

AIRPORT TRAIL UNDERPASS

SUMMARY/ISSUE

Investigate the Airport Trail underpass demand, design, construction process, costs and funding options.

PREVIOUS COUNCIL DIRECTION/POLICY

At the Combined Meeting of Council on 2010 November 08, Council moved that with respect to Alderman Stevenson's NM2010-42 the following be adopted:

NOW THEREFORE BE IT RESOLVED, that the Administration is directed to immediately commence negotiations with the Calgary Airport Authority to identify the process to construct the underpass,

AND FURTHER BE IT RESOLVED that Administration adds to their work program the preliminary design of the ultimate Airport Trail underpass from Barlow Trail to Métis Trail including the approach roadway and a provision for future Primary Transit,

AND FURTHER BE IT RESOLVED that based on the preliminary design of the ultimate Airport Trail underpass, the Administration is directed to prepare a report outlining the construction schedule, an estimate of the full cost of the underpass, any incremental stages thereof and the necessary financing including;

1. An analysis of transportation options for access to the Calgary International Airport. This analysis to include among others a discussion from a City of Calgary and Calgary Region perspective of currently available road and transit links including planned roadways (SW Ring Road) to the airport; links currently under construction (96 Avenue Connector) and links to be provided as a result of Developer obligations (11 Street NE/128 Avenue NE bridge over the Deerfoot Trail).

2. Options and a validated estimate for the cost of constructing the tunnel (underpass) portion only; the cost of adding the connections to the roadway system within five years; and for the cost of constructing the entire link now.
3. An analysis of funding options (including private funding, 3P opportunities, etc.) for the three scenarios listed above, including an estimate of potential interest charges or other tax supported costs for each.
4. The impact on the current 10 year Capital Plan of adoption of each of the above scenarios.
5. Rail options with or without the tunnel.

AND FURTHER BE IT RESOLVED that Council authorize the additional \$250,000 of the existing funding from Program 686 (Airport Trail; Deerfoot Trail to Harvest Hills Boulevard) to undertake the work required to bring this report to Council.

ADMINISTRATION RECOMMENDATIONS:

That Council:

1. Direct Administration to award RFP 10-1940 for detail design to the highest rated proponent, waive the circulation period to Council and proceed with design of the Airport Trail underpass, four lane road from Barlow Trail to Métis Trail, and two lane road from Métis Trail to 60 Street NE (Option 3C); as per the recommended cross-section configuration (Attachment 1);
2. Authorize construction of Option 3C upon the City Manager, the General Manager, Transportation and the General Manager, Corporate Services:
 - (a) Concluding negotiations in regard to the occupancy agreement, taking into consideration report C2011-06 Airport Trail Underpass Supporting Information; and
 - (b) Based on successful conclusion of

AIRPORT TRAIL UNDERPASS

- 2(a), advise Council, proceed with construction and conclude negotiations in regard to any other agreement(s) necessary to complete the construction, operation and maintenance of the underpass;
- agreements to include additional terms and conditions as deemed necessary and to be in content and form satisfactory to the aforementioned parties and the City Solicitor respectively.
3. Approve a budget appropriation for Program 855 Airport Underpass not to exceed \$294.8 million (including \$36.0 million in bridge financing costs). Appropriation to include:
- \$78.5 million in 2011,
 - \$106.6 million in 2012,
 - \$69.6 million in 2013,
 - \$18.7 million in 2014,
 - \$6.1 million per year in 2015-2017 inclusive; and
 - \$3.1 million in 2018.
- Funding to come from:
- a. Reserve for Future Capital (\$25 million in 2011),
 - b. Municipal Sustainability Initiative (MSI) Innovation Fund (\$123 million in 2018),
 - c. MSI Contingency Fund (\$50 million in 2018); and
 - d. Reallocation of \$97 million from Transportation unallocated MSI, Transportation Infrastructure Program 543 Provincial Ring Road Connectors, and other Transportation Capital Programs to Program 855 Airport Underpass.
4. Give first reading to Borrowing Bylaw Number 1B2011 for \$173 million MSI funded bullet debt for a term up to seven years to finance the construction of the project and return to Council, when appropriate to do so, for second and third reading (Attachment 4).

INVESTIGATION

At the first meeting of the newly elected Council in 2010 November, Administration was instructed to urgently investigate the construction of the Airport Trail underpass in conjunction with the construction of the new Calgary International Airport fourth runway.

Administration has completed an updated review of design considerations, costs and procurement options (Attachment 1) and has identified the results of stakeholder engagement (Attachment 2). Administration has included a summary of previous Council and Land Use, Planning and Transportation Committee (LPT) reports on this project (Attachment 3).

Timing

In conjunction with construction of the new runway, the Calgary Airport Authority (The Authority) is closing Barlow Trail between Airport Trail and McKnight Boulevard, which is on airport lands. The City has been working closely with The Authority to coordinate transportation improvements in the northeast to ensure mobility is maintained after the closure of Barlow Trail in 2011 April.

The Calgary Transportation Plan (CTP) long range network identifies an Airport Trail link under the fourth runway. This is also identified in the 2004 Calgary International Airport Master Plan.

Three macro options exist for Council's consideration:

Option 1: Do nothing - Abandon the Airport Trail link and over time augment the northeast transportation network as necessary.

Option 2: Build later - Likely using a tunnel boring approach.

Option 3: Build now - In conjunction with the runway development project.

AIRPORT TRAIL UNDERPASS

The opportunity to build in conjunction with the runway currently exists, however The City must act immediately in order to proceed with this option.

Design

Administration has been working with The Authority and Transport Canada to understand the airport's needs and technical requirements in relation to the tunnel. The Authority has updated their design for the fourth runway and associated taxiways and has advised that the required length of the tunnel has been reduced from 720 meters to 615 meters.

Administration has confirmed that Transport Canada regulation TP 312 Aerodromes Standards and Recommended Practices renders a segmented tunnel as an unacceptable design.

The proposed design must accommodate the projected long term travel demand for Airport Trail, taking into consideration the land use and development pattern and transportation network as contained in the CTP and the Municipal Development Plan. Peak travel through the underpass has been investigated for automobiles, trucks and transit users.

Based on the projected usage, a six lane cross-section is recommended. The proposed underpass cross-section allows flexibility for future conversion from bus based to rail based transit.

Phasing and Costs

Construction of Airport Trail would be done in a series of phases. Two phases are currently underway:

- Airport Trail from 60 Street NE to Stoney Trail will be completed in 2011.
- Airport Trail between Deerfoot Trail and Harvest Hills Link will be completed by summer 2012.

Administration developed cost estimates for the three macro options related to the Airport Trail underpass. Each cost is for infrastructure, independent of project financing costs and is expressed in 2011 dollars.

Option 1: Do nothing – requiring a series of improvements in the surrounding road network, estimated to cost \$325-\$425 million in current dollars (excluding financing charges). Completed over the course of 2011 - 2040 (or in the region thereof).

Option 2: Build later – requiring bored tunnels and a series of network improvements, estimated to cost \$1,545-\$1,645 million (excluding financing charges). Completed in the region of the 2015 - 2040 horizon.

Option 3: Build now – tunnel structure with additional network improvements, phased construction as follows:

- A. Build underpass structure and four lane road from Barlow Trail to 36 Street NE. Estimated cost \$198.6 million.
- B. Build underpass and four lane road from 36 Street NE to Métis Trail. Estimated cost \$208.6 million.
- C. Build A, B and a two lane road from Métis Trail to 60 Street NE. Estimated cost \$222.6 million. (Road already being completed from 60 Street NE to Stoney Trail, targeted for 2011 completion).

The cost for Option 3C including additional considerations in relation to construction insurance, some property, and delay costs is \$258.8 million (excluding financing charges of \$36.0 million). Additional costs have been estimated to cover The Authority's redesign, project integration, as well as further contingencies for potential delay. Targeted completion in line with runway opening in 2014.

AIRPORT TRAIL UNDERPASS

Construction of the segment of Airport Trail between 36 Street NE and 60 Street NE would ideally be completed in time for the underpass opening in 2014 and is not constrained by the runway construction. This work would be done as a separate contract managed by The City.

Administration recommends proceeding with Option 3C in order to provide a complete east-west roadway connection between Deerfoot Trail and Stoney Trail.

Due to the preliminary nature of the underpass project design and schedule, this cost estimate includes approximately \$38.3 million in contingencies on the tunnel and Barlow to 36 Street roadway portion. Costs related to land acquisition, financing charges, or insurance considerations are included in the recommended budget appropriation increase. These costs are outlined in report C2011-06 Airport Trail Underpass Supporting Information.

IMPLICATIONS

General

This report has been reviewed for alignment with the City of Calgary's Triple Bottom Line (TBL) Policy Framework. The following implications are identified.

Social

Citizens of and visitors to Calgary require options when considering their transportation choices. Creating an additional east-west link with primary transit and the capacity for future innovation serves this requirement.

A significant number of airport terminal employees live in the northeast sector. More direct access to the terminal will reduce travel time for these employees. Direct access will make public transit more attractive and reduce the need for employees to drive to the airport.

Environmental

The City would assess potential adverse effects of the tunnel project for lands outside of the runway project boundary, and then develop and implement mitigation plans as appropriate, consistent with the City's Environmental Policy and requirements of its ISO 14001 registration.

Traffic modeling indicates that the tunnel would significantly reduce vehicle travel times in the vicinity of the airport, which would represent beneficial effects in terms of modestly reduced fuel consumption and greenhouse gas emissions.

Economic (External)

Construction of the Airport Trail underpass will advance the city-wide road network as well as assisting in goods movement and connectivity between the airport and destinations such as Stoney Trail, industrial lands and the future CN intermodal yard.

BUSINESS PLAN/BUDGET IMPLICATIONS

A limited amount of uncommitted capital funding exists in The City's next eight year budgets. Administration identified potential transportation project rescheduling in report C2010-50. The proposed project deferrals were rejected therefore this report explored alternate projects of the Transportation department.

Administration reviewed various funding and their impact to capital program funding options that included:

- Private-Public Partnerships (P3's).
- Traditional financing and impact to capital program and tax rate increases.
- Financing by other parties (Province, the Authority and the Federal Government).
- Full project borrowing with an impact to the mill rate.
- Other sources (as per Attachment 1).

AIRPORT TRAIL UNDERPASS

The total cost estimate plus contingencies, financing costs and allowances is \$294.8 million.

As per the detailed analysis in Attachment 1, Administration recommends funding the Airport Trail underpass project through a combination of existing capital funds available, reserve funding and re-prioritization of the existing Transportation program.

The recommended option also requires \$173 million in bridge financing for the MSI funding, which entails \$36.0 million in financing costs. Administration will also confirm permission from The Province to exceed the seven per cent maximum eligible interest costs charged to MSI funds.

This option would consist of funding from:

- \$25 million from the Reserve for Future Capital. (Available 2011). Council's capital financing policy has designated this reserve as a contingency fund for capital programs.
- \$50 million uncommitted MSI contingency funds (Available 2018).
- \$123 million uncommitted MSI funding in the innovation funding bucket available in 2018 (Available 2018).

In addition, Administration will need to identify the sources for funding the projected shortfall of \$97 million to reach the full project estimate of \$294.8 million. Sources identified to date (in years 2012 – 2018) include:

- Transportation unallocated MSI funding: \$14 million,
- Program 543 Provincial Ring Road Connectors: \$52 million,
- \$31 million, to be identified from other Transportation projects and/or long term debt.

Pursuit of the above options would provide funding for the projected shortfall of \$97 million.

Annual road maintenance operating cost of the underpass is estimated to be \$45,000. This would be incorporated into the operating budget of the Transportation department for the underpass opening date.

City staff are presently investigating the availability and cost of operating insurance. Initial estimates place this cost in the range of \$1.0 - \$2.5 million per year.

RISKS

A distinct set of risks exists should Council decide to build or not build the underpass.

Option 1: The risks associated with not building the underpass are:

- Poor transportation network performance in the future.
- Increased cost of retrofitting improvements to Country Hills Boulevard and other regional roadways.
- Lost opportunity for a direct primary transit linkage from the NE LRT line to the terminal area.

Option 2: The risks associated with building the underpass at a later date include:

- Substantial cost increase to bore a tunnel of similar capacity.
- Prospective restriction to build any facility under an active runway.
- Potential limitation to a rail based transit tunnel only.
- Lost opportunity to co-locate utilities.

Option 3: The risks associated with building the project now include:

- Approval to proceed by The Authority.
- Agreement content and approval with The Authority.
- Tendering and construction approvals.
- Land requirements and agreements.

AIRPORT TRAIL UNDERPASS

- Funding availability including potential changes to current MSI schedules.
- Provincial leadership undergoing change.
- Expedited schedule.
- Potential additional costs to The City for delays to the runway completion.

ATTACHMENTS

1. Airport Trail Underpass Considerations
2. Stakeholder Consultation Overview
3. Summary of previous Council and LPT Reports
4. Borrowing Bylaw Number 1B2011

Airport Trail Underpass Considerations

Introduction

In response to Council's instructions, Administration undertook a rapid but comprehensive review and evaluation of the Airport Trail link across airport lands. The review involved multiple internal business units as well as external stakeholders, primarily the Calgary Airport Authority (The Authority). This study has been supported by several external experts.

The purpose of this study is to understand the options available for Airport access and the Northeast Calgary Transportation network. Each option was explored for benefits, costs and risks. The recommended option of a cut and cover tunnel is expanded in detail.

At the current stage of design development, certain unknowns remain and some risks cannot be mitigated or quantified. These risks are not only The City's but also The Authority's and those of other stakeholders.

Current State

The potential Airport Trail underpass has been under consideration since the early 1990's. The landscape of the city has changed drastically in that time, with the population increasing from about 700,000 to over one million with significant development in many areas of the city.

