(DRAFT)

Washington Transportation Plan Update

Interim Briefing to the Transportation Commission

Transportation System Preservation

"Needs for the next decade"

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This presentation is a public record document. It is a draft and will be revised as needed. 3rd Edition last revised 9/9/2004.

Washington State Department of Transportation

The Preservation Imperative

- Washington has been a leader in recognizing and funding preservation investment needs for transportation systems as one of the first states to have a pavement management system. Both commission policy and legislation emphasize the priority of preservation investments.

- But to date, the recognition, measurement and investment of preservation needs has been piecemeal.

- The Governmental Accounting Standards Board (GASB) has a new standard that emphasizes the importance of system preservation. GASB statement 34 requires that all state and local governments report transportation system asset value and condition (optional) on financial statements. This means that poor asset condition could affect bond ratings and the interest rate on public debt.

- The WTP will attempt to sum all preservation investment needs to better understand the magnitude of the problem.

Maintenance, Preservation, and System Improvements:

Maintenance, including routine and recurrent preventive maintenance, is an operating expense.

Preservation is a capital investment that generally extends the service life of an asset. Preservation also includes asset rehabilitation in existing transportation corridors to sustain their transportation uses and capacities.

System Improvement is a capital investment that adds new facilities to the system or adds capacity or other new functionality to an existing asset.

Much of the information in this presentation is preliminary and requires further refinement.

Transportation Assets Requiring Preservation Investment

Highways and Roadways

Pavements, Bridges, Tunnels, Rest Areas, Traffic Control and Drainage Systems

Washington State Ferry System

Vessels, Terminals, and Maintenance Facilities

Transit Systems

Vehicles and Maintenance and Operation Facilities

Airports

Commercial Air Service Facilities, General Aviation Airports, Runways, Terminals, and Navigation Aids

Seaports

Docks, Wharfs and Cranes

Federal Waterways

Locks, Dams, and Dredged River Channels

Railroads

Tracks, Facilities and Rolling Stock

Preservation *Needs Assessments* Have Been Extensive, but Piecemeal

- State highway chip seal and asphalt pavement needs have been carefully studied under *Lowest Life Cycle* methodology; State highway Portland Cement Concrete (PCC) pavements are less well scoped.

- The State of Washington Inventory of Bridges is a comprehensive inventory including both state and local bridges over 20 feet. There is no comprehensive inventory of bridges under 20 feet. State bridge cost estimates are very approximate and generic.

- Other state highway assets, such as: electrical systems, drainage systems, sign supports, etc., are less well inventoried.

- Ferry needs were generally described in 2001 by the Legislative Joint Task Force on Ferries which developed standards and definitions.

- There is no comprehensive inventory of local roadway and transit assets and preservation needs. The County Road Administration Board has good information on county road pavements and bridges, but no comparable information exists for city streets.

- The 2003 Legislature required cities, counties, and transit agencies to report transportation asset condition information and to develop maintenance and preservation plans. Information on these assets will improve in the future.

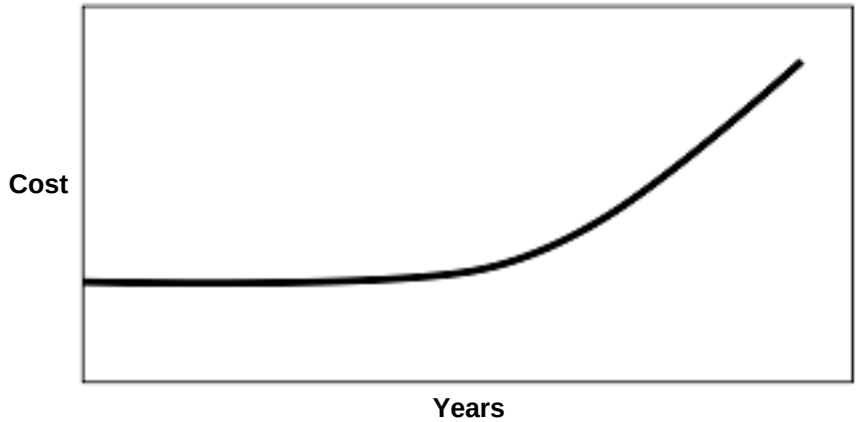
Purpose of this Interim Presentation:

- Emphasize the magnitude of the system preservation challenge.
- Present current information not only on state-owned assets, but also on airports, transit systems, railroads and local governments.
- Ask the commission for specific areas of future interest and additional data requirements.

Significant Issues in System Preservation

- Preservation investment needs tend to increase as the asset inventory grows older.
- Neglect or deferral of preservation investment leads to compromise or loss of use of existing assets. This leads, in turn, to spiraling costs to retain or recapture existing facilities and capacity.
- Preservation investment is becoming more expensive and complicated as expectations increase for auxiliary environmental and safety retrofits on existing facilities.
- Basic current expense maintenance activities must also be funded if there is to be a sound foundation for stewardship of existing assets.

“Pay me now, or pay me more - lots more - later”



An Overview of the Presentation

- **Roadways and Highways**
- **Ferries**
- **Aviation**
- **Public Transit**
- **Railroads**
- **Local Roadways**

Roadways and Highways

- **Structures**
- **Pavements**
- **Other Facilities**

Roadways and Highways Structures Overview

State

Pedestrian Bridges	55
Railroad Bridges	5
Vehicular Bridges (over 20 ft. long)	2,967
Structures (under 20 ft. long)	257
Culverts (over 20 ft. long)	80
Tunnels and Lids	38
Border Bridges (maintained by border state)*	6
Total	3,408

* Maintenance cost split in half between states

Local

	County	City
Railroad Bridges	4	6
Vehicular Bridges (over 20 ft. long)	3,255	674
Structures (under 20 ft. long)	492	76
Culverts (over 20 ft. long)	26	4
Tunnels and Lids	1	3
Total	3,778	763

Condition Ratings of State Structures

	Description	2000	2001	2002	2003
Good	A range from no problems to some minor deterioration of structural elements.	84%	85%	87%	86%
Fair	All primary structural elements are sound but may have deficiencies such as minor section loss, deterioration, cracking, spalling or scour.	11%	11%	10%	11%
Poor	Advanced deficiencies such as section loss, deterioration, cracking, spalling, scour or seriously affected primary structural components. Bridges rated in poor condition may be posted with truck weight restrictions.	5%	4%	3%	3%

Structurally Deficient/Functionally Obsolete (SD/FO) Bridges by State (2003)

Ranking	State	Total State and Interstate Bridges	Total SD/FO Bridges	Percent SD/FO
1	North Dakota	1106	46	4%
2	Nebraska	3449	406	7%
3	Arizona	4390	327	7%
10	South Dakota	1806	255	14%
20	Colorado	3400	633	19%
30	Maryland	2501	1600	24%
35	Washington	3054	887	29%
41	Oregon	2659	844	32%
50	Rhode Island	587	318	54%

Source: FHWA National Bridge Inventory

Ranking by Structurally Deficient (SD) only, Washington ranks 11th with 125 SD bridges

Structure Preservation Programs

- Steel Bridge Painting
- Bridge Deck Preservation
- Seismic Strengthening
- Bridge Rehab / Replacement
  - Structural Deficiencies
  - Width and Geometry Deficiencies
- Scour Protection
- Special Repair
  - Moveable Bridge Repair
  - Major Repair
- Miscellaneous Structures
- Keller Ferry

SR 99 George Washington Bridge, Seattle

I-90 Spokane Viaduct

Structures: Steel Bridge Painting

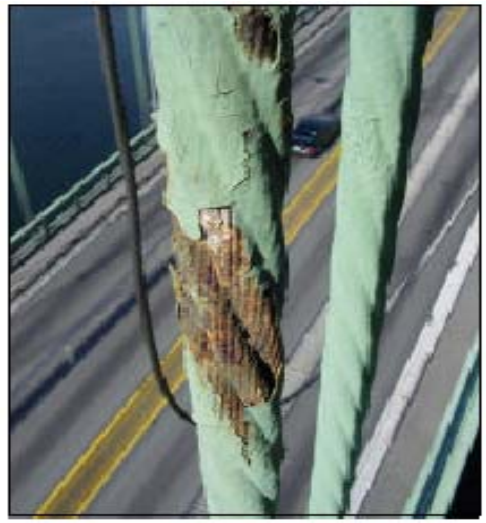
- WSDOT has painted 60 steel bridges over the last six years for a cost of $37.5 million.
- Recently completed projects include:

  - Snake River at Burbank
  - Nooksack River
  - Gorge Creek
  - Skagit River

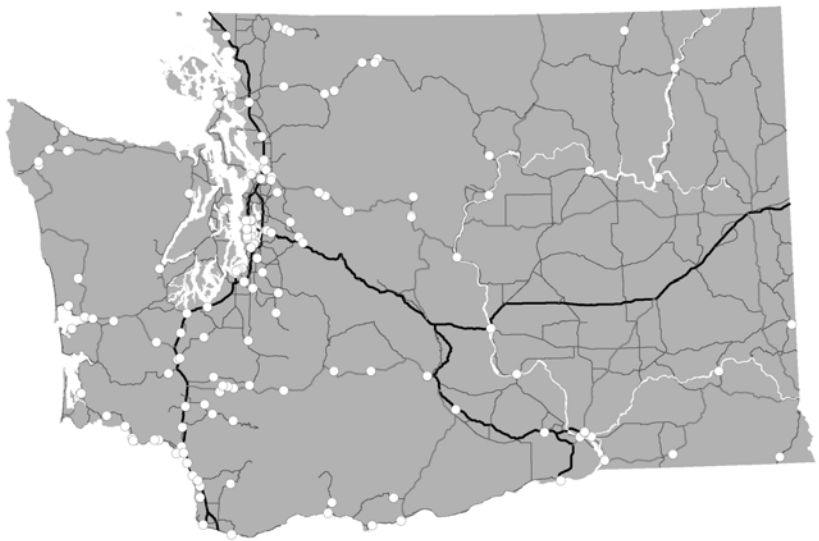
- Current backlog of 52 bridges for approximate cost of $50 million*. Top priorities include:
  - SR 16 Tacoma Narrows Suspender Cables
  - SR 433 Lewis & Clark Bridge, Longview **
  - SR 99 Aurora Ave Bridge, Seattle

- Approximately 114 additional bridges will need painting within the next ten years at an additional estimated cost of $81 million (current dollars).

