

Attachment 3: Updated Transit Capital Project Prioritization List

Background

The original RouteAhead Plan from 2012 included a list of rapid transit projects with criteria scores based on land use, customer experience, and project characteristics.

In 2019, Council approved an updated list of major transit growth projects and updated evaluation framework based on the following criteria: ridership, customer experience, economic, social, and environmental considerations (TT2019-0637). In 2020, Council approved an updated prioritized project list and directed Administration to return to Committee in Q4 2022 with a further updated prioritization list as part of the 10-year review of RouteAhead (TT2020-1289).

This Attachment addresses the 2020 Council direction using the same evaluation framework approved in 2019 and includes future Green Line segments in the project list, not previously included in 2020.

Prioritization Approach

Projects were first evaluated by analyzing benefits independent of capital and operating costs (Table 1). Second, a prioritization matrix used Net Present Value (NPV) to compare the benefit score against 30-year capital and operating estimates. This approach produces two key outputs: 1) an overall project ranking based solely on the benefits and 2) a matrix plotting benefits against project investments that highlights readiness. Lastly, qualitative considerations were used to determine readiness and create a short-term and long-term project list. Report TT2020-1289 contains further details of the prioritization approach.

Table 1: List of Project Benefits – Criteria and Weighting

	Weighting (%)	Criteria	Metric
Benefits	30	Ridership	Passengers per avg. weekday
	20	Customer Experience	Increases travel time advantage
			mins / trip
			Overcomes issues of reliability and delay
			on time performance
			Increases passenger capacity
			capacity / corridor
	20	Economic	Population Opening Day
			# Population in 800m radius
			Population Future
			# Population in 800m radius
	20	Social	Jobs Opening Day
			# Jobs in 800m radius
			Jobs Future
			# Jobs in 800m radius
	10	Environmental	Community Services
			# of Services in 1,000m radius
			Affordable Housing Units
			# of Affordable Housing Units in 600m
			Low Income Population Served
			Total # of Low Income Pop in 600m radius
			GHG Emissions Reductions
			Tonne CO2/Year
			Proximity to MDP Activity Centres and Corridors
			# Stations within Corridor in 800m

2022 Prioritization Results

Table 2 below shows the overall project rankings based solely on benefit scores, while Figure 1 depicts all projects on a map.

Table 2. Future Rapid Transit Network Projects Benefits Scores

PROJECT	TOTAL BENEFITS SCORE
MAX 301 North	91
52 Street E BRT	91
Green Line N - 16 Ave to 64 Ave N	86
Westbrook to MRU Transit Connection	85
Shaganappi HOV: Bowness Road to Stoney Trail	80
North Regional Context Study/144 Ave N BRT	79
Airport Transit Connector - Blue Line to Airport	78
Route 305 West	74
Red Line S Extension to 210 Ave S	74
Blue Line NE - 88 Ave to 128 Ave NE	72
MAX 302 South	69
NW-HUB / West Campus Mobility	68
Green Line N - 64 Ave to Beddington Blvd N	67
162 Ave Transitway/BRT	65
Airport Transit Connector - Green Line to Airport	62
Green Line S - Shepard to McKenzie Towne	59
Green Line N - Beddington Blvd to 96 Ave N	59
Green Line S - Auburn Bay/Mahogany to Seton	59
Green Line N - North Pointe to 160 Ave N	58
Green Line N - 96 Ave to North Pointe	55
Blue Line NE - Saddle Towne to 88 Ave NE	49
MAX Purple/17 Ave SE - Blackfoot Truck Stop to Downtown	42
Green Line S - McKenzie Towne to Auburn Bay/Mahogany	39
MAX Purple/17 Ave SE - 52 St E to 84 St SE	39
MAX Purple/17 Ave SE - 84 St E to City Limits	38
Blue Line NE - 128 Ave to Stonegate NE	38
Blue Line W to 85 St SW	31
Max Teal/South Crosstown BRT to 68 St E	29

Figure 1. Future Rapid Transit Network



The prioritization matrices are shown in Chart 1 and Chart 2. The projects are divided into BRT and LRT due to the large gap in relative costs between LRT and BRT projects. The matrices show benefits plotted against project investment, calculated using the NPV of each project. Each matrix consists of four quadrants which indicate where projects fall on the spectrum of low to high benefit and low to high investment. Projects in the upper left quadrant indicate high benefit and lower relative cost and are labelled – Do First. Projects in the upper right side indicate high benefit and high relative cost and are labelled – Critical to Success. Projects in the lower left quadrant indicate lower relative benefit and low relative cost and are labelled – Do Next. Finally, projects in the bottom right quadrant indicate lower relative benefit and higher relative cost and are labelled – Long Term Priorities.

