The Calgary Airport Authority

Parallel Runway Project
Volume V – Item 6
Transportation Baseline Report

Report
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Transportation Baseline Report

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60114017

Date:
June 2010
March 16, 2010

Peter Rudolf  
Director Airfield Development  
Calgary Airport Authority  
2000 Airport Road N.E.  
Calgary, AB  
T2E 6WS

Dear Peter:

Re: Baseline Study – Transportation  
Comprehensive Study Environmental Assessment  
Parallel Runway Project 16L-34R - Runway Development Program

This report presents the results of the baseline study for Transportation conducted by AECOM Canada Ltd. for the Parallel Runway Project 16L-34R and connecting taxiways to be constructed at the Calgary International Airport in Alberta.

The report is part of the Comprehensive Study – Environmental Assessment and forms part of Volume V of that study.

If you have any questions concerning this report, please contact the undersigned at (403) 717-3498.

Sincerely,

AECOM Canada Ltd.

Barry Hawkins Project Manager  
barry.hawkins@rwy-yyc.com

TJ:
Encl.
cc: File
### Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full text</th>
</tr>
</thead>
<tbody>
<tr>
<td>AADT</td>
<td>Average Annual Daily Traffic</td>
</tr>
<tr>
<td>V/C</td>
<td>Volume to Capacity ratio</td>
</tr>
<tr>
<td>RTM</td>
<td>Regional Transportation Model</td>
</tr>
<tr>
<td>LRT</td>
<td>Light Rail Transit</td>
</tr>
<tr>
<td>PHF</td>
<td>Peak Hour Factor</td>
</tr>
<tr>
<td>%HV</td>
<td>Percent of Heavy Vehicles</td>
</tr>
<tr>
<td>PV</td>
<td>Passenger Vehicles</td>
</tr>
<tr>
<td>HV</td>
<td>Heavy Vehicles</td>
</tr>
<tr>
<td>TTL</td>
<td>Traffic Turning Left</td>
</tr>
<tr>
<td>LT</td>
<td>Left Turn</td>
</tr>
<tr>
<td>TH</td>
<td>Through</td>
</tr>
<tr>
<td>RT</td>
<td>Right Turn</td>
</tr>
</tbody>
</table>
Executive Summary

The Transportation Baseline Report forms part of a Comprehensive Study (CS) for the proposed Parallel Runway Project (PRP) at Calgary International Airport (YYC). The CS is being prepared as part of an environmental assessment (EA) and approval process established by the Calgary Airport Authority (the Authority). The transportation component of this work reviews the transportation road network in the Local (roadways adjacent to the Airport Lands) and Regional (City of Calgary and surrounding area) Study Areas to determine the impact of the PRP development.

The transportation baseline report describes the conditions of the roadway network before the project is built. The purpose of this report is to enable comparisons to be made between conditions before and after the project is in place. Such comparisons form the basis of the assessment of the project’s transportation effects.

To determine the baseline roadway network conditions, traffic volume data were collected at key intersections and roadway links from the City of Calgary and Alberta Transportation, as well as from counts completed by AECOM in October 2009. Supplementary to traffic volume data, the City of Calgary Regional Transportation Model (RTM), developed and run by the City of Calgary Forecasting division, provides a tool to review and compare future roadway network scenarios. The calibrated RTM representing existing conditions was used in the assessment to provide baseline information for the existing road network, which can then be compared to forecast information, taking into account any changes due to the PRP.

Key data collected from the RTM for existing conditions includes link volumes and v/c ratios on roadways surrounding YYC, as well as travel times between representative locations. The v/c plots provided by the RTM showed that with the exception of Deerfoot Trail, the roads analyzed within the LSA operated at v/c ratios of 0.8 or less which is within City of Calgary acceptable standards.

In addition to providing baseline traffic volume and trip time information, the this report describes the current public transit routes and active modes pathway systems within the LSA as well as the roadway network characteristics such as:

- Posted speed
- Number of lanes
- Classification
- Ownership
- Communities served
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Appendix C  2009 Intersection Volumes Development
1. Introduction

This Baseline Report forms part of a Comprehensive Study (CS) of the proposed Parallel Runway Project (PRP) at Calgary International Airport (YYC). The CS is being prepared as part of an environmental assessment (EA) and approval process established by the Calgary Airport Authority (the Authority). The process shadows the EA process under the Canadian Environmental Assessment Act (CEAA).

The PRP consists of the following components:

- A 4267 m x 60 m runway (14000 ft x 200 ft)
- Associated taxiways
- A perimeter road with security fencing
- Grading of workspace to the east of the proposed runway
- Visual navigation aids
- Electronic navigation aids
- A maintenance building
- A field electric centre
- Changes to airside/groundside roads necessitated by construction of the runway
- Closure of Barlow Trail between 48 Avenue and Airport Road
- A taxiway underpass (designated Taxiway J Underpass) servicing the airport’s cargo area for airport service vehicles to pass under one of the taxiways
- Utility services to the runway including some changes to the airfield storm drainage system
- A taxiway underpass (designated Taxiway F Underpass)

Further details regarding the process and project can be found in Volume II, Chapter 5 of the CS.

