

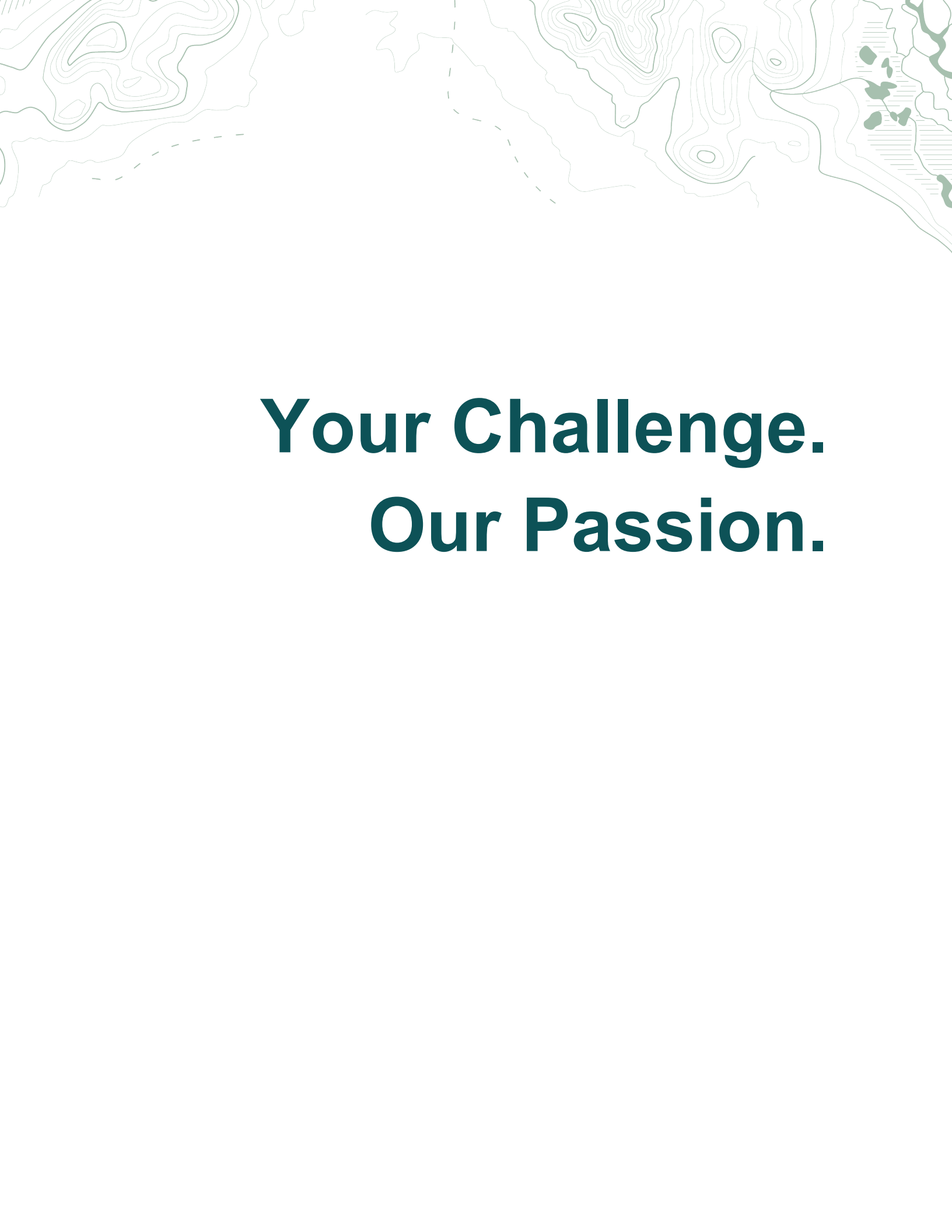
**RED DEER TRAVEL
DEMAND MODEL
UPDATE
Final Report**

October 24, 2025

Prepared for: City of Red Deer
Prepared by: McElhanney Ltd.

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A faint, stylized topographic map of a mountainous region, likely the Sierra Nevada, serves as the background. The map features contour lines and a dashed line representing a mountain range. The text is centered over the map.

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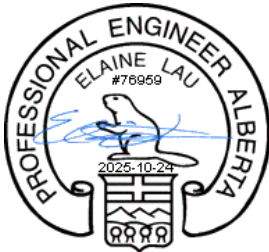
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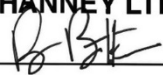


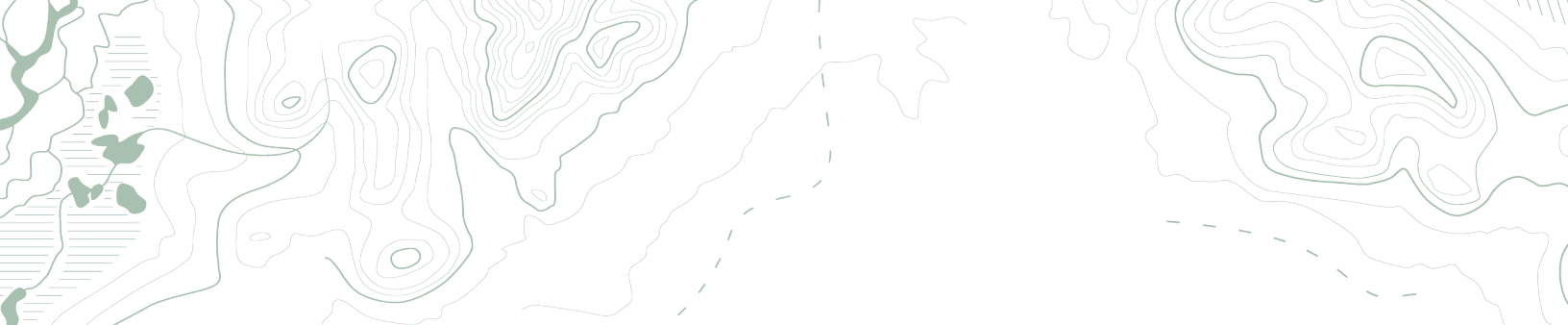
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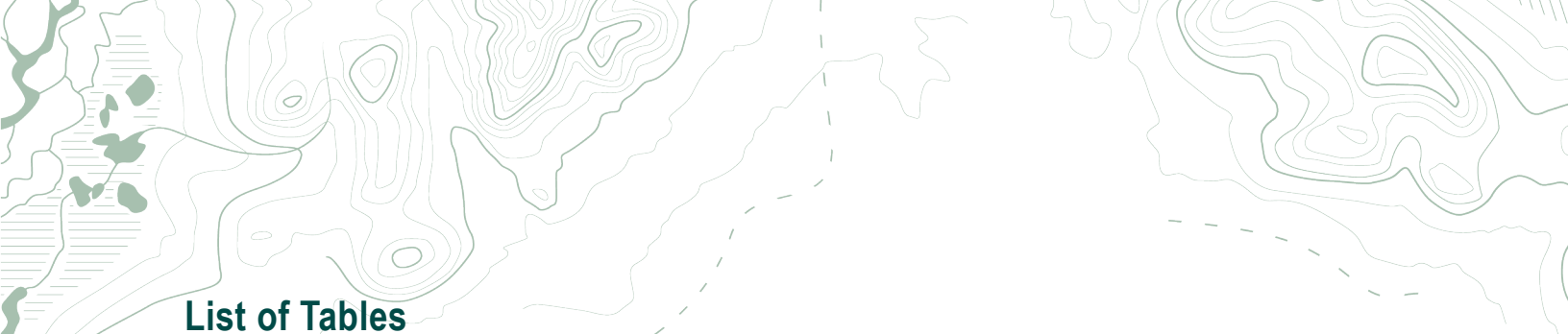
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Appendix A – Model Data Dictionary

Appendix B – Population & Employment Inputs

Appendix C – Observed Trip Generation Rates

Appendix D – Gateway & Commercial Vehicle Demand Matrices

Appendix E – List of Future Network Changes

Appendix F – Statement of Limitations



Glossary of Acronyms

Acronym	Description
AHS	Alberta Health Services
ARP	Area Redevelopment Plan
ATR	Automated Traffic Recorders
BPR	Bureau of Public Roads
EB	Eastbound
GFA	Gross Floor Area
GIS	Geographic Information System
HBO	Home-based Other (Trips)
HBS	Home-based School (Trips)
HBW	Home-based Work (Trips)
Hwy	Highway
HTS	Household Travel Survey
ITE	Institute of Transportation Engineers
MASP	Major Area Structural Plan
N/A	Not Applicable
NB	Northbound
NHB	Non Home-based (Trips)
O-D	Origin-Destination
QE2	Queen Elizabeth II (Highway 2)
SB	Southbound
SZ	Superzone
TAZ	Traffic Analysis Zones
TEC	Alberta Transportation and Economic Corridors
TMP	Transportation Master Plan
V/C	Volume-to-Capacity
VDF	Volume-Delay Function
WB	Westbound



1. Introduction

The City of Red Deer has updated its travel demand model to ensure that the tool continues to reflect the most current demographic, land use, travel patterns and road network conditions. The previous model, developed in 2018, provided a strong foundation for evaluating travel behaviour, testing roadway projects, and guiding the City's Transportation Master Plan (TMP). However, changes in growth patterns, new development approvals, roadway investments, and updated travel behaviour data necessitated a comprehensive model update.

The 2025 update incorporates:

- **Most recent demographic data** including the 2021 Federal Census and Statistics Canada 2024 estimates.
- **The 2024 Household Travel Survey (HTS)**, which captured travel patterns, trip purposes, and mode shares for Red Deer residents.
- **Recent traffic counts and screenline volumes** collected between 2019 and 2024, supplemented with Alberta Transportation ATR data and gateway monitoring.
- **Updated road network information**, reflecting constructed and committed projects, along with refinements to classification, speed, and capacity assumptions.

The objective of the model update is to maintain a state-of-the-art planning tool that:

- Provide an evidence-based tool to test growth scenarios and major development proposals.
- Assess performance of the transportation network under current and future conditions.
- Support planning for major capital projects and inform the City's offsite levy program.
- Integrate seamlessly with the City's ongoing policy initiatives, including land use planning, economic development, and multimodal mobility.

This document describes the base travel demand update process, including the development of updated inputs, calibration and validation procedures, and the use of the model for forecasting future growth scenarios.

2. Model Overview

2.1. MODEL FRAMEWORK

The updated model continues to use the standard four-step travel demand modelling approach, except for the mode choice subcomponent. The parameters have been recalibrated based on the latest HTS results. [Figure 1](#) provides an overview of the model framework. The four model steps are:

- **Trip Generation:** The process of estimating the number of trips (such as work trips or school trips) originating from and destined to various TAZs.
- **Trip Distribution:** The process of modelling ‘where trips go’ - In other words, this step involves distributing trips from an origin TAZ to various TAZ destinations in the region.
- **Travel Mode Choice¹:** The process of splitting the total number of modelled trips between every TAZ pair into various travel modes – For example, if the total number of modelled trips between two TAZs is 100, the mode choice step can split these into 70 trips conducted using a personal vehicle and 30 by transit.
- **Trip Assignment:** The process of determining the route choice taken by the trip maker – For example, if there is more than one route connecting two TAZs, the trip assignment process splits the trips between the routes based on various factors such as total travel time and operating cost of each route.

The model analysis timeframe captures the typical AM Peak hour and the PM Peak hour. The model was updated using Version 2024 (SP-1-16) of the PTV Visum software platform.

The geographic coverage remains citywide with external zones representing Blackfalds, Gasoline Alley, Springbrook/Red Deer Airport, and regional gateways (demand that originate or destined for areas outside of the model network). The internal (City) zone coverage was also expanded to include the annexed area west of Highway 2.

[Figure 1](#) illustrates the general framework for the City’s travel demand model update and its key components and data sources. The model data dictionary is provided in [Appendix A](#).

¹ Note that the current City of Red Deer model does not include a mode choice sub-component.

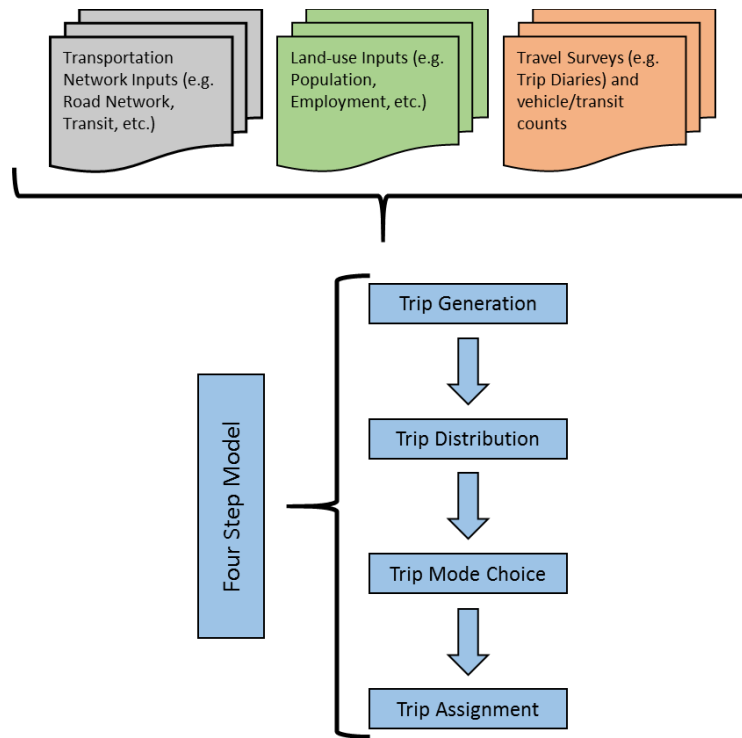


Figure 1: Red Deer Travel Demand Model Framework

The accuracy and predictive capability of the model depend heavily on the quality and completeness of the data used in the calibration and validation of each component. Key inputs for the model development included:

- A geographic representation of TAZs in the region with associated land use (population and employment) estimates;
- A network representing the transportation network (primarily highways, arterials and collector roadways) in the City; and
- The 2024 Household Travel Survey (HTS) was used to calibrate various components of the transportation model.

Since transportation models are generally calibrated to current travel conditions, these inputs reflect the most recent year available. The HTS captures travel behavior such as trip origins and destinations, mode choice, and time of travel, and provides a snapshot of current travel patterns based on a representative sample of the population.

Figure 2 and *Figure 3* illustrates the AM and PM peak model framework, respectively, which highlights the overall structure of the model and the key model inputs and outputs.

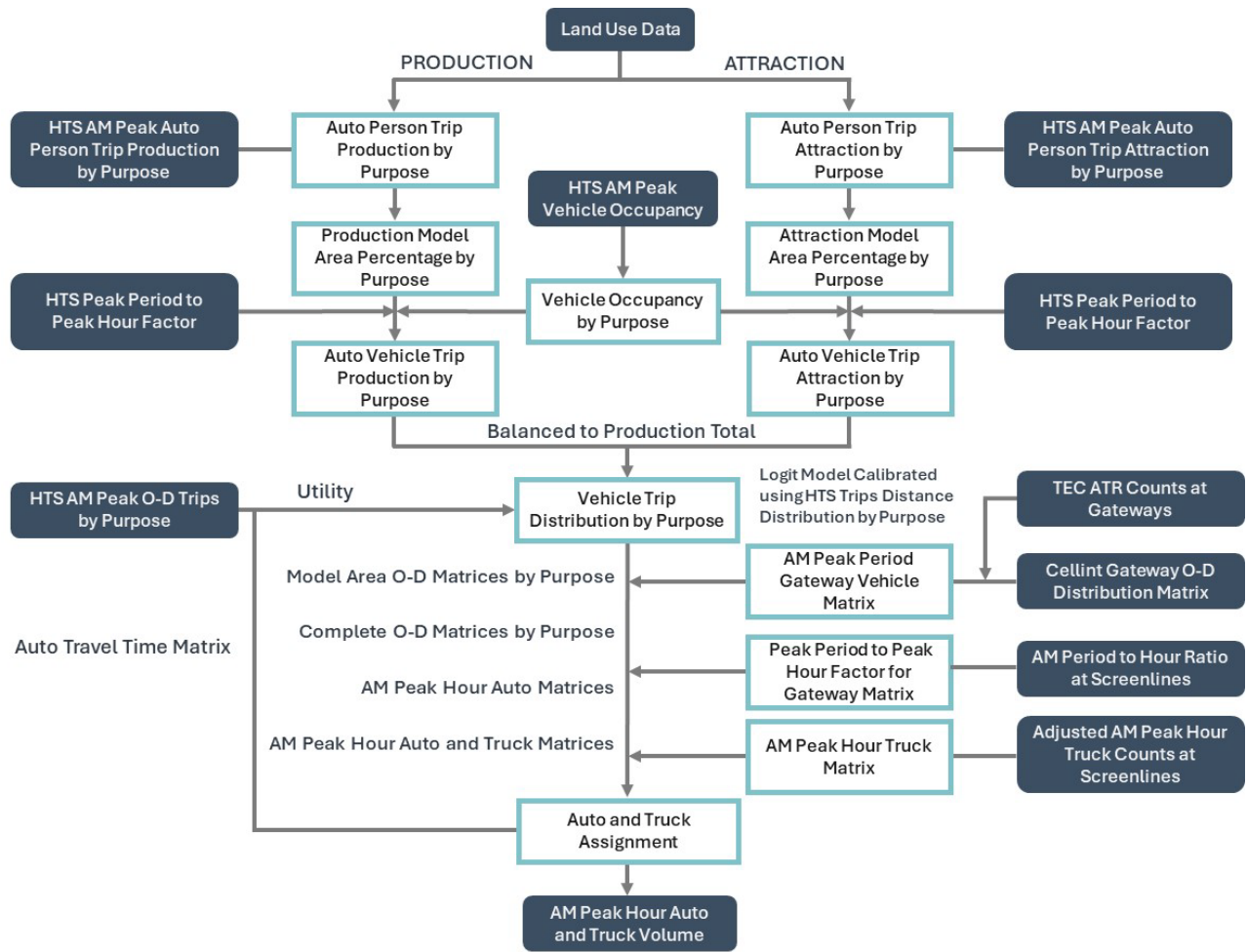


Figure 2: AM Peak Model Framework

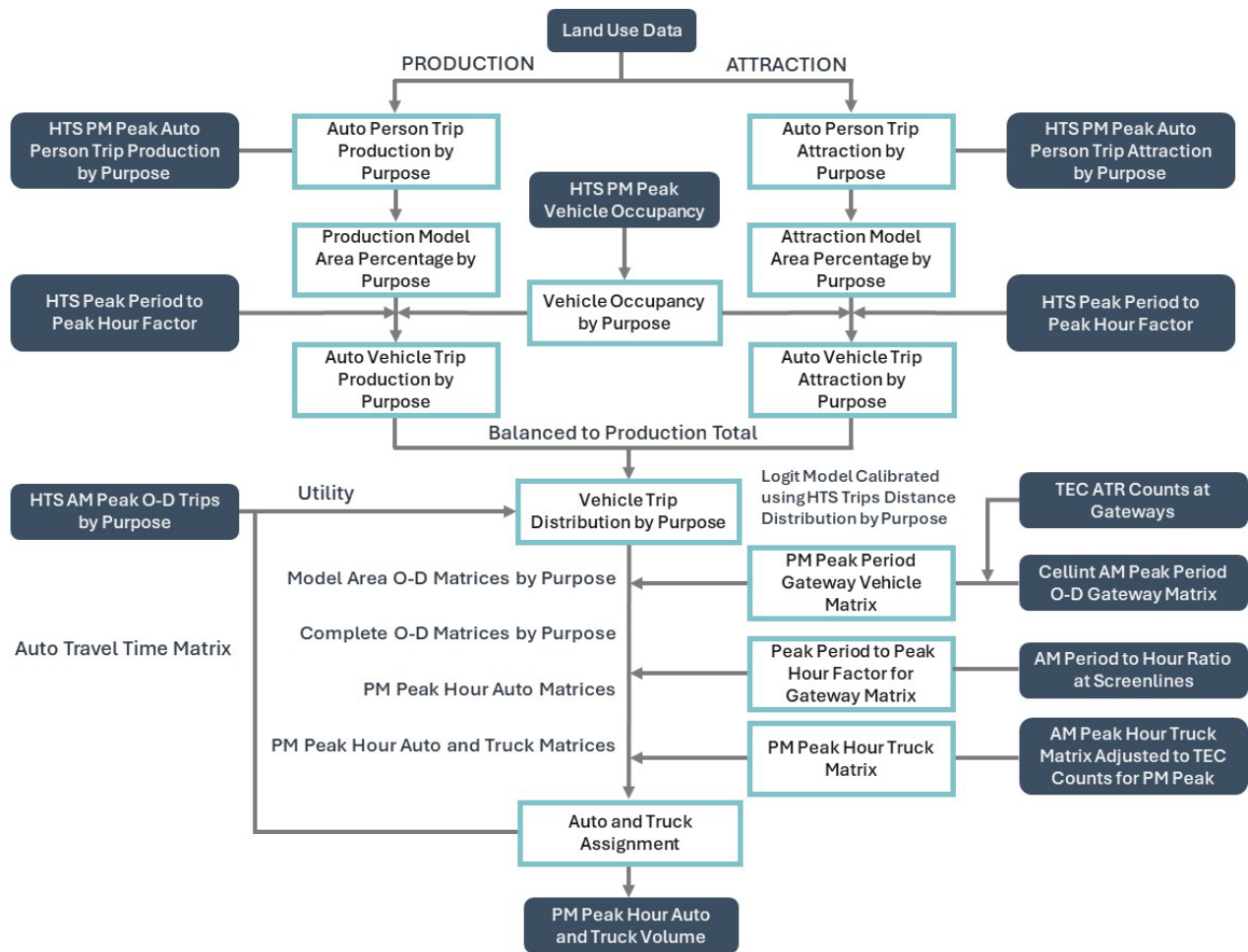


Figure 3: PM Peak Model Framework

The Existing Base model reflects 2024 travel conditions, and upon calibration and validation, it was used to forecast future travel conditions based on projected land use and socio-economic changes over the ultimate planning horizon (188K population). The horizons captured in this model update include:

- **Existing Base Model** – Update and calibrated to existing (2024) AM and PM peak hour conditions with the existing road network and a population horizon of approximately 100,000 people (100K Base Horizon).
- **Future Base Model** – Reflect AM and PM peak hour conditions with some planned future road network upgrades, and a population horizon of approximately 188,000 people (188K Base Horizon).
- **Future Full Build Model** - Reflect AM and PM peak hour conditions with all planned future road network upgrades, and a population horizon of approximately 188,000 people (188K Buildout Horizon).

2.2. ROAD NETWORK AND CLASSIFICATION

The roadway network was updated from the 2018 model using the City's GIS shapefiles, supplemented with staff input and Google Maps verification. Updates included refinements to classifications, posted speeds, and lane counts. Redundant categories such as Divided Expressway, Rural Highway, and Urban Ramp were consolidated to simplify coding and improve consistency. *Table 1* provides a summary of the updated road classification while *Figure 4* illustrates the existing base road network.

Table 1: Summary of Road Classification Update

Base Year Model	Type No.	Default Number of Lanes	Lane Capacity	Default Free Flow Speed
Freeway	10	2	1,800	110 km/h
Freeway Ramp	12	1	1,400	60 km/h
Urban - Highway	20	2	1,000	70 km/h
Urban - Arterial	21	2	900	60 km/h
Urban - Collector	22	1	700	50 km/h
Urban - Local	23	1	500	50 km/h
Urban - Ramp	24	1	800	50 km/h
Rural - Highway	30	1	1,000	80 km/h
Rural - Arterial	31	1	800	60 km/h
Rural - Collector	32	1	500	50 km/h
Rural - Rural Road	33	1	800	60 km/h

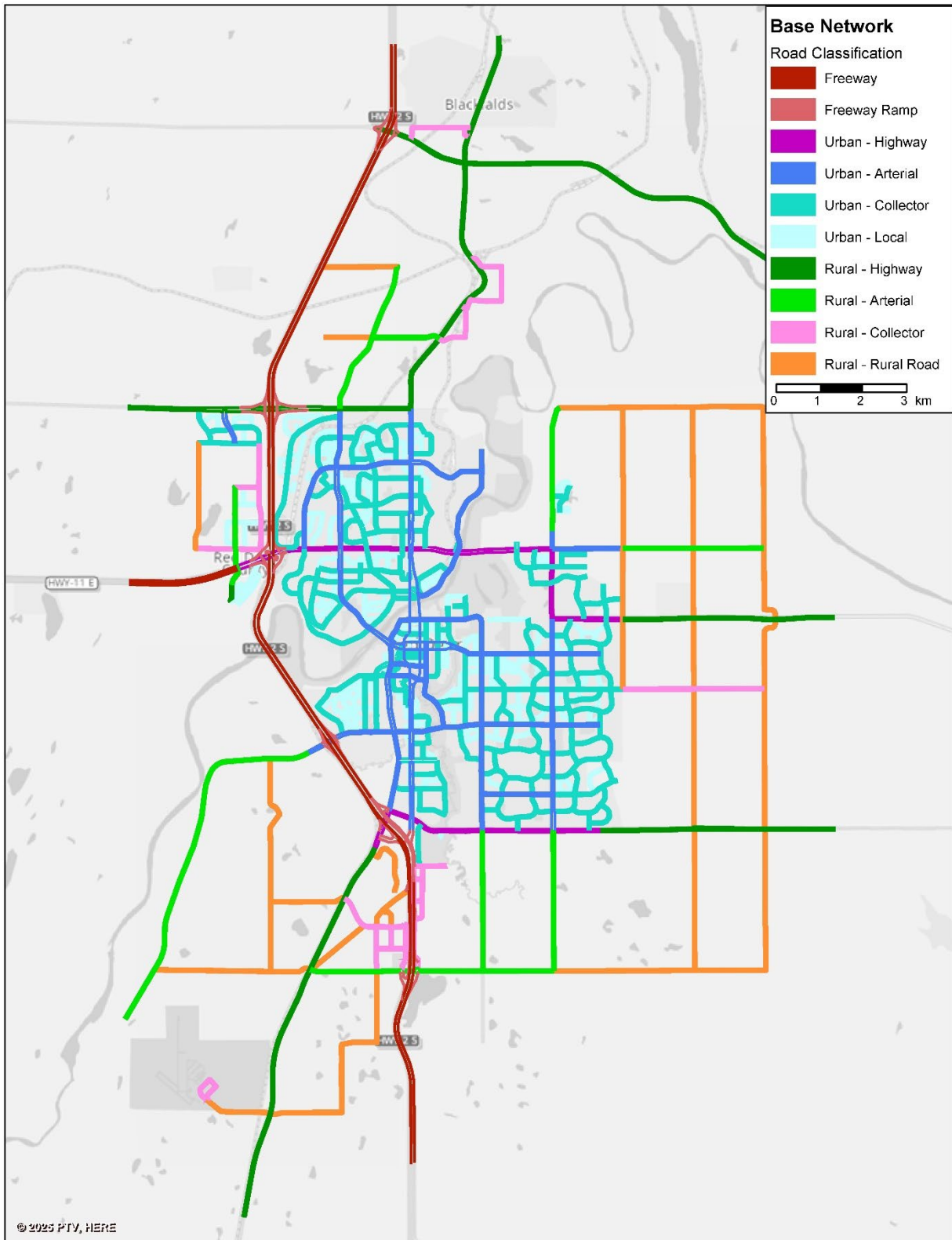


Figure 4: Base Year Road Classification

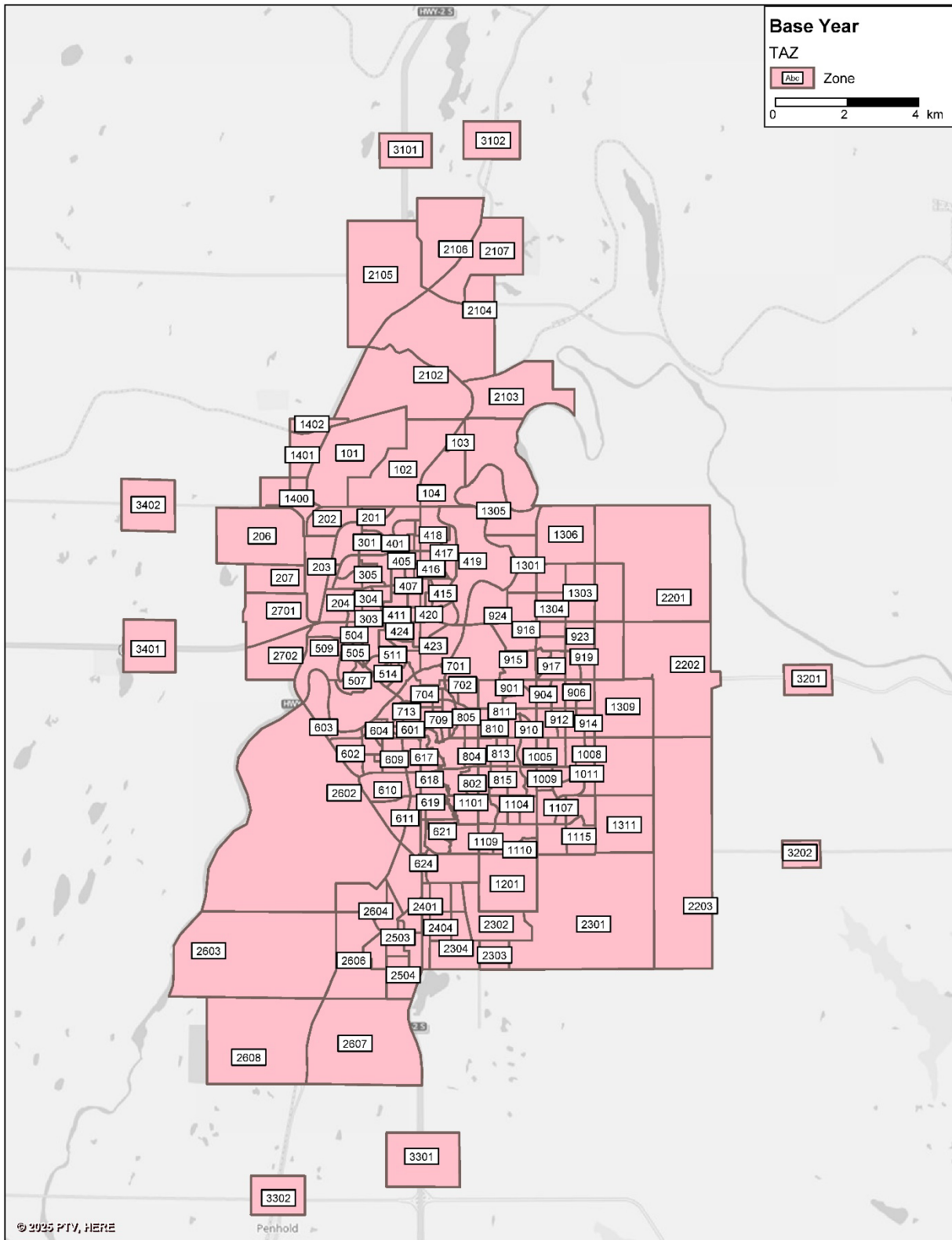


2.3. TRAFFIC ANALYSIS ZONE SYSTEM

The TAZ system forms the basis of the model by spatially representing trip productions and attractions. The updated TAZ system includes 232 zones, compared to 229 in the 2018 model, reflecting the annexed lands west of Highway 2 (see [Figure 5](#)). The system is designed to align with census dissemination areas, neighbourhood boundaries, and major natural barriers such as the Red Deer River.