Projects circled in green indicate a high degree of readiness in the next 5 -10 years based on the qualitative factors of functional planning, land acquisition, high ridership corridors, system capacity, and/or surrounding community development. The green circle considers additional characteristics like Council's 2023 – 2026 Strategic Direction, Transit Oriented Development, and coordination with other City Departments and key City strategies.

Chart 1. BRT Projects – Weighted Benefits, Investment, and Readiness

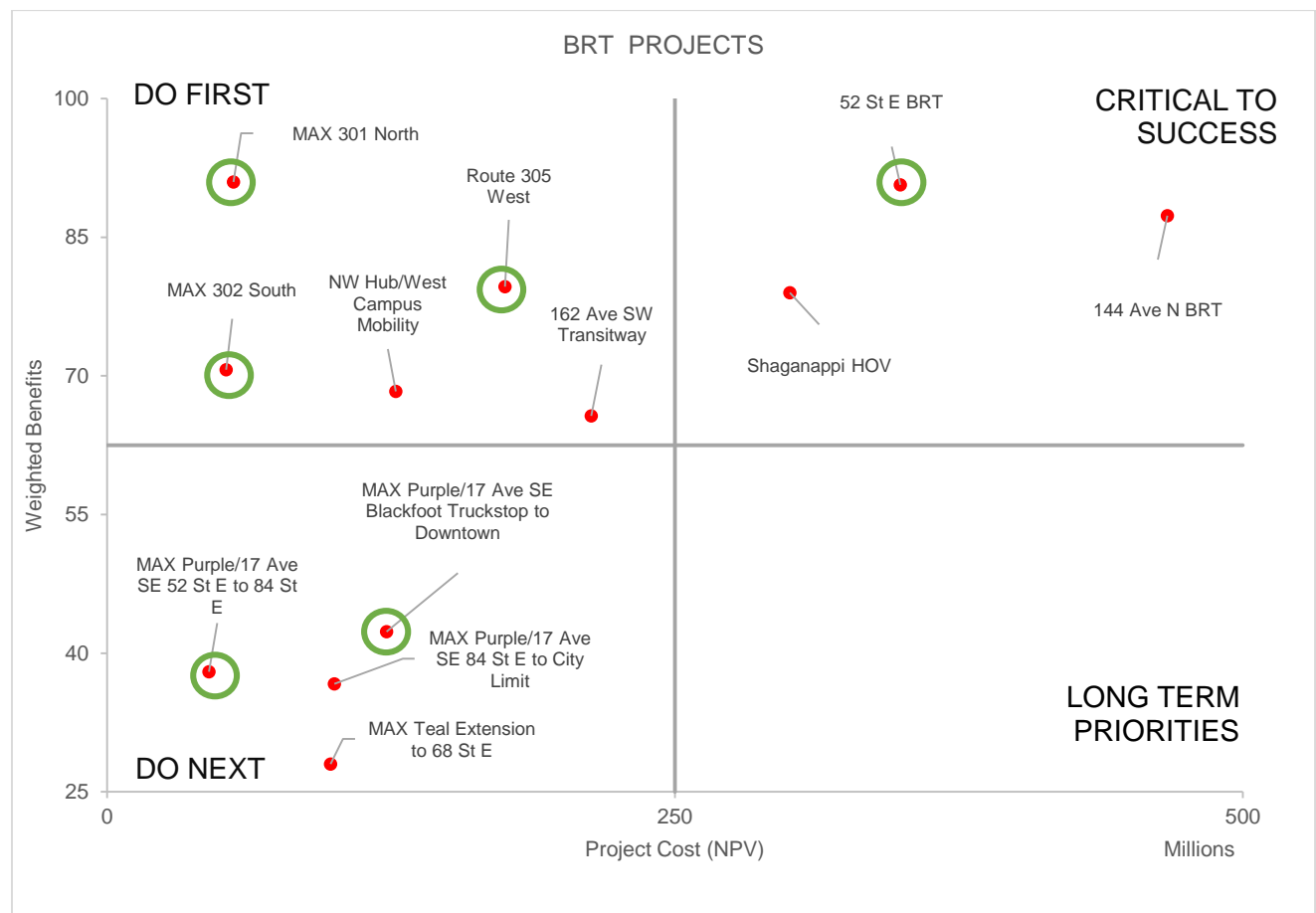
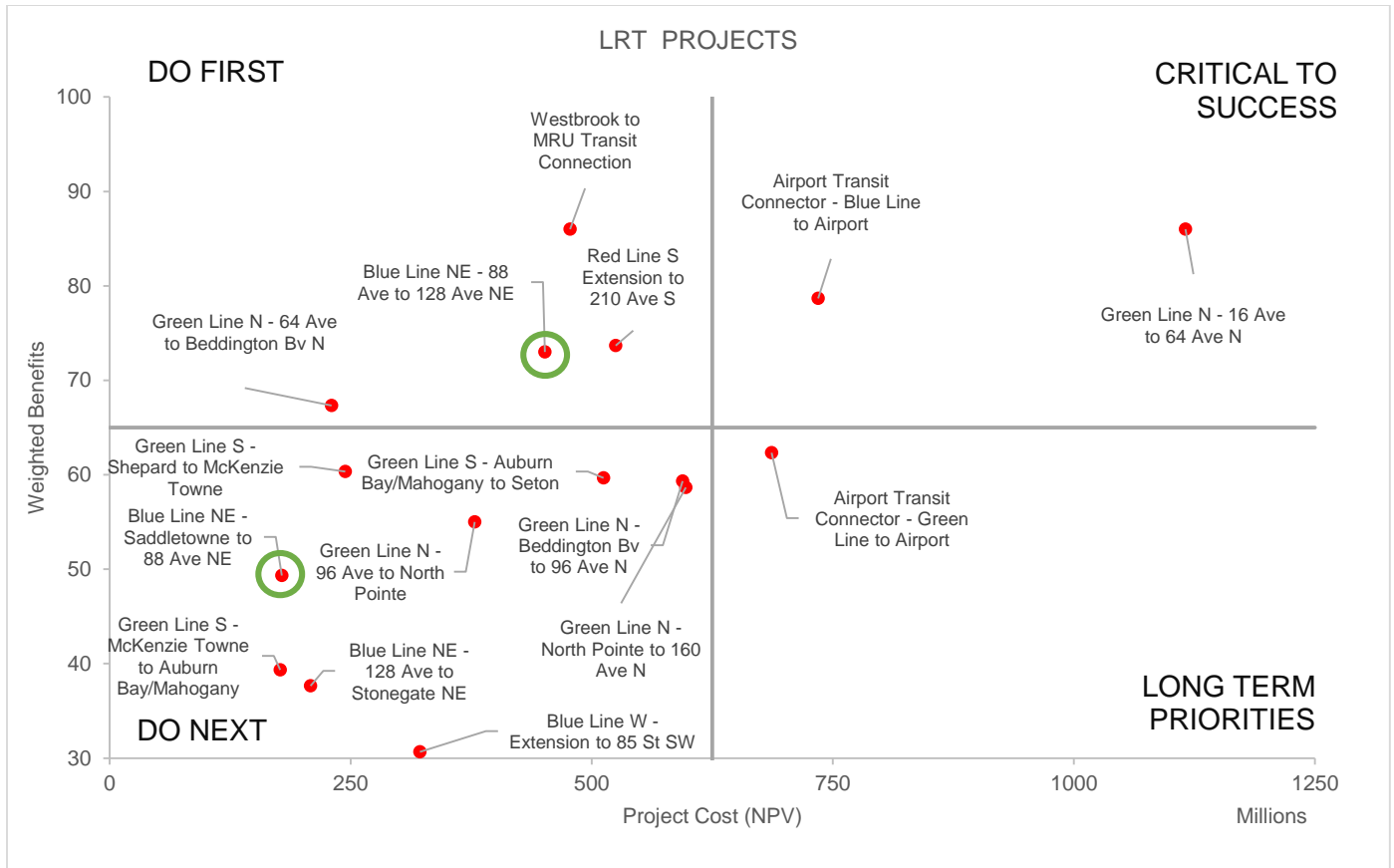


Chart 2. LRT Projects – Weighted Benefits, Investment, and Readiness



Tables 3 and 4 summarize the results into combined rankings of short and long-term rapid transit projects ranked according to benefit and investment.