Over the past two decades we have seen significant changes in travel behaviour. Air travel by Canadians is increasing faster than population growth. Public transit service to airports is improving in Canada. For example:

- Montreal recently launched its "747" express bus, connecting downtown Montreal to the airport with 15-minute weekday frequency.
- In Toronto, express buses operate on a 10-minute weekday frequency connecting the airport to the subway/rapid transit network.
- In Vancouver, the fully-automated Canada Line (Skytrain) operates between downtown Vancouver and the airport on an 8- to 10-minute weekday frequency.

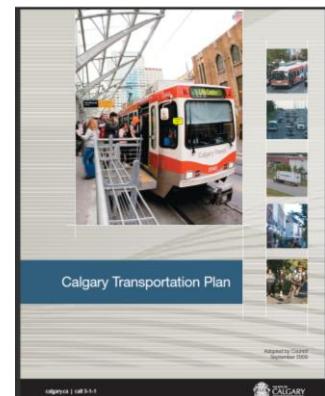
All of these new services are offered at premium fares ranging from \$7 to \$10 for a one-way trip, indicating the value cities are placing on transit service for airport passengers and employees.

The City of Calgary's commitment to offering citizens and visitors a range of convenient and accessible mobility options was cemented in 2009 when Council adopted the Calgary Transportation Plan (CTP).

A key excerpt from the CTP must be brought to the foreground when making the decision regarding the Airport Trail underpass:

"The decisions made today about where and what to build will affect Calgarians for 100 years or more – just as decisions made in the past affect us today."

Figure 1: Calgary Transportation Plan





The Calgary International Airport serves over 12 million passengers and 230,000 aircraft movements annually. As part of the Airport Development Program (ADP), the Runway Development Program (RDP) is a \$620 million project to build a 14,000 foot long, 200 foot wide runway.

The runway project will necessitate the closure of Barlow Trail on airport lands, effective 2011 April 03.

Figure 2: YYC Parallel Runway Illustration

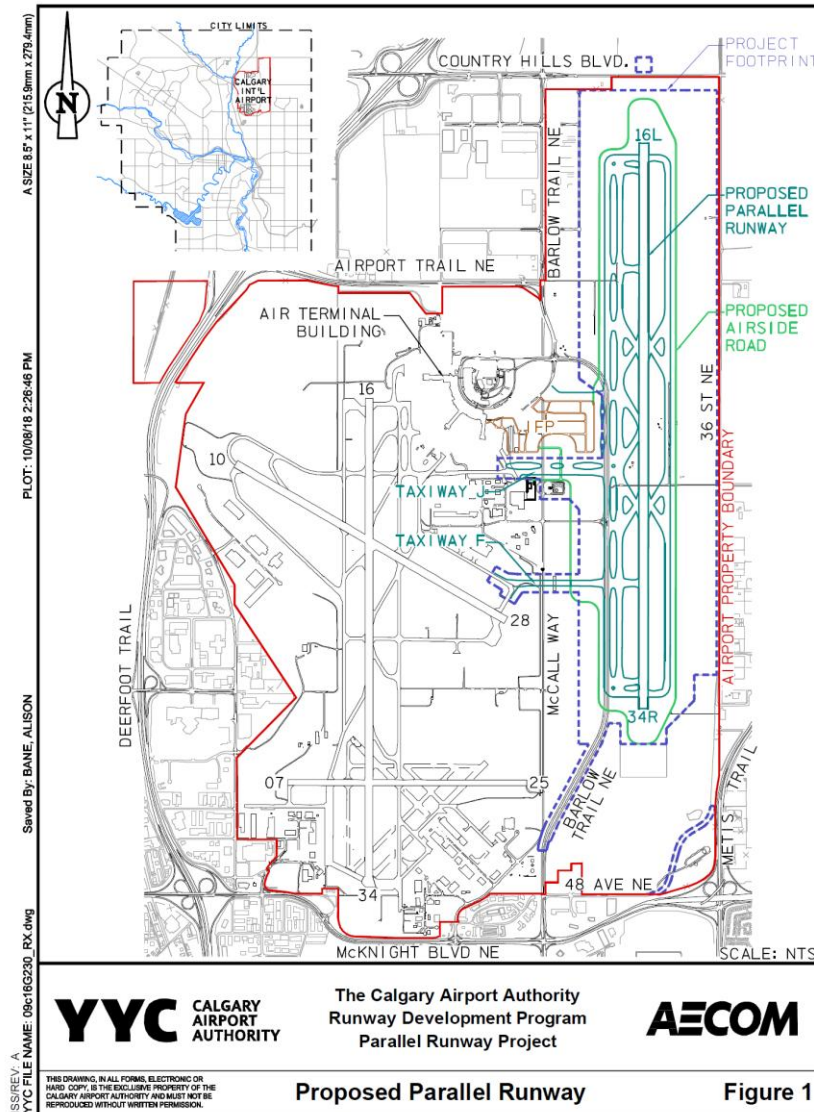


Figure 3: YYC Parallel Runway Project Plan

Future Demand

In order to forecast future travel demand, Administration prepares a series of regional transportation models that reflect the land use and demographics envisioned in the CTP and the Municipal Development Plan (MDP). These models incorporate multiple modes, time of day and various planning horizons: long range (60 to 75 years), 30-year, 20-year, 10-year and five-year.

Airport Trail NE forms an integral component of the NE transportation network. On a regional context, the road represents a direct link to the airport terminal for travellers and airport employees. Airport Trail provides an east-west arterial/skeletal roadway designed to link the Airport terminal and adjacent lands to Deerfoot Trail to the west and Stoney Trail to the east. The route is also contemplated as a Primary Transit Network route linking the NE LRT line to the terminal and Central LRT line as well as High Speed and Regional Rail corridors. The majority of Airport Trail traverses Standard Industrial and Employee Intensive Industrial lands as outlined in the MDP.

Currently 27,000 vehicles per day (vpd) travel on Barlow Trail north of McKnight Boulevard. This traffic will need to migrate onto the surrounding roads including Deerfoot Trail, Country Hills Boulevard and McKnight Boulevard. A review of the recently developed long range transportation model forecasts that the demand on the Airport Trail segment between Barlow Trail and 36 Street NE would be an estimated 3,000 vehicles per hour (per direction) during the peak hours. A detailed analysis of the future forecasted traffic flows has been undertaken as part of the functional planning study. This report relies on the functional study results.

The CTP identifies a primary transit network for Calgary including Métis Trail, 52 Street, 60 Street, 96 Avenue (Airport Trail) and Country Hills Boulevard as part of the primary transit network in northeast Calgary. This transit network will be supported by an extended NE LRT alignment that will attract more transit ridership, which in turn will reduce vehicular traffic on the northeast road network.

For comparison purposes, the Vancouver airport transit connection has the following:

- 15 per cent of airport passengers use public transit to get to/from the airport (2010)
- 13 per cent of airport employees use public transit to get to/from the airport (2010)
- Approximately 10 per cent of the Canada Line's 100,000-105,000 average weekday riders (or approximately 10,000 weekday riders) are coming to/from the airport.

Sources: Dave Harkness, Director of Parking & Ground Transportation at Vancouver Airport Authority and PROTRANS BC (operator of the Canada Line, owned by SNC Lavalin).

While Vancouver has only one path into the airport by transit, we have two – one from the west, where the majority of passengers/employees will come from, and one from the east, under the Airport Trail underpass. What Vancouver doesn't have is the cross-town background transit ridership, which we included in our forecast. This information confirms that the ridership forecasts for the Airport Trail primary transit link are generous.

An assessment of the future transit ridership estimated that between 5,000-10,000 passengers per day will travel between the airport and the Northeast LRT line and a similar transit ridership is expected between the airport and the future North Central LRT line. Peak hour ridership is typically approximated as 10 per cent of the daily ridership or 500-1,000 passengers in the peak hour.

Northeast Network Improvements:

There are plans to accommodate future upgrading of the transportation network in the northeast over the next 20-40 years including the following (Figure 4) potential projects:

- Widening of Airport Trail / 96 Avenue NE to six lanes
- Interchanges on Airport Trail at 19 Street NE, Barlow Trail, 36 Street NE
- Widening of Country Hills Boulevard to six lanes
- Widening of Métis Trail to six lanes
- Interchanges on Métis Trail at 64 Avenue, 80 Avenue, Country Hills Boulevard, 128 Avenue
- Interchange at Deerfoot Trail / 128 Avenue NE
- Extension of NE LRT toward Stoney Trail
- Completion of North Central LRT
- Interchanges on McKnight Boulevard at 11/12 Street, 19 Street, Barlow Trail, 52 Street, 68 Street

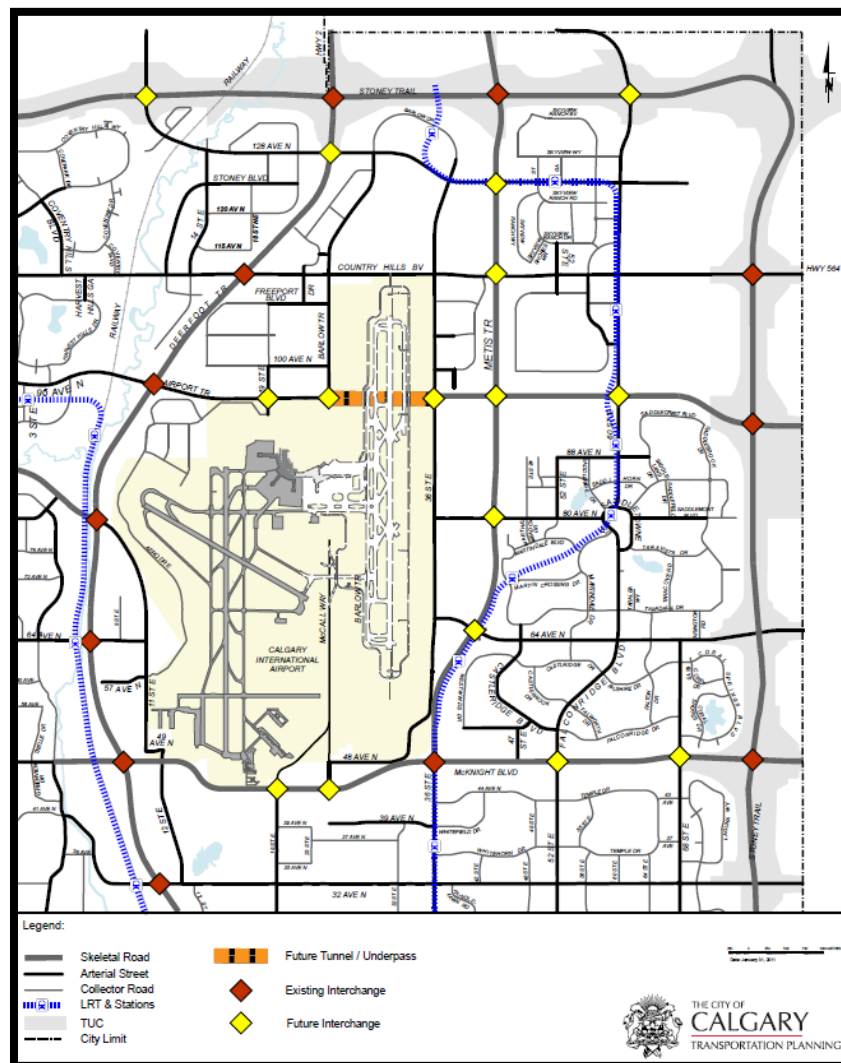


Figure 4: Northeast Calgary Road and LRT Network

Notwithstanding the significant employment base for the airport and surrounding businesses, the impact of the Airport Trail underpass will not be limited to the Northeast quadrant of the city. With industrial development within city limits and to the east such as the CN Intermodal Yard at Conrich, the true impact spans the city limits and beyond.

A prominent example of the positive impact of the underpass is the east-west connection and link to the Calgary Ring Road and Stoney Trail SE projects (Figure 5). Targeted for 2013, the addition of Stoney Trail SE would provide a virtually free flow alternative route to the airport for residents of the southern portion of the city.

In addition, travellers to and from east and south regions outside city limits are now awarded with alternate routing choices for their travel.

The combination of choice with the potential for leveraging new technologies such as variable messaging (Figure 5) to support traveller decision making is also a relevant consideration in relation to this issue. Implementation of these types of technologies is likely to increase in the very near future and The City needs to factor this into all transportation infrastructure planning.



Figure 5: Calgary Ring Road



Figure 6: Variable Message Signage

Scenarios

The primary decision at this point is whether to proceed with construction of the Airport Trail underpass or not. To support the decision making process, Administration have conducted significant investigation into the Airport Trail underpass and prepared three macro options regarding this subject. Cost projections have been independently validated, as per the direction of NOM2010-42 point 2.

Option 1 - Do Nothing

A review of the recently developed long range transportation model identifies that the Airport Trail segment between Barlow Trail and 36 Street NE will have an estimated 3,000 vehicles per hour (per direction) during peak hours. The impending closure of Barlow Trail dictates that this traffic will be absorbed on surrounding routes.

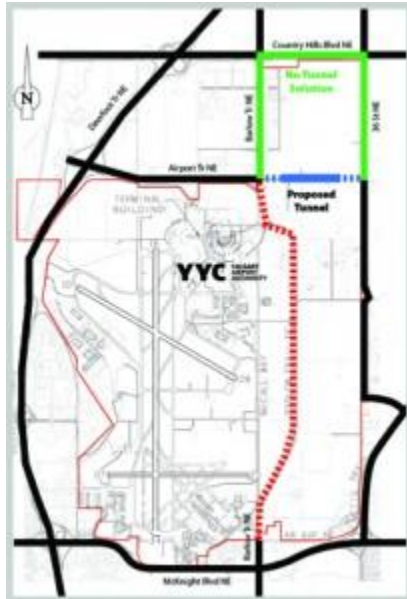


Figure 7: Proposed Alternate Route

The solution to this option has been presented by others as traffic carrying on northbound on 36 Street NE and using Country Hills Boulevard and Barlow Trail as an alternate route to the airport (Figure 7). The current estimated additional time for travelling in prime traffic conditions is roughly an additional five to eight minutes, over six kilometres (one way).

