



Town of Crossfield

Final Report

Transportation Master Plan

June 2020





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1.0 Introduction

The Town of Crossfield (Crossfield) retained ISL Engineering and Land Services Ltd. (ISL) to update the Town of Crossfield Transportation Master Plan (TMP), previously prepared in 2007.

For this TMP Update, Crossfield's first travel demand model was developed. The model provides a more comprehensive tool for evaluation and assessment of the road network, now and in the future. The ultimate goal of the TMP is to provide a framework for Council and Administration to assess the capability of the road network to accommodate new development in the short and long term. This information is also useful for carrying out short- and long-term planning and budgeting, including development of off-site levies.

1.1 Background

Crossfield is a town located along the Queen Elizabeth II Highway (QEII) in southern Alberta within Rocky View County, approximately 50 kilometres north of Calgary. Crossfield had a population of 3,308 according to its 2018 Town Census. The Town is bisected by the CPR mainline track between Calgary and Edmonton, which runs adjacent to the downtown area and through its industrial area. According to the Town's Municipal Development Plan (MDP), its 2010 annexation added about 11 quarter-sections (708 hectares) of land to the Town. This updated TMP contemplates further potential expansion, with the Town currently considering about another 27 quarter sections in all directions.

1.2 Purpose of Study

The primary objectives of this TMP update were to:

- Assess the validity of the prior TMP and Network Analysis based on the updated land area to include annexed land in 2010, and population and traffic growth;
- Extend the study horizon to the future horizon of 15,800 population (Please refer to Section 2.2.1 for more details on the methodology to determine the population of the future horizon);
- Extend the study boundaries to include the annexed land in 2010;
- Develop a travel demand model to assess future growth of the town;
- Review / update the Town's standard roadway cross sections;
- Assess the required transportation network at the future horizon of 15,800 population; and
- Provide updated Class 5 cost estimates for existing road upgrades and future roadway infrastructure, to support a future update to the Town's transportation off-site levies.



2.0 Land Use and Modelling

Long-term forecasting for the TMP Update was completed with a travel demand model that ties intimately to existing and future land use for Crossfield and provides a rational basis on which to assess future transportation requirements. The travel demand model developed for the TMP will also provide an effective foundation for Crossfield’s ongoing use including evolution of land use plans, infrastructure planning, supporting development applications, and for other design purposes. The following sections provide a summary of the land use assumptions that form the basis for recommendations in this report.

2.1 Existing Land Use and Modelling

In Crossfield, the majority of the developed area is located west of Highway 2A with the downtown core established along Railway Street. The majority of commercial land uses are found in the downtown area, and industrial land use is mostly located south of Laut Avenue and east of the CPR track. For residential land use, most of the mature neighborhoods are located west of the CPR track on both sides of Limit Avenue.

2.1.1 Existing Zone Setup

For modelling purposes, Crossfield and the surrounding area were subdivided into various zones, as shown in Exhibit 2.1. The zone boundaries generally follow road boundaries and reflect natural and man-made divisions such as major roads, the railway tracks, section lines, and separation of land uses. Generally, the zone system provides a good breakout of the areas within Crossfield’s boundary, and provides a reasonably fine definition of land uses and zone connections to the road network for transportation modelling. The existing model for Crossfield consists of 49 internal zones with 22 zones within Crossfield and 27 zones within Rocky View County surrounding Crossfield.

Located within Rocky View County and along the QEII highway, Crossfield services many external trips (external to internal, internal to external, and external to external). Therefore, the interaction between residential and employment zones within Crossfield and with external municipalities is a key consideration. To provide a reasonable snapshot of transportation requirements and their impact on roadways within Crossfield, the transportation demand model was developed including 14 external zones to account for the external trips. External zones are used in the model to represent traffic passing into and out of Crossfield’s transportation system from regional destinations (Table 2.1).

Table 2.1: External Zones

External Zone	Roadway	External Zone	Roadway
801	QEII North	808	RNG RD 13 South
802	Hwy 2A North	809	TWP RD 282 West
803	TWP RD 292 West	810	RNG RD 11 South
804	RNG RD 12 North	811	QEII South
805	RNG RD 13 North	812	Hwy 72 East
806	TWP RD 290 West	813	Hwy 574 East
807	Hwy 574 West	814	TWP RD 292 East

2.1.2 Existing Population and Employment

Existing population data was derived from 2018 Town Census report and was further divided into smaller zones for the travel demand model. General employment data at the town level was provided and also obtained from Statistics Canada, and employment data by zone was estimated and confirmed with the Town prior to input to the model. There are four employment categories:

- Retail Employment – employment at retail / higher-turnover businesses
- Non-Retail Employment – employment at non-retail / lower-turnover businesses including offices
- Industrial Employment – employment at auto shops / industrial sites
- School Employment – employment at elementary / secondary schools

In 2018, the Town had an approximate population of 3,300 people, with 1,200 households and 1,100 jobs. The population and employment data are summarized in Appendix A and is shown graphically in Exhibits 2.2 and 2.3.

2.1.3 Existing Roadway Classification

For modelling purposes, the existing road classifications and related roadway capacities were based on the practical function of each roadway, while considering the local context. The modelled road classifications for Crossfield's transportation network are shown in Exhibit 2.4.

2.2 Future Land Use and Modelling

For the TMP Update, one future horizon of 15,800 population was modelled. The future land use was based on the approved Area Structure Plans (ASPs) within the Town and the future annexation area. Five ASPs were included in the future model:

- Hawks Landing ASP: Zone 201;
- Iron Landing ASP: Zone 202;
- Vista Crossing ASP: Zone 203;
- Sunset Ridge ASP: Zone 204;
- Crossfield East ASP: Zones 205 – 209 and 301 – 307;

2.2.1 Future Population and Employment

The future population and household information was extracted from the available ASPs. For the Crossfield East ASP, where land use data was not available, the population and household data are assumed using the land area, a maximum density of 6.0 gross units per acre (upa) per the Municipal Development Plan (MDP), and an average household population of 2.7 persons per household. The preceding was calculated based on the 2018 population and household counts from the 2018 Town Census.

Following similar methodologies as the existing employment estimation, employment figures were estimated within the ASP areas where commercial, industrial and school land uses were identified. The retail and non-retail jobs were primarily located in zones 103 and 104, while the industrial jobs were focussed in zone 109, and school jobs in zone 101.



Using the available ASP information, it was estimated that, for the future study horizon, the Town will approximately increase its population by 12,500 to 15,800, its households by 4,500 to 5,700, and local jobs by 2,900 to 4,000. The preceding future population and employment data was agreed to be implemented in the travel demand model by the Town in a meeting dated April 25, 2019. The future population and employment data are shown in Exhibits 2.5 and 2.6 and summarized in Appendix A.

According to the Town of Crossfield Municipal Development Plan (MDP) in 2018, population of 12,000 to 15,000 is expected in 2040. Using the existing population of 3,300 in 2018 and assuming a linear population growth, the various interim population horizons are estimated as follows:

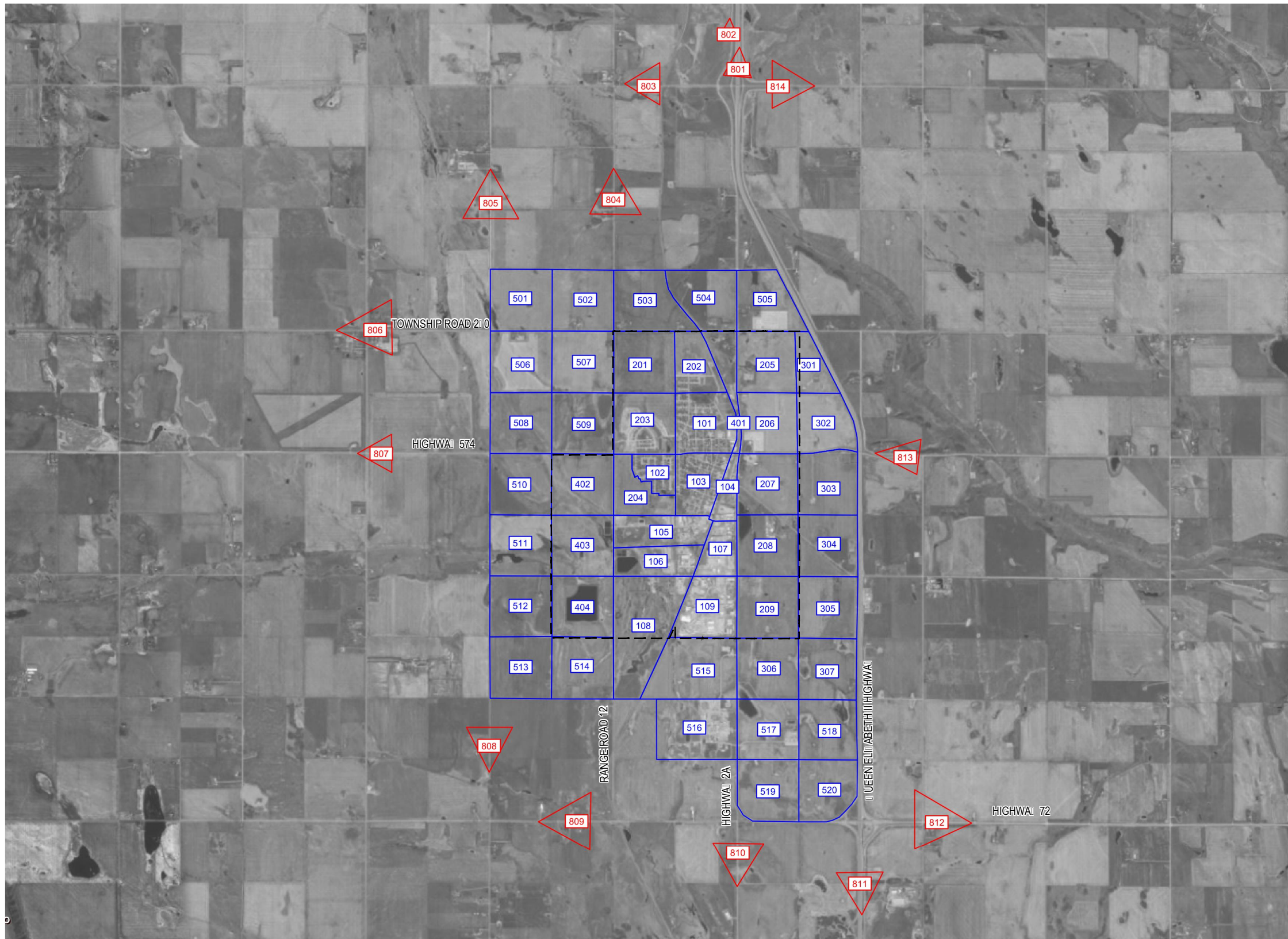
- 7,000 population: between 2025 and 2027;
- 10,000 population: between 2031 and 2035;
- 15,800 population: between 2042 and 2050;

2.2.2 Future Roadway Classification

For the modelling purposes, the future road classifications and related capacities were based on the road functions proposed in the ASPs while considering the local context. The road classifications for Crossfield's future transportation network are shown in Exhibit 2.7. It is noted that a future interchange at QEII and Highway 574 was contemplated in the Crossfield East ASP and was analyzed in one of the future scenarios, thus it is shown in Exhibit 2.7.




2.2.3 Future Background Traffic Growth

At the future horizon of 15,800 population, traffic to/from the external gates will also change. The background traffic growth pattern was based on historic highway growth pattern. Using Average Annual Daily Traffic (AADT) data from Alberta Transportation (AT) (2008-2017), it was calculated that near Crossfield, QEII has a linear annual growth rate of 2.4%, Highway 2A has a linear annual growth rate of 0.93% and Highway 574 has a linear annual growth rate of 2.66%. It is noted that, to be conservative, a minimum linear annual growth rate of 1.0% was assumed for all other gates for the study.



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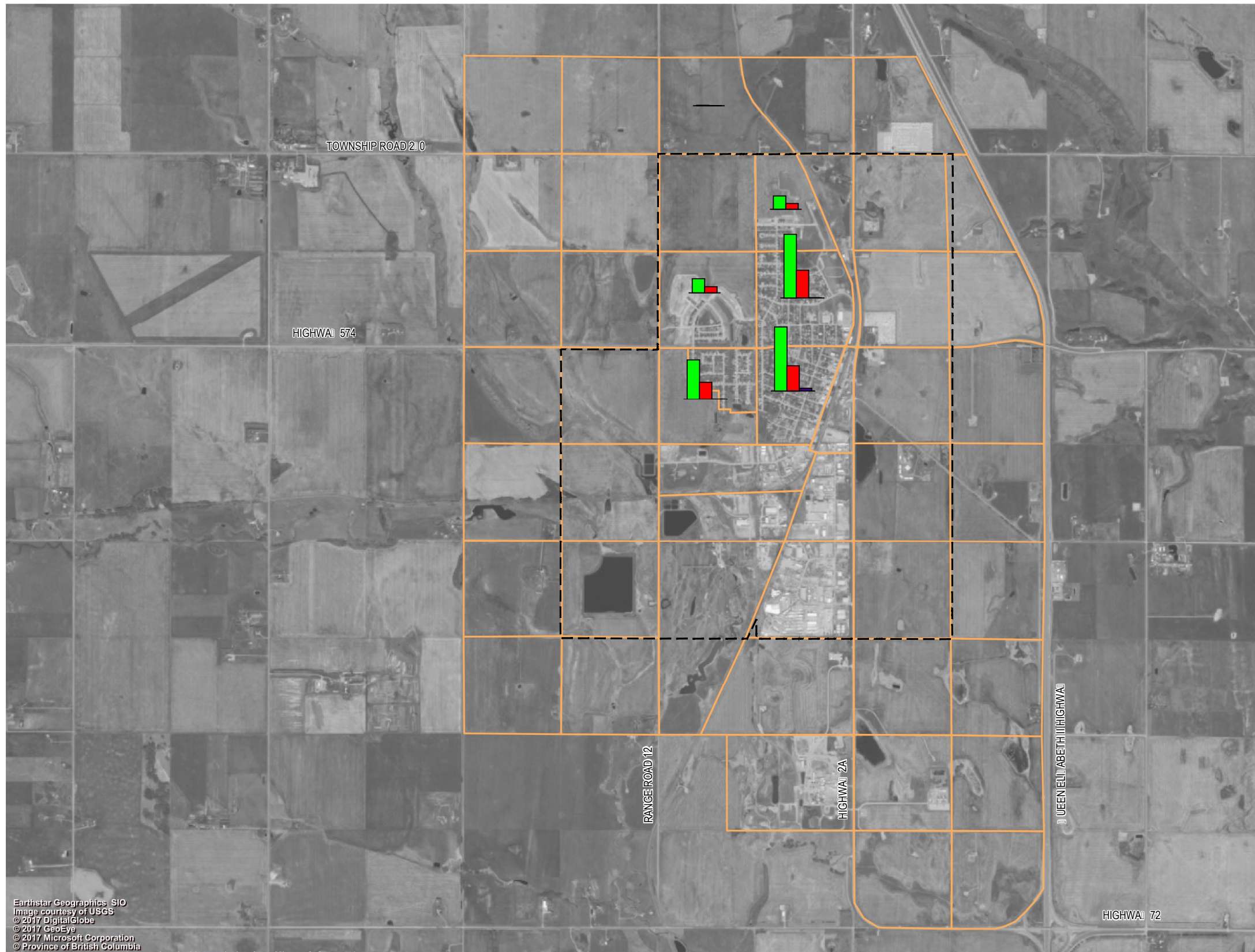
Legend:

-  INTERNAL ONE
-  INTERNAL ONE
-  TOWN BOUNDARY



CROSSFIELD TMP
TRANSPORTATION PLAN

EXHIBIT 2
 MARCH 2020

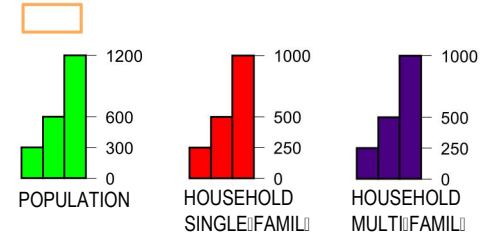


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Population and Household Existing

one Boundary



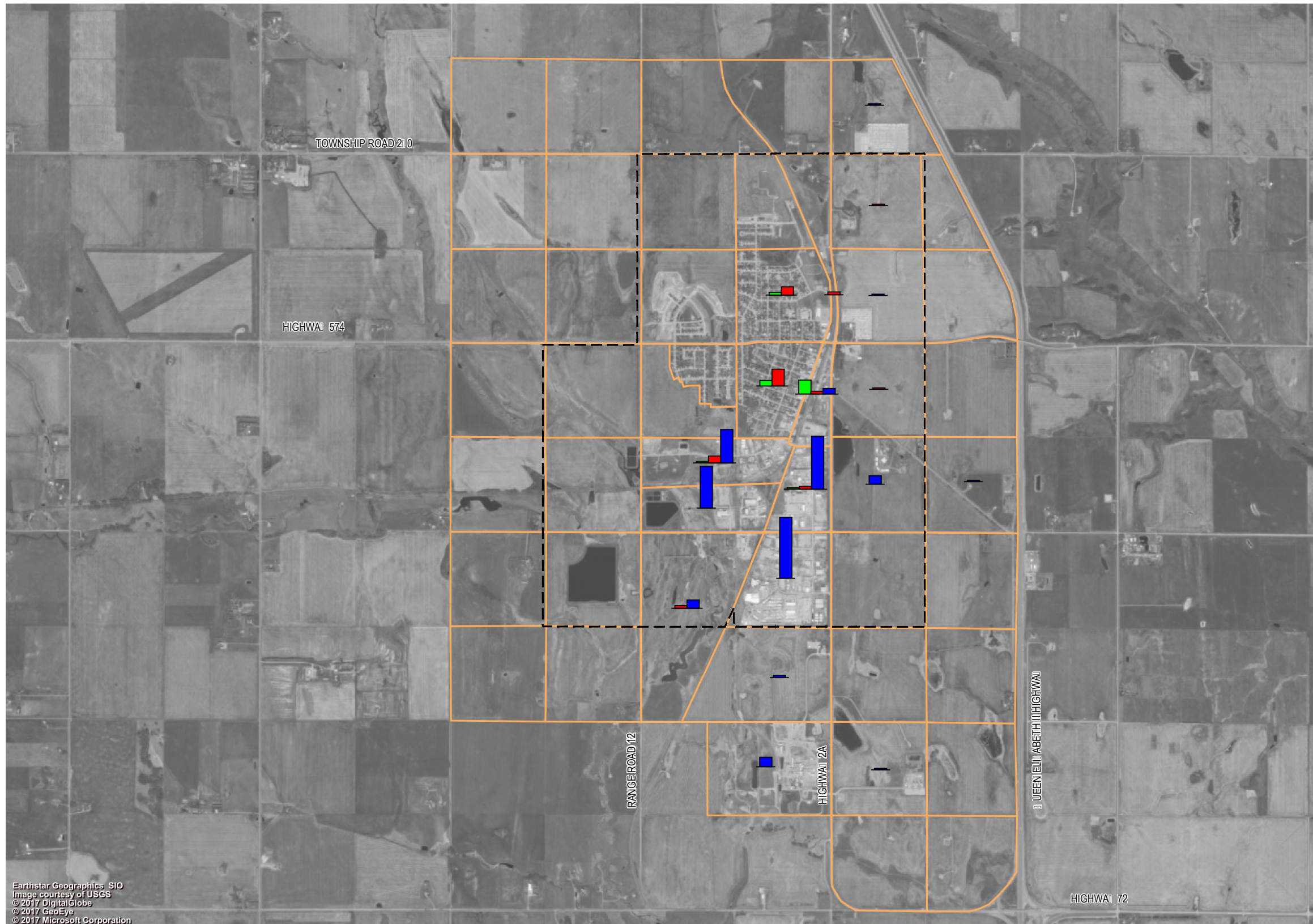
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CROSSFIELD TMP

EXISTING POPULATION

EXHIBIT 2.2
 MARCH 2020



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Employment Existing

one Boundary

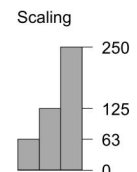


Chart

RETAIL

NON-RETAIL

INDUSTRIAL

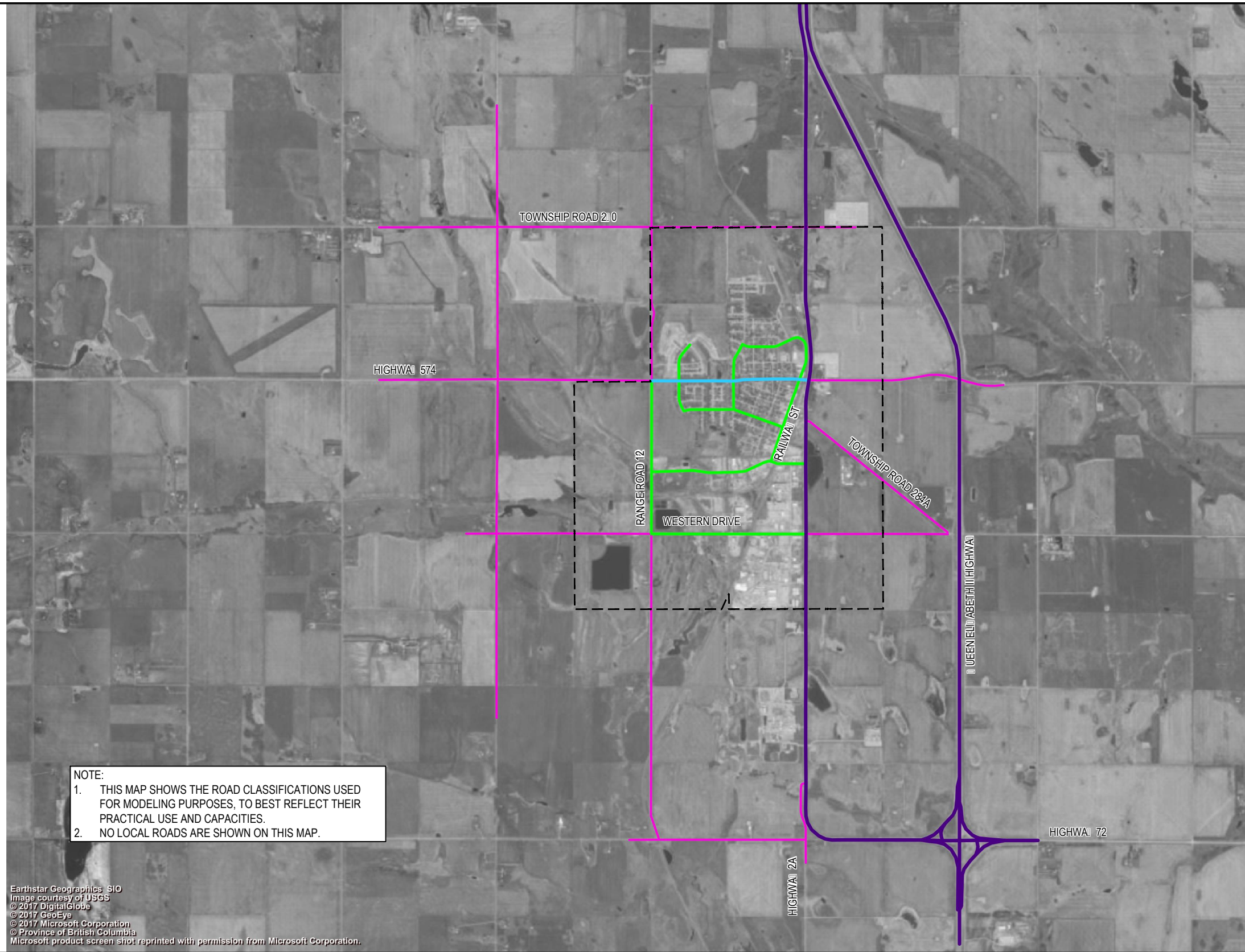


--- TOWN BOUNDARY

CROSSFIELD TMP

EXISTING EMPLOYMENT

EXHIBIT 2.3
MARCH 2020



NOTE:
 1. THIS MAP SHOWS THE ROAD CLASSIFICATIONS USED FOR MODELING PURPOSES, TO BEST REFLECT THEIR PRACTICAL USE AND CAPACITIES.
 2. NO LOCAL ROADS ARE SHOWN ON THIS MAP.

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Existing Road Classification

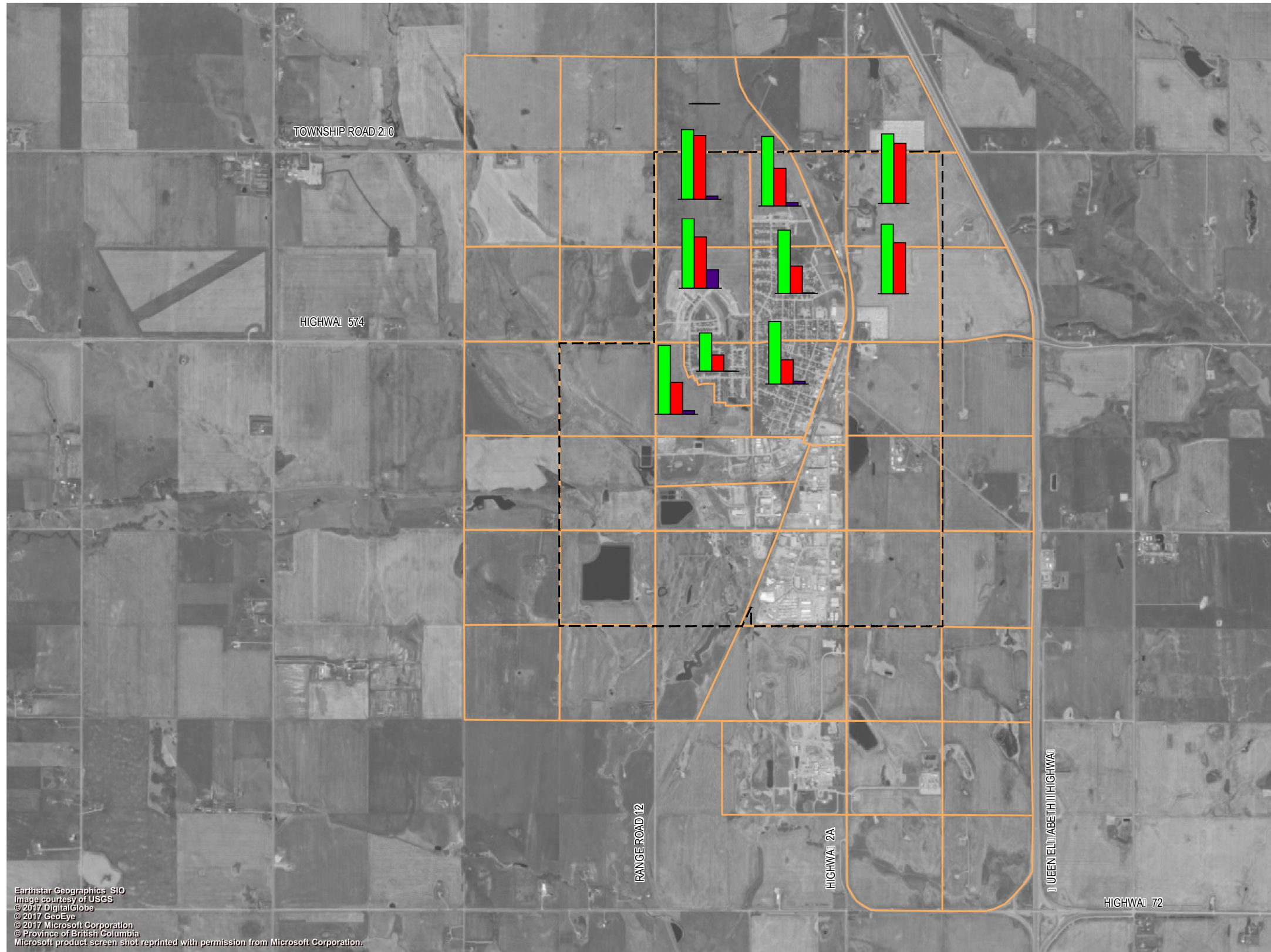
- Type
- HIGHWAY
 - ARTERIAL
 - COLLECTOR
 - RURAL
 - TOWN BOUNDARY



CROSSFIELD TMP

EXISTING ROAD CLASSIFICATION

EXHIBIT 2.0
 MARCH 2020

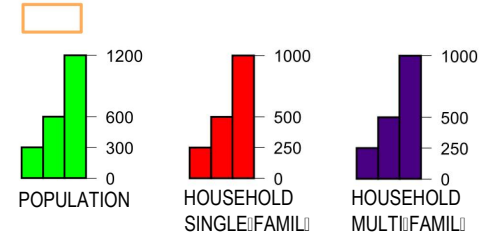


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Population and Household Future

