TRANSPORTATION PLANNERS AND ENGINEERS

Century Park DC2 Rezoning
Traffic Impact Assessment

Final Report

Prepared for

ProCura

Date

April 5, 2017

Prepared by

Bunt & Associates

Project No.

3084.05

CORPORATE AUTHORIZATION

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TABLES

1. INTRODUCTION

1.1 Background

The Century Park DC2 zone was originally approved in 2005 and provided the foundation for the development of a comprehensive mixed use urban village. Over the past 10 years, ProCura has constructed four residential buildings along 109 Street and built out the commercial area north of 23 Avenue between 109 Street and 111 Street. In order to provide additional flexibility and innovation in site design over multiple design phases, Stantec, on behalf of ProCura, is currently preparing a revised DC2 zone for the Century Park development site.

A traffic impact assessment (TIA) was completed in October 2004 and additional TIA work was completed in June 2013. The proposed DC2 zone would allow for an increase in residential units and commercial space within the development. As well, the internal site layout is proposed to be revised to include a grid network of on-site streets that promotes walkability throughout the site. As part of the rezoning application, an updated TIA has been identified as being required.

1.2 Study Objectives

The objective of the TIA is to identify the projected traffic activity along the arterial and collector roadways adjacent to the proposed Century Park development and identify roadway cross-sections, intersection geometry, and traffic control required to accommodate the projected traffic volumes at acceptable levels of service.

1.3 Study Methodology

The methodology used in preparation of the Century Park DC2 Rezoning TIA includes the following key components:

- An examination of the existing and future roadway networks;
- The review and confirmation of background traffic volumes associated with the study area;
- The review of land use assumptions identified within the proposed development;
- The identification of traffic on the future roadway network that is anticipated to be generated by the proposed Century Park development based on trip generation, trip distribution, and trip assignment assumptions;
- A review of the arterial/arterial and arterial/collector intersection operations adjacent to the proposed development to identify potential future traffic control and intersection geometry;
- A review of the proposed internal roadway network to identify potential capacity constraints within the plan area; and
- A review of pedestrian and bicycle connections to adjacent neighbourhoods, throughout the proposed development, and to existing transit facilities.

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2. SITE CONTEXT – AREA CONDITIONS

2.1 Site Location

Century Park is located within the west portion of the Ermineskin neighbourhood in the southwest sector of the City of Edmonton. Century Park is bounded by existing multifamily residential developments to the north, 23 Avenue to the south, 109 Street to the east, and 111 Street to the west. **Exhibit 2-1** illustrates the location of Century Park within the City of Edmonton.

2.2 Existing Conditions

The existing conditions are summarized on **Exhibit 2-2**.

2.2.1 Site Development and Adjacent Land Uses

The site currently includes four residential buildings along 109 Street north of 25 Avenue and commercial land uses north of 23 Avenue between 109 Street and 111 Street. The Century Park LRT station and transit centre is constructed on 111 Street along the west side of the development site and the City of Edmonton currently leases land within the western portion of the Century Park site to operate a park 'n' ride that includes approximately 1,320 parking spaces. The remainder of the site is currently vacant.

As portions of the site have already been constructed, the proposed DC2 and this study focus on the undeveloped areas of the Century Park site as noted on Exhibit 2-2.

The site is surrounded by residential development to the north, to the east across 109 Street, and to the west across 111 Street. Additional commercial development is located south of 23 Avenue between approximately 108A Street and 111 Street.

2.2.2 Transportation System

Century Park is currently accessed via the following arterial and collector roadways:

- ***111 Street*** is a north-south six-lane divided arterial north of 23 Avenue. LRT tracks currently run at-grade along the centre of the roadway between the Century Park LRT station and 57 Avenue. South of 23 Avenue, 111 Street is a four-lane divided arterial. Left and right turn bays are developed along the 111 Street corridor in the vicinity of the proposed development and the posted speed limit is 60 km/hr.

- ***23 Avenue*** is an east-west four-lane divided arterial adjacent to Century Park. Left and right turn bays are currently developed along the 23 Avenue corridor in the vicinity of the proposed development and the posted speed limit is 60 km/hr.

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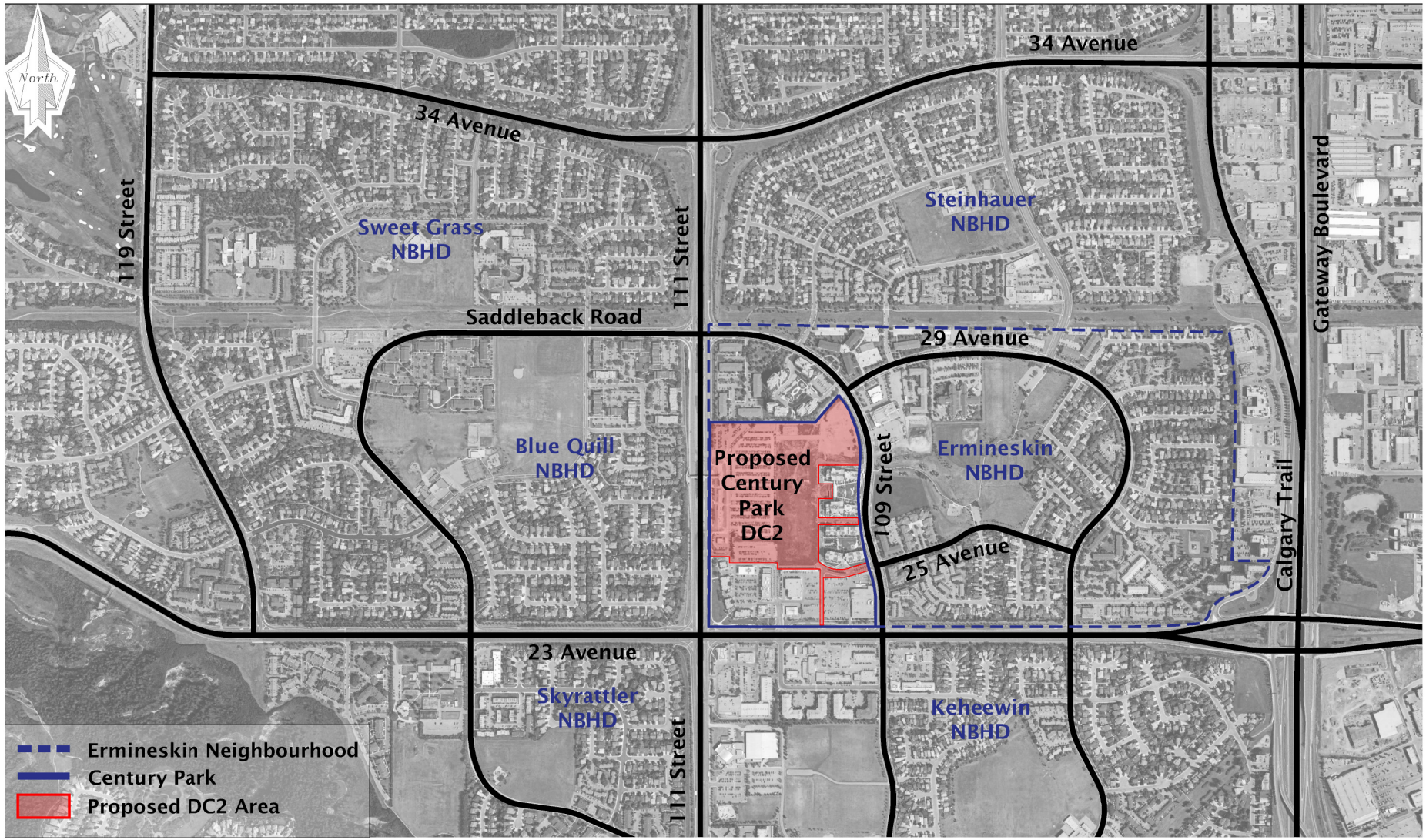

Exhibit 2-1

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Site Location

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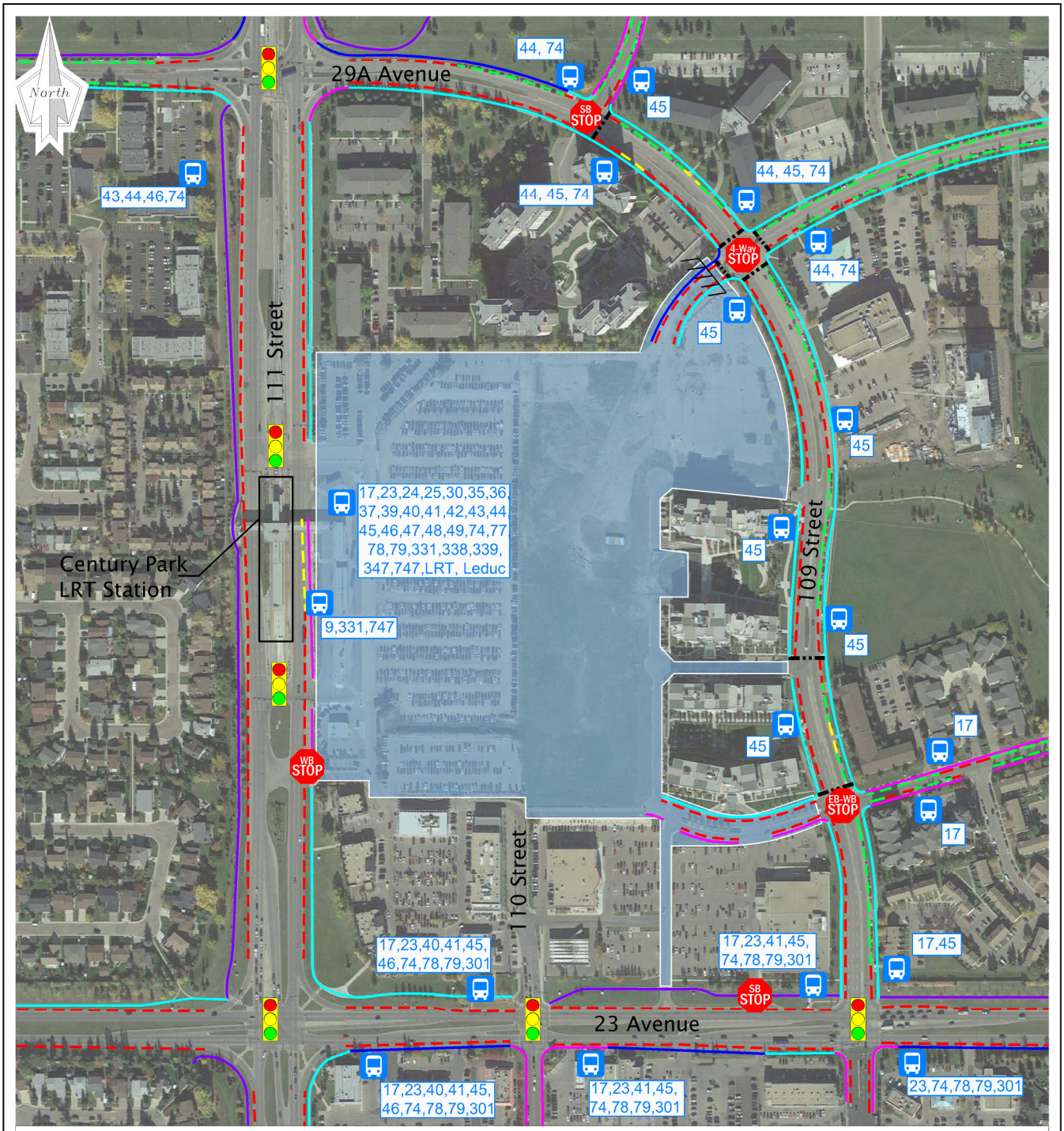

Exhibit 2-2

Existing Conditions (March 2016)

- ***109 Street (29A Avenue)*** is a divided collector roadway running north-south along the east boundary of Century Park, transitioning to 29A Avenue east of 111 Street. West of 111 Street, 29A Avenue is named Saddleback Road. 109 Street includes one travel lane and one parking lane in the northbound direction and two travel lanes in the southbound direction. Left turn bays are also provided at the intersections and access points along 109 Street. The posted speed limit along 109 Street is 50 km/hr.

The following intersections have been identified for inclusion in this assessment as they represent key intersections in the vicinity of the proposed development that are anticipated to accommodate the majority of the study area traffic:

- ***29A Avenue (Saddleback Road North) and 111 Street*** is a four-legged signalized intersection. The LRT tracks run north-south through the centre of the intersection. An LRT crossing for pedestrians is currently constructed along the south approach and crosswalks are also provided across the east and west approaches. Pedestrians are banned from crossing the north approach.

- ***28 Avenue and 111 Street*** is a three-legged signalized intersection with a crosswalk painted on the east approach. The east approach currently provides access to the City's park 'n' ride lot within Century Park. Pedestrians are not permitted to cross east-west across 111 Street at the intersection; instead, pedestrians are directed to a pedway provided between the Transit Centre, the Century Park LRT station platform, and the Blue Quill neighbourhood to the west.

- The ***111 Street and Century Park Transit Centre Access*** is a three-legged signalized intersection that provides transit access to the Century Park Transit Centre. There is currently a painted crosswalk on the east approach.

- ***25 Avenue and 111 Street*** is a three-legged unsignalized intersection with stop control on the east approach. The east approach currently provides access to the City's park 'n' ride lot and commercial developments within Century Park. There are no painted crosswalks at the 25 Avenue/111 Street intersection.

- ***23 Avenue and 111 Street*** is a four-legged signalized intersection with crosswalks on all approaches. Slotted left turn bays and channelized right turn bays are constructed on all approaches of the 23 Avenue/111 Street intersection.

- ***23 Avenue and 110 Street*** is a four-legged signalized intersection that provides access to the commercial developments on the north and south sides of 23 Avenue. Crosswalks are provided on all approaches.

- ***23 Avenue and 109A Street*** is a right-in/right-out access to commercial developments within the south portion of Century Park.

- ***23 Avenue and 109 Street*** is a four-legged signalized intersection with crosswalks painted on all approaches. Slotted left turn bays are constructed on the east and west approaches, left turn bays are constructed on the north and south approaches, and a right turn bay is constructed on the north approach.

- ***25 Avenue and 109 Street*** is a four-legged unsignalized intersection with stop control on the east and west approaches. The west approach provides access to existing residential and commercial development within Century Park, while the east approach provides access to the Ermineskin neighbourhood. There is a painted crosswalk across the north approach.

- ***26 Avenue (south Century Park site access) and 109 Street*** is a three-legged unsignalized intersection with stop control on the west approach. The intersection provides access to existing medium density residential developments located within the east part of Century Park. There is a painted crosswalk along the north approach.

- ***28 Avenue (central Century Park site access) and 109 Street*** is a three-legged unsignalized intersection. The west approach is assumed to be stop controlled; however, a stop sign is not currently installed. The intersection currently provides access to medium density residential developments within the eastern portion of Century Park. There are no painted crosswalks at the 28 Avenue/109 Street intersection.

- ***29 Avenue and 109 Street*** is an all-way stop controlled intersection with crosswalks painted on all approaches. The west approach is currently constructed; however, it was closed to traffic when the site visit was completed in March 2016. Since that time the access has been opened to accommodate exiting only from the LRT park 'n' ride parking area.

2.2.3 Transit Routes

The Century Park LRT station is currently the south terminus of the Capital LRT line. In addition to the LRT station, the Century Park transit centre currently accommodates 34 transit routes. **Appendix A** summarizes the transit routes that currently access the Century Park transit centre as well as routes that stop along the adjacent roadway network.

2.2.4 Traffic Volumes

Existing and historic traffic flows on arterial roadways adjacent to the development area were ascertained based upon a review of the City of Edmonton's transportation data website. **Table 2-1** summarizes the historic Average Annual Weekday Traffic (AAWDT) volume information.

Table 2-1: Historic AAWDT Volumes

Roadway	2009	2010	2011	2012	2013	2014
111 Street North of 23 Avenue	20,300	-	-	-	-	31,200
111 Street North of Saddleback Road North	-	24,400	-	24,200	-	26,000
23 Avenue West of 109 Street	24,900	-	27,700	29,900	28,400	-
23 Avenue West of 110 Street	19,600	-	-	-	-	-
23 Avenue West of 111 Street	23,700	27,000	27,400	27,600	26,400	26,900

Overall, the historic daily traffic volumes along the adjacent arterials reflect the growth patterns within the study area since 2009.

Intersection turning movement counts for the following intersections were also obtained from the City of Edmonton's transportation data website:

- 29A Avenue (Saddleback Road) and 109 Street (2014);
- 23 Avenue and 111 Street (2013);
- 23 Avenue and 110 Street (2013); and
- 23 Avenue and 109 Street (2014).

It is noted that a 2014 traffic count is available online for the 23 Avenue/111 Street intersection; however, the turning movement volumes are significantly different from historic counts suggesting that the data by movement may have been switched during processing; therefore, the 2013 traffic count was included in the review.

Intersection turning movement volumes for the other key study area intersections were collected by Bunt and Associates as part of the 2013 Century Park Rezoning Application Transportation Review and through the completion of the 2016 traffic count program as follows:

- 28 Avenue and 111 Street (June 6, 2012);
- 26 Avenue and 111 Street (June 6, 2016);
- 25 Avenue and 109 Street (April 7, 2016);
- 26 Avenue and 109 Street (April 5, 2016);
- 28 Avenue and 109 Street (April 5, 2016); and
- 25 Avenue and 109 Street (AM July 18, 2013, PM July 30, 2013).

Exhibit 2-3 summarizes the AM and PM peak hour traffic volumes for the key study area intersections. Detailed traffic count information for the counts completed by Bunt & Associates is included in **Appendix B.**

2.3 Future Site Conditions

2.3.1 Horizon Year

The horizon year selected for analysis is assumed to be 2047 in order to correspond with the City of Edmonton's 2047 traffic model. It is anticipated that the development could be completely built out within this horizon.

2.3.2 Transportation Network

Plans have been prepared for the extension of the Capital LRT Line from Century Park to 41 Avenue SW and it is anticipated that construction of the extension will be complete within the 2047 horizon. The following roadway and intersection modifications are anticipated to be completed as part of the implementation of the LRT extension:

- The LRT is planned to be grade separated (below grade) through the 23 Avenue/111 Street intersection;
- 111 Street is planned to be upgraded to a six-lane divided arterial standard south of 23 Avenue;
- 23 Avenue is planned to be upgraded to a six-lane divided arterial through the 111 Street intersection. Three westbound lanes are planned from 110 Street to approximately 180m west of 111 Street and three eastbound lanes are planned from Saddleback Road to 110 Street;
- The 25 Avenue/111 Street intersection is planned to be downgraded to an unsignalized right in/right out access;
- The 23 Avenue/111 Street intersection is planned to include dual left turn bays, three through lanes, and channelized right turn bays on all four approaches; and
- The 23 Avenue/111 Street intersection is planned to include one left turn bay, two through lanes, and one shared through/right lane on the east approach and one left turn bay, two through lanes, and one right turn bay on the west approach. No changes are proposed to the north and south approaches.

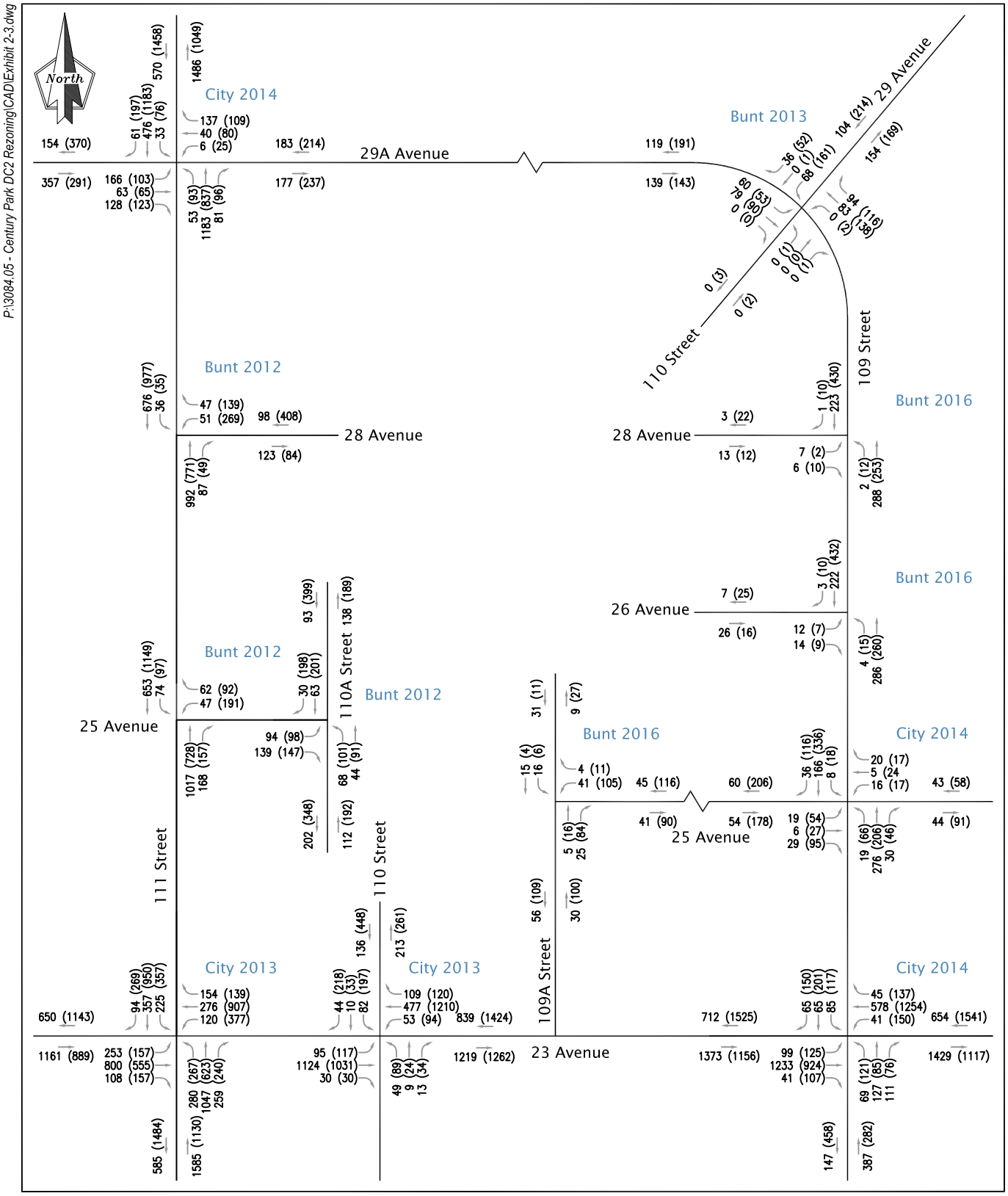

Exhibit 2-3

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Existing Traffic Volumes

2.3.3 Background Traffic Volumes

Background traffic is the component of traffic on the adjacent road system that would be present regardless of the proposed Century Park development proceeding. The City of Edmonton provided a standard package from their 2047 model for use in the assessment. The standard package provides AM peak hour, PM peak hour, and daily link volumes on the future arterial roadway network based on a set of population, employment, and transportation infrastructure assumptions. The following key model assumptions are noted:

- The 2047 model includes the extension of the Capital LRT line to Heritage Valley;
- The 2047 model includes approximately 10,500 people within the Ermineskin and Steinhauer neighbourhoods as compared to an existing (2016) population of 7,370; and
- The 2047 model includes approximately 2,700 employees within Ermineskin and Steinhauer (accessed via 34 Avenue, 23 Avenue, and 111 Street) with the bulk of the employment associated with Century Park.

A copy of the City of Edmonton's 2047 standard model package is provided in **Appendix C** for reference.

The bulk of the potential future growth within Ermineskin is anticipated to be associated with development within Century Park. Therefore, adjustments to the 2047 model volumes were required to provide background traffic for use in the assessment. The following steps were used to determine background traffic for use in the assessment:

- Intersection turning movement volumes were estimated for the key arterial/arterial and arterial/collector intersections from the arterial link volumes identified in the model outputs.
- The turning movement volumes into and out of the Ermineskin neighbourhood at the 29A Avenue/Saddleback Road North/111 Street, 28 Avenue/111 Street, 25 Avenue/111 Street, 23 Avenue/110 Street, and 23 Avenue/109 Street intersections from the 2047 model were removed from the network.
- The existing measured turning movement volumes into and out of the Ermineskin neighbourhood at the 29A Avenue/Saddleback Road North/111 Street, 28 Avenue/111 Street, 25 Avenue/111 Street, 23 Avenue/110 Street, and 23 Avenue/109 Street intersections were added back into the network.

This process updates the model volumes to reflect current traffic activity using the site accesses and the 109 Street/29A Avenue corridor to access the adjacent arterials, while continuing to account for growth on the adjacent arterial roadway network that may be present as a result of additional development south of Anthony Henday Drive. Based on the above, the background traffic volumes used in the assessment includes traffic associated with existing residential and commercial development on the Century Park site, including approximately 1,320 park 'n' ride parking spaces. It is important to note that all of the existing turning movement volumes used in the development of the background traffic volumes reflect the existing peak hour of adjacent street traffic as opposed to the peak hour of generator for specific land uses (e.g. AM peak hour park 'n' ride).

Exhibit 2-4 illustrates the 2047 AM and PM peak hour background traffic volumes used in the assessment, while **Exhibit 2-5** illustrates the 2047 daily background traffic volumes used in the assessment. Daily volumes were estimated by multiplying the sum of the AM and PM peak hour volumes by a factor of six.

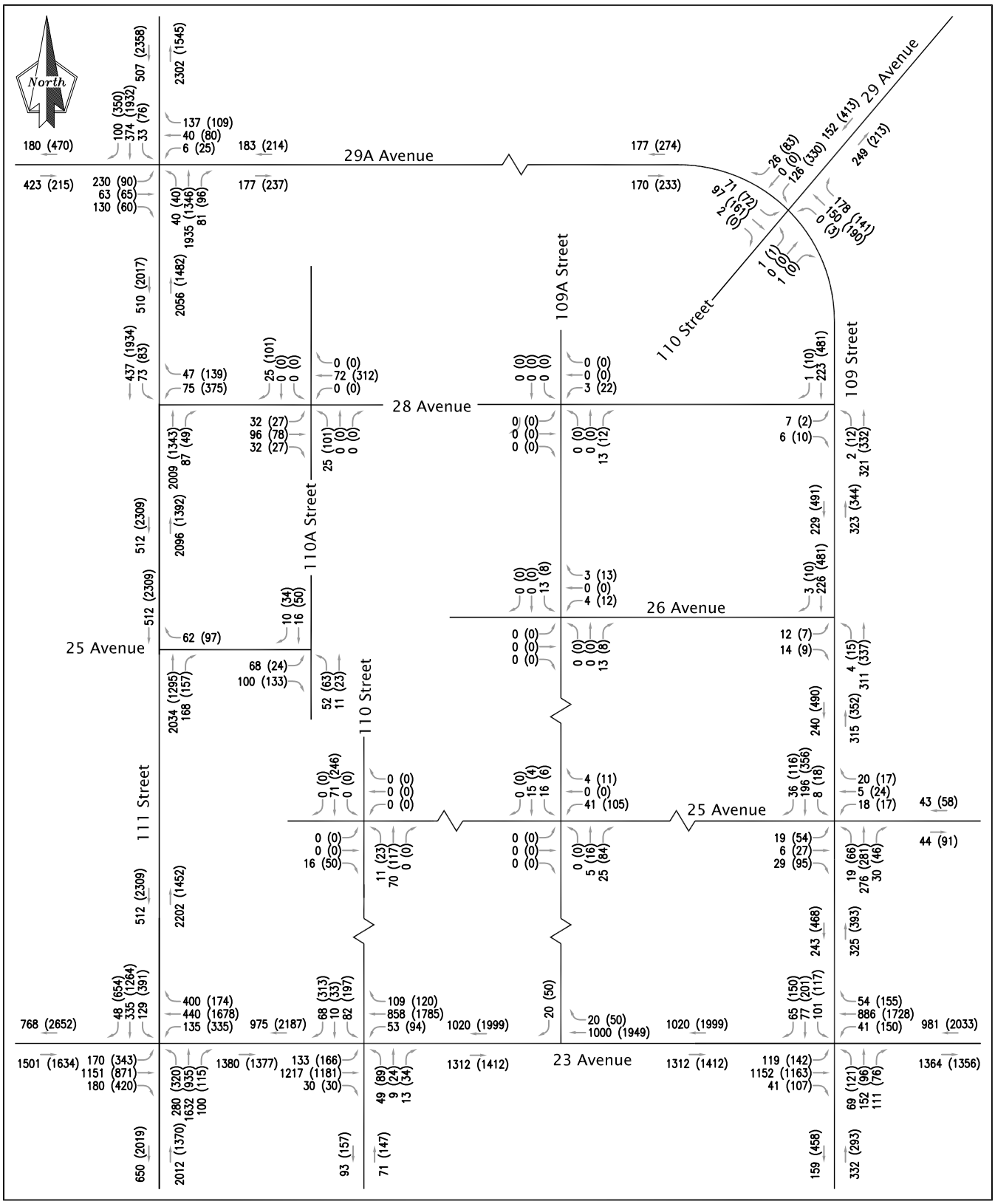

Exhibit 2-4

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2047 Background Traffic Volume Estimates
AM (PM) Peak Hours

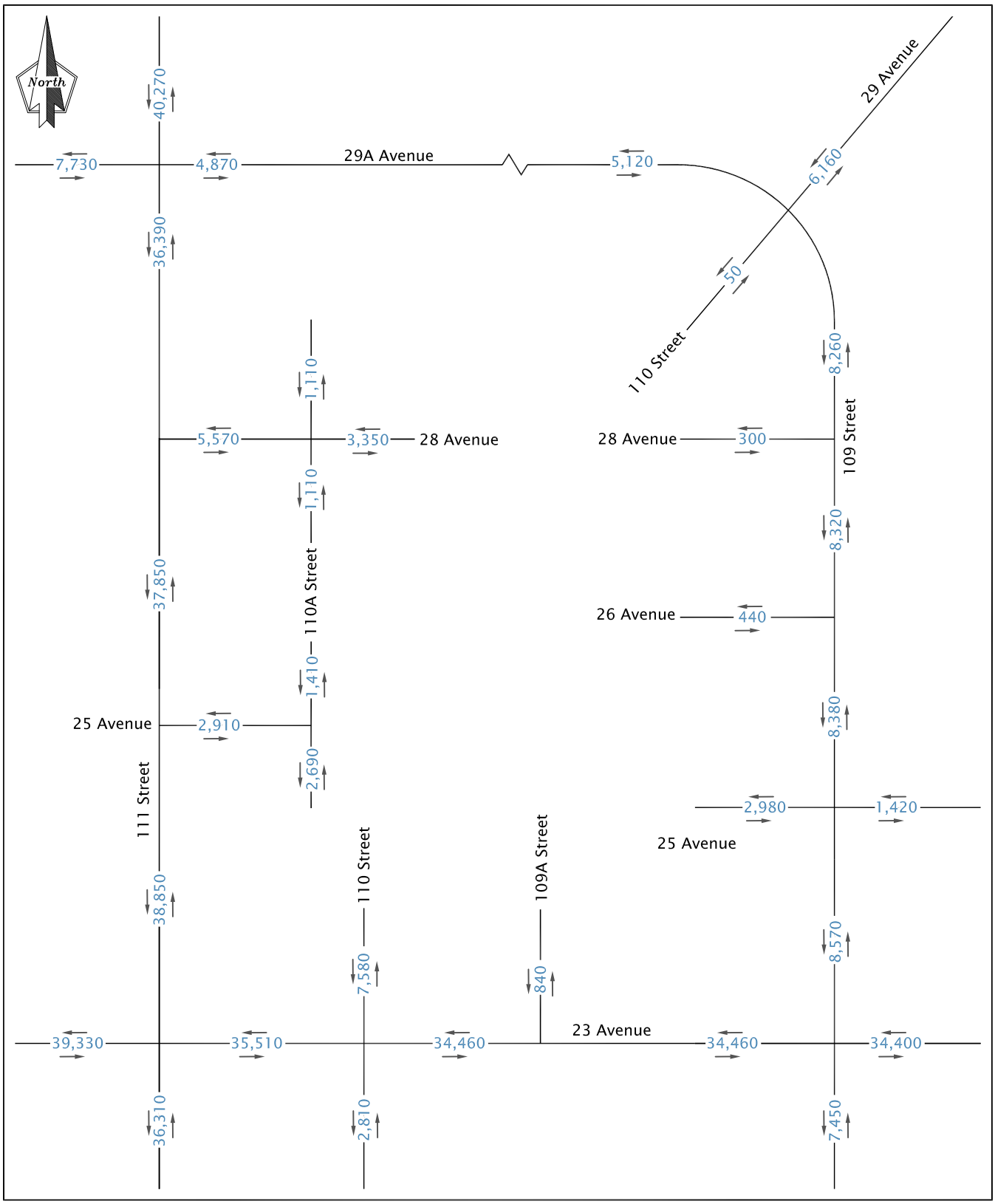

Exhibit 2-5

N.T.S.

2047 Daily Background Traffic Volume Estimates

3. PROPOSED LAND USE

3.1 Proposed Land Use Concept

The proposed land use concept for Century Park includes the segregation of the site into a number of blocks separated through the development of a grid network of internal streets. The site is proposed to be anchored to the Century Park LRT station and transit centre through the development of an east-west main street. A north-south primary street is proposed to connect to 23 Avenue at the existing 110 Street intersection and to 109 Street at the existing 29 Avenue intersection. Four additional east-west and two additional north-south secondary streets are proposed to provide access to individual parcels. The Century Park development concept is illustrated in **Exhibit 3-1.**

The proposed DC2 zone allows for a range of development opportunities on the site. The key regulations regarding the potential maximum development of trip generating land uses are as follows:

- The maximum Floor Area Ratio (FAR) for the overall site shall be 3.9;
- The maximum number of dwelling units for the overall site shall not exceed 4,500;
- The maximum gross floor area for non-residential land uses is 31,200 m^2 (335,824 SF).

While the DC2 zone includes many other development regulations that may limit the size/intensity of development within the site, the above noted regulations reflect the key limiting factors for on-site development.

3.2 Assumed Development Potential

In order to assess the potential traffic impacts associated with the proposed DC2 zone, assumptions regarding how the site may ultimately develop were required. To that effect, Stantec provided a draft program brief that evaluated the potential development area and assumed land use break down for use in the TIA. These estimates were further revised based on assumptions regarding the potential breakdown within residential and non-residential land use categories. Specifically, 10% of the residential units are assumed to be developed as townhouses and 50,000 SF of commercial office space is assumed to be developed as medical/dental land uses. It is also noted that the non-residential area was rounded up to 350,000 SF to be conservative in the transportation analysis. **Table 3-1** summarizes the land use schedule assumed for the preparation of the TIA.

