Preferred Configuration

FUTURE BUS RAPID TRANSIT PLANS

Plan For Growth
Transportation Plan
BRT Plan

October 2017

City of Saskatoon

saskatoon.ca/**engage**

Plan for GROWTH

BRT OVERVIEW

The City of Saskatoon Growth Plan identified two Bus Rapid Transit (BRT) corridors as key elements which will help shape the future of Saskatoon.

The Red and Blue BRT corridors will:

- Be major organizing elements of the Growth Plan
- Form the structural backbone of Saskatoon Transit
- Support a mode shift to transit
- Support land use intensification along major corridors
- Anchor the Transit Villages developments

This report defines the concept or preferred configuration of the Red and Blue BRT lines which will focus the planning and design effort on the most appropriate BRT system for Saskatoon for the foreseeable future.

The preferred configuration will define the scale and scope of the transit signal priority measures, geometric priority measures, station design, customer systems and runningways.

This approach will facilitate fast-tracking of the BRT system development through Stakeholder Engagement, Functional Planning, Detailed Design and Implementation.

Growth Plan

Between 2009 and 2011, the City reviewed the planning and funding strategy for community growth, and conducted a visioning process **(Saskatoon Speaks)** to identify residents' expectations and aspirations for Saskatoon. These processes determined that:

If trends continue, the costs required for growth would be 'extremely significant' and the future shape and characteristics of the city would not meet citizen expectations. The conclusion was reached that Saskatoon needed to consider 'fundamental changes' in our approach to transit, transportation and land use.

In 2012, City Council adopted **Strategic Plan 2013 – 2023** based on public feedback from the Saskatoon Speaks visioning process and initiated the **Growth Plan to Half a Million** to addresses the Sustainable Growth and Moving Around strategic goals.

In 2016, City Council adopted the **Growth Plan to Half a Million**. It charts a path for how the city will develop and how people will move about based on the following key components:

Strategic Infill	Support development of Downtown, North Downtown and University of Saskatchewan "endowment lands" to accommodate more people and jobs within Circle Drive.
Corridor Growth	Encourage growth and redevelopment near existing major corridors.
Transit and BRT	Make transit more attractive to more people as the population increases.
Core Area Bridges	Make the best use the existing road capacity and planning for the future.
Employment Areas	Ensure the right amount of employment in the right areas.
Active Transportation Plan	Provide support for greater use of walking and cycling for work and personal use.
Financing Growth	Plan ahead for the costs of growth.

Saskatoon Transit

Saskatoon's current transit system is a hub-and-spoke configuration that brings most routes and passengers to the downtown and the University of Saskatchewan. The system provides good coverage with 95% of Saskatoon's population within 450m of transit; however, the network lacks directness of travel. The Saskatoon transit mode share is only 4.5% which compares poorly with similar cities such as Victoria and Winnipeg which have transit mode shares of 10% and 14%, respectively.

Many of the routes are circuitous loops that start and end downtown, at the University or at a transit terminal. As the city grows, it will become difficult to expand these looped routes, and those that are expanded will have longer trip distances and travel times. This will also necessitate additional transit terminals and multiple transfers for longer distance trips.

Saskatoon Transit has a 2043 target objective to increase transit mode share to 8% system-wide and 25% to downtown. Under a "business as usual" strategy, these targets are not achievable, and deterioration in current performance is likely. Buses currently operate in mixed traffic with no transit priority measures. This means that without changes to bus operation, increases in future traffic congestion due to growth will negatively impact transit customer travel times and operating costs.

The Growth Plan calls for a restructuring of Saskatoon Transit to more of a grid network with direct two-way routes serving major corridors and development nodes. The Red and Blue Line BRT would be the core services around which a new transit network would be developed.

BRT BENEFITS

Bus Rapid Transit is defined as:

"a rubber tired bus based rapid transit system that improves travel speed, reliability, capacity and customer experience through enhancements to bus priority measures, stations, customer systems and runningways."

BRT may be implemented in phases or at a scale to match community aspirations, passenger demand and funding availability.

There are five benefit categories that can be achieved with a BRT system implementation. These expected system improvements directly support the Growth Plan transit objectives:

Reduce transit travel times – BRT passenger travel times will decrease 5 to 20% compared to existing bus routes.