One Boundary



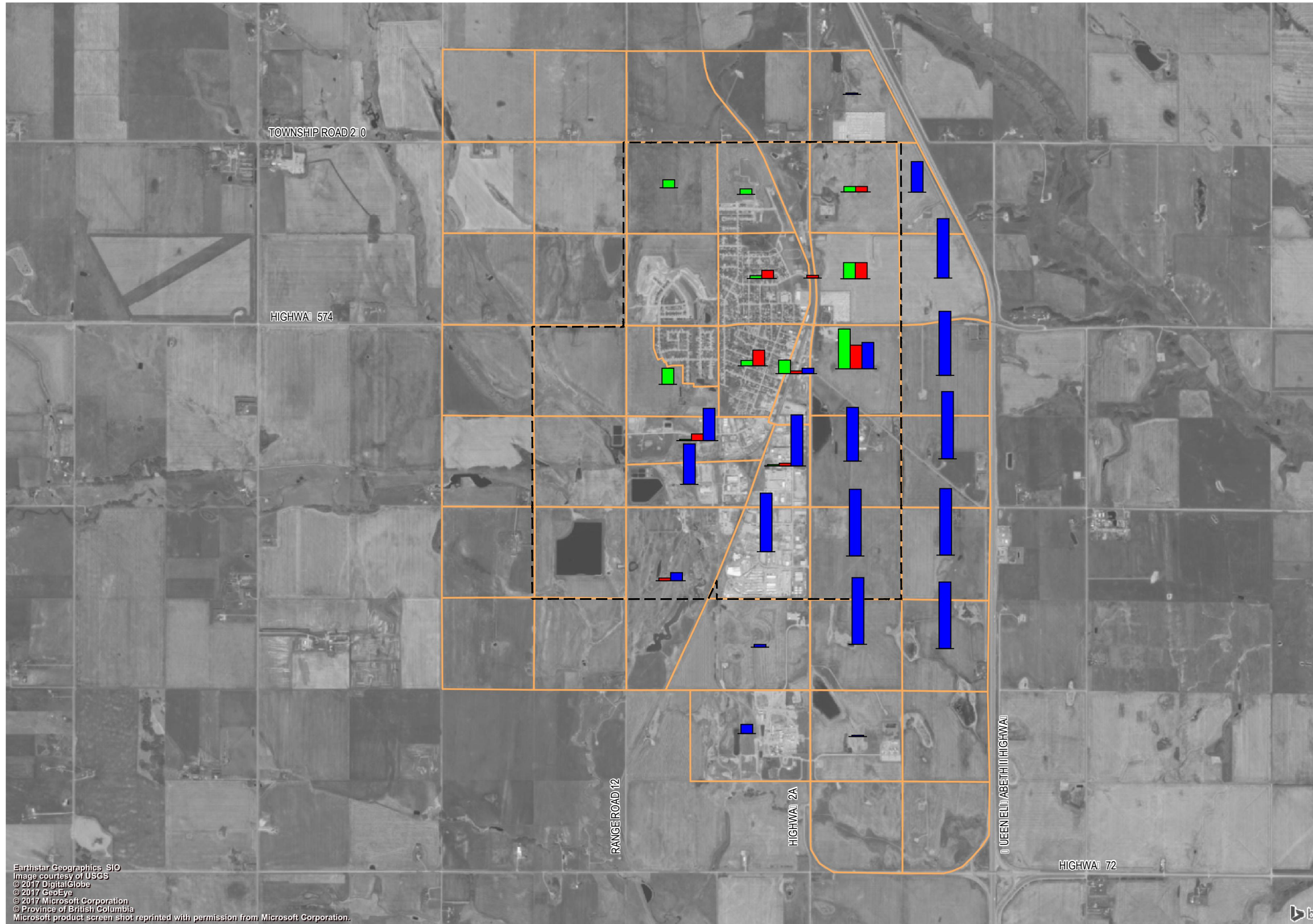
--- TOWN BOUNDARY



CROSSFIELD TMP

FUTURE POPULATION

EXHIBIT 2.5
 MARCH 2020



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Employment Forecast

One Boundary

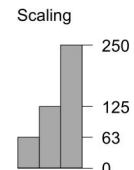


Chart

RETAIL

NON-RETAIL

INDUSTRIAL



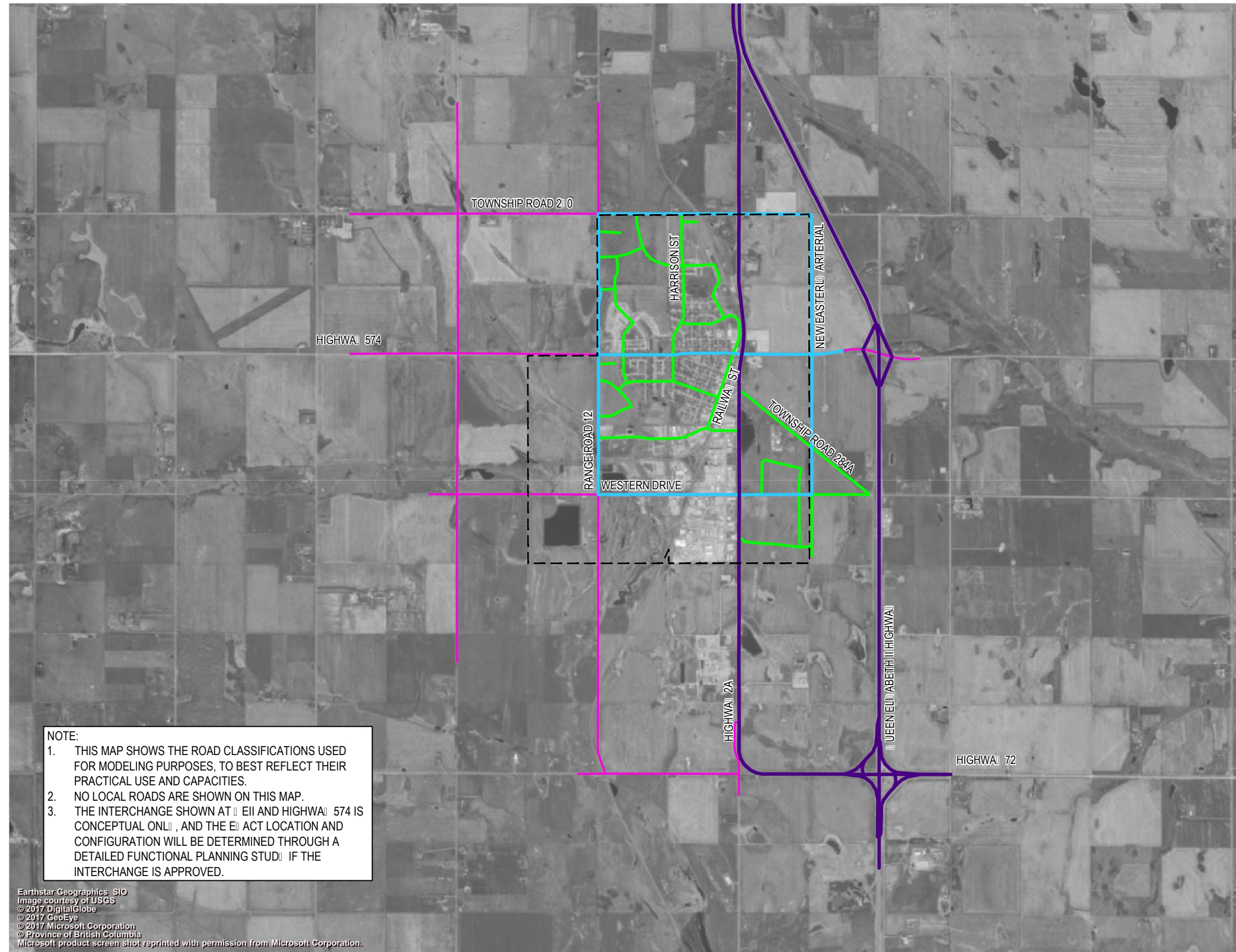
--- TOWN BOUNDARY



CROSSFIELD TMP

FUTURE EMPLOYMENT

EXHIBIT 2.0
 MARCH 2020



NOTE:

1. THIS MAP SHOWS THE ROAD CLASSIFICATIONS USED FOR MODELING PURPOSES, TO BEST REFLECT THEIR PRACTICAL USE AND CAPACITIES.
2. NO LOCAL ROADS ARE SHOWN ON THIS MAP.
3. THE INTERCHANGE SHOWN AT HIGHWAY 574 AND HIGHWAY 2A IS CONCEPTUAL ONLY, AND THE EXACT LOCATION AND CONFIGURATION WILL BE DETERMINED THROUGH A DETAILED FUNCTIONAL PLANNING STUDY IF THE INTERCHANGE IS APPROVED.

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Future Road Classification

Type

- HIGHWAY
- ARTERIAL
- COLLECTOR
- RURAL
- TOWN BOUNDARY



CROSSFIELD TMP

FUTURE ISM MODEL ROAD CLASSIFICATION

EXHIBIT 2.0
 MARCH 2020

3.0 Travel Demand Model and Calibration

The development of a travel demand model for a Transportation Master Plan provides significant benefits as it evaluates travel pattern changes as they relate to changes in land use and regional and local transportation network links. This is vital to Crossfield as any potential changes to the road network including the QEII Highway and Highway 2A could significantly alter traffic patterns in Crossfield, and it is helpful to understand what transportation infrastructure may be required to accommodate these changes in addition to future planned developments.

3.1 Travel Demand Modelling Process

The travel demand model development and the analysis undertaken in this study used the VISUM 18 transportation planning software suite developed by PTV Group. This GIS-based travel forecasting 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 realistic traffic forecasts that can be interpreted easily and presented in effective visual format.

The traditional four-step travel demand modelling process was used for this study, as shown in Figure 3.1 and summarized as follows:

- **Trip Generation** – residential, commercial, and industrial land uses are used to determine the number of peak hour trips being generated for the study area;
- **Trip Distribution** – zone-to-zone trip distribution is based on the road network impedance (i.e., travel time) and determines a zone-to-zone origin-destination (OD) trip matrix;
- **Mode Split** – the OD trip matrix is split into various travel modes, such as driving, walking, and transit. For this study, 100% of trips were assumed to be by passenger vehicle, with no additional mode split analysis;
- **Trip Assignment** – the estimated OD trip matrix is assigned onto the established road network to get link volumes for the existing and future traffic scenarios;

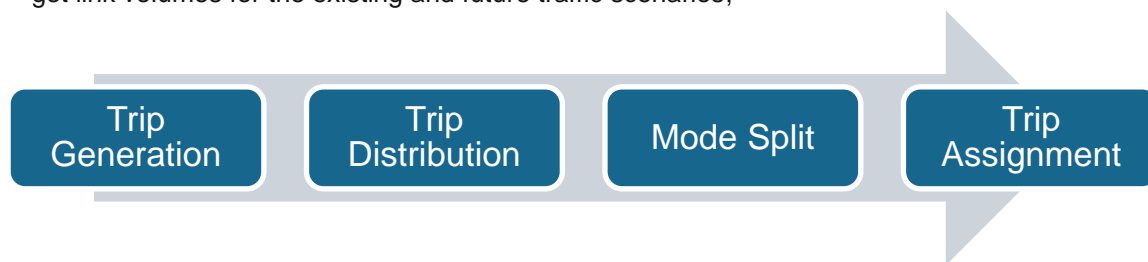


Figure 3.1: Traditional Four-Step Travel Demand Modelling Process

The existing travel demand model captures the existing travel patterns, including trip generation, trip distribution, trip assignment, and pass-by traffic through Crossfield. With a model calibrated to existing conditions, these characteristics can then be applied to annexed areas of Crossfield to forecast the future traffic volumes. The future transportation demand model provides Crossfield with a scalable, flexible platform that can be readily adapted over time to include additional scenarios or transportation complexity as Crossfield grows. The flow chart in Figure 3.2 is a general representation of the four-step travel demand modelling process implemented for this study.

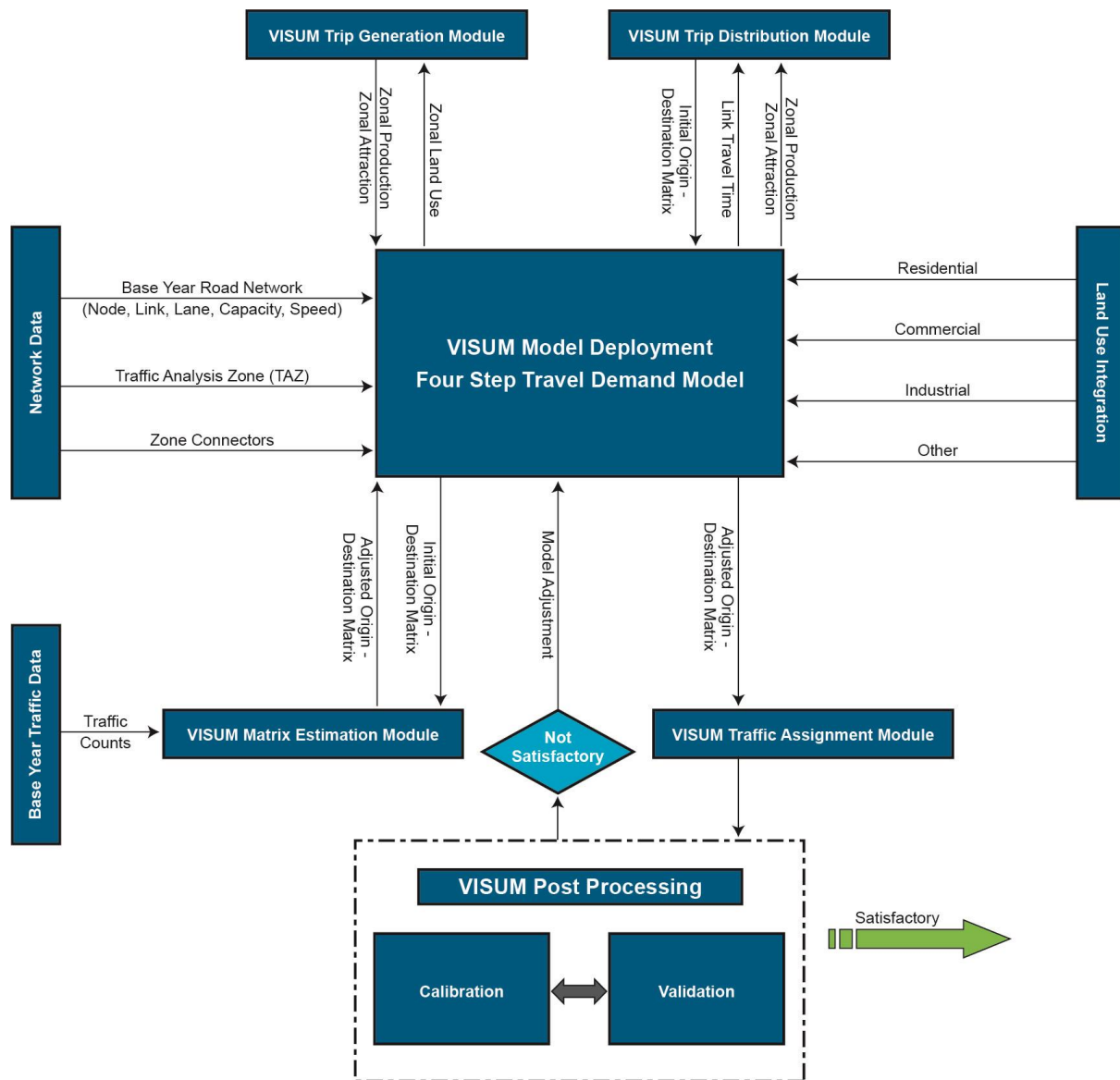


Figure 3.2: General Representation of Base Year Model Development

3.2 Roadway Capacity

Roadway capacities within the VISUM model are based on their functional classification, shown in Exhibit 2.4. Link capacities used in the TMP model are summarized in Table 3.1. The link capacities are generally conservative, in that they are based on the capacity of a single traffic lane, multiplied out to the total number of lanes on the road in a given scenario. There were additional variations in the model not noted here, such as reduced speed and capacity on roadways with lower speed limits to allow for an appropriate travel time penalty on such routes.

Table 3.1: Link Capacities

Road Classification	Capacity, veh/hr/lane	Speed, km/h
Freeway (Free Flow)	2,100	100-110
Highway	1,000-1,200	60-80
Arterial	900-1,200	50-80
Collector	700-800	50-60
Local	350-400	30-50
Rural	800-1,100	50-80

Model outputs for scenario planning are based on the volume-to-capacity (v/c) ratio of each roadway, with ranges defined in Table 3.2. Given the conservative ranges for the link capacities, the macro-level planning works up to a capacity band ranging from 95% to 105% of link capacity. For example, the link capacities do not provide for channelized turn bays at intersections, which in practice will increase total capacity through a traffic signal on an arterial. The acceptance of certain higher-volume links in some cases has either been proven via more detailed micro-level analysis or is considered to be an acceptable level of congestion given the existing constraints and limitations of certain roadways.

Table 3.2: Volume-to-Capacity Ratio Ranges

Colour	v/c Ratio	Notes
Dark Green	<0.60	Effective operations
Light Green	0.60 – 0.80	Effective operations
Yellow	0.80 – 0.95	Normal operations, urban traffic conditions
Orange	0.95 – 1.05	At or near capacity
Red	>1.05	Above capacity

3.3 Existing Horizon Calibration

A 2018 baseline model was developed for the transportation network, using existing land use and traffic counts within Crossfield to develop and calibrate the travel demand model. Traffic count data was obtained from Alberta Transportation, plus Town of Crossfield count data including counts extracted from Traffic Impact Assessment (TIA) reports. Ten additional traffic counts were conducted by ISL in February and March 2019. The traffic counts were balanced to higher intersection volumes as traffic counts were undertaken on different days and the balanced AM and PM peak turning volumes are shown in Appendix B.

Calibration plots of the existing network model for AM and PM peaks are provided in Appendix C. Regression values (R^2) of 0.90 and 0.95 were obtained for the network in the AM and PM peaks, respectively. These values represent strong convergence with the existing traffic data; the typical R^2 value for acceptance is 0.75 for a TMP in a small to medium size municipality.

The v/c ratio plots for Crossfield's existing network in the AM and PM peaks are provided in Exhibits 3.1 and 3.2. The v/c ratio plots indicate all existing roadways within Crossfield show good operations with moderate volumes at both AM and PM peak times, and they do not indicate any major network congestion locations or bottlenecks.



3.4 Existing Detailed Intersection Analysis

Detailed traffic operation analysis was also completed at all intersections with available traffic count data in Synchro. The purpose of the detailed analysis was to verify the findings of the macro-level analysis in VISUM.

Synchro 9 was used to analyze the traffic operations at the intersections. The Level of Operating Service (LOS) A represents the highest LOS or generally free flowing conditions, while LOS F generally represents a breakdown or gridlock condition in vehicular flow. There are varying degrees of delay and LOS at the intermediate LOS B, C, D and E levels. LOS D is representative of normal peak hour congestion, while LOS E is representative of an intersection nearing its capacity. Typically, LOS D or better is the accepted standard for peak hour operations in smaller urban centres. LOS criteria for intersections are based on average delay per vehicle and are summarized in Table 3.3. Synchro also calculates each movement’s volume-to-capacity ratio (v/c ratio). A v/c ratio of 1.00 represents an intersection or movement at full capacity. Typically, a v/c ratio of 0.90 or lower for all intersection movements is the accepted standard for peak hour operations in smaller urban centres.

Table 3.3: Level of Service Criteria

LOS		A	B	C	D	E	F
Signalized	Average Delay per Vehicle (s/veh)	< 10	10 – 20	20 – 35	35 – 55	55 – 80	> 80
Unsignalized		< 10	10 – 15	15 – 25	25 – 35	35 – 50	> 50

The Synchro analyses show that all analyzed intersections operated at an acceptable level (LOS D or better and v/c <0.90) with existing traffic controls and lane configurations. Therefore, no traffic lane changes or traffic control revisions are presently recommended at any of the analyzed intersections.

3.5 Existing Railway Crossing Assessment

Crossfield currently has four at-grade railway crossings located at Western Drive, Laut Avenue, Limit Avenue, and Township Road 290.

The CPR at-grade crossing data was obtained from CPR and traffic volumes were calculated using existing traffic counts to conduct at-grade crossing warrant analysis per *Section 9, Part C of Transport Canada Grade Crossings Standard (January 1, 2019)*. The standard has several criteria to determine the warrants for a warning system with or without gates, which includes the forecast cross-product, railway operating speed, number of tracks, etc. Note that the cross-product is defined as the product of the average annual daily railway movements and the average annual daily traffic of vehicles on the road that cross through the grade crossing.

Table 3.4 summarizes the warning system warrant based on the criteria listed above, particularly the cross-product. According to the standard, a warning system without gates is required at a public grade crossing if the forecast cross-product is 2,000 or more, and a warning system with gates is required if the forecast cross-product is 50,000 or more. The different railway crossing warning systems listed in the *Transport Canada Grade Crossing Standards* are shown in Figure 3.3. The warrant analysis shows that the existing warning systems installed at all crossings meet or exceed the warrants per the federal standard. It is noted that at Laut Avenue crossing, an active warning system (FLB&G) was warranted as there are two crossings at this location.

Table 3.4: Existing Railway Crossing Assessment

CP Mile	Location	Train Daily Volume	Traffic AADT	Cross Product	Warrant	Existing	Standard
28.05	Western Drive	12	890	10,680	without Gate	Active - FLBG	Exceed
28.54	Laut Avenue	12	2,590	31,080	with Gate	Active - FLBG	Meet
29.12	Limit Ave / Hwy 574	12	4,480	53,760	with Gate	Active - FLBG	Meet
30.19	TWP 290, West of RR 11A	12	60	720	N/A	Passive	Meet

Note: FLBG means Flashing Light Units, Bells & Gates.

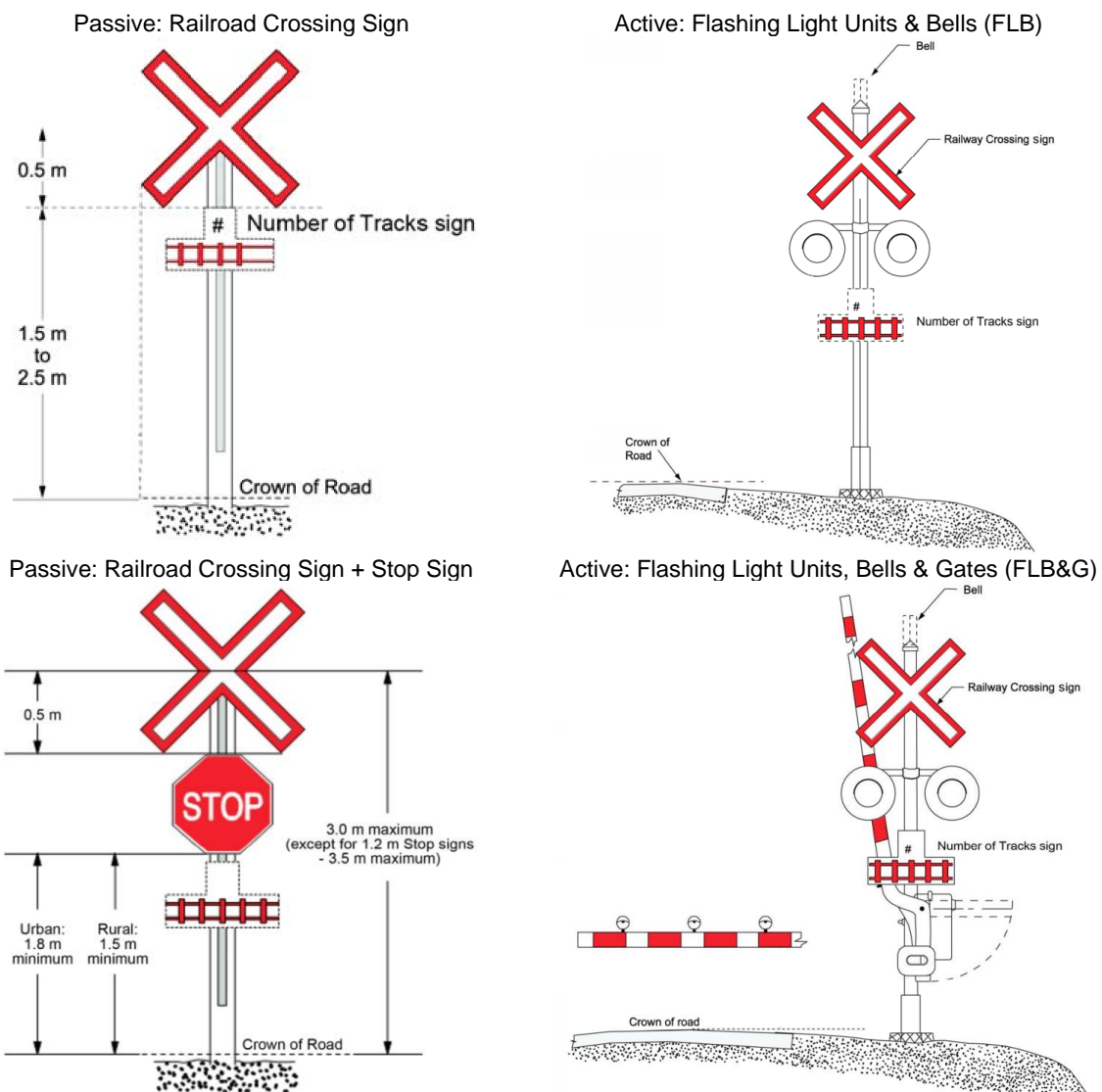
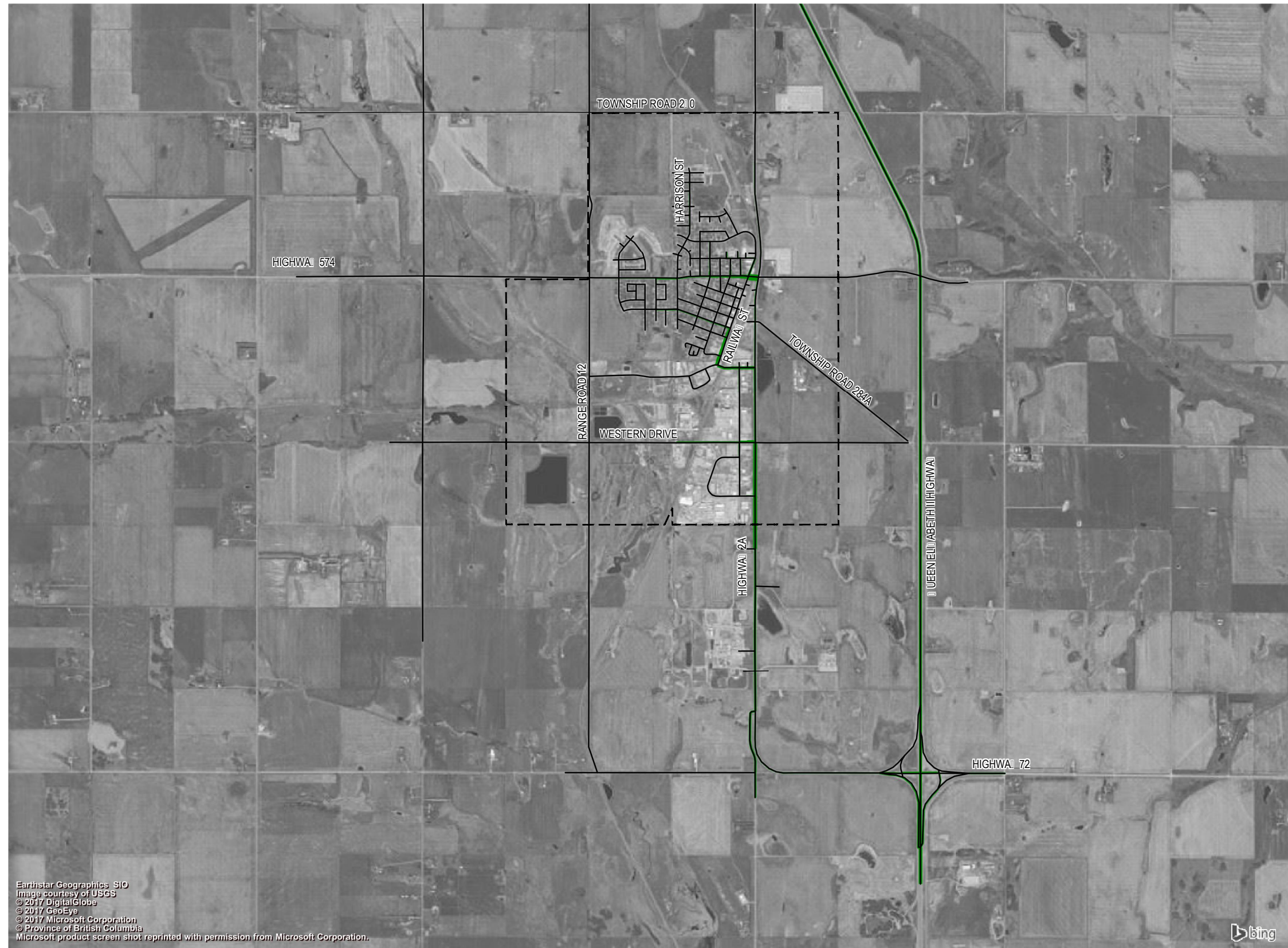


Figure 3.3: Railway Crossing Warning Systems



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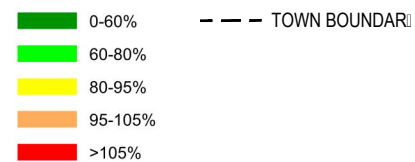


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AM Peak Hour Congestion Existing

Line Colors

Volume capacity ratio PrT (AP)

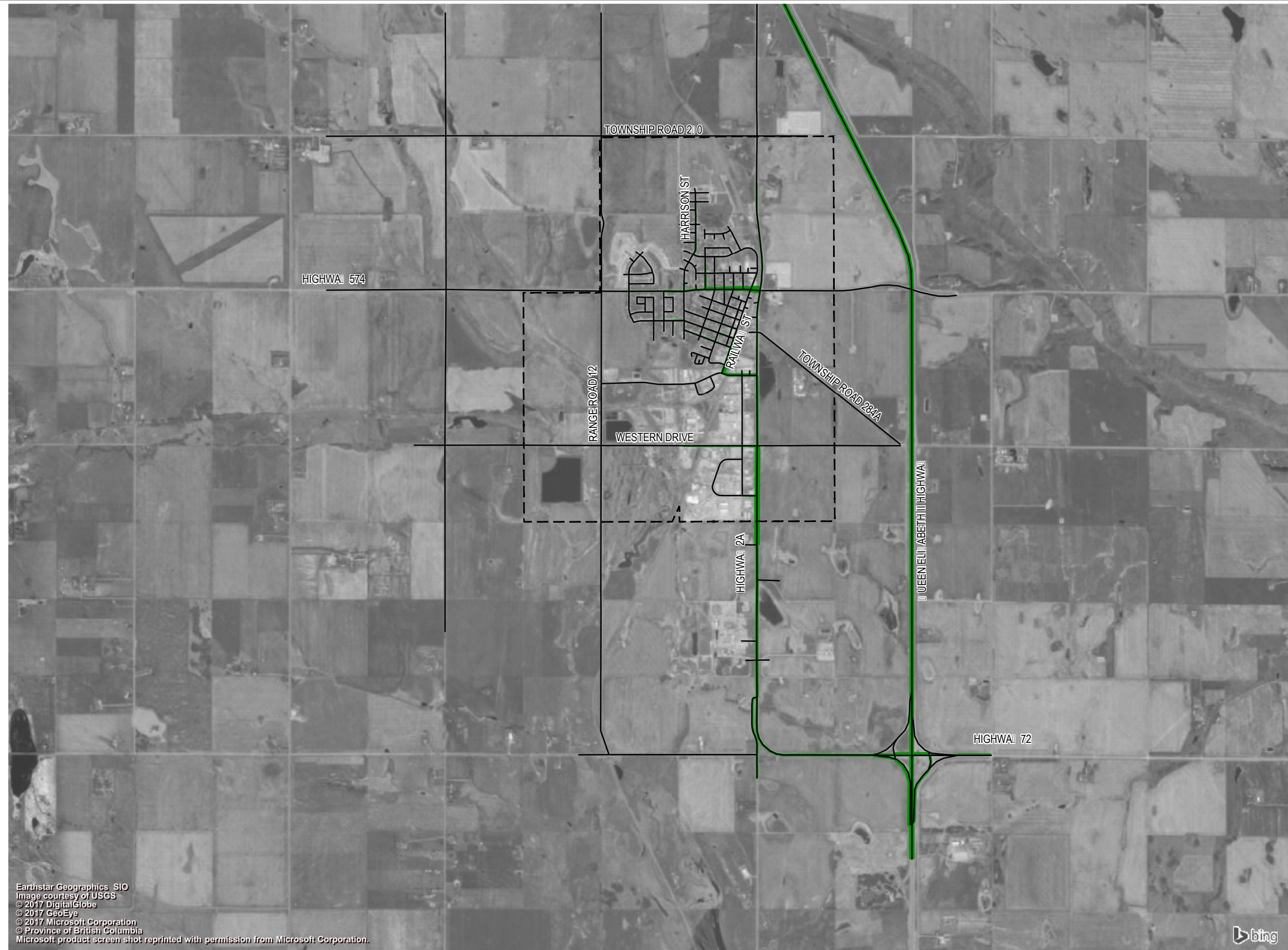


CROSSFIELD TMP

EXISTING AM
 C RATIO

EXHIBIT 3.
 MARCH 2020





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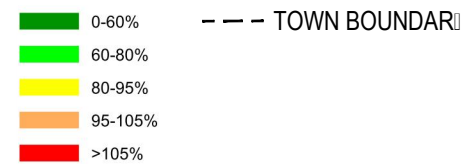


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PM Peak Hour Congestion Existing

Line Colors

Volume capacity ratio PrT (AP)



CROSSFIELD TMP

EXISTING PM
 C RATIO

EXHIBIT 3.2
 MARCH 2020



4.0 Future Scenario Road Network and Analysis

In the development of the travel demand model for the future horizon of 15,800 population, land use and trip generation was added for the growth areas. Background traffic growth for QEII, Highway 2A and other external gates was also added as outlined in Section 2.2.