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Source: Stantec December 2015

Exhibit 3-1

Proposed Site Concept

Table 3-1: Assumed Land Use Schedule

	Land Use	Dwelling Units/Area
Residential	Residential – Apartment	4,050 du
	Residential – Townhouses	450 du
	Total Residential	**4,500 du**
Commercial	Retail	250,00 SF
	Medical Dental Office	50,000 SF
	Office	50,000 SF
	Total Commercial	**350,000 SF**

Based on the draft program brief, the land use schedule summarized in Table 3-1 could represent an FAR in the order of 3.88 or 99% of the maximum FAR.

3.3 Site Access

The access points to Century Park from the adjacent roadway network are already constructed; although, the 25 Avenue access to 111 Street is proposed to be downgraded to a right in/right out access with the extension of the Capital Line LRT.

The construction of the internal roadway network will be staged with on-site development; however, a network of internal access roads that connects to the three adjacent roadways via existing access points will be provided with each development stage.

In the event that a site access or internal roadway link is proposed to be closed during construction, a site access strategy should be developed to ensure accessibility to all adjacent roadways from all remaining parcels is maintained.

Parkade accesses will be located along primary and secondary streets internal to the site. Direct parkade access to the adjacent public roadway network will not be permitted.

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4. SITE TRAFFIC CHARACTERISTICS

4.1 Trip Generation Rate Assumptions

The AM peak hour, PM peak hour, and daily trip generation rates used in the assessment are based on a combination of City of Edmonton recommended rates and trip generation rates published in the Institute of Transportation Engineers' (ITE's) Trip Generation Manual, 9th Edition. The base trip rates used in the assessment are summarized in **Table 4-1**.

Table 4-1: Trip Generation Rates

Land Use	Source	AM Peak Hour	PM Peak Hour	Daily
Row Housing	City of Edmonton	0.46 trips/du	0.58 trips/du	6.59 trips/du
Apartment Housing	City of Edmonton	0.34 trips/du	0.40 trips/du	5.81 trips/du
Retail	ITE Land Use Code 820	1.09 trips/du	4.43 trips/du	49.28 trips/du
Medical/Dental Office	ITE Land Use Code 720	2.39 trips/du	3.57 trips/du	36.13 trips/du
Professional Office	ITE Land Use Code 710	1.56 trips/du	1.49 trips/du	11.03 trips/du
Park 'n' Ride	Bunt 2012	0.72 trips/space	0.05 trips/space	N/A

4.1.1 Retail Trip Generation Rates

Fitted curve equations for ITE Land Use Code (LUC) 820 – Shopping Centre were used to determine trip generation for the retail land uses. The City of Edmonton measured rates for commercial sites were not used in the assessment because the amount and type of retail anticipated to be provided is different than the sites surveyed in Edmonton. As well, the site already includes a grocery store, a drive through coffee shop, and two drive through banks, which are often included when estimating trip generation for commercial sites in Edmonton. It is anticipated that the type of retail land uses that may develop within the study area will complement, but will not be as vehicle oriented as the commercial land uses to the south.

4.1.2 Park 'n Ride Trip Generation Rates

The potential for up to 1,320 park 'n' ride spaces has been accounted for in the traffic assessment through the use of existing data in the background traffic volumes. However, under existing conditions, the majority of park 'n' ride traffic arrives approximately one hour before the peak hour of adjacent street traffic in the morning. As well, through previous studies, park 'n' ride activity was identified as peaking in the fall months while the Bunt traffic counts were completed in the spring. In order to provide a

conservative assessment, increases to the existing traffic volumes were developed to reflect peak fall park 'n' ride operations and to also reflect the potential for the AM peak hour of park 'n' ride traffic to coincide with the peak hour of adjacent street traffic.

An AM peak hour trip generation rate was calculated to account for the differences noted above by comparing traffic counts from the spring of 2012 to traffic counts from the fall of 2012. Based on the spring 2012 counts, a trip generation rate of 0.34 trips/parking space was calculated for the park 'n 'ride during the AM peak hour of adjacent street traffic. This is the base level of activity included in the existing traffic volumes. Based on the fall 2012 counts, the AM peak hour trip generation was estimated to be in the order of 1.06 trips/parking space. Therefore, the difference of 0.72 trips/space was applied to the existing 1,320 park 'n' ride parking spaces to normalize the potential arrival times for park 'n' ride activity in the mornings and adjust for seasonal variations.

The PM peak hour park 'n' ride activity coincided with the peak hour of adjacent street activity; therefore, only a seasonal adjustment was required. Based on the review of the spring and fall 2012 counts, an increase of 0.05 trips/space was applied to account for the peak fall traffic characteristics of the park 'n' ride.

No adjustments were made to the daily rates for the park 'n' ride as the stall turnover is not anticipated to be affected by the time of year.

4.2 Gross Trip Generation Estimates

Table 4-2 summarizes the projected gross two-way AM peak hour, PM peak hour, and daily vehicle trips anticipated to be generated by the Century Park development upon full build out.

Table 4-2: Gross Trip Generation

Land Use	Intensity	AM Peak Hour		PM Peak Hour		Daily	
		In	Out	In	Out	In	Out
Row Housing	450 du	43	164	170	91	1,483	1,483
Apartment	4,050 du	234	1,143	1,021	599	11,765	11,765
Commercial	250,000 SF	169	104	532	576	6,160	6,160
Medical/Dental Office	50,000 SF	94	25	50	129	903	903
Professional Office	50,000 SF	69	9	13	62	276	276
Park 'n' Ride	1,320 stalls	789	162	17	50	0	0
Total		**1,398**	**1,607**	**1,803**	**1,507**	**20,587**	**20,587**

As shown in Table 4-2, the area is estimated to generate in the order of 3,005 gross two-way AM peak hour trips, 3,310 gross two-way PM peak hour trips, and 41,174 gross two-way daily trips.

4.3 Trip Generation Adjustment Factors

The following sections summarize the adjustment factors to be used in the assessment.

4.3.1 Internal Capture

Internal capture reflects the potential interaction between the residential, retail, and office land uses within the proposed development. Internal capture rates from the ITE Trip Generation Handbook, 3rd Edition were used to estimate the potential magnitude of trips that may occur between the land uses developed within the site for the AM and PM peak hours, while the internal capture rates from the 2nd Edition were used to estimate the daily internal capture percentage. Based on the types and sizes of the land uses proposed to be developed, the site is anticipated to generate 3.9% internal trips in the AM peak hour, 17.5% internal trips in the PM peak hour, and 8.2% internal trips on a typical weekday. The internal trip percentages have been calculated based on the total gross site trips, not including park 'n' ride trips.

4.3.2 Pass-by Trips

Trips generated by the commercial area are anticipated to be compromised of pass-by and primary trips. A pass-by trip represents an intermediate stop along the way to a primary destination, while a primary trip represents the primary purpose of the trip. As the retail uses are not anticipated to be vehicle oriented uses, pass-by trips were assumed to represent 10% of the external AM peak hour trips, 20% of the external PM peak hour trips, and 20% of the external daily trips.

4.4 Trip Distribution

The City of Edmonton's 2013 Origin-Destination Car Driver Trips spreadsheets for the 2044 horizon were used to distribute the residential, medical/dental, and office trips. Although the site is located within the northern portion of the SW Suburb area, it is anticipated that the site's origin-distribution characteristics may be more closely aligned with the SW Inner area. For example, the SW Inner sector includes more trips to/from the downtown, university, downtown fringe areas as compared to the SW Suburb sector. Given the LRT access, a higher percentage of trips between Century Park and the downtown, University, and downtown fringe areas of the City is reasonable in the longer term as the site continues to develop as a TOD site. **Exhibit 4-1** illustrates the overall residential, medical/dental, and office distribution to the different sectors of the Edmonton region.

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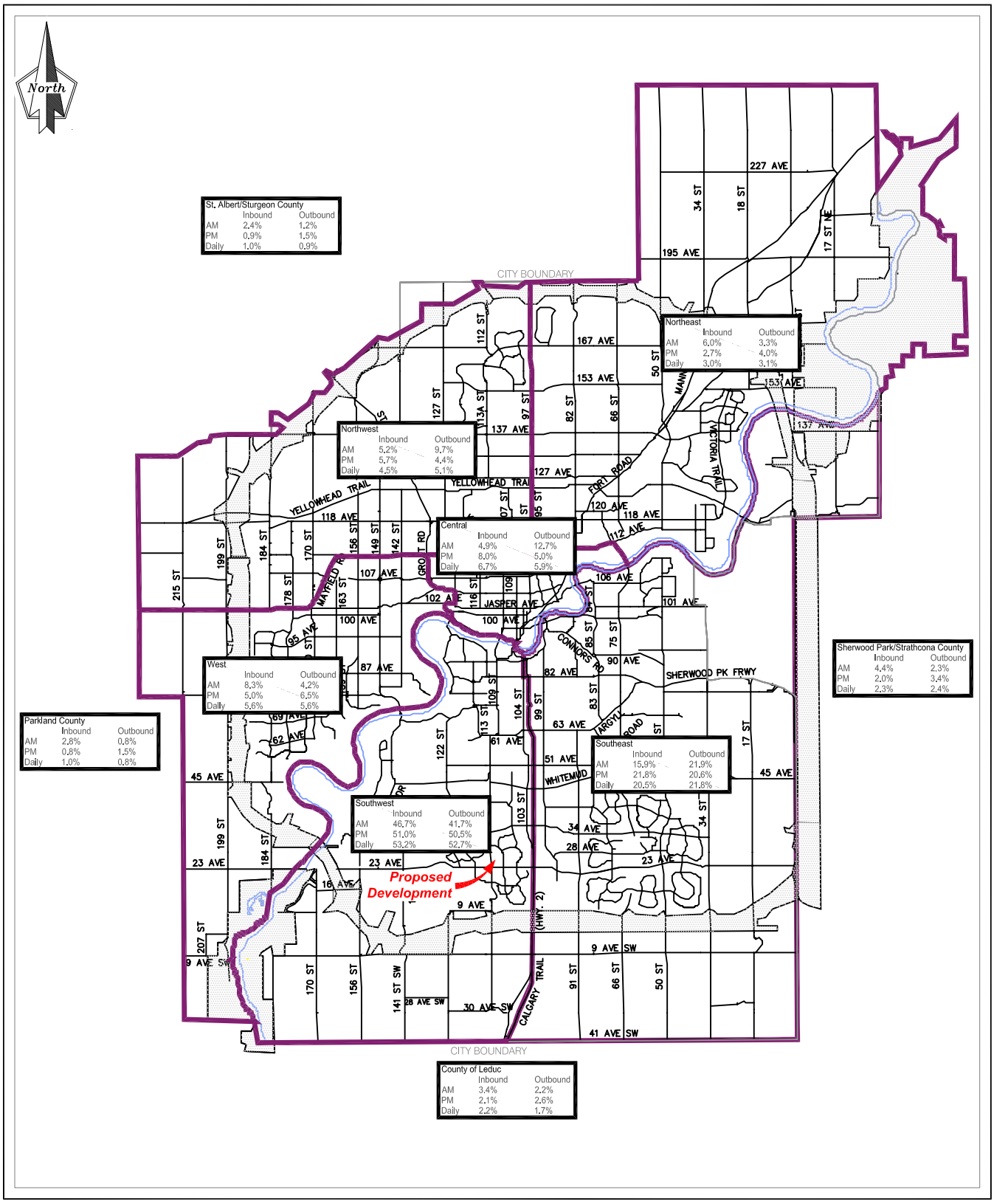

Exhibit 4-1

N.T.S.

External Residential, Medical/Dental, and Office Trip Distribution

The net external primary retail trips will be distributed based on a review of neighbourhood populations within the following neighbourhoods:

- Rideau Park;
- Royal Gardens;
- Aspen Gardens;
- Duggan;
- Greenfield;
- Westbrook Estates;
- Steinhauer;
- Sweet Grass;
- Ermineskin;
- Blue Quill;
- Blue Quill Estates;
- Keheewin;
- Skyrattler;
- Bearspaw; and
- Twin Brooks.

4.5 Mode Split

The proposed DC2 development is located directly east of the Century Park LRT station and transit centre. The development of the proposed DC2 is consistent with the City's strategic goal of integrating land use and transportation as it focuses higher density land uses at an existing LRT station and transit centre.

As a result of the site location and transit accessibility, potential mode splits to transit were assumed for each origin-destination pair in the City's 2013 Origin-Destination Car Driver Tips spreadsheets for the 2044 horizon. Specifically, the following mode splits to transit were assumed for key origin-destination pairs:

- Downtown and University – 80% mode split to transit
- Downtown Fringe – 40% mode split to transit
- Inner Sectors – 30% mode split to transit
- Suburbs – 10% mode split to transit
- Adjacent Cities and Counties – 0% mode split to transit

Table 4-3 summarizes the aggregate mode split to auto percentages calculated based on the above noted mode splits to transit and the origin-destination assumptions by time of day.

Table 4-3: Mode Split to Auto Percentages

Land Use	AM Peak Hour		PM Peak Hour		Daily	
	In	Out	In	Out	In	Out
Residential, Office, Medical-Dental	81.1%	69.9%	73.7%	78.2%	75.5%	76.3%
Retail	85%	85%	85%	85%	85%	85%

Neighbourhood profiles from the 2016 City of Edmonton Census for the Blue Quill and Ermineskin neighbourhoods were reviewed to determine the main modes of transportation from home to work given the proximity to the Century Park LRT station and transit centre. Based on the review, the mode split to transit, walking, and cycling for communities in the vicinity of the proposed DC2 development is in the order of 32% to 34%. Given the proximity of the proposed DC2 to the Century Part LRT station and the transit centre, mode splits to transit, walking, and cycling in the order of 20-30% are anticipated to appropriate for the site, and may be conservative in the longer term.

In addition to the above, a 15% mode split to transit and active modes was assumed for external retail trips to reflect the orientation of the retail land uses in relation to the LRT station and the opportunity to draw active modes trips from the adjacent communities.

4.5.1 Net Trip Generation Estimates

Table 4-4 summarizes the net external generation estimates for the proposed DC2 development. Detailed trip generation calculations are included in **Appendix D** for reference.

Table 4-4: Net Generation Estimates

Trip Component	AM Peak Hour		PM Peak Hour		Daily	
	In	Out	In	Out	In	Out
Gross Trips	1,398	1,607	1,803	1,507	20,587	20,587
Internal Capture	40	40	284	284	1,679	1,679
Mode Split	102	409	346	227	4,122	4,018
Pass-by	8	8	71	71	902	902
Net External Trips	**1,248**	**1,150**	**1,102**	**925**	**13,884**	**13,988**

As shown in Table 4-4, the proposed DC2 is anticipated to generate in the order of 2,398 net two-way trips in the AM peak hour, 2,027 net two-way trips in the PM peak hour, and 27,872 net two-way trips on a daily basis.

4.6 Trip Assignment and Total Traffic Volumes

The traffic anticipated to be generated by the land uses within the proposed Century Park DC2 development was assigned to the roadway network based on the assumed distribution and the availability of roadways and access points. The site generated traffic volumes were then added to the background traffic volumes to calculate the total traffic volumes for use in the assessment.

Exhibit 4-2 illustrates the daily site generated and 2047 total traffic volumes. **Exhibit 4-3** illustrates the AM and PM peak hour site generated traffic volume estimates while **Exhibit 4-4** illustrates the AM and PM peak hour total traffic volume estimates.

4.7 Trip Generation Comparison

The trip generation estimates calculated based on the proposed rezoning application were compared to previous estimates from the Century Park Traffic and Parking Impact Assessment prepared by Bunt & Associates in 2004. As some development has occurred on the property since 2004 the comparison includes the total traffic estimates at the access points to the overall Century Park development site. The comparison is based on the 2025 With LRT scenario from the 2004 TIA, which included the extension of the LRT to Century Park and the inclusion of 1,200 LRT park 'n' ride stalls in the northwest corner of the site. **Table 4-5** summarizes the total volumes estimated to access the site via 23 Avenue, 111 Street, and 109 Street.

Table 4-5: Site Traffic Comparison

Source	AM Peak		PM Peak	
	In	Out	In	Out
2004 TIA	1,714 vph	1,403 vph	1,861 vph	2,603 vph
2017 Application	1,926 vph	1,616 vph	2,078 vph	2,406 vph
Increase (Decrease) – 2017-2004	212 vph	213 vph	217 vph	(197 vph)
	425 vph		20 vph	

Although the current traffic estimates have increased as compared to the estimates included in the 2004 TIA, the increases are not as high as expected based on the increase in development potential. This can be attributed to a number of factors such as:

- Residential trip rates were measured in Edmonton in 2012 and are generally lower than previously assumed;
- Mode split to transit was estimated at 5% in 2004, while current estimates are in the order of 22% to 30% for residential units and 15% for commercial land uses;
- Improved methodology for estimating internal capture trips; and
- Measured traffic associated with park 'n' ride stalls versus estimates.

The analysis includes updated traffic counts that reflect the development that has occurred to date, providing a new base line for the assessments. The changes in the above noted assumptions reflect changes that have occurred in Edmonton over the past 13 years and improved methodologies for estimating traffic associated with mixed use developments.

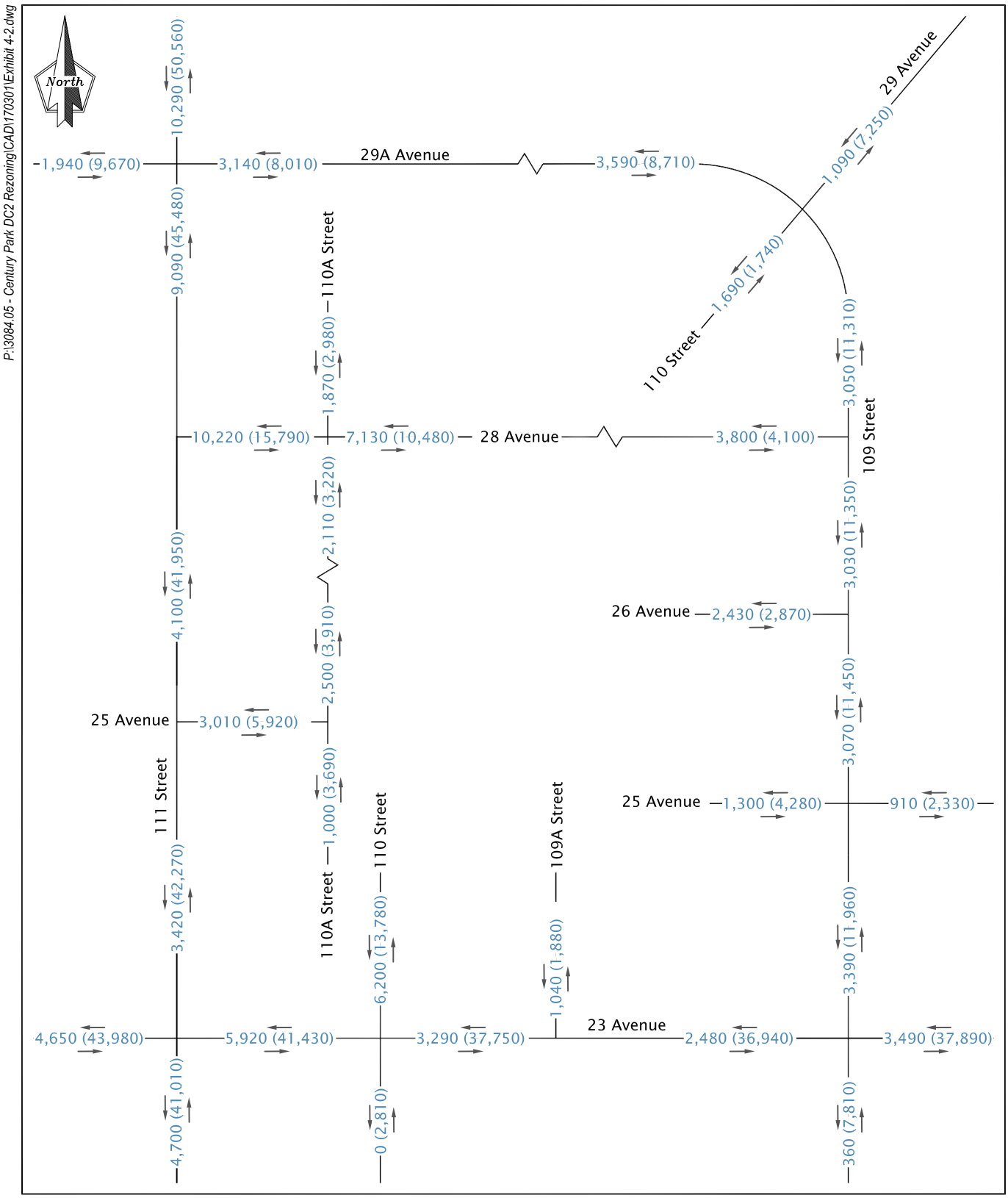

Exhibit 4-2

N.T.S.

Daily Traffic Volume Estimates
Site Generated (2047 Total)

P:\3084.05 - Century Park DC2 Rezoning\CAD\170301\Exhibit 4-3.dwg

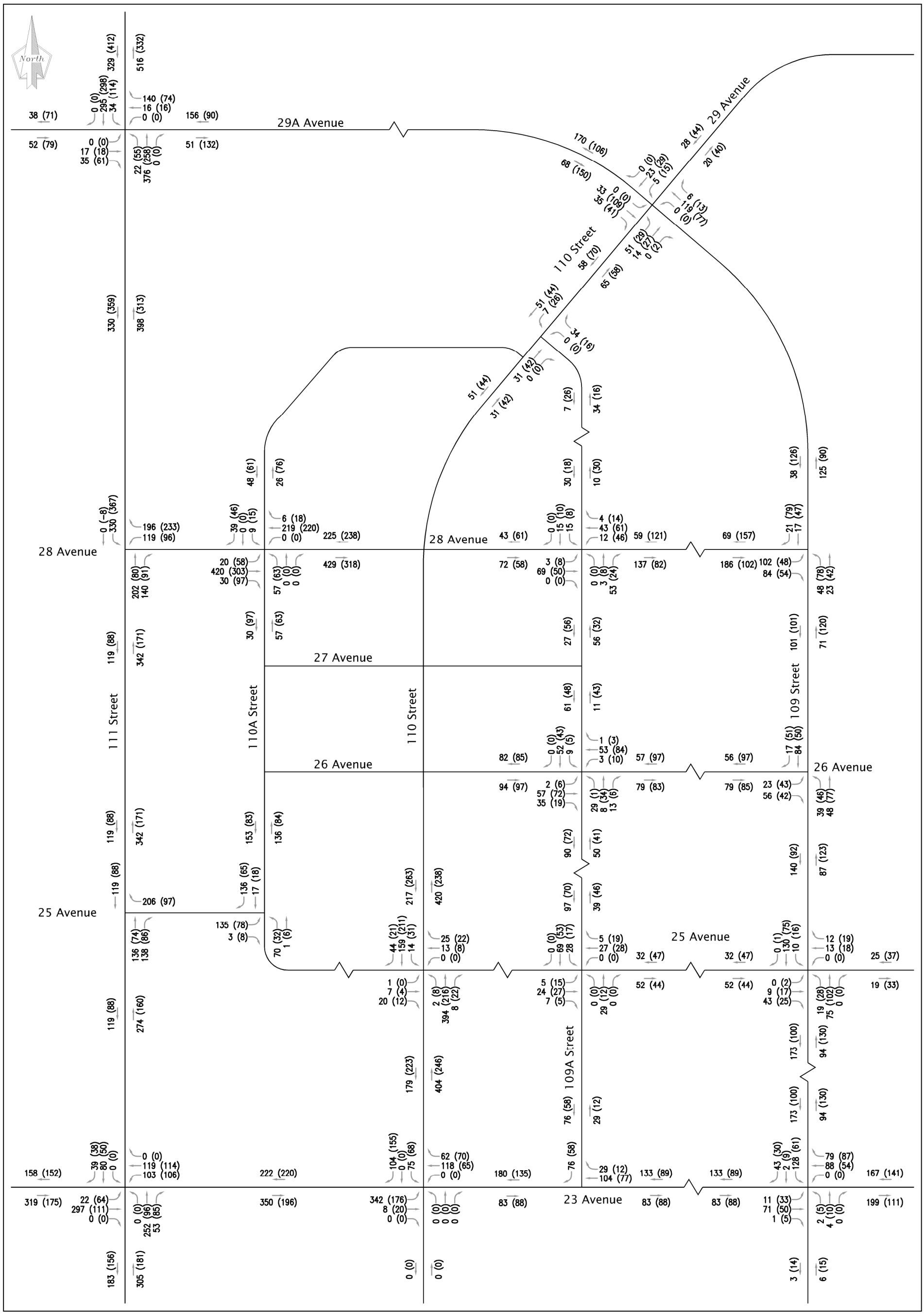

Exhibit 4-3

N.T.S.

Site Generated Traffic Volume Estimates
AM (PM) Peak Hours

P:\3084.05 - Century Park DC2 Rezoning\CAD\170405 Final Report\Exhibit 4-4.dwg

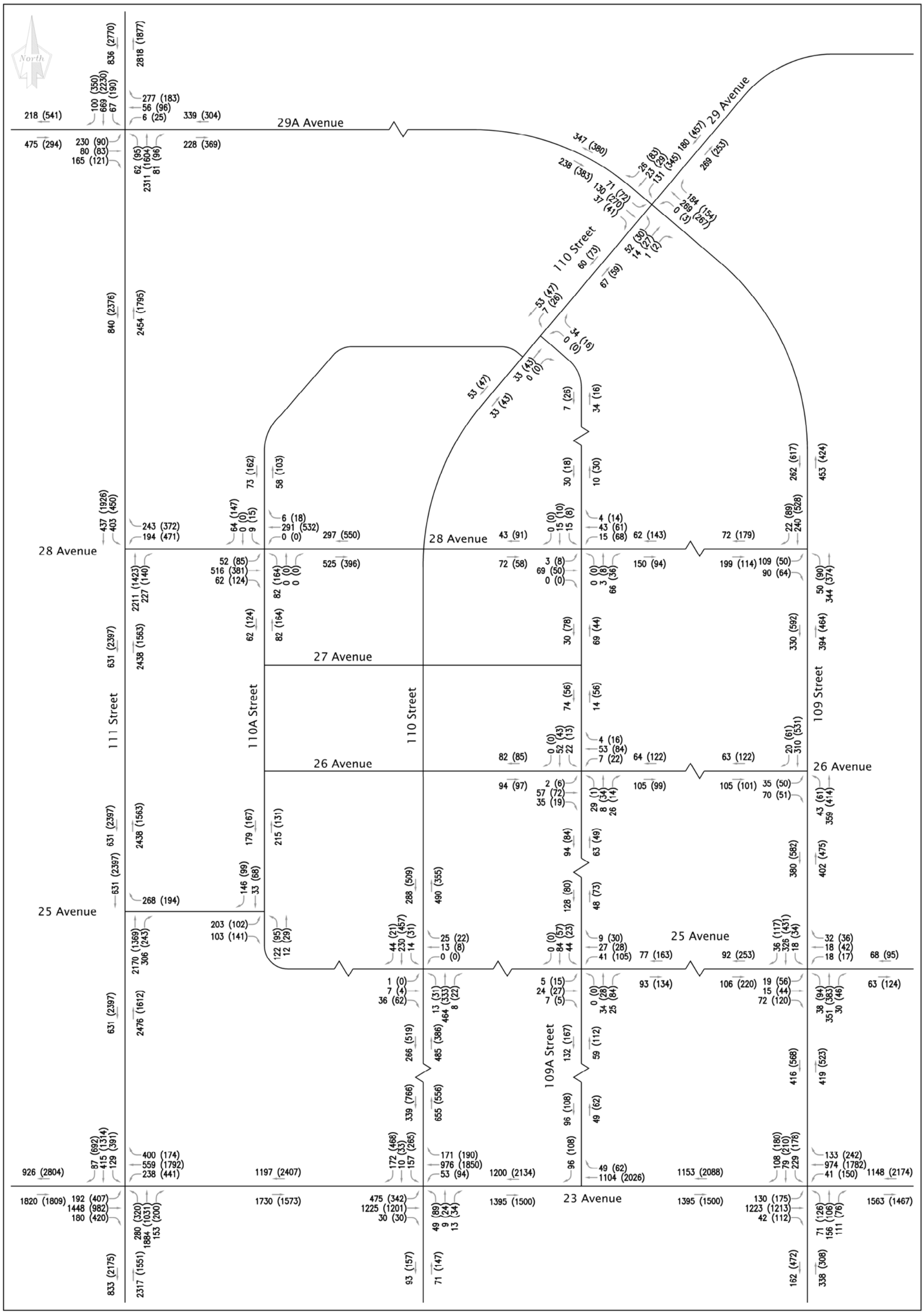

Exhibit 4-4

N.T.S.

2047 Total Traffic Volume Estimates
AM (PM) Peak Hours

5. TRANSPORTATION ANALYSIS

5.1 Internal Roadway Requirements

The daily volumes along the internal roadway network were reviewed to determine the base number of travel lanes recommended within the site. The majority of the internal roadways are anticipated to accommodate daily volumes less than 5,000 vpd, which can be accommodated on a two-lane roadway. The following exceptions are noted:

- ***28 Avenue*** east of 111 Street is anticipated to accommodate daily volumes in the order of 15,790 vpd. Based on the assumed parkade access locations, daily volumes are anticipated to be in the order of 10,480 vpd east of the first on-site intersection (110A Street). 28 Avenue east of 111 Street is currently constructed to include two eastbound lanes and three westbound lanes. It is recommended that the two eastbound lanes be extended east to 110 Street to allow smooth traffic flow into the site. The curb lane could drop as a right turn bay at the 28 Avenue/110 Street intersection. A single westbound lane may be sufficient between 110 Street and 110A Street; however, intersection lane arrangements will be confirmed through the intersection assessment.

- ***25 Avenue*** east of 111 Street is anticipated to accommodate daily volumes in the order of 5,920 vpd. As the 25 Avenue/111 Street intersection will ultimately be converted to a right in/right out access, one inbound lane and one outbound lane are recommended along 25 Avenue between 110A Street and 111 Street. Based on the site design, the 25 Avenue/110A Street intersection will operate as a T-intersection, and the intersection geometry will be confirmed through the intersection assessment.

- ***110 Street*** north of 23 Avenue is anticipated to accommodate daily volumes in the order of 13,780 vpd. The access currently includes four lanes, two northbound and two southbound, between 23 Avenue and the first on-site intersection, located approximately 70m north of 23 Avenue. North of the first on-site intersection, 110 Street is developed as a divided two lane roadway, with 6m lanes on either side of the median. The cross-section is anticipated to be able to accommodate the projected daily volumes.

5.2 Intersection Assessments

5.2.1 Analysis Methodology

The capacity assessment is based on the methods outlined in the Highway Capacity Manual 2010, using Synchro 9.0 analysis software. Intersection operations are typically rated by two measures. The volume-to-capacity (v/c) ratio describes the extent to which the traffic volumes can be accommodated by the physical capacity of the road configuration and traffic control. A value (measured during the peak hour) less than 0.90 indicates that generally there is sufficient capacity and the projected traffic volumes can be accommodated at the intersection. A value between 0.90 and 1.0 suggests unstable operations may occur and volumes are nearing capacity conditions. The second measure of performance, Level of Service (LOS), is based on the estimated average delay per vehicle among all traffic passing through the intersection. A low average delay merits a LOS A rating. Average delays greater than 80 seconds per vehicle at a signalized intersection generally produce a LOS F rating, while at unsignalized intersections a LOS F is reached when vehicles experience an average delay greater than 50 seconds.

The City of Edmonton's Roadway Planning and Design Objectives (February 2005 Edition) identifies the Peak Hour LOS Design Objectives for Signalized Arterials at LOS D in the medium term and E in the long term. At signalized intersections, LOS D generally relates to v/c ratios between 0.75 and 0.90, while LOS E generally relates to v/c ratios greater than 0.90 and less than 1.0. For this assessment, efforts were taken to meet the City's long term design objectives for signalized arterials at LOS E; however, capacity improvements may not be recommended where vehicle capacity is limited by LRT operations.

The anticipated 95th percentile queue length has also been included in the following assessment summaries. The queues provided may include a footnote that relates to the ability of the program to estimate the queue accurately. The 'm' footnote indicates that the volume entering the intersection is being metered by an upstream intersection. The Synchro help file also provides the following regarding the '#' footnote:

> "The # footnote indicates that the volume for the 95th percentile cycle exceeds capacity. This traffic was simulated for two complete cycles of 95th percentile traffic to account for the effects of spill over between cycles. If the reported v/c <1 for this movement, the methods used represent a valid method for estimating the 95th percentile queue. In practice, 95th percentile queue shown will rarely be exceeded and the queues shown with the # footnote are acceptable for the design of storage bays."[1]

[1] Trafficware LLC., Synchro Studio 9 User Guide, Chapter 10 – Timing/Signing Settings, Queue Lengths, pg. 10-19.

The methodology includes a number of assumptions that relate to the operating conditions present at the intersection. The following assumptions were used in the analysis:

- Saturation Flow Rate – 1900 vphg
- Total Lost Time Adjustment Factor – 0.5
- Peak Hour Factor – 1.0
- % Heavy Vehicles – as per existing counts, 2% where unknown

In addition to the above, the saturation flow rate was reduced by 25% for all intersection turning movements that cross the LRT tracks and the saturation flow rate was increased by 25% for all intersection turning movements that run parallel to the LRT tracks to account for the potential impact of LRT operations along 111 Street. As well, all left turn movements that cross the LRT tracks are assumed to operate under protected only phasing. This is in addition to the use of protected only phasing for all dual left turn bays.

Unsignalized intersection assessments were completed using the HCM2010 methodology within Synchro 9.0. As per the HCM2010 methodology, assessment results are reported for critical movements only. As well, the HCM2010 95th percentile queue is reported as vehicles; therefore, a distance in metres was calculated assuming an average of 7.5m per vehicle.

Sidra Intersection 7 was used to evaluate the potential operations of roundabout intersections. The 95th percentile queues were estimated assuming an average of 7.5m per vehicle to be consistent with the assumptions used for the HCM2010 assessments.