The model uses a three or four-digit traffic zone numbering system, which generally correlates to the superzone number. The City is divided into an ensemble of traffic zones or superzones (see [Figure 6](#)) that are used for calibration and to summarize results. The TAZs are categorized into three main zone types:

- **Internal (I) Zones** – Representing areas within the City boundary (Zones 1 to 1403, Superzones 1 to 13).
- **External (X) Zones** – Representing Red Deer County and nearby communities such as Blackfalds (Zones 2101 to 2702, Superzones 21-27).
- **Gateway (G) Zones** – Representing trips entering and exiting the model area via major highways (Zones 3101 to 3402, Superzones 31 -34)



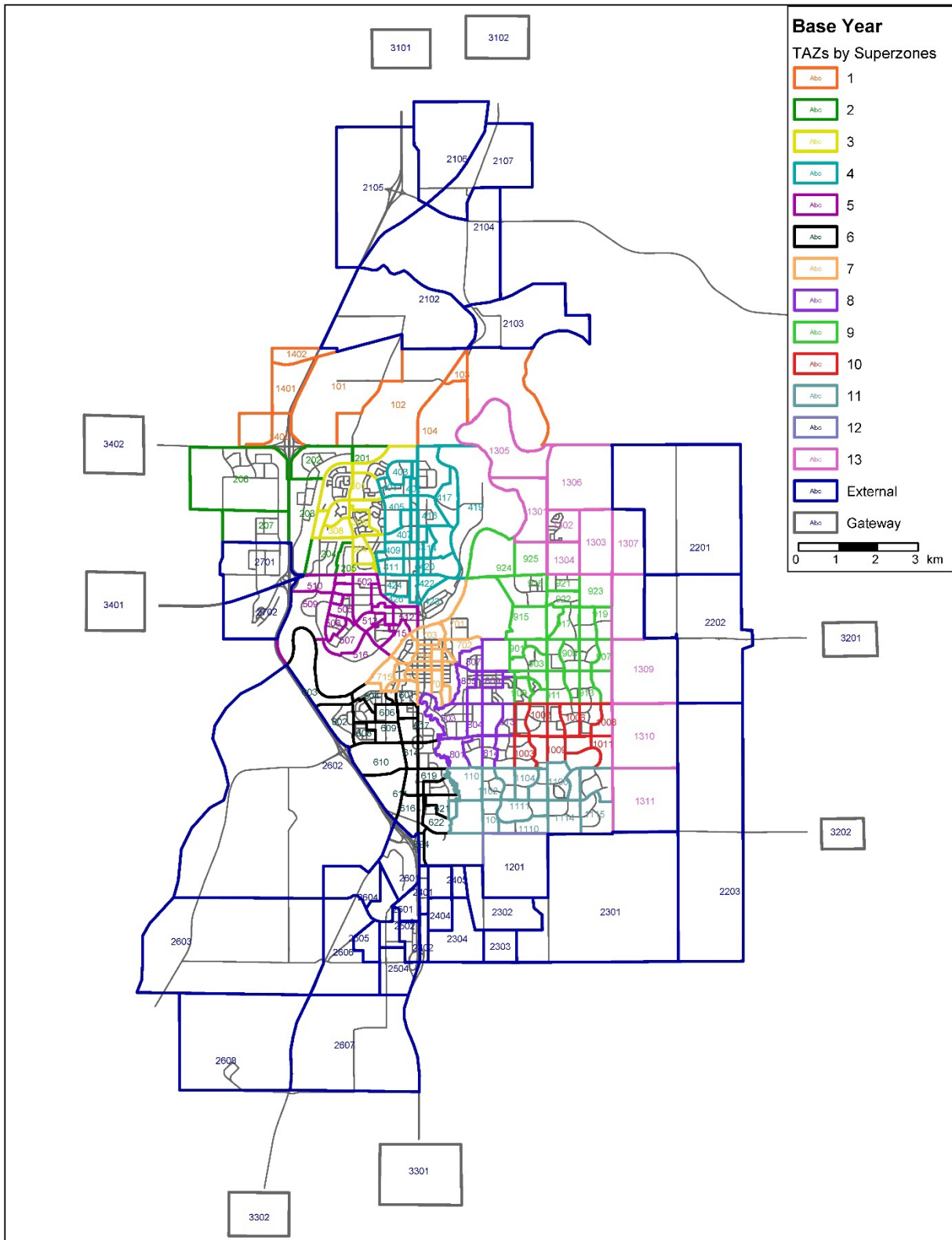


Figure 6: Model Superzone System



2.3.1. Gateway Zones

The gateway zones were maintained from the previous model and are summarized in [Table 2](#).

Table 2: Gateway Zone Summary

TAZ	Roadway	Description
North		
3101	Queen Elizabeth Highway (Highway 2) North	North of the Town of Blackfalds
3012	Highway 2A North	
South		
3301	Queen Elizabeth Highway (Highway 2) South	South of McKenzie Road (Township Road 374)
3302	Highway 2A South	South of Airport Drive
East		
3201	David Thompson Highway (Highway 11) East	East of Range Road 265
3202	Highway 595 East	
West		
3401	David Thompson Highway (Highway 11) West	East of Range Road 282
3402	Highway 11A West	

2.3.2. Centroids and Centroid Connectors

Travel demand assumptions in the model are established using zone-based data, which are linked to the roadway network through centroid connectors. Centroids represent the approximate center of activity within each zone. As part of this update, every zone centroid in the model area was reviewed to confirm that its location reasonably reflected the main development area of the zone. The placement of centroids was verified and, where necessary, adjusted using Google Maps aerial imagery to better represent typical access and egress locations.

Connector links were then created to simulate travel between the centroid and the roadway system, following these general principles:

- Connectors were typically attached to mid-block nodes rather than intersections to minimize conflicts with turning traffic.
- Physical barriers such as rivers, rail corridors, and parkland were avoided.
- Freeway nodes were not used as connector locations.

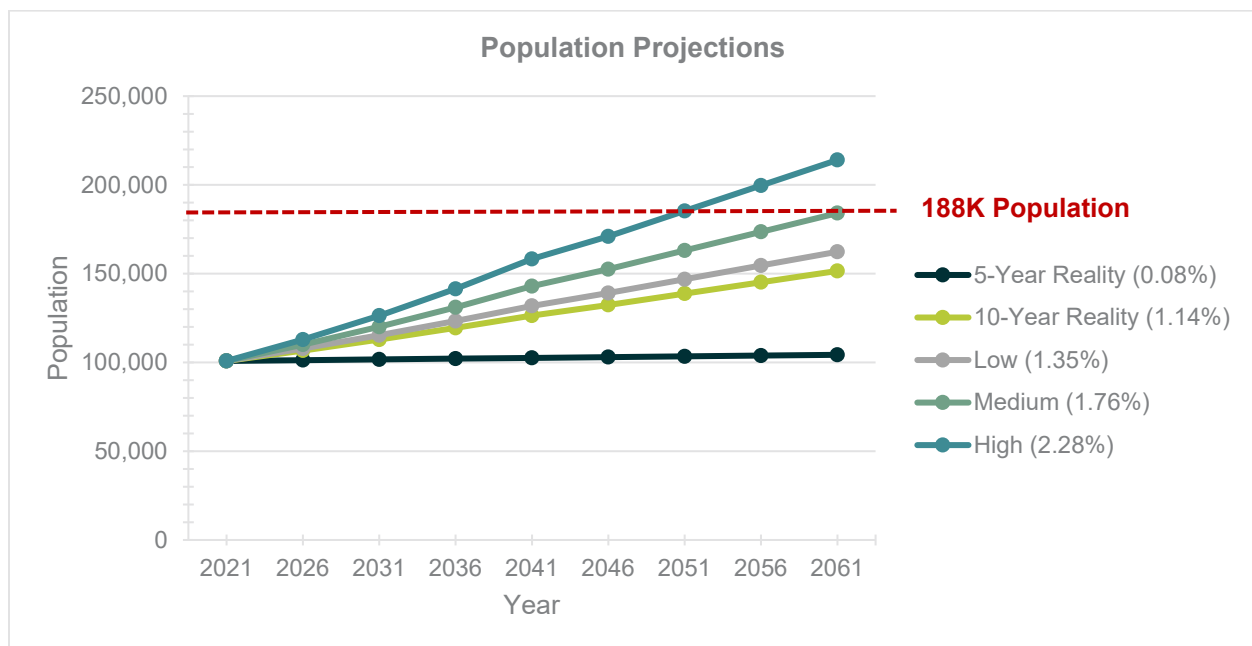
2.4. DEMOGRAPHIC AND LANDUSE DATA

2.4.1. Population and Employment Projections

Population and employment are the primary drivers of travel demand. The 2021 Federal Census recorded a population of 100,844, while Statistics Canada estimated 113,000 people in 2024 (including adjustments for undercount). The population of Red Deer is forecast to grow to the ultimate long-term horizon of 188,000 people, as shown in [Figure 7](#) below. Generally, it is anticipated that Red Deer will reach this population level by 2077.

The *City of Red Deer Real Estate Growth Projections* outlined several growth assumptions, including a 5-year and 10-year growth rate (0.08% and 1.14%, respectively) based on current growth trends, and three other growth scenarios – Low Growth (1.35%), Medium Growth (1.76%) and High Growth (2.28%). The City has experienced minimal population growth in recent years, with relatively low growth rates observed in the past 5 to 10 years. Through discussions with the City's Planning Department, it was advised that the Low Growth rate reflects a prudent approach to long-term forecasting. This approach ensures that the planning efforts reflect current realities while allowing for moderate, sustainable growth over the planning horizon.

Employment is forecast to grow from 43,000 jobs in 2024 to 68,000 by buildout. Significant growth areas include the annexed lands west of Highway 2 (see [Figure 8](#)), planned for regional commercial development, the Capstone district redevelopment, and the Red Deer Regional Hospital expansion.



Data Source: *City of Red Deer Real Estate Growth Projections*

Figure 7: City of Red Deer Population Forecasts



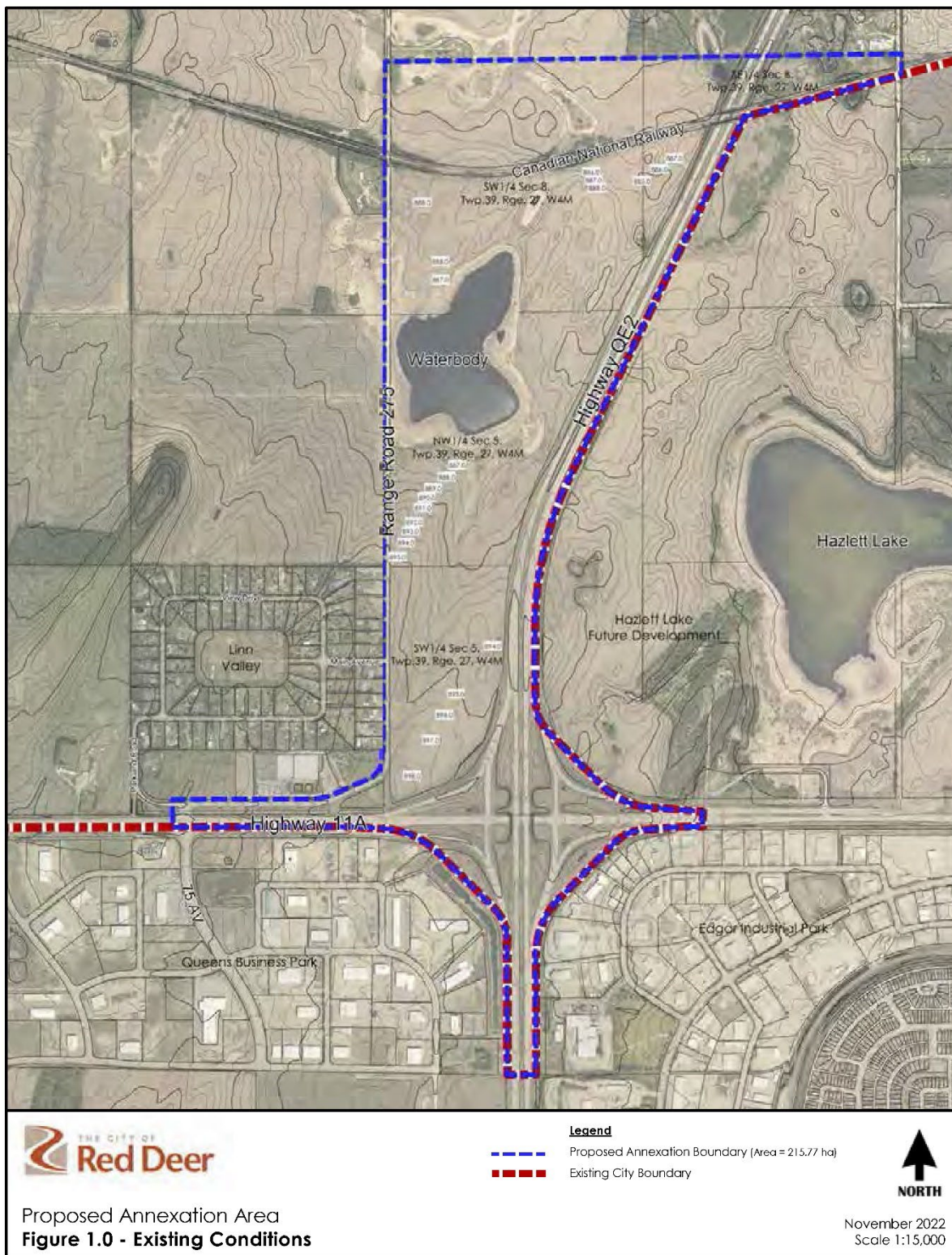


Figure 8: Annexation Area



2.4.2. Landuse Data by TAZs

The base year land use inputs were developed using the previous model's demographic data as a foundation. Zone-level population and employment inputs for the 100K horizon were reviewed against the 2021 Census and the 2024 HTS. This comparison confirmed that demographic distributions by TAZ have remained largely consistent. Adjustments were made at the superzone level to align with 2021 Census age profiles.

The demographic assumptions for the 188K horizon were also reviewed in coordination with the City's Planning Department. This review identified the need for adjustments to employment estimates in select TAZs to better align with anticipated development patterns and approved plans. Key revisions to the employment projections include:

- Zone 601 – Employment is estimated to increase by 2,580 jobs from previous assumption. This reflects the redevelopment of the Red Deer Regional Hospital Centre, which is anticipated to have 200 more hospital beds. The employment rate was assumed to be 12.9 employees per bed (statistics pulled from AHS).
- Zone 711 – Employment is estimated to increase by 80 jobs from previous assumption. This reflects the expansion of the New Justice Centre, which includes a larger building with additional court rooms. The employment was assumed to be doubled.
- Zone 1101 – Employment is estimated to increase by 200 jobs from previous assumption. This reflects future commercial development in the area and a commercial employment density of 700 ft² per employee.
- Zone 1401 to 1403 – Employment is estimated to be 1,860 jobs. This reflects future commercial development in the annexation area. The estimates were established by applying a commercial employment density of 700 ft² per employee to the total leasable square footage as provided by the City.

Figure 9 to *Figure 12* illustrates the population and employment by TAZs for the 100K and 188K horizon. The population and employment data by TAZ for model input, for both the base and 188K horizons, are provided in **Appendix B**.



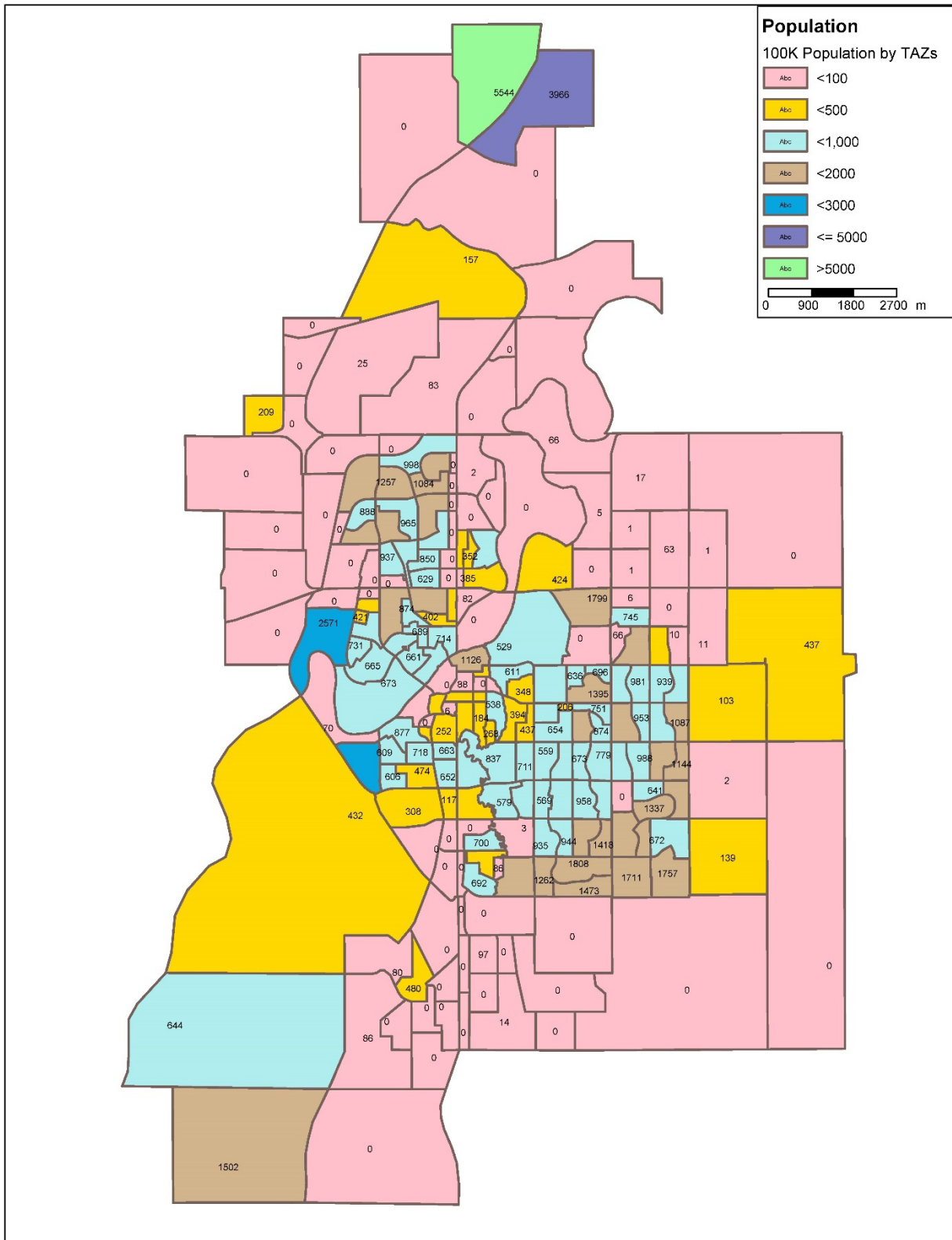


Figure 9: 100K Population Estimates by TAZs









3. Data Sources

3.1. HOUSEHOLD TRAVEL SURVEY

To update and calibrate the 2025 model, the City completed a new travel survey in 2024. The survey was designed and administered under the City's direction to capture current travel patterns, building on the foundation of the 2016 survey. Residents were asked to record all trips made on a designated weekday, with details on trip purpose, origin, destination, and travel mode.

Data collection occurred during the fall of 2024, spanning from September to November 2024, producing 8,196 valid household trips after processing and expansion. This dataset represents approximately 225,700 daily trips across the city. The observed mode split included approximately 90% auto trips, 7% active transportation trips, and 3% transit trips.

The 2024 HTS results provided critical inputs for model calibration and validation, including updated trip generation rates by household and demographic category, trip purpose distributions, and origin–destination patterns. These inputs ensured that the updated model reflects the most recent travel behaviour of Red Deer residents.

Further detail on the methodology and findings is documented in the *Red Deer 2024 Household Travel Survey – Technical Report*.

3.2. TRAFFIC COUNTS

Several sources of traffic count data were used for validating the transportation model, including

- TEC Traffic Data
- City Intersection Turning Counts
- Alberta Permanent Traffic Monitoring Stations (ATR)

Figure 13 shows the location of all traffic counts that were used to validate the Red Deer transportation model. All the traffic count data was summarized for the morning peak period (8:15-9:15 AM) and afternoon peak period (4:15-5:15 PM) for model validation purposes. **Blue markers** represent traffic counts obtained from the City, which were incorporated into the VISUM model, while the **purple markers** denote TEC traffic counts and the Permanent Traffic Monitoring Stations.

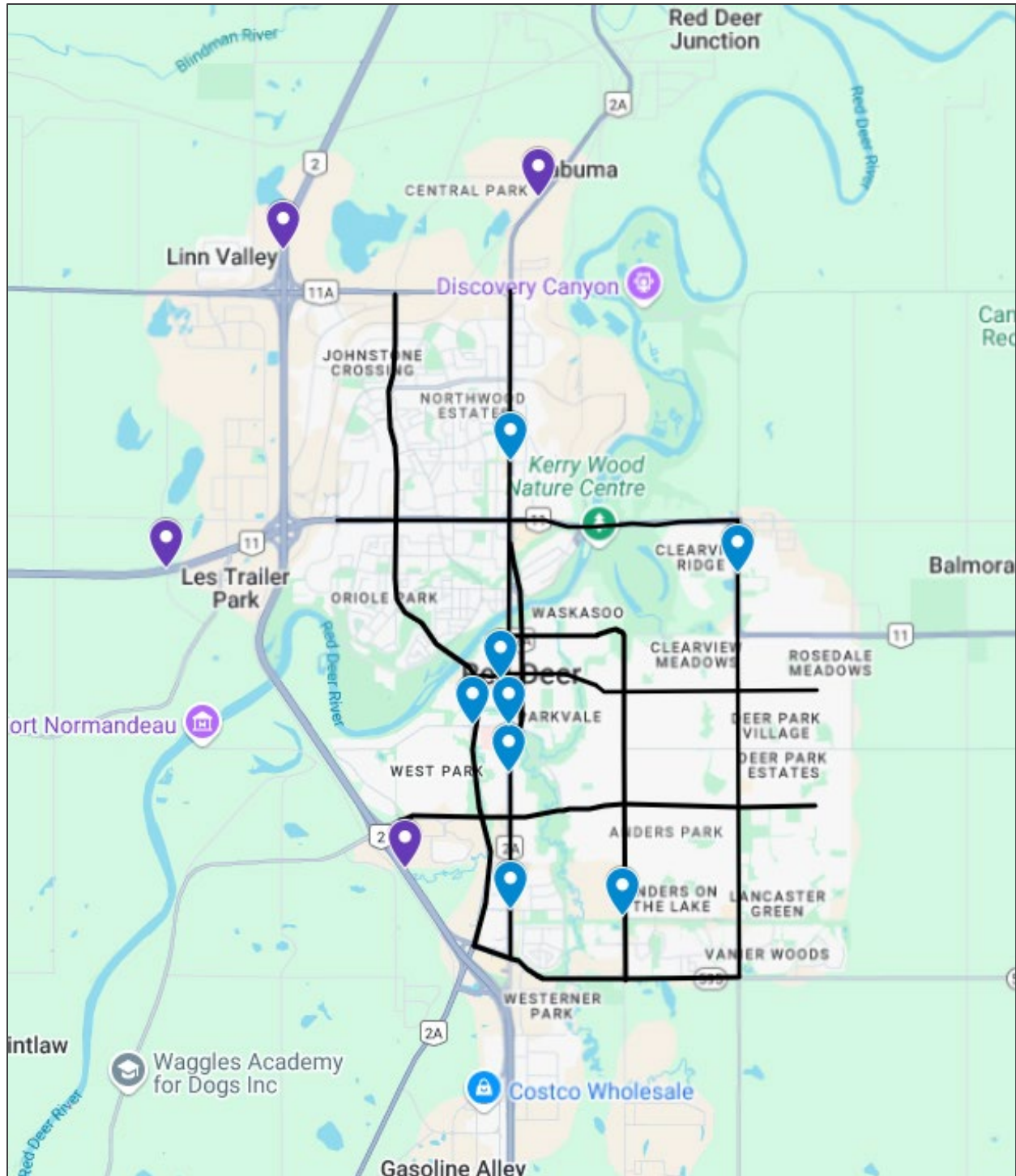


Figure 13: Traffic Count Locations Used for Base Model Validation

Table 3 and Table 4 outlines the observed counts used for the AM and PM peak hour model validation, respectively.

Table 3: AM Traffic Counts for Model Validation

Intersection	North-South Road	East-West Road	AM Peak (08:15-09:15 AM)			
			SB	WB	NB	EB
22 St & 40 Ave	40 Ave	22 St	480	600	460	0
22 St & 50 Ave	50 Ave	22 St	425	120	340	130
36 St & 50 Ave	50 Ave	36 St	580	50	460	70
43 St & 50 Ave	50 Ave	43 St	610	305	0	265
43 St & Taylor Dr	Taylor Dr	43 St	520	160	640	185
49 St & 51 Ave	51 Ave	49 St	810	0	0	330
71 St & 50 Ave	50 Ave	71 St	770	95	980	120
Timothy Dr & 30 Ave	30 Ave	Timothy Dr	520	155	1,070	45
Hwy 2A	Hwy 2A	N/A	660	N/A	463	N/A
Hwy 2 Interchange	Hwy 2	N/A	1,540	N/A	1,180	N/A
Hwy 11	N/A	Hwy 11	N/A	515	n/a	970
Hwy 2	Hwy 2	N/A	1,430	N/A	1,510	N/A

Table 4: PM Traffic Counts for Model Validation

Intersection	North-South Road	East-West Road	PM Peak (04:15-05:15 PM)			
			SB	WB	NB	EB
22 St & 40 Ave	40 Ave	22 St	775	410	770	0
22 St & 50 Ave	50 Ave	22 St	1,090	230	920	430
36 St & 50 Ave	50 Ave	36 St	1,050	55	660	125
43 St & 50 Ave	50 Ave	43 St	1,160	225	0	465
43 St & Taylor Dr	Taylor Dr	43 St	910	465	845	330
49 St & 51 Ave	51 Ave	49 St	0	525	1,180	0
71 St & 50 Ave	50 Ave	71 St	1,350	180	1,230	185
Timothy Drive & 30 Ave	30 Ave	Timothy Dr	1,580	140	1,145	70
Hwy 2A	Hwy 2A	N/A	760	n/a	895	N/A
Hwy 2 Interchange	Hwy 2	N/A	1,810	n/a	2,010	N/A
Hwy 11	N/A	Hwy 11	N/A	1,120	N/A	710
Hwy 2	Hwy 2	n/a	2,055	N/A	2,090	N/A



Truck volumes for both AM and PM periods were also extracted from the count data, as summarized in [Table 5](#). In particular, this data was used to develop a PM truck origin-destination matrix that pivots from the existing AM matrix that was provided with the previous model.

Table 5: AM and PM Truck Volumes for Model Update

Intersection	AM Peak (08:15-09:15 AM)				PM Peak (04:15-05:15 PM)			
	SB	SB	WB	NB	EB	WB	NB	EB
22 St & 40 Ave	11	11	4	11	9	2	7	0
22 St & 50 Ave	10	10	1	13	5	1	5	2
36 St & 50 Ave	15	15	0	8	3	0	4	0
43 St & 50 Ave	13	13	0	0	6	0	0	0
43 St & Taylor Dr	11	11	3	13	7	5	8	0
49 St & 51 Ave	0	0	0	0	0	0	0	0
71 St & 50 Ave	28	28	3	13	10	3	19	1
Timothy Dr & 30 Ave	23	23	2	14	6	1	17	3

3.3. GATEWAY DEMAND

The AM peak hour gateway demands were derived from the previous model by applying a growth factor based on the most recent traffic count information. For the PM peak hour demands, the gateway trips were derived from the AM to PM traffic count ratio nearest to the four gateway locations.

3.4. CORRIDOR TRAVEL TIME

In addition to traffic volumes, validation of the updated model included comparison against observed travel times. Corridor travel times collected in 2019 were provided by the City, which recorded vehicle speeds along selected corridors (see [Figure 14](#)) during the AM peak, midday, and PM peak periods on a single survey day. These speed observations were then used to calculate average travel times by corridor, rounded to the nearest minute for analysis.

The findings from this study served two purposes within the model development process: (a) to inform the assignment network by establishing link speed parameters such as free-flow speed and speed adjustment factors, and (b) to provide an independent dataset for validating modelled travel times following trip assignment (refer to [Section 5.2](#) for the validation results).

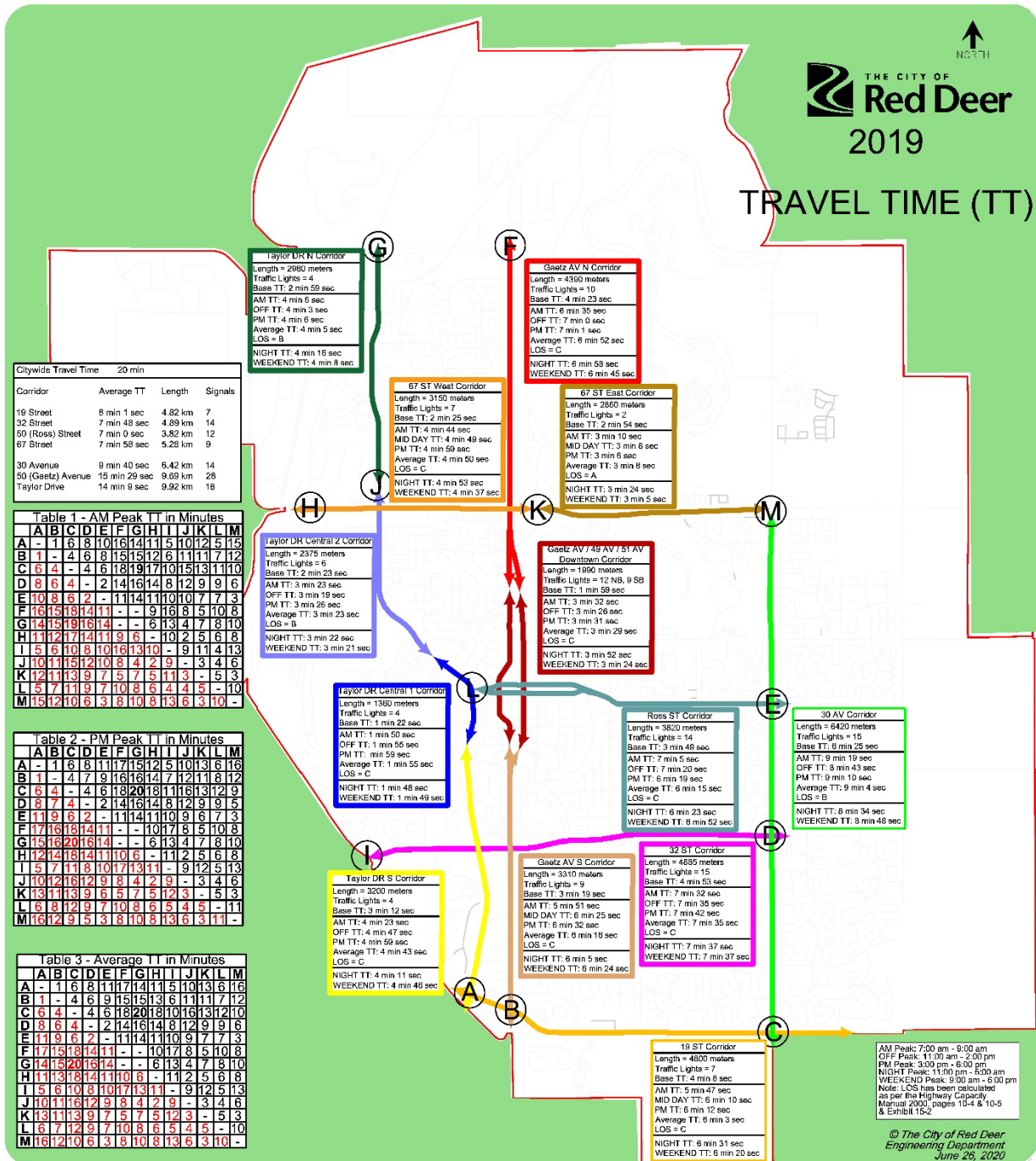


Figure 14: City of Red Deer Corridor Travel Time Study (2019)

4. Base Year Model Update

4.1. TRIP GENERATION

4.1.1. Household Travel Survey

The 2024 HTS served as the foundation for estimating trip rates and travel patterns. This survey provides weighted trip data by origin and destination, with details on trip purposes and activity locations. The HTS outputs were initially applied as reference values to guide the trip rate estimation process. The survey captured trip purposes - **home-based work (HBW)**, **home-based school (HBS)**, **home-based other (HBO)**, and **non-home-based (NHB)** – and provided weighted trip data between origins and destinations, including trip purposes and activity locations. Although the survey represented about 3.6% of households at the superzone scale, disaggregation into multiple trip purposes and demographic categories (e.g., age, employment type) reduced the statistical robustness of the raw rates. For this reason, the HTS values were used as reference points to guide the estimation of trip generation rates and trip length distributions, with adjustments applied during the calibration process to ensure consistent and reasonable modeling outcomes.

For the trip trend analysis and estimation of AM and PM production and attraction trip rates, the following peak period data were applied: 2-hour AM peak period (7:15 to 9:15 AM) and 3-hour PM peak period (3:00 to 6:00 PM).

4.1.2. Productions

Trip productions, representing the number of trips generated by households and individuals, formed the basis of demand estimation in the 2024 model update. Updated HTS data were used to generate trip rates by age group and purpose, with population distributions from the previous model scaled to match HTS totals.

For the AM peak (7:15–9:15 AM), trip generation rates were estimated by dividing trips by population across age groups and purposes. Rates were calibrated during validation to align with HTS observations, with most adjustments within 20% and a target deviation of no more than 10%. The results showed expected patterns, with adults aged 25–44 producing the highest HBW, HBO, and NHB trips, and children (Age 0–14) producing the highest HBS trips.

The PM peak (3:00–6:00 PM) was analyzed using a longer period to capture the greater variability of afternoon travel. Similar to the AM period, trip rates were estimated and calibrated, with adjustments summarized at the zonal level. Overall, the calibrated AM and PM trip production rates provide a stable and representative basis for forecasting travel demand in the 2024 model.

Table 6 outlines the AM and PM peak trip production rates for each trip purpose. The list of trip production rates for individual superzones by trip purposes and age groups is provided in [Appendix C](#).

Table 6: AM and PM Peak Trip Production Rates by Trip Purposes and Age Groups

Age Group (Years)	AM Peak				PM Peak			
	HBW	HBS	HBO	NHB	HBW	HBS	HBO	NHB
0-14	0.00	0.22	0.02	0.02	0.00	0.16	0.12	0.07
15-24	0.09	0.15	0.02	0.02	0.12	0.09	0.12	0.06
25-34	0.27	0.02	0.10	0.08	0.30	0.02	0.32	0.17
35-44	0.24	0.20	0.11	0.14	0.25	0.10	0.32	0.28
45-64	0.19	0.04	0.09	0.05	0.27	0.02	0.31	0.13
65+	0.03	0.00	0.11	0.01	0.04	0.00	0.38	0.08

4.1.3. Attractions

Trip attractions represent the level of trip generation based on employment or enrollment data. Similar to the trip production process, trip attraction rates were also estimated and validated using HTS data. The estimation approach relied on regression analysis to establish relationships between trip purposes and relevant land use or employment categories.