4.1 Future Scenarios

For this TMP update, two road network scenarios were considered based on the approved ASPs. It is noted that the Town wishes to develop a Ring Road network of four arterials at the periphery of the Town (Township Road 290, Range Road 12, Western Drive, and New Easterly Arterial):

- **Scenario 1:** Highway 574 remains as a flyover at QEII;
- **Scenario 2:** Highway 574 modified to provide an interchange connection at QEII;

For Scenario 1, the v/c ratio plots for the AM and PM peaks are shown in Exhibits 4.1 and 4.2. The results indicate that capacity constraints exist on Highway 2A (Western Drive – McCool Crescent) and Limit Avenue (Harrison Street – Highway 2A); to improve operations, twinning of these roadways would be required.

For Scenario 2, the v/c ratio plots for the AM and PM peaks are shown in Exhibits 4.3 and 4.4. The results indicate that capacity constraints exist on Limit Avenue only (Harrison Street – Highway 2A) and that, to improve operations, twinning is required.

4.2 Future Detailed Intersection Analysis

Detailed traffic operation analysis was completed at major intersections for both scenarios in Synchro and results indicated that the following intersections operated beyond criteria and intersection improvements are needed, summarized in Table 4.1. The improvement recommendations are further discussed in Section 4.4. It is cautioned that intersection turning volumes from a travel demand model are provided at a lower level of accuracy than corridor volumes but do provide an adequate basis for considering future transportation network improvements. Local-level analysis via TIAs should continue to be used as part of the development approval process as new growth areas come online.

Table 4.1: Future Intersection Traffic Operation Summary

Intersection	Operates beyond Criteria?	
	Scenario 1	Scenario 2
Highway 2A / Township Road 290	Yes	Yes
Limit Avenue / Railway Street	Yes	Yes
Highway 2A / Limit Avenue	Yes	Yes
Highway 2A / Township Road 284A	Yes	No
Highway 2A / Western Drive	Yes	No
Highway 2A / McCool Crescent	Yes	No
Highway 574 / New Easterly North-South Arterial	No	Yes
QEII / Highway 72 East Junction	Yes	No



4.3 Future Railway Crossing Assessment

The railway crossing assessments were conducted at the four at-grade railway crossings per *Section 9, Part C of Transport Canada Grade Crossings Standard (January 1, 2019)* for the future two scenarios, with and without the Highway 574 / QEII interchange. Future traffic forecasting volumes were obtained from the VISUM model and the existing train volumes were used for the warrant calculation. Table 4.2 summarizes the warning system warrant calculations. For more detailed information on the railway crossing warrant, please refer to Section 3.5.

The warrant analysis shows that the existing warning systems installed at all crossings meet or exceed the federal guidelines, except at Township Road 290. It is noted that CPR does not offer train volume forecasts due to many variables, such as the economy, unknown customer plans, and fluctuations in commodity demand. A quick sensitivity analysis showed that even if the daily train volume doubles to 24 trains per day, the conclusions are unchanged.

Table 4.2: Future Railway Crossing Assessment

CP Mile	Location	Train Daily Volume	Traffic AADT	Cross Product	Warrant	Existing Treatment	Standard
Scenario 1 - Highway 574 / QEII Flyover							
28.05	Western Drive	12	2,508	30,094	Without Gate	Active - FLBG	Exceed
28.54	Laut Avenue	12	1,706	20,466	With Gate	Active - FLBG	Meet
29.12	Limit Ave / Hwy 574	12	14,215	170,581	with Gate	Active - FLBG	Meet
30.19	TWP 290, West of RR 11A	12	5,798	69,571	with Gate	Passive	Below
Scenario 2 - Highway 574 / QEII Interchange							
28.05	Western Drive	12	2,364	28,369	Without Gate	Active - FLBG	Exceed
28.54	Laut Avenue	12	1,642	19,699	With Gate	Active - FLBG	Meet
29.12	Limit Ave / Hwy 574	12	14,633	175,596	with Gate	Active - FLBG	Meet
30.19	TWP 290, West of RR 11A	12	5,637	67,644	with Gate	Passive	Below

The railway crossing at Township Road 290 is required to be upgraded to an active crossing with flashing light units, bells and gates (FLB&G). A high-level Class 5 cost estimate for the railway crossing improvement at the Township Road 290 is expected to be around \$400,000 (including 30% contingency but excluding 15% engineering and testing cost). It is noted that if Township Road 290 needs to be upgraded to 4-lane arterial in the future, another \$400,000 would be required, although some cost saving is possible with reuse of some railway crossing infrastructure. It is recommended that the Town prepare a detailed railway crossing design and cost estimate prior to budgeting for and implementing the railway crossing upgrade.

Due to high cross product at the Limit Ave crossing location, grade separation was considered but ultimately not recommended due to its high cost, significant impacts to the existing mature neighbourhoods and town centre, and limited benefits it provides. Upon review of available Transport Canada railway crossing policies and reports, it was found that all crossings in Crossfield are well below the typical warrant for grade separation.

In the Grade Separation Guidelines published by Transportation Safety Board of Canada in 2018, it is stated that Transport Canada does not provide a guideline for when grade separation should be considered; however, in comparison, the United States Department of Transportation Federal Highway Administration Railroad-Highway Grade Crossing Handbook (2007) states that highway-rail grade crossings should be considered for grade separation across the railroad right-of-way whenever the cost of grade separation can be economically justified based on fully allocated life-cycle costs and one or more of the following conditions exist, which are not met for Limit Ave crossing location:

- Crossing exposure (the product of the number of trains per day and AADT [average annual daily traffic]) exceeds 500,000 in urban areas or 125,000 in rural areas; or
- Passenger train crossing exposure (the product of the number of passenger trains per day and AADT) exceeds 400,000 in urban areas or 100,000 in rural areas.

4.4 Future Road Improvement Recommendations

The future road improvement recommendations for Scenario 1 and Scenario 2 are listed in Table 4.3. It is noted that the two scenarios share some common improvement recommendations, especially along the Limit Avenue corridor from Harrison Street to Highway 2A. For Scenario 1, as no new interchange at QEII / Highway 574 is being proposed, traffic will continue to increase on Highway 2A, which warrants traffic signalizations and intersection improvements at multiple intersections on Highway 2A as well as the QEII / Highway 72 interchange east junction; whereas in Scenario 2, with the proposed QEII / Highway 574 interchange, a portion of traffic will be diverted to Limit Avenue and allow most intersections on Highway 2A and the QEII / Highway 72 interchange east junction to remain unsignalized.

Table 4.3: Future Road Improvement Recommendations

Road / Intersection	Improvement Description
Recommendations for Both Scenario 1 and Scenario 2	
Limit Avenue Corridor	Twinning (Harrison Street – Highway 2A)
Limit Avenue / Railway Street	Signalization with railway pre-emption and coordination with Hwy 2A
Limit Avenue / Highway 2A	Signalization with railway pre-emption, coordination with Railway St and turn bays on all approaches
Highway 2A / Township Road 290	Signalization with NBL and SBL turn bays
Ring Road	Construct / pave 2-lane ring road
Township Road 290 at CP Railway	Railway Crossing Improvement (FLB&G)
Recommendations for Scenario 1 Only	
Highway 2A Corridor	Twinning (Western Drive - McCool Crescent)
Highway 2A / Township Road 284A	Signalization
Highway 2A / Western Drive	Signalization with SBL and NBL turn bays
Highway 2A / McCool Crescent	Signalization with SBL and NBL turn bays
QEII / Highway 72 East Junction	Signalization
Recommendations for Scenario 2 Only	
Highway 574 / New Easterly Arterial	Add turn bays for all approaches



It is noted that the capital improvements for Scenario 1 and Scenario 2 depend on the potential future QEII / Highway 574 interchange; therefore, it is recommended that only improvements that are required in both scenarios be included in the Capital Plan. For the improvements that are only required in only Scenario 1 or Scenario 2, it is recommended the Town further discuss with AT regarding the QEII / Highway 574 interchange or flyover and include either the Scenario 1 or Scenario 2 improvements in the next TMP update.

Additionally, it is recognized that the Ring Road is a collection of arterial roadways on the peripheries of the Town, thus it depends on the progress of land development and subdivision in the Town and should only be developed on an as-needed basis. It is recommended that when land developments or subdivisions come online, the Town work with the developer (via the undertaking of a TIA) to confirm the need and extent to construct or pave portion of the Ring Road.

4.4.1 Timeline of Improvements

As no operational issues were identified in the existing roadway network, the improvements identified in the future network are mainly development-driven by the build-out of the ASP areas. The timeline of the improvements will primarily correlate with the progress of the build-out based on size and type of development, staging of development, and location of development.

When new developments are planned, it is recommended that a local-area TIA be undertaken to determine the timeline of specific improvements associated with the proposed development, tied to the proposed development phasing plans. Off-site levy collection for roadway improvements is a valuable tool to spread the cost of certain infrastructure improvements that benefit multiple growth areas fairly among the benefitting development cells, and to ensure the collection of money for future upgrades based on cumulative impacts to the transportation network, even if a specific development in the near future does not trigger a specific improvement.

To provide an initial basis for infrastructure staging and budgeting, two interim study horizons of 7,000 and 10,000 population were analyzed for this TMP update. As outlined in Section 2.2.1, the Town's 2018 MDP projected a population of 12,000 to 15,000 in 2040. Using the existing population of 3,300 in 2018 and assuming a linear population growth, the interim populations of 7,000 and 10,000 would be reached between 2025-2027 and 2031-2035, respectively.

Through interpolation of intersection turning volumes between the existing horizon (3,300 population) and future horizon (15,800 population), intersection turning volumes for the interim study horizons were generated and analyzed in Synchro. The improvement recommendations and the improvement horizons are summarized in Table 4.4 below.

4.4.2 Opinion of Probable Cost

Class 5 (order of magnitude) opinions of probable costs were prepared to provide information on potential future transportation infrastructure costs. The Class 5 cost estimates can be used to update and incorporate with other infrastructure budgeting tools to assist in planning budgets on a town-wide scale for future transportation studies, designs, and capital construction projects. Future transportation studies and designs would provide more detailed estimates required to continually review and update the off-site levy bylaw, or to budget and implement individual projects.

The assumptions used in the development of the opinion of probable cost are as follows:

- Costs in 2020 dollars;
- Includes allowance for underground storm system;
- Cost includes 30% for contingency and 15% for engineering and testing;
- Excludes land acquisition (assumes that land will be dedicated through the development process);
- Class 5 cost estimate with an accuracy of +75% to -40%;
- The suggested improvement horizon is estimated by interpolation and will be subject to change due to development pattern changes and background traffic growth;
- Unit costs used were taken from recent tender close bids from Calgary-area projects and the detailed cost breakdown is included in Appendix D;
- Roadway twinning and 2-lane new roadway is assumed to be 50% of the full 4-lane roadway cost;
- Class 5 traffic signal cost is as follows (including 30% contingency but excluding 15% engineering and testing cost) and the cost breakdown is included in Appendix D:
 - New traffic signal (municipal intersection): \$500,000;
 - New traffic signal (AT intersection): \$750,000;
 - Note that the cost of an AT traffic signal is higher mostly due to its design requirements on illumination, foundation, etc.;
- Signal infrastructure upgrades are not required for signal timing coordination and optimization;
- Railway pre-emption cost does not include any infrastructure upgrades to the railway crossing system, and any labour and equipment cost that might incur from CPR;
- The cost of the internal roads of lower classification within the ASP areas were assumed to be the sole responsibility of the developer as part of the subdivision development agreement; and
- Any improvement to QEII is fully funded by AT and is thus excluded.

4.4.3 Future Improvement Summary for Capital Improvements

Per Section 4.4, many proposed improvements depend on the potential QEII / Highway 574 interchange, thus it is recommended that only improvements that are required for both Scenario 1 and Scenario 2 be included in the Capital Plan. These recommended improvements (with timelines) and Class 5 cost estimates are summarized in Table 4.4. The recommended improvements that are required for both Scenario 1 and Scenario 2 are shown in Exhibit 4.5. Please refer to Appendix D for more details on the cost estimate breakdown.

Additional notes are provided for the following corridors and intersections:

- Ring Road: The development of the ring road depends on the progress of land development and subdivision in the Town and should only be developed on an as-needed basis. The ring road constitutes a significant portion of the capital cost recommended for the Town, but it is important to recognize that there would be cost sharing agreement in place with the developers for the cost of ring road, which would be specified in the off-site levy bylaw.
- Road Network in the Crossfield East ASP Area: It is recognized that the road network in the Crossfield East ASP area could be further evaluated and refined by providing a better grid-like road network. Skewed intersections proposed in the plan are recommended to be revisited for potential realignment as right-angle intersections.



Table 4.4: Recommended Improvements Staging, Horizon and Cost for Scenarios 1 and 2

Corridor / Intersection	Improvement Description	Class 5 Cost Estimate
Improvements by 7,000 Population		
Highway 2A / Limit Avenue	Signalization with railway pre-emption and turn bays on all approaches	\$2,500,000
Both Scenarios - Subtotal (Rounded)		\$2,500,000
Improvements by 10,000 Population		
Limit Avenue Corridor	Twinning (Railway Street - Highway 2A)	\$300,000
Ring Road	Construct / pave 2-lane ring road	\$37,000,000
Township Road 290 at CP Railway	Railway Crossing Improvement (FLB&G)	\$460,000
Both Scenarios - Subtotal (Rounded)		\$37,760,000
Improvements by 15,800 Population		
Railway Street / Limit Avenue	Signalization with railway pre-emption and coordination with Highway 2A	\$600,000
Limit Avenue Corridor	Twinning (Harrison Street - Railway Street)	\$2,400,000
Highway 2A / Township Road 290	Signalization with NBL and SBL turn bays	\$2,600,000
Both Scenarios - Subtotal (Rounded)		\$5,600,000
Both Scenarios - Total (Rounded)		\$45,860,000

4.4.4 Future Improvement Summary To Be Verified with AT

Per Section 4.4, for the improvements that are only required in only Scenario 1 or Scenario 2, it is recommended the Town further discuss with AT regarding the QEII / Highway 574 interchange or flyover and include either the Scenario 1 or Scenario 2 improvements in the next TMP update. These standalone Scenario 1 and Scenario 2 recommended improvements (with timelines) and Class 5 cost estimates are summarized in Tables 4.5 and 4.6 and shown in Exhibits 4.5 and 4.6. Please refer to Appendix D for more details on the cost estimate breakdown.

Table 4.5: Recommended Improvements Staging, Horizon and Cost for Scenario 1 Only

Corridor / Intersection	Improvement Description	Class 5 Cost Estimate
Improvements by 10,000 Population		
Highway 2A / Western Drive	Signalization with NBL and SBL turn bays	\$2,500,000
Highway 2A / McCool Crescent	Signalization with NBL and SBL turn bays	\$2,500,000
Scenario 1 - Subtotal (Rounded)		\$5,000,000
Improvements by 15,800 Population		
Highway 2A / Township Road 284A	Signalization with SBL turn bay	\$1,800,000
Highway 2A Corridor	Twinning (Western Drive - McCool Crescent)	\$3,500,000
Scenario 1 - Subtotal (Rounded)		\$5,300,000
Scenario 1 - Total (Rounded)		\$10,300,000

Table 4.6: Recommended Improvements Staging, Horizon and Cost for Scenario 2 Only

Corridor / Intersection	Improvement Description	Class 5 Cost Estimate
Improvements by 15,800 Population		
Highway 574 / New Easterly Arterial	Add NBL, SBL, EBL, and WBL turn bays	\$1,500,000
Scenario 2 - Subtotal (Rounded)		\$1,500,000
Scenario 2 - Total (Rounded)		\$1,500,000

The following items should also be noted in the QEII / Highway 574 discussion with AT:

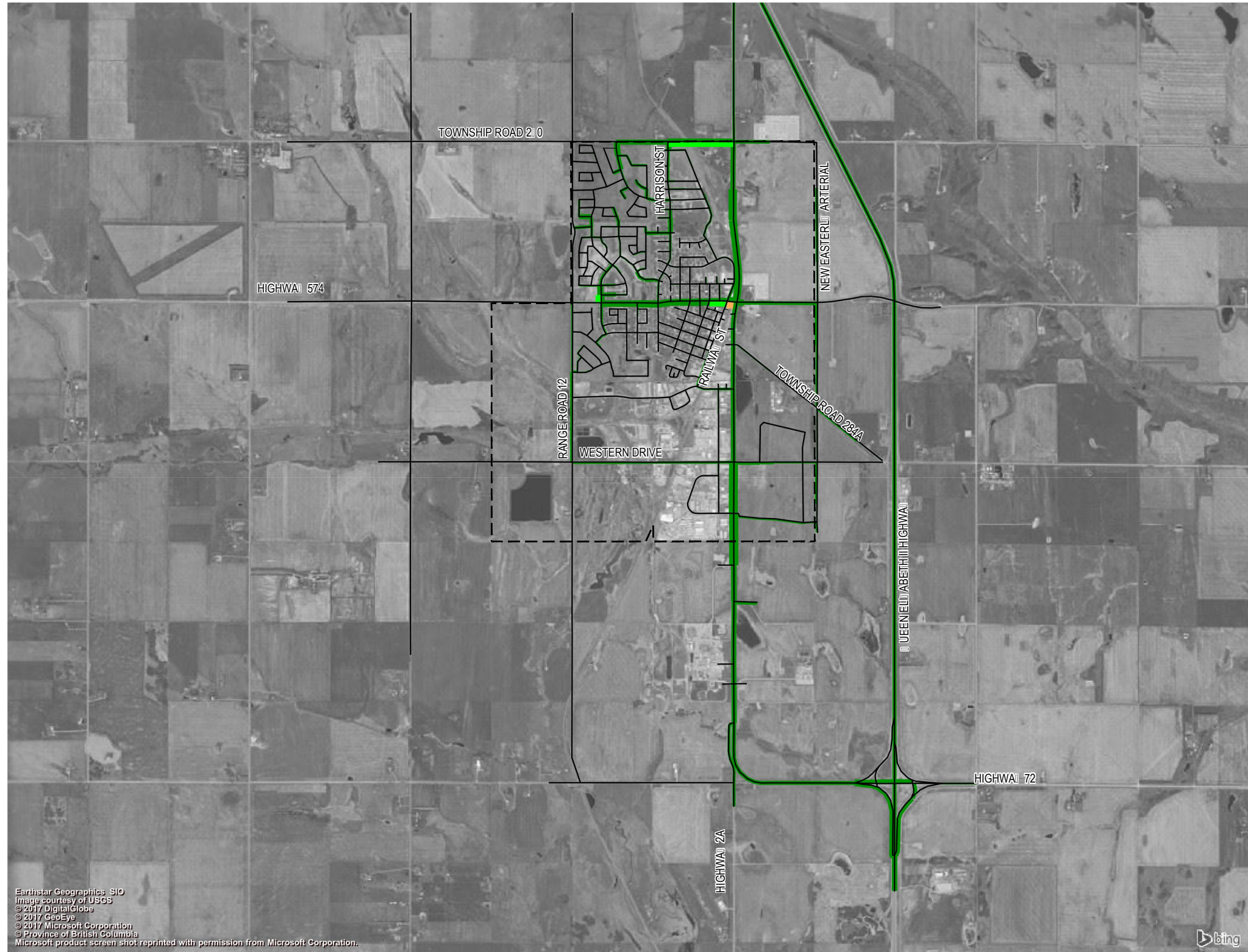
- QEII / Highway 574 Interchange:
 - The Town of Crossfield and Rocky View County wish to grow their residential, commercial and industrial sectors in the area between Highway 2A and QEII, with the recent publication of their joint Crossfield East Area Structure Plan. They have identified a potential interchange at QEII / Highway 574 to provide more direct access to this area.
 - It is understood that it is the Town's desire to leverage this interchange to generate greater interest in the residential, commercial and industrial land development industry as it provides significant benefits to the goods movement, Town's residents, and travellers along QEII.
- QEII Airdrie Bypass:
 - A recently completed North Calgary Regional Transportation Study by several municipalities in the north Calgary region and AT also identified a possible future QEII Airdrie Bypass that may run diagonally from QEII near Highway 574 to the northeast corner of Stoney Trail.
 - The study only identified a conceptual connection and a Route Identification and Functional Planning Study was recommended to further define the alignment and protect the right-of-way. Therefore, it is recommended that the Town meet with AT to express the Town's interest in being invited as a stakeholder and proactively working with AT to identify possible connections from Highway 574 as part of this future study.



4.5 Review of Road Asset Management Program

The Road Asset Management Program (RAMP) completed in 2017 for the Town of Crossfield was reviewed in the context of the new TMP update. It is noted that the RAMP study focused on the 5-year horizon, from 2018 to 2022. As the main purpose of the TMP study is to forecast and evaluate the transportation network at the long-term horizon with 15,800 population, there is limited opportunity to incorporate the RAMP study findings into this TMP. However, upon review of the RAMP study, the following recommendations can be made:

- Future RAMP updates should consider the build-out of various Area Structure Plans (ASPs) for the long-term maintenance program budgeting purposes;
- In the long-term, the pavement improvement of Township Road 284A should be aligned with the future Township Road 284A road construction as part of the build-out of the East Crossfield ASP;
- Through public engagement (further discussed in Section 6.0), the approaches of Laut Avenue at the CPR crossing and Highway 2A were identified as problematic locations with possible grading issues, which should be investigated and can potentially be resolved under the RAMP;
- As the Town continues to grow into the annexation areas, some gravel road surfaces will need to be upgraded to paved surfaces, which should be considered in future RAMP updates;
- As Railway Street was identified for functional overlay in 2021, this presents an opportunity to coordinate with any improvements recommended in the Crossfield Downtown & Entrance Area Action Plan. Through public engagement, on-street parking in the downtown area was also identified as a major issue. With the functional overlay, a downtown parking strategy could be studied and implemented; and
- Through public engagement, traffic speeding concerns were identified on Mountain Avenue associated with school hours. As Mountain Avenue was identified for functional overlay in 2022, potential traffic calming improvement measures could be implemented at the same time.



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AM Peak Hour Congestion Forecast Scenario 1

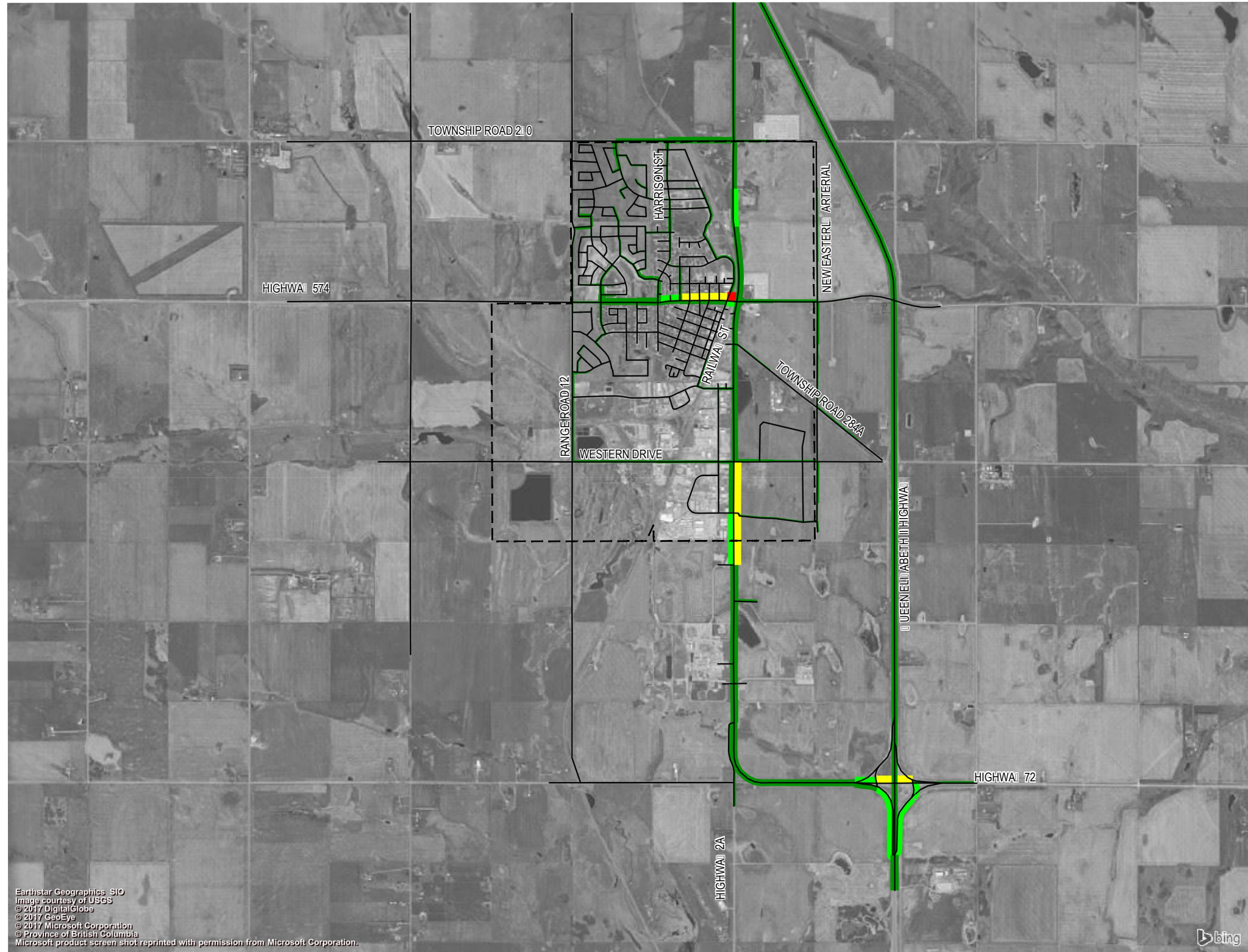
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- 60-80% (light green)
- 80-95% (yellow)
- 95-105% (orange)
- >105% (red)

CROSSFIELD TMP

FUTURE AM SCENARIO
 C RATIO

EXHIBIT
 MARCH 2020





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PM Peak Hour Congestion Forecast Scenario 1

Line Colors

Volume capacity ratio PrT (AP)

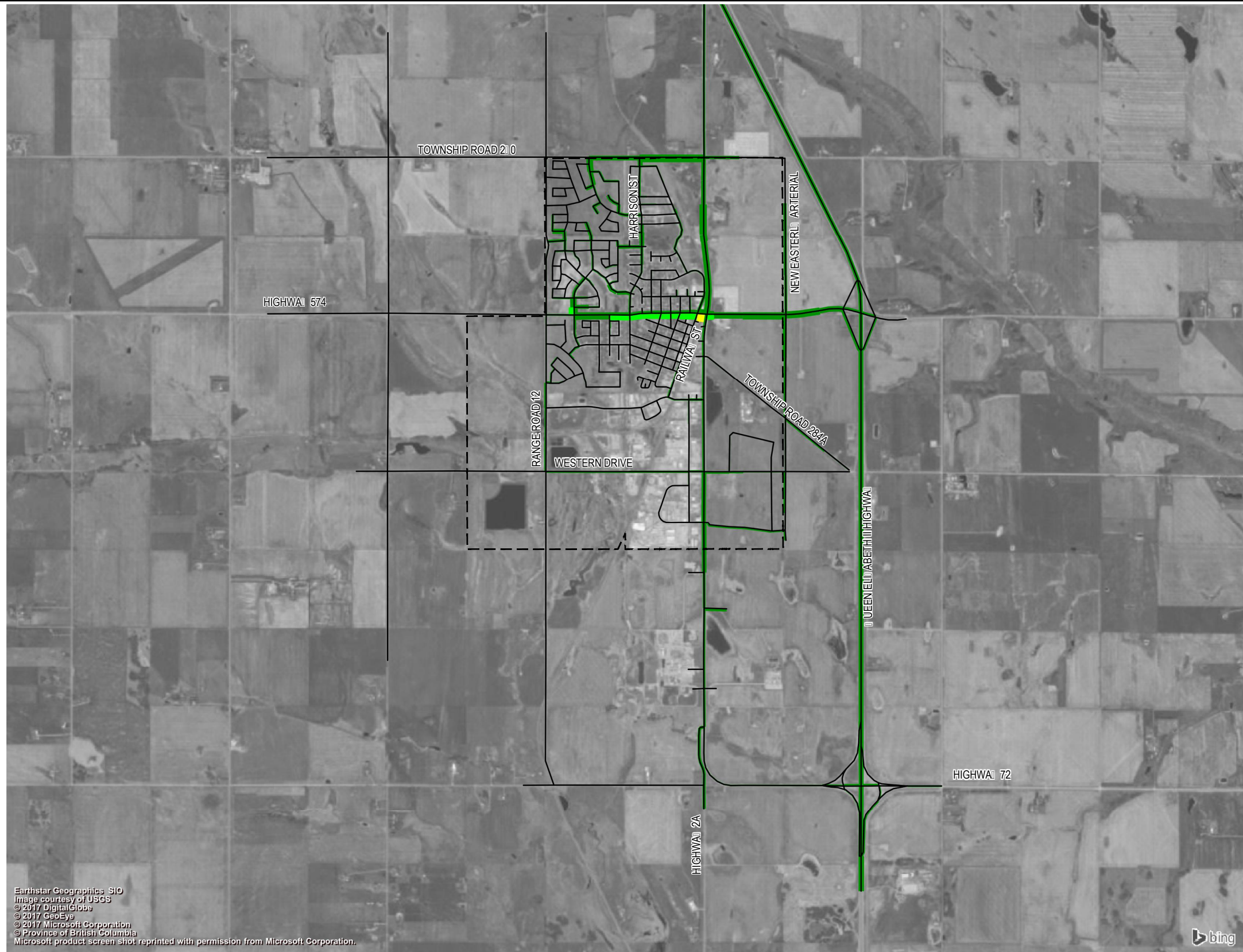
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 - 60-80%
 - 80-95%
 - 95-105%
 - >105%
- TOWN BOUNDARY

CROSSFIELD TMP

Future PM Scenario
 C Ratio

EXHIBIT 2
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AM Peak Hour Congestion Forecast Scenario 2

Line Colors

Volume capacity ratio PrT (AP)