5.2.2 23 Avenue and 111 Street

The Capital LRT line extension south of Century Park is planned to continue south along 111 Street within the centre of roadway. The LRT is planned to be grade separated at the 23 Avenue/111 Street intersection; however, the intersection is also planned to be expanded to include the following:

- ***West Approach*** – two left turn bays, three through lanes, one channelized right turn bay;
- ***East Approach*** – two left turn bays, three through lanes, one channelized free flow right turn bay;
- ***South Approach*** – two left turn bays, three through lanes, one channelized right turn bay; and
- ***North Approach*** – two left turn bays, three through lanes, one channelized right turn lane.

Tables 5-1 and **5-2** summarize the results of the intersection assessments completed for the 23 Avenue/111 Street intersection under 2047 background and 2047 total traffic scenarios for the AM and PM peak hours respectively.

Table 5-1: 23 Avenue and 111 Street – AM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background– Pre-timed (140s cycle, EB, WB, NB, and SB Prot L, Free WB R)												
Geometry	L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R		
Volume (vph)	170	1151	180	135	440	400	280	1632	100	129	335	48
v/c	0.50	0.71	0.30	0.45	0.29	0.27	0.78	0.76	0.13	0.74	0.19	0.08
Delay (s)	65.6	47.4	14.5	49.1	57.2	1.8	77.3	39.8	3.4	91.8	32.8	6.4
LOS	E	D	B	D	E	A	E	D	A	F	C	A
95th Queue (m)	36	116	32	32	56	12	#60	154	9	#34	33	4
Intersection Delay						**42.2**	**Intersection LOS**					**D**
2047 Total– Pre-timed (140s cycle, EB, WB, NB, and SB Prot L, Free WB R)												
Geometry	L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R		
Volume (vph)	192	1448	180	238	559	400	280	1884	153	129	415	87
v/c	0.57	0.89	0.30	0.79	0.37	0.27	0.78	0.87	0.20	0.74	0.23	0.14
Delay (s)	67.5	55.6	15.5	64.1	56.6	0.7	77.3	45.2	8.6	101.9	30.7	6.4
LOS	E	E	B	E	E	A	E	D	A	F	C	A
95th Queue (m)	40	153	34	#55	68	4	#60	188	21	#35	41	11
Intersection Delay						**46.6**	**Intersection LOS**					**D**

Table 5-2: 23 Avenue and 111 Street – PM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background– Pre-Timed (140s cycle, EB, WB, NB, and SB Prot L, Free WB R)												
Geometry	L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R		
Volume (vph)	343	871	420	335	1678	174	320	935	115	391	1264	654
v/c	0.83	0.60	0.65	0.49	0.93	0.10	0.96	0.68	0.20	0.99	0.89	0.89
Delay (s)	78.6	47.4	24.9	66.8	25.4	0.1	103.9	50.7	2.3	92.2	53.6	56.0
LOS	E	D	C	E	C	A	F	D	A	F	D	E
95th Queue (m)	#73	88	87	m46	#187	m0	#77	98	5	#93	138	#237
Intersection Delay						**48.7**	**Intersection LOS**					**D**
2047 Total– Pre-Timed (140s cycle, EB, WB, NB, and SB Prot L, Free WB R)												
Geometry	L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R			L/L/T/T/T/R		
Volume (vph)	407	982	420	441	1792	174	320	1031	200	391	1314	692
v/c	0.99	0.67	0.66	0.65	1.00	0.10	0.96	0.75	0.34	0.99	0.92	0.95
Delay (s)	102.9	49.2	27.1	68.1	38.5	0.0	103.9	52.8	6.9	99.7	53.9	53.6
LOS	F	D	C	E	D	A	F	D	A	F	D	D
95th Queue (m)	#94	101	92	m57	m#201	m0	#77	109	20	m#91	#150	#259
Intersection Delay						**53.5**	**Intersection LOS**					**D**

As shown in Tables 5-1 and 5-2, the 23 Avenue/111 Street intersection is anticipated to operate at acceptable levels of service in the AM peak hour. In the PM peak hour, the intersection is estimated to operate at or near capacity; however, it is still within the thresholds established for the City's long term design objective. Protected only left turn phasing, coupled with a long cycle length increases delays and LOS E/F, particularly for left turn movements. In general, the site generated traffic is anticipated to be accommodated by the future intersection geometry; however, the 23 Avenue/111 Street intersection is still anticipated to represent a congestion point along the network. As congestion increase, drivers may choose to travel during alternate times or may opt to utilize transit to reach their destination. No additional geometry or traffic control measures are recommended.

5.2.3 29A Avenue (Saddleback Road North) and 111 Street

The 29A Avenue (Saddleback Road North)/111 Street intersection is signalized with the LRT operating north-south through the centre of the intersection. The following existing geometry was used in the assessment:

- ***West Approach*** – two left turn bays, one shared through/channelized right turn bay;
- ***East Approach*** – one left turn bay, one through lane, one shared through/channelized right turn bay;
- ***South Approach*** – one left turn bay, two through lanes, one channelized right turn lane; and
- ***North Approach*** – one left turn bay, two through lanes, one channelized right turn bay.

As shown in **Tables 5-3** and **5-4**, the 29A Avenue/Saddleback Road/111 Street intersection is anticipated to operate near or slightly over capacity during peak hours with the addition of site generated traffic based on the assumed signal timings and saturation flow adjustments for LRT operation.

In the AM peak hour, operations for the westbound right turn could be improved if the shared through/right lane was re-developed as a dedicated right turn bay. The westbound through volume is very low during the peak hours; therefore, this revision is not anticipated to significantly decrease westbound operations. As well, since the westbound through volume is low, the associated queues may not actually reduce the ability of right turns to access the turn lane; therefore, the results may be conservative. This modification could be evaluated in the future if additional capacity is deemed to be beneficial to the overall network.

Although the assessment indicates that the intersection is projected to have the capacity to accommodate site generated traffic, the provision of LRT priority and the complexity of signal timings associated with LRT operations are anticipated to continue to result in delays for vehicles accessing or crossing 111 Street. Therefore, the 29A Avenue/Saddleback Road/111 Street intersection is anticipated to continue to represent a congestion point within the network in the 2047 horizon.

Table 5-3: 29A Avenue/Saddleback Road and 111 Street – AM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Pre-timed (140s cycle, EB, WB, NB, and SB Prot L)												
Geometry	L/L/TR			L/T/TR			L/T/T/R			L/T/T/R		
Volume (vph)	230	63	130	6	40	137	40	1935	81	33	374	100
v/c	0.92	0.69		0.07	0.38		0.62	0.83	0.08	0.52	0.16	0.11
Delay (s)	101.5	49.1		64.0	27.4		125.4	8.6	0.1	93.5	19.0	1.1
LOS	F	D		E	C		F	A	A	F	B	A
95th Queue (m)	#79	87		9	30		m26	91	m0	#33	38	4
Intersection Delay						**22.1**	**Intersection LOS**					**C**
2047 Total – Pre-timed (140s cycle, EB, WB, NB, and SB Prot L)												
Geometry	L/L/TR			L/T/TR			L/T/T/R			L/T/T/R		
Volume (vph)	230	80	165	6	56	277	62	2311	81	67	669	100
v/c	0.92	0.88		0.07	1.06dr		0.97	1.00	0.08	0.93	0.29	0.11
Delay (s)	101.5	71.0		64.0	50.6		172.8	31.2	0.1	152.5	20.7	1.1
LOS	F	E		E	D		F	C	A	F	C	A
95th Queue (m)	#79	#138		9	69		m#48	#395	m0	#69	68	4
Intersection Delay						**40.2**	**Intersection LOS**					**D**

Table 5-4: 29A Avenue/Saddleback Road and 111 Street – PM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Pre-timed (140s cycle, EB, WB, NB, and SB Prot L)												
Geometry	L/L/TR			L/T/TR			L/T/T/R			L/T/T/R		
Volume (vph)	90	65	60	25	80	109	40	1346	96	76	1932	350
v/c	0.69	0.54		0.38	0.38		0.38	0.69	0.11	0.33	0.60	0.33
Delay (s)	91.2	51.3		81.9	24.7		94.8	6.3	0.2	56.1	25.6	2.6
LOS	F	D		F	C		F	A	A	E	C	A
95th Queue (m)	#35	65		24	29		m28	16	0	49	161	16
Intersection Delay						**20.0**	**Intersection LOS**					**C**
2047 Total – Pre-timed (140s cycle, EB, WB, NB, and SB Prot L)												
Geometry	L/L/TR			L/T/TR			L/T/T/R			L/T/T/R		
Volume (vph)	90	83	121	25	96	183	95	1604	96	190	2230	350
v/c	0.69	0.85		0.38	0.50		0.91	0.82	0.11	0.84	0.97	0.34
Delay (s)	91.2	74.2		81.9	21.9		137.4	13.6	0.2	85.9	45.4	5.4
LOS	F	E		F	C		F	B	A	F	D	A
95th Queue (m)	#35	#123		24	36		m#78	219	m0	#130	#365	29
Intersection Delay						**36.0**	**Intersection LOS**					**D**

5.2.4 28 Avenue and 111 Street

The 28 Avenue/111 Street intersection is currently signalized and the LRT operates north-south through the centre of the intersection. The existing geometry, as noted below, was used in the assessment:

- ***East Approach*** – two left turn lanes, one right turn lane;
- ***South Approach*** – three through lanes, one right turn lane; and
- ***North Approach*** – two left turn bays, three through lanes.

As shown in **Tables 5-5** and **5-6**, the intersection is anticipated to operate at acceptable levels of service in the future, with the addition of site generated traffic.

Table 5-5: 28 Avenue and 111 Street – AM Peak Hour

	Westbound		Northbound		Southbound	
Movement	**L**	**R**	**T**	**R**	**L**	**T**
2047 Background – Pre-timed (140s cycle, SB Prot L)						
Geometry	L/L/R		T/T/T/R		L/L/T/T/T	
Volume (vph)	75	47	2009	87	73	437
v/c	0.14	0.18	0.65	0.12	0.14	0.09
Delay (s)	48.2	14.3	15.3	1.5	56.4	5.4
LOS	D	B	B	A	E	A
95th Queue (m)	22	16	82	m1	m24	12
Intersection Delay			**15.3**	**Intersection LOS**		**B**
2047 Total – Pre-timed (140s cycle, SB Prot L)						
Geometry	L/L/R		T/T/T/R		L/L/T/T/T	
Volume (vph)	194	243	2211	227	403	437
v/c	0.37	0.58	0.71	0.30	0.80	0.09
Delay (s)	51.8	11.9	17.3	1.9	74.4	5.6
LOS	D	B	B	A	E	A
95th Queue (m)	49	36	108	m2	m#103	m13
Intersection Delay			**22.6**	**Intersection LOS**		**C**

Table 5-6: 28 Avenue and 111 Street – PM Peak Hour

	Westbound		Northbound		Southbound	
Movement	**L**	**R**	**T**	**R**	**L**	**T**
2047 Background – Pre-timed (140s cycle, SB Prot L)						
Geometry	L/L/R		T/T/T/R		L/L/T/T/T	
Volume (vph)	375	139	1343	49	83	1934
v/c	0.64	0.39	0.60	0.08	0.15	0.53
Delay (s)	56.1	10.5	18.5	0.5	30.0	3.7
LOS	E	B	B	A	C	A
95th Queue (m)	90	25	83	m0	m23	27
Intersection Delay			**14.5**	**Intersection LOS**		**B**
2047 Total – Pre-timed (140s cycle, SB Prot L)						
Geometry	L/L/R		T/T/T/R		L/L/T/T/T	
Volume (vph)	471	372	1423	140	450	1926
v/c	0.80	0.69	0.63	0.20	0.80	0.53
Delay (s)	63.8	11.9	18.8	0.6	29.3	1.3
LOS	E	B	B	A	C	A
95th Queue (m)	115	46	m84	m0	m77	m11
Intersection Delay			**16.1**	**Intersection LOS**		**B**

5.2.5 25 Avenue and 111 Street

With the extension of the LRT to the south, the 25 Avenue/111 Street intersection will be downgraded to a right in/right out intersection. Based on a review of available concept plans, a northbound auxiliary lane is planned in addition to three through lanes. The HCM2010 methodology underestimates the capacity of right turns along multi-lane corridors; therefore, the following geometry was assumed in the assessment:

- ***East Approach*** –one right turn lane;
- ***South Approach*** – two through lanes, one right turn lane; and
- ***North Approach*** –three through lanes.

As only two through lanes are included in the assessment for the south approach, only 67% of the through volumes were included in the assessment.

As shown in **Tables 5-7** and **5-8** the intersection is anticipated to operate at acceptable levels of service in the peak hours under the 2047 background and 2047 total traffic scenarios. Long delays are projected for vehicles exiting the site during the AM peak hour; however, the on-site queue is projected to be accommodated within the available storage space and is not anticipated to impact inbound vehicle movements.

Table 5-7: 25 Avenue and 111 Street – AM Peak Hour

	Westbound		Northbound		Southbound	
Movement	**L**	**R**	**T**	**R**	**L**	**T**
2047 Background – Unsignalized (WB Stop)						
Geometry	R		T/T/R*		T/T/T	
Volume (vph)	62		1363**	168	512	
v/c	0.17					
Delay (s)	16.5					
LOS	C					
95th Queue (m)	5					
Intersection Delay			**0.5**	**Intersection LOS**		**A**
2047 Total – Unsignalized (WB Stop)						
Geometry	R		T/T/R*		T/T/T	
Volume (vph)	268		1454**	306	631	
v/c	0.77					
Delay (s)	42.4					
LOS	E					
95th Queue (m)	47					
Intersection Delay			**4.3**	**Intersection LOS**		**A**

*Two easternmost northbound through lanes used in the assessment

**67% of total volume within two through lanes

Table 5-8: 25 Avenue and 111 Street – PM Peak Hour

	Westbound		Northbound		Southbound	
Movement	**L**	**R**	**T**	**R**	**L**	**T**
2047 Background – Unsignalized (WB Stop)						
Geometry	R		T/T/R*		T/T/T	
Volume (vph)	97		868*	157	2309	
v/c	0.18					
Delay (s)	13.0					
LOS	B					
95th Queue (m)	5					
Intersection Delay			**0.4**	**Intersection LOS**		**A**
2047 Total – Unsignalized (WB Stop)						
Geometry	R		T/T/R*		T/T/T	
Volume (vph)	194		917**	243	2397	
v/c	0.37					
Delay (s)	15.9					
LOS	C					
95th Queue (m)	13					
Intersection Delay			**0.8**	**Intersection LOS**		**A**

*Two easternmost northbound through lanes used in the assessment

**67% of total volume within two through lanes

5.2.6 23 Avenue and 110 Street

The 23 Avenue/110 Street intersection is currently a signalized intersection that provides access to the commercial land uses within the south portion of the overall Century Park site. The reconfiguration of the 23 Avenue/111 Street intersection is anticipated to result in minor modifications at the 23 Avenue/110 Street intersection; therefore, the following geometry was assumed in the assessment:

- ***West Approach*** – one left turn bay, two through lanes, one right turn lane;
- ***East Approach*** – one left turn bay, two through lanes, one shared through/right turn lane;
- ***South Approach*** – one left turn bay, one shared through/right lane; and
- ***North Approach*** – one left turn lane, one shared through/right lane.

Tables 5-9 and **5-10** summarize the results of the assessments completed for the AM and PM peak hours respectively. A minimum 40s green time was maintained for the north/south main phase to accommodate pedestrian movements across 23 Avenue.

Table 5-9: 23 Avenue and 110 Street - AM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Pre-timed (140s cycle, EB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/TR			L/TR			L/TR		
Volume (vph)	133	1217	30	53	858	109	49	9	13	82	10	68
v/c	0.22	0.50	0.03	0.29	0.44		0.19	0.06		0.26	0.18	
Delay (s)	1.1	7.9	0.0	12.6	8.8		44.9	24.5		45.8	12.9	
LOS	A	A	A	B	A		D	C		D	B	
95th Queue (m)	m1	46	m0	m5	17		24	10		36	16	
Intersection Delay						**10.1**	**Intersection LOS**					**B**
2047 Total – Pre-timed (140s cycle, EB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/TR			L/TR			L/TR		
Volume (vph)	475	1225	30	53	976	171	49	9	13	157	10	172
v/c	0.85	0.50	0.03	0.29	0.52		0.25	0.06		0.49	0.37	
Delay (s)	16.1	5.7	0.0	14.3	10.9		47.1	24.5		51.9	9.3	
LOS	B	A	A	B	B		D	C		D	A	
95th Queue (m)	m29	m18	m0	m6	25		24	10		64	23	
Intersection Delay						**12.1**	**Intersection LOS**					**B**

As shown in Table 5-9, the 23 Avenue/110 Street intersection is anticipated to operate well in the AM peak hour under the 2047 background and 2047 total traffic scenarios.

Table 5-10: 23 Avenue and 110 Street - PM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Pre-timed (140s cycle, EB, NB, & SB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/TR			L/TR			L/TR		
Volume (vph)	166	1181	30	94	1785	120	89	24	34	197	33	313
v/c	0.48	0.55	0.03	0.52	0.89		0.56	0.16		0.49	0.58	
Delay (s)	45.6	44.2	10.8	21.4	24.2		49.9	22.2		42.8	11.6	
LOS	D	D	B	C	C		D	C		D	B	
95th Queue (m)	m64	m159	m3	m18	155		33	18		66	40	
Intersection Delay						**31.1**	**Intersection LOS**					**C**
2047 Total – Pre-timed (140s cycle, EB, NB, & SB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/TR			L/TR			L/TR		
Volume (vph)	342	1201	30	94	1850	190	89	24	34	265	33	468
v/c	0.98	0.56	0.03	0.53	0.95		0.79	0.16		0.66	0.84	
Delay (s)	85.7	43.1	10.8	31.4	53.9		78.8	22.2		49.9	34.5	
LOS	F	D	B	C	D		E	C		D	C	
95th Queue (m)	m#136	m162	m3	m26	#208		#42	18		88	#124	
Intersection Delay						**50.4**	**Intersection LOS**					**D**

As shown in Table 5-10, the 23 Avenue/110 Street intersection is anticipated to operate at acceptable levels of service in the PM peak hour. It is noted that the southbound queue could extend through the first two on-site intersections in the PM peak hour. It is anticipated that exiting traffic will share the road and allow vehicles to enter the queue at the access locations during peak periods. As well, the on-site roadway includes two northbound lanes; therefore, if northbound left turns are blocked by southbound queues, other northbound traffic will not be impacted.

It is noted that the eastbound left and westbound through v/c ratios are within the upper limits of acceptable levels of service in the PM peak hour, which reflects the use of pre-timed north-south pedestrian crossing times. Right-of-way is available to widen 23 Avenue to a full six-lane divided arterial between Calgary Trail and 111 Street; however, this would increase pedestrian crossing distances, which in turn would require a longer north/south main phase to serve pedestrian movements and reduce the effectiveness of the widening at this particular location. Based on the assessments completed, future widening of 23 Avenue to a six-lane divided arterial cross-section between Calgary Trail and 110 Street should consider the overall improvements to the lane balance and traffic flow along the corridor rather than isolated intersection capacity improvements, especially at locations where pedestrian crossing activity is a priority.

5.2.7 23 Avenue and 109A Street

The 23 Avenue/109A Street intersection is anticipated to remain a right-in/right-out intersection in the 2047 horizon. Similar to the 25 Avenue/111 Street intersection, the assessment was completed assuming the auxiliary lane operates as a right turn bay; therefore, the intersection was assessed using the following geometry:

- ***West Approach*** – two through lanes;
- ***East Approach*** – two through lanes, one right turn lane; and
- ***North Approach*** – one right turn lane.

An existing traffic count was not completed at the right in/right out access and the intersection was not included in the City's model; therefore, 20 westbound right turns and southbound right turns were assumed in the AM peak hour and 50 westbound right turns and 50 southbound right turns were assumed in the PM peak hour. As shown in **Tables 5-11** and **5-12**, the 23 Avenue/109A Street right in/right out access is anticipated to operate well in the peak hours under the 2047 background and 2047 total traffic scenarios.

Table 5-11: 23 Avenue and 109A Street – AM Peak Hour

	Eastbound	Westbound		Southbound	
Movement	**T**	**T**	**R**	**R**	
2047 Background – Unsignalized (SB Stop)					
Geometry	T/T	T/T/R*		R	
Volume (vph)	1312	1000	20	20	
v/c				0.04	
Delay (s)				12.6	
LOS				B	
95th Queue (m)				1	
Intersection Delay		**0.1**	**Intersection LOS**		**A**
2047 Total – Unsignalized (SB Stop)					
Geometry	T/T	T/T/R*		R	
Volume (vph)	1395	1104	49	96	
v/c				0.21	
Delay (s)				15.0	
LOS				C	
95th Queue (m)				6	
Intersection Delay		**0.5**	**Intersection LOS**		**A**

*Shared through/right lane coded as right turn lane in Synchro

Table 5-12: 23 Avenue and 109A Street – PM Peak Hour

	Eastbound	Westbound		Southbound	
Movement	**T**	**T**	**R**	**R**	
2047 Background – Unsignalized (SB Stop)					
Geometry	T/T	T/T/R*		R	
Volume (vph)	1412	1949	50	50	
v/c				0.21	
Delay (s)				24.0	
LOS				C	
95th Queue (m)				6	
Intersection Delay		**0.3**	**Intersection LOS**		**A**
2047 Total – Unsignalized (SB Stop)					
Geometry	T/T	T/T/R*		R	
Volume (vph)	1500	2026	62	108	
v/c				0.48	
Delay (s)				34.7	
LOS				D	
95th Queue (m)				18	
Intersection Delay		**1.0**	**Intersection LOS**		**A**

*Shared through/right lane coded as right turn lane in Synchro

5.2.8 23 Avenue and 109 Street

The 23 Avenue/109 Street intersection is an existing signalized intersection with the following geometry:

- ***West Approach*** – one left turn bay, two through lanes, one right lane;
- ***East Approach*** – one left turn bay, two through lanes, one right bay;
- ***South Approach*** – one left turn bay, one through lane, one shared through/right lane; and
- ***North Approach*** – one left turn bay, two through lanes, one right bay.

As shown in **Table 5-13**, the 23 Avenue/109 Street intersection is anticipated to operate well in the AM peak hour under the existing geometry and traffic control.

Table 5-13: 23 Avenue and 109 Street - AM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Pre-timed (140s cycle, EB & SB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/R			L/T/TR			L/T/T/R		
Volume (vph)	119	1152	41	41	886	54	69	152	111	101	77	65
v/c	0.36	0.56	0.05	0.22	0.53	0.08	0.22	0.29		0.26	0.06	0.12
Delay (s)	5.5	3.2	0.1	27.1	29.1	2.1	45.2	25.6		31.9	30.8	7.4
LOS	A	A	A	C	C	A	D	C		C	C	A
95th Queue (m)	4	15	m0	17	111	4	31	30		34	13	11
Intersection Delay						**16.5**	**Intersection LOS**					**B**
2047 Total – Pre-timed (140s cycle, EB & SB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/R			L/T/TR			L/T/T/R		
Volume (vph)	130	1223	42	41	974	133	71	156	111	229	79	108
v/c	0.43	0.59	0.05	0.24	0.59	0.18	0.23	0.30		0.58	0.06	0.18
Delay (s)	10.6	4.4	0.2	28.4	30.3	6.5	45.3	31.7		39.8	30.8	6.2
LOS	B	A	A	C	C	A	D	C		D	C	A
95th Queue (m)	12	27	m0	17	125	16	32	35		72	14	14
Intersection Delay						**18.9**	**Intersection LOS**					**B**

As shown in **Table 5-14**, the 23 Avenue/109 Street intersection is anticipated to operate at acceptable levels of service in the PM peak hour.

Table 5-14: 23 Avenue and 109 Street - PM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Pre-timed (140s cycle, EB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/R			L/T/TR			L/T/T/R		
Volume (vph)	142	1163	107	150	1728	155	121	96	76	117	201	150
v/c	0.67	0.47	0.10	0.59	0.87	0.18	0.44	0.20		0.42	0.23	0.32
Delay (s)	58.0	6.9	1.8	33.2	33.2	7.6	51.2	24.0		50.7	43.8	8.2
LOS	E	A	A	C	C	A	D	C		D	D	A
95th Queue (m)	#53	45	2	57	244	21	51	21		50	35	18
Intersection Delay						**25.3**	**Intersection LOS**					**C**
2047 Total – Pre-timed (140s cycle, EB Pm+Pt L)												
Geometry	L/T/T/R			L/T/T/R			L/T/TR			L/T/T/R		
Volume (vph)	175	1213	112	150	1782	242	126	106	76	178	210	180
v/c	0.83	0.49	0.11	0.62	0.89	0.27	0.46	0.21		0.65	0.25	0.37
Delay (s)	71.0	6.8	1.7	35.6	35.2	8.2	52.0	25.2		60.7	44.0	9.8
LOS	E	A	A	D	D	A	D	C		E	D	A
95th Queue (m)	#76	45	m2	59	259	31	54	22		75	36	23
Intersection Delay						**27.2**	**Intersection LOS**					**C**

5.2.9 25 Avenue and 109 Street

The 25 Avenue/109 Street intersection is an existing four-legged stop controlled intersection that provides access to the Ermineskin neighbourhood to the east and Century Park to the west. The following existing geometry was assumed in the assessment:

- ***West Approach*** – one shared left/through lane, one right turn lane;
- ***East Approach*** – one shared left/through/right lane;
- ***South Approach*** – one left turn bay, one through lane, one right bay; and
- ***North Approach*** – one left turn bay, one through lane, one shared through/right lane.

As shown in **Table 5-15**, the 25 Avenue/109 Street intersection is anticipated to operate well in the AM peak hour under the 2047 background and 2047 total traffic scenarios. As shown in **Table 5-16**, the addition of site generated traffic is anticipated to result in LOS F for the eastbound shared left/through lane in the PM peak hour. The v/c ratio for the movement is projected to be less than 0.90 and there are a number of other access points available to 109 Street from the site; therefore, no improvements are recommended at the intersection.

Table 5-15: 25 Avenue and 109 Street - AM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Unsignalized (E/W Stop)												
Geometry	LT/R			LTR			L/T/R			L/T/TR		
Volume (vph)	19	6	29	18	5	20	19	276	30	8	196	36
v/c	0.06		0.03	0.08			0.01			0.01		
Delay (s)	14.8		9.3	12.1			7.8			7.9		
LOS	B		A	B			A			A		
95th Queue (m)	2		1	2			0			0		
Intersection Delay						**2.1**	**Intersection LOS**					**A**
2047 Total – Unsignalized (E/W Stop)												
Geometry	LT/R			LTR			L/T/R			L/T/TR		
Volume (vph)	19	15	72	18	18	32	38	351	30	18	326	36
v/c	0.14		0.09	0.17			0.03			0.02		
Delay (s)	21.6		10.0	16.0			8.2			8.1		
LOS	C		B	C			A			A		
95th Queue (m)	4		2	5			1			0		
Intersection Delay						**3.1**	**Intersection LOS**					**A**

Table 5-16: 25 Avenue and 109 Street - PM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Unsignalized (E/W Stop)												
Geometry	LT/R			LTR			L/T/R			LT/TR		
Volume (vph)	54	27	95	17	24	17	66	281	46	18	356	116
v/c	0.37		0.13	0.19			0.06			0.01		
Delay (s)	30.6		10.7	19.3			8.6			7.9		
LOS	D		B	C			A			A		
95th Queue (m)	12		3	5			2			0		
Intersection Delay						**4.8**	**Intersection LOS**					**A**
2047 Total – Unsignalized (E/W Stop)												
Geometry	LT/R			LTR			L/T/R			LT/TR		
Volume (vph)	56	44	120	17	42	36	94	383	46	34	431	117
v/c	0.78		0.17	0.44			0.09			0.03		
Delay (s)	98.3		11.3	33.9			9.0			8.2		
LOS	F		B	D			A			A		
95th Queue (m)	35		5	16			2			1		
Intersection Delay						**10.9**	**Intersection LOS**					**B**

5.2.10 26 Avenue and 109 Street

The 26 Avenue/109 Street intersection is a stop controlled T-intersection that provides access to the existing residential buildings on the east side of Century Park. The following geometry was assumed in the assessment:

- ***West Approach*** – one shared left/right lane;
- ***South Approach*** – one left turn bay, one through lane; and
- ***North Approach*** – one through lane, one shared through/right lane.

As shown in **Tables 5-17** and **5-18**, the 26 Avenue/109 Street intersection is anticipated to operate well as an unsignalized intersection in the 2047 horizon under both the background and total traffic scenarios.

Table 5-17: 26 Avenue and 109 Street – AM Peak Hour

	Eastbound		Northbound		Southbound	
Movement	**L**	**R**	**L**	**T**	**T**	**R**
2047 Background – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	12	14	4	311	226	3
v/c	0.04		0.00			
Delay (s)	11.1		7.7			
LOS	B		A			
95th Queue (m)	1		0			
Intersection Delay			**0.6**	**Intersection LOS**		**A**
2047 Total – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	35	70	43	359	310	20
v/c	0.19		0.04			
Delay (s)	13.2		8.1			
LOS	B		A			
95th Queue (m)	5		1			
Intersection Delay			**2.1**	**Intersection LOS**		**A**

Table 5-18: 26 Avenue and 109 Street – PM Peak Hour

	Eastbound		Northbound		Southbound	
Movement	**L**	**R**	**L**	**T**	**T**	**R**
2047 Background – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	7	9	15	337	481	10
v/c	0.04		0.01			
Delay (s)	13.4		8.5			
LOS	B		A			
95th Queue (m)	1		0			
Intersection Delay			**0.4**	**Intersection LOS**		**A**
2047 Total – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	50	51	61	414	531	61
v/c	0.33		0.06			
Delay (s)	22.4		9.0			
LOS	C		A			
95th Queue (m)	11		2			
Intersection Delay			**2.4**	**Intersection LOS**		**A**

5.2.11 28 Avenue and 109 Street

The 28 Avenue/109 Street intersection is an existing unsignalized T-intersection that provides access to two existing residential towers on the east side of the Century Park site. The following existing geometry was assumed in the assessment:

- ***West Approach*** – one shared left/right lane;
- ***South Approach*** – one left turn bay, one through lane; and
- ***North Approach*** – one through lane, one shared through/right lane.

As shown in **Tables 5-19** and **5-20**, the 28 Avenue/109 Street intersection is anticipated to operate well as an unsignalized intersection in the 2047 horizon under both the background and total traffic scenarios.

Table 5-19: 28 Avenue and 109 Street – AM Peak Hour

	Eastbound		Northbound		Southbound	
Movement	**L**	**R**	**L**	**T**	**T**	**R**
2047 Background – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	7	6	2	321	223	1
v/c	0.02		0.00			
Delay (s)	11.3		7.7			
LOS	B		A			
95th Queue (m)	1		0			
Intersection Delay			**0.3**	**Intersection LOS**		**A**
2047 Total – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	109	90	50	344	240	22
v/c	0.41		0.04			
Delay (s)	17.4		7.9			
LOS	C		A			
95th Queue (m)	15		1			
Intersection Delay			**4.5**	**Intersection LOS**		**A**

Table 5-20: 28 Avenue and 109 Street – PM Peak Hour

	Eastbound		Northbound		Southbound	
Movement	**L**	**R**	**L**	**T**	**T**	**R**
2047 Background – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	2	10	12	332	481	10
v/c	0.02		0.01			
Delay (s)	11.3		8.5			
LOS	B		A			
95th Queue (m)	1		0			
Intersection Delay			**0.3**	**Intersection LOS**		**A**
2047 Total – Unsignalized (EB Stop)						
Geometry	LR		L/T		T/TR	
Volume (vph)	50	64	90	374	528	89
v/c	0.37		0.10			
Delay (s)	23.5		9.2			
LOS	C		A			
95th Queue (m)	13		2			
Intersection Delay			**2.9**	**Intersection LOS**		**A**

5.2.12 29 Avenue and 109 Street

The 29 Avenue/109 Street intersection is a four-legged, all-way stop controlled intersection with the following geometry:

- ***West Approach*** – one shared left/through lane, one right turn lane;
- ***East Approach*** – one shared left/through/right lane;
- ***South Approach*** - one left turn bay, one shared through/right lane; and
- ***North Approach*** – one left turn bay, one through lane, one shared through/right lane.

The set-back of on-street parking along the east side of 109 Street and the north side of 29 Avenue allows for right turn movements to bypass queued vehicles if required; however, separate right turn bays have not been included in the assessment in order to be conservative.

The west leg of the intersection provides access to the Century Park site; however, it currently accommodates eastbound traffic only. As part of the site redevelopment, the developer is interested in re-establishing the access for both inbound and outbound traffic.

In order to assess the intersection as a full four-legged intersection, potential geometry and traffic control operations were considered. Under all-way stop control, it is typically recommended that no more than two lanes are provided on each approach. As noted above, the north and south approaches currently

include three lanes. Although the additional lanes could provide more capacity at the intersection, it is recommended that the geometry be revised to eliminate the northbound and southbound dedicated left turn bays to clarify operations under all-way stop control. As an alternative, the intersection was also assessed as a signalized intersection. The existing geometry is appropriate for a signalized intersection, and signalization would also provide an increased level of protection for pedestrians crossing all four approaches, which was identified as a concern at public consultation events.

Tables 5-21 and **5-22** summarize the intersection assessments completed for the 29 Avenue/109 Street intersection under all-way stop control and signal control. The signalized intersection assessment utilized the existing geometry noted above, while the all-way stop controlled assessment utilized the following geometry:

- ***West Approach*** – one shared left/through lane, one right turn lane;
- ***East Approach*** – one shared left/through/right lane;
- ***South Approach*** – one left turn lane, one shared through/right lane; and
- ***North Approach*** – one shared left/through lane, one shared through/right lane.

As shown in Tables 5-21 and 5-22, the 29 Avenue/109 Street intersection could operate at acceptable levels of service as either an all-way stop controlled intersection or a signalized intersection. Under all-way stop control it is recommended that the right turn bays be formalized on the south and east approaches through the extension of the parking bans. This would also require the left turn bay to be closed on the south approach in order to maintain a maximum of two lanes per approach.

The intersection is anticipated to operate well under signal control with no lane configuration modifications; however, curb bulbs could be implemented on the southeast and northeast corners to improve pedestrian visibility and reduce pedestrian crossing distances at the intersection.

Based on the assessments completed, the installation of a signal is recommended. While an all-way stop would provide appropriate capacity, the removal of lanes may be counter-intuitive to users as volumes increase. As well, the provision of a signal would provide improved pedestrian crossing opportunities at the intersection. A short signal cycle length (80s) was used in the assessment to reduce pedestrian wait times at the intersection.