As part of the CS, a series of baseline studies have been undertaken to describe the biophysical, socio-economic and cultural resource baseline conditions. In total, 13 baseline studies have been undertaken:

- Soils and Terrain
- Vegetation
- Surface Water and Aquatics Resources
- Wildlife and Wildlife Habitat
- Groundwater
- Transportation
- Land Use
- Noise
- Climate and Greenhouse Gases
- Air Quality
- Cultural Resources
- Socio-economics
- Human Health

During the CS, the results of each of the baseline studies were documented in stand-alone technical reports such as this one. In each case, a draft was prepared and made available for public, stakeholder, and government agency comment. The final baseline conditions will be summarized in each individual assessment chapter (Volume III), with each of the stand-alone technical reports becoming an appendix to the CS.
1.1 Local Study Area

The Local Study Area (LSA) for the Transportation effects assessment is the area containing YYC lands and the immediate roads adjacent to the airport. The LSA (Figure 1) is bounded by Deerfoot Trail on the west, McKnight Boulevard on the south, Country Hills Boulevard on the north, and Métis Trail/36 Street NE on the east.

1.2 Regional Study Area

The Regional Study Area (RSA) includes all major roads within the City of Calgary plus roads connecting to the adjacent towns of Balzac, Airdrie, and Chestermere. The RSA (Figure 2) will capture any effects on the major routes that may result from the PRP.

Most of the transportation impacts from the PRP development will be captured in the LSA assessment. The RSA will only be looked at when average commuters’ travel times are considered.
2. Methodology

2.1 Traffic Data

Traffic data, obtained for the LSA only, consisted of City of Calgary turning movement data and 24 hour automatic counts. AECOM traffic counts were also conducted (see Appendix B). Figure 3 shows the locations and timing of all traffic data collections.

Roadway traffic volumes are estimated regularly by the City of Calgary on its busier roads. Figure 4 shows the average annual weekday traffic (AADT) on the roadways within the LSA.

Available turning movement data was obtained from the City of Calgary for the following intersections in the LSA:

- McKnight Boulevard and 36 Street – 2008
- McKnight Boulevard and Deerfoot Trail – 2008
- McKnight Boulevard and Barlow Trail – 2005
- Barlow Trail and 48 Avenue – 2005
- Barlow Trail and Airport Trail – 2007
- Airport Trail and 19 Street – 2007
- Airport Trail and Deerfoot Trail – 2008
- Country Hills Boulevard and Barlow Trail – 2007
- Country Hills Boulevard and 36 Street – 2006
- 36 Street and 80 Avenue – 2006
- 36 Street and 67 Avenue – 2008

Traffic counts were conducted by AECOM on Wednesday October 28, 2009 at the intersection of Barlow Trail and Airport Road NE and on Thursday, October 29, 2009 at the intersections of McCall Way with Airport Service Place and with 78 Avenue NE.

Twenty-four hour 2008 automatic counts are also available on links within the LSA along Deerfoot Trail, McKnight Boulevard, and Barlow Trail.

Based on historical data, growth rates were developed for the major roadways in the LSA to extrapolate 2009 intersection volumes, as shown in Table 1 and Figure 5. The linear annual growth rates are:

- 36 Street – 10%
- Deerfoot Trail – 5%
- McKnight Boulevard – 5%
- Airport Trail – 5%
- Country Hills Boulevard – 5%
- Barlow Trail – 5%
### Table 1 2009 Intersection Volumes

<table>
<thead>
<tr>
<th></th>
<th>North</th>
<th>South</th>
<th>East</th>
<th>West</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LT</td>
<td>TH</td>
<td>RT</td>
<td>LT</td>
</tr>
<tr>
<td><strong>McKnight Boulevard and 36 Street NE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AM</td>
<td>81</td>
<td>260</td>
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<td>27</td>
</tr>
<tr>
<td>PM</td>
<td>121</td>
<td>888</td>
<td>384</td>
<td>17</td>
</tr>
<tr>
<td><strong>McKnight Boulevard and Deerfoot Trail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>406</td>
<td>2990</td>
<td>1323</td>
<td>628</td>
</tr>
<tr>
<td>PM</td>
<td>514</td>
<td>6021</td>
<td>562</td>
<td>286</td>
</tr>
<tr>
<td><strong>McKnight Boulevard and Barlow Trail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>351</td>
<td>323</td>
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<td>233</td>
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<tr>
<td>PM</td>
<td>714</td>
<td>1122</td>
<td>591</td>
<td>132</td>
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<tr>
<td><strong>Barlow Trail and 48 Avenue</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>406</td>
<td>2990</td>
<td>1323</td>
<td>628</td>
</tr>
<tr>
<td>PM</td>
<td>514</td>
<td>6021</td>
<td>562</td>
<td>286</td>
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<tr>
<td><strong>Barlow Trail and Airport Trail</strong></td>
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<td></td>
<td></td>
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<tr>
<td>AM</td>
<td>269</td>
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<td></td>
<td></td>
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<tr>
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<td>204</td>
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<td>PM</td>
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<td>146</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>225</td>
<td>22</td>
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<td>10</td>
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<td>PM</td>
<td>1140</td>
<td>178</td>
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<td><strong>Country Hills Boulevard and 36 Street</strong></td>
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<td>0</td>
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<tr>
<td>PM</td>
<td>505</td>
<td>17</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td><strong>36 Street and 80 Avenue</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>283</td>
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<tr>
<td>PM</td>
<td>3</td>
<td>127</td>
<td>16</td>
<td>328</td>
</tr>
<tr>
<td><strong>36 Street and 67 Avenue</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>0</td>
<td>7</td>
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<td>283</td>
</tr>
<tr>
<td>PM</td>
<td>0</td>
<td>8</td>
<td>29</td>
<td>163</td>
</tr>
</tbody>
</table>

**Note:** LT – Left Turn Movement  
TH – Through Movement  
RT – Right Turn Movement
2.2 Calgary Regional Transportation Model (RTM)

