

Washington State Department of Transportation
Strategic Planning & Research
2015-2017 Biennium Work Program

Part 1: Planning

Part 2: Research



Washington State
Department of Transportation

Effective Date: July 1, 2015 – June 30, 2017

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Program Overview

Introduction

Transportation has a profound effect on the character of a community and affects access to jobs, education, recreation, health and wellness opportunities, and goods and services. In order to make good decisions about transportation - a major factor in economy and quality of life - we need to have good information.

The transportation planning process determines how the existing system is performing, and what transportation issues are likely to exist in the future. It also identifies ways to address problems and improve system performance. Planning is where government, business, and communities come together to solve problems and to support decision-making.

The planning process is more than a list of transportation projects. Planners develop strategies for operating, managing, maintaining, and financing the transportation system to advance long-term societal goals. Planning ensures responsible, efficient, affordable transportation projects and is key to achieving the agency vision:

**The Washington State Department of Transportation's vision is
to be the best in providing a sustainable and integrated
multimodal transportation system.**

To work toward this vision, WSDOT Secretary of Transportation Lynn Peterson's strategic plan for 2014 to 2017, *Results WSDOT – Setting WSDOT's Direction*, emphasizes greater community involvement and partnerships, agency efficiency and innovation, and a multimodal approach to transportation system capacity. It combines WSDOT's strengths with values and goals to ensure the agency continues to be innovative, efficient, effective, and trustworthy in serving the needs of our customers. The agency's work program for Strategic Planning & Research activities in 2015-2017 outlines activities consistent with that direction to strengthen partnerships, to increase credibility, drive priorities, and inform decision-making.

Results WSDOT Goals:

www.wsdot.wa.gov/Secretary/ResultsWSDOT.htm



Strategic Investments:

Effectively manage system assets and multimodal investments on corridors to enhance economic vitality



Modal Integration:

Optimize existing system capacity through better interconnectivity of all transportation modes



Environmental Stewardship:

Promote sustainable practices to reduce greenhouse gas emissions and protect natural habitat and water quality



Organizational Strength:

Support a culture of multi-disciplinary teams, innovation, and people development through training, continuous improvement, and Lean efforts



Community Engagement:

Strengthen partnerships to increase credibility, drive priorities, and inform decision making



Smart Technology:

Improve information system efficiency to users and enhance service delivery by expanding the use of technology

As part of the agency's strategic plan, WSDOT is undertaking Practical Solutions to enable more flexible and sustainable transportation investment decisions. It encourages this by increasing the focus on project purpose and need throughout all phases of project development. It engages local stakeholders at the earliest stages of defining scope to ensure their input is included at the right stage of planning and project design.

Transportation infrastructure investment decisions have wide-ranging implications for the long-term sustainability of our community, economy, and environment. The systems built over the last half a century have fueled strong economic growth, but those systems are in urgent need of repair and maintenance.

Practical Solutions is a two-part approach:

- Least Cost Planning is an approach to making planning decisions that considers a variety of conceptual solutions to achieve the desired system performance targets. Central to least cost planning is a process that engages the public, applies methods to evaluate planning options, and provides guidance on how to select options.

- Practical Design is an approach to making project decisions that focuses on the need for the project and looks for cost-effective solutions. A fully implemented practical design approach applies to all aspects of transportation system development, from system planning through all phases of project development.

Strategic Planning & Research activities are critical to the successful implementation of Practical Solutions.

Consistent with WSDOT's Community Engagement Plan, staff will solicit and document feedback that provides clarification, transparency, accountability, and supports the linkage between planning and programming.

Purpose of the Work Program

This Strategic Planning and Research (SPR) work program for the 2015-2017 biennium meets federal requirements for data and the implementation of a comprehensive, cooperative, and continuing planning process to ensure continued eligibility to receive and use federal transportation funds. There will be adequate resources to support identified activities—emerging needs will be prioritized against the existing program and adjustments made as necessary.

The Moving Ahead for Progress in the 21st Century Act (MAP-21) requires that States set aside two percent of the apportionments they receive from four of the core Federal-aid programs for State planning and research activities. Of this amount, States must allocate 25 percent for research, development, and technology. States are required to document proposed use of planning and research funds in a work program approved by USDOT.

