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Distribution
CITY CLERK'S DEPARTMENT

North Central Bus Rapid Transit (BRT) Functional Study

Brian Tang
Senior Transportation Engineer
Transportation Infrastructure

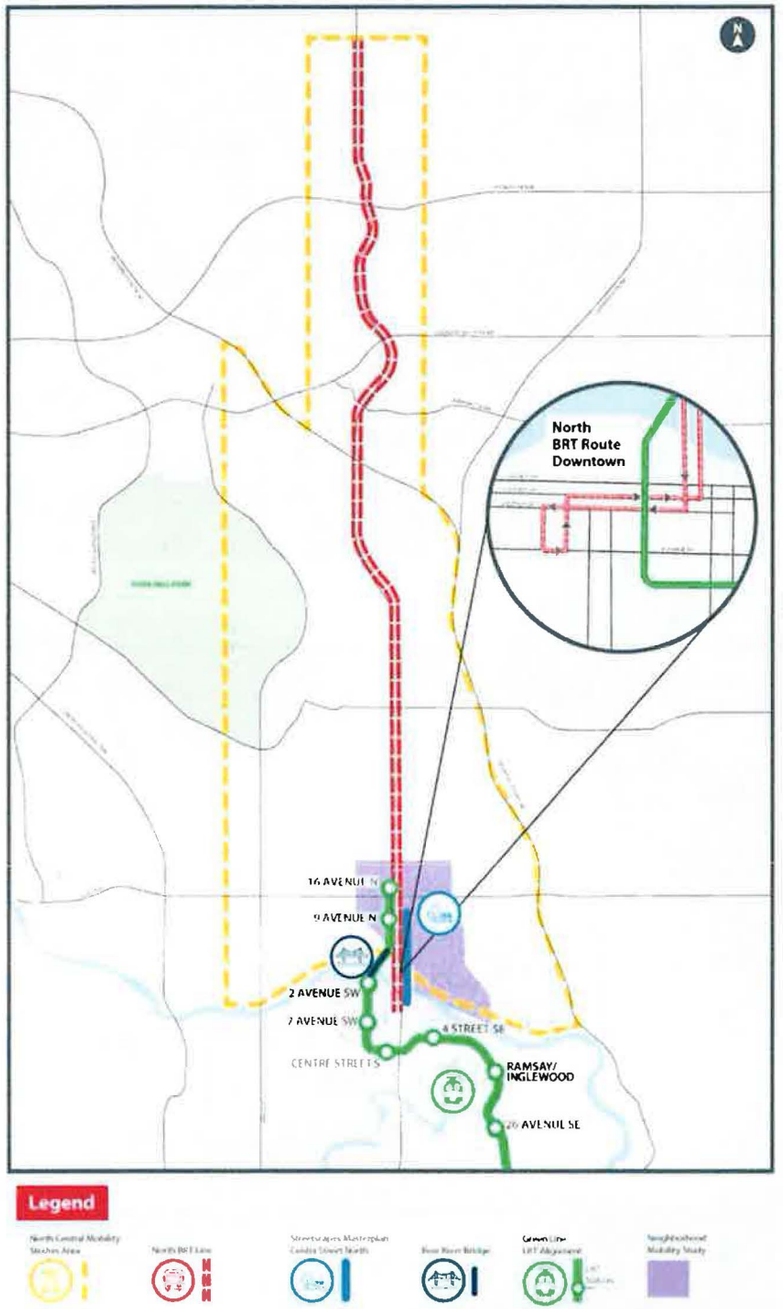
GC2021-0747
ISC: Unrestricted

Scope of Study

- Review of existing BRT operations on Centre St. N/Harvest Hills Blvd. N corridor from downtown to 160 Ave N.

- Explored opportunities for service improvements such as:
  - ✓ Dedicated lanes
  - ✓ Transit signal priority
  - ✓ Queue jump lanes

- Explored opportunities to improve station amenities & active mode facilities in the area