In addition to the above, the City of Edmonton has identified concerns regarding the proximity of the existing MDR right in/right out site access located on the west side of 109 Street north of 29 Avenue. The access is located approximately 16m north of the Century Park access (curb face to curb face), which does not meet current City of Edmonton access spacing guidelines. Closure of the right in/right out access and the provision of a new connection between the MDR site and Century Park has been identified as a condition of re-opening the Century Park access to accommodate both inbound and outbound traffic.

Table 5-21: 29 Avenue and 109 Street - AM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Unsignalized (All-Way Stop)												
Geometry	LT/R			LTR			L/TR			LT/TR		
Volume (vph)	1	10*	1	126	10*	26	10*	150	178	71	97	2
v/c	0.00		0.00	0.26			0.02	0.44		0.19		0.07
Delay (s)	9.3		8.1	10.9			8.5	11.3		9.7		8.5
LOS	A		A	B			A	B		A		A
95th Queue (m)	0		0	8			0	17		2		8
Intersection Delay						**10.6**	**Intersection LOS**					**B**
2047 Total – Unsignalized (All-Way Stop)												
Geometry	LT/R			LTR			L/TR			LT/TR		
Volume (vph)	52	14	1	131	23	26	10*	269	184	71	130	37
v/c	0.13		0.00	0.33			0.02	0.68		0.24		0.16
Delay (s)	11.1		8.9	12.9			9.1	19.2		10.9		9.6
LOS	B		A	B			A	C		B		A
95th Queue (m)	4		0	11			1	41		7		5
Intersection Delay						**15.1**	**Intersection LOS**					**B**
2047 Total – Pre-timed (80s cycle)												
Geometry	LT/R			LTR			L/TR			L/T/TR		
Volume (vph)	52	14	1	131	23	26	10*	269	184	71	130	37
v/c	0.15		0.00	0.39			0.01	0.53		0.19		0.10
Delay (s)	17.5		0.0	19.6			8.5	10.8		14.5		10.6
LOS	B		A	B			A	B		B		B
95th Queue (m)	15		0	34			m2	43		m12		m8
Intersection Delay						**13.2**	**Intersection LOS**					**B**

*Movement was projected to accommodate 0 vph; a nominal 10 vph was assumed in the assessment.

Table 5-22: 29 Avenue and 109 Street - PM Peak Hour

	Eastbound			Westbound			Northbound			Southbound		
Movement	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
2047 Background – Unsignalized (All-Way Stop)												
Geometry	LT/R			LTR			L/TR			LT/TR		
Volume (vph)	1	10*	10*	330	10*	83	3	190	141	72	161	10*
v/c	0.02		0.02	0.74			0.01	0.57		0.29		0.17
Delay (s)	10.2		9.4	25.4			9.8	16.7		12.4		10.6
LOS	B		A	D			A	C		B		B
95th Queue (m)	1		1	48			0	26		9		5
Intersection Delay						**18.9**	**Intersection LOS**					**C**
2047 Total – Unsignalized (All-Way Stop)												
Geometry	LT/R			LTR			L/TR			LT/TR		
Volume (vph)	30	27	2	345	29	83	3	267	154	72	270	41
v/c	0.14		0.00	0.93			0.01	0.83		0.45		0.37
Delay (s)	13.1		10.7	52.5			10.8	36.7		16.8		14.5
LOS	B		B	F			B	E		C		B
95th Queue (m)	4		0	83			0	63		17		12
Intersection Delay						**35.0**	**Intersection LOS**					**D**
2047 Background with Improvements – Unsignalized (All-Way Stop)												
Geometry	LT/R			LT/R			LT/R			LT/TR		
Volume (vph)	30	27	2	345	29	83	3	267	154	72	270	41
v/c	0.13		0.00	0.78		0.15	0.54		0.28	0.42		0.35
Delay (s)	12.4		10.1	32.5		10.2	18.0		11.6	15.5		13.5
LOS	B		B	D		B	C		B	C		B
95th Queue (m)	4		0	53		4	24		8	16		11
Intersection Delay						**19.6**	**Intersection LOS**					**C**
2047 Total – Pre-timed (80s cycle)												
Geometry	LT/R			LTR			L/TR			L/T/TR		
Volume (vph)	30	27	2	345	29	83	3	267	154	72	270	41
v/c	0.09		0.00	0.73			0.01	0.63		0.30		0.24
Delay (s)	12.3		0.0	24.9			16.3	23.8		22.1		16.7
LOS	B		A	C			B	C		C		B
95th Queue (m)	11		0	93			2	80		19		26
Intersection Delay						**21.9**	**Intersection LOS**					**C**

*Movement was projected to accommodate 0 vph; a nominal 10 vph was assumed in the assessment.

5.2.13 On-Site Intersections

Traffic assessments were also completed for the six on-site intersections on the periphery of the DC2 study area. These intersections are generally the first on-site intersection within the plan area, and the intersection assessments were completed to confirm the on-site lane arrangements required to support the proposed development program. As the traffic analysis includes a number of assumptions regarding the potential locations of parkade accesses and location of land uses within the site, the on-site intersection assessments are intended to provide an order of magnitude review to confirm the recommended number of lanes along the internal roadways. The actual design of the internal roadways should reflect the number of lanes identified in Section 5.1 and should be cognizant of the lane balance between the site accesses and the on-site network.

Table 5-23 on the following page summarizes the on-site intersection assessments completed under the 2047 total traffic scenarios.

28 Avenue and 110A Street

The 28 Avenue/110A Street intersection was assessed assuming a single lane is provided on the east, south, and north approaches, and a shared left/through lane and a shared through/right lane are provided on the west approach. The intersection was initially assumed to be stop controlled on the north and south approaches; however, based on the assessments, the northbound movements were projected to be over capacity. A revised assessment was completed assuming all-way stop control, which improved operations; however, the westbound movements were approaching capacity in the PM peak hour. A second westbound lane was added to the assessment, and with this improvement in addition to all-way stop control, the intersection is anticipated to operate at acceptable levels of service. Notwithstanding the above, the intersection will also be impacted by queue spillback from the 28 Avenue/111 Street intersection in the PM peak hour, which will require additional queuing space on-site. Therefore, the four-lane cross-section should be extended to 110 Street to provide additional queuing space.

25 Avenue and 110A Street

The 25 Avenue/110A Street intersection currently operates as an all-way stop controlled T-intersection with a left turn lane and a right turn lane on the west approach and a single lane on the north and south approaches. With the downgrading of the 25 Avenue/111 Street intersection to a right in/right out intersection, it is recommended that the west approach be revised to include a single lane. As well, the traffic control could be revised to north/south stop control, which would allow movements into the site to operate under free flow conditions. Based on the assessments completed, the intersection is anticipated to operate at acceptable levels of service during the AM and PM peak hours as an unsignalized intersection.

The intersection was also assessed as a single lane roundabout. As shown in Table 5-23, the intersection could operate at excellent levels of service if a roundabout was implemented in this location.

Table 5-23: On-Site Intersection Assessments

Intersection	Movement	Eastbound			Westbound			Northbound			Southbound			Overall	
		L	T	R	L	T	R	L	T	R	L	T	R	Delay	LOS
28 Avenue and 110A Street	**AM Peak Hour - 2047 Total - Unsignalized (N/S Stop)**														
	Geometry	LT/TR			LTR			LTR			LTR			5.6	A
	Volume (vph)	52	516	62	10*	291	6	82	10*	10*	9	10*	64		
	v/c Ratio	0.04			0.01			0.54			0.17				
	Delay (s)	8.0			8.7			44.8			13.6				
	LOS	A			A			E			B				
	95th Queue (m)	1			0			21			5				
	PM Peak Hour - 2047 Total - Unsignalized (N/S Stop)														
	Geometry	LT/TR			LTR			LTR			LTR			75.6	F
	Volume (vph)	85	381	124	10*	532	18	164	10*	10*	15	10*	147		
	v/c Ratio	0.09			0.01			2.07			0.43				
	Delay (s)	8.9			8.5			594.0			20.7				
	LOS	A			A			F			C				
	95th Queue (m)	2			0			121			16				
28 Avenue and 110A Street	**AM Peak Hour - 2047 Total - Unsignalized (All-Way Stop)**														
	Geometry	LT/TR			LTR			LTR			LTR			12.4	B
	Volume (vph)	52	516	62	10*	291	6	82	10*	10*	9	10*	64		
	v/c Ratio	0.48/0.47			0.45			0.18			0.14				
	Delay (s)	13.2/12.7			12.7			10.7			9.8				
	LOS	B/B			B			B			A				
	95th Queue (m)	20/19			18			5			4				
	PM Peak Hour - 2047 Total - Unsignalized (All-Way Stop)														
	Geometry	LT/TR			LTR			LTR			LTR			33.4	D
	Volume (vph)	85	381	124	10*	532	18	164	10*	10*	15	10*	147		
	v/c Ratio	0.54/0.58			0.99			0.40			0.35				
	Delay (s)	18.0/18.3			61.0			16.0			14.2				
	LOS	C/C			F			C			B				
	95th Queue (m)	24/28			106			14			11				
28 Avenue and 110A Street	**AM Peak Hour - 2047 Total - Unsignalized (All-Way Stop) - With Improvements**														
	Geometry	LT/TR			**LT/TR**			LTR			LTR			11.9	B
	Volume (vph)	52	516	62	10*	291	6	82	10*	10*	9	10*	64		
	v/c Ratio	0.48/0.48			0.26/0.25			0.18			0.13				
	Delay (s)	13.4/12.9			10.6/10.5			10.6			9.7				
	LOS	B/B			B/B			B			A				
	95th Queue (m)	20/20			8/8			5			4				
	PM Peak Hour - 2047 Total - Unsignalized (All-Way Stop) - with Improvements														
	Geometry	LT/TR			**LT/TR**			LTR			LTR			16.5	C
	Volume (vph)	85	381	124	10*	532	18	164	10*	10*	15	10*	147		
	v/c Ratio	0.53/0.57			0.53/0.54			0.38			0.33				
	Delay (s)	17.4/17.6			17.0/17.2			14.8			13.2				
	LOS	C/C			C/C			B			B				
	95th Queue (m)	23/26			22/23			13			11				

*Movement was projected to accommodate 0 vph; a nominal 10 vph was assumed in the assessment.

Table 5-23: On-Site Intersection Assessments

Intersection	Movement	Eastbound			Westbound			Northbound			Southbound			Overall	
		L	T	R	L	T	R	L	T	R	L	T	R	Delay	LOS
25 Avenue and 110A Street	**AM Peak Hour - 2047 Total - Unsignalized (N/S Stop 2000 HCM Report)**														
	Geometry		LR						LT			TR			
	Volume (vph)	203	-	103				122	12	-	-	33	146		
	v/c Ratio		0.13						0.44			0.22		11.3	B
	Delay (s)		5.3						26.0			10.50			
	LOS		A						D			B			
	95th Queue (m)		3						17			6.50			
	PM Peak Hour - 2047 Total - Unsignalized (N/S Stop 2000 HCM Report)														
	Geometry		LR						LT			TR			
	Volume (vph)	102	-	141				95	29	-	-	68	99		
	v/c Ratio		0.06						0.27			0.22		8.6	A
	Delay (s)		3.4						15.6			11.0			
	LOS		A						C			B			
	95th Queue (m)		2						9			7			
25 Avenue and 110A Street	**AM Peak Hour - 2047 Total - Unsignalized (Roundabout)**														
	Geometry		L/R						LT			TR			
	Volume (vph)	203	-	103				122	12	-	-	33	146		
	v/c Ratio		0.25						0.15			0.19		5.7	A
	Delay (s)		4.8						6.4			4.7			
	LOS		A						A			A			
	95th Queue (m)		11						6			8			
	PM Peak Hour - 2047 Total - Unsignalized (Roundabout)														
	Geometry		L/R						LT			TR			
	Volume (vph)	102	-	141				95	29	-	-	68	99		
	v/c Ratio		0.22						0.13			0.17		4.6	A
	Delay (s)		4.4						5.2			4.4			
	LOS		A						A			A			
	95th Queue (m)		10						5			7			
25 Avenue and 110 Street	**AM Peak Hour - 2047 Total - Unsignalized (E/W Stop)**														
	Geometry		LTR			LTR			LTR			LTR			
	Volume (vph)	1	7	36	10*	13	25	13	464	8	14	230	44		
	v/c Ratio		0.07			0.12			0.01			0.01		1.7	A
	Delay (s)		11.6			15.6			7.9			8.4			
	LOS		B			C			A			A			
	95th Queue (m)		2			3			0			0			
	PM Peak Hour - 2047 Total - Unsignalized (E/W Stop)														
	Geometry		LTR			LTR			LTR			LTR			
	Volume (vph)	10*	4	62	10*	8	22	31	333	22	31	457	21		
	v/c Ratio		0.17			0.12			0.03			0.03		2.3	A
	Delay (s)		15.0			17.3			8.5			8.1			
	LOS		C			C			A			A			
	95th Queue (m)		5			3			1			1			

*Movement was projected to accommodate 0 vph; a nominal 10 vph was assumed in the assessment.

Table 5-23: On-Site Intersection Assessments

Intersection	Movement	Eastbound			Westbound			Northbound			Southbound			Overall	
		L	T	R	L	T	R	L	T	R	L	T	R	Delay	LOS
25 Avenue and 109A Street	**AM Peak Hour - 2047 Total - Unsignalized (N/S Stop)**														
	Geometry	LTR			LTR			LTR			LTR				
	Volume (vph)	5	24	7	41	27	9	10*	34	25	44	84	10*		
	v/c Ratio	0.00			0.03			0.09			0.20			8.2	A
	Delay (s)	7.3			7.4			10.2			11.4				
	LOS	A			A			B			B				
	95th Queue (m)	0			1			2			5				
	PM Peak Hour - 2047 Total - Unsignalized (N/S Stop)														
	Geometry	LTR			LTR			LTR			LTR				
	Volume (vph)	15	27	5	105	28	30	10*	28	84	23	57	10*		
	v/c Ratio	0.01			0.07			0.16			0.17			7.9	A
	Delay (s)	7.4			7.5			10.5			13.0				
	LOS	A			A			B			B				
	95th Queue (m)	0			2			5			5				
26 Avenue and 109A Street	**AM Peak Hour - 2047 Total - Unsignalized (N/S Stop)**														
	Geometry	LTR			LTR			LTR			LTR				
	Volume (vph)	2	57	35	7	53	4	29	8	26	22	52	10*		
	v/c Ratio	0.00			0.01			0.08			0.12			5.2	A
	Delay (s)	7.3			7.4			9.9			10.6				
	LOS	A			A			A			B				
	95th Queue (m)	0			0			2			3				
	PM Peak Hour - 2047 Total - Unsignalized (N/S Stop)														
	Geometry	LTR			LTR			LTR			LTR				
	Volume (vph)	6	72	19	22	84	16	1	34	14	13	43	10*		
	v/c Ratio	0.00			0.02			0.07			0.10			4.4	A
	Delay (s)	7.4			7.5			10.6			11.1				
	LOS	A			A			B			B				
	95th Queue (m)	0			0			2			2				
26 Avenue and 109A Street	**AM Peak Hour - 2047 Total - Unsignalized (Roundabout)**														
	Geometry	LTR			LTR			LTR			LTR				
	Volume (vph)	2	57	35	7	53	4	29	8	26	22	52	10*		
	v/c Ratio	0.10			0.06			0.06			0.09			4.8	A
	Delay (s)	4.3			4.2			5.7			5.1				
	LOS	A			A			A			A				
	95th Queue (m)	4			2			2			4				
	PM Peak Hour - 2047 Total - Unsignalized (Roundabout)														
	Geometry	LTR			LTR			LTR			LTR				
	Volume (vph)	6	72	19	22	84	16	1	34	14	13	43	10*		
	v/c Ratio	0.10			0.11			0.05			0.07			4.5	A
	Delay (s)	4.4			4.4			4.3			5.0				
	LOS	A			A			A			A				
	95th Queue (m)	4			5			2			2				

*Movement was projected to accommodate 0 vph; a nominal 10 vph was assumed in the assessment.

Table 5-23: On-Site Intersection Assessments

Intersection	Movement	Eastbound			Westbound			Northbound			Southbound			Overall	
		L	T	R	L	T	R	L	T	R	L	T	R	Delay	LOS
28 Avenue and 109A Street	**AM Peak Hour - 2047 Total - Unsignalized (N/S Stop)**														
	Geometry		LTR			LTR			LTR			LTR			
	Volume (vph)	3	69	10*	15	43	4	10*	3	66	15	15	10*		
	v/c Ratio		0.00			0.01			0.09			0.05		4.9	A
	Delay (s)		7.4			7.4			9.4			10.1			
	LOS		A			A			B			B			
	95th Queue (m)		0			0			2			2			
	PM Peak Hour - 2047 Total - Unsignalized (N/S Stop)														
	Geometry		LTR			LTR			LTR			LTR			
	Volume (vph)	8	50	10*	68	61	14	10*	8	36	8	10	10*		
	v/c Ratio		0.01			0.05			0.07			0.04		4.8	A
	Delay (s)		7.4			7.5			9.9			10.6			
	LOS		A			A			A			B			
	95th Queue (m)		0			1			2			1			
28 Avenue and 109A Street	**AM Peak Hour - 2047 Total - Unsignalized (Roundabout)**														
	Geometry		LTR			LTR			LTR			LTR			
	Volume (vph)	3	69	10*	15	43	4	10*	3	66	15	15	10*		
	v/c Ratio		0.08			0.05			0.08			0.04		4.5	A
	Delay (s)		4.0			4.4			4.8			5.3			
	LOS		A			A			A			A			
	95th Queue (m)		3			2			3			2			
	PM Peak Hour - 2047 Total - Unsignalized (Roundabout)														
	Geometry		LTR			LTR			LTR			LTR			
	Volume (vph)	8	50	10*	68	61	14	10*	8	36	8	10	10*		
	v/c Ratio		0.07			0.12			0.05			0.03		4.9	A
	Delay (s)		4.6			5.2			4.3			5.4			
	LOS		A			A			A			A			
	95th Queue (m)		2			5			2			1			
29 Avenue and 109A Street	**AM Peak Hour - 2047 Total - Unsignalized (NB Stop)**														
	Geometry		TR			LT			LR						
	Volume (vph)	-	33	10*	7	53	-	10*	-	34					
	v/c Ratio					0.01			0.05					3.1	A
	Delay (s)					7.3			8.9						
	LOS					A			A						
	95th Queue (m)					0			1						
	PM Peak Hour - 2047 Total - Unsignalized (NB Stop)														
	Geometry		TR			LT			LR						
	Volume (vph)	-	43	10*	26	47	-	10*	-	16					
	v/c Ratio					0.02			0.03					2.8	A
	Delay (s)					7.4			9.1						
	LOS					A			A						
	95th Queue (m)					1			1						

*Movement was projected to accommodate 0 vph; a nominal 10 vph was assumed in the assessment.

25 Avenue and 110 Street

The 25 Avenue/110 Street intersection is anticipated to operate as an east-west stop controlled intersection with a single lane on each approach. As shown in Table 5-23, the intersection is anticipated to operate well as an unsignalized intersection upon full build out of the site.

25 Avenue and 109A Street

The 25 Avenue/109A Street intersection is anticipated to be developed as a four-legged unsignalized intersection as the development of Century Park continues. A single lane is assumed to be developed on each approach and the north and south approaches are anticipated to be stop controlled. Based on the assessments completed, the intersection is anticipated to operate very well as an unsignalized intersection upon full buildout of Century Park.

26 Avenue and 109A Street

The 26 Avenue/109A Street intersection was assessed under north-south stop control with a single lane on each approach and as a single lane roundabout. Based on the assessments completed, the intersection could operate very well under either configuration.

28 Avenue and 109A Street

The 28 Avenue/109A Street intersection is proposed to be developed as an unsignalized four-legged intersection. The intersection was assessed as a north-south stop controlled intersection with a single lane on each approach and as a single lane roundabout. As shown in Table 5-23, the intersection is anticipated to operate very well under either configuration.

29 Avenue and 109A Street

The 29 Avenue/109A Street intersection is anticipated to be developed as an unsignalized T-intersection with a single lane on each approach. Based on the assessments completed, the intersection is anticipated to operate at excellent levels of service upon full build out of the site.

5.3 109 Street Roadway Requirements

Daily volumes along 109 Street are projected to range from 8,010 vpd to 11,960 vpd between 23 Avenue and 111 Street under the 2047 total traffic scenario. Collector roadways in Edmonton typically accommodate between 1,000 vpd and 10,000 vpd, depending on the location of the roadway within a neighbourhood and the adjacent land uses. For example, higher volumes are typically found at the periphery of neighbourhoods on the approaches to the arterial roadway network and adjacent to commercial sites.

109 Street was originally constructed to accommodate a regional shopping centre and includes a five-lane cross-section. While the east curb line currently accommodates on-street parking, the lane widths are

sufficient to accommodate two northbound travel lanes if required. However, based on the intersection assessments completed along the corridor, the existing geometry is sufficient to accommodate the projected AM and PM peak hour traffic volumes at acceptable levels of service. Overall, 109 Street was developed to accommodate traffic volumes associated with a regional shopping centre and provides sufficient capacity to accommodate the proposed mixed use residential/commercial development.

As no capacity concerns were identified along the 109 Street corridor, there is the potential to review the cross-section in the future. For example, two southbound through lanes are not anticipated to be required between 25 Avenue and 29 Avenue; therefore, the southbound curb lane could be re-purposed as on-street parking with or without the construction of curb bulbs at the intersections. Alternate cross-sections that require more extensive construction could also be considered as part of any future neighbourhood rehabilitation projects.

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6. ON-SITE PARKING

6.1 Parking Requirements

Residential parking for vehicles will generally be provided on the site in accordance with the parking requirements outlined in the Edmonton Zoning Bylaw; however, residential visitor parking is proposed to be provided at a minimum of 1 space per 10 dwelling units to a maximum of 1 space per 7 dwelling units. Based on a maximum of 4,500 dwelling units between 450 and 643 visitor parking spaces could be provided on-site. This is in addition to between 3,150 (0.7 spaces per dwelling unit) and 7,875 (1.75 spaces per dwelling unit) residential parking spaces that could be developed on site depending on the mix of units provided.

Parking for commercial land uses is proposed to be provided at a minimum of 1 space per 44.0 m^2 of Gross Floor Area (GFA) to a maximum of 25.0 m^2 GFA. These rates were developed based on a review of mode split assumptions and the potential for shared parking to occur on the site for a range of commercial land uses. ULI's Shared Parking was used to test a potential 350,000 SF commercial development that includes a mix of office and retail land uses. **Table 6-1** summarizes the assumed land use mix used in the assessment and the parking spaces that would be required under the existing City of Edmonton Zoning Bylaw.

Table 6-1: Parking Assessment Land Use Assumptions and Zoning Bylaw Requirements

Land Use	Area (SF)	Area (m^2)	Bylaw Rate	Stalls Required
Office	50,000	4,645.15	1 per 29.4m^2	158.0
Medical/Dental	50,000	4,645.15	1 per 22.2m^2	209.2
Commercial/Retail[A]	184,000	17,094.16	1 per 40m^2	427.4
Restaurants[B]	50,000	4,645.15	1 per 3.6m^2 ps	645.2
Major Alcohol	5,000	464.52	1 per 23.3m^2	19.9
Child Care Services[C]	5,000	464.52	1 per 117m^2	4.0
Fitness Club	6,000	557.42	1 per 10m^2	55.7
Total	**350,000**	**32,516.07**		**1,520**

[A]Individual CRUs anticipated to be less than 4,500m^2 each

[B]Parking calculations for restaurants assume 50% patron space

[C]Drop-off spaces for child care services would be in addition to the parking requirements

As shown in Table 6-1, the assumed mix of commercial land uses would require approximately 1,520 parking spaces, or one space per 21.4 m^2 of gross floor area. The TIA assumed a mode split of 15% for commercial land uses based on the proximity of the Century Park LRT station and identified an additional 4% to 17% of trips that would be generated by land uses internal to the site. Reducing the parking

requirements by 25% to account for the potential influence of transit and internal capture would result in an aggregate parking demand of one space per 28.5 m^2.

The above calculation does not account for the potential for shared parking within the site. Based on a parking assessment using the methodology outlined in the Urban Land Institute's Shared Parking, and assuming a mode split/internal capture rate of 25%, the parking demand associated with the assumed commercial land uses would peak on a weekday at 1:00 PM, when 955 spaces would potentially be occupied. However, at this time, visitor parking demand is estimated to only be 20% of the demand. Based on a visitor parking supply in the order of 450 spaces (1 per 10 units), approximately 360 parking spaces could be available to be shared by commercial land use employees and patrons. Based on the availability of visitor spaces, a total of 595 additional spaces would be required. However, incorporating visitor spaces into the shared parking calculations requires further review of the various time of day and day of week variations for visitor parking. Based on residential visitor parking profiles, visitor demands peak on weekday evenings and weekend evenings beginning at 7:00 PM when 100% of the visitor spaces are assumed to be full. At this time, the assumed commercial uses would require 735 parking spaces or 1 space per 44.2 m^2 to meet the estimated demands. This aggregate shared parking demand was used to establish the minimum parking requirements included in the Zoning Bylaw. Shared parking calculations are included in **Appendix E** for reference.

In addition to the potential for shared use between commercial and residential visitor parking, ProCura is proposing to unbundle residential parking from specific units. This would provide even greater flexibility in the supply of parking for the various on-site users.

As the above provides one sample of parking demand for the full build out of the site, it is recommended that a parking impact assessment be completed at approximately 50% of development, or once development has been initiated within five of the internal parcels. This will provide an opportunity to measure actual parking demands and adjust the supply requirements moving forward.

6.2 Parking Locations

The majority of the off-street parking will be provided within either above grade or underground parking structures; however, surface parking is proposed to be provided along the internal private streets to provide convenient access for visitors to the commercial land uses.

6.3 Non-Accessory Parking

In addition to the potential for on-site parking to be shared between site users, the proposed DC2 zone allows for the inclusion of non-accessory parking. The intent of non-accessory parking on the site is to maximize the occupancy of on-site parking spaces during all times of the day. Where on-site parking is not required to serve site users, ProCura would like to allow for park 'n' ride activities on the site. This requires a parking management strategy that can allocate spaces for the different site users based on time of day and communication with site users to ensure the on-site requirements are being met.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Study Synopsis

7.1.1 Century Park Development Concept

The review of the transportation network was based on the following land use assumptions:

- 4,050 apartment dwelling units;
- 450 townhouse units;
- 50,000 SF office space;
- 50,000 SF medical/dental space; and
- 250,000 SF retail space.

7.1.2 Traffic Generation

Based on the trip generation, internal capture, pass-by, and mode split assumptions, the proposed development could generate 2,398 net new AM peak hour trips, 2,027 net new PM peak hour trips, and 27,872 net new daily trips.

7.2 Conclusions

Based on the assessments completed, 111 Street is anticipated to continue to be congested during peak hours in the 2047 horizon. The addition of site generated traffic is anticipated to compound congestion; however, the development site is ideally located to take advantage of the LRT system, potentially reducing the number of vehicle trips on the network in the longer term. The remaining study area intersections can accommodate the projected traffic volumes at acceptable levels of service.

7.3 Recommendations

Based on the assessments completed, the following recommendations are advanced:

- Two eastbound and two westbound lanes should be provided along 28 Avenue from east of 111 Street to 110 Street;
- 25 Avenue should be revised to include one lane in each direction when the 25 Avenue/111 Street access is converted to a right in/right out access;
- The 29 Avenue/109 Street intersection should be signalized;
- The MDR site access located north of the 29 Avenue/109 Street intersection should be closed and a new access should be developed between the MDR site and Century Park;
- Residential parking should be provided as per City of Edmonton Zoning Bylaw parking rates;

- A minimum of one stall per 10 dwelling units and a maximum of one stall per seven dwelling units should be established for residential visitor parking;
- Commercial parking should be provided at a minimum of one space per 44 m^2 and to a maximum of one space per 25 m^2 GFA; and
- A parking impact assessment should be completed at 50% of development, or when development has been initiated on five parcels, in order to confirm future parking supply requirements.

APPENDIX A

Existing Transit Routes

Appendix A: Century Park Existing Transit Routes

Route	Destination	Description
9	Southgate-Downtown-Kingsway/RAH-Northgate-Eaux Claires	Late Night Service
17	Century Park – Southgate	
23	Mill Woods Towne Centre – Century Park – Leger Transit Centre – West Edmonton Mall	
24	Leger Transit Centre – Ambleside – Century Park Transit Centre	
25	Leger Transit Centre – Century Park	
30	Mill Woods – Century Park – Leger – Riverbend – South Campus/Ft. Edmonton	
35	Century Park – Leger – Riverbend – South Campus/Ft. Edmonton	
36	Century Park – South Campus/Ft. Edmonton	
37	Century Park – Leger	
39	Century Park – Rutherford	
40	Yellowbird – Century Park – Southgate	
41	Century Park – Southgate	
42	Century Park – Southgate	
43	Century Park – South Campus/Ft. Edmonton	
44	Twin Brooks – Century Park – Southgate	
45	Century Park – Southgate	
46	Yellowbird – Harry Ainley	September to June Only
47	Century Park – Callaghan	Peak Hours Only
48	Century Park – Blackburne	Peak Hours Only
49	Rutherford – Century Park	
74	Mill Woods Transit Centre – Lakewood – Century Park – Southgate	
77	Mill Woods Transit Centre – Century Park	Peak Hours Only
78	Century Park – South Edmonton Common – Ellerslie Crossing – Mill Woods Towne Centre	
79	Mill Woods Transit Centre – Summerside – South Edmonton Common – Century Park Transit Centre	
301	Century Park – Southgate	Small Bus Routh Nights Only

Route	Destination	Description
324	Century Park – Ambleside	Small Bus Route
331	Century Park – Chappelle	
334	Riverbend – Leger – South Campus/Ft. Edmonton	
337	Leger – Century Park	
338	Blackburn – Century Park – Leger – Brookside – Southgate	
339	Century Park – Blackburn – Rutherford	
347	Century Park – Allard	Peak Hours Only
747	Century Park – Edmonton International Airport	EIA Shuttle
Route 1	Leduc – Century Park	Leduc Transit – Peak Hours Only

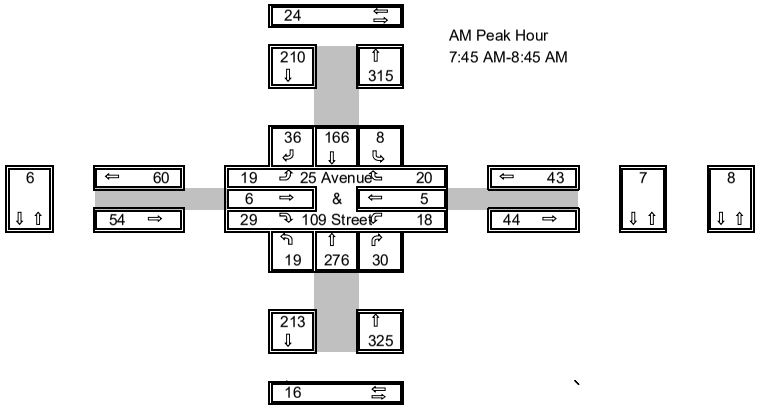
APPENDIX B

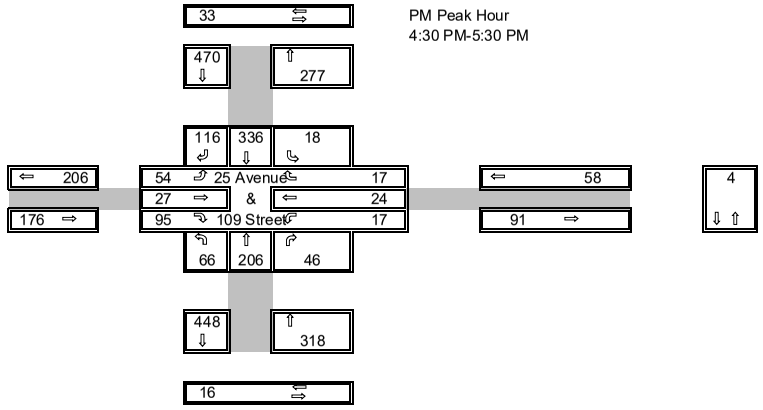
Bunt & Associates Traffic Counts

Project No.	3084.05
Location	109 Street and 25 Avenue
Date	Thursday, April 7, 2016
Weather	Clear
Surveyor	MIO

Street	25 Avenue												109 Street												Total		Pedestrians			
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly	East	West	North	South
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals	Approach	Approach	Approach	Approach
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			N/S	N/S	E/W	E/W
7:00 AM	7	0	2	0	5	0	2	1	3	0	4	1	2	0	28	1	4	1	0	0	36	0	6	0	103		2	1	9	1
7:15 AM	7	0	3	0	10	0	4	1	1	0	1	0	5	0	32	1	8	2	0	0	38	2	10	0	125		0	2	11	4
7:30 AM	5	0	2	1	6	0	2	1	1	0	6	0	2	0	53	2	6	2	0	0	40	0	8	0	137		1	0	3	3
7:45 AM	3	0	0	0	7	0	6	2	2	0	3	1	0	0	63	5	6	4	0	2	44	1	6	0	155	520	2	1	8	1
8:00 AM	6	0	2	0	7	0	4	1	0	0	8	0	3	1	71	2	3	4	0	0	36	1	13	0	162	579	0	0	7	1
8:15 AM	4	0	2	0	6	1	2	1	2	0	6	0	6	1	75	3	5	2	4	0	37	1	13	0	171	625	1	2	3	6
8:30 AM	6	0	2	0	8	0	1	1	1	0	2	0	8	0	55	2	4	2	2	0	44	2	4	0	144	632	4	3	6	8
8:45 AM	6	0	0	0	4	1	2	1	3	0	8	0	7	0	52	2	7	2	2	0	34	2	20	0	153	630	1	1	4	5
Total	44	0	13	1	53	2	23	9	13	0	38	2	33	2	429	18	43	19	8	2	309	9	80	0	1150	632	11	10	51	29
Total	44		14		55		32		13		40		35		447		62		10		318		80							
Peak hour	7:45 AM-8:45 AM																													
Peak Hour Total	19		6		29		18		5		20		19		276		30		8		166		36		632		7	6	24	16
% HV	0%		0%		3%		28%		0%		5%		11%		4%		40%		25%		3%		0%		6%					
PHF	1.19		0.75		1.04		1.50		0.63		0.83		0.68		0.88		1.07		0.50		1.09		0.69		0.92					
2 Hr Factor	2.32		2.33		1.90		1.78		2.60		2.00		1.84		1.62		2.07		1.25		1.92		2.22		1.82					

