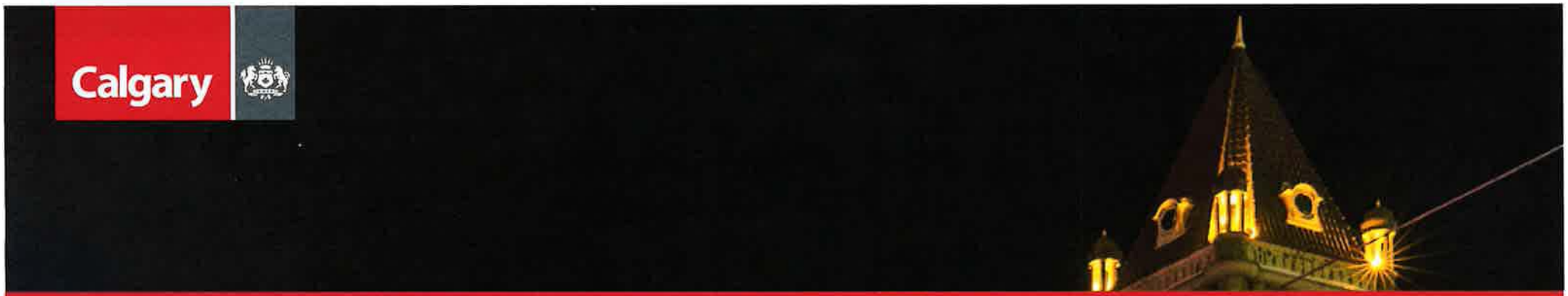


Airport Transit Line Study

Transportation Report to SPC on Transportation and Transit
June 24, 2020

Alex Saba
Sr. Transportation Engineer

Agenda

- Background
- Customer Experience
- Public engagement
- Recommended alignment and cost
- Airport transit mode progression
- Airport transit ridership
- Transit technology
- Administration recommendation
- Questions