Key Engagement Themes

29 public sessions & stakeholder meetings

6 online surveys

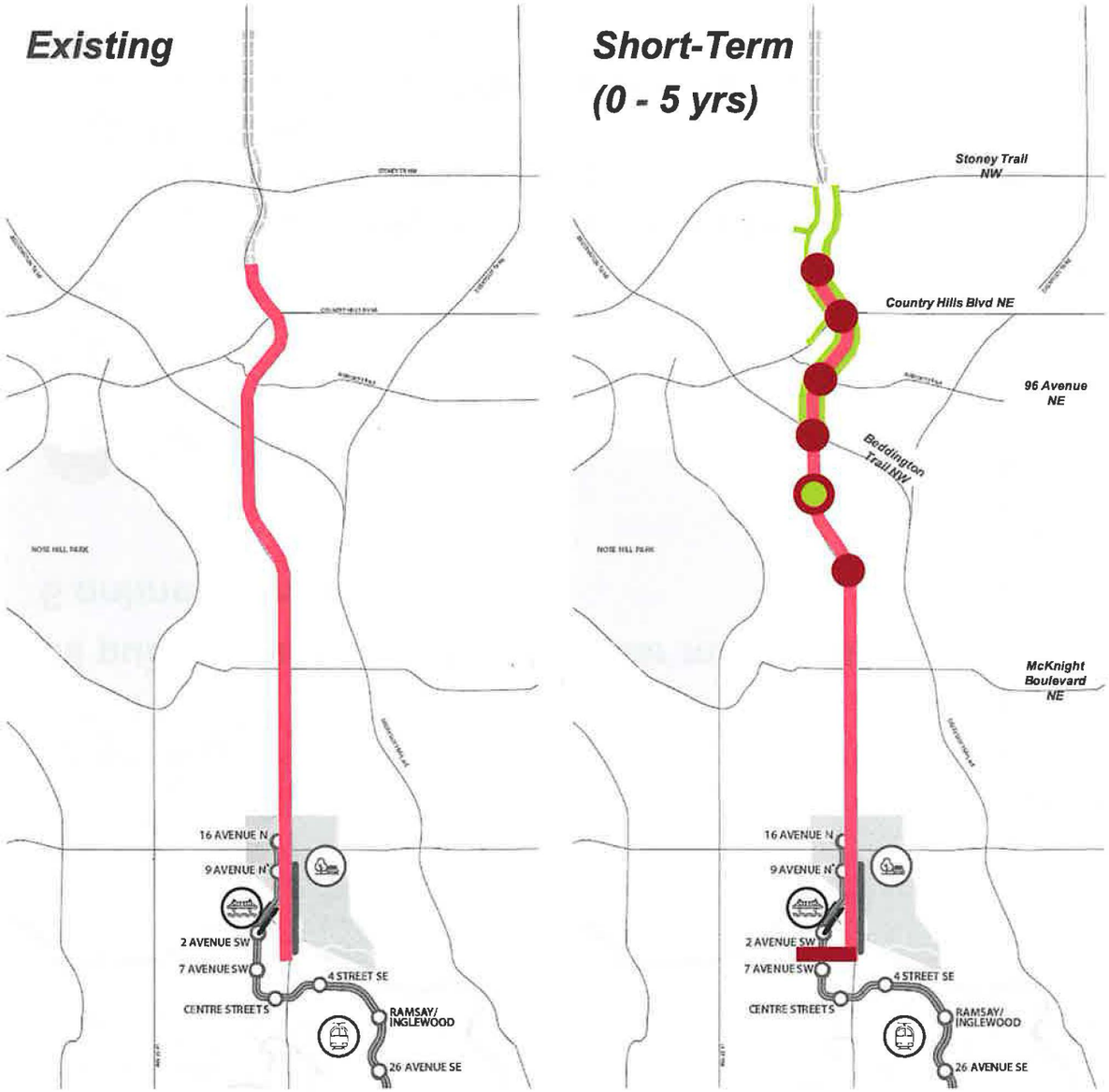
60,000 people made aware of the project
11,000 participants through our engagement opportunities
750+ ideas and contributions across all phases of engagement

Here's what we heard:

- ✓ Desire for improved BRT service & station amenities.
- ✓ Fast & reliable BRT service
- ✓ Improved accessibility
- ✓ Concerns of overcrowding on existing bus routes

North Central BRT Study

Short-Term Corridor Improvements



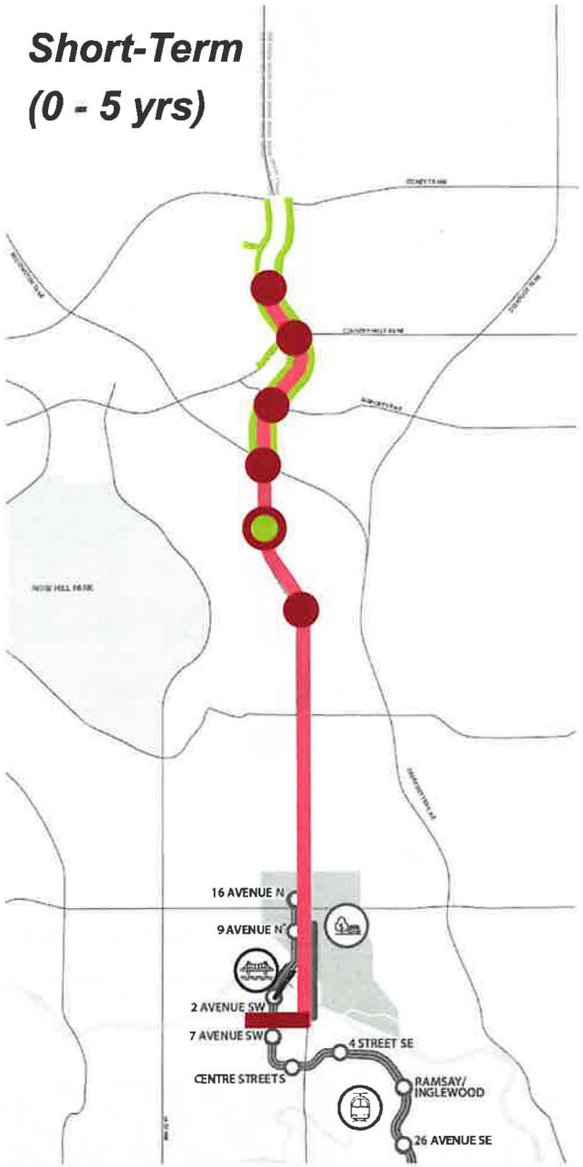
Legend

- BRT Service
- Transit Only Lanes
- Potential Transit Only Lanes
- Operational Improvement
- Pedestrian/Mobility Improvement
- P — Park and Ride Improvement
- MAX Station Improvement

