

(DRAFT)

Washington Transportation Plan Update

Interim Briefing to the Transportation Commission
Building Future Visions

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*This presentation is a public
record document. It is a draft
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**Washington State
Department of Transportation**

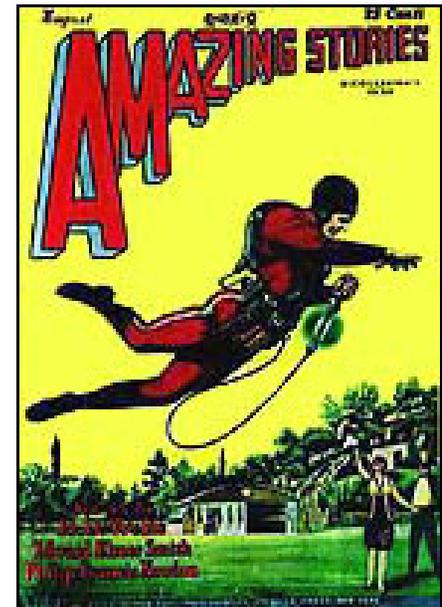
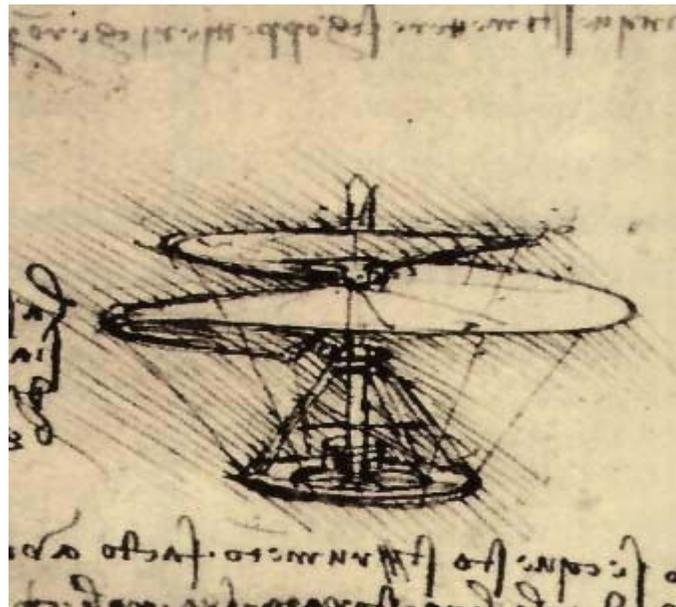
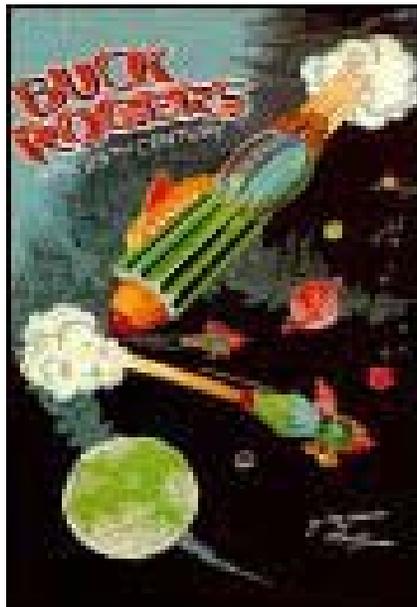
Beyond our grasp
(sometimes by just a little; sometimes by a lot)

But within our sight
(sometimes clearly; sometimes very distantly)

Thinking today about transportation futures



1931 "Stout Sky Car"



High Capacity Transit

▪ Spokane Regional Light Rail Project and Bus Rapid Transit

Spokane is considering light rail as one of the options for high capacity transit in the Spokane Valley corridor. The proposed alignment is parallel to I-90 and east of downtown Spokane. The metro area is trying to plan for efficient transportation to guide development in this new growth area. Phase I (15.6 miles) will connect downtown Spokane to the City of Liberty Lake.



▪ Clark County

Vancouver has explored a tie in with Portland TriMet's Max light rail system since the early 1990s. Voters rejected a local bond levy to link Max on the Washington side of the Columbia River in 1995. In May 2004 TriMet opened the Interstate Max (Yellow Line) light rail line. The Yellow line runs parallel to I-5 to a point just south of the River. The TriMet light rail vision includes extension of the Interstate Max line north to Vancouver, possibly as part of a new I-5 bridge across the Columbia. TriMet also has proposed a second light rail line in the I-205 corridor crossing upstream of downtown Vancouver. The two lines would join in downtown Vancouver allowing direct service between Vancouver and downtown Portland, Portland International Airport, and Clackamas Town Center.



TriMet Max Service Map

High Capacity Transit

■ Central Puget Sound – Sound Transit

Central Link

Will operate 14 miles from Westlake Station to Tukwila. This project is fully funded and is under construction with an operation date of 2009.

North Link

Will operate from Westlake Station through First Hill and Capital Hill to the University of Washington. This project is partially funded. Beyond the University to Northgate, two alignments are being considered, bringing the entire route to a total distance of 8 miles. This portion of the project is unfunded.

