

ARUP



DIALOG

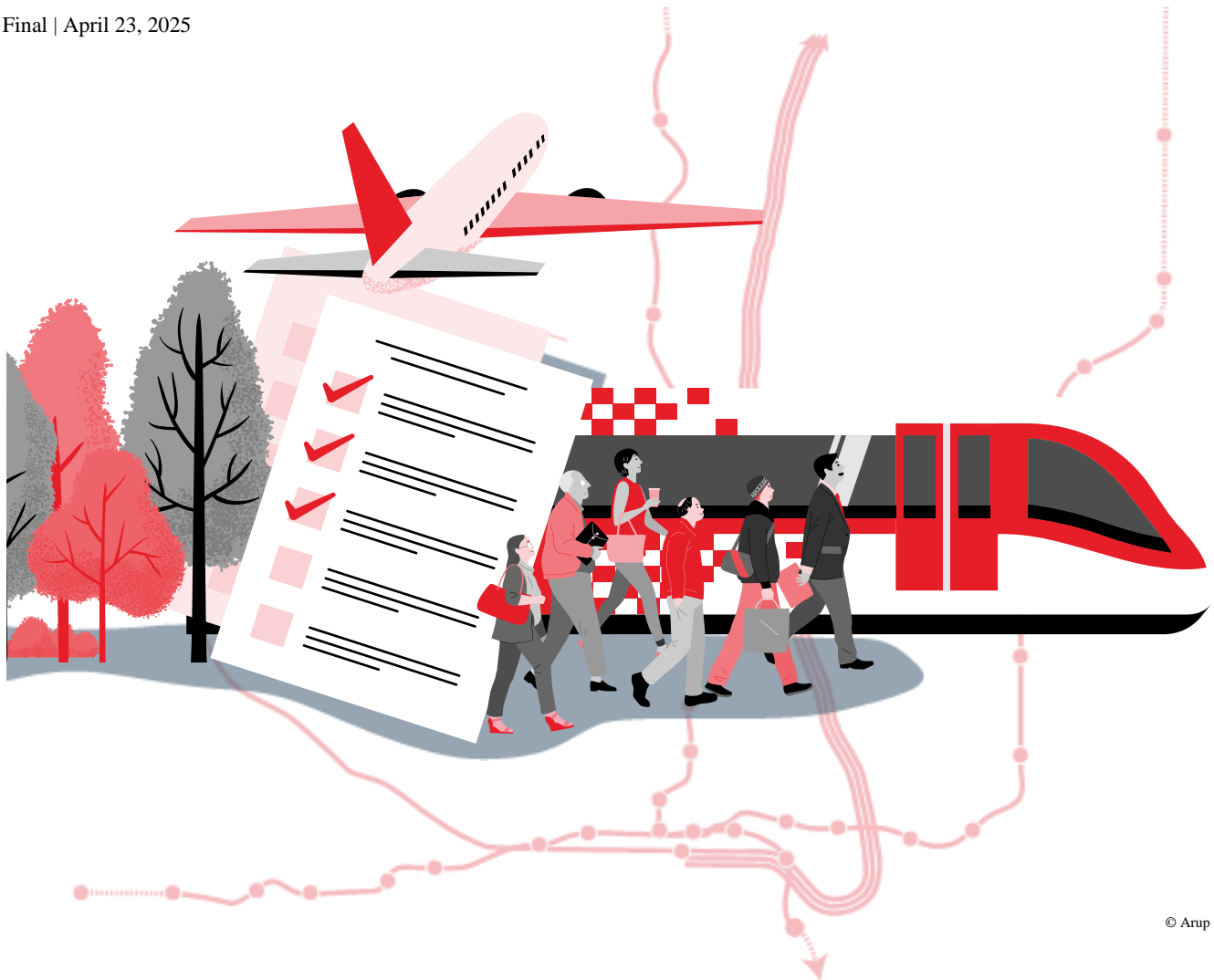


City of Calgary

Calgary Airport Rail Connection Study

Executive Summary

Final | April 23, 2025






© Arup

Job number 297775-00

Arup Canada Inc.
685 Centre Street SW, Suite 1670
Calgary, AB T2G 1S5
Canada
arup.com

