Highway Construction Costs

Are WSDOT's highway construction costs in line with national experience?

November 3, 2005

Washington State Department of Transportation

Are WSDOT's highway construction costs in line with national experience?

WSDOT has assembled information from around the state and around the country to answer the frequently-heard comment that highway construction costs in this state are typically higher than in other states. This is not true. Washington State's costs for typical roadway projects are very much in line with comparable projects from other states. However, when it comes to very large, complicated projects, the significant variations in scope and setting for each project limit the usefulness of state-to-state comparisons. The important problem of cost control on these projects must be addressed on a case-by-case basis.

For this study we reviewed 15 projects from 12 different states. We also looked at 21 projects from Washington State. This report takes a graphical approach in an attempt to show what a given project may look like for a given cost per lane mile.

The biggest factors in variations in costs per lane mile are:

- Structures and interchanges: Projects that have structures and interchanges have a much higher cost per lane mile.
- Right of way: If a project can be built within existing right of way, then its cost per lane mile is much less than a project that needs additional right of way.
- Environmental impacts: Mitigation costs for environmental impacts have a dramatic affect on cost per lane mile.
- Existing soil and site conditions: Differing soil and site conditions also have an impact on the cost per lane mile.

What states include in their project costs also varies. Some states only report construction costs. Other costs that need to be included are right of way and design and construction engineering. Delivery methods may also affect project costs. For example, design-build may generate a higher initial cost, but it accelerates delivery of the project

The information in this report is organized by reference to the following questions:

- What are the actual costs for typical completed roadway projects around the nation?
- What are the costs of typical completed roadway projects in Washington State?
- How do costs for large complicated projects in Washington compare to other states?
- What other information provides insight into the cost of projects?

What is a lane mile?

The case studies in this report have brought up the question of what should be credited as a lane mile. Most of these improvement projects revise the horizontal and vertical alignment of the existing roadway. Therefore, they are rebuilding the existing lanes, as well as adding new ones. For the purpose of this study, we will credit lane miles to a project if they are adding additional lanes, or are replacing the entire roadway structure of the existing lanes.

What is included in the cost per lane mile?

This report uses the total project cost, including administration, engineering, right of way, environmental mitigation, construction costs, and applicable sales tax when calculating the cost per lane mile.

Where did this information come from?

The information for projects from other states came from their states' Department of Transportation web sites. Follow-up calls to some of the states were required for verification or to collect additional information.

Are there similar reports available?

The Washington State Department of Transportation published a report dated January 2003. An exhaustive search has not found reports from any other states. FHWA does not have a current report or benchmark on cost per lane mile. FHWA is currently working on a similar report, but it will not be available until late 2004. Some states have planning level estimates posted on their web sites.

For example, the Arkansas Department of Transportation has the following costs posted on their website:
http://www.arkansashighways.com/about/facts2000.html

Typical Construction Costs Per Mile

- Widening 2-4 Lanes Urban.....$2.6 M
- New Rural 2-Lane Mountain Terrain.....$2.3 M
- Rural Interstate Reconstruction.....$3.6 M
- New Interstate Construction.....$6.5-$8.5 M
- New Interstate Total Costs.....$7.2-$9.4 M

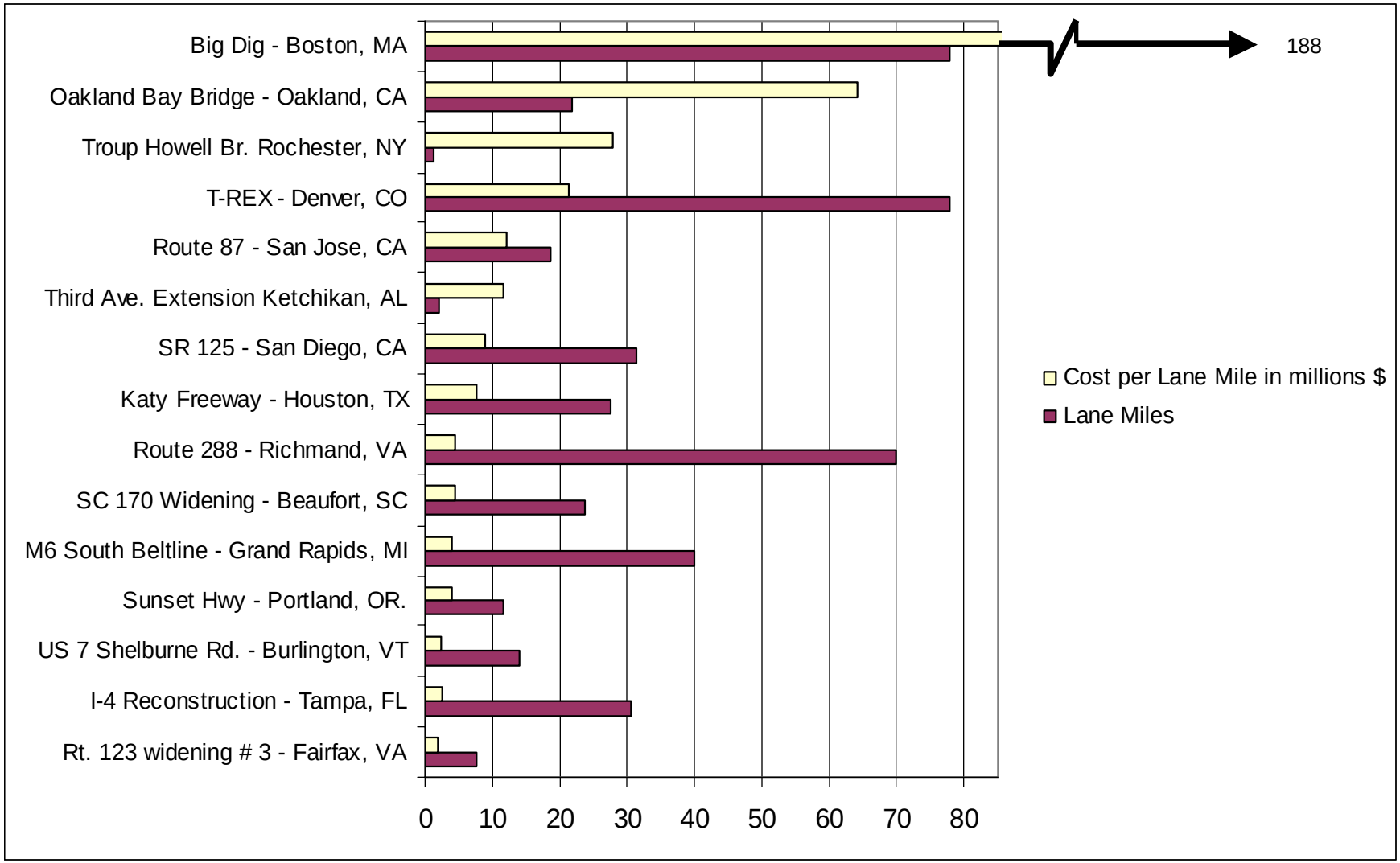
The problem with planning level estimates is that they only include construction costs. They fail to take development costs into account or project-specific issues such as right of way, environmental mitigation, or soil and site conditions.

The Florida Department of Transportation website includes the following disclaimer:

Costs of intersections/interchanges/structures over 20 feet, preliminary engineering, right-of-way, and construction engineering inspection are ***not*** *included. The cost-per-centerline mile figures are based on general, statewide averages. They are not to be used for Work Program estimating because they are not job specific.*

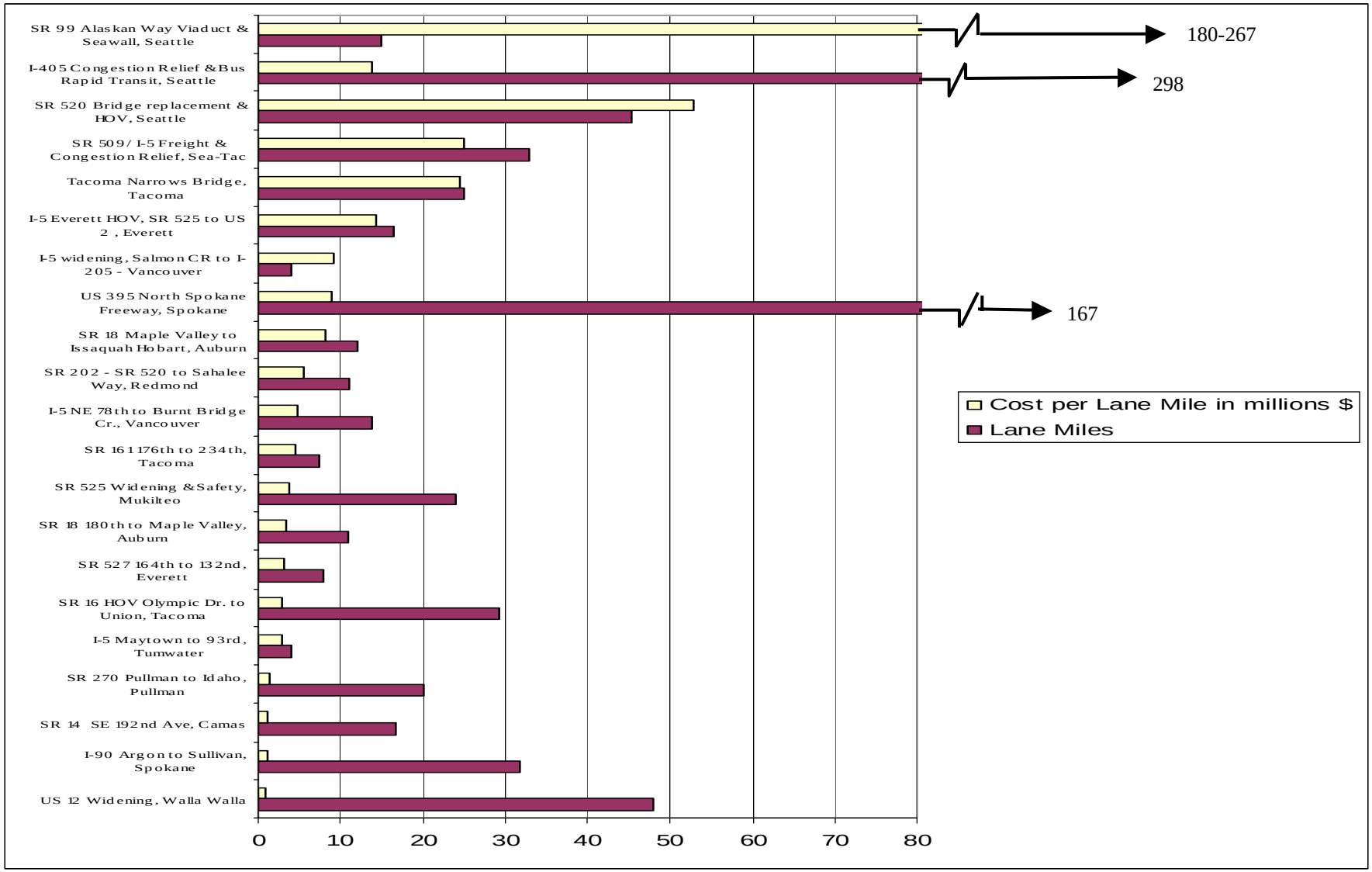
What are the actual costs for projects around the nation?

Of the 15 projects studied from around the country the cost per lane mile varied from $1.9 million per lane mile for simple widening project in Virginia without interchanges and large structures to $188 million per lane mile for the Big Dig in Boston that was constructed in a high density urban area with a considerable amount of tunnels and bridges These projects are currently under construction or have been recently been completed.