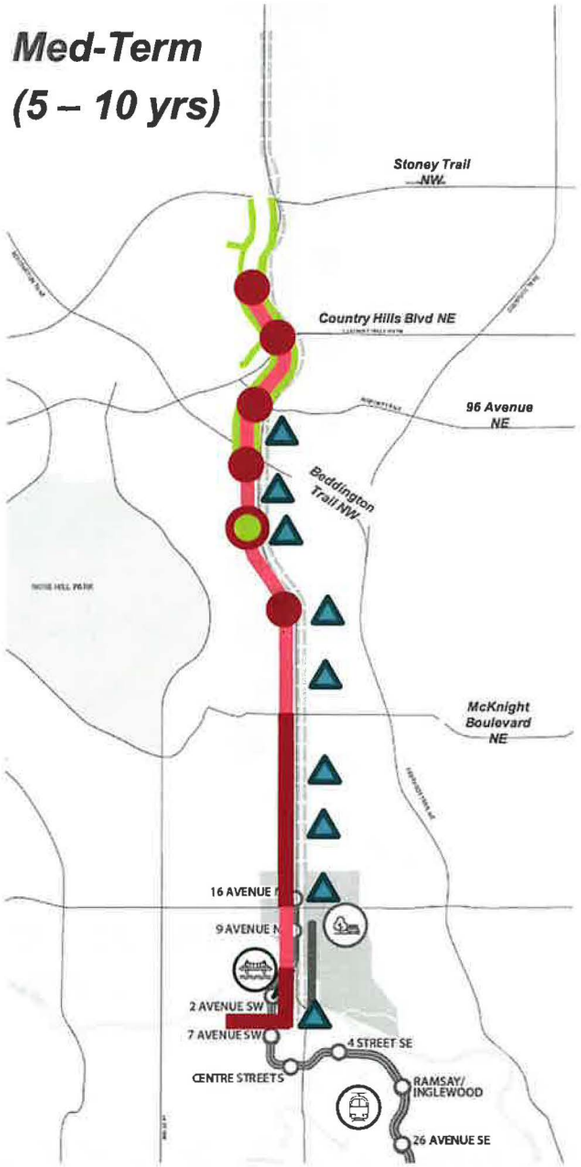
North Central BRT Study

Medium-Term Corridor Improvements

Short-Term
(0 - 5 yrs)



Med-Term
(5 – 10 yrs)



Legend

- BRT Service
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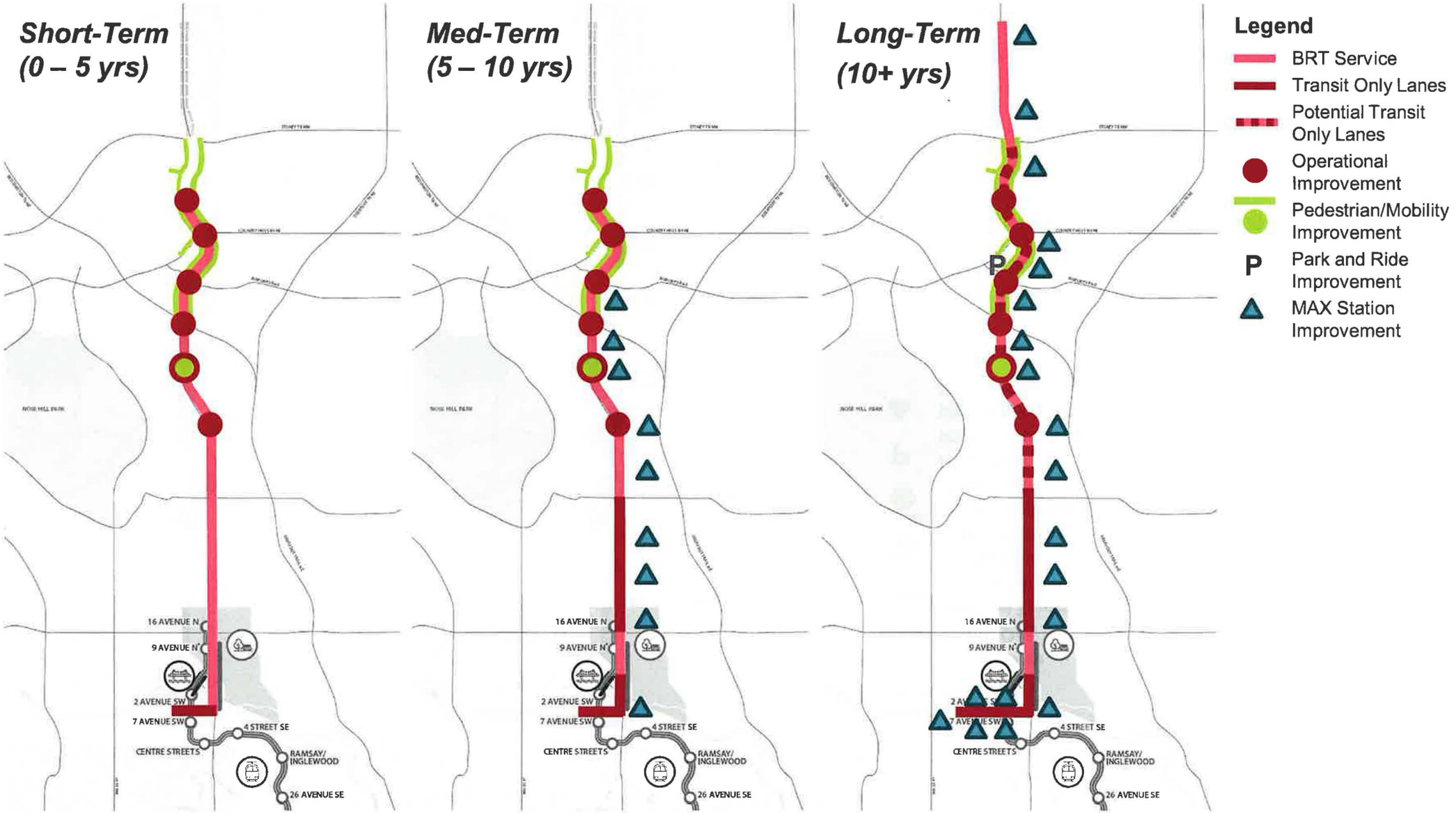
North Central BRT Study