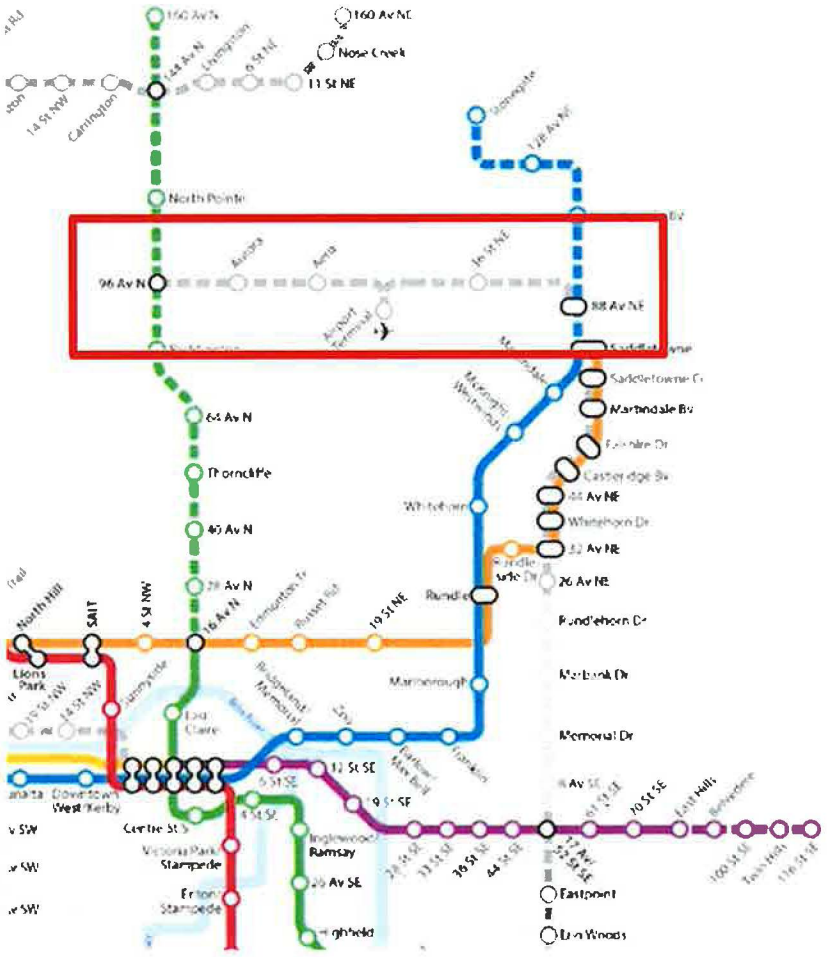
Background

Previous Council Direction/Policy

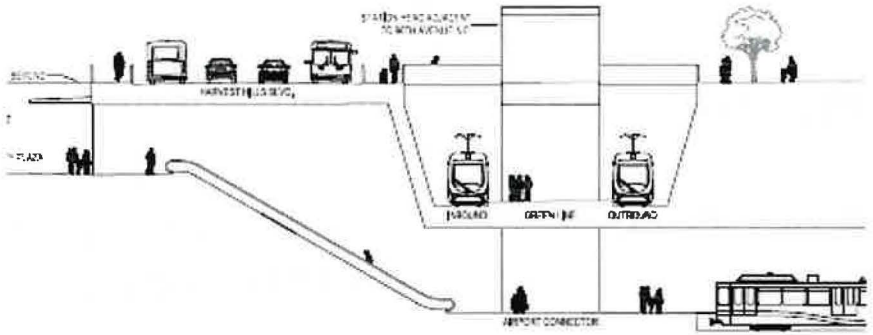
- Airport Trail Functional Planning Study
- Functional Planning Study for the Blue Line extension
- Green Line LRT Alignment and Stations

Other Initiatives

- Aurora Business Park's Area Structure Plan update
- Calgary Airport Authority Master Plan update
- Passenger rail service between Calgary and Banff



Customer Experience



Experience	Current	Future
Transit Trip to Airport	Bus service	Rail service
Reliability	Mixed traffic	Dedicated track
Fleet Capacity (passenger per hour per direction)	240	3600
Station Transfer Environment	Standard shelters	Covered structure integrated with LRT
Comfort and Convenience	Dedicated buses outfitted with luggage racks	Dedicated fleet to accommodate luggage

Public Engagement

Stakeholders

- Calgarians
- Calgary Airport Authority
- Alberta Transportation
- Area developers
- Landowners along the alignment

Engagement

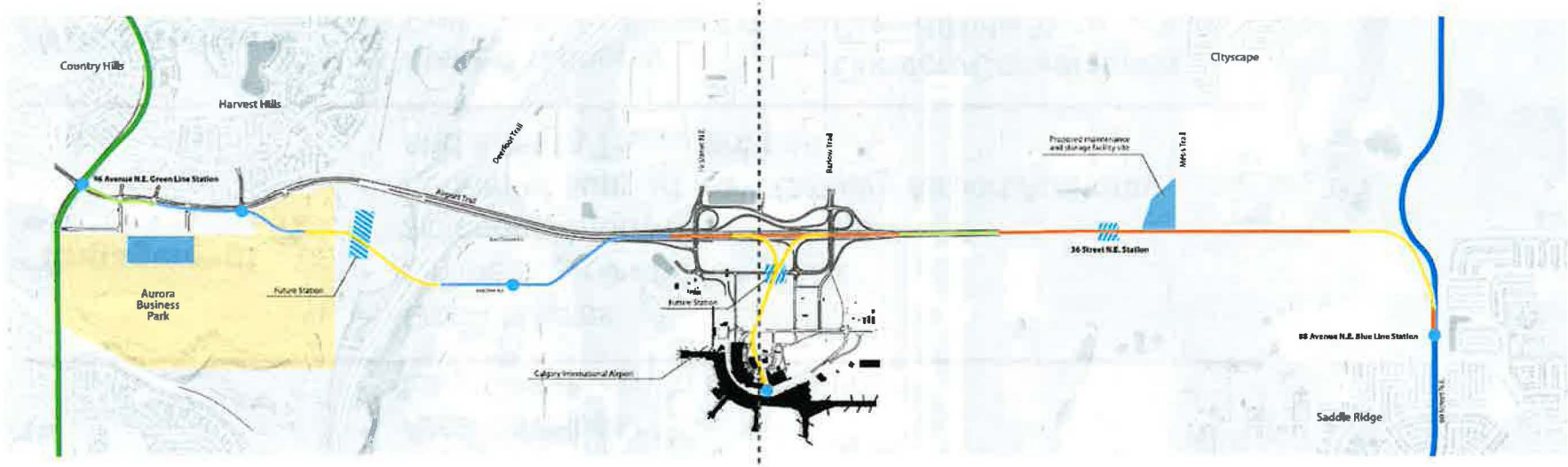
- Open houses
- Online survey and feedback
- Adjacent landowner meetings
- Letters of support from Calgary Airport Authority and Alberta Transportation

What we heard

- Make it a priority
- Rail is best
- Eliminate transfers

- Comfort/Convenience
- Speed/Ride Time
- Service demand flexibility
- Integration with transit network

Recommended Alignment and Cost



West Leg: YYC to Green Line

- Approx. $500M to $1B capital cost
- Approx. $20.5M annual operating cost
- Estimated peak service frequency: every 4.5 minutes

East Leg: Blue Line to YYC

- Approx. $400M to $800M capital cost
- Approx. $14.5M annual operating cost
- Estimated peak service frequency: every 4 minutes

Estimates provided are Class 4 costs which are accurate to within -30% to +50%.