Street	25 Avenue												109 Street												Total		Pedestrians			
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly	East	West	North	South
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals	Approach	Approach	Approach	Approach
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			N/S	N/S	E/W	E/W
4:00 PM	11	0	4	0	16	0	2	1	3	0	5	0	10	0	49	1	7	1	4	0	59	3	19	0	195		1	0	5	3
4:15 PM	7	0	4	0	23	1	4	2	2	0	3	0	17	0	66	0	5	0	1	0	76	3	19	0	233		4	6	7	3
4:30 PM	15	0	8	0	19	0	3	1	7	0	2	0	9	1	52	2	4	2	5	0	82	1	27	0	240		0	1	7	6
4:45 PM	9	0	9	0	25	0	2	1	4	0	4	0	20	0	53	0	12	1	5	0	85	1	34	0	265	933	1	4	9	2
5:00 PM	17	0	5	0	27	1	5	1	5	0	3	0	15	1	49	1	12	1	5	0	79	3	24	0	254	992	0	3	7	6
5:15 PM	13	0	5	0	23	0	3	1	8	0	8	0	20	0	48	1	14	0	3	0	83	2	31	0	263	1022	3	0	10	2
5:30 PM	13	0	6	0	21	1	2	3	7	0	2	0	16	0	52	1	8	1	8	0	65	0	21	0	227	1009	0	1	8	0
5:45 PM	15	0	2	0	19	0	7	0	1	0	7	0	10	0	51	0	11	1	4	0	79	0	20	0	227	971	0	1	10	2
Total	100	0	43	0	173	3	28	10	37	0	34	0	117	2	420	6	73	7	35	0	608	13	195	0	1904	1022	9	16	63	24
Total	100		43		176		38		37		34		119		426		80		35		621		195							
Peak hour	4:30 PM-5:30 PM																													
Peak Hour Total	54		27		95		17		24		17		66		206		46		18		336		116		1022		4	8	33	16
% HV	0%		0%		1%		24%		0%		0%		3%		2%		9%		0%		2%		0%		2%					
PHF	1.50		0.75		0.95		1.42		1.50		1.06		0.83		0.97		0.88		0.90		0.98		0.85		0.96					
2 Hr Factor	1.85		1.59		1.85		2.24		1.54		2.00		1.80		2.07		1.74		1.94		1.85		1.68		1.86					





Project No.	3084.05
Location	25 Avenue and 109A Street
Date	Thursday, April 7, 20
Weather	Clear
Surveyor	AL

Street	25 Avenue														Access										Total		Pedestrians	
Direction	Eastbound						Westbound								Northbound						Southbound							Hourly	West Pathway	
Movement	Left		Thru		Right		Left		Thru		Right	Total	Right from DO		Left		Thru		Right		Left		Thru		Right			Totals		
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			WB	EB
7:00 AM							5	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	4	0	0	0	17		17	0
7:15 AM							10	0	0	0	0	0	0	0	0	0	0	0	8	0	2	0	1	0	0	0	21		28	1
7:30 AM							8	0	0	0	1	0	1	0	0	0	0	0	9	0	3	0	3	0	0	0	25		24	0
7:45 AM							10	0	0	0	0	0	0	0	0	0	2	0	3	0	4	0	4	0	0	0	23	86	12	0
8:00 AM							9	0	0	0	0	0	0	0	0	0	3	0	7	0	4	0	6	0	0	0	29	98	12	1
8:15 AM							14	0	0	0	3	0	1	0	0	0	0	0	6	0	5	0	2	0	0	0	31	108	11	2
8:30 AM							8	0	0	0	1	0	0	0	0	0	0	0	8	0	1	0	3	0	0	0	21	104	12	1
8:45 AM							13	0	1	0	0	0	1	0	0	0	0	0	4	0	1	0	2	0	0	0	22	103	12	2
Total	0	0	0	0	0	0	77	0	1	0	5	0	3	0	0	0	5	0	52	0	21	0	25	0	0	0	189	108	128	7
Total	0		0		0		77		1		5		3		0		5		52		21		25		0					
Peak hour	7:30 AM-8:30 AM																													
Peak Hour Total	0		0		0		41		0		4		2		0		5		25		16		15		0		108		59	3
% HV	#DIV/0!		#DIV/0!		#DIV/0!		0%		#DIV/0!		0%		0%		#DIV/0!		0%		0%		0%		0%		#DIV/0!		0%			
PHF	#DIV/0!		#DIV/0!		#DIV/0!		0.73		#DIV/0!		0.33		0.50		#DIV/0!		#DIV/0!		1.04		0.80		1.88		#DIV/0!		0.87			
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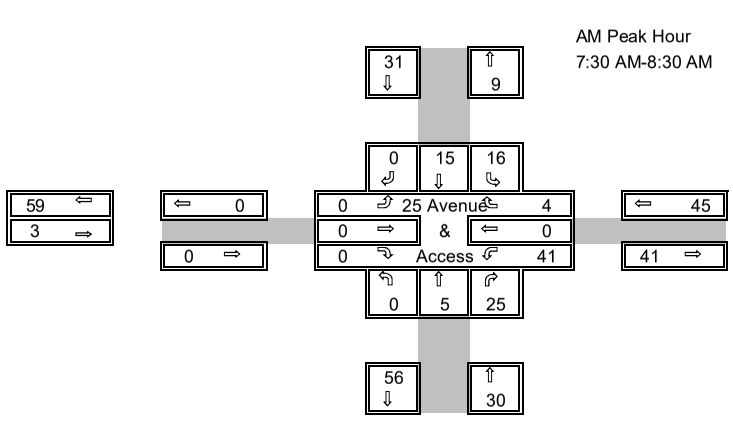
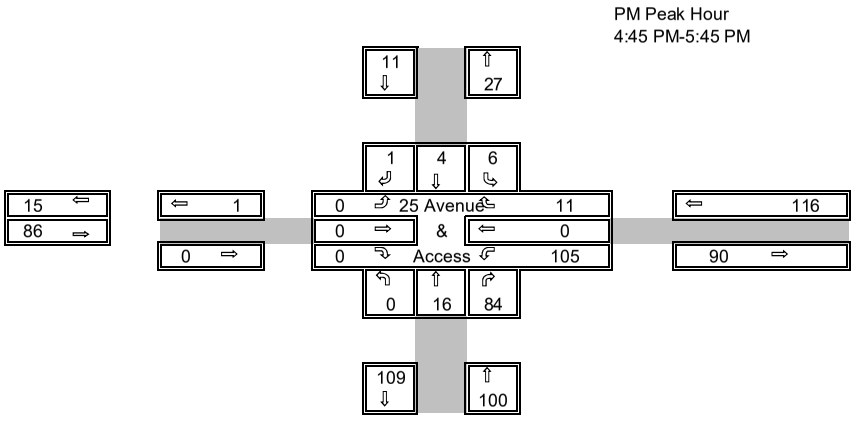
Street	25 Avenue														Access										Total		Pedestrians	
Direction	Eastbound						Westbound								Northbound						Southbound							Hourly	West Pathway	
Movement	Left		Thru		Right		Left		Thru		Right	Total	Right from DO		Left		Thru		Right		Left		Thru		Right			Totals		
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			WB	EB
4:00 PM							10	0	0	0	4	0	0	0	0	0	2	0	15	0	0	0	0	0	0	0	31		0	15
4:15 PM							13	0	0	0	3	0	0	0	0	0	3	0	13	0	1	0	2	0	0	0	35		5	7
4:30 PM							14	0	0	0	0	0	0	0	0	0	3	0	23	0	2	0	0	0	0	0	42		3	7
4:45 PM							29	0	0	0	4	0	2	0	0	0	3	0	21	0	3	0	2	0	0	0	64	172	3	14
5:00 PM							21	0	0	0	1	0	0	0	0	0	4	0	24	0	2	0	0	0	1	0	53	194	6	27
5:15 PM							34	0	0	0	4	0	0	0	0	0	4	0	18	0	0	0	0	0	0	0	60	219	4	19
5:30 PM							21	0	0	0	2	0	0	0	0	0	5	0	21	0	1	0	2	0	0	0	52	229	2	26
5:45 PM							15	0	0	0	3	0	0	0	0	0	1	0	14	0	0	0	1	0	0	0	34	199	1	14
Total	0	0	0	0	0	0	157	0	0	0			2	0	0	0	25	0	149	0	9	0	7	0	1	0	371	229	24	129
Total	0		0		0		157		0				2		0		25		149		9		7		1					
Peak hour	4:45 PM-5:45 PM																													
Peak Hour Total	0		0		0		105		0		11		2		0		16		84		6		4		1		229		15	86
% HV	#DIV/0!		#DIV/0!		#DIV/0!		0%		#DIV/0!		0%		0%		#DIV/0!		0%		0%		0%		0%		0%		0%			
PHF	#DIV/0!		#DIV/0!		#DIV/0!		0.91		#DIV/0!		0.69		0.25		#DIV/0!		1.33		1.00		0.50		0.50		#DIV/0!		0.89			
2 Hr Factor	#DIV/0!		#DIV/0!		#DIV/0!		1.50		#DIV/0!		0.00		1.00		#DIV/0!		1.56		1.77		1.50		1.75		1.00		1.62			

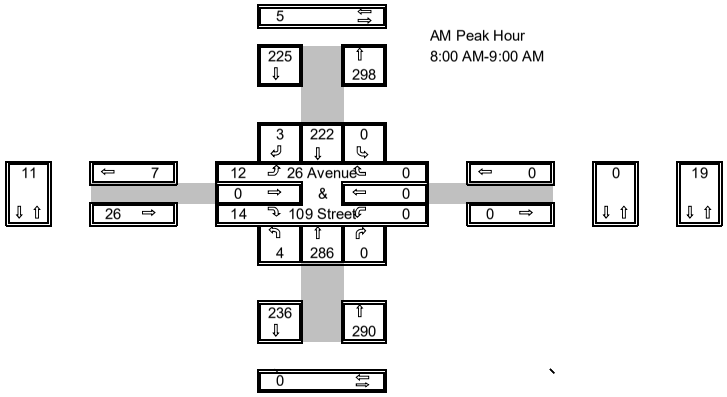


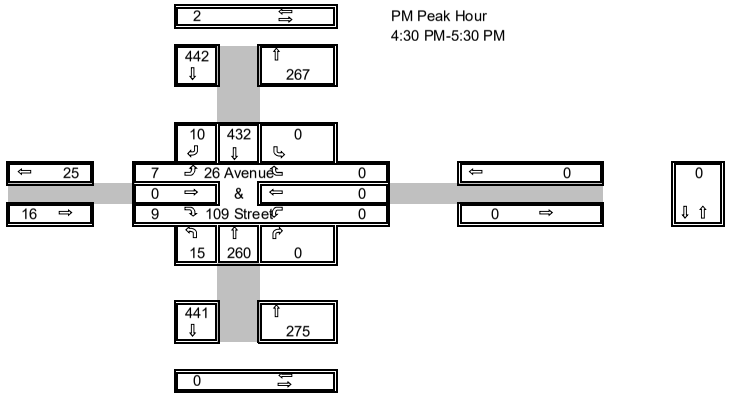


Project No.	3084.05
Location	109 Street and 26 Avenue
Date	Tuesday, April 5, 2016
Weather	Clear
Surveyor	MIO

Street	26 Avenue												109 Street												Total		Pedestrians			
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly	East	West	North	South
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals	Approach	Approach	Approach	Approach
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			N/S	N/S	E/W	E/W
7:00 AM	0	0			3	0							1	0	36	1					50	0	0	0	91			1	0	0
7:15 AM	1	0			1	0							0	0	30	3					37	1	0	0	73			2	1	0
7:30 AM	5	0			1	0							2	0	58	1					59	1	0	0	127			1	0	0
7:45 AM	2	0			1	0							0	0	60	5					52	1	1	0	122	413		1	0	0
8:00 AM	2	0			2	0							0	0	79	2					40	1	2	0	128	450		3	1	0
8:15 AM	5	0			4	0							2	0	75	5					43	1	0	0	135	512		2	0	0
8:30 AM	1	0			6	0							1	0	53	3					64	3	0	0	131	516		3	2	0
8:45 AM	4	0			2	0							1	0	67	2					69	1	1	0	147	541		3	2	0
Total	20	0	0	0	20	0	0	0	0	0	0	0	7	0	458	22	0	0	0	0	414	9	4	0	954	541	0	16	6	0
Total	20		0		20		0		0		0		7		480		0		0		423		4							
Peak hour	8:00 AM-9:00 AM																													
Peak Hour Total	12		0		14		0		0		0		4		286		0		0		222		3		541		0	11	5	0
% HV	0%		#DIV/0!		0%		#DIV/0!		#DIV/0!		#DIV/0!		0%		4%		#DIV/0!		#DIV/0!		3%		0%		3%					
PHF	0.75		#DIV/0!		1.75		#DIV/0!		#DIV/0!		#DIV/0!		1.00		1.04		#DIV/0!		#DIV/0!		0.79		0.75		0.92					
2 Hr Factor	1.67		#DIV/0!		1.43		#DIV/0!		#DIV/0!		#DIV/0!		1.75		1.68		#DIV/0!		#DIV/0!		1.91		1.33		1.76					

Street	26 Avenue												109 Street												Total		Pedestrians			
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly	East	West	North	South
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals	Approach	Approach	Approach	Approach
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			N/S	N/S	E/W	E/W
4:00 PM	0	0			0	0							1	0	52	1					93	2	2	0	151			10	0	1
4:15 PM	2	0			2	0							1	0	65	0					98	1	1	0	170			4	1	0
4:30 PM	2	0			1	0							4	0	75	1					110	2	1	0	196			5	0	0
4:45 PM	2	0			1	0							2	0	59	1					113	1	2	0	181	698		3	1	0
5:00 PM	0	0			5	0							2	0	56	1					110	0	3	0	177	724		6	0	0
5:15 PM	3	0			2	0							7	0	67	0					93	3	4	0	179	733		5	1	0
5:30 PM	1	0			2	0							3	0	66	2					105	0	6	0	185	722		14	3	0
5:45 PM	0	0			6	0							3	0	79	0					92	1	2	0	183	724		2	2	0
Total	10	0	0	0	19	0	0	0	0	0	0	0	23	0	519	6	0	0	0	0	814	10	21	0	1422	733	0	49	8	1
Total	10		0		19		0		0		0		23		525		0		0		824		21							
Peak hour	4:30 PM-5:30 PM																													
Peak Hour Total	7		0		9		0		0		0		15		260		0		0		432		10		733		0	19	2	0
% HV	0%		#DIV/0!		0%		#DIV/0!		#DIV/0!		#DIV/0!		0%		1%		#DIV/0!		#DIV/0!		1%		0%		1%					
PHF	0.88		#DIV/0!		2.25		#DIV/0!		#DIV/0!		#DIV/0!		0.94		0.86		#DIV/0!		#DIV/0!		0.96		2.50		0.93					
2 Hr Factor	1.43		#DIV/0!		2.11		#DIV/0!		#DIV/0!		#DIV/0!		1.53		2.02		#DIV/0!		#DIV/0!		1.91		2.10		1.94					

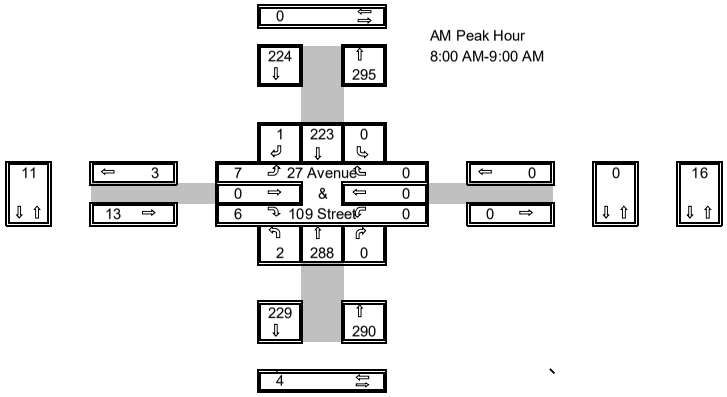


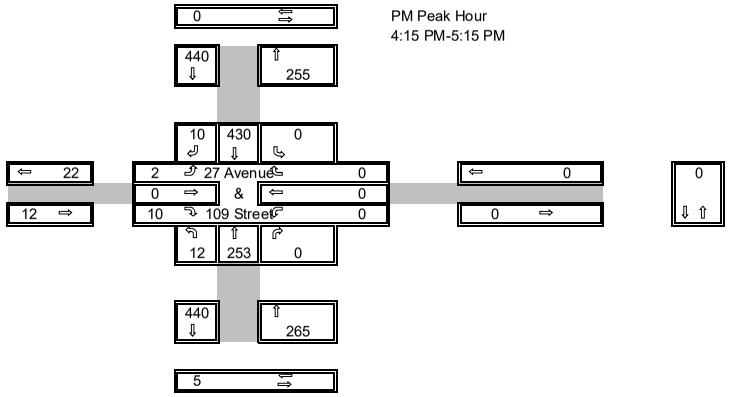


Project No.	3084.05
Location	109 Street and 27 Avenue
Date	Tuesday, April 5, 2016
Weather	Clear
Surveyor	MIO

Street	27 Avenue												109 Street										Total		Pedestrians			
Direction	Eastbound						Westbound						Northbound						Southbound									
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Hourly Totals	East Approach N/S	West Approach N/S	North Approach E/W	South Approach E/W
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV						
7:00 AM	2	0			0	0							0	0	34	2					51	0	0	0	89			0	0	5
7:15 AM	4	0			3	0							0	0	34	2					35	1	0	0	79			4	0	0
7:30 AM	2	0			3	0							1	0	60	1					52	1	2	0	122			5	0	1
7:45 AM	2	0			1	0							0	0	66	5					54	2	0	0	130	420		1	0	1
8:00 AM	2	0			1	0							0	0	80	3					39	0	0	0	125	456		3	0	1
8:15 AM	2	0			0	0							1	0	74	4					48	2	0	0	131	508		3	0	1
8:30 AM	2	0			2	0							0	0	60	3					61	2	0	0	130	516		1	0	1
8:45 AM	1	0			3	0							1	0	62	2					70	1	1	0	141	527		4	0	1
Total	17	0	0	0	13	0	0	0	0	0	0	0	3	0	470	22	0	0	0	0	410	9	3	0	947	527	0	21	0	11
Total	17		0		13		0		0		0		3		492		0		0		419		3							
Peak hour	8:00 AM-9:00 AM																													
Peak Hour Total	7		0		6		0		0		0		2		288		0		0		223		1		527		0	11	0	4
% HV	0%		#DIV/0!		0%		#DIV/0!		#DIV/0!		#DIV/0!		0%		4%		#DIV/0!		#DIV/0!		2%		0%		3%					
PHF	1.75		#DIV/0!		0.50		#DIV/0!		#DIV/0!		#DIV/0!		0.50		1.13		#DIV/0!		#DIV/0!		0.79		0.25		0.93					
2 Hr Factor	2.43		#DIV/0!		2.17		#DIV/0!		#DIV/0!		#DIV/0!		1.50		1.71		#DIV/0!		#DIV/0!		1.88		3.00		1.8					

Street	27 Avenue												109 Street										Total		Pedestrians			
Direction	Eastbound						Westbound						Northbound						Southbound									
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Hourly Totals	East Approach N/S	West Approach N/S	North Approach E/W	South Approach E/W
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV						
4:00 PM	0	0			3	0							2	0	51	1					94	2	1	0	154			8	0	1
4:15 PM	0	0			2	0							1	0	70	0					93	2	4	0	172			6	0	0
4:30 PM	0	0			3	0							2	0	73	1					110	1	1	0	191			3	0	1
4:45 PM	2	0			2	0							3	0	54	2					125	1	2	0	191	708		4	0	2
5:00 PM	0	0			3	0							6	0	52	1					97	1	3	0	163	717		3	0	2
5:15 PM	1	0			1	0							4	0	63	1					97	2	1	0	170	715		4	0	2
5:30 PM	1	0			5	0							1	0	72	1					106	0	2	0	188	712		6	0	1
5:45 PM	1	0			2	0							3	0	74	0					95	1	3	0	179	700		2	0	0
Total	5	0	0	0	21	0	0	0	0	0	0	0	22	0	509	7	0	0	0	0	817	10	17	0	1408	717	0	36	0	9
Total	5		0		21		0		0		0		22		516		0		0		827		17							
Peak hour	4:15 PM-5:15 PM																													
Peak Hour Total	2		0		10		0		0		0		12		253		0		0		430		10		717		0	16	0	5
% HV	0%		#DIV/0!		0%		#DIV/0!		#DIV/0!		#DIV/0!		0%		2%		#DIV/0!		#DIV/0!		1%		0%		1%					
PHF	0.25		#DIV/0!		1.25		#DIV/0!		#DIV/0!		#DIV/0!		1.00		1.13		#DIV/0!		#DIV/0!		0.85		1.25		0.94					
2 Hr Factor	2.50		#DIV/0!		2.10		#DIV/0!		#DIV/0!		#DIV/0!		1.83		2.04		#DIV/0!		#DIV/0!		1.92		1.70		1.96					

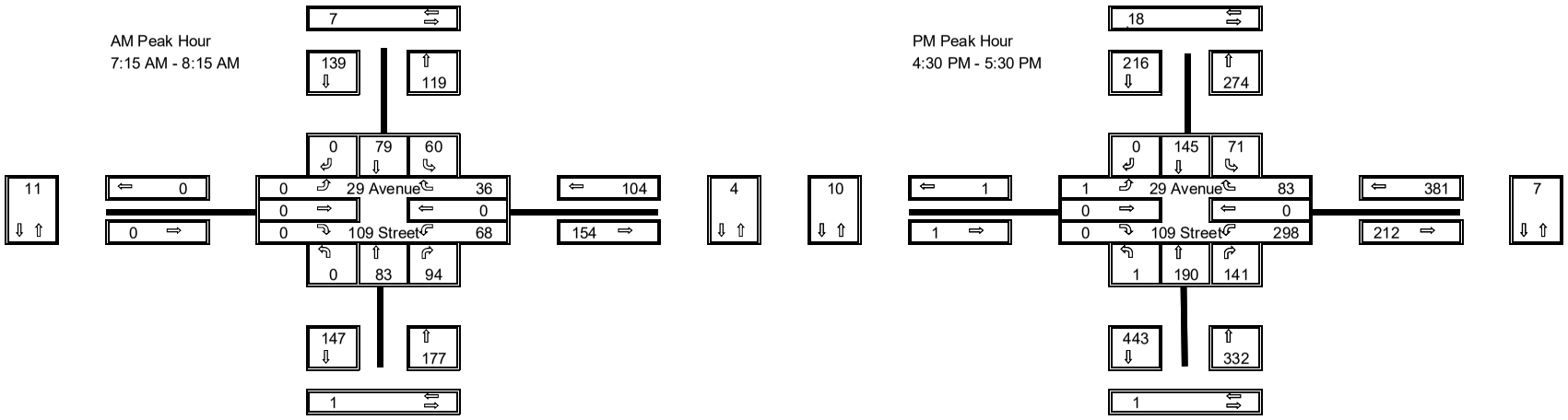




Project No. 3084.03
Location 29 Avenue & 109 Street
Date 30-Jul-13
Weather Clear
Surveyor AP

Street	29 Avenue												109 Street												Total	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV		
6:30 AM	0	0	0	0	0	0	17	0	0	0	5	0	0	0	8	1	10	0	0	0	10	1	11	0	0	0	63	
6:45 AM	0	0	0	0	0	0	8	1	0	0	4	1	0	0	12	1	14	0	6	1	24	1	0	0	73	
7:00 AM	0	0	0	0	0	0	13	0	0	0	5	1	0	0	10	1	19	1	6	1	21	1	0	0	79	
7:15 AM	0	0	0	0	0	0	18	0	0	0	4	1	0	0	21	2	23	0	15	1	14	2	0	0	101	316
7:30 AM	0	0	0	0	0	0	19	0	0	0	13	1	0	0	21	2	23	0	9	1	24	0	0	0	113	366
7:45 AM	0	0	0	0	0	0	17	0	0	0	11	1	0	0	19	1	18	0	20	1	17	1	0	0	106	399
8:00 AM	0	0	0	0	0	0	14	0	0	0	5	0	0	0	16	1	30	0	12	1	21	0	0	0	100	420
8:15 AM	0	0	0	0	0	0	11	0	0	0	9	1	0	0	21	0	21	0	13	1	15	1	0	0	93	412
8:30 AM	0	0	0	0	0	0	21	0	0	0	3	0	0	0	22	1	19	0	14	2	15	1	0	0	98	397
8:45 AM	0	0	0	0	0	0	26	1	0	0	11	2	0	0	15	0	20	0	10	1	14	3	0	0	103	394
	0	0	0	0	0	0	164	2	0	0	70	8	0	0	165	10	197	1	115	11	176	10	0	0	929	420
Total	0		0		0		166		0		78		0		175		198		126		186		0			
Peak hour	7:15 AM - 8:15 AM																									
Peak Hour Total	0		0		0		68		0		36		0		83		94		60		79		0		420	
% HV	#DIV/0!		#DIV/0!		#DIV/0!		0%		#DIV/0!		8%		#DIV/0!		7%		0%		7%		4%		#DIV/0!		4%	
Peak Hour Factor	#DIV/0!		#DIV/0!		#DIV/0!		0.89		#DIV/0!		0.64		#DIV/0!		0.90		1.02		1.50		0.82		#DIV/0!		0.93	
2 hour factor	#DIV/0!		#DIV/0!		#DIV/0!		2.06		#DIV/0!		1.89		#DIV/0!		1.84		1.85		1.80		1.90		#DIV/0!		1.89	

Street	29 Avenue												109 Street												Total	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV		
4:00 PM	1	0	0	0	0	0	47	0	1	0	21	2	0	0	29	1	21	0	16	1	22	1	0	0	163	
4:15 PM	0	0	0	0	0	0	57	0	0	0	20	2	0	0	33	0	39	0	11	1	36	3	0	0	202	
4:30 PM	0	0	0	0	0	0	56	1	0	0	14	2	0	0	51	1	34	0	18	0	34	1	0	0	212	
4:45 PM	0	0	0	0	0	0	80	0	0	0	22	3	0	0	42	0	34	0	16	1	33	1	0	0	232	809
5:00 PM	1	0	0	0	0	0	79	0	0	0	24	1	1	0	46	1	32	1	18	0	39	1	0	0	244	890
5:15 PM	0	0	0	0	0	0	80	2	0	0	16	1	0	0	49	0	40	0	17	1	35	1	0	0	242	930
5:30 PM	0	0	0	0	1	0	60	0	0	0	18	1	1	0	34	1	25	0	21	0	30	1	0	0	193	911
5:45 PM	0	0	0	0	0	0	53	1	0	0	18	2	0	0	34	1	38	0	21	2	31	1	0	0	202	881
	2	0	0	0	1	0	512	4	1	0	153	14	2	0	318	5	263	1	138	6	260	10	0	0	1690	930
Total	2		0		1		516		1		167		2		323		264		144		270		0			
Peak hour	4:30 PM - 5:30 PM																									
Peak Hour Total	1		0		0		298		0		83		1		190		141		71		145		0		930	
% HV	0%		#DIV/0!		#DIV/0!		1%		#DIV/0!		8%		0%		1%		1%		3%		3%		#DIV/0!		2%	
Peak Hour Factor	0.25		#DIV/0!		#DIV/0!		0.94		#DIV/0!		0.83		0.25		1.01		1.07		0.99		0.91		#DIV/0!		0.95	
2 hour factor	2.00		#DIV/0!		#DIV/0!		1.73		#DIV/0!		2.01		2.00		1.70		1.87		2.03		1.86		#DIV/0!		1.82	



Project No.	3084.03
Location	111 Street & North Access
Date	6-Jun-12
Weather	Rain
Surveyor	AP & NM

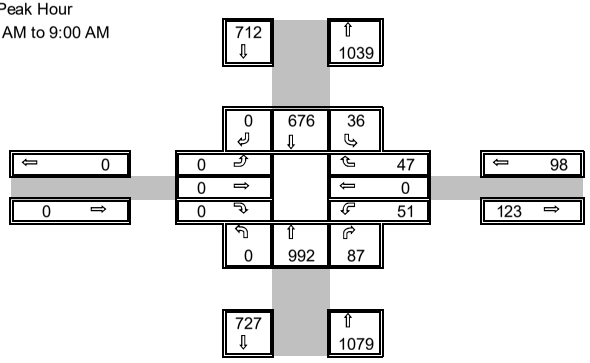
Drives **ADJACENT STREET PEAK**

Street	North Access												111 Street												Total	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV		
6:00 AM	0	0	0	0	0	0	4	1	0	0	1	0	0	0	43	7	8	0	7	2	61	1	0	0	135	
6:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	80	3	13	0	2	0	42	0	0	0	141	
6:30 AM	0	0	0	0	0	0	5	0	0	0	6	0	0	0	108	6	23	0	4	3	83	3	0	0	241	
6:45 AM	0	0	0	0	0	0	8	0	0	0	6	0	0	0	120	6	36	0	25	2	57	1	0	0	261	778
7:00 AM	0	0	0	0	0	0	10	0	0	0	9	0	0	0	175	8	59	0	29	1	74	7	0	0	372	1015
7:15 AM	0	0	0	0	0	0	14	0	0	0	11	0	0	0	209	4	57	0	19	3	92	5	0	0	414	1288
7:30 AM	0	0	0	0	0	0	15	2	0	0	18	0	0	0	270	9	43	0	11	1	130	4	0	0	503	1550
7:45 AM	0	0	0	0	0	0	8	0	0	0	14	0	0	0	251	8	31	0	5	2	98	10	0	0	427	1716
8:00 AM	0	0	0	0	0	0	20	0	0	0	18	0	0	0	278	7	31	0	6	1	110	12	0	0	483	1827
8:15 AM	0	0	0	0	0	0	17	0	0	0	13	0	0	0	272	9	28	0	2	0	123	10	0	0	474	1887
8:30 AM	0	0	0	0	0	0	10	0	0	0	9	0	0	0	207	7	15	0	18	2	221	3	0	0	492	1876
8:45 AM	0	0	0	0	0	0	4	0	0	0	7	0	0	0	203	9	13	0	6	1	185	12	0	0	440	1889
Total	0	0	0	0	0	0	115	3	0	0	113	0	0	0	2216	83	357	0	134	18	1276	68	0	0	4383	1889
EPCU Total	0		0		0		121		0		113		0		2382		357		170		1412		0			
Peak hour	8:00 AM to 9:00 AM																									
Peak Hour Total	0		0		0		51		0		47		0		992		87		36		676		0		1889	
% HV	#DIV/0!		#DIV/0!		#DIV/0!		0%		#DIV/0!		0%		#DIV/0!		3%		0%		11%		5%		#DIV/0!		4%	
Peak Hour Factor	#DIV/0!		#DIV/0!		#DIV/0!		1.28		#DIV/0!		1.31		#DIV/0!		1.16		1.45		0.45		0.75		#DIV/0!		0.96	
Site Peak Hour Total	0		0		0		49		0		44		0		801		195		91		370		0		1550	

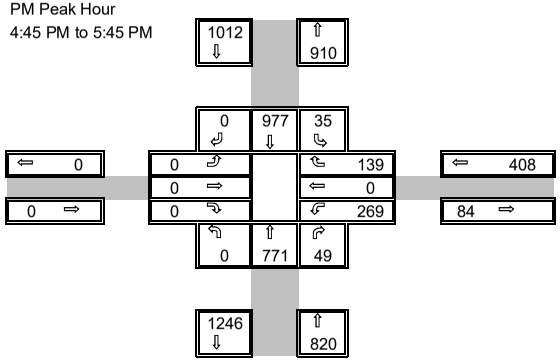
Street	North Access												111 Street												Total	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV		
3:30 PM	0	0	0	0	0	0	12	0	0	0	9	0	0	0	170	7	0	0	3	2	256	4	0	0	463	
3:45 PM	0	0	0	0	0	0	16	0	0	0	14	0	0	0	138	15	2	0	7	3	266	1	0	0	462	
4:00 PM	0	0	0	0	0	0	26	0	0	0	24	0	0	0	152	11	5	0	5	4	303	6	0	0	536	
4:15 PM	0	0	0	0	0	0	48	1	0	0	25	0	0	0	142	10	4	0	7	1	244	2	0	0	484	1945
4:30 PM	0	0	0	0	0	0	16	0	0	0	19	1	0	0	153	9	11	1	6	1	255	4	0	0	476	1958
4:45 PM	0	0	0	0	0	0	87	0	0	0	51	0	0	0	173	12	10	0	17	1	273	6	0	0	630	2126
5:00 PM	0	0	0	0	0	0	55	0	0	0	37	0	0	0	168	6	13	0	2	1	210	3	0	0	495	2085
5:15 PM	0	0	0	0	0	0	71	0	0	0	36	0	0	0	189	11	15	0	5	1	262	3	0	0	593	2194
5:30 PM	0	0	0	0	0	0	56	0	0	0	15	0	0	0	206	6	11	0	7	1	219	1	0	0	522	2240
5:45 PM	0	0	0	0	0	0	30	0	0	0	14	1	0	0	175	9	6	0	10	3	277	2	0	0	527	2137
6:00 PM	0	0	0	0	0	0	15	1	0	0	13	0	0	0	170	5	3	0	7	0	179	4	0	0	397	2039
6:15 PM	0	0	0	0	0	0	13	0	0	0	4	0	0	0	169	8	6	0	6	2	212	1	0	0	421	1867
Total	0	0	0	0	0	0	445	2	0	0	261	2	0	0	2005	109	86	1	82	20	2956	37	0	0	6006	2240
EPCU Total	0		0		0		449		0		265		0		2223		88		122		3030		0			
Peak hour	4:45 PM to 5:45 PM																									
Peak Hour Total	0		0		0		269		0		139		0		771		49		35		977		0		2240	
% HV	#DIV/0!		#DIV/0!		#DIV/0!		0%		#DIV/0!		0%		#DIV/0!		5%		0%		11%		1%		#DIV/0!		2%	
Peak Hour Factor	#DIV/0!		#DIV/0!		#DIV/0!		0.77		#DIV/0!		0.68		#DIV/0!		1.04		1.23		0.49		0.88		#DIV/0!		0.89	
Site Peak Hour Total	0		0		0		269		0		139		0		771		49		35		977		0		2240	