Long-Term Corridor Improvements



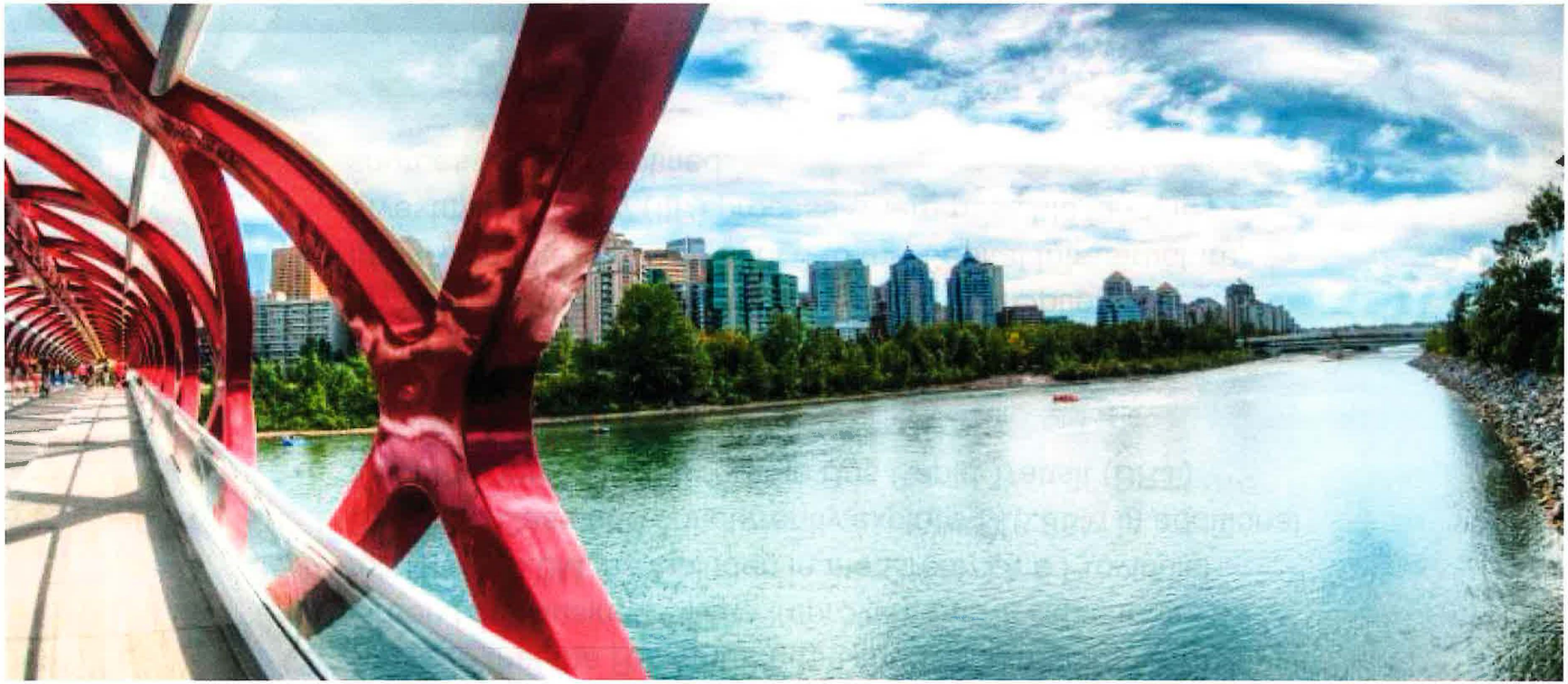
Our Recommendations

That the Green Line Committee:

1. Approve the North Central BRT Functional Study.

2. Approve that the Recommended short- and medium-term Green Line Business Case Improvements in Attachment 3, totaling $50.0M, be included in the Green Line Provincial Business Case and concurrently explore $16.85M in additional funding sources to support the Bus Rapid Transit (BRT) program.

3. Advance the long-term Recommended Capital Infrastructure Investment Priority (IIP) Improvements and Optional Improvements in Attachment 3 to the Capital Infrastructure Investment Priority (IIP) process where possible funding sources will be identified.



Questions?

