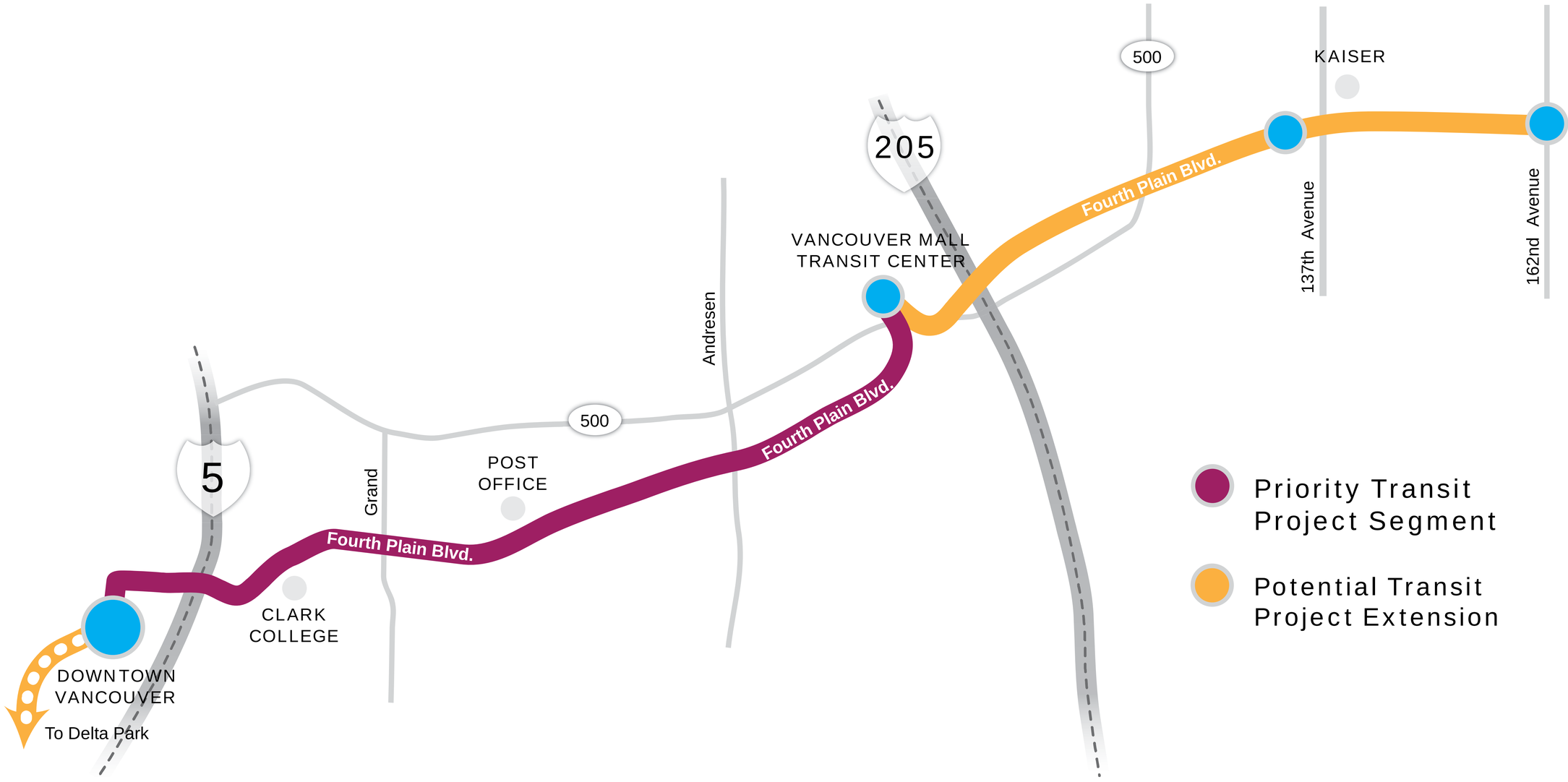
C-TRAN

Study Area Map



FOURTH PLAIN TRANSIT IMPROVEMENT PROJECT

Goals and Objectives

The project Goals and Objectives have been adopted based upon input from a wide variety of project stakeholders and are used to evaluate transit alternative concepts for the Fourth Plain Corridor. The project Goals include:

Goal 1	Improve Corridor Transit Service
Goal 2	Create a cost-effective, long-term transit solution
Goal 3	Meet Current and Projected Corridor Travel Demand
Goal 4	Enhance the Safety and Security of the Corridor
Goal 5	Support Economic Vitality and Corridor Revitalization Efforts
Goal 6	Support a Healthy and Livable Community

Project Alternatives

C-TRAN has evaluated several alternatives for improved transit on the Fourth Plain Corridor. The following alternatives have been evaluated based on today's conditions as well as short- and long-term projections for growth:

Bus Rapid Transit Alternatives

Bus Rapid Transit (BRT) is a transit mode that combines some of the attributes of light rail transit at much less cost and with the flexibility of bus transit. Alternatives remaining include:

- **Curb-side Running BRT.** Buses would run in the right lane of traffic, much like today.
- **Median Running BRT.** Buses would run in the left lane of traffic, with stations located in a protected median, rather than at the curb.

Non-Bus Rapid Transit Alternatives

Two non-bus rapid transit alternatives are being considered:

- **No Build Alternative.** The No-Build Alternative, which can be thought of as a continuation of existing service, will continue to be an option through the analysis phase.
- **Transportation Systems Management (TSM).** TSM is an option for low-cost enhancements to the current bus system. The TSM alternative will include operational improvements to the system, such as more frequent regular bus service, transit signal priority and other low-cost enhancements.

Fourth Plain Lane Concepts

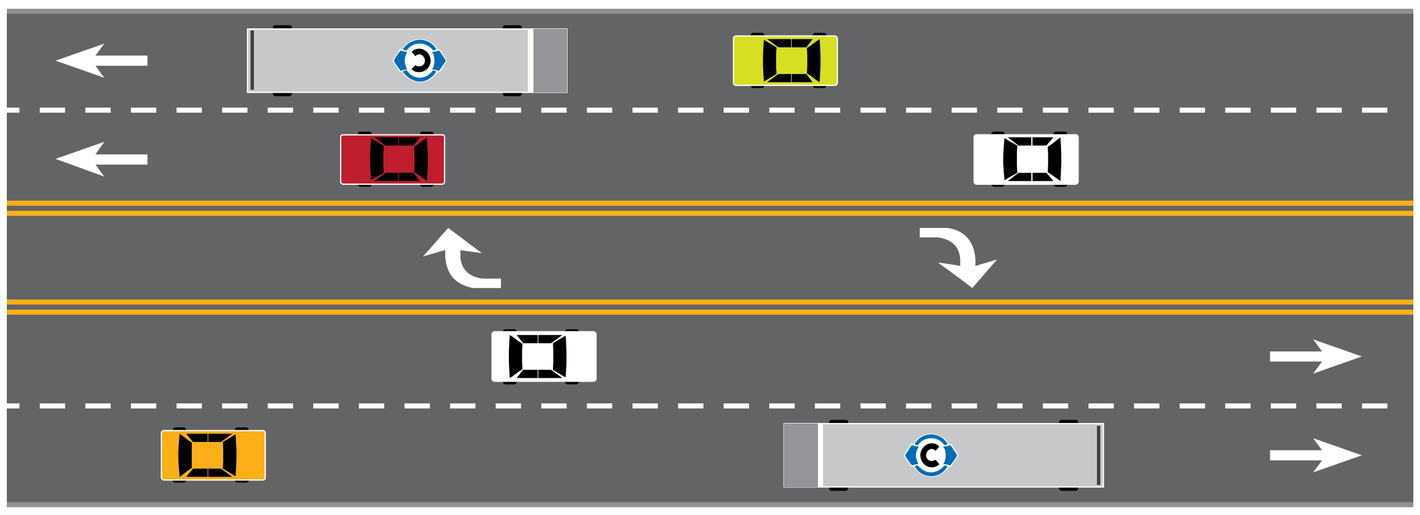
OPTION A: Mixed Traffic Curbside

Three lane concepts are being considered for Fourth Plain Boulevard.