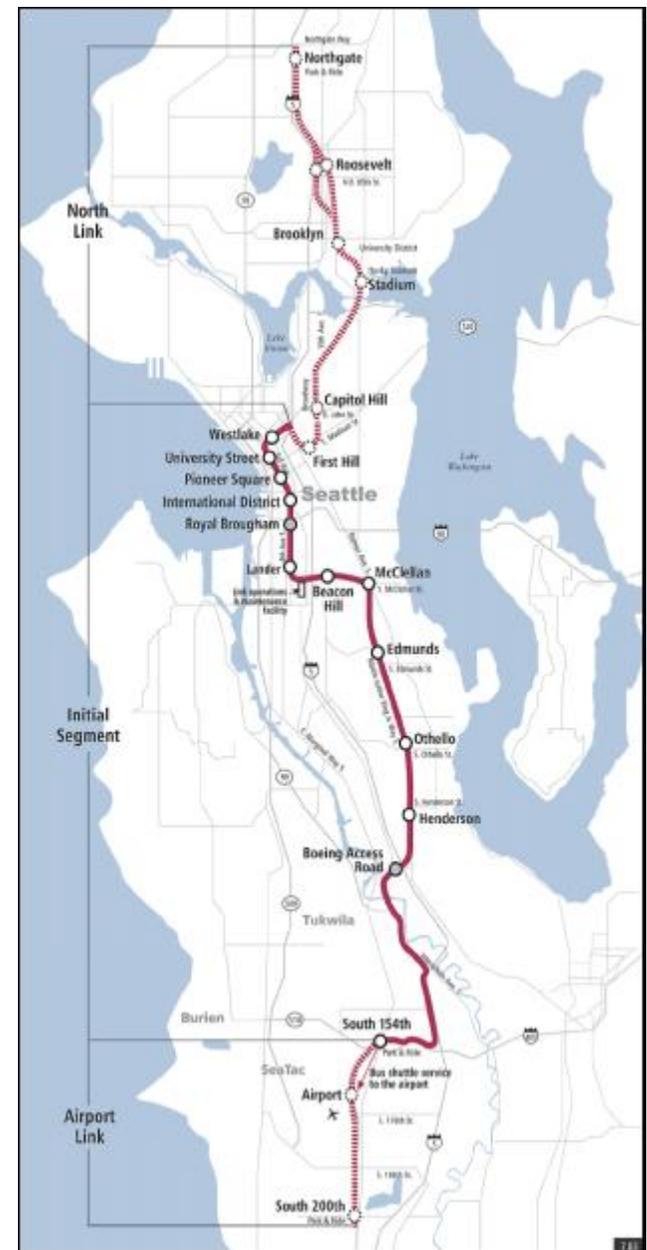
Airport Link

Will operate approximately 1.6 miles extending from the interim terminus station at 154th Street Station south through the Port's property at SeaTac International Airport (including an elevated station near the main terminal).

Tacoma Link

A streetcar – which operates 1.5 miles between the Theatre District and Tacoma Dome Station. The Puyallup Tribe has expressed an interest in extending Tacoma Link to their new casino under construction near I-5.

The presence of Tacoma Link is viewed by some as a placeholder for future extension of Sound Transit's Central Link south to Tacoma. Others have viewed it as the first step in building a larger Tacoma streetcar/light rail network.



Sound Transit *Link* Service Map

High Capacity Transit

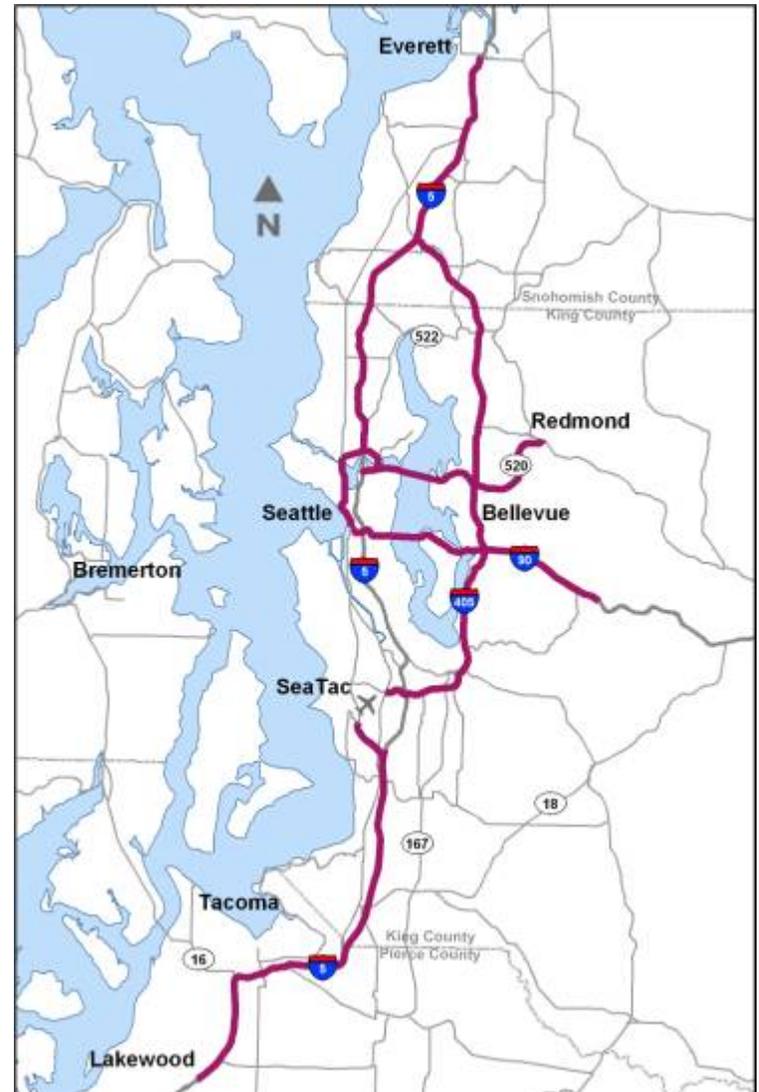
▪ *Sound Move – ST Vision*

Possible additional HCT and potential rail lines are identified in the Sound Transit's Vision:

- University District to Everett,
- SeaTac to Fort Lewis,
- I-405 between 164th (Swamp Creek) and SeaTac Airport,
- Downtown Seattle to Bellevue and Redmond,
- Seattle to Ballard to the University District, and
- I-90 between downtown Seattle and Issaquah.