Back of Deck Slides for use if Questions from Council

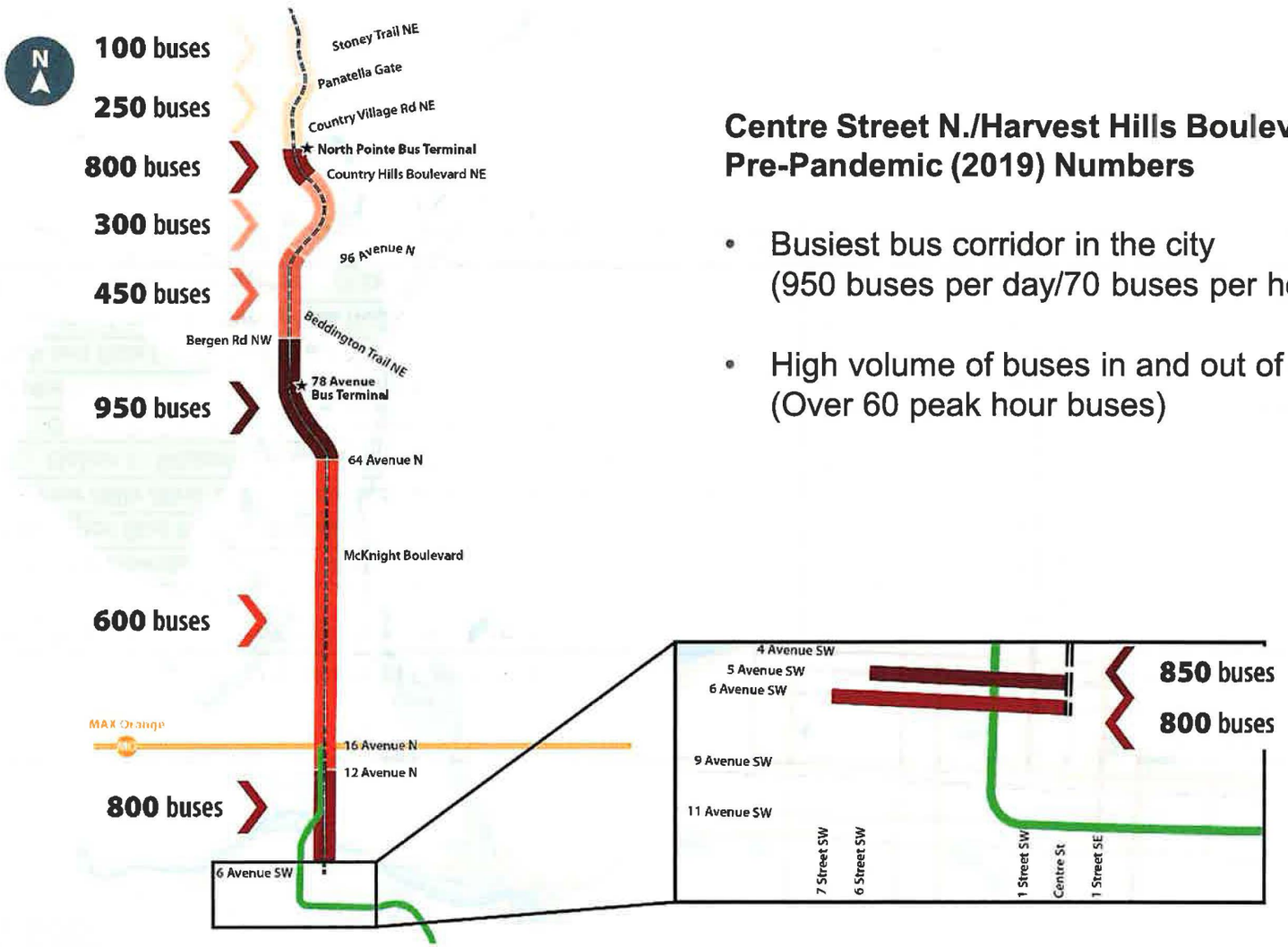
Short and Medium-Term Recommendations

Timing	Improvement Description	Capital Cost (M)	Funding Source Recommendation	
			Recommended Green Line Business Case Improvements (M)	Recommended Capital IIP List Improvements (M)
Short-Term	Pedestrian Improvements (Connections to Harvest Hills Boulevard N)	$ 0.80		$ 0.80
	Provide widened sidewalk and cycling facilities along Harvest Hills Boulevard N (Stoney Trail to Beddington Trail)	$ 11.50		$ 11.50
	Bus Only Crossing Improvements (Bus Trap)	$ 1.30	$ 1.30	
	Transit Signal Priority	$ 0.20	$ 0.20	
	Lengthen Left Turn Lane @ 64 Avenue N	$ 0.40	$ 0.40	
	Pedestrian/Transit Improvements @ 78 Avenue Bus Terminal	$ 0.60	$ 0.60	
	Lengthen Left Turn Lane @ 96 Avenue NE	$ 0.90	$ 0.90	
	Downtown Bus Lanes (to 6 Street SW)	$ 3.40	$ 3.40	
	Bus Only Lane @ North Pointe Park and Ride and Lot Adjustments	$ 3.30	$ 3.30	
	Harvest Hills Blvd N @ Country Hills Blvd N Bus Only Lanes	$ 3.40	$ 3.40	
	Centre Street S Streetscaping Improvements	$ 2.60		$ 2.60
	Chinatown 4 Ave - Public Realm/Plaza Improvement	$ 1.95		$ 1.95
	Sub-Total	**$ 30.35**	**$ 13.50**	**$ 16.85**
Medium-Term	Stations – 16 Avenue N to North Pointe Bus Terminal	$ 24.70	$ 24.70	
	Centre Street BRT Lanes (16 Avenue N to McKnight Boulevard N)	$ 11.80	$ 11.80	
	Sub-Total	**$ 36.50**	**$ 36.50**	
	Total	**$ 66.85**	**$ 50.00**	**$ 16.85**

Long-Term Recommendations

Timing	Improvement Description	Capital Cost (M)	Recommended Capital IIP List Improvements (M)	Optional Improvements (M)
Long-Term	Downtown Bus Lanes (extension from 6 to 11 Street SW)	$ 1.60	$ 1.60	
	11 Street SW Bus Terminal	$ 3.10	$ 3.10	
	Additional Downtown Stations (4 Stops)	$ 7.30	$ 7.30	
	Beddington Blvd N – Roundabout	$ 3.90		$ 3.90
	Harvest Hills Blvd. BRT Lanes from Nose Creek to North Pointe:			
	Option 1: Widening in to median, add additional BRT Lane	$ 17.50		$ 17.50
	Option 2: Convert existing curb lane to BRT lane	$ 5.50		$ 5.50
	Centre St. BRT lane: convert lane from McKnight Blvd. to Stoney Tr.	$ 4.90		$ 4.90
	Park and Ride Lot @ 96 Avenue NE	$ 6.20	$ 6.20	
	Stations – South of Country Hills Boulevard N (2)	$ 4.00		$ 4.00
	Stations - North of North Pointe (3 locations)	$ 4.80	$ 4.80	
	Total	**$41.30 - $53.30**	**$ 23.00**	**$ 35.80**