In a 2006 report entitled *The Cost of Urban Congestion in Canada*, The Transportation Association of Canada (TAC) outlined a comparison of Factors Used to Calculate the Cost of Delay (Figure 78). Using standard methodology of equal average of the \$/hour costs for work and non work trips, the \$/hour for delay in Calgary is in the region of \$17/hour or 28 cents per minute.

Traffic analysis indicates that of the northbound traffic on Barlow Trail, 42 per cent turn onto Airport Trail in the am peak and 48 per cent in the pm peak.

Using the current vpd of 27,000 and estimated additional travel time of between five and eight minutes for an average of 45 per cent being airport bound, the annual delay costs of this option are in the order of \$6.9 to \$13.8 million (one way). This simple calculation demonstrates that ignoring congestion has societal costs that must be considered.

Annex 1

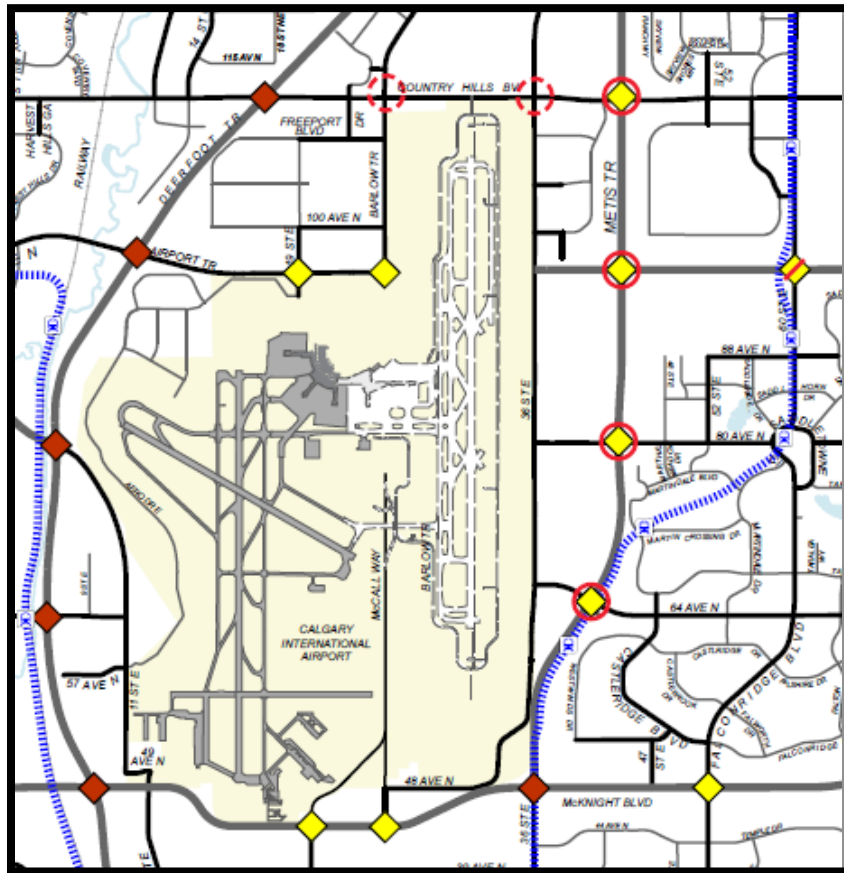
Table 1. Factors Used to Calculate Costs of Delay (2002 \$)

Urban Area	Year	% Work / Work-Related*	% Non-Work*	\$/hr – Work / Work-Related	\$/hr – Non-Work
Vancouver	2003	48%	52%	\$29.72	\$9.26
Edmonton	2000	31%	69%	\$25.48	\$7.84
Calgary	2001	37%	63%	\$28.57	\$8.79
Winnipeg	1992	88%	12%	\$24.71	\$7.63
Hamilton	2001	36%	64%	\$29.64	\$9.14
Toronto	2001	55%	45%	\$30.86	\$9.50
Ottawa-Gatineau	1995	43%	57%	\$31.35	\$9.67
Montréal	1998	70%	30%	\$27.32	\$8.48
Québec City	2001	58%	42%	\$25.96	\$8.15

*Trip purpose factors were provided by respective urban authorities (Edmonton, Calgary, Montréal, Québec City) or derived by the consultant from their model (Winnipeg) or travel survey (Vancouver, Toronto, Hamilton, Ottawa-Gatineau).

Figure 8: Cost of Delay

Pursuit of Option 1 will still require enhancements to the surrounding transportation network as indicated in the map below (Figure 9):



Map Key:

- ◆ Existing Interchanges
- ◆ Planned Interchanges
- Required Interchanges
- Potential Interchanges
- LRT Corridor
- Unlikely Interchange

Figure 9: "Do Nothing" Map Illustration

Considerations in relation to Option 1 include:

- a) The construction of four to six interchanges would be required to accommodate the increased traffic on alternate routes such as Métis Trail and Country Hills Boulevard.
- b) The loss of the primary transit corridor between Deerfoot Trail and 60 Street NE.
- c) The conflict of purpose on eastern Country Hills Boulevard between a primary link to the airport terminal and an urban arterial road with multiple points of access to commercial and retail developments.
- d) The need for additional lands along Country Hills Boulevard that are not identified in The City's transportation plans and have been zoned or developed in such a way that acquisition in the future would entail significant cost.

A summary of impacts and costs of Option 1 are detailed in the table below:

Issue	Cost (2011\$)	Risk/ Impact
Additional four to six interchanges	Four required interchanges \$220M Two potential Interchanges \$100M Total \$320M	<ul style="list-style-type: none"> Escalating construction costs depending on initiation date of project.
Widening Country Hills Boulevard	\$25M	<ul style="list-style-type: none"> Increased cost of retrofitting improvements to Country Hills Boulevard and other regional roadways.
Property considerations	\$70M	<ul style="list-style-type: none"> Property for all interchanges has not been accommodated in current plans. The land in this area is subdivided and serviced and under rapid development. Land costs could increase exponentially as properties get developed.
Travel delay of at least 5 mins/ vehicle to the airport	~\$6.9M - \$13.8M annually	<ul style="list-style-type: none"> Poor transportation network performance.
Only two access points to airport	Societal Costs	<ul style="list-style-type: none"> Delay to airport traffic if minor incident occurs.
Direct linkage from the NE LRT line to the terminal area and North Central Line	Societal Costs	<ul style="list-style-type: none"> Lost opportunity.
Option 1 Total Cost:	\$325M - \$425M (not including societal costs)	

Option 1 is desirable from many perspectives such as preserving capital funds in the short term for allocation to other projects. Airport Trail east of 36 Street NE could be downgraded from an expressway to an arterial reducing land and construction cost, as well as providing new opportunities for adjacent development access.

However, when considered in the context of long range planning and Calgary's position as a world class city with a world calibre airport, Option 1 does not represent a conscientious decision on behalf of our current business and travel community or our responsibility to future generations.

Option 2 - Build Tunnel Later

Building twin tunnels under the runway at a later date to coincide with higher demand levels (estimated post 2035), is technically possible and has been done at other locations such as the Taipei Songshan Airport and the Addison Airport in Texas. It is very important to note that this option likely carries all short term costs inherent with Option 1, with the added expense of protecting for tunnelling under a live runway at a future date.

The city of Taipei covers an area of 272 square kilometres with a population of 2.6 million. The Taipei project was over \$1.4 billion to complete and had the benefit of full ability to complete night work due to no air traffic disruption during these hours. As Calgary International Airport is a 24/7 operation, there would be additional complications regarding scheduling of this option.

Figures 10/11: Taipei Songshan Airport



Addison Airport (outside Dallas, Texas) contains one runway and has approximately 135,000 aircraft operations annually. Completed in 1999, the Addison Airport Tunnel Project is 503 metre tunnels (two lanes each). The tolled road (\$0.50 per trip) processes approximately 21,000 tolls per day, saving an estimated ten minutes in travel time.

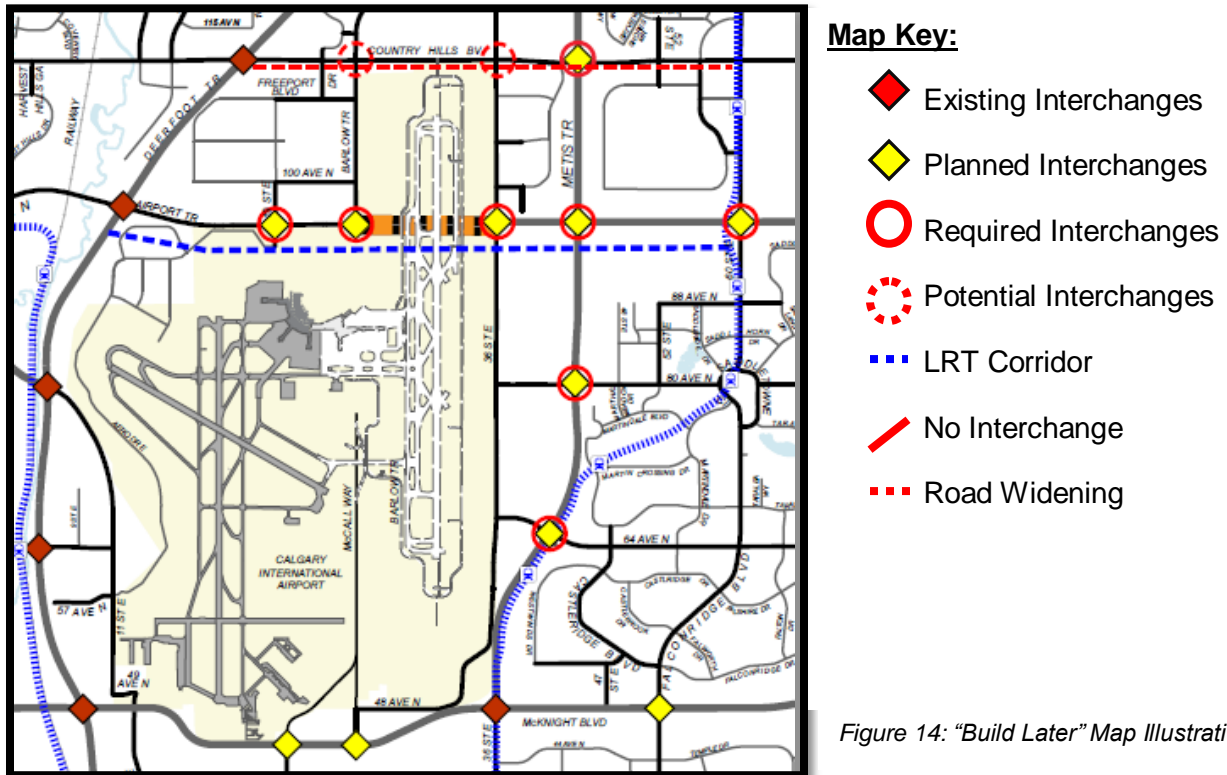


Figures 12/13: Addison Airport Tunnel Entrance and construction

Our initial investigations indicate that this option would require approval from The Calgary Airport Authority and that Transport Canada in its capacity as a regulatory department may at a future date impose changes which would nullify the feasibility of completing such a project.

It is important to note that pursuit of Option 2 would likely involve undertaking some or all of the required network improvements identified in Option 1 in order to accommodate interim demand.

The map below (Figure 14) details the required improvements for the short and long term in this scenario:



Positive considerations for this option include retaining future opportunities, which may only involve provision for rail based transportation, as well as the conservation of current capital and debt funds for allocation to other projects.

Tunnel expense is likely to be prohibitive and congestion levels would require interim improvements/potential interchanges (Figure 14) that could be avoided with the adoption of Option 3. Separate tunnels for LRT and automotive corridors may also be required with this option, due to the limitations with diameter when boring tunnels.

A summary cost projection and risks for Option 2 is shown below:

Issue	Cost (2011\$)	Risk/ Impact
Network Improvements	\$325M - \$425M	<ul style="list-style-type: none"> • As per Option 1.
Additional 4 interchanges on Airport Trail	\$200M	<ul style="list-style-type: none"> • Significant traffic disruption at a date with higher traveller volume.
Tunnel under a live runway	\$1,020M Estimated	<ul style="list-style-type: none"> • Cost is highly variable. • Would likely need to compensate for air traffic disruptions/ schedule changes. • Deep tunnel (16m below grade) will be more difficult to provide connections to Airport Trail and terminal area. • Requires The Calgary Airport Authority and Transport Canada approval.
Option 2 Total Cost	\$1,545M – \$1,645M (Estimated)	

For comparative purposes, pursuit of Option 2 would represent expending approximately 50 per cent of the remaining funds available in the Transportation department's 2008 – 2018 capital program on a single project.

Option 2 is a deviation (in the short term) from the Calgary Transportation Plan (CTP), which designated Airport Trail as part of the Primary Transit and Primary Goods Movement Networks.