* Staging will be further evaluated and confirmed through RouteAhead Project Prioritization Framework update

- Proposed Station
- Future Station
- Future Green Line
- Future Blue Line
- Aurora Business Park
- Maintenance and Storage Facility
- Trench
- Tunnel
- Elevated
- At-grade

Recommended Alignment and Cost: East Leg

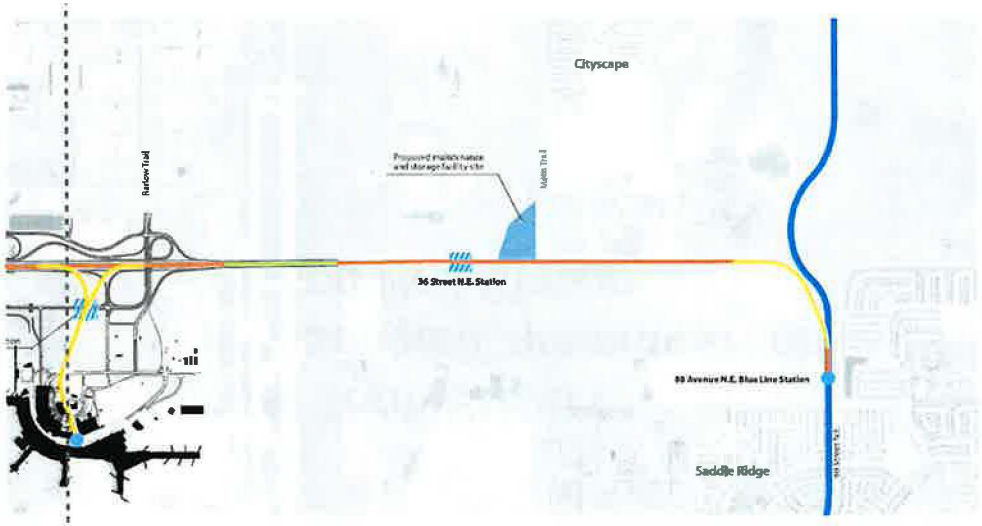
Stations:

- Airport Terminal
- 88 Avenue N.E./Blue Line

Maintenance & Storage Facility

Longer Term Stations:

- 36 Street N.E. Station
- 2nd Airport Station



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- Approx. $400M to $800M capital cost
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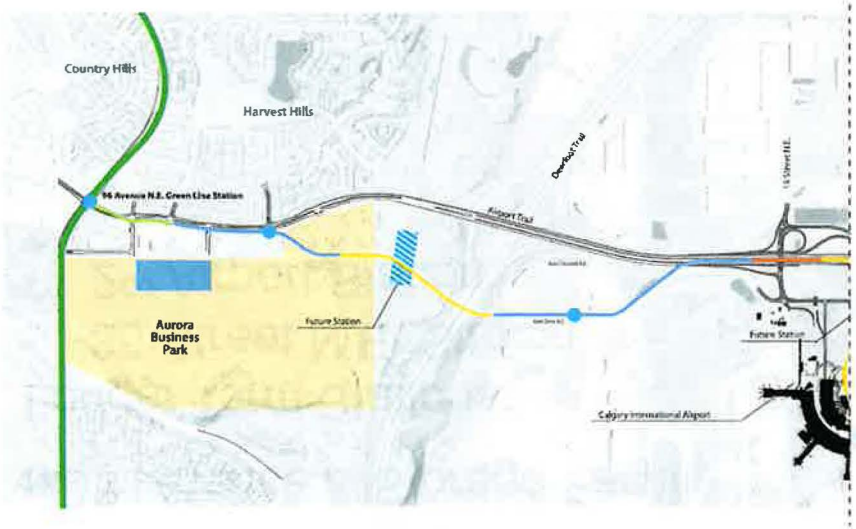
Proposed Station
Future Station
Future Green Line
Future Blue Line
Aurora Business Park
Maintenance and Storage Facility
Trench
Tunnel
Elevated
At-grade

Recommended Alignment and Cost: West Leg



Stations:

- 96 Avenue N./Green Line
- Harvest Hills/Aurora
- Aero Drive N.E.

Longer Term Station:

- Passenger/Commuter/High Speed Rail Station

West Leg: YYC to Green Line

- Approx. $500M to $1B capital cost
- Approx. $20.5M annual operating cost
- Estimated peak service frequency: every 4.5 minutes

Estimates provided are Class 4 costs which are accurate to within -30% to +50%.

