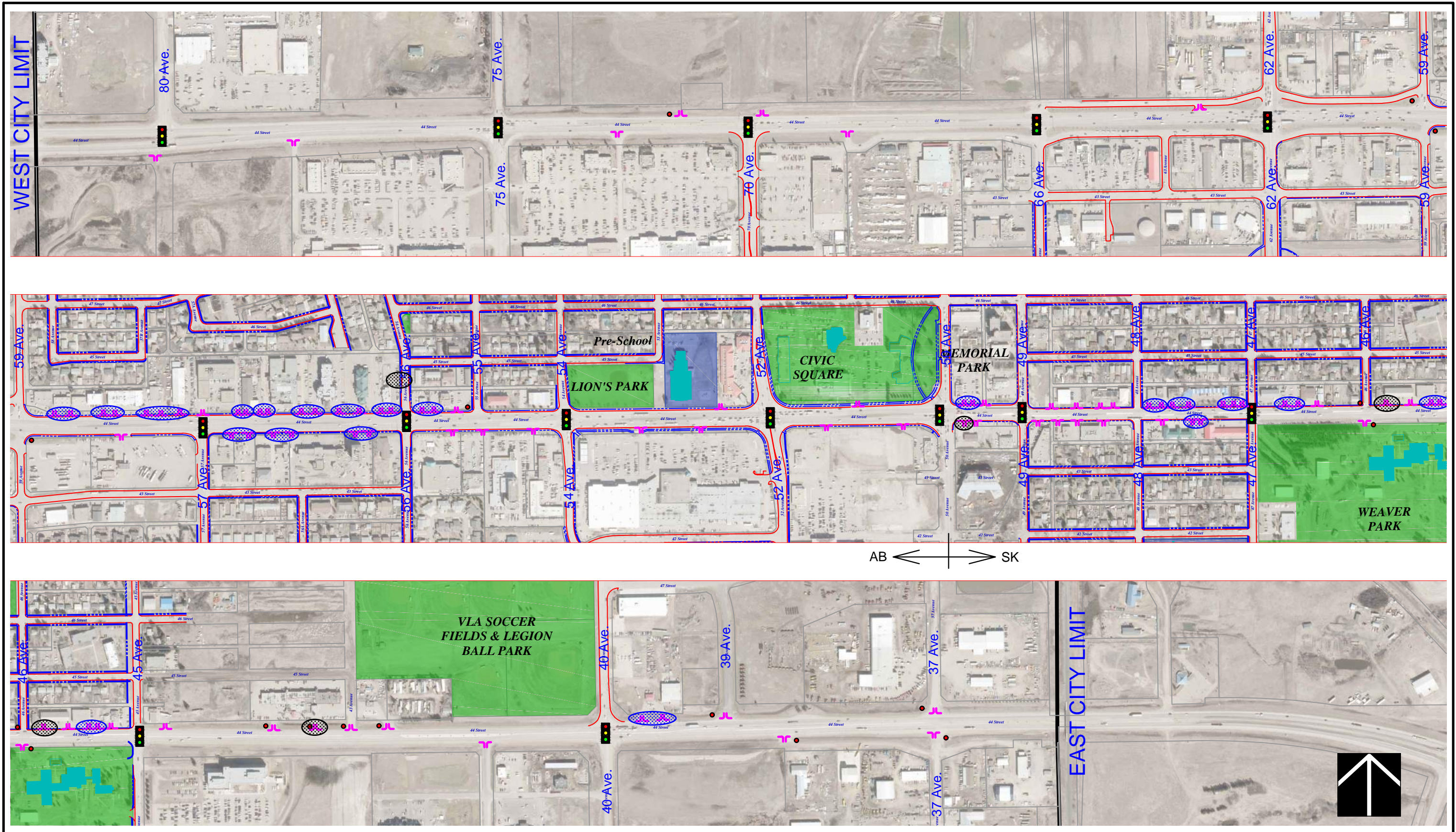
East of 45 Avenue to 39 Avenue there is approximately 62 – 63 m of ROW available. East of 39 Avenue to the City limits there is approximately 83 m of ROW available.

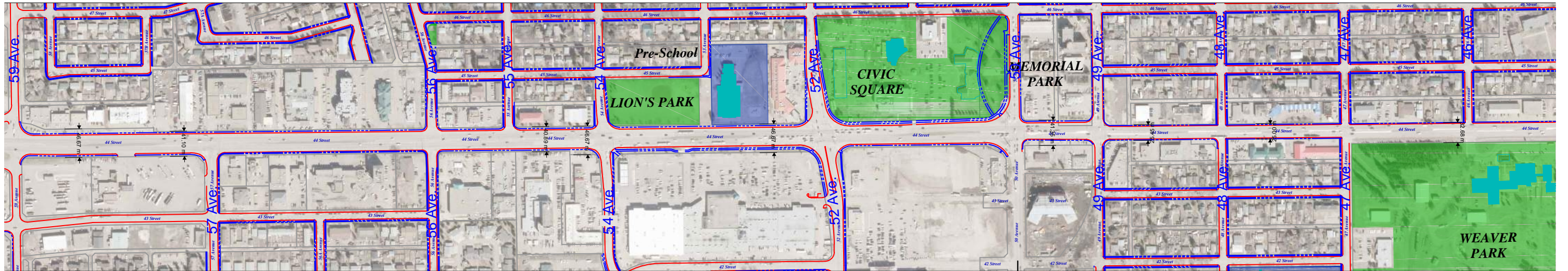
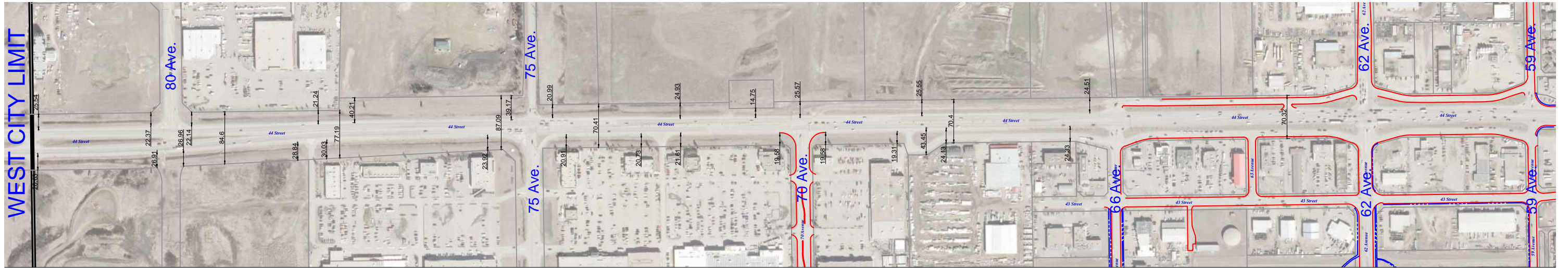
The existing right of way is provided in Exhibit 9.6.



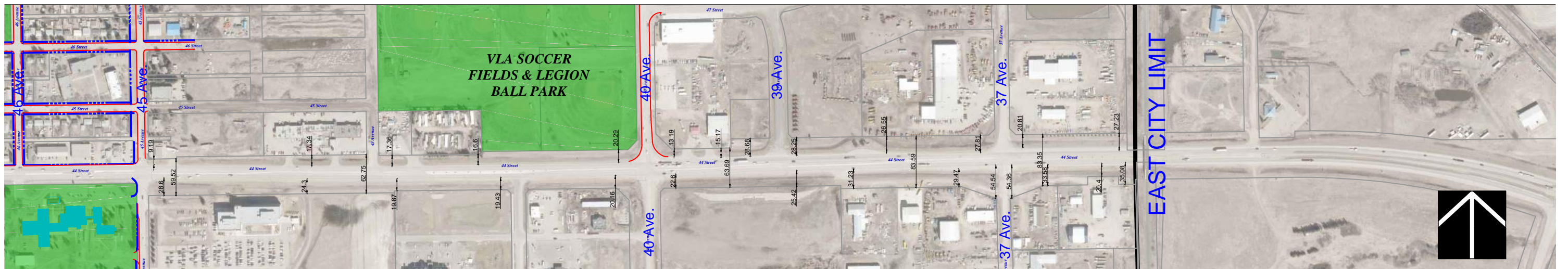








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10.0

Conclusions and Recommendations

During the TMP we learned the following key messages during a multi-faceted public engagement process: The most frequently mentioned major concerns for 30 stakeholders we spoke with were:

1. Traffic Safety:
 - High volume on Highway 17 – safety of both pedestrians and vehicles; and
 - Lack of sidewalks.
2. Traffic Congestion:
 - Highway 17; and
 - Rail Crossings.
3. Pedestrians and Cyclist Movement:
 - Bicycle lanes lacking; and
 - Sidewalks along arterials lacking.
4. Dangerous Goods Movement:
 - Dangerous Goods Route lacking.
5. Road Circulation:
 - 52 Street connection to 75 Avenue needed; and
 - 25 Street (47 Avenue to 40 Avenue) needed.

The stakeholders told us their key priority areas:

- Complete Highway 16 bypass;
- Improve pedestrian and cyclist facilities;
- Upgrade arterials;
- Create a north/south corridor; and
- Identify a Dangerous Goods Route.

The online survey response was strong, with a total of 587 participants generating 218 general comments and 1425 improvement suggestions. The key themes we extracted were:

1. **Truck Traffic/Bypass** - concerns with high volumes of truck traffic coming through the downtown core and suggest a bypass/truck route/dangerous goods route is greatly needed;
2. **Pedestrian Cyclist** - suggest the City provide more and safer crosswalks for both pedestrians and cyclists, especially on busier streets. They indicate that pedestrian controlled flashing or full signaled lights are desired. They also suggest additional, safer and better connected bike paths, sidewalks and multi-use paths are needed throughout the city;
3. **Railway Tracks** - concern with the wait times associated with the train traffic and indicate a great desire to see grade separations to alleviate congestion;
4. **Traffic signals (lights)** - suggest that the traffic lights within the city need to be better synced to improve traffic flow and congestion. They also suggest more traffic lights throughout the city at busy intersections are required;
5. **Transit** - desire for a public transit system;
6. **Maintenance** - concern with the maintenance of the city's roads, mainly with potholes and snow removal;
7. **Congestion** - desire for less congestion on their roadways and would like to see an improvement in congestion management;
8. **Traffic routes** - desire "more route" alternatives to get to their desired destinations and suggest more arterial roads and more north/south corridors be developed.

Also from the online survey we learned about the following location specific themes:

1. **Highway 17 (50 Avenue)** - concern with high volumes of traffic on this two-lane road which causes congestion and traffic flow issues. Suggest twinning this highway and adding turning lanes and traffic signals, with more left turn signals onto Highway 17. They also indicate an area of concern being the intersection at Highway 17 and 36 Street;
2. **Highway 16 (44 Street)** - concern with high volumes of traffic and truck traffic causing congestion and traffic flow issues. Suggestions provided for improvement include a bypass around the city, adding lanes (6 lanes), adding traffic signals (better synced), and adding turning lanes;
3. **College Drive (59 Avenue/25 Street)** - desire to add lanes to College Drive (complete the twinning). Suggest traffic lights at the entrance to Bud Miller Park and a connection from 25 Street through to 40 Avenue;
4. **Downtown** – concern with general traffic in the downtown core, along with the desire for additional parking;
5. **36 Street** - general traffic concerns with 36 Street, including traffic flow and congestion, and suggestions to add lanes and improve traffic signals.

Our final point of public engagement was at “Your Voice” – Lloydminster’s multi-project Open House Event on November 3, 2015, where about 40 to 50 people passed the TMP booth. Key feedback was:

1. Sidewalk and Multi-Use Trail Priorities plan:
 - a. There are missing sidewalks along 53 Avenue from 46 to 51 Street on both sides, and from 45 to 46 Street on the west side;
 - b. The highest concentration of concern was along 25 Street.
2. Proposed Roadway Improvements plan:
 - a. The highest concentration of concern was along 50 Avenue, especially south of 25 Street;
 - b. Some people wanted the rail grade separation on 62 Avenue.

Other prominent messages we heard at “Your Voice” were:

1. Sentiments to ban trucks from Highways 16 and 17;
2. 47 Avenue may be a candidate for a traffic calming study;
3. Some residents spoke passionately against the one-way couplet because:
 - a. It is expensive;
 - b. It has been planned for a long time, but nothing has been done;
 - c. There was a similar one-way couplet in Lloydminster before, but it did not last.

ISL conducted a major traffic analysis exercise. We built a travel demand model and calibrated it to existing traffic counts and validated it to Household Travel Survey data. The model forecasted future traffic flows and congestion for three land use horizons (short, medium, and long term). The model identified road improvements for each land use horizon.

We used the model results as well as public feedback to identify a long range road network. Key elements of the network are:

1. A strong arterial grid – this was an issue often identified by the public;
2. The north/south corridor – in addition to creating more capacity phase 1 of this project supports Lloydminster’s desire for a stronger downtown. Since phase 2 may take a longer time to complete, the City should implement turn bays as necessary for the interim. This responds to public concerns and will provide significant benefit for relatively small cost;
3. The Highway 16 Bypass – In the medium term the model forecasts that volumes will be about 700 vehicles per hour, relieving potential congestion on 44 Street and providing an alternate route for trucks and hazardous goods. These are all issues that were important during public consultation. Given the time frame to implement the bypass, property acquisition should start soon in order to build the bypass in the medium term;



4. Rail Crossings – the City should investigate the following:
 - a. The benefits and feasibility of a real time training crossing information system for drivers, especially for the downtown crossings;
 - b. Which arterial rail crossing ranks the highest in terms of technical need. Crossings to evaluate are 40 Avenue, 62 Avenue and 75 Avenue.

It is to be noted that ISL is making an assumption for the location and cost of the grade separated railway crossing.

In the travel demand model the 59/62 Avenue corridor remains relatively congested, even if widened from four to six lanes. It signals a trend in Lloydminster common to many cities: that widening roads will not eliminate congestion. Other solutions should be considered, including Transportation Demand Management as well as land use changes coupled with encouraging shifts to other modes (walking, transit, and cycling).

We also used the model results, a review of the City's pedestrian and cyclist circulation system, and public feedback to create comprehensive transportation capital plans for the 3, 5, 10, and 20 year time frames. We also identify capital projects that are just beyond the City's current limits, as these were identified by ISL's travel demand model. The timelines for the sidewalk and trail connectivity are based on broad assumptions but some projects may be required sooner due to adjacent development.

The recommended capital plans are as follows (recommended sidewalk and trail improvement locations are in Exhibits 5.1):

#	3 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
1	52 Street extension to 75 Avenue	1163.0	4800.00	5.58
2	North-South Corridor Phase - 1 (35 Street to 62 Street)	5863.0		32.67
3	Improve Sidewalk Connectivity	1214.5	144.29	0.18
4	Improve Trail Connectivity	4309.8	171.33	0.74
Total =				39.16

#	5 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
5	North-South Corridor Phase - 2 (12 Street to 35 Street)	2414.0	3200.00	7.72
6	25 Street Extension to 40 Avenue from 47 Avenue	1171.0	4800.00	5.62
7	College Drive Twinning from 36 Street to 53 Avenue	2000.0	3200.00	10.43
8	Rail Grade Separation (Subject to further Study)			35.00 to 45.00
9	Improve Sidewalk Connectivity	809.7	144.29	0.12
10	Improve Trail Connectivity	2873.2	171.33	0.49
Total =				59.38 with 35 and, 69.38 with 45.00

#	10 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
11	12 Street Twinning from 40 Avenue to 75 Avenue	4971.0	3200.00	15.91
12	40 Avenue Twinning from 52 Street to 62 Street	1650.0	3200.00	5.28
13	40 Avenue Twinning from 12 Street to 44 Street	3240.0		6.80
14	75 Avenue Twinning from 12 Street to 44 Street	3273.0		7.27
15	50 Avenue Twinning from 12 Street to City's Southern Boundary	814.0	3200.00	2.6
16	Improve Sidewalk Connectivity	4263.9	144.29	0.62
17	Improve Trail Connectivity	13072.0	171.33	2.24
Total =				70.72

#	20 Year Capital Plan Projects	Length (m)	Unit Rate (\$/m)	Cost (\$ M)
18	62 Street extension from 40 Avenue to 49 Avenue	1625.0	4800.00	7.80
19	6 - Lanes of 62 Avenue from 36 Street to 44 Street	834.0	4000.00	3.34
20	6 - Lanes of 59 Avenue from 25 Street to 36 Street	1111.0	4000.00	4.44
21	59 Avenue twinning from 12 Street to 25 Street	1327.0	3200.00	4.25
22	75 Avenue twinning from 44 Street to 52 Street	900.0	3200.00	2.88
23	Improve Sidewalk Connectivity	7200.1	144.29	1.04
24	Improve Trail Connectivity	36785.0	171.33	6.30
Total =				30.05

#	Projects Outside City Limits	Time Frame	Jurisdiction
A	Range Road 13 Twinning from 44 Street to Spruce Hill Road	Short Term	County of Vermillion River
B	50 Avenue Twinning from City's Southern Boundary to Highway 16 Bypass	Medium Term	County of Vermillion River
C	Highway 16 Bypass	Medium Term	Provinces of Alberta and Saskatchewan
D	35 Street extension to Range Road 13	Medium Term	County of Vermillion River
E	Range Road 13 Twinning from 44 Street to 52 Street	Long Term	County of Vermillion River
F	52 Street extension from City's Western Boundary to Range Road 13	Long Term	County of Vermillion River



ISL reviewed Goods Movement in the City in two parts. First was truck routes. We considered public feedback, land use, and technical issues. Figure 7.3 shows the recommended truck route network. It includes all roads in industrial areas.

The second part of Goods Movement was Dangerous Goods Routes (DGR). For the DGR's we identified their purpose and a number of guidelines to develop a DGR. The City will finalize a DGR by working with stakeholders.

ISL conducted a collision data analysis. We found there were issues with data differences between the two provincial data sets. Our analysis included investigating injury collisions, which is a practice done by jurisdictions following a Safe System approach. Under such an approach there is more emphasis placed on collisions that injure or kill people. The top four most severe collision causes accounting for about 75% of all severe collisions were:

1. Left Turn Across Path;
2. Fixed / Movable Object;
3. Left Turn-Straight – Opposite Direction;
4. Right Angle.

Finally, ISL conducted a functional review of 44 Street through the City. The purpose of the review was to:

1. Review collisions and provide options for remedial measures;
2. Evaluate existing posted speed limits;
3. Review access management strategies in the corridor;
4. Complete an operational assessment to identify capacity issues;
5. Assess the right of way requirements;

The review found that the leading collision causes in the corridor were rear end and left turns.

Based on this study intersection rumble strips and improved skid resistance are identified as a recommended countermeasure to reduce the rear end collisions as shown in the figure below.

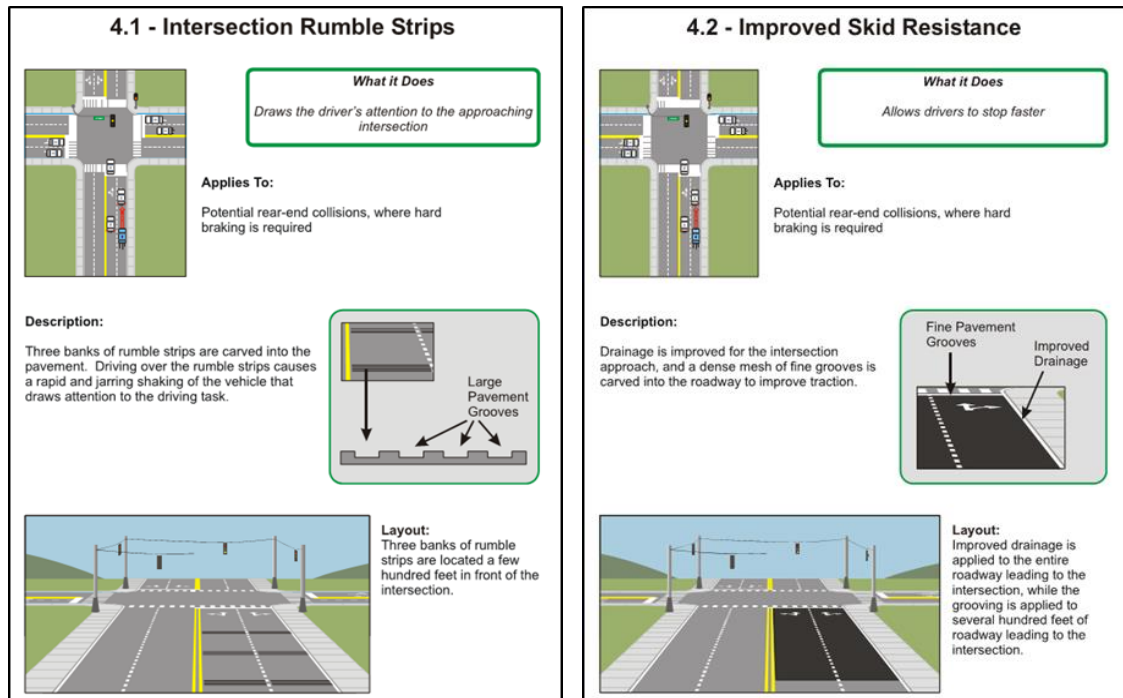


Figure 10.1: Figure 16 of FWHA Countermeasure 4.1: Intersection rumble strips and Figure 17. Countermeasure 4.2: Improved Skid Resistance

Based on the 2005 study of FWHA mentioned previously, protected only left-turn phases are identified as a recommended countermeasure to reduce the rear end collisions as shown in the figure below:

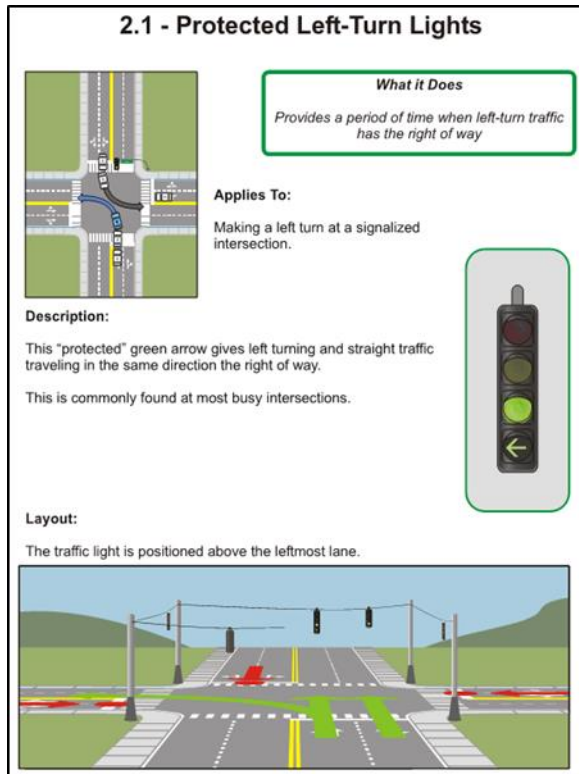


Figure 10.2: Figure 13 of 2005 FWHA Countermeasure 2.1 Protected left-turn lights

In terms of speed limits on 44 Street, ISL recommends increasing the speed limits along 44 Street once the following are in place:

1. Update signal coordination and inter-green intervals;
2. Install deceleration/acceleration lanes as per Exhibit 9.2.

In terms of access management, ISL recommends that the City strive to reduce the number of accesses along the corridor. Ideally accesses should be spaced at about 250m.

In terms of capacity issues, ISL recommends changes at two corridor intersections:

1. At 75 Avenue – 44 Street add a second northbound to westbound left turn lane and then retime the traffic signal to add more green time to 44 Street. This will require reconstruction of both the north and south approaches;
2. At 62 Avenue – 44 Street add right turn lanes for the southbound to westbound and the eastbound to southbound movements. For the eastbound to southbound movement, the City may need to ban the U-turn to the service road for large vehicles.

In terms of right of way requirements, it will depend on the need for service roads. If service roads remain or the road widens to six lanes, the required right of way is about 70.5m. However, in sections without a service road the required right of way is about 50m.



Appendix A

Stakeholder Workshop Summary Report



LLOYDMINSTER TRANSPORTATION MASTER PLAN

July 6, 2015 STAKEHOLDER WORKSHOPS SUMMARY REPORT

October 2015

Date of meeting: July 6, 2015 10:00 a.m. – 12:00 p.m.
July 6, 2015 2:00 – 4:00 p.m.

Location: City of Lloydminster Operations Centre

Meeting participants:

Workshop #1 – Industry Stakeholders

Kim Meakin, Saskatchewan Ministry of Highways & Infrastructure
Cindy Scheiber, RM of Wilton
Erin Simpson, RM of Wilton
John Winter, Lloydminster Chamber of Commerce
Curtis Lystang, ADM
Pat Tenney, Lloydminster Chamber of Commerce
Dorothy Carson, Lloydminster Construction Association
Russ Lorenz, Lloydminster Construction Association
Joe Wenisch, RCMP
Doug Rodwell, City of Lloydminster
Bill Heaslip, Alberta Transportation
Matthew Gabruch, Saskatchewan Ministry of Highways
Ward Read, Lloydminster Economic Development Corporation
Dan Hobson, Lloydminster Economic Development Corporation
Wanda Boon, RM of Britannia
John, RM of Britannia
Wes Ford, Rosenau Transport

Workshop #2 – Community Stakeholders

Serena Sjodin, Lloydminster Chamber of Commerce/Streetscapes
Conny Lurggum, Legacy Centre
Velma Wildman, Senior Citizen Society
Pat Bucknell, LPSD
Joe Wenisch, RCMP
Doug Rodwell, City of Lloydminster
Dwayne Lundquist, Husky Oil
Patrick Lancaster, City of Lloydminster
Peter McHugh, City of Lloydminster
Cindy Rekimowich, City of Lloydminster
Kevin Musgrave, Musgrave Agencies
Trisha Le, City of Lloydminster
Alanna Negri, Lakeland College

Introduction

The City of Lloydminster (City) is updating its Transportation Master Plan (2010) due to significant growth in the region in recent years necessitating changes and upgrades to the transportation infrastructure and network.

As stakeholders and the public play a key role in providing local/community level input, two stakeholder workshops were held on July 6, 2015 in the City's Training Room located at the Operations Centre to inform the development of the plan. One workshop was held with industry and one with community representatives. This document provides an overview of the workshop format, and a summary of the input received.

Workshop Format

Two workshops were held on July 6, 2015. Workshop agendas are attached in Appendix A. The workshop presentation can be found in Appendix B.

Workshop #1 – Industry Stakeholders 10:00 a.m. – 12:00 p.m.

Total Attendance: 17

Workshop #2 – Community Stakeholders 2:00 – 4:00 p.m.

Total Attendance: 13

What We Heard Overall

Generally, workshop participants feel that there are many areas of the Lloydminster transportation network that are working well that the City should recognize and build upon. Those identified as most significant include traffic signal lights, newer pedestrian/cycle linkages and multi use trails, traffic calming measures (speed bumps and roundabouts), the connection to 75 Avenue from 62 Avenue, and the 52 Street Truck Route.

When asked about major concerns with the transportation network the following were the most frequently mentioned concerns in each of the following areas:

Traffic Safety

- High volume on Highway 17 (safety of both pedestrians and vehicles)
- Lack of sidewalks

Traffic Congestion

- Highway 17
- Rail Crossings

Pedestrian and Cyclist Movement

- Lack of bicycle lanes
- Lack of sidewalks along arterials

Goods Movement

- Lack of a Dangerous Goods Route

Road Circulation

- 52 Street connection (to 75 Avenue)
- 25 Street (47 Avenue to 40 Avenue)

While participants have a long wish list of areas where they feel the City should focus its transportation efforts, the following were identified as key priorities:

- Complete Highway 16 bypass
- Improve pedestrian and cyclist facilities
- Upgrade arterials
- Create a north/south corridor
- Identify a Dangerous Goods Route

What We Heard: Workshop Questions

In a large group setting, participants were asked what an efficient and safe transportation network looks like. The following chart illustrates the responses received, and the similarities and differences between the responses of the two workshop groups.

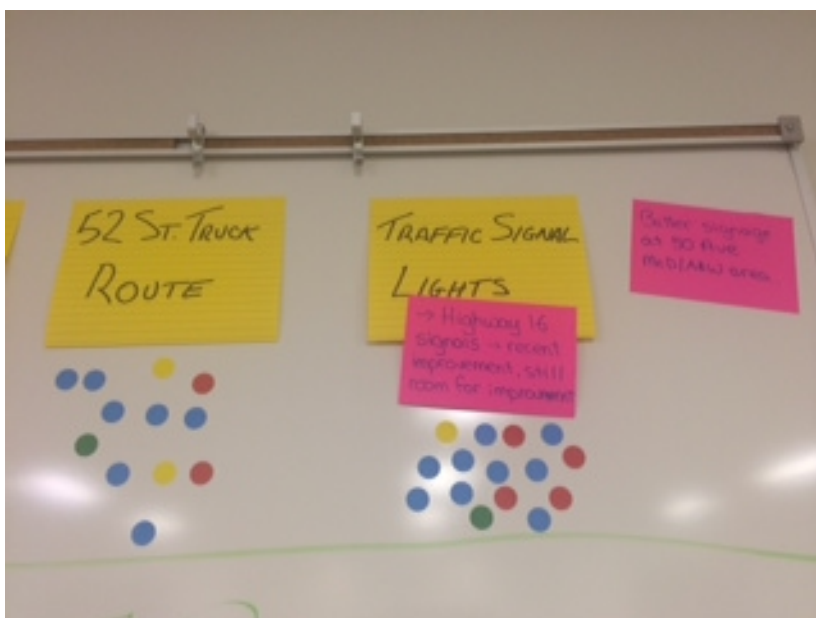
1. What does an efficient and safe transportation network look like?

	Workshop 1 Industry Stakeholders	Workshop 2 Community Stakeholders
Traffic calming measures are in place		
Light signals are effective and synchronized		
There are designated truck routes resulting in less truck traffic		
There is provision for dangerous goods		

	Workshop 1 Industry Stakeholders	Workshop 2 Community Stakeholders
Crosswalk lines are clearly painted		
Snow is cleared		
There are controlled accesses along thoroughfares		
Proper signage is in place		
There is coordination with rail traffic		
Speed controls are in place		
Bus routes are available		
There is accommodation for pedestrians		
There are dedicated cycle lanes		
There are main arteries that work to move traffic		
Appropriate infrastructure is in place		
Accommodation is in place for all modes of transportation		
Aids are in place for pedestrian crossings		
There are plans for seasonal changes		

2. What is really working well in the transportation network in Lloydminster now?

In small groups, workshop participants discussed the question above. The answers were then prioritized and the top priority items were shared with the broader group. The top priorities overall were written on a whiteboard and individuals were provided with sticky dots and given the opportunity to place them next to their individual priorities. This exercise was referred to as “dot-mocracy.” Numbers at the end of each bullet indicate results of the “dot-mocracy” exercise. Blue text indicates commonalities between the two workshop groups.