Potential Future Sound Transit Rail Lines



Seattle Monorail Project

The Monorail was approved by voters in November 2002. Construction is currently schedule to begin Fall 2004 and is planned to be operational in Summer 2009. The Seattle Monorail Project forecasts indicate a projected 69,000 riders per weekday with 20.4 million riders per year by 2020. Forecasts project financial independence by 2020.

Phase I – Funded by MVET on Seattle Residents

Green Line – 14 mile line from Ballard to West Seattle connecting Key Arena, Seattle Center, Belltown, Downtown, Pike Place Market, King Street Station, Safeco Field and Qwest Field

Future Phases - Unfunded

Pink Corridor - Crown Hill to Lake City and from Morgan Junction to the Fauntleroy Ferry Terminal

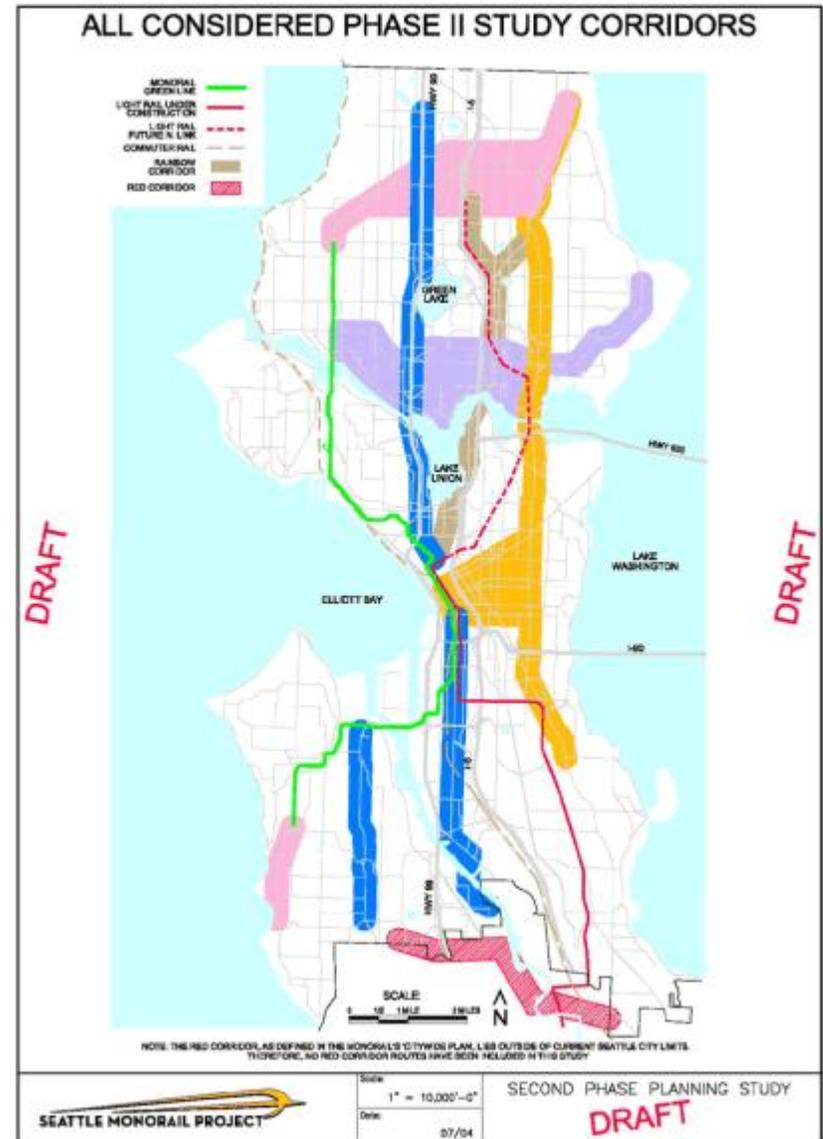
Purple Corridor - Ballard to Sand Point

Blue Corridor - Bitter Lake to Georgetown and from the Delridge Station to Westwood

Gold Corridor – Rainier Valley to Lake City

Rainbow Corridor – Downtown to Lake City along Eastlake

Red Corridor – Outside current Seattle City limits; not included in current plans



And These Go With Transit

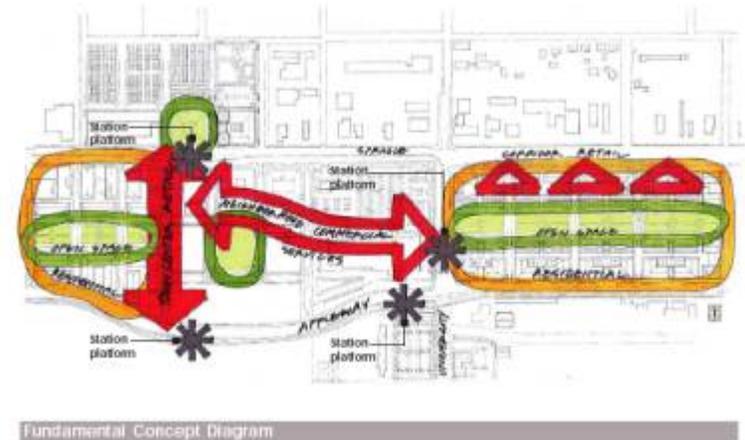
▪ Transit Oriented Development (TOD)

Spokane – University City

- Preliminary planning by Spokane Light Rail suggests a new town center retail street to provide the primary focus of the transit supportive development in the University City area.