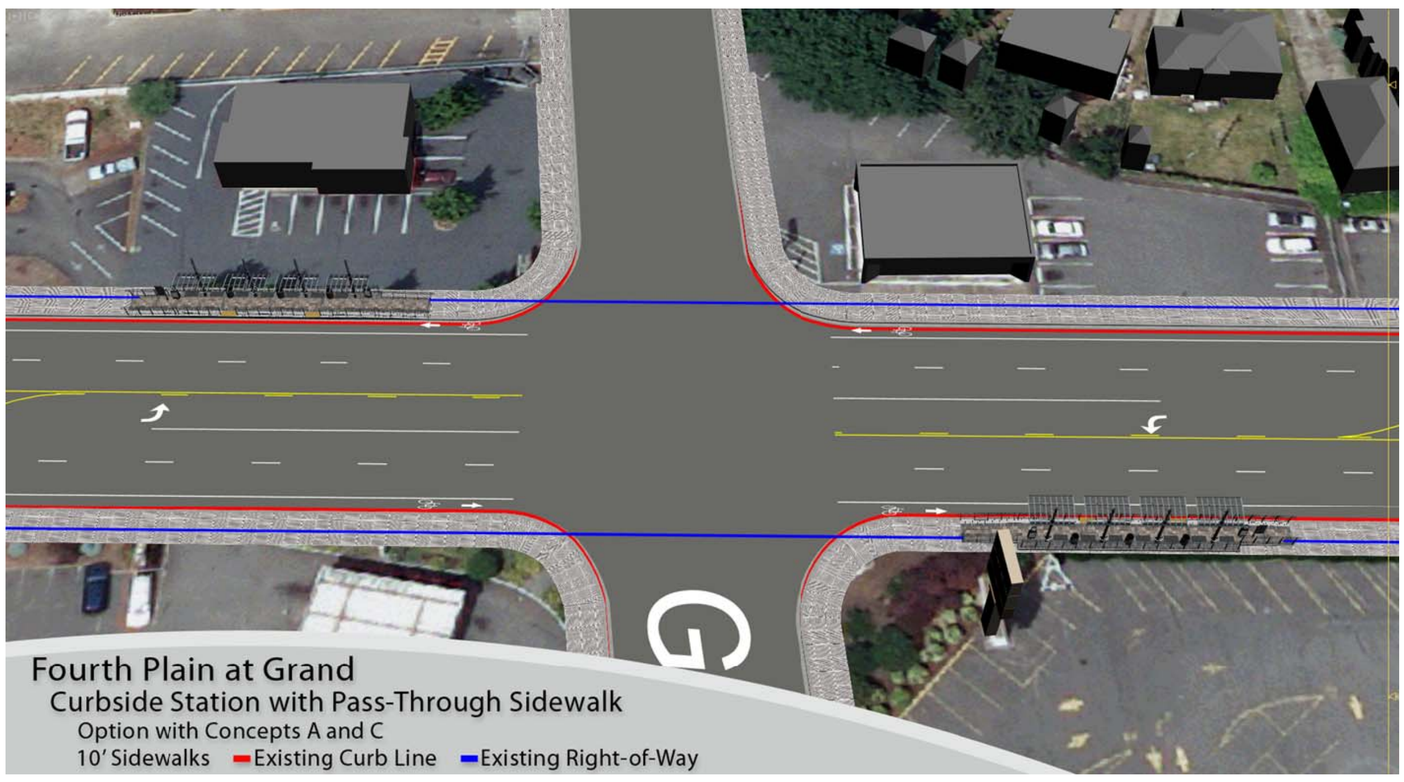
For Option A - Mixed Traffic Curbside, the Bus Rapid Transit vehicle would travel in mixed traffic in the curbside lane (much like current service). Stations would be located curbside.

Features

- Auto travel times would be about the same as the No-Build Alternative.
- There would be minimal property impacts.
- This alternative would include streetscape improvements and begin to implement other elements of the Fourth Plain Subarea Plan.



Option A: Mixed traffic - curbside lane configuration



Curbside station visualization

Fourth Plain Lane Concepts

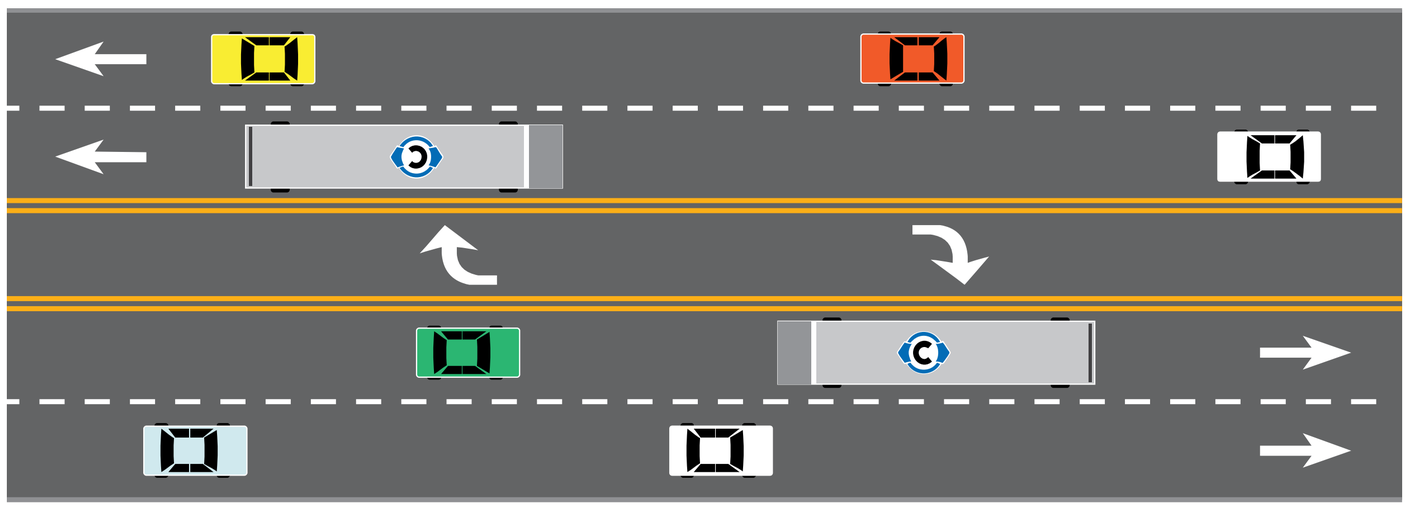
OPTION B: Mixed Traffic Left Lane

For Option B - Mixed Traffic Left Lane, the Bus Rapid Transit vehicle would travel in mixed traffic in the left hand lane. *Nearly all existing left turns would still be allowed.* Station locations and stops would be located within the median and would have signalized pedestrian access. The bus would have doors on both sides.

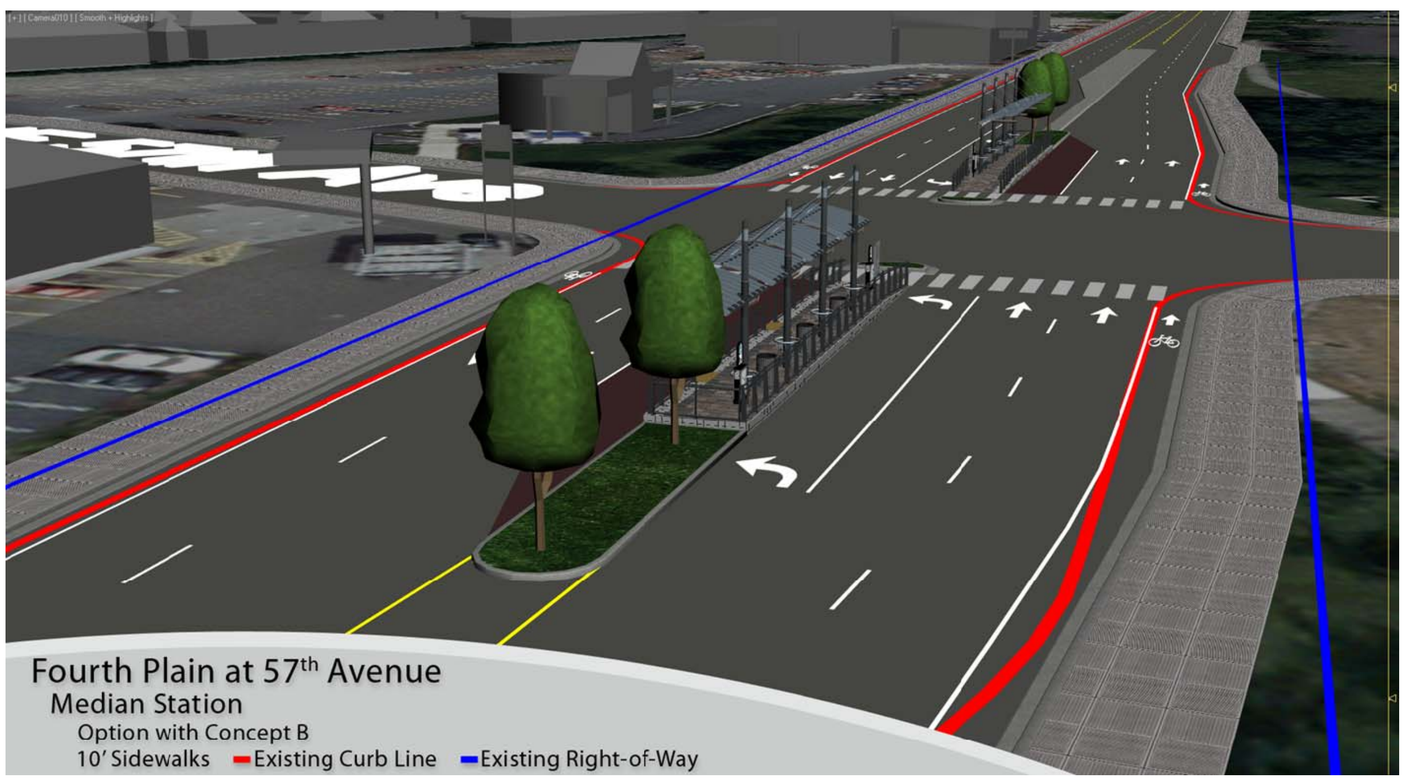
The left lane mixed-traffic lane configuration is only being considered on Fourth Plain between Fort Vancouver Way and 65th Avenue. East of 65th, the lane will transition to the mixed-traffic curbside due to traffic, design considerations and lower ridership.

Features

- Auto travel times would be about the same as the No-Build Alternative.
- There would be some property impacts in the vicinity of the stations, but no displacements.
- Median stations would provide pedestrian refuges for crossing Fourth Plain Boulevard.
- This would include the most streetscape improvements and begin to implement other elements of the Fourth Plain Subarea Plan.