The Washington State Department of Transportation's (WSDOT) strategic planning and biennial budget process defines the policy direction for the planning and research work program and identifies priorities for planning and research activities during the biennium. This policy direction includes funding levels, source of funds, and – in some instances – guidance as to project scope. Taken as a whole, the WSDOT SPR program recognizes that the state's transportation system is multimodal and inextricably linked to Washington's politics, economy, and environment; driven in large part by the pattern of our communities' physical development and social fabric. This approach supports the federal statewide planning framework and the transportation policy goals in state statutes.

This work program includes both federal and state funds. Since neither the federal planning factors nor the state policy goals are prioritized, the program seeks to balance overarching policies for safety and asset preservation, with the need to develop strategies to address not only current, but likely future system performance needs.

Work Program Priorities

Connections between WSDOT’s Strategic Plan, Federal Planning Factors and State System Policy Goals

	WSDOT’s Strategic Plan					
	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6
Federal Planning Factors <i>Title 23 of the United States Code, section 134(h) describes Federal Planning Factors issued by Congress for statewide planning and programming to address.</i>						
Support the economic vitality of the United States, the States, metropolitan areas, and nonmetropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.	X				X	
Increase the safety of the transportation system for motorized and non-motorized users.	X	X				X
Increase the security of the transportation system for motorized and non-motorized users.	X	X				X
Increase accessibility and mobility of people and freight.	X	X			X	X
Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.			X		X	
Enhance the integration and connectivity of the transportation system, across and between modes, throughout the State, for people and freight.		X		X	X	X
Promote efficient system management and operation.				X	X	X
Emphasize the preservation of the existing transportation system.	X	X			X	
Statewide Transportation System Policy Goals <i>State Transportation System Policy Goals (RCW 47.04.280) are the basis for establishing detailed and measurable objectives and related performance measure.</i>						
Economic Vitality: To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.	X	X				
Preservation: To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services.	X	X				
Safety: To provide for and improve the safety and security of transportation customers and the transportation system.	X					X
Mobility: To improve the predictable movement of goods and people throughout Washington State.	X	X			X	X
Environment: To enhance Washington’s quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.	X	X	X		X	X
Stewardship: To continuously improve the quality, effectiveness, and efficiency of the transportation system.	X	X	X	X	X	X

SPR Funding and Reporting

Program Funding

The state legislature provides state and federal appropriation authority for the planning and research program on a biennial basis, from July 1 through June 30 of odd-numbered years. The state appropriation is used to match the federal funds available as well as provide for a certain level of nonfederal expenditures. The federal appropriation establishes a limit for federal expenditures for SPR funds based on estimates of availability of these funds for the biennium. This limit can be increased if more federal funding becomes available than was anticipated at the time of the biennial appropriations, with a corresponding decrease to the state funds appropriation. However, this limit must be approved before any expenditure of additional funds can be made. The federal appropriation can also be increased when other unanticipated federal funds become available through supplemental appropriations or unanticipated receipts. Supplemental appropriations are made by the legislature; unanticipated receipts are approved by the Office of Financial Management through the Finance and Administration Division.

Because the federal fiscal year does not begin until October 1 and new apportionments are not available until that time, the WSDOT will reserve enough of the prior federal fiscal year's apportionment to finance the new work program for the first three months of each state fiscal year. Additional obligation documents will be submitted to the Federal Highway Administration (FHWA) when additional federal funds become available to fully finance the approved work program.

2015-2017 Reporting

WSDOT will monitor implementation of the 2015-2017 SPR work program and provide periodic progress reports to federal partners consistent with requirements. Performance and expenditure reports will compare performance with established goals and describe progress with corresponding financial information.

Timing:

- Jan 2016 – progress report.
- July 2016 – progress report.
- Jan 2017 – progress report.
- July 2017 – FY 15-17 close-out report.

