Portland / Vancouver I-5 Transportation and Trade Partnership

DECISION 0

What happens if you do nothing?

(See Conceptual Design Pages 8-12)

Objective:

This paper provides background information on the Corridor. It is provided to help the Task Force understand:

- Today's conditions in the I-5 Corridor (in the table below this is called **"Existing Conditions 2000"**).
- The conditions in the I-5 Corridor in 2020 if only the funded improvements in current capital plans are constructed (in the table below this is called **"No Build 2020"**).
- The conditions in the I-5 Corridor in 2020 if only the planned improvements are made (in the table below this is called **"Baseline 2020"**).

Summary of Results:

Key Evaluation Factors	Compared to Existing Conditions		
	Existing Conditions 2000	No Build 2020	Baseline 2020
TRANSIT PERFORMANCE			
Number of people crossing the Columbia River using transit during the evening peak period	2,100 riders	+57% (+1,200 riders)	+210% (+4,400 riders)
Percent of people using transit from downtown Portland to all destinations during the evening peak period	24%	+25% (30%)	+59% (38%)
Percent of people using transit from downtown Vancouver to all destinations during the evening peak period	5.6%	-12% (4.9%)	+20% (6.7%)
Time to travel via transit between downtown Portland and downtown Vancouver during the evening peak period	27 minutes	+28 min.	+13 min.
FREEWAY PERFORMANCE			
Traffic volumes on I-5 during the evening peak period (Northbound)	24,800	+3% (+800)	+4% (+1,000)
Traffic volumes on I-205 during the evening peak period (Northbound)	27,500	+17% (+4,700)	+18% (+ 5,000)
Total traffic volumes on I-5 Br. and new bridges during the evening peak period (Northbound)	24,800	+3% (+800)	+4% (+1,000)
Traffic volumes on all bridges (I-5, I-205 and new) across the Columbia River during the evening peak period (Northbound)	52,300	+10% (+5,500)	+11% (+ 5,700)

Oregon Department of Transportation

Washington State Department of Transportation

Key Evaluation Factors – Cont.		Compared to Existing Conditions	
	Existing Conditions 2000	No Build 2020	Baseline 2020
Number of congested lane-miles on I-5 and I-205 during the evening peak period	24% congested miles	+40% (34.6%)	+26% (30.2%)
Number of people crossing the Columbia River in automobiles during the evening peak period	84,800 people in HOV/SOV	-1.7% (-1,400 people)	-0.5% (-400 people)
Time to travel via autos and trucks between downtown Portland and downtown Vancouver during the evening peak period	28 minutes	+6.5 min.	+2.4 min.
Time to travel via HOV between downtown Portland and downtown Vancouver during the evening peak period	23 minutes	+3.8 min.	+1.9 min.
Number of hours of delay for vehicles on all study area roadways during the evening peak period	18,140 hours of delay	+77% (+13,900 hrs.)	+19% (+3,400 hrs.)
Percent of congested study area truck route lane-miles during the evening peak period	19% truck route miles congested	+56% (29.6% mi.)	+30% (24.7%mi.)
Number of hours of delay for trucks on all study area roadways during the evening peak period	13,400 hours of truck delay	+92% (+12,400 hrs.)	+28% (+3,700 hrs.)
IMPACTS			
Number of vehicle-miles traveled in the region per capita (24 hours).	16.41 VMT/cap (29.4 M VMT)	-1.5% (16.16 VMT/cap) (37.6 M VMT)	-3.5% (+15.83 VMT/cap) (36.8 M VMT)
Representative neighborhood traffic diversion in North Portland – during the evening peak period.	60,900 vehicles	+16% (+10,000 veh.)	+8% (+5,000 veh.)
Representative neighborhood traffic diversion in Vancouver during the evening peak period.	36,600 vehicles	+15% (+5,300 vehicles)	+25% (+9,100 vehicles)
Number of residences displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	0	OR 0 WA 0	OR +6 WA 0
Number of businesses displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	0	OR 0 WA 0	OR +6 WA 0
Number of residences displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	0	OR 0 WA 0	OR 0 WA 0
Number of businesses displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	0	OR 0 WA 0	OR 0 WA 0
Impact to natural resources	0	0	Minor
Impact to historical and cultural resources *(Most impacts are minor or indirect)*	0	0	OR +1 WA +1
Impact to air quality	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th

Analysis:

Transportation

- Between 2000 and 2020, the region's population is estimated to increase from 1,793,000 to 2,325,000 – a 30 percent increase. Employment is predicted to increase by 40 percent over the next 20 years.

- The number of daily regional truck trips is expected to increase by 50 percent over the next 20 years.

- Compared to Existing Conditions 2000, the number of hours of delay for all vehicles on all study area roadways will increase by 74 percent under No Build 2020 conditions. A 23 percent increase in delay is expected under Baseline 2020 conditions.

- Due to an extended travel period infringing upon the truck peak, the number of hours of delay for trucks on all study area roadways will increase by 92 percent under No Build 2020 conditions and by 28 percent under Baseline 2020 conditions.

- Compared to Existing Conditions 2000, the amount of congested truck route lane-miles is expected to increase by 56 percent under No Build 2020 conditions and by 30 percent under Baseline 2020 conditions.