- *Pro forma* budget assumes $132 million for the next ten years. This will address the backlog and keep pace with the current needs.



SR16 Tacoma Narrows (suspender cables)



Location of steel bridges now needing or expected to need bridge painting in the next ten years.

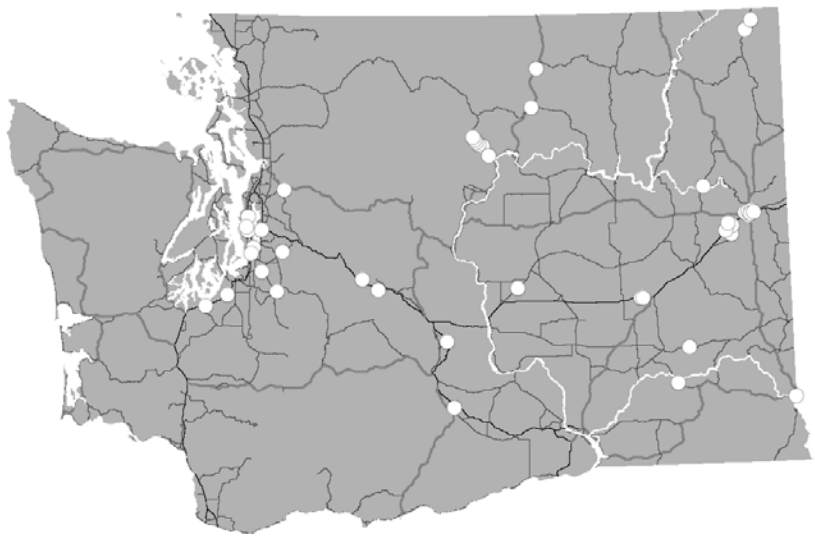
* $1200 x tons of steel in the bridge

** Oregon has no funds to pay for its half

Structures: Bridge Deck Preservation

- WSDOT has rehabilitated 58 bridge decks over the last six years for a cost of $39 million.
- Major deck overlay program in 1980s and 1990s put Washington way ahead of most other states.
- Recently completed projects include:
  - I-5 Puyallup River in Tacoma
  - I-5 Northgate Vicinity Bridges
  - SR 173 Columbia River, Brewster
- Most recent condition assessment is that 44 bridge decks will need rehabilitation in the next ten years.
- Cost to rehabilitate 44 identified decks is estimated at $56 million (in current dollars).
- Top priorities include:
  - SR 12 Snake River, Clarkston
  - I-90 Spokane Viaduct, Spokane (abnormal studded tire wear)
  - I-90 Kachess River, Easton
- *Pro forma* budget assumes $56 million in the next ten years which will address all currently identified needs.

I-90 Spokane Viaduct



Remaining ten year Bridge Deck Needs

* Estimated at $35 per square foot, this is 2002-2003 dollars

Structures: Seismic Strengthening

This summary does not include the two largest bridge replacement problems, the Alaskan Way Viaduct and the SR 520 Evergreen Point Bridge.

- WSDOT has performed seismic strengthening on 132 bridges over the last six years for a cost of $64 million.
- Recently completed projects include:
  - SR 99 Aurora Ave, Seattle
  - SR 99 Spokane Street, Seattle
- Where are we? (since 1980)
  - 24 major bridge retrofits are completed - leaving three remaining.
  - 318 superstructure retrofits are complete - leaving four remaining.
  - 80 single column substructure retrofits are complete - leaving 109 remaining.
  - 8 bridge substructure retrofits (multiple columns and foundations), are complete - leaving 684 remaining.
- *Pro forma* budget assumes $46 million in next ten years, which is expected to complete highest risk structures.

I-5 Beacon Holgate Bridge column damage from Nisqually Earthquake (before strengthening)

I-5 Beacon Holgate Bridge post Nisqually Earthquake Repair (after strengthening)

Bridge Replacement

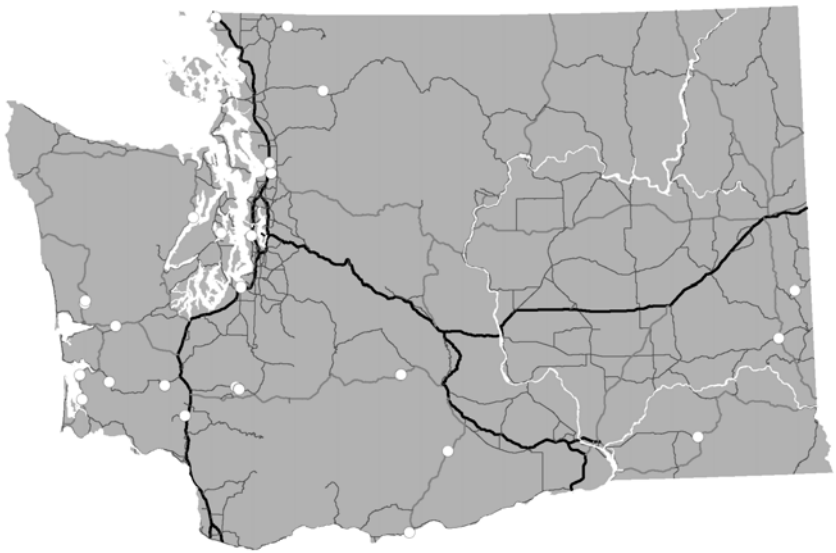
This summary does not include the two largest bridge replacement problems, the Alaskan Way Viaduct and the SR 520 Evergreen Point Bridge.

Structurally Deficient Bridges

- Over the last six years WSDOT has replaced 16 bridges at a cost of $190 million. Recently completed projects include:
  - SR 290 Spokane River West Trent
  - SR 97 Toppenish Creek
  - US 2 Barclay Creek, Baring

SR 6 S. Fork Chehalis River, Pe Ell

- In the category of *structural needs,* 29 bridges need replacement or major rehabilitations, with a projected cost of approximately $250 million (in current dollars). Top priorities include:
  - SR 97 Satus Creek, Toppenish
  - SR 303 Manette, Bremerton
  - SR 6 S. Fork Chehalis River, Pe Ell
  - US 101 Bone River, Nemah



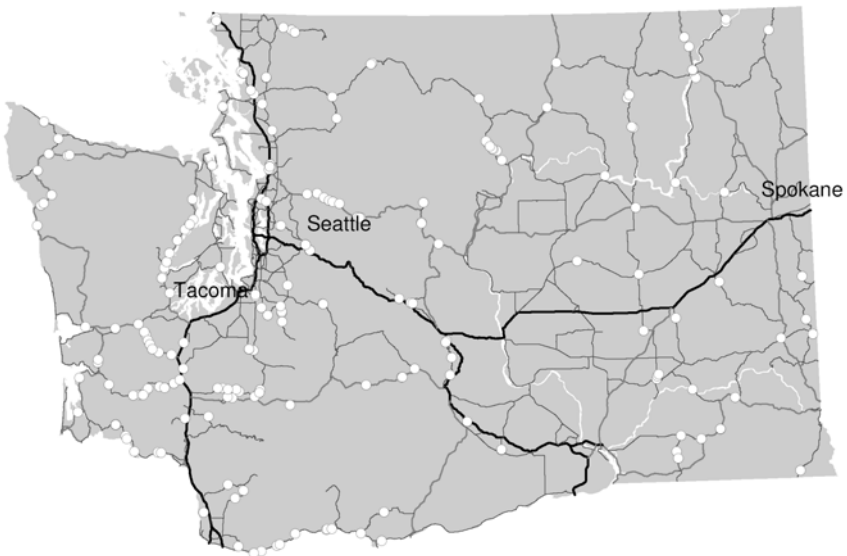
Location of Structurally Deficient Bridges

Structure: Width and Geometry Deficiencies

- Numerous bridges built prior to 1950 have a roadway width of less than 24 feet and/or poor roadway geometry.
- Replacement costs include approach realignments.
- Ninety-nine such bridges are on **Highways of Statewide Significance.** The total cost to replace is approximately $500-600 million.
- One hundred thirty-two such bridges are **non-Highways of Statewide Significance.** The total cost to replace these bridges is approximately $800-850 million.

In the *Bridge Replacement* category the *pro forma* budget assumes about $250 million over the next ten years which will address all currently identified needs. No *pro forma* dollars are assumed for replacement of width and geometry deficient bridges.

SR 9 Pilchuck Creek Bridge – Roadway width 17.1 ft



Location of Width and Geometry Deficient Bridges

Structures: Scour Protection

- WSDOT has mitigated scour on 70 bridges over the last six years for a cost of $7 million.

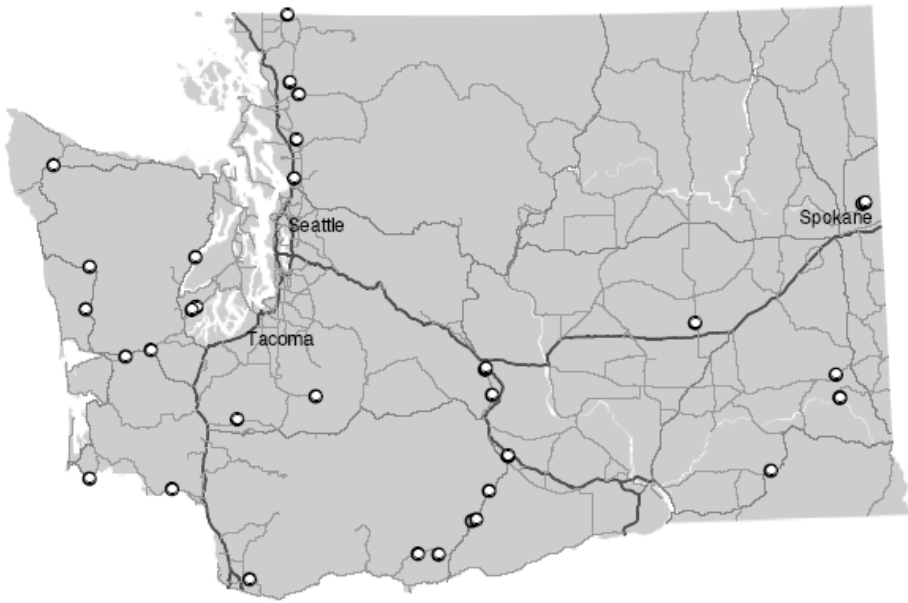
- Of the 45 bridges needing scour protection, the top five are:

  - SR 522 Snohomish River, near Monroe
  - I-5 Steamboat Slough, near Everett
  - SR 107 Chehalis River, near Montesano
  - US 12 Touchet River at Waitsburg
  - SR 508 South Fork Newaukum, Onalaska

- Future project costs are difficult to estimate because of increasingly stringent environmental permit requirements for in-stream work. Current remaining estimate for scour protection is $7 million (in current dollars) for 45 bridges.