4.1.3.1. Home-Based Work (HBW)

For HBW trips, attraction rates were derived from employment data across industrial, institutional, office, retail, and school sectors. The regression results demonstrated strong correlations, with coefficients varying by sector, and were subsequently applied to distribute HBW attractions across traffic zones. Zonal adjustments were made during calibration to improve alignment with HTS observations, ensuring deviations remained within $\pm 10\%$ for most zones. [Table 7](#) outlines the average modelled trip attraction rates by employment category.

Table 7: AM and PM Peak HBW Trip Attraction Rates by Trip Purposes and Employment Category

Employment Category	AM Peak	PM Peak
Office	0.27	0.20
Retail	0.19	0.12
Industrial	0.13	0.17
Institutional	0.34	0.45
School	0.32	0.33

4.1.3.2. Home-Based School (HBS)

HBS trip attractions were estimated directly from student enrollment figures, reflecting the strong link between school population and school-related trips. [Table 8](#) outlines the peak HBS trip attraction rates by superzone.

Table 8: AM and PM Peak HBS Trip Attraction Rates by Superzone

Superzone	AM Peak	PM Peak
1	0.20	N/A
2	N/A	N/A
3	0.87	N/A
4	N/A	N/A
5	0.16	N/A
6	0.16	N/A
7	N/A	N/A
8	0.33	N/A
9	0.33	N/A
10	N/A	N/A
11	N/A	N/A
12	N/A	N/A
13	N/A	N/A

4.1.3.3. Home-Based Other (HBO)

For HBO trips, regression models using retail and office employment provided the basis for attraction rates. These relationships captured the influence of commercial and service-oriented land uses on trip-making for discretionary and non-home-based purposes. [Table 9](#) outlines the average modelled trip attraction rates by employment category.

Table 9: AM and PM Peak HBO Trip Attraction Rates by Employment Category

Employment Category	AM Peak	PM Peak
Office	0.18	N/A
Retail	0.28	0.82

4.2. NON-HOME-BASED PRODUCTIONS AND ATTRACTIONS

Regression models using retail and office employment also provided the basis for attraction rates for NHB trips. These relationships captured the influence of commercial and service-oriented land uses on trip-making for discretionary and non-home-based purposes. [Table 10](#) outlines the average modelled trip attraction rates by employment category.

Table 10: AM and PM Peak HBO Trip Attraction Rates by Employment Category

Employment Category	AM Peak	PM Peak
Office	0.22	0.12
Retail	0.22	0.45

4.3. TRIP DISTRIBUTION

The trip distribution model distributes trips produced by each TAZ origin to various destinations. The trip distribution model was calibrated by trip purpose, so that the average trip lengths and distributions matched well with those observed in the HTS by purpose was analyzed based on various trip lengths. The AM and PM distribution results were validated against the average trip lengths for each trip purpose as observed in the HTS (summarized in [Table 11](#)).

The following utility function was applied to trip distribution with different co-efficient estimated by different trip purposes, i.e., C= -0.09, -0.60, C= -0.45, and -0.13 for HBW, HBS, HBO and NHB trips:

$$f(U) = e^{-cU}$$

where U represents the congested travel time between zone pairs during the peak hour (AM or PM).

In general the coefficients lined up with expectation. HBW trips are generally longer, which is reflected by the lower negative coefficient (-0.09). The coefficients were estimated using a guided estimation process, where an initial guess is used based on estimates from other models and experience. The coefficients are then varied to improve the model's trip length distribution with observed proportions from the HTS.

Table 11: Average Trip Lengths by Purposes

Trip Purpose	AM Peak Average Trip Length (km)		PM Peak Average Trip Length (km)	
	Model	HTS	Model	HTS
HBW	6.94	6.17	6.88	6.16
HBS	3.13	3.74	3.05	3.59
HBO	3.85	4.74	4.99	4.75
NHB	4.24	4.43	4.23	4.55

Trip distributions were validated against the HTS trip distributions by applying the Coincidence Ratio.

$$CR = \frac{\sum_T \min (PM_T, PO_T)}{\sum_T \max (PM_T, PO_T)}$$

Where, PM_T = proportion of modeled distribution

PO_T = proportion of observed distribution

T = is the histogram interval for distance

A coincident ratio of 1 indicates that the model matches exactly with observed trip length distributions. The validation results for the AM peak and PM peak are shown in [Table 12](#). Overall, modelled trip distributions match very well with observed survey outputs.

Table 12: Coincidence Ratio for Trip Distribution by Trip Length

Trip Purpose	Base Year Model (AM)		Base Year Model (PM)	
	Coincidence Ratio (%)	Remarks	Coincidence Ratio (%)	Remarks
HBW	82%	Excellent	83%	Excellent
HBS	74%	Great	81%	Excellent
HBO	65%	Reasonable	89%	Excellent
NHB	69%	Reasonable	83%	Excellent

4.3.1. Gateway Trip Rates

Gateway trips, represent trips that have an origin and/or destination outside the model extents, which includes both internal and external zones. The Base Year model used the gateway trip rates from the previous model for the AM scenario. However, for the PM scenario, the gateway trips were derived from the AM to PM traffic count ratio nearest to the four gateway locations, i.e., Highway 2 Interchange, Highway 2A, Highway 11 and Highway 2. The eastern gateway trip rate was estimated from the ratio of the total inbound and outbound traffic counts at these four locations. [Table 13](#) summarizes the gateway trip rates for PM peak, derived from the AM gateway trips.

Table 13: Gateway Trip Rates for PM Peak

Location Name	Intersections	Node Numbers	SB	NB	WB	EB
Linn Valley	Highway 2 Interchange	3101	1.18	1.70	n/a	n/a
Labuma	Highway 2A	3102	1.14	1.93	n/a	n/a
Les Trailer Park	Highway 11	3401	n/a	n/a	2.19	0.73
Les Trailer Park	Highway 11	3402	n/a	n/a	2.19	0.73
West Park Extension	Highway 2	3301	1.44	1.38	n/a	n/a
West Park Extension	Highway 2	3302	1.44	1.38	n/a	n/a
Eastern Gateways	n/a	3201	0.00	0.00	1.15	1.70
Eastern Gateways	n/a	3202	0.00	0.00	1.15	1.70

4.3.2. Mode Split

There was no mode split component included in the Red Deer model. Transit and other sustainable transportation mode shares were considered small enough to be excluded from the analysis at this time. The focus of this analysis was the road network to address current issues and challenges with the historically highest mode share in Red Deer, and to address potential network constraints with rapid community growth and expansion. In the future, as the other modes become more attractive to users, especially with investments in sustainable transportation, these modes can be added to the model for future studies.

4.4. TRIP ASSIGNMENT

4.4.1. Volume-Delay Function

The assignment process applies a standard volume-delay function (VDF). Consistent with the previous model, the updated model retained the same VDFs to ensure continuity in how congestion effects are represented. The model uses the industry-standard Bureau of Public Roads (BPR) function, with parameters calibrated to reflect congestion impacts on travel times:

$$t_i = t_{0i} \times \left(1 + a \times \left(\frac{V_i}{C_i} \right)^b \right)$$

Where: t_i = congested travel time on link i

t_{0i} = free-flow travel time on link i

V_i = modelled vehicle volume on link i

C_i = vehicle capacity on link i

The parameters by road classification are summarized in [Table 14](#). These values are consistent with those applied in the previous Red Deer model and remain appropriate for representing peak-hour route diversion behaviour.

Table 14: BPR Function Parameter by Road Classification

Roadway Classification	a	b
Freeways	1	6
Freeway Ramps	1	6
All Other Roadways	1	4

4.4.2. Time of Day Factors and Vehicle Occupancy

Trip generation was derived from the HTS for 2-hour and 3-hour periods to ensure substantial sampling of trips. Those trips were converted to peak hour person-trips and, subsequently, vehicle trips, which are required for a one-hour traffic assignment on the network².

[Table 15](#) below summarizes the time-of-day factors used to convert peak period person trips to peak hour person trips.

[Table 16](#) summarizes the vehicle occupancy rates. Both sets of factors were calculated by trip purpose.

² Volume-delay functions and road capacities are typically based on 1-hour traffic volumes

Table 15: Peak Hour Time of Day Factor

Trip Purpose	AM Peak		PM Peak	
	From Home/Origin Factor	To Home/Destination Factor	From Home/Origin Factor	To Home/Destination Factor
HBW	0.45	0.01	0.02	0.53
HBS	0.71	0.07	0.05	0.18
HBO	0.47	0.08	0.14	0.24
NHB	0.78	N/A	0.32	N/A

Table 16: Vehicle Occupancy by Purpose

Trip Purpose	AM Peak	PM Peak
HBW	1.06	1.13
HBS	1.85	2.34
HBO	1.35	1.31
NHB	1.27	1.25

4.4.3. Gateway Trips

Applying the gateway trip generation process described in **Section 4.3.1**, the AM and PM peak hour gateway trip matrix was developed. The resulting gateway trip matrices are provided in **Appendix D**. As in the previous model, this distribution has no impact on base year assignment results, since gateway trip matrices are applied directly during the assignment stage. The purpose of the disaggregation is to allow distinct growth factors to be applied to each trip purpose in future forecast or improvement scenarios.

4.4.4. Commercial Vehicle Trips

The commercial vehicle trip matrix was established based on the process described in **Section 3.2**. The resulting AM and PM peak hour commercial trip matrices are provided in **Appendix D**.

5. Base Year Model Validation and Calibration

5.1. TRAFFIC COUNTS

The Base Year model was validated against the traffic counts mentioned in **Section 3.2**, using the GEH methodology. The GEH was calculated using the following formula:

$$GEH = \sqrt{\frac{2(M - O)^2}{(M + O)}}$$

Where, M= traffic volumes from the model and O = Observed traffic counts

GEH thresholds of 5 and 10 were applied, with an overall weighted GEH of ≤5 targeted. Initial calibration achieved R² values of 0.95 (AM) and 0.88 (PM), indicating strong correlation, though several locations showed GEH >10 due to network coding errors (e.g., overlapping nodes and mis-specified turning movements).

These issues were corrected, and a constrained demand adjustment (±20% of the auto assignment matrix) was applied to better match observed counts without distorting travel patterns. Most AM trips required little or no adjustment, with about 17% modified by 10–20%. Following refinement, model accuracy improved: 78% of AM and 62% of PM count locations achieved GEH ≤5. [Figure 15](#) and [Figure 16](#) show the AM and PM peak hour traffic count validation results post-adjustments, respectively.

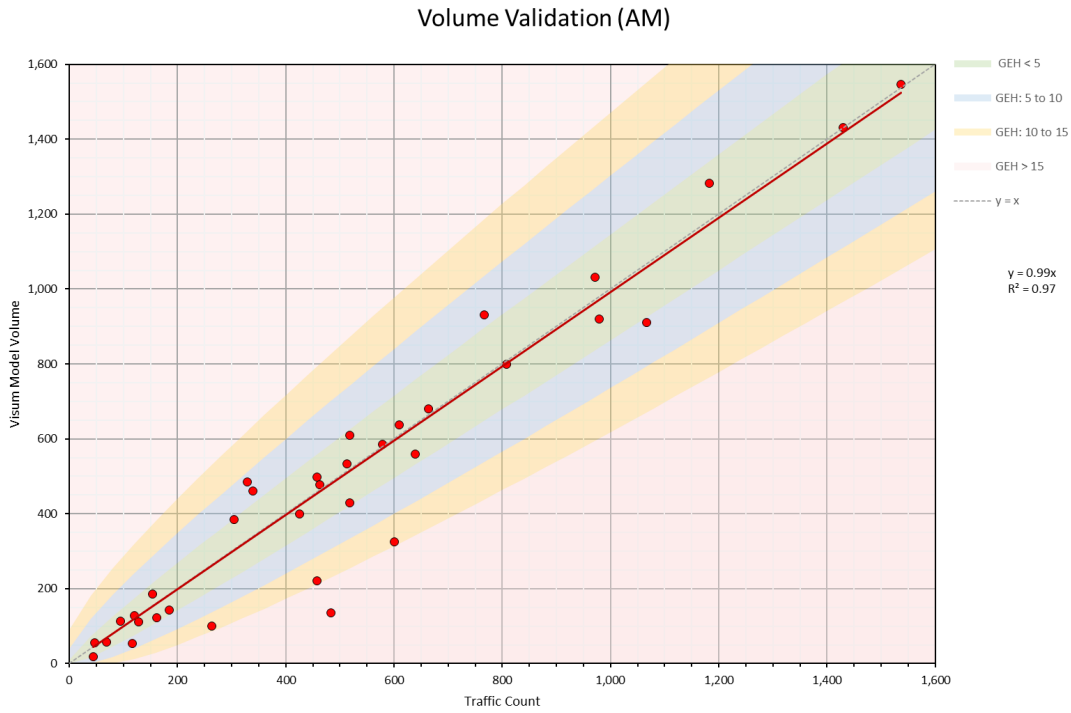


Figure 15: 2025 AM Model Validation Against the Traffic Counts After Demand Adjustment

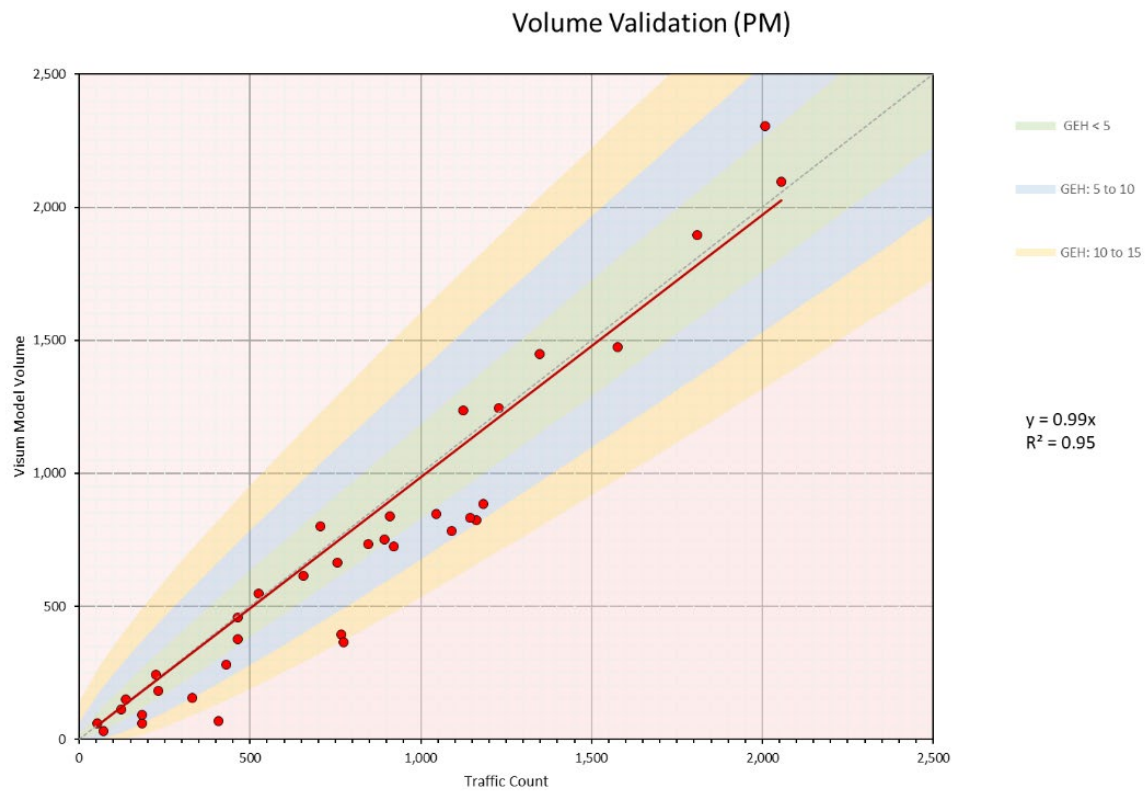


Figure 16: 2025 PM Model Validation Against the Traffic Counts After Demand Adjustment

5.2. TRAVEL TIME

Observed travel times from the City's Corridor Travel Time Study (**Section 3.4**) were used to validate the modelled travel time results. To maintain consistency with the actual links in the model, the segments shown in *Figure 14* were aggregated into seven corridors, as outline below in *Table 17*.

All seven corridors appeared to be non-congested during peak hours. The modelled travel times were generally shorter than the observed travel times but were still within a ≤ 3 minutes range. Considering the data provided by the City is from 2019, travel time was extracted from Google map for the corridors during the AM and PM hours. The difference between the Google Map and model travel times were ≤ 1 minute for all seven corridors. In the model, several links along two corridors—Gaetz Avenue and 67 Street—were either blocked or assigned zero capacity, leading to inaccurate travel times on those segments. However, since the model validated well for the remaining corridors, no further adjustments were made to the travel time validation for Gaetz Avenue and 67 Street.

It should be noted that the City's travel time study reflects conditions recorded on a single day for each segment, meaning results are subject to day-to-day variability.

Table 17: Model vs Observed Travel Time Validation

Corridors	Routes	Observed (Minute)	Google Map (Minutes)	Model (Minute)	Observed Vs Model (Minute)	Google Map Vs Model (Minute)
AM Peak Hour						
19 Street	A to C	5.8	4	4.4	≤ 2	≤ 1
32 Street	I to D	7.5	6	5.6	≤ 2	≤ 1
Ross Street	L to E	7.1	5	4.9	≤ 2	≤ 1
30 Avenue	C to M	9.3	7	7.1	≤ 2	≤ 1
Taylor Drive	A to G	13.7	10	10.5	≤ 3	≤ 1
PM Peak Hour						
19 Street	A to C	6.2	5	4.4	≤ 2	≤ 1
32 Street	I to D	7.9	6	5.6	≤ 2	≤ 1
Ross Street	L to E	6.3	6	4.9	≤ 1	≤ 1
30 Avenue	C to M	9.2	7	7.1	≤ 2	≤ 1
Taylor Drive	A to G	13.5	10	10.7	≤ 3	≤ 1

5.3. BASE YEAR MODEL RESULTS

Figure 17 highlights the resulting modelled link volumes under the AM peak hour, and the corresponding link volume-to-capacity (v/c) ratios are shown in *Figure 18*. The PM peak hour results are provided in *Figure 19* and *Figure 20*. The modelled results indicate the following trends:

100k AM Peak Hour

- As expected, the City's key arterials carry a higher volume of traffic during the AM peak hour. These routes include: 67 Street (Highway 11), Taylor Drive, 49 Street/50 Street, 32 Street, Gaetz Avenue (Highway 2A) and 19 Street.
- Most of the City's collector and local roadways accommodate low to moderate volumes of traffic during the AM peak hour.
- The majority of the City's road network is generally operating under good conditions, with some areas of higher congestion. This includes Highway 2A, north of Highway 11 and a small section of 32 Street.

100k PM Peak Hour

- Similar to the AM peak hour, the City's key arterials carry a higher volume of traffic during the PM peak hour, while most of the City's collector and local roadways accommodate low to moderate volumes of traffic.
- The majority of the City's road network is generally operating under good conditions, with some areas of higher congestion.
- Areas of congestion on the network where the v/c ratios are over 0.75, include:
 - Highway 2A, north of Highway 11
 - Sections of 67 Street
 - Small section of 32 Street

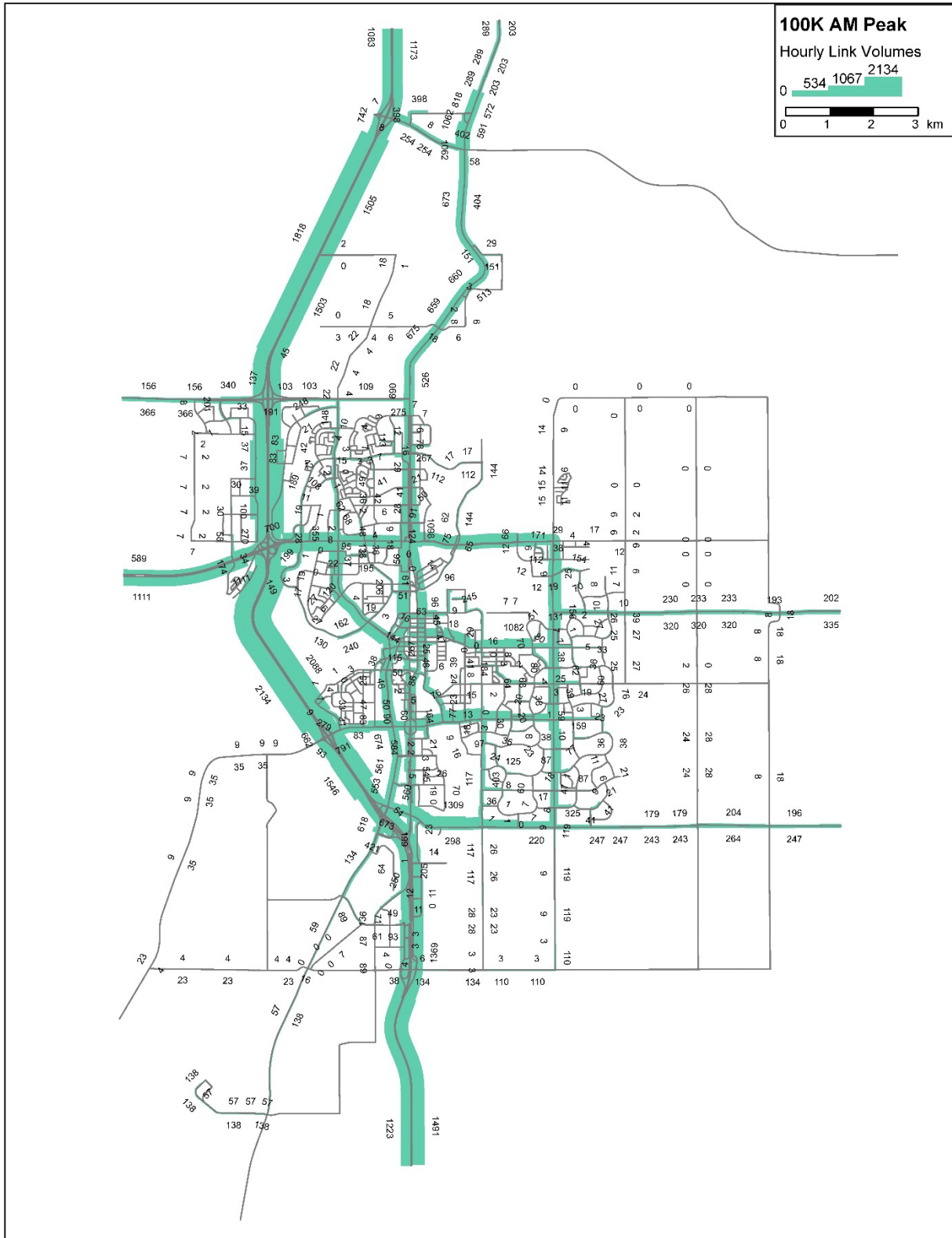


Figure 17: 100K Base Link Volumes – AM Peak Hour



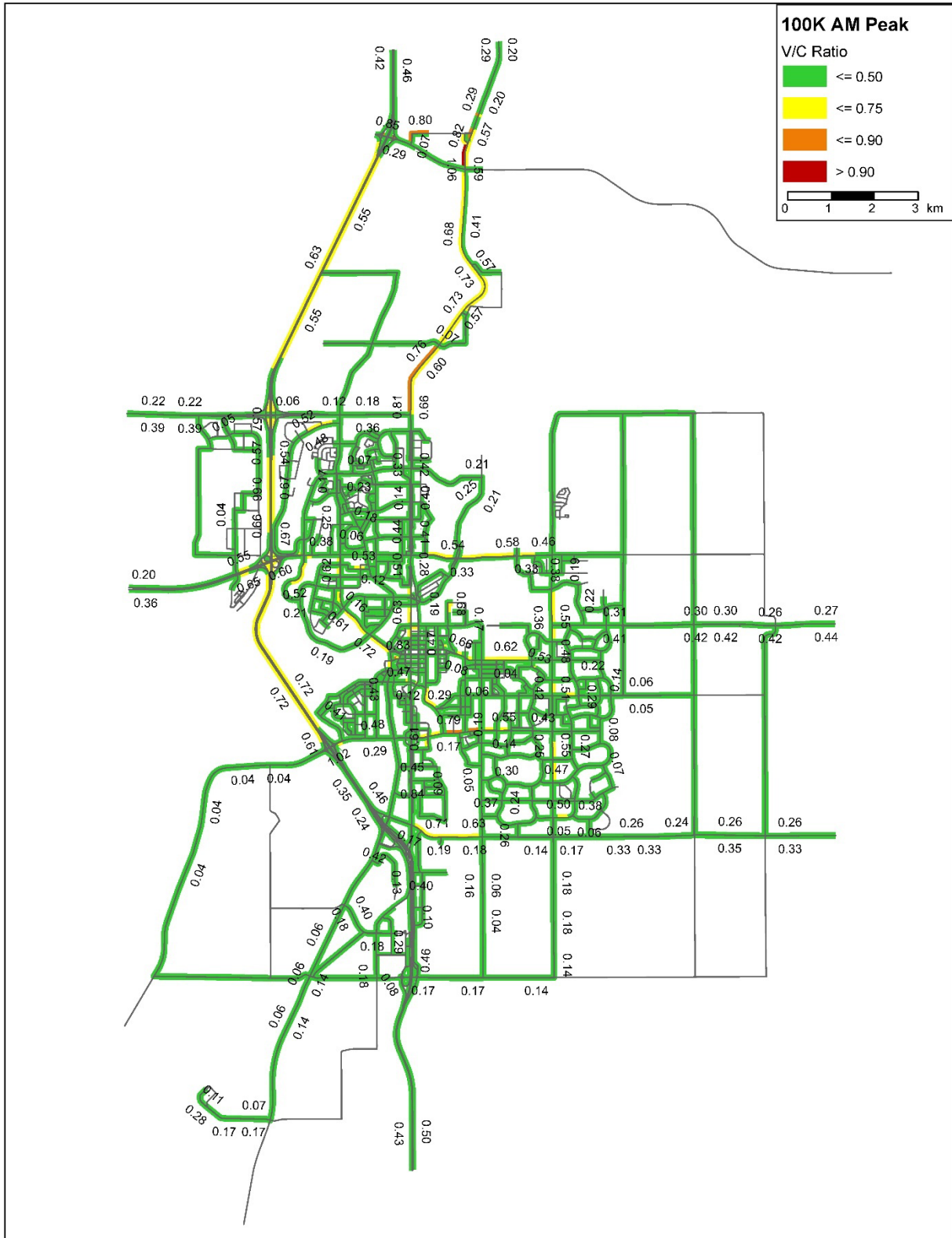


Figure 18: 100K Base V/C Ratios – AM Peak Hour



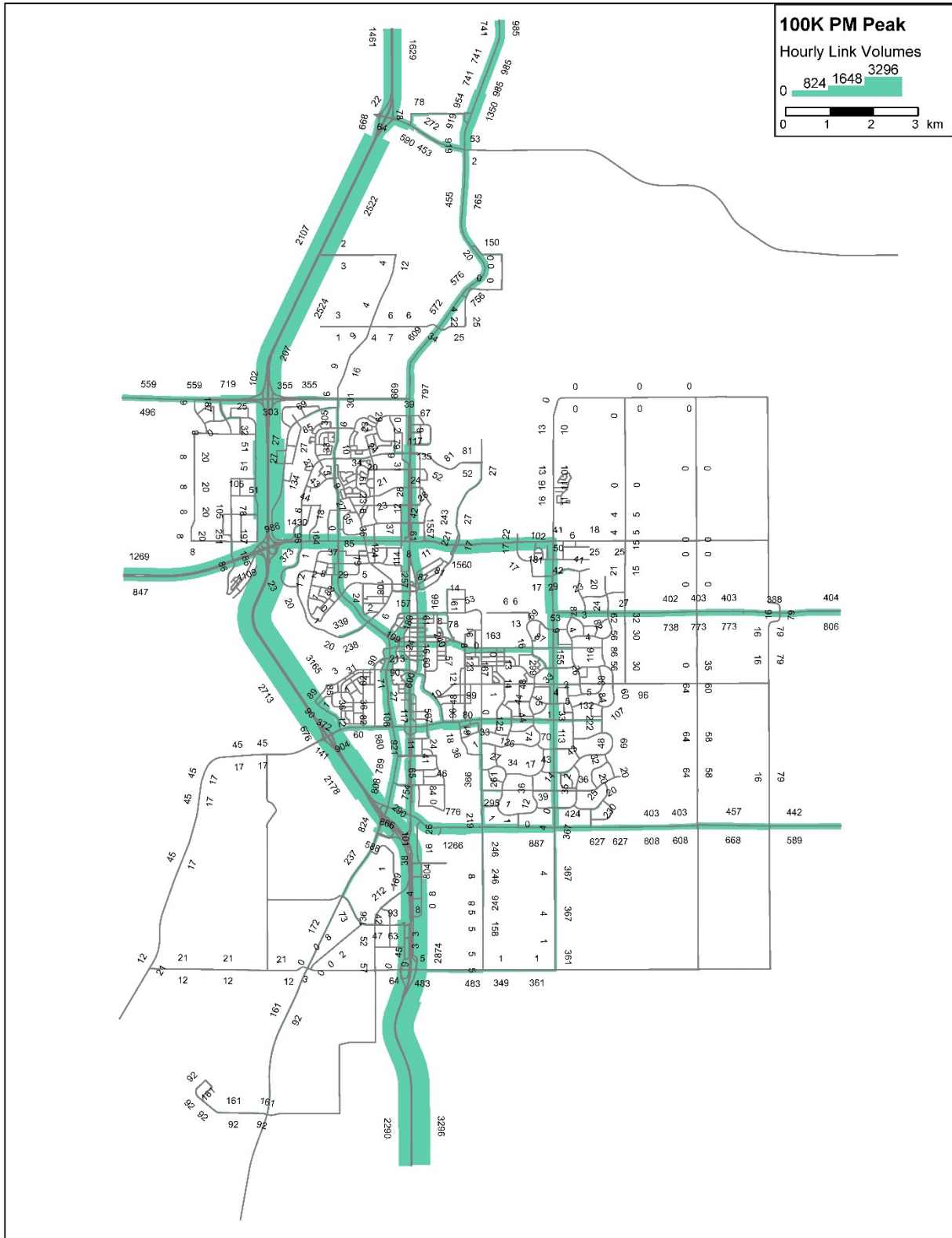


Figure 19: 100K Base Link Volumes – PM Peak Hour



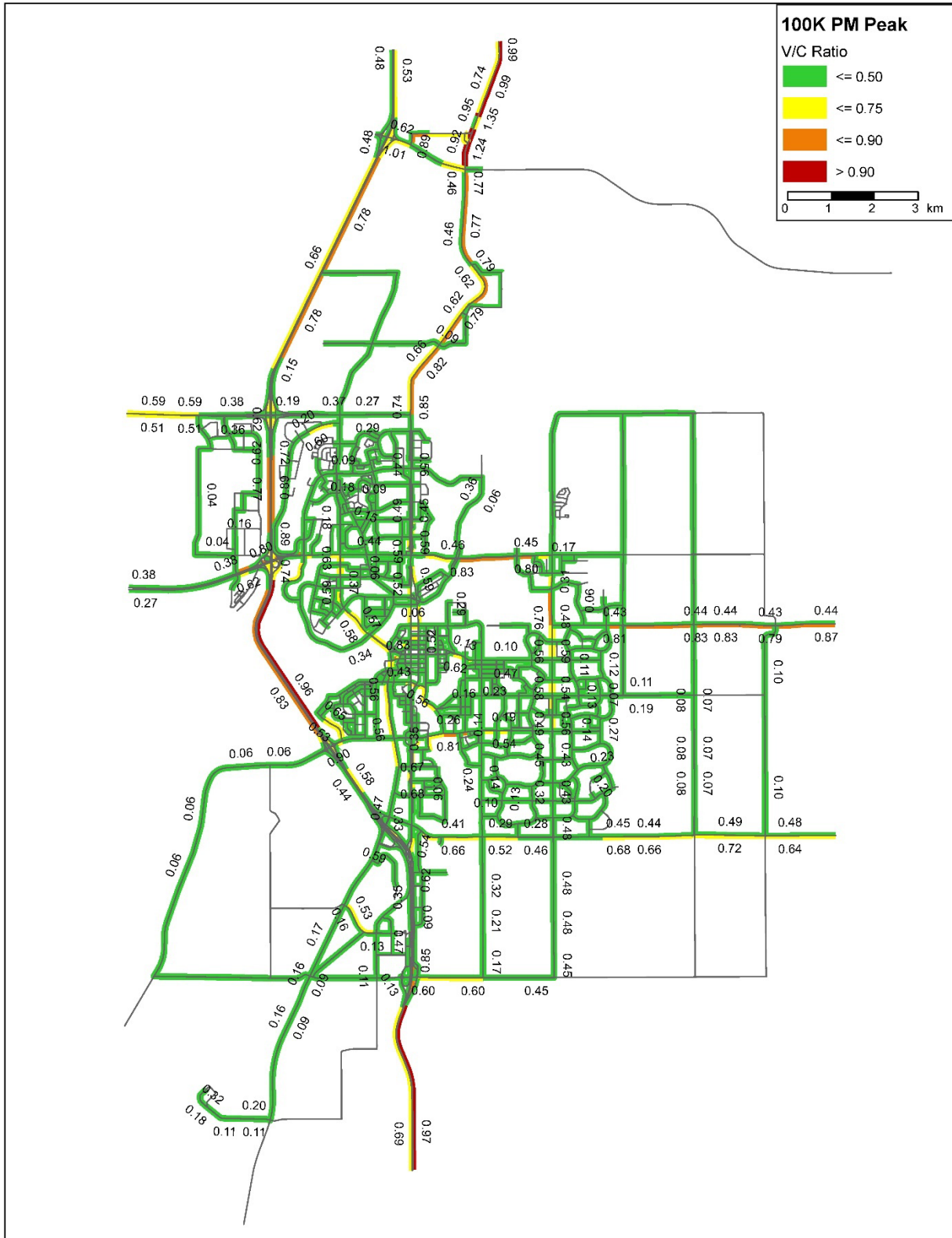


Figure 20: 100K Base V/C Ratios – PM Peak Hour



6. Future Baseline

6.1. FUTURE ANALYSIS SCENARIOS

Building on the previous model's 188K horizon network, two future scenarios were identified by the City, including:

- **188K Base Model** – Reflect AM and PM peak hour conditions with some planned future road network upgrades, and a population horizon of 188,000 people.
- **188K Buildout Model** - Reflect AM and PM peak hour conditions with all planned future road network upgrades, and a population horizon of 188,000 people.