Document Verification

Project title Calgary Airport Rail Connection Study
Document title Executive Summary
Job number 297775-00
Document ref
File reference

Revision	Date	Filename		
Draft Issue 1	February 6, 2025	Description	Draft final report summarizing all Study activities, including memos delivered throughout the Study, as appendices.	
			Prepared by	Checked by
		Name	Julia Seck Stuti Manchanda Boer Cui	Daniel Haufschild
Draft Issue 2	April 4, 2025	Description	Draft final report incorporating comments received.	
			Prepared by	Checked by
		Name	Julia Seck Stuti Manchanda Boer Cui	Daniel Haufschild
Final Version	April 23, 2025	Description	Final version of Study Final Report.	
			Prepared by	Checked by
		Name	Julia Seck Stuti Manchanda Boer Cui	Daniel Haufschild Tim Corcoran
		Signature		
				

Issue Document Verification with Document



PERMIT TO PRACTICE
ARUP CANADA INC.

RM SIGNATURE: _____

RM APEGA ID #: 243750

DATE: 2025-05-21

PERMIT NUMBER: P011283

The Association of Professional Engineers and
Geoscientists of Alberta (APEGA)

Contributors

Client	
Project Manager	Alex Saba
Project Director	Francois Bouchart, Ryan Vanderputten
Subject Matter Experts (City of Calgary)	Asif Kurji, Nancy Scott, Liming Sun, Graham Gerylo, Jessica Clement
Study Partner	
Government of Alberta	Rob Lonson, Chris Gentile, Darcy Kolodnicki, Joshua Mackintosh
Arup	
Project Manager	Daniel Haufschild
Deputy Project Manager	Kevin Yeung
Rail Planning and Operations Workstream	Trevor Anderson (Lead), Cai Lin Yang, Sabrena Ohi, Robert Boronea, Boer Cui, Stuti Manchanda, Jenny Zhou, Shelly Huang, Ldya Tekle, Kenan Rijleh, Diana Rivadeneira
Rail Alignment Design Workstream	Simon Stephenson (Lead), Tim Corcoran (P.Eng.), Julia Seck, Ugur Akpinar, Luv Seghal, Raphaelle Barbier Saint Hilaire, Reuben Stewart, Farah Al-Hadeethi, Scott Gann, Morgan Hobson
Subconsultants	
K I Squared Advisory	Ian Druce (Strategic Advisor), Dan Gomez-Duran (Ridership), John Forsdick (Input Committee Facilitator)
Dialog (Stations Design)	Georg Josi, Sandra Renihan, Martin Jones, Doug Carlyle, Paul van Ellenberg, Ben Hackman, Behnam Mahdoudi
Dillon (Environmental)	Jeff Quennelle, Blaine Standing
Navigator (Public Affairs and Communications Support)	Catherine Moar, Alistair Morton

This document was prepared by Arup Canada Inc. (“Arup”) for the benefit of The City of Calgary solely in its capacity as Consultant pursuant to an Agreement dated October 2, 2023. This report takes into account the particular instructions and requirements of The City in the agreed Scope and Fee Schedule for the Calgary Airport Rail Connection Study. Arup (a) makes no warranty, expressed or implied, with respect to the use of any information or methods disclosed in this document; and (b) assumes no liability with respect to the use of any information or methods disclosed in this document. Any third-party recipient of this document, by its acceptance or use of this document, acknowledges there is no contractual relationship between Arup and the third-party, and no responsibility is undertaken to any third-party.

Executive Summary

Study Purpose

In 2020, Calgary City Council approved the Airport Transit Line Study which proposed a transit connection between the Blue Line LRT and Green Line LRT on Airport Trail/96 Avenue NE via the Calgary International Airport. The connection also included a Multi-modal hub that enables a connection to future regional rail services. Since then, private rail developers have proposed projects to the Government of Alberta via their Unsolicited Proposal Framework that would also connect downtown Calgary to the airport, including the Calgary-Banff/Bow Valley passenger rail project and two high-speed connections between Edmonton and Calgary.

As a result, The City of Calgary, in partnership with the Government of Alberta, conducted this study to identify the optimal airport-downtown rail connection. This study considered City and Provincial objectives, and private sector proposals to achieve a long-term vision for rail access connecting the downtown to the airport, including proposed connections to the future Green Line LRT, Blue Line LRT, as well as connections to Edmonton and the Bow Valley as part of a potential integrated regional rail network.

