State Facilities Action Plan

Briefing: Strategic Issues Facing WSDOT in the Puget Sound Region

PSRC Transportation Policy Board
July 13, 2017
Overview

• PSRC has requested that WSDOT produce a State Facilities Action Plan:

  2. Address near-term performance and funding deficiencies. The updated Transportation 2040 will identify near-term actions to improve system performance and close additional funding gaps, including:

   • A State Facilities Action Plan will document state efforts to develop an I-5 action plan identifying low cost operational improvements and a clear I-5 preservation plan, improve the flow of HOV lanes, and accelerate seismic retrofits. State plans for future projects beyond those in Connecting Washington will also be covered.

• Addresses some of the most strategic issues that must be confronted before the next major regional transportation plan update for 2050

• Secretary Millar will discuss WSDOT’s organization changes

• State Facilities Action Plan presentation will address:
  – I-5 Operational Improvements (Matt Neeley)
  – I-5 Preservation Needs (Rob Fellows)
  – Seismic Preparedness (Rob Fellows)
  – HOV Speed and Reliability (Rob Fellows)
  – State Routes of Local Interest (Charles Prestrud)
Current Organizational Structure
Organizational Changes

BEFORE

- Strategic Employee & Enterprise Services
  - M. North

- Human Resources & Safety
  - T. Dowler*

- Information Technology
  - G. Rodeheaver

- Lean Process Improvement
  - R. Burgess

- Risk Mgmt. & Legal Services
  - K. Larsen

- OSAPA
  - D. Bremmer

- Chief Financial Officer
  - A. Arnis

- Budget & Financial Analysis
  - D. Vaughn

- Accounting & Financial Svcs
  - J. Dahl

- Capital Program Development & Management
  - J. Alexander

- Innovative Partnerships
  - A. Buckley

AFTER

- Finance & Administrative Services
  - M. North

- Chief Financial Officer
  - D. Vaughn

- Human Resources & Safety
  - T. Dowler*

- Information Technology
  - G. Rodeheaver

- Accounting & Financial Svcs
  - J. Dahl

- Capital Program Development & Management
  - J. Alexander

- Innovative Partnerships
  - A. Buckley

- Budget & Financial Analysis
  - E. Greef

- Risk Mgmt. & Legal Services
  - K. Larsen

- Lean Process Improvement
  - R. Burgess

- Innovative Partnerships
  - A. Buckley

* Acting
Organizational Changes

BEFORE

- Tolling
  - P. Rubstello

- Deputy Director
  - E. Barry

- Systems
  - J. Charlebois

- Business Admin.
  - P. Saleh

AFTER

- Urban Mobility & Access
  - P. Rubstello

- Regional Transit Coordination
  - D. Counts

- Management of Mobility
  - Vacant

- Tolling
  - E. Barry
Organizational Changes

BEFORE

Engineering & Regional Operations / Chief Engineer
L. Laird

- Deputy Chief Engineer Regional Operations
  K. Dayton

- Northwest Region
  L. Eng

- North Central Region
  D. Sarles

- Olympic Region
  J. Wynands

- Southwest Region
  K. Strickler

- South Central Region
  T. Trepanier

- Eastern Region
  M. Gribner

- Alaskan Way Viaduct
  J. Hedges

- SR 520
  J. Meredith

- Construction
  C. Christopher

- Development
  J. Carpenter

- Traffic Operations
  J. Nisbet

- Maintenance Operations
  P. Bakotich

- SR 167/SR 509 Gateway Project
  C. Stone

AFTER

Regional and Mega Programs / Chief Engineer
K. Dayton

- Mega Projects
  Vacant

- Alaskan Way Viaduct
  J. Hedges

- SR 520
  J. Meredith

- I-405
  K. Henry

- SR 167/SR 509 Gateway Project
  C. Stone

- Eastern Region
  M. Gribner

- Northwest Region
  L. Eng

- North Central Region
  D. Sarles

- Olympic Region
  J. Wynands

- Southwest Region
  K. Strickler

- South Central Region
  T. Trepanier

- Eastern Region
  M. Gribner
Organizational Changes

**BEFORE**

- Community and Economic Development
  - Vacant
- Planning
  - K. Woehler
- Aviation
  - T. Atkins
- Freight, Rail & Ports
  - R. Pate
- Public Transportation
  - B. Lagerberg
- Active Transportation
  - B. Chamberlain
- Local Programs
  - K. Davis