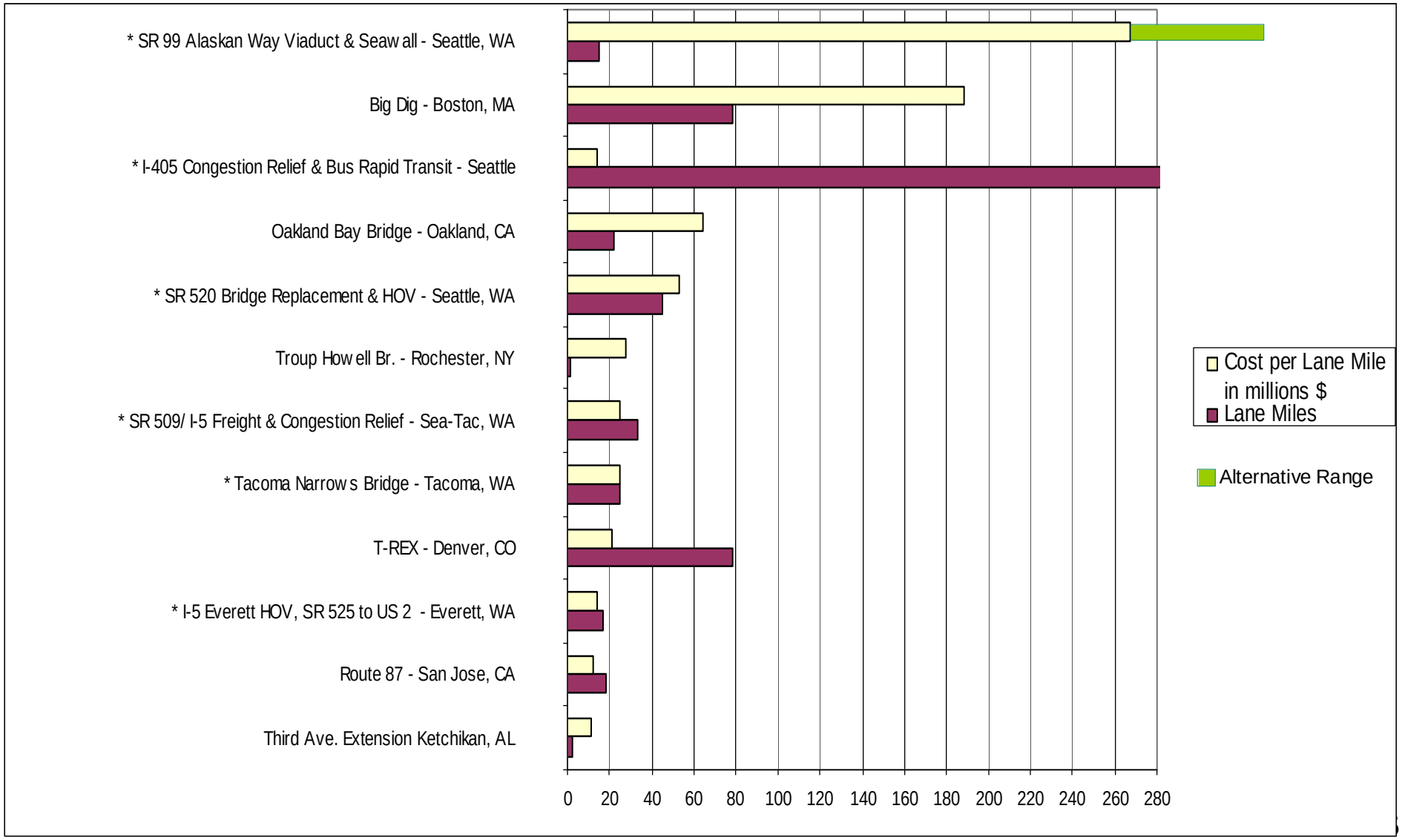
What are the costs for typical projects in Washington State?

Of the 21 projects studied in Washington State, the cost per lane mile varied from $1 million per lane mile for a rural widening project near Walla Walla to in excess of $180 million per lane mile for the Alaskan Way Viaduct and sea wall replacement in a high density urban area of Seattle. Some of the projects studied are still in the development stages and therefore show a range for total project cost estimates.



How do costs for large projects in Washington State compare to other states?

Of the 36 projects studied, 13 of them had costs in excess of $10 million per lane mile. The common denominator for these projects was that they included interchanges, major structures, expensive right of way, and/or complex soil and site conditions. Seven of these large projects studied are in Washington State. The costs per lane mile for the Washington projects are comparable to similar projects around the nation.



What other information provides insight into the cost of projects?

As a part of this study, we also looked at interchange and bridge costs. As one can see from this report, interchanges and structures are major contributors to highway construction costs.

$24.6M/Mile
(Bridge only $67.2M/Mile)
Tacoma Narrows Bridge -
Tacoma, WA

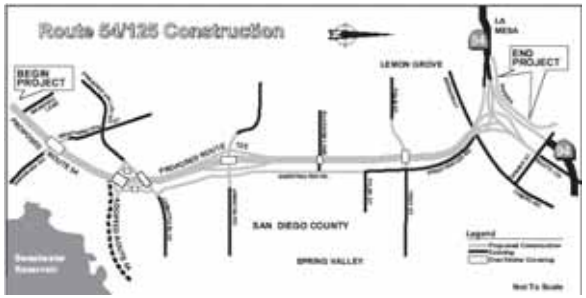
$64.2-$82.6M/Mile
Oakland Bay Bridge -
Oakland, CA

$45.6-$52.9M/Mile
SR 520 Bridge Replacement &
HOV - Seattle, WA

An example is the Tacoma Narrows Bridge project in Washington. The total project cost is $24.6 million per lane mile. However, if you look at just the bridge costs, it equates to $67.2 million per lane mile. The bridge cost is comparable to the contractor's bid for a suspension bridge in Oakland, California.

Another example is the SR 520 Bridge replacement and HOV in Seattle, which has a proposed cost per lane mile of $49.7-$55.1 million due to a long span floating bridge.

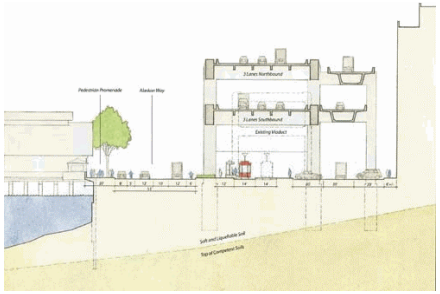
SR 125 in San Diego and US 395 in Spokane both have very complex and expensive interchanges included in their costs per lane mile. The cost per lane mile for these two projects are very similar.



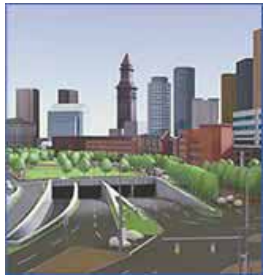
$8.9M/Mile
SR 125 -
San Diego, CA

$9M/Mile
US 395 North Spokane
Freeway - Spokane, WA

Summary of Projects



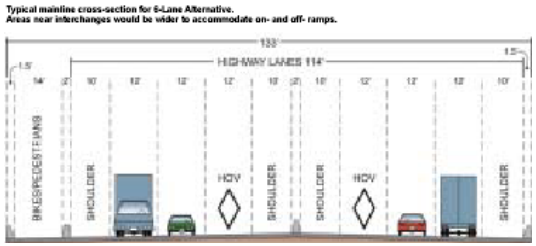
$180-$267M/Mile
SR 99 Alaskan Way
Viaduct & Seawall -
Seattle, WA



$188M/Mile
Big Dig -
Boston, MA

$64.2-$82.6M/Mile
Oakland Bay Bridge -
Oakland, CA

$12.2-13.8 M/Mile
I-405 Congestion Relief
& Bus Rapid Transit -
Seattle, WA



$45.6-$52.9M/Mile
SR 520 Bridge Replacement &
HOV - Seattle, WA

$27.8M/Mile
Troup Howell Br. -
Rochester, NY

$22.3-$25M/Mile
SR 509/ I-5 Freight &
Congestion Relief -
Sea-Tac, WA

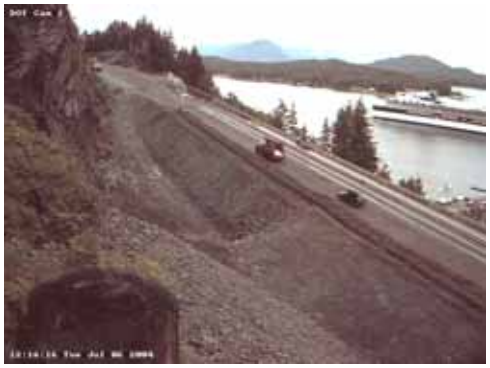
$24.6M/Mile
Tacoma Narrows Bridge -
Tacoma, WA

Summary of Projects

$21.4M/Mile
T-REX -
Denver, CO

$14.25M/Mile
I-5 Everett HOV -
Everett, WA

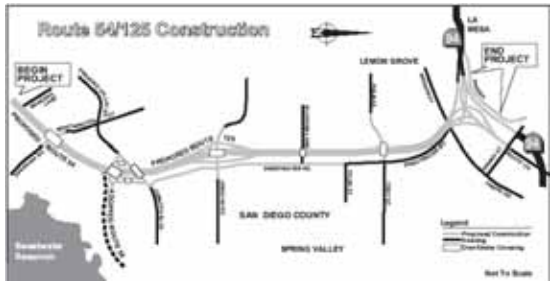
$12.1M/Mile
Route 87 -
San Jose, CA



$11.5M/Mile
Third Ave. Extension -
Ketchikan, AL

$9.3M/Mile
I-5 Widening Salmon
Creek to 205 -
Vancouver, WA

$9M/Mile
US 395 North Spokane Freeway -
Spokane, WA



$8.9M/Mile
SR 125 -
San Diego, CA

Summary of Projects

$8.2M/Mile
SR 18 Maple V alley
to Issaquah Hobart -
Auburn, WA

$7.5M/Mile
Katy Freeway
- Houston, TX

$5.6M/Mile
SR 202 - SR 520 to
Sahalee Way -
Redmond, WA

$4.8M/Mile
I-5 NE 78th to
Burnt Bridge Cr.
-Vancouver, WA

$4.6M/Mile
Route 288 -
Richmond, VA

$4.5M/Mile
SR 161 176th to 234th -
Tacoma, WA

$4.4M/Mile
SC 170 Widening
- Beaufort, SC

$4.0M/Mile
M6 South Beltline -
Grand Rapids, MI

Summary of Projects

$3.9M/Mile
Sunset Hwy -
Portland, OR

$3.8M/Mile
SR 525 Widening & Safety -
Mukilteo, WA

$3.5M/Mile
SR 18 180th to Maple Valley -
Auburn, WA

$3.5M/Mile
SR 16 HOV Olympic Dr.
to Union -
Tacoma, WA

$3.2M/Mile
SR 527 164th to 132nd -
Everett, WA

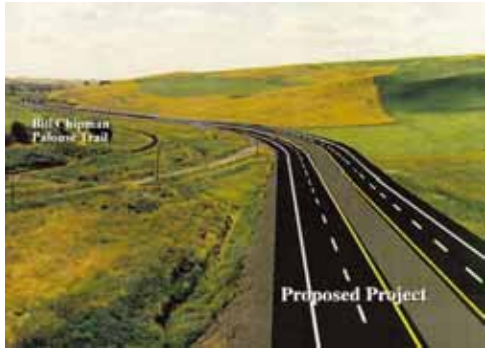
$2.8M/Mile
I-5 Maytown to 93rd -
Tumwater, WA