- The amount of congested lane-miles on I-5 and I-205 will increase by 40 percent under No Build 2020 conditions and 26 percent under Baseline 2020 conditions.

- Due to increased congestion on the freeway, traffic will "spill-over" onto parallel alternative routes. Traffic volumes on north-south arterial roadways in North Portland would generally increase by 16 percent under No Build 2020 and 8 percent under Baseline 2020 conditions. North-south arterial traffic volumes in Vancouver would generally increase by 15 percent and 25 percent, respectively.

- Regional vehicle-miles traveled (VMT) each weekday is currently 29,430,000 vehicle-miles. Due to anticipated population and employment growth, as well as traffic congestion, VMT is estimated to increase to 37,580,000 vehicle-miles under No Build 2020 conditions – a 28 percent increase. VMT will increase to 36,800,000 vehicle-miles under Baseline 2020 conditions – a 25 percent increase compared to Existing Conditions 2000.

- On a per capita basis, weekday VMT is expected to decrease. Today, VMT/capita is 16.41. Under No Build 2020, this would reduce to 16.16 and under Baseline 2020 it would decrease to 15.83. These decreases indicate that in the future people will generally be making shorter trips.

- In the future, automobile and truck travel times will increase and travel speeds will decrease along I-5. Today, the average evening peak travel time from downtown Portland to downtown Vancouver in a non-HOV is 28 minutes – equivalent to an average speed of 19 mph. Under No Build 2020 conditions, travel time would increase to 34 minutes and average speeds would decrease to 15 mph. Under Baseline 2020 conditions, travel time would increase to 30 minutes and average speeds would decrease to 17 mph.

- Transit travel times will increase, too. Today, the average transit travel time between downtown Portland and downtown Vancouver is 27 minutes. Transit times would more than double (to 55 minutes) under No Build 2020 conditions. Under Baseline 2020 conditions, transit times would increase by 13 minutes. While Interstate MAX will greatly improve transit travel times in the I-5 Corridor south of the Columbia River, patrons destined north of the Expo Center would still need to transfer to a bus and proceed through congested highway and bridge conditions.

- Today, about 9 percent of all the study area trips between 3 and 7 p.m. are via transit. This would increase to over 12 percent under No Build 2020 conditions and to over 18 percent under Baseline 2020 conditions. Baseline 2020 conditions provide enhanced transit service throughout the regions.

- About 2,100 patrons currently use transit between Clark County and Portland during the weekday 3 to 7 p.m. period. Under No Build 2020, this would increase 1,200 riders or 57 percent. Under Baseline 2020 conditions, this would increase by 4,400 riders or 210 percent.

- Over the next 20 years, the total number of vehicles (during the peak period and in the peak direction) crossing the Columbia River on the I-5 and I-205 bridges is expected to increase by 11 to 13 percent. Under both the No Build 2020 and the Baseline 2020 conditions most of this growth (75 to 80 percent) would occur along I-205 since the I-5 bridge and corridor would be congested.

- Freeway improvements in the Rose Quarter area may conflict with City of Portland land use and development goals.

Portland / Vancouver I-5 Transportation and Trade Partnership

DECISION 1

Will a West Arterial Road, by itself, satisfy the Problem, Vision and Values Statement?

(See Conceptual Design pages 13-15)

Objective:

Provide additional access between Portland and Vancouver, with particular emphasis on alternative access for freight between the ports of Vancouver and Portland, Columbia Corridor, and the Northwest industrial area. This improvement is also targeted to reduce truck traffic in the St. Johns and North Portland neighborhoods.

Summary of Results:

Key Evaluation Factors	Baseline 2020	Compared to Baseline West Arterial
TRANSIT PERFORMANCE		
Number of people crossing the Columbia River using transit during the evening peak period	6,500 riders	+35% (+2,300 riders)
Percent of people using transit from downtown Portland to all destinations during the evening peak period	37%	+3.7% (38.4%)
Percent of people using transit from downtown Vancouver to all destinations during the evening peak period	6.7%	+7.5% (7.2%)
Time to travel via transit between downtown Portland and downtown Vancouver during the evening peak period	41 minutes	-4.6 min.
FREEWAY PERFORMANCE		
Traffic volumes on I-5 during the evening peak period (Northbound)	25,800	-11% (- 2,900)
Traffic volumes on I-205 during the evening peak period (Northbound)	32,500	-15% (- 4,800)
Total traffic volumes on I-5 Br. and new bridges during the evening peak period (Northbound)	25,800	+25% (+6,500)
Traffic volumes on all bridges (I-5, I-205 and new) across the Columbia River during the evening peak period (Northbound)	58,300	+3% (+ 1,700)
Number of congested lane-miles on I-5 and I-205 during the evening peak period	30% congested miles	-17% (24.9%)
Number of people crossing the Columbia River in automobiles during the evening peak period	84,000 people in HOV/SOV	+3.4% (+2,900 people)
Time to travel via autos and trucks between downtown Portland and downtown Vancouver during the evening peak period	30 minutes	-5.6 min.
Time to travel via HOV between downtown Portland and downtown Vancouver during the evening peak period	25 minutes	-5.3 min.
Number of hours of delay for vehicles on all study area roadways during the evening peak period	21,450 hours of delay	-20% (-4,250 hrs.)
Percent of congested study area truck route lane-miles during the evening peak period	25% truck route miles congested	-10% (22.5% mi.)
Number of hours of delay for trucks on all study area roadways during the evening peak period	17,100 hours of truck delay	-23% (-4,000 hrs.)