Proposed Station
Future Station
Future Green Line
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Aurora Business Park
Maintenance and Storage Facility
Trench
Tunnel
Elevated
At-grade

Airport Transit Mode Progression

Calgary's Route 100

Toronto UPE

Vancouver Canada Line

Timeline	Today	Short Term	Medium Term	Long Term (60+yrs)
Daily Ridership	800–900	8,000–15,000	17,000–29,000	36,000+

Bus with Transit Priority Measures

Blue Line – YYC – Green Line

Rail Connection

East Leg (Blue Line to YYC)
West Leg (Green Line to YYC)

Airport Transit Ridership

Calgary's Route 100

Toronto UPE

Vancouver Canada Line

Timeline	Today	Short Term	Medium Term	Long Term (60+yrs)
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Bus with Transit Priority Measures

Blue Line – YYC – Green Line

Rail Connection

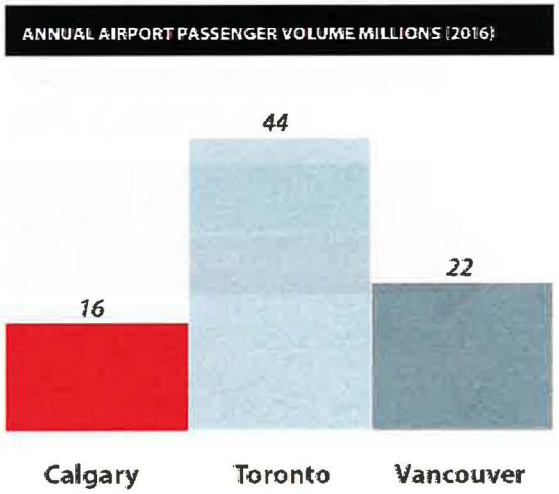
East Leg (Blue Line to YYC)
West Leg (Green Line to YYC)

Daily ridership includes:

- Blue Line to Green Line crosstown users
- Airport passengers, employees and contractors

2048 Airport Assumptions:

- Annual passenger volume – 30 Million
- Number of employees – 16,000



Transit Technology

Recommended

Light Rail Transit (LRT)

Light Rail Transit (LRT), *Calgary*

Operating and maintenance cost: **$$$**

Capital cost: **$$$$**

Automated People Mover (APM)

Automated People Mover (APM), *Canada Line*

Operating and maintenance cost: **$$**

Capital cost: **$$$$**

APM is a driverless system

Bus Rapid Transit (BRT)

Bus Rapid Transit (BRT), *Calgary*

Operating and maintenance cost: **$$$**

Capital cost: **$$$**

Benefits for APM:

- Shortest travel time
- Less dwell time at stations
- Fully automated
- Less operating and maintenance costs
- Minimized land impacts
- Customer experience
- Smaller maintenance facility
- Lower fleet cost
- Flexible, scalable, modular
- Suppliers can provide a turnkey product
- No tail tracks at Green Line

Administration Recommendation

That SPC on Transportation and Transit recommends that Council:

1. Approve the recommended alignment and station locations between the future Green Line/96 Avenue N.E. station and Barlow Trail N.E.

2. Approve the location for a maintenance and storage facility.

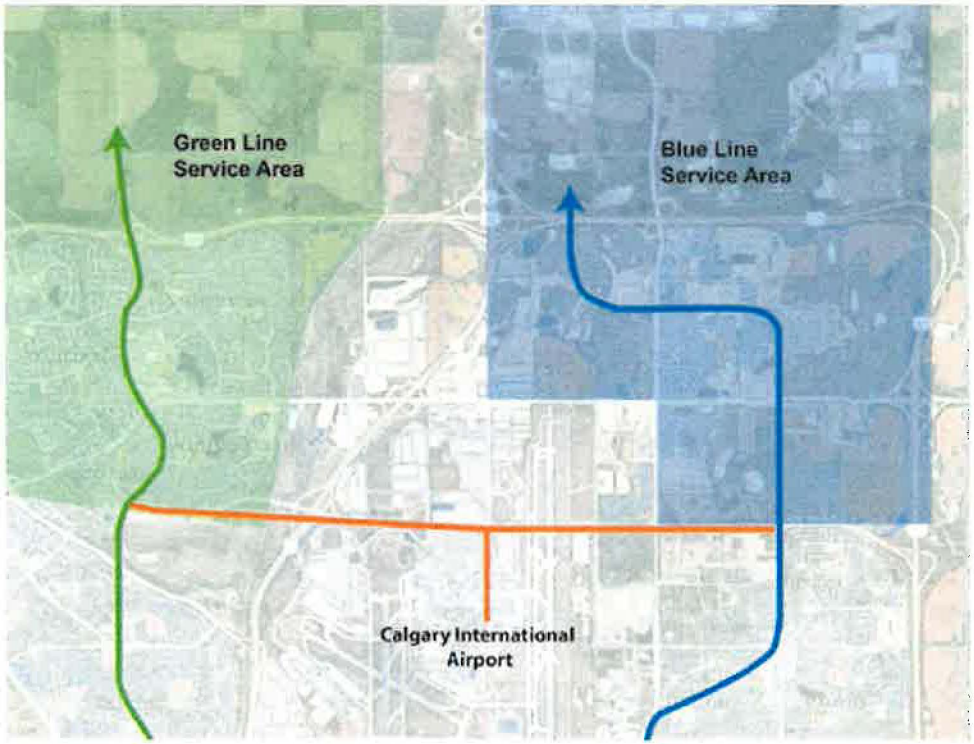
3. Protect for the land needed for the Airport Transit Line alignment right of way.