$2.7M/Mile
I-4 Reconstruction -
Tampa, Fl

$2.3M/Mile
US 7 Shelburne Rd. -
Burlington, VT

Summary of Projects

$1.9M/Mile
Rt. 123 Widening # 3 -
Fairfax, VA



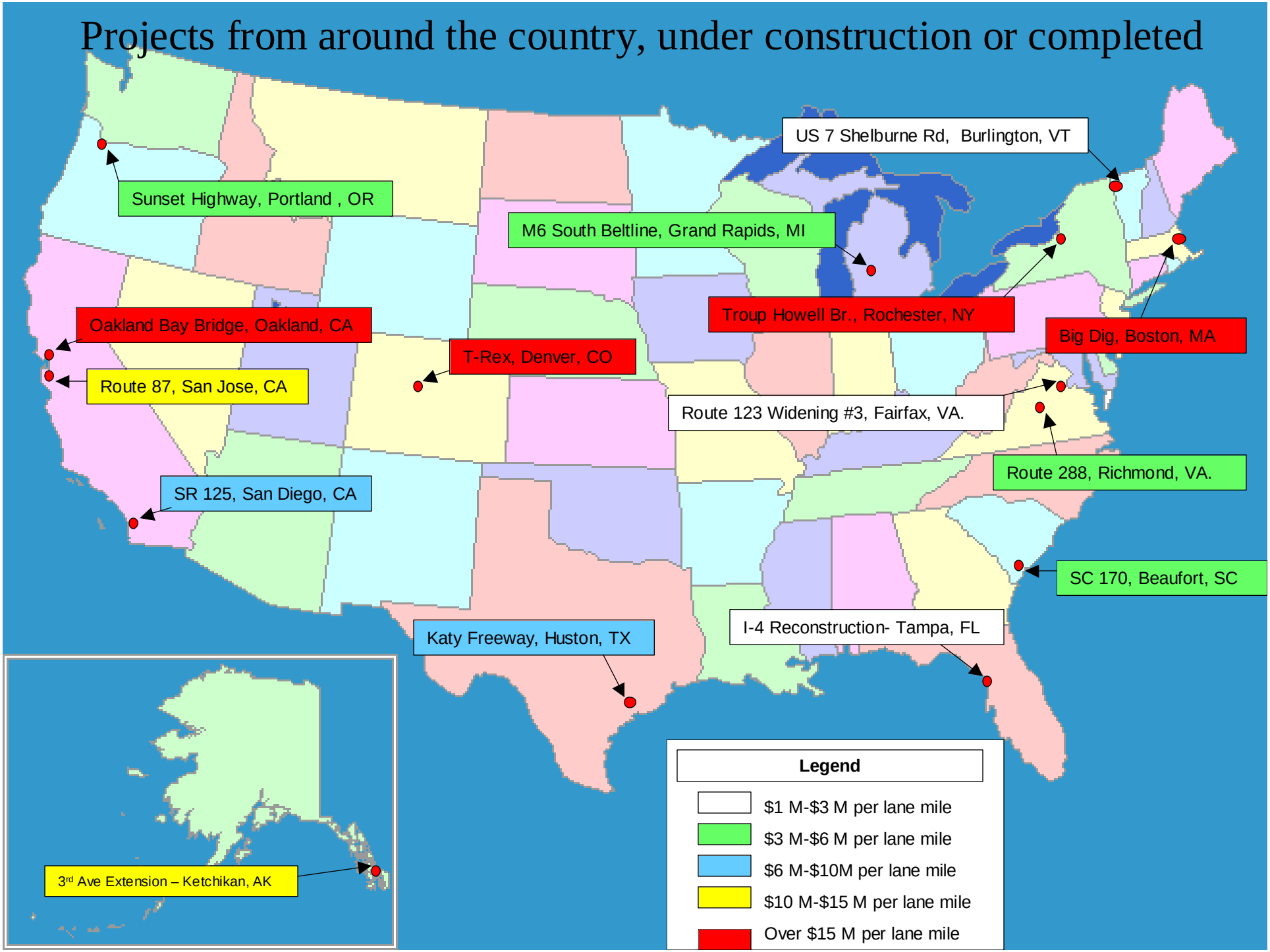
$1.5M/Mile
SR 270 Pullman to Idaho -
Pullman, WA

$1.2M/Mile
SR 14 SE 192nd Ave, -
Camas, WA

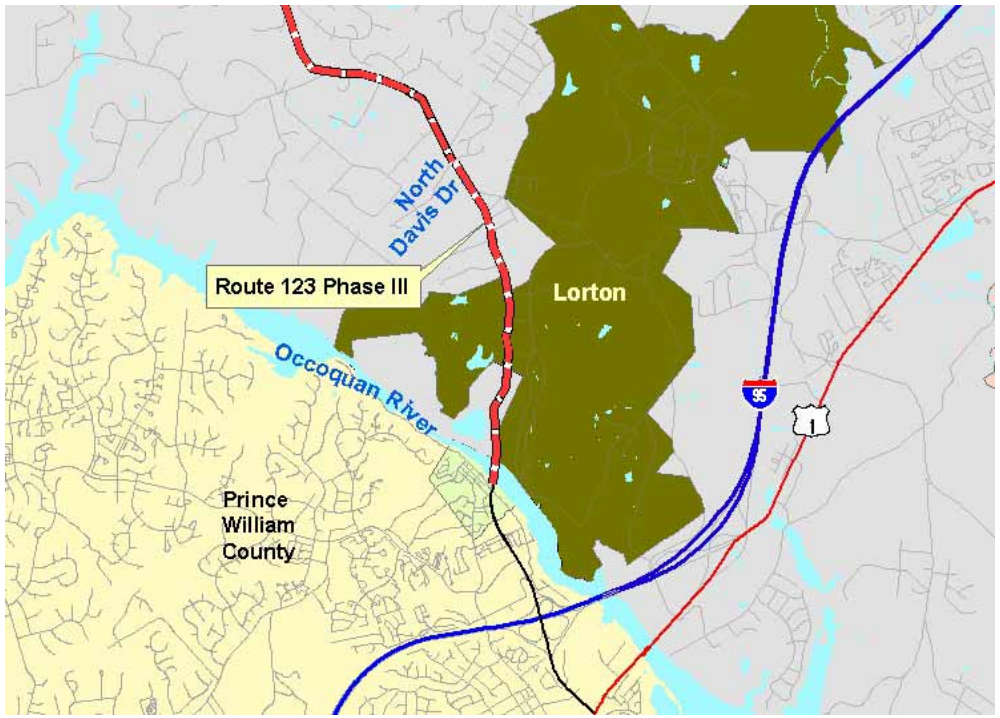
$1.1M/Mile
I-90 Argon to Sullivan -
Spokane, WA

$1.0M/Mile
US 12 Widening -
Walla Walla, WA

Projects from around the country, under construction or completed



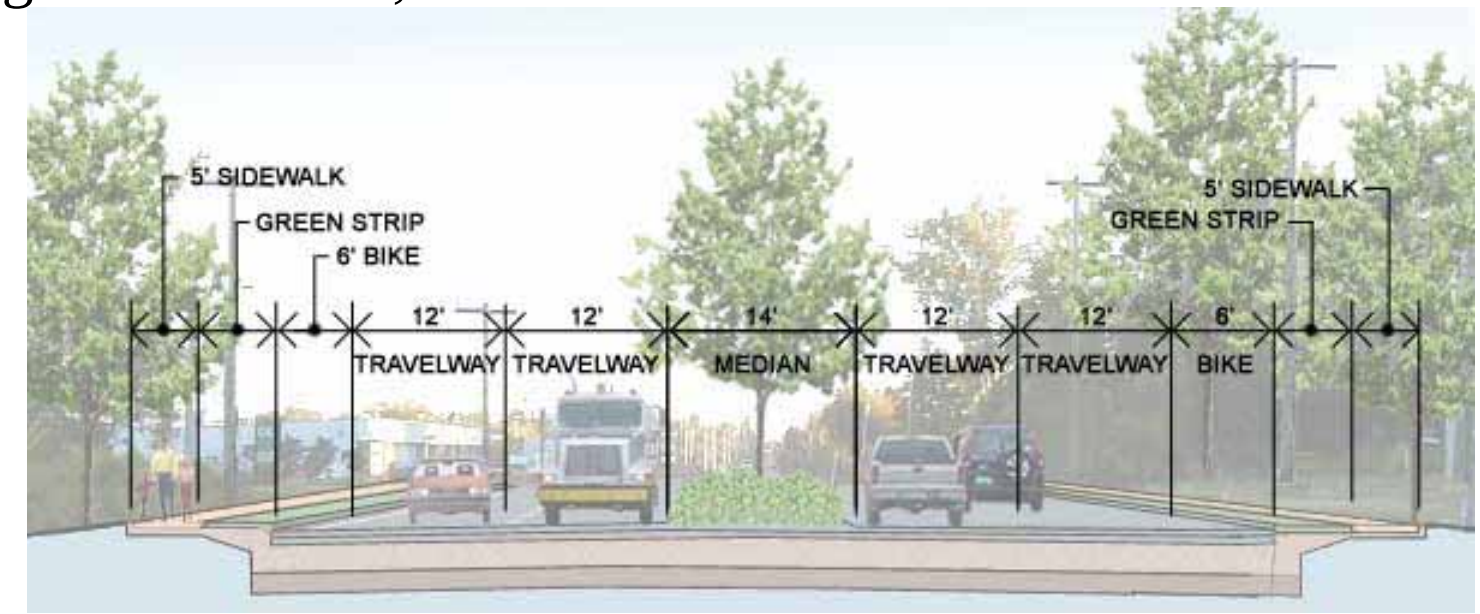
Route 123 Widening – Phase 3, Fairfax, Virginia



This is the third of several contracts to widen Route 123 in Fairfax and Prince William Counties to a four lane divided highway for eight miles between Burke Lake Road and the Occoquan River.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
Route 123 will have: •Two 12-foot lanes in each direction •A 41-foot-wide median and pedestrian trails •Signals added at Henderson Road, Silverbrook Road, Crosspointe Drive, Hampton Road, Davis Drive, Furnace Road, Hooes Road, Hooes Road and Furnace Road, and Vulcan/Occoquan Regional Park	$14.6M	7.6 (1.9 miles x 4 lanes)	$1.9M

U.S. Route 7 Shelburne Rd Reconstruction, South Burlington/Shelburne, Vermont



U.S. Route 7, also known as Shelburne Road, serves as the southern gateway to Chittenden County. The Vermont Agency of Transportation (VTrans) is at work to improve a portion of U.S. Route 7, which will be extended 3½ miles from Imperial Drive in South Burlington to the recently completed LaPlatte River Crossing in Shelburne. The result will be a landscaped four-lane boulevard, with a planted median island, bike lanes, sidewalks, bus stops and shelters, street lighting, and a coordinated signal system. These features have the ability to reduce congestion and improve mobility, while providing for the needs of bicyclists and pedestrians. Median u-turn breaks will be provided at five locations.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•South Burlington: Population 15814 •Shelburne: Population 6944	$32M	14 (3.5miles x 4 lanes)	$2.3M

Interstate 4 Reconstruction, Tampa Bay, Florida

This segment, known as Segment 1, is completed. The project involved completely reconstructing Interstate 4 from four to six lanes in eastern Hillsborough County, part of a $350 million dollar corridor reconstruction effort stretching from 50th Street in Tampa to the Polk County line.

On this particular segment of the corridor, interchange ramps were modified, with new bridges at Dr. Martin Luther King, Jr. Boulevard, Orient Road, Hillsborough Avenue, U.S. Highway 92, and U.S. Highway 301. The Chelsea Road overpass was removed and will not be replaced. A new road (Sligh Avenue) was built across from Breckenridge Office Park to connect U.S. Highway 301 to Maple Lane, providing access to the area north of I-4 and east of the Tampa Bypass Canal. Eureka Springs Road was converted into a two-way road across the Tampa Bypass Canal to provide access to the Eureka Springs area and Vandenberg Airport. The existing access to Eureka Springs Road from U.S. Highway 92 and I-4 eastbound (Exit 6C) was permanently removed.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Five bridges •Start Date: October 13, 1997 •Completed: March 2002	$82.7M	30.6 (5.1 miles x 6 lanes)	$2.7M

Sunset Highway (U.S. 26), Portland, Oregon

Existing Site
Existing U.S. 26 has two lanes in each direction.

