Cost of Light rail to Vancouver

The Portland/Vancouver I-5 Transportation and Trade Partnership was formed by the governors of Oregon & Washington to make recommendations about the congestion problem on I-5 between the Rose Quarter and SR-500. They forecasted the costs and riderships of two bus options and light rail for a loop going up I-5, over to I-205 and down I-205 to Gateway.
(all data is for the evening rush hour and is from the I-5 partnership -- see bottom of next page):

Express Bus-Short

3 lane/LRT loop	cost: $1,222 million	for 13,000 riders
3 lane/Express Bus-**Short**	cost: $14 million	for 9,000 riders
Increase due to rail	cost: $1,208 million	for 4,000 more riders (subtracting the two)

Cost per increased rider: $1,208,000,000 ÷ 4000 = **$302,000 per increased rider**

Express Bus-Long

3 lane/LRT loop	cost: $1,222 million	for 13,000 riders
3 lane/Express Bus-**Long**	cost: $32 million	for 10,600 riders
Increase due to rail	cost: $1,190 million	for 2,400 more riders (subtracting the two)

Cost per increased rider: $1,190,000,000 ÷ 2400 = **$495,000 per increased rider**

It would literally be cheaper to buy a Pearl district condo for each of those ridders that would not ride the bus. (Of course it would hard to identify those individuals)

Effect of Light Rail on Traffic Congestion

The proposed light rail system is forecasted to carry only 2400-4000 passengers that would not have otherwise taken the bus, thus its real effect is to remove those 2400-4000 people from the road.

Using the higher number of riders: Since the study period was a four hour evening rush period, those 4000 people are 1000 people per hour. At an average car loading of 1.2 people, that is 833 cars per hour removed from the road. The capacity of a freeway lane is about 2000 cars per hour, so the effect is to add 42% of one lane of freeway capacity (or 25% of one freeway lane if you use the 2500 riders forecast).

Considering that the current capacity is 6 lanes (the forecast was for I-5 and I-205 river crossings combined), the added 42% of one lane is an **increase in capacity of 7% to the current 6 lanes in the study area** (or 4% if you use the 2500 number)**. ----- For $1.2 Billion.**

(Over)

Are new riders attracted to transit by Light Rail?

Another way to look at the projected data is how much does constructing light rail increase transit rider ship?

(Repeating the charts)

3 lane/LRT loop	cost: $1,222 million	for 13,000 riders
3 lane/Express Bus-**Short**	cost: $14 million	for 9,000 riders
Increase due to rail	cost: $1,208 million	for 4,000 more riders (subtracting the two)
Increased ridership:	4,000 ÷ 13,000 = 0.31 - **A 31% increase in ridership** for spending an additional $1.2 billion	

Express Bus-Long

3 lane/LRT loop	cost: $1,222 million	for 13,000 riders
3 lane/Express Bus-**Long**	cost: $32 million	for 10,600 riders
Increase due to rail	cost: $1,190 million	for 2,400 more riders (subtracting the two)
Increased ridership:	2,400 ÷ 13,000 = 0.18 - **An 18% increase in ridership** for spending an additional $1.19 billion. This is spending 37 times the money for an additional 18% transit rider ship.	

Notice that as the bus system got better, it captured even more of the light rail riders. A spending increase of 229% got 15% (9,000 to 10,600) more riders. Would another 229% spending increase get another 15% ridership increase? If so, the bus would be carrying around 12,484. This is only 515 riders less than rail, or only 4% less than rail, for a cost of only $74 million compared to$1.2 BILLION.

Here is the question that should have been asked:
How much must we spend on a deluxe bus system to match the ridership of light rail?
Look at dedicated bus ways AND buses on HOV lanes.

Date source: http://www.i-5partnership.com/reports/q3.html (Attached).
Rider Ship is from the “Travel Time” section (circled in red).
Costs are from the ‘Cost’ section (circled in red).

According ODOT, the cost estimate was made by consultant Parsons Brinkerhoff in cooperation with Tri-Met and the ridership projections were by Metro and David Evans.