Part 1: Planning

- Section 1: Multimodal System Planning
- Section 2: Planning Partnerships
- Section 3: System Performance and Analysis
- Section 4: Data and Planning Applications
- Section 5: Management and Administration

Planning Connections to Federal Planning Factors and Statewide Transportation System Goals

Federal Planning Factors	
Support the economic vitality of the United States, the States, nonmetropolitan areas, metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.	x
Increase the safety of the transportation system for motorized and non-motorized users.	x
Increase the security of the transportation system for motorized and non-motorized users.	
Increase accessibility and mobility of people and freight.	x
Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.	x
Enhance the integration and connectivity of the transportation system, across and between modes, throughout the State, for people and freight.	x
Promote efficient system management and operation.	x
Emphasize the preservation of the existing transportation system.	x
Statewide Transportation System Policy Goals	
Economic Vitality	x
Preservation	x
Safety	x
Mobility	x
Environment	x
Stewardship	x

Area 1: Multimodal System Planning

“WSDOT will ensure Washington has the most efficient and integrated multimodal transportation system possible, utilizing all available system capacity.”

- Secretary Lynn Peterson

Transportation has a profound effect on the character of a community and affects access to jobs, education, recreation, health and wellness opportunities, and goods and services. In order to make good decisions about transportation - a major factor in economy and quality of life - we need to have good information.

The transportation planning process determines how the existing system is performing, and what transportation issues are likely to exist in the future. It also identifies ways to address problems and improve system performance. Planning is where government, business, and communities come together to solve problems to support decision-making.

The planning process is more than a list of transportation projects. Planners develop strategies for operating, managing, maintaining, and financing the transportation system to advance long-term societal goals. Planning ensures responsible, efficient, affordable transportation projects. Failure to do transportation planning would result in a loss of federal funding for transportation.

This work element includes the following sub-areas:

- Subarea 1.1: Washington State Transportation Plan 2035- Phase 2
- Subarea 1.2 Statewide Modal Planning Integration
- Subarea 1.3: Planning Policy Development and Guidance
- Subarea 1.4: Planning Analysis and Plan Development
- Subarea 1.5: Corridor and Network Planning
- Subarea 1.6: Prioritization and Programming of Capital Improvement Projects

Estimated Costs for Multimodal System Planning

SPR	4,305,760	State	2,253,890	Total	6,559,650
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Subarea 1.1: Washington Transportation Plan 2035 – Phase 2

The Washington Transportation Plan (WTP) is a blueprint for transportation investment in Washington State. It is built around the state transportation policy goals listed in RCW 47.04.280 (Economic Vitality, Preservation, Safety, Mobility, Environment, and Stewardship). The plan also addresses the planning factors spelled out in federal rule, 23 CFR 450.206. The WTP is jointly developed by the Washington State Transportation Commission and WSDOT. In January 2015 Phase 1 of the WTP was adopted by the Washington Transportation Commission and provides policy guidance and recommendations across all transportation modes and regions in the state.

WSDOT will, by December 2017, create and submit WTP – Phase 2 as the federally compliant long range statewide transportation plan that will include a 20 year forecast period for the development and implementation of the state’s multimodal transportation system. The plan will integrate multimodal content from federal, state, regional, local, and tribal transportation plans.

Activities for this effort include:

- Develop a collaborative multimodal performance goal setting and decision-making process.
- Track the status of recommendations from Phase 1, WSDOT modal plans, MPO plans, RTPO plans, tribal plans, and other transportation plans and determine which recommendations may be implemented in Phase 2.
- Develop Scope of Work consistent with 23 CFR 450.206 & 214.
- Develop project timeline.
- Reactivate the WTP 2035 - Phase 1 Advisory Group.
- Reactivate the WTP 2035 - Phase 1 Steering Committee.
- Implement strategies found in policies such as Results WSDOT, RCW 47.04.280, Governor’s Executive Order 14-04, and MAP-21; and transportation plans consistent with 23 CFR 450.208.
- Document processes for consulting with nonmetropolitan local officials and tribal consultation as required in 23 CFR 450.210.
- Develop a communications plan that describes internal and external outreach.
- Follow WSDOT’s tribal communication protocol and provide updates to WSDOT’s Tribal Liaison.
- Document compliance with WSDOT’s Title VI, Environmental Justice, and Limited English Proficiency plans as per 23 CFR 450.218.
- Conduct outreach including, but not limited to, presentations and briefings to federal, state, tribal, and local governments; metropolitan and regional planning organizations; other interested parties, and business groups.
- Assist in WSDOT modal plan updates to coordinate planning activities as required in 23 CFR 450.208.
- Integrate WSDOT modal plans into Phase 2 as per 23 CFR 450.208.
- Describe any performance measures or targets developed per MAP-21.
- Provide logistical and administrative support to Advisory Group and Steering Committee.
- Develop draft and final reports.
- Certify to the FHWA and FTA that WSDOT meets or substantially meets federal statewide planning requirements.