Improve reliability – On time performance defined as leaving a timepoint within 0 to 3 minutes late increases to over 90%.

Create a positive experience for customers – Safe, comfortable, accessible passenger waiting areas, active transportation connections to the community and real time schedule information will attract and retain transit customers.

City Building – Creating a positive image and the synergy with corridor and Transit Villages development will influence urban form and development patterns.

Responsible Investment - BRT development will be at a scale appropriate to the transit market, community aspirations and available funding. Attracting new ridership will increase farebox revenue.

BUILDING A BRT SYSTEM

There are five major components that make up a BRT system:

- Transit Signal Priority Measures;
- Roadway Geometric Measures;
- Stations;
- Customer Systems; and
- Runningway Improvements.

Each of the system components may be applied through a range of options that will define the scale, functionality and cost of the BRT system.

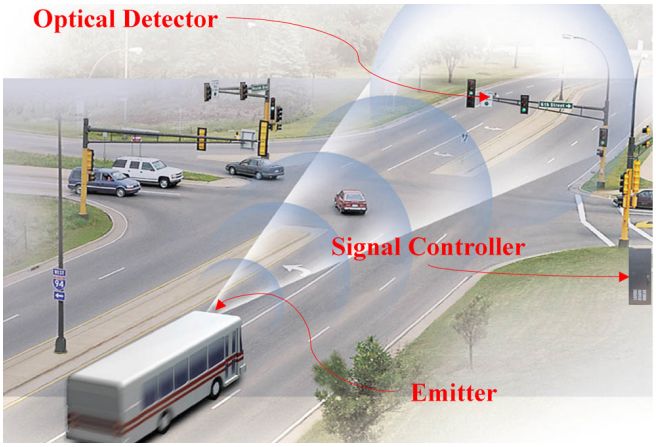
Transit Signal Priority Measures

Transit signal priority (TSP) measures are considered the foundation of a BRT system. They can provide significant travel time and reliability improvements at a relatively low cost.

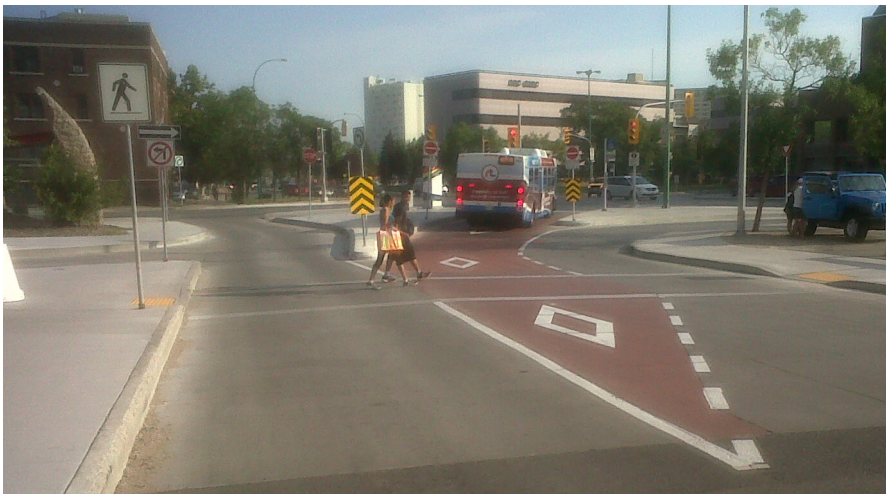
TSP uses the existing traffic signal infrastructure, bus arrival detection and software logic to determine the optimum way to limit bus delay at traffic signals.

TSP is developed by analyzing traffic movements at all signalized intersections along the BRT route to determine the functionality and value of specific TSP applications. The impact to auto traffic, pedestrian and cycle movements are considered within the scope of the analysis. TSP can be applied at limited locations, multiple select locations or at all beneficial locations.