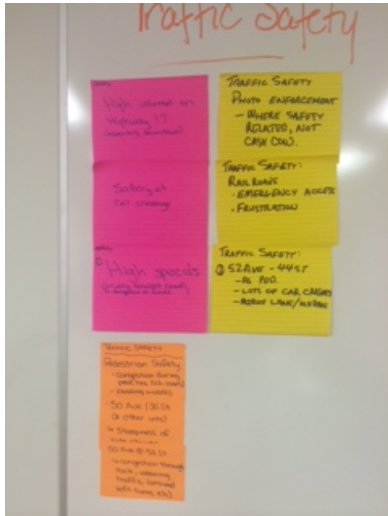
Workshop #1 – Industry Stakeholders

- Hill Industrial Park connecting to 75 Avenue from 62 Avenue - 15
- Traffic signal lights - 15
- Highway 16 signals – recent improvement, still room for improvement – 13
- 52 Street truck route - 12
- Bike paths/ multi-use trails - 9
- Highway 16 concrete pads at select intersections - 8
- Highway 16 east of 50 Avenue (since widening) - 6
- Traffic circles – Parkview X - 5
- 36 Street through to 40 Avenue (helped with traffic flow) - 5
- Inter-municipal communication - 5
- Planning of new subdivisions – more walkable - 2
- Parkview speed bumps - 2
- School zone signage “on road” - 1
- Better signage at 50 Avenue (McDonalds, A&W area) – 0

Workshop #2 – Community Stakeholders

- Traffic calming (speed humps, roundabouts, etc.) – 13
- Arterials - 10
 - 75 Avenue, 12 Street, 40 Avenue, 67 Street
 - 67 Street, 62 Avenue, 59 Avenue, 25 Street (ring route works)
 - 52 Street works well
 - 67 Avenue north of 52 Street works
 - 59 Avenue works well
- Pedestrian/cyclist linkages (mostly in newer areas) – 8
- Signal lights - 7
 - Left turn lanes and lights
- Airport – 6
- 36 Street to 40 Avenue - 5
- Plan for one-way couplet – 3
- New lights at 25 Street and 53 Avenue - 3
- Cycle path through College Park is good start – 3
- Cycle/walk path from Parkview to Bud Miller – 0

3. What are the major concerns regarding transportation in Lloydminster in each of the following areas: Traffic Safety, Traffic Congestion, Pedestrian and Cyclist Movement, Goods Movement, Road Circulation?



Workshop participants were split into groups and were asked to identify their key concerns relating to five transportation related areas. They were then asked to prioritize the concerns and share their highest concerns with the broader group. Common themes are noted in blue.

Traffic Safety

Workshop #1 – Industry Stakeholders

- High volumes on Highway 17, especially downtown
- Speeding
- Photo enforcement where safety related
- Rail crossings
 - Safety
 - Emergency access
 - Frustration
- 52 Avenue – 44 Street
 - As pedestrians
 - Many collisions
 - Merge lane
 - Median
- Pedestrian safety
 - Congestion during peak hours (school zones)
 - Passing cross walks

-
- 50 Avenue/36 Street (and other intersections)
 - Steepness of side streets
 - 50 Avenue/52 Street
 - Congestion through rails, weaving traffic around left turns, etc.

Workshop #2 – Community Stakeholders

- Highway 17 (pedestrian and vehicle)
- Lack of sidewalk volumes
- Truck traffic on Highway 16
- Road widths
- High speeds on 23 Street

Traffic Congestion

Workshop #1 – Industry Stakeholders

- Frustrated drivers (wait for train, hit red lights on Highway 16)
- Railway crossings causing congestion (especially 50 Avenue)
- People don't understand how to navigate through 4-way stops
- By Sobeys (75 Avenue/44 Street) need southbound to eastbound left turn lane
- 50 Avenue (Highway 17) south of 44 Street

Workshop #2 – Community Stakeholders

- Arterials can't handle volumes (now and future)
- Highway 17 downtown and south
- Highway 16 west and south
- Every intersection needs turning lanes
- 36 Street from 49 Avenue to 59 Avenue
- Need turn lanes including Highway 17 N/S
- Rail crossings
- Trains downtown cause congestion

Pedestrian and Cyclist Movement

Workshop #1 – Industry Stakeholders

- Trail on east side to connect to upgrader
- No sidewalks or trails on Highway 17
- Arterial sidewalks and paths
 - Highway 17 south of Highway 16
 - Highway 16 west
- Motorist disregard for pedestrian crossings
- Sidewalks missing
- Designated bike paths/routes—need more
 - Safer connections across roads

Workshop #2 – Community Stakeholders

- Lack of sidewalk trail on arterials
 - 12 Street, 67 Street, 40 Avenue, 75 Avenue)
- Crossing highway is challenging
- Cycle lanes
 - Crossing roads is wrong priority
 - Raise crossing
- Lack of sidewalks and trails on Highway 17
- Sidewalks/trails in older neighbourhoods

Goods Movement

Workshop #1 – Industry Stakeholders

- No good north/south route for dangerous goods (slows traffic)
- South ring road needed for trucks to coordinate with provinces
- Need to use rail lines for industrial development that requires rail access
- No lights on 67 Street/50 Avenue
- More lanes (turn, deceleration) on arterials
- Trucks running lights – can't/won't stop
- Trucks downtown
- College Drive—trucks versus commuters

Workshop #2 – Community Stakeholders

- Need a Dangerous Goods Route
- Trucks on Highway 17 on Highway 16
 - Should divert trucks
- Get trucks of Highways 16 and 17

Road Circulation

Workshop #1 – Industry Stakeholders

- 52 Street to 75 Avenue
- 25 Street (47 Avenue to 40 Avenue)
- South Highway 16 bi-pass
- Hill Industrial Road connections to 75 Avenue
 - Alleviate 44 Street west of 62 Avenue
- Goods only corridors
- Highway 17 and 67 Street needs light
- Manage rail crossings
 - Build trains without impacting roads
 - Over/under passes
 - Plan now
 - Emergency service locations/circulation (eastbound right turn, southbound right turn—need bays)
- 62 Avenue/44 Street
 - Wait too long
 - Left turn (spills out too)

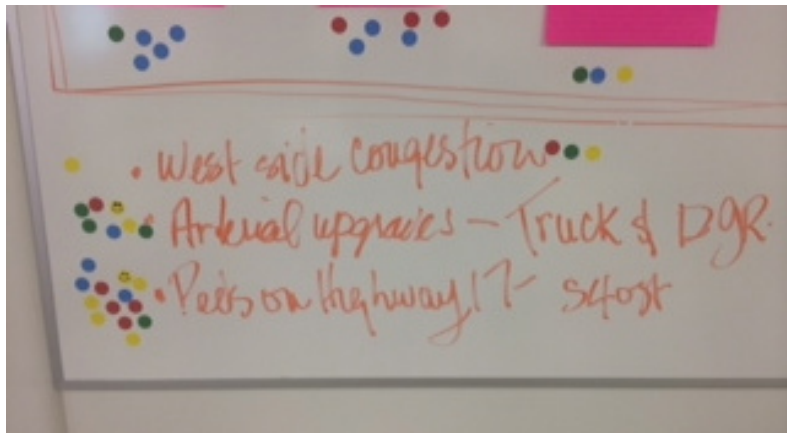
Workshop #2 – Community Stakeholders

- 25 Street to 40 Avenue
- Traffic light coordination
- 75 Avenue – 12 Street
 - Busy
 - Fast traffic
- Semi trucks can't turn
- Snow melt makes it ice
- 52 Street connection

- Snow “removal”
 - Doesn’t get removed, it packs and gets icy
 - Travel lane squeezed by parking closer to the middle
 - Accommodate future public transit

4. Where should the City of Lloydminster focus its transportation resources in the future?

In small groups, workshop participants discussed the question above. The answers were then prioritized and the top priority items were shared with the broader group. The top priorities overall were written on a whiteboard and individuals were provided with sticky dots and given



the opportunity to place them next to their individual priorities. This exercise was referred to as “dot-mocracy.” Numbers at the end of each bullet indicate results of the “dot-mocracy” exercise.

Workshop #1 – Industry Stakeholders: Priorities

- Highway 16 by-pass – rail line (confirm this plan) - 14
- Pedestrian accommodation on Highway 17 (south of 40 Street) - 13
- North/south corridor – Dangerous Goods Route - 13
- Development and site planning – foresight - 10
- Arterial upgrades (Truck and Dangerous Goods Routes) - 7
- Finish missing connections - 6
- New signal lights - 4
- West side congestion - 4
- Railroad issues including grade separations – 0
- Traffic movement on Highway 16 – 0

Additional Comments:

- Prioritize projects based on costs in short and long-term
- Manage railroads and work together (safety issue – emergency services)
- Add new lights where needed
- Alleviate west side congestion (southbound turn lanes – 62 Avenue and 67 Street, whole intersection)
- Arterial upgrades
 - North of 67 Street (future annexation)
 - All annexation areas
 - Congestion
 - 40 Avenue and 12 Street, 75 Avenue and 52 Street, turning lanes, traffic lights
 - Pedestrians – Highway 17 South of 44 Street
- Pedestrians affecting traffic
- Signage for Truck Route and Dangerous Goods Route
- Overpass and rails (downtown highest priority, shunting here and @ 75 Avenue and 40 Avenue train movements)
- Highway 17 south of 44 Street (incline with ice at 36 Street)
- Make pedestrian/cycle friendly (better connections or create connections, public awareness)
- Connect 25 Street to 40 Avenue
- Lights at College Drive
- Continue widening College Drive

Workshop #2 – Community Stakeholders: Priorities

- Improve arterials – turning lanes/lights - 15
- 40 Avenue, 12 Street, 75 Avenue, 52 Street - 13
- Address trucks, Dangerous Goods Route and trains - 12
- Highway 17 south upgrades - 12
- Improve pedestrian and cycle facilities - 11
- Public transit - 6
- Connect 25 Street to 40 Avenue - 5
- Widen and add lights on College Drive – 5
- Beautification of corridors - 3

Additional Comments

- Cycle paths – wider sidewalks, narrower roads, more linkages, lighting
- Get trucks and dangerous goods out of town
- Railroads (overpass or underpass)
- Iceway
- Public transit – could be smaller routes (1—2 buses)
- Pedestrian crossings at highways (overpass)
- Downtown – wider sidewalks, dedicated cycle lanes, slower traffic
- Shared spaces
- Connections between neighbourhoods
- Land use planning and remediate issues

Truck Route

The existing and a proposed truck route were discussed with participants in Workshop #1 – Industry Stakeholders. Comments received are as follows:

- Consider overhead utility lines
- Add signal lights at the following locations:
 - Intersection of 12 Street and 40 Avenue
 - Intersection of 67 Street and 40 Avenue
 - Intersection of 67 Street and 50 Avenue (Highway 17)
 - Intersection of 62 Street and 62 Avenue
- Consider speed limits
- Consider southbound turn lanes at the following locations:
 - 75 Avenue to 62 Street and 52 Street
 - Complete the roadway links (bad intersection 62 Avenue and 67 Street):
 - Between 62 Avenue and 67 Street
 - Along 67 Street at approximately 59 Avenue
 - Remove DGR along 50 Avenue (Highway 17) between 44 Street (Highway 16) and 62 Street
- Add turning and acceleration/deceleration lanes:
 - 75 Avenue between 44 Street (Highway 16) and 67 Street
- 12 Street and 75 Avenue (this intersection is currently highly used by trucks)
- Truck/fuel stop needed at intersection of 12 Street and 75 Avenue

-
- Add turn lanes at intersection of 12 Street and 50 Avenue (Highway 17)
 - Consider using upgraded road east of 40 Avenue
 - Round corners or include merge lane at intersection of 67 Street and 40 Avenue

General Comments

Workshop #1 – Industry Stakeholders

- More countdowns on lights
- More sidewalks and trails in older areas including industrial and commercial

Appendix A – Workshop Agendas

Lloydminster Transportation Master Plan Stakeholder Workshop Agenda

July 6, 2015 10:00 a.m. – 12:00 p.m.



1. Welcome and Introductions – City of Lloydminster
2. Project Overview and Goals – City of Lloydminster
3. Meeting Purpose
4. Group Discussion: What does an efficient and safe transportation network look like?
5. Current Situation Brainstorm: What is working really well with the transportation network in Lloydminster now?
6. Table Discussion #1: What are the major concerns regarding transportation in Lloydminster in each of the following areas?
 - Traffic Safety
 - Traffic Congestion
 - Pedestrians and Cyclist circulation
 - Goods Movement
 - Road Circulation
7. Report Back
8. BREAK
9. Table Discussion #2: Where should the City of Lloydminster focus its transportation resources in the future?
10. Report Back
11. Table Discussion #3: Truck Route
12. Review and Workshop Summary
13. Dotmocracy: Prioritization of Transportation Resources
14. Conclusion – City of Lloydminster

4420 50 Avenue, Lloydminster AB/SK T9V 0W2 | P: 780 875 6184 | www.lloydminster.ca

Lloydminster Transportation Master Plan

Stakeholder Workshop Agenda

July 6, 2015 2:00 – 4:00 p.m.



1. **Welcome and Introductions – City of Lloydminster**
2. **Project Overview and Goals – City of Lloydminster**
3. **Meeting Purpose**
4. **Group Discussion: What does an efficient and safe transportation network look like?**
5. **Current Situation Brainstorm: What is working really well with the transportation network in Lloydminster now?**
6. **Table Discussion #1: What are the major concerns regarding transportation in Lloydminster in each of the following areas?**
 - Traffic Safety
 - Traffic Congestion
 - Pedestrians and Cyclist circulation
 - Goods Movement
 - Road Circulation
7. **Report Back**
8. **BREAK**
9. **Table Discussion #2: Where should the City of Lloydminster focus its transportation resources in the future?**
10. **Report Back**
11. **Dotmocracy: Prioritization of Transportation Resources**
12. **Review and Workshop Summary**
13. **Conclusion – City of Lloydminster**

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Appendix B
Online Survey Summary



LLOYDMINSTER TRANSPORTATION MASTER PLAN

PUBLIC ONLINE SURVEY: SUMMARY REPORT

January 2016

INTRODUCTION

As part of the public engagement process for the update of the Lloydminster Transportation Master Plan, an online survey was conducted to provide the opportunity for the public to identify issues and concerns with the region's transportation network, including everything from highways and roadways, to walking trails, sidewalks and bicycle paths. The survey was available online from June 29 to July 31, 2015. The City implemented a communications/advertising campaign to create awareness and encourage residents to complete the survey.

The survey asked respondents to identify areas of concern on a map and provide suggestions for improvement. This document provides a summary of the feedback received.

A total of 587 respondents participated in the online survey. Two hundred and twenty-two (222) general comments were received, as well as 1414 improvement suggestions.

The online survey allowed participants to leave markers on the digital map to identify areas of concern. A total of 3009 markers were provided, broken down into the following key areas:

- Traffic Congestion – 1519
- Traffic Safety – 578
- Goods Movement – 329
- Walk/Cycle Connections – 251
- Missing Road Connections – 134
- Other – 198

IMPROVEMENT SUGGESTIONS/COMMENTS

A total of 1414 improvement suggestions and 222 general comments were received in the online survey and summarized into the following key themes, as well as location specific key themes:

Key Themes

Truck Traffic/Bypass (167) (13)

Respondents indicate a concern with high volumes of truck traffic coming through their downtown core and suggest a bypass/truck route/dangerous goods route is greatly needed.

Pedestrian Cyclist (150) (25)

Respondents suggest the City provide more and safer crosswalks for both pedestrians and cyclists, especially on busier streets. They indicate that pedestrian controlled flashing or full signaled lights are

desired. They also suggest additional, safer and better connected bike paths, sidewalks and multi-use paths are needed throughout the city.

Railway Tracks (102) (12)

Respondents indicate a concern with the wait times associated with the train traffic and indicate a great desire to see grade separations to alleviate congestion.

Traffic signals (lights) (78) (7)

Respondents suggest that the traffic lights within the city need to be better synced to improve traffic flow and congestion. They also suggest more traffic lights throughout the city at busy intersections are required.

Transit (75) (31)

Respondents indicate a desire for a public transit system.

Maintenance (46) (7)

Respondents indicate a concern with the maintenance of the city's roads, mainly with potholes and snow removal.

Congestion (35) (15)

Respondents indicate a desire for less congestion on their roadways and would like to see an improvement in congestion management.

Traffic routes (41)

Respondents, in general, desire "more route" alternatives to get to their desired destinations and suggest more arterial roads and more north/south corridors be developed.

Location Specific Themes

Highway 17 (50 Avenue) (171) (13)

Respondents indicate a concern with high volumes of traffic on this two-lane road which causes congestion and traffic flow issues. They suggest twinning this highway and adding turning lanes and traffic signals, with more left turn signals onto Highway 17. They also indicate an area of concern being the intersection at Highway 17 and 36 Street.

Highway 16 (44 Street) (110) (14)

Respondents indicate a concern with high volumes of traffic and truck traffic causing congestion and traffic flow issues. Suggestions provided for improvement include a bypass around the city, the addition of lanes (6 lanes), the addition of traffic signals (better synced), and the addition of turning lanes.

College Drive (59 Avenue/25 Street) (53) (3)

Respondents indicate a desire to add lanes to College Drive (complete the twinning). They also suggest a need for traffic lights at the entrance to Bud Miller Park and a connection from 25 Street through to 40 Avenue.

Downtown (19)

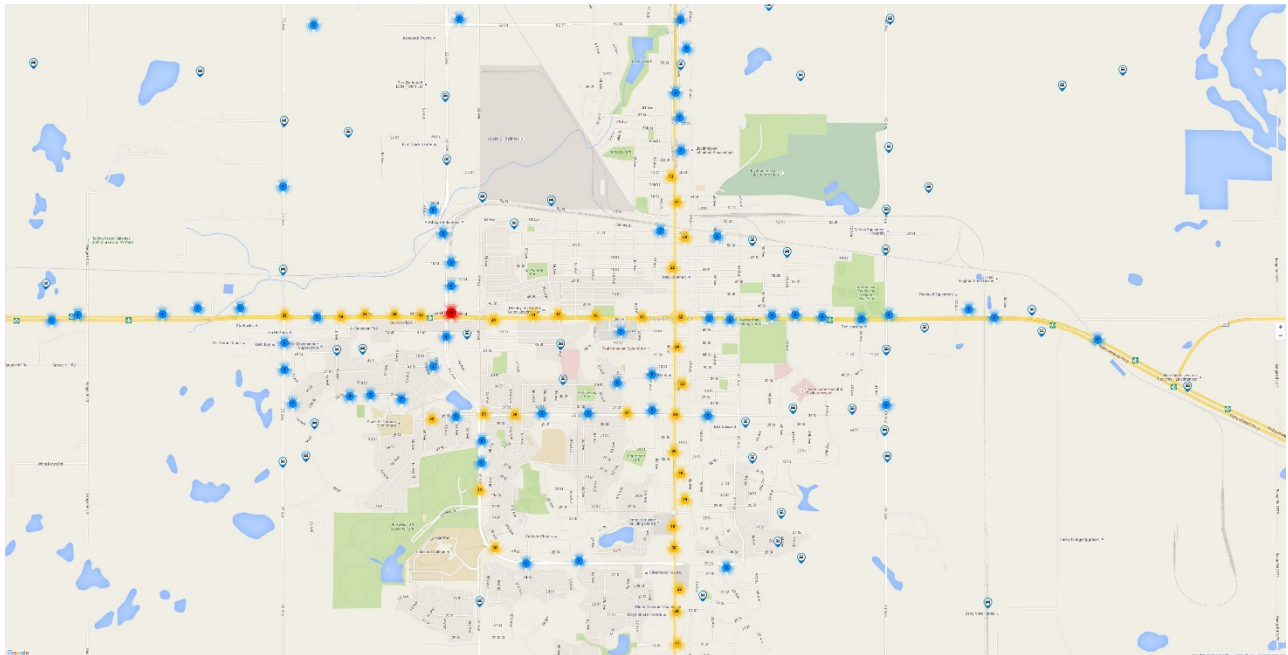
Respondents indicate general traffic concerns in the downtown core, along with the desire for additional parking.

36 Street (16) (1)

Respondents indicate general traffic concerns with 36 Street, including traffic flow and congestion, and the suggestions to add lanes and improve traffic signals.

MAP MARKERS

Traffic Congestion – The map below shows all the pins that resident identified.



1519 markers were left to indicate areas of concern regarding Traffic Congestion. The areas indicted most often as having Traffic Congestion issues are as follows:

(Note: not all respondents who indicated a location left a comment to support it)

Highway 17 (50 Avenue) (425 respondents)

Comments regarding traffic congestion on this roadway indicate the causes of congestion are that it is a single lane (desire for added lanes, twinning); long waits at the railway crossing (desire for overpass/underpass); uncoordinated traffic light timing; the need for turning lanes, specifically left turning lanes and turning signals all along the corridor. The intersections at Highway 16, the railway crossings and 52 Street are indicated as particularly congested areas.

Highway 16 (44 Street/Ray Neilson Drive) (311 respondents)

Comments regarding traffic congestion on this roadway indicate the single lane (desire to add lanes), signal timing, and lack of turning lanes and turning arrows along this roadway. The intersection at Highway 17 and 62 Avenue are noted as particularly congested areas.

36 Street (100 respondents)

Comments regarding traffic congestion on this roadway indicate the lack of turning signals and turning lanes along the roadway as issues. Many responses indicate the intersection at Highway 17 as being the area of most concern. The speed bumps were also mentioned as a concern.

College Drive (59 Avenue/25 Street) (84 respondents)

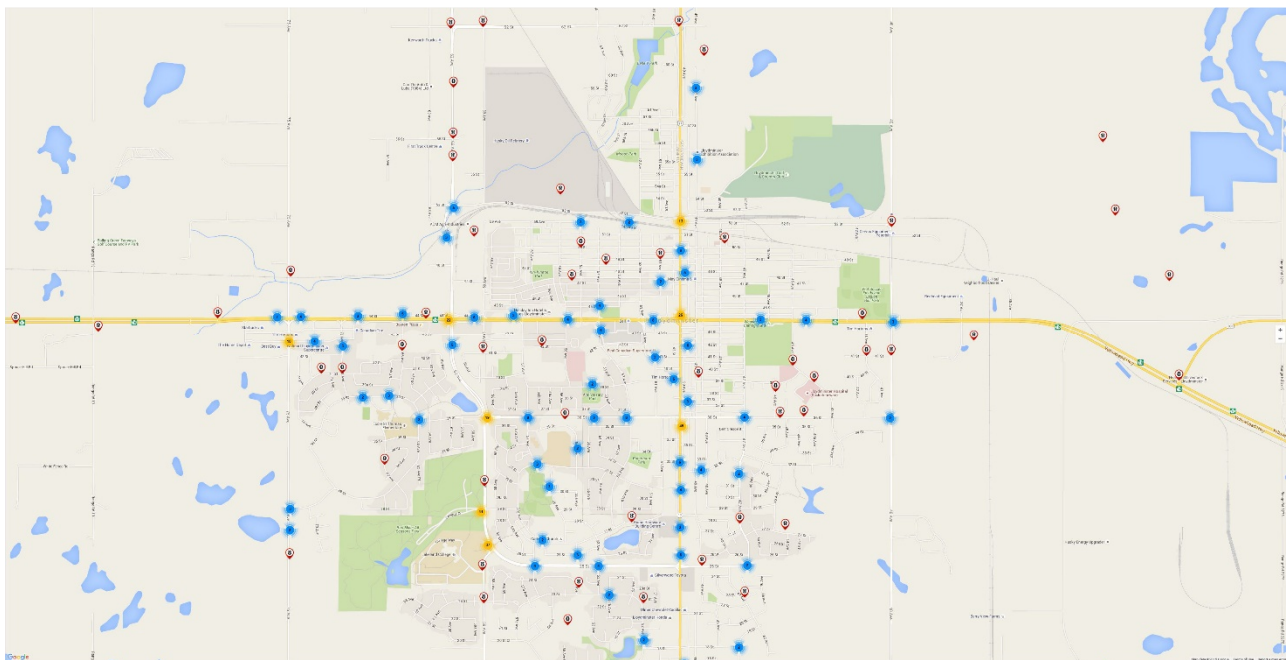
Comments regarding traffic congestion along 59 Avenue indicate the lack of lanes (desire for added lanes) and the need for traffic lights and turning lanes into Bud Miller Park as issues. Many respondents indicate the intersection at 36 Street as being of particular concern.

62 Avenue (58 respondents)

Comments regarding traffic congestion on this roadway indicate the railway crossing as an issue, as well as turning lanes and signal timing along the roadway. Many responses indicate the intersection at Highway 16 as being of most concern.

60 other streets, avenues or locations were mentioned, with each having between 1 and 35 responses.

Traffic Safety – The map below shows all the pins that resident identified.



578 respondents left markers to indicate areas of concern regarding Traffic Safety. The areas indicted most often as having traffic safety issues are as follows:

(Note: not all respondents who indicated a location left a comment to support it)

Highway 17 (50 Avenue) (90 respondents)

Comments regarding traffic safety along Highway 17 indicate concern over increasing congestion causing safety hazards; the need for safer turning options, specifically turning left onto Highway 17; and the desire for turning signals to expedite left turns. There is also concern regarding traffic safety at several intersections with 36 Street and 44 Street being mentioned most often as a concern. Other concerns are regarding pedestrian crossing safety, site line issues and dangerous drivers.

Highway 16 (44 Street/Ray Neilson Drive) (73 respondents)

Comments regarding traffic safety on Highway 17 indicate a variety of concerns including the intersection at 50 Avenue and 62 Avenues. Also mentioned as concerns were turning lanes (short or nonexistent), pedestrian safety, site line issues and congestion.

College Drive (59 Avenue/25 Street) (54 respondents)

Comments regarding traffic safety along College Drive indicate a desire for a traffic light at the 59 Ave/25 Street intersection to help both traffic and pedestrian movements. There is also concern for traffic and pedestrian safety at 29 Street (entrance to Bud Miller Park).

36 Street (43 respondents)

Comments regarding traffic safety along 36 Street indicate concerns with intersections (49 Avenue, 50 Avenue and 59 Avenue specifically) and the desire for left turn lanes and left turn signals at these locations.

75 Avenue (29 respondents)

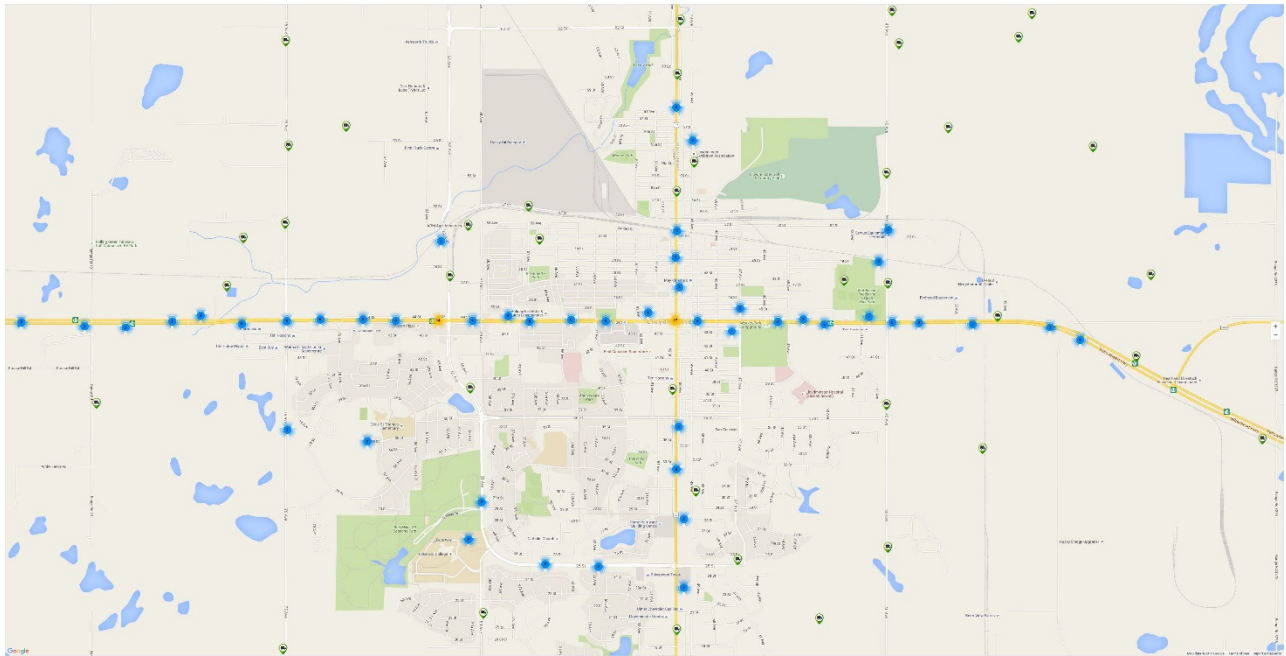
Comments regarding traffic safety along 75 Avenue indicate concerns with the intersection at 49 Street (crossing between Sobey's/Best Buy) as well as with the intersection at Highway 16.

62 Avenue (23 respondents)

Comments regarding traffic safety along 62 Avenue indicate concerns with the intersections at Highway 16 and 36 Street. A few comments indicate a desire for a grade separation at the railway crossing.

59 other streets, avenues or locations were mentioned, with each having between 1 and 15 responses.

Goods Movement – The map below shows all the pins that resident identified.



329 respondents left markers to indicate areas of concern regarding Goods Movement. The areas indicted most often as having Goods Movement issues are as follows:

(Note: not all respondents who indicated a location left a comment to support it)

Highway 16 (44 Street/Ray Neilson Drive) (134 respondents)

Comments regarding goods movement issues indicate a concern with too much truck traffic travelling on Highway 16 through the city and a desire for a truck route/bypass to be built to alleviate the truck congestion.

Highway 17 (50 Avenue) (33 respondents)

Comments regarding goods movement issues along Highway 17 indicate a concern with the truck traffic and a desire for a dangerous good route or bypass to alleviate the concern.