**AFTER**

- Multimodal Development & Delivery
  - Vacant
  - Position TBD
- Planning
  - K. Woehler
- Aviation
  - T. Atkins
- Safety/Quality
  - J. Milton
- Development
  - J. Carpenter
- Construction
  - C. Christopher
- Traffic Operations
  - J. Nisbet
- Maintenance Operations
  - P. Bakotich
- OSAPA
  - D. Bremmer
- Freight, Rail & Ports
  - R. Pate
- Public Transportation
  - B. Lagerberg
- Active Transportation
  - B. Chamberlain
- Local Programs
  - K. Davis
New Organizational Structure

* Acting
** These divisions shift to Multimodal Development and Delivery office will be delayed until the Assistant Secretary position is filled.
I-5 Operational Improvements

Paper addresses:

• I-5 operational issues and possible improvements

• “Operational improvements” defined as changes to use available capacity more efficiently and mitigate weather, incidents or events

• Examples include:
  – ramp meters
  – active traffic management
  – incident response
  – integrated corridor management
  – traveler information
  – changes in geometrics or striping
  – shoulder running or auxiliary lanes
  – peak period managed lanes

• Excludes HOV/managed lanes (addressed in a different briefing paper)
I-5 Operational Improvements

From 2016 Corridor Capacity Report

- I-5 accounts for 56% of total freeway delay in the Puget Sound region
- Delay more than doubled between 2011 and 2015 due to growth in travel
- Delay increased between 2013 and 2015 at bottleneck locations
  - In Tacoma, partially due to construction

Examples of operational changes making a difference

- Congestion through Joint Base Lewis-McChord decreased by 16%
  - In part due to installation of 18 new ramp meters
- New peak use shoulder lane on Northbound I-405 has reduced congestion, increased throughput, and reduced travel times
I-5 Operational Improvements

**WSDOT is beginning a work plan to identify near-term improvements**

- Starting with two pilot projects
  - Tumwater to Mounts Rd.
  - Corson Ave. to King/Snohomish line

**Scope of Work:**
- Prepare baseline operational models
- Engage partners and service providers to brainstorm near term operational/demand management strategies
- Identify “design and/or construction ready” previously identified strategies

- Moving Forward
  - Assess and or model strategies
  - Identify near-term opportunities
  - Consider options to expand analysis area

**Example strategies:**

- **New or upgraded ramp meters**
  - Upgraded meters through Seattle
  - New meters at Mercer St., Spokane St., Marysville

- **HOV lane dynamic control**
  - Southbound, Mercer to Corson

- **Integrated corridor management**
  - South Seattle/SODO

- **Peak use shoulder lane**
  - Northbound SR 528 to Everett
  - Lake City Way to Northgate vic.

- **Modify NB I-5 Express Lanes Connection**

- **Restripe to add HOV lane**
  - Northbound Seneca to Olive
I-5 Operational Improvements

Remaining work

Completed paper will include:

• Application of Practical Solutions to operational issues
• Description of pilot assessment process
• Summarize near-term benefits of operational investments
• List of I-5 system improvements projects that are ready to go
• Summary of outreach and input
• Approach and overview of longer-range I-5 Action Plan

More work needed to plan for 2050:

• With corridor stakeholders, assess future needs and opportunities for I-5
I-5 Preservation Needs

Pavement

- I-5 has 800 lane miles of pavement, plus 200 lane miles of ramps
- Portland Concrete Cement built in the 1960s had expected 20-year life
  - Out-performed expectations, but now nearing the end of its service life
  - WSDOT has been proactive addressing poor pavement conditions
  - 9% is currently rated in poor condition
- Best practices
  - Use panel replacement and grinding to extend concrete life
  - Resurface asphalt every 15-18 years
  - Use life cycle cost analysis to decide whether to replace with asphalt or concrete, or to use crack-and-seat method to recycle existing pavement as new foundation
- Due to heavy and growing traffic volumes, preservation construction must be balanced by maintenance of mobility needs
- $1.2B needed for pavement preservation through 2040
I-5 Preservation Needs