Description: Highway 26 will be widened to three through lanes in each direction with auxiliary lanes for traffic exiting to Highway 217, Cedar Hills Boulevard, and Murray Boulevard.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• The project will add one traffic lane in each direction along US 26 between Cornell and Murray Boulevard to widen US 26 to three lanes in each direction, with exit lanes for Cornell Road and Murray Boulevard • Related project elements include construction of sound walls and mitigation for wetland and stormwater impacts • Braided ramp structure • It is expected that the majority of the project will be completed entirely within the existing right-of-way • Includes a new westbound on-ramp from Barnes Road to US 26	$45 M	11.6	$3.9 M

M6 South Beltline, Grand Rapids, Michigan

M6/US 131 Interchange

The Michigan Department of Transportation is undertaking a $160 million project to construct the new M-6 (South Beltline/Paul B. Henry Freeway) interchange with US-131. The project entails construction of a freeway-to-freeway interchange, and construction of M-6 from Clyde Park Avenue to Division Avenue. This project includes 27 new bridges and 14 new ramps. Also, MDOT will be reconstructing and widening 4.2 miles of US-131 from 76th Street to 44th Street in the city of Wyoming, and Byron and Gaines townships.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Phase 1: 5.7 miles (I-96 to M-37), 2 Interchanges - Opened in 2001 •Phase 2: 7.4 miles (M-37 west to US-131), 2 Interchanges - Open in 2005 •Phase 3: 6.9 miles (US-131 west to I-196), 4 Interchanges - Open in 2005	$160 M	40	$4 M

SC 170 Widening, Beaufort, South Carolina

The SC 170 Widening Project is located west of the City of Beaufort, SC. The project includes the widening of 11.9 miles from two lanes to four and the replacement of the bridges over both the Chechessee and the Broad Rivers.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Design/Build project •11.9 miles of highway widening, two additional lanes •Replacement of the Chechessee River Bridge (0.3 miles long) •Replacement of the Broad River Bridge (two miles long)	$105M	23.8	$4.4M

Route 288, Virginia

The entire Route 288 corridor from the Powhite Parkway in Chesterfield County to I-64 in Goochland County is expected to open to traffic early fall 2004. Route 288 will be a four lane interstate-style highway with 10 interchanges and a bridge over the James River.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•10 Interchanges •One bridge over the James River •The project is expected to be completed in sections throughout 2004	$319M	70 (17.5 miles x 4 lanes)	$4.5M

Katy Freeway – Houston, Texas

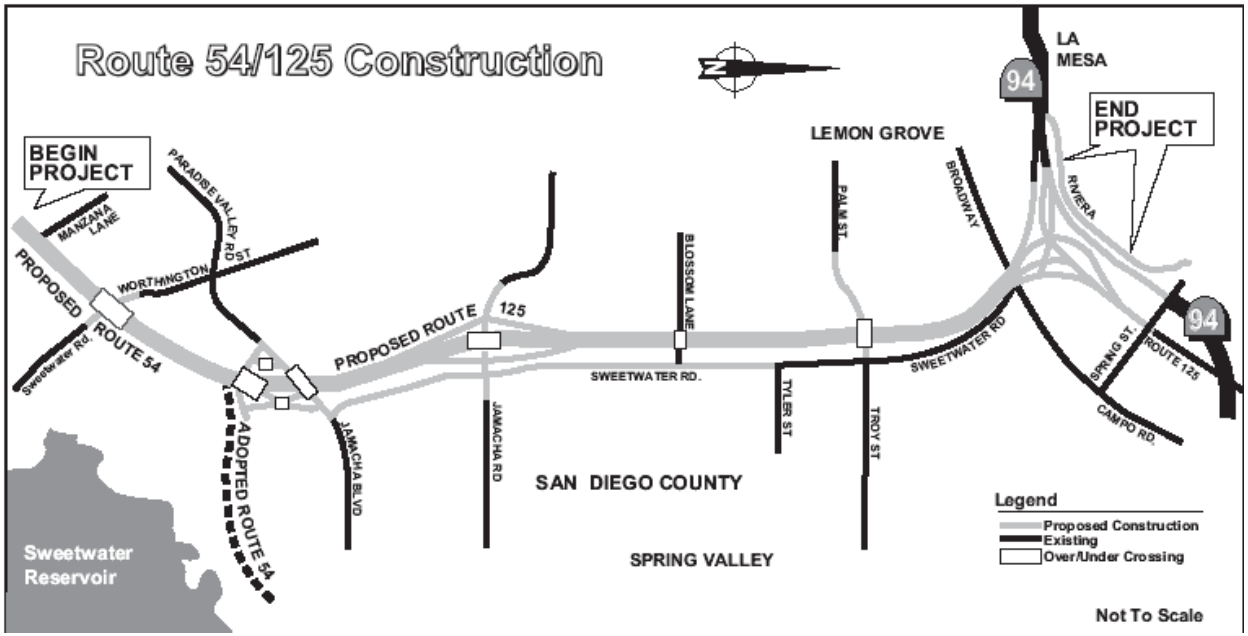
Katy Freeway at Fry Road before

Katy Freeway at Fry Road after

The project will widen the main lanes to four or five lanes in each direction and add a third continuous lane to the frontage roads. The diamond lane will be maintained and shoulders will be added on each side of it, although its beginning and ending points will be moved about one mile to the East. A continuous auxiliary lane will be added on each side of the freeway. The existing access roads will be converted to 2-way local access roads. Both frontage roads will be widened at their approaches to the three major crossroads (Barker Cypress Rd, Fry Rd, and Mason Rd) to allow for turning lanes. U-turn lanes will be built on both sides of all six crossings.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•I-10 East of Grand Parkway to West of SH 6 •Reconstruction of 6.91 miles of Interstate Freeway while under traffic •Reconstruction of three Grade-Separated Intersections at Mason, Fry and Barker Cypress •Construction of three New Grade-Separated Intersections at S. Greenhouse, Westgreen & Park Ten •$208 Million Low Bid Received: May 6, 2003 •35 Months Duration (June 2003 to May 2006) •Construction Officially Began: June 21, 2003	$208M	27.6	$7.54M

SR-125, San Diego, California



Existing Site
SCENIC HIGHWAY, 2 miles long, San Diego County, residential and commercial.

Description: This project includes construction of approximately 5.2 miles of a six lane freeway, a flood control facility, interchanges, plus right of way for future carpool lanes.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•This total includes construction cost (C) and right of way (R/W) only	$277.1M	31.2	$8.88 M

Third Avenue Extension, Ketchikan, Alaska

The new Third Avenue Extension traverses a rugged, southwest-facing mountainside above the City of Ketchikan, on Revillagigedo Island in Southeast Alaska. Built to relieve traffic congestion along Tongass Avenue in downtown Ketchikan, the new roadway will be nearly 1 mile in length, and will extend Third Avenue between Washington Street and Schoenbar Road. The project is very challenging due to the close proximity of residences immediately downslope, the steepness of the terrain (varying from 35 degrees to vertical), and difficult access and construction conditions. The central segment of the project is particularly difficult where it crosses a 400-foot wide landslide, a 200-foot tall rock escarpment known locally as White Cliff, and a talus slope at the base of White Cliff.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•xxx •xxx •xxx	$23M	2 (1 mile x 2 lanes)	$11.5M

Route 87, San Jose, California

Existing Site
Four lanes in each direction

Completed project
Six lanes in each direction

In the next few years, construction improvements along State Route 87 will complete the corridor from South San Jose, greatly ease congestion to and from the San Jose International Airport, and provide easier access from downtown San Jose to U.S. 101. This improves the existing Guadalupe Parkway by converting it from a four-lane road with four signalized intersections into a six-lane freeway.

This multi-million dollar project, jointly funded by Caltrans and the City of San Jose, involves several phases of major construction activities, which began in 1998.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Six lanes total, two of which will be diamond lanes (High Occupancy Vehicles, or HOV) • Two interchanges, one at Taylor Street and the other at Skyport Drive • Undercrossings at Coleman Avenue, Hedding Street, and Airport Parkway • Upgraded Route 87 structure over Interstate 880; the two highways will continue to remain separate • Riparian mitigation planting along the Guadalupe River in roughly a 2-to-1 ratio to replace and enhance the natural habitat	$225M	18.6	$12.1M

T-REX, Denver, Colorado

Sample interchange and roadway widening

Existing Site
Existing view of I-25 and Washington Street looking southeast at the Washington Street access ramps.

Description: This simulation depicts the additional I-25 lanes and the new LRT alignment located to the South (right) of I-25. This area was nicknamed " the narrows" because of the limited right-of-way and close proximity of Buchtel Road. Retaining walls allowed the most efficient use of the available space. On the right, a replacement access ramp carries traffic over the top of LRT lines to reach Buchtel.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Located in open suburban area •New right of way required in some parts of corridor; median widening in other parts of corridor •Cost includes “Light Rail element” (approximately $800 million)	$1.67B	78	$21.45M

Troup Howell Bridge, Rochester, New York

$37 million multi-year project to replace the 8-span I-490 bridge over the Genesee River in downtown Rochester, New York, is the third phase of the State's commitment to improve I-490 between the Erie Canal west of Rochester and the Genesee River, also known as the Western Gateway Project.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Most of the structure will be replaced including all of the original 1955 structure: however, the newer eastern spans will be retained and rehabilitated •xxx •xxx	$37M	1.33	$27.8M

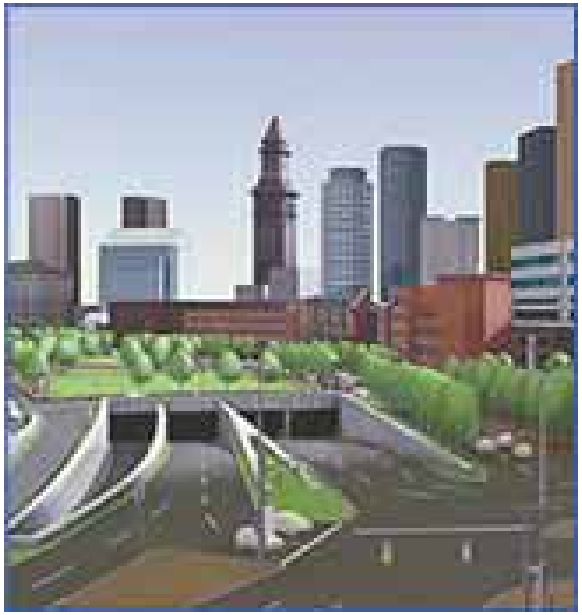
Oakland Bay Bridge, San Francisco, California

Existing Site
Earthquake damage on the east span of the existing Oakland Bay Bridge.

Description: Design visualization of the new suspension bridge. The new bridge will carry 5 lanes in each direction. The engineers' estimate was $740 million. The sole bid was offered May 26 at $1.4B with use of foreign steel and $1.8B using domestic steel. Record steel prices are the key factor in the huge differential, but the span's unique design, tough schedule, and strict specifications also played a factor in ratcheting up the bid contingencies.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•11,525' east span •Five lanes in each direction	$1.4B- $1.8B	21.8	$64.2M - $82.6M

Big Dig, Boston, Massachusetts



In the next year the Big Dig celebrates more milestone openings than in all of its last eleven years of construction combined.