Table 3. Short-Term Future Rapid Transit Projects

Short-Term Projects	Rank	Additional Considerations
MAX 301 North	1	Contributes to mode progression and increased transit service along the Green Line North corridor. Requires coordination with Green Line Stage 1 construction and future tie-ins.
52 Street E BRT	2	Council 2023 – 2026 priority project. Some improvements made in 2020, but further upgrades needed to become full BRT. Existing route 23 is at or near capacity. Improvements on southern portion of corridor also benefit MAX 302.
Route 305 West	3	Currently operates as peak-only service. Route 1 currently provides all-day service along the same route. Capacity exists along both routes. Coordination and consideration required on the effect of upgrading Route 305 on Route 1.
Blue Line NE – Saddletowne to 128 Ave N	4	Council 2023 – 2026 priority project. Enables Airport Transit Connection to Blue Line. Land acquisition near completion. Functional study approved in 2012.

MAX 302 South	5	Contributes to mode progression and increased transit service along the Green Line South corridor. Requires coordination with Green Line Stage 1 construction and future tie-ins and 52 St E BRT.
MAX Purple/17 Ave SE - Blackfoot to Downtown	6	Council 2023 – 2026 priority project. Increases transit service levels east of downtown and provides Green Line connection. Requires coordination with Green Line on the Green line tie-in connection and timelines. Functional study required.
MAX Purple/17 Ave SE - 52 St E to 84 St SE	7	Improves transit service levels on existing MAX Purple route to current terminus at East Hills. Contributes to development along 17 Ave SE and sets up potential regional transit connections to the east.
Max Teal/South Crosstown BRT to 68 St E	8	Provides additional connections in SE Calgary to the MAX Teal route which currently serves Westbrook, Mount Royal University, and Rockyview Hospital. Tie-in and coordination with WB to MRU transit connection is required.

Table 4. Long-Term Future Rapid Transit Projects

Long-Term Projects	Rank	Additional Considerations
Green Line N - 16 Ave to 64 Ave N	1	Council 2023 – 2026 priority project. Next extension of Green Line northwards after completion of Stage 1.
Westbrook to MRU Transit Connection	2	MAX Teal already serves this area using same route and currently has capacity. This project would likely result in shortened MAX Teal route. There are potential benefits and risks of introducing new streetcar technology to the existing system.
Shaganappi HOV: Bowness Road to Stoney Trail	3	Project depends on traffic and congestion along Shaganappi Trail triggering need for HOV lanes.
North Regional Context Study/144 Ave N BRT	4	Project timing largely depends on the rate of development in north Calgary. Provides a significant crosstown connection in the north.
Airport Transit Connector - Blue Line to Airport	5	Council 2023 – 2026 priority project. Dependent on future construction of Blue Line NE to 88 Avenue Station. Coordination required with Airport Trail NE interchanges and Calgary International Airport master planning and infrastructure investments. Current Airport demand is met by Routes 100 and 300, future travel demand forecasted increases support mode progression to a higher capacity rapid transit connection. Functional planning complete in 2020.
Red Line S Extension to 210 Ave S	6	Council 2023 – 2026 priority project. Extends the Red Line South, Calgary's highest ridership LRT leg, to serve new and developing communities. Potential to increase capacity issues during peak periods as additional riders will be attracted to the system. Project is paired with a Storage and Maintenance Facility to expand Calgary Transit's ability to store and maintain light rail vehicles to ensure maximum lifecycle from this investment.
NW-HUB / West Campus Mobility	7	NW Hub provides enhanced transit service to major activity centres and the actively developing community of University District.
Green Line N - 64 Ave to Beddington Blvd N	8	Council 2023 – 2026 priority project. Timing dependent on future construction of other Green Line segments.