- 0-60%
 - 60-80%
 - 80-95%
 - 95-105%
 - >105%
- TOWN BOUNDARY

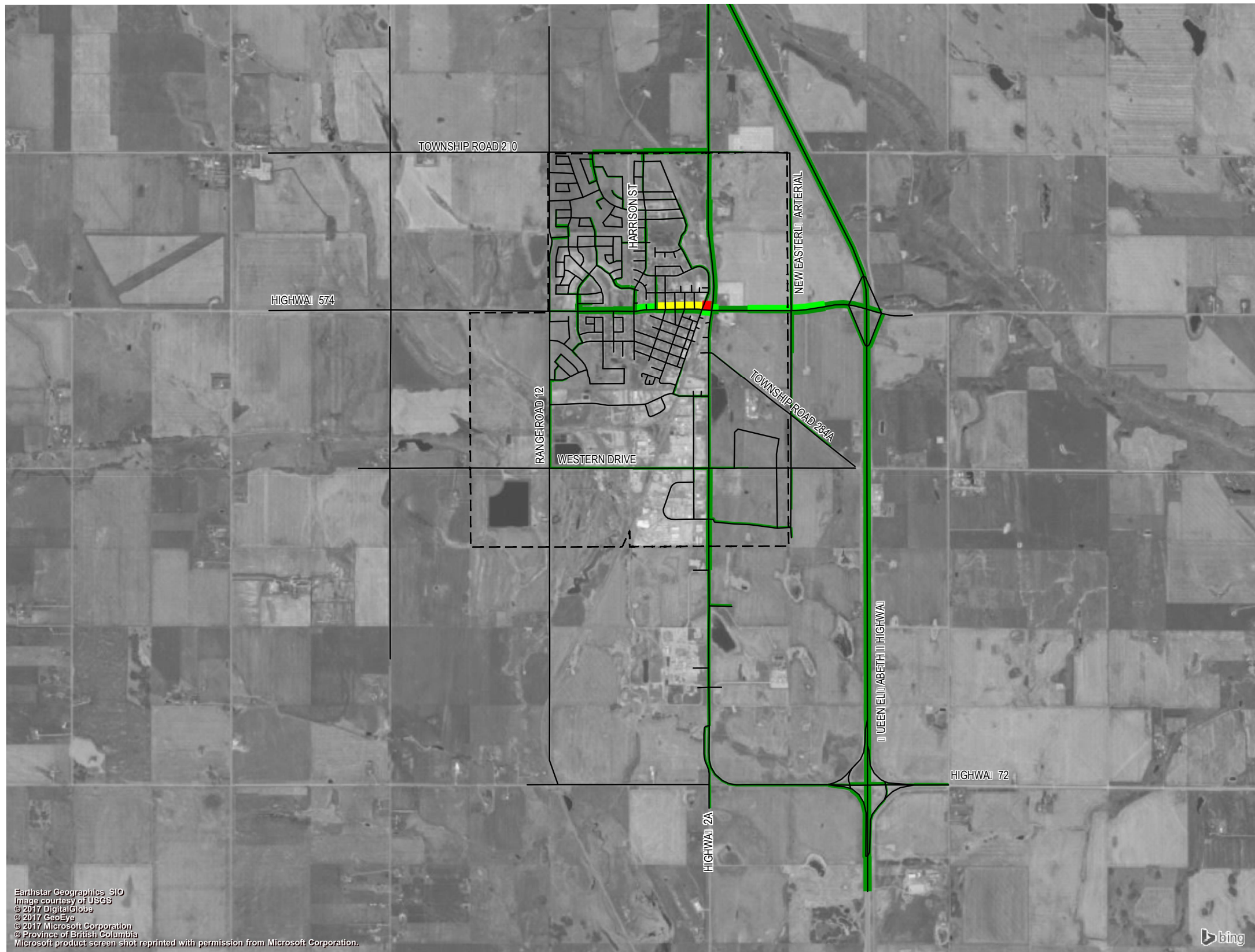
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Future AM Scenario 2

C Ratio

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PM Peak Hour Congestion Forecast Scenario 2

Line Colors

Volume Capacity Ratio PrT (AP)

- 0-60%
 - 60-80%
 - 80-95%
 - 95-105%
 - >105%
- TOWN BOUNDARY

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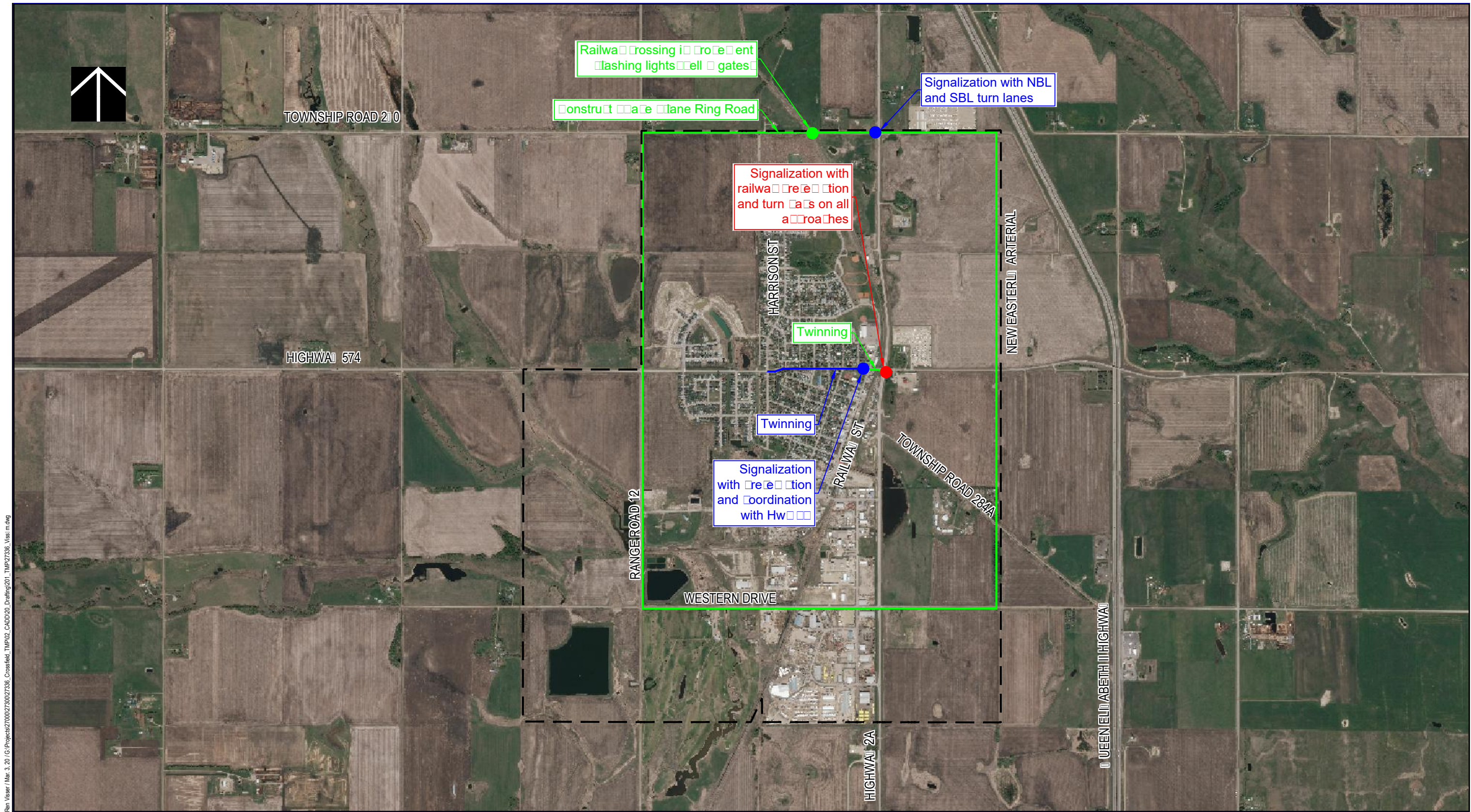
Future PM Scenario 2

C Ratio

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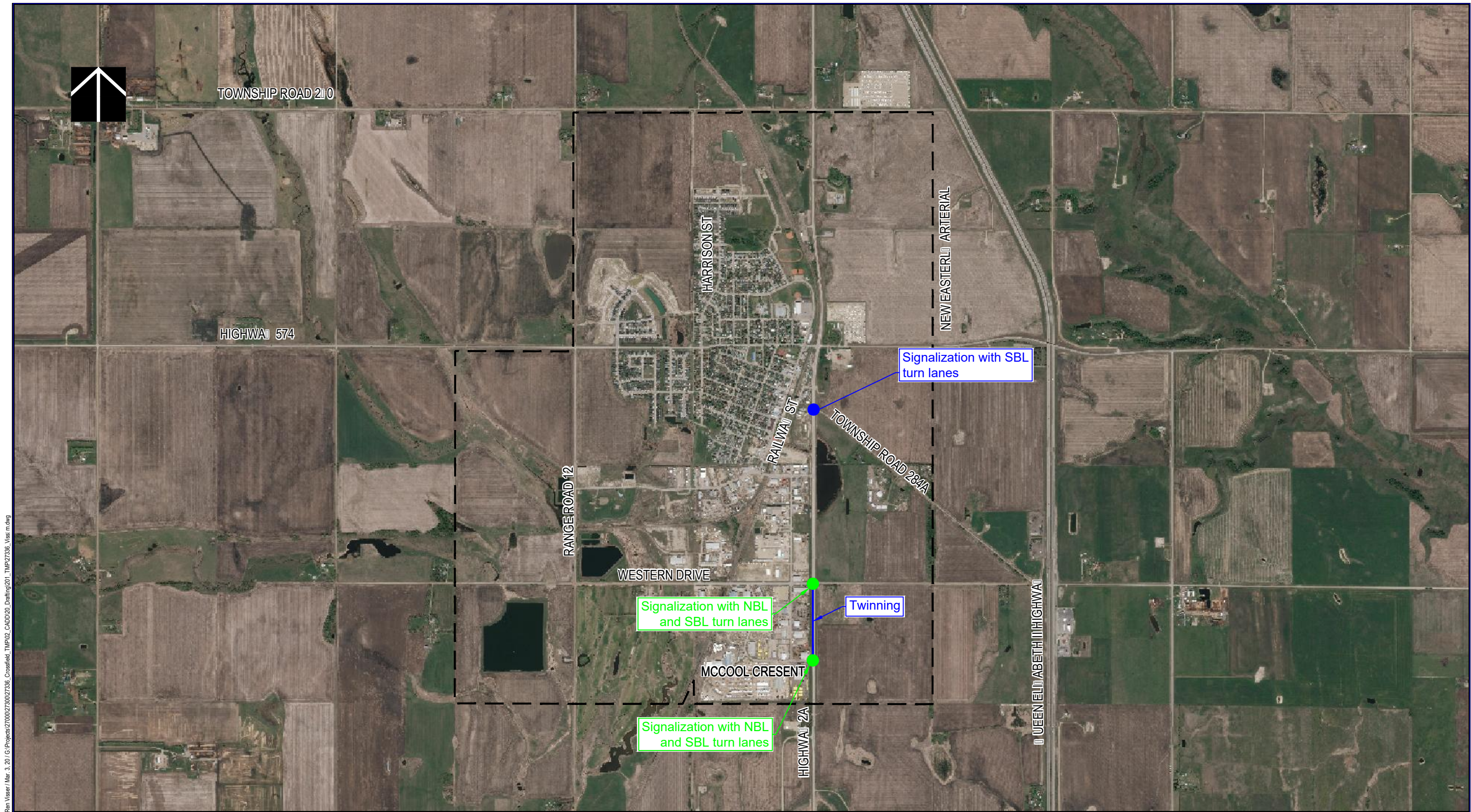
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- 10,000 POPULATION
- 15,800 POPULATION
- TOWN BOUNDARY



CROSSFIELD TMP
FUTURE ROAD IMPROVEMENTS
BOTH SCENARIO 1 AND SCENARIO 2

EXHIBIT 5
MARCH 2020



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Legend:

- 7,000 POPULATION
- 10,000 POPULATION
- 15,800 POPULATION
- - - TOWN BOUNDARY

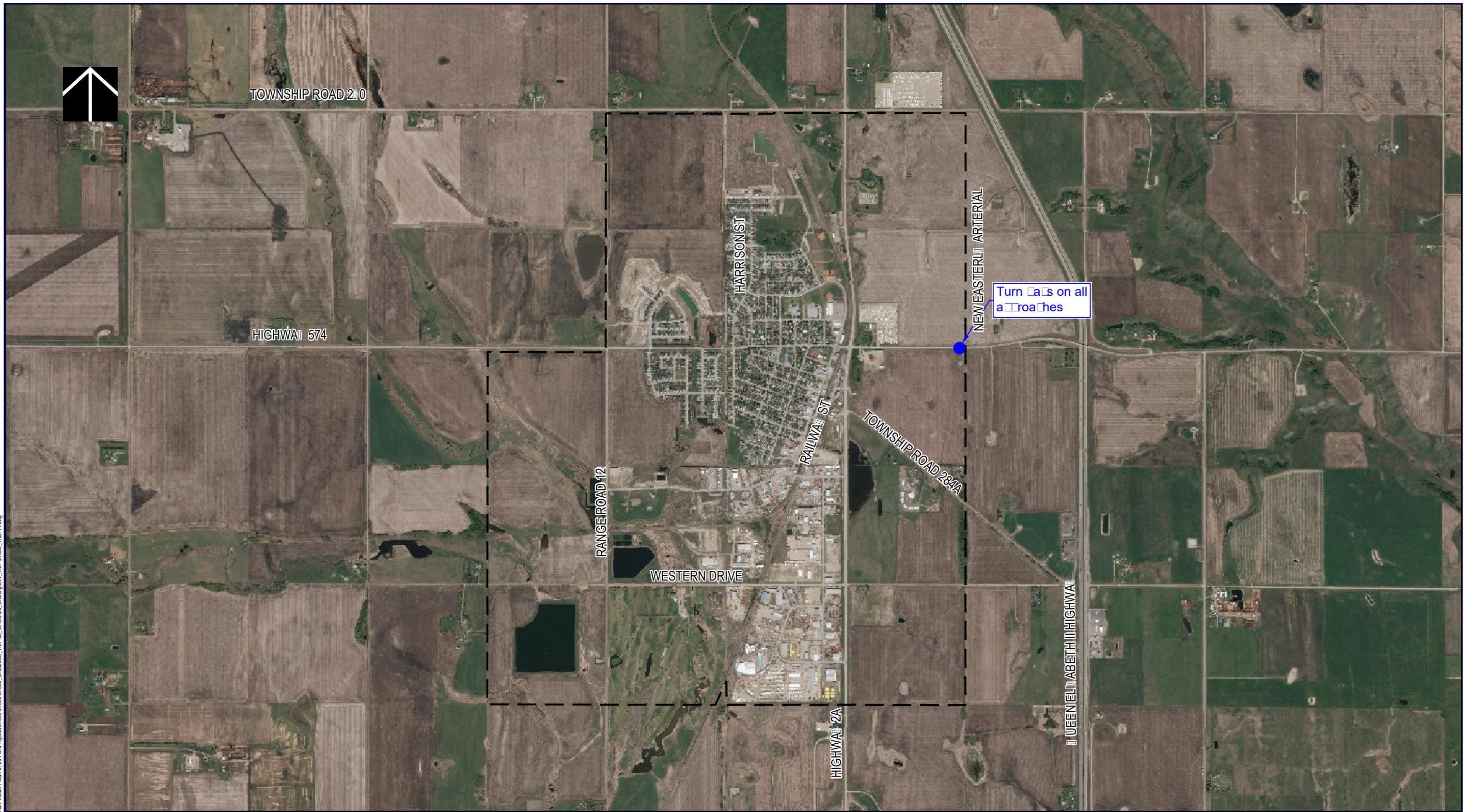


CROSSFIELD TMP

FUTURE ROAD IMPROVEMENTS
SCENARIO ONLY

EXHIBIT 11
MARCH 2020

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Legend:

- 7,000 POPULATION
- 10,000 POPULATION
- 15,800 POPULATION
- - - TOWN BOUNDARY



CROSSFIELD TMP

FUTURE ROAD IMPROVEMENTS
SCENARIO 2 ONLY

EXHIBIT 11
MARCH 2020

5.0 Road Classifications and Typical Cross Sections

As the Town of Crossfield generally follows *The City of Calgary Design Guidelines for Subdivision Servicing (2014)*, this TMP included a high-level review of future road classification and potential cross-section development that are appropriate for Crossfield's local context.

5.1 Road Classifications

The following key principles were followed for the road classification recommendations:

- Identify key arterial routes and protect the road ROW for future expansion and growth;
- Simplify and standardize road classifications to only four categories;
- Differentiate industrial streets from residential streets as vehicle characteristics and road user needs are different;

The future road classification recommendations are summarized below and shown in Exhibit 5.1:

- Highway:
 - Highway 2A: Highway 2A runs through the Town and is currently under the jurisdiction of AT. It is classified as a highway as it provides higher capacity with limited access. With the future development occurring on both sides of Highway 2A and additions of traffic signals, it is suggested to upgrade Highway 2A to an urbanized highway with median and sidewalks;
- Arterial:
 - Limit Avenue: Limit Avenue is one of the key east-west corridors within Crossfield. It is classified as an arterial due to its connection to downtown, major residential and commercial areas, and future residential and commercial developments, as well as its regional connection to Rocky View County;
 - Ring Road: The Ring Road includes Township Road 290, Range Road 12, Western Drive, and a future Easterly Arterial Road. They will form part of the major road network surrounding the Town and will facilitate future growth and expansion. In general, it will favor movement over access, and provide connections to highways, collectors and industrial streets;
- Collector: Collectors are a lower road class and primarily provides access to adjacent land uses while connecting to higher class roads, and they form the primary network within neighborhoods;
- Industrial Street: Industrial Streets primarily serve industrial land uses at the south side of the Town with wider roadways to accommodate heavy vehicles and provide local access to industrial businesses; and
- Local: Local roads are the lowest road class and primarily provide access to adjacent land uses, including residential streets. It is noted that local roads are not shown in Exhibit 5.1.

It is noted that the road network in the Crossfield East ASP area was refined to a grid-like road network with the skewed intersections revised to right-angle intersections, per the recommendations in Section 4.4.

5.2 Ring Road Alignment

To accommodate the projected future growth of Crossfield, the Ring Road is proposed which consists of four arterial roads surrounding the Town. Although at the future horizon of 15,800 population, the



four arterial roads can operate well as two-lane roads, they are protected to be fully upgraded to four-lane arterial roads beyond the future horizon of 15,800 population. Single-line alignments and ROWs of the Ring Road are shown in Exhibit 5.2.

5.3 Typical Cross Sections

Currently the Town does not have a uniform road cross section design standard for various road classifications. Through measurements of the Town’s legal map, the typical road right-of-way widths vary and are summarized below:

- Major Road: 20 m (Limit Avenue between Highway 2A and Harrison Street), 45 m (Limit Avenue west of Harrison Street);
- Industrial Major: 25 m (Western Drive between Highway 2A and CPR Tracks), 20 m (Western Drive west of CPR Tracks);
- Industrial Road: 20 m (Laut Avenue between Highway 2A and Laut Crescent), 22 m (Laut Avenue west of Laut Crescent);
- Collector: 20 m (e.g. Railway Street, Smith Avenue, Murdoch Street, etc.), 22 m (Vista Drive);
- Residential Street: 20 m (e.g. Saskatchewan Street, Mountain Avenue, Munson Street, etc.), 14 m to 16 m (residential streets in Sunset Heights and Vista Crossing);

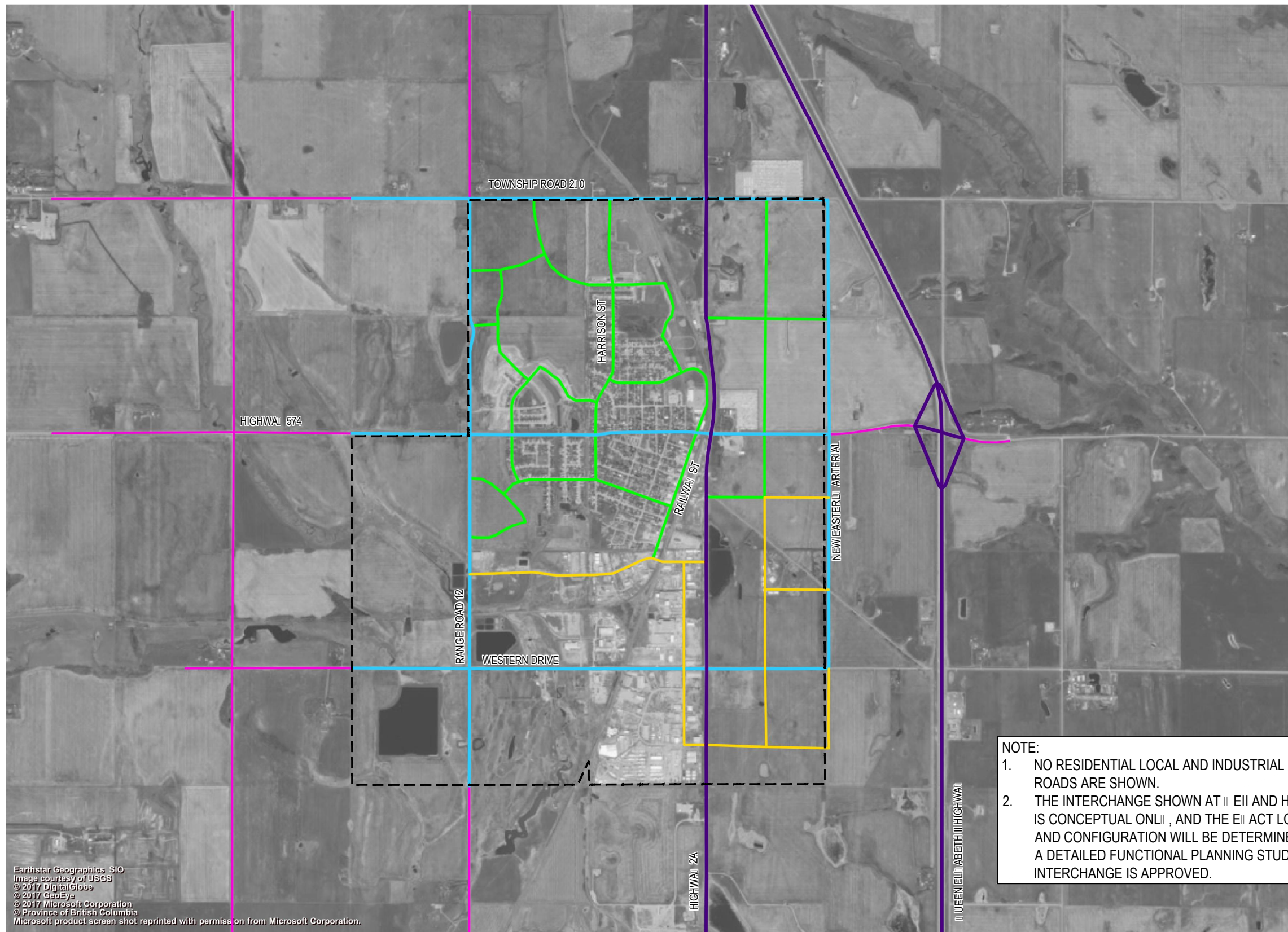
The Town currently follow the road standards from the *2014 The City of Calgary Design Guidelines for Subdivision Servicing (DGSS)*. Considering the Town’s local conditions and the directions given by the Town, customized cross sections (see Exhibit 5.3) could be considered in addition to the standard cross sections in DGSS. It is noted that the road cross sections could be further adjusted based on local context through the local development approval process and they can be verified during the Outline Plan process.

The customized cross sections are based on the following key principles. The difference as compared to DGSS was highlighted:

- The customized cross section is developed for four commonly used road classifications in the Town;
- Promote walkability by providing pedestrian facilities (sidewalks/pathways) on both sides of all roadways; and
- As requested by the Town, no dedicated cycling facility (on-street and off-street) and public trees were proposed within the road right-of-way, which differed from the DGSS.

Table 5.1: Proposed Typical Cross Sections

Proposed Classification	Characteristics	ROW / Pavement Width
Arterial	Divided 4 Lanes	32.0 m / 14.0 m
Collector	Undivided 2 Lanes & Parking	20.8 m / 11.2 m
Industrial Street	2 Lanes No Parking	18.0 m / 9.0 m
Residential Street	Separate Walk with Rear Lane	18.4 m / 9.0 m
	Monowalk with Rear Lane	16.0 m / 9.0 m
	Monowalk No Rear Lane	16.0 m / 8.5 m



Earthstar Geographics SIO
 Image courtesy of USGS
 © 2017 DigitalGlobe
 © 2017 GeoEye
 © 2017 Microsoft Corporation
 © Province of British Columbia
 Microsoft product screen shot reprinted with permission from Microsoft Corporation.

NOTE:
 1. NO RESIDENTIAL LOCAL AND INDUSTRIAL LOCAL ROADS ARE SHOWN.
 2. THE INTERCHANGE SHOWN AT EII AND HIGHWAY 574 IS CONCEPTUAL ONLY, AND THE EXACT LOCATION AND CONFIGURATION WILL BE DETERMINED THROUGH A DETAILED FUNCTIONAL PLANNING STUDY IF THE INTERCHANGE IS APPROVED.

Future Road Classification

- Type
- HIGHWAY
 - ARTERIAL
 - COLLECTOR
 - INDUSTRIAL STREET
 - RURAL
 - TOWN BOUNDARY



CROSSFIELD TMP

PROPOSED ROAD CLASSIFICATION

EXHIBIT 5.1
 MARCH 2020

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Legend:

□	R	□	L	I	M	I	N	A	R	□
FOR DISCUSSION ONLY										
SUBJECT TO REVISION										

1:10 000 0 100 200 300m



CROSSFIELD TMP

RIN ROAD ALIGNMENTS
NORTH SECTION

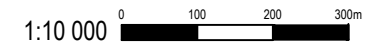
EXHIBIT 5.2
MARCH 2020

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Legend:

□ R O L I M I N O R O □
 FOR DISCUSSION ONLY
 SUBJECT TO REVISION



CROSSFIELD TMP

R I N □ R O A D A L I □ N M E N T S
 □ E S T S E C T I O N

EXHIBIT 5.2.2
 MARCH 2020



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Legend:

□ R O L I M I N O R □
FOR DISCUSSION ONLY
SUBJECT TO REVISION

1:10 000 0 100 200 300m



CROSSFIELD TMP

RIN □ ROAD ALI □ NMENTS
SO □ TH SECTION

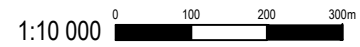
EXHIBIT 5.2.3
MARCH 2020



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Legend:

◻ R ◻ L I M I N ◻ R ◻
 F O R D I S C U S S I O N O N L Y
 S U B J E C T T O R E V I S I O N

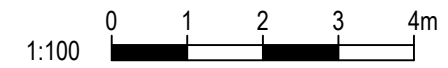
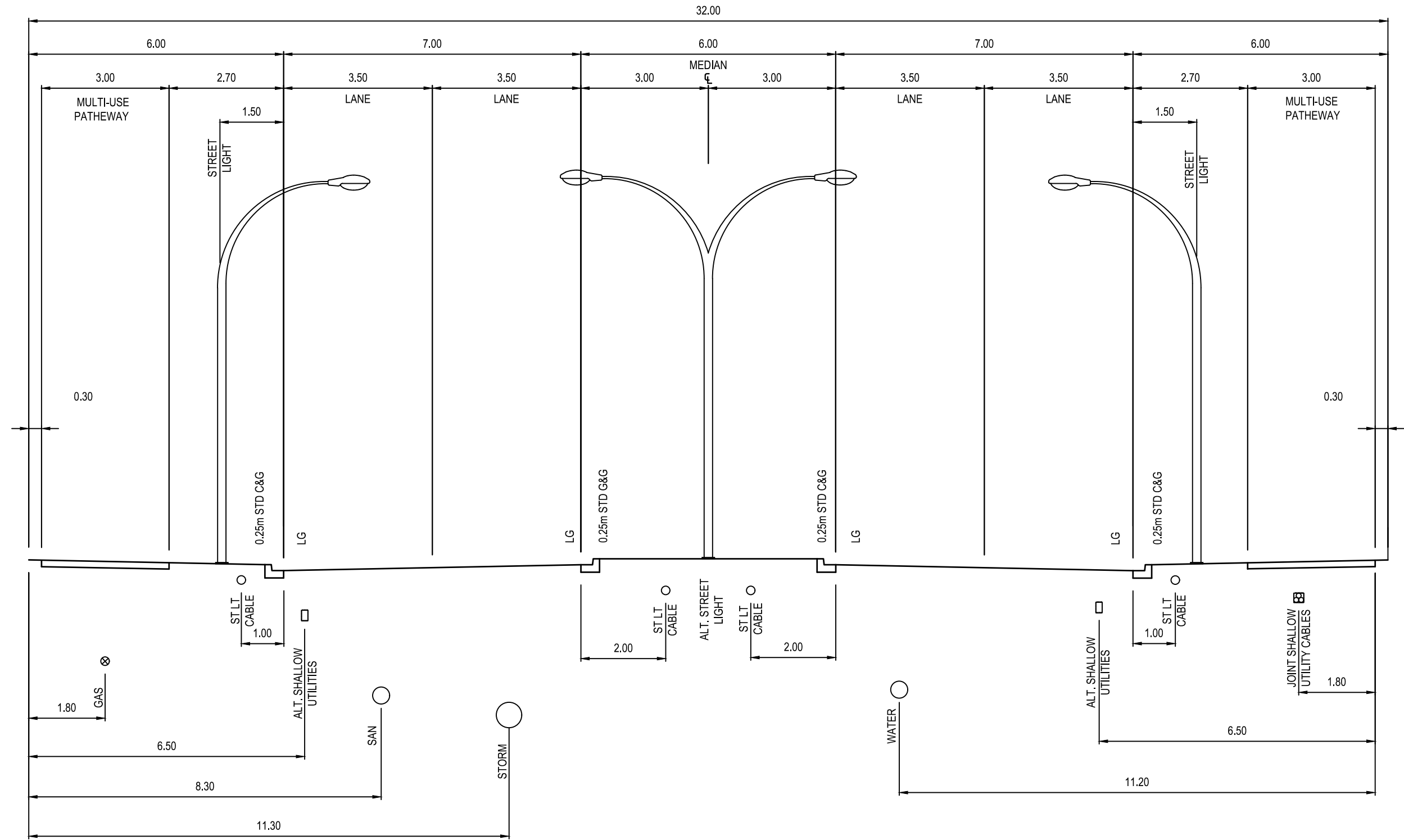