Option B: Mixed traffic - left lane configuration



Median station visualization

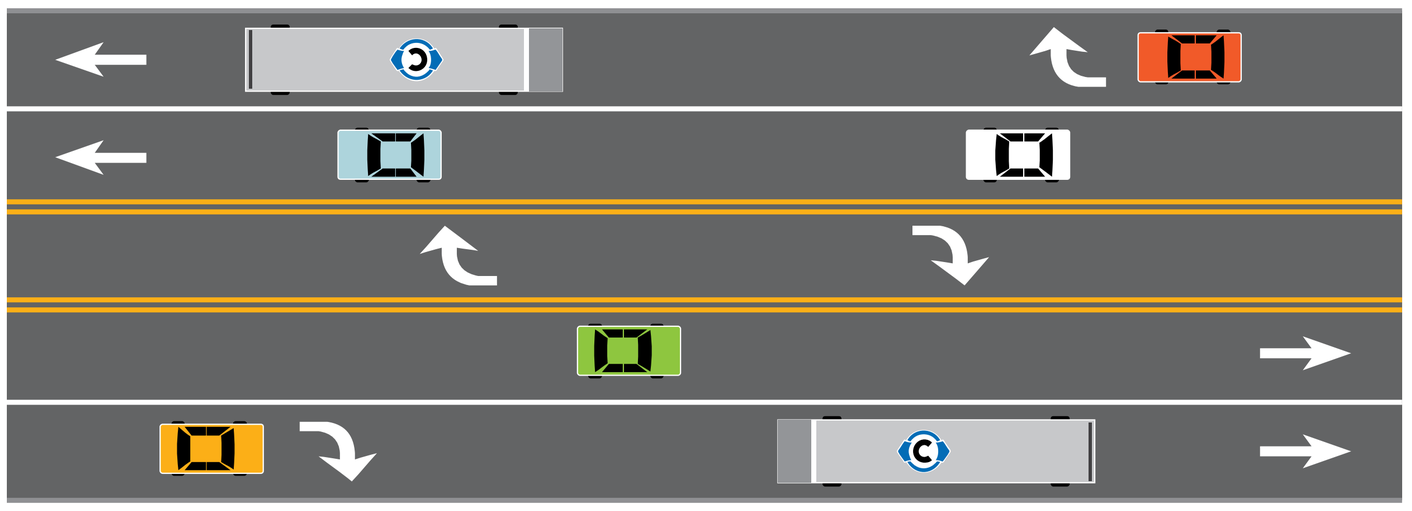
Fourth Plain Lane Concepts

OPTION C: Business Access Transit Lane

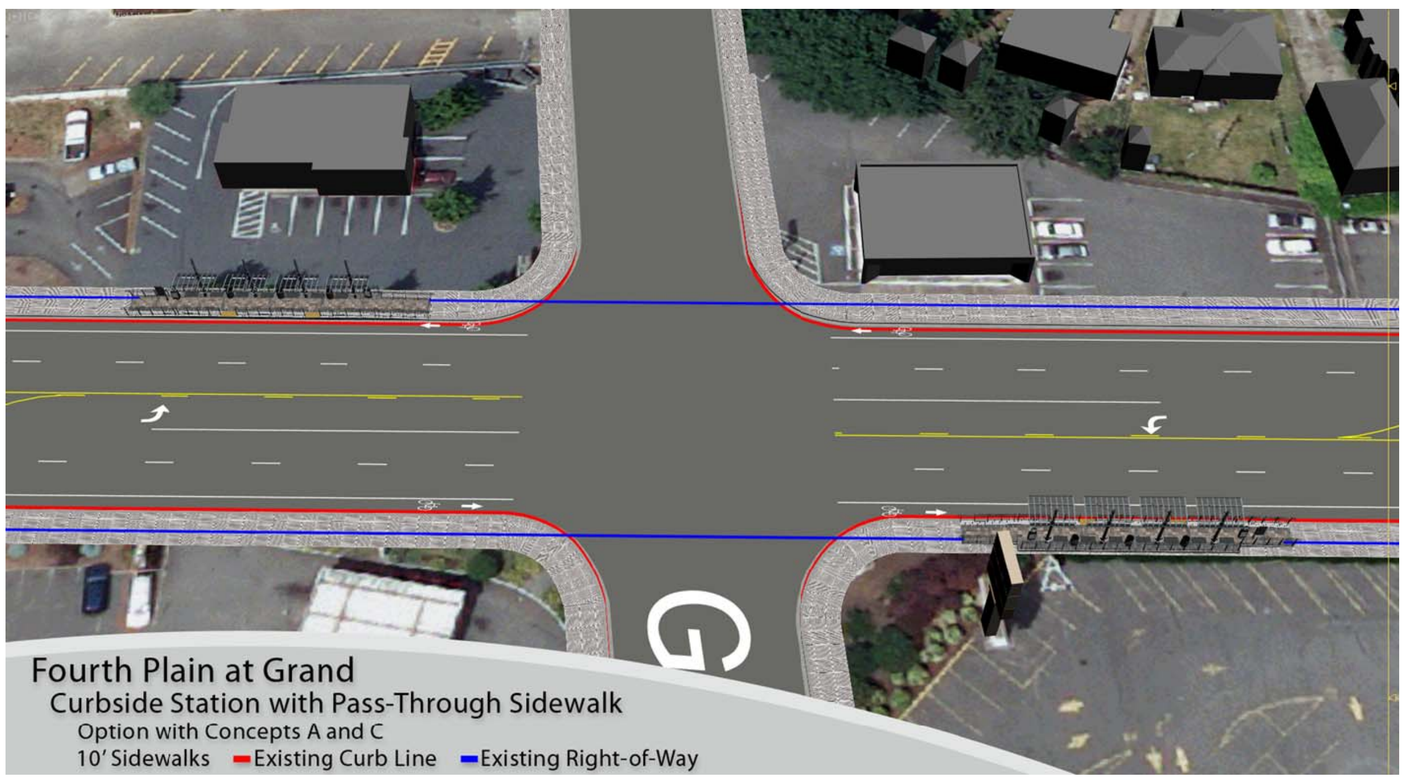
For Option C - Business Access Transit Lane, one travel lane in each direction would be converted to a shared lane for the Bus Rapid Transit vehicle and right-turning vehicles only. Stations would be located curbside.

Features

- Auto travel times would be about 50% longer than the No-Build Alternative due to the reduction in auto capacity.
- There would be a diversion of auto trips from the corridor due to the congestion.
- Transit travel time would be about the same as the mixed-traffic BRT Alternatives.
- There would be minimal property impacts.
- This would include streetscape improvements similar to



Option C: Business Access Transit (BAT) lane configuration



Curbside station visualization

Fourth Plain Lane Concepts
EVALUATION MATRIX

C-TRAN has evaluated the three BRT lane options for Fourth Plain Blvd. The matrix below shows how well each of the options meets the project Goals and Objectives.

	BRT Option A Mixed Traffic Curbside	**BRT Option B** Mixed Traffic Left Lane	**BRT Option C** Business Access Transit Lane
Goal 1: Improve corridor transit service	+	+	+
	All improve transit ridership, travel time, and reliability.		
Goal 2: Create a cost-effective, long-term transit solution	+	+	+
	Option B is slightly more expensive, but all are cost-effective.		
Goal 3: Meet current and future corridor travel demand	+	+	!
	Options A and B maintain the same auto travel times as the "No Build," whereas option C creates congestion.		
Goal 4: Enhance the safety and security of the corridor	+	+	+
	All options improve safety and security in the corridor. Option B provides pedestrian refuges.		
Goal 5: Support economic vitality and corridor revitalization efforts	+	+	!
	All options improve the appearance of the corridor. Option C would divert some autos from the corridor. Option B would limit a few driveways to right-turn only.		
Goal 6: Support a healthy and livable community	+	+	+
	All options would create community improvements. Option B would require a few property impacts, but no displacements.		

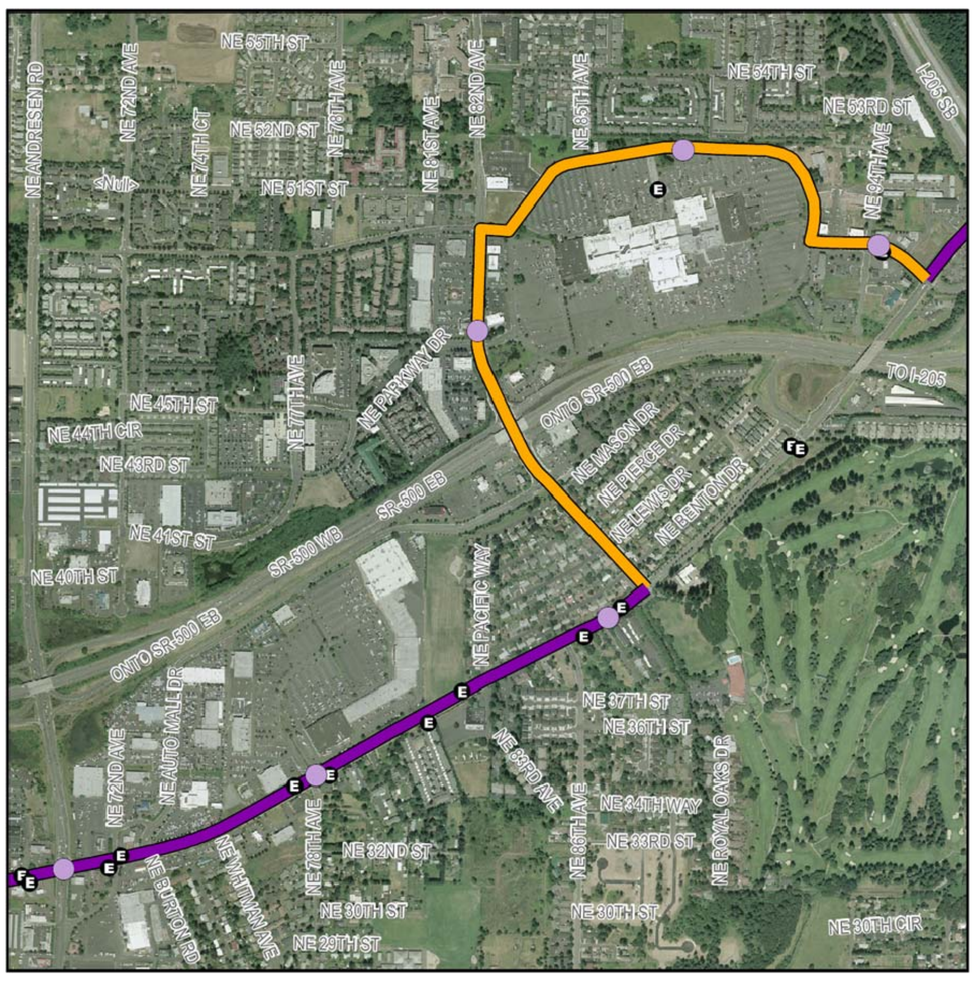
Fourth Plain Lane Concepts

MALL ROUTING OPTIONS

The study explored a number of options for access to the Westfield Vancouver Mall. The two options below are currently being considered by C-TRAN. Other options previously studied were eliminated because of ridership, technical difficulties and because they didn't demonstrate any significant benefits.