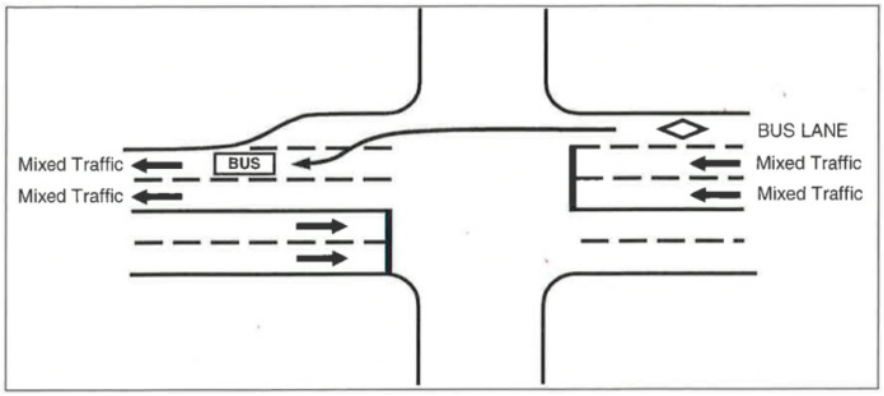
The preferred configuration for the Saskatoon BRT is to apply TSP at all beneficial locations.



Roadway Geometric Measures



Congestion within the Saskatoon road network occurs primarily at major intersections and bridge approaches. Geometric improvements such as queue jump lanes, removal of bus bays, bus bypass lanes, and other similar measures will provide buses with a time advantage at the most critical points along the corridor. When used in conjunction with transit signal priority, the ability to bypass congestion at critical points will provide travel time savings and reliability improvements that are comparable with exclusive transit lanes.



Roadway geometric measures are developed by analyzing traffic movements and bus by-pass opportunities along the BRT route. The impact to auto traffic flows, pedestrian and cycle movements are considered within the analysis. There are usually relatively few opportunities to apply geometric improvement measures; however, they can be very effective at strategic locations.

The preferred configuration for the Saskatoon BRT is to apply Roadway Geometric Measures at select beneficial locations.

Stations

All transit customers begin and end their journey as a pedestrian, and the station is the point where they transition from being a pedestrian to a passenger. The station environment and connections to the adjacent community are critical to creating a positive customer experience that is welcoming, safe, convenient and comfortable.

The relationship between transit and active transportation is focused at the stations. It is important that each station is connected to the community active transportation network in a safe and legible manner.

Stations can have a positive influence on the adjacent public space and private development. Stations that are developed to support and compliment corridor and nodal development can make a significant contribution to city building.

Station components include the curb, pad, identification pylon, shelter, lighting, waste receptacle, bike racks, branding and allowance for public art. Stations may be developed at varying scales; from loading pads with simple small glass shelters to medium sized, pedestrian scale, highly functional, and comfortable facilities to large “signature” facilities. The cost of each station can vary considerably from under $100,000 to the $250,000 - $500,000 range to over $1 million.

The preferred configuration for the Saskatoon BRT stations is to develop medium scaled stations that will accommodate 12 to 20 waiting customers in a safe, protected and well lit environment that will be seen as a positive influence on the public realm and adjacent community. Stations should have a common design theme; however, each one would be sized to accommodate the expected customer traffic at specific locations.

Customer Systems

Customer systems include destination and wayfinding information, route and schedule information, real time next bus information, commercial advertising, security monitoring and help phones, and off board fare processing.

The provision of accurate and timely customer information can have a very positive influence on customer confidence, transit system image and ridership.

The preferred configuration for the Saskatoon BRT customer systems is to provide good destination, wayfinding, route, schedule, next bus information and security monitoring. Off-board fare processing could be added in the future.

Runningways

Runningways are the path that a BRT bus follows. Runningways may vary from an operation in mixed traffic curb running on an existing roadway to exclusive lanes within an existing road right of way to exclusive roadways separate from other traffic. Determining the appropriate runningway application is a function of the traffic environment, travel time savings and expected ridership.

Most congestion in Saskatoon is related to intersections. There is generally sufficient capacity in the existing travel lanes to allow transit vehicles to move freely, provided they can move through intersections with minimal delay. There are some critical sections within the inner city where exclusive lanes would provide some advantage in travel time, promote the primary transit corridor or compliment the adjacent community functions.

Higher end runningways may be relatively expensive and should be evaluated based on the speed, functionality and capacity improvements achieved in relationship to the investment.

The preferred configuration for the Saskatoon BRT runningways is to develop a mixed traffic system with exclusive lanes in select short road sections along 3rd Avenue in the downtown, Broadway Avenue and College Drive.