Oregon Department of Transportation

Washington State Department of Transportation

Key Evaluation Factors – Cont.	Baseline 2020	Compared to Baseline West Arterial
IMPACTS		
Number of vehicle-miles traveled in the region per capita (24 hours).	15.83 VMT/capita (36.8 M VMT)	-.3% (15.73 VMT/cap) (36.7 M VMT)
Representative neighborhood traffic diversion in North Portland – during the evening peak period.	65,900 vehicles	-1.4% (-900 vehicles)
Representative neighborhood traffic diversion in Vancouver during the evening peak period.	45,700 vehicles	+4.6% (+2,100 vehicles)
Number of residences displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR+6 WA 0	OR +5 WA 0
Number of businesses displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR +6 WA 0	OR +9 WA +1
Number of residences displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR 0 WA 0	OR 0 WA 0
Number of businesses displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR 0 WA 0	OR 0 WA 0
Impact to natural resources	Minor	Major
Impact to historical and cultural resources *(Most impacts are minor or indirect)*	OR 1 WA 1	OR 0 WA 0
Impact to air quality	Avail Oct 30th	Avail Oct 30th
COSTS		
Highway cost (2001 $ Millions)	$291	+$947
Transit capital cost (2001 $ Millions)	NA	NA
Transit operating cost (Annual 2001 $ Millions)	NA	NA

Analysis of Strengths and Weaknesses:

West Arterial Road Option	Strengths	Weakness
	▪ Improves travel times in the I-5 corridor by 6 minutes compared to today. ▪ Substantially reduces truck delay compared to Baseline 2020 and prevents truck delay from growing worse than it is today. ▪ Least amount of overall displacements compared to I-5 improvements (15 displacements for West Arterial Road vs. 29 for 3 lane and 49 for adding a 4th lane). ▪ Carries about 9600 vehicles over the Columbia River during the evening peak period. ▪ Improves the quality of life in the St. Johns neighborhood in Portland due to providing an attractive alternative route for trucks to get to and from industrial areas on the Peninsula. ▪ Peak period traffic on the St. Johns Bridge would decrease by over 50 percent. Truck traffic would decrease by 60 percent. ▪ Because most of the roadway would be built over the railroad and in the railroad cut, there are fewer direct community impacts (e.g. noise, air pollution, and visual) than if the alignment were elsewhere. ▪ There is an increase in transit ridership. The increase is due to additional transit service on the West Arterial and in the I-5 corridor.	▪ The West Arterial Road's four-lane bridge over the Columbia River is near capacity during the morning and afternoon peak periods. ▪ Significantly increases in travel demand on Mill Plain and 4th Plain are expected. The potential for adverse impacts to adjacent neighborhoods and downtown exists. ▪ Major environmental impacts on Hayden Island that are difficult to avoid and will need to be mitigated. ▪ Requires agreement with Union Pacific Railroad to run over railroad tracks.

DECISION 2

Will Commuter Rail, by itself, satisfy the Problem, Vision and Values Statement?

(See Conceptual Design page 16)

Due to the magnitude of the tasks, the complexity of the technical analysis and limited staff resources, we have decided to defer consideration of the Commuter Rail option until spring 2002. The Commuter Rail decision would not be fully informed until completion of the Rail Capacity Analysis in spring 2002. We believe those findings will help inform the Task Force by providing a better sense of the reserve rail capacity remaining on the existing freight rail network in the Portland/ Vancouver area.

Obtaining the necessary track and train data from the two freight railroads has taken longer than anticipated, but the rail forecasting model is currently under development. We believe we will have sufficient ridership and cost data on the feasibility of commuter rail service by spring 2002 to allow Task Force consideration of this option for inclusion in any subsequent environment impact statement, if recommended.

By next spring, we also believe that as a possible outcome of the events of September 11th, we will have a better sense of potential new funding sources for passenger rail (intercity and commuter) service in the federally-designated Northwest High Speed Rail Corridor (Eugene, OR to Vancouver, B.C.). Concerns of the operational efficiency, safety, and attractiveness of air travel might result in additional funding for high-speed rail, which could significantly influence the financial feasibility of intercity passenger rail and commuter rail service in the Region.

Portland / Vancouver I-5 Transportation and Trade Partnership

DECISION 3

What type of overall transit improvements best satisfy the Problem, Vision and Values Statements?

(See Conceptual Design pages 17-19)

Objective:

Identify the type of transit that best meets the needs of the I-5 corridor. Three transit options were considered:

- Short Express Bus system that takes riders between Clark County and the future Interstate MAX station at the Expo Center (Interstate MAX) is scheduled to open in 2004.
- Long Express Bus system that takes riders between Clark County and downtown Portland with no transfer to light rail, and
- Light Rail (LRT) loop system in Clark County that would connect with the Portland Light Rail system

A commuter rail line between Clark County and Portland is also being considered, however, results of the analysis will not be complete until the Spring of 2002.