4. Direct Administration to include the recommended alignment and station locations in future updates to the Aurora Business Park Area Structure Plan.

QUESTIONS?

BACK OF DECK SLIDES

Why is Airport Transit Line a Separate Line from Transit Network?



Cost Effective:

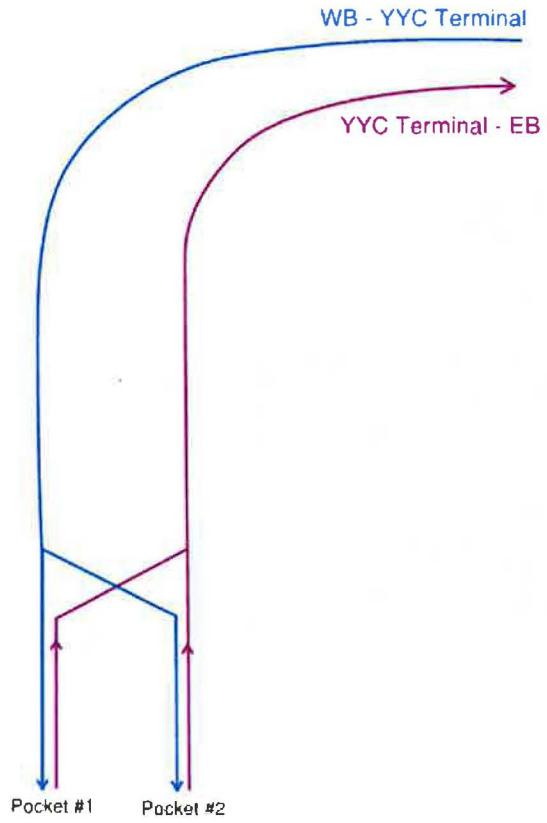
- Service planning and operations are flexible and scalable to meet demands
- Stations can be sized to meet Airport Transit Line demands

Customer Experience:

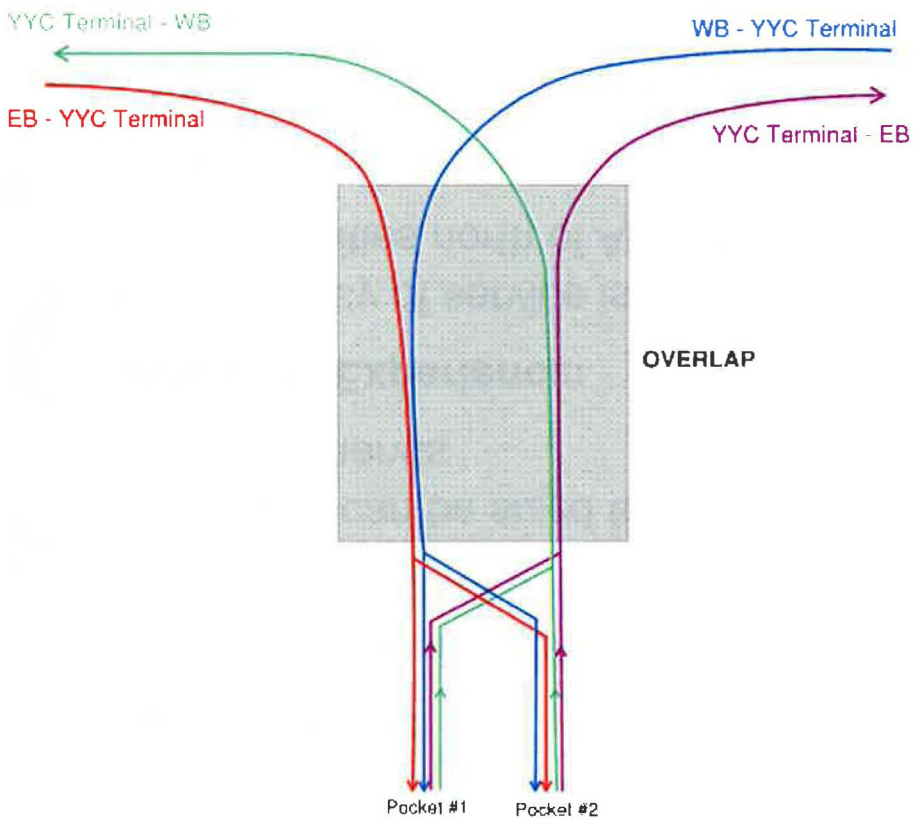
- Frequency of service is maintained for communities north of Airport Trail
- Frequency of Service of Airport Transit Line is not limited to mainline service
- Reduces customer confusion at transfer stations
- Frequent service via APM technology will optimize on transfer time