CROSSFIELD TMP

**RIN ◻ ROAD ALI ◻ NMENTS
EAST SECTION**

**EXHIBIT 5.2 ◻
MARCH 2020**

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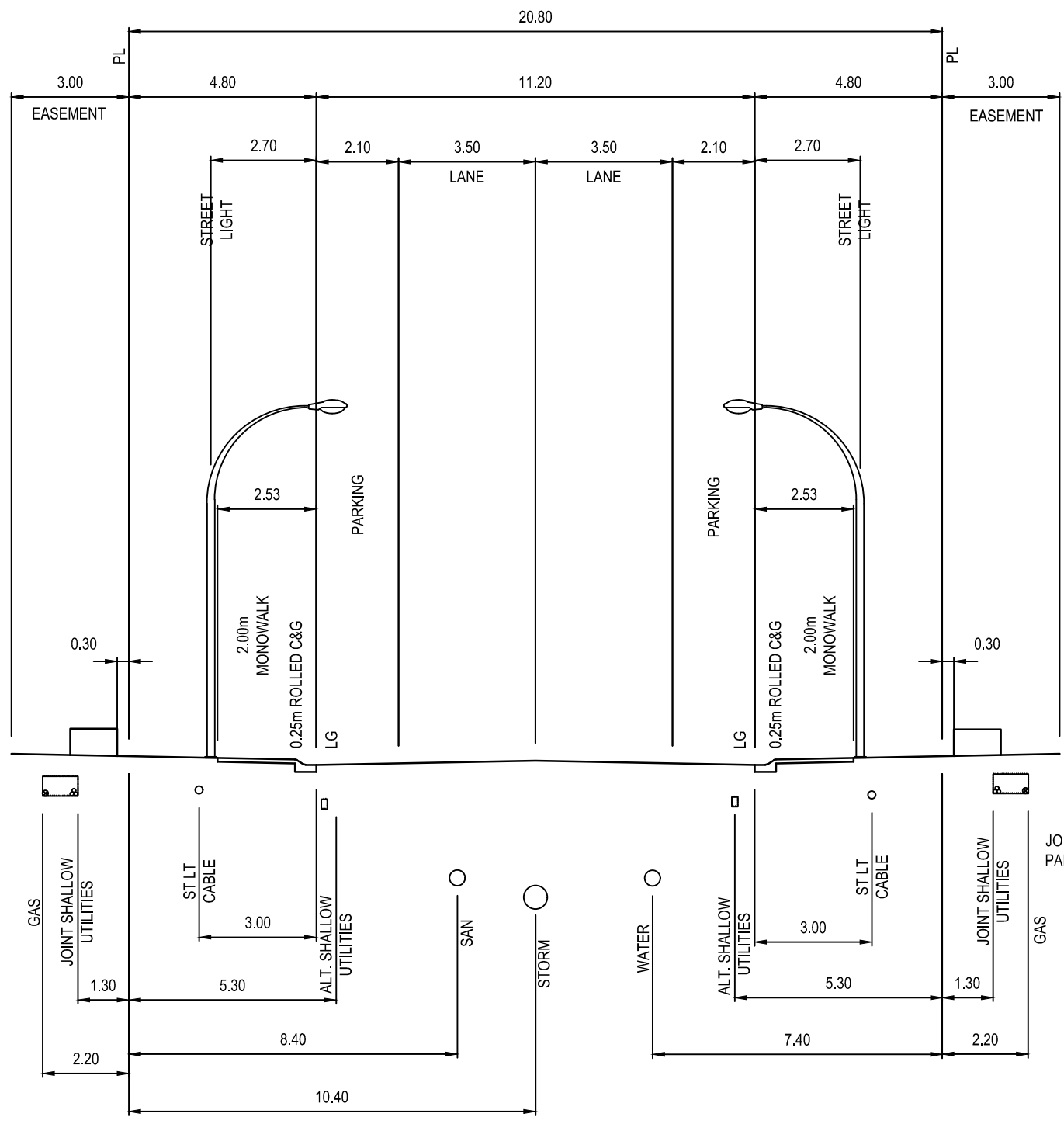


CROSSFIELD TMP

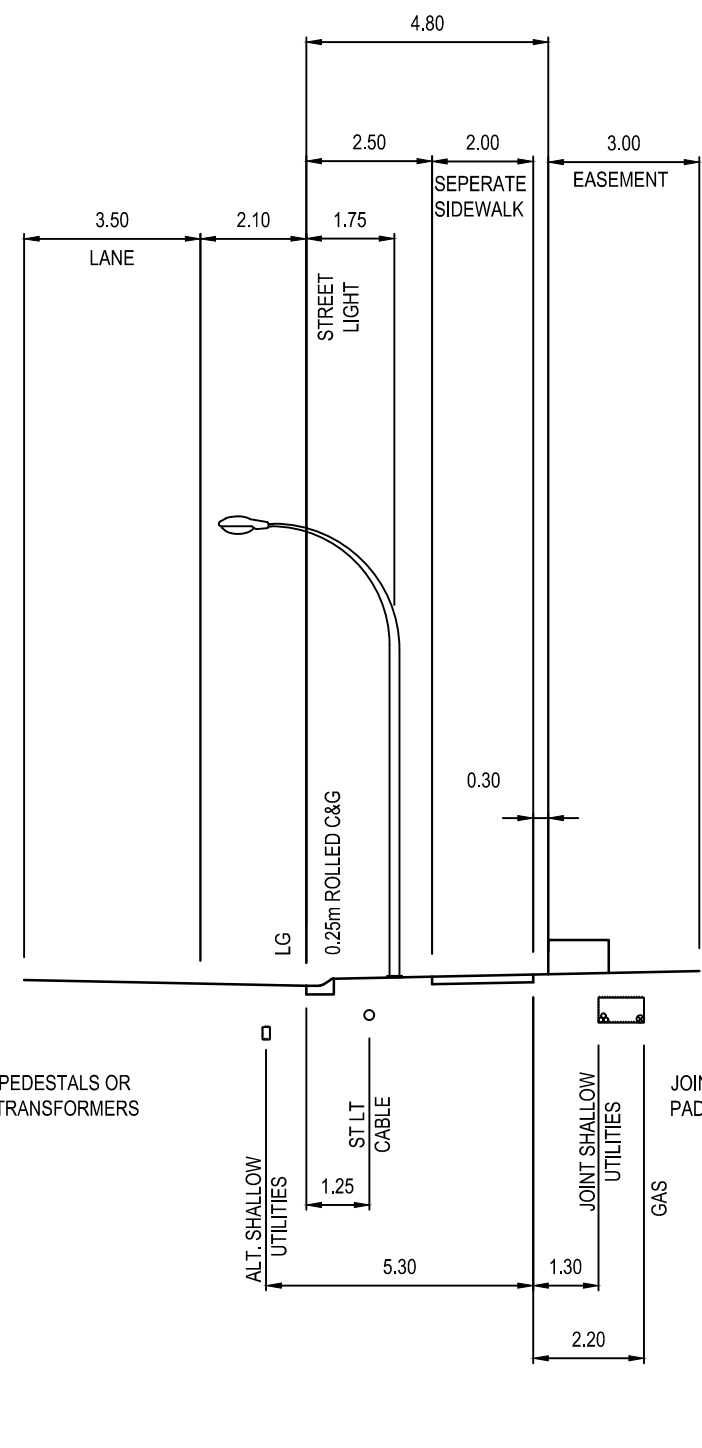
TYPICAL CROSS SECTION
ARTERIAL STREET

EXHIBIT 5.3. □
MARCH 2020

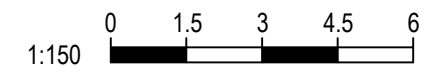
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MONOLITHIC SIDEWALK



SEPERATE SIDEWALK

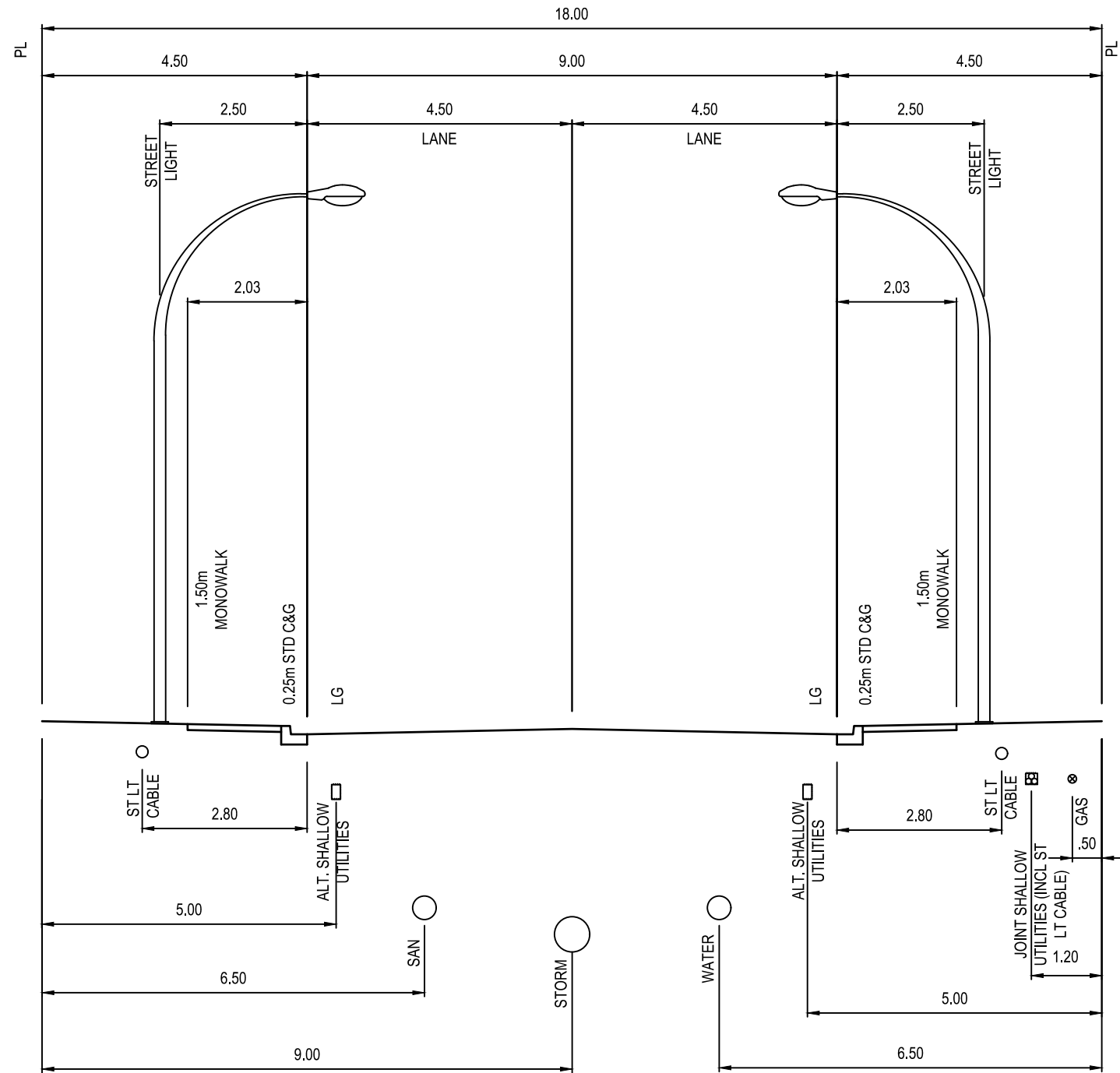


CROSSFIELD TMP

TYPICAL CROSS SECTION
COLLECTOR STREET

EXHIBIT 5.3.2
MARCH 2020

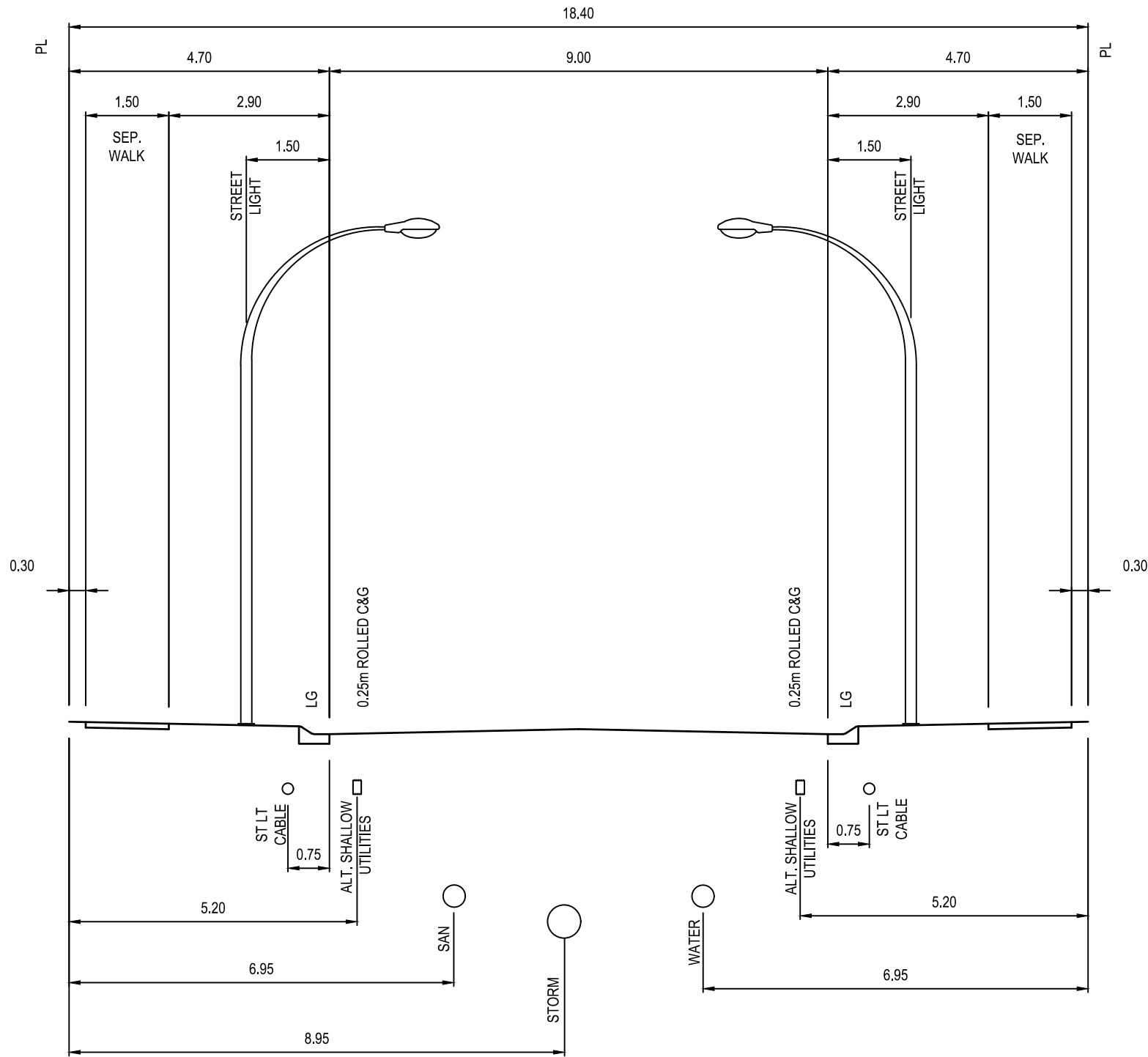
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CROSSFIELD TMP
TYPICAL CROSS SECTION
INDUSTRIAL STREET

EXHIBIT 5.3.3
MARCH 2020

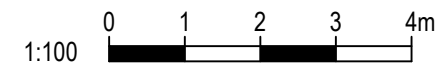
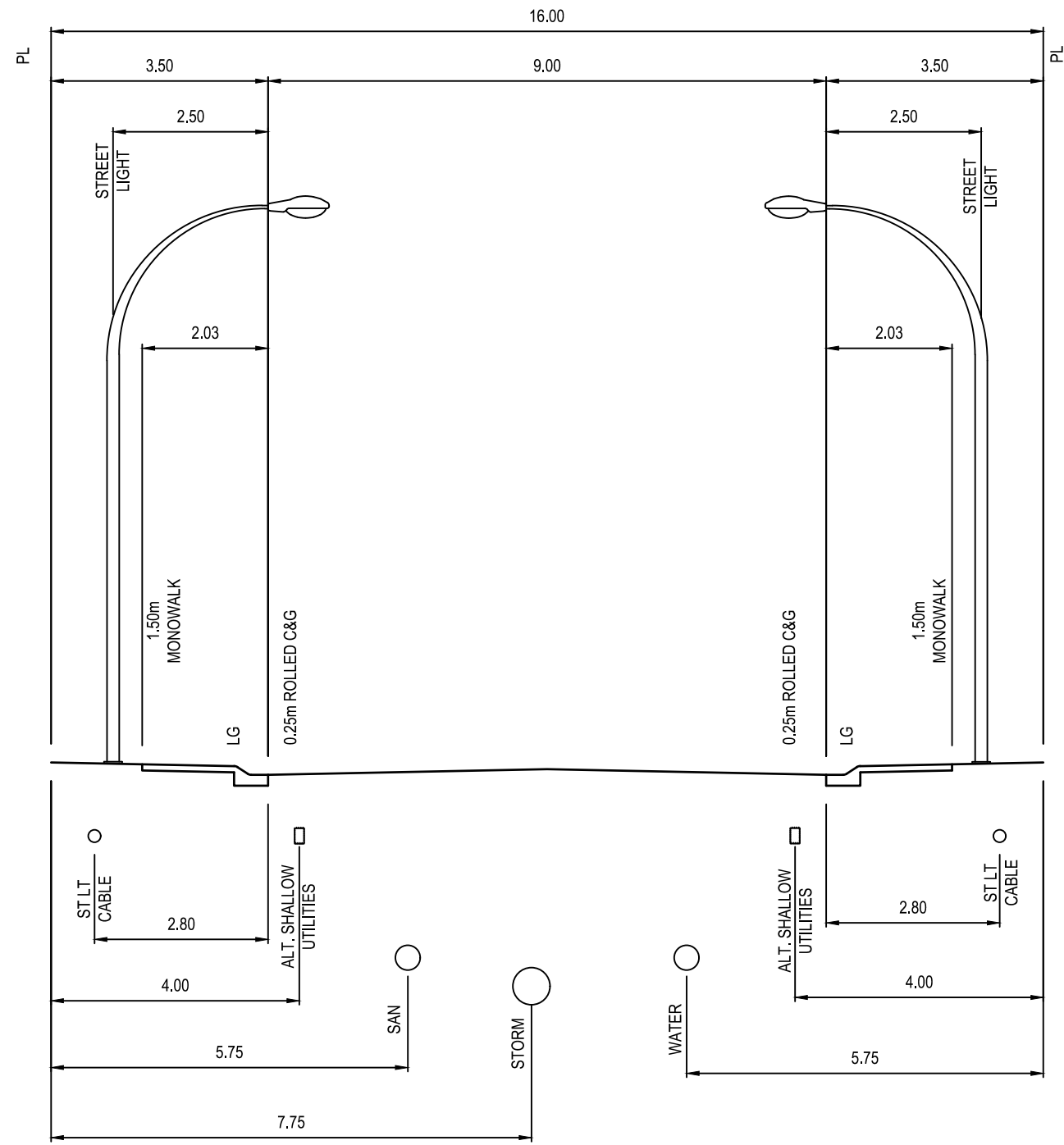
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CROSSFIELD TMP
TYPICAL CROSS SECTION
RESIDENTIAL STREET SEPERATE AL WITH REAR LANE

EXHIBIT 5.3.
MARCH 2020

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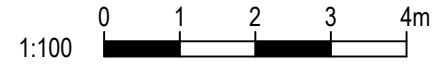
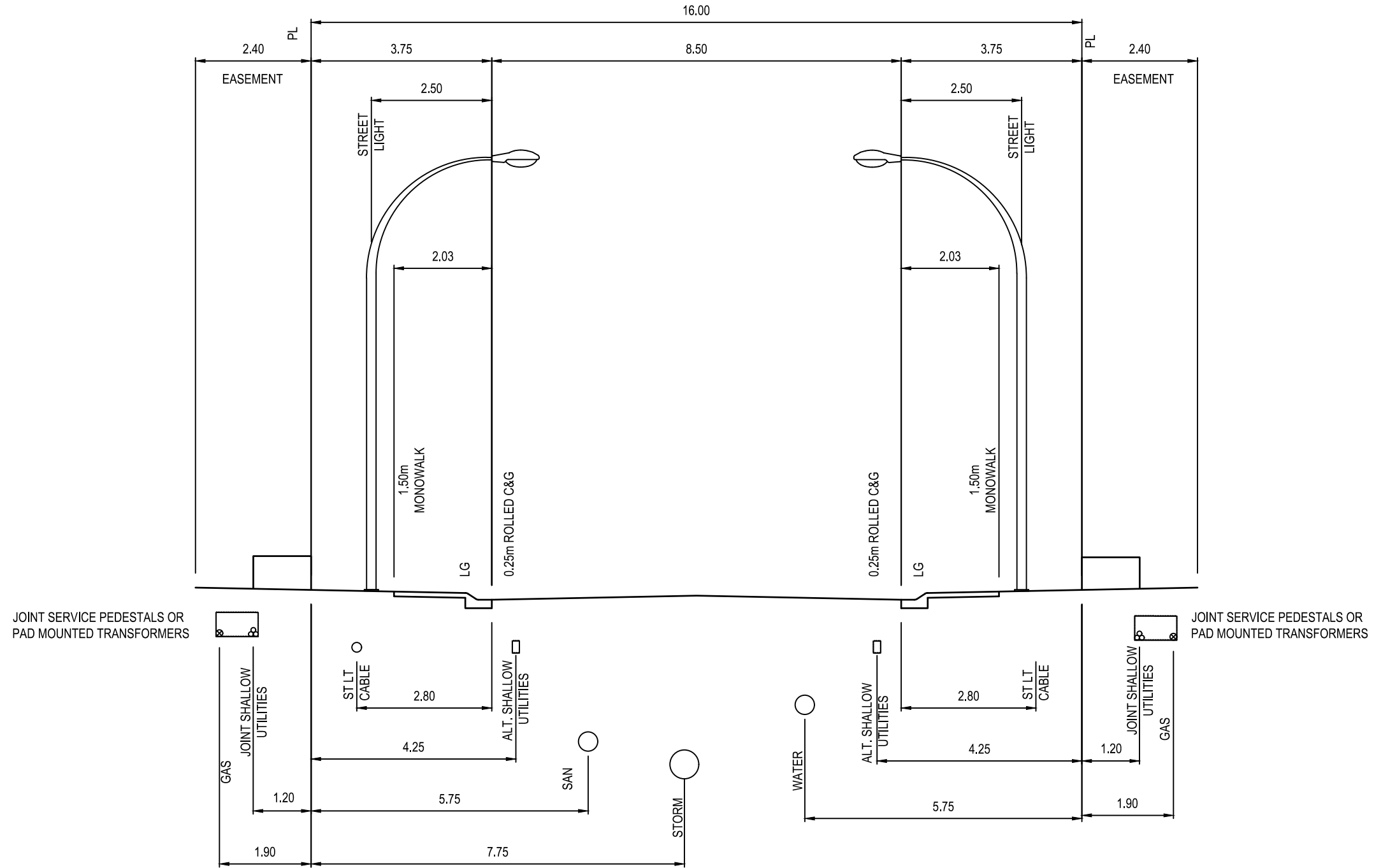


CROSSFIELD TMP

TYPICAL CROSS SECTION
RESIDENTIAL STREET MONO AL ITH REAR LANE

EXHIBIT 5.3.5
MARCH 2020

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CROSSFIELD TMP

TYPICAL CROSS SECTION

RESIDENTIAL STREET MONO AL ITH NO REAR LANE

EXHIBIT 5.3

MARCH 2020

6.0 Public and Stakeholder Engagement

As part of the TMP update, public and stakeholder engagement activities were conducted. In Stage 1 – Existing Transportation Network Development and Analysis, public engagement was held through an open house and online survey to gather feedback on existing issues and opportunities. Additionally, a stakeholder engagement session was held with key stakeholders in Crossfield to gather their particular feedback.

6.1 Initial Engagement

The initial public open house was held on April 1, 2019 from 6pm to 8pm at the Town Hall. An online survey also ran from March 25, 2019 to April 6, 2019 to solicit feedback. The objective was to provide an opportunity for Crossfield residents to review the project process and timelines, learn more about what a TMP is and how it impacts residents, and share feedback on existing issues and opportunities related to safety, pedestrian/cyclist connectivity, traffic movement and signalization, and the road network.

Identified key stakeholders were invited to attend a stakeholder meeting held on April 1, 2019 from 2:30pm to 4:30pm. With information about the project and open house materials available, stakeholders were provided the opportunity to provide feedback on transportation issues and opportunities. The identified key stakeholders that attended the stakeholder meeting included:

- Town of Crossfield
- Fire Department
- Rocky View County
- Chamber of Commerce
- Municipal Law Enforcement
- Rocky View Bus
- Calgary Catholic School Board
- WG Murdoch School
- Crossfield Elementary School
- Dream Development (Vista Crossing)
- Truplanin Logistics Corp.
- Carmen's Bigway Foods
- Maxfield
- Core Linepipe

Feedback was also received from Alberta Transportation regarding the highway network near the Town of Crossfield. The feedback stated that the conversion of the flyover at Highway 574 / QEII to an interchange is not currently identified by AT as a future interchange location outlined in the Freeways and Access Locations Designation Order, and Highway 2A may be subject of a planning study in the near future (~5 years) subject to priorities and funding availability. Any planning for an interchange at Highway 574 would require amendment of the Designation Order by the Provincial Cabinet.

In total, 15 stakeholders attended the workshop, 14 interested members of the public attended in-person and 7 responses were received from the online survey with 54 locations identified in the feedback. Below is a summary of what we heard at these engagement activities, and the detailed engagement feedback information is included in Appendix E.



Traffic Safety

- Participants expressed concern about Laut Avenue and recommended raising the slope to provide a gradual transition onto Hwy 2A and also leveling the train crossing as driving conditions had a tendency to be slick and treacherous during the winter months. In addition, participants recommended having signals at Laut Avenue / Hwy 2A.
- Participants raised concerns about large vehicle access, particularly emergency vehicles which have been observed to experience difficulty navigating through the town when cars were parked on both sides of a street (e.g. Mountain Avenue).
- Some participants raised concern about speeding vehicles particularly on Mountain Avenue, before and after school hours.

Traffic Movement and Signalization

- Participants suggested improvements at the Railway Street / Limit Avenue intersection. Suggestions included adding an eastbound right merge lane onto Hwy 2A or adding a traffic signal at the intersection.
- Some participants indicated visibility issues with clearly seeing street signs, such as Railway Street, and recommended moving signage to a more prominent visible position.
- Some participants suggested changing Vista Drive to a 4-way stop and making Railway Street and Smith Avenue a 3-way stop.

Pedestrian / Cyclist Connectivity

- Participants indicated they would like improvements in the pedestrian connections and public realm which would include wider sidewalks, pedestrian flashing light crossings, boulevard trees, and sidewalks on both sides of certain streets such as Ross Street.
- Some participants suggested new bike lanes within the town business district. Others recommended extending the existing bike lane west of the old railway tracks into the town limits.
- Some participants noted a lack of pathways in the old part of town while others suggested an additional pathway from Sunset area to the Rodeo grounds.

Road Network

- Some participants suggested additional access points from the Town to Airdrie and Hwy 2A. Participants also stated that new developments would require additional road capacity.
- Participants indicated they would like to see more parallel parking in the town as an alternative to angle parking (e.g. along Railway St from Nanton Ave to Laut Ave).

Other

- Participants highlighted issues with the railway crossing as they found the trains slow and lengthy. Suggestions were made to have another access point to cross the tracks or constructing a bridge to avoid the train.
- Some participants indicated they would like to have transit services introduced from the town to Airdrie and Calgary.

6.2 Final Engagement

The final online public engagement was held from April 27, 2020 to May 10, 2020. The objective was to present the draft Transportation Master Plan (TMP) to Crossfield residents and solicit feedback on the draft TMP. Eleven responses were received, which is included as verbatim feedback in Appendix E. There is generally more support from residents on the provision of potential QEII / Highway 574 interchange (Scenario 2).

6.3 Recommendations

Based on the engagement feedback, the following recommendations were made:

- Investigate grades on Laut Avenue at Hwy 2A and CPR crossing;
- Monitor traffic turning volumes at Hwy 2A / Laut Ave, Limit Ave / Vista Drive, and Railway Street / Smith Ave, and conduct 4-way stop and/or signal warrant analysis as needed;
- Work with emergency services to address any issues or concerns with large vehicle access;
- Work with RCMP to monitor and enforce speed where needed;
- Investigate the placement of street signs in the Town and improve their visibility as needed;
- Improve public realm and pedestrian connection / experience within the Town at identified areas such as downtown and Railway Street;
- Develop a Cycling and Pathway Master Plan to identify cycling facilities and pathway improvements;
- Develop a parking management plan for the downtown; and
- Conduct a Transit Feasibility Study for regional transit connection to Airdrie and/or Calgary.



7.0 Closing

The Town of Crossfield Transportation Master Plan Update provides a framework for Council and Administration to assess the capability of the road network to accommodate new development in the short- and long-term, and to carry out short- and long-term planning and budgeting.

This study proposes various roadway improvement recommendations totaling to approximately \$46 million for 15,800 population, which only includes recommendations that are required for both Scenario 1 (with flyover on Highway 574 over QEII) and Scenario 2 (with an interchange at QEII / Highway 574). For the improvements that are required only in Scenario 1 or Scenario 2, it is recommended that the Town discuss with AT on the potential QEII / Highway 574 interchange or flyover and include either the Scenario 1 or Scenario 2 improvements in the next TMP update.

The recommendations that are required for both Scenarios 1 and 2 are further broken down into two interim study horizons to understand the staging requirements (note that the years for the future population horizons are estimated based on projected population growth):

- Existing 3,300 population (2018): no improvements are required;
- By 7,000 population (between 2025 and 2027): improvements are required at Highway 2A / Limit Avenue;
- By 10,000 population (between 2031 and 2035): improvements are required on Limit Avenue corridor (Railway Street – Highway 2A), Township 290 railway crossing, and Ring Road. Note that Ring Road will be developed on an as-needed basis dependent on the land development and subdivision progress;
- By 15,800 population (between 2042 and 2050): improvements are required at Railway Street / Limit Avenue, Limit Avenue corridor (Harrison Street – Railway Street), and Highway 2A / Township Road 290;

The recommendations that are required only in Scenario 1 or only in Scenario 2 are also broken down in two interim study horizons:

- Scenario 1 Only:
 - By 10,000 population: improvements are required at Highway 2A / Western Drive and Highway 2A / McCool Crescent;
 - By 15,800 population: improvements are required at Highway 2A / Township Road 284A and Highway 2A corridor (Western Drive – McCool Crescent);
- Scenario 2 Only:
 - By 15,800 population: improvements are required at Highway 574 / New Arterial Road

Additionally, it is suggested that the Town update its off-site levy bylaw to reflect the proposed transportation improvement projects, and also work with CPR to upgrade any railway crossing when warranted. Through public engagement, some interest was expressed on improving the local pathway system; therefore, it is recommended that the Town undertake a Cycling and Pathway Master Plan to develop a local pathway network and related cycling infrastructure.



It is recognized that all proposed improvements are based off to the overall population horizon as development progress and sequence can be difficult to predict and can change over time. Therefore, an overall population is a preferred growth indicator. Changes in the development sequence could potentially affect the staging recommendations.

It is noted that some transportation issues and opportunities identified through public and stakeholder engagement might not be addressed in the TMP, hence they have been shared with the Town and may be addressed through its annual operational budget, such as pavement surface improvement and traffic calming measures.

Finally, it is recommended that the Transportation Master Plan be updated every five to ten years to reflect the land use changes, rate of growth and/or new policy directions, preferably in concurrence with updates to the Municipal Development Plan to ensure integrated land use and transportation planning. Timing for the updates can be based on the pace of development and growth, with more frequent updates warranted if growth accelerates.