Summary of Results:

Key Evaluation Factors		Compared to Baseline			
	Baseline 2020	**Express Bus- Short** (w/3 Lane & 4-lane Supp. Bridge)	**Express Bus- Long** (w/ 4th Lane & 4-lane Supp. Bridge)	**LRT Loop** (w/3 Lane & 4-lane Supp. Bridge)	**LRT Loop** (w/ 4th Lane & 4-lane Supp. Bridge)
TRANSIT PERFORMANCE					
Number of people crossing the Columbia River using transit during the evening peak period	6,500 riders	+38% (+2,500 riders)	+63% (+4,100 riders)	+100% (+6,600 riders)	+94% (+6,100 riders)
Percent of people using transit from downtown Portland to all destinations during the evening peak period	37%	+3.5% (38.3%)	+4.6% (38.7%)	+5.4% (39.0%)	+4.6% (38.7%)
Percent of people using transit from downtown Vancouver to all destinations during the evening peak period	6.7%	+7.5% (7.2%)	+10% (7.4%)	+46% (9.8%)	+42% (9.5%)
Time to travel via transit between downtown Portland and downtown Vancouver during the evening peak period	41 minutes	-5.1 min.	-15 min.	-16 min.	-16 min.
FREEWAY PERFORMANCE					
Traffic volumes on I-5 during the evening peak period (Northbound)	25,800	-17% (-4,500)	-39% (-10,100)	-21% (-5,300)	-43% (-11,000)
Traffic volumes on I-205 during the evening peak period (Northbound)	32,500	-21% (- 6,900)	-25% (- 8,100)	-25% (- 8,300)	-31% (- 10,200)

Oregon Department of Transportation

Washington State Department of Transportation

Key Evaluation Factors – Cont.		Compared to Baseline			
	Baseline 2020	Express Bus- Short (w/3 Lane & 4-lane Supp. Bridge)	Express Bus- Long (w/ 4th Lane & 4-lane Supp. Bridge)	LRT Loop (w/3 Lane & 4-lane Supp. Bridge)	LRT Loop (w/ 4th Lane & 4-lane Supp. Bridge)
Total traffic volumes on I-5 Br. and new bridges during the evening peak period (Northbound)	25,800	+39% (+10,100)	+41% (+10,600)	+33% (+8,400)	+40% (+10,400)
Traffic volumes on all bridges (I-5, I-205 and new) across the Columbia River during the evening peak period (Northbound)	58,300	+5% (+ 2,800)	+4% (+ 2,500)	0%	0%
Number of congested lane-miles on I-5 and I-205 during the evening peak period	30% congested miles	-35% (19.5%)	-55% (13.5%)	-36% (19.2%)	-57% (12.9%)
Number of people crossing the Columbia River in automobiles during the evening peak period	84,000 people in HOV/SOV	+7.0% (+5,800 people)	+7.0% (+5,900 people)	+1.7% (+1,400 people)	+2.1% (+1,800 people)
Time to travel via autos and trucks between downtown Portland and downtown Vancouver during the evening peak period	30 minutes	-8.6 min.	-8.8 min.	-9.5 min.	-11 min.
Time to travel via HOV between downtown Portland and downtown Vancouver during the evening peak period	25 minutes	-6.7 min.	-5.5 min.	-7.7 min.	-8.1 min.
Number of hours of delay for vehicles on all study area roadways during the evening peak period	21,450 hours of delay	-22% (-4,800 hrs.)	-26% (-5,550 hrs.)	-26% (-5,650 hrs.)	-18% (-3,750 hrs.)
Percent of congested study area truck route lane-miles during the evening peak period	25% truck route miles congested	-16% (21% mi.)	-25% (18.8%mi.)	-18% (21.5% mi.)	-26% (18.5% mi.)
Number of hours of delay for trucks on all study area roadways during the evening peak period	17,100 hours of truck delay	-28% (-4,800 hrs.)	-30% (-5,100 hrs.)	-32% (-5,500 hrs.)	-18% (-3,100 hrs.)
IMPACTS					
Number of vehicle-miles traveled in the region per capita (24 hours).	15.83 VMT/capita (36.8 M VMT)	-.1% (15.82 VMT/cap) (36.8 M VMT)	-.1% (15.81 VMT/cap) (36.8 M VMT)	-.6% (15.73 VMT/cap) (36.6 M VMT)	-.4% (15.76 VMT/cap) (36.6 M VMT)
Representative neighborhood traffic diversion in North Portland – during the evening peak period.	65,900 vehicles	+2.9% (+1,900 vehicles)	-11% (-7,500 vehicles)	+0.5% (+300 vehicles)	-14% (-9,200 vehicles)
Representative neighborhood traffic diversion in Vancouver during the evening peak period.	45,700 vehicles	+2.0% (+900 vehicles)	-5.2% (-2,400 vehicles)	-3.0% (-1,400 vehicles)	-17% (-7,700 vehicles)
Number of residences displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR+6 WA 0	OR+15 WA+1	OR+3 WA+29	OR+15 WA+1	OR+3/ WA+27
Number of businesses displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR +6 WA 0	OR +11 WA +2	OR +7 WA +10	OR +9 WA+2	OR +7 WA+8