Thurston Way

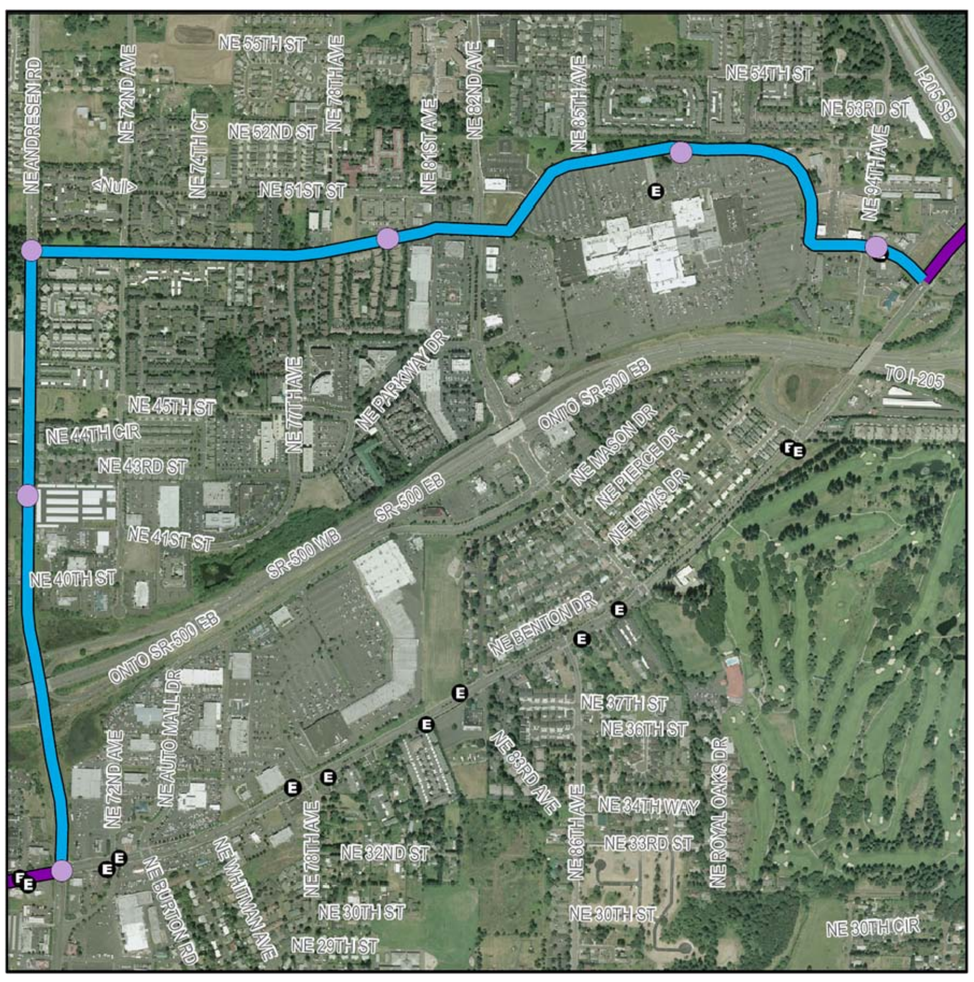
- Travel time similar to other options.
- Allows for “through” routing option.
- Serves Thurston Way area and western side of Mall.
- Allows for median station on Ring Road adjacent to Mall Transit Center, which would provide faster access than circulating through the Transit Center.



Thurston Way routing option

Andresen Road

- Travel time similar to other options.
- Allows for "through" routing option.
- Serves fairly intense development on Andresen and western side of Mall.
- Misses extended segment of Fourth Plain Boulevard, though it could be covered by revising Route 32.
- Allows for median station on Ring Road adjacent to Mall Transit Center, which would provide faster access than circulating through the Transit Center.



Andresen Road routing option

Fort Vancouver Way Lane Concepts

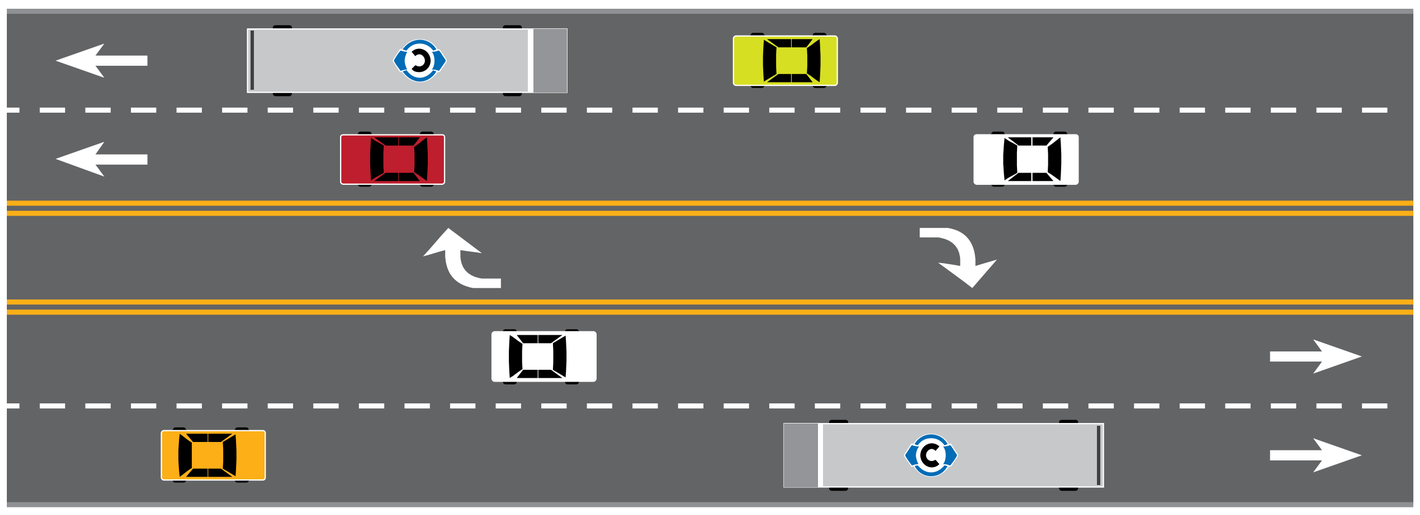
OPTION A: Mixed Traffic Curbside

Five lane concepts are being considered for Fort Vancouver Way.

For Option A - Mixed Traffic Curbside, the Bus Rapid Transit vehicle would travel in mixed traffic in the curbside lane (much like current service). Stations would be located curbside.

Features

- There would be no property impacts.
- Improved direct transit access to Clark College compared to the No-Build Alternative.
- Direct Access from Fourth Plain to the VA Medical Center would be provided with other bus service.
- Minimal impact to on-street parking by using station bulb-outs.



Option A: Mixed traffic - curbside lane configuration

Curbside mixed traffic lane visualization

Fort Vancouver Way Lane Concepts

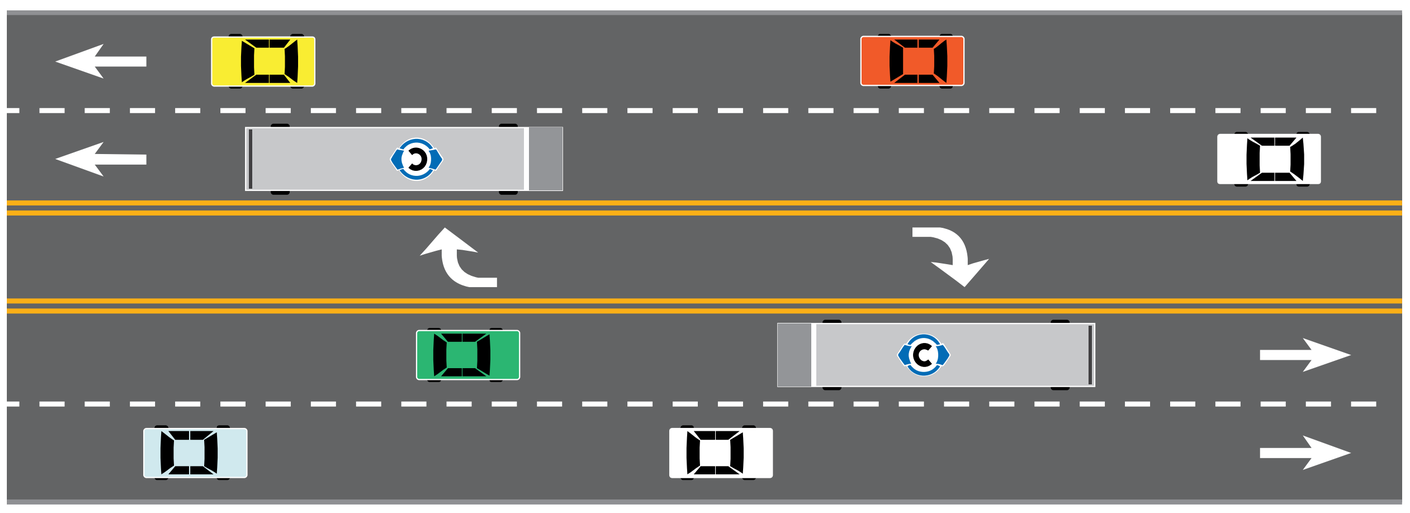
OPTION B: Mixed Traffic Left Lane

For Option B - Mixed Traffic Left Lane, the Bus Rapid Transit vehicle would travel in mixed traffic in the left hand lane. Station locations and stops would be located within the median and would have signalized pedestrian access. The bus would have doors on both sides. For this concept, the bus would not stop in the left traffic lane; it will pull out of, and back into, the left lane to make the stop.