40 Avenue (18 respondents)

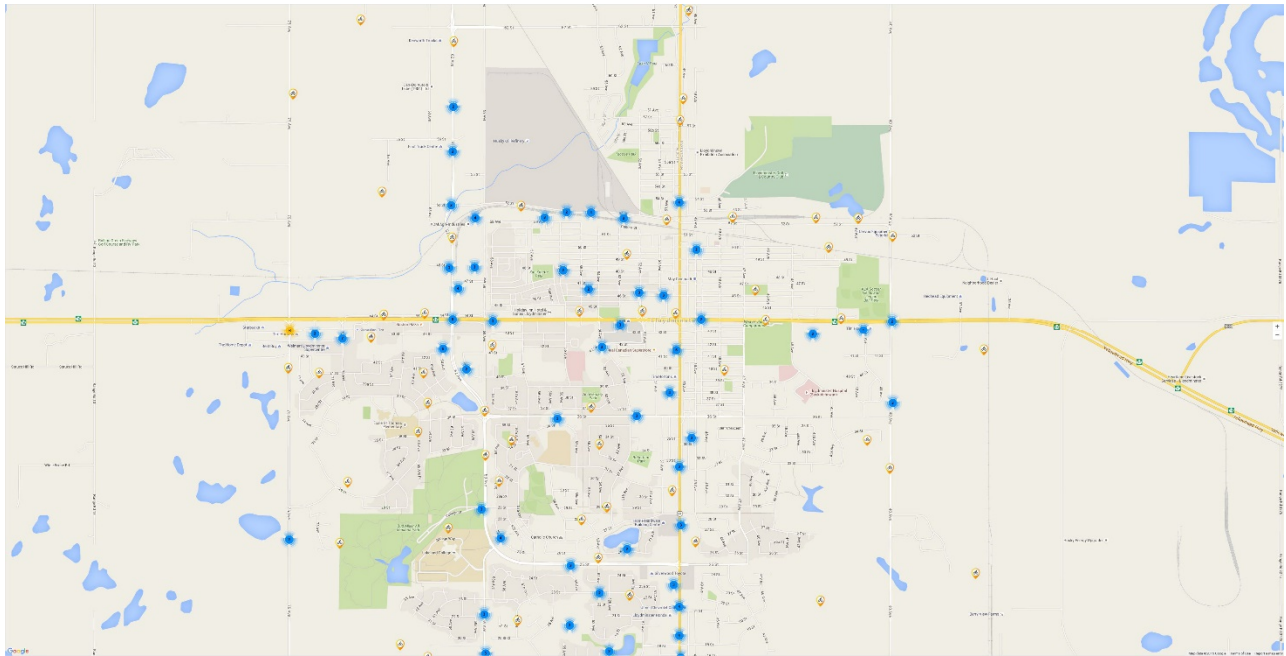
Comments regarding goods movement issues indicate that 40 Avenue should be considered as a future truck route.

75 Avenue (14 respondents)

Comments regarding goods movement issues indicate that 75 Avenue might be considered as a future truck route.

35 other streets, avenues or locations were mentioned, with each having between 1 and 7 responses.

Walk/Cycle Connections – The map below shows all the pins that resident identified.



251 respondents left markers to indicate areas of concern regarding Walk/Cycle connections. The areas indicted most often as having Walk/Cycle connections issues are as follows:

(Note: not all respondents who indicated a location left a comment to support it)

Highway 17 (50 Avenue) (32 respondents)

Comments regarding walk/cycle connections along Highway 17 indicate a lack of or no safe pedestrian/bike crossings and the desire to have more and a lack of sidewalk/bike paths specifically as it turns into 50 Avenue.

Highway 16 (44 Street/Ray Neilson Drive) (31 respondents)

Comments regarding walk/cycle connections along Highway 16 indicate a lack of connections across the highway in general (highlighting 52 Avenue and destinations such as Husky Place); a lack of sidewalks and/or bike paths along the highway, specifically as it turns into 44 Street; and a lack of safe crosswalks/crossing areas north/south.

62 Avenue (17 respondents)

Comments regarding walk/cycle connections along 62 Avenue indicate a lack of sidewalks/bike paths and the desire for them to be installed.

52 Street (14 respondents)

Comments regarding walk/cycle connections along 52 Street indicate a lack of sidewalks/bike paths and the desire for them to be installed. There is also concern about the unsafe pedestrian/cyclist crossing at the rail tracks.

College Drive (59 Avenue/25 Street) (16 respondents)

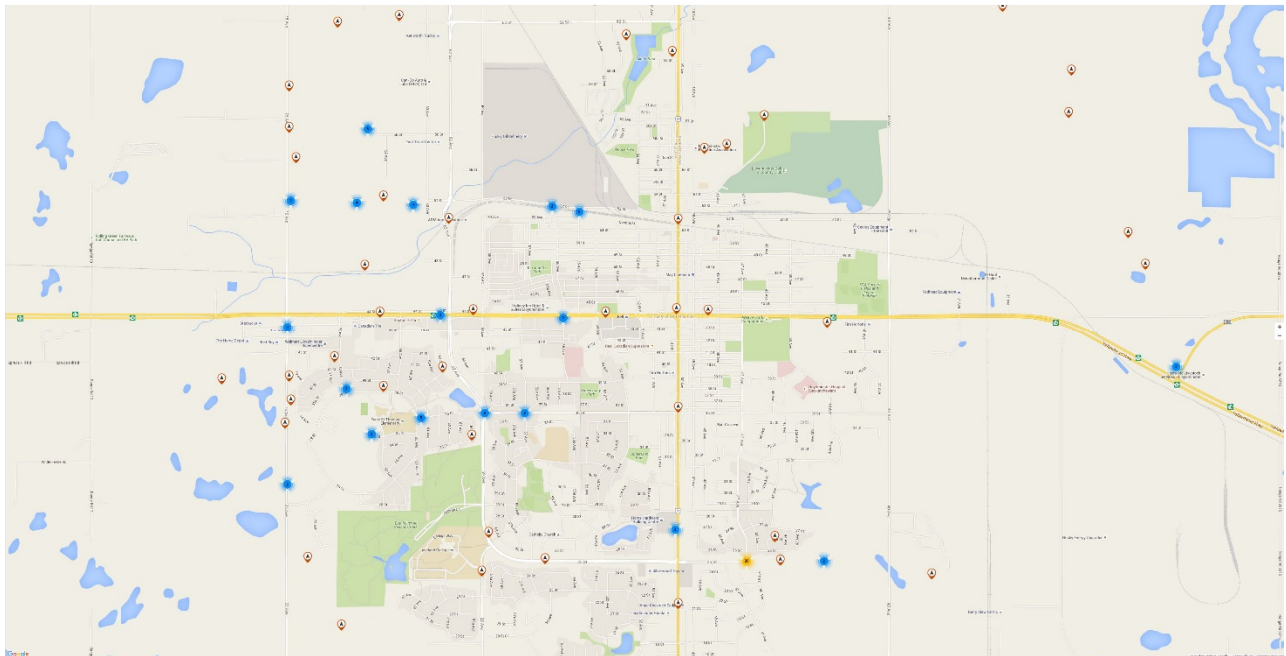
Comments regarding walk/cycle connections along 59 Avenue indicate the bike path/sidewalk ends abruptly. There is also a desire to have a bike/walk path along this corridor and for good crossing connections, specifically at Bud Miller Park.

75 Avenue (9 respondents)

Comments regarding walk/cycle connections along 75 Avenue indicate a desire for safe crossings.

50 other streets, avenues or locations were mentioned with each having between 1 and 7 responses.

Missing Road Connections – The map below shows all the pins that resident identified.



134 respondents left markers to indicate areas of concern regarding Missing Road Connections. The areas indicated most often as having Missing Road Connections issues are as follows:

(Note: not all respondents who indicated a location left a comment to support it)

College Drive (59 Avenue/25 Street) (24 respondents)

Comments regarding missing road connections along College Drive indicate a desire for a connection to 40 Avenue.

Highway 16 (44 Street/Ray Neilson Drive) (14 respondents)

Although 14 respondents left comments about this roadway, their comments did not indicate any missing connections, but rather spoke to congestion frustrations and the desire for alternate routes through the city.

52 Street (14 respondents)

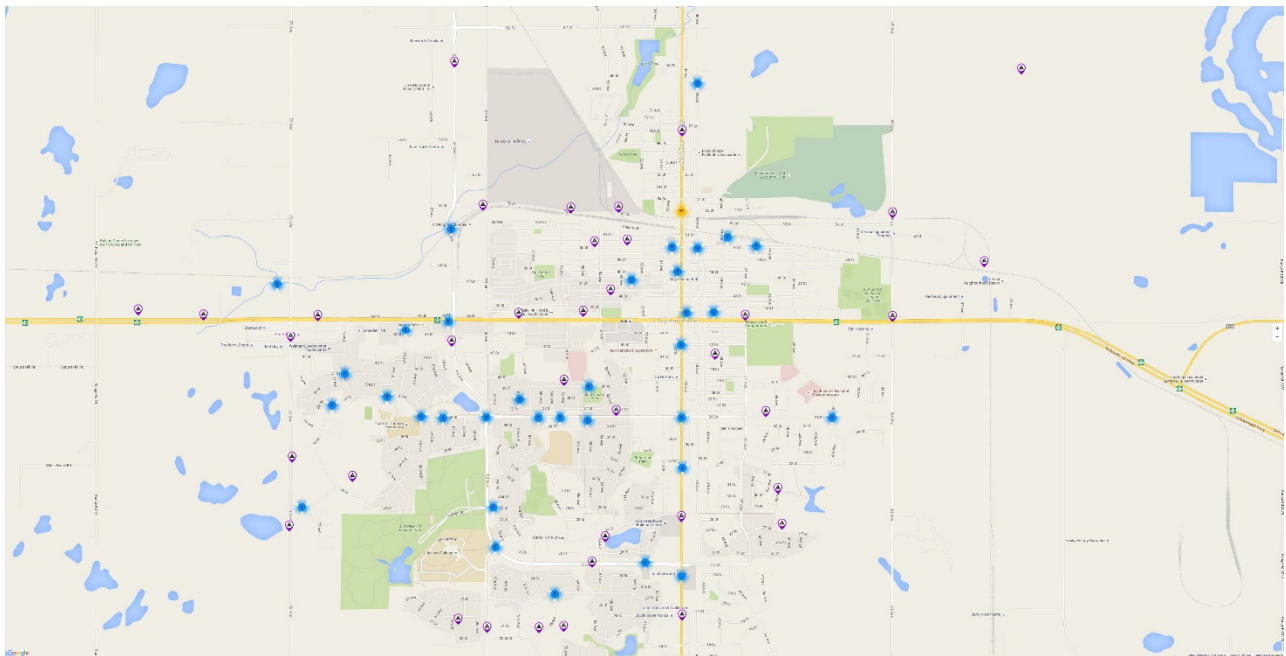
Comments regarding missing road connections along 52 Street indicate a desire for a connection through to 75 Avenue. Several comments indicate a desire for more crossings over the rail tracks that align with 52 Street.

75 Avenue (14 respondents)

While 14 respondents mentioned this corridor, no comment themes can be determined from the comments left.

30 other streets, avenues or locations were mentioned with each having between 1 and 7 responses.

Other – The map below shows all the pins that resident identified.



198 respondents left markers to indicate areas of concern regarding Other concerns. The areas indicted most often as having Other issues are as follows:

(Note: not all respondents who indicated a location left a comment to support it)

Highway 17 (50 Avenue) (34 respondents)

Many comments in the Other category for Highway 17 indicate a concern with the railway crossing and the congestion it causes. Suggestions left include the building of an over/underpass.

36 Street (17 respondents)

Other comments left for 36 Street suggest concern for speeding and a desire for turning lanes.

48 other streets, avenues or locations were mentioned with each having between 1 and 11 responses.



Appendix C
Your Voice Summary Report





To: **Traffic Branch Manager** Date: **November 19, 2015**
Attention: **Sheena Zimmerman, EIT** Project No.: **14392**
Cc: **Hassan Shaheen, ISL, Brendan Schlamp, Lloydminster**
Reference: **Your Voice TMP Comment Card Summary**
From: **Marcel J. Huculak, P. Eng**

Lloydminster hosted the "Your Voice" event on Tuesday November 3, 2015. The Transportation Master Plan was one of many projects presenting information at the Open House.

At TMP portion of Your Voice, ISL presented the following five graphic display boards (see also Appendix A):

1. Project Overview – a brief description of the project, describing key outcomes and project timelines.
2. Involving the Community – a brief description of the public consultation activities to date, and key responses we heard.
3. Sidewalk and Multi-Use Trail Priorities plan
4. Proposed Roadway Improvements plan
5. Proposed Truck Route plan

The City and ISL each had one staff member to attend to the displays and respond to questions. People were asked by staff to fill out a comment card (see Appendix B) as well as participate in a dot-mocracy exercise for the following two plans:

1. Sidewalk and Multi-Use Trail Priorities plan
2. Proposed Roadway Improvements plan

People used separate table mounted displays for the dot-mocracy exercise. We asked them to use a dot to mark on the map the project they thought was most important. Appendix C is a photo of the results. Key findings were:

1. Sidewalk and Multi-Use Trail Priorities plan
 - a. There are missing sidewalks along 53 Avenue from 46 to 51 Street on both sides, and from 45 to 46 Street on the west side.
 - b. The highest concentration of dots was along 25 Street (4 dots)
2. Proposed Roadway Improvements plan
 - a. There highest concentration of dots was along 50 Avenue, especially south of 25 Street.
 - b. Some people wanted the rail grade separation on 62 Avenue.

In terms of the comment cards, Appendix D shows all the comments received. In terms of a general summary of we found:

1. For question 3: "Please provide any comments on the proposed Truck Route":
 - a. There are sentiments to ban Highway 16 and 17 from trucks.
 - b. There are concerns with medians restricting truck maneuvering.
2. For question 3: "Please provide any additional comments you wish to share with the Project Team.":
 - a. We received 21 comments
 - b. Five comments were related to trails and sidewalks
 - c. Two comments for speed bumps on 47 Avenue.
 - d. Two comments for a bypass
 - e. Two comments to NOT provide a one-way couplet

Some people had lengthy discussions with staff:

1. With regard to 47 Avenue, some residents were concerned about speeds and shortcutting traffic. It may be a candidate for a traffic calming study.
2. Some residents spoke passionately against the one-way couplet:
 - a. They pointed out it is very expensive
 - b. They pointed out it's been on the books for a long time, but nothing has happened.
 - c. They said that there was a similar one-way couplet in Lloydminster before; if it was such a good idea, why is it not still in place?



After the Open House, we found that the downtown plan booth also had some push back against the one-way couplet. We advise that the City should closely coordinate the two projects to ensure their outcome is consistent.



Appendix A
Graphic Display Boards



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Project Overview

LLOYDMINSTER TRANSPORTATION MASTER PLAN

To better meet the needs of our growing community, the City's Transportation Master Plan is being updated. This long-term planning document includes everything from highways and roadways to sidewalks and multi-use paths.

The TMP sets the framework for how we will address our current and future transportation needs and transportation facilities, and will support the City's broader strategic objectives expressed in the Municipal Development Plan and the Integrated Community Sustainability Plan.

Key Outcomes

1. Identify a road network to support growth, including future growth areas and the proposed Highway 16 realignment.
2. Identify future road improvements.
3. Identify future sidewalk and trail network improvements.

Project Timeline

The TMP will be presented to City Council in early 2016. It will also be released to the public at this time.

Please review the transportation priorities we've identified through previous public engagement and share your voice on our priorities moving forward.

Fill out a comment card and leave it with us.

Please visit the project webpage for updates!

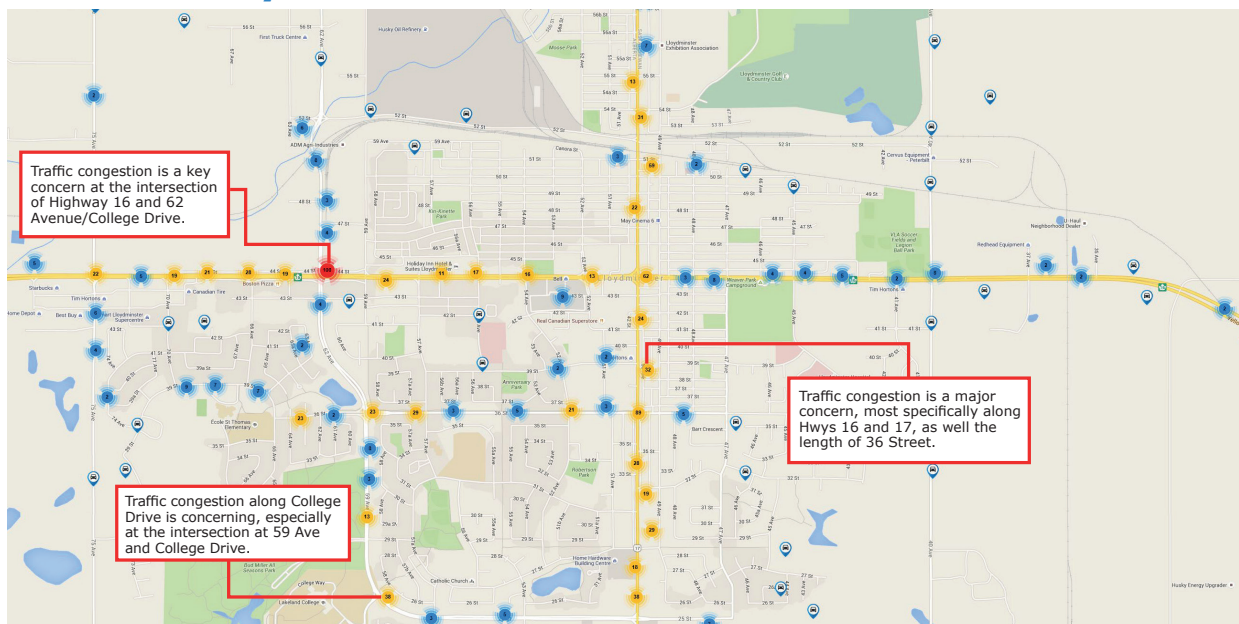
Lloydminster.ca/tmp2015

Involving The Community

Who we connected with - We connected with, listened to and learned from our residents, industry and community stakeholders, neighbouring municipalities and provincial governments.

How we connected – A public survey, stakeholder workshops and one-on-one meetings between May to July 2015.

Public Survey:



The Response

We received nearly 600 responses to our online survey with almost 3000 points of concern noted on the maps provided. Wow!

There is overwhelming agreement that improvements are required to the transportation network to meet the needs of our growing community. Congestion was, by far, the number one issue identified by respondents.

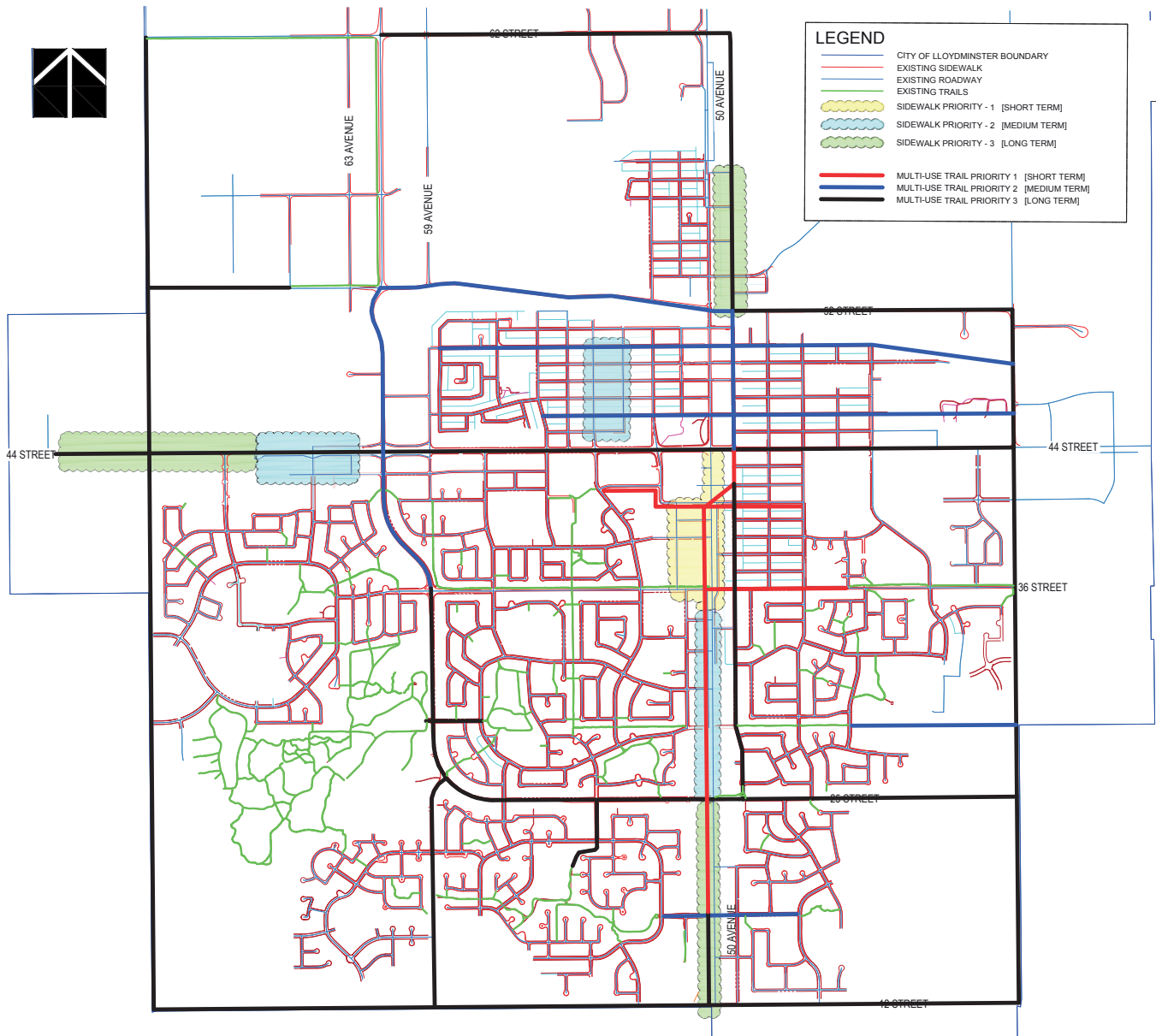
What Else We Heard

- There is support for a highway bypass to help resolve congestion.
- There is support for including more turning lanes throughout the city.
- There is concern about the amount of truck traffic within the city, specifically on Highway 16, and support for a designated and enforced truck route.
- There is concern about traffic congestion resulting from delays at the railway crossings, specifically noting the length of delay, and the impact on both traffic flow and emergency vehicle access.
- There is a desire for more connections, crosswalks, sidewalks, trails and paths for the safety of both pedestrians and cyclists throughout the city. Highway 17 was noted as a key location in need, as well as Highway 16 and 62 Avenue north of Highway 16.



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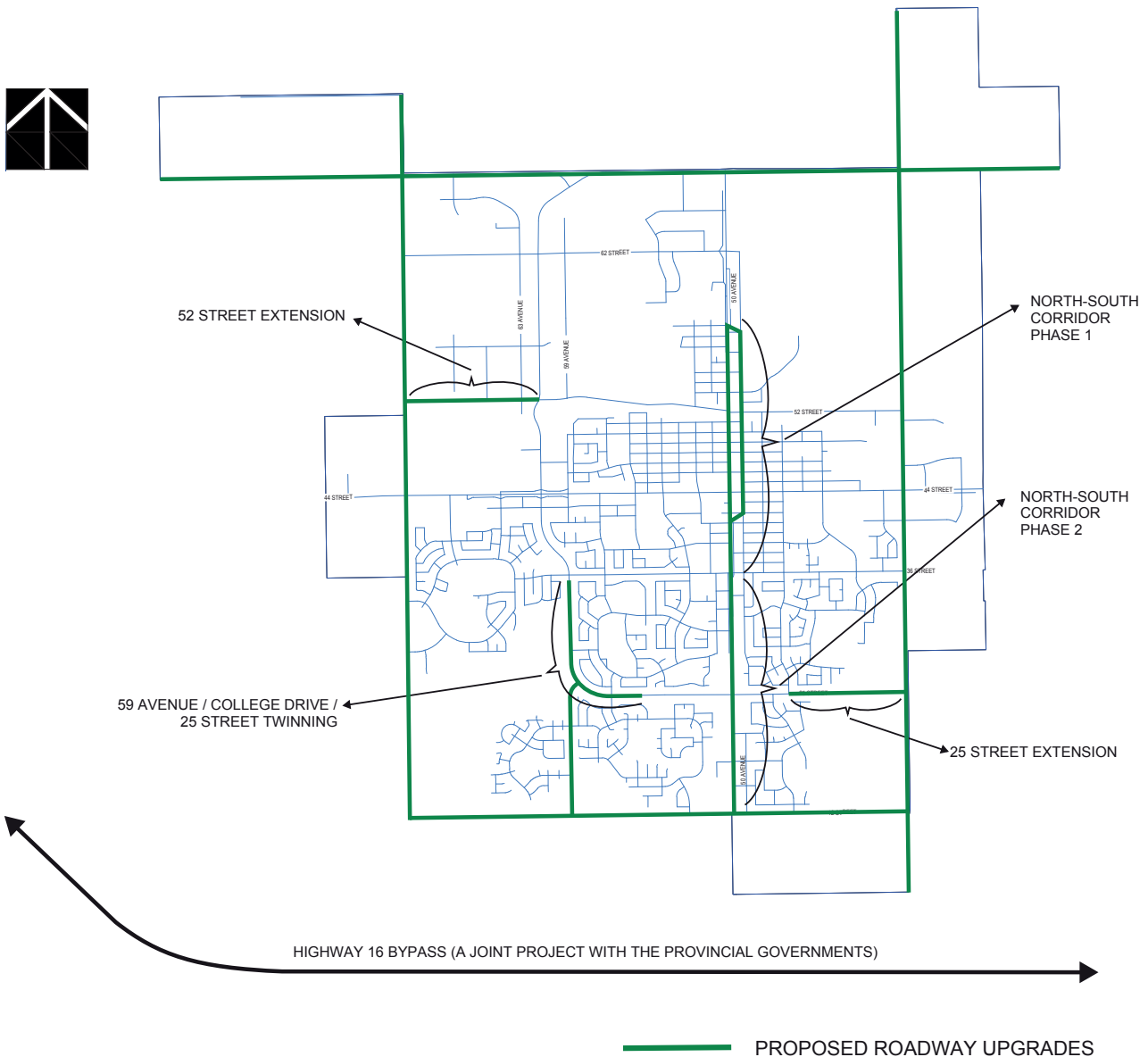
Sidewalk and Multi-Use Trail Priorities





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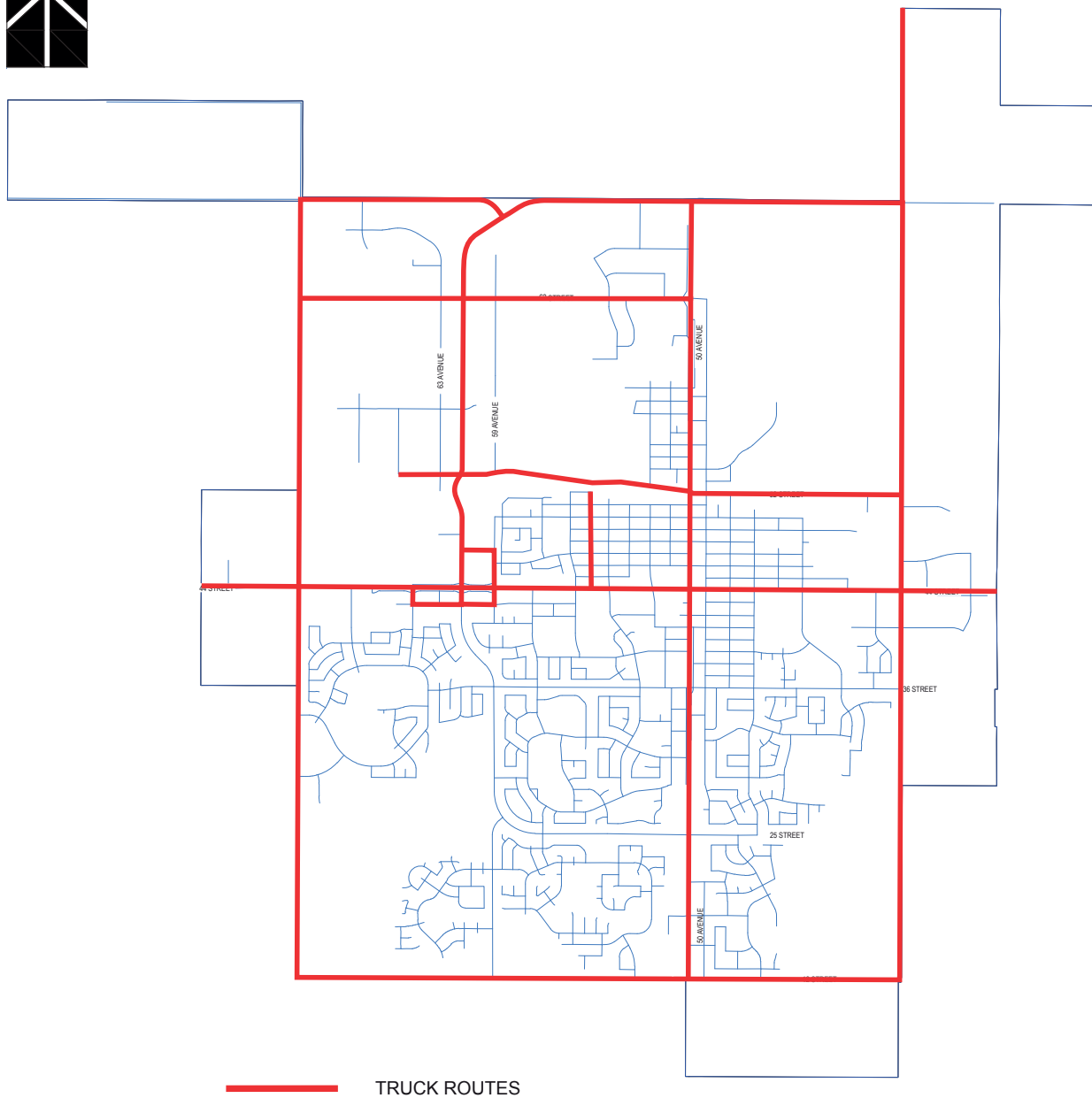
Proposed Roadway Improvements





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Proposed Truck Routes





**Appendix B
Comment Card**



Comment Card

Your input is encouraged to assist with the Transportation Master Plan development.