Initiation and Context

The Calgary Airport Rail Connection Study builds on the 2020 Airport Transit Line Study, which identified the importance of linking Calgary International Airport with the Blue and Green LRT lines. The preferred alignment connects the future Blue Line station at 88 Avenue Northeast to the Green Line station at 96 Avenue Northeast, improving access between the airport and northeast and northwest Calgary. The study also identifies a future multi-modal hub near the airport, designed to support future regional and high-speed rail connections and align with the RouteAhead vision for an integrated network. Calgary's airport campus is a major economic generator and employment centre, and improved transit access will support workforce mobility and long-term growth.

The Calgary Airport Rail Connection Study was jointly initiated in 2023 by The City of Calgary and the Government of Alberta, with \$3 million in provincial funding. The final report includes functional drawings, and recommendations to inform future planning and the province's Passenger Rail Master Plan. The Study Team included Arup and The City of Calgary, with the Government of Alberta as a Study partner. The City of Calgary led the Study, with Arup as The City's engineering consultant to undertake the planning, analysis, and design.

Study Objectives

The objectives of the Calgary Airport Rail Connection Study included:

- **Develop The City's long-term vision for rail access** between Downtown Calgary and the Calgary International Airport, considering connections to Edmonton, Bow Valley and Banff;
- **Establish a collective understanding of route options and ridership opportunities** for a rail connection between Downtown Calgary and the Calgary International Airport;
- **Progress planning, design, and assessment to establish an optimal functional route** through a technically and physically constrained corridor;
- **Analyze benefits, costs, opportunities, and risks of route and station options** to help guide short to long-term transportation and land use planning; and
- **Provide clear direction for where investment should be focused initially** to support a service that will be valued by customers and respects taxpayers' investment

Input Committee

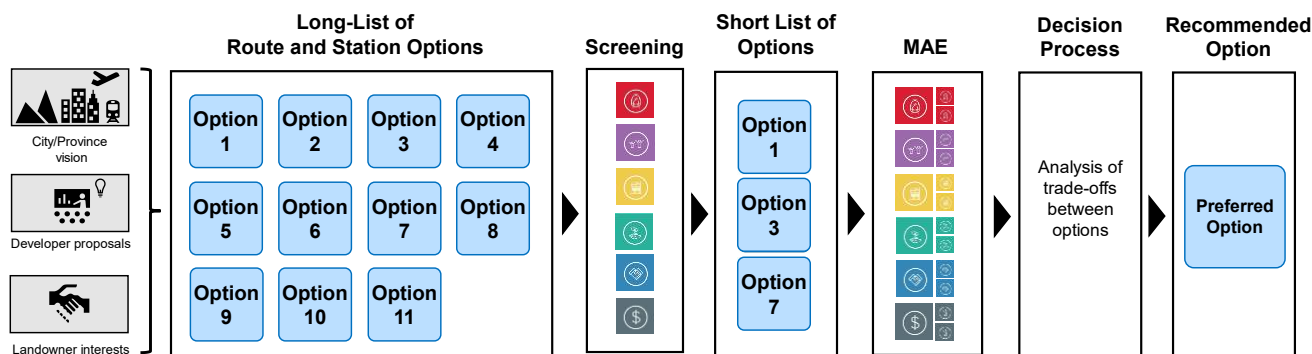
To ensure a collaborative and comprehensive approach, an Input Committee was established with representatives from the Government of Alberta and City of Calgary as co-chairs. The Input Committee included representatives from the Calgary Airport Authority and Canadian Pacific Kansas City Railway as key landowners, the Canada Infrastructure Bank, and the private rail developers, including Liricon/Plenary, Prairie Link, and TransPod. The intent of the Input Committee was to provide technical inputs and advice to the Study Team on topics including alignment and station options, technology-specific plans and requirements, multiple account evaluation, and the recommended option. There were six meetings to provide opportunities for input throughout the various stages of study work program. The input from the Input Committee has informed the Study Team's recommendations by ensuring alignment with interest-holder needs, technical feasibility, and best practices.