Estimated Costs for WTP 2035 -Phase 2

SPR	334,920	State	83,730	Total	418,650
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Subarea 1.2: Statewide Modal Planning Integration

WSDOT develops separate system plans that describe the states' interests in ferries, state highways, rail, aviation, freight, bicycle transportation, pedestrian walkways, and public transportation. These are typically known as "modal" plans and are funded by state funds or through specific agreements with USDOT agencies. Although it is not technically a modal plan, WSDOT includes Strategic Highway Safety Plan activities in this subarea.

This subarea integrates into the statewide transportation planning process, directly or by reference, the goals, objectives, performance measures, and targets in modal and other state transportation plans and transportation processes as required by 23 USC Section 135.

Activities include:

- Strategic Highway Safety Plan
 - The Washington Traffic Safety Commission leads the update of the Strategic Highway Safety Plan (Target Zero). WSDOT's participation activities could provide the following support using SPR funds:
 - Policy expertise to ensure consistency with statewide plans, policies, and requirements;
 - Data as requested;
 - GIS mapping services as requested;
 - Facilitation with MPOs and local governments; and
 - Reviewing drafts and appendices.
- Washington Aviation System Plan
 - WSDOT's Aviation Division secured FAA funds to update the Aviation System Plan. The Multimodal Division, Freight Division, and Regions will provide the following support using SPR funds:
 - Policy expertise to ensure consistency with statewide plans, policies, and requirements;
 - Freight technical expertise regarding air cargo/surface connections and the economic growth during development of the Aviation System Plan;
 - Data as requested;
 - Coordination with MPOs and local governments to discuss potential impacts to local transportation systems; and
 - Reviewing drafts and appendices for consistency with statewide planning processes.
- Accessible Pedestrian Walkways and Bicycle Transportation Facilities
 - Participate in the development of policies, guidance, and procedures to improve multimodal transportation connections that enhance the unique characteristics of communities and regions.
 - Continue to have periodic regional non-motorized coordination meetings with pedestrian/bicycle organizations and local agency partners.
 - Continue to lead a region pedestrian/bicycle group to coordinate agency non-motorized planning and development.
 - Continue to partner with various local entities with non-motorized data collection by loaning temporary data collectors and assisting with data download/analysis.

- Act as the advocate for bicycle, pedestrian and transit on WSDOT projects, active transportation planning, and dealing with the public in these areas.
- National Freight Program
 - Work with the six state agencies and associations that comprise the State Interagency At-Grade [Rail] Crossing Workgroup to address passenger and truck freight mobility issues caused by increasing freight rail traffic.
 - Develop guidance for truck freight issues for WSDOT’s Corridor Sketch Plans, Practical Design/Least Cost Planning pilots, and the Move Washington traffic/operations initiative.
 - Work with internal and external partners to produce the Freight Goods and Transportation System biennial update in SFY16.
 - Provide and update GIS maps of the FGTS, State Freight Economic Corridors, and major freight supply chains.
 - Provide a technical update of the Washington State Freight Plan in 2016 to provide current data for the WTP - Phase 2. The update may (1) automate the update of the GIS-mapped State Freight Economic Corridors and (2) update the Plan’s freight project list in partnership with MPOs, RTPOs, Tribes and ports.
 - Administer the Statewide Freight Working Group for collaborative freight planning.
 - Enhance the Commercial Vehicle Pass System, including system testing to ensure viability in the event of an emergency roadway closure.
- Public Transportation
 - The Public Transportation Division will complete the Statewide Public Transportation Plan update.
 - The Multimodal Planning Division will provide policy expertise to ensure consistency with statewide plans, policies, and requirements and provide data as requested.
 - Participate in the development of WSDOT guidance for public transportation and demand management strategies for Corridor Sketch Plans, Practical Design/Least Cost Planning pilots, and the Move Washington traffic/operations initiative.
 - Comment on demand management action strategies that relieve congestion and improves safety by providing additional transit and non-motorized capacity for a given set of trips.