Spokane Transit Oriented Development



Seattle – Northgate

- 8 acres, residential, retail, office, and transit hub serving light rail, buses, and possible monorail
- By 2020 Northgate light-rail ridership is forecast at 10,000 daily boardings, with 75% of riders arriving and departing by bus
- Cost: No current estimate.
- King County has 8 other TOD designated sites

Northgate Transit Oriented Development Alternative #1



And These Go With Transit

▪ Efficient Transportation Strategies

- Vanpools
- Carpools
- Flexcars
- Telecommuting
- Alternative Schedules
- Guaranteed Ride Home
- Parking Cash-Out
- Parking Charges
- Education and Marketing
- Fare Subsidies for Transit / Vanpools
- Priority Parking for Vanpools / Carpools

▪ Direct Access Ramps in Highway System Plan

I-5

1. Connection to South Industrial Way/E3 busway
2. Northeast 50th Street Interchange
3. SR 523 (Northeast 145th) Interchange
4. SR 512 Interchange vicinity
5. Connection to 48th Street (Tacoma Mall)
6. Connection to Tacoma Dome

SR 167

7. SR 167 and I-405 to SW 27th Street

SR 522

8. Bothell UW Campus Access



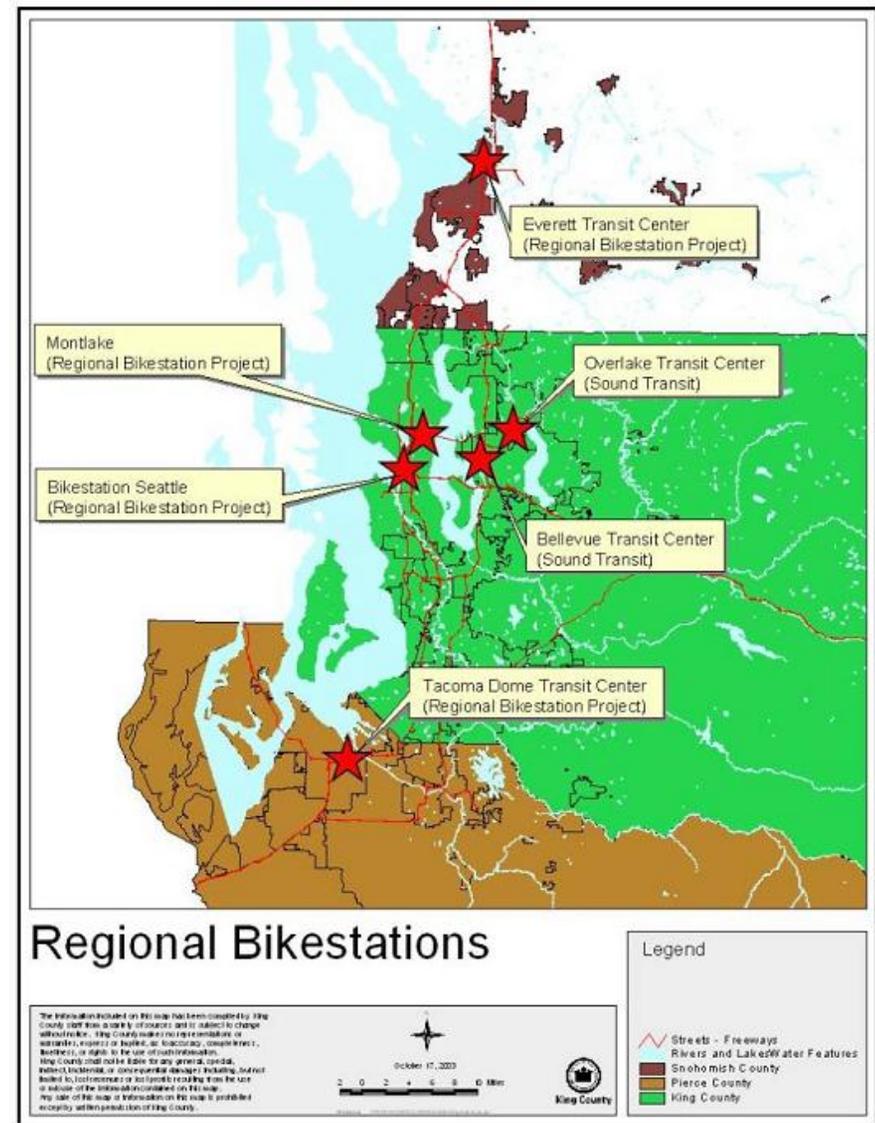
I-90 at Eastgate



And These Go With Transit

▪ Integrating pedestrian and bicycle into daily transportation

- Including bike racks on buses and vans.
- Locating transit stops for pedestrian safety.
- Improving bicycle and pedestrian accommodations on ferries and around terminals as well as around transit stations.
- Adding medians, refuge islands and other traffic calming features, particularly in transit corridors.
- Implementing safe and creative solutions for sharing limited right-of-way in urban areas (e.g., Bus/Bike Only Lanes, suspended pedestrian bridge).
- Completing the regional bike stations and connecting them with the bicycle and pedestrian network.



And These Go with Transit

HOV Systems

SR 520 Bridge Replacement & HOV Project

- A dedicated HOV lane to move transit and carpools (6-Lane Alternative) and provides full shoulders for disabled vehicles and emergency aid. Sizes pontoons to carry future high-capacity transit.
- Estimated Cost: \$2.2 billion



The Tacoma / Pierce County Core HOV Program

- A series of highway projects that will provide operational improvements on I-5 and SR 16, and will complete the next portion of HOV lanes in the Puget Sound Region.
- Estimated Cost: \$1.4 billion



I-5 - Pierce County Line to Tukwila HOV Lanes

- In south King County, a multi-phase project is under way to add HOV lanes in both directions between Tukwila and the Pierce County line.
- Extends I-5 traffic camera and flow map coverage by 13 miles to the Pierce County line
- Estimated Cost: \$280.4 million