APPENDIX
Existing and Future Population and
Employment Data by Zone

A

Existing Population and Employment

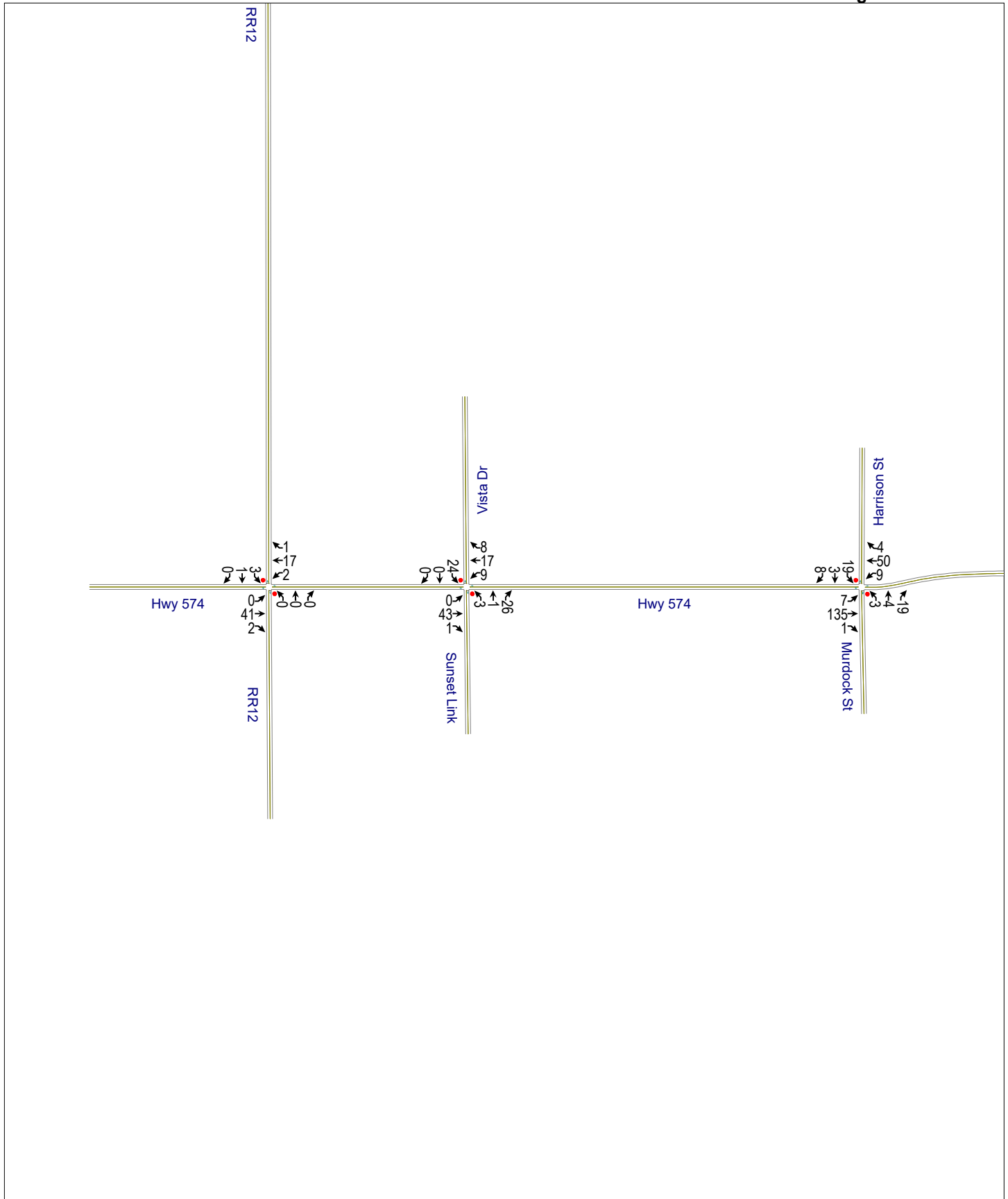
Zone ID	Population & Household			Employment				
	Population	Single Family	Multi Family	Total	Retail	Non-Retail	Industrial	School
101	1,089	392	5	96	10	30	0	56
102	669	242	2	0	0	0	0	0
103	1,086	357	39	80	20	60	0	0
104	0	0	0	80	50	10	20	0
105	0	0	0	150	5	25	120	0
106	0	0	0	220	0	0	150	0
107	0	0	0	115	5	10	190	0
108	0	0	0	60	0	10	30	0
109	0	0	0	220	0	0	220	0
201	0	0	0	0	0	0	0	0
202	225	82	0	0	0	0	0	0
203	239	87	0	0	0	0	0	0
204	0	0	0	0	0	0	0	0
205	0	0	0	5	0	5	0	0
206	0	0	0	5	0	0	5	0
207	0	0	0	5	0	5	0	0
208	0	0	0	30	0	0	30	0
209	0	0	0	0	0	0	0	0
301	0	0	0	0	0	0	0	0
302	0	0	0	0	0	0	0	0
303	0	0	0	0	0	0	0	0
304	0	0	0	5	0	0	5	0
305	4	1	0	0	0	0	0	0
306	0	0	0	0	0	0	0	0
307	4	1	0	0	0	0	0	0
401	4	1	0	10	0	10	0	0
402	0	0	0	0	0	0	0	0
403	0	0	0	0	0	0	0	0
404	0	0	0	0	0	0	0	0
501	0	0	0	0	0	0	0	0
502	4	1	0	0	0	0	0	0
503	8	2	0	0	0	0	0	0
504	4	1	0	0	0	0	0	0
505	4	1	0	5	0	0	5	0
506	4	1	0	0	0	0	0	0
507	4	1	0	0	0	0	0	0
508	4	1	0	0	0	0	0	0
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510	0	0	0	0	0	0	0	0
511	4	1	0	0	0	0	0	0
512	4	1	0	0	0	0	0	0
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514	4	1	0	0	0	0	0	0
515	0	0	0	10	0	0	10	0
516	0	0	0	34	0	0	34	0
517	0	0	0	5	0	0	5	0
518	0	0	0	0	0	0	0	0
519	0	0	0	0	0	0	0	0
520	0	0	0	0	0	0	0	0
Total	3,368	1,175	46	1,135	90	165	824	56

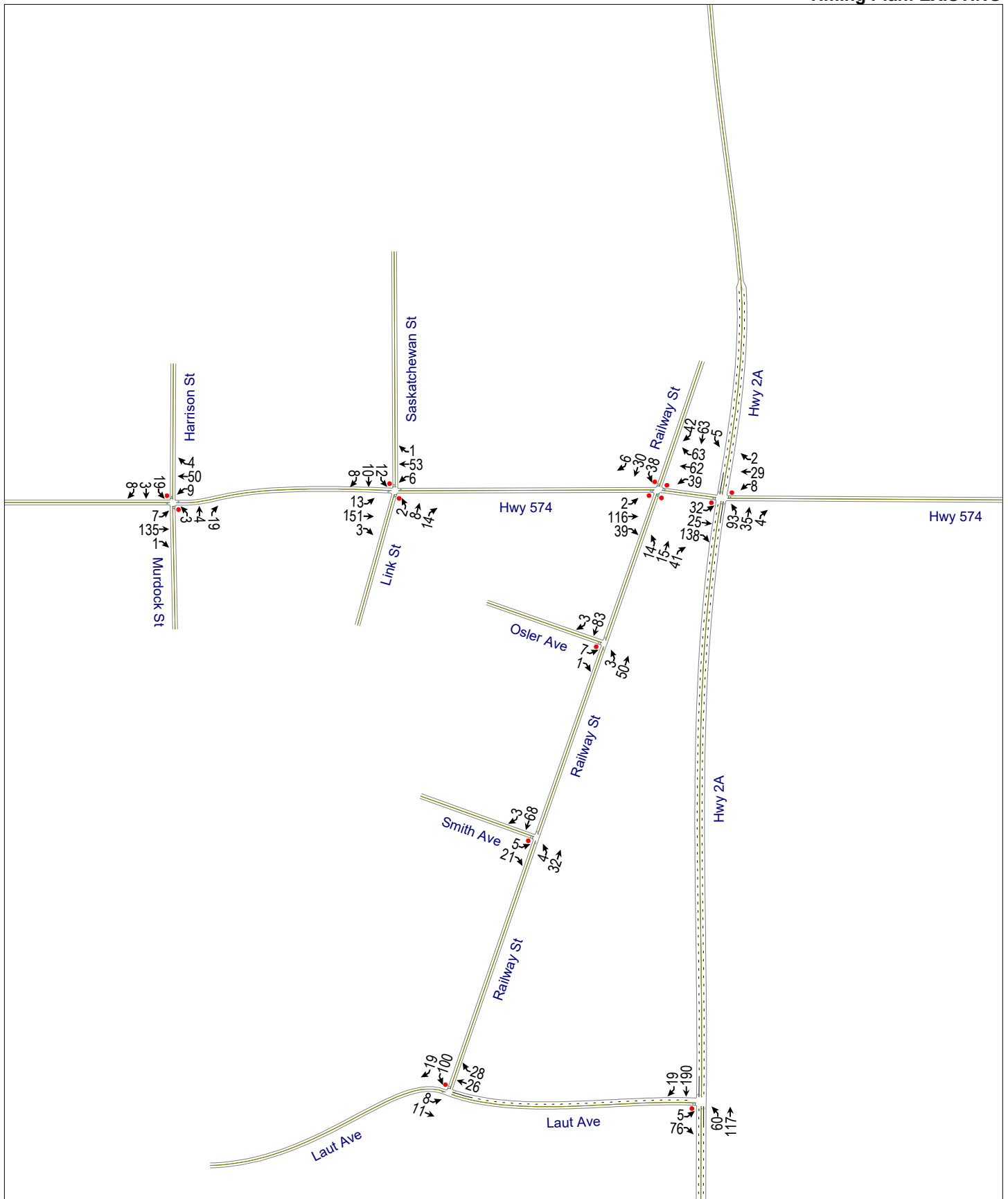
Future Population and Employment

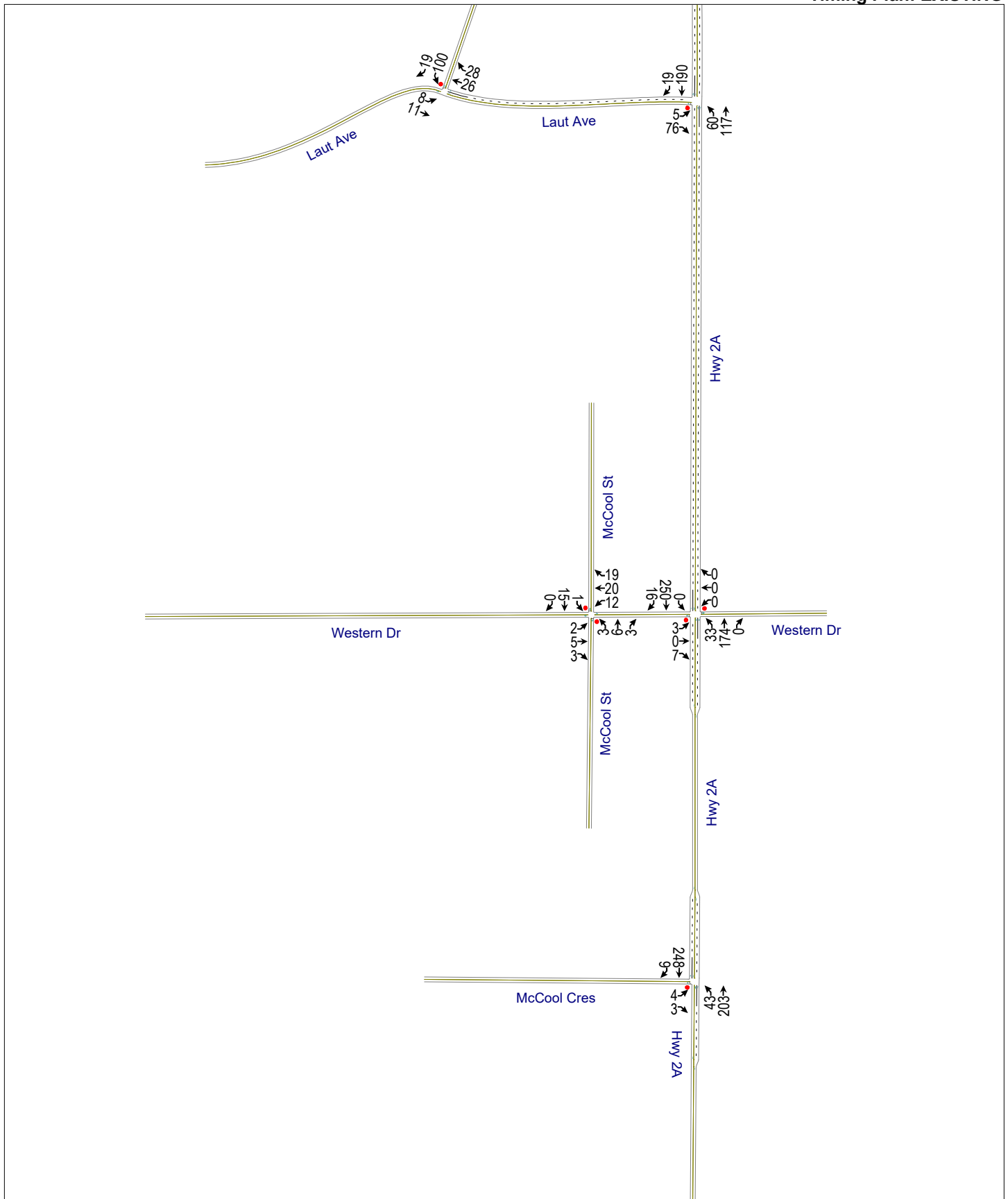
Zone ID	Population & Household			Employment				
	Population	Single Family	Multi Family	Total	Retail	Non-Retail	Industrial	School
101	1,089	392	5	96	10	30	0	56
102	669	242	2	0	0	0	0	0
103	1,086	357	39	80	20	60	0	0
104	0	0	0	80	50	10	20	0
105	0	0	0	150	5	25	120	0
106	0	0	0	150	0	0	150	0
107	0	0	0	205	5	10	190	0
108	0	0	0	40	0	10	30	0
109	0	0	0	220	0	0	220	0
201	2,599	917	46	90	30	0	0	60
202	1,658	542	50	80	20	0	0	60
203	2,909	736	267	60	0	0	0	60
204	1,428	459	51	60	60	0	0	0
205	2,370	864	0	100	20	20	0	60
206	2,014	734	0	120	60	60	0	0
207	0	0	0	340	150	90	100	0
208	0	0	0	200	0	0	200	0
209	0	0	0	264	0	0	264	0
301	0	0	0	114	0	0	114	0
302	0	0	0	220	0	0	220	0
303	0	0	0	240	0	0	240	0
304	0	0	0	264	0	0	264	0
305	0	0	0	264	0	0	264	0
306	0	0	0	264	0	0	264	0
307	0	0	0	264	0	0	264	0
401	4	1	0	10	0	10	0	0
402	0	0	0	0	0	0	0	0
403	0	0	0	0	0	0	0	0
404	0	0	0	0	0	0	0	0
501	0	0	0	0	0	0	0	0
502	4	1	0	0	0	0	0	0
503	8	2	0	0	0	0	0	0
504	4	1	0	0	0	0	0	0
505	4	1	0	5	0	0	5	0
506	4	1	0	0	0	0	0	0
507	4	1	0	0	0	0	0	0
508	4	1	0	0	0	0	0	0
509	4	1	0	0	0	0	0	0
510	0	0	0	0	0	0	0	0
511	4	1	0	0	0	0	0	0
512	4	1	0	0	0	0	0	0
513	0	0	0	0	0	0	0	0
514	4	1	0	0	0	0	0	0
515	0	0	0	10	0	0	10	0
516	0	0	0	34	0	0	34	0
517	0	0	0	5	0	0	5	0
518	0	0	0	0	0	0	0	0
519	0	0	0	0	0	0	0	0
520	0	0	0	0	0	0	0	0
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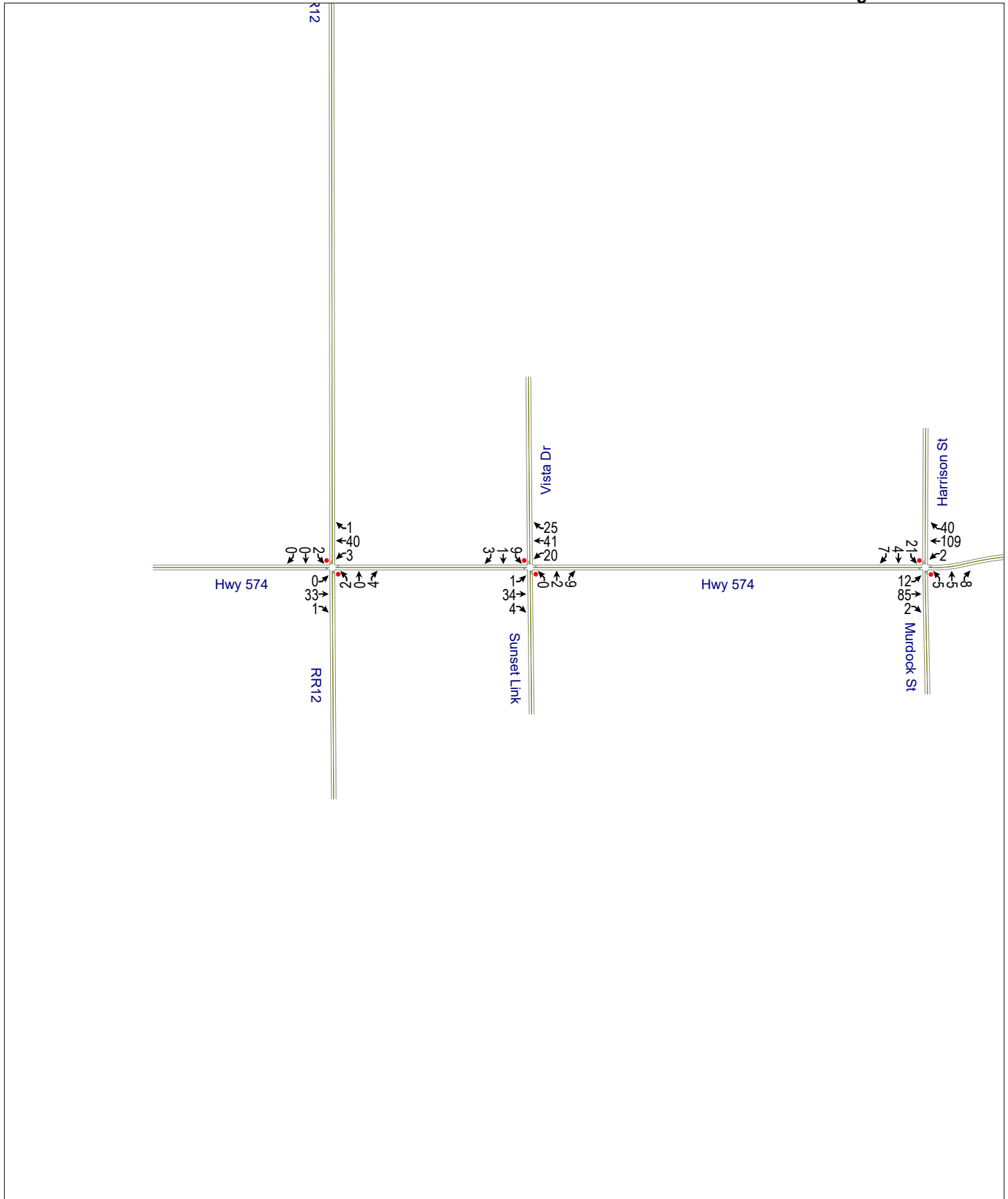


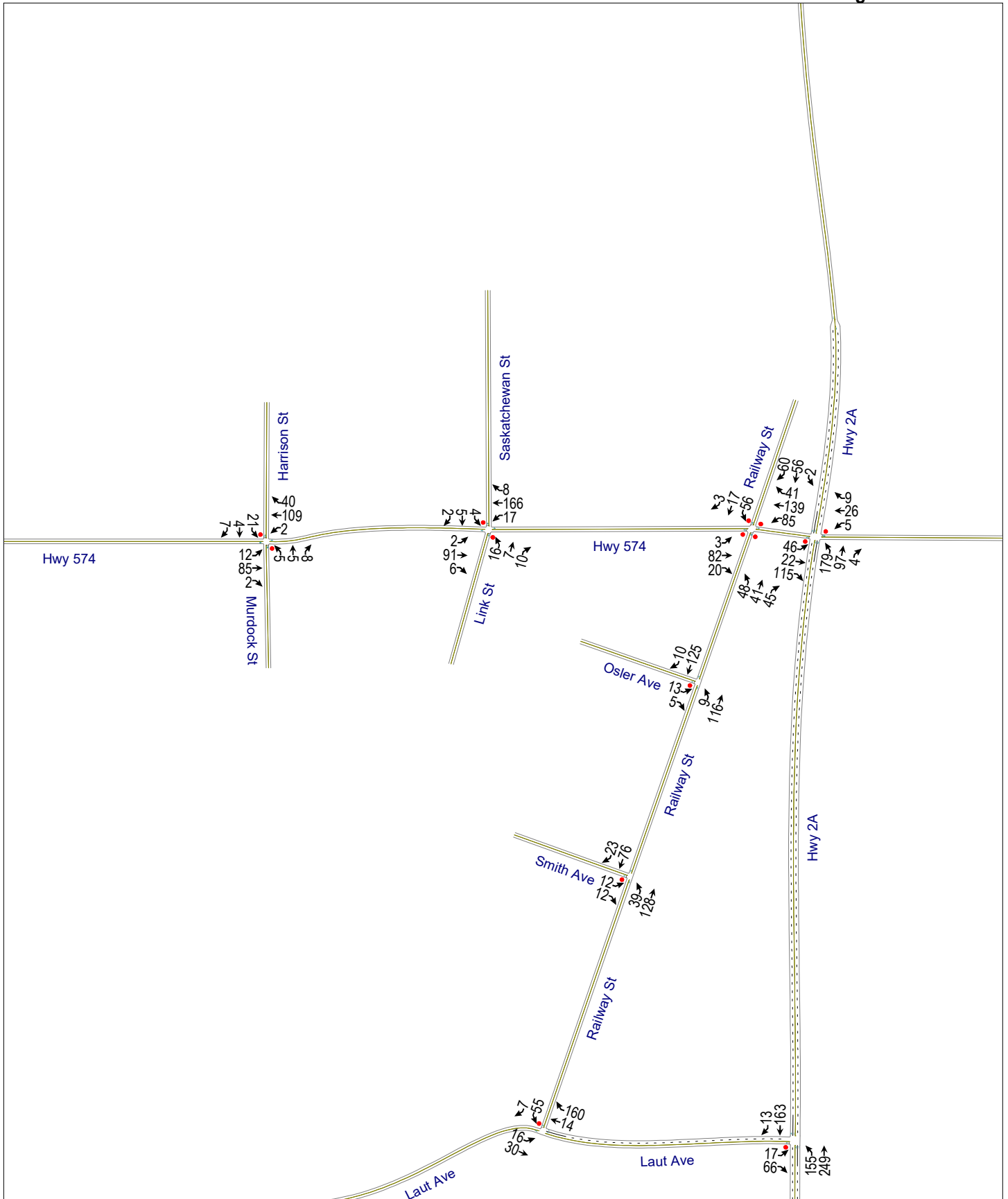
APPENDIX
Existing AM and PM Peak Intersection
Turning Volumes **B**