- *Pro forma* budget assumes $3 million for each of 05-07 and 07-09 biennium.

SR 903 Roslyn Creek near Cle Elum



Location of bridges needing Scour Protection

Structures: Moveable Bridge Repair

- WSDOT has modernized 12 bridges over the last six years for a cost of $20 million.

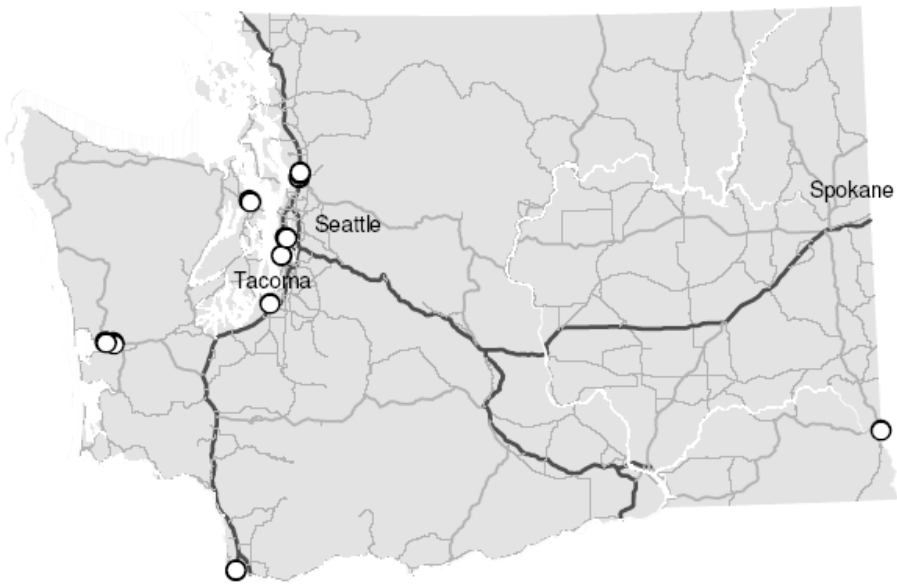
- Recently completed projects include:
  - SR 529 Steamboat Slough, near Marysville
  - I-5 Columbia River Bridge, in Vancouver
  - US 12 Wishkah Bridge in Aberdeen

- Current estimate of approximate need is $15 million (in current dollars). This estimate is an order of magnitude and not based on an actual plan or specification.

- *Pro forma* budget assumes $5 million per biennium in order to complete program by 2011.

- Four remaining major projects are:
  - SR 99 First Ave South, Seattle
  - SR 529 Snohomish River, Everett
  - US 101 Hoquiam River at Simpson Ave.
  - US 101 Hoquiam River at Riverside

US 101 – Hoquiam River at Riverside



Location of moveable bridge repair needs

Structures: Major Repair

- WSDOT has repaired a number of bridges in this category over the last six years for a cost of $55 million.

- Recently completed projects include:
  - I-5 Toutle River Bridge, near Castle Rock
  - SR 20 Deception and Canoe Pass, Whidbey Island
  - SR 241 Yakima River, near Sunnyside

- *Pro forma* budget assumes $6 million per biennium. Top priorities include:
  - I-90 Lacey V. Murrow Bridge, Lake Washington (patching concrete on outside of pontoon below waterline)
  - US 101 Mud Bay, Olympia
  - I-5 East Fork of Lewis River, Woodland

- Expectation: assumed level of investment is expected to keep pace with new needs.

US 101 Mud Bay (Olympia) concrete column deterioration

Miscellaneous Structures

- WSDOT has replaced 68 sign bridges (see pictures) over the last six years for a cost of $12 million.
- Recent sign bridge projects include:
  - NC Region U.S. 2 and U.S. 97 (8 structures)
  - SW Region I-205 (1 cantilever)
- Sign Bridge Replacement
  - There are 1,373 sign bridges in the state.
  - Current backlog of 140 sign bridges needing replacement.
- *Pro forma* budget assumes $10 million over the next ten years, which may eliminate the backlog.

I-90 – Applegate MP 280

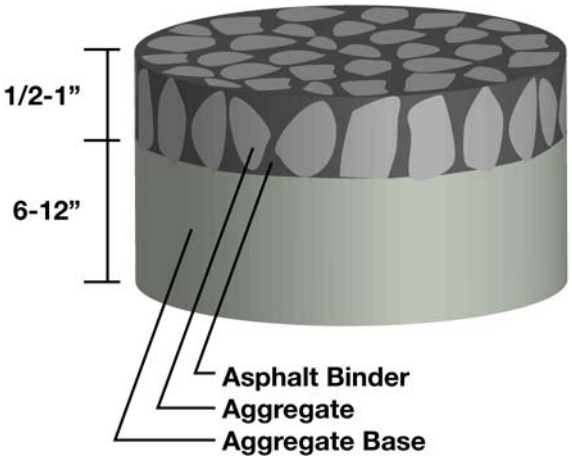
US 2 – Everett Vicinity

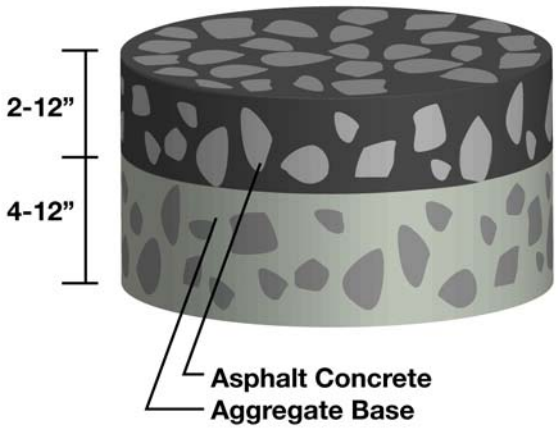
Structures: Keller Ferry

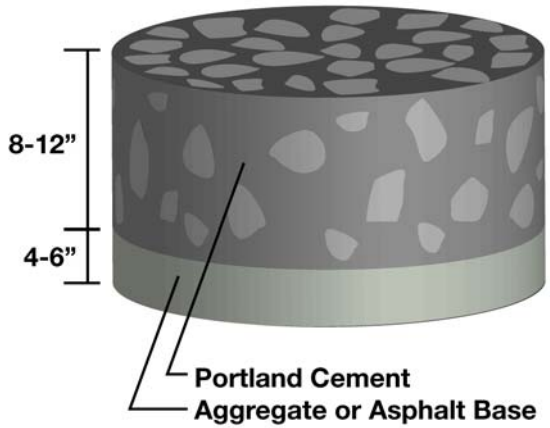
- WSDOT has owned and operated this ferry crossing for 74 years.
- The existing vessel, the Martha S. was placed into service in September 1948. Replacement parts are no longer being commercially manufactured for the current vessel.
- The ferry makes an average of 45 round trips per day, 10 minutes each way. The average number of vehicles are 190 per day and increases to about 300 during the summer months.
- School buses and emergency vehicles rely on this crossing. During dry-dock Coast Guard inspections, hull maintenance, and equipment failures, traffic has to be re-routed adding about 50 miles of travel for each vehicle.
- *Pro forma* budget assumes $10 million during the 2009-11 biennium to replace the ferry.

Pavements: Roads and Highways:

Three Pavement Types







Chip Seal Pavements

A chip seal is a durable surface that provides six to eight years of performance life and has an approximate cost of $12,000 per lane mile.

Hot Mix Asphalt Pavements

Hot mix asphalt pavement surface life between rehabilitation treatments can range from six to 18 years (based on actual pavement performance) and has a cost of $123,000 (due miles) per lane mile, and $156,000 (past due miles) per lane mile.

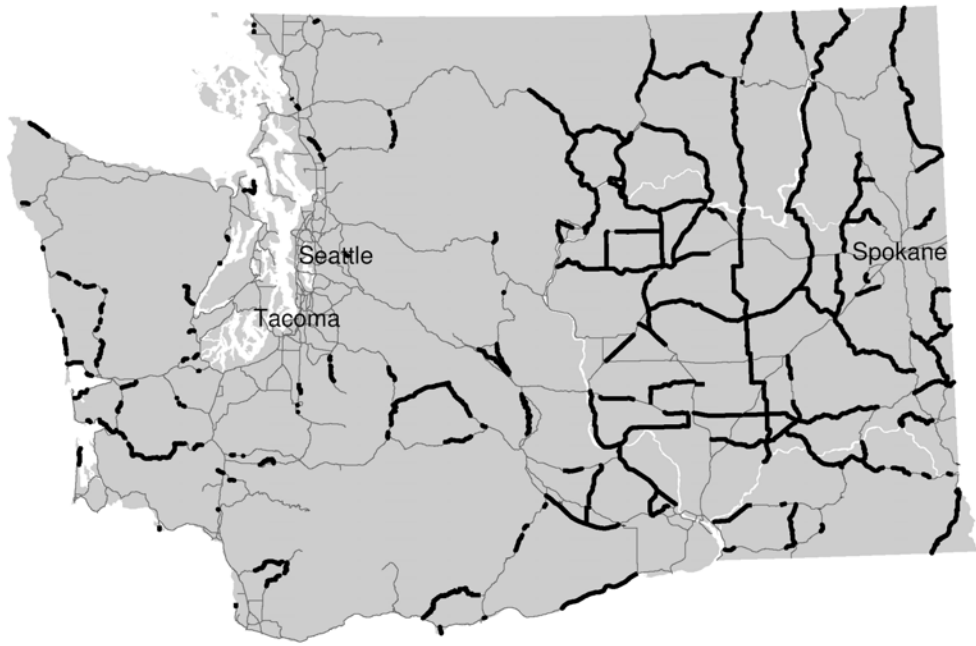
Portland Cement Concrete (PCC) Pavements

WSDOT has experienced PCC pavement lives ranging from 25 to 45 years and has an approximate cost of $330,000 for dowel bar retrofit per lane mile and $1 million for full replacement per lane mile.