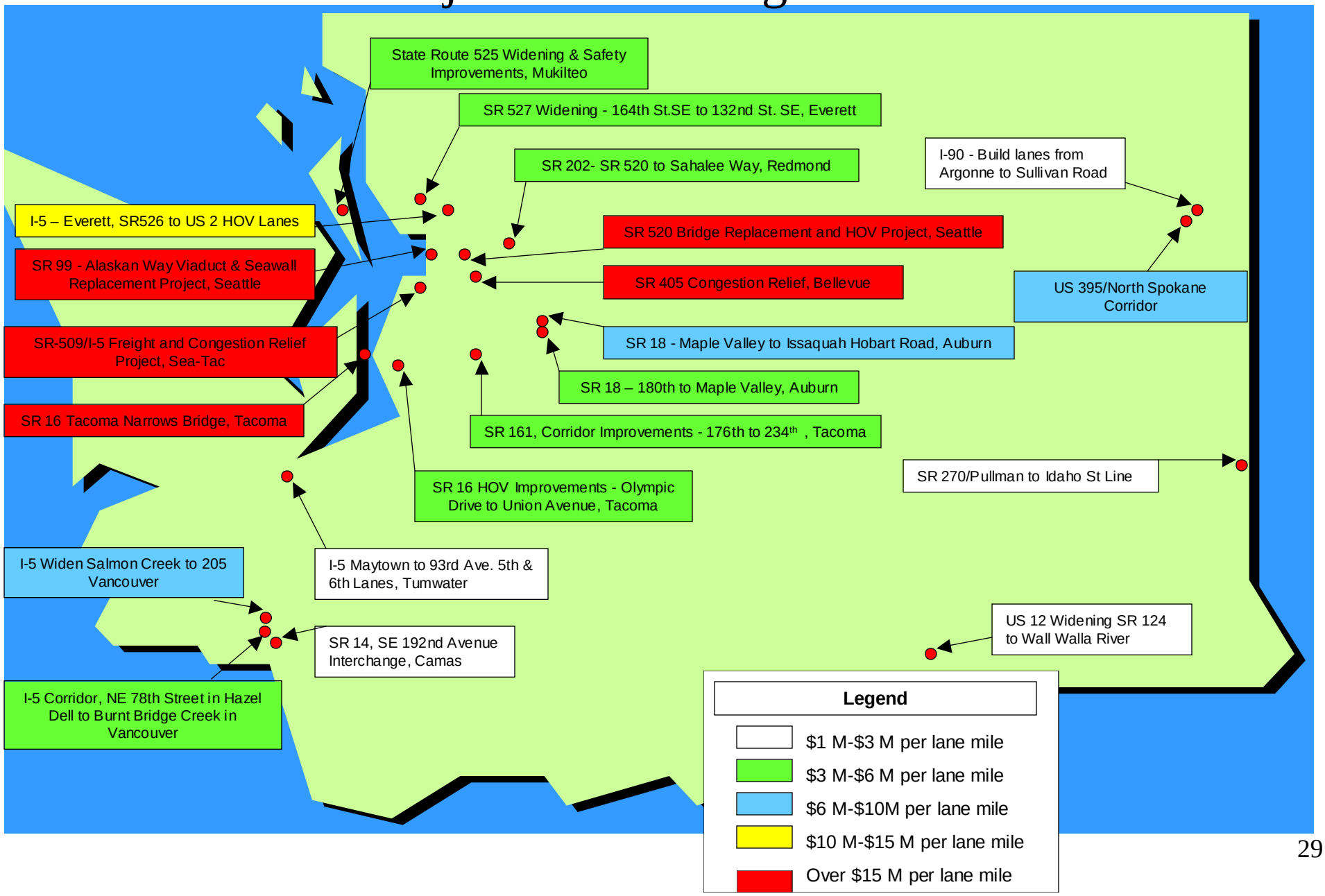
Future Fact: When the Big Dig is completed in 2005, it will have cost nearly twice as much as the construction of the 1,892 miles of I-95 between Houlton, Maine and Miami, Florida.

The Big Dig - Facts

Who: United States Department of Transportation, Federal Highway Administration & The Massachusetts Turnpike Authority
What: The largest civil works project in U.S. history
Where: Boston: 8 miles of Interstate highway construction, approximately 4 miles of I-93 between Roxbury and Somerville, and approximately 4 miles of I-90 between Chinatown and East Boston
When: Federal legislation passed 1987, ground broken in Boston 1991, completion 2005
Why: To reconnect the city and to alleviate traffic bottlenecks
Cost: $14,700,000,000

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Located in urban area •Mix of elevated roadway, tunnels and bridges over waterways •Replaces and or rehabilitates existing freeway	$14.7B	78	$188.46M

Projects in Washington State



US 12 - Widening From SR 124 to the Walla Walla River, Washington

This five-phase project consists of four construction phases and a planning phase. The construction portion will widen the US 12 corridor to four lanes from the SR 124 junction to the Walla Walla River. The planning phase will determine the preferred alignment for Highway 12 from the Wallula Junction near the Walla Walla River to Walla Walla.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Under construction: The first construction project in the corridor, McNary Pool to Attalia, will be open to traffic by late fall 2004 • Design and environmental work is in progress on Phases 2 and 3	$50.8M	48 (12 miles x 4 lanes)	$1M

I-90 - Build lanes from Argonne to Sullivan Road, Washington

This project will add two additional lanes (one general purpose lane in each direction) to I-90 from the Argonne Road Interchange to the Sullivan Road Interchange. This project is one component of the 13-mile Spokane to Idaho Corridor that is being built in a series of projects.

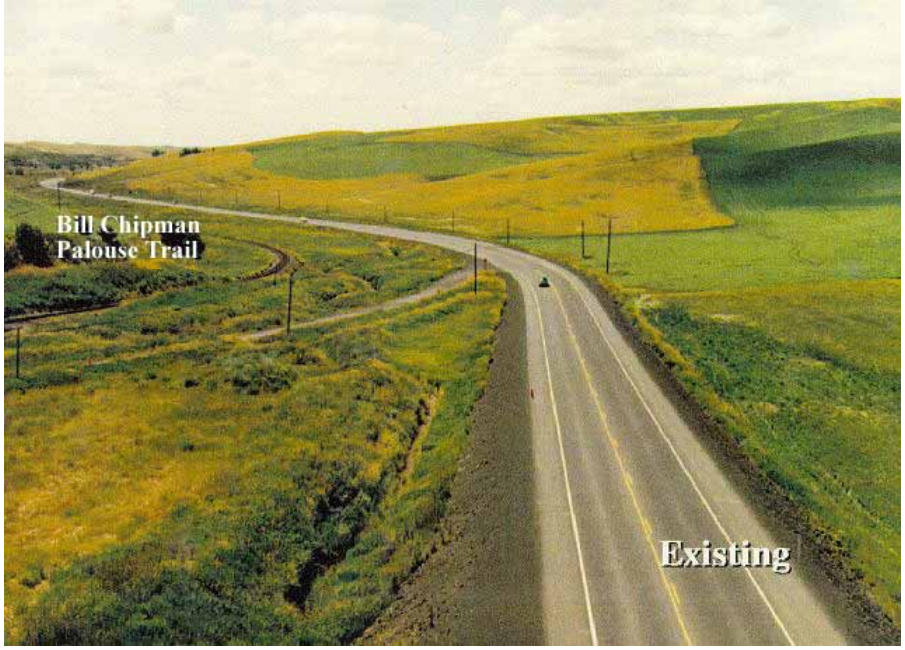
Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Under Construction, completion expected in 2005 • Strategic Freight Corridor • This project is one component of the 13-mile Spokane to Idaho Corridor that is being built in a series of projects • Three sections in this corridor, totaling five miles in length, have been designated as "High Accident Corridor" locations	$35.6M	31.8 (5.3 miles x 6 lanes)	$1.1M

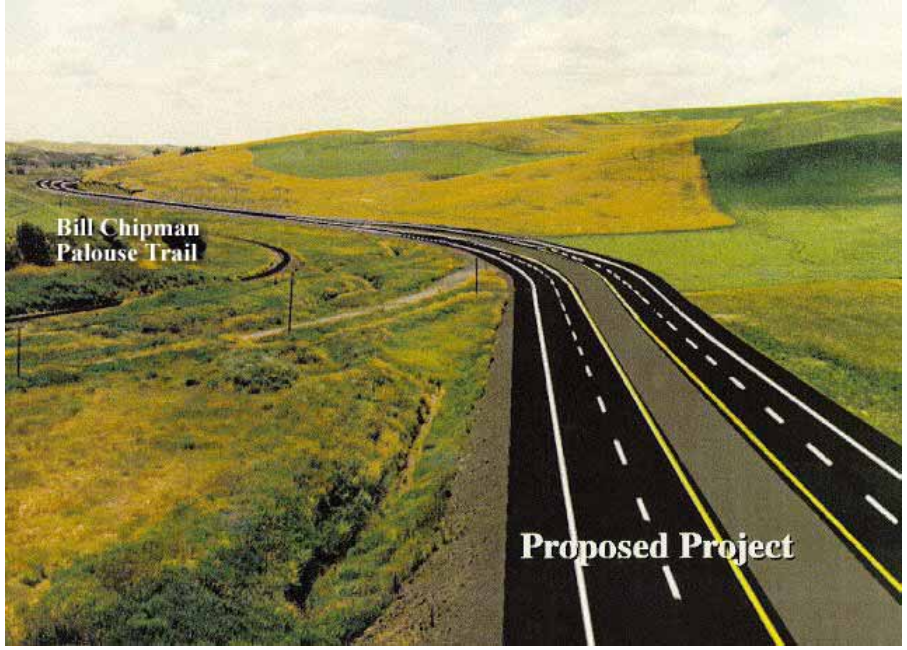
SR 14, SE 192nd Avenue Interchange, Camas, Washington

This project constructed a new interchange on State Route 14 between the SE 164th Avenue Interchange and just west of Camas (near Brady Road). This project provides a future connection to a major north/south city street off of SR 14. The Brady Road intersection with SR 14 was moved to meet SE 192nd Avenue at a signalized intersection 500 feet north of the new interchange. Also, the interchange is helping to preserve mobility and increased safety for motorists who travel the SR 14 corridor.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Project Completed: October 2002 •A diamond interchange at SR 14 and SE 192nd Avenue •A new Brady Road intersection at SE 192nd Avenue •A new alignment of Brady Road leading to SE 192nd Avenue •A 1,000 foot section of SE 192nd Avenue •The elimination of the existing intersection of Brady Road and SR 14 •An access road from SE 192nd Avenue to the Pacific Rock Products facility •An additional lane on the eastbound SR 14 off-ramp to SE 164th Avenue •Additional lane on SR 14 from just east of SE 164th Avenue to SE 192nd Avenue •New pavement from east of SE 164th Avenue Interchange to Camas	$19.8M	16.8 (4.2 miles x 4 lanes)	$1.2M

SR 270/Pullman to Idaho St Line - Additional Lanes, Washington





This project will add a general-purpose lane in each direction and will provide five miles of 60-foot wide median to separate opposing traffic. Access control will be established along SR 270. The highway will be realigned to the north near the Avista Utilities property and at the Airport Road East vicinity. This will allow the existing SR 270 alignment at these locations to be used as a frontage road system for local businesses, farms, and residents. The frontage road system, in combination with access control will reduce the number of approaches to SR 270, which in turn will improve traffic flow and safety.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Drilling and soil testing began in mid-December 2003; completed at the end of February 2004 • JARPA was submitted for approval March 1, 2004; right-of way acquisitions began in July 2003 • Construction is scheduled to start in 2005, with probable completion in 2007 • Frontage roads on the south side of the existing trail consolidate crossing points and conflicts; improving safety. • Additional wetlands will be established and Paradise Creek will be improved in an effort to enhance the corridor	$30.6M	20 (5 miles x 4 lanes)	$1.5M

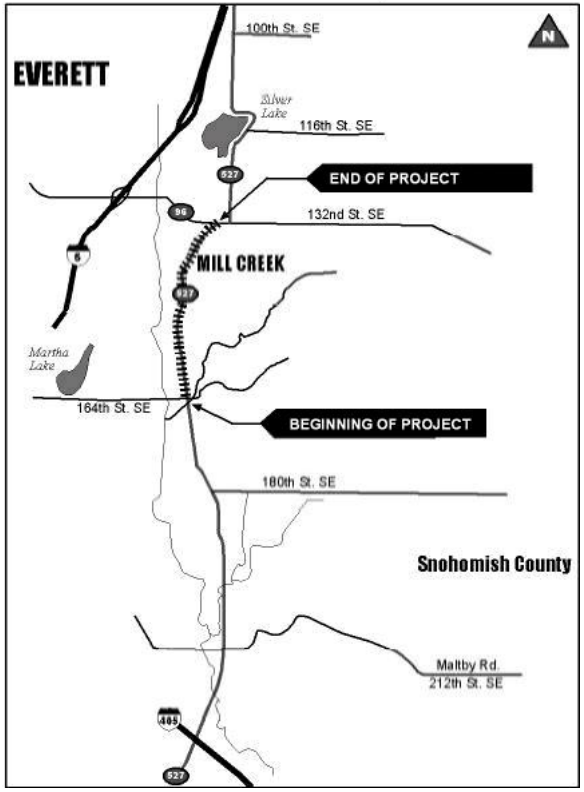
I-5 Maytown to 93rd Ave. - 5th & 6th Lanes, Tumwater, Washington