Project Background: Pre-Pandemic Numbers

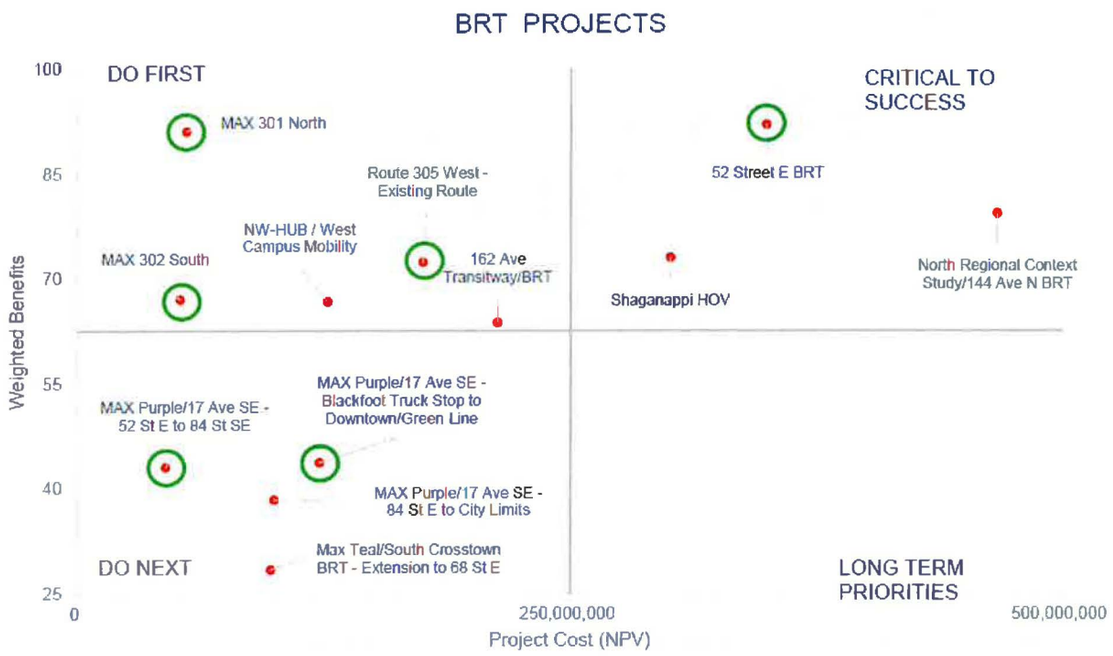


Centre Street N./Harvest Hills Boulevard N.: Pre-Pandemic (2019) Numbers

- Busiest bus corridor in the city (950 buses per day/70 buses per hour)
- High volume of buses in and out of downtown (Over 60 peak hour buses)

RouteAhead: Prioritization of Future Capital Projects, TT2020-1289

Table 6: BRT Projects - Weighted Benefits, Project Investment and Project Readiness



The green circles indicate project readiness in the next 5-10 years.

Table 7: Short-term future rapid transit projects ranked according to benefit and investment.

Short-term Projects	Rank
52 Street E BRT	1
MAX 301 North	2
Route 305 West	3
Blue Line NE*	4
MAX 302 South	5
MAX Purple/17 Ave SE - Blackfoot Truck Stop to Downtown	6
MAX Purple/17 Ave SE - 52 St E to 84 St SE	7
Max Teal/South Crosstown BRT - Extension	8

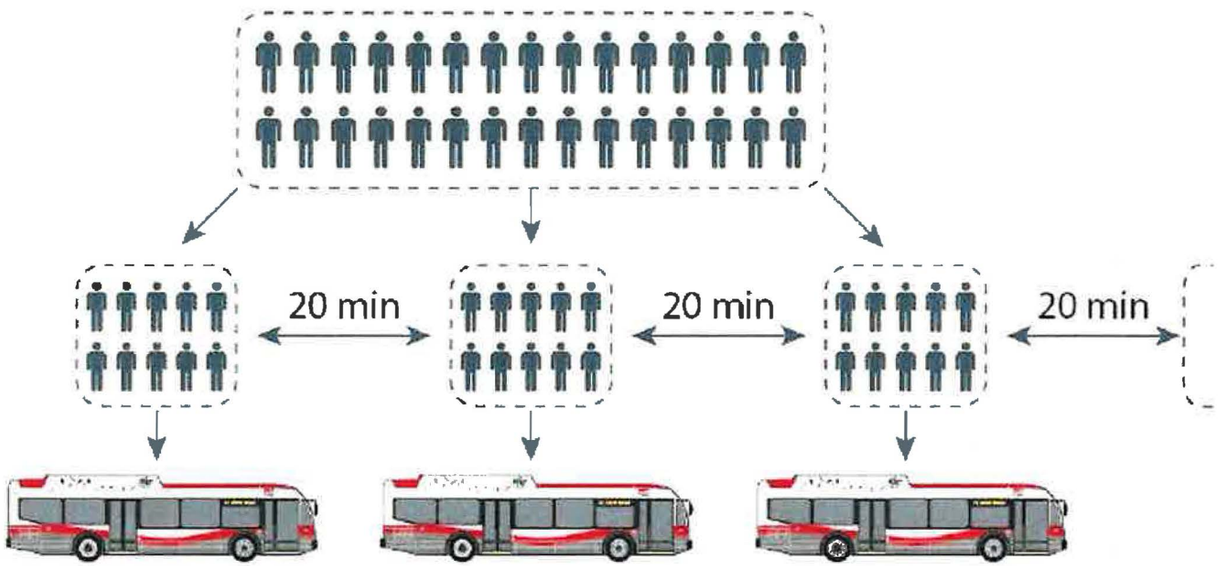
**Includes both Blue Line NE - Saddletowne to 88 Ave NE & 88 Ave to 128 Ave NE Projects*

Bus Capacity

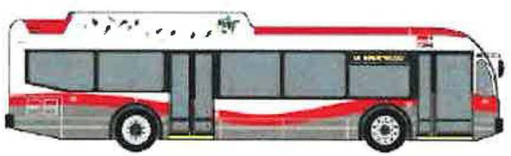
Assumptions

- Ridership demand is equally distributed spatially and over the hour
  - each bus gets the same amount of customers
- Define an "optimal capacity" that reasonably avoids customer discomfort and overloads, and flexibility for ridership variation.