			Annual Vehicle Miles Traveled – 2002 (in billions)	
	Lane Miles	% Lane Miles	Miles	%
Chip Seal Pavements	4,490	23.4%	1.7	5.3%
Hot Asphalt Mix	12,284	64.0%	22.5	71.5%
Portland Cement Concrete	2,410	12.6%	7.3	23.3%

Pavements: Chip Seal

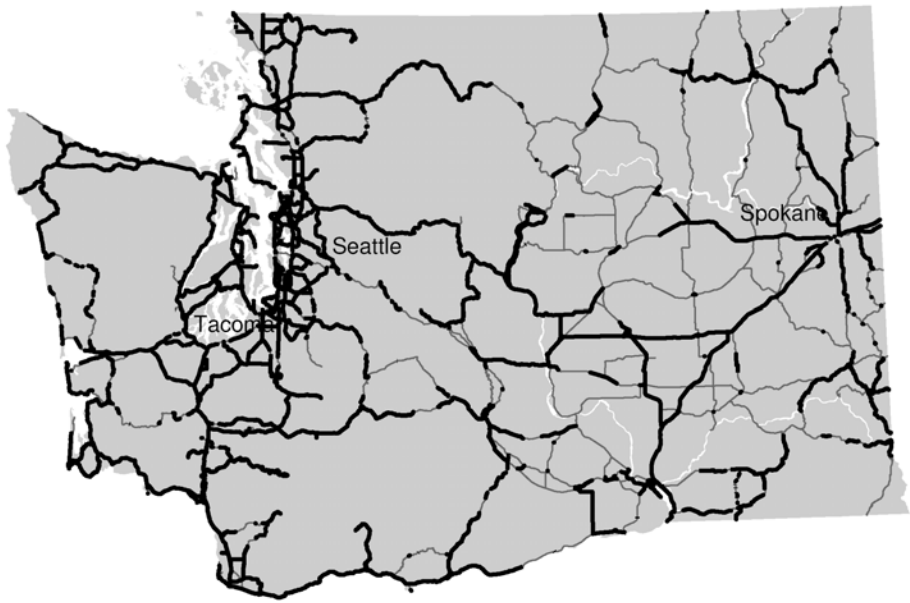
- 4,490 lane miles of chip seal pavements.
- Currently at Lowest Life Cycle – of $18.7 million.
- The average pavement life is six to eight years.



Location of 4,490 lane miles of Chip Seal Pavements: 5.3% of Vehicle Miles Traveled (VMT)

Pavements: Hot Mix Asphalt

- Average Hot Mix Asphalt (HMA) life is approximately 15 years (14% increase in last six years).
- 540 lane miles of past due/backlog will be eliminated in 2007-2009.
- Biennial cost to stay at Lowest Life Cycle is $205 million.



Location of 12,284 lane miles of Hot Mix Asphalt Pavements: 71.5% of Vehicle Miles Traveled

Pavements: Concrete

Concrete Pavement Funding

- 2003 Transportation Funding Program provided $144 million for I-5 in King County in 2009.
- Pre-existing revenue may provide up to $216 million over the ten-year period.

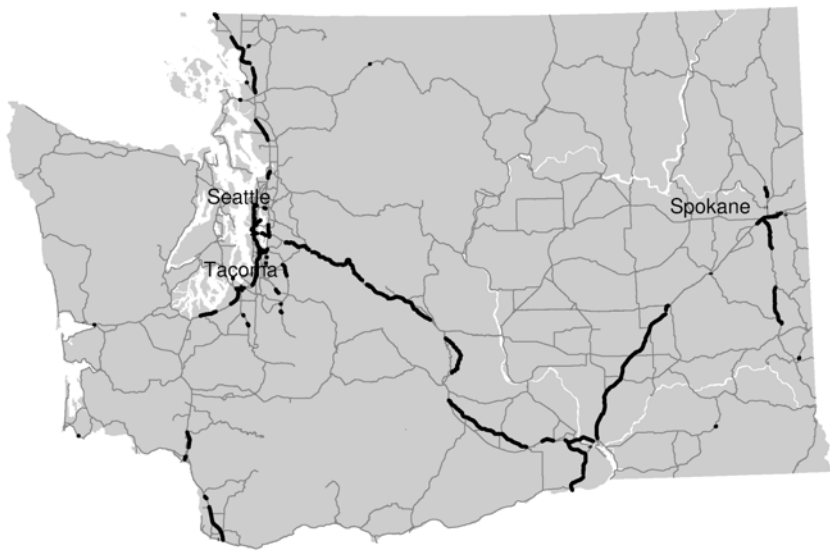
2004 Concrete Lane Miles*		
Current Age (Construction or Reconstruction)	Total Lane Miles	Lane Miles Rehabiliated to Date by Dowel Bar Retrofit
0-10	147.1	0.0
11-20	274.0	0.0
21-30	566.8	35.0
31-40	642.0	322.4
41-50	279.1	58.1
51-60	5.0	0.2
61 or more	66.1	0.0
Total	**1980.0**	**415.7**

** Does not include 321 lane miles of bridge sections and 112 lane miles of ramps.*

Concrete Pavement Needs

- 175 lane miles should be dowel bar retrofitted in the next decade.
- 600 lane miles should be replaced in the next ten years.

Just taken by itself, retrofitting concrete pavements with dowel bars costs $400K per lane mile, and replacing concrete pavement costs about $1 million per lane mile. However, it will cost more than just the cost to rehabilitate the pavement. Costs will also include amounts needed to meet modern design and environmental standards, such as stormwater runoff control and noise mitigation. Taking all of this into account, the total cost is unknown.



Location of 2,410 lane miles of Portland Cement Concrete Pavement: 23.3% of VMT

Other Facilities Preservation

- Major Electrical Rehabilitation
- Major Drainage Rehabilitation
- Unstable Slopes
- Safety Rest Areas
- Weigh Stations

Other Facilities: Major Electrical Rehabilitation

- WSDOT has addressed 36 old traffic signals and other electrical features over the last six years for a cost of $44.5 million.
- Recently completed projects include the I-90 Mt. Baker Tunnel Fire Suppression, Seattle
- Major Electrical Rehabilitation needs funding to create an inventory and condition assessment for this category.
- *Pro forma* budget assumes $61 million in next ten years.
- Expectation: may need additional funding once inventory and condition assessment are done.

Other Facilities: Major Drainage Rehabilitation

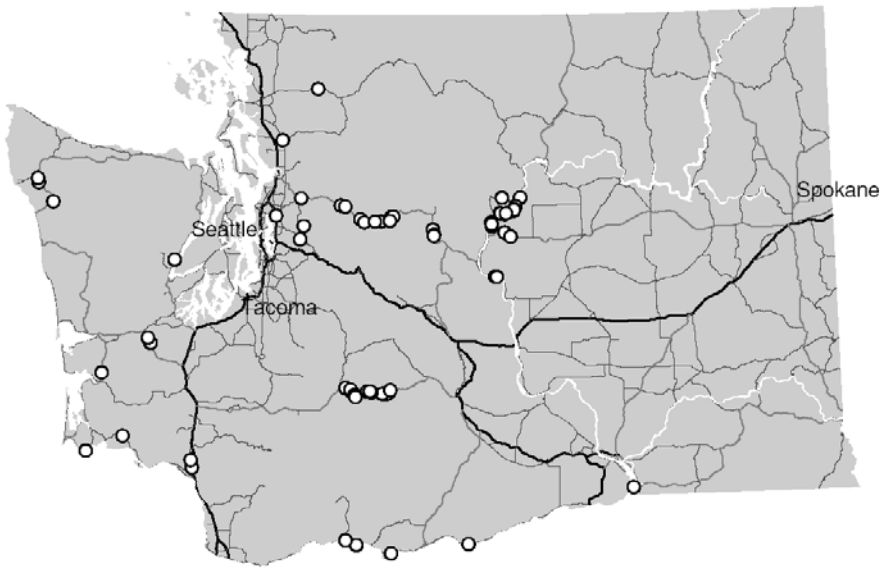
- WSDOT has addressed approximately 60 culverts and drainage features over the last six years for a cost of $18.4 million.
- Recently completed projects include:
  - SR 112 Jim Creek, Port Angeles
  - SR 167 Garrison and Springbrook Creek, Kent
- Major Drainage Rehabilitation needs funding to create an inventory and condition assessment for this category (does not include stormwater retrofit work).
- *Pro forma* budget assumes approximately $20 million in next ten years.
- Expectation: may need additional funding once inventory and condition assessment are done.

SR 105 MP 16.7 (Vicinity Norris Slough)

Other Facilities: Unstable Slopes

- WSDOT has rehabilitated approximately 83 slopes over the last six years for a cost of $101.5 million.
- Recent rehabilitated high-risk slope projects include:
  - SR 28 Rock Island Dam, Wenatchee
  - SR 202 Tokul Creek, Falls City
- Approximate estimate (in current cost) to complete the remaining high and medium priority slopes is $100 million.
- *Pro forma* budget assumes approximately $90 million in next ten years leaving a shortfall of $10 million.
- Top priorities include:
  - SR 12 White Pass
  - SR 2 Stevens Pass

SR 12 near White Pass

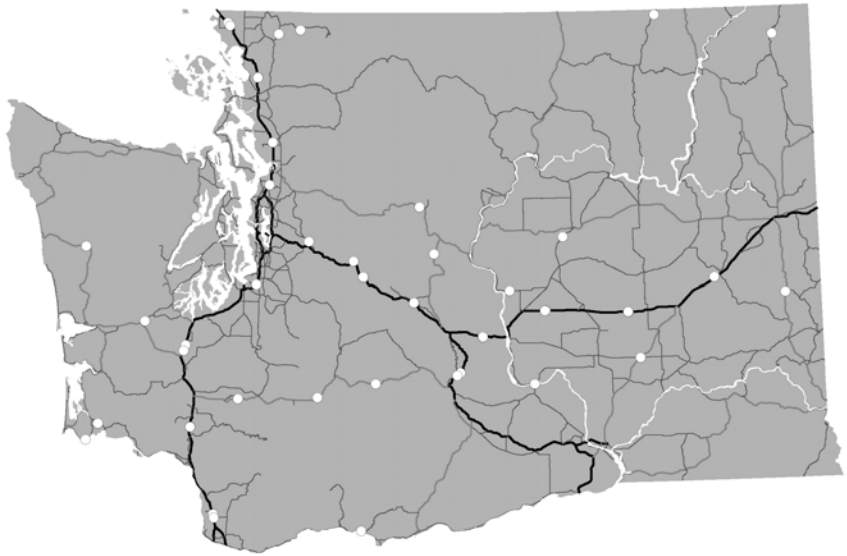


Location of Known Unstable Slopes

Other Facilities: Safety Rest Area Preservation

WSDOT has rehabilitated or replaced 27 water, sewer and systems over the last six years for a cost of $6.3 million.