Study Process

Figure ES-1 summarizes the overall process to develop and identify the optimal rail connection between downtown Calgary and the Calgary International Airport. The Study Team developed a long list of route options, which were informed by The City's vision, developer proposals, key landowners interests, and a review of global best practices from airport rail connections in North America and Europe. Each option was evaluated using a Multiple Account Evaluation process, which assessed the options based on several accounts backed by evidence and reasoning from various technical and financial analysis. The Study Team referenced the results of the previous public engagement carried out for the 2020 Airport Transit Line Study to inform the Multiple Account Evaluation process. The previous engagement identified that key priorities for Calgarians included: integration with existing transit systems, speed, cost-effectiveness, and accessibility. The Multiple Account Evaluation built upon the evaluation framework used for the 2020 Airport Transit Line Study by reusing the same major accounts that captured these priorities, with updates on the specific criteria associated with each account to align with current City, Province, and key landowner policies, plans and objectives. The Multiple Account Evaluation included criteria under the following major accounts: transportation, community well-being, urban development, environmental, feasibility and developability, and financial capacity.

A shortlist of three options was selected through a screening process that used a subset of Multiple Account Evaluation criteria. The short list of three options were subsequently assessed against the Multiple Account Evaluation framework, allowing the Study Team to draw insights on the trade-offs to facilitate the selection of the preferred option.

Figure ES-1: Study Process



Source: Arup

Project Vision

Through engagement with The City and members of the Input Committee, the Study Team articulated the following Project Vision and Objectives for the Calgary Airport Rail Connection:

*The Calgary Airport Rail Connection will provide a **convenient, fast and frequent, and reliable** rail transit service between downtown Calgary and the Calgary International Airport, providing a **seamless connection** for all those who live, work, and travel within the city.*

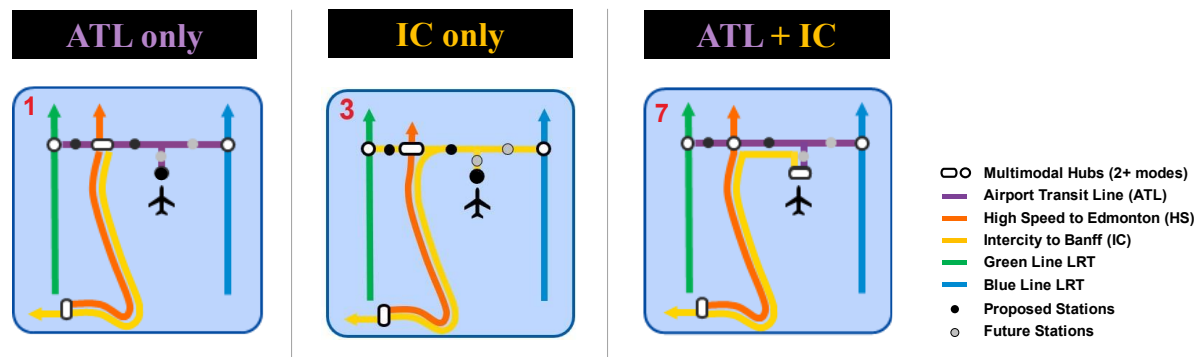
An optimal rail transit service will:

- Support a **modal shift** away from automobiles for people wanting to access airport lands, with key stops **in areas surrounding the Calgary International Airport**
- Provide a **safe, accessible, and affordable** ride for all those using the transit service
- **Integrate seamlessly** with The City's Primary Transit Network and activity centres, including an **East-West connection between the Green and Blue LRT** line extensions
- Enable a downtown to airport service within the next decade that supports rail services between Calgary and its **regional communities, Edmonton, and the Bow Valley**
- Promote economic development by ensuring **efficient movement of goods**, including within the Canadian Pacific Kansas City Railway corridor
- Accommodate the future **growth, expansion, and land development** opportunities in the city and the vicinity of the airport
- Support a service that will be **valued by customers and respects taxpayers' investment**

Shortlisted Options

Three options were shortlisted from the long list of options for a more detailed assessment against the complete Multiple Account Evaluation criteria. These shortlisted options offer different approaches to achieve the project vision which are described below and presented schematically in **Figure ES-2**.