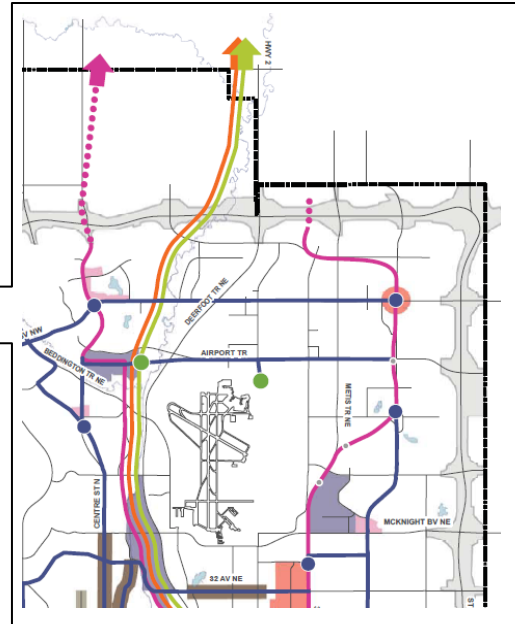
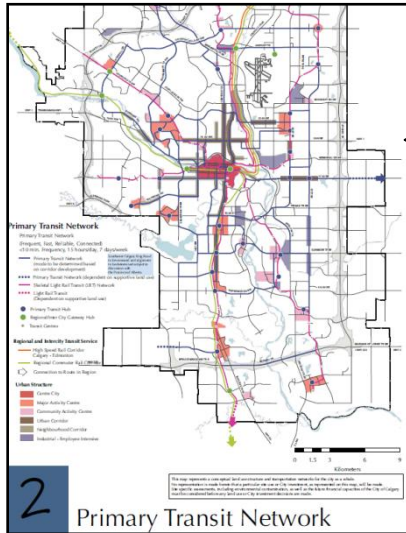


Figure 15: CTP Primary Transit Network

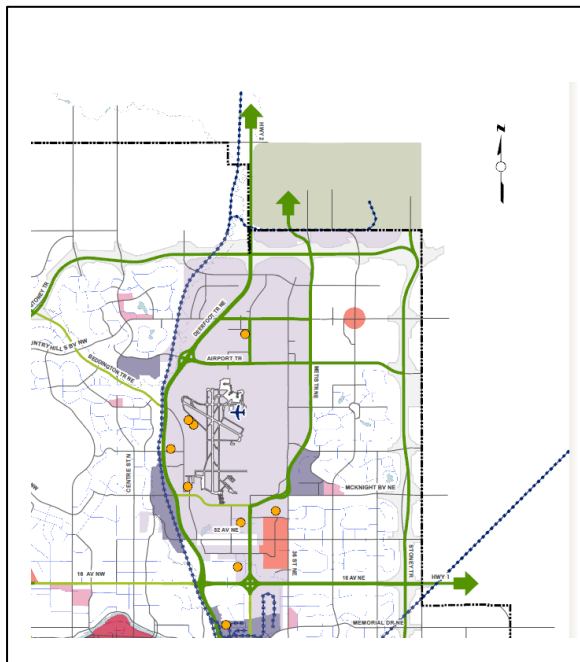
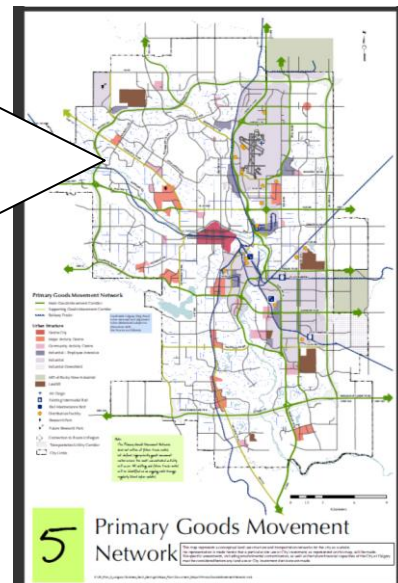


Figure 16: CTP Primary Goods Movement Network



Option 3 - Build Now

Option 3 consists of building the airport underpass and associated road works at the same time as the construction of the new fourth runway.

A comparison project for this option is the Hartsfield-Jackson International Airport in Atlanta (Figures 17-19). Serving 88 million passengers per year and just under one million aircraft operations annually, Hartsfield-Jackson is the world's busiest airport based on passenger traffic and number of landings and take-offs. Completed in 2006, the four cell, two tunnel arrangement (approximately 500 metres total) is part of Interstate 285 and can accommodate up to 18 lanes of traffic. The tunnel construction was integrated as part of the \$1.28 billion runway expansion project, which also included the acquisition of 364 hectares of land.

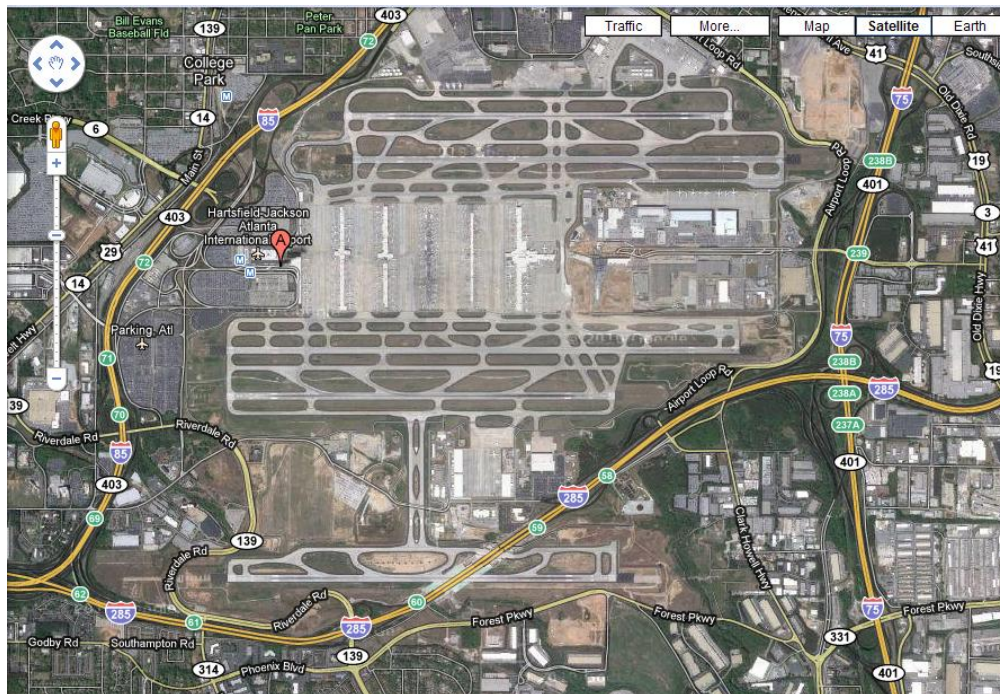


Figure 17-19: Hartsfield-Jackson International Airport Tunnel Images

On 2011 January 19 City staff had a conference call with Mr. John Cordner III, current Vice President AECOM Airport Developments Group, who was the Project Manager for the Hartsfield-Jackson Tunnel Project and was also involved with the Edmonton International Airport Expansion Project. Mr. Cordner shared a wealth of information with the team, particular points of interest being the following:

- The project duration was 39 months from notice to proceed to completion for the main structure. Interstate traffic was diverted throughout entire tunnel construction process as closure was not an option.
- Pursuit of the project as a Design-Build (DB) shortened their original project timelines.
- The tunnel roof is the runway surface. This required the concrete thickness to be over 24 inches at the centre, causing initial concerns over curing times.
- The tunnel is split into two segments, one under the runway and one under the taxiway. An overpass structure for the access road and one for the automated people mover (ATL Skytrain) line also cross the interstate at the north east end of the tunnels.
- Total tunnel project cost was approximately \$150 million.

Mr. Cordner also provided details for operations staff at the Hartsfield-Jackson International Airport and Administration will follow up with these staff to support additional information gathering.

Recommended Cross-section:

In response to the projected demand and proposed function of the corridor, a series of cross-sections were developed and reviewed. The cross-section options considered the following: lane widths, shoulders, accommodation for transit, goods movement, emergency evacuation, ventilation, lighting, traffic control measures, security surveillance, storm water management and utilities.

The cross-sections were evaluated using the following criteria: Primary Transit provision, pedestrian accommodation, traffic operations, constructability, safety, goods movement, emergency services, flexibility for widening and cost.

The design volume used for the Airport Trail segment between Barlow Trail and 36 Street NE of 3,000 vehicles per hour (per direction) during the peak hours would require a six lane roadway with signalized intersections. On opening day the volumes will be significantly lower and as a result, a four lane roadway is sufficient for the projected demand.

The Authority has updated their design for the fourth runway and associated taxiways and has advised that the proposed length of the tunnel has been reduced from 720 meters to 615 meters. Transport Canada has advised that building a segmented tunnel is inconsistent with TP 312 Aerodromes Standards and Recommended Practices section 3.1.6.6, and as such this is not an acceptable design option. The Safety & Security Section of the Aviation branch expressed numerous problems associated with a segmented tunnel.

The recommended option (Figure 20) consists of a 35.4 metre wide, two cell arrangement which could accommodate a dedicated transit way in the future. The scale of the transit way is suitable for rapid bus or rail based transit. Based on ridership forecasts, it is estimated that the long term transit demand along Airport Trail could be met by running a bus based service to and from the airport. Flexibility for converting to a rail based system in the future has been protected for in the recommended tunnel cross-section.

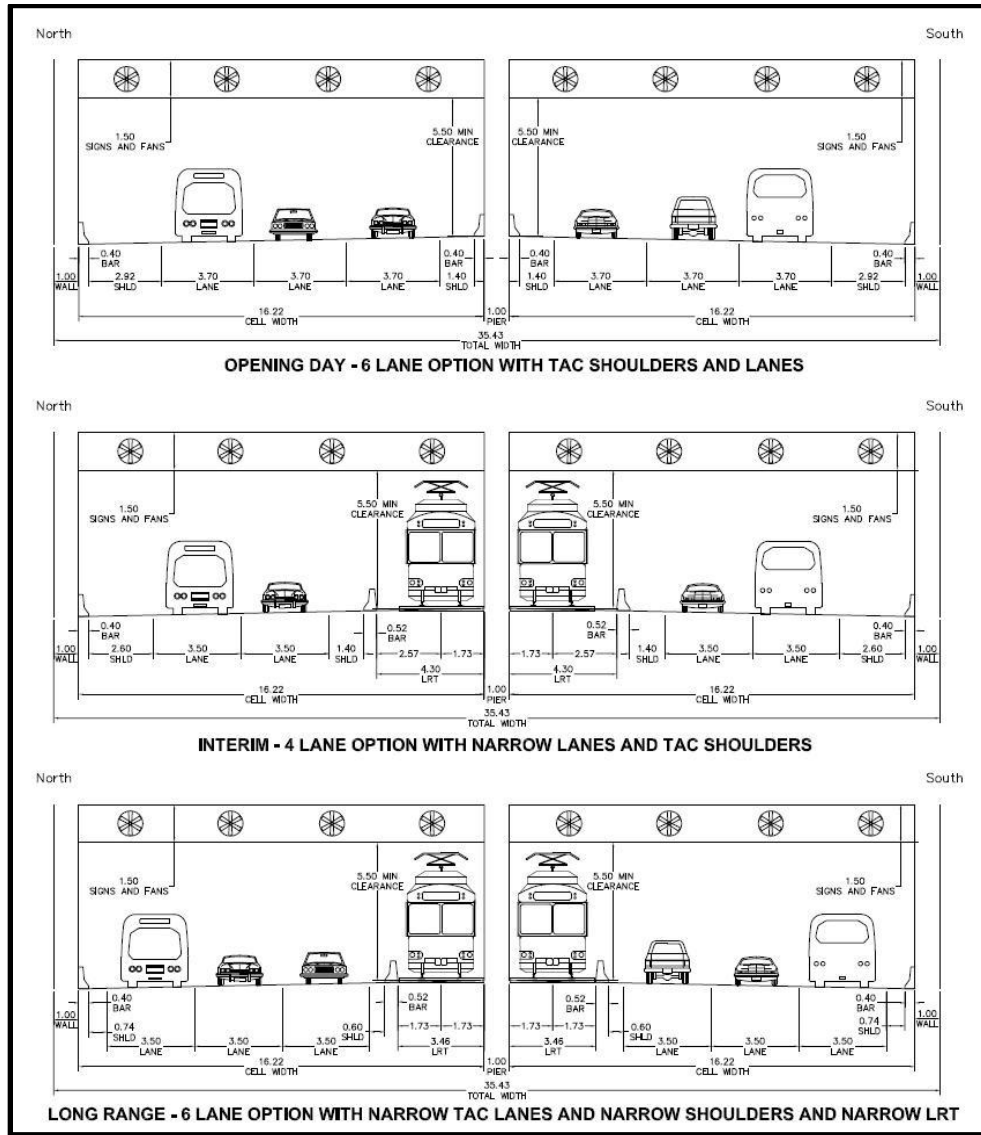


Figure 20: Recommended Cross-section

Recommended Option Phasing Plan:

Opening Day	<ul style="list-style-type: none"> • two lanes in each cell, per direction • option to add primary transit or HOV lane, per direction • standard shoulder and lane widths
Interim	<ul style="list-style-type: none"> • could accommodate a dedicated transit lane in addition to two lanes in each cell, (per direction with reduced lane widths)
Ultimate	<ul style="list-style-type: none"> • three lanes per direction plus a dedicated transit way, (lane width is obtained by reducing the shoulder widths)

The recommended cross-section provides for the best opening day scenario and most flexibility for accommodating additional lanes and multiple forms of public transit in the future. The overall width of the structure has been optimized to minimize any over building. Figure 20 illustrates the regional transportation that is contemplated to evolve with an Airport Trail link in place.

A 20 per cent mode split for future employees in the airport area and airport passengers was applied and the upper end forecast of 10,000 per day is appropriate in the context of the Canada Line ridership. This volume of travel demand can be serviced by rapid bus service.

Primary Transit service to the west would connect to the North Central LRT, future high speed rail station and commuter rail that will parallel the Nose Creek valley. To the east, connections North and South would be achieved via the existing line and future extension of the NE LRT to City limits.