- I-90 Indian John Hill, Cle Elum is a recently completed project.
- Approximate estimate (in current cost) to address aging:
  - Water and sewer systems are $10 million.
  - Building is $15 million.
- *Pro forma* budget assumes approximately $19 million in the next ten years - leaving a shortfall of $6 million.



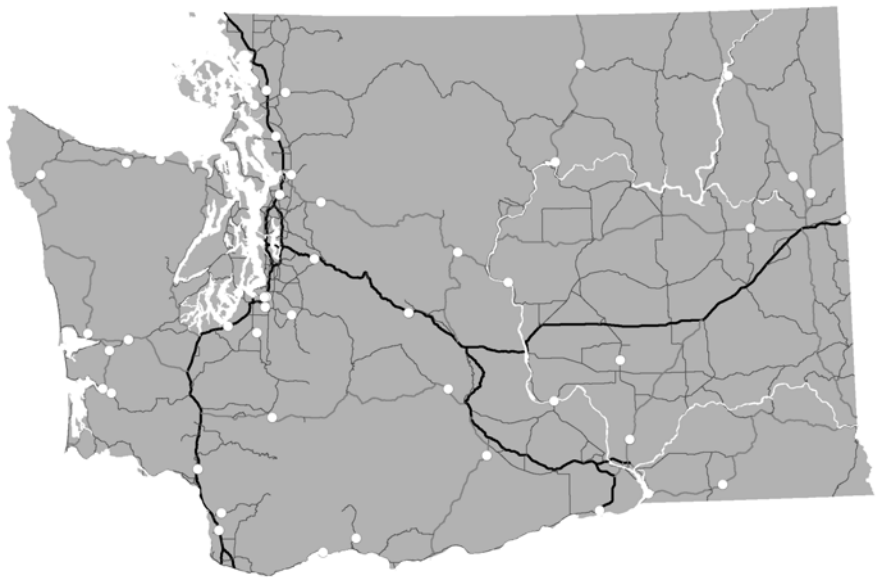
Location of Safety Rest Areas

- Top priorities include:
  - I-5 Maytown Sewer, Maytown
  - I-90 Ryegrass Water, Vantage

	Interstate Safety Rest Areas	Non-Interstate Safety Rest Areas	Total
Number of Buildings	59	26	85
Site Acreage	488.02	77.48	565.50
On-site Public Drinking Water Systems	15	15	30
On-site Sewage Treatment & Pretreatment System	22	15	37
2004 Projected Annual Use (Visitors)	36,241,879	6,025,873	42,267,752

Other Facilities: Weigh Stations

- WSDOT has built or rehabilitated 29 weigh station projects over the last six years, for a cost of $18 million.
- Recently completed projects include:
  - SR 28 Rock Island
  - I-82 Prosser
- *Pro forma* budget will provide approximately $15 million in the next ten years and should complete modernization of sites by 2013.
- Top priorities include:
  - I-82 Prosser
  - I-90 Cle Elum Eastbound
  - I-90 Spokane Port of Entry



Location of Weigh Stations

And So - What Have We Not Included?

- SR 99 Alaskan Way
- SR 520 Evergreen Point Floating Bridge
- I-5 Concrete Replacement through downtown Seattle

Alaskan Way

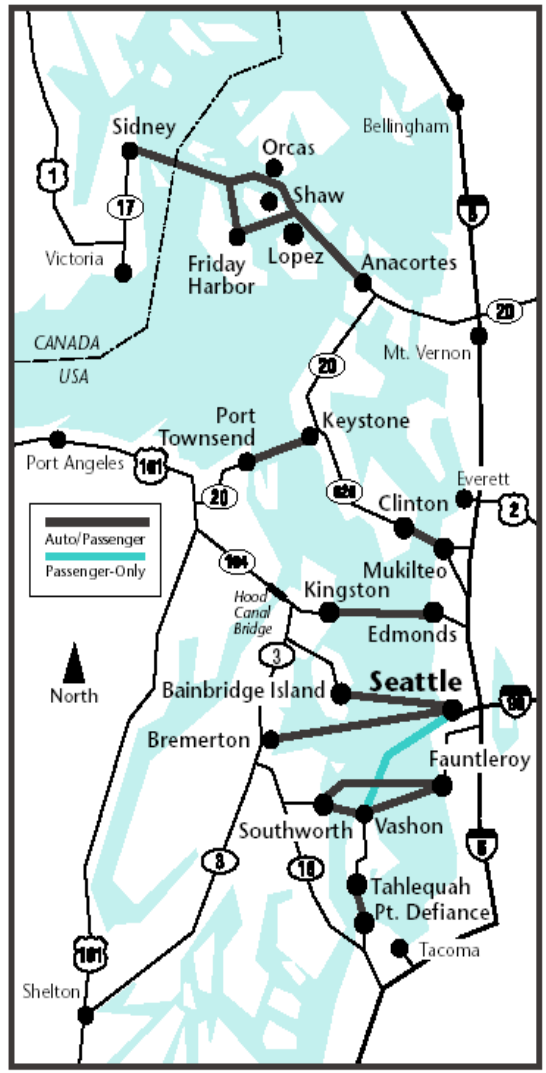
Evergreen Point Floating Bridge

Ferries

- **Terminals**
- **Vessels**

Washington State Ferries (WSF)

- WSF serves eight counties within Washington and the province of British Columbia in Canada.
- WSF operates 10 ferry routes with nearly 500 sailings per day.
- WSF Ferry system routes are equivalent to 200 miles of highway.
- WSF has the largest ferry system in the United States.
- WSF has the second largest transit system in Washington.
- Ferry ridership has grown from 16.7 million trips in 1980 to 26.7 million trips in 2003.
- Annual number of trips is expected to grow to 36.5 million by 2020.
- The growing dependence on the ferry system underlines the importance of continued investment in preservation of the system.



Joint Task Force on Ferries Preservation Standards

Terminals and Vessels

Preservation Performance Objectives

The 2001 Legislature's Joint Task Force on Ferries and the OFM performance auditor recommended that WSF achieve the following preservation performance standards by FY 2011:

- 90%-100% of category 1 (vital) terminal and vessel systems and structures (weighted by their costs) are operating within their optimum life cycles* and
- 60%-80%of category 2 (other) systems and structures (weighted by their costs) are operating within their optimum life cycles.

*Life cycle optimization means making a preservation investment at the point it is needed - not too soon or too late - when additional system deterioration will occur.

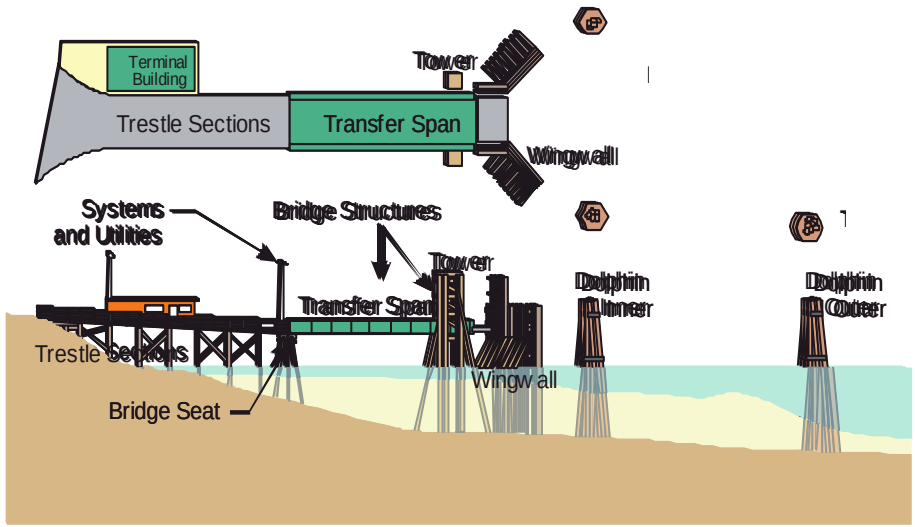
Preservation Performance Standards

Level A	Level B	Level C	Level D
Life Cycle Rating Levels for Category 1 Systems and Structures			
90-100%	90-100%	90-100%	0-89%
Life Cycle Rating Levels for Category 2 Systems and Structures			
90-100%	70-89%	50-69%	0-49%

Level	Definitions of Levels of Preservation Performance
Definitions	Category 1 systems and structures are those designated by regulatory agencies as "vital" to the protection of people, the environment, and the capital assets. All other infrastructure is designated category 2.
A	The Ferry System's infrastructure is designated level A when the life cycle ratings for both category 1 and 2 systems and structures is 90% or greater.
B	The Ferry System's infrastructure is designated level B when the life cycle rating for category 1 systems and structures is 90% or greater and the life cycle rating for category 2 systems and structures is at least 70% but less than 90%.
C	The Ferry System's infrastructure is designated level C when the life cycle rating for category 1 systems and structures is 90% or greater and the life cycle rating for category 2 systems and structures is at least 50% but less than 70%.
D	The Ferry System's infrastructure is designated level D when the life cycle rating for category 1 systems and structures is less than 90% or the life cycle rating for category 2 systems and structures is less than 50%.

State Ferry Terminals

- There are 20 ferry terminals.
- Most of the terminals were constructed in the 1950s.
- Over the next ten years, WSF proposes to preserve 337 terminal systems at an estimated cost of $486 million.
- The resulting performance rating meets the Joint Task Force on Ferries targets. 93% of vital systems and 83% of other systems will be operating within their life cycle rating.