Preferred Configuration Summary

In summary, the preferred configuration can be described as follows:

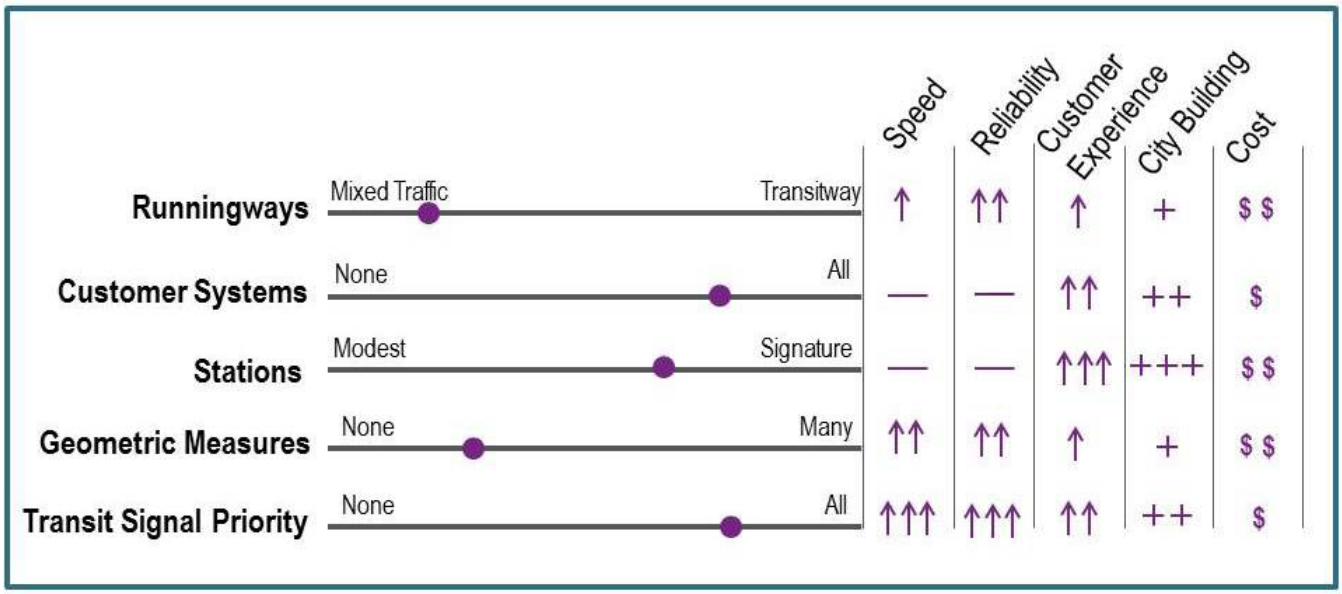
- Transit signal priority measures would be provided at all locations where analysis determines the installation would be beneficial.
- Geometric priority measures, including queue jump and by-pass lanes, would be provided in select locations where analysis determines the installation would be beneficial.
- Station design will be at the high end of a medium scale shelter following the general design criteria. Stations would have a common design theme; however, would be provided in three varying sizes depending on customer volumes.
- A full suite of standard Customer System elements would be provided. Provision (ducting) for security monitoring, help phones and off board fare processing would be included with a decision on the inclusion of items later.
- The majority of the runningways will be a mixed traffic curb running operation with exclusive lane runningways in three or four sections within the inner city.