The Calgary Regional Transportation Model (RTM) is the City of Calgary’s current travel demand forecasting model and is typically used for strategic and transportation planning. It is based on information such as lane use, population, employment, travel patterns, and the road network. The model follows a four-step process:

- **Trip Generation** – generates travel demand
- **Trip Distribution** – distributes generated trips between city zones
- **Modal Split** – determines how the trips are split between the different modes available
- **Trip Assignment** – assigns trips to routes within the road network

The calibrated 2005 RTM will be used in the assessment to provide baseline information for the 2010 existing road network, taking into account currently ongoing and/or completed roadway projects such as the opening of Stoney Trail. Figure 6 illustrates the network roadways and classifications used in the model to determine 2010 existing baseline conditions. The baseline conditions will then be compared to information obtained from the model for the forecasted road network, taking into account any changes due to the PRP. Information will be obtained from the model for:

- 2010 existing baseline conditions
- 2010 forecasted with Barlow Trail open
- 2020 forecasted with Barlow Trail open
- 2020 forecasted with Barlow Trail closed

For the purposes of the baseline assessment, the following information was obtained from the City of Calgary Forecasting for existing conditions:

- Link volumes and volume-to-capacity (v/c) plots for:
  1. Deerfoot Trail (between Country Hills Boulevard and McKnight Boulevard)
  2. McKnight Boulevard (between Deerfoot Trail and Métis Trail)
  3. Country Hills Boulevard (between Deerfoot Trail and 36 Street NE)
  4. Airport Trail
  5. Barlow Trail (between Country Hills Boulevard and McKnight Boulevard)
  6. 36 Street NE (between Country Hills Boulevard to Métis Trail)

- Travel time between:
  1. Airport terminal to downtown
  2. Airport terminal to University of Calgary
  3. Airport terminal to Maxbell
  4. Airport terminal to Peter Lougheed hospital
  5. Airport terminal to Northeast Industrial
  6. Airport Terminal to Hilton Garden Inn
  7. McKnight Boulevard at 36 Street to Deerfoot Trail at Country Hills Boulevard
  8. Country Hills Boulevard at 36 Street to McKnight Boulevard at Deerfoot Trail

Travel time and v/c ratios obtained from the RTM may not be accurate and will not be used to reflect real time travel. The purpose of obtaining this information is to provide a baseline for future comparisons with similar data obtained from the forecasted model.
3. Baseline Road Network and Characteristics

Ground transportation in Calgary is accommodated mainly on public roads, public transit, and a pathway system that serves active modes of travel – walking, cycling, etc. All these systems exist in the vicinity of YYC and serve travel to and from the airport. Calgary is also served by Canadian Pacific and Canadian National Railways, neither of which provide local service in the vicinity of YYC.

Most travel in Calgary occurs on the roadway system, which accommodates personal vehicles, goods movement, taxis, public transit and commercial bus travel, and active modes. Calgary has an extensive public transit system that includes Light Rail Transit (LRT), and various transit bus services.

Active modes of transportation – walking, cycling, etc. – are accommodated within the roadway system and on purpose-built separate pathways.

3.1 LSA Roadway Identification and Ownership

Roadways within the LSA fall under three jurisdictions:

- Deerfoot Trail is under the jurisdiction of the Province of Alberta
- Roads on the Government of Canada lands occupied by the YYC are managed by the Authority
- The City of Calgary has jurisdiction over the remainder of the public roads in the LSA

These entities are responsible for construction and maintenance of the roadways under their jurisdictions including signage, lane marking, snow removal, rehabilitation, and enforcement.

The City of Calgary operates the traffic signal system on the entire roadway network, by arrangement with the other entities.

3.2 LSA Roadway Classification

Roadway classifications are designated by the City of Calgary Transportation System Bylaw 41M95, which has been approved by the Province of Alberta. Figure 7 shows the transportation bylaw classifications for roadways in the LSA, designated as:

- Freeway/Expressway
- Major Street
- Light Rail Transit
- Right-of-Way to be to be determined
- LRT Alignment to be determined

Roadways designated in the bylaw do not necessarily exist in their designated standard, or may not yet exist in any form. Many roadways undergo a gradual staged transformation to their designated design standard. The City of Calgary has published a map classifying the current stage of development or roadways in Calgary (Figure 8). Such roadway characteristics are shown in Table 2 for roads considered important within the LSA.

The City of Calgary also publishes maps showing the number of travel lanes and posted speed for this roadway network (Figures 9 and 10, respectively).
The City of Calgary designates certain roads or areas for use by trucks. The LSA is an Unrestricted Truck Zone that includes all public roadways as truck routes. Barlow Trail is designated Dangerous Goods Route and High Load Corridor, while Deerfoot Trail is designated Dangerous Goods Route. This identifies Barlow Trail as a potential route for high load travel, subject to a required permit.