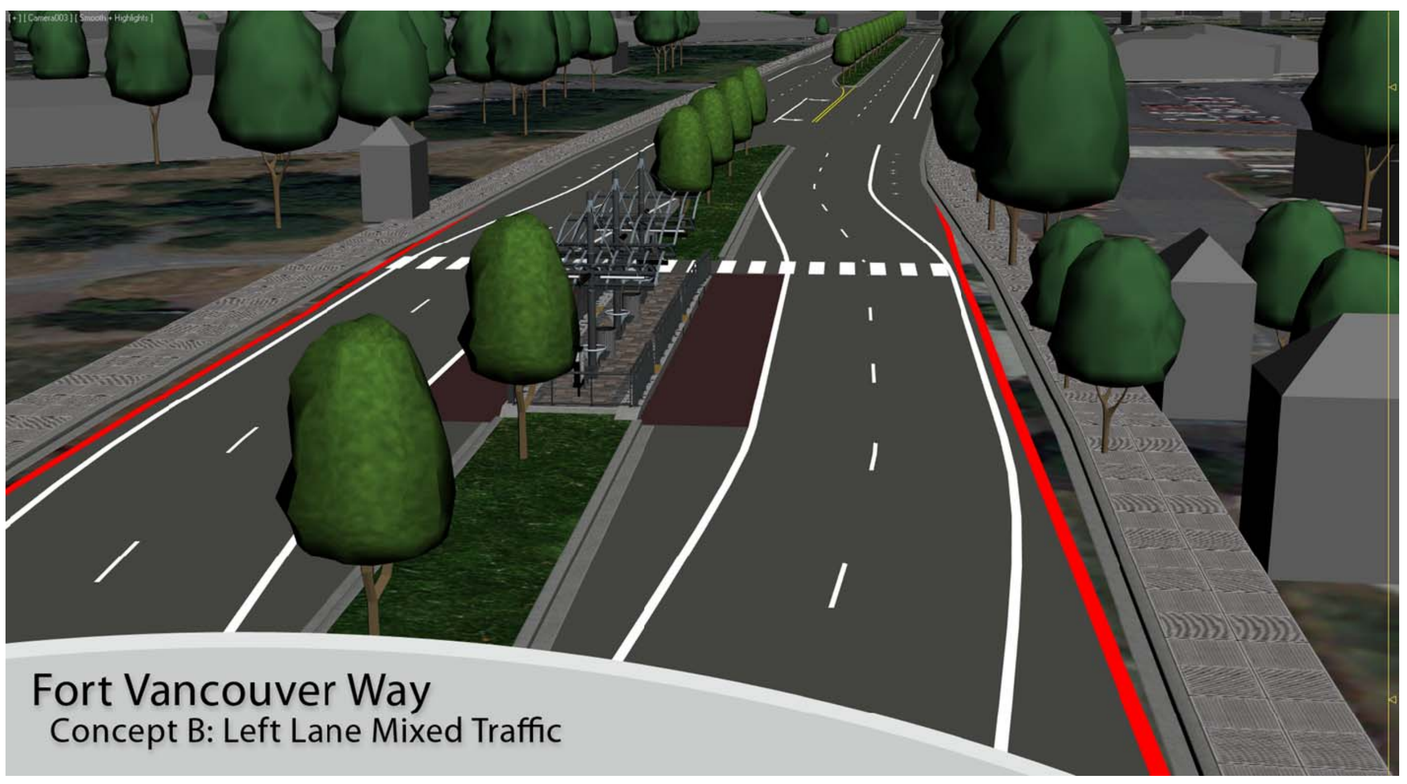
The visualization shows how the roadway must be widened a few feet in the vicinity of the station.

Features

- There would be no property impacts.
- Improved direct transit access to Clark College compared to the No-Build Alternative.
- Direct Access from Fourth Plain to the VA Medical Center would be provided with other bus service.
- Somewhat greater impact to on-street parking due to extended station area influence.
- Medians provide pedestrian refuges.



Option B: Mixed traffic - left lane configuration



Left lane mixed traffic lane visualization

Fort Vancouver Way Lane Concepts

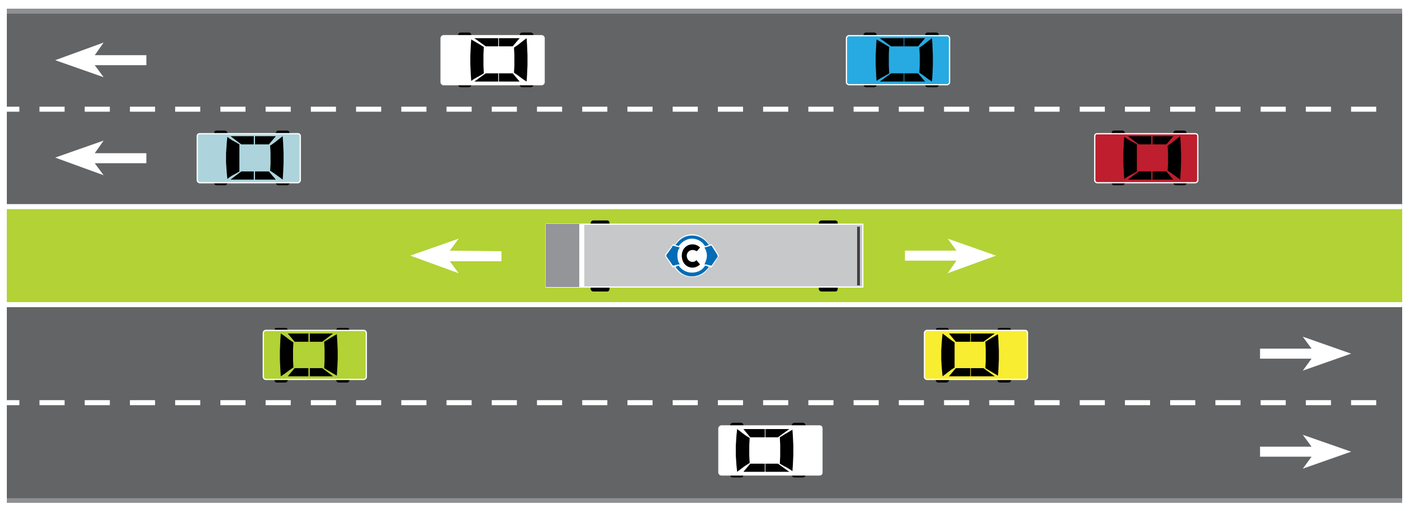
OPTION E: Bi-directional Median Lane

Option E provides for a single center-running transit lane that would be used by Bus Rapid Transit vehicles traveling in both directions. Use of the bi-directional lane would be controlled by a block signaling system that would prevent two BRT buses traveling in opposite directions from occupying the lane at the same time. Stations would be in the median of the street.

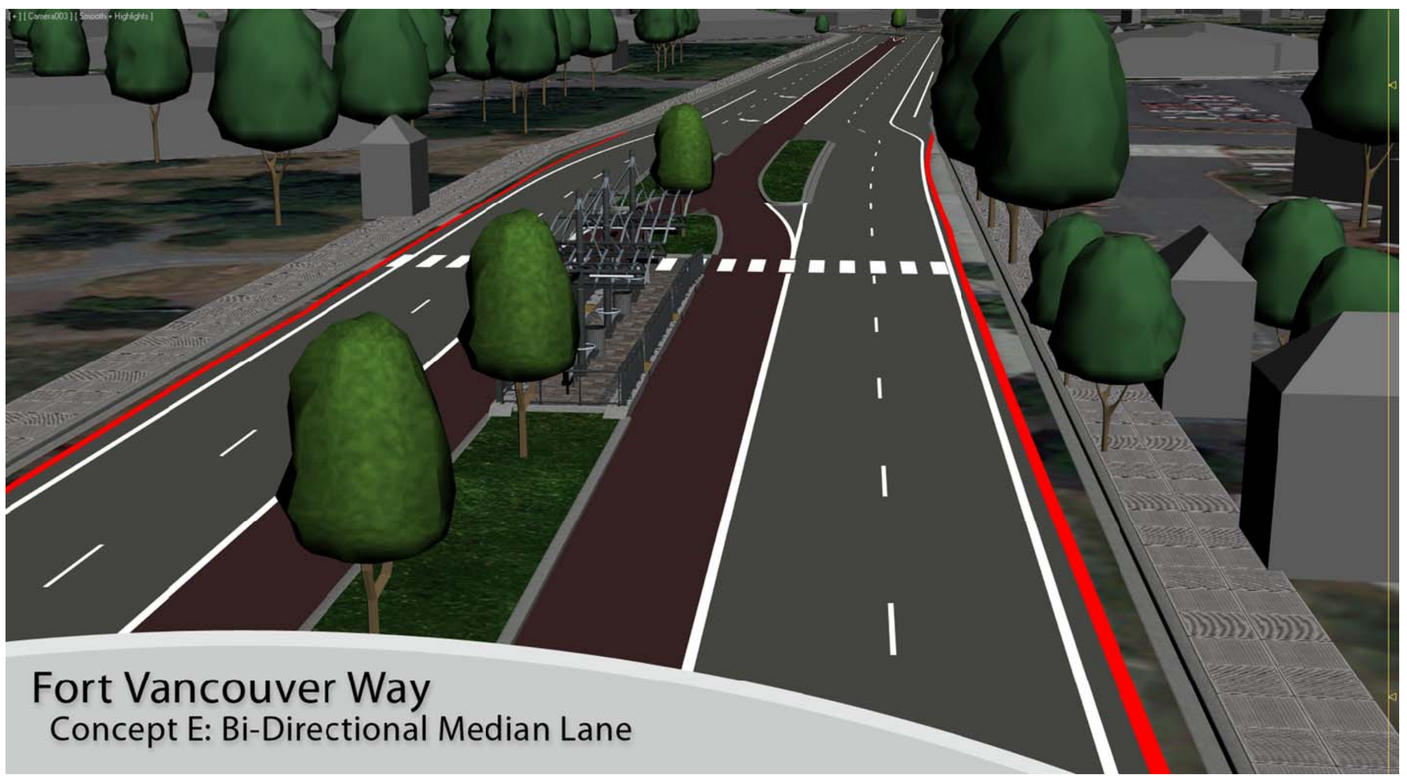
The visualization shows a bi-directional lane with a station that can accommodate buses travelling in both directions at the same time.