Benefits Summary

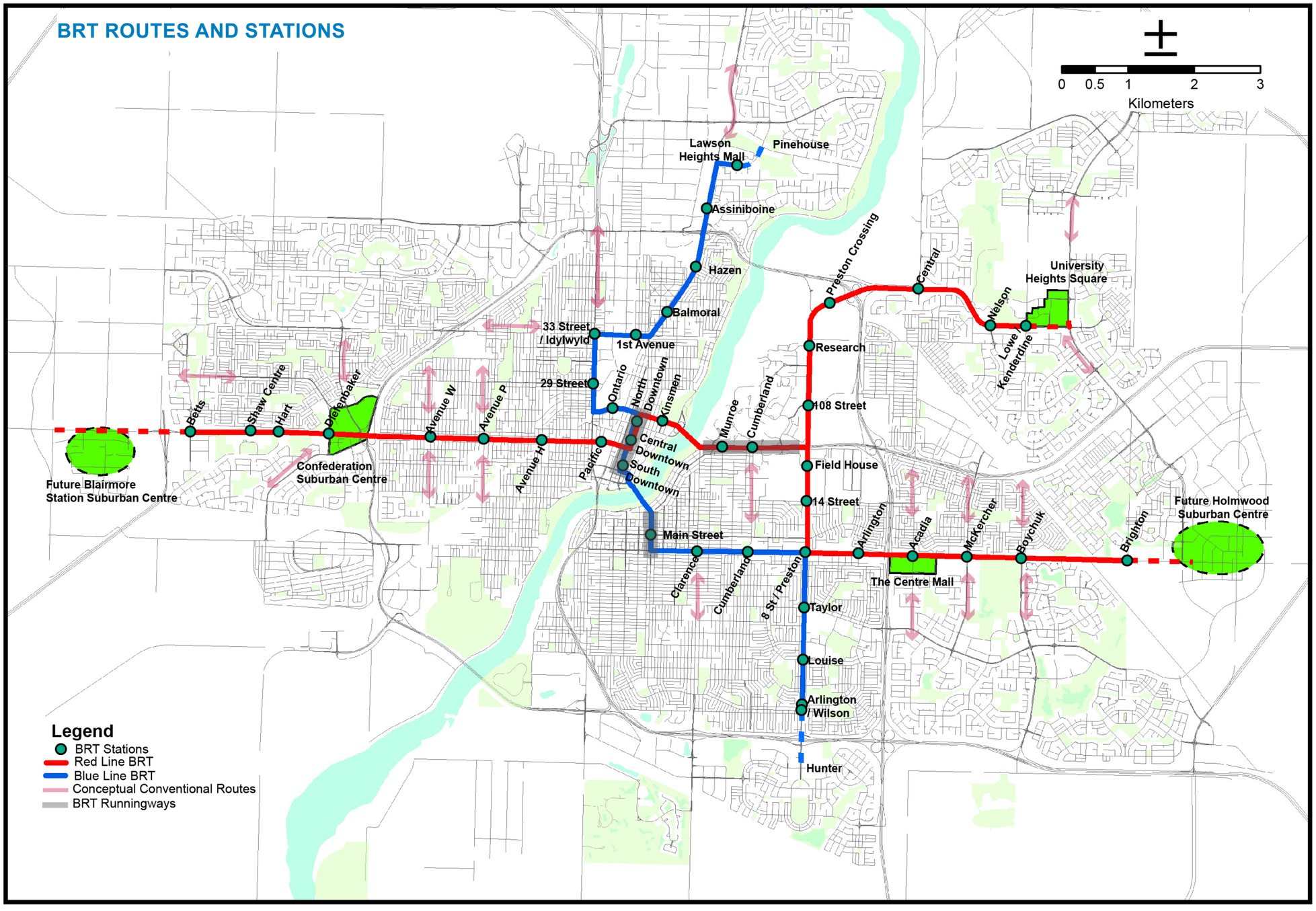
The expected benefits would include:

- Substantial improvement in transit operating speeds.
- Substantial improvement in schedule reliability.
- Significant improvement in the transit customer experience.
- Positive community image and support for corridor and Transit Villages development.
- Investment appropriate for the transit market, community aspirations and available funding.

The exhibit below illustrates the preferred configuration of Saskatoon's BRT system and the expected benefits.



BRT ROUTES AND STATIONS



BRT PROJECT TIMELINE

The major project milestones are as follows:

- **August to November 2017** – Validating the BRT system concept and identifying a "preferred configuration".
- **December 2017 to February 2018** – Stakeholder engagement and refinement of the BRT Functional Plan, Station Design, Transit Network Plan, Park and Ride Strategy, and Implementation Plan.
- **April 2018** – Completion of BRT Detailed Design.
- **Summer/Fall 2018** – Potential BRT pre-construction work (survey, utility locates, geo-technical work, etc.).

BRT IMPLEMENTATION AND COST

The BRT system described above could be implemented over a three year construction schedule for a rough cost of approximately $120 million plus or minus 25%. However, it must be recognized that the construction schedule and approximate cost are being put forward prior to completion of the Functional Plan and Detailed Design. The project cost noted is a very rough approximation and is based on similar BRT experience in other jurisdictions. The schedule may also be influenced by available funding.

Year 1	Year 2	Year 3
25%	40%	35%