### Table 2 LSA Roadway Characteristics

<table>
<thead>
<tr>
<th>Road Name</th>
<th>Road Segment</th>
<th>Ownership</th>
<th>Classification</th>
<th>Number of Lanes</th>
<th>Posted Speeds km/h</th>
<th>Communities Served</th>
</tr>
</thead>
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<tr>
<td>Country Hills Boulevard</td>
<td>E of Barlow</td>
<td>City of Calgary</td>
<td>Rural</td>
<td>2</td>
<td>80</td>
<td>NE Calgary, Saddle Ridge</td>
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<tr>
<td></td>
<td>W of Barlow</td>
<td>City of Calgary</td>
<td>Major Arterial</td>
<td>4</td>
<td>70</td>
<td>NE Calgary, Harvest Hills, Coventry Hills</td>
</tr>
<tr>
<td>Airport Trail</td>
<td>Barlow to Deerfoot</td>
<td>City of Calgary</td>
<td>Expressway</td>
<td>4</td>
<td>90</td>
<td>NE Calgary</td>
</tr>
<tr>
<td>36 Street NE</td>
<td>Country Hills to McKnight</td>
<td>City of Calgary</td>
<td>Rural</td>
<td>2</td>
<td>60</td>
<td>NE Calgary, Castle Ridge, Whitehorn, Rundle</td>
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<tr>
<td>McKnight Boulevard</td>
<td>Métis to Deerfoot</td>
<td>City of Calgary</td>
<td>Expressway</td>
<td>4</td>
<td>70</td>
<td>NE Calgary, Castle Ridge, Falconridge, Coral Springs, Whitehorn, Temple, Monterey Park</td>
</tr>
<tr>
<td>Deerfoot Trail</td>
<td>N of Beddington</td>
<td>Government of Alberta</td>
<td>Expressway</td>
<td>6</td>
<td>110</td>
<td>City of Calgary</td>
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<tr>
<td></td>
<td>S of Beddington</td>
<td>Government of Alberta</td>
<td>Expressway</td>
<td>6</td>
<td>100</td>
<td>City of Calgary</td>
</tr>
<tr>
<td>Barlow Trail</td>
<td>N of Airport Trail</td>
<td>City of Calgary, Airport Authority Land</td>
<td>Major Arterial</td>
<td>4</td>
<td>70</td>
<td>NE Calgary</td>
</tr>
<tr>
<td></td>
<td>S of Airport Trail</td>
<td>City of Calgary, Airport Authority Land</td>
<td>Expressway</td>
<td>4</td>
<td>90</td>
<td>NE Calgary</td>
</tr>
</tbody>
</table>

#### 3.3 Public Transit Routes

Public transit routes for the LSA are shown on Figure 11. YYC is served by two routes, the North Crosstown Route 430, and the Airport/Erin Woods Route 57.

Route 430 operates with 30-minute service during the peak hours and 60-minute service for the late evening hours. Route 57 operates on weekdays with 20-minute service during the peak hour and 30-minute service off peak. Route 57 connects to the Light Rail Transit system at Whitehorn Station on 39 Avenue and 36 Street NE.

YYC is also served by a number of charter bus and tour operators, some of which provide scheduled service to destinations outside Calgary, such as Banff.

#### 3.4 Active Modes Pathway System

Figure 11 shows the City of Calgary pathways and bikeways map for the LSA. The airport is connected to the system by a pathway along the west side of Barlow Trail.
4. Baseline Road Network Operation

The calibrated 2010 baseline RTM is the primary source for the information provided in this section to determine the road network operation within the LSA and RSA.

4.1 Roadway Links

Morning (AM) and (PM) peak traffic volumes and v/c ratios are displayed in Table 3 for baseline existing conditions based on the results of the RTM.

Table 3 Baseline Roadway Links Operation

<table>
<thead>
<tr>
<th>Road Name</th>
<th>To</th>
<th>From</th>
<th>AM Peak Hour</th>
<th>Traffic Volume</th>
<th>V/C</th>
<th>PM Peak Hour</th>
<th>Traffic Volume</th>
<th>V/C</th>
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<tbody>
<tr>
<td>Country Hills Boulevard</td>
<td>Métis Trail</td>
<td>Barlow Trail</td>
<td>2060</td>
<td></td>
<td>&lt; 0.8</td>
<td>2220</td>
<td></td>
<td>&lt; 0.8</td>
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<td>Barlow Trail</td>
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<td>&lt; 0.8</td>
<td>2480 – 3230</td>
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<td>Barlow Trail</td>
<td>Deerefoot Trail</td>
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<td>1540</td>
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<td>&lt; 0.8</td>
</tr>
<tr>
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<td>Country Hills Boulevard</td>
<td>80 Avenue</td>
<td>1120 – 1240</td>
<td>&lt; 0.8</td>
<td></td>
<td>1310 – 1420</td>
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<td>&lt; 0.8</td>
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<td>McKnight Boulevard</td>
<td>Métis Trail</td>
<td>Deerefoot Trail</td>
<td>3960 – 4450</td>
<td>&lt; 0.8</td>
<td></td>
<td>5550</td>
<td></td>
<td>&lt; 0.8</td>
</tr>
<tr>
<td>Deerfoot Trail</td>
<td>Country Hills Boulevard</td>
<td>Beddington Trail</td>
<td>8360 – 8460</td>
<td>0.8 – 1.0</td>
<td></td>
<td>8530</td>
<td>0.8 – 0.9</td>
<td></td>
</tr>
<tr>
<td>Beddington Trail</td>
<td>McKnight Boulevard</td>
<td>11630 – 13420</td>
<td>0.8 – 1.1</td>
<td>12200 – 12830</td>
<td>0.85 – 1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barlow Trail</td>
<td>Country Hills Boulevard</td>
<td>Airport Trail</td>
<td>900 – 1160</td>
<td>&lt; 0.8</td>
<td></td>
<td>1030 – 1330</td>
<td>&lt; 0.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Airport Trail</td>
<td>McKnight Boulevard</td>
<td>1860</td>
<td>&lt; 0.8</td>
<td></td>
<td>2060 - 2260</td>
<td>&lt; 0.8</td>
<td></td>
</tr>
</tbody>
</table>

V/c ratios represent the maximum v/c ratio along the specified link and not at intersections

4.2 Travel Times

Trips that are likely to be impacted by changes in the road network associated with the PRP development are those with the airport as their origin or destination. For the purpose of analyzing any future impacts caused by changes in the road network on travel times, two components will be considered; a person’s average travel time between two points and the number of travelers making the same trip. Using the 2005 calibrated RTM, Tables 4 and 5 illustrate the distribution of trips originating from, and destined for, YYC, respectively.