Features

- There would be no property impacts.
- Improved direct transit access to Clark College compared to the No-Build Alternative.
- Direct Access from Fourth Plain to the VA Medical Center would be provided with other bus service.
- Somewhat greater impact to on-street parking due to extended station area influence.



Option E: Bi-directional median lane configuration



Bi-directional median lane visualization

Fort Vancouver Way Lane Concepts

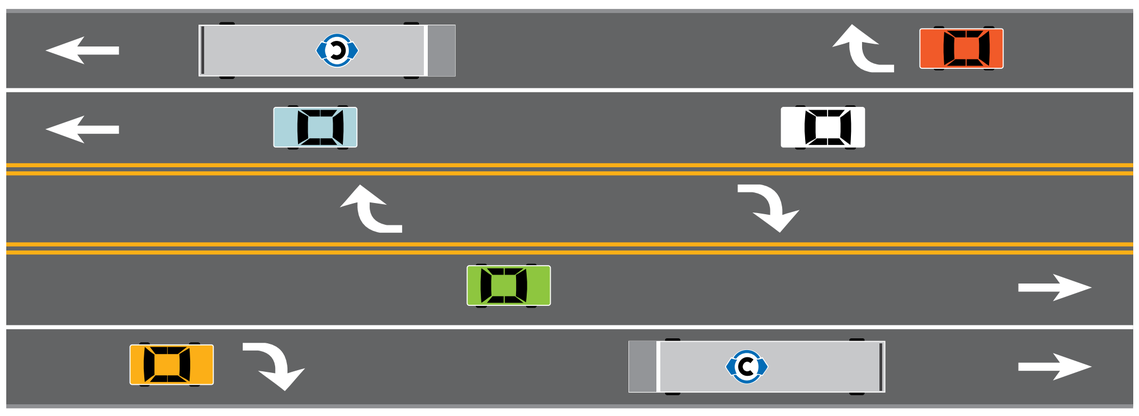
OPTIONS C and G

(not recommended for further consideration)

Options C and G are not being recommended for further consideration because they would create unacceptable traffic impacts.

BRT Option C: Business Access Transit Lane (not recommended for further consideration)

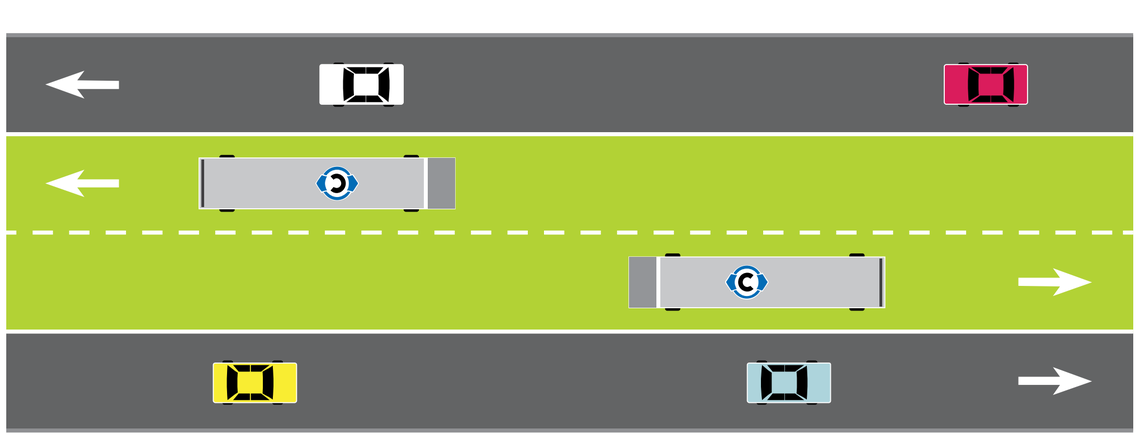
Lane Concept C would convert the curbside lane into a Business Access and Transit lane, also known as a BAT lane. The lane would be restricted to use by BRT vehicles and vehicles making right turns. Use of the right lane for through travel would not be allowed, except for the BRT service. Traffic analysis has shown that these changes would be infeasible without substantial traffic delays.



Option C: Business Access Transit (BAT) lane configuration

BRT Option G: Median Bus Lane - Converted (not recommended for further consideration)

This concept would convert the left travel lane on Fort Vancouver Way to exclusive bus lanes. This would leave one travel lane in each direction. Traffic analysis has shown that these changes would be infeasible without substantial traffic delays.



Option G: Median bus lane configuration

C-TRAN

Fort Vancouver Way Lane Concepts

EVALUATION MATRIX

C-TRAN has evaluated the three BRT lane options for Fort Vancouver Way. The matrix below shows how well each of the options meets the project Goals and Objectives.

	BRT Option A Mixed Traffic Curbside	**BRT Option B** Mixed Traffic Left Lane	**BRT Option E** Bi-directional Median Lane
Goal 1: Improve corridor transit service	+	+	+
	All improve transit ridership, travel time, and reliability.		
Goal 2: Create a cost-effective, long-term transit solution	+	+	+
	All cost about the same; all are cost effective.		
Goal 3: Meet current and future corridor travel demand	+	+	+
	All options maintain the same auto travel times as the No Build.		
Goal 4: Enhance the safety and security of the corridor	+	+	?
	All provide safety improvements. Medians in Option B provide pedestrian refuges. There are questions about the safety of E due to the bi-directional lane and the number of mid-block pedestrian crossings.		
Goal 5: Support economic vitality and corridor revitalization efforts	+	+	+
	All options improve the appearance of the corridor.		
Goal 6: Support a healthy and livable community	+	+	+
	All options would create community improvements. Option B would remove more on-street parking spaces.		

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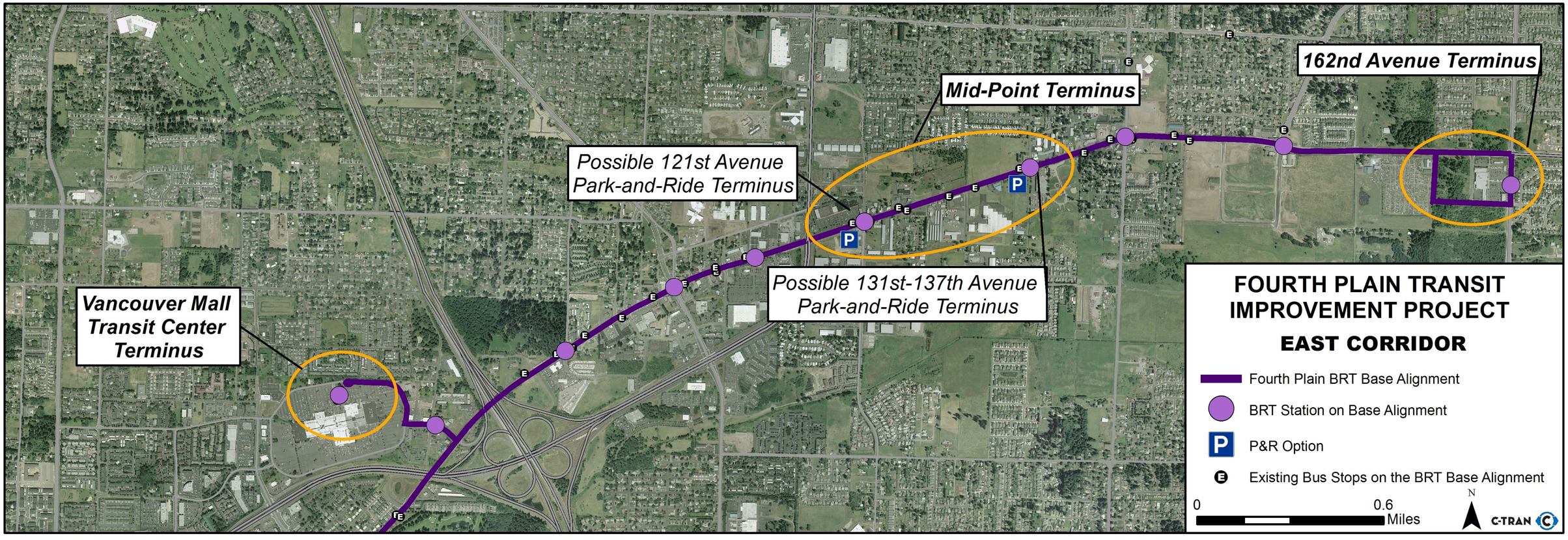
Eastern Terminus Options