This project is located in a rural area south of Tumwater; it widened the existing four lane interstate to six lanes for approximately two miles. It added four lane miles, a wider shoulder, and a median barrier. Since a portion of the stormwater was treated in the existing grassy median, a new stormwater treatment facility was constructed to treat for the new roadway and replace what was lost by filling in the median.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Project completed in September 2002 • An additional 12.76 acres of right of way was purchased outside of the roadway to accommodate stormwater treatment facilities	$11.2M	4	$2.8M

SR 527 Widening - 164th Street SE to 132nd Street SE, Washington

State Route 527 Area Map



To increase safety and increase traffic flow on this heavily traveled route, it needs to be widened. This project will widen more than two miles between 164th and 132nd Streets southeast through the City of Mill Creek. When construction is finished, the Bothell-Everett Highway will have two lanes in both directions and a center area that will be a landscaped median in some sections and left-turns in other sections. This project also builds sidewalks, curbs, gutters, and bike lanes.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under construction: The Final Phase Erosion and Planting Fall 2004 •The project installs new sidewalks and bike lanes, making it safer for pedestrians and bicyclists •A new "fish-friendly" culvert crossing for Mill Creek	$25.6M	8 (2 miles x 4 lanes)	$3.2M

SR 16 HOV Improvements - Olympic Drive to Union Avenue

This project completes the original design concept for SR 16 started in the early 1980's, but never completed due to lack of funding. Portions of the ultimate westbound lanes were never completed. Consequently, all traffic on SR 16 between Pearl and 12th Street has been traveling on what was intended to be the ultimate eastbound lanes. Completing the ultimate westbound lanes will make this section of roadway safer and much more comfortable to drive.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Construction will begin in early 2004 and will last for three years, ending in conjunction with the opening of the new Tacoma Narrows Bridge in 2007 •Total estimated project cost, including design, engineering, right of way acquisition and construction: $90.5 million •Four new bridges are constructed •Two bridges are widened •One tunnel is constructed •10 miles of HOV lanes are constructed (MP 0.8 to MP 8.2 = 7.4 miles, minus the TNB portion of 2.5 miles equals 5 miles, times 2 lanes equals 10) •5 miles of multi-use trail are constructed (same distance as the HOV lanes) •5 new stormwater ponds are constructed (four on Union to Jackson and one on 36th to Olympic) •Four noise walls are constructed	$90.5M	25.9	$3.5M

SR 18 - 180th to Maple Valley, Washington

This project, a portion of a larger project to widen SR 18 from Auburn to North Bend, is a 2.7-mile stretch of highway located between Covington and Maple Valley.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Project Completed: October 2002 •2 new two-lane bridges •Six detention Ponds, five infiltration Ponds, stream re-vegetation, 8-acre wetland created •Widened 256th Street, replaced two culverts, restoration of a nearby wetland •Noise wall	$37.7M	10.8 (2.7 Miles x 4 lanes)	$3.5M

State Route 525 Widening & Safety Improvements

State Route 525 (SR 525), commonly known as the Mukilteo Speedway, runs from Interstate 5, past State Route 99 (SR 99), through the City of Mukilteo, to the ferry dock and then continues as SR 525 on Whidbey Island in Island County. This congested route is used by residents, area businesses, commuters, and ferry traffic. Widening the highway from a two-lane highway to a four-lane, divided highway to help increase traffic flow, decrease congestion, and increase safety is a top priority of WSDOT.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under construction: Final paving will be complete by the end of summer 2004 •Widens SR 525 to four lanes •Adds new sidewalks and bike lanes •Upgrades lighting for improved safety •Contractor: KLB Construction •New interchange at SR 525 and SR 99 •18 underground stormwater storage tanks	$91.3M	24 (6 miles x 4 lanes)	$3.8M

SR 161, Corridor Improvements - 176th to 234th- Tacoma, Washington

This project will widen SR 161 (Meridian South) in East Pierce County from two lanes to four lanes, with a two-way left turn lane. The project is comprised of two segments - 176th to 204th and 204th to 234th.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Construction on the segment between 204th to 234th streets will begin in the early spring 2004: Construction on the northern segment, 176th to 234th, will begin in 2005. •Install new traffic signals at the intersections of 200th Street, 204th Street and Eustis Hunt Road •Modify traffic signals at 224th, 194th, 187th, and 176th streets •Improve channelization and illumination at 234th, 232nd, 229th, 224th, 213th, 204th, 200th, 194th, 187th and 176th streets; also at Eustis Hunt and County Dump roads. •The 176th Street intersection will have two lanes going through in each direction on both 176th Street and SR 161, and it will have double left turn lanes in all four directions. •The 200th Street intersection will have a double left turn from southbound SR 161 to eastbound 200th Street •Stormwater detention ponds in the vicinity of 234th, 229th, 204th, 200th and 194th streets, and County Dump Road •Sidewalk, curb and gutter along the south side of 176th Street and along SR 161 in the northeast quadrant of the intersection; sidewalk, gravel walkways, curb, and curb and gutter between 229th Street and vicinity of 224th Street. •Closed storm sewer system between County Dump Road and 176th Street and between 229th Street and the vicinity 224th Street. •Railroad crossing signal and gate system at the Tacoma Eastern Railroad crossing. •Wetlands mitigation site	$33.9	7.6 (1.9 miles x 4 lanes)	$4.5M

I-5 Corridor, NE 78th Street in Hazel Dell to Burnt Bridge Creek in Vancouver, Washington

This Clark County project widened I-5 to three lanes in each direction from Burnt Bridge Creek in Vancouver to NE 78th Street in Hazel Dell. Construction began in August 1999 and was completed the first week of November 2002.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Completed November 2002 •Widened a 2.3-mile section of I-5 (northbound and southbound) to three lanes, with a fourth acceleration/deceleration lane added at Main Street and NE 78th Street •Replaced bridges at Main Street, NE 63rd Street, and NE 78th Street •Replaced the Clark County railroad crossing just south of NE 63rd Street •Rebuilt the existing interchange at NE 78th Street •Installed a traffic signal at Hazel Dell Avenue and Main Street •Added sound walls •Added a stormwater detention pond near the Ellen Davis Trail •Connected the east and west sides of the Discovery Trail by adding a pedestrian bridge and pedestrian tunnel	$65.7M	13.8 (2.3 miles x 6 lanes)	$4.8M

SR 202- SR 520 to Sahalee Way, Washington

Stage 1 - SR 520 to East Lake Sammamish Parkway vicinity:
The first stage of this project adds an additional lane in each direction between SR 520 and East Lake Sammamish Parkway and improves the intersection of SR 202 and East Lake Sammamish Parkway. Other work includes bicycle lanes, sidewalks, drainage, landscaped median, signing upgrades, and signal revisions at the SR 520 off-ramp and at NE 70th Street.

Stage 2 - East Lake Sammamish Parkway to Sahalee Way:
The second stage includes two new lanes, retaining walls, noise walls, bicycle lanes, sidewalks, and replacement of the bridges at 196th Avenue NE and at Evans Creek. From 196th Avenue NE to Sahalee Way, crews will raise the roadway 14 feet to accommodate an existing landslide.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Construction to begin Fall 2004 • Stage one is scheduled for completion at the end of 2005: Stage two is scheduled for completion in fall 2007	$63.2M	11.2 (2.8 miles x 4 lanes)	$5.6M

SR 18 - Maple Valley to Issaquah Hobart Road, Washington

This project is the latest phase in WSDOT's plan to reduce congestion and enhance safety on SR 18 by widening the highway to a four-lane divided highway between Auburn and I-90. The widening is being done in segments, from west to east, and is complete all the way to Maple Valley.

The three-mile section extending to Issaquah Hobart Road is a two-lane undivided highway with the potential for high speed collisions. More than 23,000 vehicles use SR 18 through the construction zone on an average day.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under Construction; schedule calls for opening all four lanes of Highway 18 in fall of 2005 •Widens the existing two lane highway to four lanes with a 48-foot median •Constructs a new interchange at 244th Avenue Southeast and Removes at-grade intersections at 236th Avenue SE, 244th Avenue SE, and at SE 200th Street •Replaces existing bridges over SR 169 and the Cedar River and builds a new bridge over SR18 at Southeast 200th Street	$97.9	12 (3 miles x 4 lanes)	$8.2M

US 395/North Spokane Corridor

When completed, the North Spokane Corridor will be a 60-mile-per-hour, limited access highway with a direct connection to I-90, just west of the existing Thor/Freya Interchange. Other interchanges will be placed at locations such as Trent Avenue (SR 290), Wellesley Avenue, Francis/Freya Street, Parksmith Drive, US 2, and US 395 at Wandermere. This project will be developed in two major phases:

- Phase 1 - Spokane River North to establish the corridor from the River to US 395 at Wandermere.
- Phase 2 - Spokane River South to extend the corridor between I-90 and the Spokane River. Phase 2 will also include a Collector/Distributor (C/D) system (of six lanes) along I-90 between the Liberty Park and Sprague Avenue Interchanges.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under Construction. On August 22, 2001, construction began on the first construction element, a grading and drainage contract, from the vicinity of Parksmith Drive to US 2. The project was completed in July, 2002. In July 2003, $189 million was appropriated through a nickel increase in gasoline tax. Two projects to be built, Francis Avenue to Farwell Road and US 2 to Wandermere and US 2 Lowering. •Seven interchanges •About 3.5 miles of I-90, centered around the NSC/I-90 Interchange connection, will require new construction •The corridor includes the construction of over 10 miles of pedestrian/bicycle trails	$1.5B	167	$9M

Widen I-5 Each Direction from Salmon Creek to I-205 – Vancouver, WA

Project Benefits

•**Safety:** New bridges meeting current design and seismic standards will replace existing bridges. The project also will increase capacity and allow motorists to move more safely and efficiently through the I-5 corridor.

• **Congestion Relief:** Traffic flow in the I-5 corridor between the Main Street interchange in Vancouver and the I-205 junction will be improved. Through computer modeling, it is estimated that if this project wasn't built, afternoon travel speeds in 2010 and 2020 would be 42 and 26 mph, respectively. Once completed, average travel speeds in 2010 and 2020 are projected to increase to 60 and 51.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
The End Result Widening this section of I-5 will increase capacity and allow motorists to move more safely and efficiently through the I-5 corridor. In addition to widening 2 miles of I-5 from approximately the NE 99th Street interchange (Salmon Creek) to the I-205 junction, the project will: •Replace the northbound and southbound bridges that cross over Salmon Creek (near Salmon Creek Park) •Build a new bridge at NE 129th Street •Add an additional lane and a second left-turn lane at the northbound I-5 off ramp to NE 134th Street •Revise the signal at NE 134th Street to accommodate the second left-turn lane	$37.1M	4	$9.3M

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

Adds a new carpool lane in each direction on I-5 between Highway 526 and Marine View Drive.
Adds a new merge lane in both directions on I-5 between 41st Street and US 2.
WSDOT will install retaining walls and a detainment and treatment area for freeway water run-off.

Project Benefits

• **Safety:** Accidents will be decreased by reducing back-ups on the highway and ramps, and providing wider shoulders.

• **Environment:** WSDOT will install noise walls where warranted and build water quality facilities for treatment of freeway water run off.