Table 4 Trips with an Airport Origin

<table>
<thead>
<tr>
<th>Destinations</th>
<th>YYC</th>
<th>Forest Lawn</th>
<th>Northeast Industrial</th>
<th>Saddle Ridge</th>
<th>The Properties</th>
<th>Pleasant Heights</th>
<th>Crowchild</th>
<th>Beddington</th>
<th>Calgary North</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>YYC</td>
<td>5000</td>
<td>4000</td>
<td>6000</td>
<td>3000</td>
<td>3000</td>
<td>2000</td>
<td>2000</td>
<td>5000</td>
<td>2000</td>
<td>3000</td>
</tr>
</tbody>
</table>
Table 5 Trips with an Airport Destination

<table>
<thead>
<tr>
<th>Origins</th>
<th>YYC</th>
<th>Forest Lawn</th>
<th>Northeast Industrial</th>
<th>Saddle Ridge</th>
<th>The Properties</th>
<th>Pleasant Heights</th>
<th>Crowchild</th>
<th>Beddington</th>
<th>Calgary North</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>YYC</td>
<td>5000</td>
<td>4000</td>
<td>5000</td>
<td>3000</td>
<td>3000</td>
<td>2000</td>
<td>2000</td>
<td>4000</td>
<td>2000</td>
<td>3000</td>
</tr>
</tbody>
</table>

Based on these data, as well as familiarity with travel patterns from the airport, travel times between the airport and different zones as shown in Table 6 were obtained from the model to compare with future conditions. Travel times were also obtained for two cross-town trips that do not have the airport as an origin or a destination but that access the road network within the LSA.

Table 6 Baseline Travel Times

<table>
<thead>
<tr>
<th>Origin</th>
<th>Destination</th>
<th>Travel Times in Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AM Peak</td>
</tr>
<tr>
<td>Airport Terminal</td>
<td>Downtown Calgary</td>
<td>21</td>
</tr>
<tr>
<td>Airport Terminal</td>
<td>University of Calgary</td>
<td>20</td>
</tr>
<tr>
<td>Airport Terminal</td>
<td>Maxbell</td>
<td>13</td>
</tr>
<tr>
<td>Airport Terminal</td>
<td>Peter Lougheed Hospital</td>
<td>10</td>
</tr>
<tr>
<td>Airport Terminal</td>
<td>Northeast Industrial</td>
<td>11</td>
</tr>
<tr>
<td>Airport Terminal</td>
<td>Hilton Garden Inn</td>
<td>7</td>
</tr>
<tr>
<td>McKnight Boulevard @ 36 Street</td>
<td>Deerfoot Tr @ Country Hills Boulevard</td>
<td>14</td>
</tr>
<tr>
<td>Country Hills Boulevard @ 36 Street</td>
<td>McKnight Blvd @ Deerfoot Trail</td>
<td>13</td>
</tr>
</tbody>
</table>
5. Summary and Conclusions

This Transportation Baseline Report forms part of a CS for the proposed PRP at YYC. The CS is being prepared as part of an EA and approval process established by the Authority. The transportation component of this work reviews the transportation road network in the LSA (roadways adjacent to the airport lands) and RSA (City of Calgary and surrounding area) to determine the effects of the parallel runway development.

The transportation baseline report describes the conditions of the roadway network before the project is built to enable comparisons to be made between conditions before and after the project to assess potential effects on the transportation network. To determine the baseline roadway network conditions, traffic volume data were collected at key intersections and roadway links from the City of Calgary and Alberta Transportation, as well as from counts completed by AECOM in October 2009. Supplementary to traffic volume data, the City of Calgary RTM, developed and run by the City of Calgary Forecasting division, provides a tool to review and compare future roadway network scenarios. The calibrated RTM representing existing conditions was used in the assessment to provide baseline information for the existing road network, which can then be compared to forecast information, taking into account any changes due to the PRP. Key data collected from the RTM for existing conditions includes link volumes and v/c ratios on roadways surrounding YYC, as well as travel times between representative locations.

The Transportation Effects Assessment will then consider the 2015 and 2025 horizons to assess the effects of the runway development on the LSA and RSA. For comparison purposes, data obtained from the RTM for each of the future horizons will include travel times, roadway characteristics, and link volumes. Two network scenarios will be reviewed for each horizon: the first with Barlow Trail included as per the existing configuration, and the second with Barlow Trail closed between McKnight Boulevard and Airport Road. These scenarios will allow a comparative assessment of the effects of the closure of Barlow Trail, which has been identified as a key roadway network change.
Statement of Qualifications and Limitations

The attached Report (the “Report”) has been prepared by AECOM Canada Ltd. (“Consultant”) for the benefit of the client (“Client”) in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the “Agreement”).