Peak of Adjacent Street

AM Peak Hour
8:00 AM to 9:00 AM



PM Peak Hour
4:45 PM to 5:45 PM



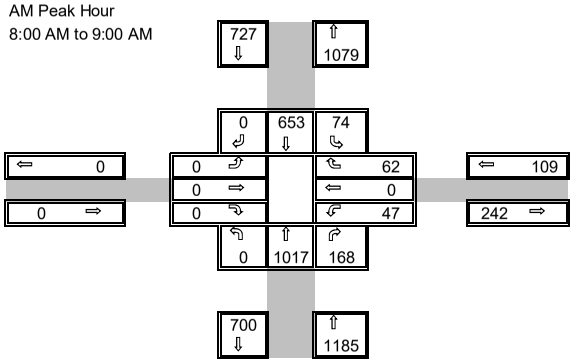
Project No. 3084.03
Location 111 Street & South Access
Date 6-Jun-12
Weather Rain
Surveyor RP

111 Street & South Access
Adding North Access Through Movements, peak hour of **ADJACENT STREET**

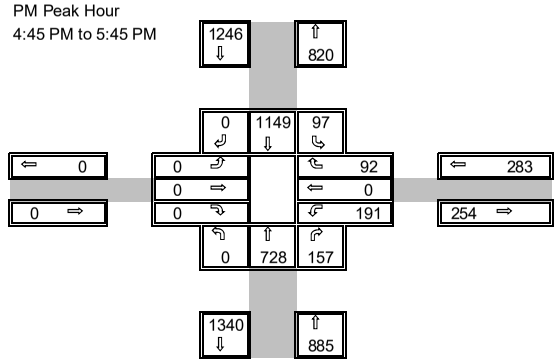
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV		
6:00 AM							3	0			1	0			50	7	42	0	7	0	58	2			170	
6:15 AM							6	0			1	0			92	3	67	1	5	0	37	0			212	
6:30 AM							8	0			7	0			124	6	86	0	7	0	81	3			322	
6:45 AM							6	1			9	0			147	6	121	0	6	0	59	1			356	1060
7:00 AM							4	0			7	0			227	8	143	0	4	0	80	7			480	1370
7:15 AM							11	0			10	0			256	4	134	2	7	0	99	5			528	1686
7:30 AM							15	1			12	0			301	9	58	0	16	0	129	6			547	1911
7:45 AM							11	0			7	0			275	8	54	0	11	0	95	10			471	2026
8:00 AM							12	1			9	0			300	7	46	1	14	0	116	12			518	2064
8:15 AM							9	1			14	0			286	9	59	1	9	0	131	10			529	2065
8:30 AM							10	0			21	0			201	7	27	1	21	0	210	3			501	2019
8:45 AM							14	0			18	0			198	9	33	0	30	0	159	12			473	2021
Total	0	0	0	0	0	0	109	4	0	0	116	0	0	0	2457	83	870	6	137	0	1254	71	0	0	5107	2065
EPCU Total	0		0		0		117		0		116		0		2623		882		137		1396		0			
Peak hour	8:00 AM to 9:00 AM																									
Peak Hour Total	**0**		**0**		**0**		**47**		**0**		**62**		**0**		**1017**		**168**		**74**		**653**		**0**		**2021**	
% HV	**#DIV/0!**		**#DIV/0!**		**#DIV/0!**		**4%**		**#DIV/0!**		**0%**		**#DIV/0!**		**3%**		**2%**		**0%**		**6%**		**#DIV/0!**		**4%**	
Peak Hour Factor	#DIV/0!		#DIV/0!		#DIV/0!		1.18		#DIV/0!		0.74		#DIV/0!		1.22		1.50		0.88		0.77		#DIV/0!		1.01	
Site Peak Hour Tot	**0**		**0**		**0**		**38**		**0**		**38**		**0**		**958**		**458**		**33**		**386**		**0**		**1911**	

Street	South Access												111 Street												Total	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV		
3:30 PM							16	0			16	0			154	7	19	0	22	0	246	4			484	
3:45 PM							24	0			17	0			123	15	23	0	26	0	256	1			485	
4:00 PM							34	0			20	0			137	11	21	2	22	0	307	6			560	
4:15 PM							35	0			21	1			125	9	30	0	28	0	264	3			516	2045
4:30 PM							26	0			19	0			145	10	37	0	33	0	238	4			512	2073
4:45 PM							54	0			27	0			156	12	48	0	26	0	334	6			663	2251
5:00 PM							41	0			27	0			154	6	38	0	32	0	233	3			534	2225
5:15 PM							54	0			19	0			185	11	37	0	21	0	312	3			642	2351
5:30 PM							42	0			19	0			198	6	34	0	18	0	257	1			575	2414
5:45 PM							33	0			15	0			166	9	37	2	27	0	280	2			571	2322
6:00 PM							30	0			13	0			160	5	34	0	26	0	168	5			441	2229
6:15 PM							34	0			24	0			151	8	35	0	20	0	205	1			478	2065
Total	0	0	0	0	0	0	423	0	0	0	237	1	0	0	1854	109	393	4	301	0	3100	39	0	0	6461	2414
EPCU Total	0		0		0		423		0		239		0		2072		401		301		3178		0			
Peak hour	4:45 PM to 5:45 PM																									
Peak Hour Total	**0**		**0**		**0**		**191**		**0**		**92**		**0**		**728**		**157**		**97**		**1149**		**0**		**2414**	
% HV	**#DIV/0!**		**#DIV/0!**		**#DIV/0!**		**0%**		**#DIV/0!**		**0%**		**#DIV/0!**		**5%**		**0%**		**0%**		**1%**		**#DIV/0!**		**2%**	
Peak Hour Factor	#DIV/0!		#DIV/0!		#DIV/0!		0.88		#DIV/0!		0.85		#DIV/0!		1.08		0.82		0.93		0.84		#DIV/0!		0.91	
Site Peak Hour Tot	**0**		**0**		**0**		**191**		**0**		**92**		**0**		**728**		**157**		**97**		**1149**		**0**		**2414**	

AM Peak Hour
8:00 AM to 9:00 AM



PM Peak Hour
4:45 PM to 5:45 PM

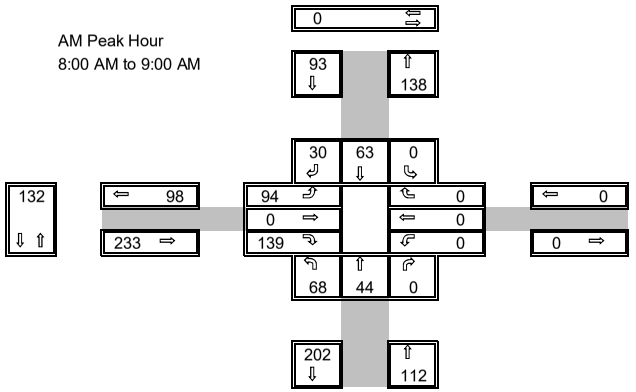


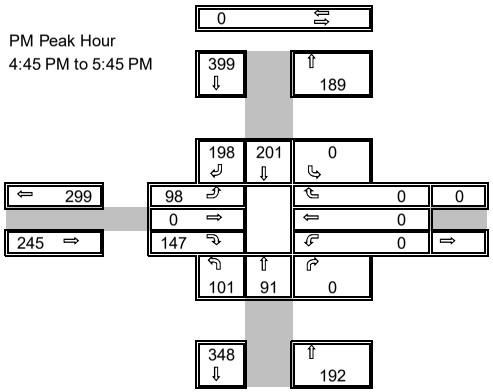
Project No. 3084.03
Location South Access & Service Road
Date 6-Jun-12
Weather Rain
Surveyor AB

peak hour of **ADJACENT STREET**

Street	South Access												Service Road												Total		Pedestrians	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly	West Approach	
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals	Peds	
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			NB	SB
6:00 AM	44	0			6	0							1	0	12	0					4	0	3	0	70		16	
6:15 AM	69	1			4	0							2	0	34	0					5	0	7	0	122		9	
6:30 AM	79	0			10	0							6	0	36	0					4	0	12	0	147		5	
6:45 AM	100	0			11	0							8	0	78	0					3	0	5	0	205	544	8	
7:00 AM	145	0			19	0							5	0	84	0					11	0	7	0	271	745	22	
7:15 AM	101	2			15	0							13	0	63	0					16	0	13	0	223	846	23	
7:30 AM	43	0			31	0							13	0	30	0					26	0	15	0	158	857	30	
7:45 AM	37	0			28	0							9	0	19	1					17	0	9	0	120	772	31	
8:00 AM	27	0			25	1							7	0	14	0					15	0	6	0	95	596	29	3
8:15 AM	30	1			40	0							17	0	9	0					19	1	8	1	126	499	33	6
8:30 AM	21	0			32	1							23	0	13	0					19	0	6	0	115	456	23	7
8:45 AM	15	0			40	0							20	1	8	0					9	0	9	0	102	438	12	6
Total	711	4	0	0	261	2	0	0	0	0	0	0	124	1	400	1	0	0	0	0	148	1	100	1	1754	857	241	22
EPCU Total	719		0		265		0		0		0		126		402		0		0		150		102					
Peak hour	8:00 AM to 9:00 AM																											
Peak Hour Total	94		0		139		0		0		0		68		44		0		0		63		30		438		132	
% HV	1%		#DIV/0!		1%		#DIV/0!		#DIV/0!		#DIV/0!		1%		0%		#DIV/0!		#DIV/0!		2%		3%		1%			
Peak Hour Factor	1.12		#DIV/0!		1.05		#DIV/0!		#DIV/0!		#DIV/0!		0.74		0.85		#DIV/0!		#DIV/0!		0.83		1.25		0.95			
Site Peak Hour Tot	391		0		76		0		0		0		39		255		0		0		56		40		857		83	

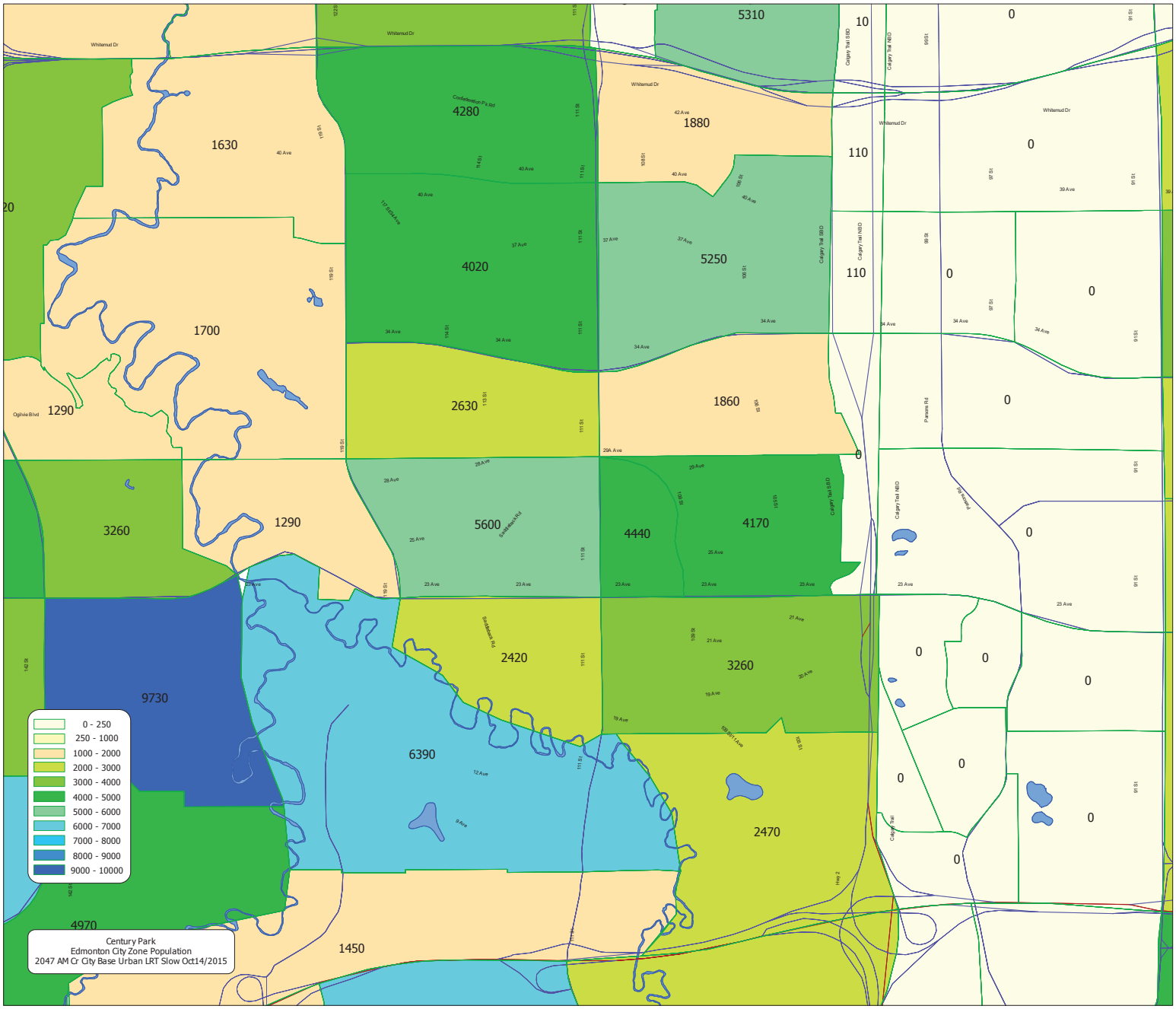
Street	South Access												Service Road												Total		Pedestrians	
Direction	Eastbound						Westbound						Northbound						Southbound							Hourly	West Approach	
Movement	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right			Totals	Peds	
start time	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV	Car	HV			NB	SB
3:30 PM	9	0			31	0							24	0	6	0					14	0	17	0	101		22	23
3:45 PM	14	0			35	0							16	0	7	0					34	0	17	0	123		18	27
4:00 PM	11	1			34	1							27	0	15	0					49	0	35	0	173		20	31
4:15 PM	14	0			38	0							22	1	13	0					37	0	28	0	153	550	15	29
4:30 PM	22	0			49	0							23	0	22	0					32	0	34	0	182	631	13	14
4:45 PM	23	0			48	0							36	0	24	0					70	0	70	0	271	779	1	34
5:00 PM	24	0			37	0							26	0	20	0					32	0	33	0	172	778	14	45
5:15 PM	27	0			31	0							17	0	27	0					66	0	50	0	218	843	9	28
5:30 PM	24	0			31	0							22	0	20	0					33	0	45	0	175	836	10	40
5:45 PM	23	1			42	0							23	0	15	0					37	0	28	0	169	734	15	38
6:00 PM	27	1			35	0							18	0	13	0					16	1	24	0	135	697	11	19
6:15 PM	15	0			38	0							34	0	10	0					9	0	25	0	131	610	11	20
Total	233	3	0	0	449	1	0	0	0	0	0	0	288	1	192	0	0	0	0	0	429	1	406	0	2003	843	159	348
EPCU Total	239		0		451		0		0		0		290		192		0		0		431		406					
Peak hour	4:45 PM to 5:45 PM																											
Peak Hour Total	98		0		147		0		0		0		101		91		0		0		201		198		836		181	
% HV	0%		#DIV/0!		0%		#DIV/0!		#DIV/0!		#DIV/0!		0%		0%		#DIV/0!		#DIV/0!		0%		0%		0%			
Peak Hour Factor	1.07		#DIV/0!		0.77		#DIV/0!		#DIV/0!		#DIV/0!		0.70		0.95		#DIV/0!		#DIV/0!		0.72		0.71		0.77			
Site Peak Hour Tot	98		0		147		0		0		0		101		91		0		0		201		198		836		157	

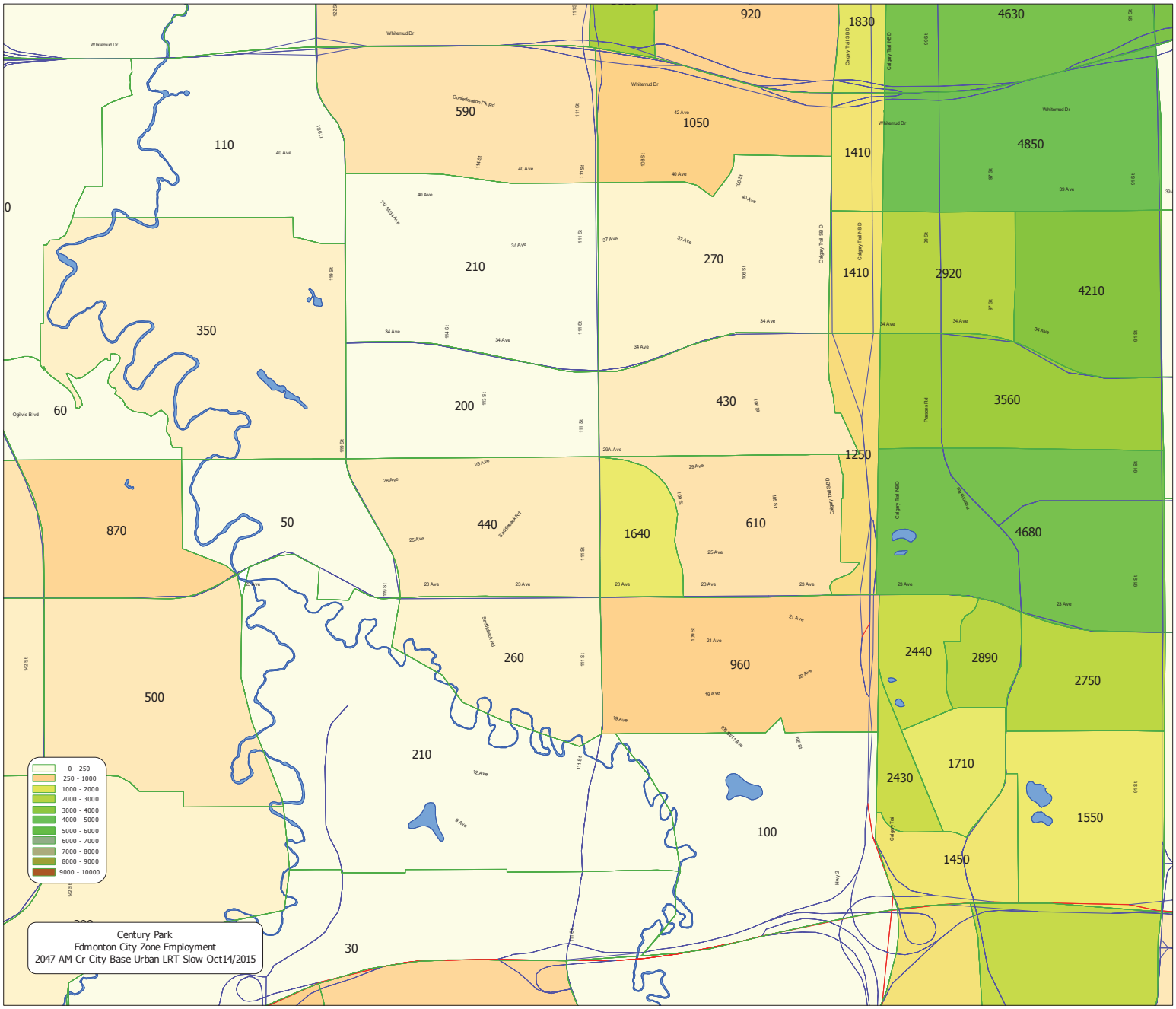


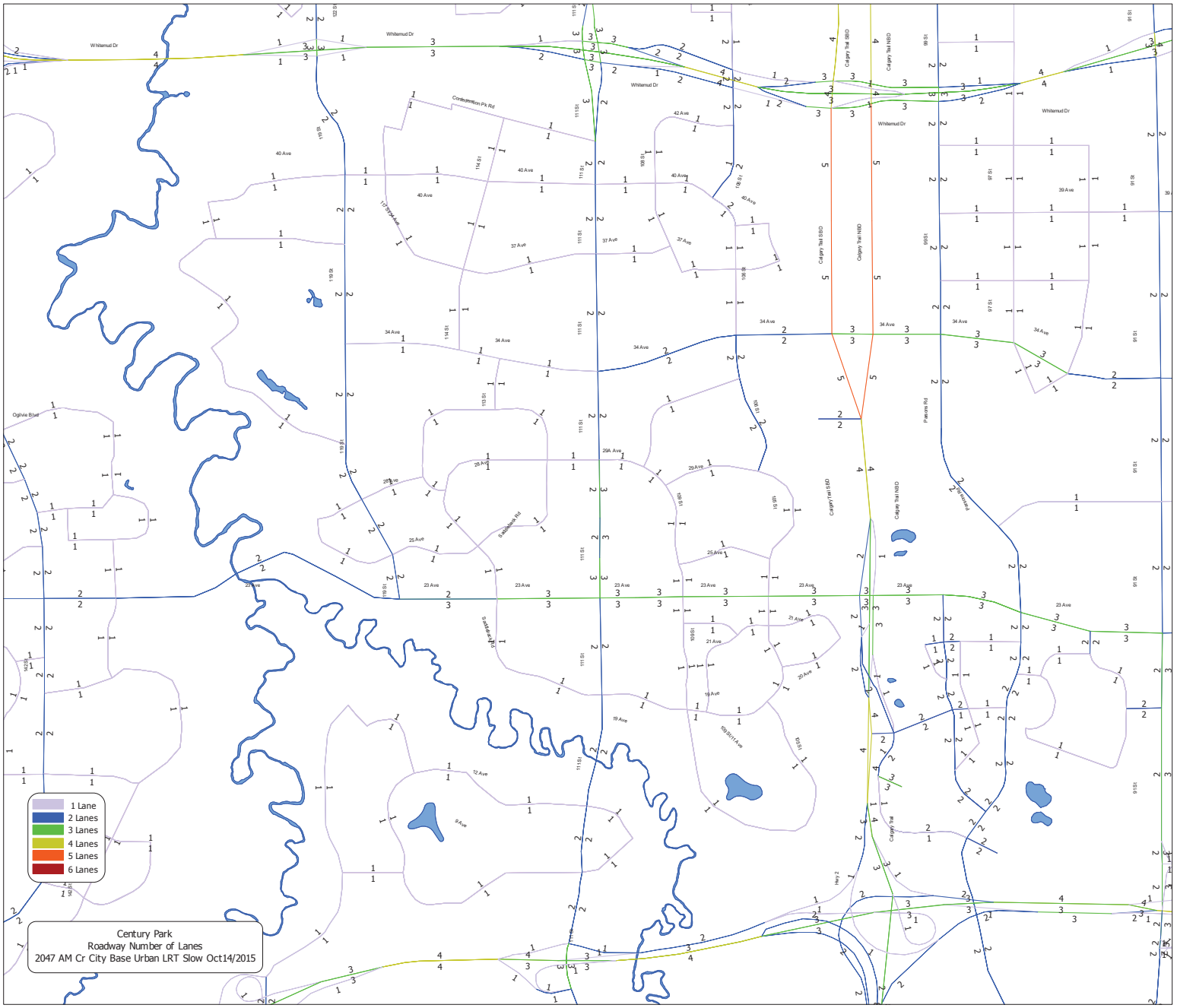


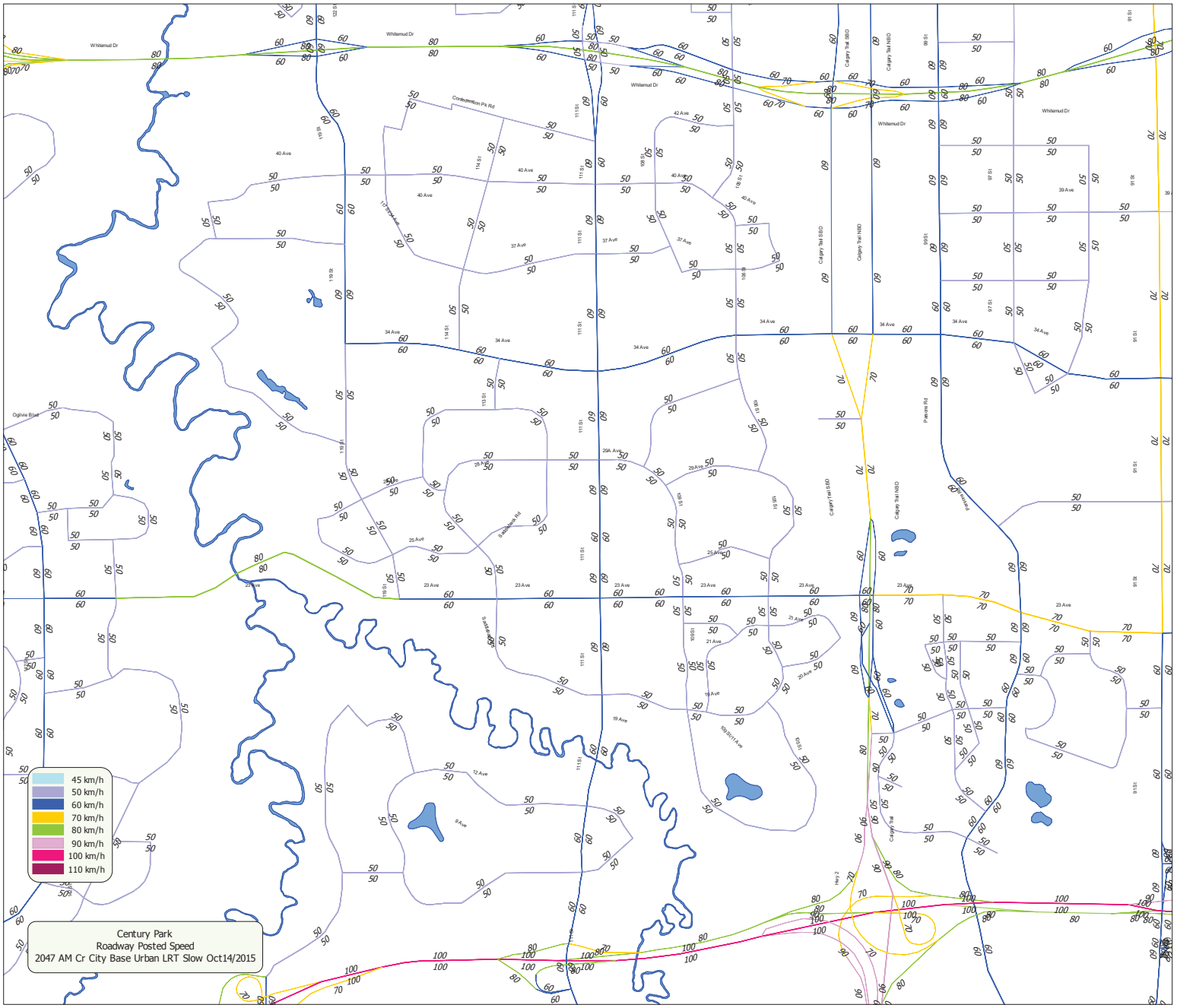
APPENDIX C

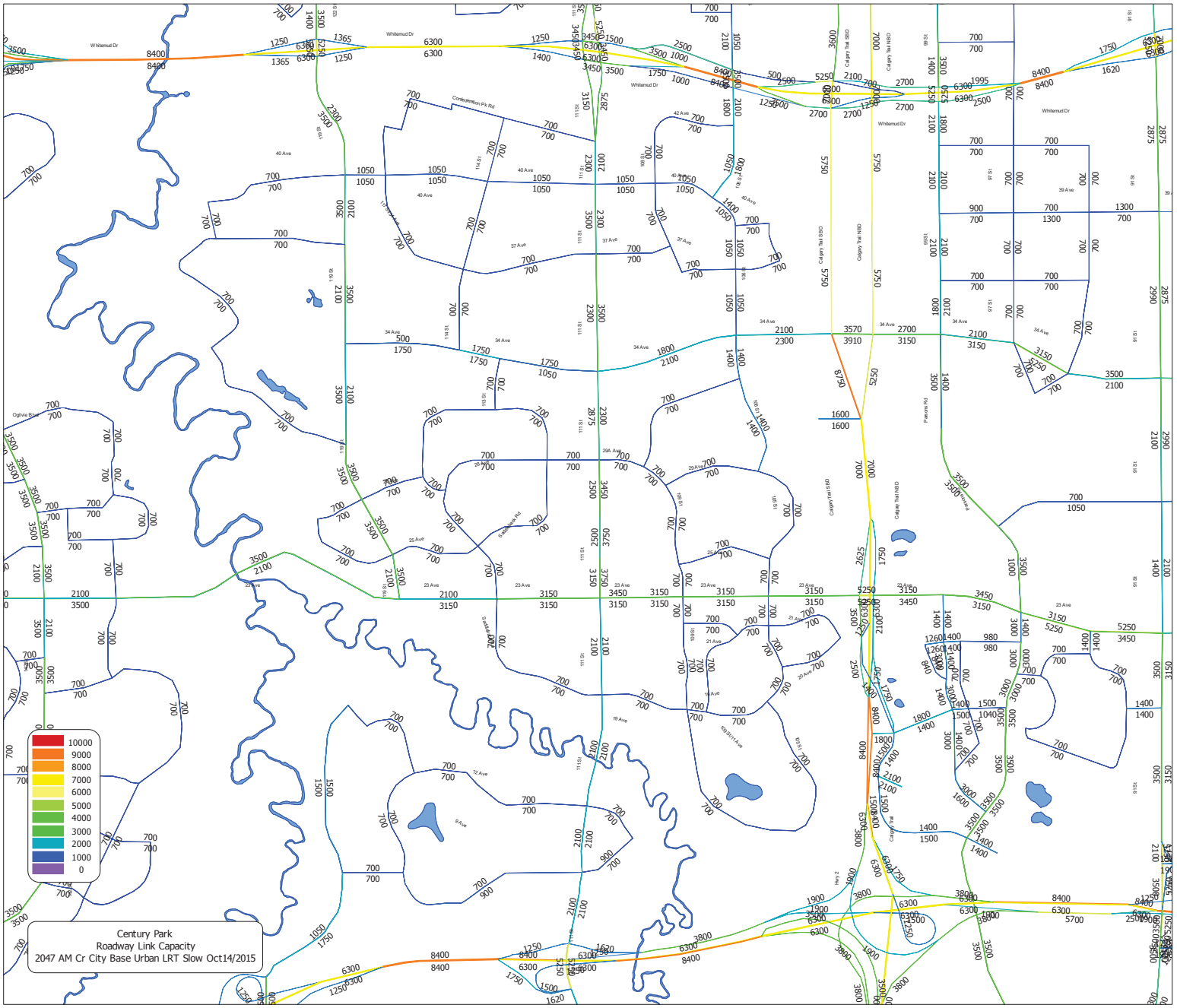
City of Edmonton 2047 Standard Model Package

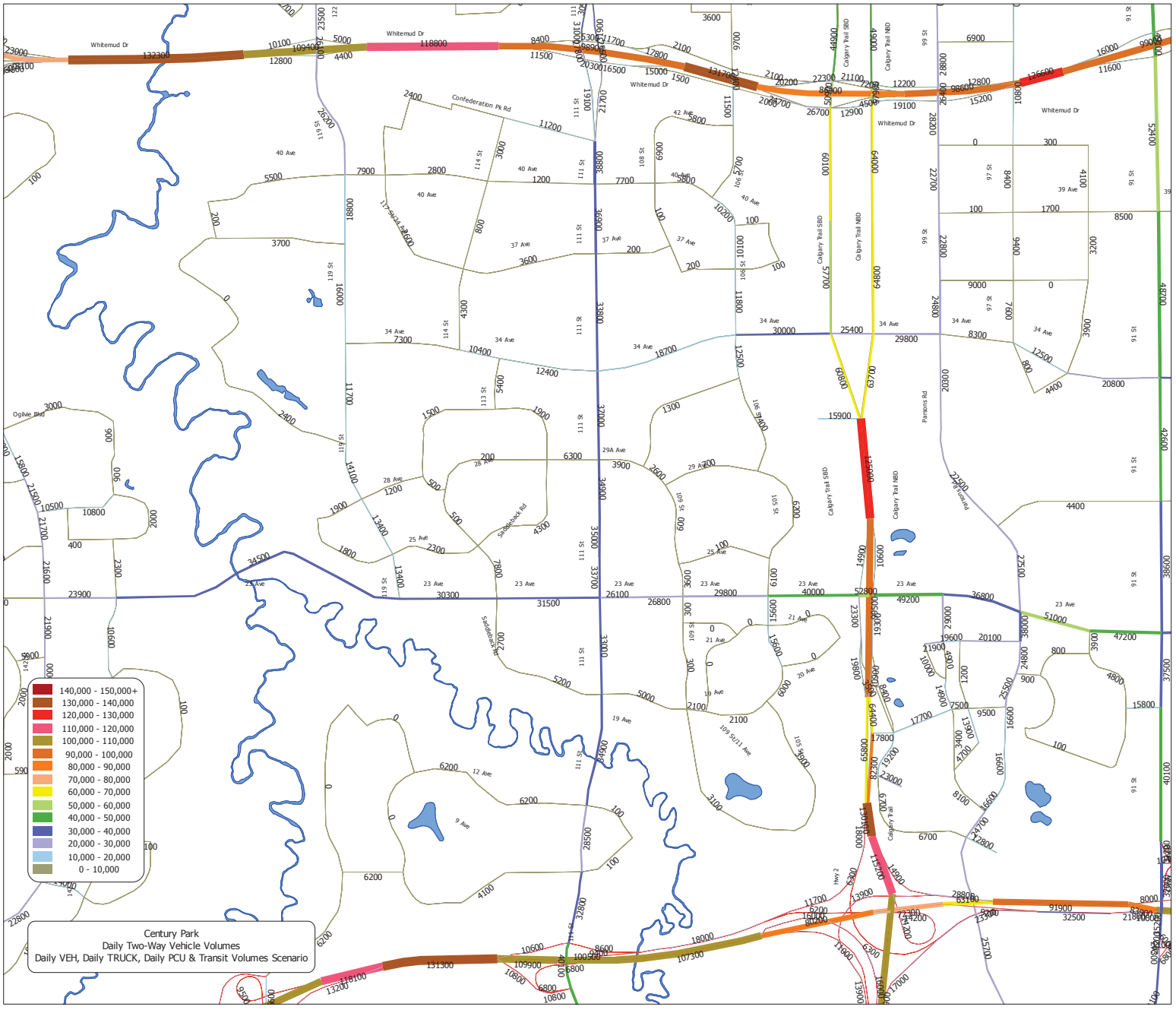

0 - 250
250 - 1000
1000 - 2000
2000 - 3000
3000 - 4000
4000 - 5000
5000 - 6000
6000 - 7000
7000 - 8000
8000 - 9000
9000 - 10000
Century Park
Edmonton City Zone Population
2047 AM Cr City Base Urban LRT Slow Oct14/2015
5310
10
0
4280
1880
110
1630
4020
5250
1700
1290
2630
1860
3260
5600
4440
4170
2420
3260
9730
6390
2470
4970
1450