Key Evaluation Factors – Cont.		Compared to Baseline			
	Baseline 2020	**Express Bus- Short** (w/3 Lane & 4-lane Supp. Bridge)	**Express Bus- Long** (w/ 4th Lane & 4-lane Supp. Bridge)	**LRT Loop** (w/3 Lane & 4-lane Supp. Bridge)	**LRT Loop** (w/ 4th Lane & 4-lane Supp. Bridge)
Number of residences displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR 0 WA 0	OR 0 WA 0	OR 0 WA 0	OR 0 WA +25	OR 0 WA +25
Number of businesses displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR 0 WA 0	OR 0 WA 0	OR 0 WA 0	OR 0 WA +53	OR 0 WA +53
Impact to natural resources	Minor	Moderate	Moderate	Moderate	Moderate
Impact to historical and cultural resources *(Most impacts are minor or indirect)*	OR 1 WA 1	OR +3 WA +8	OR +9 WA+4	OR +2 WA +9	OR +9 WA +4
Impact to air quality	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th
COSTS					
Highway cost (2001 $ Millions)	$291	+$668	+$1,477	+$668	+$1,477
Transit capital cost (2001 $ Millions)	NA	+$14	+$31	+$1,222	+$1,222
Transit operating cost (Annual 2001 $ Millions)	NA	+$3	+$5	+$12	$12

Analysis of Strengths and Weaknesses:

Transit Option	Strengths	Weakness

Express Bus – Short
 	
(Of the transit options considered, Express Bus – Short has the following strengths and weaknesses)
	▪ Least cost of any transit option.
	▪ Least impacts of construction on the natural environment and land use impact of any transit option.
	▪ No displacements directly from express bus due to the fact that it operates on the highway in already established right-of-way.
	▪ Express bus is the least cost transit option due to the fact that it operates on the highway (see Decision 4).
	▪ Provides greater speed and reliability over Baseline 2020 transit operations in the corridor.
	▪ 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 outlying population centers such as Battle Ground and Ridgefield
	  ▪ Buses can readily be placed on new routes.
		▪ Does not maintain transit travel times in the I-5 corridor (transit travel times will be approximately 9 minutes longer than they are today).
		▪ Least change in transit travel time between Portland and Vancouver.
		▪ Least change in transit ridership.
		▪ Lowest ridership attraction.
		▪ Moderate environmental impacts that are difficult to avoid and will need to be mitigated.
		▪ Traffic levels increase at and near planned transit centers and park-and-ride locations.
		▪ 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.

Express Bus – Long (Of the transit options considered, Express Bus – Long has the following strengths and weaknesses)	▪ High transit travel timesavings – is equal to the LRT Loop option. ▪ Maintains transit travel times in the I-5 corridor (with no improvements transit travel times double). ▪ Second highest ridership attraction ▪ No displacements directly from express bus due to the fact that it operates on the highway in already established right-of-way. ▪ Express bus is the least cost transit option due to the fact that it operates on the highway (see Decision 4). ▪ Provides better speed and reliability compared to short express bus.	▪ Moderate environmental impacts that are difficult to avoid and will need to be mitigated. ▪ Compared to LRT, express bus has the following disadvantages: ▪ 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. ▪ Traffic levels increase at and near planned transit centers and park-and-ride locations.

Transit Option	Strengths	Weakness
Express Bus – Long (Of the transit options considered, Express Bus – Long has the following strengths and weaknesses)	▪ 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 outlying population centers such as Battle Ground and Ridgefield ▪ Buses can readily be placed on new routes.	
Light Rail Loop (Of the transit options considered, Light Rail Loop has the following strengths and weaknesses)	▪ High travel time savings – equal to Express Bus – Long. ▪ Maintains transit travel times in the I-5 Corridor (with no improvements transit travel times double). ▪ Highest ridership attraction of the transit options. ▪ Completing the LRT system is consistent with regional and local goals. ▪ 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). ▪ Provides the best speed and reliability because LRT is in its own right-of-way. ▪ Serves a range of trip purposes throughout 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.	▪ Highest cost of the transit options due to the fact that it operates on its own right-of-way and with a track system. ▪ Highest number of displacements of the transit options (78). 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. ▪ Moderate environmental impacts. Refinement of various alignment options design could reduce or avoid many of these impacts. ▪ A low span Columbia River bridge with its occasional bridge lifts would compromise light rail operating reliability. ▪ Increase in traffic levels at and near planned transit centers and park-and-ride locations.

Portland / Vancouver I-5 Transportation and Trade Partnership

DECISION 4

What type of overall road improvements best satisfy the Problem, Vision and Values Statement?

(See Conceptual Design pages 20-26)

Objective:

Identify the number of through freeway lanes that best meets the needs of the I-5 Corridor. Two options were considered:

- Make the freeway 3 lanes throughout the corridor by fixing the two lane bottlenecks at Delta Park and in the Rose Quarter area. The evaluation of this option includes a new 4-lane supplemental bridge.
- Add a 4th lane to the freeway throughout the corridor. The evaluation of this option includes a new 6-lane supplemental bridge.