I-5 - Everett, SR 526 to US 2 HOV Lanes

- Adds new carpool lane in each direction on I-5 between SR 526 and Marine View Drive.
- Adds new merge lane in both directions on I-5 between 41st Street and US 2.
- Install retaining walls and a detainment and treatment area for freeway water run off.
- Estimated Cost: \$222 million



Highway System Expansions

On the plate

I-405

- 20-year vision of multi-modal improvements to the freeway, transit system and arterials along the I-405 corridor, stretching from Tukwila to Lynnwood
- Adds up to 2 lanes in each direction of I-405, develop Bus Rapid Transit line with stations, increases total transit service 50%, create 8 new pedestrian / bicycle crossings over I-405.
- Estimated Cost: \$11 billion (2002 dollars)



SR 509

- A freight and congestion relief project in south King County.
- Builds over 3 miles of new 6-lane freeway; over 6 miles of new I-5 lanes between Sea-Tac and Federal Way.
- Addresses multiple modes by extending Des Moines Creek Park pedestrian and bike paths over 1 mile.
- Estimated Cost: \$997 million



SR 167 - Extension (Tacoma to Edgewood)

- Extends SR 167 along the north side of the Puyallup River in Pierce County from its junction with SR 161 in Puyallup to SR 509 in the Port of Tacoma area.
- Constructs six miles of four-lane divided highway on new alignment, completes and adds new interchanges: the SR 167/SR 161 (Meridian); Valley Avenue and SR 167; I-5 and SR 167; 54th Avenue and SR 167. interchange.
- Estimated Cost: \$1.7 billion



SR 704 – Cross Base Highway

- Builds important link in the regional transportation system in central Pierce County.
- Provides new multi-lane six mile, east-west arterial corridor. Directly linking I-5 at Thorne Lane with SR 7 at 176th Street.
- Design accommodates future HOV lanes
- Roadway / railway separation at Thorne Lane
- Estimated Cost: \$167.7 million



Highway System Expansions

On the plate

SR 9 – Widening

- Highway 9 in Snohomish County from SR 522 near Woodinville to just north of Arlington at 268th Street.
- Highway 9 is the only major north-south roadway on the east side of Snohomish County and the only major alternative to I-5.
- Adds 2 through lanes in each direction; installs raised median and turn lanes in certain intersections;
- Estimated Cost: \$107 million



SR 522 – Widening

- SR 522 is an important east-west route that runs from I-5 in Seattle to US 2 in Monroe.
- Widens highway to four lanes between SR 9 and US 2.
- Adds two new interchanges and numerous safety improvements
- Constructs new drainage facilities to improve water quality
- Estimated Cost: \$266.7 million



US 395 – North / South Spokane

- Addresses need for major improvement to allow motorists and freight to move through metropolitan Spokane along the corridor from I-90 to US 395 at Wandermere.
- Will provide multi-modal improvements including park and ride lots to support transit and vanpooling operations; expanded and enhanced pedestrian and bicycle facility. Right of way will be reserved for possible light rail use.
- Estimated Cost: \$1.5 billion



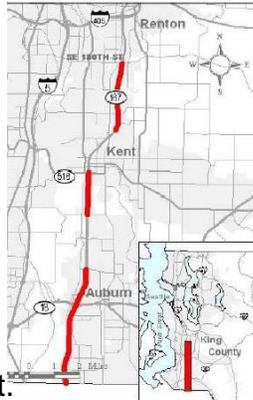
- The current Highway System Plan has \$39 billion in capacity expansion projects that are not funded. This reflects updated project cost estimates in 2004 dollars.
- Note: The \$39 billion shortfall figure includes the Alaskan Way Viaduct replacement and SR 520 bridge replacement project costs.

Highway System Expansions

What's next

SR 167 Valley Freeway

- Addresses 3 critical chokepoints on SR 167 between Renton and Sumner.
- Completes HOV lane from SR 18 to King / Pierce County line.
- Adds lane in each direction from S. 180th Street to 84 Ave South.
- Adds auxiliary lane in each direction of SR 167 between SR 516 and S. 277th St.
- May implement a high occupancy toll (HOT) lane system
- Estimated Cost: \$419 million (2004 dollars)



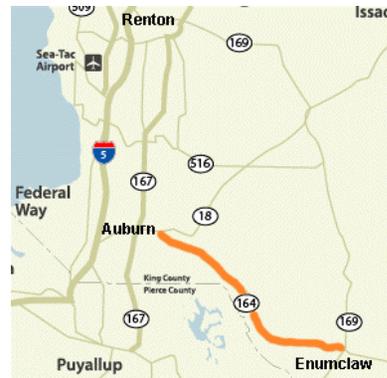
US 395 – Spokane to the Stevens County Line

- US 395 is a major north-south transport link, which moves people and goods between the U.S., Mexico and Canada.
- Widens US 395 from 2 lanes to a 4 lane divided highway with a 60-foot wide median, to improve traffic flow and safety.
- Adds new grade separated interchanges.
- Estimated Cost: \$91.5 million



SR 164 Corridor Study (Auburn to Enumclaw)

- This study will develop recommendations for both short-term and long-term transportation improvements to address increased accidents, traffic congestion, and anticipated further growth in the area.
- Estimated Cost: Cost estimate cannot be made until specific improvements are identified by Corridor Study.



SR 169 Corridor Study (Renton to Enumclaw)

- This study will develop recommendations for both short-term and long-term transportation improvements to address increased accidents, traffic congestion, and anticipated further growth in the area.
- Estimated Cost: Cost estimate cannot be made until specific improvements are identified by Corridor Study.