Bridges

- I-5 has 147 mainline bridges, and another 178 for interchange ramps
- All bridges are safe for travel and 1.4% are rated in poor condition
- Ongoing bridge preservation needed to achieve assumed 80-year life
- $675 M needed for bridge preservation and replacement through 2040
- Many bridges will start to need replacement in the 2040’s decade

![Age Distribution of Bridge Structures in 2040](chart.png)
Summary of I-5 Preservation Needs

- Life-cycle costs must be addressed for other highway elements including drainage culverts, storm water systems, illumination, signals, ITS, barriers
- Total need through 2040: $2.5 B
  - Approximately 18% of statewide total preservation need through 2040.

<table>
<thead>
<tr>
<th>Asset Type – I-5 Puget Sound Region</th>
<th>Estimated Preservation Need through 2040 (millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavements</td>
<td>$ 1,200</td>
</tr>
<tr>
<td>Bridges</td>
<td>$ 675</td>
</tr>
<tr>
<td>Major Drainage (Including Fish Barriers)</td>
<td>$ 100+</td>
</tr>
<tr>
<td>Major Electrical Barriers</td>
<td>$ 468</td>
</tr>
<tr>
<td>Total</td>
<td>Approximately $2.5 Billion</td>
</tr>
</tbody>
</table>

Approximately $2.5 Billion
I-5 Preservation Needs
Next Steps

**Completed paper will include:**

- Additional detail, graphics and maps
- Recent and upcoming preservation work
- Application of Practical Solutions to preservation program
- Clarify what will be funded under current program assumptions

**More work needed to plan for 2050:**

- Identify strategies and funding needs for bridge replacement or preservation in the 2040’s decade
- Strategies for maintaining mobility during construction
Seismic Preparedness

**WSDOT seismic preparedness activities**

- Seismic retrofits to bridges and ferry facilities
- Participation in emergency management and resilience programs

**Bridges**

- $195M spent to retrofit over 300 bridges statewide and partially retrofit over 100 more
  - Further work needed to jacket multi-column bridge piers columns with steel
- $1.5B needed to fully retrofit all 594 bridges in need of strengthening statewide
  - $1.1B in the Puget Sound region
Seismic Preparedness

**Lifeline System**

- To prioritize needs, a “lifeline system” is identified:
  - Restore essential services within 3-7 days
  - Operational within 3 months
  - Focused on connecting major ports between JBLM and Everett

- $161M in estimated need to finish the lifeline system.
  - Funded in most recent transportation budget
  - Expected to be complete in 2027.

- Central I-5 corridor through Seattle includes multiple hollow-column structures that would be expensive to retrofit
  - Estimated at $550M
  - Not included in the funded lifeline.
Seismic Preparedness

Ferries:

• Vashon and Point Defiance terminals operational in a 100 year event
• New Mukilteo and Seattle terminals will withstand an 1,000 year event
• WSF is identifying costs and priorities to remedy deficiencies in ferry terminal foundation structures including effects of liquefaction.

Emergency Management and Resilience Programs

• WSDOT coordinates with the WA State Emergency Management Department, Seismic Safety Committee of the Emergency Management Council, the CSZ Transportation Resiliency Assessment program, and local emergency planners.
• Ten available Emergency Operation Centers located statewide.
• WSDOT continues to provide input to Recommendation #6 of the 2012 Resilient Washington Report, which is due on June 30, 2017.
Seismic Preparedness
Next Steps

Completed paper will include:

• Additional detail, graphics and maps
• Additional information from results of work to update Resilient Washington plan

More work needed to plan for 2050:

• Research for impacts of a Cascadian Subduction Zone 2,500-year event
• Research and estimate retrofit work to address liquefaction
• Expanded efforts to prepare for tsunami threats
• Coordination preparedness for vital non-state roadways
• Continued work on WSDOT Catastrophic Incident Plan due Summer 2018
• Continued work on non-structural components of the lifeline system
HOV Speed and Reliability