This option includes significant impacts to the overall northeast network development, including the reconsideration of four of the interchanges along Métis Trail, and protection of the Urban Corridor status of Country Hills Boulevard (Figure 21):

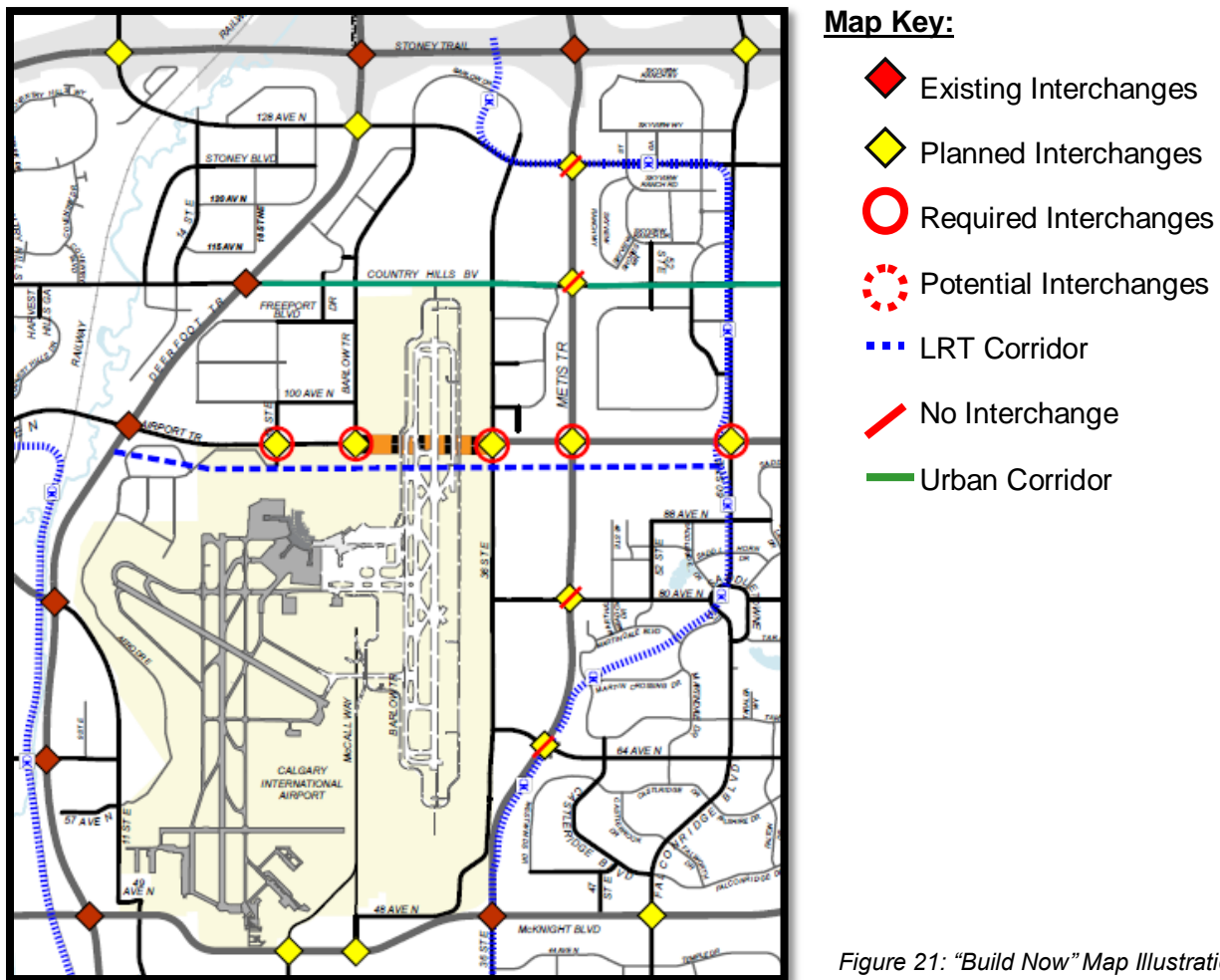


Figure 21: "Build Now" Map Illustration

The Authority is investigating a rail based people mover system to provide service within the terminal and parking areas over the long term. With Option 3, the potential for the future transit connection to be connected to the airport's people mover system is retained.



Figure 22: Example Airport Rapid Transit System

The impacts of the Barlow Trail closure to the pathways and bikeways surrounding the Calgary International Airport are outlined in the map below (Figure 23):

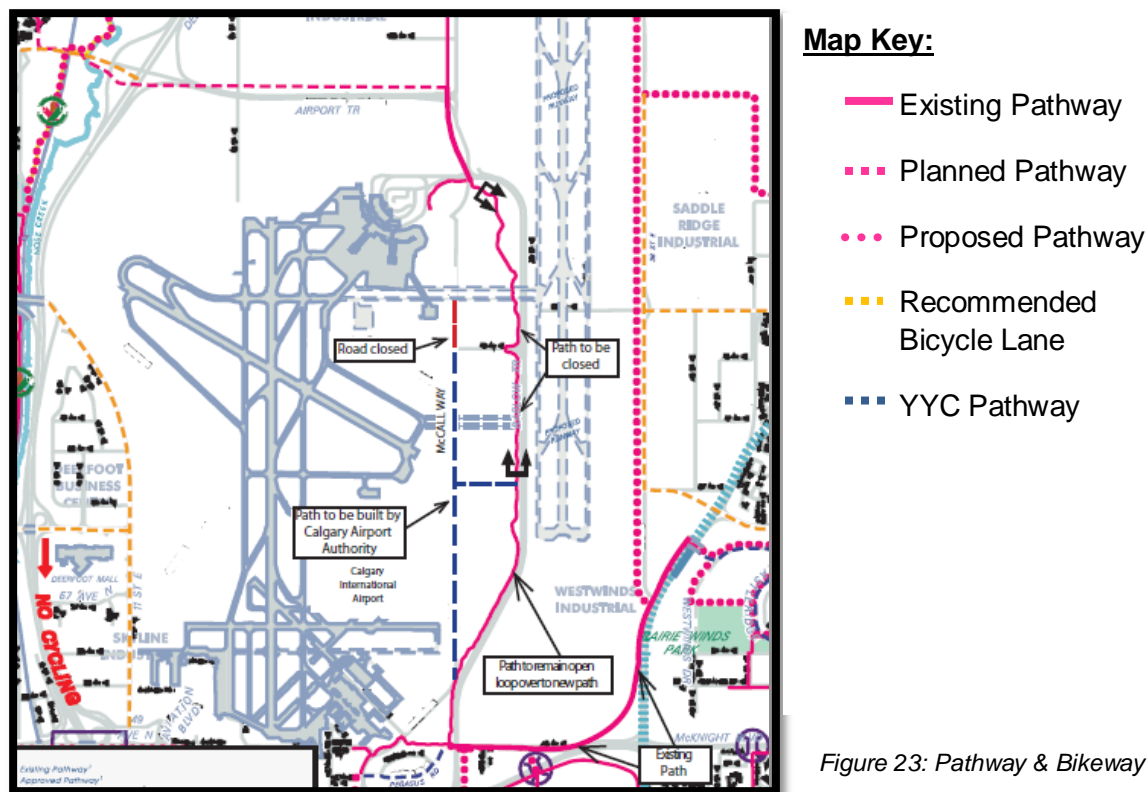


Figure 23: Pathway & Bikeway Map

A tunnel cross section with pedestrian and cyclist accommodation was also evaluated. As the nature of the tunnel would be an inhospitable environment for pedestrians or cyclists due to issues related to noise, air quality and safety, these travel modes are not accommodated in the recommended tunnel design. This would require an additional three metres on one span, estimated at an additional \$27 million in construction costs. Costs in relation to additional engineering, complete physical and air barrier, increased ventilation and safety have not been

identified at this point. To provide optimum benefit to the cycling population, the rapid bus system in this area would have the ability to carry bicycles also. If a significant increase in pedestrian/cycle demand occurs, the cross-section can accommodate a pathway with a loss of vehicle/transit space.

The Authority is constructing a new pathway along McCall Way to provide access to businesses south of the airport. In addition, future pathways are proposed for Country Hills Boulevard and Barlow Trail. A future connection along Airport Trail from the airport to Deerfoot Trail will tie into the Nose Creek Valley Trans Canada Trail system.

Cost Estimates and Construction Phasing:

Alternative airport underpass construction options were reviewed and an updated cost estimate was prepared. Costs as outlined in the table below include design and construction with contingency but do not represent costs related to all land acquisition, financing charges, delay claims, or insurance considerations.

The related construction phasing for completion of all options is illustrated below:

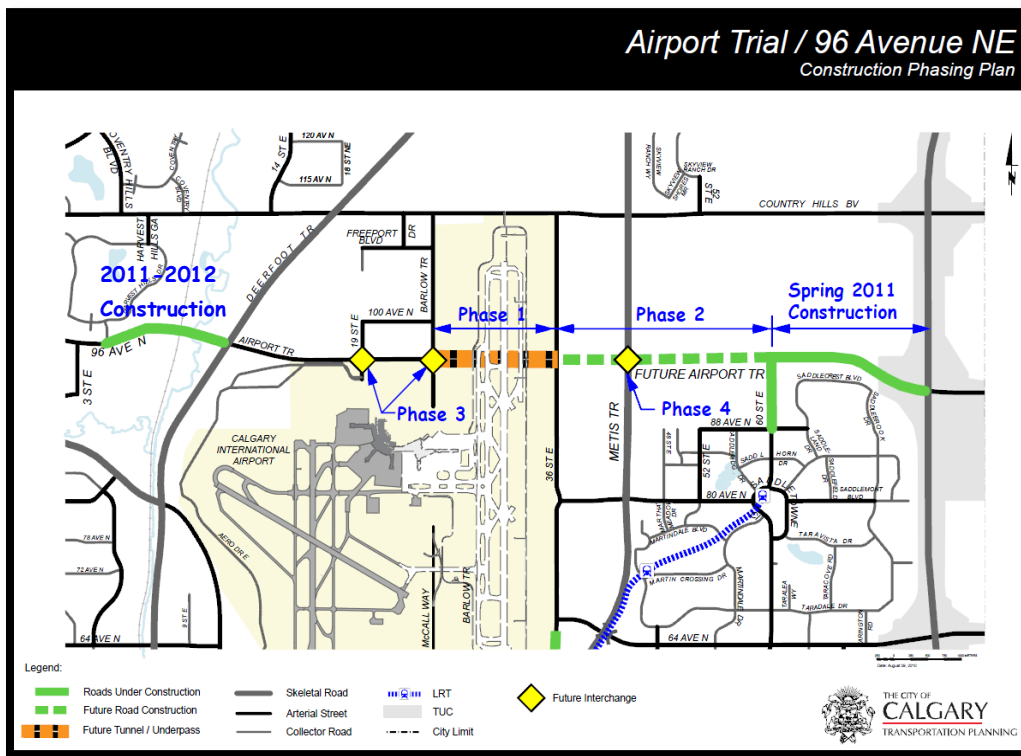


Figure 24: Construction Phasing

The segment of Airport Trail from 60 Street NE to Stoney Trail will be tendered in spring 2011. In addition, the segment of Airport Trail between Deerfoot Trail and Harvest Hills Link is under construction and will be completed by summer 2012.

Construction of the segment of Airport Trail between 36 Street NE and 60 Street NE would ideally be completed in time for the underpass opening and is not constrained by the runway construction. This work would be done as a separate contract managed by The City.

Construction of the interchanges along Airport Trail would be at a future date and this construction would be a cost sharing arrangement between The City and the affected property owners.

The Construction Phasing options related to Option 3 include the following:

Option A – Tunnel plus 4 lane road (Barlow Trail to 36 Street)	Cost (millions)
<i>Continuous Tunnel (615 m in length)</i>	\$166.6
<i>4-lane Airport Trail – Barlow Trail to 36 Street</i>	\$32.0
Total Option A	\$198.6

Option B– Option A plus extension of road (36 Street to Métis Trail)	Cost (millions)
<i>Option A costs</i>	\$198.6
<i>Four lane Airport Trail – 36 Street to Métis Trail</i>	\$10.0
Total Option B	\$208.6

Option C– Option B plus extension of road (Métis Trail to 60 Street)	Cost (millions)
<i>Option B costs</i>	\$208.6
<i>Two lane Airport Trail – Métis Trail to 60 Street</i>	\$14.0
Total Option C	\$222.6

In addition to the above cost estimate for infrastructure, considerations in relation to construction insurance, some property, delay costs and other items equate to a total construction cost estimate of \$258.8 million, excluding financing costs.

Regarding the composition of Option A, it is feasible to construct the tunnel structure only, however operating costs related to insurance and security would still be incurred from the outset. This is the case with the tunnel under the Louis Armstrong International Airport in Kenner, Louisiana, where a 254.5 metre tunnel was built and capped at both ends with the intention of future use. From annual expenditures of \$50,000 to keep the tunnel free of water

and methane gas to issues with flooding and electrical repairs, the benefits of this approach were quickly eroded by the issues that arose.

Construction of the entrance and exit in conjunction with the tunnel provides a solution which serves the segment of Airport Trail from Barlow Trail to 36 Street NE. Constructing the roadway segment on airport lands avoids future complexities associated with building on an active airfield. The tunnel segment is estimated and assumed to have a paved and/or concrete surface as part of the initial phase.

Option B would deliver the best compromised short term solution for the existing and planned road network, as per Figure 24.