• **Congestion Relief :** The new lanes for carpools, vanpools, and buses will reduce congestion. View the 2010 and 2020 graphs of forecasted project benefits. (pdf, 8 KB). To learn more about WSDOT's congestion relief efforts, visit the WSDOT Congestion Relief site.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
The $220 million project will unclog a notorious I-5 traffic chokepoint and improve safety through Everett by: • Adding six miles of northbound carpool lanes from Highway 526 to US 2 • Adding 4.6 miles of southbound carpool lanes from Marine View Drive to HWY 526 • Adding a northbound and southbound lane from 41st Street to US 2 • Widening or replacing 19 bridges • Improving freeway on- and off-ramps • Adding noise walls at certain locations and holding and filtering dirty water that runs off the freeway	$236.6M	16.6	$14.25M

SR-509/I-5 Freight and Congestion Relief Project, Washington

The SR-509/I-5 Freight and Congestion Relief Project proposes to extend existing SR 509 from its current terminus at S. 188th St./12th Place South southeasterly to a connection with Interstate 5 and corresponding widening of I-5 south to South 320th. Improved southern access to and from the Seattle-Tacoma International Airport will be provided. SR 509 would be a limited access highway of three lanes in each direction [two general purpose and one high occupancy vehicle (HOV)]. Currently there are three 'build' alternatives under consideration, as well as a 'no-build' alternative. The alignments for these alternatives differ slightly in their routing through the cities of SeaTac and Des Moines, where they connect to Interstate 5, in the nature of improvements and revisions made to the interstate and its ramps, and in revisions made to local streets and arterials.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Begin Construction Range: 2006 – 2007, End Construction Range: 2011 – 2013 • New six-lane freeway, with HOV lanes connecting SR 509 to I-5, six miles of I-5 improvements and a south access to SeaTac International Airport • Improves the I-5/SR 516 interchange, and adds a new interchange between I-5 and South Access Expressway serving Sea-Tac International Airport • Located in urban area requiring relocation of up to 240 or more families and 29 businesses, with a right-of-way cost of $122 million • Construction of 22 bridges including, two structures across S. 200th St. and four tunnels under I-5 for ramp connections • Major retaining walls to minimize further impacts and preserve a municipal water tank • Project cost range includes $18 million in past expenses, beginning in 1992	$737M to $826M	33	$22.3M to $25.0M

Tacoma Narrows Bridge, Tacoma, Washington

Existing Site
Existing Tacoma Narrows bridge currently has two narrow lanes in each direction without shoulders

Description: Design visualization of the new parallel suspension bridge. The new bridge will carry three lanes with shoulders and the old bridge will be remodeled to carry three lanes with shoulders . The project also includes 3.5 miles of roadway and and an associated toll plaza.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Adds new 1-mile-long suspension bridge and remodels existing bridge • Constructs 3.5 miles of roadway and associated toll plaza • Design Build project so the cost per lane mile includes the cost to design the project, as well as construct it	$615 M	25 (Bridge Only 6)	$24.6M Bridge Only $67.2 M

I-405 Congestion Relief & Bus Rapid Transit Projects, Washington

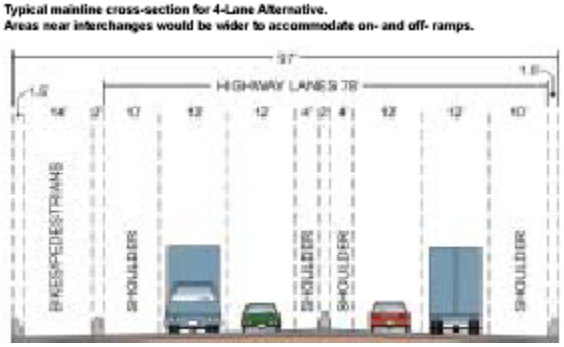
Tackling the Master Plan's list of more than 300 improvements could take 20 years or more. It is estimated to cost nearly $11 billion in 2002 dollars — more than the amount of funding currently available to re-develop at that large a scale. To realize the Master Plan's long timeline and anticipated budget, smaller-scaled portions must be identified, prioritized and then developed in phases.

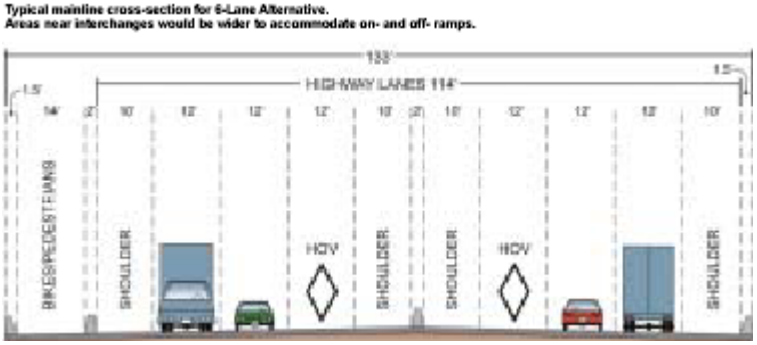
Work now focuses on defining the next 10 years' improvements on the corridor. The parameters of this 10-year, or Implementation Plan, are now being investigated. While the Implementation Plan continues to be refined, $485 million was approved by the Washington State Legislature on July 1, 2003 to design and construct three Nickel Projects along I-405 to address the most congested chokepoints: Kirkland, Bellevue, and Renton areas.

The Nickel Projects — Kirkland, Bellevue, and Renton — will be completed in the following order: Kirkland Stage 1, Renton, Bellevue and Kirkland Stage 2.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Will add up to 2 lanes northbound and 2 lanes southbound, plus auxiliary lanes •Located in dense urban areas •Impacts to watersheds and wetlands •Includes infrastructure for HOV and Bus Rapid Transit System, including direct access ramps, freeway-to-freeway connections, and BRT stations •Requires reconstruction of most interchanges and bridges, including major interchanges at I-405/SR 167, I-405/SR 520, I-405/I-90, I-405/SR 522 and at junctions with I-5	$12.4B to $14.0B	298	$12.2M to $13.8M

SR 520 Bridge Replacement and HOV Project, Seattle, Washington





The 4-Lane Alternative would have four lanes, 4-foot inside shoulder and 10-foot outside shoulder. SR 520 would be rebuilt from I-5 to Bellevue Way. Both the Portage Bay and Evergreen Point bridges would be replaced. Bridges over SR 520 would also be rebuilt. Sound walls would be built along much of SR 520 in Seattle and the Eastside. This alternative includes stormwater treatment and electronic toll collection.

The 6-Lane Alternative would include six lanes (two outer general purpose lanes and one inside HOV lane in each direction), 10-foot inside shoulder and 10-foot outside shoulder. SR 520 would be rebuilt from I-5 to 108th Avenue Northeast in Bellevue, with an auxiliary lane added on SR 520 eastbound east of I-405 to 124th Avenue Northeast. Both the Portage Bay and Evergreen Point bridges would be replaced. Overpasses along SR 520 would also be rebuilt. Sound walls would be built along much of SR 520 in Seattle and the Eastside. This alternative would include stormwater treatment and electronic toll collection. This alternative would also add five 500-foot-long lids to be built across SR 520 to reconnect communities along SR 520: Roanoke, North Capitol Hill, Portage Bay, Montlake, Medina, Hunts Point, Clyde Hill, and Yarrow Point. The lids are located at 10th Avenue East and Delmar Drive East, Montlake Boulevard, Evergreen Point Road, 84th Avenue Northeast, and 92nd Avenue Northeast.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Construction to begin 2008 •A 14-foot-wide bicycle/pedestrian path would be built along the north side of SR 520 through Montlake and the Evergreen Point Bridge and along the south side of SR 520 through the Eastside to 96th Avenue Northeast	$1.4B to $2.3B	30.2 or 45.4	$46.4M to $52.9M or $45.6M to $51.4M

SR 99 - Alaskan Way Viaduct & Seawall Replacement Project, Seattle, Washington

Replacement of the viaduct and seawall. Five alternatives are being considered:

1. Rebuild - Rebuilds existing viaduct and seawall
2. Aerial - Replaces viaduct with new, wider viaduct and rebuilds seawall
3. Tunnel - Replaces viaduct and seawall with 6-lane tunnel on central waterfront
4. Bypass Tunnel - Replaces viaduct and seawall with a 4-lane tunnel on central waterfront and expands Alaskan Way to 6-lanes
5. Surface - Replaces viaduct with a 6-to-8 lane Alaskan Way and rebuilds seawall

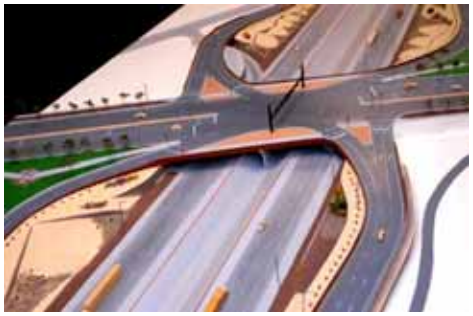
Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Five Alternatives Proposed •Late summer-2004 – Select a preferred alternative •2006 – Environmental approval •2008 – Begin construction, assuming funds are available	$2.7B to 4.0B	15	$180M to 267M

Interchanges

As one can see, interchange costs vary dramatically. Projects that include interchanges have a much higher cost per lane mile.

$15.2M
SR 16, Burley Olalla Interchange - Washington

$16.2M
I-90 Evergreen Rd. Interchange - Spokane, Washington



$19M
I-40 Louisiana Reconstruction Project - New Mexico

$26.8M
SR 500, Thurston Way Interchange - Vancouver, Washington

$28M
The Sunnybrook Boulevard Interchange - Clackamas County, Oregon

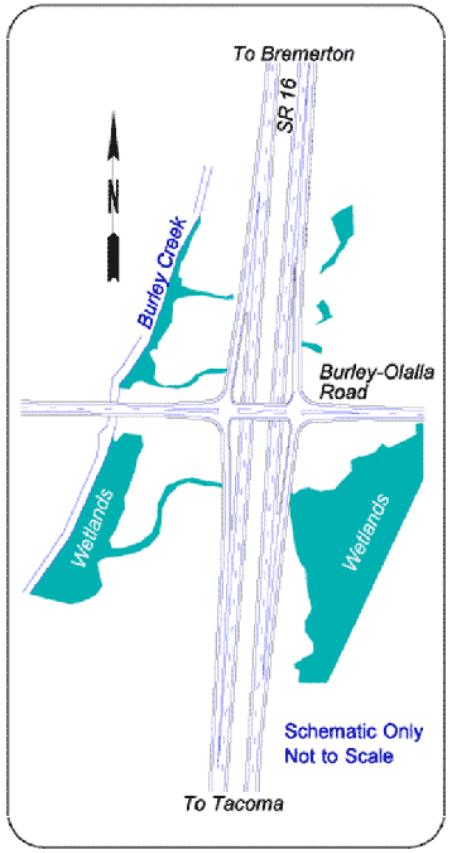
$116.6M
I-90, Sunset Interchange - Issaquah, Washington

$145M
Reconstruction of the I-70/75 interchange near Dayton, Ohio

$810M
Marquette Interchange - Milwaukee, Wisconsin

SR 16, Burley Olalla Interchange, Washington

The end result will be a grade separated interchange. An overpass will be provided for through-traffic on Burley-Olalla Road, and all movements between SR 16 and Burley-Olalla Road will be accommodated.



Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Construction will begin in 2008. Funding is not available to begin construction earlier. In the interim, WSDOT will make some improvements to the intersection to improve safety. The interim project is scheduled for construction in 2004. •Safety - The project replaces the existing at-grade intersection of Burley-Olalla Road and SR 16 with an overpass. When completed, traffic on Burley-Olalla Road will cross over SR 16. •Burley Creek and various wetlands occur within project limits.	$15.2M	N/A	N/A Cost per Interchange $15.2M

I-90 Evergreen Rd. Interchange, Spokane, Washington

This project, located in an urban area of Spokane, included a new interchange, bridge, ramps, and auxiliary lanes.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Project Completed ? •New bridge, ramps, and intersections •Stormwater treatment incorporated into permits, design, and construction •Noise wall	$16.2	N/A	N/A Cost per Interchange $16.2 M

I-40 Louisiana Reconstruction Project, New Mexico

Existing Site
Existing Interchange of I-40 and Louisiana Boulevard.