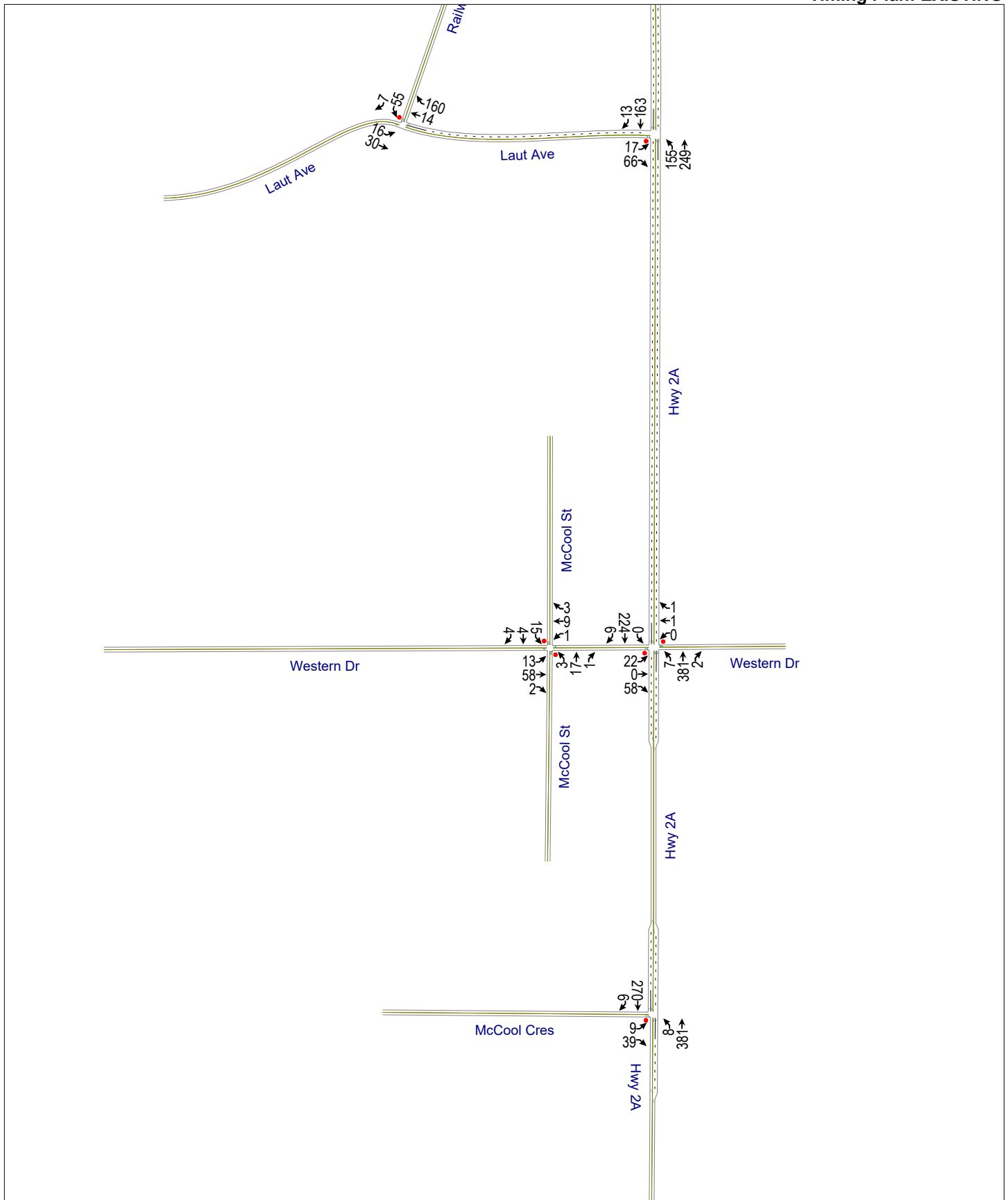










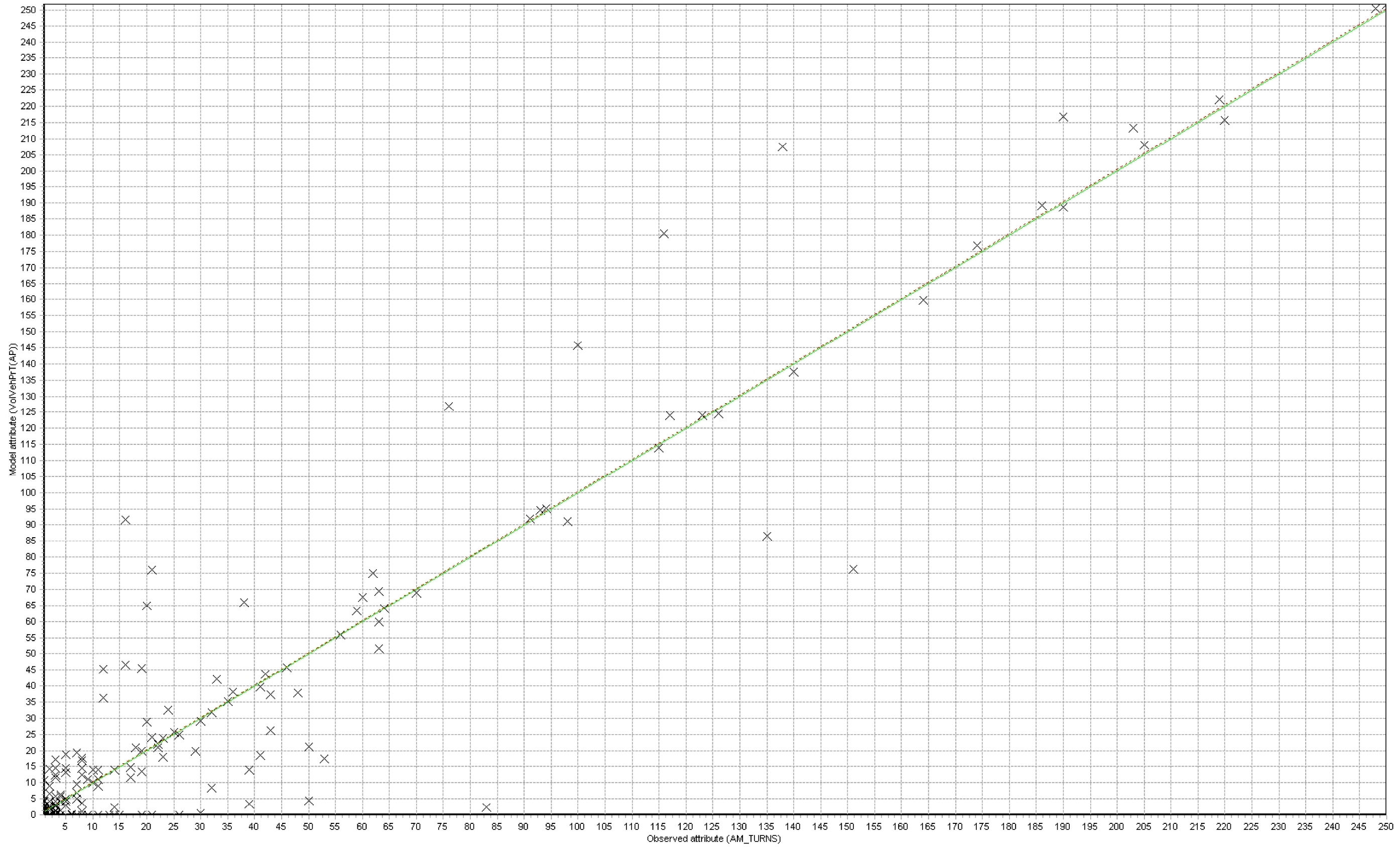




APPENDIX
Existing AM and PM Model Calibration Plots

C

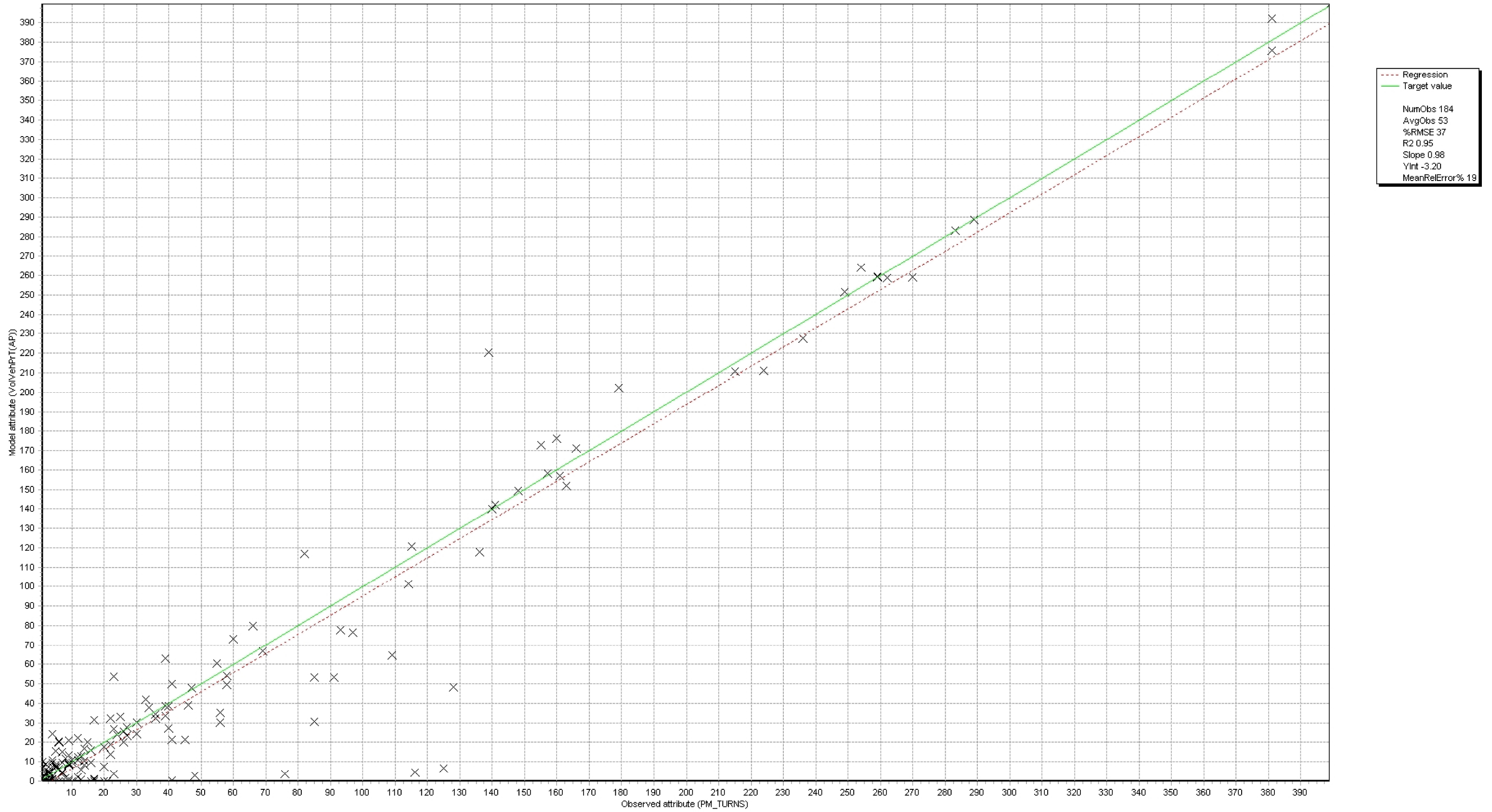
Assignment analysis, Network: Temp_Mod1



--- Regression
— Target value

NumObs 175
AvgObs 38
%RMSE 48
R2 0.90
Slope 1.00
YInt 0.20
MeanRelError% 26

Assignment analysis, Network: Existing_PM_20190506





APPENDIX
Improvement Cost Estimate Breakdown

D

4-Lane Divided Arterial

Item	Quantity	Unit	Unit Price	Cost
Stripping	9.6	m ³	\$10.0	\$96
Subgrade prep	14	m ²	\$3.0	\$42
Common Excavation	14	m ³	\$6.0	\$84
Subgrade Drainage	2	m	\$55.0	\$110
Undercut - 300mm depth	0.21	m ³	\$10.0	\$2
Additional gravel for undercut	0.50	t	\$30.0	\$15
Combigrid	1	m ²	\$6.0	\$6
Crushed 80mm - sub-base (350mm depth)	12	t	\$25.0	\$300
Crushed 25mm - base course (100mm depth)	4	t	\$30.0	\$120
Prime coat	14	m ²	\$1.0	\$14
Tack coat	28	m ²	\$0.5	\$14
Superpave 20mm - 160mm base course	6	t	\$110.0	\$660
Superpave 12.5mm - 40mm surface course	2	t	\$115.0	\$230
3m Pathway - Mix B (75 mm Thick with 100mm granular base)	6	m	\$150.0	\$900
Curb and Gutter	4	m	\$90.0	\$360
Streetlights	0.04	ea	\$10,000.0	\$400
Communication Ducts	1	m	\$65.0	\$65
Storm 750mm PVC	1	m	\$550.0	\$550
Catch Basin and Leads	0.02	ea	\$15,500.0	\$310
Manhole	0.01	ea	\$10,000.0	\$100
Landscaping	12	m ²	\$10.0	\$120
			Subtotal	\$4,498
			Per km Cost	\$4,498,000
			Contingency at 30%	\$1,349,400
			Engineering at 15%	\$877,110
			Per km Cost (Rounded)	\$6,800,000

Highway 2A Twinning Cost Estimate (per km)

Item	Quantity	Unit	Unit Price	Cost
Stripping	5.1	m ³	\$10.0	\$51
Subgrade prep	17	m ²	\$3.0	\$51
Common Excavation	17	m ³	\$6.0	\$102
Subgrade Drainage	2	m	\$55.0	\$110
Undercut - 300mm depth	0.15	m ³	\$10.0	\$2
Additional gravel for undercut	0.36	t	\$30.0	\$11
Combigrid	1	m ²	\$6.0	\$6
Crushed 80mm - sub-base (350mm depth)	9	t	\$25.0	\$225
Crushed 25mm - base course (100mm depth)	3	t	\$30.0	\$90
Prime coat	10	m ²	\$1.0	\$10
Tack coat	20	m ²	\$0.5	\$10
Superpave 20mm - 160mm base course	5	t	\$110.0	\$550
Superpave 12.5mm - 40mm surface course	2	t	\$115.0	\$230
Milling & Fill Existing - 50mm	15	m ²	\$26.0	\$390
3m Pathway - Mix B (75 mm Thick with 100mm granular base)	6	m	\$150.0	\$900
Curb and Gutter	4	m	\$90.0	\$360
Streetlights	0.04	ea	\$10,000.0	\$400
Communication Ducts	1	m	\$65.0	\$65
Storm 750mm PVC	1	m	\$550.0	\$550
Catch Basin and Leads	0.02	ea	\$15,500.0	\$310
Manhole	0.01	ea	\$10,000.0	\$100
Landscaping	12	m ²	\$10.0	\$120
			Subtotal	\$4,642
			Per km Cost	\$4,642,000
			Contingency at 30%	\$1,392,600
			Engineering at 15%	\$905,190
			Per km Cost (Rounded)	\$7,000,000

Traffic Signal Cost

Item	Cost
Traffic Signal - Provincial Highway	
General Requirements	\$70,000
Civil Work*	\$30,000
Electrical	\$48,000
Conduits and Junction Boxes	\$67,000
Foundations	\$105,000
Traffic Signal and Illumination Structures	\$113,000
Pole Mounted Traffic Signal Fixtures	\$41,000
Signs, Pavement Markings, and Barriers	\$61,000
Cabinets	\$42,000
Summary	
Total	\$577,000
Contingency @ 30%	\$173,100
Engineering and Testing @ 15%	\$112,515
Total (Rounded)	\$863,000

Note: cost for civil work is assumed, it is site dependant and could vary significantly.

Item	Cost
Traffic Signal - Urban Area	
General Requirements	\$47,000
Civil Work*	\$85,000
Electrical	\$43,000
Conduits and Junction Boxes	\$29,000
Foundations	\$24,000
Traffic Signal and Illumination Structures	\$32,000
Pole Mounted Traffic Signal Fixtures	\$60,000
Signs, Pavement Markings, and Barriers	\$23,000
Cabinets	\$42,000
Summary	
Total	\$385,000
Contingency @ 30%	\$115,500
Engineering and Testing @ 15%	\$75,075
Total (Rounded)	\$576,000

Note: cost for civil work is assumed, it is site dependant and could vary significantly.

Both Scenario 1 and Scenario 2

Location: Limit Avenue / Highway 2A

Improvement: Signalization with railway pre-emption and turn bays on all approaches

Item	Quantity	Unit	Unit Price	Cost
Traffic Operation Improvement				
Traffic Signal - AT Standard	1	Unit	\$577,000	\$577,000
Railway Pre-emption	1	Unit	\$35,000	\$35,000
Subtotal				\$612,000
Geometric Improvement				
Asphalt Removal	2400	m2	15	\$36,000
Milling	11000	m2	10	\$110,000
Asphalt Road Structure	1200	m2	120	\$144,000
Mill Asphalt Structure	11000	m2	40	\$440,000
New Paint	12200	m	2	\$24,400
Concrete Median w/ Curb	2400	m2	120	\$288,000
Subtotal				\$1,042,400
Summary				
Total				\$1,654,400
Contingency @ 30%				\$496,320
Engineering and Testing @ 15%				\$322,608
Total (Rounded)				\$2,500,000

Location: Limit Avenue Corridor

Improvement: Twinning (Railway Street - Highway 2A)

Item	Quantity	Unit	Unit Price	Cost
Geometric Improvement				
Twinning	0.1	km	\$2,249,000	\$224,900
Subtotal				\$224,900
Summary				
Total				\$224,900
Contingency @ 30%				\$67,470
Engineering and Testing @ 15%				\$43,856
Total (Rounded)				\$300,000

Location: Ring Road

Improvement: Construct / pave 2-lane ring road

Item	Quantity	Unit	Unit Price	Cost
Geometric Improvement				
2-Lane Ring Road	11	km	\$2,249,000	\$24,739,000
Subtotal				\$24,739,000
Summary				
Total				\$24,739,000
Contingency @ 30%				\$7,421,700
Engineering and Testing @ 15%				\$4,824,105
Total (Rounded)				\$37,000,000

Location: Railway Street / Limit Avenue

Improvement: Signalization with pre-emption and coordination with Highway 2A

Item	Quantity	Unit	Unit Price	Cost
Traffic Operation Improvement				
Traffic Signal	1	Unit	\$385,000	\$385,000
Signal Coordination	1	Unit	\$6,500	\$6,500
Railway Pre-emption	1	Unit	\$35,000	\$35,000
Subtotal				\$426,500
Summary				
Total				\$426,500
Contingency @ 30%				\$127,950
Engineering and Testing @ 15%				\$83,168
Total (Rounded)				\$600,000

Location: Limit Ave Corridor

Improvement: Twinning (Harrison Street - Railway Street)

Item	Quantity	Unit	Unit Price	Cost
Geometric Improvement				
Twinning	0.7	km	\$2,249,000	\$1,574,300
Subtotal				\$1,574,300
Summary				
Total				\$1,574,300
Contingency @ 30%				\$472,290
Engineering and Testing @ 15%				\$306,989
Total (Rounded)				\$2,400,000

Location: Highway 2A / Township Road 290

Improvement: Signalization with NBL and SBL turn bays

Item	Quantity	Unit	Unit Price	Cost
Traffic Operation Improvement				
Traffic Signal - AT Standard	1	Unit	\$577,000	\$577,000
Subtotal				\$577,000
Geometric Improvement				
Asphalt removal	2400	m2	15	\$36,000
Milling	7500	m2	10	\$75,000
Asphalt Road Structure	3600	m2	120	\$432,000
Mill Asphalt Structure	7500	m2	40	\$300,000
New Paint	10000	m	2	\$20,000
Concrete Median w/ Curb	2400	m2	120	\$288,000
Subtotal				\$1,151,000
Summary				
Total				\$1,728,000
Contingency @ 30%				\$518,400
Engineering and Testing @ 15%				\$336,960
Total (Rounded)				\$2,600,000

Scenario 1 Only

Location: Highway 2A / Western Drive

Improvement: Signalization with NBL and SBL turn bays

Item	Quantity	Unit	Unit Price	Cost
Traffic Operation Improvement				
Traffic Signal - AT Standard	1	Unit	\$577,000	\$577,000
Subtotal				\$577,000
Geometric Improvement				
Asphalt Removal	2400	m2	15	\$36,000
Milling	9500	m2	10	\$95,000
Asphalt Road Structure	2400	m2	120	\$288,000
Mill Asphalt Structure	9500	m2	40	\$380,000
New Paint	11900	m	2	\$23,800
Concrete Median w/ Curb	2400	m2	120	\$288,000
Subtotal				\$1,110,800
Combined Improvements				
Total				\$1,687,800
Contingency @ 30%				\$506,340
Engineering and Testing @ 15%				\$329,121
Total (Rounded)				\$2,500,000

Location: Hwy 2A / McCool Crescent

Improvement: Signalization with NBL and SBL turn bays

Item	Quantity	Unit	Unit Price	Cost
Traffic Operation Improvement				
Traffic Signal - AT Standard	1	Unit	\$577,000	\$577,000
Subtotal				\$577,000
Geometric Improvement				
Asphalt Removal	2400	m2	15	\$36,000
Milling	9500	m2	10	\$95,000
Asphalt Road Structure	2400	m2	120	\$288,000
Mill Asphalt Structure	9500	m2	40	\$380,000
New Paint	11900	m	2	\$23,800
Concrete Median w/ Curb	2400	m2	120	\$288,000
Subtotal				\$1,110,800
Combined Improvements				
Total				\$1,687,800
Contingency @ 30%				\$506,340
Engineering and Testing @ 15%				\$329,121
Total (Rounded)				\$2,500,000

Location: Hwy 2A / Township Road 284A

Improvement: Signalization with SBL turn bay

Item	Quantity	Unit	Unit Price	Cost
Traffic Operation Improvement				
Traffic Signal - AT Standard	1	Unit	\$432,750	\$432,750
Subtotal				\$432,750
Geometric Improvement				
Asphalt Removal	1200	m2	15	\$18,000
Milling	9500	m2	10	\$95,000
Asphalt Road Structure	1200	m2	120	\$144,000
Mill Asphalt Structure	9500	m2	40	\$380,000
New Paint	10700	m	2	\$21,400
Concrete Median w/ Curb	1200	m2	120	\$144,000
Subtotal				\$802,400
Combined Improvements				
Total				\$1,235,150
Contingency @ 30%				\$370,545
Engineering and Testing @ 15%				\$240,854
Total (Rounded)				\$1,800,000

Note: traffic signal is assumed to be 75% of the unit cost as it is a 3-leg intersection

Location: Highway 2A Corridor

Improvement: Twinning (Western Drive - McCool Crescent)

Item	Quantity	Unit	Unit Price	Cost
Geometric Improvement				
Twinning	0.5	km	\$4,642,000	\$2,321,000
Subtotal				\$2,321,000
Summary				
Total				\$2,321,000
Contingency @ 30%				\$696,300
Engineering and Testing @ 15%				\$452,595
Total (Rounded)				\$3,500,000

Scenario 2 Only

Location: Hwy 574 / New Arterial

Improvement: Add turn bays on all approaches

Item	Quantity	Unit	Unit Price	Class 5 Cost Estimate
Geometric Improvement				
Asphalt Removal	2400	m2	15	\$36,000
Milling	4000	m2	10	\$40,000
Asphalt Road Structure	4000	m2	120	\$480,000
Mill Asphalt Structure	4000	m2	40	\$160,000
New Paint	8000	m	2	\$16,000
Concrete Median w/ Curb	2400	m2	120	\$288,000
Subtotal				\$1,020,000
Combined Improvements				
Total				\$1,020,000
Contingency @ 30%				\$306,000
Engineering and Testing @ 15%				\$198,900
Total (Rounded)				\$1,500,000



APPENDIX
Public and Stakeholder Engagement
Feedback

E



Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

Project Background

The Town of Crossfield is updating its Transportation Master Plan (TMP) to guide the long-term transportation vision for the Town. The TMP will provide a framework for Council and Administration to assess the capability of the road network, to accommodate new development and is useful in short- and long-term planning and budgeting.

During the first phase of engagement, the Town held a Stakeholder Workshop and Public Open House on April 1, 2019 at the Town Office and an online survey was live from March 25 to April 6, 2019.

15 stakeholders attended the workshop, 14 members of the public attended the open house and 7 responses to the online survey with approximately 54 locations identified throughout the Town were received.

Participants were asked to provide input on the most important transportation issues to them to help inform the update to the future transportation network for all modes of transportation including driving in the community, traffic safety, and missing links in the pedestrian and cycling network.

The following is the [High Level Summary](#) of all feedback received. To read all verbatim comments received see the section: [Verbatim Comments](#).

Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

High Level Summary

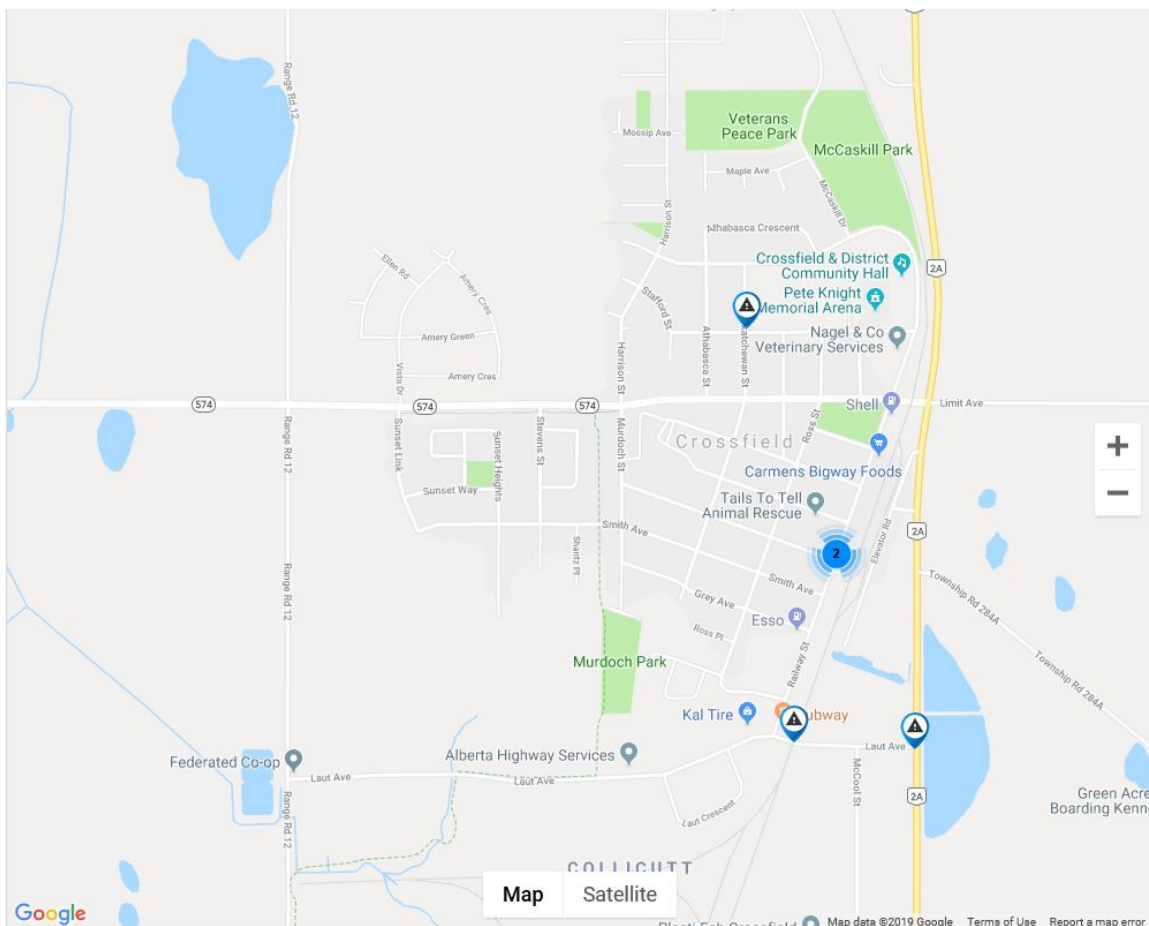
Participants were asked to provide their feedback regarding traffic safety, traffic movement, pedestrian / cyclist connectivity, road network and other issues with the Town’s transportation system. Below is a summary of what we heard at the workshop, open house and online along with a map displaying the locations of the comments received for each topic.

Traffic safety

Participants were asked if they have any traffic safety concerns and to identify where they are.



- Participants expressed concern about Laut Avenue and recommended raising the slope to provide a gradual transition onto Hwy 2A and also leveling the train crossing as driving conditions had a tendency to be slick and treacherous during the winter months. In addition, participants recommended having controlled signals at Laut Avenue / Hwy 2A.
- Participants raised concerns about large vehicle access, particularly emergency vehicles which experienced difficulty navigating through the town when cars were parked on both sides of a street (e.g. Mountain Avenue).
- Some participants raised concern about speeding vehicles particularly on Mountain Avenue, before and after school hours.



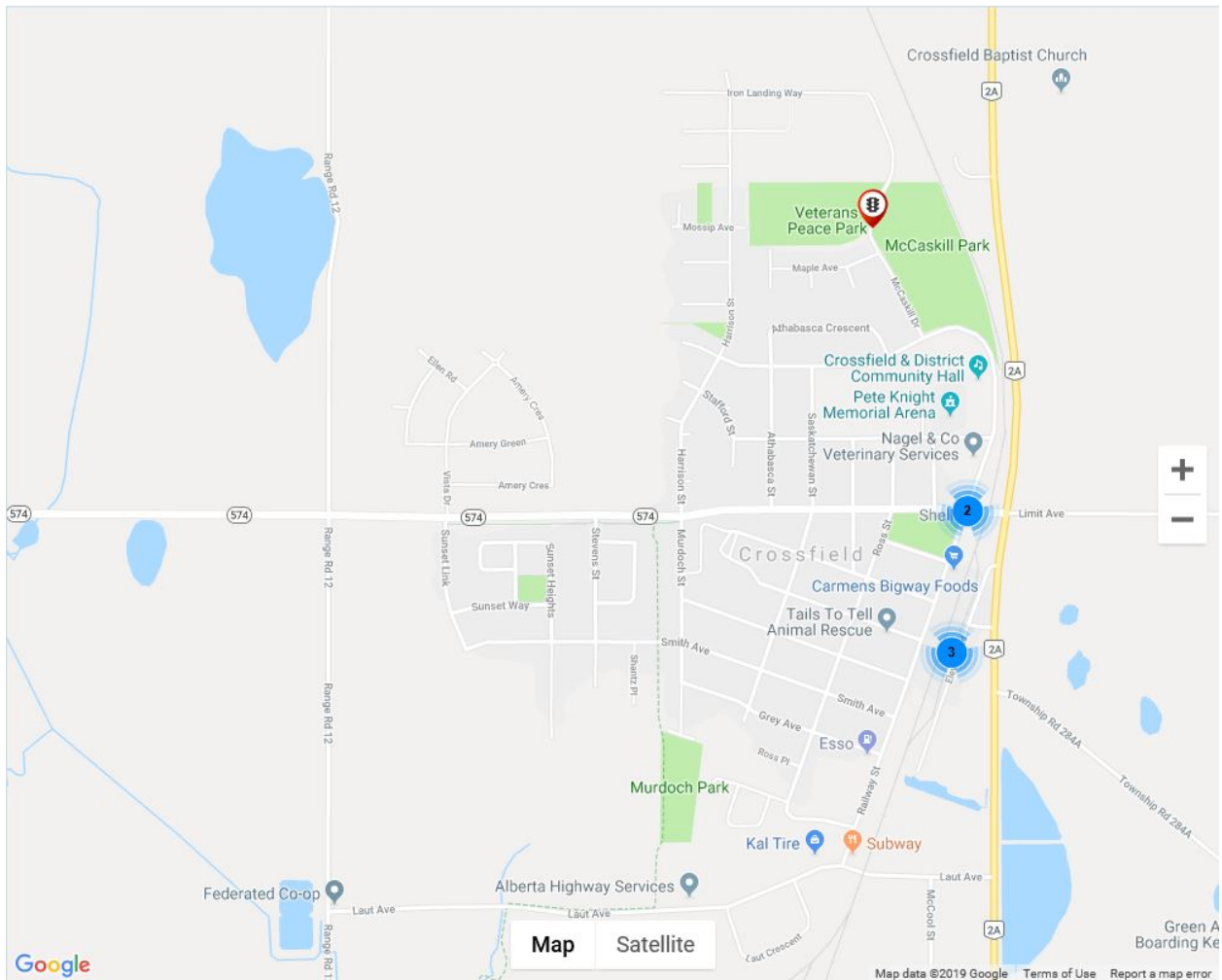
Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

Traffic Movement / Signalization

Participants were asked if they have any concerns with driving through their community and to indicate the location, direction and time of the day specific to their concern.



- Participants suggested improvements at the Railway St and Limit Avenue intersection. Suggestions included adding an eastbound right merge lane onto Hwy 2A or adding a traffic signal at the intersection.
- Some participants indicated visibility issues with clearly seeing street signs, such as Railway Street, and recommended moving signage to a more prominent visible position.
- Some participants suggested changing Vista Drive to a 4-way stop and making Railway Street and Smith Avenue a 3-way stop.

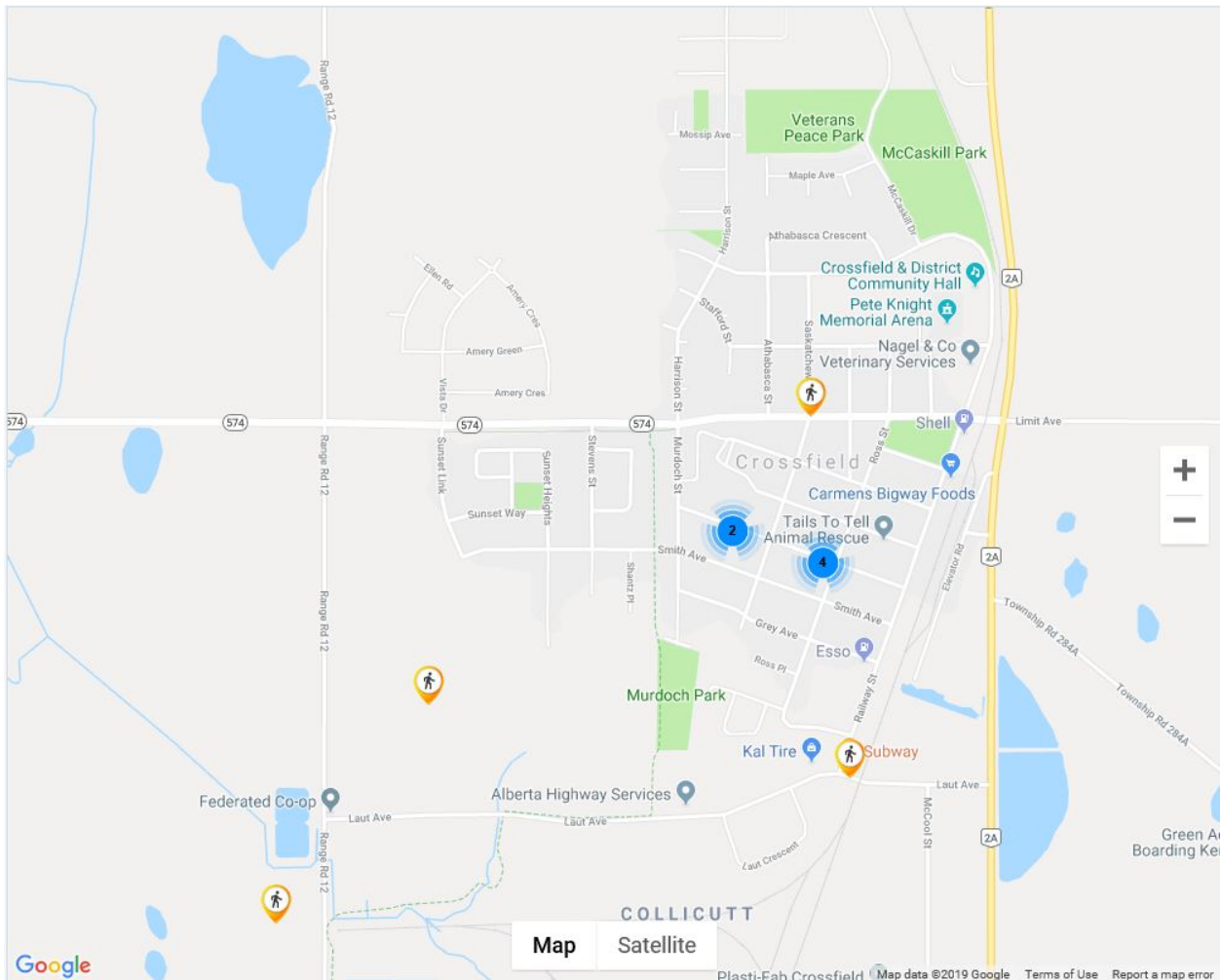


Pedestrian / Cyclist Connectivity

Participants were asked if they felt there are missing links in the pedestrian or cycling network system and to indicate where.



- Participants indicated they would like improvements in the pedestrian connections and public realm which would include wider sidewalks, pedestrian flashing light crossings, boulevard trees, and sidewalks on both sides of certain streets such as Ross Street.
- Some participants suggested new bike lanes within the town business district. Others recommended extending the existing bike lane west of the old railway tracks into the town limits.
- Some participants noted a lack of pathways in the old part of Town while others suggested an additional pathway from Sunset area to the Rodeo grounds.