Figure ES-2: Shortlisted options for the Calgary Airport Rail Connection



Source: Arup

All options include a double-track passenger railway adjacent to the Canadian Pacific Kansas City Railway corridor to allow for high-speed and intercity trains to operate on tracks separated from freight trains between the proposed Multi-modal Hub and the Downtown Station. The shortlisted options are defined as:

- **Option 1 Airport Transit Line** reflects the alignment of the City Council approved 2020 Airport Transit Line study and consists of an east-west line that connects to the proposed Green Line LRT station at 96 Avenue NE / Harvest Hills Boulevard, the airport terminal, and the proposed Blue Line LRT station at 88 Avenue NE / 60 Street NE. The Airport Transit Line would connect to intercity and high-speed rail services operating in north-south at a Multi-modal hub. Passengers on the intercity or high-speed rail service from downtown Calgary would need to transfer at the Multi-modal hub to access the airport.

- **Option 3 Intercity** consists of an east-west line that can accommodate intercity trains between the Green Line, the airport terminal, and Blue Line, plus a spur that connects to the Canadian Pacific Kansas City Railway corridor that enables intercity trains from downtown to **directly access the airport terminal on shared infrastructure.**
- **Option 7 Airport Transit Line and Intercity** consists of both the ATL and IC services serving the airport terminal. It includes the east-west service, and the intercity service between downtown Calgary and the airport terminal operating on separate infrastructure.

All options in this study assumed a Downtown Station located at the Government of Alberta lands in the vicinity of 4 Street SE and 6 Street SE. Options for intercity rail services west of the Downtown Station would be assessed in future studies.

The main differentiators across the shortlisted options are related to the connection to the airport terminal. These differentiators include passenger experience, level of service, airport land impacts, regional rail integration, delivery flexibility, ridership, and costs. Each option has trade-offs related to these differentiators. Of the three options, Option 7 (Airport Transit Line and Intercity) was not recommended. This option has additional capital costs and greater impact to airport lands to accommodate separate infrastructure for multiple rail systems to the airport, for a relatively small increase to overall ridership, revenue, and passenger experience. Also, due to the multiple level station requirement associated with Option 7, this would have necessitated a change in station location that would impact future development plans for the Calgary Airport Authority. Both Option 1 (Airport Transit Line) and Option 3 (Intercity) provided alternate approaches by prioritizing different project objectives but would ultimately achieve the project vision with similar capital costs.

Preferred Option

Based on the Multiple Account Evaluation and through consideration of the trade-offs, **Option 3 (Intercity) was selected as the preferred option for the Calgary Airport Rail Connection.**

Figure ES-3 provides an overview map of the preferred option's alignment and stations. Proposed stations include:

- **Downtown Station** located at the Government of Alberta lands in the vicinity of 4 Street SE and 6 Street SE
- **Transfer Station with the Green Line** where the east – west service connects with the future Green Line
- **Aurora Station** to serve the planned Aurora Lands, between the future Green Line and the Multi-modal Hub
- **Multi-modal Hub** located west of the Deerfoot Trail where the east-west service connects with regional rail services to Airdrie and Edmonton
- **Aero Drive Station** to serve the commercial uses located along Aero Drive
- **Airport Station** with a direct connection to the international and domestic terminals
- **Transfer Station with the Blue Line** to connect with the future Blue Line extension

Future stations have also been proposed as intermediate stations along the proposed alignment:

- Ground Transportation Hub (future station location to be confirmed in collaboration with the Calgary Airport Authority)
- 36 Street NE station