6.2. LAND USE FORECAST

The population and employment forecasts for the 188K horizon were developed through a series of data exchanges and meetings with the City's Planning Department. Building on the inputs from the previous model, forecasts for each traffic zone were reviewed and updated as directed by the City. The land use projections incorporate anticipated future growth in certain neighbourhoods, as well as from the following ARPs and MASPs:

- North of 11A MASP
- East Hill MASP
- West QE2 MASP
- Northwest MASP
- Riverlands ARP

The total population and employment forecasts within the City traffic zones had a total of approximately 182,000 people. To reach the target population of 188,000 people, the remaining 6,000 people were proportionately distributed across age groups within each traffic zone. The previous model also had a category of population that was not assigned an age group, and these inputs were also proportionately distributed across age groups within each traffic zone. Due to limited growth in the surrounding region since 2018, the external and gateway population and employment forecast remained unchanged from the previous model.

6.3. ROADWAY NETWORK

The City has identified a series of road network upgrades to support the anticipated population and employment growth. These improvements align with the City's long-term planning documents, approved MASPs and ASPs, and the Offsite Levy Program, which together guide the timing and funding of major infrastructure investments. **Appendix E** lists the corresponding network upgrades identified in the Offsite Levy Program and incorporated into the model. Key projects include:

- 188K Base Network Horizon – The 188K Base network represents projects planned for implementation within the interim (next 15 years) time frame, as identified in the Offsite Levy Program. It includes a core set of arterial widening projects and new connections, such as:
 - 80 Avenue – Phase 1 (Highway 11A to 77 Street) upgraded to 4 lanes
 - Highway 11A corridor upgrades, including widening from QEII to Taylor Drive and from Taylor Drive to Gaetz Avenue, plus a new roundabout at Taylor Drive, a Gaetz Avenue roundabout
 - Taylor Drive improvements south of Highway 11A, widened to a 4-lane divided arterial as far as Hazlett Access and extended northward to connect with Township Road 391.
 - CP Rail overpass (Hwy 11A between Taylor Drive and Gaetz Avenue)
 - 67 Street (Threfall Gate to 20 Avenue) widened from 2 lanes to 4 lanes
 - Widening on 75 Avenue and 77 Street
 - Northland Drive (Gaetz Avenue to 49 Avenue) as a 4-lane arterial
 - Township Road 391 (Taylor Drive to Highway 2A) widened to 4 lanes
- 188K Buildout Network Horizon – The 188K Buildout network builds on the 188K Base by incorporating all remaining Offsite Levy Program projects, along with additional corridor widenings, new connections, and interchanges. Key upgrades include:
 - Completion of 80 Avenue Phase 2 and Ross Street widening (20 Avenue to 10 Avenue),
 - Extension and/or widening of 19 Street, 22 Street, 30 Avenue and 32 Street
 - Expansion of the North Highway Connector, including the extension of Northland Drive, and a new bridge crossing, as well as the extension of 20 Avenue
 - Additional Highway 11A improvements, including and a full interchange at Gaetz Avenue.
 - Taylor Drive extensions north of the Hazlett Access, including new links to Township Road 391
 - New interchanges including Highway 2A & Township Road 391 interchange, 32 Street / 20 Avenue interchange, 19 Street / 20 Avenue interchange and Taylor Drive / Hwy 11A interchange

In addition to City-led projects, TEC's planned upgrades within the Red Deer area were included in the updated model to ensure that baseline conditions accurately represent future horizons. These planned improvements, unchanged from the previous model, support regional traffic growth and mitigate potential capacity constraints. Major provincial projects include:

- Realignment of Highway 11 east of 30 Avenue (4 lanes, new)
- Widening of Highway 2 (8 lanes, existing)
- Freeway upgrades to Highway 11 west of Highway 2, and
- Twinning of Highway 2A south of Highway 2 (4 lanes, existing).

Figure 21 through to *Figure 24* illustrates the future road classifications and number of lanes. *Figure 25* highlights the future network upgrades relative to the existing base network.

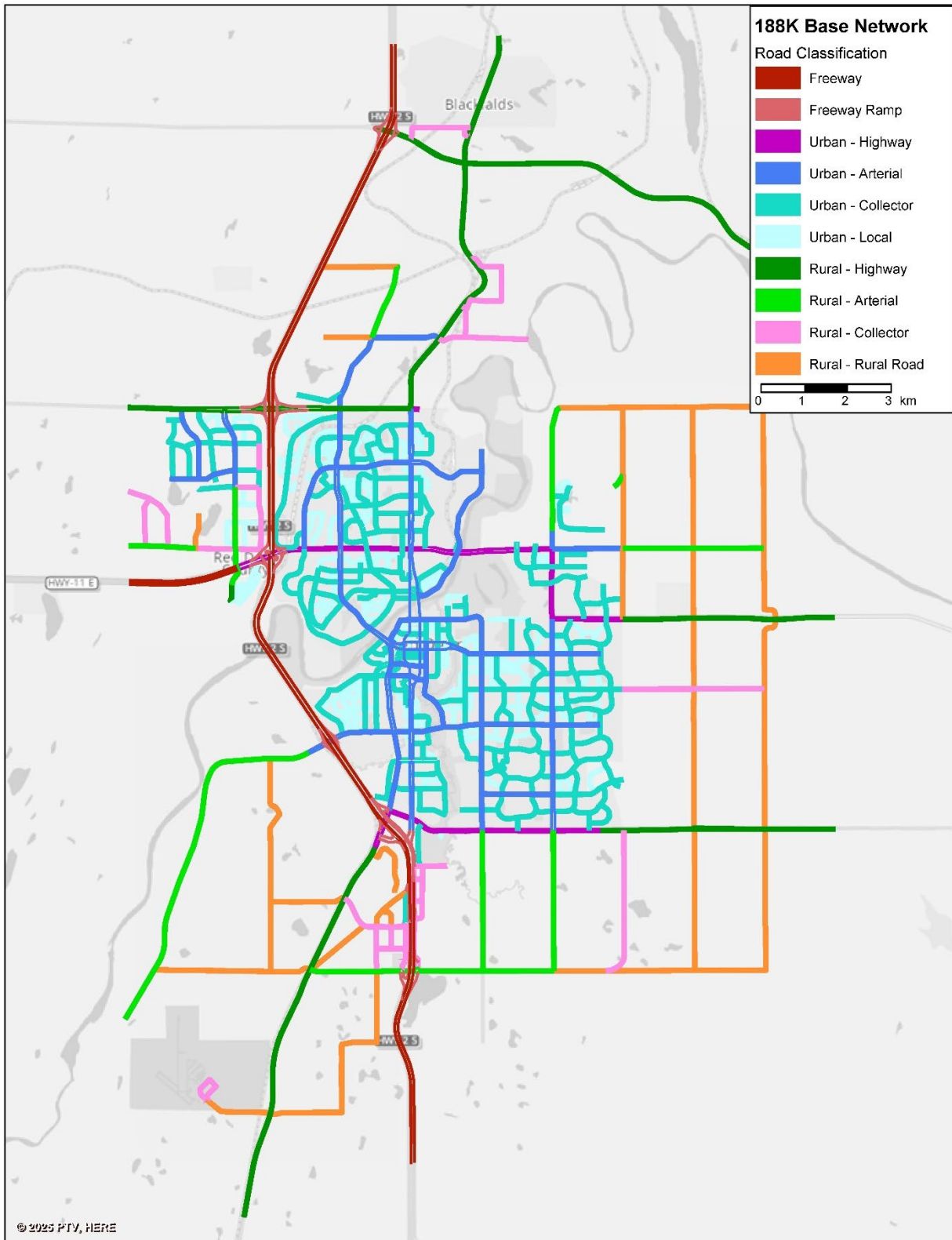


Figure 21: 188K Base Network Road Classification



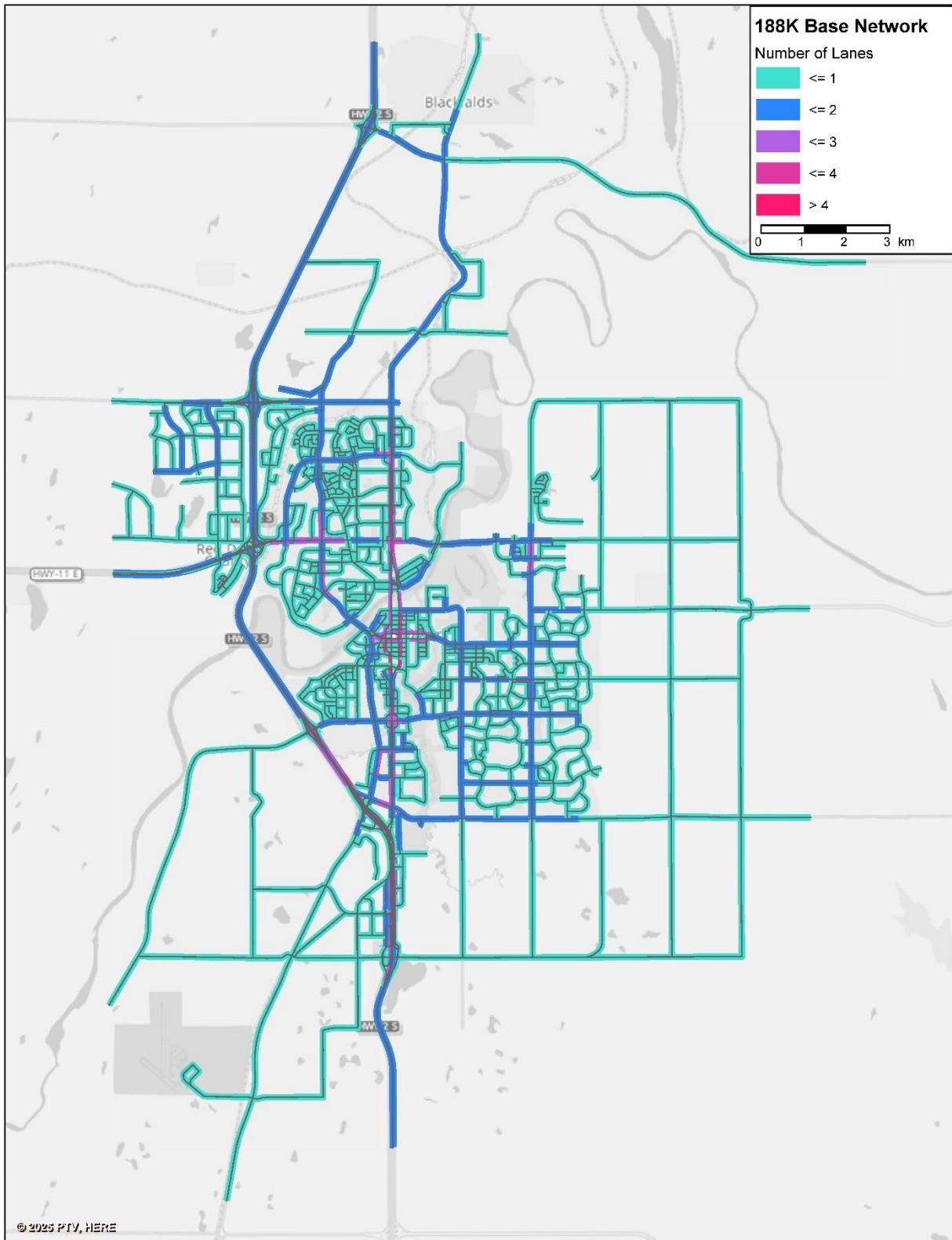


Figure 22: 188K Base Network Number of Lanes



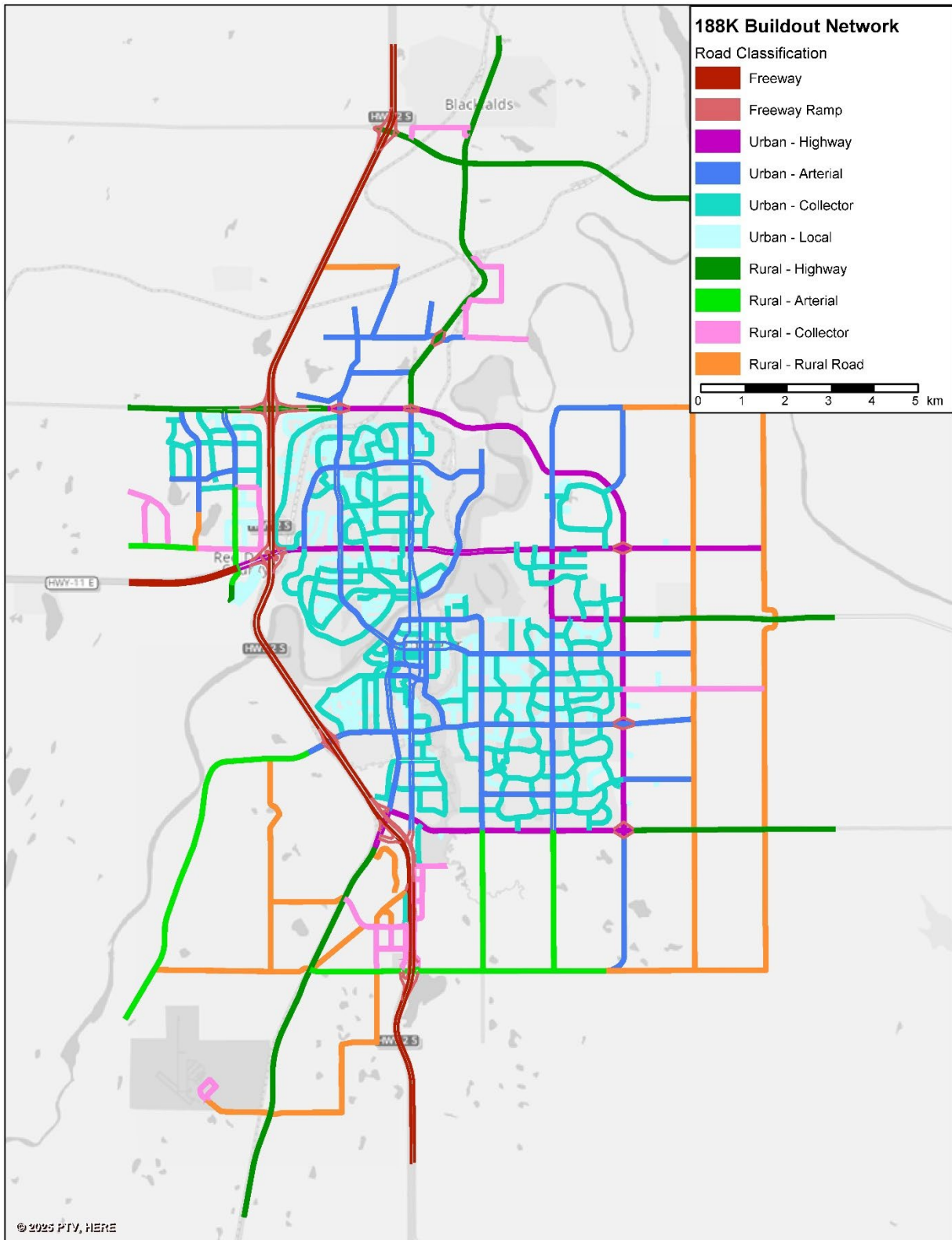


Figure 23: 188K Full Buildout Network Road Classification



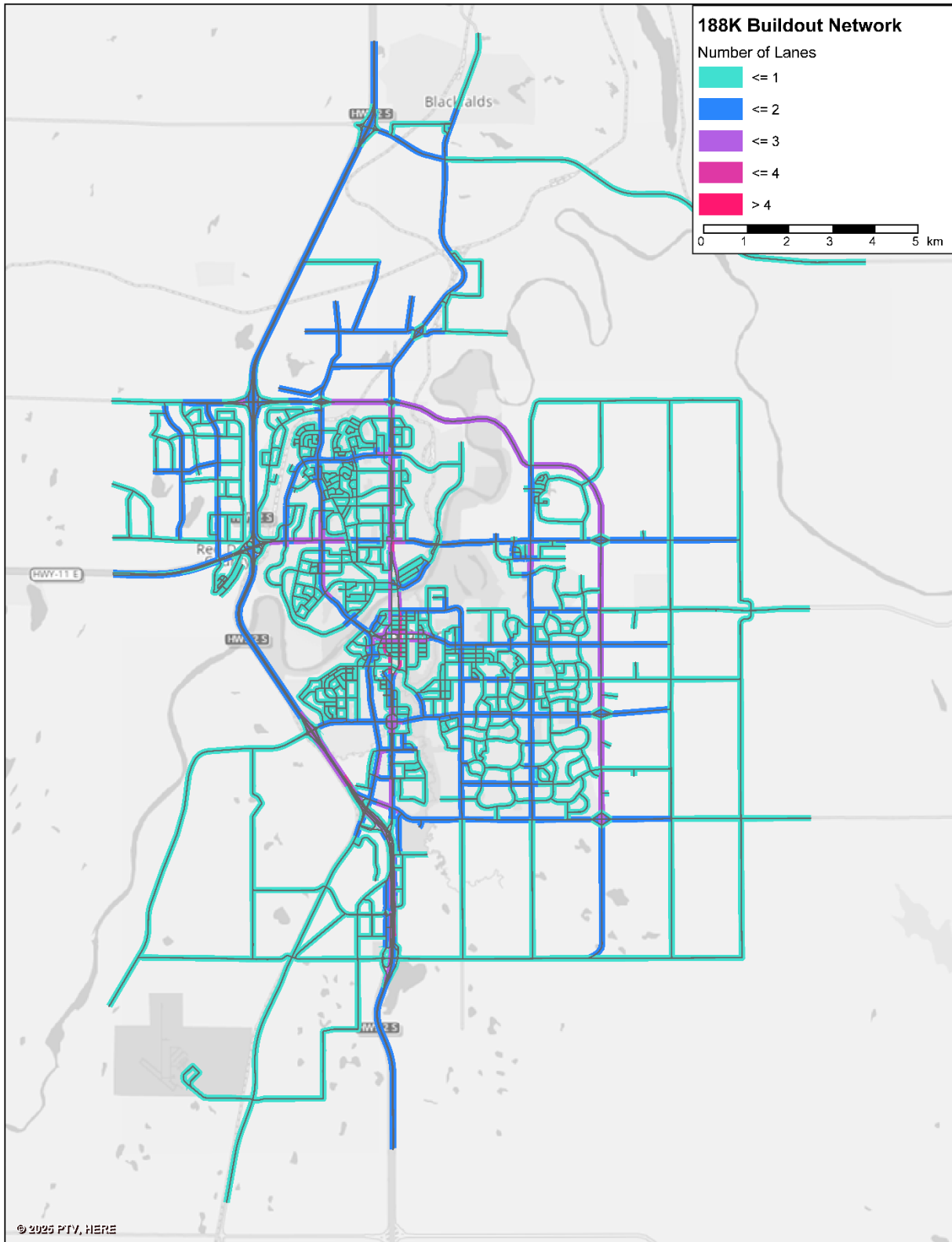


Figure 24: 188K Full Buildout Network Number of Lanes



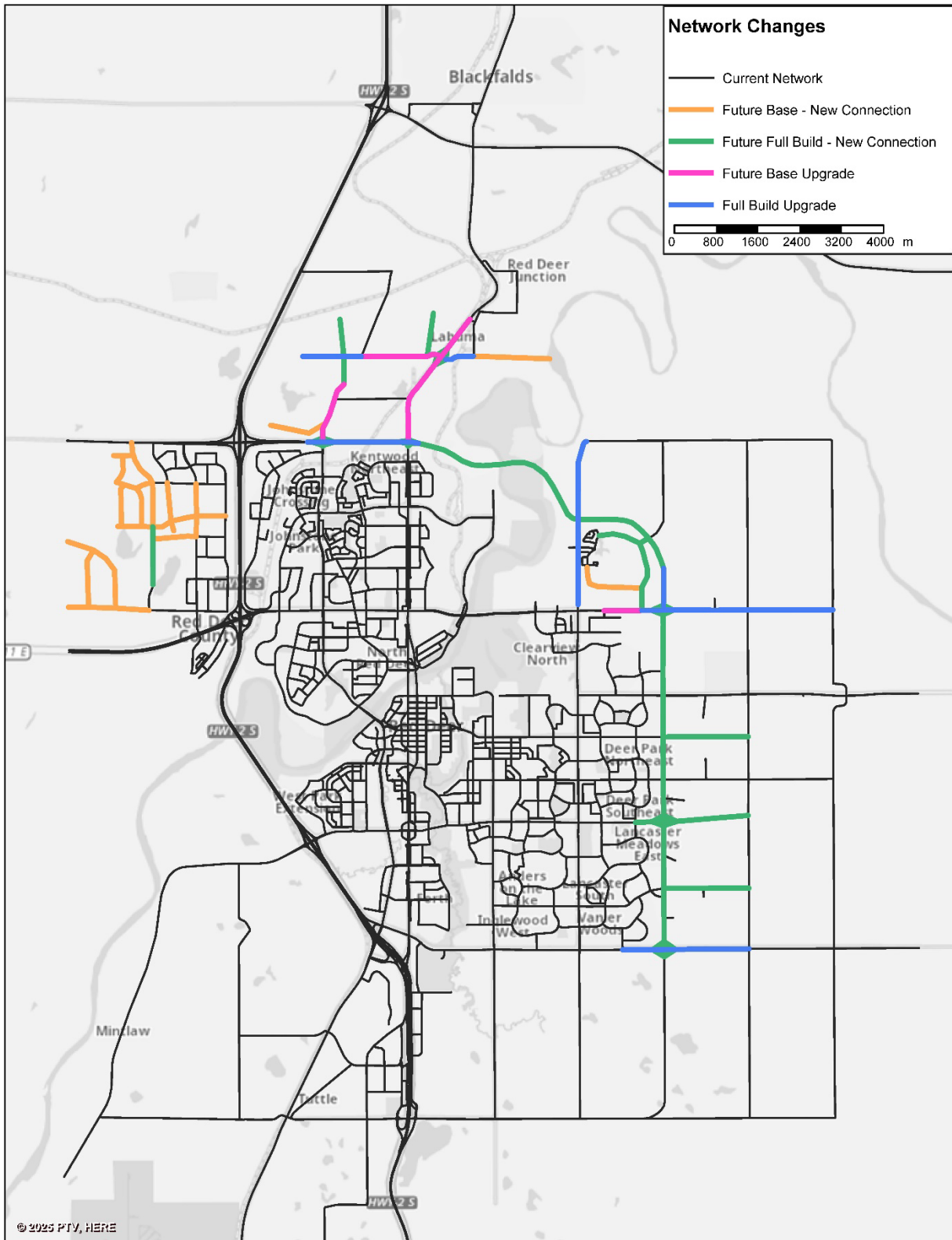


Figure 25: Future Network Changes from Existing Base Network



6.4. FUTURE PROJECTIONS ANALYSIS

The future traffic assignment reflects projected travel patterns by applying the 188K horizon demographic data, specifically, population, employment, and land use forecasts, to generate future trip demand. The future scenarios maintain the existing AM and PM peak hour trip generation and distribution structure as the Existing Base, ensuring continuity in trip-making behavior while scaling trip volumes in line with anticipated growth. This approach preserves the spatial distribution of origins and destinations while incorporating increased trip totals resulting from planned development. Additionally, the future scenarios account for expected increases in gateway volumes and truck demand, reflecting growth in regional and through-traffic. This ensures that the assignment captures both localized urban growth and broader regional growth.

6.4.1. 188K Base Network

The results of the 188K Base Network assignment indicate emerging capacity constraints along key corridors as travel demand increases with projected growth. The results also highlight increased congestion near anticipated growth areas, particularly in the northeastern parts of the city. Volume-to-capacity (V/C) ratios exceed acceptable thresholds (0.75 or higher) in several locations during peak periods, particularly along the following locations:

- Highway 2A, north of Highway 11A
- 67 Street between 20 Avenue and Pameley Avenue
- Sections of 20 Avenue and 30 Avenue, north of 67 Street
- Sections of 30 Avenue, south of 55 Street
- Sections of 55 Street, east of Thomilson Avenue
- 50 Street, east of 45 Avenue
- Sections of 19 Street, Taylor Drive, 49 Avenue and 50 Avenue
- 32 Street between 50 Avenue and 40 Avenue
- Spruce Drive between 37 Street and 43 Street
- 39 Street between 20 Avenue and 30 Avenue

The AM and PM peak hour results of the 188K Base horizon are highlighted in [Figure 26](#) through to [Figure 31](#).