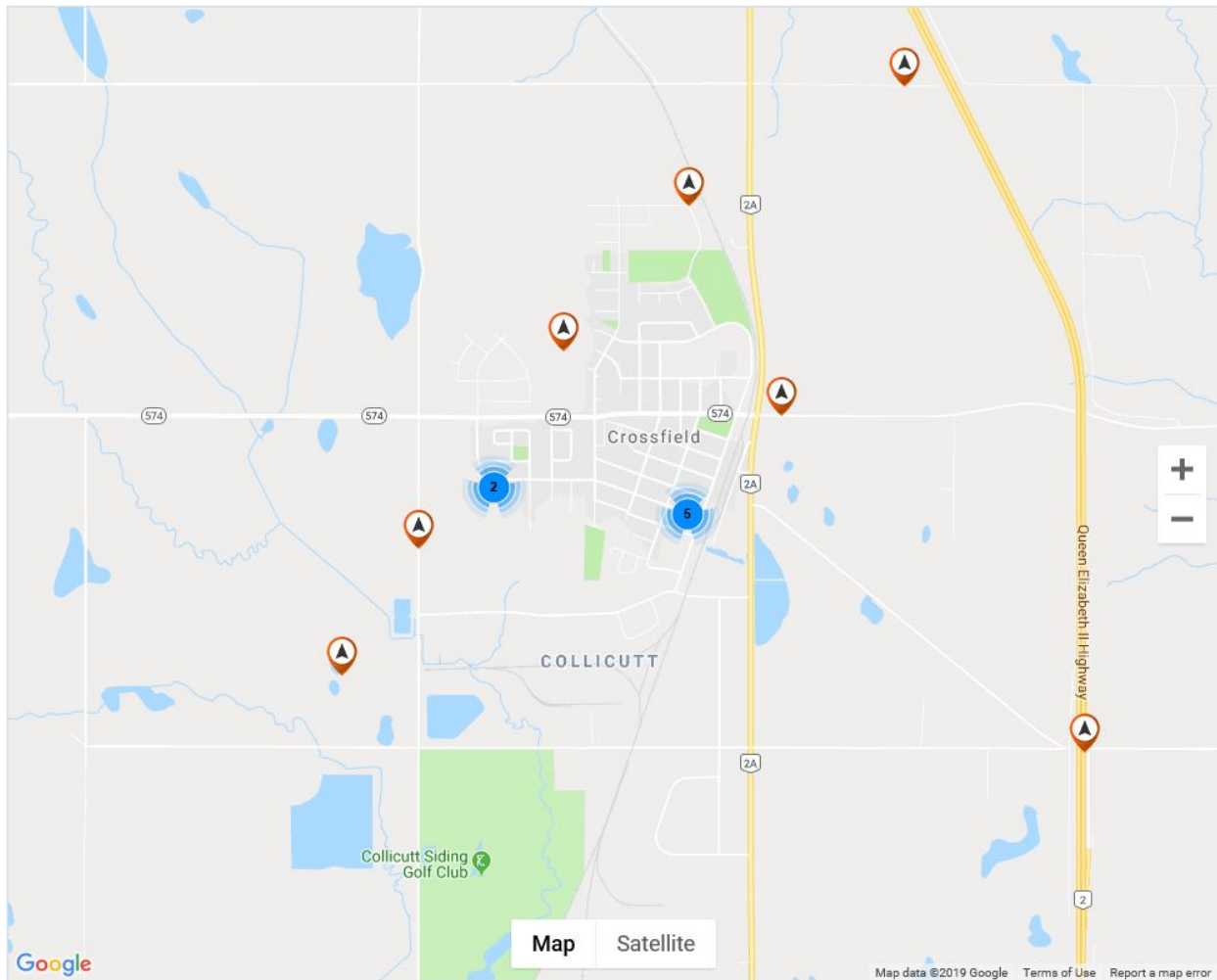
Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

Road network

Participants were asked if they felt there are missing road connections and to indicate where.



- Some participants suggested additional access points from the Town to Airdrie and Hwy 2A. Participants also stated that new developments would require additional road capacity.
- Participants indicated they would like to see more parallel parking in the town as an alternative to angle parking (e.g. along Railway St to Nanton Ave to Laut Ave).



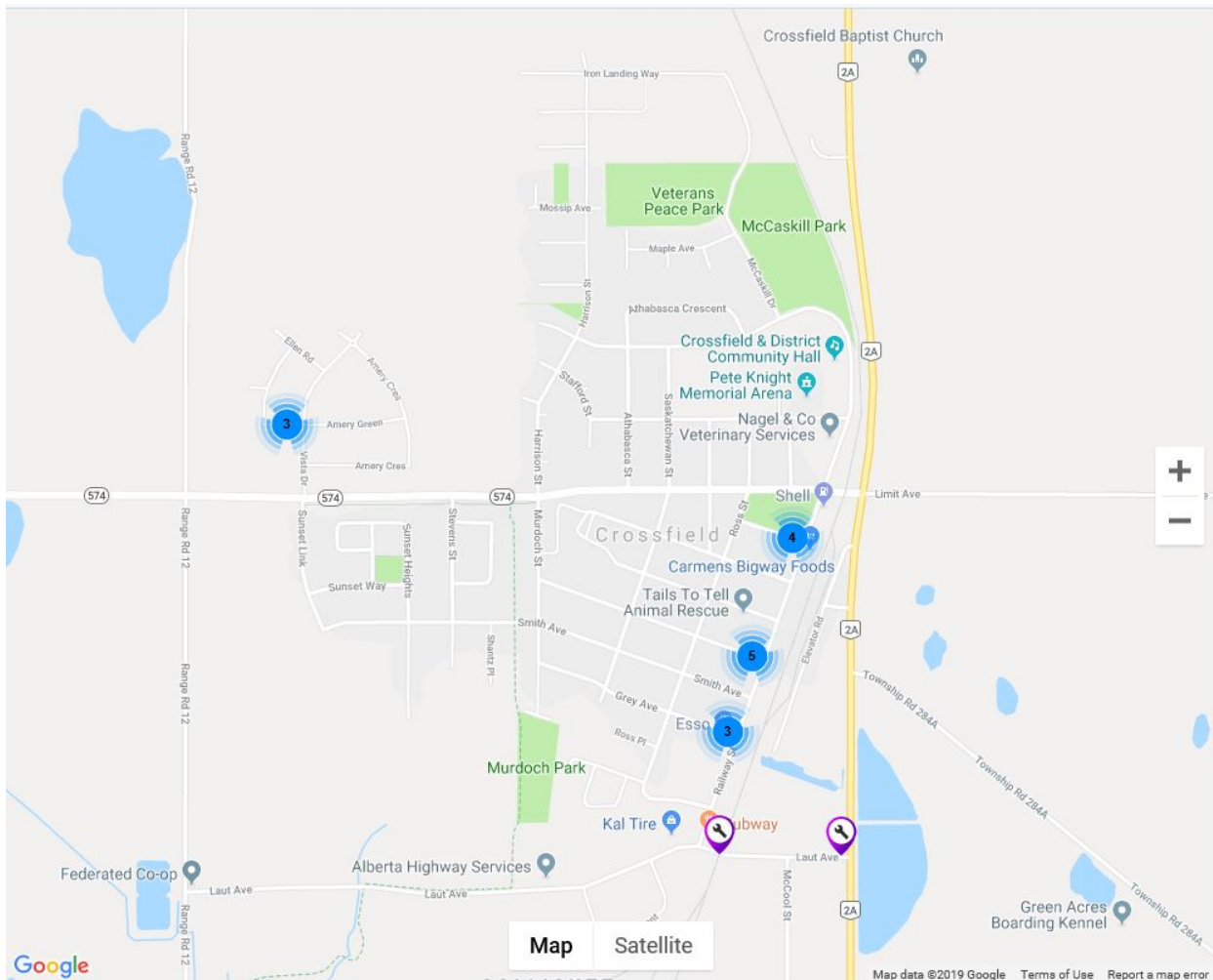
Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

Other issues

Participants were asked if there were any other issues with the Town of Crossfield’s transportation system and to identify where, keeping in mind daily commuting, accessing destinations, etc.



- Participants highlighted issues with the railway crossing as they found the trains slow and lengthy. Suggestions were made to have another access point to cross the tracks or constructing a bridge to avoid the train.
- Some participants indicated they would like to have transit services introduced from the town to Airdrie and Calgary.





Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

About the session

Participants were asked to provide their thoughts about the workshop and open house session. Below are the verbatim comments received about the session.

Was the time and location convenient?

Yes (x2)

Somewhat (x1)

No

No opinion

How did you hear about today's session?

- Town advertises Council Meeting
- Invite
- E-mail

What did you like about today's session?

- Visualizing plan
- Some feedback from questions
- Opportunity to present concerns and hear concerns and comments by others
- Table discussions

Is there anything we can improve for future sessions?

- Map color contrast for clarity
- No, went well
- No comments

Do you have any additional feedback you would like to share?

- Make Township Road 290 at least an emergency exit from Town or another exit
- Don't increase speed on Hwy 2A unless all the bumps/ridges are flattened
- Evacuation plan of Railway blocked; need to revamp current emergency exit plan
- Sidewalks on both sides of major roads? Some sidewalks where there were not currently
- Revamp emergency evacuation plan
- Map was not easy to read; color contrast poor, many areas not labelled
- No comments (X2)



Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

Verbatim Comments

Traffic safety Online



- Needs to be a tree in front of the pizza place. On the line between the liquor store and the pizza place. To provide shade. It gets so hot in the pizza place and it's under direct sunlight.
- Raise Laut Ave so that the crossing is smoother
- Raise Laut Ave so that the slope up to Hwy 2A is more gradual.
- The amount speeding down Mountain Ave before and after school topped with erratic driving by high school students
- We need a tree in front of the pizza place to provide shade. It's so hot in there with direct sunlight.

Workshop

- Safety Issues – getting fire trucks, and other larger vehicles, through the streets.
- Safety concerns in more densely populated areas
- Not safe to walk along Hwy 2A
- When cars parked on both sides, hard for emergencies, access
- Lighted intersections at Laut Ave and Hwy 2A. Leveling at this intersection is needed, especially in the winter; driving difficulties – drivers tend to do a “rolling stop” because the road tends to be quite slick.
- With long trains going through Crossfield, the trains may block all at-grade railway crossings within Town and may cause delays for emergency vehicles from reaching either side of the track.
- Most traffic from south access at McCool Crescent and Hwy 2A.
- Hard to make LT at Dickson Stevenson Trail and Hwy 2A.
- Speed limits vary East of RR11 and South of Hwy 2A.
- Accident prone – need all turns interchange! at Township Rd 285 and QEII
- Pinch point (parking on both sides) at Mountain Ave and W.G. Murdoch School
- No turn bay at Limit Ave and Highway 2A

Open House

- Speed on Highway 2A
- All turns interchange at Twp Rd 285 / Hwy 2
- Lighting improvements in the future

Traffic Movement / Signalization

Online



- Lose the parallel parking along Railway St - move it to the right of the tree line on the vacant land and make it angle parking.



Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

- Perhaps this could be a 3 way stop. Smith Ave is the biggest cross street so it would make the street more prominent and easier to turn off Smith Ave. And it's about the middle of Railway St so it breaks it up.
- Placement of street name signs is bad. Along Railway St, some signs are tucked around corners and you can't see them till you're already past it.
- This McCaskill Dr should be re-graded so that it is a curve in the continuous road, and not a stop sign and a turn. With a sidewalk.
- Traffic circle with Pete Knight statue in middle (at Railway St and Limit Ave.)
- Traffic circle with Pete Knight statue in the middle (at Railway St and Limit Ave.).

Workshop

- Highway – population areas at Railway St and Limit Avenue – add a traffic signal
- Stop sign is not working at Railway St and Limit Ave. Should input an Eastbound right merge lane onto Hwy 2A. No flashing light at the trouble spot (Railway St and Limit Ave)
- Get rid of the traffic circle at Vista; suggestion for a 4-way stop
- North-South connection Bypass road East side of Town Avoid traffic coming through Town

Pedestrian / Cyclist Connectivity



Online

- Another pathway needs to be considered from the Sunset area to the Rodeo ground area and pathway to the golf course.
- Bike trail should be extended west on the old railway tracks, all the way to town limits. And as we annex, we should keep extending the trail to town limits.
- Boulevard trees on the side streets. Make it nice for people to walk to downtown. Each side street could have a different tree or two, or use the same ones that will be on Railway St.
- In Moose Jaw, SK their crosswalk signs have a stick guy on a crosswalk, with a leash and a moose following. Maybe we could have crosswalk signs with a cowboy hat for Pete knight with a horse following
- Sidewalks
- Sidewalks on both sides of Nanton Ave x2
- Sidewalks on both sides of Ross St x2
- The back alley of Railway St could be a pedestrian thru fair. With crosswalks on all the cross streets.

Workshop

- Bylaw states no riding bikes on sidewalks within the CBD. Currently no existing bike lanes. Develop these in the CBD. Could also further develop bike lanes in residential
- Wider sidewalks
- Currently good existing crosswalks and sidewalks
- Lack of pathways in old part of Town



Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

- Challenging to add as there is little space
- Parks and Open Space Master Plan – Rocky View County (2011 AECOM Document)
 - Pathway connection between Crossfield to Airdries
- Lack of parking in south industrial area
- Width of parking at Railway St is difficult for larger vehicles (trucks, etc.)
- Access and egress in residential is an issue with future growth
- Parking – on street in new developments
- Pedestrian connection
- Lighted intersections with lighted crosswalks
- Light intersections

Open House

- Pathway connection potential in the northwest of Town from Township Road 290 into new development (Vista Crossing)
- Pedestrian crossing with flashing lights in new North residential section
- Smith Ave pathway cross by Murdoch Park; needs flashing lights
- Sidewalk to Motel and Harvest Restaurant also pathway across tracks by Fire Hall
- Pathway to dog park connect to Golf and loop around through industrial park
- Lack of sidewalks; need for people walking on McCool St between Laut Ave and Western Dr.

Road network



Online

- 4 lanes all the way to town from Hwy 2
- All the cross streets should be parallel parking on both sides. You get 8 spots of parallel vs. 5 spots of angle parking. The exception is Osler Ave where it should be angle on the south side.
- Another entrance to town from the Hwy 2A needs to be considered as the town continues to grow to the North and West.
- Bridge, on ramps and off ramps at Twp Rd 285 / Hwy 2
- Have Smith Ave continue West across RR12 and into the next section of land. To help reduce traffic on Limit Ave
- I think the Twp Rd 290 should one day be a 4 lane, 60km/hr road. At this spot, it should curve (not a turn) to the south and continue 60 kms all the way to Hwy 72.
- I think there should be another main road into Airdrie along the west side of town to cut down on commute times to Airdrie and the new Green line at Harvest Hills Blvd
- I would love to see this road connect to the QEII. It's a more visually appealing road then going through the industrial area and it would cut down commute times.
- Parallel parking on both sides of Railway St from Nanton Ave to Laut Ave
- Pave the back alley from the car wash to Osler Ave
- Paved back alleys on Railway St. Especially from the car wash to Osler Ave.



Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

- Railway St should be parallel parking on both sides from Laut Ave to Nanton Ave. You get more stalls with parallel on both sides. And it can be angle and no parking from Nanton Ave to Limit Ave.
- Smith Ave should go straight west to connect to RR12. Then it can be an alternative to Limit Ave
- The old railway line should be a bike trail. As we annex land, we could build the trail with hope that somebody might do a trail to Madden. It already connects to the existing trail.
- This road in the new development that connects to Knight Ave should be called Knight Ave. Pete Knight is a big deal!

Workshop

- Road sizing – when new developments come in take this into consideration
- Rail development in South industrial could impact congestion/volume on road
- Additional entry/exit access points in the bypass

Other issues



Online

- Angle parking on both sides of Chisholm Ave.
- Angle parking on the north side, but not in front of the fire hydrant.
- Angle parking on south side Of Osler Ave.
- Caboose, flag poles, bench, flowers (corner of Osler Ave and Railway St.)
- Ellen Way is a strange L shaped street. I can't even get it labelled properly in Google maps because it thinks it's wrong. The east/west part of Ellen Way should be renamed Amery Green.
- If a museum is built here, and it's made to look like the old prefab bank building, then the grand staircase will be blocked by a tree. Maybe a tree on each side of the stairs, but not centered in front
- It's pretty steep where Laut Ave joins Hwy 2A. I think the slope on Laut Ave should be more gradual.
- One street that's 3 blocks long has 3 names. Ellen Close, Ellen Way, Amery Green. The Ellen Way section should be renamed Amery Green. No houses are on this road so it won't affect anyone.
- Parallel parking on both sides of Smith Ave. 8 parallel stalls are better than 5 angle stalls
- Parallel parking on both sides. There's an alley but you can still do 6 or 7 parallel spots, which is better than 5 angled spots.
- Parallel parking on both sides. With the transition over to angle parking at the north end of the block (Railway St. between Nanton Ave and Smith Ave.
- The plan doesn't consider that the arches sticks out into the road about 3 feet, compared to all the other blocks. Parallel parking on both sides. Possibly no room for trees on the west side (railway Street between Smith Ave and Grey Ave.)



Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

- The plan has 5 angled spots (Hammond Ave). But if you put parallel on both sides, then you can have 8 spots.
- The plan has trees in front of doors. They should be in front of walls (Railway St and ATB Financial)
- The railway crossing is bumpy. Laut Ave should be raised up so that the slope to the top of the tracks is more gradual. And sidewalks.
- There's a nice long boring grey wall that would be a perfect background for some trees.
- This block of Ellen Way should be renamed Amery Green

Workshop

- South Access – gateway through industrial area, not appealing for residential
- Always issues getting across the train tracks
- Another access point across from train tracks (more waiting room)
- Weigh scale possibly moving North (reason for interchange conversation pausing)
- Rocky View Bus (~7585 people use)
 - About 40% from Rocky View Lodge and about 60% of riders coming from Town
 - There is a cap of 20 one-way trips in a month, but try to work with rider to make it work for special circumstances (e.g. medical appointments)
 - Transit mostly used for medical appointments
 - Seniors drive within the Town, but take bus outside Town
 - Would like to see improved connection between Crossfield – Airdrie/Beiseker
- Consideration for autonomous vehicles
- Need connections from future residential to Town (active modes)
- Transportation off-site levy
- Train crossing at Limit Ave & Hwy 2A and Laut & Railway St.: time and length of the train is an issue
- Suggestion of a bridge construction to go over the railway tracks to avoid the train
- Adding a fire hall and moving it strategically within Town
- Future school site
- Emergency access point?
- New rail crossing?
- Typically floods in Spring RR 12 between Laut Ave and Western Dr.
- Bridge over railway tracks for bypass road (or ring road)

Open House

- Commuter bus to Airdrie and Calgary
- Access from Iron Landing to Highway 2A
- Is this road (temporary construction access road from Township Road 290 into Iron Landing) temporary access? Is it in the approved plan?



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Final Concerns

Online

- I would like to see a transportation service (bus) offered for commuters going to downtown Calgary.
- Now that the roadway is wider, restore the original angle of the parking stalls along the front of the buildings on Railway St. it was clear in the winter, most people still angled the original way, when they could not see the lines painted on the road.
- Town of Crossfield manhole covers. 3d crosswalks. and sidewalk stamps: the name of the cross-street stamped into the sidewalk at the corner of each intersection, all along Railway St.



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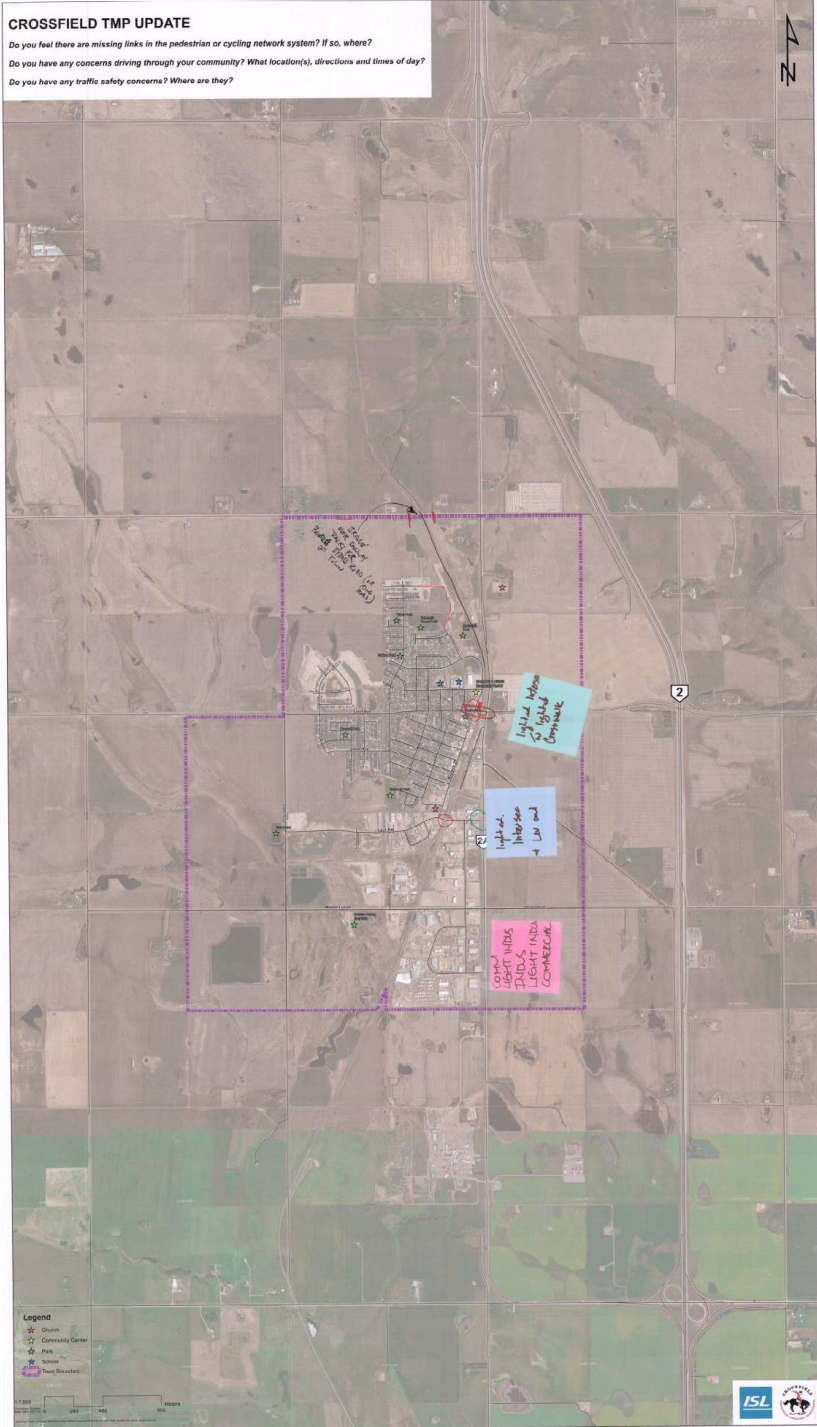
Workshop Map 1





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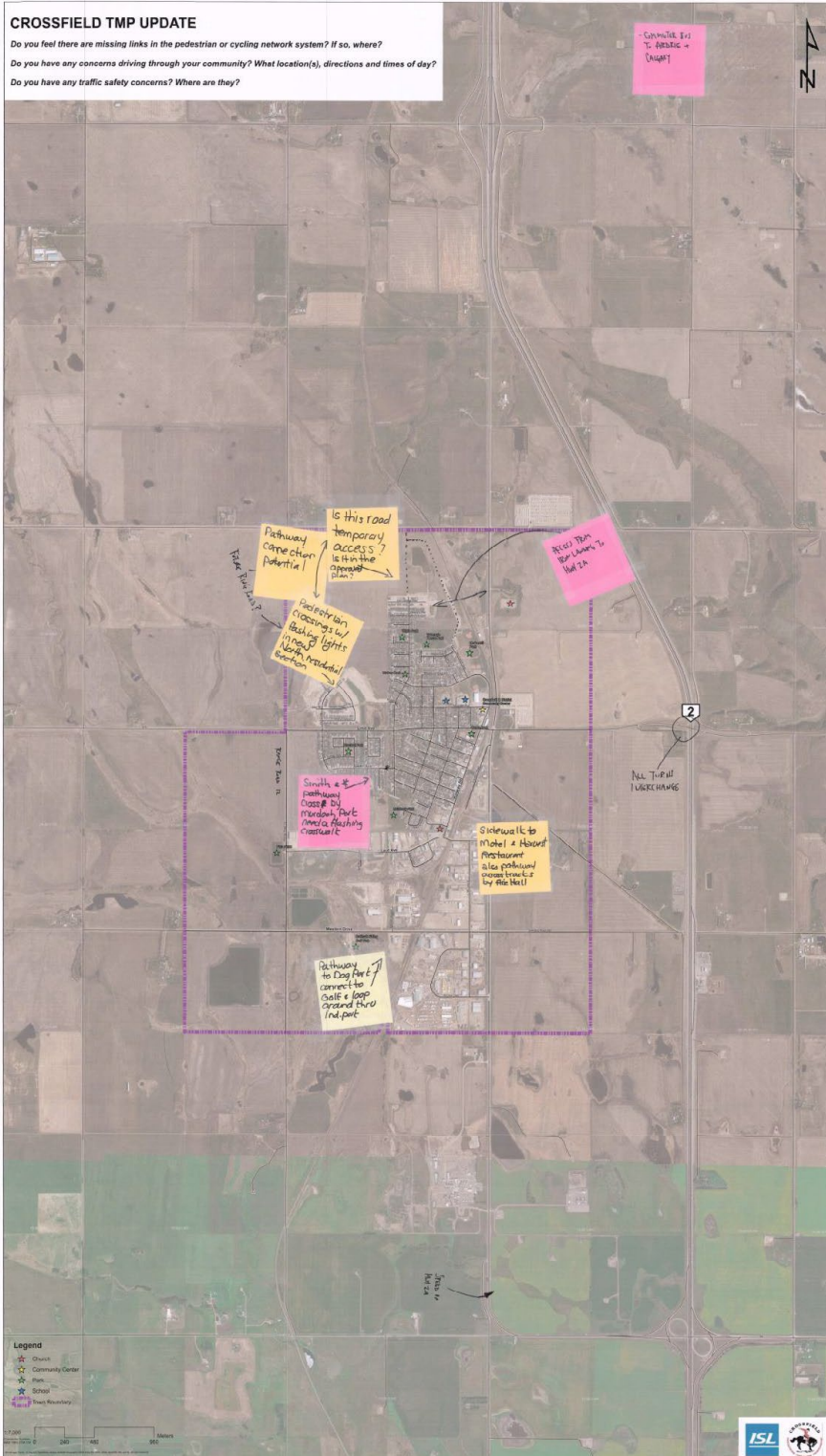
Workshop Map 2





Town of Crossfield Transportation Master Plan Update Phase 1 Engagement Summary – April 2019

Open House Map





Town of Crossfield Transportation Master Plan Update Phase 2 Engagement Summary – May 2020

Project Background

The Town of Crossfield is updating its Transportation Master Plan (TMP) to guide the long-term transportation vision for the Town. The TMP will provide a framework for Council and Administration to assess the capability of the road network, to accommodate new development and is useful in short- and long-term planning and budgeting.

The first phase of engagement was held in April 2019 to gather input on important transportation concerns related to driving in the community, safety and pedestrian and cycling links. During the first phase of engagement, the Town held a Stakeholder Workshop and Public Open House on April 1, 2019 and an online survey was live from March 25 to April 6, 2019. Feedback from the first round of engagement was used to help inform the draft updated TMP.

The second phase of engagement in May 2020 included an online survey, live from April 27 to May 10, that sought feedback from residents on the draft updated TMP recommendations. 11 participants provided feedback on the draft recommendations. The feedback provided will be used to help finalize the updated TMP.

The following is the [High Level Summary](#) of all feedback received. To read all verbatim comments received see the section: [Verbatim Comments](#).



Town of Crossfield Transportation Master Plan Update Phase 2 Engagement Summary – May 2020

High Level Summary

The draft updated TMP identifies recommendations in the short- and long-term based on whether access to Highway 2 from Highway 574 (Limit Avenue) will change.

- Scenario 1 – Highway 574 (Limit Avenue) remains as a flyover with no access to / from Highway 2 (as it currently is today)
- Scenario 2 – Highway 574 (Limit Avenue) is upgraded to an interchange to provide access to Highway 2

Some recommendations are required regardless of whether Highway 574 is upgraded to an interchange. In Scenario 1, more improvements are required on Highway 2A while in Scenario 2, improvements on Highway 574 are required. The Town does not control whether access to Highway 2 from Highway 574 will change, but the Town can advocate to the Province.

Participants were asked to provide their feedback regarding the recommendations of the two scenarios and on additional recommendations that require further study and review by the Town related to pathway connections, public realm, signage, intersection improvements, speed enforcement and transit feasibility.

Below is a high-level summary of what was shared through the online survey.

Scenario 1

- Recommendations don't take future growth of the town into consideration
- Opposing views on the Ring Road. One participant shared it was not necessary while another indicated it would be beneficial, especially as an evacuation route
- Need an overpass to get over the train tracks

Scenario 2

- Access to Highway 2 at this location is desired
- This scenario better accounts for future growth and development
- Recommendations do not really address the issues Crossfield has

Additional Recommendations

- A transit feasibility study for transit to Airdrie/Calgary is supported
- More biking and walking paths that are well maintained are important
- New signage needs to be aesthetically pleasing
- Speeding in town is a concern
- Visibility of people crossing at crosswalks is important especially as buildings are too close to sidewalks



Town of Crossfield Transportation Master Plan Update Phase 2 Engagement Summary – May 2020

Verbatim Comments

The following section includes all the feedback received through the survey.

Do you have any comments about the recommendations for Scenario 1?

- No (x3)
- S1 doesn't take into consideration the future growth potential of Crossfield or the current benefit to existing residents and businesses
- No. Don't like it.
- Twinning Hwy 2A north of Hwy 574 would also be helpful in the flow of traffic especially with the church turn off and then the turn off to the proposed ring road. The ring road around the town would certainly be helpful with evacuation routes and the complete breakdown of Range Road 14 every year.
- I say leave it as is, unless you're going to build an overpass for us to get over the train tracks when a slow moving or stopped train is going through.
- I don't think a ring road is a necessity.

Do you have any comments about the recommendations for Scenario 2?

- Make it happen
- Upgrade to interchange
- S2 give more flexibility to Crossfield residents and businesses, I believe this will grow more business opportunities/revenues, allowing more residents to get work closer to home or inspire them to start businesses in Crossfield.
- I like scenario 2. Having a quick access point from the highway might help bring in some businesses that could be beneficial to paving way for more jobs, people stopping in, and other permanent and unique business opportunities for the community itself.
- Like this one better.
- I don't feel like this really addresses most of the issues that Crossfield really has and is unlikely to have real benefits.
- It's a no for me
- Access to highway 2 from highway 574 would be ideal.
- Access to HWY 2 would be much better here!

Do you have any comments about the additional recommendations that have been identified?

- Yes, make much, much, much more bike and walking paths. Our property taxes should enhance living in Crossfield.
- Conduct a Transit Feasibility Study for regional transit connections to Airdrie and/or Calgary
- No
- When I am out walking with my kids, I am always amazed at how many people come out to enjoy the weather- Crossfield really is an active community. I would LOVE to see



Town of Crossfield Transportation Master Plan Update Phase 2 Engagement Summary – May 2020

more pathways and landscaping (and the cleaning up of existing). I feel this is incredibly important to our community!

- Fix the roads we have now.
- In the past three weeks there has been a significant increase in traffic on Hwy 574 both from large transport trucks (not farming related) and from emergency vehicles (RCMP mostly) who are exceeding speed limits. It may be prudent for the town to discuss this new usage with the RCMP and find out if there are other options instead of having vehicles fly down a main street with a lot of foot traffic in the middle of town. Most children in Crossfield have to cross this road for school. As well, having a plan to extend the pathway down both sides of Hwy 574 before the new communities would decrease the number of pedestrians crossing this road.
- Issues of buildings being too close to sidewalks - prohibits seeing if people are about to use crosswalks.
- I'm all for transit to Airdrie and Calgary. Especially during stampede. If residents have guests coming from out of town for Stampede, they don't always want to drive down there and pay for parking. So, a transit option works be ideal. Even for students who attend school in Airdrie or work in Airdrie and don't drive.
- More RCMP presence would be great. Specially with how fast people drive and how many kids are running around. Also, to help the crime go down.
- Please limit the use of signage/sandwich board signs at the entrances as it looks so awful and is quite a distraction



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