Hourly Ridership Demand Evenly Distributed



Optimal Capacity Set at 66%



ART = ~80 (Seated + 20)
LF = ~40 (Seated + 5)

So What Is To Be Done?

To increase effective capacity, a number of strategies can be used

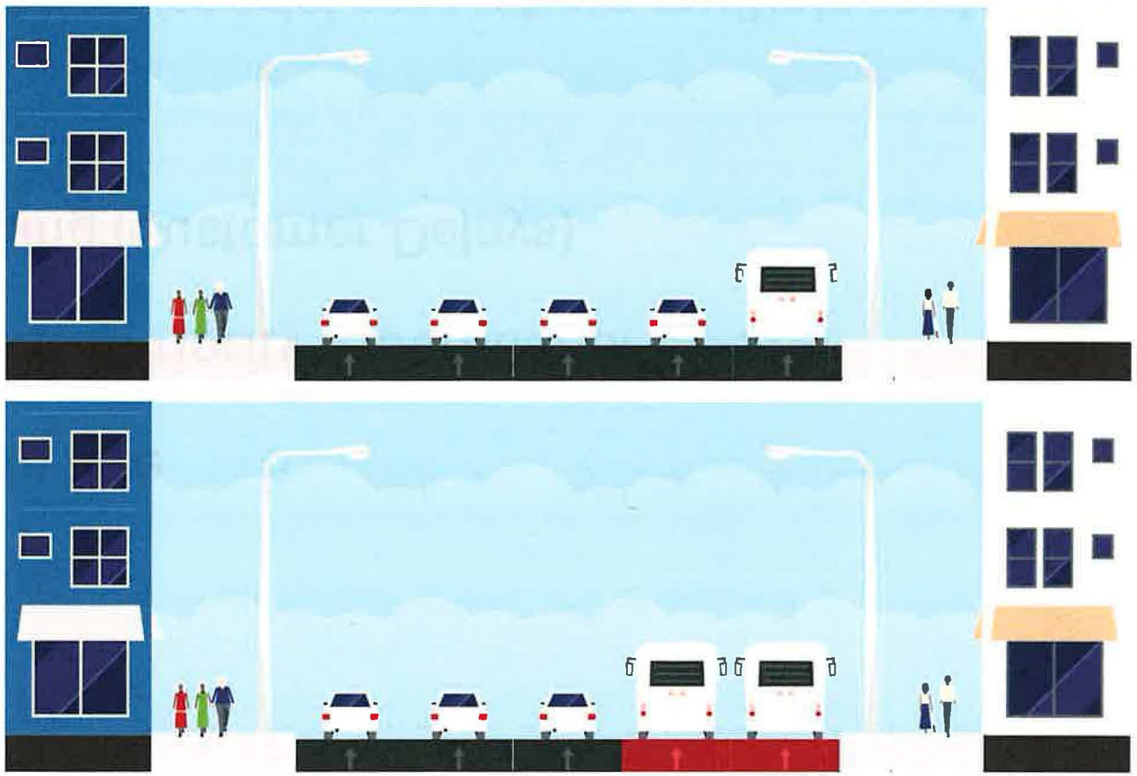
- Add Recovery Time
- Add More Buses
- Increase Vehicle Size
- Implement Transit Priority (Operational Delays)
- Improve Boarding (Customer Delays)

and,

- Route Optimization (special case where multiple routes operate in a corridor)