The information, data, recommendations and conclusions contained in the Report:

- are subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the “Limitations”)
- represent Consultant’s professional judgement in light of the Limitations and industry standards for the preparation of similar reports
- may be based on information provided to Consultant which has not been independently verified
- have not been updated since the date of issuance of the Report and their accuracy is limited to the time period and circumstances in which they were collected, processed, made or issued
- must be read as a whole and sections thereof should not be read out of such context
- were prepared for the specific purposes described in the Report and the Agreement
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time

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This Statement of Qualifications and Limitations is attached to and forms part of the Report.
Appendix A

City of Calgary Turning Movements
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:15 - 08:15

N-S Roadway: 36 St
E-W Roadway: McKnight Boulevard
Count Date: August 27, 2008
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:30 - 17:30

N-S Roadway: 36 ST
E-W Roadway: McKnight Boulevard
Count Date: August 27, 2008

Entering: 968  Exiting: 1997
PHF: 0.89  0.84  0.44
%HV: 0.0%  0.0%  0.0%
PV: 496  456  16
HV: 0  0  0
TTL: 496  456  16

Entering: 193  Exiting: 222
Pedestrians: 0

Entering: 105  Exiting: 1391
Pedestrians: 0

Entering: 2679  Exiting: 871
Pedestrians: 0

Entering: 1598  Exiting: 1095
Pedestrians: 0

Entering: 1772  Exiting: 1226
Pedestrians: 0

36 ST
McKnight Boulevard
N-S Roadway:
E-W Roadway:

August 27, 2008 Count Date:
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: AM

N-S Roadway: Deerfoot Trail
E-W Roadway: McKnight Boulevard
Count Date: AADT 2008

- Entering: 7427
- Exiting: 3263
- TTL: 288
- Pedestrians: 0

- Entering: 856
- Exiting: 436
- TTL: 855
- Pedestrians: 0

- Entering: 210
- Exiting: 1544
- TTL: 288
- Pedestrians: 0

- Entering: 206
- Exiting: 1512
- TTL: 598
- Pedestrians: 0

- Entering: 6541
- Exiting: 7833
- TTL: 386
- Pedestrians: 0

- Entering: 4493
- Exiting: 3439
- TTL: 438
- Pedestrians: 0

- Entering: 2847
- Exiting: 870
- TTL: 206
- Pedestrians: 0

- Entering: 1260
- Exiting: 386
- TTL: 870
- Pedestrians: 0

- Entering: 2847
- Exiting: 1260
- TTL: 386
- Pedestrians: 0

- Entering: 7833
- Exiting: 4493
- TTL: 2847
- Pedestrians: 0
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:15 - 08:15

N-S Roadway: Barlow Trail
E-W Roadway: McKnight Blvd.
Count Date: May 18, 2005

Entering: 1113  Exiting: 537

TTL: 78  841  194

Pedestrians: 0

Entering: 576  Exiting: 765

TTL: 292  289  132

Pedestrians: 0

Entering: 72  Exiting: 773

TTL: 1421  1099

Pedestrians: 0

Entering: 2252  Exiting: 773

TTL: 196  1882

Pedestrians: 1

Barlow Trail

McKnight Blvd.

McKnight Blvd.

Pedestrians: 1

Entering: 1421  Exiting: 2843

TTL: 1099

Pedestrians: 0

Excluding: 2182  Entering: 693
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:30 - 17:30

N-S Roadway: Barlow Trail
E-W Roadway: McKnight Blvd.
Count Date: May 18, 2005
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:15 - 08:15

N-S Roadway: Barlow Trail
E-W Roadway: 48 Ave
Count Date: June 20, 2005
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:30 - 17:30

N-S Roadway: Barlow Trail
E-W Roadway: 48 Ave
Count Date: June 20, 2005

Entering: 789  Exiting: 1552

Pedestrians: 1

TTL: 0 763 26

Pedestrians: 0

TTL: 1531 60

Pedestrians: 0

TTL: 0 1531 60

Pedestrians: 1

TTL: 0 763 26

Pedestrians: 0

TTL: 1531 60

Pedestrians: 0

TTL: 0 1531 60

Pedestrians: 1

TTL: 0 763 26

Pedestrians: 0

TTL: 1531 60
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:00 - 08:00

N-S Roadway: Barlow Trail
E-W Roadway: Airport Trail
Count Date: July 26, 2007
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:00 - 17:00