Ferry System 2005 - 2015 Ten Year Plan to Preserve Terminal Systems and Structures

	05 - 07	07 - 09	09 -11	11 - 13	13 - 15	Total
Bridge Structures	7	18	10	7	1	43
Dolphins	8	23	16	7	7	61
Passenger Only Overhead Loading	0	0	8	18	0	26
Paved Areas	1	4	3	3	9	20
System and Utilities	18	29	16	20	37	120
Terminal Building	1	10	4	6	4	25
Trestle Sections	5	6	1	13	10	35
Wingwalls	1	4	2	0	0	7
	41	**94**	**60**	**74**	**68**	**337**

This chart shows the number of systems that will be preserved every biennium.

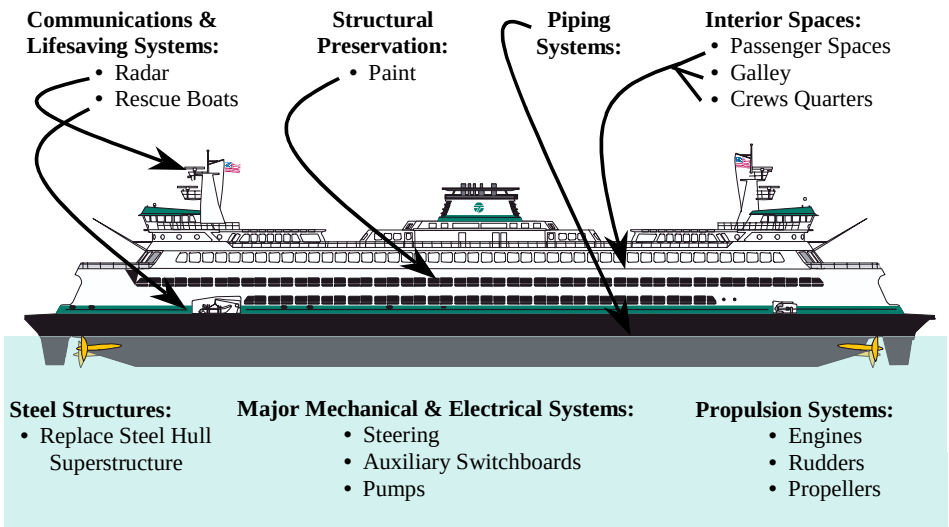
State Ferry Vessels

- 28 Ferry Vessels:
  24 carry vehicles and passengers.
  4 are passenger-only vessels.
- Oldest vessels in service were built in 1927 (steel electric class).
- Vessel capacity ranges from a high of 2,500 passengers and 218 vehicles for the Jumbo Mark II vessels to a low of 200 passengers and 40 vehicles for the *Hiyu*.
- The current ten-year preservation effort includes the retirement of seven auto/passenger ferries (four 75 year-old Steel Electric Class ferries and three other ferries) and the construction of four 130-car replacement ferries.

Class	Name	Year Constructed	Age
Jumbo Mark II	*Tacoma*	1997	7
	Wenatchee	1998	6
	Puyallup	1998	6
Jumbo	*Spokane*	1972	32
	Walla Walla	1972	32
Super	*Hyak*	1967	37
	Kaleetan	1967	37
	Yakima	1967	37
	Elwah	1967	37
Issaquah 130	*Issaquah*	1979	25
	Kitsap	1980	24
	Kittitas	1980	24
	Cathlamet	1981	23
	Chelan	1981	23
Issaquah	*Sealth*	1982	22
Evergreen State	*Evergreen State*	1954	50
	Klahowya	1958	46
	Tillikum	1959	45
Steel Electric	*Quinault*	1927	77
	Illahee	1927	77
	Nisqually	1927	77
	Klickitat	1927	77
Miscellaneous	*Rhododendron*	1947	57
	Hiyu	1967	37
Passenger-Only	*Skagit*	1989	15
	Kalama	1989	15
Chinook	*Chinook*	1998	6
	Snohomish	1999	6

State Ferry Vessels

- There are 28 vessels.
- The average age is 32 years.
- Over the next ten years, WSF proposes to preserve 699 vessel systems at an estimated cost of $562.1 million, which includes building four new boats to replace the 1927 steel electrics.
- WSF will meet the *Joint Task Force on Ferries'* goal by fiscal year 2006 and will maintain a 90% vital system rating through the ten year window. 62% of other systems will be operating within their life cycle rating during this same period.



Ferry System 2005 - 2015 Ten Year Plan to Preserve Vessel Systems and Structures

	05 - 07	07 - 09	09 -11	11 - 13	13 - 15	Total
Communications & Lifesaving Systems	29	54	48	28	66	225
Interior Spaces	2	9	6	7	4	28
Major Mechanical & Electrical Systems	8	38	18	5	13	82
Piping Systems	26	50	25	5	7	113
Propulsion Systems	4	35	12	4	13	68
Steel Structures	5	29	11	4	18	67
Structural Preservation	29	49	17	9	12	116
	103	**264**	**137**	**62**	**133**	**699**

Aviation

- **Pavement**
- **Other (Navigation Equipment, Lighting, Hangars, etc.)**

Washington Aviation System

129 Public Use Airports

- 13 Primary/commercial airports
- 6 Reliever airports (one of these is private)
- 94 General aviation airports
  - 86 public owned
  - 8 private owned
- 16 Emergency State owned or leased airports

			Funding Eligibility		
Airport Type	**Number**	**Federal Status (NPIAS**)**	**AIP Funds**	**FAA Discre-tionary**	**State Aviation Aid**
Primary/Commercial	13	13	Yes	Yes	Yes*
Reliever	6	6	No	Yes	Yes*
General Aviation-public	86	44	No	44 NPIAS	**Yes**
General Aviation-private	8	3	No	No	No
State-owned/leased	16	1	No	1 NPIAS	**Yes**
Total	**129**	**67**			

*General Aviation-public airports take highest priority.

**National Plan of Integrated Airport Systems

Primary/Commercial Service Airports	**Enplanements 2001**
Qualify for $1 million per year at a minimum in federal Airport Improvement	
Seattle-Tacoma Int'l	13,184,630
Spokane Int'l	1,423,624
Tri-Cities	204,573
Bellingham Int'l	93,643
Yakima Air Terminal	73,443
Pangborn Memorial	47,800
Walla Walla	28,542
Pullman/Moscow	28,291
William R. Fairchild Int'l	23,547
Friday Harbor	12,129
Grant County Int'l	11,534
Anacortes	7,742
Orcas Island	5,595
Reliever Airports	
discretionary funds, but do not qualify for AIP funds	
Auburn Municipal	0
Boeing/King County	0
Felts Field	0
Harvey Field	0
Renton Municipal	0
Snohomish County	0
Total	**15,145,093**

Source: WSDOT Aviation Division

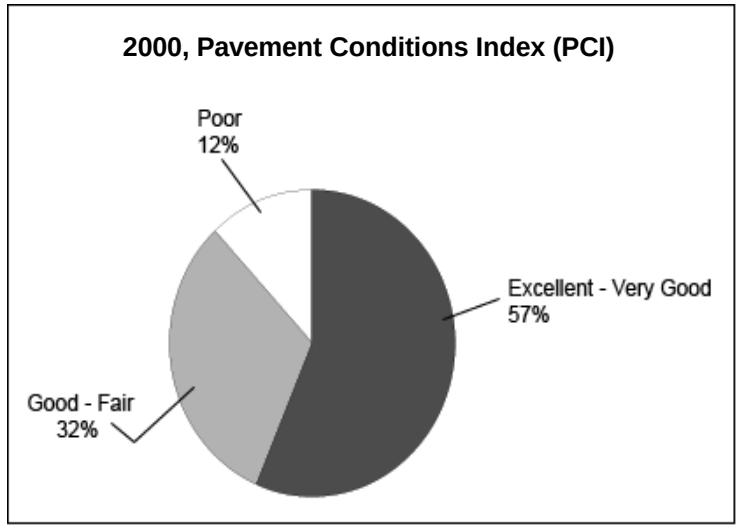
Airport Pavement Condition Statewide

Pavement surfaces

- Chip seal overlay
- Asphalt hot mix
- Concrete

Pavement Conditions Index (PCI)

- 3-year cycle
- 2000 PCI Study involved 89 airports
  - 73.06 average PCI* 10 airports had failing pavement conditions
- 2002 PCI evaluation forecast revealed a decline in the overall PCI average across the state
  - 66 average PCI
- 2004-2005 Pavement Condition Index Study underway.



Source: WSDOT Aviation Division

Current Aviation System Plan level of investment on existing identified needs leaves a shortfall of $3 million. The WSDOT- Aviation Division is in the process of identifying future needs through the System Plan update.