New Bridges and Crossings

On the plate

New I-5 Columbia River Crossing

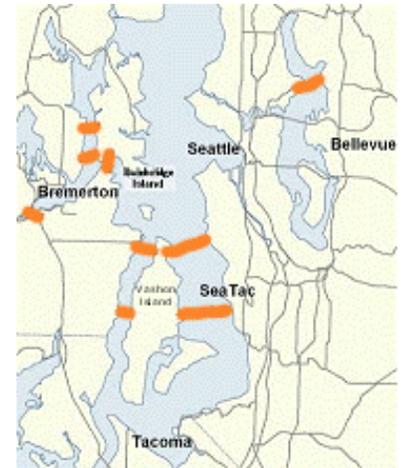
- Provide additional capacity over the Columbia River.
- Replacing the current I-5 bridge over the Columbia River is just one of several transportation improvement options that will be examined in by the Environmental Impact Statement (EIS).
- Estimated Cost: A total cost cannot be accurately estimated until the EIS and preliminary design work are completed.



What's next

Cross Sound Bridges

- Various bridges proposed to connect Kitsap Peninsula to West Seattle.
- Prior feasibility studies: Considered by every legislature from 1949 to about 1967.
- Since 1970s most communities along the water have been vocally against such a bridge.



Cross Sound Bridges



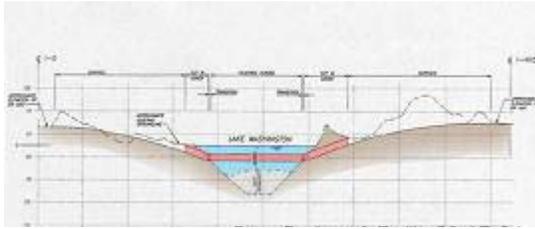
- Elliott Bay Bridge Concept.
- Submitted through public comment on replacing the Alaskan Way Viaduct

New Bridges and Crossings

Lake Washington Crossings

Submerged Floating Tunnel

- No such tunnel currently exists
- Idea studied worldwide.
- Technology available today.
- Safety issues need detailed study
- Three times the cost of floating bridge.
- Concerns regarding geological stability; ventilation; lighting; fire; flooding; and security.

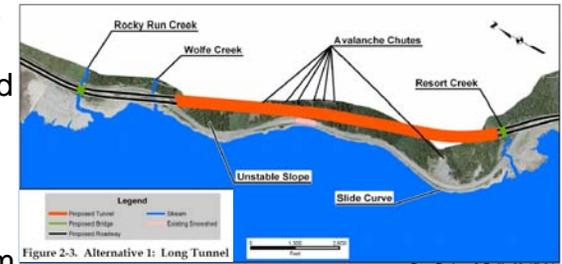


Dye, Parker, & Reilly 03-17-04

All-Weather Cascade Crossing

I-90 Snoqualmie Pass East

- Reconstructs route to meet projected traffic demands and improve public safety.
- Provide a safer, more efficient 6-lane freeway from Hyak to Easton.
- Use of tunnels and/or mitigation measures for avalanches and rockfall will minimize rockfall closures.
- Estimated Cost: \$315 to \$730 million for 15-mile corridor.



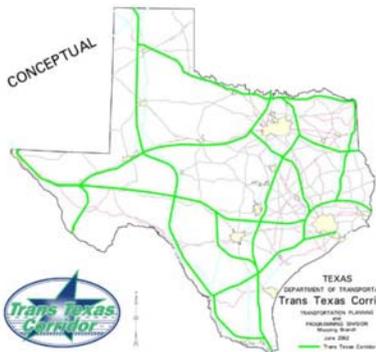
Dye, Parker, & Reilly 03-17-04

New Highway Multi-Function Corridors

■ Cascades Commerce Corridor

- A north-south, limited-access corridor east of I-405 and west of the Cascades.
- Could offer additional capacity for freight and passenger traffic through road, rail, pipeline, and utilities.
- Begin in Lewis County and extend north to the Canadian border.
- To be developed, financed, designed, constructed, and operated by private sector consortiums
- Is it feasible?
 - The 2004 Commerce Corridor Study will explore feasibility of the concept.

Trans Texas Corridor



- 4,000 mile network of corridors up to 1,200 feet wide.
- Separate highway lanes for passenger vehicles and trucks, high-speed passenger rail, high-speed freight rail, commuter rail, and a dedicated utility zone.
- Texas is soliciting proposals for innovative plans to acquire, develop, design, construct, finance, maintain and operate one of the high priority corridors.
- Estimated cost: ranges from \$145.2 billion to \$183.5 billion.



Possible Commerce Corridor

Serving Freight

▪ Freight Rail

Preservation—Short Line rail needs over the next 20 years is \$113.5 million (\$62 million in the first 10 years) and includes rail ties, ballast, and bridge repair work.

Improvements

Port of Vancouver Rail Yard—Several low-to-medium cost solutions to improve rail capacity have been identified by the railroads, the ports, and the Washington and Oregon Departments of Transportation and include: revising crossovers, increasing speeds, lengthening and/or connecting tracks in several yards. These improvements will address capacity needs for approximately five to ten years.

Canada/U.S. Border Rail Crossing—The extant rail siding is not long enough to park full freight trains off the mainline, while they undergo detailed and lengthy inspections. Currently both passenger and freight cars have to queue up on the same track. In 2004, Senator Murray appropriated a \$3 million earmark to deal with border congestion and customs delays at the Swift siding, south of Blaine. Design work is underway and full funding need is still to be determined. This is a high priority project for BNSF.

Columbia River Rail Bridge—63 freight trains and 10 Amtrak trains cross the bridge daily in 2004. Freight trains are projected to reach 90 per day in 2025, and inter-city passenger service plans call for 26 trains per day. Within the next 10 to 20 years, growth on the rail system will require additional capacity across the Columbia River.

Expansion

Adding capacity to the major E-W route over Stevens Pass would be very expensive. Improving the fans blowing exhaust out of the tunnel is a small matter compared to the need to extensively upgrade rugged mountainous sections on both sides of the tunnel.