N-S Roadway: Barlow Trail
E-W Roadway: Airport Trail
Count Date: July 26, 2007

Entering: 525  Exiting: 1396
TTL: 74 451 0

Entering: 641  Exiting: 28
TTL: 669 0

Entering: 1427  Exiting: 0

Pedestrians: 0

Barlow Trail

Airport Trail

N-S Roadway

E-W Roadway
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:00 - 08:00

N-S Roadway: 19 ST NE
E-W Roadway: Airport Trail
Count Date: July 26, 2007

INTERSECTION MOVEMENT SUMMARY DIAGRAM

Entering: 1  Exiting: 3

Entering: 2  Exiting: 0

Entering: 1010

Entering: 1013

Exiting: 211

Exiting: 1013

Exiting: 214

Pedestrians: 0

Airport Trail

19 ST NE

N
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:00 - 17:00

N-S Roadway: 19 ST NE
E-W Roadway: Airport Trail
Count Date: July 26, 2007

Entering: 2  Exiting: 4

TTL: 0 0 2

Entering: 652
Exiting: 1

TTL: 1

Entering: 1  Exiting: 11

TTL: 4 0 7

Pedestrians: 0

N

Airport Trail

19 ST NE

July 26, 2007

Count Date:
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: AM

N-S Roadway: Deerfoot Trail
E-W Roadway: Airport Trail
Count Date: AADT 2008

Entering: 5136  Exiting: 1821
TTL: 0 4603 533

Entering: 0 0
TTL: 65

Entering: 0
TTL: 0

Entering: 0
TTL: 0

Exiting: 2272  Entering: 4775
TTL: 1756 516

Exiting: 1049  Entering: 237

TTL: 0

Pedestrians: 0
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: PM

N-S Roadway: Deerfoot Trail
E-W Roadway: Airport Trail
Count Date: AADT 2008

Deerfoot Trail
Airport Trail

Entering: 2560  Exiting: 4406

Entering: 4206  Exiting: 2836

AADT 2008 Count Date: Deerfoot Trail
Airport Trail

Pedestrians: 0

TTL: 0 2419 141

TTL: 0 3936 270
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: AM

N-S Roadway: Deerfoot Trail
Count Date: AADT 2008

Entering: 3497   Exiting: 1852
TTL: 112 3191 194

Entering: 1579   Exiting: 1885
TTL: 111 282 111

Entering: 1775   Exiting: 0
TTL: 105 285 0

Entering: 3836   Exiting: 669
TTL: 282 1579 0

Entering: 292   Exiting: 5071
TTL: 112 1459 0

Deerfoot Trail
Country Hills Blvd.
Country Hills Blvd.
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: PM

N-S Roadway: Deerfoot Trail
Count Date: AADT 2008

Entering: 2180  Exiting: 3904

TTL: 188 1853 139

Entering: 2354  Exiting: 268

TTL: 743 1272

Entering: 505  Exiting: 1189

TTL: 977 3394 105

Entering: 1531  Exiting: 2458

Pedestrians: 0

AADT 2008 Count Date:

Deerfoot Trail
Country Hills Blvd.
Country Hills Blvd.
Country Hills Blvd.

N
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:15 - 08:15

N-S Roadway: Barlow Trail
Count Date: July 30, 2007

Entering: 54  Exiting: 547
Entering: 507  Exiting: 1323
Entering: 796  Exiting: 204
Entering: 249  Exiting: 918

Country Hills Blvd.  Barlow Trail
Pedestrians: 0
TTL: 13  32  9

Country Hills Blvd.
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:45 - 17:45

N-S Roadway: Barlow Trail
Count Date: July 30, 2007

TTL: 192
10
21

Pedestrians: 0

Entering: 223
Exiting: 203

TTL: 1036
161
118

Pedestrians: 0

Entering: 1315
Exiting: 403

Country Hills Blvd.
Country Hills Blvd.
Barlow Trail
Barlow Trail

Entering: 333
18
467

Exiting: 1840
18
612
696

Entering: 818

Pedestrians: 0

Pedestrians: 0

Count Date: July 30, 2007

Evening Peak - 17:45
E-W Roadway:
N-S Roadway:
Morning Peak Hour: 07:15 - 08:15

N-S Roadway: 36th St
Count Date: April 26, 2006

INTERSECTION MOVEMENT SUMMARY DIAGRAM
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:45 - 17:45

N-S Roadway: 36th St
Count Date: April 26, 2006

Pedestrians: 0

Entering: 7
Exiling: 17

TTL: 2 5 0

36th St

Country Hills Blvd.

Entering: 593
Exiling: 701

Entering: 312
TTL: 3 1

Entered: 388 13 4

Exiling: 323
Entering: 405

Pedestrians: 0

Entering: 320
Exiling: 254
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:15 - 08:15

N-S Roadway: 36 ST
E-W Roadway: 80 Ave NE
Count Date: April 26, 2006

Entering: 400  Exiting: 60

TTL: 2 181 217

Pedestrians: 0

Entering: 393  Exiting: 8

TTL: 335 220 4

Pedestrians: 0

Entering: 617

80 Ave NE

Entering: 206  Exiting: 215

Pedestrians: 0

Exiting: 582  Entering: 67

38 St.
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:45 - 17:45

N-S Roadway: 36 ST
E-W Roadway: 80 Ave NE
Count Date: April 26, 2006

Entering: 312  Exiting: 344

TTL: 1 59 252

Entering: 6  Exiting: 9

TTL: 1
Pedestrians: 0

TTL: 2
Pedestrians: 0

TTL: 2
Pedestrians: 0

TTL: 8
Pedestrians: 0

Exit: 270

Entering: 111  Exiting: 69

Exit: 257

80 Ave NE

36 ST

38 ST
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:15 - 08:15

N-S Roadway: 36 ST
E-W Roadway: 67 Ave NE
Count Date: July 25, 2008
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 17:00 - 18:00

N-S Roadway: 36 ST
E-W Roadway: 67 Ave NE
Count Date: July 25, 2008

Entering: 156  Exiting: 175

TTL: 0 8 148

Entering: 0 0 168

Exiting: 0 0 174

TTL: 0 7 26

Pedestrians: 0

N

36 ST

67 Ave NE

67 Ave NE

36 ST
Morning Peak Hour: 07:00 - 08:00

N-S Roadway: Barlow Trail/Air Services
E-W Roadway: Airport Road/Barlow Trail
Count Date: October 28, 2009

INTERSECTION MOVEMENT SUMMARY DIAGRAM

Barlow Trail/Air Services

Airport Road/Barlow Trail

Pedestrians: 1

PV: 329 859 866
HV: 24 1 13
TTL: 353 860 879

PHF: 0.72 0.93 0.88
%HV: 6.8% 0.1% 1.5%
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Afternoon Peak Hour: 11:30 - 12:30

N-S Roadway: Barlow Trail/Air Services
E-W Roadway: Airport Road/Barlow Trail
Count Date: October 28, 2009