SERVICE QUALITY LIMITATIONS OF LRT at TERMINAL STATIONS

Figure 4: Sketch Overview of YYC Terminus Operation (Stage 1 and Stage 2)



East Leg only



East & West Legs

Alignment Options Considered (slide 1 of 2)

Option 1: Aurora South Road

Alignment:

- Travels south along Harvest Hills Boulevard, then heads east along South Road N.E.
- Requires deep tunnel station below 96 Avenue N.E. Green Line Station
- Sharp turn out of the station will slow speed in that area
- Challenge to construct independently from Green Line, so would require additional cost to the Green Line project to accommodate this service in the future
- The Aero Crescent alignment simplifies bridge construction over Deerfoot Trail; however, design of access to an at-grade station is challenging as passengers cannot cross the tracks (which are typically electrified) for APMs
- Bridge structure will need to closely coordinate with existing northbound-to-eastbound interchange ramp and future westbound-to-southbound interchange ramp

Station locations:

- Provides excellent connection to Aurora Business Park but not well connected to Community
- Located very close to the future 96 Avenue N.E. station, so may not serve many additional riders and captures fewer residents of Harvest Hills

Best meets the following MAE criteria:

Option 2: Aurora Park Link N.E.

Alignment:

- From the 96 Avenue N.E. station, travels east along 96 Avenue N.E. to Aurora, near Aurora Park Link N.E.
- Requires a shallow tunnel to connect with the 96 Avenue N.E. station
- The Aero Drive alignment is central to Deerfoot North Aviation Park and will encourage transit-oriented development.
- Improved travel time over Option 1

Station locations:

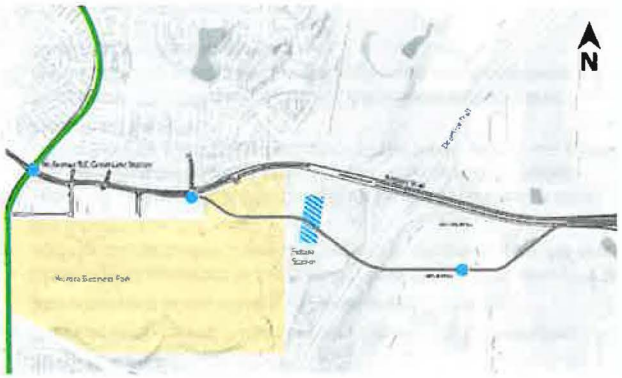
- Provides excellent connection to Aurora Business Park and adjacent communities
- Located further north than Option 1, so would serve more residents from the community
- Close proximity to 96 Avenue N.E. station

Best meets the following MAE criteria:

Alignment Options Considered (slide 2 of 2)

Recommended

Option 3: Harvest Hills Link N.E.



Alignment:

- From the 96 Avenue N.E. station, travels east along 96 Avenue N.E. to Aurora Business Park, near Harvest Hills Link N.E.
- Requires a shallow tunnel to connect with the 96 Avenue N.E. station
- The Aero Drive alignment is central to Deerfoot North Aviation Park and will encourage transit-oriented development.
- Improved travel time over Option 1

Station locations:

- Provides excellent connection to Aurora Business Park
- Station located adjacent to 96 Avenue N.E. to provide improved access for buses and pick-up/drop-off area
- Less overlap of catchment areas, so would serve more riders

Best meets the following MAE criteria:

Option 4: 96 Avenue N.E.

Alignment:

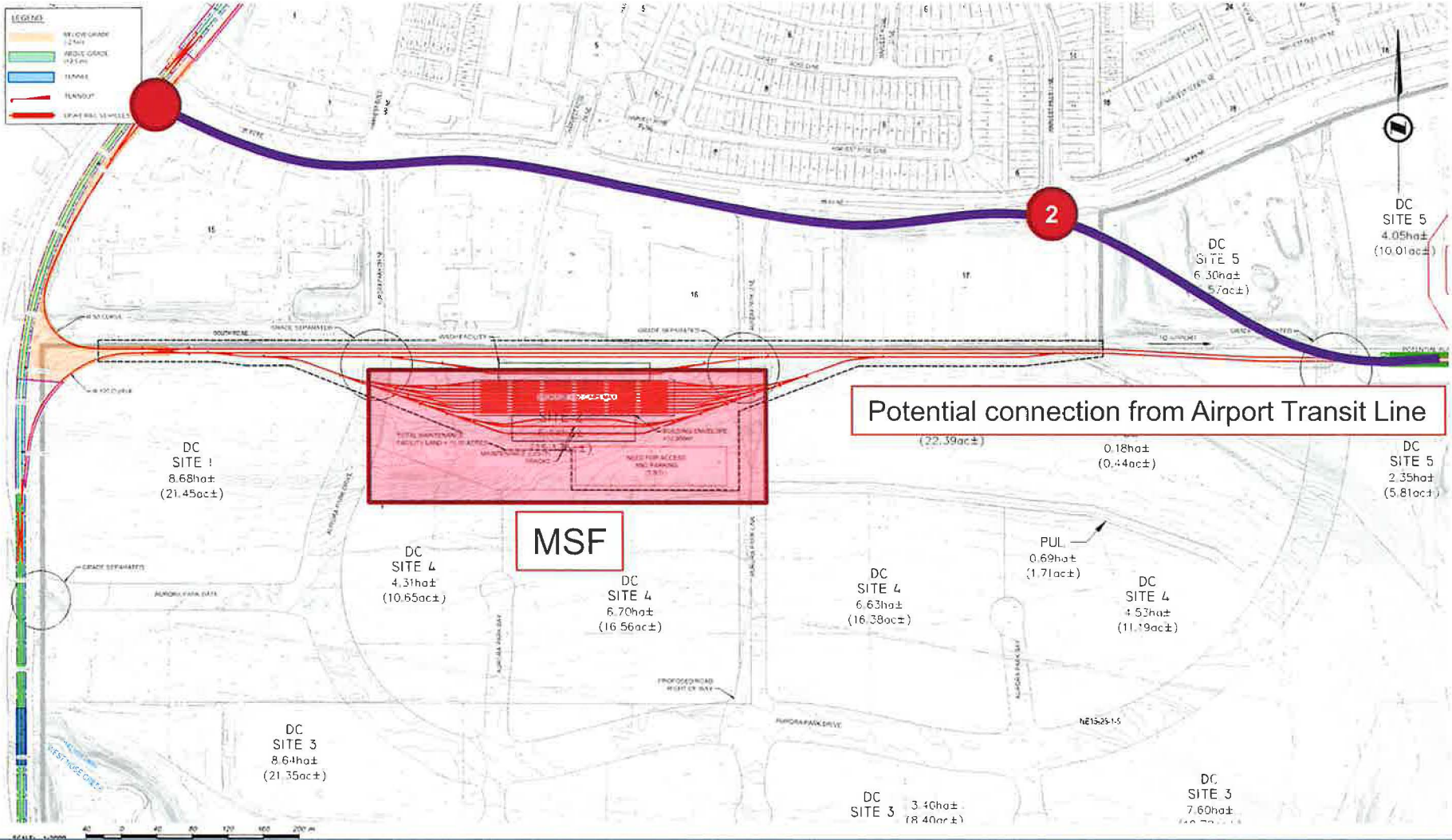
- From the 96 Avenue N.E. station, travels east along 96 Avenue N.E.
- Requires long route to the north of the Deerfoot Trail/Airport Trail interchange, with no access to the south of the interchange
- Poor connectivity to the future regional rail station
- The future upgrade to the Deerfoot Trail/Airport Trail interchange requires the alignment to be located quite far north of Airport Trail
- Forces the regional rail connection into a challenging site
- Improved travel time over Option 1

Station locations:

- Located under, or to the north of, 96 Avenue N.E.
- More costly station construction
- Future connection to regional rail is very challenging
- Station location within Airport Trail right-of-way is undesirable as it provides a poor customer experience and does not support TOD

Best meets the following MAE criteria:

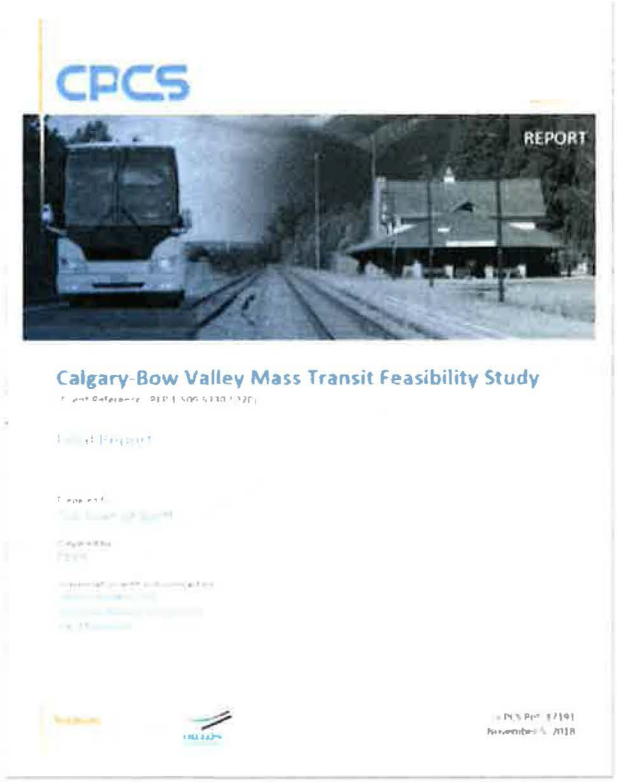
Aurora Maintenance and Storage Facility (MSF)