Estimated Costs for Statewide Modal Planning Integration

SPR	1,214,400	State	303,600	Total	1,518,000
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Subarea 1.3: Planning Policy Development and Guidance

Work in this area assists WSDOT in developing and implementing new policy directives, initiatives, strategies and practices. Work also provides guidance and training related to transportation planning issues such as growth management and transportation-efficient land use; integration of state, regional and local plans; multimodal connectivity; system and facilities preservation; operations; safety; economic prosperity; accessibility and mobility; environmental quality and health; and climate, energy, and sustainability issues.

Activities include:

- Develop guidance for implementation of least cost planning.
- Multimodal performance in context: Policy development process to analyze and propose resolution to WSDOT's pursuit of measures of performance that are more multimodal, more contextual, and provide for an array of users of the transportation system.
- Transportation Efficient Communities Team: With Washington State departments of Commerce, Ecology, and Health, develops joint information and data resources, guidance materials, and related tools for local government agencies which are in GMA update phase.
- Integrate non-motorized bike and pedestrian content into planning studies and provide guidance through examples of best practices.
- Integrate climate adaptation strategies into planning studies and provide guidance through examples of best practices.
- Work with WSDOT Tolling and Traffic Offices on HOV/HOT policy development.
- Develop research problem statements for TRB and AASHTO consideration.
- Provide related staff development and training.

One of the key areas of planning policy development and guidance is implementing WSDOT's Practical Solutions initiative, which is still evolving, and in particular the Least Cost Planning part of the initiative. WSDOT is using Practical Solutions to enable more flexible and sustainable transportation investment decisions, increasing the focus on system performance.

Practical Solutions is a two-part approach:

- **Least Cost Planning** is an approach to making planning decisions that considers a variety of conceptual solutions to achieve the desired system performance targets. Central to least cost planning is a process that engages the public, applies methods to evaluate planning options, and provides guidance on how to select options.
- **Practical Design** is an approach to making project decisions that focuses on the need for the project and looks for cost-effective solutions. A fully implemented practical design approach applies to all aspects of transportation system development, from system planning through all phases of project development.

Estimated Costs for Planning Policy Development and Guidance

SPR	791,200	State	197,800	Total	989,000
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Subarea 1.4: Planning Analysis and Plan Development

This work element will provide for detailed planning analysis on priority issues identified in corridor sketches. Each effort will be “right-sized” and will be implemented consistent with a scope, schedule, budget, and WSDOT’s Community Engagement Plan.

This work element is under development and will be based on the outcomes of Highway System Plan and corridor sketches that are described in Subarea 1.5: Corridor and Network Planning.

Major activities in this subarea are expected to include developing plans and studies such as Intersection Justification Reports and Planning Studies.

Estimated Costs for Planning Analysis and Plan Development

SPR	-0-	State	171,450	Total	171,450
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Subarea 1.5: Corridor and Network Planning

The focus for this work element in the 2015-2017 biennium will be to develop and implement new least cost planning methods that are consistent with the Practical Solutions approach and emphasize multimodal integration. Corridor and network plans (or *Planning Studies*) will be based on information contained in “corridor sketches.” Information from these plans provides information needed to identify priorities in the WTP – Phase 2.

Corridor Sketch: WSDOT is developing this new initiative to designate “corridors” for each state highway. WSDOT will work with partners to establish a vision and gather relevant information resulting in a “one-stop shop” for WSDOT to store and retrieve background information and improvement ideas.

In developing corridor sketches, WSDOT will work with communities to:

- Implement Least Cost Planning at the corridor level;
- Conduct performance based planning; and
- Identify short-, mid-, and long-term multimodal performance gaps within corridors.