Description: The entire interchange will be replaced with a Single Point Urban Interchange.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•The westbound I-40 exit ramp and on-ramp loop will be modified to connect directly to the Uptown Loop Road •A bridge crossing over the westbound I-40 exit ramp will be constructed to provide access from Winrock Mall to I-40 •The bridge structure over I-40 will be reconstructed to consist of three through lanes, two left turn lanes, and a right turn lane for northbound Louisiana Blvd. and three through lanes and a dual left turn lanes for southbound Louisiana Boulevard •Adequate vertical and horizontal clearances will be provided for future I-40 widening •The project also includes drainage improvements, construction of retaining walls, lighting, signalization, and signing; a bicycle/pedestrian crossing structure under Louisiana Blvd. will also be constructed as part of this project and will conform to current ADA guidelines	$19 M	N/A	N/A Cost per Interchange $19 M

SR 500, Thurston Way Interchange – Vancouver, WA

Existing Site
At grade intersection

Description: Motorists on SR 500 now travel over Thurston Way without stopping, and motorists traveling from SR 500 to Thurston Way can exit smoothly off SR 500. The new interchange has improved safety; created better connections to existing roads; improved pedestrian and bicycle connections; and increased capacity and decreased congestion

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• The Thurston Way Interchange project is the first transportation design-build project in the state of Washington. • As a design-build project, the project timeline was nearly one year shorter than usual, which resulted in less impact to drivers, businesses and neighborhoods.	$26.8 M	N/A	$26.8 M for the Interchange

The Sunnybrook Boulevard Interchange, Clackamas County, Oregon

A new, six-lane interchange structure will be built across I-205 connecting the Sunnybrook Boulevard east and west extension roadway improvements. The new structure provides for two east and two west-bound travel lanes with a dual left-turn lane for on-ramp and collector/distributor road access.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under Construction: Construction began 2001 - completion date 2004 •Reconfiguration of on- and off-ramps •Construction of collector/distributor (C/D) roads and auxiliary lanes •Retaining wall •Sound wall •Bicycle/pedestrian path reconstruction	$28M	N/A	N/A Cost per Interchange $28M

I-90, Sunset Interchange, Issaquah, Washington

Conceptual Alternative 1 View of the Project Area
South SPAR and Sunset Interchange Modification

The new interchange opened to traffic on Friday, August 29. Drivers now have a new way to get to Issaquah and the Sammamish Plateau from Interstate 90. The project improves traffic in the Issaquah area by reducing congestion from nearby city and county streets, and taking the burden off crowded I-90 interchanges at Front Street and SR 900. Project features updated guardrail and illumination, improved bike/pedestrian trail that crosses I-90 and a new electronic message sign on eastbound freeway.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Project nearly Complete, opened to traffic August 2003 •Installed new traffic cameras to let drivers see conditions before they make their trip •Added nearly a mile of new bike and pedestrian lanes to link trail systems; the Mountains to Sound Greenway provided leadership and assistance in establishing the bike network •Build detention ponds and wetlands to capture and clean freeway runoff	$116.6M	N/A	N/A Cost per Interchange $116.6 M

Reconstruction of the I-70/75 interchange near Dayton Ohio

During the next six years, the I-70/75 interchange will be transformed into one of the safest, most modern and efficient interstate crossroads in the country. The project also includes the construction of a new interchange just south of the Little York Road interchange. Temporarily named the "Benchwood/ Wyse Interchange," it will connect Benchwood Rd. on the west side and Wyse Rd. on the east side of the Interstate.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under Construction; completion in 2007 •Construction of a new interchange connecting Benchwood and Wyse Roads •Reconstruction of Poe Avenue •Reconstruction of the Miller Lane and Benchwood Rd. intersection •Reconstruction of the Little York Road overhead bridge •Removal of the Little York Road interchange ramps •Reconstruction of the Little York Road intersections with Miller Lane. and Poe Avenue •Reconstruction of Brown School Road and North Dixie Drive bridges over I-70 •Construction of new ramps at the I-70/75 interchange, including a new flyover ramp one half mile in length •Construction of a new railroad bridge over I-70, just east of the interchange •Landscaping of the infield areas •Incorporation of aesthetics that include a raised image of the Wright "B" Flyer and other flight-related images (see the Benchwood/Wyse Interchange Aesthetic Enhancement Page)	$145M	N/A	N/A Cost per Interchange $145M

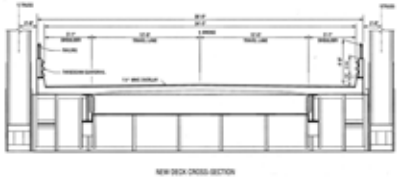
Marquette Interchange, Milwaukee, Wisconsin

To improve safety and traffic flow, the new interchange will place ramps on the right side and improve ramp spacing and curvature. The design maintains the same number of lanes in and out of the interchange from each direction. It also potentially frees land for development and incorporates many aesthetic improvements.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•The project will be constructed in four years from 2004 to 2008 •Placing entrance ramps and exit ramps on the right •Improving the spacing of ramps •Architectural retaining wall treatments •Integral details on parapet walls •Pedestrian-friendly lighting •Dramatic bridge piers •Ornamental rails	$810M	N/A	N/A Cost per Interchang e $810 M

Major Bridges

Projects with structures have a high cost per lane mile



$12.7M /Mile
SR 433, Lewis and Clark Bridge Deck Replacement –
Longview, Washington

$27.8M/Mile
Troup Howell Bridge -
Rochester, New York

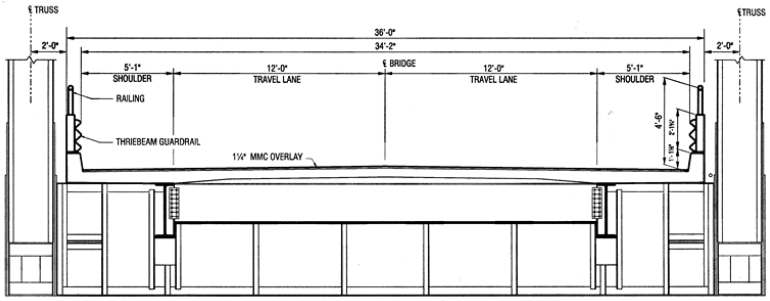
$45.8M/Mile
SR 104 Hood Canal Bridge East-half Replacement and West-half Retrofit Project, Washington

$67.2M/Mile
Tacoma Narrows Bridge –
Tacoma, Washington

$64.2-$82.6 M/Mile
Oakland Bay Bridge -
San Francisco, California

$278M/Mile
Cooper River Bridge Project -
Charleston, South Carolina

SR 433, Lewis and Clark Bridge Deck Replacement, Longview, Washington



NEW DECK CROSS-SECTION

The entire bridge will have a new driving surface and the roadway and shoulder widths will be consistent all the way across the bridge. This includes a five-foot shoulder in each direction.

Installation of a new bridge deck will extend the life of the Lewis and Clark Bridge for another 25 years. The new roadway will eliminate the existing raised sidewalks, providing wider shoulders for bicyclists and pedestrians, as well as additional room for traffic to maneuver around disabled vehicles.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•The existing Washington bridge approach to the overhead main span will be widened; this will involve removal of the existing raised sidewalks and installation of precast concrete panels at road level on both sides of the bridge •The existing concrete bridge deck and sidewalks through the overhead main span and most of the Oregon approach span will be completely removed and replaced with full width precast concrete deck panels •The existing dip on the Oregon-side approach will be reduced by raising and widening the last bridge span •The existing raised three-foot wide sidewalks will be replaced with five-foot wide shoulders at road level •Steel guardrail will be bolted to the top of one-foot-high curb on each side of the bridge; new railing, designed to replicate the appearance of the existing railing, will be installed on top of the guardrail (see proposed design drawing) •Additional lighting designed to reflect the historic nature of the bridge will be installed along the entire length of the bridge •Seismic retrofitting work will be completed on the bridge supports •The aerial and shipping navigation lighting system on the bridge will be upgraded •A new drainage system will be installed that will allow stormwater to be discharged through the bridge deck and into new vegetated areas on the Oregon and Washington sides of the bridge	$25.4M	2	$12.7M

Troup Howell Bridge, Rochester, New York

$37 million multi-year project to replace the 8-span I-490 bridge over the Genesee River in downtown Rochester, New York is the third phase of the State's commitment to improve I-490 between the Erie Canal west of Rochester and the Genesee River, also known as the Western Gateway Project.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Most of the structure will be replaced, including all of the original 1955 structure; however, the newer eastern spans will be retained and rehabilitated •xxx •Xxx	$37M	1.33	$27.8M

SR 104 Hood Canal Bridge East-half Replacement and West-half Retrofit Project, Washington

When finished, the Hood Canal Bridge will have a new wider east-half floating section, new approach sections and transition trusses on the east and west ends. In addition, the west half will be widened to allow for continuous 8-foot shoulders across the entire length of the bridge -- matching the new east half. View the future look of the bridge in the design visualization photograph.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Under Construction; new pontoons will be floated into place in spring 2007 •Replaces the east half floating portion of the bridge •Replaces the east and west approach spans •Replaces the east and west transition truss spans	$274.7M	6 (1.5 miles x 4 lanes)	$45.8M

Tacoma Narrows Bridge, Tacoma, Washington

Existing Site
Existing Tacoma Narrows bridge currently has two narrow lanes in each direction without shoulders.

Description: Design visualization of the new parallel suspension bridge. The new bridge will carry three lanes with shoulders and the old bridge will be remodeled to carry three lanes with shoulders. The project also includes 3.5 miles of roadway and and an associated toll plaza.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
• Adds new 1 mile long suspension bridge and remodels existing bridge • Constructs 3.5 miles of roadway and associated toll plaza • Design Build project so the cost per lane mile includes the cost to design the project as well as construct it.	$615 M	25 (Bridge only 6)	$24.6M Bridge Only $ 67.2 M

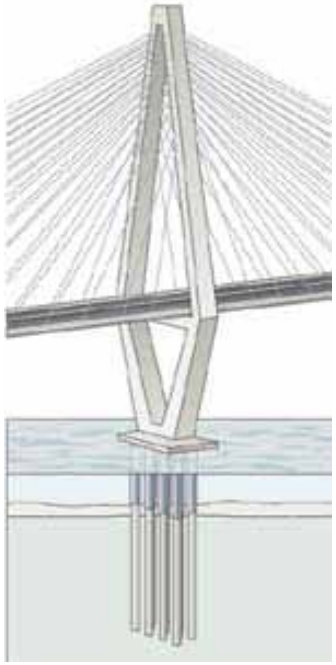
San Francisco -Oakland Bay Bridge, California

Existing Site
Earthquake damage on the east span of the he existing Oakland Bay bridge

Description: Design visualization of the new suspension bridge. The new bridge will carry 5 lanes in each direction. The engineers estimate was $740 million. The sole bid was offered May 26 of $1.4B with use of foreign steel and $1.8B using domestic steel. Record steel prices are the key factor in the huge differential, but the span's unique design, tough schedule and strict specifications also played a factor in ratcheting up the bid contingencies.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•11,525' east span •Five lanes in each direction	$1.4B- $1.8B	21.8	$64.2M- $82.6M

Cooper River Bridge Project, Charleston, South Carolina



The cable-stayed span hangs from two diamond towers at each end of the 1546 foot span. A signature icon for the Charleston region, these towers reach over 575 feet into the air and support a road deck almost 200 feet above the median high tide mark. Specialty features include platforms and tower elevators, included for safety inspections and maintenance.

Description	Project Cost in 2004 Dollars	Lane Miles	Cost per Lane Mile
•Design Build Project scheduled to open in the summer of 2005; completion July 2006 •The mainline structure accommodates eight lanes of traffic – four in each direction – separated by a center barrier •Unlike the existing Grace Bridge, which has 10-foot lanes, the new bridge will have twelve-foot traffic lanes •Two primary interchanges	$650M	2.34	$278M