Figure ES-3: Concept plan of the preferred option

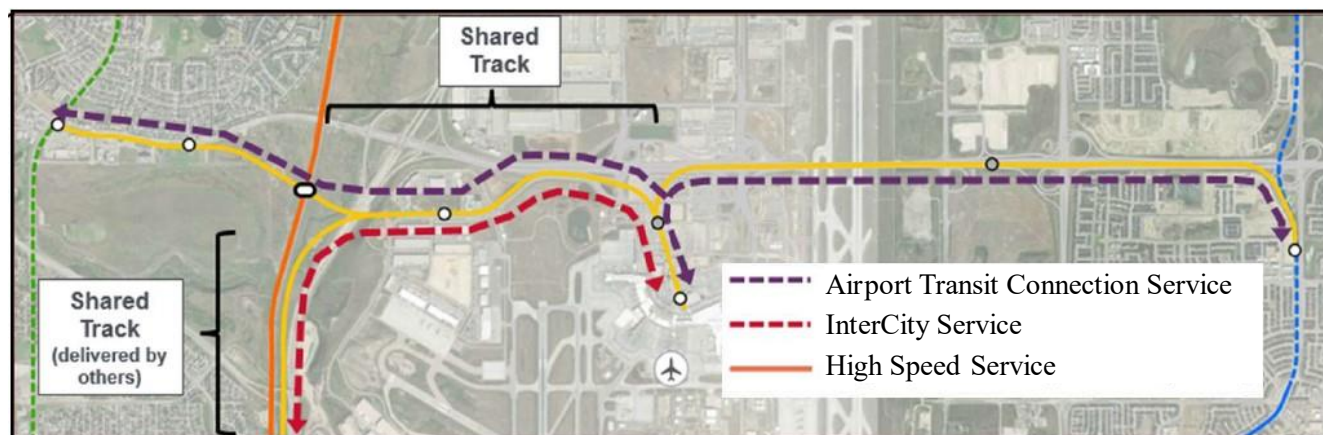


Source: Arup

This option was selected, noting that:

- Capital and operating and maintenance costs for both options at full build-out are significant relative to revenue from ridership;
- The infrastructure allows for a direct airport to downtown rail service (similar to UP Express in Toronto and Canada Line in Vancouver), and enables direct integration with the potential regional rail network; and
- Phasing the network in the short to medium-term and preserving flexibility for the rail services and technologies that can be operated in the future (as shown in **Figure ES-4**, with options for track sharing) could improve the business case and potential for partnerships.

Figure ES-4: Delivery of the preferred option in phases and locations of track sharing



Key attributes and implications of the preferred option are summarized below:

- **East-West Connection:** Building on findings from the 2020 Airport Transit Line Study, the preferred option ensures that the east-west connection between the Green Line LRT, Blue Line LRT, and Calgary International Airport remains intact, linking northeast and northwest Calgary communities where 60% of the demand was identified. At full build-out, the preferred option enables up to 8 trains per hour (one train every 7-8 minutes) between the Green Line LRT, the airport, and the Blue Line LRT.
- **Direct Airport-Downtown Link:** The alignment does not preclude a direct connection between the airport and downtown Calgary, preserving opportunities for enhanced connectivity. The alignment was modified from the 2020 Airport Transit Line Study (including larger radii) to allow for regional rail services to serve the airport in the future, which would be delivered by private rail providers. At full build-out, this option enables up to four trains per hour (one train every 15 minutes) between downtown Calgary and Calgary International Airport.
- **Regional Rail Compatibility:** The proposed rail infrastructure design ensures that future expansions for intercity and regional rail remain viable, supporting broader transit integration.
- **Phasing Flexibility:** This preferred option allows for phased development to allow incremental expansion as funding becomes available. It also enables prioritization of the east leg that would connect the Blue Line LRT to the Calgary International Airport.

Cost estimates of the preferred option are provided separately for the East-West Connection and the Airport-Downtown Link (North-South Corridor). For the East-West Connection, cost estimates are provided for the three segments to reflect the assumed phasing for this alignment (starting with the Blue Line LRT to Calgary International Airport segment followed by the Calgary International Airport to Multi-modal Hub segment, then followed by the Multi-modal Hub to Green Line LRT segment). For the North-South Corridor, the base cost estimate assumes an alignment which is elevated along the Canadian Pacific Kansas City Railway corridor from the Downtown Station to Memorial Drive and transitions to at-grade south of Memorial Drive and continues until Country Hills Boulevard NE.

Next Steps

This Study has identified a functional concept that would be subject to further refinement and design. The Final Report from this Study will also be shared with the Government of Alberta to inform the ongoing Passenger Rail Master Plan.

ARUP



DIALOG®



Contact

Daniel Haufschild

Principal

t +1- 403-537-3910

e Daniel.haufschild@arup.com

Arup Canada Inc.

685 Centre Street SW, Suite 1670

Calgary, AB T2G 1S5

Canada

arup.com