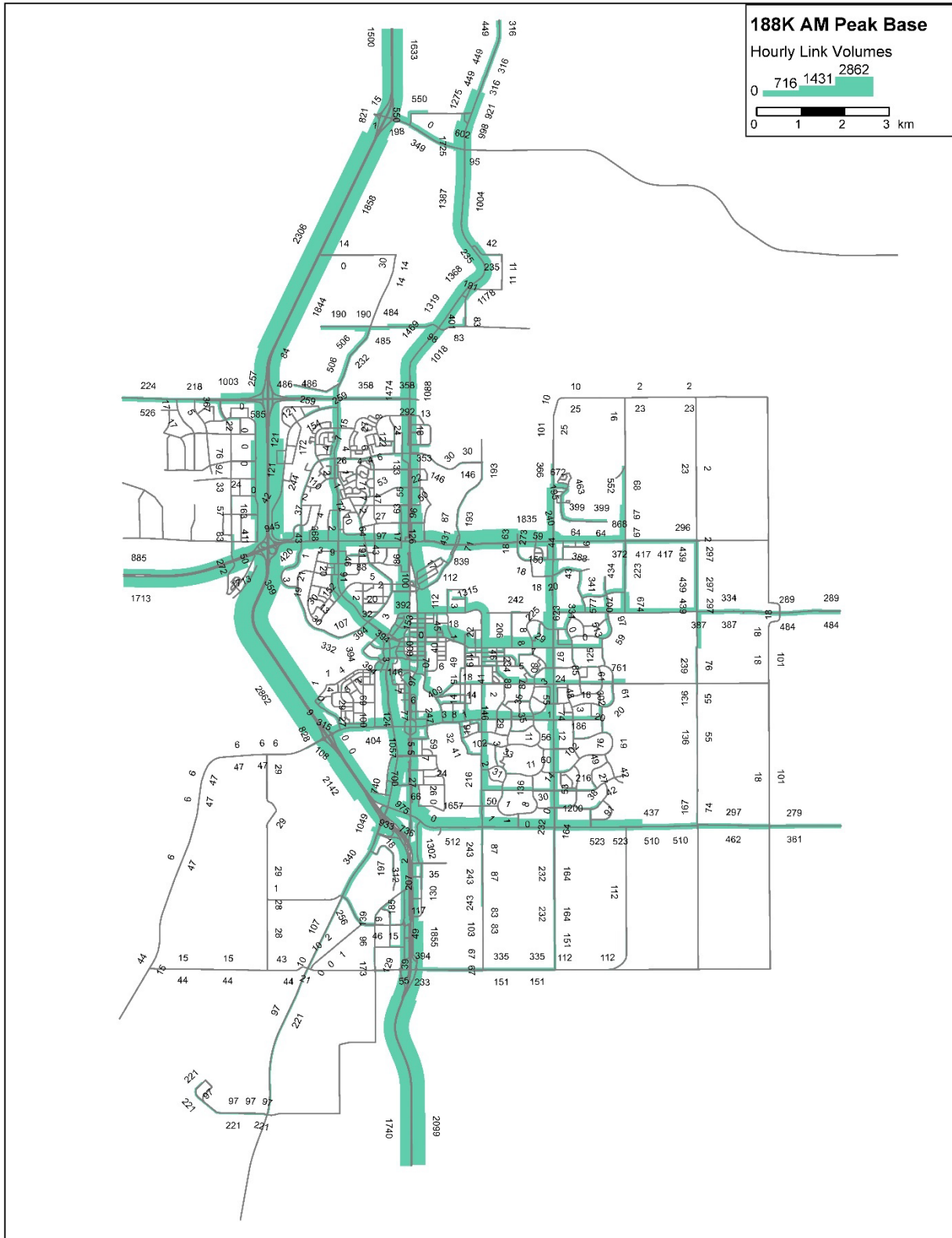


Figure 27: 188K Base Link Volumes – AM Peak Hour



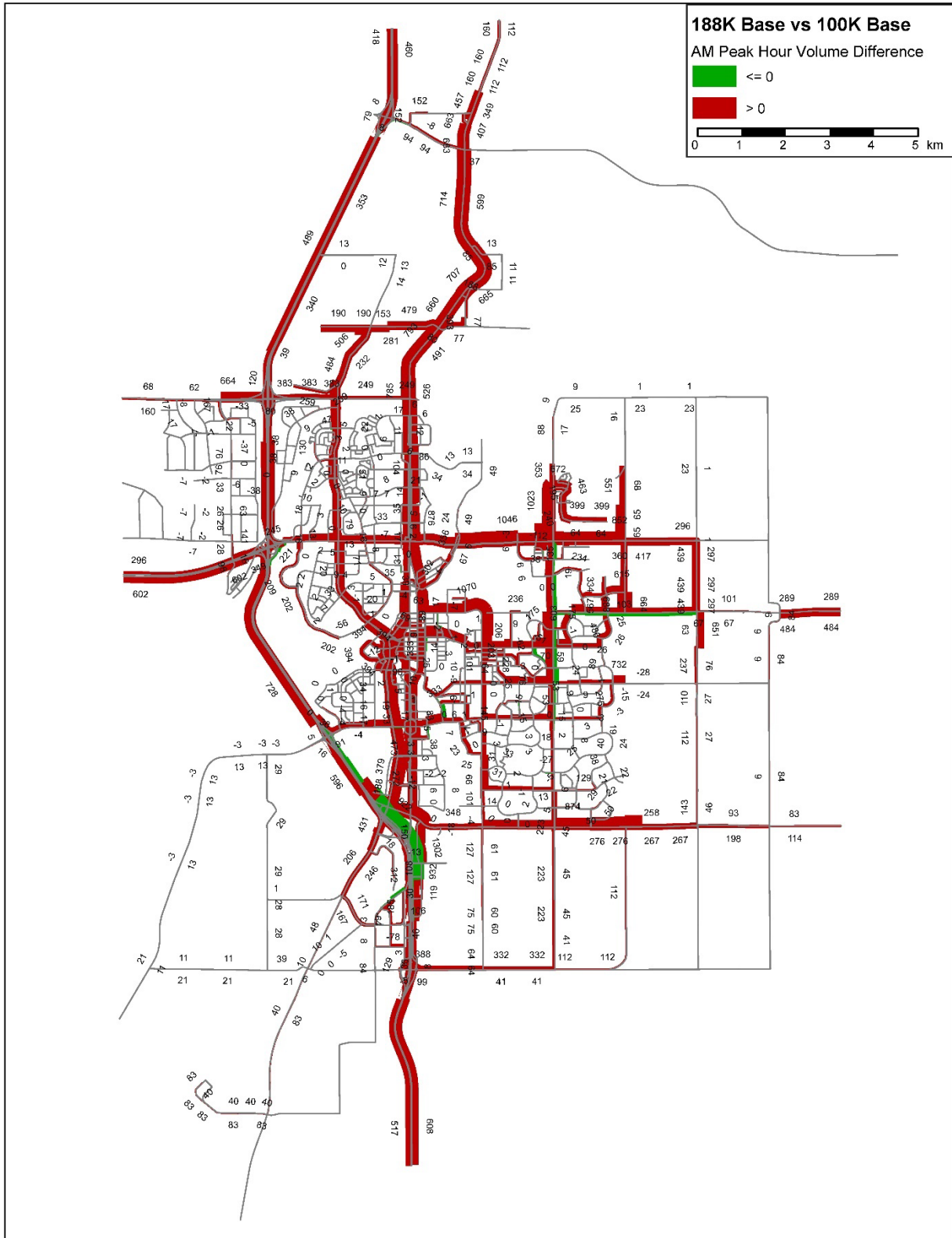


Figure 28: AM Peak Hour Link Volume Differences – 188K Base vs 100K Base



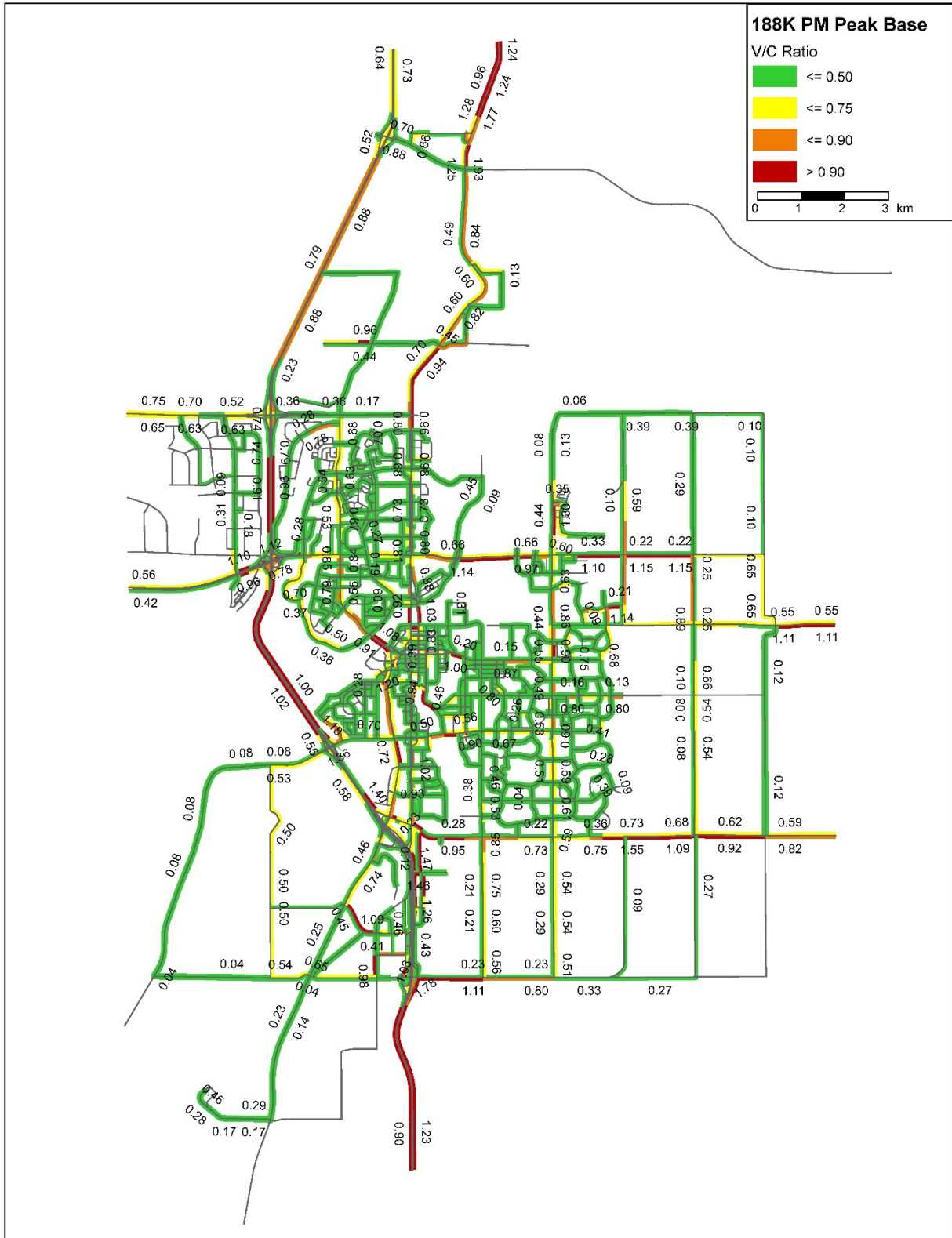


Figure 29: 188K Base V/C Ratios – PM Peak Hour



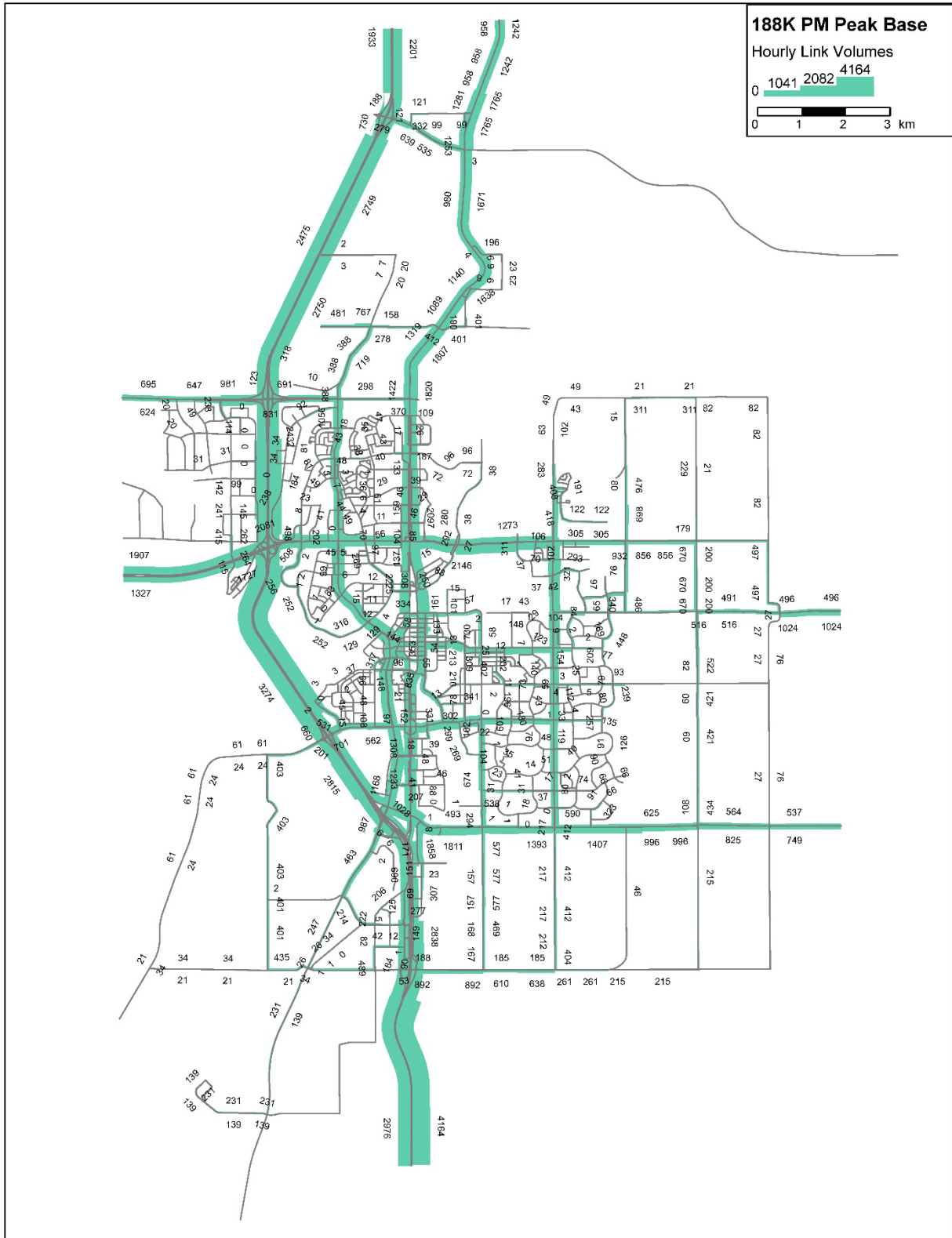


Figure 30: 188K Base Link Volumes – PM Peak Hour



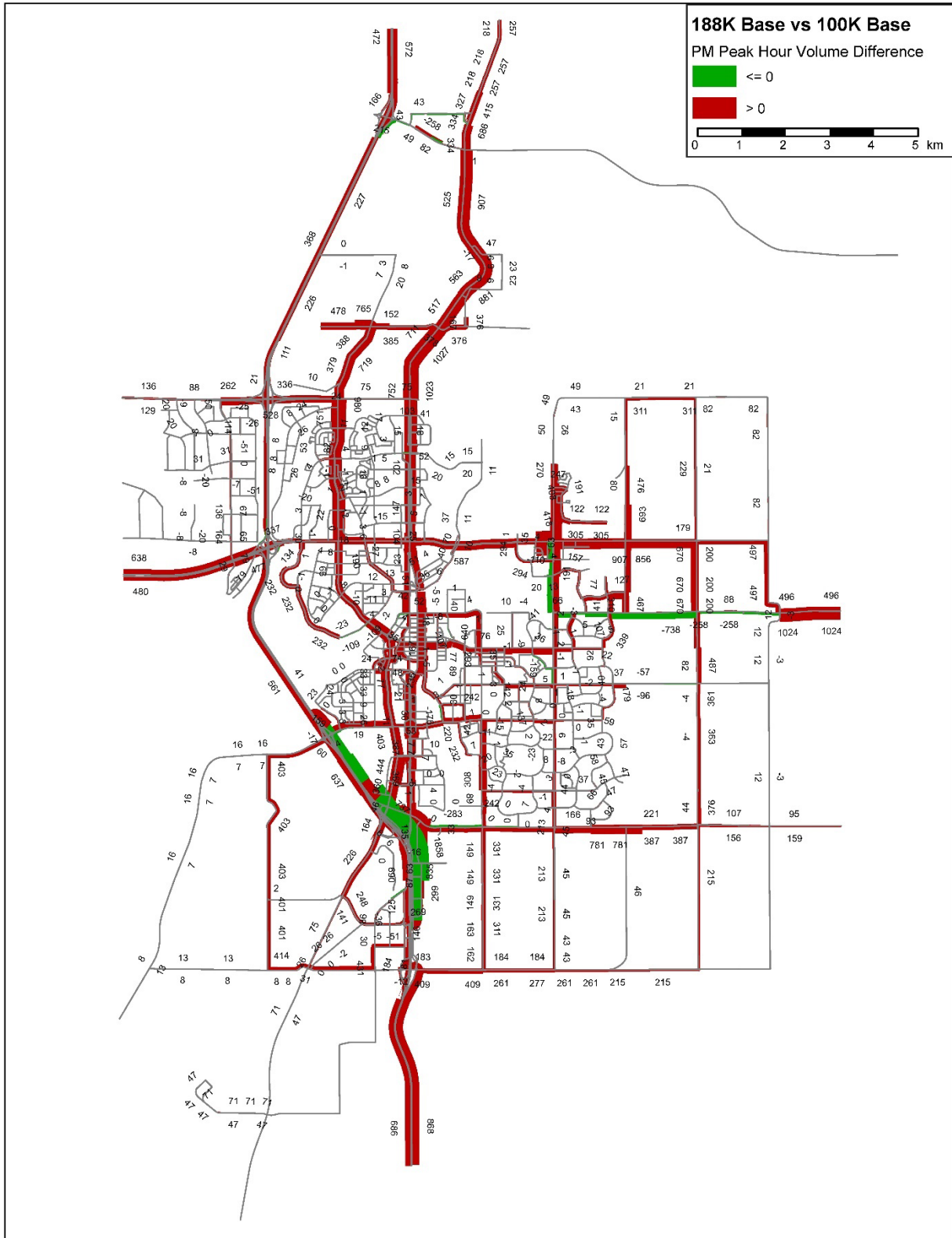


Figure 31: PM Peak Hour Link Volume Differences – 188K Base vs 100K Base



6.4.2. 188K Full Buildout

The results of the 188K Full Buildout Network assignment indicate minimal capacity constraints across the network. The additional network connections generally serve to reduce congestion on the network, especially on 20 Avenue and 30 Avenue. Several corridors continue to experience capacity constraints, including 50 Avenue, 50 Street, Taylor Drive, 32 Street, and 67 Street.

The AM and PM peak hour results of the 188K Buildout horizon are highlighted in [Figure 32](#) through to [Figure 37](#).

[Figure 38](#) and [Figure 39](#) compares the 188K Buildout and 188K Base AM and PM peak hour link volumes, respectively. The comparison highlights the following:

- The future connection of Northlands Drive is expected to reduce traffic along 30 Avenue and 67 Street, while the extension of 20 Avenue from 67 Street to 19 Street is also expected to reduce traffic on 30 Avenue.
- The eastern extension of 50 Street to the City's eastern limits is expected to draw traffic away from 67 Street.
- Some traffic increase is anticipated along the 32 Street corridor, primarily due to the new interchange at 32 Street and 20 Avenue.

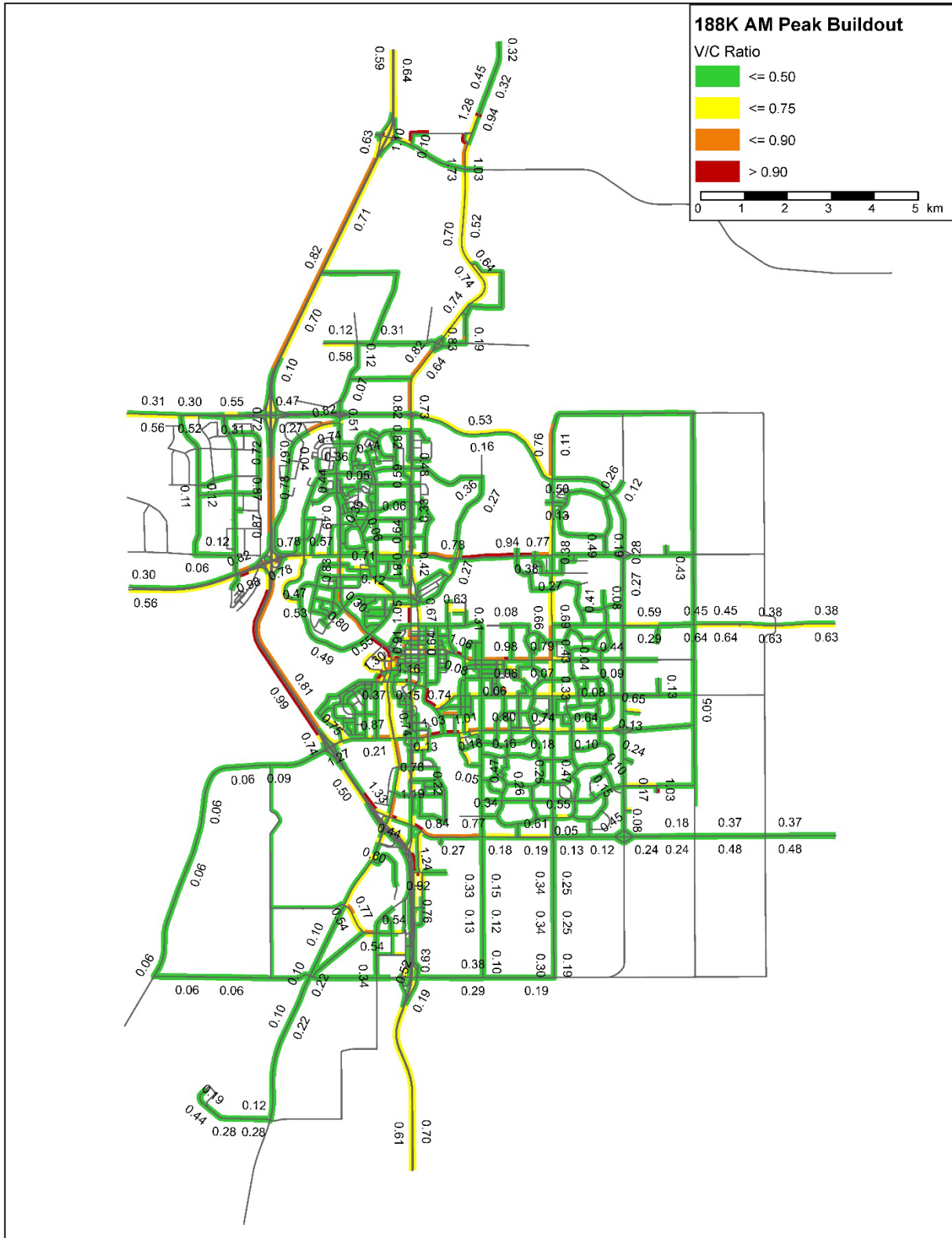


Figure 32: 188K Buildout V/C Ratios – AM Peak Hour



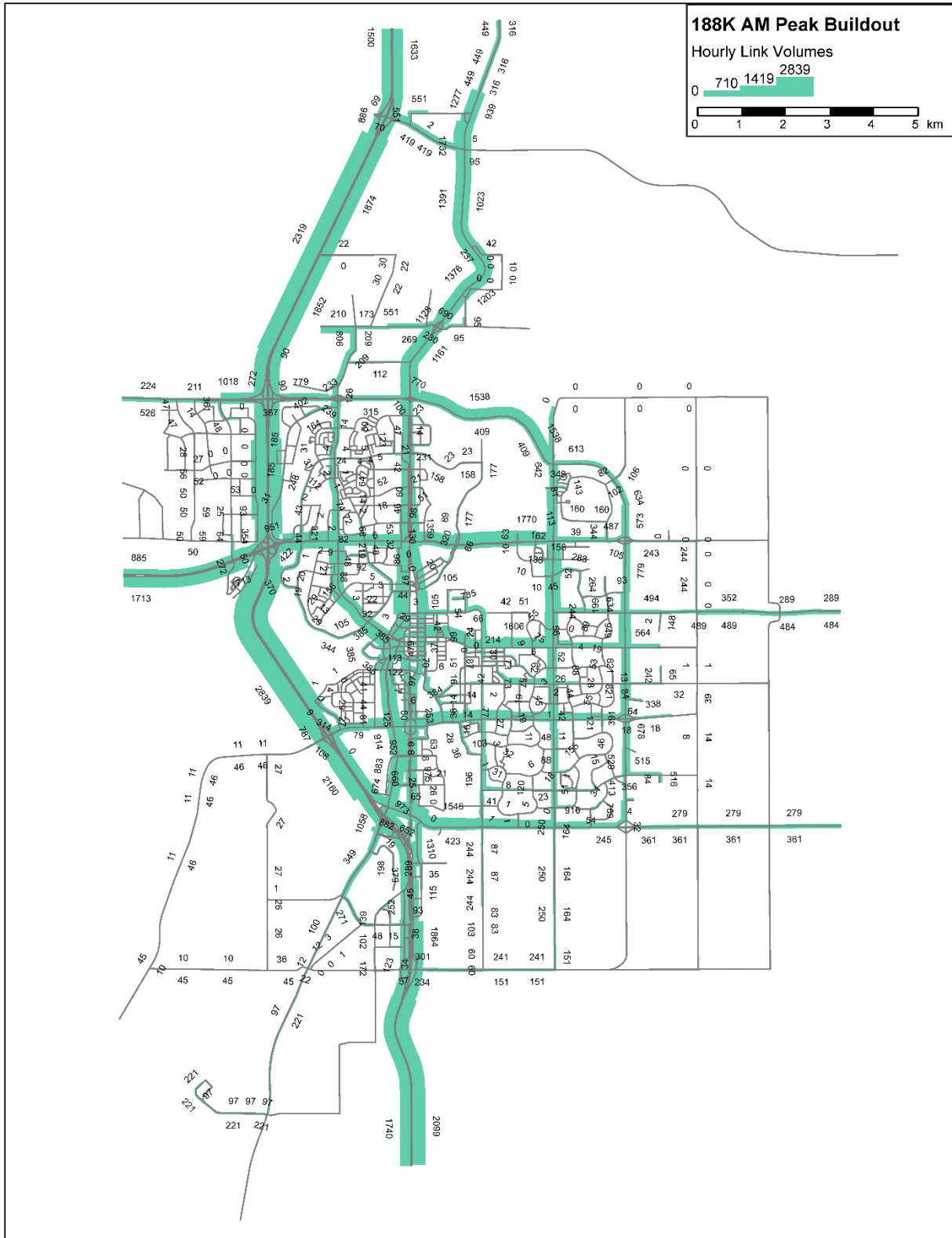


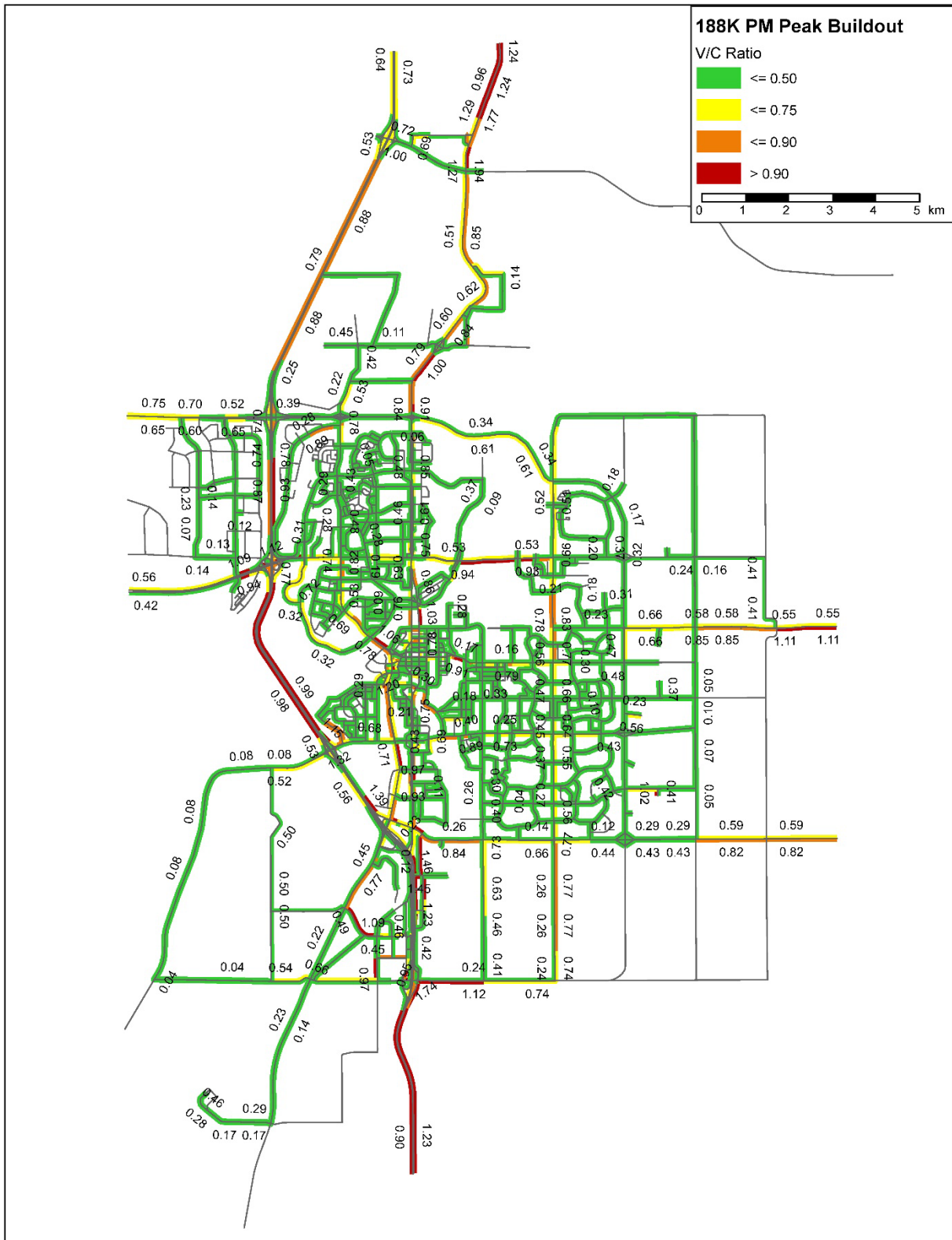
Figure 33: 188K Buildout Link Volumes – AM Peak Hour