1. Proposed Roadway Improvements

Please review the display boards and, by applying 'sticky dots', let us know which Proposed Roadway Improvements are most important to you.

2. Proposed Sidewalk and Multi-use Trail Improvements

Please review the display boards and, by applying 'sticky dots', let us know what Proposed Sidewalk and Multi-use Trail Improvements are most important to you.

3. Please provide any comments on the proposed Truck Route.

4. Please provide any additional comments you wish to share with the Project Team.

Thank you for your input.



Appendix C
Photo of Dot-mocracy Exercise Results

Quick wins!



HIGHWAY 16 BYPASS (A JOINT PROJECT WITH THE PROVINCIAL GOVERNMENTS)





Appendix D
Comments Received

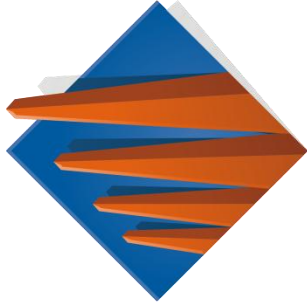
Questions 3: Please provide any comments on the proposed Truck Route.	
1	44 Street should not be a Truck Route. Lets get the big trucks out of town.
2	Make truck routes with better cornering around the city (not through the city on 44 st). Hazardous goods should not be allowed through down town.
3	Concen about 55 Ave. Wide 12th street - soon - Put in cement barrier on 66 Ave @ Hwy 16 Just like @ 62 Ave.
4	Concerns with 55 Ave on route. Staraitgen intersection of 67 St. and 62 Ave. (may be of set of lights) Lights for 12 St - 40 Ave and 12 St - 75 Ave. 44 St should not be a truck route because of public safety.
5	Finish 25 Street east to 40th Ave. Will reduce Hwy 17 traffic, Will reduce goinf by 2 schools ets., Father Gorman & Jack Kemp.
6	A bypass is very essential it will cut a lot of traffic out on hwy 16 & 17.
7	This City need to install righthand turn lanes. For some reason these have been totally missed when constructing the east & west ends of Hwy 16.
8	A truck route would be excellent to help reduce traffic through the city.
9	I like the idea of options for a truck route, but I'd like to add a weight restriction for going on hwy 16 or 17 through lloyd to lower truck traffic in the heart of the city.
10	I don't think it will deter truck traffic from using Hwy 16
11	Provide ample defined turning lanes as necessary esp. 40 / 44 St. Move Shared center turning lanes on 50 Ave (as on 62 St - Hill 7)
12	Centre lines to define lanes thru curb bumpouts 39th St.

Question 4: Please provide any additional comments you wish to share with the Project Team.			Category
4	When is the bike lane going to be installed along 50 Ave (south)? Wouldn't it be cost effective to build it at the same time as the roadwork is done?		Bike
8	Push for bypass		Bypass
15	We need a proper city by - pass route for E/W & N/S traffic. The oil & Chemical traffic should not be going through the city. There is going to be a bad wreck some day.		Bypass
13	Highway 16 coming from east after the railway overpass the cement area is very dangerous - you can't see it at the lane changes. Cut out the cement. Skip the One way - it has been tried 2 times before & only cost of again involved. Do not ask the tax payers to get involved in this idea. It will never work. Cause more accidents & confusion.		Cement Pavement / Hwy 16 Couplet
5	Hwy 17 south of 44 needs to be addressed (twinning) soon. The traffic is very busy all day long. He City manager should be fired for signing the mulligan ??????. If he doesn't remember what he signed then he should be gone.		HWY 17
7	Please give full attention 2 # 17 south e/w fill there lane & turning lanes. All Exit & Entrance 20 Now Development on South Bound Sk + AB. One Way is dreaming in Jack???? Colour.		Hwy 17 turn lanes
9	I have concern with the amount & speed of traffic that diverts down 47th ave to get to hwy 16 east, ??? Rader, hospital etc from the south west corner of the city, it is far easier to come down college drive - cross Hwy 17 at the lights & head down 47th Ave with no speed reduction to the 4 way stop on 36 street. Along the way there are at least 3 cross walks & 2 bike paths. 3 elementary schools in the area. It would be great to see some speed bumps by those cross areas + better marking of those areas as well.		Install speed humps
10	Speed tables should be installed on Highway 47 th Ave @ the walking / bike trails. The Ave. is being used as as escape route from the poor traffic flow on hwy 17. People use 47 Ave & frustration with the 50th Ave nightmare. 47 Ave and 29 St has had multiple MVA's over the years with vehicles landing on front lawns. A few years ago the roadway was resurfaced. A 3 - 4" ledge was across the road for a long time. Traffic slowed and diverted off this Ave. It was great.		Install speed humps
18	When installing No Parking signs in City especially Hwy # 16 instead of purchasing the smallest size in the sign book go up o a 30 cm X 60 cm size & then he truckers might think that may be the city is serious that they don't want vehicles parked along that area. I actually witnesses a trucker dolly off his super B trailers in front of Husky truck stop to go in and fuel up.		No Parking Signs
11	Require noise pollution by law. Vehicles & motor cycles. Provide noise moniator devise. Reinstate speed bumps on 36 st. 62 - 65 Ave.		Noise pollution / speed bumps
12	Ease - up on all the cement on Hwy 16 boulevards!! Too long, can't make left turn. 37 Ave and 80 Ave are azards on Hwy 16l - Skip 1 - way idea completely. Doesn't work I was tried before. - expensive		Removal of Cement pavements / Skip Couplet
6	Please repaint the traffic lanes @ 36 St and 57 Ave in the same way that the lanes are designed @ 36 St a& 52 Ave. Traffic flow would increase @ the former intersection if there were dedicated left turn lanes.		Repaint Marking
16	Right hand lane 44 St. and College Drive. At the development stage, if a road is proposed it should be implemented i.e. 56 St.		Right turn lane at 44 St./College Drive
Green sticky note	Could we display school zone times in every zones		School Zone Time
2	52 St west + 62 Ave south are badly in need of sidewalk or a bike path.		Sidewalk
3	It is essential that a sidewalk be constructed along Hwy 17 (50 Ave) south from Hwy 16 to 12th St. We should encourage "active transportation" i.e. walking & cycling. It is now very unsafe for pedestrians as they walk to the many businesses along Hwy 7. Is there any other city or town in AB or SK that lacks a sidewalk along its main through fare.		Sidewalk
20	Consider pedway at College drive / 59 Ave to lakelan college. Really like the pathway Plan. Like 25 St. extensions. Remember Sound barriers / set backs for residents.		Sidewalk
17	The Lloydminster East area needs sidewalk & road repair badly.		Sidewalk / Road repair
14	Traffic lights between 49th & 50th on 44th street need to be adjusted too much traffic going east!		Traffic Lights
19	I would be interested to know if the Colonial Park proposed development presented in approximately March 2010 is still in the plans (regarding trail systems and given space from Winston Churchill School to north of 36 St.		Trail System
1	Trucks have been going down 50 St. for a long time. The No Truck signs have been removed (totally unacceptable). Are we asking too much for honesty and accountability from City Hall.		Truck route



Appendix D
Household Travel Survey Diary





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2015 Household Travel Survey

TRIP DIARY

Household ID: _____

Name/Initials: _____

Thank you for completing the 2015 Household Trip Survey. Your participation in this survey will help the City of Lloydminster plan for transportation services in the future.

We recommend that you read through the form and this guide together as a household two days before your assigned travel day, and discuss any questions that you may have.

A list of Frequently Asked Questions (FAQ) is provided on pages 13 and 14.

If you have any questions you can contact Banister Research in the following ways:

- Call our offices at 1-866-451-4441 between 9 a.m. and 9 p.m.
- E-mail us at research@banister.ab.ca
- Visit the data collection website at:

www.banister.ab.ca/lloyd2015hts

Step 1: Using the Reminder Sheet, place your assigned survey day reminder (green sheet) on the Fridge or somewhere you will notice it.

Step 2: Two days before your assigned survey day, look through the trip diary and ensure that you understand everything required to complete the forms. Mark down any questions you or your household may have.

Step 3: Please wait for the reminder call the day before your assigned survey day if you have any questions or issues. Keeping a correct and accurate record your trips in the diary will help speed up data collection when we call you a few days after completion.

Remember, you only need to record VEHICLE TRAVEL, between the hours of 4:00 pm and 8:00 pm, WITHIN or TO and FROM the City of Lloydminster.

Step 4: During the assigned survey day each person in the household should carry their trip diary with them and fill out the form as the trips take place. This takes less time in the long run and ensures that everything is correct.

Step 5: Once the assigned day is completed, place all complete trip diary sheets in a convenient place (e.g. by the phone). An interviewer will be calling the day after your assigned survey day or on a previously scheduled day, to collect the information over the phone. Alternatively, you are free to enter your data online at:

www.banister.ab.ca/lloyd2015hts

Step 6: We ask that you keep your forms for 1 week after we have collected your data, in case we call back with a question. After that week, you may dispose of your forms – there is no need to mail them back to us.

A		B	C		D
TRIP	A1) START TIME	B) START LOCATION	C) "OTHER" START LOCATION		D) TRAVEL MODE
1	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver
	A2) END TIME	<input type="radio"/> Work/School → GO TO D	STREET ADDRESS:		<input type="radio"/> Passenger
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Other → GO TO C	TOWN/CITY:		<input type="radio"/> School Bus
					OTHER (SPECIFY):
2	A1) START TIME	B) START LOCATION	C) "OTHER" START LOCATION		D) TRAVEL MODE
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver
	A2) END TIME	<input type="radio"/> Work/School → GO TO D	STREET ADDRESS:		<input type="radio"/> Passenger
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Other → GO TO C	TOWN/CITY:		<input type="radio"/> School Bus
					OTHER (SPECIFY):
3	A1) START TIME	B) START LOCATION	C) "OTHER" START LOCATION		D) TRAVEL MODE
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver
	A2) END TIME	<input type="radio"/> Work/School → GO TO D	STREET ADDRESS:		<input type="radio"/> Passenger
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Other → GO TO C	TOWN/CITY:		<input type="radio"/> School Bus
					OTHER (SPECIFY):
NOTES:					

E				F	G
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?			F) END LOCATION	G) "OTHER" END LOCATION
1	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION
	Co-Workers/Associates:				
	Relatives Not in Household:				
	Friends:			STREET ADDRESS:	
	OTHER (SPECIFY):				
TOTAL (excluding yourself):			<input type="radio"/> Work/School → NEXT TRIP		
			<input type="radio"/> Other → GO TO G	TOWN/CITY:	
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?			F) END LOCATION	G) "OTHER" END LOCATION
2	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION
	Co-Workers/Associates:				
	Relatives Not in Household:				
	Friends:			STREET ADDRESS:	
	OTHER (SPECIFY):				
TOTAL (excluding yourself):			<input type="radio"/> Work/School → NEXT TRIP		
			<input type="radio"/> Other → GO TO G	TOWN/CITY:	
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?			F) END LOCATION	G) "OTHER" END LOCATION
3	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION
	Co-Workers/Associates:				
	Relatives Not in Household:				
	Friends:			STREET ADDRESS:	
	OTHER (SPECIFY):				
TOTAL (excluding yourself):			<input type="radio"/> Work/School → NEXT TRIP		
			<input type="radio"/> Other → GO TO G	TOWN/CITY:	
NOTES:					

A		B	C	D
TRIP	A1) START TIME	B) START LOCATION	C) "OTHER" START LOCATION	D) TRAVEL MODE
4		<input type="radio"/> Home → GO TO D	NAME OF LOCATION	<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus
	<input type="radio"/> AM <input type="radio"/> PM			
	A2) END TIME		STREET ADDRESS:	
		<input type="radio"/> Work/School → GO TO D		
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Other → GO TO C	TOWN/CITY:	
TRIP	A1) START TIME	B) START LOCATION	C) "OTHER" START LOCATION	D) TRAVEL MODE
5		<input type="radio"/> Home → GO TO D	NAME OF LOCATION	<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus
	<input type="radio"/> AM <input type="radio"/> PM			
	A2) END TIME		STREET ADDRESS:	
		<input type="radio"/> Work/School → GO TO D		
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Other → GO TO C	TOWN/CITY:	
TRIP	A1) START TIME	B) START LOCATION	C) "OTHER" START LOCATION	D) TRAVEL MODE
6		<input type="radio"/> Home → GO TO D	NAME OF LOCATION	<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus
	<input type="radio"/> AM <input type="radio"/> PM			
	A2) END TIME		STREET ADDRESS:	
		<input type="radio"/> Work/School → GO TO D		
	<input type="radio"/> AM <input type="radio"/> PM	<input type="radio"/> Other → GO TO C	TOWN/CITY:	
NOTES:				

E				F		G	
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?			F) END LOCATION		G) "OTHER" END LOCATION	
4	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION		
	Co-Workers/Associates:						
	Relatives Not in Household:						
	Friends:			<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:		
	OTHER (SPECIFY):						
	TOTAL (excluding yourself):						
5	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION		
	Co-Workers/Associates:						
	Relatives Not in Household:						
	Friends:			<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:		
	OTHER (SPECIFY):						
	TOTAL (excluding yourself):						
6	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION		
	Co-Workers/Associates:						
	Relatives Not in Household:						
	Friends:			<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:		
	OTHER (SPECIFY):						
	TOTAL (excluding yourself):						
NOTES:							

A		B		C		D		
TRIP	A1) START TIME		B) START LOCATION		C) "OTHER" START LOCATION		D) TRAVEL MODE	
7	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):		
	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Work/School → GO TO D	STREET ADDRESS:		OTHER (SPECIFY):		
8	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):		
	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Work/School → GO TO D	STREET ADDRESS:		OTHER (SPECIFY):		
9	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):		
	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Work/School → GO TO D	STREET ADDRESS:		OTHER (SPECIFY):		
NOTES:								

E				F		G	
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?			F) END LOCATION		G) "OTHER" END LOCATION	
7	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION		
	Co-Workers/Associates:						
	Relatives Not in Household:						
	Friends:			<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:		
	OTHER (SPECIFY):						
	TOTAL (excluding yourself):						
8	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION		
	Co-Workers/Associates:						
	Relatives Not in Household:						
	Friends:			<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:		
	OTHER (SPECIFY):						
	TOTAL (excluding yourself):						
9	Household Members:			<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION		
	Co-Workers/Associates:						
	Relatives Not in Household:						
	Friends:			<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:		
	OTHER (SPECIFY):						
	TOTAL (excluding yourself):						
NOTES:							

A		B		C		D			
TRIP	A1) START TIME		B) START LOCATION		C) "OTHER" START LOCATION		D) TRAVEL MODE		
10	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):			
								STREET ADDRESS:	
								TOWN/CITY:	
	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Work/School → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):			
								STREET ADDRESS:	
								TOWN/CITY:	
11	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):			
								STREET ADDRESS:	
								TOWN/CITY:	
	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Work/School → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):			
								STREET ADDRESS:	
								TOWN/CITY:	
12	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Home → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):			
								STREET ADDRESS:	
								TOWN/CITY:	
	<input type="radio"/> AM <input type="radio"/> PM	A2) END TIME	<input type="radio"/> Work/School → GO TO D	NAME OF LOCATION		<input type="radio"/> Driver <input type="radio"/> Passenger <input type="radio"/> School Bus OTHER (SPECIFY):			
								STREET ADDRESS:	
								TOWN/CITY:	
NOTES:									

	E				F	G
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?				F) END LOCATION	G) "OTHER" END LOCATION
10	Household Members:				<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION
	Co-Workers/Associates:					
	Relatives Not in Household:				<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:
	Friends:					
	OTHER (SPECIFY):				<input type="radio"/> Other → GO TO G	TOWN/CITY:
	TOTAL (excluding yourself):					
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?				F) END LOCATION	G) "OTHER" END LOCATION
11	Household Members:				<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION
	Co-Workers/Associates:					
	Relatives Not in Household:				<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:
	Friends:					
	OTHER (SPECIFY):				<input type="radio"/> Other → GO TO G	TOWN/CITY:
	TOTAL (excluding yourself):					
TRIP	E) HOW MANY OTHER PEOPLE WERE TRAVELING WITH YOU?				F) END LOCATION	G) "OTHER" END LOCATION
12	Household Members:				<input type="radio"/> Home → NEXT TRIP	NAME OF LOCATION
	Co-Workers/Associates:					
	Relatives Not in Household:				<input type="radio"/> Work/School → NEXT TRIP	STREET ADDRESS:
	Friends:					
	OTHER (SPECIFY):				<input type="radio"/> Other → GO TO G	TOWN/CITY:
	TOTAL (excluding yourself):					
NOTES:						

Notes

Notes

This image shows a blank sheet of white paper with vertical ruling lines. The lines are evenly spaced and run from the top to the bottom of the page. There are no margins or other markings on the paper.

FREQUENTLY ASKED QUESTIONS

What is the purpose of the survey?

Planning the Lloydminster region's transportation system requires a thorough understanding of the transportation needs of those who both live in Lloydminster as well as others who drive in Lloydminster but don't necessarily live here. In particular, we are interested in where, when and why people travel, the travel choices they make and why they make these choices. In order to do this, the City of Lloydminster is conducting this survey of randomly selected households to gather information about their travel patterns and related activities. Updated data and information regarding the travel patterns is a very important basis for planning our transportation system.

Why is it important to participate?

Since your household may be one of only a few households in your community that participates in this survey, it is very important that you provide complete information for each household member.

How are households selected to participate?

Households are randomly selected from within the City of Lloyminster.

What is the “Assigned Survey Day”?

Survey participants will be assigned a specific date on which they are to complete the trip diaries. The “Assigned Day” is the date each household has been given to record the peak hour (4:00 pm to 8:00 pm) trips of household members. It does not matter if there are only a few trips on this “assigned day”. We are trying to get a general picture from residents in the Lloydminster region and their transportation patterns. This includes residents who make many trips, as well as residents who travel less frequently.

Why do you need to know when and where our children go to school?

A significant portion of vehicle travel is generated by children going to and from school. We need to understand the transportation needs of school children as well as the adults who may be involved in taking them to and from school.

Why use a Diary?

Studies have shown that more complete and better quality information is collected when a diary is used. When people are asked to recall what they did the day before, they will often forget some events. Keeping the diary with you will allow you to record each trip as it occurs and help to reduce the chance of forgetting any trips on the Assigned Survey Day.

What do you mean by a “trip”?

A “trip” is one that moves you from one address location to another. For example, if you leave one building and drive three blocks away to a different building, you should record this as one trip.

Who fills out the Trip Diaries?

Each member of your household should fill out the **Trip Diary** forms for the 4-hour period (4:00 pm to 8:00 pm) of the Assigned Survey Day. By carrying the diary with them they will be sure not to miss any of their trips. Travel should be recorded even if it is done with another member of the household. Please complete a Trip Diary for the household members who are unable to fill out the diary themselves (e.g. babies and toddlers).

How long will this take?

The time it takes to complete the survey depends on your household size and how much traveling you do. If household members keep the Trip Diary with them on the Assigned Day, it takes about one minute per trip to complete.

**Thank you for completing the 2015
Lloydminster Household Travel
Survey Trip Diary.**

Contact Banister Research:

Phone: 780-451-4444 OR 1-866-451-4441

Fax: 780-451-2777

E-mail: research@banister.ab.ca
www.banister.ab.ca





Appendix E

Breakdown of Survey Sampling

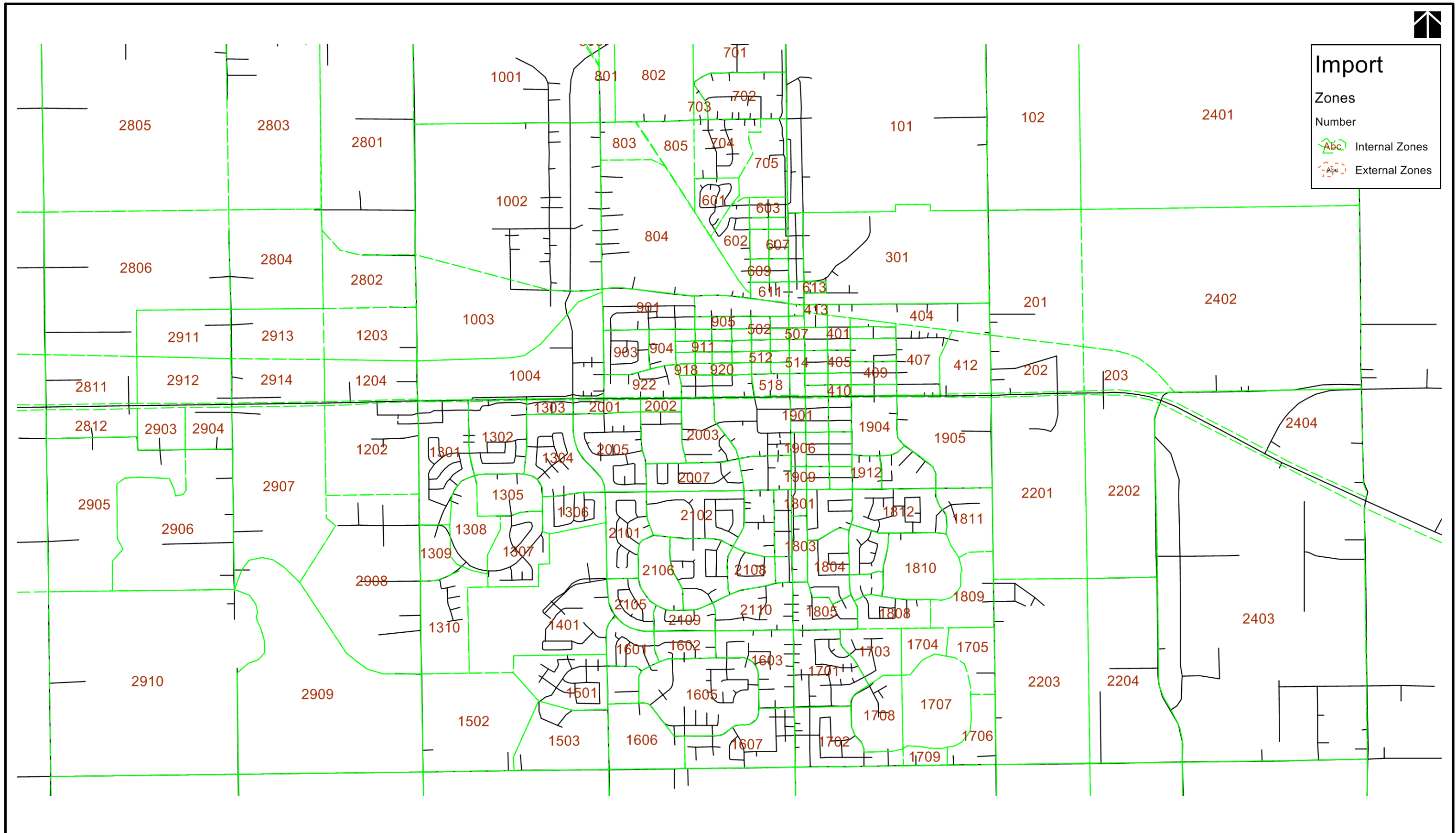




Appendix F

Traffic Analysis Zone System









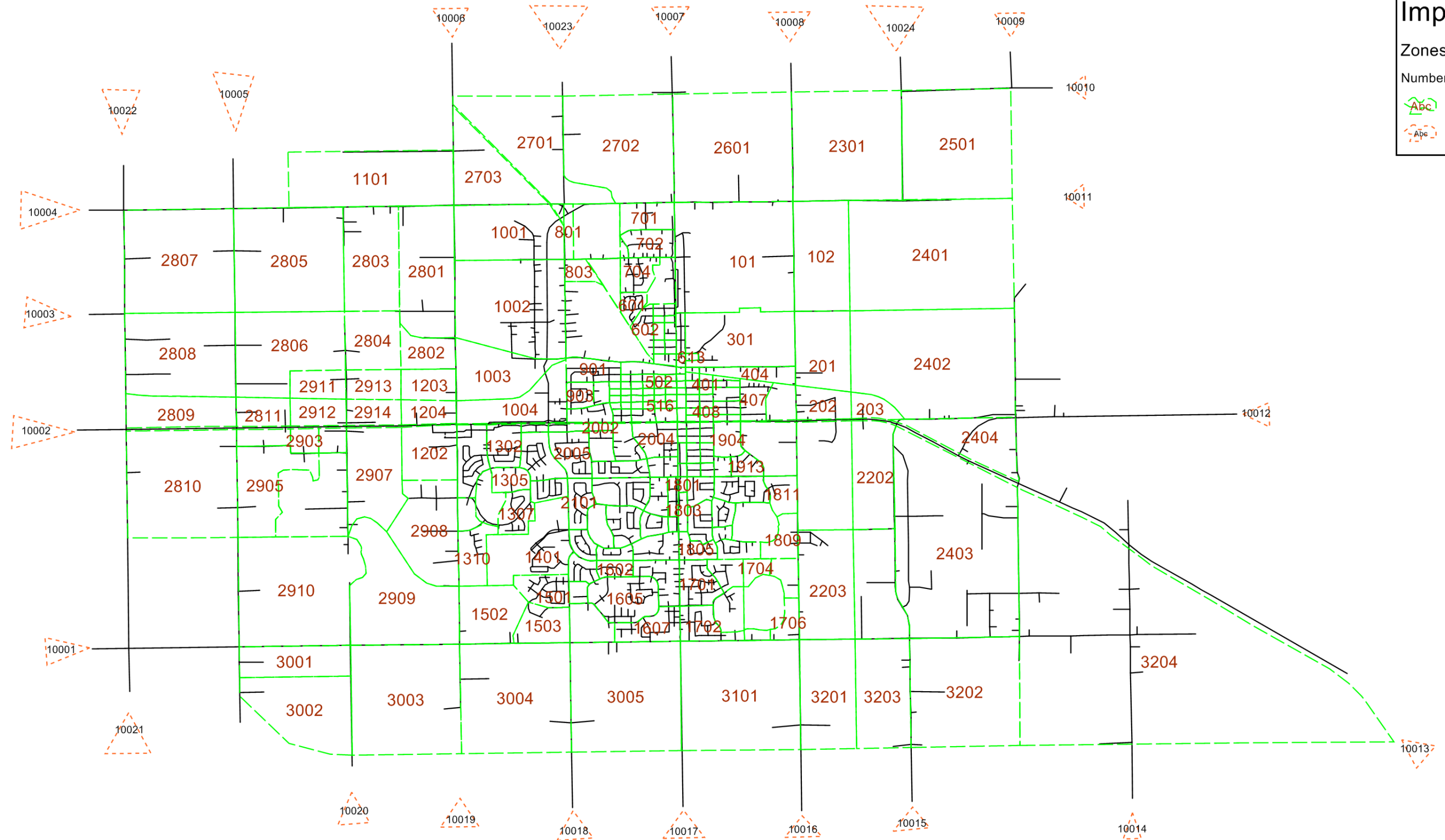
Import

Zones

Number

 Internal Zones

 External Zones



City of Lloydminster

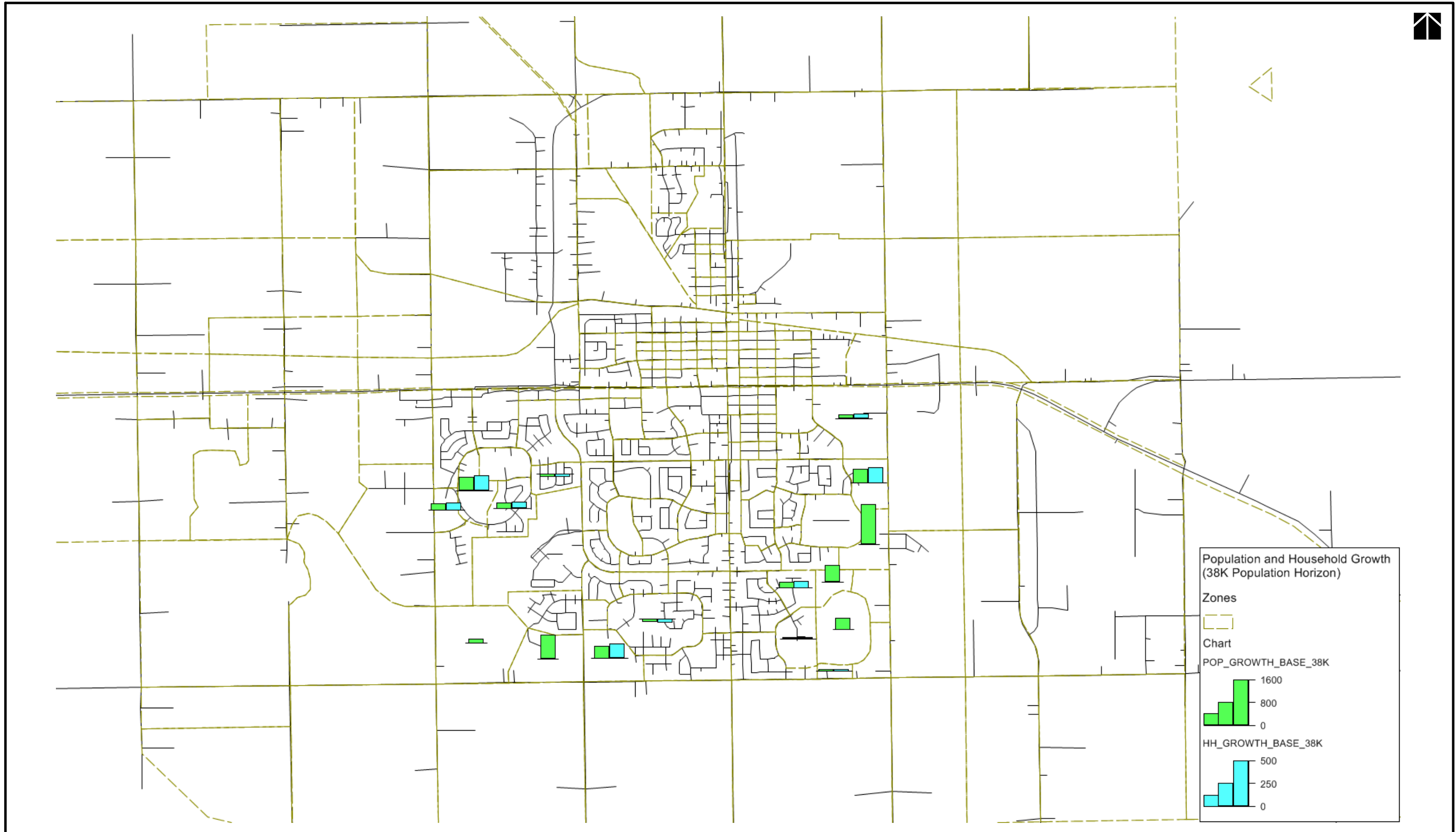
TRAFFIC ANALYSIS ZONES - REGION WIDE



Appendix G

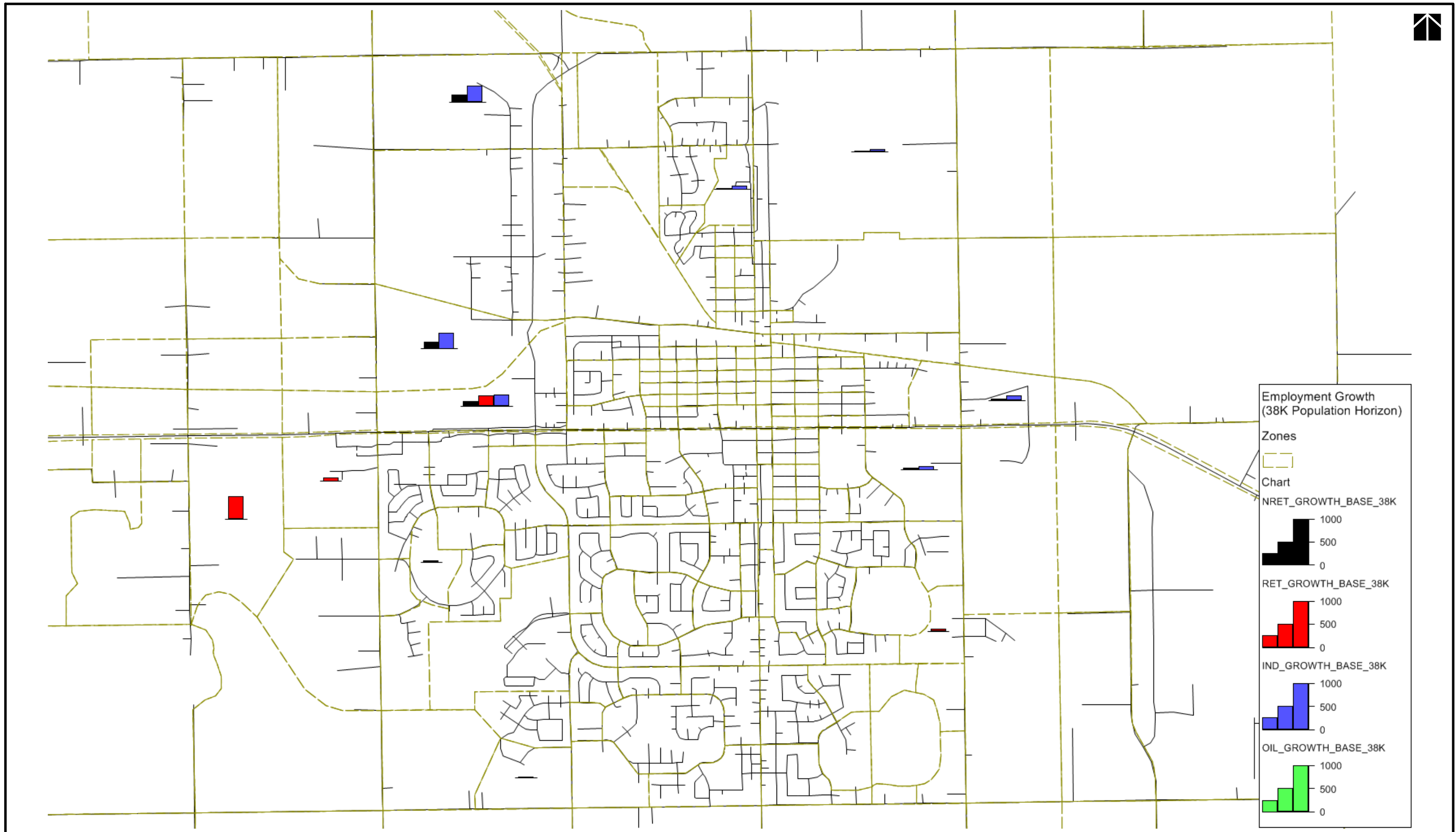
Land Use Changes Between Horizons





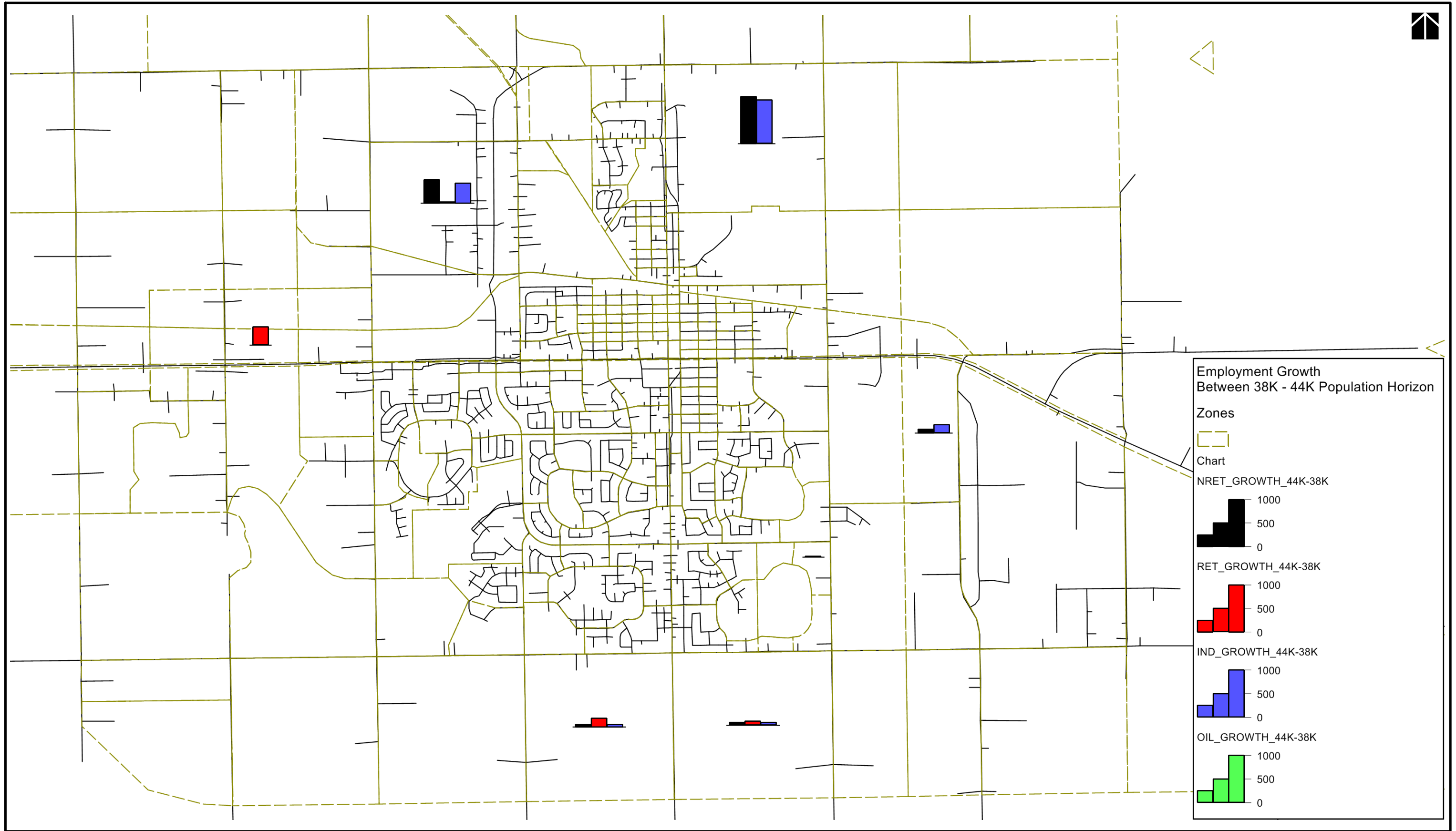
City of Lloydminster

EXHIBIT_01



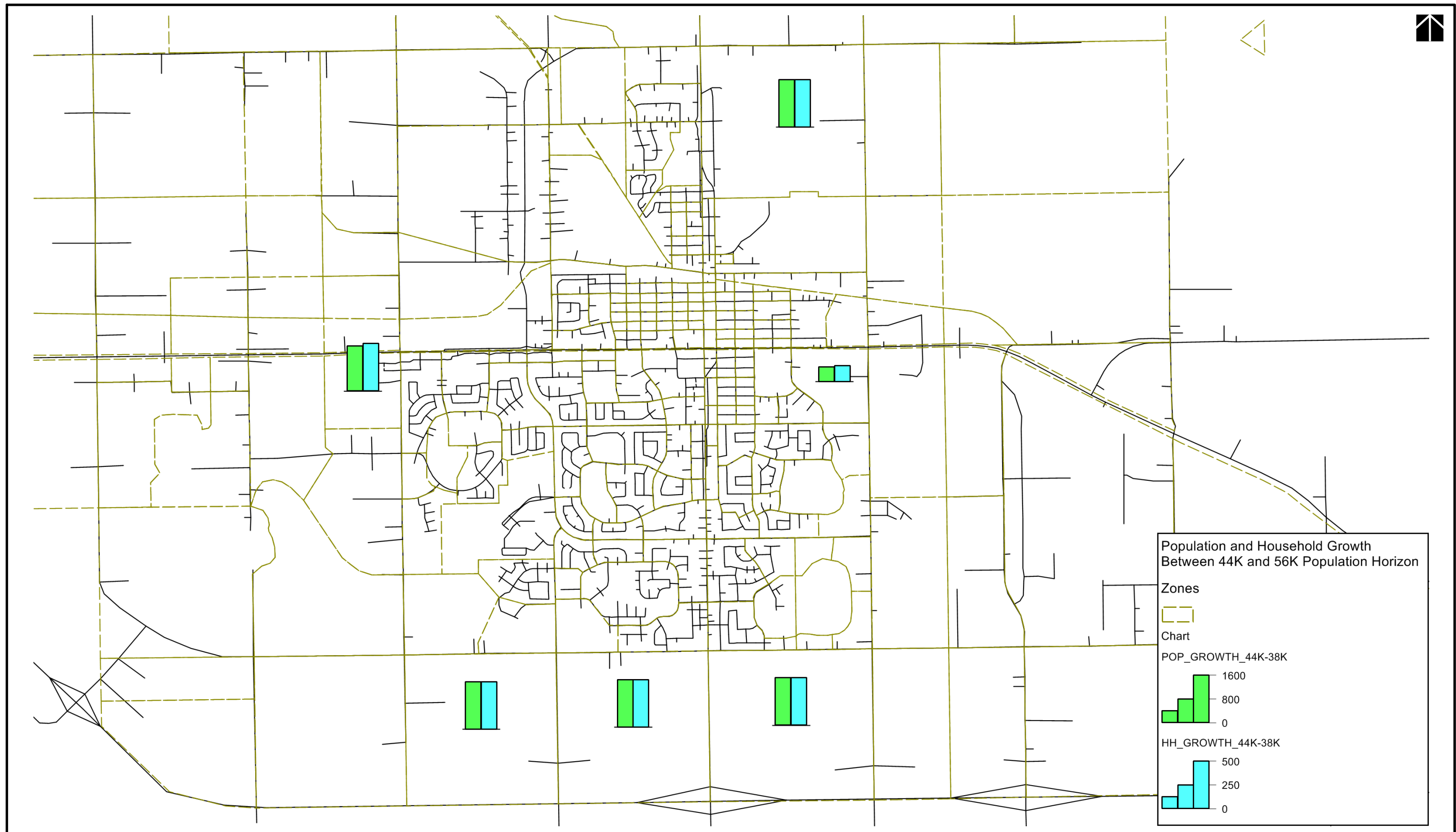
City of Lloydminster

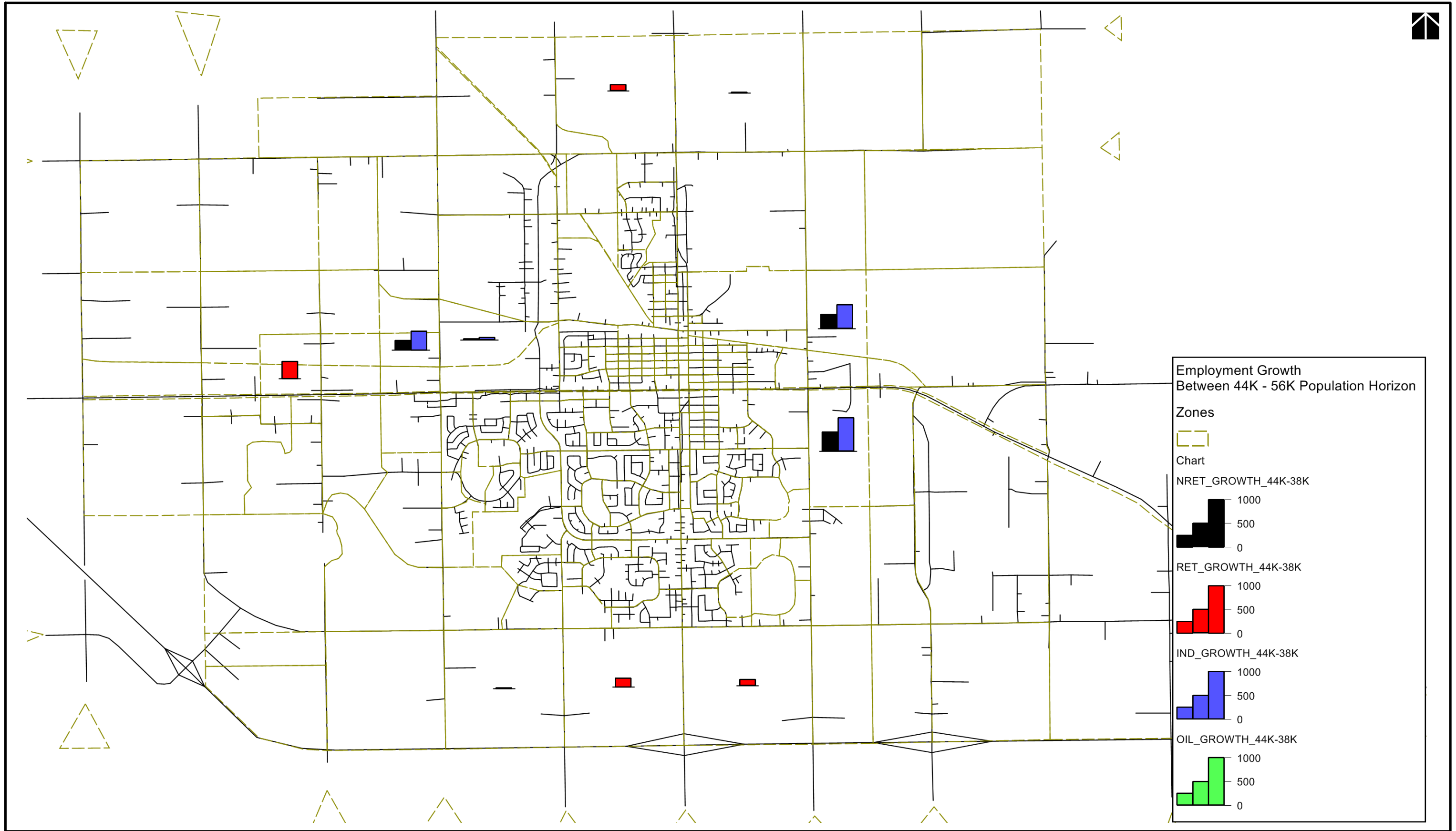
EXHIBIT_02



City of Lloydminster

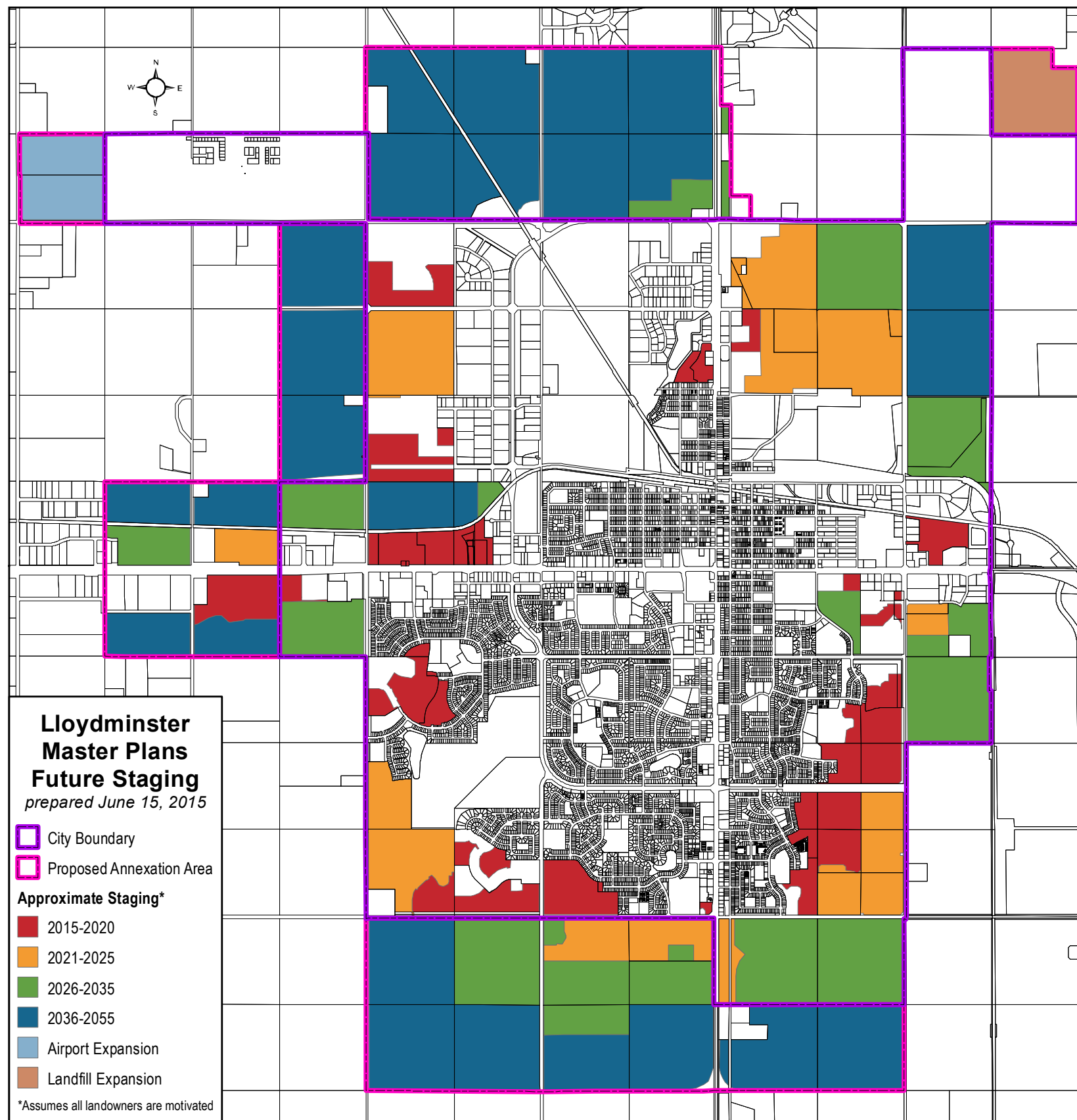
From 38,000 Population Horizon to 44,000 population (Employment Growth)





City of Lloydminster

From 44,000 Population Horizon to 56,000 population (Employment Growth)



City of Lloydminster

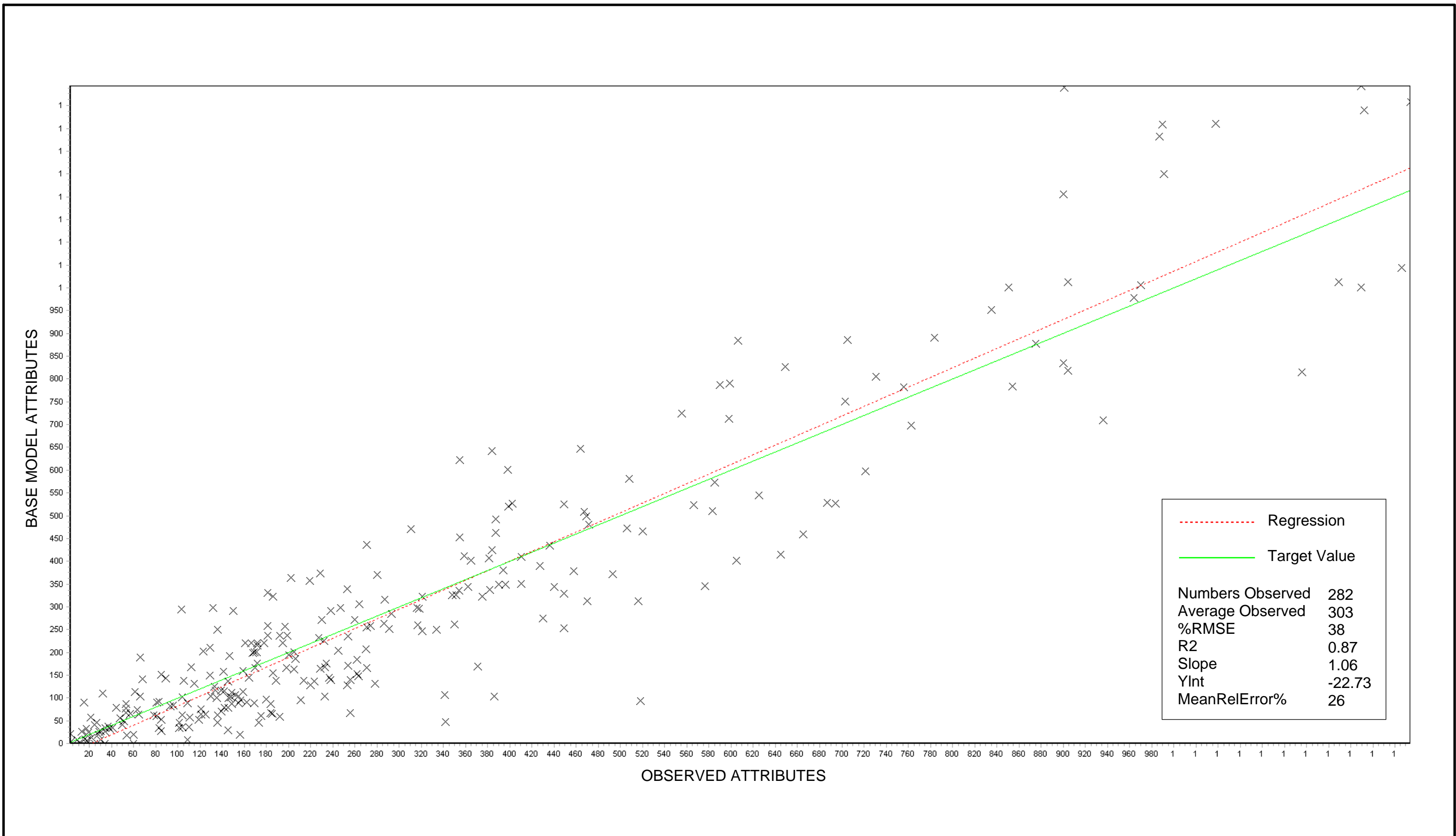
Master Plans Future Staging (Prepared June 15, 2015)



Appendix H

Regression Analysis Results

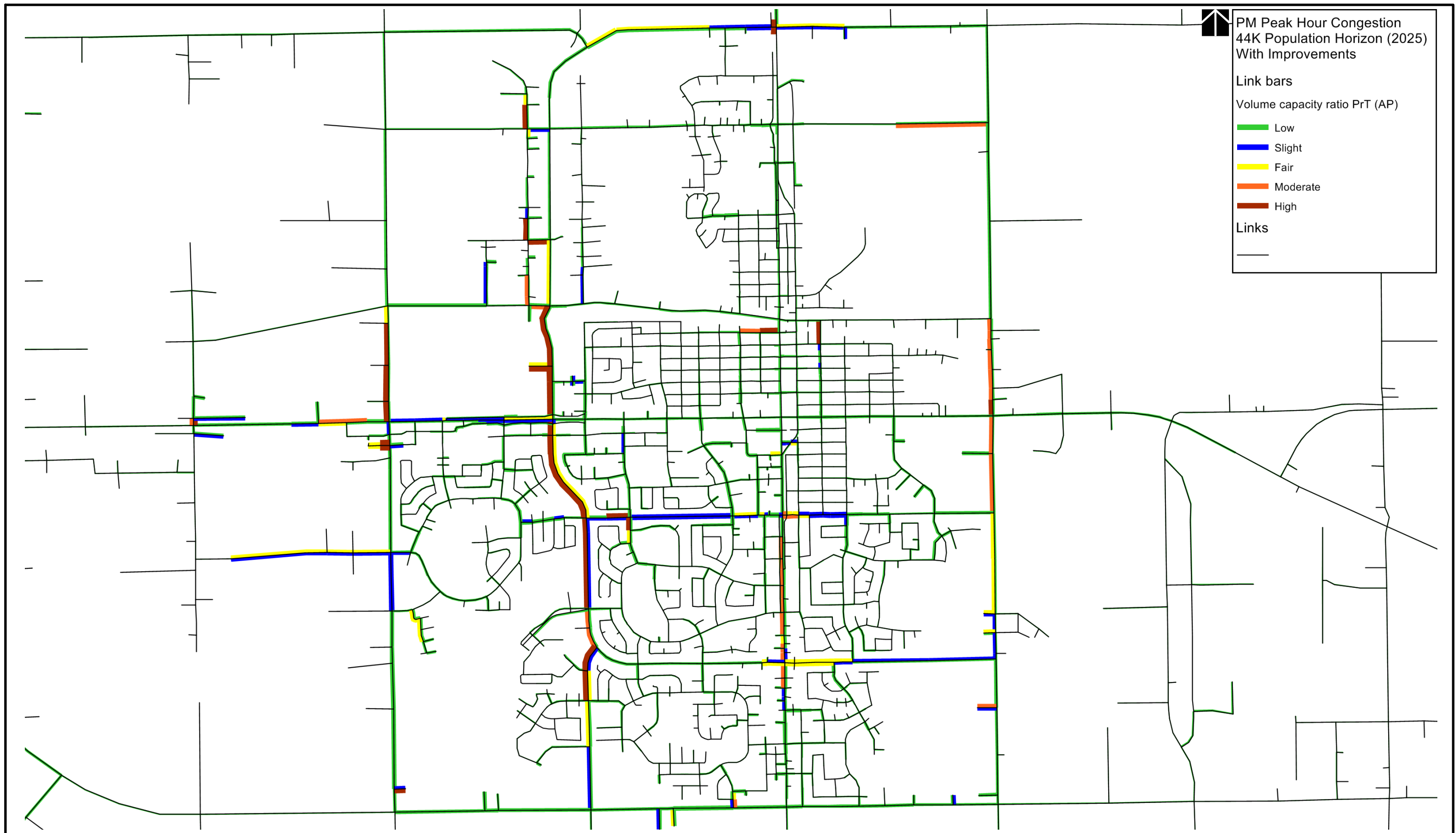






Appendix I
Road Type for Each Model Horizon





City of Lloydminster



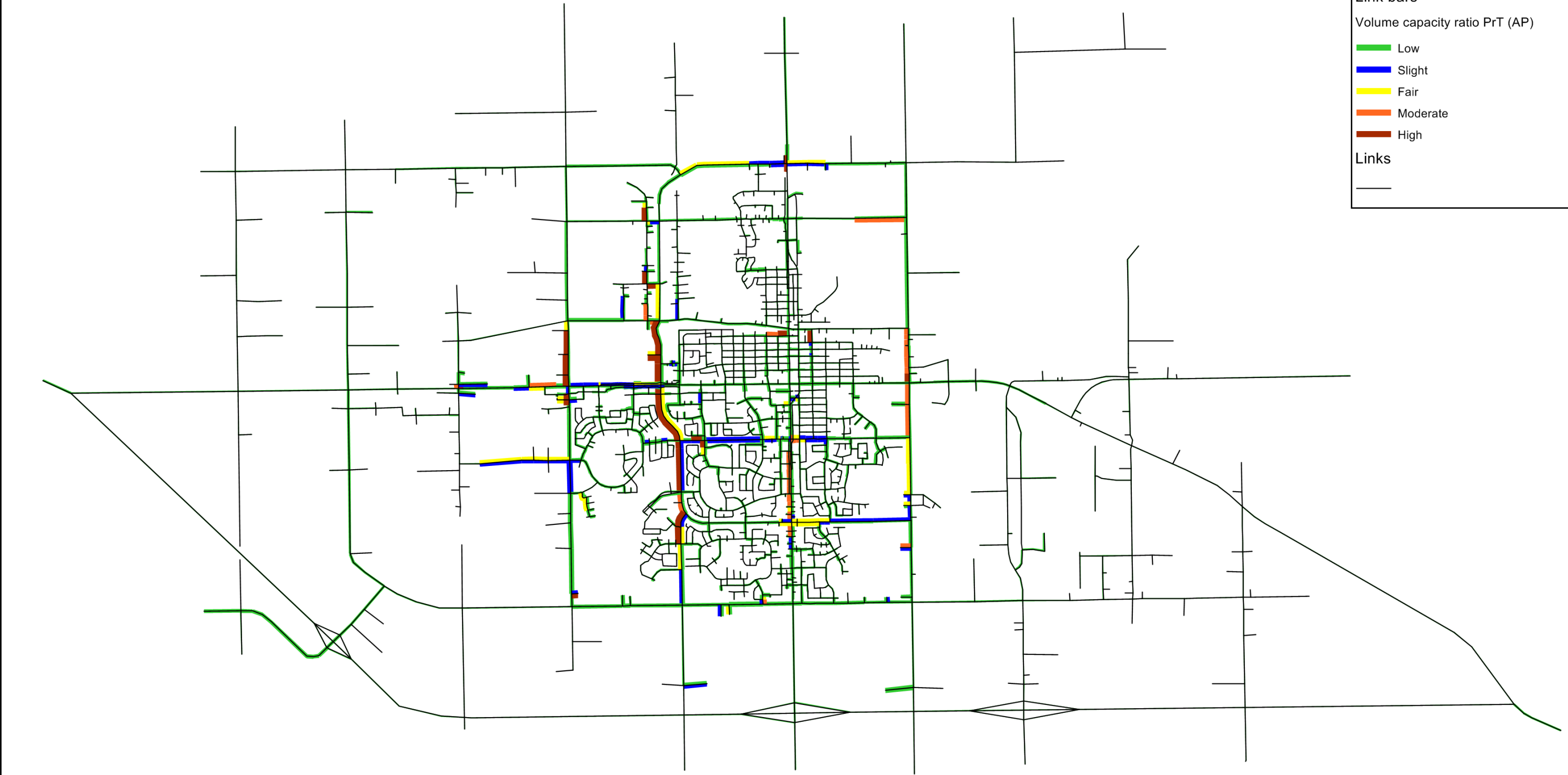
PM Peak Hour Congestion
44K Population Horizon (2025)
With Improvements