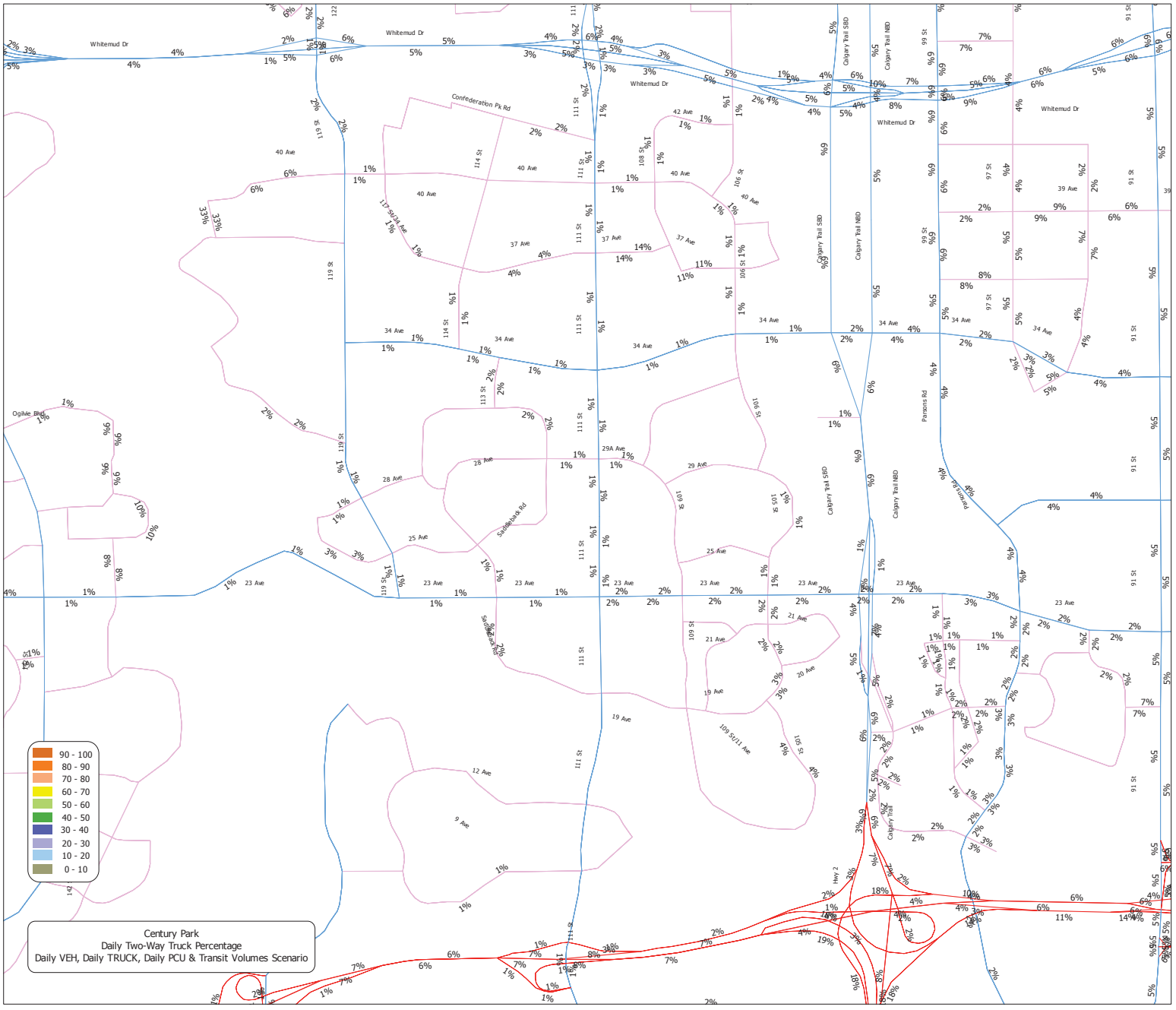

0 - 250
250 - 1000
1000 - 2000
2000 - 3000
3000 - 4000
4000 - 5000
5000 - 6000
6000 - 7000
7000 - 8000
8000 - 9000
9000 - 10000
Century Park
Edmonton City Zone Employment
2047 AM Cr City Base Urban LRT Slow Oct14/2015

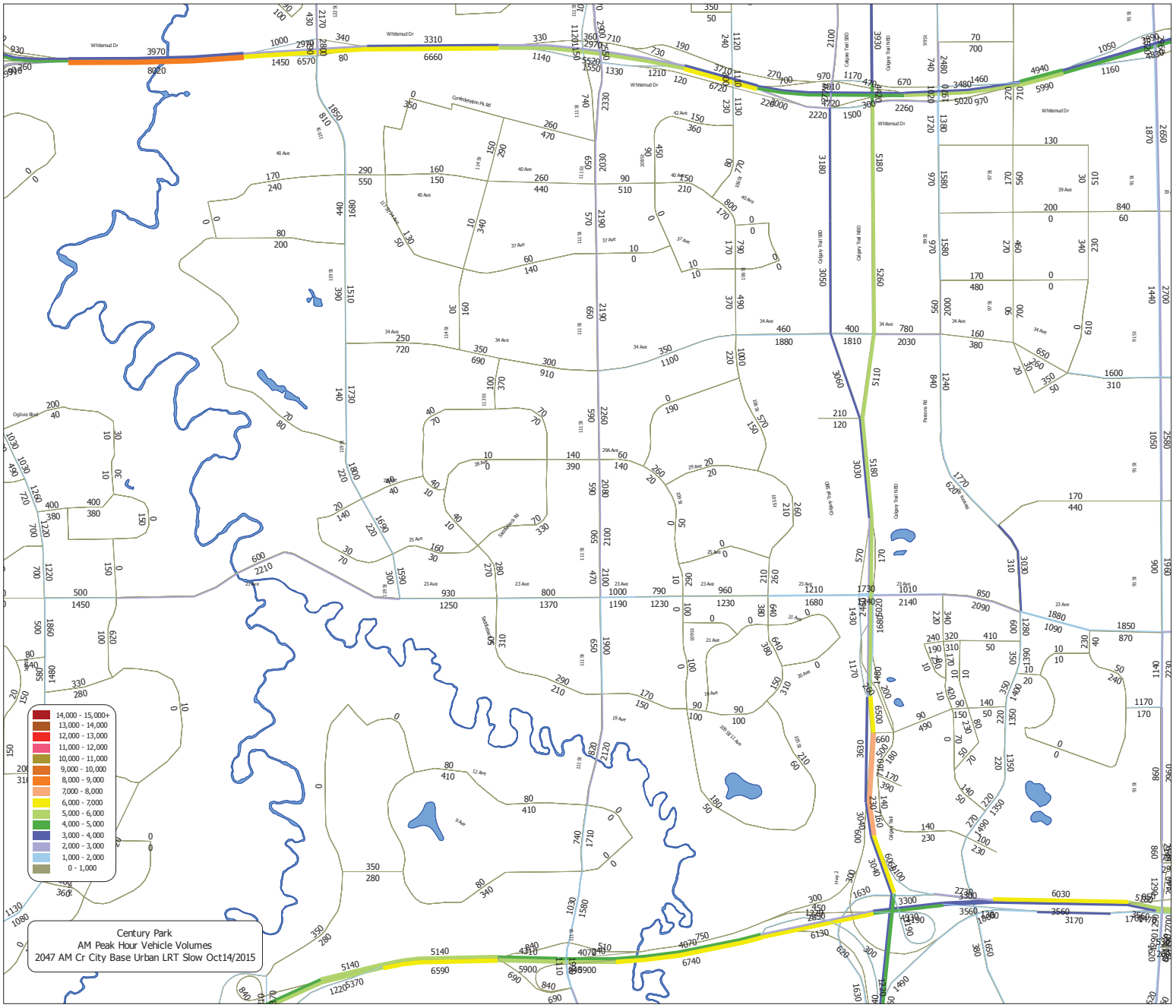

1 Lane
2 Lanes
3 Lanes
4 Lanes
5 Lanes
6 Lanes
Century Park
Roadway Number of Lanes
2047 AM Cr City Base Urban LRT Slow Oct14/2015

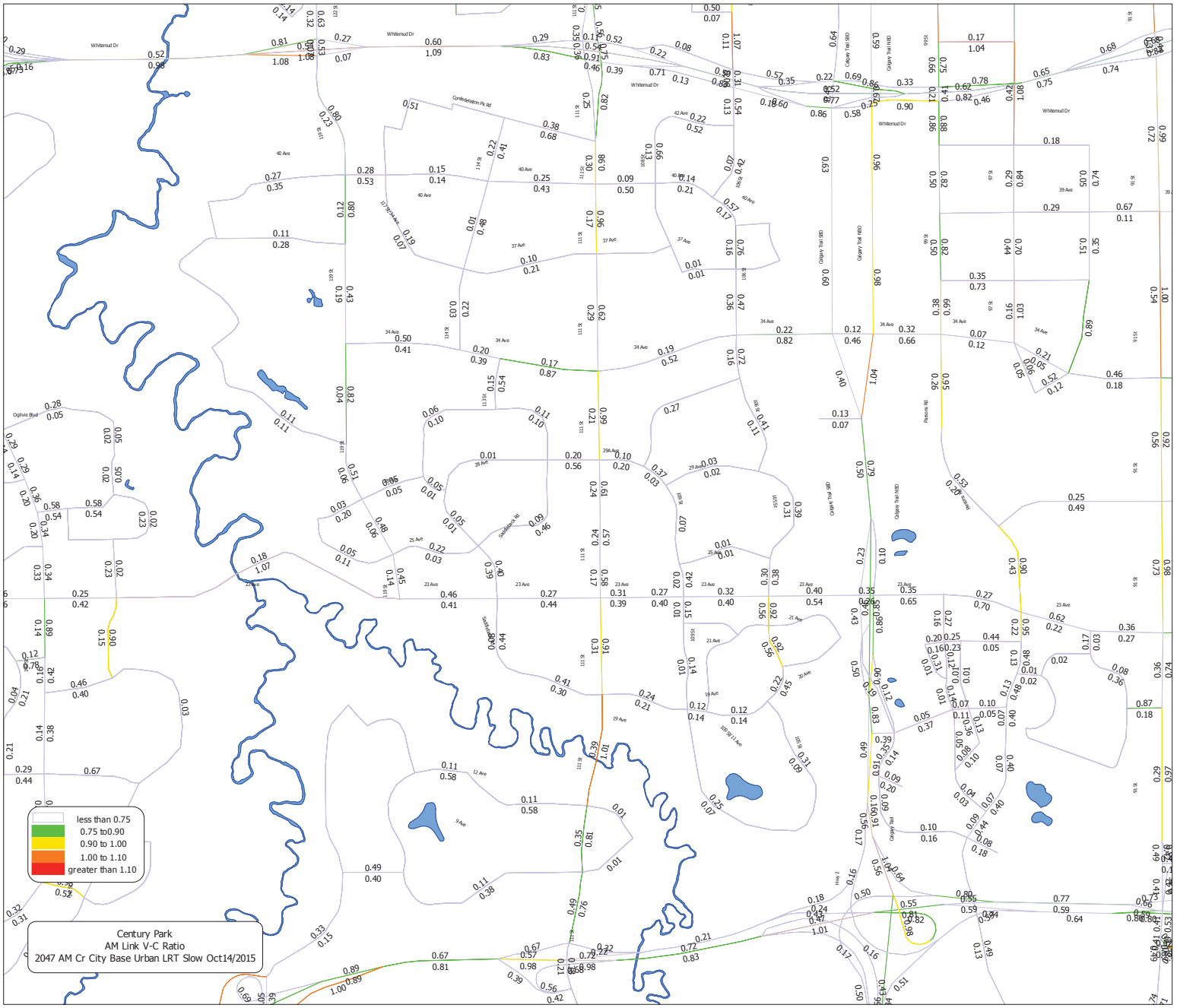

45 km/h
50 km/h
60 km/h
70 km/h
80 km/h
90 km/h
100 km/h
110 km/h
Century Park
Roadway Posted Speed
2047 AM Cr City Base Urban LRT Slow Oct14/2015

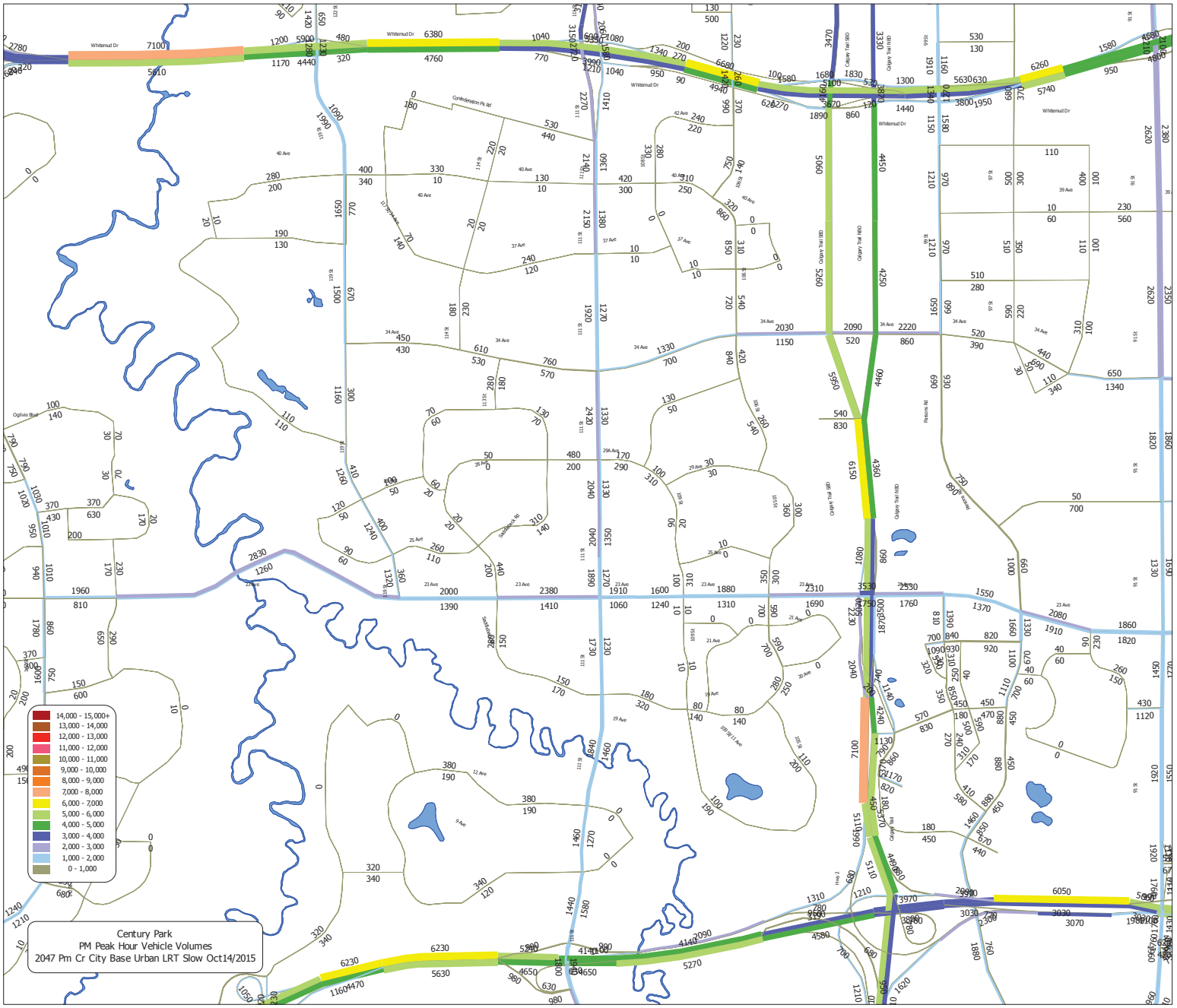

10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Century Park
Roadway Link Capacity
2047 AM Cr City Base Urban LRT Slow Oct14/2015

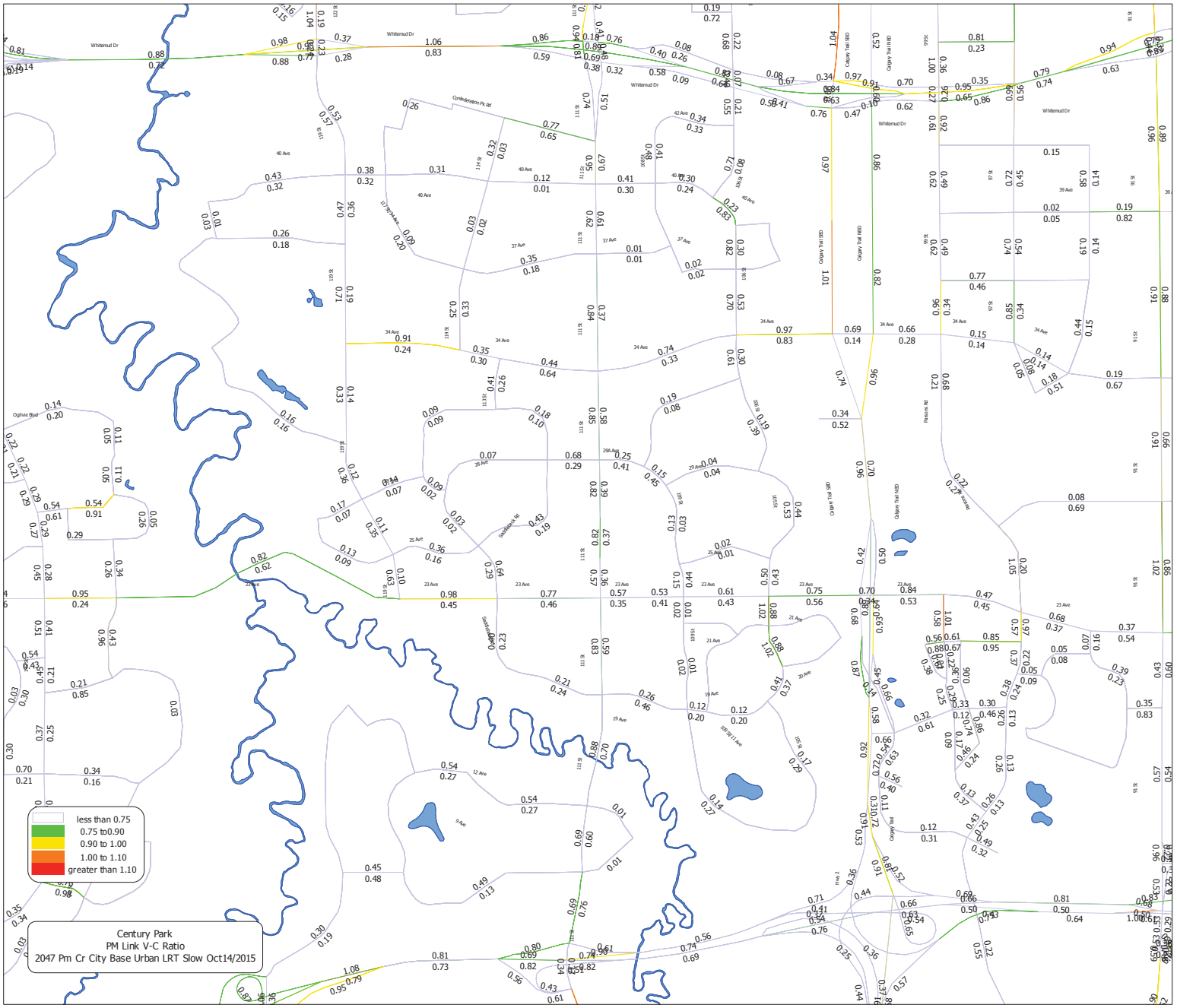

140,000 - 150,000+
130,000 - 140,000
120,000 - 130,000
110,000 - 120,000
100,000 - 110,000
90,000 - 100,000
80,000 - 90,000
70,000 - 80,000
60,000 - 70,000
50,000 - 60,000
40,000 - 50,000
30,000 - 40,000
20,000 - 30,000
10,000 - 20,000
0 - 10,000
Century Park
Daily Two-Way Vehicle Volumes
Daily VEH, Daily TRUCK, Daily PCU & Transit Volumes Scenario
Whitemud Dr
Confederation Pk Rd
Ogilvie Blvd
Parsons Rd
Calgary Trail SBD
Calgary Trail NBD
Hwy 2


90 - 100
80 - 90
70 - 80
60 - 70
50 - 60
40 - 50
30 - 40
20 - 30
10 - 20
0 - 10
Century Park
Daily Two-Way Truck Percentage
Daily VEH, Daily TRUCK, Daily PCU & Transit Volumes Scenario


14,000 - 15,000+
13,000 - 14,000
12,000 - 13,000
11,000 - 12,000
10,000 - 11,000
9,000 - 10,000
8,000 - 9,000
7,000 - 8,000
6,000 - 7,000
5,000 - 6,000
4,000 - 5,000
3,000 - 4,000
2,000 - 3,000
1,000 - 2,000
0 - 1,000
Century Park
AM Peak Hour Vehicle Volumes
2047 AM Cr City Base Urban LRT Slow Oct14/2015


less than 0.75
0.75 to0.90
0.90 to 1.00
1.00 to 1.10
greater than 1.10
Century Park
AM Link V-C Ratio
2047 AM Cr City Base Urban LRT Slow Oct14/2015


14,000 - 15,000+
13,000 - 14,000
12,000 - 13,000
11,000 - 12,000
10,000 - 11,000
9,000 - 10,000
8,000 - 9,000
7,000 - 8,000
6,000 - 7,000
5,000 - 6,000
4,000 - 5,000
3,000 - 4,000
2,000 - 3,000
1,000 - 2,000
0 - 1,000
Century Park
PM Peak Hour Vehicle Volumes
2047 Pm Cr City Base Urban LRT Slow Oct14/2015


less than 0.75
0.75 to0.90
0.90 to 1.00
1.00 to 1.10
greater than 1.10
Century Park
PM Link V-C Ratio
2047 Pm Cr City Base Urban LRT Slow Oct14/2015

APPENDIX D

Trip Generation Calculations

3084.05 - Century Park DC2 Rezoning
2-Sep-16
Land Use Information Source: Stantec -September 2, 2016 Table
Trip Generation - ITE & City of Edmonton Rates

2047 Scenario

			AM Peak Hour					PM Peak Hour					Daily				
Land Use	**Units**		**Rate**	**In**		**Out**		**Rate**	**In**		**Out**		**Rate**	**In**		**Out**	
MDR - Townhouse	450	units	0.46	21%	43	79%	164	0.58	65%	170	35%	91	6.59	50%	1,483	50%	1,483
MDR - Apartment	4,050	units	0.34	17%	234	83%	1,143	0.40	63%	1,021	37%	599	5.81	50%	11,765	50%	11,765
				277		1,307			1,191		690			13,248		13,248	
Total Residential	**4,500**	**TRUE**		1,584					1,881					26,496			
Retail - 820	250,000	SF	1.09	62%	169	38%	104	4.43	48%	532	52%	576	49.28	50%	6,160	50%	6,160
Medical/Dental Office - 720	50,000	SF	2.39	79%	94	21%	25	3.57	28%	50	72%	129	36.13	50%	903	50%	903
Professional Office - 710	50,000	SF	1.56	88%	69	12%	9	1.49	17%	13	83%	62	11.03	50%	276	50%	276
Park 'n' Ride - 90	1,320	stalls	0.72	83%	789	17%	162	0.05	25%	17	75%	50		50%	0	50%	0
				1,121		300			612		817			7,339		7,339	
Total Non-Residential	**350,000**	**TRUE**		1,421					1,429					14,678			
				1,398		1,607			1,803		1,507			20,587		20,587	
Total				3,005					3,310					41,174			

Land Use (ITE LUC)	**Intensity**	**AM Peak Hour**		**PM Peak Hour**		**Daily**	
		In	**Out**	**In**	**Out**	**In**	**Out**
Residential		277	1,307	1,191	690	13,248	13,248
Mode Split	See OD	51	388	273	133	3,073	3,007
Internal Capture		6	18	154	81	701	554
Net External Trips		**220**	**901**	**764**	**477**	**9,474**	**9,686**
Retail	250,000	169	104	532	576	6,160	6,160
Mode Split	15%	22	14	66	62	804	796
Internal Capture		23	12	91	161	801	854
Pass-by		8	8	71	71	902	902
Net External Trips		**116**	**70**	**304**	**282**	**3,653**	**3,608**
Hotel	0	0	0	0	0	0	0
Mode Split	15%	0	0	0	0	0	0
Internal Capture		0	0	0	0		
Net External Trips		**0**	**0**	**0**	**0**	**0**	**0**
Medical/Dental Office	50,000	94	25	50	129	903	903
Mode Split	See OD	17	5	5	22	188	165
Internal Capture		7	7	31	28	135	207
Net External Trips		**71**	**13**	**14**	**79**	**580**	**531**
Office	50,000	69	9	13	62	276	276
Mode Split	See OD	12	2	1	11	57	50
Internal Capture		5	3	8	14	41	63
Net External Trips		**52**	**5**	**4**	**38**	**177**	**162**
Park 'n' Ride	1,320	789	162	17	50	0	0
Net External Trips		**789**	**162**	**17**	**50**	**0**	**0**
Total		1,398	1,607	1,803	1,507	20,587	20,587
Mode Split		102	409	346	227	4,122	4,018
Internal Capture		40	40	284	284	1,679	1,679
Pass-by		8	8	71	71	902	902
Net External Trips		**1,248**	**1,150**	**1,102**	**925**	**13,884**	**13,988**

*Above values may not match report due to rounding

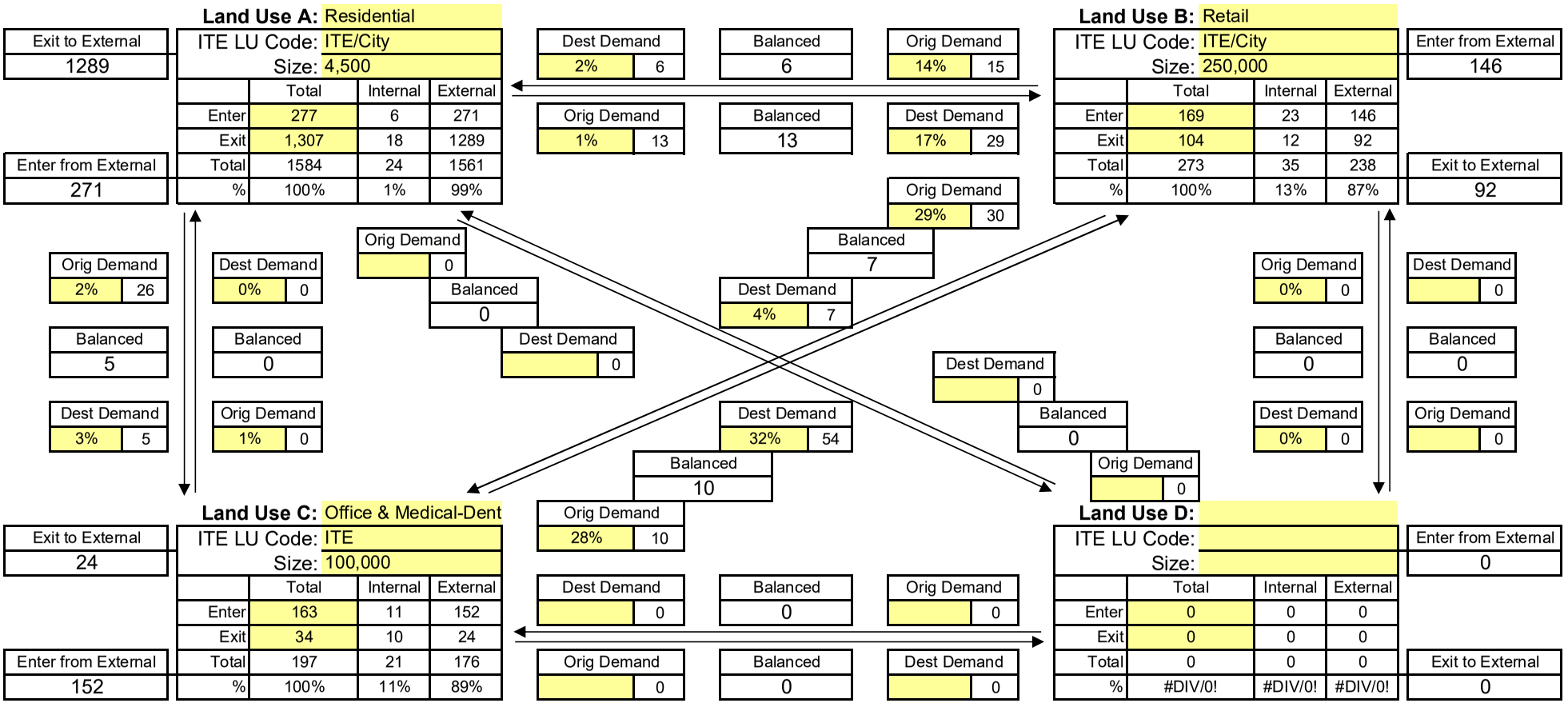
Pass-by Assumptions		
AM Peak	**PM Peak**	**Daily**
10%	20%	20%

Multi-Use Development Trip Generation and Internal Capture Summary

ITE Trip Generation Handbook, 3rd Edition

Project: Century Park
Project #: 3084.05
Scenario: AM - New Internal Capture Percentatges

Analyst: C. Oberg
Analysis Date: October 11, 2016



Land Use A	Total	Internal	External
Enter	277	6	271
Exit	1,307	18	1289
Total	1584	24	1561
%	100%	1%	99%

Land Use B	Total	Internal	External
Enter	169	23	146
Exit	104	12	92
Total	273	35	238
%	100%	13%	87%

Land Use C	Total	Internal	External
Enter	163	11	152
Exit	34	10	24
Total	197	21	176
%	100%	11%	89%

Land Use D	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!

Net External Trips for Multi-Use Development

	Land Use A	Land Use B	Land Use C	Land Use D	Total
Enter	271	146	152	0	569
Exit	1289	92	24	0	1405
Total	1561	238	176	0	1975
Single-Use Trip Generation Estimate	1584	273	197	0	2054

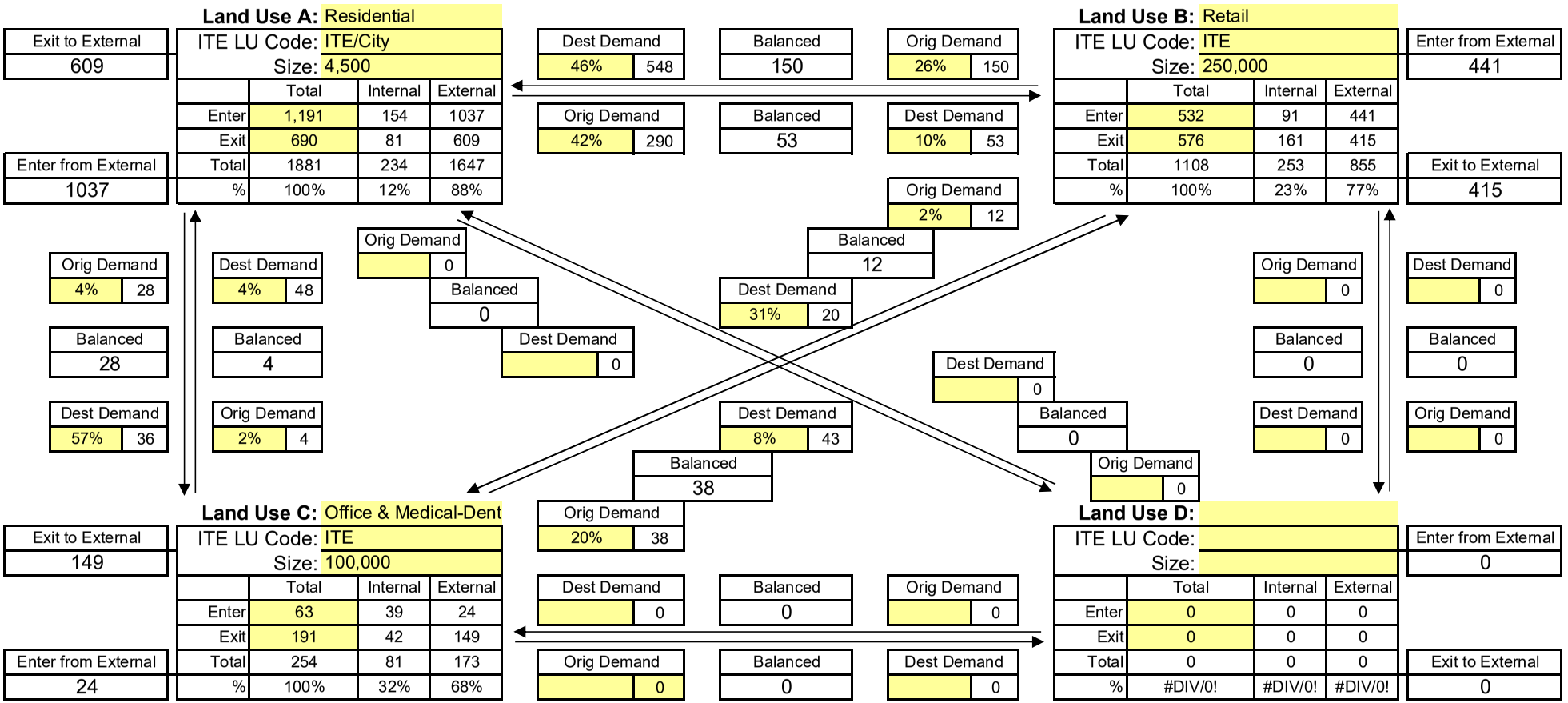
Internal Capture
3.9%

Multi-Use Development Trip Generation and Internal Capture Summary

ITE Trip Generation Handbook, 3rd Edition

Project: Century Park
Project #: 3084.05
Scenario: PM - Trip Generation Handbook 3rd Edition

Analyst: C. Oberg
Analysis Date: October 11, 2016



Land Use A	Total	Internal	External
Enter	1,191	154	1037
Exit	690	81	609
Total	1881	234	1647
%	100%	12%	88%

Land Use B	Total	Internal	External
Enter	532	91	441
Exit	576	161	415
Total	1108	253	855
%	100%	23%	77%

Land Use C	Total	Internal	External
Enter	63	39	24
Exit	191	42	149
Total	254	81	173
%	100%	32%	68%

Land Use D	Total	Internal	External
Enter	0	0	0
Exit	0	0	0
Total	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!