Figure 34: AM Peak Hour Link Volume Differences – 188K Buildout vs 100K Base





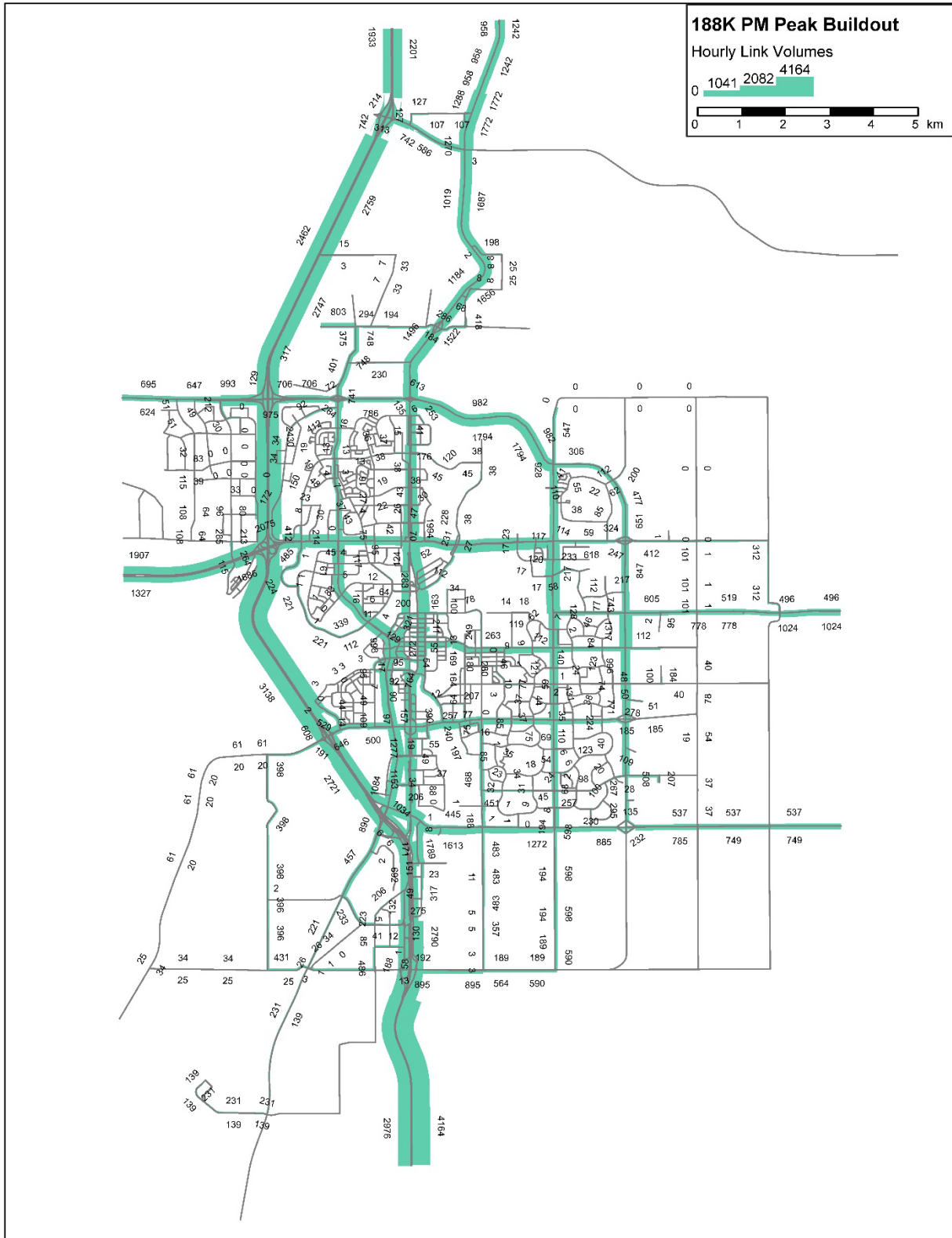


Figure 36: 188K Buildout Link Volumes – PM Peak Hour



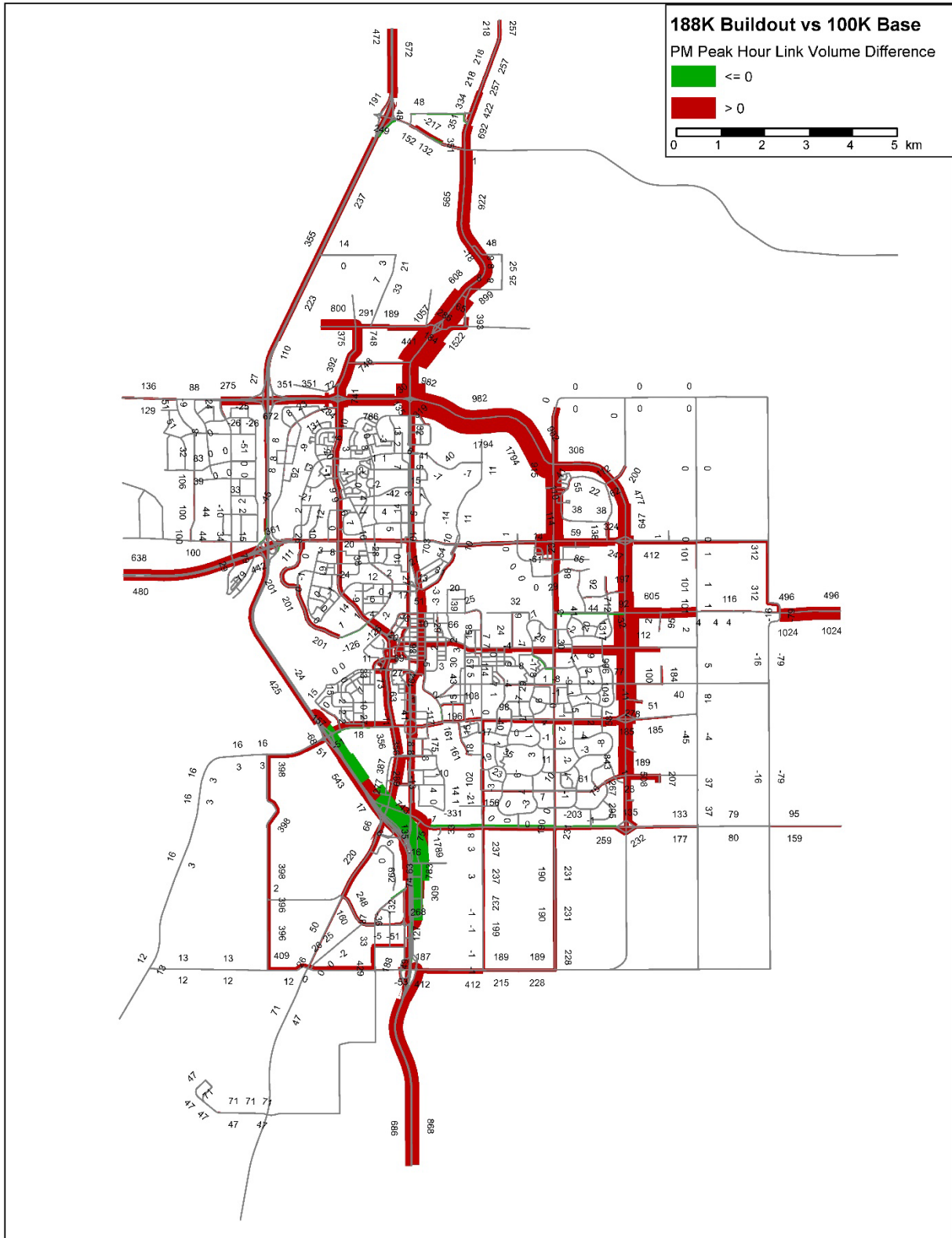


Figure 37: PM Peak Hour Link Volume Differences – 188K Buildout vs 100K Base



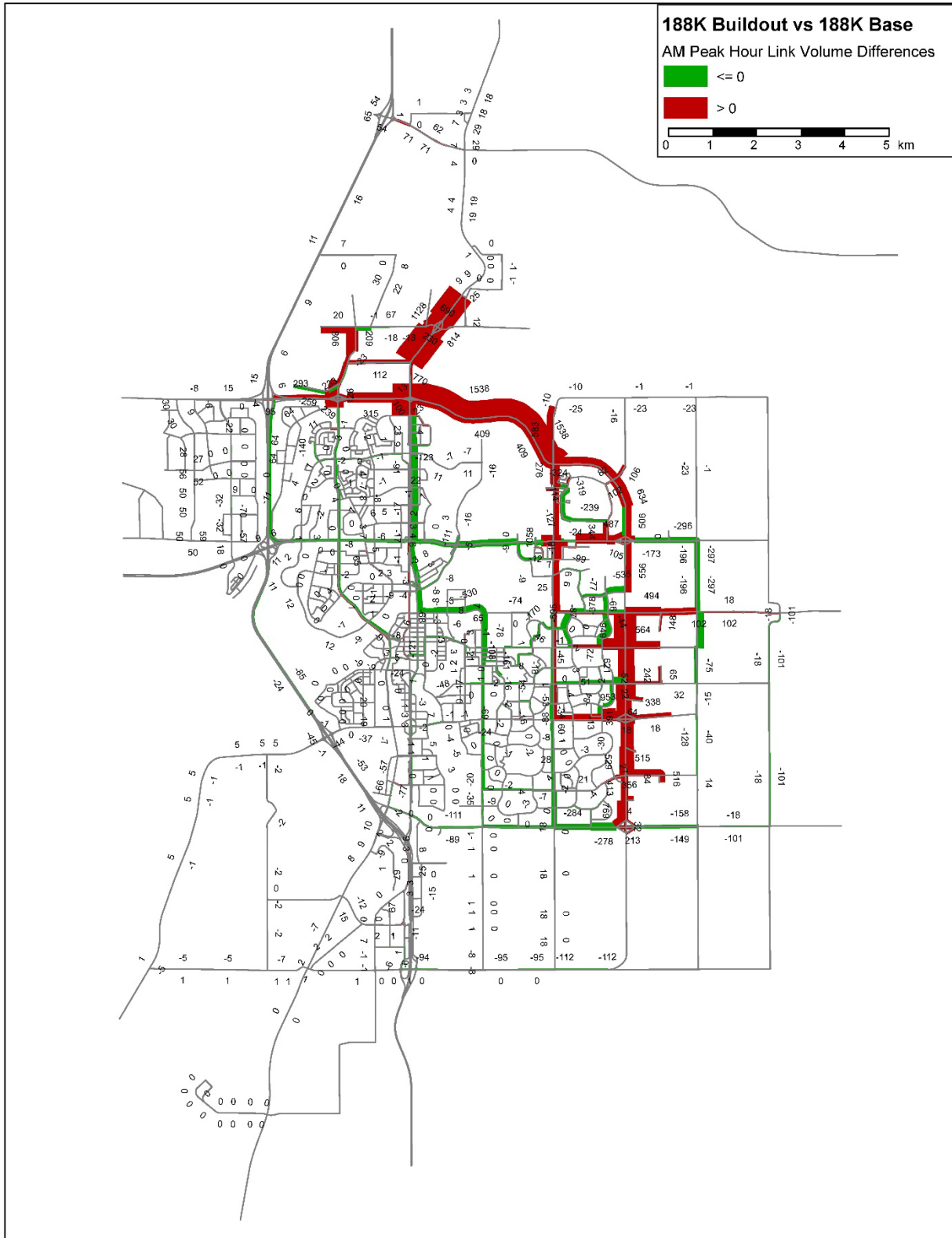


Figure 38: AM Peak Hour Link Volume Differences – 188K Buildout vs 188K Base



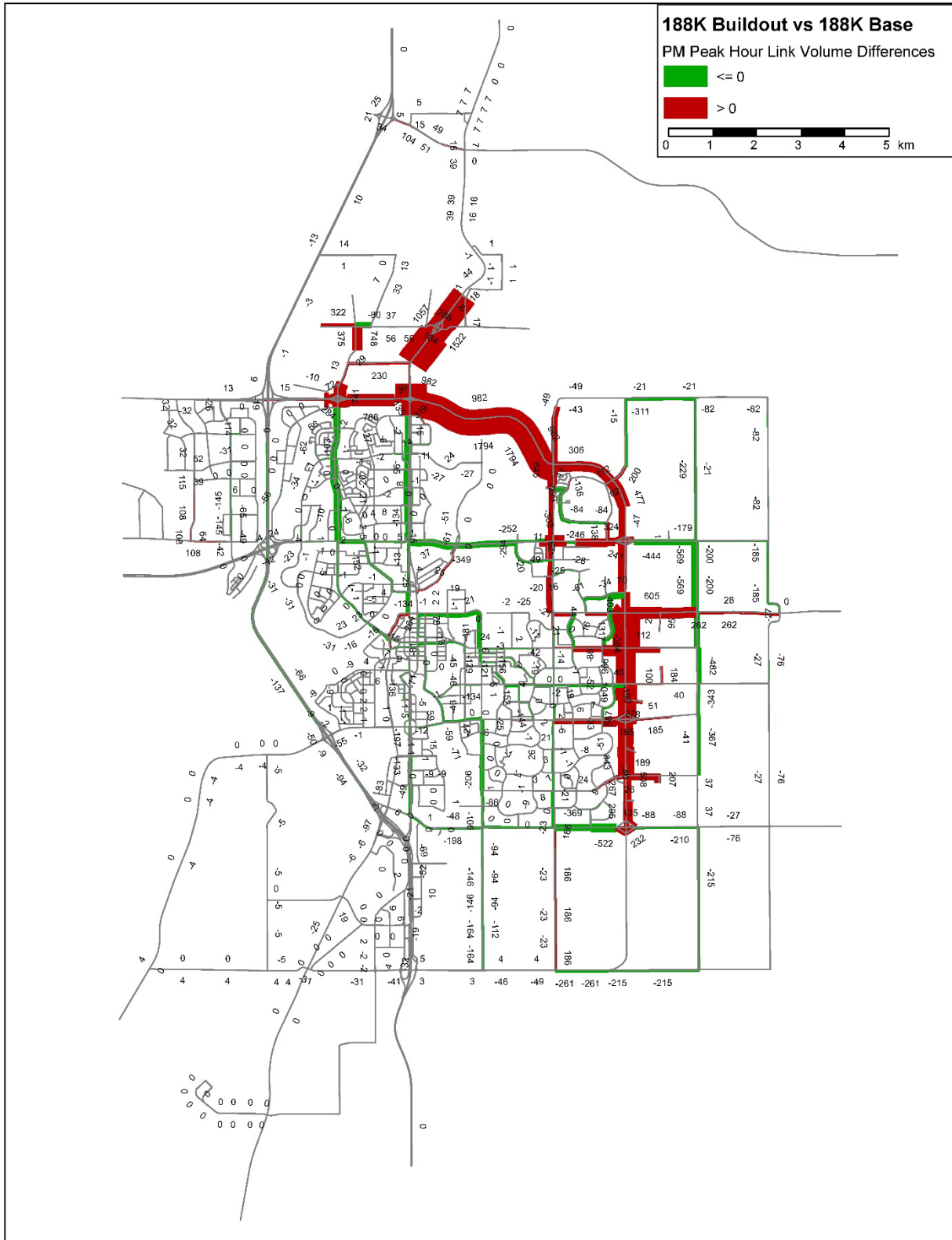


Figure 39: PM Peak Hour Link Volume Differences – 188K Buildout vs 188K Base



APPENDIX A

MODEL DATA DICTIONARY

A.1 MODEL DATA DICTIONARY – ZONE

Attribute	Description	Formula (if applicable)
Number	TAZ number	
AM_ATTR	Vehicle AM peak attractions for model area	
AM_PROD	Vehicle AM peak production for model area	
AREA	Location of zone: Internal (City of Red Deer Census Area) or External	
AM_ATTR_GATE	Vehicle AM peak attractions from gateway trips	[MATCOLSUM(2045)]
AM_PROD_GATE	Vehicle AM peak productions from gateway trips	[MATROWSUM(2045)]
AM_A_HBO_OFFICE	HBO AM Trip Attraction Rate for Office Employment	
AM_A_HBO_RETAIL	HBO AM Trip Attraction Rate for Retail Employment	
AM_A_HBO_SPECIAL_TRIPGEN	HBO AM Vehicle Trips Generated from Non-Employee-Based Sources	
AM_A_HBO_VEH_OCCUP	HBO AM Trip Attractions Vehicle Occupancy	
AM_A_HBS_STUDENT	HBS AM Trip Attraction Rate for Students	
AM_A_HBS_VEH_OCCUP	HBS AM Trip Attractions Vehicle Occupancy	
AM_A_HBW_INDUSTRIAL	HBW AM Trip Attraction Rate for Industrial Employment	
AM_A_HBW_INSTIT	HBW AM Trip Attraction Rate for Institutional Employment	
AM_A_HBW_OFFICE	HBW AM Trip Attraction Rate for Office Employment	
AM_A_HBW_OTHER	HBW AM Trip Attraction Rate for Unknown Employment	
AM_A_HBW_RETAIL	HBW AM Trip Attraction Rate for Retail Employment	
AM_A_HBW_SCHOOL	HBW AM Trip Attraction Rate for School Employment	
AM_A_HBW_VEH_OCCUP	HBW AM Trip Attractions Vehicle Occupancy	
AM_A_NHB	HBW AM Trip Attraction Rate for Non-Home-Based Trips	
AM_A_NHB_TRIPDIST	Distribution Percentage to Attraction TAZs from NHB Trip Total	[A_NHB_FORNHBTRIPDIST_A]/ [NETWORK\SUM:ZONES\A_NHB_FORNHBTRI PDIST_A]
AM_A_NHB_VEH_OCCUP	AM Vehicle Occupancy for NHB Trip Attractions	

Attribute	Description	Formula (if applicable)
EMPLOYMENT	Total Estimated Employees 2016	[EMP_OFFICE]+[EMP_RETAIL]+[EMP_INDUSTRIAL]+[EMP_INSTIT]+[EMP_SCHOOL]+[EMP_OTHER]
EMP_INDUSTRIAL	Number of Employees in Industrial Employment Category	
EMP_INSTIT	Number of Employees in Institutional Employment Category	
EMP_OFFICE	Number of Employees in Office Employment Category	
EMP_OTHER	Number of Employees in Other Employment Category	
EMP_RETAIL	Number of Employees in Retail Employment Category	
EMP_SCHOOL	Number of Employees in School Employment Category	
POPULATION	Total Population 2016	[POP_0-14]+[POP_15-24]+[POP_25-34]+[POP_35-44]+[POP_45-64]+[POP_65]+[POP_NOAGE]
POP_0-14	Zone Population for Age 0-14	
POP_15-24	Zone Population for Age 15-24	
POP_25-34	Zone Population for Age 25-34	
POP_35-44	Zone Population for Age 35-44	
POP_45-64	Zone Population for Age 45-64	
POP_65	Zone Population for Age 65 and Up	
AM_P_HBO_0-14	HBO AM Trip Production Rate for Age 0-14	
AM_P_HBO_15-24	HBO AM Trip Production Rate for Age 15-24	
AM_P_HBO_25-34	HBO AM Trip Production Rate for Age 25-34	
AM_P_HBO_35-44	HBO AM Trip Production Rate for Age 35-44	
AM_P_HBO_45-64	HBO AM Trip Production Rate for Age 45-64	
AM_P_HBO_65	HBO AM Trip Production Rate for Age 65 And Up	
AM_P_HBO_VEH_OCCUP	AM Vehicle Occupancy for HBO Trip Productions	
AM_P_HBS_0-14	HBS AM Trip Production Rate for Age 0-14	
AM_P_HBS_15-24	HBS AM Trip Production Rate for Age 15-24	
AM_P_HBS_25-34	HBS AM Trip Production Rate for Age 25-34	
AM_P_HBS_35-44	HBS AM Trip Production Rate for Age 35-44	
AM_P_HBS_45-64	HBS AM Trip Production Rate for Age 45-64	

Attribute	Description	Formula (if applicable)
AM_P_HBS_65	HBS AM Trip Production Rate for Age 65 And Up	
AM_P_HBS_VEH_OCCUP	AM Vehicle Occupancy for HBS Trips	
AM_P_HBW_0-14	HBW AM Trip Production Rate for Age 0-14	
AM_P_HBW_15-24	HBW AM Trip Production Rate for Age 15-24	
AM_P_HBW_25-34	HBW AM Trip Production Rate for Age 25-34	
AM_P_HBW_35-44	HBW AM Trip Production Rate for Age 35-44	
AM_P_HBW_45-64	HBW AM Trip Production Rate for Age 44-64	
AM_P_HBW_65	HBW AM Trip Production Rate for Age 65 and Up	
AM_P_HBW_VEH_OCCUP	AM Vehicle Occupancy for HBW Trips	
AM_P_NHB_0-14	NHB AM Trip Production Rate for Age 0-14 by Household Superzone	
AM_P_NHB_15-24	NHB AM Trip Production Rate for Age 15-24 by Household Superzone	
AM_P_NHB_25-34	NHB AM Trip Production Rate for Age 25-34 by Household Superzone	
AM_P_NHB_35-44	NHB AM Trip Production Rate for Age 35-44 by Household Superzone	
AM_P_NHB_45-64	NHB AM Trip Production Rate for Age 45-64 by Household Superzone	
AM_P_NHB_65	NHB AM Trip Production Rate for Age 65 and Up by Household Superzone	
AM_P_NHB_TOTAL	AM NHB Total Trips Generated by Household Superzone	$([POP_0-14]*[AM_P_NHB_0-14]+[POP_15-24]*[AM_P_NHB_15-24]+[POP_25-34]*[AM_P_NHB_25-34]+[POP_35-44]*[AM_P_NHB_35-44]+[POP_45-64]*[AM_P_NHB_45-64]+[POP_65]*[AM_P_NHB_65])$
AM_P_NHB_TRIPDIST	AM Distribution Percentage to Production TAZs from NHB Trip Total	
PM_ATTR	Vehicle PM peak attractions for model area	
PM_PROD	Vehicle PM peak production for model area	
PM_ATTR_GATE	Vehicle PM peak attractions from gateway trips	
PM_PROD_GATE	Vehicle PM peak productions from gateway trips	

Attribute	Description	Formula (if applicable)
PM_A_HBO_OFFICE	HBO PM Trip Attraction Rate for Office Employment	
PM_A_HBO_RETAIL	HBO PM Trip Attraction Rate for Retail Employment	
PM_A_HBO_SPECIAL_TRIPGEN	HBO PM Vehicle Trips Generated from Non-Employee-Based Sources	
PM_A_HBO_VEH_OCCUP	HBO PM Trip Attractions Vehicle Occupancy	
PM_A_HBS_STUDENT	HBS PM Trip Attraction Rate for Students	
PM_A_HBS_VEH_OCCUP	HBS PM Trip Attractions Vehicle Occupancy	
PM_A_HBW_INDUSTRIAL	HBW PM Trip Attraction Rate for Industrial Employment	
PM_A_HBW_INSTIT	HBW PM Trip Attraction Rate for Institutional Employment	
PM_A_HBW_OFFICE	HBW PM Trip Attraction Rate for Office Employment	
PM_A_HBW_OTHER	HBW PM Trip Attraction Rate for Unknown Employment	
PM_A_HBW_RETAIL	HBW PM Trip Attraction Rate for Retail Employment	
PM_A_HBW_SCHOOL	HBW PM Trip Attraction Rate for School Employment	
PM_A_HBW_VEH_OCCUP	HBW PM Trip Attractions Vehicle Occupancy	
PM_A_NHB	HBW PM Trip Attraction Rate for Non-Home-Based Trips	
PM_A_NHB_TRIPDIST	Distribution Percentage to Attraction TAZs from NHB Trip Total	
PM_A_NHB_VEH_OCCUP	PM Vehicle Occupancy for NHB Trip Attractions	
PM_P_HBO_0-14	HBO PM Trip Production Rate for Age 0-14	
PM_P_HBO_15-24	HBO PM Trip Production Rate for Age 15-24	
PM_P_HBO_25-34	HBO PM Trip Production Rate for Age 25-34	
PM_P_HBO_35-44	HBO PM Trip Production Rate for Age 35-44	
PM_P_HBO_45-64	HBO PM Trip Production Rate for Age 45-64	
PM_P_HBO_65	HBO PM Trip Production Rate for Age 65 And Up	
PM_P_HBO_VEH_OCCUP	PM Vehicle Occupancy for HBO Trip Productions	
PM_P_HBS_0-14	HBS PM Trip Production Rate for Age 0-14	
PM_P_HBS_15-24	HBS PM Trip Production Rate for Age 15-24	
PM_P_HBS_25-34	HBS PM Trip Production Rate for Age 25-34	
PM_P_HBS_35-44	HBS PM Trip Production Rate for Age 35-44	
PM_P_HBS_45-64	HBS PM Trip Production Rate for Age 45-64	

Attribute	Description	Formula (if applicable)
PM_P_HBS_65	HBS PM Trip Production Rate for Age 65 And Up	
PM_P_HBS_VEH_OCCUP	PM Vehicle Occupancy for HBS Trips	
PM_P_HBW_0-14	HBW PM Trip Production Rate for Age 0-14	
PM_P_HBW_15-24	HBW PM Trip Production Rate for Age 15-24	
PM_P_HBW_25-34	HBW PM Trip Production Rate for Age 25-34	
PM_P_HBW_35-44	HBW PM Trip Production Rate for Age 35-44	
PM_P_HBW_45-64	HBW PM Trip Production Rate for Age 44-64	
PM_P_HBW_65	HBW PM Trip Production Rate for Age 65 and Up	
PM_P_HBW_VEH_OCCUP	PM Vehicle Occupancy for HBW Trips	
PM_P_NHB_0-14	NHB PM Trip Production Rate for Age 0-14 by Household Superzone	
PM_P_NHB_15-24	NHB PM Trip Production Rate for Age 15-24 by Household Superzone	
PM_P_NHB_25-34	NHB PM Trip Production Rate for Age 25-34 by Household Superzone	
PM_P_NHB_35-44	NHB PM Trip Production Rate for Age 35-44 by Household Superzone	
PM_P_NHB_45-64	NHB PM Trip Production Rate for Age 45-64 by Household Superzone	
PM_P_NHB_65	NHB PM Trip Production Rate for Age 65 and Up by Household Superzone	
STUDENT	Number of Students in 2016	
HBO_AM_From_Factor	HBO from factor to convert AM peak trips to peak hourly trips	
HBO_AM_To_Factor	HBO to factor to convert AM peak trips to peak hourly trips	
HBO_PM_TO_Factor	HBO from factor to convert PM peak trips to peak hourly trips	
HBO_PM_FROM_Factor	HBO to factor to convert PM peak trips to peak hourly trips	
HBS_AM_From_Factor	HBS from factor to convert AM peak trips to peak hourly trips	
HBS_AM_To_Factor	HBS to factor to convert AM peak trips to peak hourly trips	
HBS_PM_TO_Factor	HBS from factor to convert PM peak trips to peak hourly trips	
HBS_PM_FROM_Factor	HBS to factor to convert PM peak trips to peak hourly trips	
HBW_AM_From_Factor	HBW from factor to convert AM peak trips to peak hourly trips	

Attribute	Description	Formula (if applicable)
HBW_AM_To_Factor	HBW to factor to convert AM peak trips to peak hourly trips	
HBW_PM_TO_Factor	HBW from factor to convert PM peak trips to peak hourly trips	
HBW_PM_FROM_Factor	HBW to factor to convert PM peak trips to peak hourly trips	
NHB_AM_From_Factor	NHB from factor to convert PM peak trips to peak hourly trips	
NHB_PM_From_Factor	NHB from factor to convert PM peak trips to peak hourly trips	
PM_P_NHB_TOT	PM NHB Total Trips Generated by Household Superzone	$([POP_0-14]*[PM_P_NHB_0-14]+[POP_15-24]*[PM_P_NHB_15-24]+[POP_25-34]*[PM_P_NHB_25-34]+[POP_35-44]*[PM_P_NHB_35-44]+[POP_45-64]*[PM_P_NHB_45-64]+[POP_65]*[PM_P_NHB_65])$
PM_P_NHB_TRIPDIST	PM Distribution Percentage to Production TAZs from NHB Trip Total	

A.2 MODEL DATA DICTIONARY – LINKS

Attribute	Description	Formula (if applicable)
Number	Link Number	
From node number	Node number at the start of the link	
To node number	Node number at the start of the link	
Type number	Link type. Refer to Link (Type) table for attributes associated with each link type	
Tsys set	Transportation modes allowed on the link (e.g. C-Car, W-Walk)	
Number of Lanes	Number of lanes, direction-specific	
Capacity PrT	Total private vehicle capacity (PCU/hour)	
v0 PrT	Free-flow speed of private vehicles (km/hour)	
Volume PrT (veh)	Link volume of private vehicles during the peak period	
Area	Area type: Urban, Rural or N/A	
COUNT_AM	AM Peak Hour Observed Counts	
COUNT_PM	PM Peak Hour Observed Counts	
FUTURE	Value of "1" indicates a future/planned roadway	
HOURLFACTOR	Factor to convert AM Peak Period to AM Peak Hour	
HRCAP	Hourly capacity (PCU/hour)	
LANECAP	Lane capacity (PCU/hour)	
LINKSOURCE	The source of link attribute information: CRD (City of Red Deer) or AT (Alberta Transportation)	
LRS_STREE1	Street name of the intersecting street at the beginning of the LRS_STREET segment	
LRS_STREE2	Street name of the intersecting street at the end of the LRS_STREET segment	
LRS_STREET	Street name from the length shapefile provided by the City of Red Deer	
POSTSPEED	Posted speed (km/hour)	
RDSP_ID	ID of the speed shapefile provided by the City of Red Deer – City only	
ROADCLASS	Road class: Freeway, Freeway Ramp, Highway, Arterial, Collector, Local – Urban or Rural	
STREET_ALI	Alternative street name - City only	
TT_SEGMENT	Tagged link segments for generating travel time summary	

A.3 MODEL DATA DICTIONARY – ZONE-LEVEL MATRICES

Matrix No.	Code	Description	Formula (if applicable)
101	AM Distribution - HBW	AM Modelled Trip Distribution - HBW	
102	AM Distribution - HBS	AM Modelled Trip Distribution - HBS	
103	AM Distribution - HBO	AM Modelled Trip Distribution - HBO	
104	AM Distribution - NHB	AM Modelled Trip Distribution - NHB	
105	AM Distribution - ALL	AM Modelled Trip Distribution - Total	Matrix([NO] = 101)+Matrix([NO] = 102)+Matrix([NO] = 103)+Matrix([NO] = 104)
106	AM Distribution - HBW I-(I/X)	AM Modelled Trip Distribution - HBW - Internal to Internal/External	Matrix([NO] = 101)*IF(FROM[NO]>=2000:0:1)
107	AM Distribution - HBS I-(I/X)	AM Modelled Trip Distribution - HBS - Internal to Internal/External	Matrix([NO] = 102)*IF(FROM[NO]>=2000:0:1)
108	AM Distribution - HBO I-(I/X)	AM Modelled Trip Distribution - HBO - Internal to Internal/External	Matrix([NO] = 103)*IF(FROM[NO]>=2000:0:1)
109	AM Distribution - NHB I-(I/X)	AM Modelled Trip Distribution - NHB - Internal to Internal/External	Matrix([NO] = 104)*IF(FROM[NO]>=2000:0:1)
110	AM Distribution - ALL I-(I/X)	AM Modelled Trip Distribution - Total - Internal to Internal/External	Matrix([NO] = 106)+Matrix([NO] = 107)+Matrix([NO] = 108)+Matrix([NO] = 109)
111	AM Distribution - HBW	Superzone AM Modelled Trip Distribution - HBW	
112	AM Distribution - HBS	Superzone AM Modelled Trip Distribution - HBS	
113	AM Distribution - HBO	Superzone AM Modelled Trip Distribution - HBO	

Matrix No.	Code	Description	Formula (if applicable)
114	AM Distribution - NHB	Superzone AM Modelled Trip Distribution - NHB	
115	AM Distribution - ALL	Superzone AM Modelled Trip Distribution - Total	Matrix([NO] = 111)+Matrix([NO] = 112)+Matrix([NO] = 113)+Matrix([NO] = 114)
116	AM Distribution - HBW I-(I/X)	Superzone AM Modelled Trip Distribution - HBW - Internal to Internal/External	Matrix([NO] = 111)*IF(FROM[NO]>=20,0,1)
117	AM Distribution - HBS I-(I/X)	Superzone AM Modelled Trip Distribution - HBS - Internal to Internal/External	Matrix([NO] = 112)*IF(FROM[NO]>=20,0,1)
118	AM Distribution - HBO I-(I/X)	Superzone AM Modelled Trip Distribution - HBO - Internal to Internal/External	Matrix([NO] = 113)*IF(FROM[NO]>=20,0,1)
119	AM Distribution - NHB I-(I/X)	Superzone AM Modelled Trip Distribution - NHB - Internal to Internal/External	Matrix([NO] = 114)*IF(FROM[NO]>=20,0,1)
120	AM Distribution - ALL I-(I/X)	Superzone AM Modelled Trip Distribution - Total - Internal to Internal/External	Matrix([NO] = 116)+Matrix([NO] = 117)+Matrix([NO] = 118)+Matrix([NO] = 119)
201	AM Gateway Car - HBW	AM Car Trips Involving Gateway Zones - HBW	
202	AM Gateway Car - HBS	AM Car Trips Involving Gateway Zones - HBS	
203	AM Gateway Car - HBO	AM Car Trips Involving Gateway Zones - HBO	
204	AM Gateway Car - NHB	AM Car Trips Involving Gateway Zones - NHB	
205	AM Gateway Car - Vehicles	AM Car Trips Involving Gateway Zones - Total	Matrix([NO] = 201)+Matrix([NO] = 202)+Matrix([NO] = 203)+Matrix([NO] = 204)
211	AM Gateway Car - HBW	Superzone AM Trips Gateway Car Trips - HBW	
212	AM Gateway Car - HBS	Superzone AM Gateway Car Trips - HBS	
213	AM Gateway Car - HBO	Superzone AM Gateway Car Trips - HBO	
214	AM Gateway Car - NHB	Superzone AM Gateway Car Trips - NHB	

Matrix No.	Code	Description	Formula (if applicable)
215	AM Gateway Car - Total	Superzone AM Gateway Car Trips - Total	$\text{Matrix}([\text{NO}] = 211) + \text{Matrix}([\text{NO}] = 212) + \text{Matrix}([\text{NO}] = 213) + \text{Matrix}([\text{NO}] = 214)$
241	AM Gateway Car - HBW - 130k	AM Car Trips Involving Gateway Zones - HBW 130k Population Scenario	
242	AM Gateway Car - HBS - 130k	AM Car Trips Involving Gateway Zones - HBS 130k Population Scenario	
243	AM Gateway Car - HBO - 130k	AM Car Trips Involving Gateway Zones - HBO 130k Population Scenario	
244	AM Gateway Car - NHB - 130k	AM Car Trips Involving Gateway Zones - NHB 130k Population Scenario	
245	AM Gateway Car - Total - 130k	AM Car Trips Involving Gateway Zones - Total 130k Population Scenario	
251	AM Gateway Car - HBW - 130k	Superzone AM Car Trips Gateway - HBW 130k Population Scenario	
252	AM Gateway Car - HBS - 130k	Superzone AM Car Trips Gateway - HBS 130k Population Scenario	
253	AM Gateway Car - HBO - 130k	Superzone AM Car Trips Gateway - HBO 130k Population Scenario	
254	AM Gateway Car - NHB - 130k	Superzone AM Car Trips Gateway - NHB 130k Population Scenario	
255	AM Gateway Car - Total - 130k	Superzone AM Car Trips Gateway - Total 130k Population Scenario	
261	AM Gateway Car - HBW - 188k	AM Car Trips Involving Gateway Zones - HBW 188k Population Scenario	
262	AM Gateway Car - HBS - 188k	AM Car Trips Involving Gateway Zones - HBS 188k Population Scenario	
263	AM Gateway Car - HBO - 188k	AM Car Trips Involving Gateway Zones - HBO 188k Population Scenario	
264	AM Gateway Car - NHB - 188k	AM Car Trips Involving Gateway Zones - NHB 188k Population Scenario	
265	AM Gateway Car - Total - 188k	AM Car Trips Involving Gateway Zones - Total 188k Population Scenario	

Matrix No.	Code	Description	Formula (if applicable)
271	AM Gateway Car - HBW - 188k	Superzone AM Car Trips Gateway - HBW 188k Population Scenario	
272	AM Gateway Car - HBS - 188k	Superzone AM Car Trips Gateway - HBS 188k Population Scenario	
273	AM Gateway Car - HBO - 188k	Superzone AM Car Trips Gateway - HBO 188k Population Scenario	
274	AM Gateway Car - NHB - 188k	Superzone AM Car Trips Gateway - NHB 188k Population Scenario	
275	AM Gateway Car - Total - 188k	Superzone AM Car Trips Gateway - Total 188k Population Scenario	
301	AM Car - HBW	AM Total Car Trips - HBW	$\text{Matrix}([\text{NO}] = 101) + \text{Matrix}([\text{NO}] = 201)$
302	AM Car - HBS	AM Total Car Trips - HBS	$\text{Matrix}([\text{NO}] = 102) + \text{Matrix}([\text{NO}] = 202)$
303	AM Car - HBO	AM Total Car Trips - HBO	$\text{Matrix}([\text{NO}] = 103) + \text{Matrix}([\text{NO}] = 203)$
304	AM Car - NHB	AM Total Car Trips - NHB	$\text{Matrix}([\text{NO}] = 104) + \text{Matrix}([\text{NO}] = 204)$
305	AM Car - TOTAL	AM Total Car Trips	$\text{Matrix}([\text{NO}] = 301) + \text{Matrix}([\text{NO}] = 302) + \text{Matrix}([\text{NO}] = 303) + \text{Matrix}([\text{NO}] = 304)$
406	Truck - Total AM Peak Hour	Total Truck Trips in AM Peak Hour	
501	AM Hour Factor	Conversion Factors from AM Peak Period to AM Peak Hour	
607	Utility TT0	Free-Flow Travel Time	
608	Utility TTC	Modelled Travel Time	
612	Utility DIS	Modelled Trip Distance	
705	Demand adj AM	Demand-adjust matrix for AM peak period	
706	Demand adj PM	Demand-adjust matrix for PM peak period	
805	Constrained Increment AM	Constrained Increment Demand-adjust matrix for AM peak period	
806	Constrained Increment PM	Constrained Increment Demand-adjust matrix for PM peak period	
905	Constrained adj AM	Constrained Demand-adjust matrix for AM peak period	
906	Constrained adj PM	Constrained Demand-adjust matrix for PM peak period	

Matrix No.	Code	Description	Formula (if applicable)
1001	PM Distribution - HBW	PM Modelled Trip Distribution - HBW	
1002	PM Distribution - HBS	PM Modelled Trip Distribution - HBS	
1003	PM Distribution - HBO	PM Modelled Trip Distribution - HBO	
1004	PM Distribution - NHB	PM Modelled Trip Distribution - NHB	
1005	PM Distribution - ALL	PM Modelled Trip Distribution - Total	
2001	AM-Car- HBW-188K	AM Total Car Trips - HBW 188k Population Scenario	
2002	AM-Car-HBS-188K	AM Total Car Trips - HBS 188k Population Scenario	
2003	AM-Car-HBO-188K	AM Total Car Trips - HBO 188k Population Scenario	
2004	AM-Car-NHB-188K	AM Total Car Trips - NHB 188k Population Scenario	
2005	AM-Car-Total-188K	AM Total Car Trips 188k Population Scenario	
2021	PM Gateway Car - HBW - Base	PM Car Trips Involving Gateway Zones with Adjustment from Counts- HBW	
2022	PM Gateway Car - HBS - Base	PM Car Trips Involving Gateway Zones with Adjustment from Counts - HBS	
2023	PM Gateway Car - HBO - Base	PM Car Trips Involving Gateway Zones with Adjustment from Counts - HBO	
2024	PM Gateway Car - NHB - Base	PM Car Trips Involving Gateway Zones with Adjustment from Counts - NHB	
2025	PM Gateway Car - Total - Base	PM Car Trips Involving Gateway Zones with Adjustment from Counts - Total	$\text{Matrix}([\text{NO}] = 2021) + \text{Matrix}([\text{NO}] = 2022) + \text{Matrix}([\text{NO}] = 2023) + \text{Matrix}([\text{NO}] = 2024)$
2027	Truck Total PM Peak Hour	Total Truck Trips in PM Peak Hour	$\text{Matrix}([\text{NO}] = 406) * 0.6$
2032	PM Car - HBW	PM Total Car Trips - HBW	
2033	PM Car - HBS	PM Total Car Trips - HBS	
2034	PM Car - HBO	PM Total Car Trips - HBO	
2035	PM Car - NHB	PM Total Car Trips - NHB	
2036	PM Car - Total	PM Total Car Trips	

Matrix No.	Code	Description	Formula (if applicable)
2041	AM Gateway Car - HBW - Base	AM Car Trips Involving Gateway Zones with Adjustment from Counts- HBW	
2042	AM Gateway Car - HBS - Base	AM Car Trips Involving Gateway Zones with Adjustment from Counts - HBS	
2043	AM Gateway Car - HBO - Base	AM Car Trips Involving Gateway Zones with Adjustment from Counts - HBO	
2044	AM Gateway Car - NHB - Base	AM Car Trips Involving Gateway Zones with Adjustment from Counts - NHB	
2045	AM Gateway Car - Total - Base	AM Car Trips Involving Gateway Zones with Adjustment from Counts - Total	$\text{Matrix}([\text{NO}] = 2041) + \text{Matrix}([\text{NO}] = 2042) + \text{Matrix}([\text{NO}] = 2043) + \text{Matrix}([\text{NO}] = 2044)$
2127	Truck Total PM Peak Hour - 188k	Total Truck Trips in PM Peak Hour 188k Population Scenario	
3001	PM-Car-HBW-188K	PM Total Car Trips - HBW 188k Population Scenario	
3002	PM-Car-HBS-188K	PM Total Car Trips - HBS 188k Population Scenario	
3003	PM-Car-HBO-188K	PM Total Car Trips - HBO 188k Population Scenario	
3004	PM-Car-NHB-188K	PM Total Car Trips - NHB 188k Population Scenario	
3005	PM-Car-Total-188K	PM Total Car Trips 188k Population Scenario	
3041	PM Gateway Car - HBW - 130k	PM Car Trips Involving Gateway Zones - HBW 130k Population Scenario	
3042	PM Gateway Car - HBS - 130k	PM Car Trips Involving Gateway Zones - HBS 130k Population Scenario	
3043	PM Gateway Car - HBO - 130k	PM Car Trips Involving Gateway Zones - HBO 130k Population Scenario	
3044	PM Gateway Car - NHB - 130k	PM Car Trips Involving Gateway Zones - NHB 130k Population Scenario	
3045	PM Gateway Car - Total - 188k	PM Car Trips Involving Gateway Zones - Total 130k Population Scenario	
3061	PM Gateway Car - HBW - 188k	PM Car Trips Involving Gateway Zones - HBW 188k Population Scenario	
3062	PM Gateway Car - HBS - 188k	PM Car Trips Involving Gateway Zones - HBS 188k Population Scenario	