Summary of Results:

Key Evaluation Factors		Compared to Baseline			
	Baseline 2020	**3 Lane** (w/Express Bus - Short & 4-lane Supp. Bridge)	**3 Lane** (w/LRT Loop & 4-lane Supp. Bridge	**4th Lane** (w/Express Bus - Short & 4-lane Supp. Bridge)	**4th Lane** (w/LRT Loop & 4-lane Supp. Bridge
TRANSIT PERFORMANCE					
Number of people crossing the Columbia River using transit during the evening peak period	6,500 riders	+38% (+2,500 riders)	+100% (+6,600 riders)	+63% (+4,100 riders)	+94% (+6,100 riders)
Percent of people using transit from downtown Portland to all destinations during the evening peak period	37%	+3.5% (38.3%)	+5.4% (39.0%)	+4.6% (38.7%)	+4.6% (38.7%)
Percent of people using transit from downtown Vancouver to all destinations during the evening peak period	6.7%	+7.5% (7.2%)	+46% (9.8%)	+10% (7.4%)	+42% (9.5%)
Time to travel via transit between downtown Portland and downtown Vancouver during the evening peak period	41 minutes	-5.1 min.	-16 min.	-15 min.	-16 min.
FREEWAY PERFORMANCE					
Traffic volumes on I-5 during the evening peak period (Northbound)	25,800	-17% (-4,500)	-21% (-5,300)	-39% (-10,100)	-43% (-11,000)
Traffic volumes on I-205 during the evening peak period (Northbound)	32,500	-21% (- 6,900)	-25% (- 8,300)	-25% (- 8,100)	-31% (- 10,200)
Total traffic volumes on I-5 Br. and new bridges during the evening peak period (Northbound)	25,800	+39% (+10,100)	+33% (+8,400)	+41% (+10,600)	+40% (+10,400)
Traffic volumes on all bridges (I-5, I-205 and new) across the Columbia River during the evening peak period (Northbound)	58,300	+5% (+ 2,800)	0%	+4% (+ 2,500)	0%

Key Evaluation Factors – Cont.		Compared to Baseline			
	Baseline 2020	**3 Lane** (w/Express Bus - Short & 4-lane Supp. Bridge)	**3 Lane** (w/LRT Loop & 4-lane Supp. Bridge	**4th Lane** (w/Express Bus - Short & 4-lane Supp. Bridge)	**4th Lane** (w/LRT Loop & 4-lane Supp. Bridge
Number of congested lane-miles on I-5 and I-205 during the evening peak period	30% congested miles	-35% (19.5%)	-36% (19.2%)	-55% (13.5%)	-57% (12.9%)
Number of people crossing the Columbia River in automobiles during the evening peak period	84,000 people in HOV/SOV	+7.0% (+5,800 people)	+1.7% (+1,400 people)	+7.0% (+5,900 people)	+2.1% (+1,800 people)
Time to travel via autos and trucks between downtown Portland and downtown Vancouver during the evening peak period	30 minutes	-8.6 min.	-9.5 min.	-8.8 min.	-11 min.
Time to travel via HOV between downtown Portland and downtown Vancouver during the evening peak period	25 minutes	-6.7 min.	-7.7 min.	-5.5 min.	-8.1 min.
Number of hours of delay for vehicles on all study area roadways during the evening peak period	21,450 hours of delay	-22% (-4,800 hrs.)	-26% (-5,650 hrs.)	-26% (-5,550 hrs.)	-18% (-3,750 hrs.)
Percent of congested study area truck route lane-miles during the evening peak period	25% truck route miles congested	-16% (21% mi.)	-18% (21.5% mi.)	-25% (18.8%mi.)	-26% (18.5% mi.)
Number of hours of delay for trucks on all study area roadways during the evening peak period	17,100 hours of truck delay	-28% (-4,800 hrs.)	-32% (-5,500 hrs.)	-30% (-5,100 hrs.)	-18% (-3,100 hrs.)
IMPACTS					
Number of vehicle-miles traveled in the region per capita (24 hours).	15.83 VMT/capita (36.8 M VMT)	-.1% (15.82 VMT/cap) (36.8 M VMT)	-.6% (15.73 VMT/cap) (36.6 M VMT)	-.1% (15.81 VMT/cap) (36.8 M VMT)	-.4% (15.76 VMT/cap) (36.6 M VMT)
Representative neighborhood traffic diversion in North Portland – during the evening peak period.	65,900 vehicles	+2.9% (+1,900 vehicles)	+0.5% (+300 vehicles)	-11% (-7,500 vehicles)	-14% (-9,200 vehicles)
Representative neighborhood traffic diversion in Vancouver during the evening peak period.	45,700 vehicles	+2.0% (+900 vehicles)	-3.0% (-1,400 vehicles)	-5.2% (-2,400 vehicles)	-17% (-7,700 vehicles)
Number of residences displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR+6 WA 0	OR+15 WA+1	OR+15 WA+1	OR+3 WA+29	OR+3 WA+27
Number of businesses displaced by highway options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR +6 WA 0	OR +11 WA +2	OR +9 WA+2	OR +7 WA +10	OR +7 WA+8
Number of residences displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR 0 WA 0	OR 0 WA 0	OR 0 WA +25	OR 0 WA 0	OR 0 WA +25
Number of businesses displaced by transit options. *(Number of displacements varies with bridge type and location. See Decision 5 for further information).*	OR 0 WA 0	OR 0 WA 0	OR 0 WA +53	OR 0 WA 0	OR 0 WA +53
Impact to natural resources	Minor	Moderate	Moderate	Moderate	Moderate