Net External Trips for Multi-Use Development					
	Land Use A	Land Use B	Land Use C	Land Use D	Total
Enter	1037	441	24	0	1502
Exit	609	415	149	0	1173
Total	1647	855	173	0	2675
Single-Use Trip Generation Estimate	1881	1108	254	0	3243

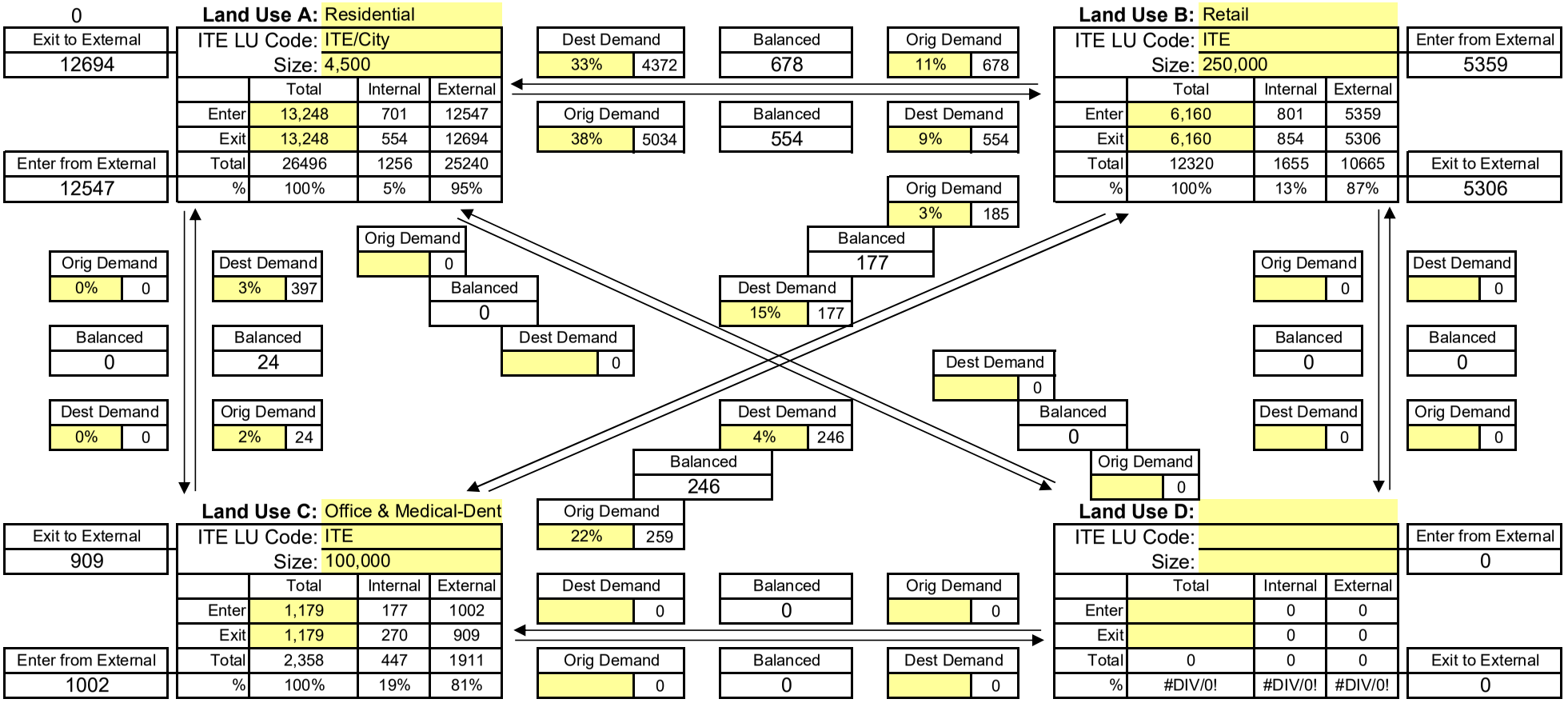
Internal Capture
17.5%

Multi-Use Development Trip Generation and Internal Capture Summary

ITE Trip Generation Handbook, 2nd Edition

Project: Century Park
Project #: 3084.05
Scenario: Daily - Trip Gen Handbook 2nd Edition

Analyst: C. Oberg
Analysis Date: October 11, 2016



Net External Trips for Multi-Use Development

	Residential	Retail	fice & Medical-Der	Land Use D	Total
Enter	12547	5359	1002	0	18908
Exit	12694	5306	909	0	18908
Total	25240	10665	1911	0	37816
Single-Use Trip Generation Estimate	26496	12320	2358	0	41174

Internal Capture
8.2%

Mode Split Assumptions

City of Edmonton 2013 OD Tables Original - SW Inner	Downtown	University	Downtown Fringe	NW Inner	NE Inner	SE Inner	SW Inner	West Inner	NW Suburb	NE Suburb	SE Suburb	SW suburb	West Suburb	Sherwood park	St. Albert	County of Strathcona	County of Leduc	County of Parkland	MD of Sturgeon	Total
2044 AM Outbound	7.7%	10.9%	5.0%	2.8%	2.0%	3.9%	20.1%	2.4%	6.9%	1.3%	18.0%	10.7%	1.8%	1.8%	0.9%	0.5%	2.2%	0.8%	0.3%	100.0%
2044 AM Inbound	1.9%	2.7%	3.0%	2.7%	3.0%	3.9%	18.1%	2.8%	2.5%	3.0%	12.0%	25.9%	5.5%	3.3%	1.8%	1.1%	3.4%	2.8%	0.6%	100.0%
2044 PM Outbound	2.0%	3.7%	3.0%	2.2%	2.2%	4.5%	27.6%	2.4%	2.2%	1.8%	16.1%	19.2%	4.1%	2.7%	1.1%	0.7%	2.6%	1.5%	0.4%	100.0%
2044 PM Inbound	4.8%	7.5%	3.2%	2.0%	1.6%	3.8%	27.2%	2.1%	3.7%	1.1%	18.0%	16.3%	2.9%	1.6%	0.7%	0.4%	2.1%	0.8%	0.2%	100.0%
2044 Daily Outbound	2.7%	4.6%	3.2%	2.3%	1.9%	4.5%	30.1%	2.2%	2.8%	1.2%	17.3%	18.0%	3.4%	2.0%	0.7%	0.4%	1.7%	0.8%	0.2%	100.0%
2044 Daily Inbound	3.6%	5.9%	3.1%	2.0%	1.8%	4.0%	27.8%	2.2%	2.5%	1.2%	16.5%	19.5%	3.4%	1.8%	0.8%	0.5%	2.2%	1.0%	0.2%	100.0%

Mode Split to Auto	20.0%	20.0%	60.0%	70.0%	70.0%	70.0%	70.0%	70.0%	90.0%	90.0%	90.0%	90.0%	90.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
City of Edmonton 2013 OD Tables Adjusted for Mode Split - SW Inner	Downtown	University	Downtown Fringe	NW Inner	NE Inner	SE Inner	SW Inner	West Inner	NW Suburb	NE Suburb	SE Suburb	SW suburb	West Suburb	Sherwood park	St. Albert	County of Strathcona	County of Leduc	County of Parkland	MD of Sturgeon	% Vehicle Trips	% Alternate Modes
2044 AM Outbound	1.5%	2.2%	3.0%	2.0%	1.4%	2.7%	14.1%	1.7%	6.2%	1.2%	16.2%	9.6%	1.6%	1.8%	0.9%	0.5%	2.2%	0.8%	0.3%	69.9%	30.1%
2044 AM Inbound	0.4%	0.5%	1.8%	1.9%	2.1%	2.7%	12.7%	2.0%	2.3%	2.7%	10.8%	23.3%	5.0%	3.3%	1.8%	1.1%	3.4%	2.8%	0.6%	81.1%	18.9%
2044 PM Outbound	0.4%	0.7%	1.8%	1.5%	1.5%	3.2%	19.3%	1.7%	2.0%	1.6%	14.5%	17.3%	3.7%	2.7%	1.1%	0.7%	2.6%	1.5%	0.4%	78.2%	21.8%
2044 PM Inbound	1.0%	1.5%	1.9%	1.4%	1.1%	2.7%	19.0%	1.5%	3.3%	1.0%	16.2%	14.7%	2.6%	1.6%	0.7%	0.4%	2.1%	0.8%	0.2%	73.7%	26.3%
2044 Daily Outbound	0.5%	0.9%	1.9%	1.6%	1.3%	3.2%	21.1%	1.5%	2.5%	1.1%	15.6%	16.2%	3.1%	2.0%	0.7%	0.4%	1.7%	0.8%	0.2%	76.3%	23.7%
2044 Daily Inbound	0.7%	1.2%	1.9%	1.4%	1.3%	2.8%	19.5%	1.5%	2.3%	1.1%	14.9%	17.6%	3.1%	1.8%	0.8%	0.5%	2.2%	1.0%	0.2%	75.5%	24.5%

APPENDIX E

Shared Parking Calculations

3084.05 - Century Park DC2 - Parking Assessment
October 17, 2016

City of Edmonton Zoning Bylaw (12800) Parking Requirement

Century Park DC2 Commercial Parking - Based on Bylaw Land Uses & Associated Parking Characterisics							
Land Use	**Size**	**Units**	**Size**	**Units**	**Bylaw Rate**		**Stalls Required**
Commercial/Retail	170.942	100 sm	17,094	sm	1.0	stalls per 40 sm of floor area	427.4
Fast Food (patron space)	9.290	100 sm	929	sm	1.0	stalls per 3.6 sm of p.s. floor area	258.1
Family Restaurant (patron space)	9.290	100 sm	929	sm	1.0	stalls per 3.6 sm of p.s. floor area	258.1
Fine/Casual Dining (patron space)	4.645	100 sm	465	sm	1.0	stalls per 3.6 sm of p.s. floor area	129.0
Office	46.452	100 sm	4,645	sm	1.0	stalls per 29.4 sm of floor area	158.0
Residential (Visitor)	0.00	units	0	sm	1.0	stalls per 10 units	0
Health Services	46.452	100 sm	4,645	sm	4.5	stalls per 22.2 sm of floor area	209
Fine/Casual PUB	0.000	100 sm	0	sm	1.0	stalls per 3.0 sm of p.s. floor area	0.0
Fitness Club	5.574	100 sm	557	sm	1	stalls per 10 sm of floor area	56
Major Alcohol	4.645	100 sm	465	sm	1	stalls per 23.3 sm of floor area	20
Child Care Services	4.645	100 sm	465	sm	1	stalls per 33.5 sm of floor area	4
	Total Non-Residential Area		**30,193.5**	**sm**		**Stalls Required**	**1,520**

Zoning Bylaw Assumptions

Commercial/Retail	Schedule 1, City of Edmonton Zoning Bylaw No. 12800 - 12.a. Any development within a Commercial Use Class not listed separately in this table, with a Floor Area of: less than 4 500 sm
Restaurant	Schedule 1, City of Edmonton Zoning Bylaw No. 12800 - 24. Restaurant (assume 60% patron space),
Office	Schedule 1, City of Edmonton Zoning Bylaw No. 12800 - 19. Professional, Financial and Office Support Services
Sobeys	Schedule 1, City of Edmonton Zoning Bylaw No. 12800 - 12.b. Any development within a Commercial Use Class not listed separately in this table, with a Floor Area of: 4,500 sm to 9,000 sm
Major Alcohol	Schedule 1, City of Edmonton Zoning Bylaw No. 12800 -20.
Child Care Services	Schedule 1, City of Edmonton Zoning Bylaw No. 12800 -33 employee parking shall be provided at a rate of 1 parking space per 33.5 sm Floor Area. Passenger pick-up/drop-off spaces chall be provided at the rate of 2 pick-up/drop-off spaces for the first 10 children, plus 1 additional pick-up/drop-off space for every 10 additional children - DROP-OFF/PICK-UP SPACES NOT INCLUDED IN SHARED PARKING ASSESSMENT

3084.05 - Century Park DC2 - Parking Assessment
October 17, 2016

Step 1: land use schedule
Step 3: base parking demand rates

Land Use Schedule & Base Parking Demand Rate (Weekday)

Century Park DC2 Commercial Parking - Based on Bylaw					
Land Uses & Associated Parking Characterisics					
Land Use	**Size**	**Units**	**Variable**	**Base Parking Demand Rate**	**Unadjusted Demand**
Commercial/Retail	170.942	100 sm	Employee	0.42	72
			Customer	1.84	315
Fast Food (patron space)	9.290	100 sm	Employee	4.17	39
			Customer	23.61	219
Family Restaurant (patron space)	9.290	100 sm	Employee	2.59	24
			Customer	16.86	157
Fine/Casual Dining (patron space)	4.645	100 sm	Employee	3.82	18
			Customer	21.18	98
Office	46.452	100 sm	Employee	3.13	145
			Visitor	0.27	13
Residential (Visitor)	0	units	Employee	0.00	0
			Customer	0.10	0
Health Services	46.452	100 sm	Employee	1.49	69
			Customer	3.02	140
Fine/Casual PUB	0.000	100 sm	Employee	4.58	0
			Customer	25.42	0
Fitness Club	5.574	100 sm	Employee	0.60	3
			Customer	9.40	52
Major Alcohol Sales	4.645	100 sm	Employee	0.71	3
			Customer	3.15	15
Child Care Services	4.645	100 sm	Employee	0.79	4
			Customer	0.07	0
Total Non-Residential Area	**301.935**	**100 sm**	**Total Weekday Stall Demand**		**1,386**

Land Use Schedule & Base Parking Demand Rate (Weekend)

Century Park DC2 Commercial Parking - Based on Bylaw					
Land Uses & Associated Parking Characterisics					
Land Use	**Size**	**Units**	**Variable**	**Base Parking Demand Rate**	**Unadjusted Demand**
Commercial/Retail	170.942	100 sm	Employee	0.50	86
			Customer	2.00	342
Fast Food (patron space)	9.290	100 sm	Employee	3.46	32
			Customer	22.48	209
Family Restaurant (patron space)	9.290	100 sm	Employee	4.17	39
			Customer	23.61	219
Fine/Casual Dining (patron space)	4.645	100 sm	Employee	4.17	19
			Customer	23.61	110
Office	46.452	100 sm	Employee	0.31	14
			Visitor	0.030	1
Residential (Visitor)	0	units	Resident	0.00	0
			Visitor	0.10	0
Health Services	46.452	100 sm	Employee	1.49	69
			Customer	3.02	140
Fine/Casual PUB	0.000	100 sm	Employee	5.00	0
			Customer	28.33	0
Fitness Club	5.574	100 sm	Employee	0.25	1
			Customer	8.00	45
Major Alcohol Sales	4.645	100 sm	Employee	0.86	4
			Customer	3.43	16
Child Care Services	4.645	100 sm	Employee	0.08	0
			Customer	0.01	0
Total Non-Residential Area	**287.070**	**100 sm**	**Total Weekday Stall Demand**		**1,347**

3084.05 - Century Park DC2 - Parking Assessment
October 17, 2016

Step 5: Monthly Variation In Parking Demand

Attachment A-1: Recommended Monthly Adjustment Factors for Employee and Customer/Visitor Parking

Land Use			January	February	March	April	May	June	July	August	September	October	November	December	Late Dec.
Commercial/Retail	Employee	1	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
	Customer	2	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Fast Food (patron space)	Employee	3	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Customer	4	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Family Restaurant (patron space)	Employee	5	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Customer	6	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Fine/Casual Dining (patron space)	Employee	7	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Customer	8	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Office	Employee	9	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
	Visitor	10	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
Residential (Visitor)	Resident	11	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Visitor	12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Health Services	Employee	13	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Customer	14	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fine/Casual PUB	Employee	15	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Customer	16	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Fitness Club	Employee	17	100%	100%	95%	80%	75%	75%	75%	80%	90%	95%	95%	100%	100%
	Customer	18	100%	95%	85%	70%	65%	65%	65%	70%	80%	85%	85%	90%	95%
Major Alcohol Sales	Employee	19	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
	Customer	20	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Child Care Services	Employee	21	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%
	Customer	22	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%

Monthly Adjustment Factors Assumptions

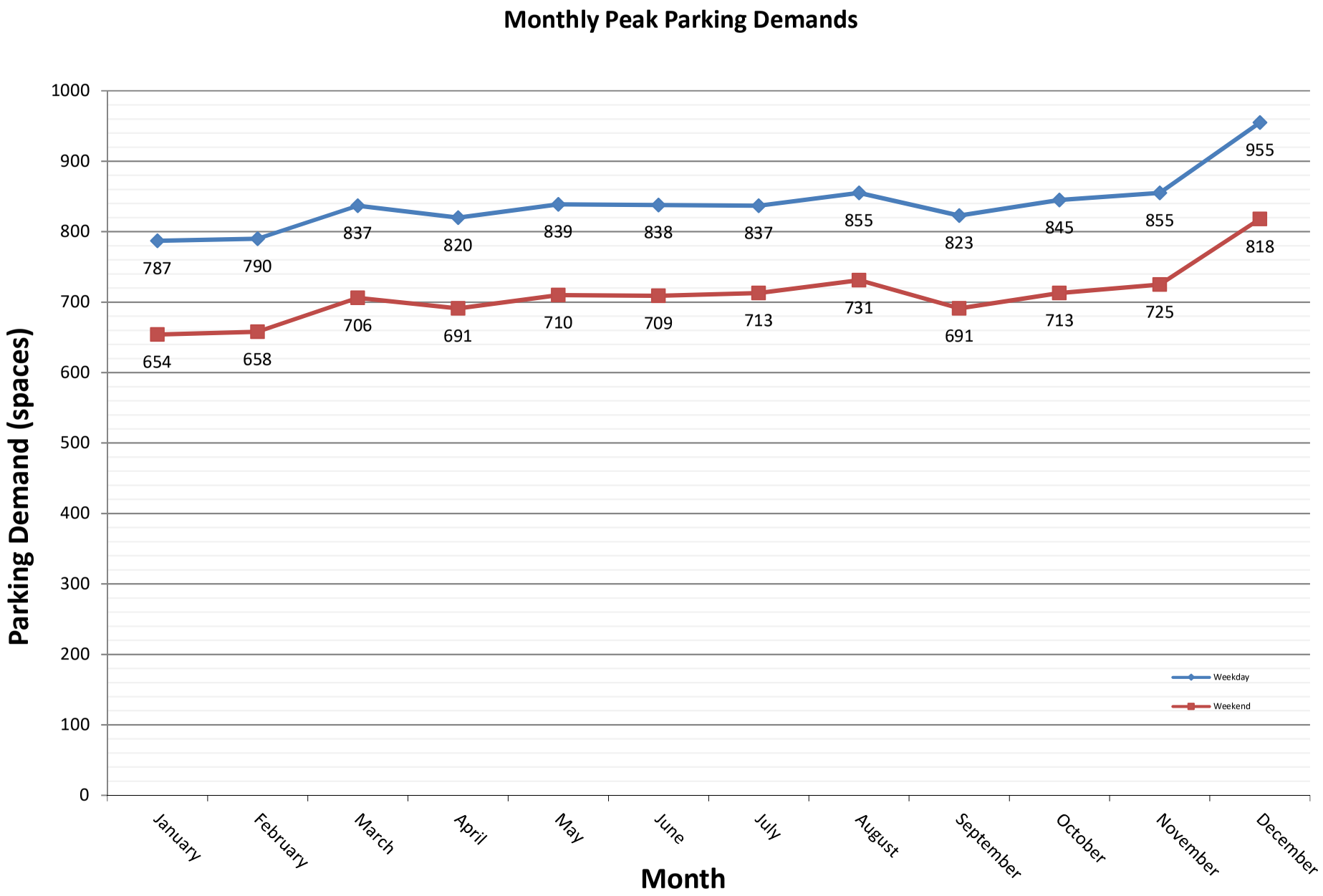
NOTE Monthly factors for Medical/Dental not available

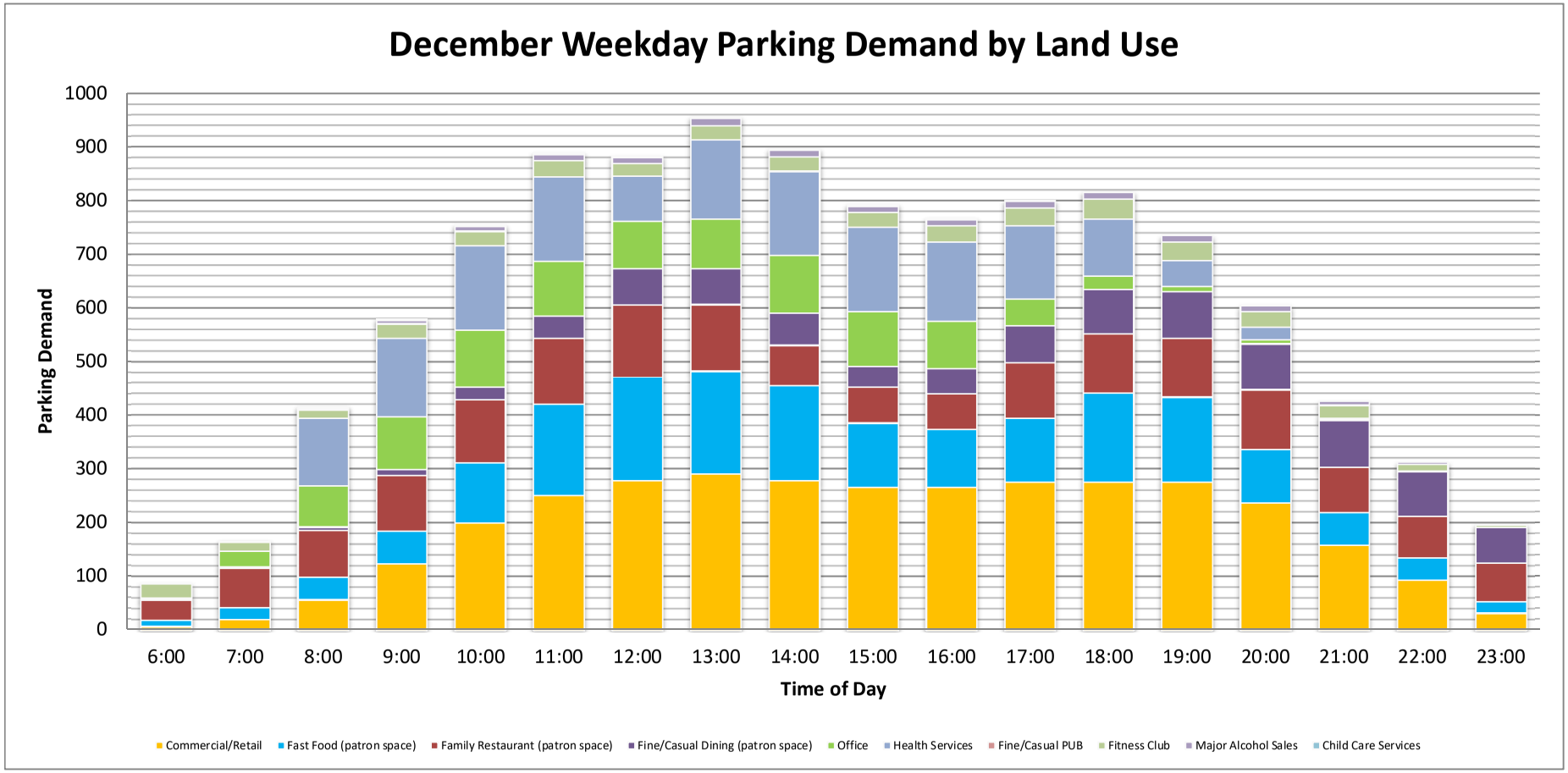
3084.05 - Century Park DC2 - Parking Assessment
October 17, 2016

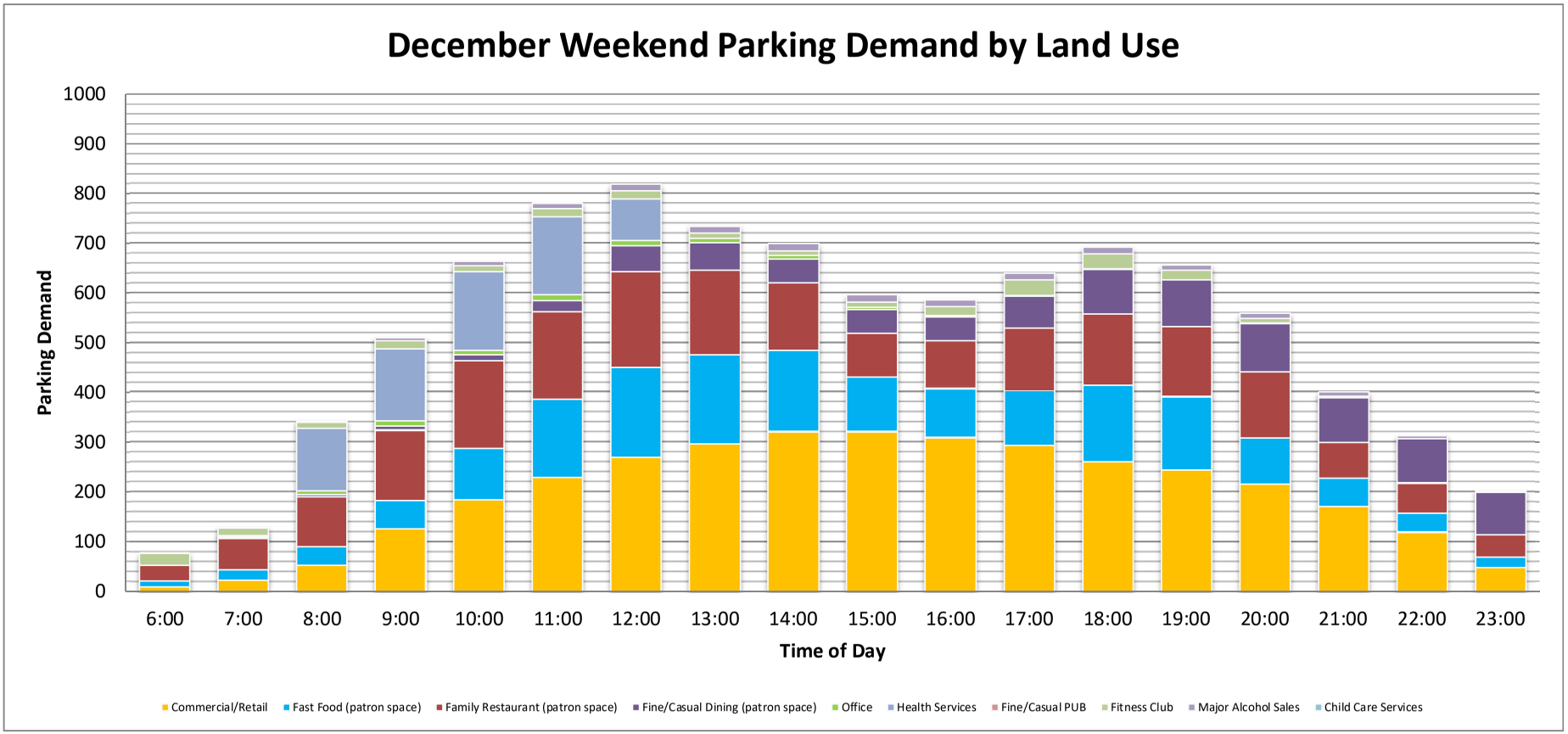
Step 7: Time of Day Parking Demand Factors

Attachment A-2: Time of Day Parking Demand Factors Weekdays																							
Land Use	Variable	Morning						Afternoon						Evening									
		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Midnight			
Commercial/Retail	Employee	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	95%	95%	90%	75%	40%	15%				
	Customer	1%	5%	15%	35%	65%	85%	95%	100%	95%	90%	90%	95%	95%	95%	80%	50%	30%	10%				
Fast Food (patron space)	Employee	15%	20%	30%	40%	75%	100%	100%	100%	95%	70%	60%	70%	90%	90%	60%	40%	30%	20%	20%			
	Customer	5%	10%	20%	30%	55%	85%	100%	100%	90%	60%	55%	60%	85%	80%	50%	30%	20%	10%	5%			
Family Restaurant (patron space)	Employee	50%	75%	90%	90%	100%	100%	100%	100%	100%	75%	75%	95%	95%	95%	95%	80%	65%	65%	35%			
	Customer	25%	50%	60%	75%	85%	90%	100%	90%	50%	45%	45%	75%	80%	80%	80%	60%	55%	50%	25%			
Fine/Casual Dining (patron space)	Employee		20%	50%	75%	90%	90%	90%	90%	90%	75%	75%	100%	100%	100%	100%	100%	100%	85%	35%			
	Customer					15%	40%	75%	75%	65%	40%	50%	75%	95%	100%	100%	100%	95%	75%	25%			
Office	Employee	3%	30%	75%	95%	100%	100%	90%	90%	100%	100%	90%	50%	25%	10%	7%	3%	1%					
	Visitor		1%	20%	60%	100%	45%	15%	45%	100%	45%	15%	10%	5%	2%	1%							
Residential (Visitor)	Resident	100%	90%	85%	80%	75%	70%	65%	70%	70%	70%	75%	85%	90%	97%	98%	99%	100%	100%	100%			
	Visitor		10%	20%	20%	20%	20%	20%	20%	20%	20%	20%	40%	60%	100%	100%	100%	100%	80%	50%			
Health Services	Employee			60%	100%	100%	100%	100%	100%	100%	100%	100%	100%	67%	30%	15%							
	Visitor			90%	90%	100%	100%	30%	90%	100%	100%	90%	80%	67%	30%	15%							
Fitness Club	Employee	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	100%	100%	75%	50%	20%	20%	20%				
	Customer	70%	40%	40%	70%	70%	80%	60%	70%	70%	70%	80%	90%	100%	90%	80%	70%	35%	10%				
Major Alcohol Sales	Employee	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	95%	95%	90%	75%	40%	15%				
	Customer	1%	5%	15%	35%	65%	85%	95%	100%	95%	90%	90%	95%	95%	95%	80%	50%	30%	10%				
Child Care Services	Employee	3%	30%	75%	95%	100%	100%	90%	90%	100%	100%	90%	50%	25%	10%	7%	3%	1%					
	Customer		1%	20%	60%	100%	45%	15%	45%	100%	45%	15%	10%	5%	2%	1%							

Attachment A-3: Time of Day Parking Demand Factors Weekends																							
Land Use	Variable	Morning						Afternoon						Evening									
		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Midnight			
Commercial/Retail	Employee	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	85%	80%	75%	65%	45%	15%				
	Customer	1%	5%	10%	30%	50%	65%	80%	90%	100%	100%	95%	90%	80%	75%	65%	50%	35%	15%				
Fast Food (patron space)	Employee	15%	20%	30%	40%	75%	100%	100%	100%	95%	70%	60%	70%	90%	90%	60%	40%	30%	20%	20%			
	Customer	5%	10%	20%	30%	55%	85%	100%	100%	90%	60%	55%	60%	85%	80%	50%	30%	20%	10%	5%			
Family Restaurant (patron space)	Employee	50%	75%	90%	90%	100%	100%	100%	100%	100%	75%	75%	95%	95%	95%	95%	80%	65%	65%	35%			
	Customer	10%	25%	45%	70%	90%	90%	100%	85%	65%	40%	45%	60%	70%	70%	65%	30%	25%	15%	10%			
Fine/Casual Dining (patron space)	Employee		20%	30%	60%	75%	75%	75%	75%	75%	75%	75%	100%	100%	100%	100%	100%	100%	85%	50%			
	Customer						15%	50%	55%	45%	45%	45%	60%	90%	95%	100%	90%	90%	90%	50%			
Office	Employee		20%	60%	80%	90%	100%	90%	80%	60%	40%	20%	10%	5%									
	Visitor		20%	60%	80%	90%	100%	90%	80%	60%	40%	20%	10%	5%									
Residential (Visitor)	Resident	100%	90%	85%	80%	75%	70%	65%	70%	70%	70%	75%	85%	90%	97%	98%	99%	100%	100%	100%			
	Visitor		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	40%	60%	100%	100%	100%	100%	80%	50%			
Health Services	Employee			60%	100%	100%	100%	100%															
	Visitor			90%	90%	100%	100%	30%															
Fitness Club	Employee	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	75%	100%	100%	75%	50%	20%	20%	20%				
	Customer	80%	45%	35%	50%	35%	50%	50%	30%	25%	30%	55%	100%	95%	60%	30%	10%	1%	1%				
Major Alcohol Sales	Employee	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	85%	80%	75%	65%	45%	15%				
	Customer	1%	5%	10%	30%	50%	65%	80%	90%	100%	100%	95%	90%	80%	75%	65%	50%	35%	15%				
Child Care Services	Employee		20%	60%	80%	90%	100%	90%	80%	60%	40%	20%	10%	5%									
	Customer		20%	60%	80%	90%	100%	90%	80%	60%	40%	20%	10%	5%									


Monthly Peak Parking Demands
Parking Demand (spaces)
1000
900
800
700
600
500
400
300
200
100
0
787
790
837
820
839
838
837
855
823
845
855
955
654
658
706
691
710
709
713
731
691
713
725
818
Weekday
Weekend
January
February
March
April
May
June
July
August
September
October
November
December
Month


December Weekday Parking Demand by Land Use
Parking Demand
1000
900
800
700
600
500
400
300
200
100
0
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Time of Day
Commercial/Retail
Fast Food (patron space)
Family Restaurant (patron space)
Fine/Casual Dining (patron space)
Office
Health Services
Fine/Casual PUB
Fitness Club
Major Alcohol Sales
Child Care Services


December Weekend Parking Demand by Land Use
Parking Demand
1000
900
800
700
600
500
400
300
200
100
0
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Time of Day
Commercial/Retail
Fast Food (patron space)
Family Restaurant (patron space)
Fine/Casual Dining (patron space)
Office
Health Services
Fine/Casual PUB
Fitness Club
Major Alcohol Sales
Child Care Services

Shared Parking Assessment	Weekday 1:00 PM Peak	Weekday 7:00 PM Peak
Non-Residential Shared Parking Demand	955	735
Available Residential Visitor Spaces	360	0
Additional Non-Residential Spaces Required	**595**	**735**