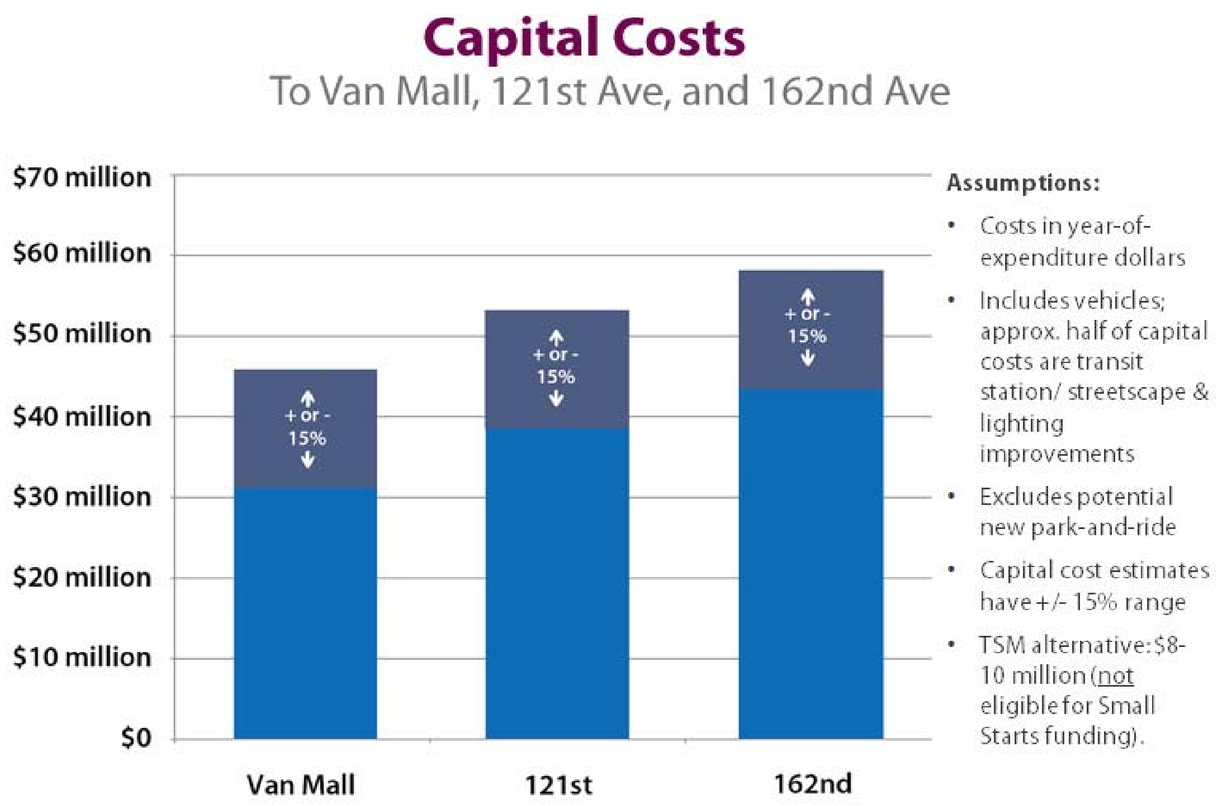


Eastern Terminus Options

An important question to be determined during the alternatives analysis is how far east to operate the BRT service. Potential terminus options include:

- Vancouver-Westfield Mall
- End service at 121st or 137th, with a park and ride lot to be located in the vicinity of Fourth Plain at 121st Ave or in the vicinity of 131st Ave.
- 162nd Avenue.

The decision will be based on the expected ridership of the segments and their ability to support high-frequency BRT service.



Vancouver-Westfield Mall Terminus

- Covers the portion of the Fourth Plain corridor with the highest current and projected (Year 2035) ridership.
- BRT operating costs are estimated to be up to 10 % less than the No-Build and TSM Alternatives with this terminus option.
- Would not support development of the fast-growing eastern portion of Vancouver.

Mid-Point Terminus (121st or 137th)

- Extends service east of I-205 to provide direct all-day connection from that area to Clark College and downtown Vancouver.
- Supports development of the fast-growing portion of Vancouver east of I-205.
- Provides option for a park and ride in the vicinity of Fourth Plain at 121st Ave or in the vicinity of 131st Ave.
- Projected Year 2035 ridership between the Westfield-Vancouver Mall and 121st remains fairly strong.
- BRT operating costs are estimated to be about the same as the No-Build Alternative with this terminus option, and 10% less than the TSM.

162nd Terminus

- Extends service to the eastern portion of Vancouver to provide direct all-day connection from that area to Clark College and downtown Vancouver.
- Supports development of the fast-growing eastern portion of Vancouver.
- Provides option for a park and ride in the vicinity of Fourth Plain at 121st Ave or in the vicinity of 131st Ave.
- Projected Year 2035 ridership between 121st and 162nd is not strong and may not warrant 10-minute service frequency.
- BRT operating costs are estimated to be about 10% higher than the No-Build Alternative with this terminus option and 10% less than the TSM.

Comparing Alternatives

OVERVIEW

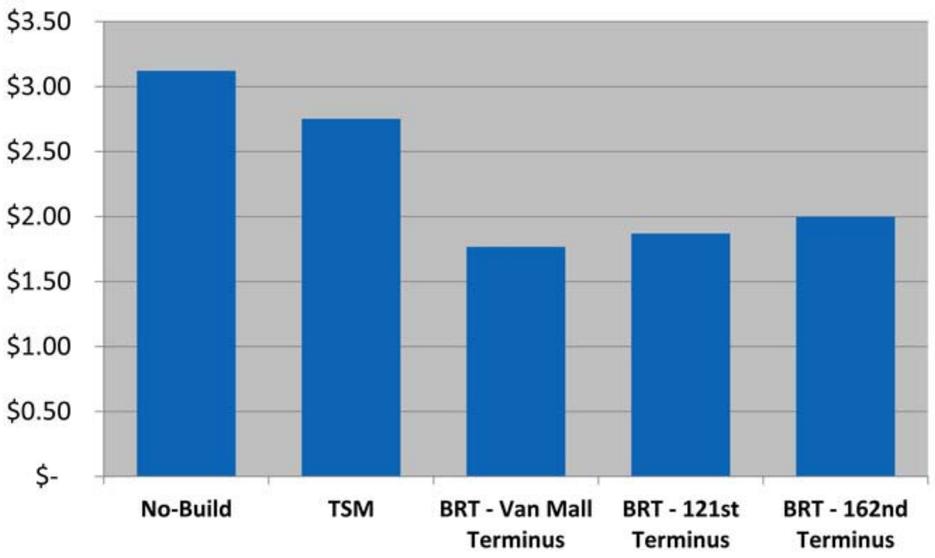
The project team compared the three main alternatives - **No Build, Transit System Management (TSM)** and **Bus Rapid Transit (BRT).**

- The study found that BRT service would nearly double ridership compared to the No Build alternative for the year 2035.
- BRT service was determined to be faster and more reliable than both the No Build and TSM alternatives. Auto travel times were the same under all three alternatives.
- The operating cost for BRT service is estimated to be less than with the No Build alternative, and the capital costs for BRT is estimated to be between $45 and $65 million.
- The team also looked at a variation of the TSM, putting Express Bus Service on SR500. This option provided only a little more ridership increase than the No Build so it was not carried forward.

The charts below compare the No Build, TSM and BRT alternatives.

Estimated Operating Cost Per Boarding

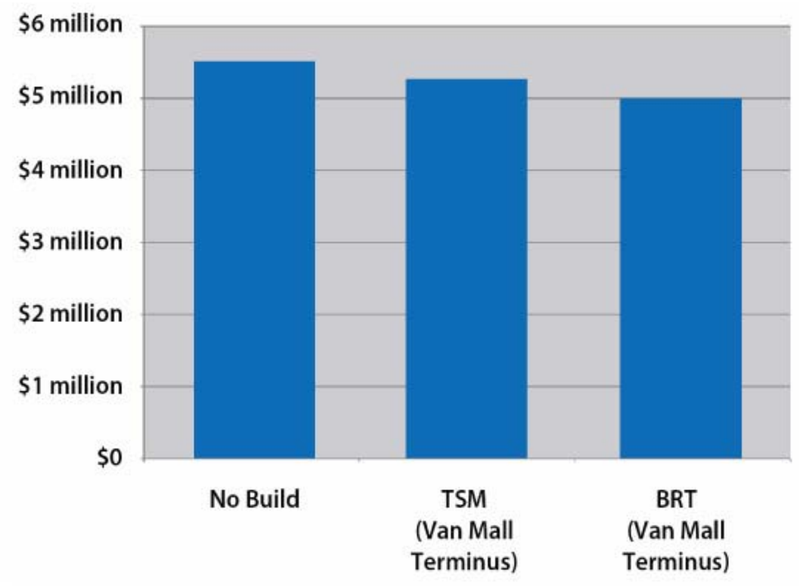
No Build, TSM, and BRT Terminus Options



Note: estimated existing operating cost per boarding is $2.70 to $3.00.