Key Evaluation Factors – Cont.		Compared to Baseline			
	Baseline 2020	**3 Lane** (w/Express Bus - Short & 4-lane Supp. Bridge)	**3 Lane** (w/LRT Loop & 4-lane Supp. Bridge	**4th Lane** (w/Express Bus - Short & 4-lane Supp. Bridge)	**4th Lane** (w/LRT Loop & 4-lane Supp. Bridge
Impact to historical and cultural resources *(Most impacts are minor or indirect)*	OR 1 WA 1	OR +3 WA +8	OR +2 WA +9	OR +9 WA+4	OR +9 WA +4
Impact to air quality	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th	Avail Oct 30th
COSTS					
Highway cost (2001 $ Millions)	$291	+$668	+$668	+$1,477	+$1,477
Transit capital cost (2001 $ Millions)	NA	+$14	+$1,222	+$31	+$1,222
Transit operating cost (Annual 2001 $ Millions)	NA	+$3	+$12	+$5	$12

Analysis of Strengths and Weaknesses:

Freeway Option	Strengths	Weakness
3 Lanes (Of the freeway options considered, making the freeway 3 lanes in each direction has the following strengths and weaknesses)	▪ Least cost of the freeway options. ▪ Improves overall congestion levels on the bi-state freeway system during the peak periods of travel. Most trips from the Vancouver area have their destination in central Portland and the most direct route is I-5. With improvements to I-5, some trips that now occur on I-205 would shift to I-5. The result is a significant reduction in congestion on I-205. ▪ Improves travel times in the I-5 Corridor. The time travel savings are entirely attributable to the 4 lane supplemental bridge. With this bridge vehicles would have a reduction in travel time of almost 11 minutes between downtown Portland and downtown Vancouver during the evening peak period compared to today. ▪ Provides a significant reduction in truck delay. Under Baseline 2020, truck delay would increase by 28% compared to today. Under "3- lane" trucks would face somewhat less delay than today.	▪ 29 displacements. All most all of the displacements are on Hayden Island and are due to the new 4 lane supplemental bridge. ▪ Moderate environmental impacts that are difficult to avoid and will need to be mitigated.

Freeway Option	Strengths	Weakness

Add a 4th Lane
 	
(Of the freeway options considered, adding a 4th lane to the freeway in each direction has the following strengths and weaknesses)
	▪ Has all of the same performance strengths as "3-lanes" plus:
	  ▪ Provides a greater level of bi-state congestion relief (primarily on I-205) than the "3-lane" improvements.
	  ▪ This is the only freeway option that substantially reduces traffic volumes on local streets.
		▪ Moderate environmental impacts that are difficult to avoid and will need to be mitigated.
		▪ 49 displacements. Of the displacements 27 are due to the Vancouver interchange modifications between 4th Plain and SR500. Most of the remainder are due to the new supplemental bridge and are located on Hayden Island.
		▪ Highest cost of the road improvements.

REFINEMENT DECISION A

Delta – Lombard Widening

(See Conceptual Design page 11)

Objective:

Widen Victory Blvd to Lombard Street in Portland to 3 lanes southbound. Widen northbound section to add shoulder width.

Summary of Results:

Traffic

- Improves traffic flow along southbound I-5, i.e., mainline level-of-service (LOS) improves from near-capacity conditions (LOS "E") to high-density and stable flow (LOS "D").
- Keeps "freeway" traffic on the freeway: e.g., reduces traffic diversion to Interstate Avenue/Denver Avenue (southbound off-ramp volume decrease by about 500 vehicles per hour), decreasing neighborhood cut-through volumes.
- The added lane enables faster on-ramp metering rates downstream at the Portland Blvd., Alberta Street and Going Street on-ramps and reduces some neighborhood cut-through traffic.
- If added lane is an HOV lane during the morning commute period, reduces HOV travel times from Salmon Creek to Portland by over two minutes.
- Provision of standard freeway shoulders, in both the southbound and northbound directions, would improve safety and the ability to respond to incidents.
- Reconfigured southbound on-ramp merge from Columbia Boulevard operates acceptably:
  - Existing ramp has a rising grade of six percent and enables heavy trucks to attain speed of only 25 mph when entering the freeway.
  - Proposed ramp would have a four- percent grade and a 1,400-foot long acceleration lane parallel to the third freeway lane. Ramp would enable trucks to attain a speed of 45 mph within the acceleration lane before entering freeway.
  - The new on-ramp merge would operate at level-of-service "C-D" during peak periods, indicating generally smooth merging conditions.

Environmental and Land Use

- Results in no displacements.