162 Ave Transitway/BRT	9	Project timeline largely depends on buildout of new communities in the SW providence area. Transitway right of way has been protected and considered during planning of new communities.
Airport Transit Connector - Green Line to Airport	10	Council 2023 – 2026 priority project. Dependent on future Green Line construction to 96 Ave N. Current Airport demand is met by Routes 100 and 300, future travel demand forecasted increases support mode progression to a higher capacity rapid transit connection. Requires coordination with Green Line LRT, Aurora Business Park planning/development, and Calgary International Airport master planning and infrastructure investments. Functional planning complete in 2020.
Green Line S - Shepard to McKenzie Towne	11	Council 2023 – 2026 priority project. Next extension of Green Line southwards after completion of Stage 1.
Green Line N - Beddington Blvd to 96 Ave N	12	Council 2023 – 2026 priority project. Timing dependent on future construction of other Green Line segments.
Green Line S – McKenzie Towne to Auburn Bay/Mahogany	13	Council 2023 – 2026 priority project. Timing dependent on future construction of other Green Line segments.
Green Line N – 96 Ave to North Pointe	14	Council 2023 – 2026 priority project. Timing dependent on future construction of other Green Line segments.
Green Line N - North Pointe to 160 Ave N	15	Timing dependent on future construction of other Green Line segments and buildout of new communities in north central Calgary.
Green Line S - Auburn Bay/Mahogany to Seton	16	Council 2023 – 2026 priority project. Timing dependent on future construction of other Green Line segments.
MAX Purple/17 Ave SE - 84 St E to City Limits	17	Council 2023 – 2026 priority project. Project timing largely depends on the rate of development in east Calgary. Contributes to development along 17 Ave SE, and sets up potential regional transit connections to the east.
Blue Line NE - 128 Ave to Stonegate NE	18	The Blue Line NE extension from 128 Ave NE to Stonegate serves new and developing communities and industrial areas. Functional planning not complete.
Blue Line W to 85 St SW	19	The current Blue Line West terminus, 69 St SW Station, has the highest ridership of the West LRT stations, likely a combination of adjacent land uses (multiple institutional and recreation uses) and feeder bus service to the station. A new station at 85 St W may transfer some of this this high ridership to the new terminus. Future LRT right-of-way has been reserved at the early stages of community planning.

Next Steps

The updated RouteAhead plan will include an updated project summary page for each future rapid transit project including the total benefits score, operating and capital cost details, project map, and qualitative considerations. The project summary pages will replace existing project pages in the original RouteAhead document. The updated RouteAhead plan will also contain guiding principles to revise the capital project list as the city grows and priorities change over time. It is important to note the quantitative analysis provided by the benefit scores and NPV tables in this report provides a baseline project ranking. Project priorities must also consider qualitative factors such as funding availability, corporate priorities, functional planning, community build-out, land acquisition, and other readiness factors to provide the full picture of whether a project should be prioritized.

Funding and advocacy are required to advance concept development, functional planning, pre-design, and land acquisition for the rapid transit projects. At the 2022 November Service Plan and Budget deliberations, based on the recent Government of Alberta ministerial mandate for Transportation, Council directed Administration to: (1) engage with the provincial government to understand and request what percentage of the provincial portion of property tax could be retained by the City of Calgary for 2023, 2024, 2025, and 2026 to assist in funding a one station extension on the Blue Line North, the “people mover” from the Calgary Airport to the Blue Line North, and advancement of MAX 301 bus rapid transit (BRT); and (2) engage with the Canada Infrastructure Bank to seek a low interest loan to assist in completion of the above noted projects.

Results from the prioritization matrices (Charts 1 and 2) and short and long-term project rankings (Tables 3 and 4) will feed into future work led by Infrastructure Calgary. Infrastructure Services will develop transit projects into corporate capital programs, ensuring agile delivery of projects as funding becomes available, and delivering high priority capital projects in tandem. Rapid transit projects will be aligned with community investment portfolios to maximize benefits. The updated RouteAhead plan will speak to Infrastructure Calgary's programmatic approach to efficiently package and deliver capital projects.