Option C delivers the full east-west connection in the short term, with a minimal addition to the overall cost. The expenditure in relation to roadway segments is laid out below (Figure 25):

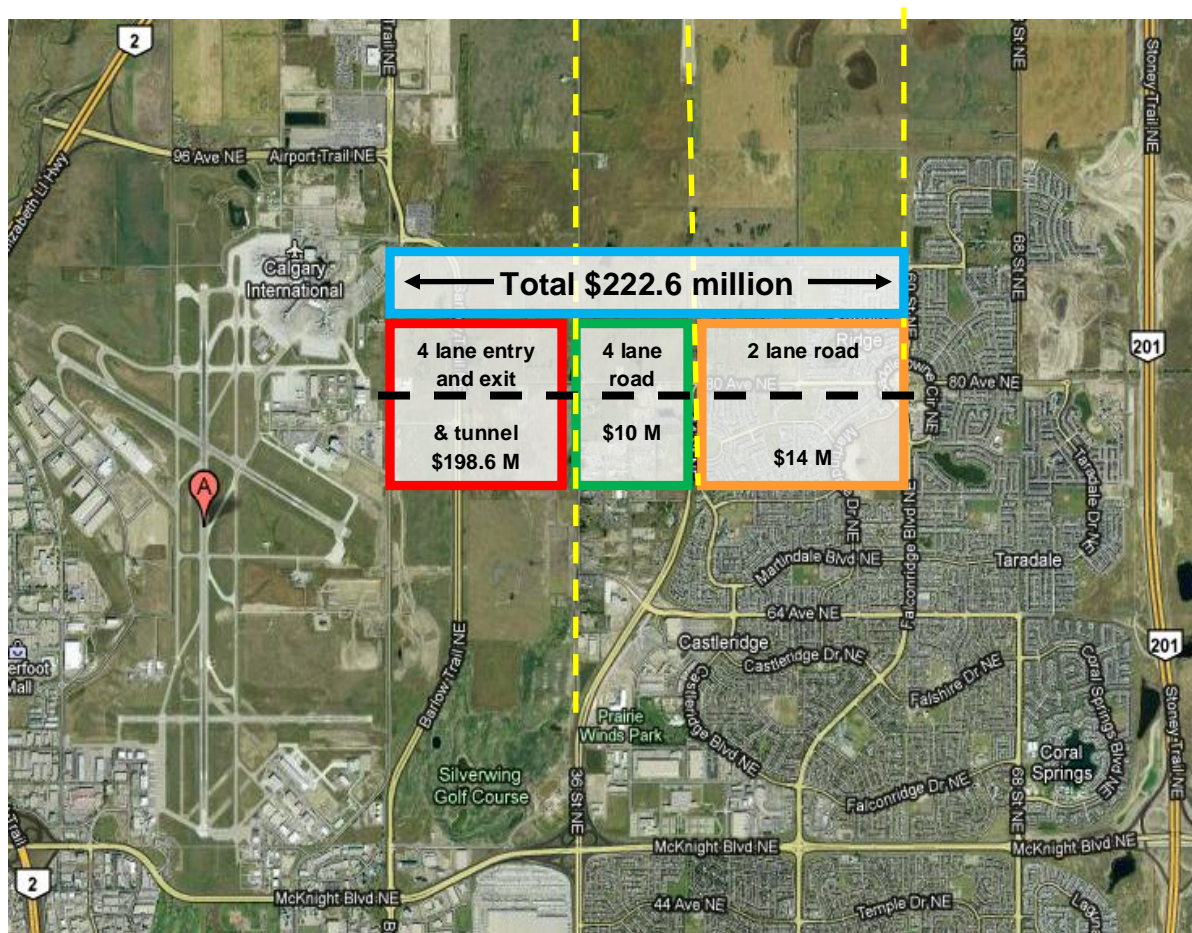


Figure 25: Expenditure Related to Roadway

Potential ultimate upgrades on Airport Trail will include construction of interchanges and inbound/outbound airport access ramps. A study completed jointly by The City and The Authority in 2005 identified improvements as shown below (Figure 26).

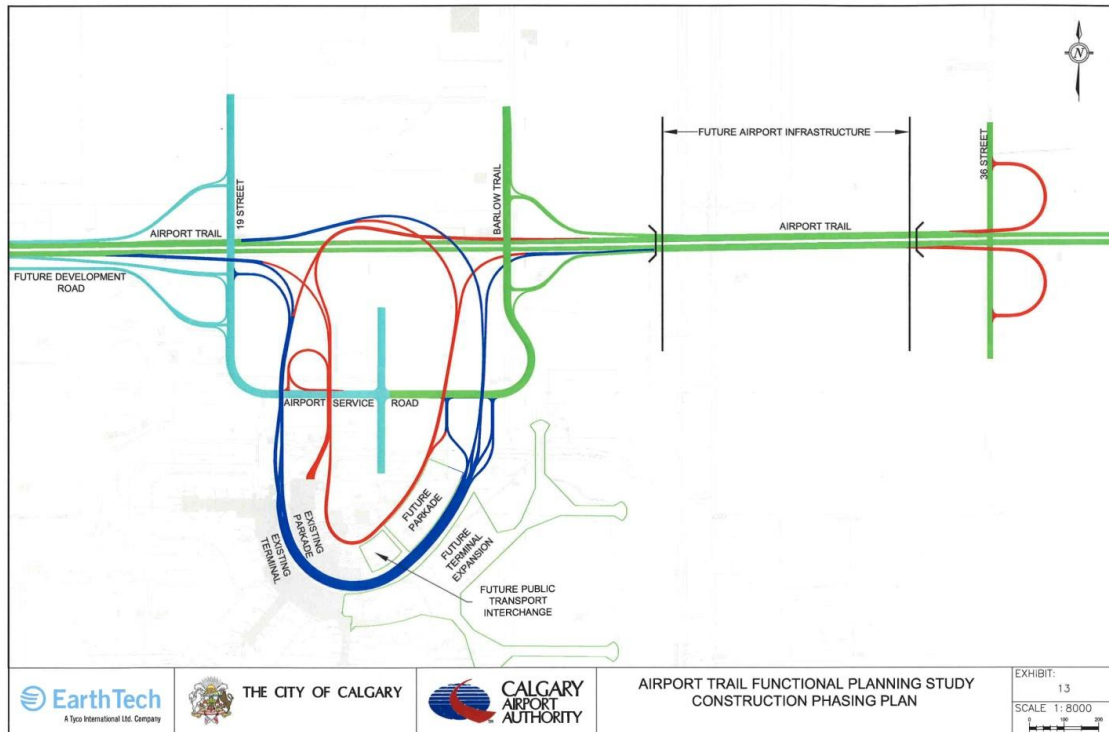


Figure 26: Airport Access

The CTP reclassifies Airport Trail segment between Deerfoot Trail and 36 Street NE as an arterial street. As a result, Administration has initiated a study to review the need, configuration and timing for future improvements. The study will be complete in winter 2011, taking into consideration Council's decision on the runway underpass. Following completion of the study, the cost sharing arrangement between area developers and The City will be developed.

Financing:

The following funding options were considered by Administration:

1. P3 opportunity

Deloitte LLP was engaged to provide a P3 analysis for the project. A Phase 1 – Feasibility (Screening review, Market Sounding and Initial Schedule analysis) was completed in 2010 December. Based on the findings, the project was determined to be feasible as a P3 project. Further assessment under the City's P3 Policy Framework (including both a Strategic Assessment and Value for Money analysis) is required to confirm this finding and estimate the value to the City. Under a P3 delivery model, it is unrealistic to start construction of the project in 2011 and aiming for the 2012 construction is more realistic with planning and procurement activities completed in 2011.

The P3 Canada fund is a potential source of a portion of the required funding. The program's \$1.2 billion fund will support up to 25 per cent of eligible capital projects. P3 Canada felt that this project would be an eligible project, but cautioned The City to pick projects that would have a higher likelihood of meeting the criteria. On June 30, 2010, PPP Canada closed the P3 Canada Fund's Round 2 call for project proposals. Round 3 will not start until mid 2011 with funding of an approved project up to 12 months later (2012).

Based on the above, administration is not recommending proceeding further with investigating the viability of a public-private partnership for this project as the time required to pursue this process is not available in this instance.

2. Grant Programs

In discussions with the Province they have indicated that this project would be eligible for MSI funding. Pending the 75 per cent commitment threshold as per MSI agreement and any previous commitments, The City could reallocate funding to the underpass project. Administration will also confirm from The Province permission to exceed the seven per cent maximum eligible interest costs charged to MSI funds.

3. Other available uncommitted MSI Funding

There is currently \$50 million uncommitted contingency funds available in 2018, which was set aside with the Airport Trail project as a potential use. There is also \$123 million uncommitted in the Innovation funding bucket available in 2018, totalling \$173 million available in 2018. Using these funds supports the financing of the tunnel but will reduce flexibility and contingences for other projects within the MSI program.

4. Other funding sources

Funding up to \$25 million from the Reserve from Future Capital is available in 2011.

5. Traditional Financing

Debt borrowing – with Council approval The City could increase its debt capacity and borrow the entire funds required to complete this project. The current total debt and debt servicing limits would need to be evaluated against the phasing plan should Council proceed with Option 3.

The City's long term capital debt is pad from general revenues including residential and commercial property tax. The approximate impact would be:

- a) 2 per cent mill rate increase for 15 years,
- b) 1.7 per cent mill rate increase for 20 years or
- c) 1.5 per cent mill rate increase for 25 years.

6. Traffic Toll Charges

While this project is not recommended as a P3 opportunity, the funding could be recovered through toll charges. Our initial estimates indicate that a \$3/ vehicle toll would be required to generate the annual funding required for the project. This is based on usage of 15,000 vpd generating annual income of approximately \$5.475 million, with a repayment horizon of 15-20 years and a five to ten per cent overhead operating cost. Electronic toll collection would be required to avoid the added expense of toll plazas.

Recent experience with LRT Park 'n' Ride parking charges indicates that the public is generally not supportive of daily user fees for transportation facilities.

7. Levy By-law

With MGA approval a levy could be initiated to cover the costs of the project either through the entire City or to a zone around the airport. This would be implemented via an assessment, consultation and bylaw process.

8. Financing by other parties (Province, the Authority, Federal Government)

The Province:

- Provide a loan to The City - Rather than provide a grant, The Government of Alberta could provide a loan to The City. This could be converted to a grant in the future. This could be accomplished, for example, through a bullet debt structure where the Government of Alberta forgives the loan on or before maturity at a time when the Provincial deficit may no longer be a concern. Alternatively a conventional long term debt structure could be used, with the Government of Alberta providing annual grants or revenue sharing that offset the annual debt servicing charges in a way that minimizes the impact on the deficit/surplus over a longer period.
- Increase the fuel tax revenue sharing program - The Government of Alberta could increase the Calgary fuel tax revenue sharing agreement by 1 – 1.5 cents/litre. This would increase Calgary's annual revenue by \$20 to \$30 million per year and offset the debt servicing for the project. A sunset date could be added to the increase such that the program reverted to the current level once the debt was repaid or equivalent debt raised for new projects.

Government of Alberta:

- Funds the full cost the underpass - The Government of Alberta builds the underpass itself, as a capital investment. The Government of Alberta could retain ownership and responsibility for the underpass, or transfer it to The City at a time when the deficit is no longer a concern.
- Costs partially offset with future MSI funding - The Government of Alberta could build the underpass. The City has identified up to \$14 million in future MSI funding that has not yet been allocated to specific projects or set aside for contingencies and could be used as a funding contribution towards the underpass. The Government of Alberta could retain this funding in 2018 rather than transfer it to the City, partially offsetting the cost.

- A license plate fee could be applied to fund the cost of this project. There are currently 659,000 registered vehicles in Calgary and surrounding area.

The Airport Authority:

- The Government of Alberta could negotiate with The Calgary Airport Authority to build and finance the underpass as part of the runway project, with The Government of Alberta committing to the debt servicing for the underpass. The Government of Alberta could retain ownership of the underpass or transfer it to The City. The costs could be partially offset by MSI funds in 2018.

These options have been investigated and due to the timelines for resolution, most will not be considered as viable options for funding the underpass project. Future funding such as fuel tax and registration fees could be added to Transportation capital funding at any time.

Financing Recommendation:

Administration recommends funding the Airport Trail underpass project through a combination of existing capital funds, reserve for future capital and bullet financing. This option would consist of utilizing:

- \$25 million from the Reserve from Future Capital. (Available 2011).
- \$50 million uncommitted MSI contingency funds (Available 2018).
- \$123 million uncommitted MSI funding in the Innovation funding bucket available in 2018 (Available 2018).
- Reallocation of \$97 million from Transportation unallocated MSI, Transportation Infrastructure Programs: 543 Provincial Ring Road Connectors, and other Transportation Capital Programs.

This equates to the total cost estimate including contingencies, borrowing costs and allowances of \$294.8 million (\$258.8 million plus \$36.0 million in borrowing costs).

Procurement:

The Calgary Airport Authority is planning to begin construction of their fourth runway project in 2011 April. In order for the tunnel design and tendering activities to catch up with the runway construction an expedited procurement process will be necessary. A variety of procurement options were reviewed for the segment of Airport Trail on Airport lands. The roadway work east of the airport would be tendered for construction separately.

Approaches investigated include the following:

Full execution by The Authority: this approach has the benefits of; a simple, coordinated approach, The Authority has a team in place that is technically capable of undertaking the work, a simplified contractual process, a reduced likelihood of contractor delay claims due to The Authority's ability to the schedule all site works. Shortcomings of this approach include; reduced influence by The City control over detailed design, cost and scheduling. This is not recommended as discussions with The Authority have indicated that they would not support this approach.

Full execution by The City: The Transportation Department typically follows a design-bid-build process. It has the benefits of maximum opportunity for interested consultants and contractors and typically leads to the lowest cost. The primary negative aspect of this typical approach is the time required and assumption of all risks. As time is the factor under the most constraint, the typical design-bid-build approach is not recommended, however a modified approach could be used to expedite traditional timescales.

The design-build approach adds the benefit of a close working relationship between the designer and contractor as well as a time savings from the overlap of detailed design and construction. The primary risk associated with this approach is the inability or extra expense involved with redesign or reconstruction later in the project. A design-build approach was successfully followed in 2001 for the Glenmore Trail & 18 Street SE interchange and more recently in 2010 for the Glenmore Trail & 37 Street SW interchange. Due to the pre-bid time requirements, this approach is not recommended.

City Council specifically asked that Administration investigate the opportunity to use a Private-Public-Partnership or P3 process for this project. The City retained Deloitte LLP to conduct a market sounding for interest in the project and gain feedback from the industry as to the feasibility of using a P3 approach for the tunnel. Using a P3 approach provides opportunities to fast track the work and incents the contractor to find cost savings through design innovation and/or scheduling efficiencies. They require diligent quality control by the owner. Another key distinction of P3s is that they typically involve financing by the contractor with a re-payment over time by the owner. Some tunnels and bridges with private ownership and tolls have used P3s. The contractual work in advance of start of construction is extensive and detailed requiring a minimum of four months but typically closer to one year. Pursuing a P3 was ruled out for this specific project due to the extensive time required for document preparation and the bidding process.

Blended approach on City and Authority: Detailed design by a consultant under contract to The City allows The City to maintain responsibility for design, and protect City interests. Securing a design firm requires a Request for Proposal (RFP) process to comply with The City's procurement policies. Construction by The Authority will provide coordinated activities to

minimize time and delay issues. The Authority has selected their Construction Manager (CM), a consortium of PCL – Parsons – Dufferin.