Matrix No.	Code	Description	Formula (if applicable)
3063	PM Gateway Car - HBO - 188k	PM Car Trips Involving Gateway Zones - HBO 188k Population Scenario	
3064	PM Gateway Car - NHB - 188k	PM Car Trips Involving Gateway Zones - NHB 188k Population Scenario	
3065	PM Gateway Car - Total - 188k	PM Car Trips Involving Gateway Zones - Total 188k Population Scenario	$\text{Matrix}([\text{NO}] = 3061) + \text{Matrix}([\text{NO}] = 3062) + \text{Matrix}([\text{NO}] = 3063) + \text{Matrix}([\text{NO}] = 3064)$
4001	AM Distribution HBW-188K	AM Modelled Trip Distribution - HBW 188k Population Scenario	
4002	AM Distribution HBS-188K	AM Modelled Trip Distribution - HBS 188k Population Scenario	
4003	AM Distribution HBO-188K	AM Modelled Trip Distribution - HBO 188k Population Scenario	
4004	AM Distribution NHB-188K	AM Modelled Trip Distribution - NHB 188k Population Scenario	
5001	PM Distribution HBW-188K	PM Modelled Trip Distribution - HBW 188k Population Scenario	
5002	PM Distribution HBS-188K	PM Modelled Trip Distribution - HBS 188k Population Scenario	
5003	PM Distribution HBO-188K	PM Modelled Trip Distribution - HBO 188k Population Scenario	
5004	PM Distribution NHB-188K	PM Modelled Trip Distribution - NHB 188k Population Scenario	
9005	constrained adj AM-188K	Constrained Increment Demand-adjust matrix for AM peak period 188k Population Scenario	
9006	constrained adj PM-188K	Constrained Increment Demand-adjust matrix for PM peak period 188k Population Scenario	
9007	TT0	Free-Flow Travel Time	
9008	TTC	Modelled Travel Time	
9009	DIS	Modelled Trip Distance	

A.4 MODEL DATA DICTIONARY – SUPERZONE-LEVEL MATRICES

Matrix No.	Name	Description	Formula (if applicable)
11	HTS Car - Vehicles	Household Travel Survey OD Matrix - Total	
12	HTS Car - Vehicles - HBW	Household Travel Survey OD Matrix - HBW	
13	HTS Car - Vehicles - HBS	Household Travel Survey OD Matrix - HBS	
14	HTS Car - Vehicles - HBO	Household Travel Survey OD Matrix - HBO	
15	HTS Car - Vehicles - NHB	Household Travel Survey OD Matrix - NHB	
111	Distribution - HBW	Modelled Trip Distribution - HBW	
112	Distribution - HBS	Modelled Trip Distribution - HBS	
113	Distribution - HBO	Modelled Trip Distribution - HBO	
114	Distribution - NHB	Modelled Trip Distribution - NHB	
115	Distribution - ALL	Modelled Trip Distribution - Total	$\text{Matrix}([\text{NO}] = 111) + \text{Matrix}([\text{NO}] = 112) + \text{Matrix}([\text{NO}] = 113) + \text{Matrix}([\text{NO}] = 114)$
116	Distribution - HBW I- (I/X)	Modelled Trip Distribution - HBW - Internal to Internal/External	$\text{Matrix}([\text{NO}] = 111) * \text{IF}(\text{FROM}[\text{NO}] \geq 20:0:1)$
117	Distribution - HBS I- (I/X)	Modelled Trip Distribution - HBS - Internal to Internal/External	$\text{Matrix}([\text{NO}] = 112) * \text{IF}(\text{FROM}[\text{NO}] \geq 20:0:1)$
118	Distribution - HBO I- (I/X)	Modelled Trip Distribution - HBO - Internal to Internal/External	$\text{Matrix}([\text{NO}] = 113) * \text{IF}(\text{FROM}[\text{NO}] \geq 20:0:1)$
119	Distribution - NHB I- (I/X)	Modelled Trip Distribution - NHB - Internal to Internal/External	$\text{Matrix}([\text{NO}] = 114) * \text{IF}(\text{FROM}[\text{NO}] \geq 20:0:1)$
120	Distribution - ALL I- (I/X)	Modelled Trip Distribution - Total - Internal to Internal/External	$\text{Matrix}([\text{NO}] = 116) + \text{Matrix}([\text{NO}] = 117) + \text{Matrix}([\text{NO}] = 118) + \text{Matrix}([\text{NO}] = 119)$
211	Gateway Car - HBW	Trips Involving Gateway Zones - HBW	
212	Gateway Car - HBS	Trips Involving Gateway Zones - HBS	
213	Gateway Car - HBO	Trips Involving Gateway Zones - HBO	

Matrix No.	Name	Description	Formula (if applicable)
214	Gateway Car - NHB	Trips Involving Gateway Zones - NHB	
215	Gateway Car - Total	Trips Involving Gateway Zones - Total	Matrix([NO] = 211)+Matrix([NO] = 212)+Matrix([NO] = 213)+Matrix([NO] = 214)

APPENDIX B

POPULATION AND EMPLOYMENT INPUTS

B.1 POPULATION BY AGE GROUP AND TRAFFIC ZONE – 100K HORIZON

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
101	1	0	4	0	0	13	8	25
102	1	0	15	0	0	22	46	83
103	1	0	0	0	0	0	0	0
104	1	0	0	0	0	0	0	0
105	1	0	0	0	0	4	5	9
201	2	0	0	0	0	0	0	0
202	2	0	0	0	0	0	0	0
203	2	0	0	0	0	0	0	0
204	2	0	0	0	0	0	0	0
205	2	0	0	0	0	0	0	0
206	2	0	0	0	0	0	0	0
207	2	0	0	0	0	0	0	0
301	3	215	142	172	265	371	92	1257
302	3	191	158	169	178	260	42	998
303	3	0	0	0	0	0	0	0
304	3	124	87	100	151	315	160	937
305	3	232	143	165	249	367	110	1266
306	3	184	129	143	178	256	75	965
307	3	141	76	116	166	204	72	775
308	3	89	81	140	149	261	286	1006
309	3	384	350	394	369	426	61	1984
310	3	168	141	148	198	208	25	888
311	3	0	0	0	0	0	0	0
401	4	277	139	153	149	264	102	1084
402	4	0	0	0	0	0	0	0
403	4	273	117	166	188	248	49	1041
404	4	0	0	0	0	0	0	0
405	4	194	154	140	149	373	118	1128
406	4	0	0	0	0	0	0	0
407	4	163	83	93	99	224	113	775
408	4	0	0	0	0	0	0	0

B.1 Population by Age Group and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
409	4	204	120	97	109	245	75	850
410	4	0	0	0	0	0	0	0
411	4	108	69	59	72	175	146	629
412	4	0	0	0	0	0	0	0
413	4	51	87	44	31	57	19	289
414	4	49	41	40	35	109	78	352
415	4	62	44	40	51	137	225	559
416	4	0	0	0	0	0	0	0
417	4	0	0	0	0	0	0	0
418	4	0	0	0	0	2	0	2
419	4	0	0	0	0	0	0	0
420	4	58	32	22	37	142	94	385
421	4	0	0	0	0	0	0	0
422	4	0	0	1	2	12	67	82
423	4	0	0	0	0	0	0	0
424	4	332	160	179	236	362	149	1418
425	4	0	25	21	26	64	65	201
426	4	54	33	32	37	103	143	402
501	5	173	121	173	143	207	57	874
502	5	217	113	164	169	288	132	1083
503	5	0	0	0	0	0	0	0
504	5	82	36	50	67	105	37	377
505	5	77	64	72	99	151	132	595
506	5	142	68	92	118	185	126	731
507	5	103	44	70	97	176	175	665
508	5	93	71	85	72	78	22	421
509	5	507	281	471	526	607	179	2571
510	5	0	0	0	0	0	0	0
511	5	133	100	115	120	165	56	689
512	5	101	93	81	104	163	172	714
513	5	148	103	129	133	126	35	674
514	5	117	96	103	107	176	62	661
515	5	124	121	141	127	164	62	739

B.1 Population by Age Group and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
516	5	54	59	48	66	162	284	673
601	6	22	30	35	50	69	46	252
602	6	495	170	396	427	512	108	2108
603	6	16	6	5	13	16	14	70
604	6	151	77	137	108	233	171	877
605	6	40	11	20	23	14	0	108
606	6	155	123	106	111	165	58	718
607	6	118	79	100	77	144	91	609
608	6	106	73	99	70	151	107	606
609	6	63	78	57	54	128	94	474
610	6	16	23	15	20	32	202	308
611	6	0	0	0	0	0	0	0
612	6	45	121	116	93	190	98	663
613	6	60	112	125	94	174	87	652
614	6	4	11	28	20	35	19	117
615	6	0	0	0	0	0	0	0
616	6	0	0	0	0	0	0	0
617	6	46	57	86	44	134	360	727
618	6	78	35	82	72	97	121	485
619	6	0	0	0	0	0	0	0
620	6	76	100	128	99	183	114	700
621	6	75	67	71	55	110	79	457
622	6	122	57	86	83	226	118	692
623	6	0	0	0	0	0	0	0
624	6	0	0	0	0	0	0	0
625	6	0	0	0	0	0	0	0
701	7	72	68	80	102	157	50	529
702	7	54	56	73	97	219	112	611
703	7	115	174	196	172	274	195	1126
704	7	5	14	16	18	28	7	88
705	7	27	20	33	20	44	47	191
706	7	0	0	0	0	0	0	0
707	7	14	9	11	3	21	7	65

B.1 Population by Age Group and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
708	7	17	24	46	23	80	142	332
709	7	0	24	17	8	57	78	184
710	7	1	17	26	13	34	22	113
711	7	3	11	23	33	38	11	119
712	7	1	1	1	0	3	0	6
713	7	0	0	1	2	48	259	310
714	7	0	0	0	0	0	0	0
715	7	0	0	0	2	24	27	53
716	7	0	0	0	0	0	0	0
717	7	81	57	82	93	154	71	538
718	7	1	4	3	12	33	215	268
801	8	69	50	84	89	173	114	579
802	8	93	116	118	85	204	106	722
803	8	126	104	116	113	240	138	837
804	8	100	89	118	103	203	98	711
805	8	62	50	48	56	121	57	394
806	8	68	65	89	49	121	45	437
807	8	32	42	56	45	123	50	348
808	8	31	31	57	47	185	513	864
809	8	69	80	108	71	152	57	537
810	8	88	76	96	85	194	115	654
811	8	33	33	40	31	58	11	206
812	8	92	68	101	67	148	83	559
813	8	102	59	97	73	200	113	644
814	8	78	68	72	83	160	108	569
815	8	125	61	84	116	194	115	695
901	9	110	76	84	102	205	59	636
902	9	144	104	101	89	163	95	696
903	9	257	149	153	169	342	325	1395
904	9	186	97	96	122	268	112	881
905	9	183	80	95	132	312	179	981
906	9	171	50	65	137	303	213	939
907	9	166	74	84	154	266	157	901

B.1 Population by Age Group and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
908	9	158	75	118	84	178	138	751
909	9	175	139	94	137	325	157	1027
910	9	193	111	130	122	248	70	874
911	9	216	88	103	157	312	158	1034
912	9	195	55	57	142	275	229	953
913	9	210	59	125	173	254	123	944
914	9	121	112	84	142	198	430	1087
915	9	0	0	0	0	0	0	0
916	9	369	265	359	253	356	197	1799
917	9	314	140	259	219	220	37	1189
918	9	15	2	6	7	24	12	66
919	9	4	0	2	3	1	0	10
920	9	118	36	88	97	81	15	435
921	9	3	1	2	0	0	0	6
922	9	136	174	143	134	121	37	745
923	9	0	0	0	0	0	0	0
924	9	102	37	86	54	117	28	424
925	9	0	0	0	0	0	0	0
1001	10	114	88	62	74	225	110	673
1002	10	114	108	59	91	266	141	779
1003	10	144	95	37	118	310	254	958
1004	10	143	91	54	104	250	110	752
1005	10	183	132	81	118	300	145	959
1006	10	169	125	57	139	315	183	988
1007	10	224	121	122	218	353	189	1227
1008	10	273	126	156	222	297	70	1144
1009	10	0	0	0	0	0	0	0
1010	10	112	92	50	101	199	87	641
1011	10	336	311	200	278	294	82	1501
1012	10	357	147	141	277	328	87	1337
1101	11	0	0	0	0	0	3	3
1102	11	144	73	55	120	340	203	935
1103	11	206	64	103	128	338	105	944

B.1 Population by Age Group and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
1104	11	283	133	140	234	409	114	1313
1105	11	211	154	142	173	339	399	1418
1106	11	305	130	88	239	413	130	1305
1107	11	248	135	134	210	252	65	1044
1108	11	133	153	127	87	144	28	672
1109	11	250	211	205	189	288	119	1262
1110	11	292	234	273	242	348	84	1473
1111	11	402	151	206	348	467	234	1808
1112	11	309	107	195	239	280	74	1204
1113	11	7	7	4	8	46	14	86
1114	11	415	199	294	291	417	95	1711
1115	11	392	320	338	238	369	100	1757
1201	12	0	0	0	0	0	0	0
1301	13	0	0	0	0	4	1	5
1302	13	0	0	0	0	1	0	1
1303	13	38	1	0	18	3	3	63
1304	13	0	0	0	0	1	0	1
1305	13	13	1	25	18	5	4	66
1306	13	0	1	0	9	3	4	17
1307	13	0	0	0	0	1	0	1
1308	13	0	1	0	9	1	0	11
1309	13	51	1	25	18	2	6	103
1310	13	0	0	0	0	1	1	2
1311	13	25	3	73	27	5	6	139
1400	1	0	0	0	0	0	0	0
1401	1	0	0	0	0	0	0	0
1402	1	0	0	0	0	0	0	0
2101	1	34	26	19	25	82	23	209
2102	21	30	22	11	20	62	12	157
2103	21	0	0	0	0	0	0	0
2104	21	0	0	0	0	0	0	0
2105	21	0	0	0	0	0	0	0
2106	21	1583	684	1323	870	910	173	5544

B.1 Population by Age Group and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	AGE GROUP						
		POP_0-14	POP_15-24	POP_25-34	POP_35-44	POP_45-64	POP_65	TOTAL
2107	21	1132	490	947	623	650	124	3966
2201	22	0	0	0	0	0	0	0
2202	22	87	60	34	49	166	41	437
2203	22	0	0	0	0	0	0	0
2301	23	0	0	0	0	0	0	0
2302	23	0	0	0	0	0	0	0
2303	23	0	0	0	0	0	0	0
2304	23	2	2	1	2	5	2	14
2401	24	0	0	0	0	0	0	0
2402	24	0	0	0	0	0	0	0
2403	24	13	13	10	13	33	15	97
2404	24	0	0	0	0	0	0	0
2405	24	0	0	0	0	0	0	0
2501	25	0	0	0	0	0	0	0
2502	25	0	0	0	0	0	0	0
2503	25	0	0	0	0	0	0	0
2504	25	0	0	0	0	0	0	0
2505	25	0	0	0	0	0	0	0
2601	26	0	0	0	0	0	0	0
2602	26	65	35	33	49	156	94	432
2603	26	127	88	101	82	194	52	644
2604	26	8	5	4	7	29	27	80
2605	26	47	30	27	40	175	161	480
2606	26	12	12	10	8	31	13	86
2607	26	0	0	0	0	0	0	0
2608	26	362	201	371	220	284	64	1502
2701	27	0	0	0	0	0	0	0
2702	27	0	0	0	0	0	0	0

B.2 EMPLOYMENT BY EMPLOYMENT CATEGORY AND TRAFIC ZONE – 100K HORIZON

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
101	1	0	0	0	0	0	0	0
102	1	87	0	0	0	0	0	87
103	1	31	0	0	0	0	0	31
104	1	336	0	0	0	3	0	339
105	1	0	0	0	0	0	0	0
201	2	239	0	0	0	0	0	239
202	2	1424	0	0	0	0	0	1424
203	2	2757	0	15	0	0	0	2772
204	2	1072	25	0	0	88	0	1185
205	2	409	0	0	0	331	0	740
206	2	1423	0	0	0	31	0	1454
207	2	558	10	0	0	27	0	595
301	3	0	0	0	0	0	0	0
302	3	0	0	0	0	9	0	9
303	3	35	0	92	0	300	0	427
304	3	0	0	0	0	3	0	3
305	3	0	0	0	0	0	0	0
306	3	0	0	0	0	9	83	92
307	3	0	0	0	0	0	24	24
308	3	0	0	0	0	0	0	0
309	3	192	136	0	0	0	0	328
310	3	0	0	0	0	10	0	10
311	3	158	0	0	0	0	0	158
401	4	0	0	0	0	0	0	0
402	4	0	0	0	0	139	0	139
403	4	0	0	0	0	0	0	0
404	4	0	0	0	0	16	0	16
405	4	0	0	0	0	0	44	44
406	4	33	0	55	0	52	0	140
407	4	0	0	0	0	0	0	0

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
408	4	0	0	0	0	455	0	455
409	4	0	0	0	0	0	0	0
410	4	215	0	0	0	174	0	389
411	4	0	0	0	0	0	0	0
412	4	155	0	0	0	300	0	455
413	4	0	0	0	0	234	0	234
414	4	0	0	0	0	0	0	0
415	4	0	0	0	0	0	18	18
416	4	610	0	120	0	271	0	1001
417	4	256	0	29	0	0	0	285
418	4	1146	0	107	0	320	0	1573
419	4	1582	0	0	0	0	0	1582
420	4	0	0	0	0	0	0	0
421	4	0	0	0	0	186	0	186
422	4	0	0	0	0	612	0	612
423	4	1142	0	174	0	46	0	1362
424	4	0	49	0	0	0	0	49
425	4	0	0	0	0	362	0	362
426	4	0	0	0	0	0	0	0
501	5	0	0	0	0	0	0	0
502	5	0	92	62	0	22	110	286
503	5	230	0	0	0	0	0	230
504	5	0	0	0	0	0	0	0
505	5	0	0	0	0	0	0	0
506	5	0	0	0	0	0	0	0
507	5	0	0	0	0	0	40	40
508	5	0	0	0	0	0	0	0
509	5	0	0	0	0	0	0	0
510	5	180	0	43	0	725	0	948
511	5	0	0	0	0	0	31	31
512	5	0	0	60	0	95	0	155
513	5	0	0	0	0	0	0	0
514	5	0	0	0	0	0	25	25

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
515	5	0	0	0	0	12	0	12
516	5	0	2	0	0	3	0	5
601	6	0	2256	500	0	73	0	2829
602	6	0	0	0	0	0	0	0
603	6	0	5	0	0	0	0	5
604	6	0	0	0	0	0	27	27
605	6	0	0	0	0	95	0	95
606	6	0	0	0	0	0	35	35
607	6	0	0	0	0	0	0	0
608	6	0	0	0	0	0	0	0
609	6	0	0	0	0	0	40	40
610	6	0	0	0	0	0	900	900
611	6	0	0	0	0	0	0	0
612	6	0	0	43	0	14	0	57
613	6	0	0	0	0	503	0	503
614	6	0	0	0	0	309	0	309
615	6	0	0	0	0	665	0	665
616	6	0	0	50	0	1292	0	1342
617	6	0	115	23	0	215	23	376
618	6	0	244	283	0	734	0	1261
619	6	0	0	0	0	859	0	859
620	6	0	0	0	0	0	0	0
621	6	0	0	0	0	0	0	0
622	6	0	0	0	0	0	0	0
623	6	0	0	0	0	266	0	266
624	6	0	0	0	1	171	0	172
625	6	0	0	0	0	0	0	0
701	7	0	0	0	0	2	298	300
702	7	0	0	0	0	0	0	0
703	7	0	0	246	0	28	0	274
704	7	0	37	2068	64	297	0	2466
705	7	0	0	0	0	0	0	0
706	7	0	0	103	0	138	67	308

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
707	7	0	0	0	0	0	0	0
708	7	0	45	1057	0	648	0	1750
709	7	0	107	117	0	0	0	224
710	7	0	299	468	0	84	0	851
711	7	0	108	1196	0	366	0	1670
712	7	0	102	160	0	311	0	573
713	7	0	0	93	0	72	0	165
714	7	15	0	194	0	38	0	247
715	7	70	4	413	0	101	5	593
716	7	180	0	230	0	391	0	801
717	7	0	0	0	0	0	0	0
718	7	0	0	0	0	0	0	0
801	8	0	0	0	0	4	0	4
802	8	0	0	0	0	0	34	34
803	8	0	31	0	0	0	38	69
804	8	0	0	0	0	6	0	6
805	8	0	0	0	0	0	28	28
806	8	0	0	0	0	0	0	0
807	8	0	0	0	0	0	0	0
808	8	0	172	0	0	0	0	172
809	8	0	0	0	0	5	0	5
810	8	0	0	0	0	0	82	82
811	8	0	0	0	0	0	0	0
812	8	0	27	0	0	50	111	188
813	8	0	0	0	0	0	0	0
814	8	0	0	0	0	0	0	0
815	8	0	0	0	0	0	35	35
901	9	0	0	0	0	0	0	0
902	9	0	0	0	0	0	0	0
903	9	0	0	0	0	0	0	0
904	9	0	0	0	0	0	0	0
905	9	0	0	0	0	0	0	0
906	9	0	0	0	0	0	0	0

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
907	9	0	0	0	0	10	0	10
908	9	0	0	0	0	10	0	10
909	9	0	0	0	0	0	0	0
910	9	0	0	0	0	0	0	0
911	9	0	0	0	0	0	0	0
912	9	0	0	0	0	16	0	16
913	9	0	0	90	0	0	0	90
914	9	0	0	0	0	0	0	0
915	9	0	0	0	0	0	0	0
916	9	0	0	0	0	243	32	275
917	9	0	0	0	0	0	0	0
918	9	0	0	0	0	0	0	0
919	9	0	0	0	0	0	0	0
920	9	0	0	0	0	0	0	0
921	9	0	0	104	0	0	0	104
922	9	0	10	183	0	0	39	232
923	9	0	0	0	0	0	0	0
924	9	0	0	0	0	0	0	0
925	9	0	0	0	0	0	0	0
1001	10	0	0	0	0	0	0	0
1002	10	0	0	0	0	0	0	0
1003	10	0	0	20	0	0	0	20
1004	10	0	0	0	0	0	0	0
1005	10	0	0	0	0	77	0	77
1006	10	0	46	0	0	0	47	93
1007	10	0	0	0	0	0	0	0
1008	10	0	0	0	0	0	0	0
1009	10	0	115	0	0	0	281	396
1010	10	0	0	0	0	0	37	37
1011	10	0	0	0	0	0	0	0
1012	10	0	0	0	0	0	0	0
1101	11	0	0	0	0	0	0	0
1102	11	0	0	0	0	0	0	0

B.2 Employee by Employment by Category and Traffic Zone – 100K Horizon

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
1103	11	0	0	0	0	0	0	0
1104	11	0	0	0	0	0	0	0
1105	11	0	0	0	0	99	0	99
1106	11	0	0	0	0	12	77	89
1107	11	0	0	0	0	0	0	0
1108	11	0	0	0	0	0	0	0
1109	11	0	0	0	0	10	0	10
1110	11	0	0	0	0	0	0	0
1111	11	0	0	0	0	0	0	0
1112	11	0	0	0	0	0	0	0
1113	11	0	0	0	0	0	0	0
1114	11	0	0	0	0	0	0	0
1115	11	0	0	0	0	0	0	0
1201	12	9	0	0	0	0	0	9
1301	13	20	0	0	0	0	0	20
1302	13	5	0	0	0	0	0	5
1303	13	15	0	0	0	0	0	15
1304	13	5	0	0	0	0	0	5
1305	13	75	0	0	0	0	0	75
1306	13	25	0	0	0	0	0	25
1307	13	5	0	0	0	0	0	5
1308	13	5	0	0	0	0	0	5
1309	13	20	0	0	0	0	0	20
1310	13	25	0	0	0	0	0	25
1311	13	35	0	0	0	0	0	35
1400	1	0	0	0	0	0	0	0
1401	1	0	0	0	0	0	0	0
1402	1	0	0	0	0	0	0	0
2101	1	0	0	0	0	0	0	0
2102	21	0	0	0	0	0	0	0
2103	21	1716	0	0	0	0	0	1716
2104	21	709	0	0	0	0	0	709
2105	21	1314	0	0	0	0	0	1314

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		EMP_INDUSTRIAL	EMP_INSTIT	EMP_OFFICE	EMP_OTHER	EMP_RETAIL	EMP_SCHOOL	TOTAL
2106	21	271	50	69	95	88	57	630
2107	21	503	94	129	176	164	105	1171
2201	22	0	0	0	0	0	0	0
2202	22	0	0	0	0	0	0	0
2203	22	0	0	0	0	0	0	0
2301	23	0	0	0	0	0	0	0
2302	23	1002	0	0	0	0	0	1002
2303	23	401	0	0	0	0	0	401
2304	23	0	0	0	0	0	0	0
2401	24	0	0	0	0	237	0	237
2402	24	0	0	0	0	41	0	41
2403	24	760	0	0	0	0	0	760
2404	24	149	0	0	0	0	0	149
2405	24	0	0	0	0	41	0	41
2501	25	0	0	0	0	216	190	406
2502	25	0	0	0	0	206	0	206
2503	25	0	0	0	0	87	0	87
2504	25	0	0	0	0	149	56	205
2505	25	0	0	0	0	0	0	0
2601	26	0	0	0	0	0	220	220
2602	26	107	6	108	0	9	0	230
2603	26	105	0	0	0	6	0	111
2604	26	0	0	0	0	0	0	0
2605	26	0	0	0	0	0	0	0
2606	26	0	0	0	0	0	0	0
2607	26	0	0	0	0	0	0	0
2608	26	0	135	0	0	90	0	225
2701	27	1123	0	0	0	0	0	1123
2702	27	1398	0	0	0	0	0	1398

B.3 POPULATION BY AGE GROUP AND TRAFFIC ZONE – 188K HORIZON

TAZ	SUPERZONE	AGE GROUP						H188K_TOTPO P
		H188k_POP_0- 14	H188k_POP_15 -24	H188k_POP_25 -34	H188k_POP_35 -44	H188k_POP_45 -64	H188k_POP_65	
101	1	1807	1427	1641	1318	2683	1347	10223
102	1	270	209	239	196	403	208	1525
103	1	0	0	0	0	0	0	0
104	1	0	0	0	0	0	0	0
105	1	898	707	813	652	1328	669	5067
201	2	0	0	0	0	0	0	0
202	2	0	0	0	0	0	0	0
203	2	0	0	0	0	0	0	0
204	2	0	0	0	0	0	0	0
205	2	0	0	0	0	0	0	0
206	2	0	0	0	1	1	0	2
207	2	0	0	0	0	0	4	4
301	3	238	181	217	174	327	66	1203
302	3	215	206	217	119	233	31	1021
303	3	0	0	0	0	0	0	0
304	3	156	128	145	114	317	131	991
305	3	286	203	234	182	361	87	1353
306	3	244	198	218	141	273	64	1138
307	3	192	120	180	136	222	63	913
308	3	105	111	188	105	245	216	970
309	3	424	448	496	243	376	43	2030
310	3	193	188	197	137	191	19	925
311	3	0	0	0	0	0	0	0

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
401	4	244	170	190	146	258	97	1105
402	4	0	0	0	0	0	0	0
403	4	236	141	203	179	237	45	1041
404	4	0	0	0	0	0	0	0
405	4	187	206	191	159	397	122	1262
406	4	0	0	0	0	0	0	0
407	4	167	118	135	112	254	125	911
408	4	0	0	0	7	0	0	7
409	4	173	142	118	103	231	69	836
410	4	0	0	0	0	0	0	0
411	4	91	80	70	67	162	132	602
412	4	0	0	0	0	0	0	0
413	4	56	131	68	37	69	22	383
414	4	46	55	56	38	115	80	390
415	4	52	51	48	48	129	205	533
416	4	0	0	0	0	0	0	0
417	4	0	0	0	0	0	0	0
418	4	0	0	0	0	2	0	2
419	4	0	0	0	0	0	0	0
420	4	51	39	29	36	139	90	384
421	4	0	0	0	0	0	0	0
422	4	0	0	1	2	11	61	75
423	4	0	0	0	0	0	0	0
424	4	318	212	241	249	386	152	1558
425	4	0	37	32	30	75	75	249
426	4	45	38	38	34	96	130	381

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
501	5	161	144	179	98	207	44	833
502	5	200	134	167	115	284	101	1001
503	5	0	0	0	0	0	0	0
504	5	95	52	64	57	129	35	432
505	5	97	102	99	91	201	136	726
506	5	127	77	92	77	175	93	641
507	5	103	57	78	72	189	144	643
508	5	122	119	123	70	109	24	567
509	5	455	323	466	347	582	133	2306
510	5	0	0	0	0	0	0	0
511	5	140	135	133	93	185	48	734
512	5	115	134	101	86	198	159	793
513	5	156	139	150	103	142	31	721
514	5	120	127	116	81	195	52	691
515	5	131	162	163	98	184	54	792
516	5	63	85	60	56	199	267	730
601	6	29	65	55	61	107	80	397
602	6	385	217	362	304	475	113	1856
603	6	13	8	6	9	14	15	65
604	6	134	112	144	87	248	202	927
605	6	81	36	47	42	33	0	239
606	6	133	173	107	86	168	67	734
607	6	103	113	103	62	151	107	639
608	6	87	100	96	52	148	117	600
609	6	55	111	59	42	134	108	509
610	6	11	26	14	12	27	188	278

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
611	6	221	266	262	181	411	331	1672
612	6	42	185	129	80	214	123	773
613	6	56	170	136	80	190	107	739
614	6	3	13	25	13	32	20	106
615	6	0	0	0	0	0	0	0
616	6	0	0	0	0	0	0	0
617	6	45	92	100	39	155	469	900
618	6	59	44	73	49	88	123	436
619	6	0	0	0	0	0	0	0
620	6	71	152	141	85	204	142	795
621	6	69	102	77	47	121	98	514
622	6	104	80	85	65	228	134	696
623	6	0	0	0	0	0	0	0
624	6	0	0	0	0	0	0	0
625	6	0	0	0	55	0	0	55
701	7	73	78	81	70	138	46	486
702	7	56	66	76	68	196	107	569
703	7	118	204	202	119	246	185	1074
704	7	10	38	38	29	60	16	191
705	7	51	43	63	27	73	84	341
706	7	0	0	0	0	0	0	0
707	7	15	11	12	3	21	7	69
708	7	20	31	52	19	78	151	351
709	7	0	34	22	6	63	91	216
710	7	1	24	32	10	36	25	128
711	7	5	17	31	30	45	14	142

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
712	7	1	1	1	0	2	0	5
713	7	0	0	1	1	43	247	292
714	7	0	0	0	0	0	0	0
715	7	500	698	779	518	1373	1502	5370
716	7	0	0	0	0	0	0	0
717	7	94	75	95	73	152	75	564
718	7	1	4	3	9	28	198	243
801	8	88	67	88	87	195	128	653
802	8	114	147	119	79	221	113	793
803	8	146	125	109	99	243	138	860
804	8	117	107	113	91	206	100	734
805	8	82	69	51	57	141	66	466
806	8	87	86	94	48	138	50	503
807	8	54	71	74	57	174	71	501
808	8	78	78	108	79	362	932	1637
809	8	100	120	128	78	193	71	690
810	8	114	102	101	81	218	130	746
811	8	47	49	46	33	73	13	261
812	8	112	86	101	61	156	88	604
813	8	127	76	98	68	214	121	704
814	8	97	87	73	79	174	116	626
815	8	151	76	82	107	203	120	739
901	9	99	91	103	85	212	49	639
902	9	126	120	120	72	164	77	679
903	9	219	168	177	136	338	258	1296
904	9	156	108	110	98	260	88	820

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
905	9	157	92	112	107	310	144	922
906	9	150	58	77	114	308	173	880
907	9	146	85	100	128	268	128	855
908	9	147	93	150	74	190	119	773
909	9	139	146	102	102	299	116	904
910	9	165	127	152	100	245	56	845
911	9	186	102	121	130	311	128	978
912	9	160	60	63	110	258	174	825
913	9	198	74	161	153	275	108	969
914	9	111	136	105	122	207	365	1046
915	9	111	80	101	78	165	81	616
916	9	450	396	537	298	551	253	2485
917	9	307	186	332	206	283	65	1379
918	9	11	2	6	5	21	8	53
919	9	166	117	148	116	241	118	906
920	9	257	153	242	189	312	127	1280
921	9	261	187	235	180	385	188	1436
922	9	115	192	164	107	117	29	724
923	9	347	249	312	243	516	252	1919
924	9	82	40	95	42	109	22	390
925	9	456	328	410	321	679	331	2525
1001	10	138	93	110	78	264	100	783
1002	10	140	114	106	99	318	129	906
1003	10	142	81	55	101	297	186	862