Link bars

Volume capacity ratio PrT (AP)

- Low
- Slight
- Fair
- Moderate
- High

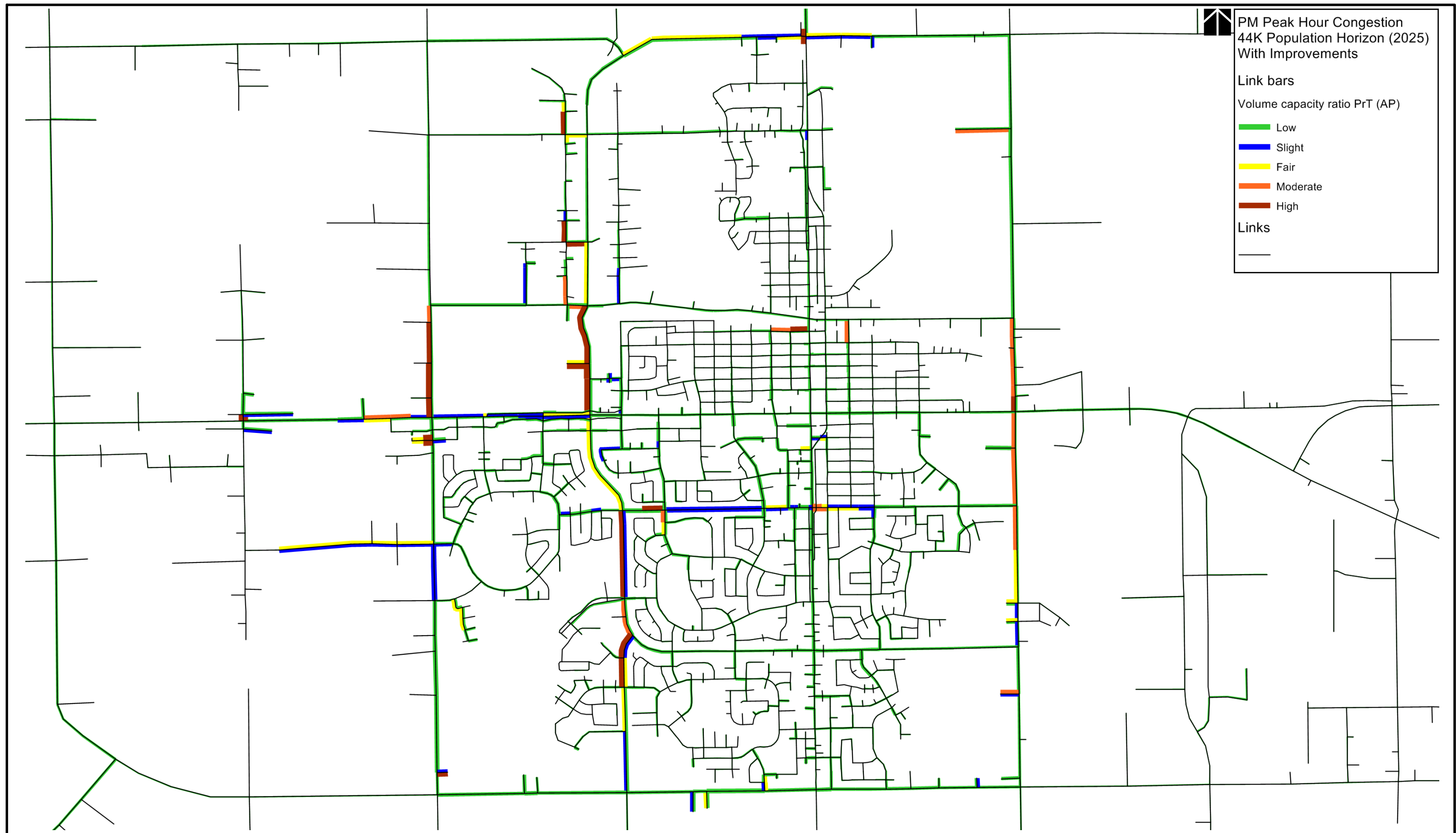
Links



City of Lloydminster



44,000 Population's Volume To Capacity Ratio - Region Wide
(Without Highway 17 Twinning to 12 Street and Without 25 Street Twinning to 40 Avenue)



City of Lloydminster

44,000 Population's Volume To Capacity Ratio - City Wide
(With 6 lanes on 62 Avenue between 44 Street and 36 Street)



PM Peak Hour Congestion
44K Population Horizon (2025)
With Improvements

Link bars

Volume capacity ratio PrT (AP)

Low

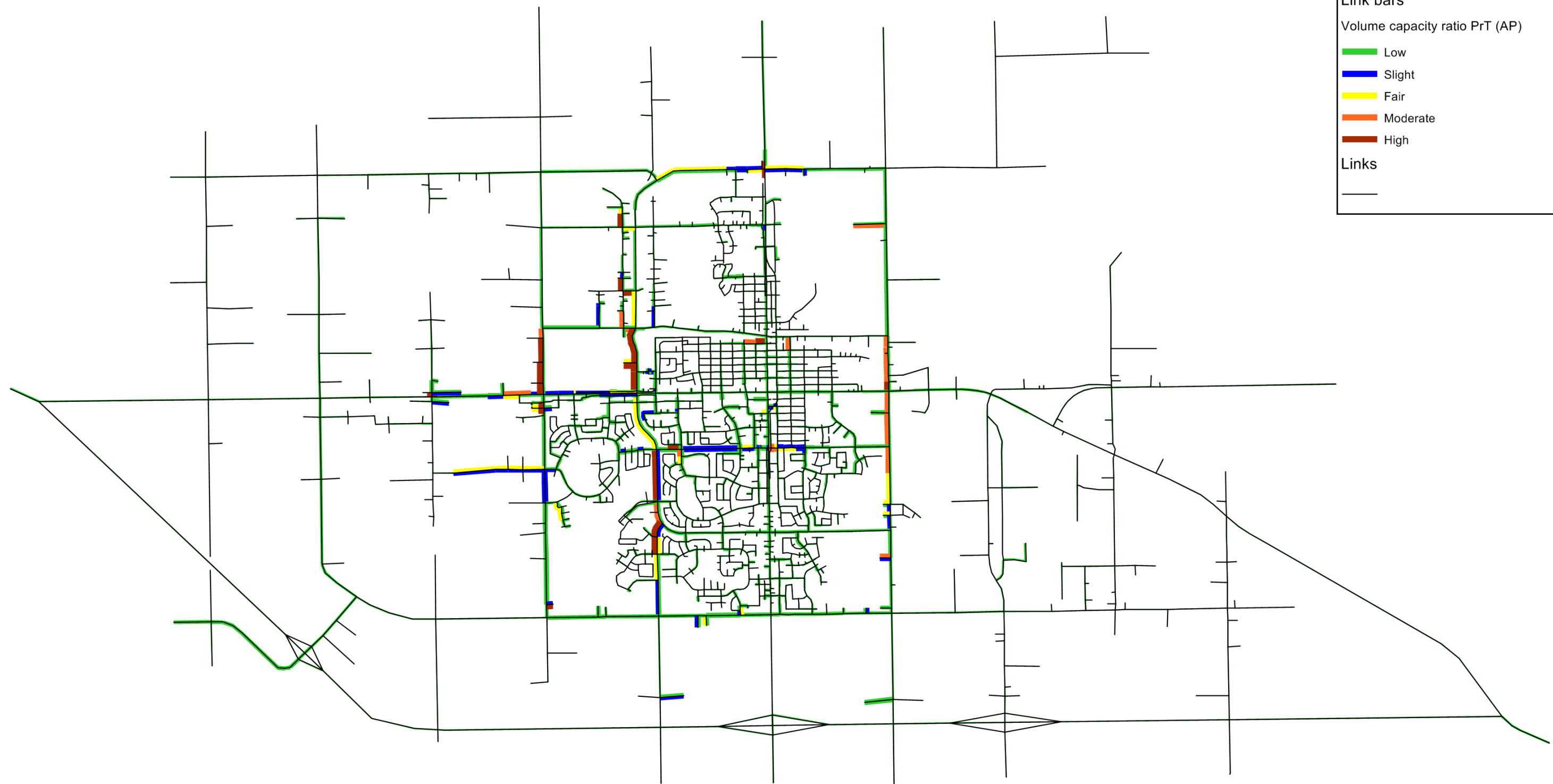
Slight

Fair

Moderate

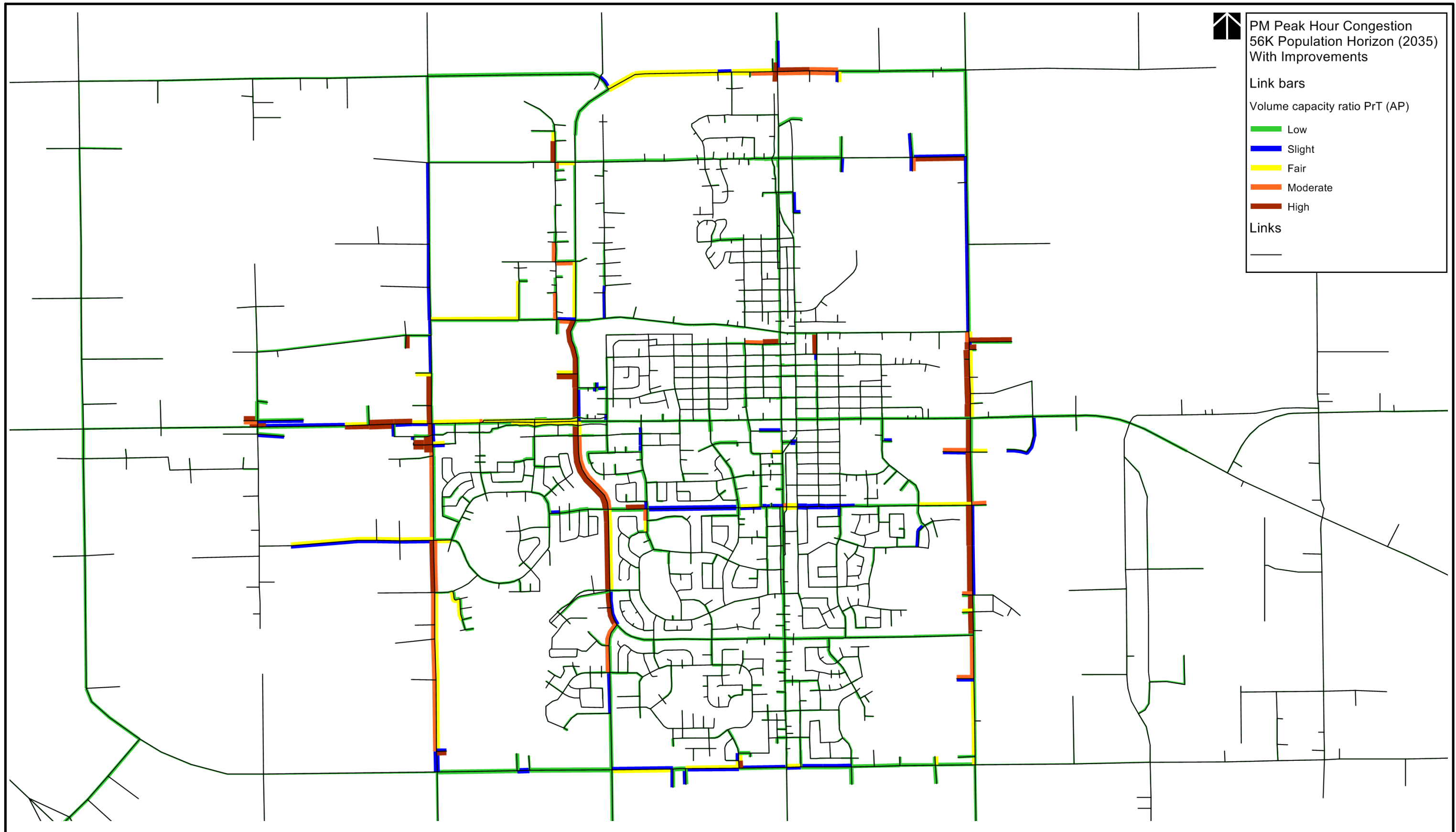
High

Links



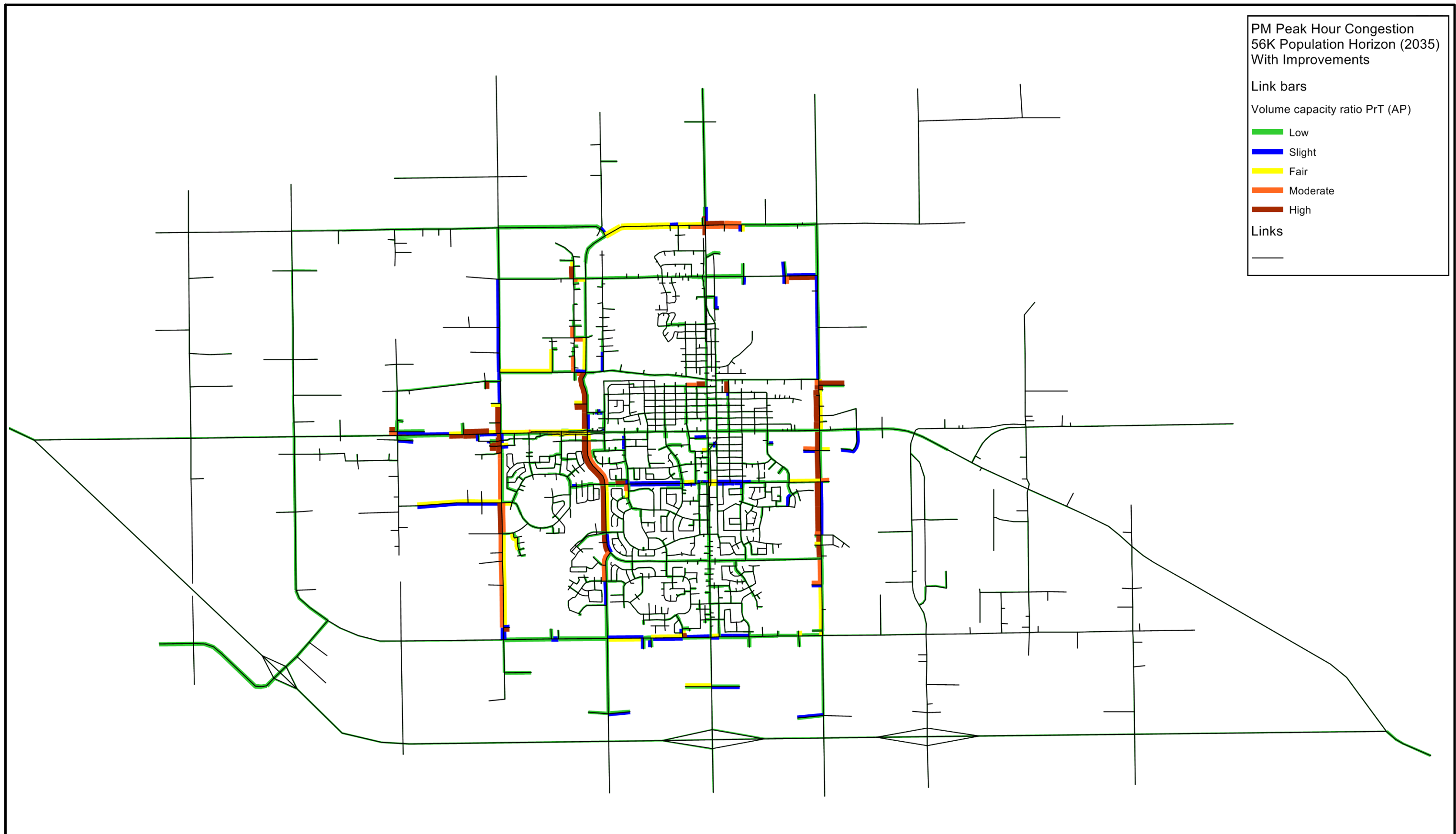
City of Lloydminster

44,000 Population's Volume To Capacity Ratio - Region Wide
(With 6 lanes on 62 Avenue between 44 Street and 36 Street)



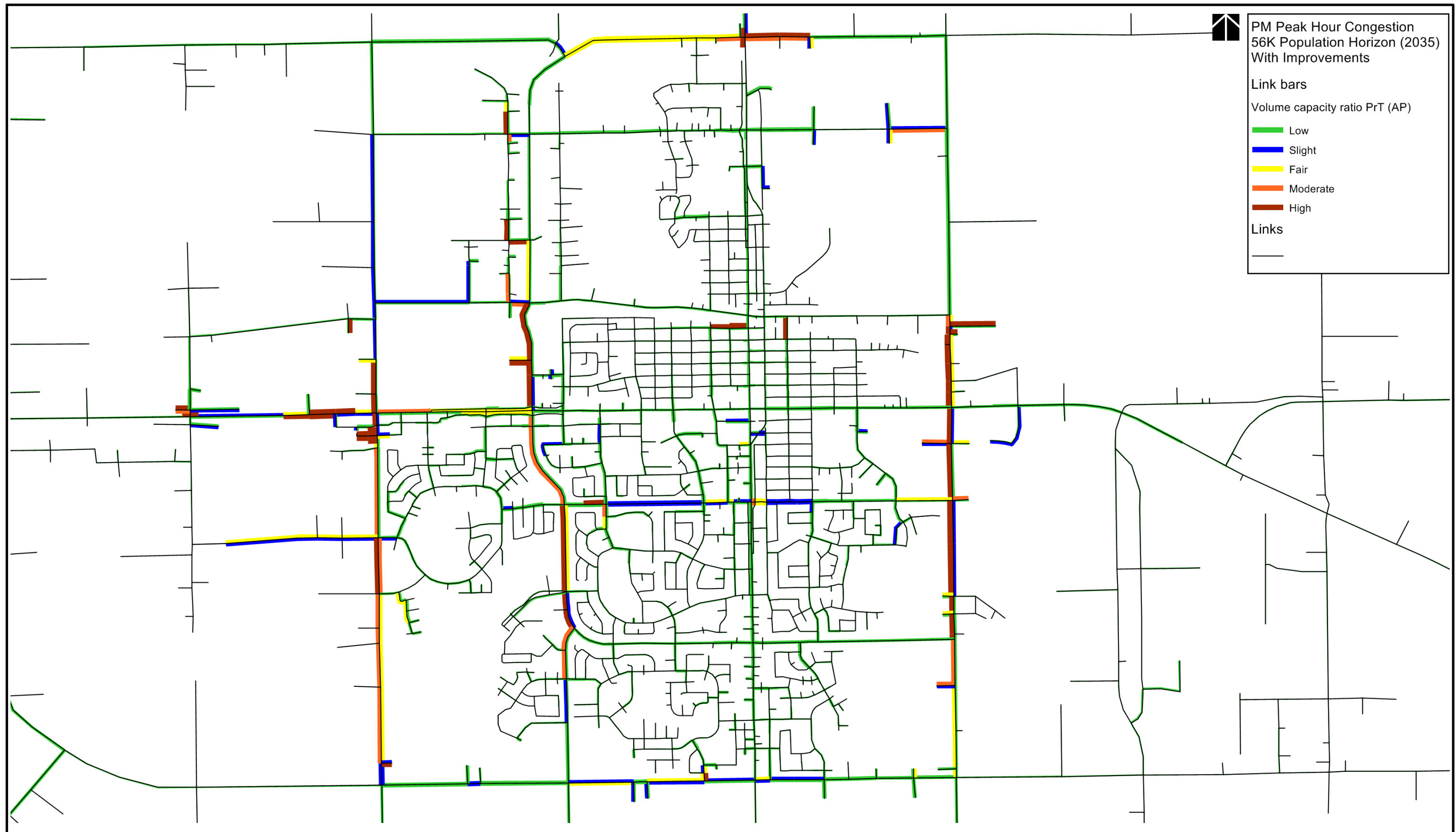
City of Lloydminster

56,000 Population's Volume To Capacity Ratio - City Wide
(With 4 lanes on 62 Avenue throughout)



City of Lloydminster

56,000 Population's Volume To Capacity Ratio - Region Wide
(With 4 lanes on 62 Avenue throughout)



City of Lloydminster

56,000 Population's Volume To Capacity Ratio - City Wide
(With 6 lanes on 62 Avenue between 44 Street and 36 Street)



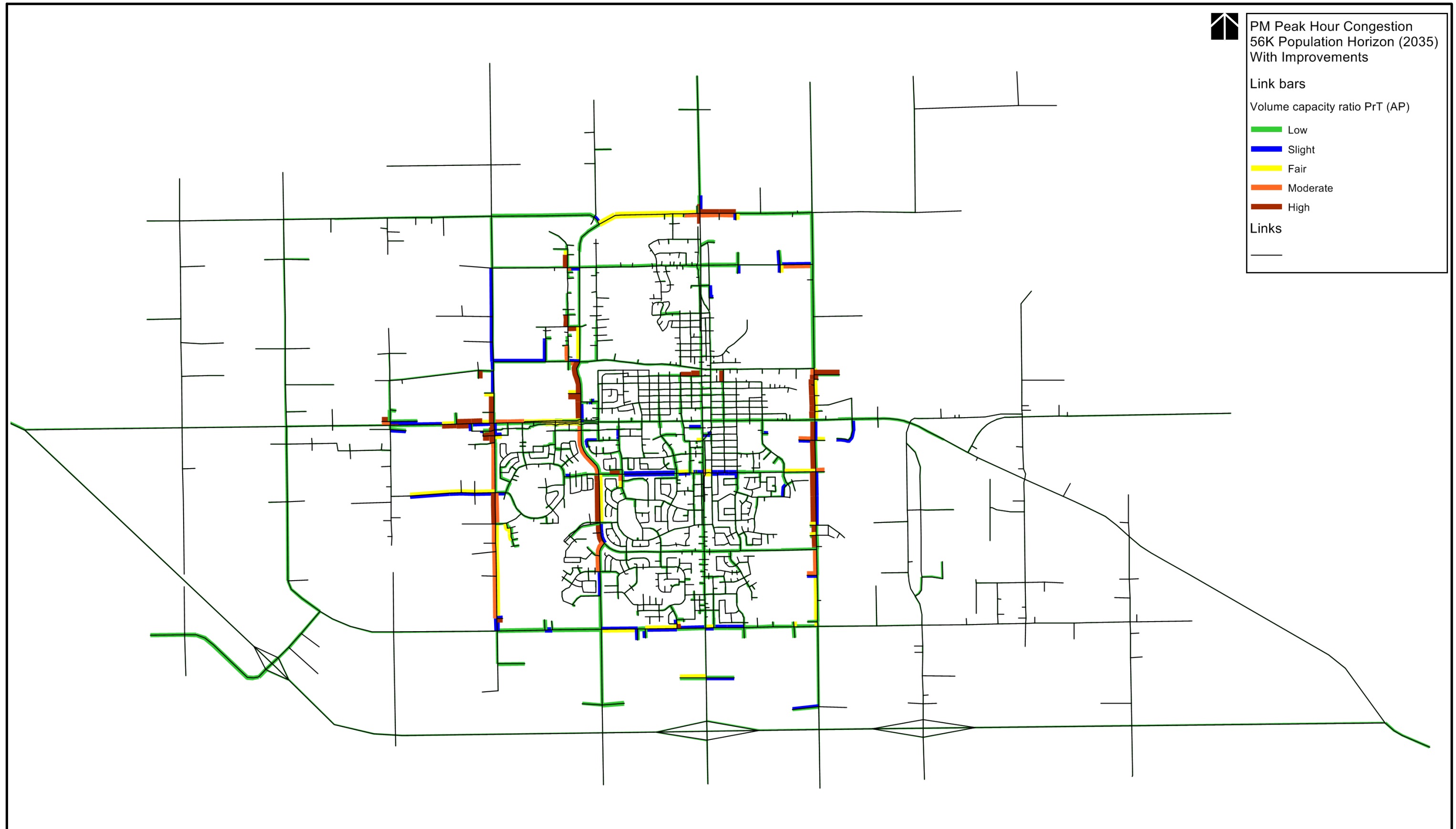
PM Peak Hour Congestion
56K Population Horizon (2035)
With Improvements

Link bars

Volume capacity ratio PrT (AP)

- Low
- Slight
- Fair
- Moderate
- High

Links



City of Lloydminster

56,000 Population's Volume To Capacity Ratio - Region Wide
(With 6 lanes on 62 Avenue between 44 Street and 36 Street)



Appendix J
Lloydminster's Traffic Bylaw (29-2012)



BYLAW NO. 29-2012

A BYLAW OF THE CITY OF LLOYDMINSTER IN THE PROVINCES OF SASKATCHEWAN AND ALBERTA TO REGULATE AND CONTROL THE OPERATION AND PARKING OF VEHICLES AND THE USE OF PUBLIC ROADS WITHIN THE CITY HEREINAFTER REFERRED TO AS "THE TRAFFIC BYLAW"

WHEREAS it is found necessary by the City of Lloydminster to pass a bylaw to be known as "The Traffic Bylaw" for the purpose of regulating traffic, parking and the use of public streets and roads;

NOW, THEREFORE, be it resolved that the Council of the City of Lloydminster in the Provinces of Saskatchewan and Alberta en-acts as follows:

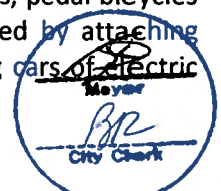
SECTION I
DEFINITIONS

I – I in this Bylaw:

- 1) "Alley" means a narrow roadway intended chiefly to give access to the rear of buildings and parcels of land.
- 2) "Bicycle" means a vehicle for the carriage of persons, which is propelled by human power and includes any device derived from a bicycle by the addition of one or more wheels, which shall not include a child's tricycle.
- 3) "Boulevard" means that portion of a roadway lying between the curb line of a roadway and adjacent property line, whether actually planted or improved or not, excepting that portion occupied by a sidewalk. Where there is no curb, that portion of a roadway ordinarily travelled by vehicles and the adjacent property line, excepting that portion occupied by a sidewalk.
- 4) "Bus" means a motor vehicle registered with the Highway Traffic Board as a public service vehicle.
- 5) a) "Bus Stop" means that portion of a Street designated by a sign and/or curb marking for use by buses, as defined in Section I, Subsection 4, for the purpose of loading and unloading passengers.
- 6) "City" means the City of Lloydminster.
- 7) "Chief of Police" means the Chief Constable for the City of Lloydminster or anyone authorized to act on his behalf.



- 8) "City Commissioner" means the Commissioner for the City of Lloydminster.
- 9) "City Council or 'Council' " means the Council of the City of Lloydminster, or any person authorized to act on the Council's behalf.
- 10) "City Clerk" means the Clerk for the City of Lloydminster.
- 11) "City Engineer" means the Engineer for the City of Lloydminster or anyone authorized to act on his behalf.
- 12) "Constable" means and includes a Commissioned or Non-Commissioned Officer in charge of a detachment of the Royal Canadian Mounted Police engaged in policing the City of Lloydminster, or any Constable by him duly authorized, or any Constable of the Lloydminster City Police appointed by the Council of the City of Lloydminster.
- 13) "Crosswalk" means that portion of a roadway ordinarily included within the prolongation of the lateral boundary lines of a sidewalk, whether marked or not, across a Street or any place identified as a crosswalk by markings on the roadway or by sign.
- 14) "Curb" means the dividing line of a roadway between that part of the roadway intended for the use of vehicles and either the boulevard or the sidewalk, whether marked with a curb stone or not.
- 15) "Dispatched Intersection" means an intersection at which the movement of traffic is controlled by a Traffic Officer, a traffic light, signal or other traffic sign or device.
- 16) "Double Parking" means the standing of a vehicle whether occupied or not, parallel to a vehicle parked beside a curb, for any reason other than delay due to traffic signs or signals.
- 17) "Driver" means the operator of a motor vehicle or vehicle, or the driver, rider or leader of livestock.
- 18) "Holiday" means any Statute day or day declared a holiday by the City Council.
- 19) "Impound" means and includes the seizure, removal and the detention of a vehicle.
- 20) "Intersection" means the whole area situated between the prolongation and the lateral curb lines, or if none, then the lateral boundary lines of two or more streets which join one another on an angle, whether or not one such Street crosses the other.
- 21) "Livestock" means poultry and domestic animals including horses, cattle, sheep and pigs.
- 22) "Mayor" means the Mayor of the City of Lloydminster or his designate.
- 23) "Motor Vehicle" includes motor cars, locomotives, power units, motor cycles, pedal bicycles with motor attachments, snowmobiles, snow planes, tractors, units formed by attaching power units to semitrailers, and all other self-propelled vehicles, excepting cars of electric



and steam railways, and other motor vehicles running only upon rails or tracks, or solely upon railway company property, fire engines, fire department apparatus, road rollers, street sprinklers, snow ploughs, and machines used for the removal of snow and road building and maintenance machinery and excepting tractors when used by farmers in connection with their farming operations or when used by implement vendors, licensed under the Agricultural Machinery Act, in connection with their implement agency business.