Clear-cutting the Stampede Pass tunnel to add double-stack capacity is much less expensive (estimated \$25 million according to BNSF) and would allow directional 'one-way' routing and thereby reduce the need for additional sidings. But it would not resolve capacity constraints at the Spokane yard, between Spokane and Pasco, and along the Columbia Gorge, where the line is already near, or at, full capacity.

Serving Freight

▪ Special Needs of Truckers

- **Weigh in Motion:** Within the next two biennia we should have all interstate weigh stations converted to this technology. For the future we hope to convert all the rest of the weigh stations, funding permitting.

- **Commercial Vehicle Information Systems and Networks (CVISN):** Up to now WSDOT has applied an incremental approach. The ultimate vision is paperless permitting and tracking and sharing data within a national system. Border crossing applications of this technology are underway with a pilot project for sealed cargo containers.



Serving Freight

▪ Intermodal Efficiencies and Connections

Rail – Truck

- BNSF is developing Intermodal Logistic Parks. Recognizing the shift from a manufacturing economy to a warehouse and distribution economy has sparked development to this concept offering multimodal transportation choices in major regional markets. BNSF is developing a “four corner” nationwide strategy with one location in the Northwest.

Short Sea Shipping

- Using shipping via barge or container ship for short-hauls in the Puget Sound in lieu of highway or rail movements that might be delayed by congestion.

FAST Corridor Program

- Puget Sound regional freight mobility partnership effort that has identified \$500M in projects. More than ½ of funding implementation is provided by state or regional partners. State funding for FAST projects is almost 1/3 of total needs and is funded through FMSIB, TIB and WSDOT.

Commuter and Intercity Passenger Rail

Sounder Commuter Rail

- 82 miles of two-way, rush hour passenger train service between Everett and Lakewood. Serving Tacoma, Puyallup, Auburn, Kent, Tukwila, Seattle, Edmonds, and Everett.
- Future service is planned for Lakewood, South Tacoma and Mukilteo



Amtrak Long Distance Services

- Coast Starlight* daily connects Seattle to Los Angeles
- Empire Builder* serves Seattle and Portland to St. Paul and Chicago daily.
- Amtrak *Cascades* with service from Vancouver, BC to Eugene, OR. This route is financially supported by Washington and Oregon.
- Service reliability is an issue on Amtrak long-distance trains as their performance is impacted by increasing freight train congestion.

Amtrak Cascades Service

- While WSDOT is currently revisiting the policy for higher speed rail in our state, the Passenger Rail Plan recommends pursuing 13 daily roundtrips between Seattle and Portland at 2.5 hrs travel time.

Amtrak Cascades Daily Roundtrip Trains

| Total Trains | 1994 | 2003 | Mid-point | 2023 |
|------------------------------|------|------|-----------|------|
| Portland, OR to Seattle, WA | 1 | 3 | 8 | 13* |
| Seattle, WA to Vancouver, BC | 0 | 2** | 3 | 4 |

*Includes three trains which travel north, beyond Seattle, to Vancouver, BC.

**Amtrak Cascades #513/516 travels between Seattle and Bellingham.

Amtrak Service Map for Pacific Northwest



Commuter and Intercity Passenger Rail

High Speed Passenger Rail

- Since the early 1990's, state policy and funds supported the development of higher speed passenger rail with increased frequency between Eugene, OR and Vancouver, BC.
- Still others called for east / west intrastate passenger rail service between Seattle, Ellensburg, Yakima, the Tri-Cities and Spokane.
- Current airline industry financial woes and the end of Greyhound bus service in many Washington cities highlight the diminishing travel alternatives.

Magnetic Levitation

- Some see Magnetic Levitation (Maglev) transportation as a travel solution. Advocates point to the benefits of a non-petroleum based, higher speed travel.
- Other jurisdictions are studying maglev (California, Florida, Maryland, Japan, and Germany).
- In January, the Chinese State Council cancelled plans for a maglev railway between Beijing and Shanghai. Instead, they announced plans to use the less expensive wheel-track high speed method.

Cost Comparison of High Speed Ground Transportation

| Technology | Type of Corridor | Estimated Cost* |
|------------------------------|----------------------------|---------------------|
| Tilt and Conventional Trains | Existing Rail Right of Way | \$10 million / mile |
| Electrification | Existing Rail Right of Way | \$20 million / mile |
| Maglev | New Corridor | \$30 million / mile |

*In 1993 dollars

Source: *High-Speed Ground Transportation: Issues Affecting Development in the United States*, U.S. Government Accounting Office, November 1993.

Transforming the Way We Travel

Smart Vehicles

Vehicle Infrastructure Integration Program (VII)

- FHWA's program applying information exchange between the vehicle, the roadway and the driver.
- Vehicles on the road can become traffic probes. Data gathered on travel behavior and real-time traffic conditions is made available over the entire network instantaneously.
- Autos will have the capability to alert drowsy drivers and prevent accidents.
- Vehicles can send road surface conditions from anti-lock /traction control system transmitted data.
- GPS and mapping systems in cars will become more sophisticated and start to integrate real time traffic and weather conditions into route planning.