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
1004	10	162	90	92	104	278	94	820
1005	10	176	110	116	101	282	105	890
1006	10	165	106	82	121	298	134	906
1007	10	217	103	175	185	334	138	1152
1008	10	271	109	228	193	286	52	1139
1009	10	0	0	0	0	0	0	0
1010	10	108	77	71	85	184	63	588
1011	10	328	263	288	239	282	61	1461
1012	10	429	153	249	291	384	78	1584
1101	11	423	263	346	319	502	168	2021
1102	11	130	71	63	108	293	144	809
1103	11	186	63	119	114	293	75	850
1104	11	244	123	153	201	339	78	1138
1105	11	183	144	156	149	282	273	1187
1106	11	279	129	103	217	362	95	1185
1107	11	222	131	153	188	217	46	957
1108	11	355	299	341	254	402	109	1760

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
1109	11	240	217	251	178	266	91	1243
1110	11	279	241	333	228	321	64	1466
1111	11	386	155	252	332	431	178	1734
1112	11	272	102	218	207	236	52	1087
1113	11	6	6	4	7	37	9	69
1114	11	480	252	427	337	474	98	2068
1115	11	495	410	515	314	475	119	2328
1201	12	0	0	0	0	0	0	0
1301	13	365	289	333	267	546	274	2074
1302	13	368	290	334	268	544	274	2078
1303	13	677	533	611	492	997	503	3813
1304	13	290	228	263	212	431	215	1639
1305	13	181	145	165	135	275	138	1039
1306	13	1445	1145	1314	1055	2138	1080	8177
1307	13	666	525	605	484	985	494	3759
1308	13	637	504	578	465	941	473	3598
1309	13	1497	1180	1359	1089	2210	1116	8451

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
1310	13	1266	1000	1151	920	1869	944	7150
1311	13	1392	1103	1271	1017	2059	1040	7882
1400	1	0	0	0	0	0	0	0
1401	1	0	0	0	0	0	0	0
1402	1	0	0	0	0	0	0	0
2101	1	55	42	30	40	132	37	336
2102	21	48	35	18	33	100	20	254
2103	21	0	0	0	0	0	0	0
2104	21	0	0	0	0	0	0	0
2105	21	0	0	0	0	0	0	0
2106	21	2551	1104	2134	1403	1467	279	8938
2107	21	1825	790	1526	1003	1050	200	6394
2201	22	0	0	0	0	0	0	0
2202	22	140	97	55	79	268	67	706
2203	22	0	0	0	0	0	0	0
2301	23	0	0	0	0	0	0	0
2302	23	0	0	0	0	0	0	0

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
2303	23	0	0	0	0	0	0	0
2304	23	3	3	2	3	8	3	22
2401	24	0	0	0	0	0	0	0
2402	24	0	0	0	0	0	0	0
2403	24	21	21	16	21	54	24	157
2404	24	0	0	0	0	0	0	0
2405	24	0	0	0	0	0	0	0
2501	25	0	0	0	0	0	0	0
2502	25	0	0	0	0	0	0	0
2503	25	0	0	0	0	0	0	0
2504	25	0	0	0	0	0	0	0
2505	25	0	0	0	0	0	0	0
2601	26	0	0	0	0	0	0	0
2602	26	106	57	54	80	253	151	701
2603	26	205	142	163	132	313	84	1039
2604	26	13	8	7	11	47	43	129
2605	26	76	49	43	65	281	260	774

TAZ	SUPERZONE	AGE GROUP						
		H188k_POP_0-14	H188k_POP_15-24	H188k_POP_25-34	H188k_POP_35-44	H188k_POP_45-64	H188k_POP_65	H188K_TOTPOP
2606	26	20	20	16	13	50	21	140
2607	26	0	0	0	0	0	0	0
2608	26	583	325	598	354	458	103	2421
2701	27	0	0	0	0	0	0	0
2702	27	0	0	0	0	0	0	0

B.4 EMPLOYEE BY EMPLOYMENT BY CATEGORY AND TRAFFIC ZONE – 188K HORIZON

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
101	1	188	85	100	0	514	99	986
102	1	969	0	88	0	2490	0	3547
103	1	32	0	0	0	0	0	32
104	1	840	0	0	0	3	0	843
105	1	0	0	0	0	409	0	409
201	2	263	0	0	0	0	0	263
202	2	1572	0	0	0	0	0	1572
203	2	3031	0	15	0	0	0	3046
204	2	1135	25	0	0	94	0	1254
205	2	433	0	0	0	356	0	789
206	2	2685	0	0	0	33	0	2718
207	2	862	10	0	0	29	0	901
301	3	0	0	0	0	0	0	0
302	3	0	0	39	0	194	0	233
303	3	37	0	93	0	322	0	452
304	3	0	0	0	0	3	0	3
305	3	0	0	0	0	0	0	0
306	3	0	0	0	0	10	83	93
307	3	0	0	0	0	0	24	24
308	3	0	0	0	0	0	0	0
309	3	211	136	0	0	0	0	347
310	3	0	0	0	0	11	0	11

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
311	3	176	0	0	0	0	0	176
401	4	0	0	0	0	0	0	0
402	4	0	0	0	0	149	0	149
403	4	0	0	0	0	0	0	0
404	4	0	0	0	0	18	0	18
405	4	0	0	0	0	0	44	44
406	4	38	0	55	0	57	0	150
407	4	0	0	0	0	0	0	0
408	4	0	0	0	0	487	0	487
409	4	0	0	0	0	0	0	0
410	4	218	0	0	0	188	0	406
411	4	0	0	0	0	0	0	0
412	4	157	0	0	0	323	0	480
413	4	0	0	0	0	251	0	251
414	4	0	0	0	0	0	0	0
415	4	0	0	0	0	0	18	18
416	4	659	0	120	0	291	0	1070
417	4	293	0	30	0	0	0	323
418	4	1256	0	108	0	343	0	1707
419	4	1732	0	0	0	0	0	1732
420	4	0	0	0	0	0	0	0
421	4	0	0	0	0	200	0	200
422	4	0	0	0	0	656	0	656
423	4	1174	0	179	0	50	0	1403
424	4	0	49	0	0	0	0	49

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
425	4	0	0	0	0	368	0	368
426	4	0	0	0	0	0	0	0
501	5	0	0	0	0	0	0	0
502	5	0	92	63	0	24	110	289
503	5	246	0	0	0	0	0	246
504	5	0	0	0	0	0	0	0
505	5	0	0	0	0	0	0	0
506	5	0	0	0	0	0	0	0
507	5	0	0	0	0	0	40	40
508	5	0	0	0	0	0	0	0
509	5	0	0	0	0	0	0	0
510	5	193	0	44	0	777	0	1014
511	5	0	0	0	0	0	31	31
512	5	0	0	61	0	100	0	161
513	5	0	0	0	0	0	0	0
514	5	0	0	0	0	0	25	25
515	5	0	0	0	0	13	0	13
516	5	0	2	0	0	3	0	5
601	6	0	4836	513	0	78	0	5427
602	6	0	0	0	0	0	0	0
603	6	0	5	0	0	0	0	5
604	6	0	0	0	0	0	27	27
605	6	0	0	0	0	103	0	103
606	6	0	0	0	0	0	35	35
607	6	0	0	0	0	0	0	0

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
608	6	0	0	0	0	0	0	0
609	6	0	0	0	0	0	40	40
610	6	0	0	0	0	0	900	900
611	6	0	186	122	0	583	0	891
612	6	0	0	43	0	15	0	58
613	6	0	0	0	0	537	0	537
614	6	0	0	0	0	331	0	331
615	6	0	0	0	0	688	0	688
616	6	0	0	52	0	1322	0	1374
617	6	0	115	23	0	231	23	392
618	6	0	244	289	0	786	0	1319
619	6	0	0	0	0	921	0	921
620	6	0	0	0	0	0	0	0
621	6	0	0	0	0	0	0	0
622	6	0	0	0	0	0	0	0
623	6	0	0	0	0	285	0	285
624	6	0	0	0	1	183	0	184
625	6	0	0	0	0	0	0	0
701	7	0	0	0	0	2	298	300
702	7	0	0	0	0	0	0	0
703	7	0	0	250	0	30	0	280
704	7	0	37	2117	64	320	0	2538
705	7	0	0	0	0	0	0	0
706	7	0	0	106	0	148	67	321
707	7	0	0	0	0	0	0	0

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
708	7	0	45	1081	0	693	0	1819
709	7	0	107	120	0	0	0	227
710	7	0	299	481	0	90	0	870
711	7	0	216	1222	0	392	0	1830
712	7	0	102	164	0	334	0	600
713	7	0	0	93	0	77	0	170
714	7	17	0	199	0	41	0	257
715	7	81	4	2959	0	6035	5	9084
716	7	205	0	233	0	419	0	857
717	7	0	0	0	0	0	0	0
718	7	0	0	0	0	0	0	0
801	8	0	0	0	0	4	0	4
802	8	0	0	0	0	0	34	34
803	8	0	31	0	0	0	38	69
804	8	0	0	0	0	6	0	6
805	8	0	0	0	0	0	28	28
806	8	0	0	0	0	0	0	0
807	8	0	0	0	0	0	0	0
808	8	0	172	0	0	0	0	172
809	8	0	0	0	0	5	0	5
810	8	0	0	0	0	0	82	82
811	8	0	0	0	0	0	0	0
812	8	0	27	0	0	53	111	191
813	8	0	0	0	0	0	0	0
814	8	0	0	0	0	0	0	0

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
815	8	0	0	0	0	0	35	35
901	9	0	0	0	0	0	0	0
902	9	0	0	0	0	0	0	0
903	9	0	0	0	0	0	0	0
904	9	0	0	0	0	0	0	0
905	9	0	0	0	0	0	0	0
906	9	0	0	0	0	0	0	0
907	9	0	0	0	0	11	0	11
908	9	0	0	0	0	11	0	11
909	9	0	0	0	0	0	0	0
910	9	0	0	0	0	0	0	0
911	9	0	0	0	0	0	0	0
912	9	0	0	0	0	17	0	17
913	9	0	0	90	0	0	0	90
914	9	0	0	0	0	0	0	0
915	9	0	0	0	0	0	0	0
916	9	0	0	29	0	408	32	469
917	9	0	0	0	0	0	0	0
918	9	0	0	0	0	0	0	0
919	9	0	0	0	0	0	0	0
920	9	0	0	18	0	85	0	103
921	9	0	0	128	0	108	0	236
922	9	0	10	209	0	112	39	370
923	9	0	0	0	0	19	0	19
924	9	0	0	0	0	0	0	0

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
925	9	0	0	0	0	19	50	69
1001	10	0	0	0	0	0	0	0
1002	10	0	0	0	0	0	0	0
1003	10	0	0	20	0	0	0	20
1004	10	0	0	0	0	0	0	0
1005	10	0	0	0	0	83	0	83
1006	10	0	46	0	0	0	47	93
1007	10	0	0	0	0	0	0	0
1008	10	0	0	0	0	0	0	0
1009	10	0	115	0	0	0	281	396
1010	10	0	0	0	0	0	37	37
1011	10	0	0	0	0	0	0	0
1012	10	0	0	0	0	0	0	0
1101	11	0	0	0	0	219	0	219
1102	11	0	0	0	0	0	0	0
1103	11	0	0	0	0	0	0	0
1104	11	0	0	0	0	0	0	0
1105	11	0	0	0	0	106	0	106
1106	11	0	0	0	0	13	77	90
1107	11	0	0	0	0	0	0	0
1108	11	0	0	23	0	108	0	131
1109	11	0	0	0	0	11	0	11
1110	11	0	0	0	0	0	0	0
1111	11	0	0	0	0	0	0	0
1112	11	0	0	0	0	447	0	447

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
1113	11	0	0	0	0	0	0	0
1114	11	0	0	0	0	0	0	0
1115	11	0	0	0	0	0	0	0
1201	12	9	0	0	0	0	0	9
1301	13	20	0	0	0	39	0	59
1302	13	5	0	0	0	13	0	18
1303	13	15	0	12	0	77	50	154
1304	13	5	0	0	0	0	218	223
1305	13	75	0	0	0	19	0	94
1306	13	25	0	33	0	740	99	897
1307	13	5	0	0	0	39	50	94
1308	13	5	0	0	0	39	50	94
1309	13	20	0	42	0	236	99	397
1310	13	25	0	0	0	77	99	201
1311	13	35	0	0	0	77	50	162
1400	1	0	0	0	0	620	0	620
1401	1	0	0	0	0	620	0	620
1402	1	0	0	0	0	620	0	620
2101	1	0	0	0	0	0	0	0
2102	21	0	0	0	0	0	0	0
2103	21	2480	0	0	0	0	0	2480
2104	21	1025	0	0	0	0	0	1025
2105	21	1899	0	0	0	0	0	1899
2106	21	392	73	100	137	127	82	911
2107	21	727	135	186	254	237	152	1691

B.4 Employee by Employment by Category and Traffic Zone – 188K Horizon

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
2201	22	0	0	0	0	0	0	0
2202	22	0	0	0	0	0	0	0
2203	22	0	0	0	0	0	0	0
2301	23	0	0	0	0	0	0	0
2302	23	1448	0	0	0	0	0	1448
2303	23	580	0	0	0	0	0	580
2304	23	0	0	0	0	0	0	0
2401	24	0	0	0	0	342	0	342
2402	24	0	0	0	0	59	0	59
2403	24	1098	0	0	0	0	0	1098
2404	24	215	0	0	0	0	0	215
2405	24	0	0	0	0	60	0	60
2501	25	0	0	0	0	312	275	587
2502	25	0	0	0	0	297	0	297
2503	25	0	0	0	0	126	0	126
2504	25	0	0	0	0	215	81	296
2505	25	0	0	0	0	0	0	0
2601	26	0	0	0	0	0	318	318
2602	26	155	9	156	0	13	0	333
2603	26	152	0	0	0	9	0	161
2604	26	0	0	0	0	0	0	0
2605	26	0	0	0	0	0	0	0
2606	26	0	0	0	0	0	0	0
2607	26	0	0	0	0	0	0	0
2608	26	0	195	0	0	130	0	325

TAZ	SUPERZONE	EMPLOYMENT CATEGORY						
		H188k_EMP_IN DUSTRIAL	H188k_EMP_IN STIT	H188k_EMP_OF FICE	H188k_EMP_OT HER	H188k_EMP_RE TAIL	H188k_EMP_SCH OOL	H188K_TOTE MP
2701	27	1623	0	0	0	0	0	1623
2702	27	2021	0	0	0	0	0	2021

APPENDIX C

OBSERVED TRIP GENERATION RATES

C.1 HTS TRIP PRODUCTION RATES BY PRODUCTION SUPERZONE

C.1.1 HOME-BASED WORK (HBW) BY AGE GROUP

AM PEAK

HBW	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Age 15-24	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.10	0.00	0.00
Age 25-34	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.29	0.00	0.00
Age 35-44	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.26	0.00	0.00
Age 45-64	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.21	0.00	0.00
Age 65+	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.00

PM PEAK

HBW	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.000	0.00	0.00	0.00
Age 15-24	0.00	0.00	0.00	0.00	0.00	0.107	0.00	0.00	0.131	0.113	0.00	0.00	0.00
Age 25-34	0.00	0.00	0.00	0.00	0.00	0.270	0.00	0.00	0.330	0.285	0.00	0.00	0.00
Age 35-44	0.00	0.00	0.00	0.00	0.00	0.227	0.00	0.00	0.278	0.240	0.00	0.00	0.00
Age 45-64	0.00	0.00	0.00	0.00	0.00	0.240	0.00	0.00	0.294	0.254	0.00	0.00	0.00
Age 65+	0.00	0.00	0.00	0.00	0.00	0.037	0.00	0.00	0.046	0.040	0.00	0.00	0.00

C.1.2 HOME-BASED SCHOOL (HBS) BY AGE GROUP

AM PEAK

HBS	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.00	0.27	0.00	0.11	0.00	0.00	0.28	0.13	0.27	0.00	0.00
Age 15-24	0.00	0.00	0.00	0.18	0.00	0.08	0.00	0.00	0.19	0.09	0.18	0.00	0.00
Age 25-34	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.03	0.01	0.03	0.00	0.00
Age 35-44	0.00	0.00	0.00	0.24	0.00	0.10	0.00	0.00	0.25	0.12	0.24	0.00	0.00
Age 45-64	0.00	0.00	0.00	0.05	0.00	0.02	0.00	0.00	0.05	0.03	0.05	0.00	0.00
Age 65+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PM PEAK

HBS	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.170	0.124	0.178	0.00	0.00
Age 15-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.093	0.068	0.097	0.00	0.00
Age 25-34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.017	0.012	0.017	0.00	0.00
Age 35-44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.110	0.080	0.115	0.00	0.00
Age 45-64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.022	0.016	0.023	0.00	0.00
Age 65+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.00

C.1.3 HOME-BASED OTHER (HBO) BY AGE GROUP

AM PEAK

HBO	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.02	0.00	0.03	0.00	0.02	0.00	0.02	0.02	0.02	0.00	0.00
Age 15-24	0.00	0.00	0.01	0.00	0.03	0.00	0.02	0.00	0.01	0.02	0.01	0.00	0.00
Age 25-34	0.00	0.00	0.08	0.00	0.16	0.00	0.12	0.00	0.08	0.12	0.09	0.00	0.00
Age 35-44	0.00	0.00	0.09	0.00	0.17	0.00	0.13	0.00	0.08	0.13	0.10	0.00	0.00
Age 45-64	0.00	0.00	0.07	0.00	0.14	0.00	0.11	0.00	0.07	0.11	0.08	0.00	0.00
Age 65+	0.00	0.00	0.09	0.00	0.18	0.00	0.14	0.00	0.09	0.14	0.10	0.00	0.00

PM PEAK

HBO	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.101	0.00	0.00	0.101	0.00	0.00	0.00	0.149	0.00	0.00	0.00
Age 15-24	0.00	0.00	0.099	0.00	0.00	0.099	0.00	0.00	0.00	0.145	0.00	0.00	0.00
Age 25-34	0.00	0.00	0.274	0.00	0.00	0.274	0.00	0.00	0.00	0.403	0.00	0.00	0.00
Age 35-44	0.00	0.00	0.275	0.00	0.00	0.275	0.00	0.00	0.00	0.405	0.00	0.00	0.00
Age 45-64	0.00	0.00	0.262	0.00	0.00	0.262	0.00	0.00	0.00	0.385	0.00	0.00	0.00
Age 65+	0.00	0.00	0.321	0.00	0.00	0.321	0.00	0.00	0.00	0.472	0.00	0.00	0.00

C.2 HTS TRIP GENERATION RATES BY HOUSEHOLD SUPERZONE

C.2.1 NON HOME-BASED OTHER (NHB) BY AGE GROUP

AM PEAK

NHB	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.00	0.00
Age 15-24	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00
Age 25-34	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.00	0.00
Age 35-44	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.00
Age 45-64	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.00
Age 65+	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00

PM PEAK

NHB	Internal Superzone												
Age Group	1	2	3	4	5	6	7	8	9	10	11	12	13
Age 0-14	0.00	0.00	0.093	0.00	0.071	0.071	0.00	0.00	0.059	0.082	0.082	0.00	0.00
Age 15-24	0.00	0.00	0.073	0.00	0.056	0.056	0.00	0.00	0.047	0.064	0.064	0.00	0.00
Age 25-34	0.00	0.00	0.206	0.00	0.156	0.156	0.00	0.00	0.132	0.181	0.181	0.00	0.00
Age 35-44	0.00	0.00	0.346	0.00	0.263	0.263	0.00	0.00	0.221	0.304	0.304	0.00	0.00
Age 45-64	0.00	0.00	0.161	0.00	0.123	0.123	0.00	0.00	0.103	0.142	0.142	0.00	0.00
Age 65+	0.00	0.00	0.105	0.00	0.079	0.079	0.00	0.00	0.067	0.092	0.092	0.00	0.00

[illegible]

APPENDIX D

GATEWAY & COMMERCIAL VEHICLE DEMANDS

D.1 GATEWAY DEMAND MATRIX

D.1.1 BASE GATEWAY DEMAND

AM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	10	6	15
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	19	20	78
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	37	34	82
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	38	36	94
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	43	77	260
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	103	140	333
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	40	26	59
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	27	26	39
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	167	47	85
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	30	37	26
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	51	57	48
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	7	12	50
31	5	63	1	42	81	144	101	23	60	15	26	0	0	1	0	0	0	0	0	35	0	0	1476	0
32	8	15	25	38	46	44	28	22	161	36	49	0	0	1	0	0	0	0	0	7	0	0	0	53
33	13	54	47	52	142	208	33	32	78	63	89	0	0	1	0	0	0	0	0	31	1514	0	0	0
34	9	180	1	96	498	759	347	78	159	67	110	0	0	1	0	0	0	0	0	119	0	269	0	0

PM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	18	9	33
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	31	29	171
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	63	48	180
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	127	65	52	205
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	72	111	569
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205	174	201	731
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	69	37	130
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	47	37	86
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	283	68	187
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	51	54	57
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	86	82	105
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	12	17	110
31	6	77	1	50	99	175	122	27	72	18	32	0	0	1	0	0	0	0	0	42	0	0	1516	0
32	10	17	28	43	53	50	32	25	185	41	57	0	0	1	0	0	0	0	0	8	0	0	0	53
33	18	74	66	71	196	288	46	44	108	87	123	0	0	1	0	0	0	0	0	43	1739	0	0	0
34	6	131	1	70	362	552	253	57	116	48	80	0	0	1	0	0	0	0	0	87	0	269	0	0

D.1.1 188K GATEWAY DEMAND

AM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	15	9	22
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	27	29	113
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	54	49	118
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	55	52	135
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	61	111	375
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	148	202	481
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	58	37	85
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	40	37	57
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	241	68	123
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	44	54	38
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	74	83	69
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	10	17	72
31	7	91	1	60	118	208	145	33	86	22	38	0	0	1	0	0	0	0	0	50	0	0	2130	0
32	12	22	36	54	66	63	40	32	233	52	71	0	0	1	0	0	0	0	0	9	0	0	0	77
33	19	77	68	74	205	301	48	46	113	90	128	0	0	1	0	0	0	0	0	45	2185	0	0	0
34	13	261	2	139	719	1096	502	113	230	96	159	0	0	2	0	0	0	0	0	172	0	389	0	0

PM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	23	12	42
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	41	38	221
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	81	62	231
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	164	83	67	264
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	93	143	733
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265	224	259	941
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	88	47	167
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	60	47	111
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103	365	88	240
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	66	69	73
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	111	106	135
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	2
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	16	22	141
31	7	99	1	65	127	225	157	35	93	23	41	0	0	2	0	0	0	0	0	54	0	0	1952	0
32	12	22	36	56	68	65	41	33	238	53	73	0	0	1	0	0	0	0	0	10	0	0	0	69
33	24	95	84	92	253	371	59	57	139	112	158	0	0	1	0	0	0	0	0	55	2239	0	0	0
34	8	169	1	90	466	711	325	73	149	62	103	0	0	1	0	0	0	0	0	111	0	347	0	0

D.2 COMMERCIAL VEHICLE DEMAND MATRIX

D.2.1 BASE COMMERCIAL VEHICLE DEMAND

AM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	6	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	3
2	0	0	0	61	17	35	0	0	11	0	0	0	0	0	0	0	0	0	0	30	23	0	0	6
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	21	0	14	0	0	47	0	21	0	0	0	0	0	0	0	0	0	0	0	0	5	0	34
5	12	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	10	0	0
6	0	26	0	0	0	0	0	0	0	15	0	17	0	0	0	0	0	0	17	0	35	12	0	0
7	0	0	0	14	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	6	0	8	0	0	0	0	0	0	0	5	0	0	0	6	0	0	0	0	0	34	0	0
10	0	0	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	25	0	0	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	8	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	14	0	0	30
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0
31	0	39	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115	0
32	4	0	0	0	0	10	0	0	18	0	0	0	0	6	0	6	0	0	0	0	0	0	0	6
33	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	0	0	0
34	0	0	0	29	0	50	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0

D.2 Commercial Vehicle Demand Matrix

PM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2
2	0	0	0	37	10	21	0	0	6	0	0	0	0	0	0	0	0	0	0	18	14	0	0	4
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	13	0	8	0	0	28	0	13	0	0	0	0	0	0	0	0	0	0	0	0	3	0	20
5	7	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	6	0	0
6	0	16	0	0	0	0	0	0	0	9	0	10	0	0	0	0	0	0	10	0	21	7	0	0
7	0	0	0	8	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	4	0	5	0	0	0	0	0	0	0	3	0	0	0	4	0	0	0	0	0	20	0	0
10	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	15	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	5	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	0	0	18
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
31	0	23	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0
32	3	0	0	0	0	6	0	0	11	0	0	0	0	4	0	4	0	0	0	0	0	0	0	4
33	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0
34	0	0	0	18	0	30	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0

D.2.1 188K COMMERCIAL VEHICLE DEMAND

AM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	15	9	22
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	27	29	113
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	54	49	118
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	55	52	135
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	61	111	375
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	148	202	481
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	58	37	85
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	40	37	57
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	241	68	123
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	44	54	38
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	74	83	69
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	10	17	72
31	7	91	1	60	118	208	145	33	86	22	38	0	0	1	0	0	0	0	0	50	0	0	2130	0
32	12	22	36	54	66	63	40	32	233	52	71	0	0	1	0	0	0	0	0	9	0	0	0	77
33	19	77	68	74	205	301	48	46	113	90	128	0	0	1	0	0	0	0	0	45	2185	0	0	0
34	13	261	2	139	719	1096	502	113	230	96	159	0	0	2	0	0	0	0	0	172	0	389	0	0

PM PEAK

Superzone	1	2	3	4	5	6	7	8	9	10	11	12	13	21	22	23	24	25	26	27	31	32	33	34
1	0	0	0	5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	3
2	0	0	0	53	15	30	0	0	9	0	0	0	0	0	0	0	0	0	0	26	19	0	0	5
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	18	0	12	0	0	41	0	18	0	0	0	0	0	0	0	0	0	0	0	0	4	0	29
5	10	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	9	0	0
6	0	23	0	0	0	0	0	0	0	13	0	15	0	0	0	0	0	0	15	0	30	10	0	0
7	0	0	0	12	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	5	0	7	0	0	0	0	0	0	0	4	0	0	0	5	0	0	0	0	0	29	0	0
10	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	22	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	7	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	12	0	0	26
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0
31	0	34	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
32	4	0	0	0	0	9	0	0	16	0	0	0	0	5	0	5	0	0	0	0	0	0	0	5
33	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0	0	0
34	0	0	0	25	0	43	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0

APPENDIX E

FUTURE NETWORK IMPROVEMENTS

E.1 FUTURE NETWORK IMPROVEMENTS

Item	Project Description	Construction Start Year	188K Base Model	188K Buildout Model
4	40318 - 80th Avenue - Phase 1 - Highway 11A to 77 Street	2035	Y	Y
5	40354 - 80th Avenue - Phase 2 - 77 Street to 800 metres south of 77 Street	2050	N	Y
7	40384- Highway 11A from QEII to Taylor Drive - 2 lanes to 4 lanes	2035	Y	Y
8	40388 - Ross Street from 20 Avenue to 600 metres east of 20 Avenue - 4 lane divided arterial	2050	N	Y
9	40389 - Highway 11A and Taylor Drive Roundabout	2036	Y	Y
10	40383 - 32 Street from Daines Avenue to 20 Avenue - 4 lane divided arterial	2049	N	Y
11	40384 - Highway 11A from Taylor Drive to Gaetz Avenue - 2 lanes to 4 lanes	2042	Y	Y
12	77 Street between 75 Avenue and 80 Avenue	2041	Y	Y
13	75 Avenue between Burnt Bluff Street and 79 Street	2040	Y	Y
14	77th Street from 80 Avenue to 800 metres west of 80 Avenue	2042	Y	Y
16	40355 - 67 Street from Threfall Gate to 20 Avenue - 2 lanes to 4 lanes	2041	Y	Y
18	19 Street from east of Vermont Avenue to 20 Avenue - 2 lanes to 4 lanes	2057	N	Y
19	19 Street and 30 Avenue Roundabout	2057	N	Y
20	40420 - Northland Drive from Gaetz Avenue to 49 Avenue - 4 lanes	2043	Y	Y
21	Northland Drive - Red Deer River Bridge	2067	N	Y
22	Northland Drive from 49 Avenue to 78 Street Crescent - 2 lanes	2067	N	Y
23	Northland Drive from 78 Street Crescent to 30 Avenue - 2 lanes	2067	N	Y
24	30 Avenue from Northland Drive to 67 Street - 2 lanes to 4 lanes	2040	N	Y
25	40413 - Highway 11A and Gaetz Avenue Roundabout	2043	N	Y
26	40419 - CP Rail Overpass (Hwy 11A between Taylor Dr & Gaetz Avenue) J40419	2042	Y	Y
27	20 Avenue from 55 St to 32 St - 2 lanes	2048	N	Y
28	20 Avenue from 67 St to 400 m North of 55 St - 2 lanes	2046	N	Y
29	20 Avenue 400 m North of 55 Street to 55 Street - 2 lanes	2047	N	Y
30	20 Avenue from 32 St to 19 St - 2 lanes	2049	N	Y
31	Northland Drive from 30 Avenue to 20 Avenue - 2 lanes	2045	N	Y

E.1 Future Network Improvements

Item	Project Description	Construction Start Year	188K Base Model	188K Buildout Model
32	Taylor Drive from Highway 11A to 400 metres north of Highway 11A (Hazlett Access) - 4 lane divided arterial	2038	Y	Y
33	Taylor Drive from 400 metres north of Highway 11A (Hazlett Access) to New Roadway (Item 36)- 4 lane divided arterial	2039	Y	Y
34	Taylor Drive from New Roadway to Township Road 391 - 4 lane divided arterial	2041	N	Y
35	Taylor Drive from Township Road 391 to 800 metres north - 4 lane undivided arterial	2050	N	Y
36	New roadway between Highway 11A and Township Road 391 from Taylor Drive to Highway 2A - 4 lane undivided arterial	2040	N	Y
37	Township Road 391 between Taylor Drive and Highway 2A - 4 lane divided arterial	2042	Y	Y
38	Highway 2A and Township 391 Interchange	2067	N	Y
39	30 Avenue from Northland Drive to Township Road 390 - 2 lanes	2049	N	Y
40	67 Street from 20 Avenue to 400 metres east of 20 Avenue - 2 lanes to 4 lanes	2057	N	Y
41	Northland Drive from Gaetz Avenue to 67 Street - 2 lanes to 4 lanes	2055	N	Y
42	32 Street from 20 Avenue to east quarter line (900m) - 2 lanes	2050	N	Y
43	20 Avenue from 67 Street to 32 Street - 2 lanes to 4 lanes	2056	N	Y
44	32 Street from east quarter line to 10 Avenue (900m) - 2 lanes	2056	N	Y
45	22 Street from 20 Avenue to east quarter line (900m) - 2 lanes	2051	N	Y
46	20 Avenue from 32 Street to 19 Street - 2 lanes to 4 lanes	2057	N	Y
47	19 Street from 20 Avenue to 400 metres east of 20 Avenue - 2 lanes to 4 lanes	2058	N	Y
48	22 Street from east quarter line to 10 Avenue (900m) - 2 lanes	2056	N	Y
49	19 Street from 400 metres east of 20 Avenue to 10 Avenue - 2 lanes to 4 lanes	2059	N	Y
50	Northland Drive from Gaetz Avenue to 67 Street - 4 lanes to 6 lanes	2067	N	Y
51	Northland Drive from 67 Street to 39 Street - 4 lanes to 6 lanes	2067	N	Y
52	Northland Drive from 39 Street to 19 Street - 4 lanes to 6 lanes	2067	N	Y
53	32 Street and 20 Avenue Interchange	2067	N	Y
54	Highway 11A and Gaetz Avenue Interchange	2067	N	Y
55	40421 - Northland Drive Right of Way Acquisition	2019	Y	Y
56	Interchange at Taylor Drive/Hwy 11A	2067	N	Y
57	Ross Street from 600 metres east of 20 Avenue to 10 Avenue - 4 lane divided arterial	2055	N	Y

E.1 Future Network Improvements

Item	Project Description	Construction Start Year	188K Base Model	188K Buildout Model
58	NorthLand Drive - CN Rail Overpass	2067	N	Y
59	19 Street and 20 Avenue Interchange	2067	N	Y
60	New Roadway from Twp Rd 391 to 880 metres north - 4 lane undivided arterial	2050	N	Y
61	Ross Street from Donlevy Avenue to 20th Avenue - 4 lane divided arterial	2048	N	Y
62	67 Street from 400 metres east of 20 Avenue to 10 Avenue - 2 lanes to 4 lanes	2058	N	Y
64	22 Street and 20 Avenue Roundabout	2051	N	Y
N/A	67 Street and 20 Avenue Interchange	N/A	N	Y

APPENDIX F

STATEMENT OF LIMITATIONS

Statement of Limitations

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