- 24) "One Way Street and One Way Alley" means a street or alley as the case may be, designated as one upon which vehicles shall move only in the direction indicated.
- 25) "Owner" means, in the case where a vehicle is required to be registered, the person named in the Certificate of Registration, and in the case where a vehicle is not required to be registered, shall mean any person having a priority interest in the vehicle, amounting to more than mere possession.
- 26) "Parade" shall mean any group of pedestrians walking or marching and numbering twenty-five (25) or more, except militia, and any group of vehicles numbering ten (10) or more and proceeding under common leadership except funeral processions and military parades.
- 27) "Parking" shall mean the standing of a vehicle whether occupied or not, upon a roadway, otherwise than temporarily in obedience to traffic regulations or traffic signs or signals.
- 28) "Parking-Area" means that portion of a roadway or an area indicated by signs, markings or meters as a place to park vehicles.
- 29) "Parking Meter" means a device which includes thereon, the length of time during which a vehicle may be parked, which shall have as a part thereof a receptacle for receiving and storing coins, a slot or place in which such coins may be deposited, a timing device to indicate the passage of the interval of time during which parking is permissible, and which shall also display a signal when said interval of time shall have elapsed.
- 30) "Parking Space" means that portion of a parking area set aside for the use of a single vehicle.
- 31) "Parking Meter Zone" means the streets, parts of streets or other public parking area where parking meters are now or may hereafter be established and maintained to collect a fee for the use of the metered space so established.
- 32) "Parking Permit" means a permit issued by the City of Lloydminster to allow for parking of vehicles for certain purposes and time limits.
- 33) "Pedestrian" means any person on foot and shall include anyone being drawn or propelled by a person on foot and shall include an invalids chair whether propelled by a pedestrian or otherwise.
- 34) "Person" means any human being, of either sex and shall include anybody corporate and politic, or firm, partnership, association or aggregate of individuals, and shall include the plural as well as the singular.



- 35) "Private Roadway" means a roadway or a driveway located on privately owned property.
- 36) "Property Line" means the line marking the boundary between any roadway and the lots abutting thereon.
- 37) "Public Place" means any place, building or conveyance to which the public has access by right or by invitation, express or implied, and for greater certainty but not to restrict the meaning thereof, shall include dance halls, theatres, skating and hockey rinks, curling rinks, churches, church halls, meeting halls, restaurants, beer parlours, bowling alleys, pool rooms, hotels, motels, motor hotels, stores and malls.
- 38) "Right-of-Way" means the priority of immediate use of streets, street intersection, street crossing or alley crossing.
- 39) "Roadway" means as distinguished from "Street", the whole entire width as from property line to property line, of that part of the City set aside for vehicle and pedestrian travel.
- 40) "Semi-trailer" means a vehicle that is at any time drawn upon a public roadway, by a motor vehicle and is designed for the conveyance of goods or persons or as living quarters for persons, and is so designed that its weight and the weight of its load is carried partly upon its own axle or axles and partly upon another vehicle but does not include:
- a) Timbers with wheels attached thereto when used for the purpose of transporting buildings.
 - b) An asphalt distributor used for the construction or maintenance of bituminous surfaced roadways.
- 41) "Sidewalk" means that portion of a roadway set apart primarily for the use of pedestrians.
- 42) "Snowmobile" means a vehicle that:
- a) is not equipped with wheels but is equipped with tractor treads alone or with skis or with skis and a propeller; or
 - b) is a toboggan equipped with tractor treads or a propeller; and
 - c) is designed primarily for operating over snow and is used exclusively for that purpose; and
 - d) is designed to be self-propelled;
- other than any vehicle that is designed to accommodate eight or more persons and is used for the transportation of goods or persons.
- 43) "Sound Truck" means any vehicle from which the amplification of sound is made for the sake of advertising any commodity of thing, or of any entertaining or sporting or other event, or from which a public address is made.
- 44) "Stop" means:
- a) when required, a complete cessation of movement, or



- b) when prohibited, and stopping even momentarily, of a vehicle, whether occupied or not, except when necessary to avoid conflict with other traffic or in compliance with the directions of a Traffic Officer, Police Officer, or Police Constable, or a traffic control signal, or sign.
- 45) "Street" means that portion of every roadway, public road, avenue, alley, public drive, or public place in the City, intended for the use of vehicles
- 46) "Time" shall mean Mountain Standard Time, or any time change so established by Council.
- 47) "Traffic" means pedestrians, ridden or herded livestock, vehicles and other conveyances either singularly or together while using a roadway.
- 48) "Traffic Lane" means a longitudinal division of a public highway of sufficient width to accommodate the passage of a single line of vehicles.
- 49) "Traffic Signal" means a device whether manually, electrically or mechanically operated for the purpose of directing, warning, or regulating traffic by means of an illuminated signal.
- 50) "Traffic Sign" means any sign, signal, other than traffic signal, marking or other device placed, painted or erected for the guidance, regulation, warning, direction, or the prohibition of traffic.
- 51) "Traffic Ticket" shall mean, as the case may necessitate, the Saskatchewan Traffic ticket as described by the Saskatchewan Vehicles Act, Section 223, Subsection (i) to (8) inclusive; and the Alberta Traffic ticket as described by the Summary Convictions Act, Chapter 355, Section 6, Subsection (1) to (4) inclusive.
- 52) "Trailer" means a vehicle other than a semitrailer that is at any time drawn upon a public highway by a motor vehicle and is designated for the conveyance of goods or as living quarters for persons, but does include:
- a) a motor vehicle towed for sale, storage, or repair purposes; or
 - b) a vehicle owned or used by a department of the government or a municipality or by a contractor engaged in work for or under the direction of a department of the government or a municipality, and which is used as living quarters for employees of the department municipality or contractor; or
 - c) timbers with wheels attached thereto when used for the purpose of moving buildings; or
 - d) an asphalt distributor used for the construction or maintenance of bituminous surfaced highways; or
 - e) a vehicle, other than a house trailer, camping trailer or boat trailer while such vehicle:
 - i. is being drawn by a motor vehicle registered as a farm truck or special farm truck; and
 - ii. is being used for a purpose for which a vehicle registered as a farm truck or special farm truck may be used under the regulationsand a trailer shall be deemed to be a separate vehicle and not part of the motor vehicle by which it is drawn.



- 53) "Truck" means a motor vehicle designed for the conveyance of goods, a motor vehicle equipped with a lifting device or a motor vehicle on which any machinery is permanently mounted.
- 54) "Truck Route" shall mean a road marked by sign and designated as a road for the use of large vehicles.
- 55) "Vehicle" means and includes motor vehicles, road rollers, street sprinklers, trailers, semi-trailers, fire engines, fire department apparatus and vehicles propelled by muscular power but does not include cars of electric or steam railways and other vehicles or motor vehicles running only upon the railway company property.

SECTION II

AUTHORITY OF A CONSTABLE

- 2-1 In case of fire, or other emergency or in order to expedite traffic or safeguard pedestrians, or prevent accidents, or meet any unforeseen condition, a Constable is hereby authorized to direct traffic in such a manner as he may deem necessary whether or not in conformity with the provisions of this bylaw.
- 2-2 Any Constable or the City Engineer may temporarily close any portion of any street to vehicular traffic or temporarily prevent parking on any street when such action is necessary for the maintenance of such streets or in case of any emergency.
- 2-3 Every person shall comply with any traffic signal, direction or order of a Constable given pursuant to this bylaw.

SECTION III

TRAFFIC CONTROL SIGNALS AND SIGNS

- 3-1 The City Council may by resolution, authorize the erection of traffic signs and signals, and regulate loading time in loading zones.
- 3-2 No person shall wilfully deface, injure, move, obstruct, or interfere with any traffic signal or sign.
- 3-3 No operator of a vehicle or no pedestrian shall disobey the instructions of any traffic sign or signal unless otherwise directed by a Constable.
- 3-4 No persons shall unlawfully place or erect any sign which is an imitation of or resembles a traffic signal or sign or which attempts to direct the movement of traffic or which hides from view any traffic sign or signal.



SECTION IV
PARADES AND SOUND TRUCKS

- 4-1 Unless and until the Council and/or a Constable of the R.C.M.P. issues a permit, therefore no person shall march or join in a parade or procession on a street.
- 4-2 Any person taking part in or adhering to any parade or procession held or conducted in violation of this bylaw shall be in violation of this bylaw and liable to the penalties provided in the same manner as if such person had been in charge of the parade or procession.
- 4-3 A person wishing to organize or arrange for a parade or procession shall advise the Council of the place from which the parade is to commence and the place to which the parade wishes to go, the anticipated size, route, and duration of the parade and also if such parade is to include vehicles or animals.
- 4-4 The Chief of Police shall advise the applicant whether or not he is prepared to approve the proposed parade, and the streets along which the parade may take place and the vehicles, floats, or other displays that will be allowed to take part in the parade.
- 4-5 If the Chief of Police approves the parade he shall give to the applicant a recommendation as outlined in Schedule 5, Form "A" setting out the conditions of his approval and any other material he deems relevant to the application.
- 4-6 The applicant for a parade shall take the recommendation of the Chief of Police to the Mayor who may grant or refuse permission for the parade or may refer the matter to Council either with or without a recommendation thereon.
- 4-7 If an application for permission to hold a parade is referred by the Mayor or Council, Council may grant or refuse the permission.
- 4-8 Except with permission from the Council, all parades must proceed on the right hand side of the street and not interfere with traffic proceeding from the opposite direction.
- 4-9 When a permit has been granted for a parade or procession
(a) Notwithstanding the provisions of section 5-1 or anything elsewhere contained herein persons may congregate on sidewalks or a portion of a street designated for the purpose in order to view the parade or procession.
(b) The Chief of Police may close all or portions of the streets along the route set out in the permit for the anticipated time of the parade and for such additional time as necessary to again clear the street or streets for normal traffic.
(c) The Commissioner or the Chief of Police may suspend temporarily, parking and loading privileges on all or a portion of the streets on the proposed route of the parade.
- 4-10 Unless the person who receives permission to conduct or arrange for a parade has received specific permission from the Mayor to allow animals, vehicles, or floats to take part in the parade no person shall allow any vehicle over which he has any control other than a passenger car to participate in a parade or to be placed in the street on the route of a parade during the parade or in connection therewith.



- 4-11 Where pursuant to the provisions of the subsection (1) permission is obtained allowing floats or vehicles other than private cars to be placed in or on the route of the parade, the person or persons sponsoring the parade shall indemnify and save harmless the City from and against any and all claims for injury to any person or persons and damage to real or personal property arising by reason of or in any way connected with the entry, placing or operation of the vehicle or float in the parade or procession whether prior to, during or after the parade or procession, and whether arising out of or directly or indirectly caused by any act, omission or negligence of the City, its employees or agents, and shall furnish a policy of liability insurance in an amount required by the Commissioner naming the city as one of the insured and the granting of the permission for allowing vehicles or floats to take part in the parade or procession shall be the consideration for such indemnity.
- 4-12 Notwithstanding the indemnity provided in subsection 4-11 or the insurance required thereby, the owner, the sponsor, the driver or operator of the vehicle or float and all persons on such vehicle or float taking part in the parade or procession shall ensure that no part of the vehicle or float will damage the streets, electric or telephone pole or wires, street lights, transit posts, cables or supports, traffic signal lights or signs, fire hydrants, or any other property of the City or of a public utility in, upon, over or beside a street.
- the vehicle, the float or anything thereon or attached thereto not injure any person or cause damage to any property or persons and
 - vehicle or the float will come in contact with any telephone wire or any wire charged with or carrying electric current.
- 4-13 No person shall advertise any article or event by use of a sound truck, unless a permit is obtained from the Mayor permitting such advertisement.
- a) such advertising shall be conducted within the time limits and the areas set by the Mayor.
 - b) a copy of such permit shall be carried in the sound truck from which such advertising is directed, such permit shall comply with Form "D" of this Bylaw Schedule.

SECTION V

PEDESTRIAN RIGHTS AND DUTIES

- 5-1 No person shall walk through or interfere in any way with any funeral, military or other lawful parade or procession held within the City of Lloydminster.
- 5-2 No person or persons shall in any way obstruct the free passage of traffic in any street, sidewalk, alley or any other public place.
- 5-3 No person shall play any game, use any type of conveyance such as a toboggan, skis, or cart or throw any missile, other substance or use a bow and arrow or sling shot upon any street.
- 5-4 While a vehicle is in motion, no person shall get off or board or catch or hold on thereto.
- 5-5 No person shall cross a street except at a place marked, signed or designated as a crosswalk.
- 5-6 No person shall stand or walk on any street except when crossing at a crosswalk, but shall use the sidewalk or boulevard.



a) Notwithstanding section 5-6, when no sidewalk or boulevard is located on any street or when it is impractical or it is unreasonable to use the sidewalk or boulevards a person may walk on the street provided that the extreme edge of the street to his left hand side is used.

- 5-7 A pedestrian waiting for a traffic light to change shall stand on the curb or sidewalk and not on the street.
- 5-8 No person waiting for entrance to any place of business or amusement shall form a queue on the sidewalk adjacent to the curb and shall not be more than two persons standing abreast.
- 5-9 No person shall stand in a street for the purpose of soliciting.
- 5-10 Any person to whom a violation ticket is being issued under this Bylaw shall furnish the Constable issuing the ticket with his name and address and any other information required in fulfillment of his duties.

SECTION VI

STOPPING, STANDING AND PARKING

- 6-1 No person shall park a vehicle in any private parking place or on any private property to which he is not the owner, occupant, licensee, or permittee except with the consent of the owner, occupant, licensee or permittee.
- 6-2 No person shall park a vehicle whether occupied or unoccupied:
- a) Within Ten (10) feet of any fire hydrant
 - b) In front of or within six (6) feet of a private driveway.
 - c) In front of an emergency exit
 - d) On the City airport runway or taxi strip
 - e) Next to a curb that has been painted yellow
 - f) In a marked or signed loading zone for more than ten (10) minutes and while such vehicle is engaged in loading or unloading operations on the adjacent premises.
 - g) Within an intersection
 - h) On a crosswalk
 - i) On a sidewalk or boulevard
 - j) In front of the entrance to any fire station.
 - k) In any place or area where the signing indicates that the parking there is restricted to a certain class or classes of vehicles.
 - l) In an alley except for the purpose of loading or unloading
 - m) Where signs have been erected prohibiting or regulating parking
 - n) On the south side of the parking lot located directly north of Fire Station No. 1; unless such person is a member of the Lloydminster Fire Department.
 - o) In the parking lot behind City Hall, unless engaged in business with City Hall
 - p) No person shall park a vehicle in a parking meter space in which the meter for that space has been covered with a bag displaying the words "No Parking" printed thereon such bag.
 - q) No person shall park a vehicle within 15 feet of any intersection or sign or signal controlling any intersection.
 - r) in a parking space or area either on a street or on private property that is clearly designated by signage or ground marking as being restricted to Handicap or Disabled



Parking, unless the vehicle has clear identification on it that permits the vehicle to be parked in that zone or space.

s) no person shall park a motor vehicle for longer than the time indicated on signs posted in designated parking areas.

t) no person shall park a motor vehicle in an area that is clearly designated by signage or ground marking as a fire lane

6-3 No person shall double park a vehicle whether occupied or unoccupied, upon any street, or public parking lot.

6-4 No person shall park upon any street any vehicle which is displayed for sale.

6-5 No person shall park a vehicle in a bus stop unless engaged in loading or unloading. Notwithstanding the foregoing no person shall park a vehicle in a school bus stop during the hours stipulated in Section 10-33 of this bylaw.

6-6 No person shall park a vehicle on any street unless it displays license plates for the current year.

6-7 a) Vehicle repairs including changing tires, shall only be made on streets in cases of emergency and then only immediately adjacent to the curb and in a location which will not interfere with traffic. In the case of animal drawn vehicles, no repairs shall be made on any street without first unhitching the animal.

b) No vehicle shall be left stationary on any roadway without supervision, in a jacked up position or in any other manner which might endanger the safety of other users of the roadway.

6-8 No person shall leave upon any street any recreational or utility trailer unhitched and unattended for a period exceeding 48 hours. No person shall leave upon any street any other type of trailer unhitched or unattended.

6-9 No person shall park upon any street any vehicle carrying highly flammable or explosive material unless the vehicle is engaged in the delivery of such material and a notice is posted giving sufficient warning to other users of the street.

6-10 No person shall use any street within the City for the purpose of storing any vehicle and no person shall leave any vehicle standing, stored, or parked upon any street for a continuous period exceeding forty-eight (48) hours, Sundays and holidays excepted.

6-11 No person shall park a motor truck, motor bus, semi-trailer or motor vehicle with a trailer attached thereon, excepting trucks up to a maximum weight of two tons for the purpose of delivery or pickup for a period not exceeding fifteen minutes, upon the streets described as follows:

a) In any parking meter space or any parking meter zone.

b) On any street or on any property within the residential district of the City of Lloydminster as defined by the Zoning Bylaw, being Bylaw No. 12-2001, and or any amendments thereto.

c) This subsection shall not be construed to apply to trucks without trailers which have an authorized weight of three quarter (3/4) ton or less.



- 6-12 No person shall park a vehicle on the east side of 49 Avenue from the Fire Hall driveway, in the first two stalls south of the driveway, contrary to the signing of these areas.
- 6-13 No person shall park in any public parking lot, any vehicle which may block or obstruct the movement of traffic therein. In addition, no person shall park any vehicle contrary to the directions of the attendant signs or system of parking used on such parking, lot.
- 6-14 At every place where signs have been erected designating a portion of a street to be used for funeral purposes, no person shall park a vehicle in such a signed area.
- (a) No person other than the funeral director shall remove any sign that has been erected that designates an area to be used for funeral purposes.
 - (b) Authorization is hereby given to a funeral director to erect signs to temporarily prevent parking on any portion of any street for funeral purposes.

SECTION VII

MANNER OF PARKING

- 7-1 Where traffic signs provide for angle parking within the City, no person shall park any vehicle on such street except at an angle of forty-five (45) degrees to the curb and with the right hand front wheel no more than six (6) inches from the curb, or on any street designated for one-way traffic, with either the right hand or the left hand front wheel no more than six (6) inches from the curb, as the case may be. No vehicle may be parked in this manner if the overall length of such vehicle exceeds twenty (20) feet.
- 7-2 Where traffic signs provide for parallel parking within the City, no person shall park any vehicle on such streets other than parallel to the curb and with the right hand wheels of the vehicle within eighteen (18) inches of the curb, or on any street designated for one-way traffic, with either the right hand wheels or the left hand wheels of the vehicle within eighteen (18) inches of the curb, as the case may be.
- 7-3 No person shall stop or park any vehicle on any street with the left hand side to the curb, except for one way streets. Notwithstanding the above no person shall park a vehicle on the left hand side of a one way alley.
- 7-4 Where stalls or allotments are designated or marked out within a parking area, every person parking a vehicle within any such area shall park the same so that the vehicle shall be wholly within the boundary of such stall or allotment. In the case of parallel parking if the vehicle is of such length as to prevent it from being parked within one stall, then two stalls may be used and if the stalls are in a parking meter zone then the person parking the vehicle shall deposit coins in the parking meters provided for such parking meter stalls.
- 7-5 No person shall park a vehicle in a parking space in a parking meter zone unless:
- (a) In the case of angle parking, the front of such vehicle is alongside or as close as practical to the parking meter provided for such spaces.
 - (b) In the case of parallel parking, the front or rear of such vehicle is alongside or as close as is practical to the parking meter provided for such spaces.



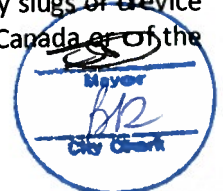
- 7-6 No person shall park any vehicle on any street or other public parking place within the City, any vehicle which has a leaking gas tank or has gas escaping from such vehicle and falling upon the street so as to create a danger to other users of the streets or damage to such streets.

SECTION VIII
PARKING METERS

- 8-1 No person shall park a vehicle in a parking meter zone between the hours of nine o'clock in the forenoon and six o'clock in the afternoon on Monday through Friday except when such days are public holidays, unless such person deposits in the parking meter:
- (a) The sum of five cents, ten cents, or twenty-five cents for each fifteen minutes of time during which the vehicle is parked in a metered parking stall on the street;
 - (b) The sum of five cents, ten cents or twenty-five cents for each one half (1/2) hour of time during which the vehicle is parked in a metered parking stall located in any off street parking lot or parking area;
 - (c) Where a meter permits the acceptance of one dollar (\$1.00) coins they may be used to obtain the same amount of time as outlined in a) or b).

Where on the parking meter and where in this bylaw the words five cents, ten cents, and twenty-five cents or "Dollar" appear they shall be construed as meaning a "nickel", "dime", "quarter" or "dollar" coin respectively.

- 8-2 (a) It shall be deemed to be a second violation if the vehicle remains parked after the issuance of a traffic ticket for the first offence, for a time in excess of that allowed for parking in the space occupied by the vehicle.
(b) No person shall park a motor vehicle in any parking meter space for a period exceeding two (2) hours.
(c) Notwithstanding the foregoing, no person shall park in metered or unmetered City Parking Lot for a period exceeding ten (10) hours.
- 8-3 Section 8-1 shall not apply to a vehicle which displays a valid Parking Permit. The applicant for such permit shall complete Form C of Schedule 5 of this Bylaw and the time limit and fees paid for such permit shall conform with Schedule 2 attached to this Bylaw. All permits shall expire on December 31st of each year.
- 8-4 Subsection 8-1 shall not apply when the parking meter is out of order, provided that a written notice to the effect that the meter is out of order is placed securely to the meter or under the windshield wiper or elsewhere in the vicinity of the windshield and is clearly visible.
- 8-5 No person shall display on a vehicle, an expired parking permit or an imitation of a valid parking permit purporting to be a valid parking permit exempting that vehicle from the provisions of section 8-1.
- 8-6 It is an offence to deposit or cause to be deposited in any parking meter any slugs or device or other substitute for a one cent or a five cent coin of the Government of Canada or of the



United States of America, or anything that will damage or impair the usefulness of any parking meter.

- 8-7 In every prosecution for a violation of Section 8-1, the coin shall not be deemed to have been deposited unless such coin has been inserted in the parking meter, the handle of the parking meter has been properly turned, and time is registered on the timing mechanism for such parking meter.
- 8-8 The City Council may, from time to time, provide for the installation of parking meters on specified streets within the City or portions thereof. The areas where parking meters are so installed shall for the purpose of this bylaw be known as a "metered Parking Zone", and the regulations under this section shall apply thereto.

SECTION IX

BICYCLES

- 9-1 Every person operating a bicycle shall comply with the traffic rules and regulations as established in this Bylaw and, in addition, no operator while operating such a bicycle shall:
- (a) ride more than two abreast
 - (b) tow any person on any type of conveyance or,
 - (c) ride upon any sidewalk, boulevard or in any park
- 9-2 No person shall remove both hands from the handlebars or feet from the pedals, or practice fancy riding or acrobatics while on any street in the City.
- 9-3 No person shall operate a bicycle on a roadway within the City recklessly, negligently, or at a speed or in a manner which is dangerous to other users of the roadways, having regards to all the circumstances, including the nature, condition and use of the roadway and the amount of traffic which is present at the time or might reasonably be expected to be present on the roadway.
- 9-4 No person shall carry any other person or persons on the same bicycle or load of greater weight than fifty (50) pounds, nor shall such load extend to a greater width than the handle bars nor to such height as to obstruct clear vision in all directions of the operator seated on the bicycle.
- (a) Notwithstanding this subsection, the operator of a bicycle may carry one (1) other person on the same, provided such bicycle is equipped with a proper seat, proper foot rests and handle grips for the purpose of carrying a passenger.
- 9-5 Every bicycle shall have the following equipment which must be maintained in efficient working condition at all times.
- (a) a horn or bell which will emit sound under normal conditions for not less than one hundred (100) feet.
 - (b) a brake reasonably adequate to stop the bicycle within a safe stopping distance.
 - (c) a headlight reasonably adequate to provide the rider with a lighted area sufficient for safe operation at night.
 - (d) a tail light or reflector to provide overtaking vehicles with adequate warning of the presence of such bicycle.



SECTION X
RIGHTS AND DUTIES OF VEHICLE OPERATORS

- 10-1 No person shall make deliveries from a vehicle in such a manner as to block the free passage of other vehicles or pedestrians.
- 10-2 No owner or operator of any vehicle or towed container passing over or parked upon any street shall permit any oil, hydro-carbon or any debris or refuse to escape from such vehicle or passenger of any vehicle throw any refuse, trash, or cause or contribute to the pollution of any public roadway, thoroughfare, avenue, road or any public or private property within the City of Lloydminster.
- a) Such spilled material as outlined in this subsection, shall be immediately removed by the person spilling such material so that the road shall be in as clean and useable a state as before the material was spilled. In the case where the City crew completes the necessary cleaning, the cost of such cleaning shall be charged to the person responsible for such spillage.
- 10-3 No operator of a vehicle other than operators of the Fire Department apparatus shall drive on any Fire Hall Driveway.
- 10-4 No operator shall drive on or over any newly painted line in any street or parking lot which is indicated by a traffic sign.
- 10-5 No person of any vehicle shall solicit business while travelling on any street, nor shall an operator or passenger of any vehicle annoy any person by soliciting or enticing any person to his vehicle.
- 10-6 No person shall tow any vehicle upon any street if the connection is so arranged that the towing vehicle and the vehicle being towed are separated by more than fifteen (15) feet.
- 10-7 No operator of a vehicle shall cause or permit any carriage, wagon, sleigh, cart or person on skis, skates, or any other type of conveyance to be attached to, or drawn by such vehicle on any street within the City.
- 10-8 No person driving a vehicle within the City shall follow another vehicle more closely than is reasonable and prudent, having due regard for the speed of the vehicle and the amount and nature of traffic and the condition of the street.
- 10-9 No operator of a vehicle shall pass any other vehicle which has stopped at a crosswalk to permit the passage of a pedestrian.
- 10-10 (a) The operator of any vehicle shall not pass any school bus engaged in the loading or unloading of passengers, and while such school bus is displaying flashing red lights.
(b) No operator of a school bus shall attempt to load or unload any person from such vehicle at any place other than a school bus stop.
- 10-11 No operator of a vehicle shall operate same as to splash or otherwise mark the clothing of a pedestrian who is crossing a street at a crosswalk, on a side or on a street where no sidewalks are provided.



- 10-12 No operator of any vehicle other than vehicles of members of the Fire Department or the Police Department shall follow any fire apparatus in response to a fire alarm, closer than one block, or park any vehicle within one block where fire apparatus has stopped in answer to a fire alarm.
- 10-13 No person shall drive on or over any unprotected hose of the Fire Department without the consent of the Fire Chief, Assistant in Command or any Constable.
- 10-14 No operator of a vehicle shall back a vehicle around a corner or through an intersection or along any street except when reasonably necessary in entering or leaving a parking place.
- 10-15 An operator of a vehicle before backing, shall give ample warning of his intention to do so and shall not back up unless such movement can be made without interfering with other traffic.
- 10-16 The operator of a vehicle entering a flow of traffic from a standing position at a curb, shall yield the right-of-way to the other vehicles using the street.
- 10-17 Whenever access can be had to the rear of the buildings, all deliveries or collections of commodities to or from stores, hotels, restaurants and commercial buildings shall be made therein.
- 10-18 Notwithstanding any traffic signal indication to proceed, no operator of a vehicle shall enter an intersection unless there is sufficient space on the other side of the intersection to accommodate the vehicle without obstructing the passage of pedestrians or other traffic.
- 10-19 (a) No person whether as a pedestrian or driver, and whether or not with the use or aid of any animal, vehicle or other thing, shall perform or engage in any stunt or other activity upon a highway that is likely to distract, startle, or interfere with other users of the highway.
(b) No person shall, whether by using or by means of the horn, engine, exhaust system, braking system, tires making contact with the roadway or otherwise, create or cause the emission of any loud and unnecessary noise from the motor vehicle, any part thereof, or anything or substance that the motor vehicle or a part thereof comes into contact with.
- 10-20 No person shall operate a vehicle within the City in a noisy or reckless manner so as to unduly disturb residents of the said City.
- 10-21 The right-of-way for all pedestrian and vehicular traffic shall be regulated as follows at intersections other than dispatched intersections:
- a) vehicles shall have the right-of-way on all portions of a street except at intersections or crosswalks.
 - b) pedestrians shall have the right-of-way at all intersections and crosswalks.
 - c) the operator of a vehicle entering the flow of traffic from a standing position at a curb or from an alley, garage, or driveway shall yield the right-of-way to all other pedestrians and vehicles.
 - d) the operator of a vehicle travelling at an unlawful speed or a pedestrian darting out into a crosswalk from a sidewalk in such a manner as to give no warning of his intention to cross the street shall forfeit any right-of-way which he might otherwise have herein.



- 10-22 At dispatched intersections, the right-of-way rules herein provided, shall not apply but all traffic shall move in accordance with the directions of the dispatching officer or signal lights.
- 10-23 Notwithstanding anything in this Bylaw, ambulances, police cars and fire department apparatus when on emergency duty only and when continually sounding an emergency gong, siren, or horn and exhibiting a flashing emergency red light, shall have the right-of-way upon all streets and at all intersections, and shall be excused from compliance with the provisions of this Bylaw; provided that due care and attention for the safety of other users of the roadway is taken.
- 10-24 Upon the sound of an emergency siren or gong or on sight of a flashing red light, all vehicles shall pull over to the right hand curb, coming to a full stop and give free and unobstructed passage to such emergency vehicle.
- 10-25 No operator of any vehicle shall turn such vehicle so as to proceed in the opposite direction at any point, except at an intersection of streets, neither of which is a driveway or alley, provided that such turn is not otherwise prohibited.
- 10-26 No operator shall drive or stand any vehicle upon any street or other public place in such a manner as to block, obstruct, impede or hinder traffic, thereon. Where such obstruction is unavoidable due to mechanical failure, the operator will not be in breach of this subsection, provided he promptly takes measures to clear the faulty vehicle from the street or parking place.
- 10-27 No person shall drive through or upon any street portion thereof or any other place which is roped, barricaded or where there is notice posted prohibiting the use of such street or place.
- 10-28 No operator of a vehicle shall drive within any sidewalk or boulevard area or across or along any curb, sidewalk, or boulevard except at a permanent or temporary driveway.
- (a) Notwithstanding this subsection, a person may with the written consent of the City Engineer and upon the conditions set down by same, drive across a curb, sidewalk, or boulevard at a point other than a regular crossing.
- 10-29 The operator of a vehicle emerging from an alley, driveway or garage shall stop such vehicle immediately prior to driving onto a sidewalk or sidewalk area extending across any such alley, driveway or garage entrance and yield the right-of-way to pedestrians and vehicles using the road or sidewalk.
- a) The owners or occupants of a garage or other place of business having a driveway over a sidewalk area shall display a warning sign sufficient to inform the public of the existence and danger of such driveway.
- 10-30 No person shall drive, operate or cause any vehicle to be drawn across any street so that the wheels or any other part of the vehicle or machinery will mar, injure or destroy the road surface. Any person causing such damage shall be liable for the expenses of repairing such street.



10-31 Every person propelling any push cart or riding or driving any animal upon any street shall be subject to the provisions of this Bylaw.