Core Freeway HOV System

• Over 250 lane-miles of HOV lanes
• Purposes:
  – Provide fast and reliable service to regional centers
  – Maximize the person-carrying capacity of the freeway system
• Begun in 1980’s to support new Metro express bus service
• Complementary park and ride and freeway stations
• Supports largest vanpool fleet in the United States

HOV Speed and Reliability

• WSDOT and regional partner agencies defined a speed and reliability standard of 45 mph during peak hour on 90% of weekdays over six months
• 2016 Corridor Capacity Report shows portion of weekdays meeting 45 mph standard has plummeted in peak direction, especially on I-5 and I-405
  – AM Federal Way to Seattle met standard 72% of weekdays in 2011; 18% in 2015
  – Transit service is slower, less reliable and more expensive to operate
Options for managing HOV speed and reliability

- HOV is one type of “managed lane,” which manage volumes to match capacity using:
  - Limited access points
  - Limited user eligibility (e.g., vehicle occupancy)
  - Price

- Changing HOV rules requires difficult policy choices
  - Hard to take benefits from existing users
  - Pricing options are controversial
  - Challenging to change eligibility to match demand and capacity sustainably

- WSDOT’s approach to date has focused on other “managed lane” options, including HOT and express toll lanes
  - SR 167 HOT lanes and I-405 express toll lanes use pricing to more closely match volume and capacity
I-405 express toll lanes have performed well

- Meeting 45 mph standard
  - In two-lane section
  - Northbound since opening peak use shoulder lane
- Getting full use of capacity
  - Moving 1700-2000 vehicles per hour in dual-lane segment
  - Previous HOV lane carried 1300 vehicles/hour or less
- Controversy resulted from
  - Bringing more traffic into an existing bottleneck
  - Loss of HOV lane access for 2-person carpools during peaks
HOV Speed and Reliability

Remaining work

**Completed paper will include:**
- Added detail on HOV speeds and reliability performance and issues
- More background on managed lanes
- Description of collaborative process WSDOT proposes to determine the way forward on HOV and managed lanes

**More work needed to plan for 2050:**
- WSDOT proposes to work with PSRC to evaluate alternative strategies for managing congestion on the state’s highway network in the Puget Sound
  - Understand changing role of HOV lanes for transit
  - Assess managed lanes, pricing, operational and demand management strategies
  - Consider cost effectiveness and a broad range of performance measures
Local Interest State Routes

What are Local Interest State Routes?

- State highways that communities rely on for regional travel and local circulation
  - Usually principal or minor arterials; often function as “main streets”
  - Serve a wide range of needs, including daily commuting, commerce, non-motorized travel, transit and school bus routes, and emergency services access
  - Growth is exacerbating congestion on these routes, while state and local investments have not kept pace to address growing local access and mobility needs

Paper addresses:

- How WSDOT will update and confirm recommended projects from previous studies
- Prioritization of mobility needs in these corridors
Local Interest State Routes

Growing Demand and Competing Objectives

- Population and employment growth has caused rapid rise in travel
- Sparse arterial networks, pass-through traffic, limited capacity and limited access control have added to demand on these routes
- Safety objectives, pedestrian and bicycle needs, environmental concerns and limited right of way constraint roadway capacity solutions
Local Interest State Routes

System implications
• Impacts of added traffic from expanded local highways on congested freeways must be considered
• Regional policies on balancing land use and transportation
• Connections to HOV/express system

Practical solutions
• Emphasizes lower cost enhancements that address essential corridor functions and improve performance
• Identifies performance gaps in collaboration with local partners and evaluate trade-offs among competing objectives.
• Considers policy change, local network improvements, operational improvements, or demand management strategies before new capacity
• Aims to identify the most cost-effective solutions to satisfy functional needs
Local Interest State Routes
Remaining work

Completed paper will include:

• WSDOT proposed work plan to apply practical solutions approach to local interest state routes
  – Process to review whether projects and plans completed previously need to be updated, revisited and/or reconfirmed
  – Process to assess emerging needs, and identify and prioritize practical strategies
  – List of planned and funded capital projects in Transportation 2040
  – Work plan for completing these activities

More work needed to plan for 2050:

• Implement the work program
• Work with PSRC to align investment priorities to provide the Legislature with consistent and technically-supported, cost-effective transportation program recommendations
CONTACT

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