Construction Cost (2001 $): $41 million

Portland / Vancouver I-5 Transportation and Trade Partnership

REFINEMENT DECISION B

Rose Quarter

(See Conceptual Design page 12)

Objective:

Widen to 3 lanes from Fremont Bridge to I-84 Interchange. Modify ramps between Broadway/Weidler and I-84 (both north and south bound) to eliminate congested "weave" section. This refinement decision is a major component of the improvements to consider when making the 3-lane freeway decision (Decision 4).

Summary of Results:

Traffic

- Improves AM and PM peak period Portland-Vancouver travel times by 4-8 percent for autos and trucks.
- Reduces Study Area vehicle-hours of delay by 15 percent for trucks and for all vehicles.
- Ramp improvements reduce problem weave and merge sections, reducing conflict points and improving traffic safety.
- Traffic flow within Rose Quarter segment of I-5 would be significantly improved (compared to a No-Build 2020 condition).
- I-5 south of the Rose Quarter (from I-84 to Morrison Street) would not be improved, and would be over capacity due to congestion related to ramp traffic and weaving. Travel demands on the Banfield freeway (I-84) would also continue to be over capacity.
- No significant changes in traffic volumes on the Fremont Bridge.
- Widening to three lanes shifts traffic from local streets to the freeway (see table below):

Projected Change in Arterial Traffic Volumes with Rose Quarter I-5 Improvements

	AM Peak	PM Peak
NE Broadway (at Interstate Ave.)	-3%	-6%
NE Broadway/Weidler (east of Grand)	-10%	-3%
MLK/Grand (at Broadway)	-18%	-16%
Steel Bridge	-26%	-20%

Environmental and Land Use

- As developed for this conceptual analysis, Rose Quarter freeway improvements would displace 6 businesses.
- As developed for this conceptual analysis, I-5 improvements would impact City of Portland's desire to create high density pedestrian-oriented development adjacent to the existing freeway. This redevelopment strategy is intended to mitigate the current visual impacts of the freeway.

Construction Cost (2001 $): $ 250 million

Oregon Department of Transportation

Washington State Department of Transportation

Portland / Vancouver I-5 Transportation and Trade Partnership

REFINEMENT DECISION C

Improved I-5 Access at Columbia Boulevard

(See Conceptual Design page 23)

Objective:

Provide southbound off ramp and northbound on ramp between Columbia Boulevard and I-5 to improve truck freight access to Columbia Corridor and reduce truck traffic in North Portland neighborhoods.

Summary of Results:

Traffic

- Reduces truck traffic on Interstate and Denver (south of Argyle) by over 70% during peak periods.
- Reduces total traffic on Interstate and Denver (south of Argyle) by approximately 40% during peak periods.
- Increases truck and total traffic on Columbia Boulevard by 500-600 vehicles per hour west of I-5 (a 30 to 50 % increase over Baseline).
- During the morning peak, reduces total traffic on the Marine Drive northbound on ramp to I-5 by over 30%, and reduces truck traffic by approximately 20%, thus improving operations at a highly congested interchange.
- Requires modifications to the Delta Park/Victory interchange, including signalization of northbound and southbound ramp intersections.

Environmental and Land Use

- Displaces 2 commercial/industrial businesses.

Construction Cost (2001 $): $ 70 million.

Oregon Department of Transportation

Washington State Department of Transportation

Portland / Vancouver I-5 Transportation and Trade Partnership

REFINEMENT DECISION D

Access to Hayden Island via the Marine Drive interchange ...

(See Conceptual Design page 24)

Objective:

Move the access to Hayden Island to reduce weaving and merging problems on I-5, without building new road capacity across the Columbia River. Access to and from Hayden Island via Marine Drive interchange would be on a new bridge between Marine Drive and Hayden Island.

Summary of Results:

Traffic

- Columbia River bridges remain the principal bottleneck in the corridor; but minor improvements in traffic flow and safety on I-5 would be realized by eliminating the existing weaving and merging problems associated with Hayden Island interchange.
- Even with this improvement, Marine Drive interchange remains significantly overloaded. Would require major reconstruction of interchange to avoid impacts to heavy volumes of freight traffic and other vehicles accessing I-5 at Marine Drive.
- Requires out of direction travel for trucks and autos traveling between Clark County and Hayden Island.

Environmental and Land Use

- Results in no displacements.

Construction Cost (2001 $): **$ 76 million** (not including reconstruction of Marine Drive interchange).

Portland / Vancouver I-5 Transportation and Trade Partnership

REFINEMENT DECISION E

Downtown Vancouver Ramps Improvements

(See Conceptual Design page 25)

Objective:

Modify ramps between SR 500 and Interstate Bridge (both north and south bound) to reduce conflicts caused by high traffic volumes in weaving and merging sections.

Summary of Results:

Traffic

- These ramp improvements would eliminate four problem merging, weaving, and diverging freeway segments between SR 500, E. 39th Street, 4th Plain, and Mill Plain interchanges. This reduces high speed conflict points and improves traffic safety.
- Improves access to downtown Vancouver by reducing ramp-related congestion and delay.
- Supports provision of new southbound off-ramp to E. 6th Street in downtown Vancouver, consistent with City of Vancouver goals.

Environmental and Land Use

- Displaces 27 residential properties, with no commercial/industrial displacements.

Construction Cost (2001 $): $93 million