10-32 Unless otherwise posted by proper signage authorized by City Council, no person shall drive any vehicle at a rate of speed greater than those listed in Schedule 6 attached hereto and forming part of this bylaw.

10-33 For purposes of this Bylaw the applicable hours of a school zone shall be between:

- a) 8:00 a.m. and 9:30 a.m.
- b) 11:30 a.m. and 1:30 p.m.
- c) 3:00 p.m. and 4:30 p.m.

on any day on which school is held.

10-34 For purposes of this Bylaw the applicable hours of a playground zone shall be between the hours of 8:30 a.m. and 1 hour after sunset.

10-35 No driver shall pass or attempt to pass a vehicle moving in the same direction as he is in a school zone or playground zone when the speed limit prescribed by Section 10-32 a) ii) is in effect.

10-36 No person shall open the door of a motor vehicle on the side available to moving traffic for a period of time longer than necessary to load or unload wares or passenger.

10-37 Notwithstanding the provisions of this Bylaw, City Council may, by resolution set a maximum speed on any street or portion of any street and shall cause to be erected and maintained signs indicating such maximum speed. No person shall drive a vehicle on any street or portion thereof upon which such signs have been erected at a speed greater than that indicated by such sign.

10-38 No motor vehicle shall be driven on any street within the corporate limits of the City of Lloydminster having displayed, mounted, attached, or affixed to it any advertisement or display offering for sale the said motor vehicle. Any owner or operator permitting a motor vehicle to be operated in violation of the aforementioned paragraph is in breach of this bylaw.

SECTION XI

WEIGHTS AND SIZES OF LOADS

11-1 The maximum gross weight that may be transmitted to the street through any point or points of contact of any vehicle or combination of vehicles when operated or moved over or upon a City street or section thereof without a permit issued under section 11-9 of this bylaw.

a) Subject to clause (b) and a maximum tire width of 13 inches by any wheels 500 pounds for each inch of width of tire on such wheel.

b) By the wheels on any single axle having 18 inches or less of tire -----9,000 pound



- c) On any single axle other than for a two axle truck having
a gross weight less than 20,000 pounds-----18,000
pound
- d) On any tandem axle group -----32,000
pound
- e) By the wheels on any axle of any axle of tandem axle group -----18,000
pound
- f) Subject to clause (g) on any group of 3 or more consecutive axles on which the distances
between any axle or tandem axle group does not meet the definition of a single or tandem
axle group and which includes the steering axle of a power unit or trailer -----
42,000 pound
- g) For every foot or fraction thereof that the steering axle is less than 10 feet from the next
closest adjacent axle there shall be a corresponding reduction in the load of 2,000 pounds on
that group of axles.
- h) For a 1 axle trailer -----56,000
pound
- i) For any semi-trailer unit or combination of vehicles ----- 74,000
pound

11-2 For the purpose of this bylaw the following streets shall be exempt from the provisions of
Section 11-1; these streets shall be known as truck routes;

- A)
 - i. 44 Street right through the City
 - ii. 62 Avenue from 44 Street to 52 Street
 - iii. 40 Avenue from 44 Street to 52 Street
 - iv. 52 Street from 40 Ave to 62 Ave
 - v. Highway 17 through the city
 - vi. 55 Avenue from 44 Street to 52 Street
 - vii. 59 Avenue the from 44 Street to 52 Street
- B)
 - i. The maximum gross weight that may be transmitted to the street throughout any point or
points of contact of any vehicle or combination of vehicles when operated or moved over or
upon the streets mentioned in section 11-2(A) or section thereof without a permit issued
pursuant to Section 11-8 of this bylaw, shall not exceed;
 - a. Subject to clause (b) and a maximum tire width of 13 inches by any wheel, 500 pounds
for each inch of width of tire on such wheel.
 - b. By the wheels on any single axle having 18 inches or less of tire -----9,000
pounds
 - c. On any single axle other than for a two axle truck having a gross weight less than 20,000
pounds -----20,000
pounds
 - d. On any tandem axle group -----35,000
pounds
 - e. By the wheels on any axle of any tandem axle group -----18,000
pounds
 - f. Subject to clause (g) on any 3 or more consecutive axles on which the distances between
any axle or tandem axle group does not meet the definition of a single axle or tandem axle
group and which includes the steering axle of a power unit or trailer -----
42,000 pounds



g. For every foot or fraction thereof that the steering axle is less than 10 feet from the next closest adjacent axle there shall be a corresponding reduction in the load of 2,000 pounds on that group of axles.

h. For a 4 axle trailer -----56,000
pounds

i. For any semi trailer unit -----82,000
pounds

C) a. the maximum gross weight for:

i. a 4 axle truck -----59,000
pounds

ii. for any semi- trailer unit -----82,000
pounds

iii. for any combination of vehicles other than those included in clause
(i) and (ii) ----- 110,000
pounds.

11-3 Whenever a vehicle or truck passing over any street of the City is found to be operating in violation of the provisions of this section, such vehicle shall not be permitted to proceed further until the excess load is reduced or a permit is obtained from the City to comply with the provisions of this bylaw.

11-4 A) No vehicle and its load exceeding in width 8 feet 6 inches in height 13 feet 6 inches; and in length 65 feet shall be moved over any street unless authorized by a permit issued by the City Clerk in pursuance with this bylaw. Such permit shall not be required for a vehicle and its load of loose hay, straw, or fodder if such vehicle and load do not exceed a width of 10 feet.

B) Notwithstanding the above, trucks pulling a Mobile Home and have either a Saskatchewan or Alberta permit to haul such mobile home may proceed straight through the City or directly to a Mobile Home sales lot without obtaining a City permit to do so.

11-5 Any Constable may request any load to be weighed. The operator of any vehicle shall upon request of a Constable take his vehicle to a scale designated by such Constable and submit it to be weighed before proceeding.

11-6 The City Council may designate certain classes of vehicles which shall not be operated within the City other than on streets designated by signs as truck routes. Such truck routes may be determined from time to time by the City Council. No person shall operate a vehicle in contravention of these truck routes.

11-7 No person shall operate a vehicle in violation of section 11-6 unless the operation of such vehicle elsewhere than on a truck route is necessary to make a delivery to do work or to obtain repairs for the vehicle, and also has a permit permitting such operation within the City.

11-8 The City Engineer may at his discretion place street bans on any street or portion of street, such bans shall be posted at the four entrances to the City and advertised in the local newspaper.



- 11-9 Any person who is unable to comply with the weight, width or length restrictions or any other section of this Bylaw may obtain a permit to operate such vehicle from the City Clerk.
- a) Such permit shall be free of charge and shall comply with Form "B" of this bylaw schedule.
 - b) Any person obtaining such a permit shall not use it for any other purpose except for the conditions set down on such permit.

SECTION XII

IMPOUNDING AND DISPOSAL OF VEHICLES

- 12-1 Any Constable may impound any vehicle which is operated, placed, left, kept or which constitutes a hazard or otherwise is in violation of this Bylaw, or any other Bylaw, on any street, alley or other public parking place, provided, however, this section shall not apply to over staying time in a metered parking place for any period less than two (2) hours.
- 12-2 Any Constable, upon request of the owner, licensee or permittee of private property, may impound any vehicle which has been left, placed or parked on such private property without the consent of the owner, licensee or permittee.
- 12-3 Every vehicle impounded pursuant to the provisions of this Bylaw shall be placed in such premises as may be provided for such purpose and shall be kept for such length of time and subject to such conditions as are herein after provided.
- 12-4 No person shall attempt to prevent the impounding of any vehicle or in any manner interfere with the impounding of any vehicle.
- 12-5 The owner of any vehicle which has been impounded pursuant to the provisions of this Bylaw may recover possession of such vehicle prior to its sale, as herein provided, upon proof of his ownership thereof and upon payment of the impounding charges, which charges shall be in accordance with Section 12-12 of this Bylaw. Provided that no vehicle which is found to be unfit for operation will be restored to the owner thereof unless the said owner or other person duly authorized on his behalf shall have satisfied the Chief Constable that he has made proper provision to put the said vehicle in such condition that it may be operated on the streets of the City without contravention of the law.
- 12-6 Upon the impounding of any vehicle, the City Commissioner shall within seventy-two (72) hours of ascertaining the owners name and address forward a written notice to the owner thereof by registered mail.
- a) The said notice shall contain a description of the vehicle, a statement of the impounding charges and shall also state the place where the vehicle is presently located and the time and the manner in which and the place where it is to be sold.
 - b) If the name or address of the owner of any vehicle which is impounded pursuant to the provisions of this Bylaw is unknown and cannot be readily ascertained, the City Commissioner shall publish a notice in one issue of a weekly newspaper having a circulation in the City, containing a description of the said vehicle, stating that it may be sold if not reclaimed and giving the date on which the sale will take place, which date shall not be less than thirty (30) days after the last publication of the said notice.
 - c) Failure to give or insufficiency of the notices herein provided shall not invalidate any sale.



- 12-7 If the owner of any vehicle impounded pursuant to the provisions hereof fails to reclaim the same and pay the charges incurred in connection with the impounding of the said vehicle within thirty days (30) from the date of the notice provided for in section (12-6) (a) hereof, the Chief Constable may dispose of such vehicle by public auction, according to the following conditions
- a) The City Commissioner may put a reserve price on any vehicle to be sold pursuant to this Bylaw in which case no vehicle may be sold under such price.
 - b) Any vehicle which is put up for sale by public auction but which is not sold may be sold by the City Commissioner by private sale and if no private sale can be effected, then the City Commissioner shall report to the Council which shall thereon by resolution direct how such vehicle shall be dealt with.
- 12-8 Upon the sale of any vehicle pursuant to the provisions hereof, the City Commissioner shall, after deducting the charges, pay the balance of the proceeds of the sale to the City Treasurer to be held in trust for the owner thereof. If such moneys shall have been so held by the City Treasurer for one (1) year and if no lawful claim has been made therefor, the said moneys shall be forfeited to the general funds of the City and shall form part thereof.
- 12-9 a) The City Commissioner shall keep a record of every vehicle impounded pursuant to the provisions of this Bylaw and the name and address of the owner thereof, if known. He shall also keep a record of the time when and place from which the said vehicle is restored to the owner thereof or is sold as the case may be.
- b) In event of any such vehicle being sold as herein provided, the City Commissioner shall keep a record of the particulars of the sale and the amount of any surplus, if any, accruing to the owner thereof over and above the amount of the impounding charges.
- 12-10 The impounding of any vehicle under this Bylaw shall not relieve the owner of liability under any other Bylaw of this City for any offence for which he would otherwise be liable and he shall pay any such penalty as a condition precedent to recovery of his vehicle or the proceeds thereof under this Bylaw.
- 12-11 Where a vehicle has been impounded under this Bylaw no person shall take it out of the possession of the person who impounded such vehicle or remove it from the place in which it has been stored, without the written consent of the Chief of Police.
- 12-12 The following costs, fees, charges and expenses shall be levied and imposed on the owner of any vehicle impounded pursuant to the provisions of this Bylaw:
- a) Removal from any part of the City \$20.00
 - b) Storage per day \$ 2.00
 - c) Where any vehicle requires extra services or additional facilities necessary for its proper handling, the cost of such extra service or additional facilities shall be added to such charges.
 - d) The costs incidental to transfer of title or other like costs shall be borne by the purchaser of any vehicle sold.
 - e) The costs of any advertising either for the owner or for sale shall be charged as a cost.
- 12-13 Notwithstanding anything in this Bylaw:



Any Constable may impound, for a period not exceeding thirty days, any bicycle or other type of conveyance which is left, placed, kept or constitutes a hazard or is otherwise in violation of this or any other Bylaw of the City.

SECTION XIII
MOTOR TOBOGGANS

- 13-1 No person shall operate a motor toboggan anywhere within the limits of the City except on private property and with the permission of the owner thereof
a) In any prosecution under this section, proof that the motor toboggan was operated within the limits of the City shall be prima facie proof of a breach of this section, unless the person charged proves to the satisfaction of the Magistrate or Justice of the Peace trying the case, that the motor toboggan was operated on private property and with the permission of the owner thereof.
- 13-2 No person shall operate a motor toboggan in the City after sundown unless the motor toboggan is equipped with an electric head lamp at the front and a red lamp at the rear of the motor toboggan and both lamps are in operation.
- 13-3 No person shall operate a motor toboggan in the City in such a manner as to constitute a nuisance or create an undue annoyance to residents or other persons in the City.
- 13-4 No person shall operate a motor toboggan in the City in a manner that is dangerous to other persons or property.
- 13-5 Any Constable may seize any motor toboggan being operated in breach of this Bylaw and may retain custody of same until the determination of the charge respecting such breach.

SECTION XIV
ONUS

- 14-1 The owner of a vehicle or trailer other than a public service vehicle is liable for violations of any provisions of this Bylaw in connection with the operation of the vehicle or trailer, unless he proves to the satisfaction of the Magistrate or Justice of the Peace trying the case, that at the time of the offence the vehicle or trailer was not being operated by him, nor by any other person with his consent, expressed or implied.
- 14-2 Where at the time of a breach of any provisions of this Bylaw in connection with the operation of a motor vehicle, other than a public service vehicle the vehicle was not being operated by the owner of the vehicle nor by any other person with his consent, expressed or implied, the person in charge of the vehicle is liable for the breach unless he proves to the satisfaction of the Magistrate or Justice of the Peace trying the case that the vehicle was not being operated by him nor by any other person with his consent, expressed or implied.
- 14-3 Subject to section 14-2 the owner of a public service vehicle shall be liable for violation of any provision of this Bylaw in connection with the operation of the vehicle, whether or not at the time of the offence the vehicle was being operated by him.



- 14-4 The owner is not liable as herein above provided if he proves to the satisfaction of the Magistrate or Justice of the Peace trying the case that at the time of the offence the vehicle was not being operated by him, nor by any other person with his consent, expressed or implied.
- 14-5 The owner of a motor toboggan is liable for violation of any of the provisions of this Bylaw in connection with the operation of the motor toboggan, unless such owner proves to the satisfaction of the Magistrate or Justice of the Peace trying the case, that at the time of the offence the motor toboggan was not being operated by him nor by any person with his consent, expressed or implied.

SECTION XV

PENALTIES

- 15-1 Any person, firm, company or corporation charged with a breach of this Bylaw may, in lieu of appearing in Court, pay the sum indicated on the traffic ticket to the office of the City Clerk of the City of Lloydminster.
- a) If such person charged pays the amount of the penalty set out by the Constable he waives his right to a hearing and a conviction will be recorded as if he had appeared in Court and pleaded guilty. Such payment shall be in the form of a money order, cash, or certified cheque.
- 15-2 Any person, firm, company, or corporation committing a breach of the offenses as listed in Schedule 1 of this Bylaw, in lieu of the penalty provided in section 15-3, may pay to the office of the City Clerk of the City of Lloydminster the penalty as outlined in Schedule 1 of this Bylaw, for the corresponding offence. In the event of failure to make payment for such offence within thirty (30) days of the date of the commission of the offence, such person shall be subject to the provisions of section 15-3.
- 15-3 Any person, firm, company or corporation committing a breach of this Bylaw, except where otherwise stated herein, shall be liable upon summary conviction by a Magistrate, Provincial Judge, or Justice of the Peace, whose territorial limits and jurisdiction includes the place of the occurrence of the breach:
- a) For an offence to a fine of not less than one hundred (\$100.00) dollars nor more than five hundred (\$500.00) dollars, plus court costs.
- 15-4 Notwithstanding anything in this Bylaw, Schedule 3 of this bylaw outlines the penalties that shall be paid for the corresponding violation.
- 15-5 A person who violates any provision of section 11-1 or exceeds the maximum weight specified in a permit issued to him under section 11-9 is guilty of an offence and liable on summary conviction to a fine of not less than \$25 nor more than \$100 for the first offence, and not less than \$25 nor more than \$200 for a subsequent offence, and is also liable for any damage or injury done or caused to a street or a public building or improvement, or to any person or property through the violation and where the violation is that of exceeding the maximum gross weight, or the gross weight specified in the permit the Provincial Magistrate or Justice of the Peace shall impose a further fine of \$3.00 for each 100 pounds or fraction thereof by which the actual gross weight exceeds the prescribed maximum gross weight, provided that in computing the further fine 1,000 pounds or two per cent of the maximum



gross weight fixed by the Bylaw or specified in the permit, whichever is the lesser, shall not be taken into account and in addition to the further fine the Provincial Magistrate or Justice of the Peace may order that the vehicle in respect of which the offence was committed shall be immediately seized, taken into the custody of the law and impounded for a specified period of not less than five days or until the fine and costs have been fully paid and satisfied, whichever is the longer period. "Costs" includes the expenses of impounding the vehicle and of keeping it impounded.

15-6 In respect to the offence of speeding under this Bylaw, the payment by the offender of the penalty sums and costs listed in Schedule 4 without appearing in court in answer to a summons is hereby adopted.

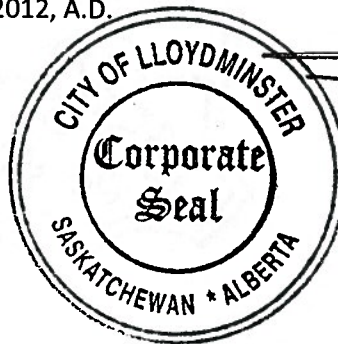
This Bylaw shall repeal Bylaw 23-76 and amending bylaws thereto including Bylaws 07-1977, 31-1977, 33-1977, 35-1977, 04-1978, 66-1978, 75-1978, 05-1979, 18-1980, 48-1980, 36-1986, 21-1988, 02-1989, 30-1989, 21-1990, 22-1999, 01-2001, 26-2001, 20-2003, 22-2004, 31-2004, 06-2006, 17-2009, 19-2011, 21-2011.

This Bylaw shall come into force and effect June 4, 2012.

INTRODUCED AND READ a first time this 14th day of May, 2012, A.D.

READ a second time this 14th day of May, 2012, A.D.

READ a third time this 14th day of May, 2012, A.D.




MAYOR


CITY CLERK

SCHEDULE 1
TO BYLAW 29-2012

Penalties to be Charged for the Corresponding Offense
Pursuant to Section 15-2

<u>SECTION</u>	<u>OFFENCE</u>	<u>PENALTY</u>
6-1	Private Parking	50.00
6-2 (a)	Within 10 feet of Fire Hydrant	75.00
6-2 (b)	Within 6 feet of a driveway	10.00
6-2 (c)	Emergency exit	20.00
6-2 (d)	Airport runway or taxi strip	20.00
6-2 (e)	Yellow curb	10.00
6-2 (f)	Loading Zone	10.00
6-2 (g)	In an intersection	20.00
6-2 (h)	On a crosswalk	10.00
6-2 (i)	On a sidewalk or boulevard	75.00
6-2 (j)	In front of a Fire station entrance	20.00
6-2 (k)	Restricted to certain classes	10.00
6-2 (l)	In an alley	10.00
6-2 (m)	Signed area	10.00
6-2 (n)	Fire Dept. lot	20.00
6-2 (o)	City Hall parking lot	10.00
6-2 (p)	Hooded meter	10.00
6-2 (q)	15 feet of intersection or sign	75.00
6-2 (r)	Restricted to Handicap or Disabled Parking	100.00
6-2 (s)	Timed Parking Violation	50.00
6-2 (t)	Parked in a Fire Lane	75.00
6-3	Double park	20.00
6-4	Vehicle displayed for sale	50.00
6-5	Bus Stop	50.00
6-6	No current plates	75.00
6-7 (a)	Repairing vehicles	20.00
6-7 (b)	Unattended jacked-up vehicle	20.00
6-8	Unhitched trailer	75.00
6-9	Vehicles carrying explosives or flammables	20.00
6-10	Parking over 48 hours	75.00
6-11	Over 3/4 ton downtown or residential area	10.00
6-12	City Hall zone	10.00
6-13	Parking and obstructing traffic	20.00
6-14	Parked in Funeral Zone	20.00
7-1	Angle parking improperly	10.00
7-2	Parallel parking improperly	10.00
7-3	Left side to curb	75.00
7-4	Improper parking in stalls	10.00
7-5 (a)	Angle parking too far from meter	10.00



7-5	(b)	Parallel parked too far from meter	10.00
7-6		Parked vehicle leaking gas	20.00
8-1		Expired Meter	5.00
8-2(a)		Second offence of Section 8-1	10.00
8-2(b)		Over 2 hours on meter	10.00
8-2(c)		Over 10 hours on meter of Parking Lot	10.00
10-1		Delivery blocking traffic vehicle	20.00



SCHEDULE 2

To Bylaw 29-2012

Conditions and Costs for the Issue of Parking Permits Pursuant to Section 8-3

Parking Permits

Description	Time Limit	Fee
Class 1		
City Business available to Mayor, Aldermen, Police Vehicles, Fire Vehicles and paraplegics.	One (1) Hour	No Charge
Class 2		
City and Government business available to City owned vehicles, Government of Saskatchewan or Alberta vehicles, Press vehicles (radio, television or newspaper)	One (1) Hour	\$110.00/yr OR \$ 10.00/month
Class 3		
Commercial delivery and Pick-up available to licensed City businesses.	One-half (1/2) Hour	\$110.00/yr OR \$ 10.00/month
Class 4		
Repair and Service available to licensed repair and service companies.	One (1) Hour	\$110.00/yr OR \$ 10.00/month
Class 5		
Construction available for construction operations in metered areas, No Parking, or Loading Zones.	No Time Limit	\$2.00 per day/each stall
Class 6		
Daily - available to vehicles registered out of Alberta and Saskatchewan.	No Time Limit – valid for one week only	No Charge



SCHEDULE 3

To Bylaw 29-2012

Outline of Penalties for Violations

Pursuant to Section 15 – 4

a) A penalty of not less than \$5.00 and not more than \$10.00 shall be imposed for violations of the following sections:

5-1, 5-3, 5-5, 5-6, 5-7, 5-8, 5-9, 8-5

b) A penalty of not less than \$10.00 and not more than \$20.00 shall be imposed for violations of the following sections:

2-3

5-2, 5-4, 5-10

9-1, 9-2, 9-4

10-1, 10-3, 10-4, 10-5, 10-6, 10-8, 10-11, 10-12, 10-13, 10-15, 10-16, 10-17,
10-18, 10-20, 10-21, 10-26, 10-29

11-5, 13-2, 13-3, 13-4

c) A Penalty of not less than \$25.00 and not more than \$50.00 shall be imposed for violations of the following sections:

3-2, 3-4

4-8, 4-10, 4-12, 4-13

8-5

9-3

10-2, 10-7, 10-9, 10-10(a), 10-10(b), 10-14, 10-19, 10-24, 10-25, 10-27, 10-28, 10-30

11-3

13-1

d) A Penalty of not less than \$50.00 and not more than \$100.00 shall be imposed for violations of the following sections:

4-1, 4-2

6-14(a)

8-6

11-4,

12-4, 12-11



SCHEDULE 4

To Bylaw 29-2012

**Costs of Penalty Sums and Costs with respect
to the offense of Speeding
Pursuant to Section 15-6**

	Payment
1. Where the speed limit is 55 km per hour or less and the speed of the vehicle is:	
a) Not more than 15 km per hour in excess of the speed limit	\$60.00
b) More than 15 but not more than 25 km per hour in excess of the speed limit	\$70.00
c) More than 25 km per hour in excess of the speed limit	\$80.00
2. Where the speed limit is over 55 km per hour and the speed of the vehicle is:	
a) Not more than 15 km per hour in excess of the speed limit	\$50.00
b) More than 15 but not more than 25 km per hour in excess of the speed limit	\$60.00
c) More than 25 km per hour in excess of the speed limit	\$75.00

Any person who commits a breach of any of the above sections shall, on summary conviction, be liable to a penalty of not less than the sum set out thereunder, nor more than \$150.00 and in default, to a term of imprisonment not exceeding 15 days.



SCHEDULE 5
To Bylaw No 29-2012

FORM "A"

THE CITY OF LLOYDMINSTER
PARADE APPLICATION

APPLICATION having been made by: Name _____

Address _____

Phone No. _____

on behalf of _____

FOR PERMISSION TO HOLD A PARADE CONSISTING OF:

ROUTE PROPOSED:

DATE AND TIME PROPOSED:

OTHER CONDITIONS:



RECOMMENDED _____ Chief of Police

REQUIRED INSURANCE OBTAINED _____ City Commissioner

PERMISSION GRANTED TO APPLICANT TO HOLD A PARADE ON THE STREETS
AT THE TIME AND SUBJECT TO THE CONDISIONS HEREIN SET OUT AND TO THE
PROVISIONS OF THE TRAFFIC BYLAW.

MAYOR



SCHEDULE 5

To Bylaw 29-2012

FORM "B"

**THE CITY OF LLOYDMINSTER
TRANSPORTATION PERMIT**

In accordance with the provisions of Section 11-9 of the "Lloydminster Traffic Bylaw" permission is hereby granted to:

Charge to: _____

Address: _____

Hauled by: _____

To Transport: _____ Gross Weight: _____

Tractor Licence: _____ Trailer Licence: _____

Number of Axles: _____

Width: _____ Length: _____ Height: _____

Axle Loads – Steering: _____ Drivers: _____

Trailer: _____ Total: _____

Tire Sizes – Steering: _____ Drivers: _____

Trailer: _____

Within or through the City of Lloydminster via:

Restrictions:



Date: _____ Date Expires _____ A.M./P.M.

Applicants Signature: _____

Authorized by: _____

NOT RECORDED
MAR 2 2014

EXHIBIT 10112

10112



SCHEDULE 5

To Bylaw 29-2012

FORM "C"

THE CITY OF LLOYDMINSTER
APPLICATION FOR PARKING PERMIT

UNDER SECTION 8, SUBSECTION 3
OF THE LLOYDMINSTER TRAFFIC BYLAW

I, _____ OF _____
(Firm Name)

BEING THE OWNER OF A VEHICLE: _____
(Make and Type)

LICENSE NUMBER: _____, DO HEREBY MAKE APPLICATION FOR A
PARKING PERMIT FOR LOADING AND UNLOADING GOODS WITHIN THE CITY
OF LLOYDMINSTER AND AGREE TO ABIDE BY THE CONDITIONS AS SET OUT
UNDER SECTION 8, SUBSECTION 3, CLAUSE (a) OF THE LLOYDMINSTER
TRAFFIC BYLAW.

APPLICATION TO COVER PERMIT FOR THE YEAR _____ TO _____
UNLESS REVOKED BY CITY COUNCIL.

DATED AT LLOYDMINSTER THIS _____ DAY OF _____ A.D. 19_____.

(Signature of Applicant)

APPROVED ON BEHALF OF THE CITY OF LLOYDMINSTER THIS

_____ DAY OF _____ A.D. 19_____.

(Signature and Title)

DATE: _____



CITY POLICE

APPLICANT'S SIGNATURE:

AUTHORIZED BY:



SCHEDULE 5

To Bylaw 29-2012

FORM "D"

THE CITY OF LLOYDMINSTER

SOUND TRUCK PERMIT

Under the provisions of Section 4-13 of the Lloydminster Traffic Bylaw:

Permission is hereby granted to: _____

To operate a sound truck on the _____ day of _____ A.D. 19____.

Between the hours of _____ and _____.

Any deviation of the use of the said sound truck other than within the dates and times set forth in this permit shall be in violation of section 4-13 and will result in prosecution.

A copy of this permit shall be retained by the operator of the sound truck and shall be shown to any officer of the City Police Department or R.C.M.P.

Approved: _____

(Mayor, City of Lloydminster)

Issued by: _____

(N.C.O., R.C.M.P. Lloydminster Detachment)

Date: _____



SCHEDULE 6

To Bylaw 29-2012

Schedule of Allowable Rates of Speed on City Avenues and Streets

Pursuant to Section 10-32

10-32

a) Unless otherwise posted by proper signage authorized by City Council, no person shall drive any vehicle at a rate of speed greater than:

- i) 20 kilometers per hour in any lane or alley
- ii) 30 kilometers per hour on any avenue or street within school zones and playground zones during applicable hours
- iii) 50 kilometers per hour on all other avenues and streets

b) Notwithstanding Subsection 10-32 a) iii) a 60 kilometers per hour speed zone shall exist as follows:

	<u>ON</u>	<u>FROM</u>	<u>TO</u>
i)	40 Avenue	South City Limits (12 Street)	125m North of 52 Street
ii)	59 Avenue	250m South of 23 Street	36 Street
iii)	59 Avenue	100m North of 56 Street	62 Street
iv)	62 Avenue	36 Street	100m South of 43 Street
v)	62 Avenue	180m North of 44 Street	125m North of 52 Street
vi)	75 Avenue	400m South of 44 Street	400m North of 44 Street
vii)	12 Street	100m East of 49 Avenue	100m West of 50 Avenue
viii)	25 Street	150m West of 50 Avenue	59 Avenue
ix)	44 Street	250m East of 70 Avenue	The West City Limits
x)	52 Street	40 Avenue	62 Avenue
xi)	62 Street	130m West of 53 Avenue	62 Avenue
xii)	67 Street	750m East of 40 Avenue	40 Avenue
xiii)	62 Ave	125m North of 52 Street	200m North of 62 Street
xiv)	12 Street	400 m East of 50 Avenue	600 m West of 50 Avenue

c) Notwithstanding Subsection 10-32 a) iii) an 80 kilometers per hour speed zone shall exist as follows:

	<u>ON</u>	<u>FROM</u>	<u>TO</u>
i)	40 Avenue	125m North of 52 Street	North City Limits (1620m North of 67 Street)
ii)	12 Street	East City Limits (40 Avenue)	100m East of 49 Avenue
iii)	12 Street	100m West of 50 Avenue	West City Limits (75 Avenue)
iv)	67 Street	40 Avenue	West City Limits



			(2430m West of 75 Avenue)
v)	44 Street	100m West of 75 Avenue	West City Limits (810m West of 75 Avenue)
vi)	75 Avenue	South City Limits (12 Street)	400m South of 44 Street
vii)	75 Avenue	400m North of 44 Street	North City Limits (67 Street)
viii)	40 Avenue Limits	400 m South of 44 Street	South of 44 Street to South City (12 Street)

d) Notwithstanding Subsection 10-32 a) iii), the speed zones on the following avenues and streets shall exist in accordance with the latest Saskatchewan Highways and Transportation Deputy Minister's Order:

	<u>ON</u>	<u>FROM</u>	<u>TO</u>
i)	50 Avenue (Highway 17)	South City Limits (12 Street)	North City Limits (67 Street)
ii)	44 Street	East City Limits	50 Avenue (Highway 17)