BRT Improvements - Downtown Bus-Only Lanes

Images created with Streetmix

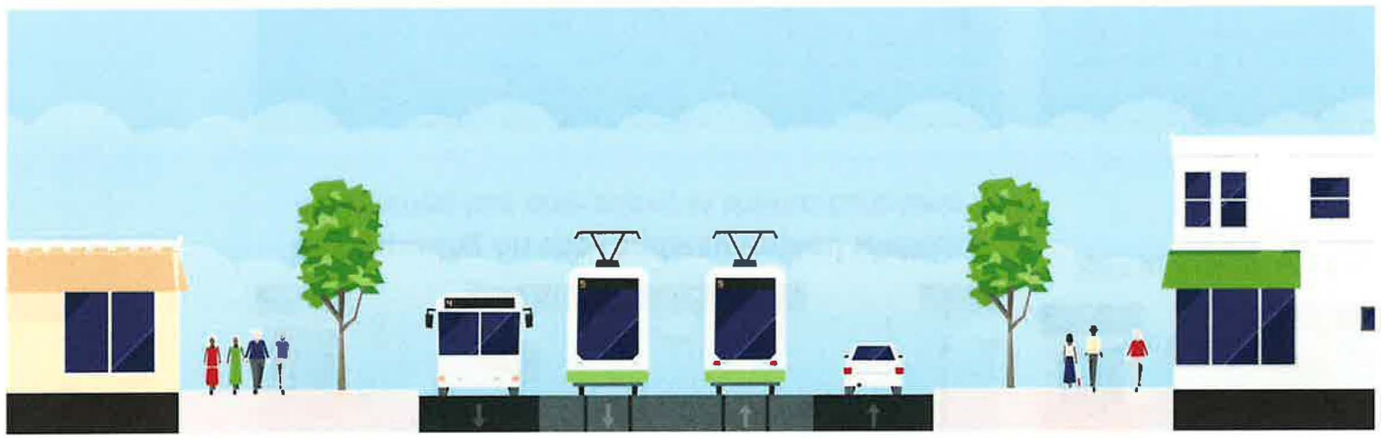


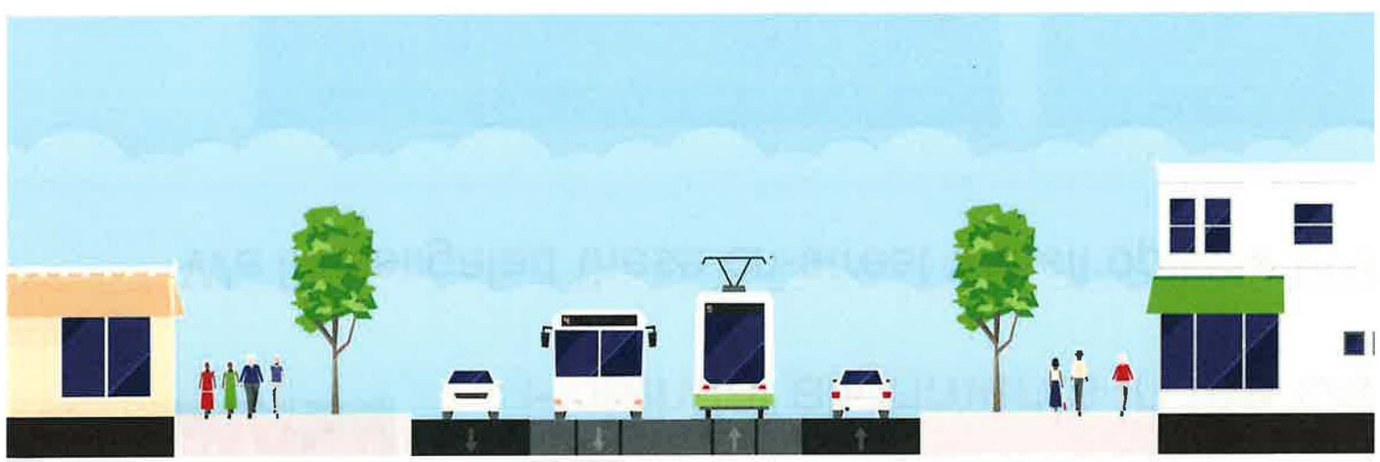
Downtown Transit Lanes

- Dedicated bus lanes on 5 and 6 Avenue SW
- 3 lanes maintained during peak periods
- Off peak parking could be provided in outside through lanes

BRT Improvements – Bow River to 16 Avenue N.

- Options reviewed:
  - BRT operating within LRT Right of Way
  - BRT operating within curb lanes



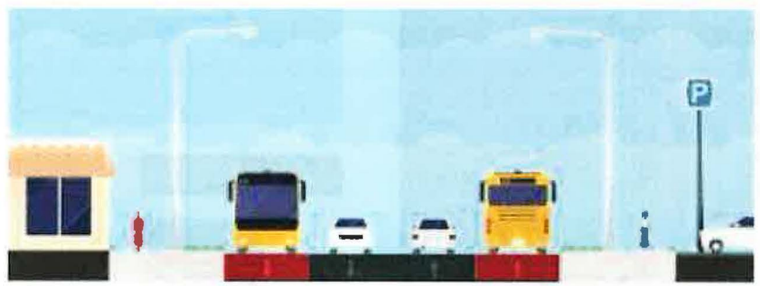


Images created with Streetmix

North Central BRT Study: Potential alignments in the Central Zone

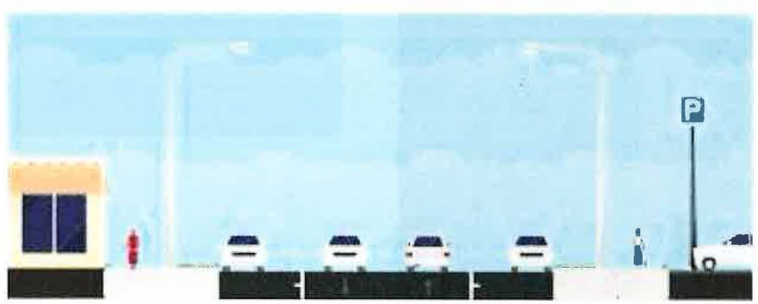
We investigated these on-street transit options in the Central Zone:

BRT Running on the roadway (mixed traffic): Maintained bus operations in shared curb lane



BRT in a dedicated curb lane (during peak travel times or 24 hours a day)

BRT in a median transitway. If GL is not extended north in the near-term consider a median transitway



On-street parking could be maintained in the shared or curb lane scenarios

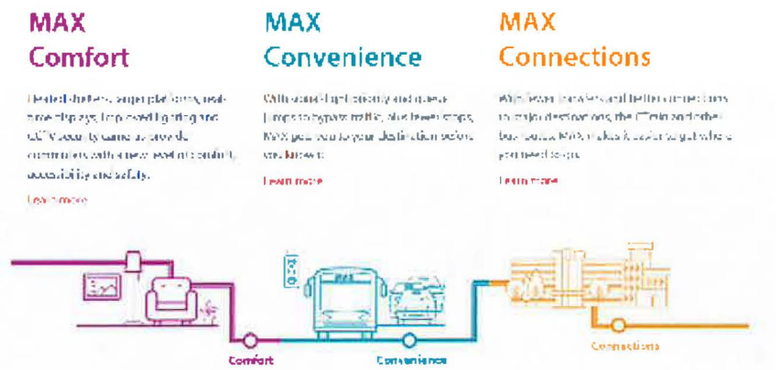
Images created on Streetmix

North Central BRT Study

- As Green Line leaves downtown and crosses the Bow River, communities to the north need to connect to the LRT and to downtown.

- Upgrading the existing BRT route to a MAX BRT will provide riders with a more direct and reliable service.

- MAX BRT provides customers with:
  - ✓ **Convenience** – Fewer stops, signal priority, queue jumps, dedicated lanes, next bus arrival time displays.
  - ✓ **Travel time and reliability** – Use of transit priority infrastructure gets customers to destinations faster and more reliably.
  - ✓ **Comfort and safety** – Enhanced lighting, heated shelters, larger platforms.
  - ✓ **Connections** – Access to more major destinations, and fewer transfers to get to final destinations.



Centre Street South: Public Realm/Streetscape