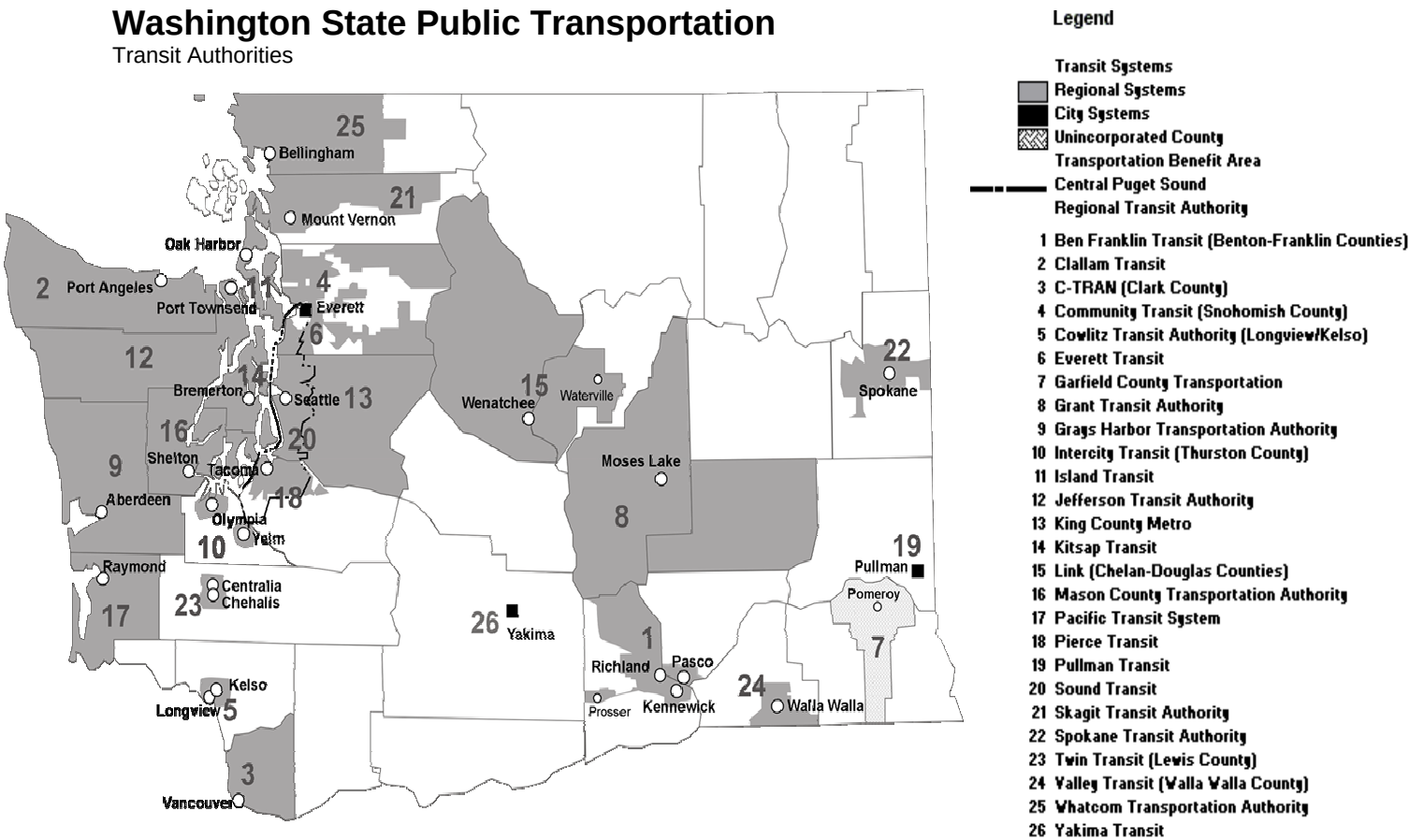
*PCI scale is from 0 to 100; 0=worst; 100=brand new condition

Public Transit

- **Vehicle Replacement**
- **Facilities**

Washington State Public Transit System

- There are 26 transit agencies.
- Transit authorities serve areas for nearly 87% of state population.
- 5,600 vehicles, over 300 park and ride lots, 75 transit centers and 102 maintenance facilities serve over 155 million passengers annually.



Asset Preservation vs. Preserving Level of Service

Preserving transit requires equal investments in capital and operating expenditures. Statewide capital obligations account for 43% of total expenditures and operation costs for current level of service exceed 45%. In other words, transit systems need buses and drivers to operate.

Washington's Transit Assets

Transit assets include vehicles (buses, paratransit vehicles, vanpools, trolleys, commuter rail cars, and other vehicles), maintenance bases, transit stations, transit stops, and park and ride lots.

King County Metro manages 9,596 bus stops, 19,168 park and ride stalls, 854 passenger shelters, 11 transit centers, and 7 transit bases.

Washington State Public Transit Authority Vehicle Inventory
2002

System	Buses		Vans		Para-transit	
	No.	Age Range	No.	Age Range	No.	Age Range
Ben Franklin Transit	64	0 - 31 yrs	168	0 - 13 yrs	84	0 - 14 yrs
Clallam Transit System[1]	32	3 - 38 yrs	11	2 - 12 yrs	7	13 yrs
Community Transit	276	3 - 25 yrs	334	0 - 9 yrs	49	2 - 6 yrs
C-TRAN	110	1 - 27 yrs	0	-	50	4 - 10 yrs
CUBS*	7	0 - 5 yrs	0	-	8	0 - 7 yrs
Everett Transit	40	1 - 16 yrs	0	-	14	5 - 10 yrs
Garfield County Public Transportation	2	2 & 4 yrs	0	-	1	16 yrs
Grant Transit Authority	36	2 - 18 yrs	0	-	5	10 - 18 yrs
Grays Harbor Transit[2]	29	0 - 25 yrs	0	-	22	1 - 21 yrs
Intercity Transit	39	2 - 17 yrs	75	1 - 11 yrs	24	1 - 8 yrs
Island Transit	13	5 - 16 yrs	69	1 - 7 yrs	24	6 - 12 yrs
Jefferson Transit Authority	12	6 - 21 yrs	9	5 - 19 yrs	8	5 - 11 yrs
King County Metro Transit[3]	1,324	1 - 24 yrs	818	2 - 11 yrs	293	3 - 10 yrs
Kitsap Transit	86	20 - 24 yrs	122	4 - 12 yrs	47	4 - 12 yrs
Link Transit	26	1 - 19 yrs	0	-	31	1 - 9 yrs
Mason County Transportation Authority	13	4 - 35 yrs	0	-	14	2 - 11 yrs
Pacific Transit	10	5 - 12 yrs	0	-	6	2 - 14 yrs
Pierce Transit	167	1 - 30 yrs	250	1 - 11 yrs	108	2 - 8 yrs
Pullman Transit	16	6 - 18 yrs	0	-	4	1 - 8 yrs
Skagit Transit	22	3 - 12 yrs	6	2 - 5 yrs	16	3 - 9 yrs
Sound Transit[4]	174	2 - 4 yrs	0	-	0	-
Spokane Transit Authority[5]	127	1 - 20 yrs	51	1 - 19 yrs	70	2 - 13 yrs
Twin Transit	12	2 - 15 yrs	0	-	2	7 & 11 yrs
Valley Transit[6]	13	2 - 13 yrs	0	-	8	2 - 9 yrs
Whatcom Transportation Authority[7]	38	6 - 9 yrs	20	3 - 7 yrs	38	3 - 11 yrs
Yakima Transit	21	0 - 17 yrs	7	1 - 4 yrs	15	2 - 12 yrs
Total	2,709		1,940		948	

Source: Summary of Public Transportation - 2002

*CUBS - (Community Urban Bus Service) operating name for Cowlitz Transit Authority

The following list of vehicles are not included in the count above:

[1]Clallam Transit System operates a 16-year old rubber tire trolley replica on its system.

[2]Grays Harbor Transit operates a 18-year old rubber tire trolley replica on its system.

[3]King County Metro Transit operates 5 streetcars, ranging in age from 73 to 78 years.

Sound Transit operates 58 rail cars and 11 engines as a part of its Sounder Commuter Rail program.

[5] Sound Transit also operates 3 electric powered light rail cars.

[6]Spokane Transit Authority operates 6 rubber tire trolley replicas on its system, ranging in age from 3 to 9 years.

[7]Valley Transit operates 3 rubber tire trolley replicas on its system, ranging in age from 8 to 13 years old.

Whatcom Transportation Authority operates 4 rubber tire trolley replicas on its system, all 6 years old.

Transit Asset Management Plan

RCW 35.84.060 requires transit agencies, as a condition of receiving state funding, to submit an asset management plan for certification by the Transportation Commission.

- Legislation passed in 2003 as recommendation of Blue Ribbon Commission
- Guides maintenance and preservation of transit assets

The plan must include:

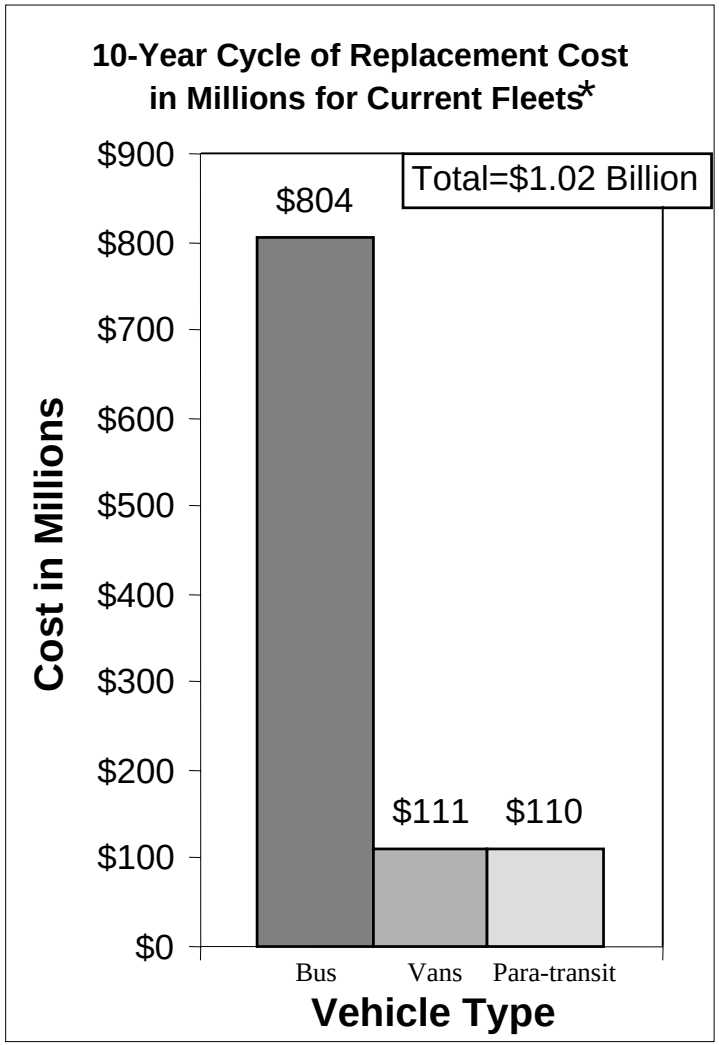
- An inventory of all transportation system assets
- A preservation plan based on lowest life cycle cost methodologies*.

State law now requires an Asset Management Plan when receiving state transit grant funding.

Asset Management Plans are due from grant recipients by December 2004.

**** Lowest Life Cycle Cost (LLCC) methodology is demonstrated by a cost model that reflects each agency's policies & standards in a planned preventative/preservation maintenance program resulting in the lowest maintenance costs over the life of an asset. This methodology ensures that an asset is maintained at an acceptable condition maximizing safety and useful life.***

Fleet Replacement Cycles



Source: WSDOT Summary of Public Transportation – 2002 and King County Metro average estimates for vehicle cost.