Also see the video: Evaluation of Rail Transit Projects with Tom Rubin (19 meg file) at http://www.saveportland.com/

Portland / Vancouver I-5 Transportation and Trade Partnership

Washington and Oregon working together
for the economy, jobs, and quality communities

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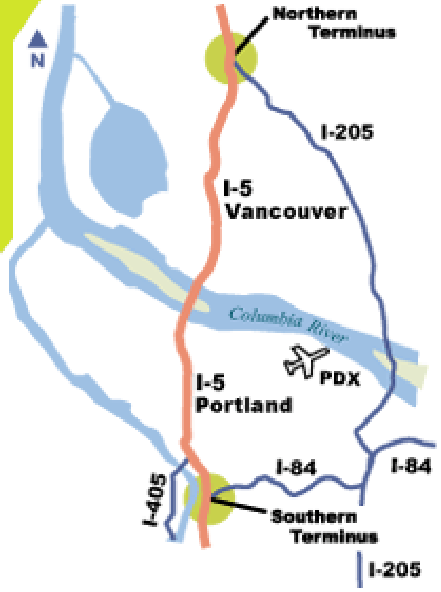
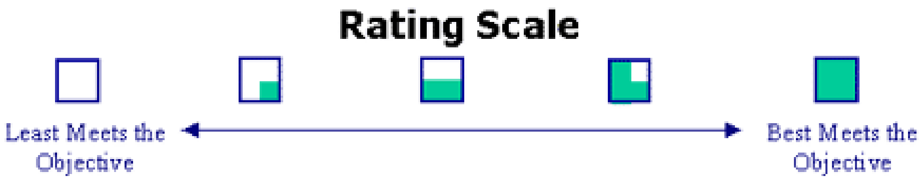


Do we need additional transit service?
What type of transit service?

Express Bus - Short	Express Bus - Long	Light Rail Loop
- Express bus system in Clark County - Express bus on I-5 in HOV lane from 134th in Clark County to Expo Transit Center - New bridge to carry HOV lane across the Columbia River - Includes expanded park and ride and more feeder bus service	- Express bus system in Clark County - Express bus on I-5 in HOV lane from 134th in Clark County to downtown Portland - A fourth lane in each direction from 134th to the Fremont Bridge would operate as an HOV lane during peak periods - Includes expanded park and ride and more feeder bus service	- Light rail system in Clark County - New bridge to carry light rail - Includes expanded park and ride and more feeder bus service

Summary of Findings
(See Details of Summary Findings below)



Measure	Baseline 2020	Express Bus - Short	Express Bus - Long	Light Rail Loop
Reduce transit travel times Downtown Portland to downtown Vancouver in p.m. peak period	☐ 41 min.	⬓ 35 min.	🟩 26 min.	🟩 25 min.
Increase ridership Number of people crossing the Columbia River using transit in the p.m. peak period	◲ 6,500 riders	⬓ 9,000 riders	◳ 10,600 riders	🟩 13,100 riders

Promote transportation choice Percent increase in people using transit from downtown Vancouver to all destinations in p.m. peak	☐	◲	◲	🟩
Flexibility of service Ability to re-route service to meet changing travel demands	🟩	🟩	🟩	☐
Serves a variety of transit markets All day service, 7 days a week, available for multiple trip purposes	☐	☐	☐	🟩
Encourages compact communities Improved transit service and predictability of service remaining in corridor	☐	☐	☐	🟩
Minimizes environmental Impacts Impacts to natural resources such as fish, wildlife, plants, wetlands	⬓ Moderate	⬓ Moderate	⬓ Moderate	⬓ **to** ☐ mod/major
Minimizes displacements Number of residential and other displace-ments given conceptual design	◕ 12 (Rose Quarter)	◕ +1 See 3 lane	◕ +1 See 3 lane	☐ +79 with current alignment (w/o bridge)
Cost (2001 dollars)	NA	⬓ +$14 M plus $668 M hwy upgrades	⬓ +$31 M plus $1,477 M hwy upgrades	☐ +$1,222 M

Summary Details

Express Bus - Short	Express Bus - Long	Light Rail Loop
Travel Time		
Provides greater speed and reliability over Baseline 2020 transit operations in the corridor.	Provides better speed and reliability compared to short express bus.	Provides the best speed and reliability of the transit options because LRT is in its own right-of-way.
Improves time to travel on transit between downtown Portland and downtown Vancouver in the evening peak period: *Baseline = 41 min.* *Express Bus - Short = 36 min.*	Significantly improves time to travel on transit between downtown Portland and downtown Vancouver in the evening peak period: *Baseline = 41 min.* *Express Bus - Long = 15 min.*	Significantly improves time to travel on transit between downtown Portland and downtown Vancouver in the evening peak period: *Baseline = 41 min.* *Light rail loop = 16 min.*