PHF: 0.93 0.62 0.75
%HV: 6.9% 13.2% 7.6%
PV: 406 105 230
HV: 30 16 19
TTL: 436 121 249

PHF: 0.84 0.72 0.52
%HV: 7.7% 14.9% 0.0%
PV: 96 86 29
HV: 8 15 0
TTL: 104 101 29

Pedestrians: 2

Pedestrians: 0

Exiting: 197
Entering: 234

 Exiting: 807
Entering: 806

PHF: 0.91 0.50
%HV: 5.0% 4.7%
PV: 472 25
HV: 497 17
TTL: 740 35

PHF: 0.87 0.38
%HV: 4.0% 0.0%
PV: 208 6
HV: 219 0
TTL: 436 11

Pedestrians: 2

Pedestrians: 0

Exiting: 497
Entering: 415

Barlow Trail/Air Services

Airport Road/Barlow Trail
INTERSECTON MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour: 07:00 - 08:00

N-S Roadway: McCall Way
E-W Roadway: Air Services Place
Count Date: October 28, 2009

Pedestrians: 0
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Afternoon Peak Hour: 12:00 - 13:00

N-S Roadway: McCall Way
E-W Roadway: Air Services Place
Count Date: October 28, 2009

Entering: 40
Exiting: 23

PHF: 0.55 0.52
%HV: 0.0% 0.0%
PV: 0 11 29
HV: 0 0 0

TTL: 0 11 29

McCall Way

Air Services Place

McCall Way

Air Services Place

Pedestrians: 0

TTL: 21 11 168

HV: 0 0 23
PV: 21 11 145
%HV: 0.0% 0.0% 13.7%
PHF: 0.75 0.69 1.00

Exiting: 233
Entering: 200
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:15 - 17:15

N-S Roadway: McCall Way
E-W Roadway: Air Services Place
Count Date: October 28, 2009

Entering: 138
Exiting: 28
PHF: 0.56 0.77
%HV: 0.0% 0.0%
PV: 0 36 102
HV: 0 0 0
PV: 24 12 516
%HV: 0.0% 0.0% 3.4%
PHF: 0.86 0.38 0.87

Exiting: 271
Entering: 570
PHF: 0.45 0.0%
%HV: 0.0% 0.0% 0.80
PV: 0 0 26
HV: 0 0 0
PV: 17 193 210
%HV: 0.0% 0.81% 8.1%
PHF: 0.091 0.0% 0.72

TTL: 24 12 534
HV: 0 0 18
PV: 0 0 0
%HV: 0.0% 0.0% 0.0%
PHF: 0.86 0.77 0.87

Pedestrians: 0

Air Services Place
McCall Way
INTERSECTION MOVEMENT SUMMARY DIAGRAM

Morning Peak Hour:  07:00 - 08:00

N-S Roadway:  McCall Way
E-W Roadway:  78 Avenue
Count Date:  October 28, 2009

Pedestrians: 0

Entering: 552  Exiting: 166
PHF: 0.84  0.94  0.75
%HV: 4.4%  1.9%  0.0%
PV: 216  314  6
HV: 10  6  0
TTL: 226  320  6

Entering: 51  Exiting: 389
PHF: 0.70  0.74  0.25
%HV: 5.3%  16.1%  100.0%
PV: 72  52  0
HV: 4  10  1
TTL: 76  62  1

N-S Roadway:
Pedestrians: 0
78 Avenue

E-W Roadway:
Pedestrians: 0
78 Avenue

McCall Way

Pedestrians: 0

78 Avenue

McCall Way

Pedestrians: 0

78 Avenue

McCall Way
Afternoon Peak Hour: 11:00 - 12:00

N-S Roadway: McCall Way
E-W Roadway: 78 Avenue
Count Date: October 28, 2009
INTERSECTIONS MOVEMENT SUMMARY DIAGRAM

Evening Peak Hour: 16:00 - 17:00

N-S Roadway: McCall Way
E-W Roadway: 78 Avenue
Count Date: October 28, 2009

Entering: 285  Exiting: 563

PHF: 0.87 0.84 0.62
%HV: 13.6% 5.6% 0.0%
PV: 102 118 42
HV: 16 7 0

TTL: 118 125 42

Exiting: 210  Entering: 414

PHF: 0.84 0.96 0.75
%HV: 33.3% 9.4% 0.80
PV: 3 12 1
HV: 3 16 0

Pedestrians: 0
Appendix C

2009 Intersection Volumes Development
### Development of 2009 Intersection Volumes

#### AM

<table>
<thead>
<tr>
<th>Year</th>
<th>North LT</th>
<th>North TH</th>
<th>North RT</th>
<th>South LT</th>
<th>South TH</th>
<th>South RT</th>
<th>East LT</th>
<th>East TH</th>
<th>East RT</th>
<th>West LT</th>
<th>West TH</th>
<th>West RT</th>
<th>Growth Rate</th>
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<td>77</td>
<td>247</td>
<td>73</td>
<td>25</td>
<td>722</td>
<td>1158</td>
<td>319</td>
<td>669</td>
<td>104</td>
<td>248</td>
<td>1471</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>2009</td>
<td>81</td>
<td>260</td>
<td>77</td>
<td>27</td>
<td>759</td>
<td>1216</td>
<td>335</td>
<td>703</td>
<td>110</td>
<td>261</td>
<td>1545</td>
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<td>30</td>
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<table>
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### Country Hills Boulevard and 36 Street

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#### McKnight Boulevard and Deerfoot Trail

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Growth Rate: 5

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Growth Rate: 5

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Growth Rate: 10

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Growth Rate: 10

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