FTA Vehicle Replacement Schedule

Buses	12 years
Paratransit	5 years
Vans	4 years

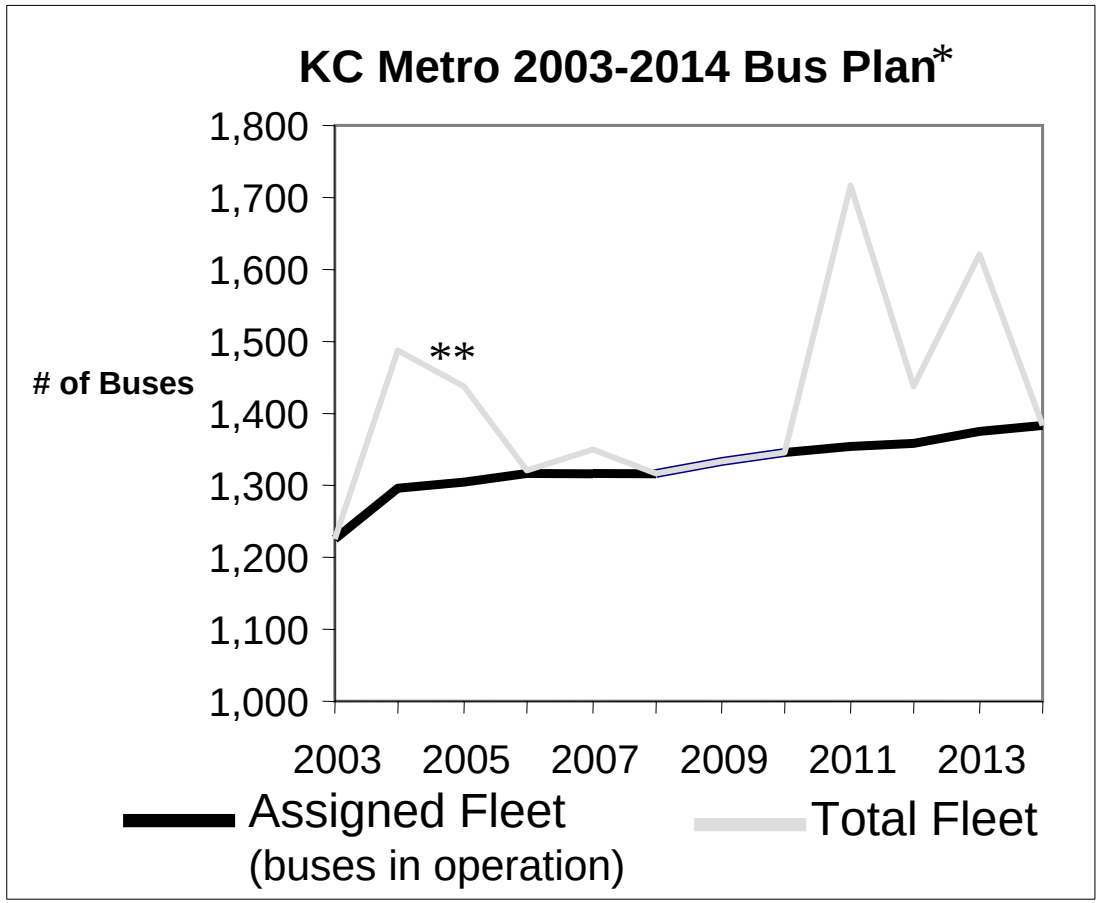
Note: The FTA estimates are generous because most transit agencies keep them in operation longer because it saves them money.

*Programmatic estimate to give an order of magnitude of vehicle replacement needs. Better information will be available as asset inventories and plans are received.

King County Metro's 10-Year Bus Plan

Transit agencies use a long range bus purchase and replacement plan to maintain the needed number of operating buses to ensure the smooth continuation of service. This illustration shows King County Metro's 10-year bus plan.

Because it is cheaper to buy buses in bulk, bus purchases tend to happen sporadically and new buses are integrated into the operating fleet over time.



Source: King County Metro

* This points out the importance of an asset management plan: Bus purchases need to precede bus retirements to keep the fleet operating.

** The peaking of bus purchasing points out the need for consistent and predictable funding for bus replacements.

WTP Transit Agency Work Group

A working group of transit agencies has been formed to help define transit issues and challenges related to the nine WTP issue areas.

The group includes representatives from King County Metro, Link Transit (Chelan/Douglas Co.), Community Transit (Snohomish Co.), Sound Transit (King, Pierce, Snohomish Cos.), C-Tran (Vancouver), Skagit Transit, Intercity Transit (Thurston Co.), and the Washington Transit Association.

The group is identifying system problems, where the problems exist, approaches (or menu of approaches) to resolving the issues, discussing what is needed to implement an approach, and prioritizing the problems as high, medium or low.

What we have heard about transit preservation issues:

- Funding stability and predictability are important.
- Preservation of the system requires system growth to match population growth and to offset longer travel times due to roadway congestion. Costs will increase to provide the same level of service.
- Park and ride lots are aging.
- There is a potential loss of general service due to rising demand response service costs and needs.
- Roadway work that effectively factors public transportation and pedestrian services in design.

Rail

- **Track**

Washington State Rail System

- Fifteen railroad companies move freight on 3,123 route miles of track in Washington. Private companies own 91% of the state's freight rail network.

- The two largest railroads comprise about 75% of the state's route miles. The Burlington Northern and Santa Fe Railway (BNSF) and Union Pacific Railroad (UP) are the state's federal Class I mainline railroads. These lines connect Washington to the rest of the nation both south to California and east to Chicago, as well as north into Canada. UP operates only main lines. BNSF operates both mainline and feeder line service.

- Washington state was once served by 5,000 miles of freight track but economic factors over the past thirty years have contributed to the abandonment of 1,885 miles of track since 1970.

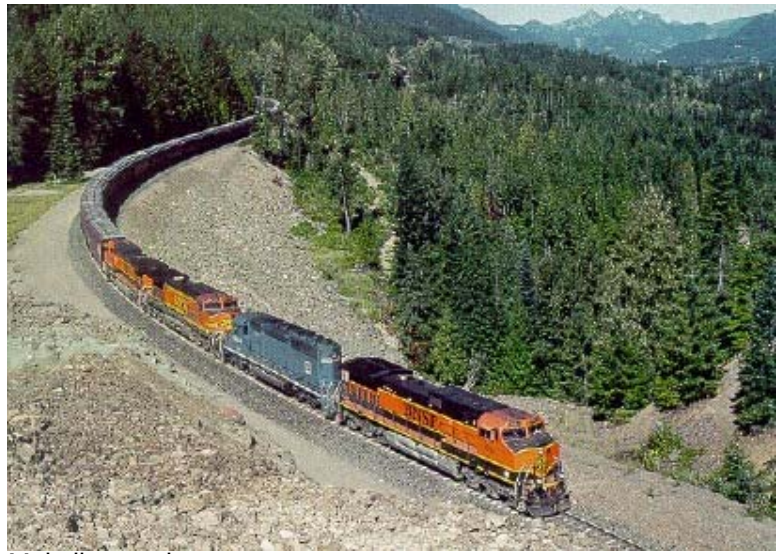
Active Rail Lines in Washington

Abandoned Rail Lines in Washington

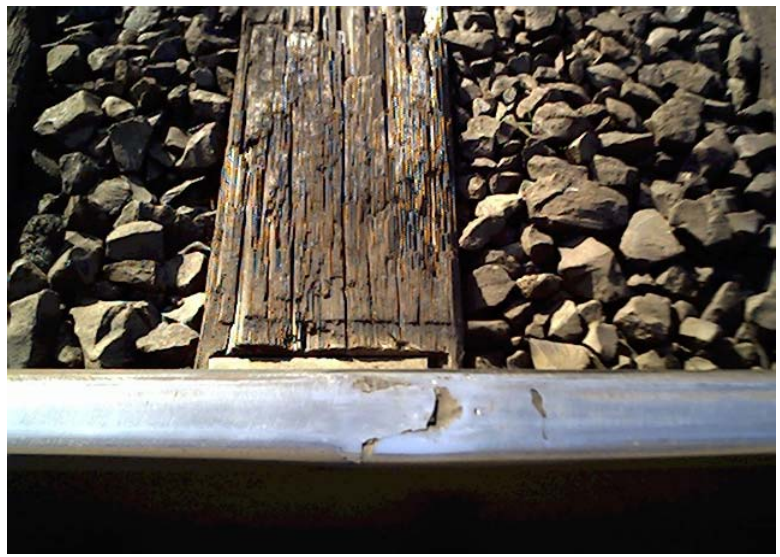
Rail Track Condition

What are the conditions of the railroad track?

- There is little public knowledge of railroad track conditions in Washington State due to the proprietary constraints of the privately held railroads.
- WSDOT assumes tracks serving high volume Class I routes are adequately preserved by the Class I railroads.
- Little is known of the historic and maintenance and preservation work performed on short line* tracks.



Main line track



Short line broken rail

* Short Line Railroads - 13 Short line railroad companies operate more than 1,030 miles of rail line in Washington, or about 1/3 of the state's rail trackage. The Federal Railroad Administration defines short lines or light density lines as less than 5 million gross ton-miles per mile. By nature of their definition, short line railroads operate with narrow profit margins and typically do not generate enough revenue to perform appropriate track maintenance for long-term preservation.

Preservation Estimates for WSDOT Rail Program

Intercity Passenger Rail – Amtrak *Cascades*

To preserve current level of Amtrak *Cascades* service between Portland, Seattle, Bellingham, and Vancouver, BC:

$14 million per year*

**Includes Talgo equipment maintenance, operating subsidies, and approximately $600,000 per year for preservation of BNSF's main line tracks.*

Source: WSDOT Passenger Rail Plan

Freight Rail Short Line

Total capital preservation needs for Washington's short line railroads over the next 20 years:

$113.5 Million,
$62 Million in the first 10 years

(Includes rail ties, ballast and bridge repair work.)

Source: Survey of Short Line Providers
WSDOT Rail Office, June 2004

Three Points to Take Away…

- **Preservation needs are larger than you thought and very compelling (plus, cities and counties are yet to come).**
- **While the 2003 funding package is a step in the right direction, all funding sources are falling short of meeting preservation needs.**
- **This is the base case for your New Law Budget.**