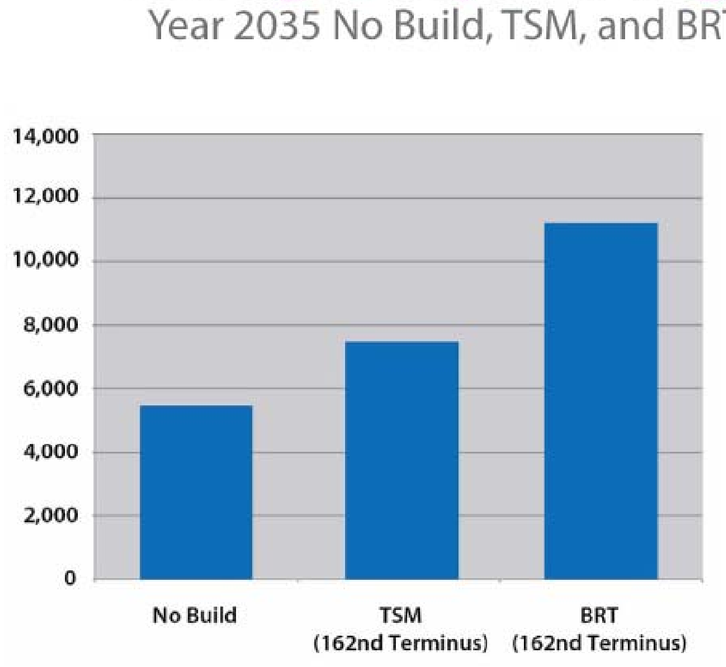
Estimated Operating and Maintenance Costs

No Build, TSM, and BRT with Van Mall Terminus



Average Daily Boardings

Year 2035 No Build, TSM, and BRT

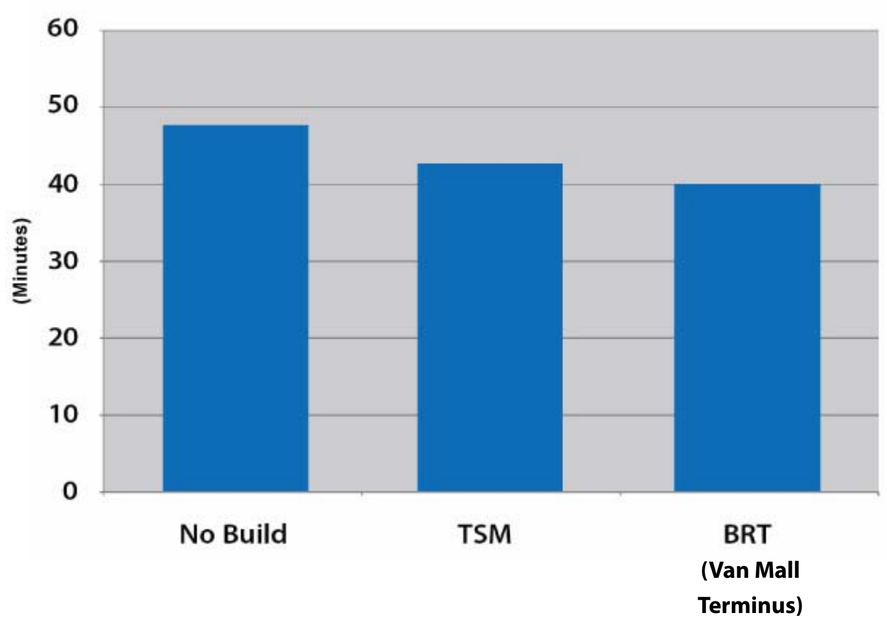


All 2035 modeling assumes light rail extension into downtown Vancouver (cross-river trips not in Fourth Plain totals).

Existing (2010) includes cross-river trips.

PM Peak Hour Transit Travel Time

From downtown Vancouver to Westfield Vancouver Mall



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Comparing Alternatives

SUMMARY OF BENEFITS & TRADEOFFS

Bus Rapid Transit (BRT)

- Corridor transit ridership by Year 2035 is projected to be about double the No-Build Alternative and about 50% higher than the TSM Alternative.
- Year 2035 transit travel times along the corridor are projected to be about 20% faster than No-Build and about 10% faster than the TSM Alternative.
- Reliability of transit travel times would be better than the No-Build Alternative.
- Year 2035 transit operating costs for the Vancouver-Westfield Mall terminus is estimated to be about $700,000 per year less than the No-Build Alternative.
- For curbside BRT, capital costs are estimated to be $35 million (with Vancouver-Westfield Mall terminus) to $60 million (with 162nd Ave terminus). Capital costs are estimated to be $5-7 million more for median (left lane) BRT.

Transportation System Management (TSM)

- Corridor transit ridership by Year 2035 is projected to be about 20% higher than the No-Build Alternative, but BRT Alternatives would have about 50% more ridership.
- Year 2035 Transit travel times are projected to be about 10 % faster than No-Build and about 10 % slower than the BRT Alternatives.
- Year 2035 transit operating costs for the Vancouver-Westfield Mall Terminus are estimated to be about the same as No-Build and about $600,000 per year more than the BRT Alternatives.
- Capital costs are estimated to be about $8-12 million, or 20 % of the capital costs for the BRT Alternatives (includes purchasing additional buses). BRT projects qualify for FTA Small Starts Funding, but TSM projects do not.
- Auto travel times would be about the same as the No-Build Alternative.
- There would be no property impacts.

No Build Alternative

- Corridor transit ridership by Year 2035 is projected to be about half that of the BRT Alternatives.
- Transit travel times would continue to increase and by Year 2035 would be about 10% slower than the TSM Alternative and about 20% slower than the BRT Alternatives.
- Transit operating costs are estimated to increase as a result of slower bus travel times and be higher than the BRT Alternatives for the Westfield Vancouver Mall terminus option.
- Reliability of transit travel times would continue to deteriorate and be worse than the BRT Alternatives.
- Buses would not have enough capacity for demand.
- There would be no capital costs for transit improvements in the corridor.
- There would be no property impacts.

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Comparing Alternatives
EVALUATION MATRIX

The matrix below shows how well each of the alternatives meets the project Goals and Objectives.

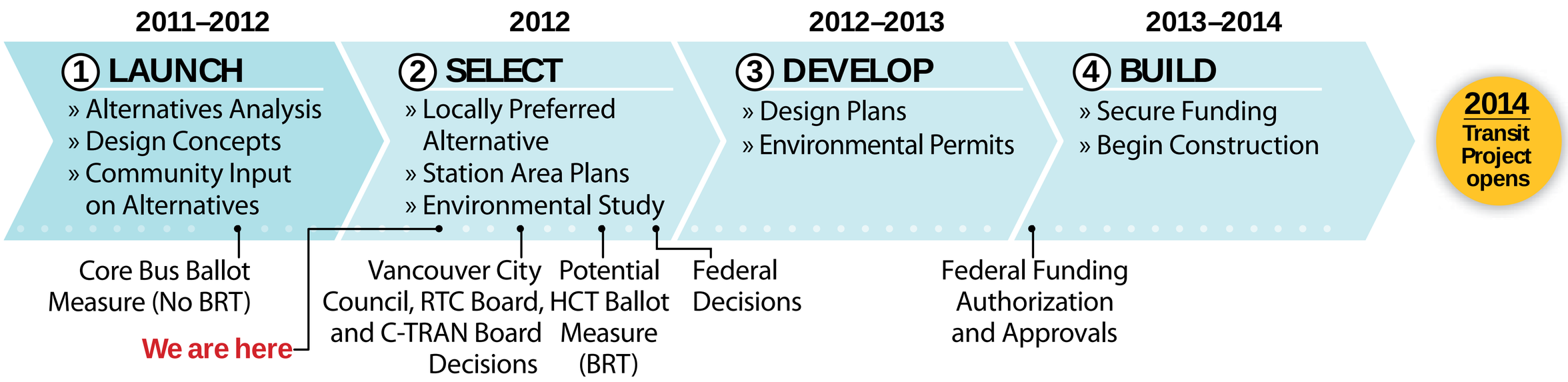
	No Build	TSM	BRT
Goal 1: Improve corridor transit service	!	!	+
	BRT has twice the ridership of No Build and 50% more than TSM. Travel time and reliability would continue to degrade with No Build and TSM.		
Goal 2: Create a cost-effective, long-term transit solution	?	!	+
	No Build has the least capital cost, while operating cost would be slightly more than the shorter BRT options. Because it does not provide adequate capacity it is not considered very cost effective. *For the TSM, capital costs are more than the No Build, operating costs are more than the BRT, and there is no identifiable means of funding it. It also does not meet the transit needs.* *BRT may have the least operating costs; and while the capital costs are the highest, the project meets federal funding criteria. So, because it addresses the transit need, it is considered cost effective.*		
Goal 3: Meet current and future corridor travel demand	!	?	+
	All provide comparable auto travel (although the BAT option for BRT would create congestion). The No-Build option would not meet transit demand and would exceed capacity.		
Goal 4: Enhance the safety and security of the corridor	!	?	+
	BRT would improve both safety and security with streetscape and crossing improvements and the opportunity for lighting. TSM would provide minimal improvements. No Build would not improve the corridor, which has one of the County's highest pedestrian and bicycle accident rates.		
Goal 5: Support economic vitality and corridor revitalization efforts	?	?	+
	BRT improves the appearance of the corridor and maintains access to businesses; it also helps implement the community's vision for the corridor. No Build and TSM would maintain access as it is.		
Goal 6: Support a healthy and livable community	!	!	+
	BRT creates community improvements and improves service for people dependent on transit. There would be fewer improvements for TSM and none for No Build.		

Next Steps

Thank you for your participation.

The input and feedback you provided will be given to the Corridor Advisory Committee and to staff as they craft a set of formal recommendations to the C-TRAN Board of Directors.

Project Schedule



Upcoming Meetings

Regional Transportation Council Board Meeting	May 1, 2012 - 4:00 PM Clark County Public Services Building
Vancouver City Council Workshop	May 7, 2012 - 4:00 PM Vancouver City Council Chambers
C-TRAN Board Meeting	May 8, 2012 - 5:30 PM C-TRAN Administrative Offices
Vancouver City Council Hearing on Proposed Locally Preferred Alternative	May 21, 2012 - 7:00 PM Vancouver City Council Chambers
Regional Transportation Council Decision Meeting	June 5, 2012 - 4:00 PM Clark County Public Services Building
C-TRAN Board Decision Meeting	June 12, 2012 - 5:30 PM C-TRAN Administrative Offices