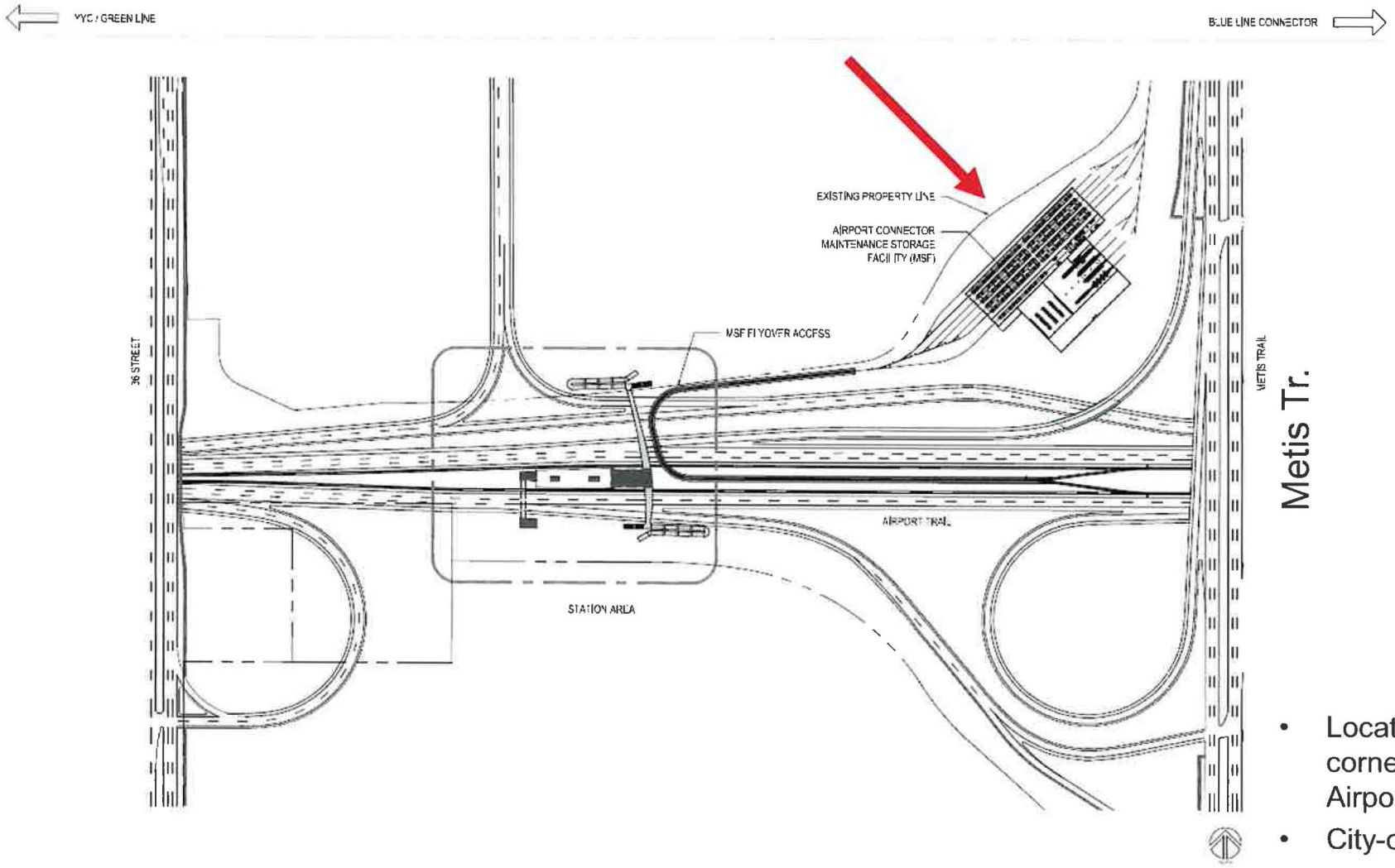
Proposed rail service between Calgary and Banff

I. Memorandum of understanding between Alberta Government and Canada Infrastructure Bank (CIB) to assess the feasibility of a new passenger rail service between Calgary and Banff with a connection to the airport.

II. Briefing to Council on June 15, 2020



Maintenance and Storage Facility



- Located in northwest corner of Metis Tr. and Airport Tr. N.E.
- City-owned land