Does not maintain transit travel times in the I-5 corridor: Transit travel times with express bus short will be approximately 9 minutes longer than they are today.	Maintains transit travel times in the I-5 corridor: Transit travel times with express bus long will be approximately the same as they are today	Maintains transit travel times in the I-5 corridor: Transit travel times with light rail will be approximately the same as they are today
Least change in transit travel time between Portland and Vancouver	High transit travel time savings - is equal to the LRT Loop option.	High travel time savings - equal to Express Bus - Long.
Increases transit ridership over baseline. Number of people using transit during the evening peak period: • Baseline 2020 = 6500 riders • Express Bus - Short = 900	Increases transit ridership over baseline. Number of people using transit during the evening peak period: • Baseline 2020 = 6500 riders • Express Bus - Long = 10,600	Increases transit ridership over baseline. Number of people using transit during the evening peak period: • Baseline 2020 = 6500 riders • Light Rail Loop = 12,600
This option, however, has the lowest ridership attraction compared to other transit options: • Express Bus - Short = 9000 riders • Express Bus - Long = 10,600 riders • Light rail loop = 13,000 riders	This option has the second highest ridership attraction compared to other transit options: • Express Bus - Short = 9000 riders • Express Bus - Long = 10,600 riders • Light rail loop = 13,000 riders	This option has the highest ridership attraction compared to other transit options: • Express Bus - Short = 9000 riders • Express Bus - Long = 10,600 riders • Light rail loop = 13,000 riders
Does little to promote transportation choice. For instance, • Transit ridership in downtown Vancouver increases by 8% for express bus-short option compared to 40-50% with LRT	Like Express Bus - Short does little to promote transportation choice. For instance, • Transit ridership in downtown Vancouver increases by 10% for express bus-long option compared to 40-50% with LRT	Does the most to promote transportation choice. For instance, • Transit ridership in downtown Vancouver increases by 40-50% for LRT compared to 8-10% with Express Bus.
Express Bus - Short	**Express Bus - Long**	**Light Rail Loop**
Environmental Impacts		

Moderate environmental impacts that are difficult to avoid and will need to be mitigated. Least impacts of construction on the natural environment and land use impact of any transit option.	Moderate environmental impacts that are difficult to avoid and will need to be mitigated.	Moderate environmental impacts. Refinement of various alignment options design could reduce or avoid many of these impacts.
Express Bus - Short	**Express Bus - Long**	**Light Rail Loop**
Displacements		
One displacement directly from express bus due to the fact that it operates on the highway in already established right-of-way.	One displacement directly from express bus due to the fact that it operates on the highway in already established right-of-way.	Highest number of displacements of the transit options (79) The number of displacements may be reduced with alternative routes or alignments of light rail. The high number of displacements is due to the fact that light rail has its own new right of way.
Express Bus - Short	**Express Bus - Long**	**Light Rail Loop**
Cost		
• $14 million ($2001) • Least cost of any transit option. • Express bus is the least cost transit option due to the fact that it operates on the highway in an already established right-of-way (see 3 vs. 4 Lane).	• $32 million ($2001) • Express bus is a lower cost transit option due to the fact that it operates on the highway in an already established right-of-way (see 3 vs. 4 Lane).	• $1,222 million ($2001) • Highest cost of the transit options. • High cost is due to the fact that it operates on its own right-of-way and with a track system.
Express Bus - Short	**Express Bus - Long**	**Light Rail Loop**
Other		
Compared to light rail transit (LRT), buses have the following advantages: • Buses can be flexibly routed to serve different origins and destinations, and to address particular traffic congestion problems • Buses can effectively serve	Compared to LRT, buses have the following advantages: • Buses can be flexibly routed to serve different origins and destinations, and to address particular traffic congestion problems. • Buses can more effectively serve	Compared to express bus, LRT has the following advantages: • Does the most to promote transportation choice (transit ridership in downtown Vancouver increases by 40-50% with LRT, compared to 8-10% for express bus options). • Serves a range of trip purposes throughout

outlying population centers such as Battle Ground and Ridgefield • Buses can readily be placed on new routes • Compared to light rail, express bus serves a more limited transportation market. Express bus, as evaluated, is point-to-point service that serves the commuter market and runs Monday - Friday in the a.m. and p.m. peak periods only.	outlying population centers such as Battle Ground and Ridgefield • Buses can readily be placed on new routes. • Compared to light rail, express bus serves a more limited transportation market. Express bus, as evaluated, is point-to-point service that serves the commuter market and runs Monday - Friday in the a.m. and p.m. peak periods only	the day, seven days a week. • Light rail can provide service to multiple points along the line and be a catalyst for community redevelopment. • Reinforces the Vancouver and Portland Central Cities and Regional Centers such as Vancouver Mall and Gateway. • Across all measures, I-5 performs better when paired with Light Rail Transit than with Express Bus Transit because Light Rail attracts more riders. • Completing the LRT system is consistent with regional and local goals. • A low span Columbia River bridge with its occasional bridge lifts would compromise light rail operating reliability.

For more information see:

Graphs:
Transit

Data Table (Microsoft Word format | Adobe Acrobat format)

Maps:
Express Bus - Short/3 Lanes
Express Bus - Long/4 Lanes
Light Rail Loop/3 lanes
Light Rail Loop/4 lanes

Costs of Option Packages Studied

Environmental Findings