The CM will coordinate and manage the tender process for the contractors who build the project. Using The Authority's CM has benefits of better onsite coordination of activities, a procurement process that is consistent with City policy and using a group that have a good track record on public sector projects in Calgary. There is a risk of reduced City control over construction overruns and delays to The Authority's schedule. These risks can be mitigated by increased construction inspection and coordination; this is the preferred approach.

Two procurement concerns arise from working with The Authority's CM. The CM was not selected by The City through a dedicated public process and the contract between The Authority and the CM allows for the CM's team members to compete for a small portion of the work themselves. Administration feels that the CM was selected via an extensive competitive process that is consistent with the intent of City policy and the NWPTA legislation. Reviews can be implemented to assure that work by CM forces is done at or below the competitive market cost to the taxpayer.

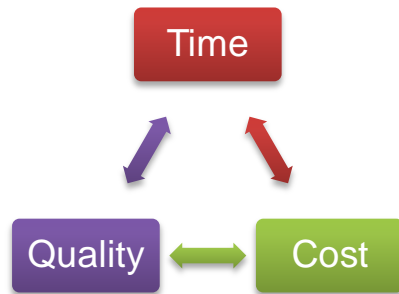


Figure 27: Time-Quality-Cost Matrix

Selection of a procurement process was made in the context of the three primary tradeoffs of Time-Quality-Cost (Figure 27). Time is the least flexible in this case. Quality is of high importance considering the long lifespan and fairly inaccessible nature of a tunnel. Therefore costs are going to tend to be higher.

The Authority has responded to The City's procurement options and advised that they do not wish to assume the responsibility and associated risk of designing and/or constructing the underpass.

The Authority has advised The City that the use of their CM is the only acceptable method of project management. The City would enter into a separate contract with the CM and hire our own detailed designer. The construction contract would be tendered by the CM. We would pursue a design-build overlap to take advantage of the reduced risk to the runway construction schedule.

In order to expedite the process The City has issued an RFP for Preliminary Engineering, Detail Design and Construction Administration and has selected a consultant contingent on Council approval of construction of the project. In addition Administration is recommending a single source contract be awarded to PCL-Parson's-Dufferin for the CM. The recommended approach fulfills The City's obligations under the New West Partnership Trade Agreement (NWPTA).

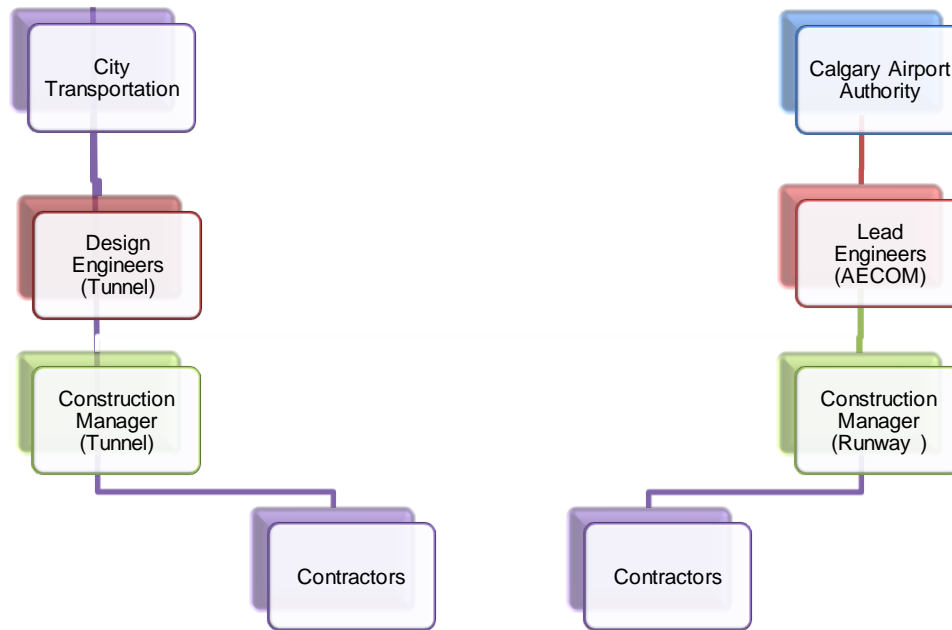


Figure 28: Proposed Project Management

Operating Costs

Upon completion of the tunnel the future yearly road maintenance costs (Barlow Trail to 36 Street portion only) are estimated at \$45,000 per year for winter and summer maintenance. The annual structural inspections would be completed as part of the Transportation Department's current process, utilizing existing resources. At this point, the operating cost does not include the yearly operating and maintenance cost of the ventilation, lighting, pumping station and emergency monitoring. These costs will be refined as the detailed design progresses and will be incorporated into the Transportation operating budget in line with the opening date.

An additional operating cost under investigation is the provision of liability insurance for the segment of Airport Trail on lands leased from The Authority. The Authority has advised The City that a minimum of \$1 billion in coverage would be necessary. City staff are presently investigating the availability and cost of such insurance. Initial estimates place this cost in the range of \$1.0 - \$2.5 million per year.

Additional Risks & Liabilities

The Authority has identified a series of other potential circumstances which The City would have to indemnify The Authority in a manner that The City would not normally be exposed to under the MGA.

Conclusions and Recommendations

This report demonstrates that:

- An underpass or tunnel is technically feasible and in use at multiple airports.
- The proposed Airport Trail underpass would have substantial use.
- Accommodating travel demand in the sector will require investment at some stage.
- Option 3 results in the most balanced and flexible transportation network for the Northeast sector as well as the best combined access to the airport terminal.
- The proposed project will incur costs for The Authority and increases the risk of delays to their project.
- Option 3, if executed immediately, represents the lowest total cost option.

The short and long term cost projections (not including financing charges) for the three options are:

Option	<u>2011- 2014 \$</u>	<u>2015 – 2040 \$</u>	<u>Total \$ millions</u>
1 – Do Nothing	\$25	\$300 - \$400	\$325 - \$425
2 – Build Later	-	\$1,545 - \$1,645	\$1,545 - \$1,645
3C– Build Now	\$258.8	-	\$258.8

As per the above chart, Option 3C provides the best long term benefit for the investment. Constructing an Airport Trail link now also supports Council’s sustainability principles for Land Use and Mobility.

The window of opportunity for the pursuit of Option 3 has virtually closed and it is imperative that a decision regarding this option is made at this point. Further delay on the consideration of this option with eventual pursuit will potentially expose The City to costs associated with the delay of The Authority’s overall Airport Development Program (ADP).

Stakeholder Consultation Overview

The topic of airport access was debated through the civic election process in 2010. The top four candidates (Nenshi, McIver, Higgins, Connelly) all expressed support for access, however, Nenshi was the only one of the group to come out in favour of an airport underpass as one of the key pillars of his campaign. Only one candidate came out in vocal opposition to an underpass — former Alderman Hawkesworth. He withdrew his name after the ballots had been printed, throwing his support behind Barb Higgins. His vote of 1513 could be seen as support for his stand against the underpass.

The October 2010 poll results for each of the top four candidates, plus former Alderman Hawkesworth were:

Naheed Nenshi	140,263 votes	40 per cent
Ric McIver	112,386 votes	32 per cent
Barb Higgins	91,359 votes	26 per cent
Joe Connelly	2,484 votes	1 per cent
Bob Hawkesworth	1,513 votes	>1 per cent

Post election, the issue has continued debate in the local media. From January 8–10 the Calgary Herald held an online poll, asking readers: Do you agree with Mayor Naheed Nenshi that building the airport underpass is a high priority?

Reader response: 2733 responded with 40 per cent saying “No,” and 60 per cent saying “Yes.” It is understood that this is not scientific and reflects only the opinions of those Internet users who chose to participate. Online comments on the issue range widely from comparisons to traffic issues in other areas of the city with respect to need from suggestions that the road should be built and tolled for those who wish to use it.

In 2010 December content including an overview of the northeast network transportation plans and videos from Mayor Nenshi and GM of Transportation Malcolm Logan was added to www.calgary.ca. Comments with respect to this information include concerns about constrained access routes for emergency services, to optimism about future primary transit potential and an overall ethos of cost conscious decision making.

Regardless of supportive or opposing stance on the issue, clearly the potential Airport Trail underpass continues to be of interest to the citizens of Calgary and travellers to our city.

Stakeholder Event

On Thursday 2011 January 13, Administration met with a group of key stakeholders to gauge their perspective on the closure of Barlow Trail and the potential of an Airport Trail underpass.

Stakeholders were invited from nearby community associations, land owners and developers, members of the special interest groups: Airport Trail Access Committee (ATAC) and Coalition Opposed to the Airport Tunnel (COAT), to provide the different points of view. Sixteen stakeholders attended the meeting.

The meeting followed a simple format, with welcome by the Mayor, a brief description of the project, facilitated discussions, report back to the group as a whole, and a brief wrap up. The facilitated discussion in groups of approximately six individuals provided the Transportation facilitators with a simple methodology for hosting conversations on this matter. These

conversations linked and built on each other as people moved between topics, cross-pollinated ideas, and discovered perspectives apart from their own.

As part of his welcome, Mayor Nenshi thanked attendees for their time and input and noted the number of good conversations with the community that had already occurred and ultimately one challenge now is timing. He continued that this was a wonderful opportunity to come together and gather thoughts on the best way forward; that now was the time to be effective and efficient in moving forward for the long term.

The Mayor and Aldermen Stevenson and Jones left the room, allowing for open discussion at each of the three tables. The Mayor and Alderman Stevenson rejoined the meeting for the feedback and final comments.

Feedback Summary

Across the room the following over-arching themes, questions and concerns were raised.

Themes:

- It is important to consider the cost of doing something versus the cost of doing nothing.
- This project is about, and needs to provide, value for all Calgarians.
- The underpass is a Calgary issue, not just a NE issue, and the east-west connection has been part of The City's vision for the NE and the whole of the city for more than a decade. The plan has been in place for a long time, to support the growth of the NE area. It is time to act
- Calgary as a world class city — it is time to start thinking like one and acting accordingly.

Questions/Concerns:

- Can the existing road network handle future traffic? And if not, then what is required to make sure it can?
- What are the cost implications of doing nothing at this time?
- Will the underpass provide better access to the city?

Closing Comments from Participants:

Each of the participants was asked for a closing comment. In their words:

- Calgarians already spend many hours on the road because we under-built in the past. It is time to do it right the first time, for now and for the future.
- The east/west connection has been a priority for more than five years for the NE and for the city.
- It is important to provide an efficient transport system. There is a concern that by limiting the connection points, will the existing roadways become larger roadways with limited access?
- This is important – let's plan ahead.
- It is important not to miss this opportunity.
- Concerns that the additional driving that will be required if we don't do it will increase greenhouse gas emissions.
- Start recognizing that Calgary is a world-class city. Doing it now makes more sense with our status.
- It is important to get the LRT to the airport sooner rather than later, as a world-class city
- One third of visitors to Calgary stay in the NE. We've lost ground against other cities since 1988 in servicing visitors. The extra 20 minutes will cost 20 hotels in the area

between \$1.4–1.6million per annum. There are strong concerns about the visitor experience.

- Quicker connections to “trains, planes and automobiles” offers more benefits to the whole of Calgary:
 - Increases for business
 - Increase for tourism
 - Increase to transportation, and particularly the ability to move shipping off two-lane roads and on to bigger roads.
- The experience of flying into or out of the airport is a whole-of-city thing, not just a NE thing.
- The plan for Calgary’s NE was visionary 15/17 years ago, and this part of it is crucial. If we don’t do it, we will have to band-aid all the surrounding intersections for a long time.
- It seems so hard for NE Calgary to get anything done. Why? Surely this needs to be done.
- Spend the money to serve more people through an LRT to the airport. Is the underpass really needed?

Further Consultation:

Administration has attempted to address stakeholder questions as part of the C2011-05 Airport Trail Underpass Council Report. Subject to the Council decision in relation to this report and the project at large, further stakeholder consultation will be executed as we strive to deliver quality service to the citizens of Calgary.

Detailed Discussion Questions & Responses

Following a short presentation on the anticipated options to go before Council, attendees were asked three questions to stimulate discussions.

1. Regarding the closure of Barlow Trail, what are the impacts of this closure on:
 - You?
 - Your business?
 - Your quadrant or community?
 - The City?
2. Regarding the potential Airport Trail underpass:
 - What would “yes” look like or mean to you?
 - What would “no” look like or mean to you?
3. Considering the underpass, what are your thoughts on:
 - Cost/Benefit/Value
 - Timing
 - Scope
 - Budget/Financing/Priorities
 - Connections to the project
 - Personal social responsibility to all Calgarians
 - Anything else?

Their thoughts and comments were recorded by facilitators, and appear below.

1. Barlow Trail Closure:

To start discussions, the groups considered the impacts of the closure of Barlow Trail. Through these discussions several content areas emerged, beyond the immediate question of who will be impacted.

Existing infrastructure

- Concerns about the stress on the existing infrastructure with existing and future traveller loads when Barlow Trail is closed
- Potential for greater accidents on fewer roads
- What is the status of the widening of Country Hills Blvd from Barlow Trail to Métis Trail?
- Now 64 Avenue + Métis Trail are only one lane each way, and intersection upgrades should be finished by 2011 April 3 when Barlow Trail closes
- With the closure of Barlow Trail, McKnight Boulevard will be busier, given that many of the vehicles from Barlow Trail will be using McKnight Boulevard. However, most traffic will take Deerfoot Trail with some on 36 Street (until Métis Trail is finished up to Country Hills Boulevard)

Access

- There are concerns about emergency services accessing anywhere in the NE area, as well as for people getting to work, particularly to the airport
- Stoney Trail is alternative route. There are questions about how efficient it will be
- Country Hills Boulevard has lots of congestion now and it will only increase after Barlow Trail closes
- NE seniors are already concerned about their access points – they don't want to travel on Deerfoot Trail or Stoney Trail
- Access in and out of the airport to the downtown core will be more difficult
- 36 Street closed with snow – restricted access to Calgary International Airport
- Two access points = 36 Street and 68 Street while Métis Trail under construction
- Congestion
 - Time to get around the closure
 - Business outside the city – people travelling to the city
- Restricted access to NE due to changing traffic patterns
- Access to downtown hotels for convention business – ripple effects
- Commute time likely to increase from 30 minutes to 50 minutes
- If 36 Street was as good as Barlow Trail, it may not be as big a deal. If it was upgraded and maintained properly, it could serve as an alternative.
- NE residents have already changed their commute times because of traffic congestion/volume to the airport, and it will only get worse with the closure of Barlow Trail
- Can the closure of Barlow Trail be delayed?