Adaptive Cruise Control

- Systems combining advanced sensing and vehicle control technologies to ease driving stress, enhance safety and efficiency.
- Available now in some autos as a high-end option
- Could eliminate rear end collisions
- Allows autos to communicate with each other and coordinate responses to avoid collisions

Transforming the Way We Travel

Smart Vehicles

Collision Avoidance and Roadway Departure Alarm Systems

- Vehicles will have the ability to alert drowsy drivers to a lane departure through various possible methods:
 - creating the sound of running over highway rumble strips,
 - flashing red lights on the windshield,
 - using a vibrating steering wheel
 - even turning the wheel to keep the vehicle in the lane.
- Available within 5 years in some high-end vehicles
- Vehicles with front end radar and video sensors monitor the lane striping, when change occurs the vehicle notifies the driver.
- More advanced devices will allow autos to communicate with each other and coordinate responses to avoid collisions
- Side scanning radar systems could eliminate sideswipe accidents

Buying System Capacity through Smarter Vehicle and Smarter Roads

- Technology allows vehicles to sense surrounding autos and adjust speed, in turn permitting vehicles to travel in groups, or non-connected trains. The vehicles in these trains will all communicating directly with each other, allowing the vehicles to travel at closer distances and high speeds, more efficiently using current highway capacity.

Transforming the Way We Travel

Smart Roads

- Improved Roadway Management and Driver Information Systems
 - Variable Speed Limits
 - Increase compliance
 - Less burden on justice system
 - Improve safety
 - Responsive to dynamic conditions
 - Increase system efficiency
 - Real-time information
 - Automated Maintenance
 - Using machinery in place of humans in hazardous situations (i.e. remote control traffic cones)
 - Web and 511 customized traveler information
 - Delivered to traveler's car or personal digital assistant (PDA)
 - Arterial Signalization / Ramp Metering Interactivity
 - Transit Applications
 - Signal prioritization
 - Queue jumps for buses

Transforming the Way We Travel

Energy and Air Quality Efficiency

- Alternative fuels vehicles operate on one of these non-petroleum energy sources:
 - Biodiesel
 - Ethanol
 - Natural Gas
 - Electricity
 - Propane
 - Hydrogen

Currently, the two most talked about non-petroleum fuel source vehicles are the Hybrids and Fuel Cells, or Hydrogen Fuel Cell vehicles.

- Hybrids – hybrids by definition are a cross breed of two separate sources. A hybrid vehicle is merely a vehicle with two sources of fuel. Today, most hybrids are electric/internal combustion engine (Toyota Prius and Honda Civic).
 - Since the hybrid does depend on an internal combustion engine it does expel pollutants, just in smaller amounts than other fully operating combustion engines.
- Fuel Cell – Hydrogen Fuel Cell had for many years been held out as the holy grail non-polluting engines. The fuel comes from the chemical process of separating the oxygen atoms from the hydrogen atoms. Most fuel cells currently in testing have to have some other fuel source available to perform the chemical separation. In a true hydrogen fuel cell vehicle the only waste product created by the process is warm water. The goal over the next 10 to 20 years is to develop a process where the hydrogen atoms can be separated without the use of another internal combustion engine.

Transforming the Way We Travel

Energy and Air Quality Efficiency

Hybrid Vehicles

- Industry experts expect hybrid sales to accelerate sharply in the next few years.
- By 2008, it is estimated hybrids will account for 2% of all vehicle sales.
- By 2010, it might be possible to order a hybrid engine as an option, similar to the standard / manual transmission option today.

| Hybrid Launch Dates in North America | |
|---|--------------|
| Make and Model | Release Date |
| Honda Insight | 1999 |
| Toyota Prius | 2000 |
| Honda Civic | 2002 |
| Chevy Silverado | 2004 |
| GMC Sierra pickup | 2004 |
| Ford Escape SUV | 2005 |
| Honda Accord | 2005 |
| Lexus RX400 | 2005 |
| Toyota Camry | 2005 |
| Toyota Highlander | 2005 |
| Nissan Altima | 2006 |
| Chevy Malibu | 2007 |

Changing Transportation Economics

Congestion Pricing

System-Wide Tolling

- Charges accrue over all roads, from driveway to highway. Fee based on actual use of the road.
- “Dynamic Pricing” (variable pricing based on demand) may be applied in this form of congestion pricing.
- Minnesota and Oregon are studying and testing systems.
- PSRC will study a GPS incentive based system testing pricing as a driving behavior modifier.



- Germany’s truck toll system has had numerous delays due to technical difficulties.

Segment Tolling

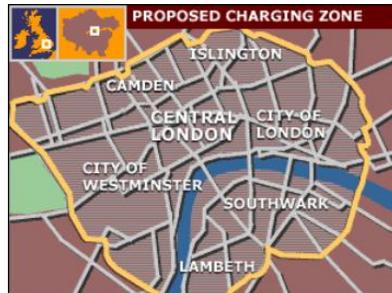
- Limited access facilities. Dynamically priced based on traffic volumes and delay.
- Until late 1980’s federal policies discouraged tolls roads or imposing tolls on existing highways.
- Diminished road funding, advances in tolling technology, and more liberal federal policies have led to a resurgent interest in pricing roads.
- Advances in electronic toll collection now provide for “at speed” (no tollbooth) collection of tolls.



Transponder

Cordon Tolling

- All drivers are charged a toll when entering an area, such as a downtown district.
- Singapore (1975 – electronic since 1998)
 - Central Business District and ring roads
 - Reduced number of solo drivers.
- London (2003)
 - Central Business District (8 sq. miles)
 - Photo tolling (688 cameras / 203 sites)
 - Vehicles within Cordon reduced 17%



High-Occupancy-Toll (HOT) Lanes

- SOVs can buy into HOV lanes (1 or 2 lanes) when there is available capacity.
- Almost 20 different projects using or studying HOT lane applications in US.
 - Operational or Under Const.**
 - I-10 & US 290 (Houston, TX)
 - I-15 (San Diego, CA)
 - SR 91 (Orange County, CA)
 - I-394 (Minneapolis, MN)
 - I-25 / US 36 (Denver, CO)
 - System-Wide Studies**
 - Minneapolis, MN
 - Atlanta, GA
 - Washington, DC Beltway (VA)
 - Proposed**
 - SR 167 (King County, WA)
 - I-95 (Miami, FL)