Impact of business

- There will be a negative impact on south Barlow Trail businesses and a loss of competitive advantage for hotels in that area
- Impact on businesses
 - The visitor experience – hotels
 - Added cost – amount of transportation dollars the hotels will have to pay to get around
 - 1/3 of all hotels in area (NE area from 49th to 16th)

- Study has shown \$1.4million added to area hotel costs with the closure
- Added business delivery costs – for transportation gas and staff time, delivery costs, etc
- Changing shopping patterns due to changing traffic patterns – loss of convenience passing shoppers, heading elsewhere

Plan for Calgary

- Area Structural Plan (ASP) should mean that 96 Avenue goes from Deerfoot Trail to Stoney Trail
- Don't allow the closure to happen. The City has a responsibility to provide access for the whole of the city. Why did/does The City allow The Airport Authority to close off Barlow Trail?
- The Community Associations have been dealing with traffic issues in the NE for nine years, and are keen to see improvements.
- Transportation is a priority of the Calgary Chamber of Commerce
 - the airport access will affect the city
 - the underpass is seen as a potentially transformative project
 - Two issues:
 - Alignment with overall direction/plan of the City
 - How does it fit in with overall transportation plan?
 - Budget/cost?
 - Financial plan – How is it going to be paid for?

Costs

- Costs more to do an interchange at Country Hills Boulevard and Métis Trail than an underpass
- What is the cost of lease the use of the underpass or right of way (ROW) and maintenance cost?
- Business and property tax impacted – concerns about decreased land value and therefore less tax to The City, but also potential for decreased value of the businesses in the NE area

Other

- Is the runway needed now? Is the opportunity to continue collecting the improvement fee driving this timeline?
- Lack of communication about where traffic will go

2. The “Yes” and “No” consequences:

Moving from focussing on the closure of Barlow Trail, discussions moved to look at how participants viewed the consequences of either building or not building an underpass.

What would it look like if the underpass goes ahead?

- The North East Area Transportation plan will be working, as per the plan that has been in place a long time.

What would it look like if the underpass does not go ahead?

- A lot more congestion until some real solution is in place
- Concerns about impact on Country Hills Boulevard — can the existing road network handle future traffic?

- If not now, then likely never If it is postponed, it will have to be built anyway
- Concern about ability to service existing and increasing international airport needs
- Increased cost of building it later
- It would kill any LRT until North/Central line is built
- It will kill the big vision idea of the city – the city’s vision of being a great city will be affected by having no underpass.
- Future: added business and traffic: problems now will only be amplified in the future
- Not just access to the airport but around the airport as well, for staff and others
- Commercial vehicle traffic will be affected – a lot comes in and out of the airport and the industrial lands
- Air freight on new runway – more freight will need to be delivered once new runway open
- If not built, problems will be magnified – future traffic/business/population

And underneath both “yes” and “no” are two debates:

- A. The tension between more, smaller roads with many connecting intersections versus fewer larger roads with fewer but larger connecting intersections.
- B. Can/will The Airport Authority delay their timeline to facilitate the building of the underpass, if it is required?

3. Potential Underpass Thoughts:

Discussions about the potential of an underpass were extensive and thoughtful, with many thoughts raised in each of the three groups.

Project

- It is very important that The City gets proper costs and schedule to build to the proper specifications – do it right the first time
- Many Calgarians believe it will affect them – that this is not just a NE issue – it is a whole-of-Calgary issue if it is not built
 - E.g.: A Shaughnessy resident has to travel to the airport, taking day trips out of Calgary International Airport. The length of time it will take him to drive will be greatly increased with the closure of Barlow Trail.
 - Access at Edmonton International Airport is much easier than Calgary International Airport.

Value

- Question the value for money for all Calgarians
- The underpass is cost effective, based on all the discussions tonight

Timing

- Concern about the timing – if not now, then not likely due to logistics and cost, and dramatic changes in the required scope of the project
- Is it possible for the underpass to be built if the runway is already in place?
- Bare minimum – at least the structure should be in place now, if not any of the additional roadwork
- Strong concern that if we don’t get it now, we won’t get it

Scope/Plan

- The east/west connection is part of the larger plan for the City of Calgary
- The underpass is justified in that it will support development of the area

Scope/Access

- Will the underpass provide better access to the city?

Scope/LRT access

- Can the Centre LRT access provide better public transport access (over Deerfoot Trail) than this underpass?
- It is important that the potential for LRT be included in the project. The only way the LRT will go to the airport is via the underpass.
- The underpass is supported by increasing LRT options

Funding

- Questions/challenges around financing model. Considered options include:
 - Toll road
 - P3
 - Conventional
 - Borrowing
 - Shifting Federal/Provincial funding
 - Special business/property taxes for NE
- Open to idea of toll if it gets it done

Connections to the project/Tourism

- Calgarians flying out of and arriving back into Calgary will react to increase in time to travel to and from the airport
- Additional expense to hotel owners with increase in traffic
- Concerns that people flying into Calgary will have a less positive image of the city because of the increased traffic congestion/volume, and this might affect people actually coming to Calgary

Connections to the project/NE communities

- Community Associations are often asked by their residents about the status of the underpass
- the volume of traffic to Calgary International Airport increased has increased in recent years, and will continue to in the future, given there will be more people in the NE area through housing and industry developments

Other

- Increase in greenhouse gas emissions with the increase in traffic congestion
- Tunnel north into the terminal to facilitate north/south movement of traffic.

Summary from Previous Council and LPT Reports:

<u>Date</u>	<u>Report No. and Name</u>	<u>Outcome</u>
2008 July 23	LPT2008-50 96 Avenue - Airport Trail Runway Crossing	Continue working with the Federal and Provincial Governments to secure funding for the project.
2008 November 3	C2008-65 96 Avenue/Airport Trail runway crossing - Update Report (LPT2008-50)	Update report on airport trail runway crossing.
2009 February 23	C2009-15 Calgary Airport Authority/City of Calgary Agreements and Legislation	Report on governance of the Calgary Airport Authority.
2009 April 06	C2009-23 Status Update on Preliminary Design for Airport Trail	Update to cost estimate and status of preliminary design.
2009 June 10	LPT 2009-43 Status Update on Cost Estimate for Airport Trail/96 Avenue N.E.	Update to cost estimate. (<i>Excerpt table on page 2</i>)
2009 November 18	LPT 2009-70 Northeast Transportation Network - Status Report	Update on Northeast Calgary Transportation Network.
2010 May 17	C2010-28 96 Avenue N.E./Airport Trail Tunnel	Airport Trail easement and cost estimate.
2010 May 17	C2010-29 Northeast Calgary Transportation Network Review	Directed Admin to report back to Council on June 7 with scope, work program implications and estimated cost for a review of the transportation network in NE Calgary.
2010 June 07	C2010-32 Northeast Calgary Transportation Network Review - Supplemental Report	Terms of reference for a study to review and prepare a report on Northeast Calgary Transportation Network.
2010 July 19	C2010-50 Construction of Airport Trail Tunnel	Timing of Airport Trail tunnel under the new runway and the limited term options available for design and construction.
2010 November 08	NOM2010-42 Airport Trail Underpass Project	Administration is directed to immediately commence negotiations with the Calgary Airport Authority to identify the process to construct the underpass.
2010 December 13	C2010-74 Airport Trail Easement Agreement - Deferral Request	Request to defer airport tunnel (underpass) easement agreement report.

Table of costs from LPT 2009-43:

Stage	Description	Seg. Tunnel (millions)	Cont. Tunnel (millions)
1	4-Lane Airport Trail	\$26	\$26
	1 Runway Bridge	\$43	-
	2 Taxiway Bridges	\$35	-
	Continuous Tunnel	-	\$172
TOTAL Stage 1		\$104	\$198
2	2 additional lanes for Airport Trail	\$5	\$5
	Interchanges 19 St., Barlow Tr. & 36 St.	\$74	\$74
	*Other Structures	\$117	\$117
TOTAL Stage 2		\$196	\$196
3	Future Taxiway	\$18	-
TOTAL Stage 3		\$18	\$0
GRAND TOTAL		\$318	\$394

* includes inbound/outbound roads and other bridge structures and ramps for accessing the airport terminal.

Factors in the above calculations included:

- Tunnel length = 720 metres.
- The "Future Taxiway" would not be part of the Runway Development Program and would be built at a later date.

Table of costs from C2010-50 – Attachment 5

Comparison of Airport Trail Tunnel Options

Strategy	Description	Inter-changes	Cost, \$Millions (2009 Dollars)		Total Cost Millions	Net Present Value	Pros	Cons	Interchanges		
			2011+	2025	(2009 Dollars)	\$Millions			Service	System	
1	No tunnel	5**	27***	320***	345	480	<ul style="list-style-type: none"> - minimal infrastructure investment (widening Country Hills Blvd only) serves short term traffic demand - minimal impact on 10 year capital program (Council approved priority projects can proceed as scheduled) 	<ul style="list-style-type: none"> - only two links to terminal - more expensive to bore later 	4	1	
tunnel	2	Bore twin tunnels later with road connections 2025+	5**	-	1020	1020	1435	<ul style="list-style-type: none"> - provides 3rd link to terminal - better distribution of traffic in airport area 	<ul style="list-style-type: none"> - highest cost - would account for about 60% of anticipated funds available in next 10 year capital program - tunnel road may be closed in the future for security reasons 	4	1
	3*	Pre build cut tunnel & road section Construct a 515 metre open cut tunnel & a 4 lane road between Barlow Tr & Metis Tr	5**	200	300	500	620	<ul style="list-style-type: none"> - provides 3rd link to terminal - better distribution of traffic in airport area - lowest cost tunnel option 	<ul style="list-style-type: none"> - will defer existing high priority TIIP projects (possible examples: TCH & Bowfort, Glenmore Trail East) - tunnel road may be closed in the future for security reasons - possible impact on runway schedule 	4	1

Notes:

- * Commitment for open cut tunnel required by July 2010
- ** To facilitate traffic flow around airport lands, up to five additional interchanges may be required in the future
- *** Includes extra \$27M to upgrade CHB from Deerfoot Trail to Metis Trail, 2 to 4 lanes, and extra \$50M for interchange land at CHB and Barlow Tr
4 lane sections assumed for all strategies

BYLAW NUMBER 1B2011

**BEING A BYLAW TO AUTHORIZE THE CITY OF CALGARY TO INCUR
INDEBTEDNESS BY THE ISSUANCE OF ONE OR MORE
DEBENTURES IN THE TOTAL AMOUNT OF \$173 MILLION FOR
FINANCING THE AIRPORT TRAIL UNDERPASS FOR THE
TRANSPORTATION DEPARTMENT**

WHEREAS Council of The City of Calgary (“Council”) has approved Report C2011-05 relating to the Airport Trail Underpass;

AND WHEREAS the Airport Trail Underpass for the Transportation Department (“the Project”) is estimated to cost \$294.8 million;

AND WHEREAS it is estimated that \$121.8 million of the total cost will be financed from sources other than debenture borrowing;

AND WHEREAS Council has decided to pass a bylaw pursuant to Section Nos. 251 and 258 of the *Municipal Government Act* (R.S.A. 2000 c. M-26) (“the MGA”) to borrow the sum of \$173 million from Alberta Capital Finance Authority (“ACFA”) by the issuance of debentures for financing of the Project;

AND WHEREAS the Municipal Sustainability Initiative (“MSI”) represents the Province of Alberta’s commitment to work in partnership with municipalities by providing sustainable funding for various purposes;

AND WHEREAS the estimated lifetime of the Project financed under this Bylaw is equal to, or in excess of seven (7) years;

AND WHEREAS the amount of the long term debt of The City as at 2010 December 31 (unaudited) is \$2,869 million with \$437 million being tax supported debt, \$614 million self-sufficient tax supported debt and \$1,818 million being non tax supported debt and no part of the principal or interest is in arrears;

AND WHEREAS all required approvals for the Project will be obtained to ensure the Project is in compliance with all the laws in force in the Province of Alberta.

**NOW, THEREFORE, THE COUNCIL OF THE CITY OF CALGARY ENACTS AS
FOLLOWS:**

1. The proper officers of The City are hereby authorized to issue one or more debentures on behalf of The City in the amount of \$173 million as authorized by this Bylaw.
2. The City shall repay the indebtedness according to one of the following repayment structures in effect:
 - (a) repay semi-annual equal principal and interest installments over a period not to exceed seven (7) years calculated at a rate not exceeding the interest rate fixed by the lender on the date of the borrowing; or

- (b) pay interest, principal, fees and deposits when due and as required on the indebtedness not to exceed seven (7) years in total at rates not exceeding the interest rate fixed by the lender on the date of the borrowing.
- 3. The City shall pay the principal amount, and the interest amount if eligible, from MSI funds. In the event of any deficiency, The City shall levy and raise municipal taxes sufficient to pay the indebtedness.
- 4. The indebtedness shall be contracted on the credit and security of The City.
- 5. The net amount borrowed under this Bylaw shall be applied only to the Project specified by this Bylaw.
- 6. This Bylaw comes into force on the date it is passed.

READ A FIRST TIME THIS ___ DAY OF _____, 2011.

READ A SECOND TIME THIS ___ DAY OF _____, 2011.

READ A THIRD TIME THIS ___ DAY OF _____, 2011.

MAYOR
SIGNED THIS ___ DAY OF _____, 2011.

CITY CLERK
SIGNED THIS ___ DAY OF _____, 2011.