Headquarters Staff will:

- Update and revise the Highway System Plan (HSP) to incorporate WSDOT’s *Strategic Plan Elements, Moving Washington Forward* and least cost planning principles. The HSP will include an analysis of the future condition and 20-year forecasted needs of the state highway system that meets state requirements for a plan and provides some of the content requirements in 23 CFR 450.214 for the long-range statewide transportation plan (WTP - Phase 2).
 - The scope of the HSP update is still being finalized, but the update should include a programmatic approach as well as a corridor approach for identifying transportation performance gaps and cost-effective strategies to address them. The HSP update will use the “Corridor Sketch” initiative to integrate WSDOT’s least cost planning principles as well as Moving Washington Framework for all state highways.
 - Develop a communications plan to describe how WSDOT will conduct internal and external outreach for the HSP update.
 - Work with Regions, technical groups, MPOs, and RTPOs on the development and publication of the 2015-2034 update of the HSP.
- Continue to work on developing a clear linkage between the HSP and corridor planning studies, prioritization process, and projects summaries for capital highway projects, including the scope, schedule, and budget.
- Continuously review, analyze, improve, and update the different components of the 20-year Highway System Plan (HSP).
- Provide advice and assistance to the regions regarding the preparation of scope, schedule, and budget.
- Review and recommend headquarters’ approval of planning studies.
- Manage, track, coordinate, and recommend approval of funded planning studies.
- Develop and update tools and methods for identifying mobility needs, analyzing safety data, and calculating the benefits of multimodal transportation strategies.
- Collect and analyze modal (pedestrian, bicycle, passenger, and freight) data.

- Manage, coordinate, and conduct analysis on various transportation issues such as safety, pavement and bridge preservation, and traffic congestion to identify locations that operate below WSDOT’s performance thresholds and work with the Regions on developing cost-effective incremental solutions to address them.
- Expand the use of online GIS tools to share more information about highway system analysis.
- Develop and evaluate analysis tool(s) for determining the performance of mobility improvements on the state highway system.

Regions will:

- Develop corridor sketches and planning studies.
- Identify and document potential cost-effective strategies to address identified performance gaps. This includes a discussion of what’s working and what needs to change.
- Prepare vision statements.
- Integrate inputs and output of the corridor sketch process in the state, regional, and local multimodal plans that support the corridor, network and system performance.
- Solicit and document feedback from internal and external partners that provides clarification, transparency, accountability, and supports the linkage between planning and programming processes and investments.
- Continue coordination with MPOs, RTPOs, and local jurisdictions in the development and collection of pedestrian/bicycle data.
- Develop options for sharing information about long-term mobility needs, and biennial safety needs, in list and map formats, with internal and external customers.
- Perform traffic modeling for internal needs and in conjunction with other agencies.
- Continue to assist with model post-processing of future year volumes.
- Integrate findings of WSDOT’s statewide pilot, *Climate Impacts Vulnerability Assessment*.

Estimated Costs for Corridor and Network Planning

SPR	1,965,240	State	610,310	Total	2,575,550
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Subarea 1.6: Prioritization and Programming of Capital Improvement Projects

- Develop options for sharing information about long-term biennial safety needs in list and map formats with internal and external customers.
- Expand the use of geospatial analysis and presentation of existing and future processes; including expansion of existing map library.
- Implement an asset management process for state highway features and update or coordinate changes to meet established performance objectives.
- Develop a consistent set of tools to assist WSDOT Regions in identifying safety needs and developing cost-effective solutions to address them.
- Work with WSDOT’s Environmental Services Office to develop a ten-year plan for addressing storm water barriers on the state transportation network.
- Document and implement a programming policy; including timing/content of Project Definition, Project Summary, and Work Order Authorization, and their relation to phase starts.
- Establish and implement an improved process for tracking project priorities and implement a robust programming effort for rail crossing projects.
- Develop and implement basis of estimate (BOE) for capital preservation and improvement projects.
- Evaluate and implement a series of project performance estimates based on specific investment scenarios.
- Identify a process for a robust project scenario analysis given differing funding and revenue assumptions.
- Identify, standardize, and implement a method for tracking changes and communicating scope of projects as they move through the development and delivery process.
- Implement a standardized scoping process for capital improvement and preservation projects.
- Develop a ten-year plan for retrofitting existing impervious roadway surfaces for stormwater treatment. Primary emphasis will be placed on urbanizing areas in the Puget Sound Basin.

Estimated Costs for Prioritization and Programming of Capital Improvement Projects

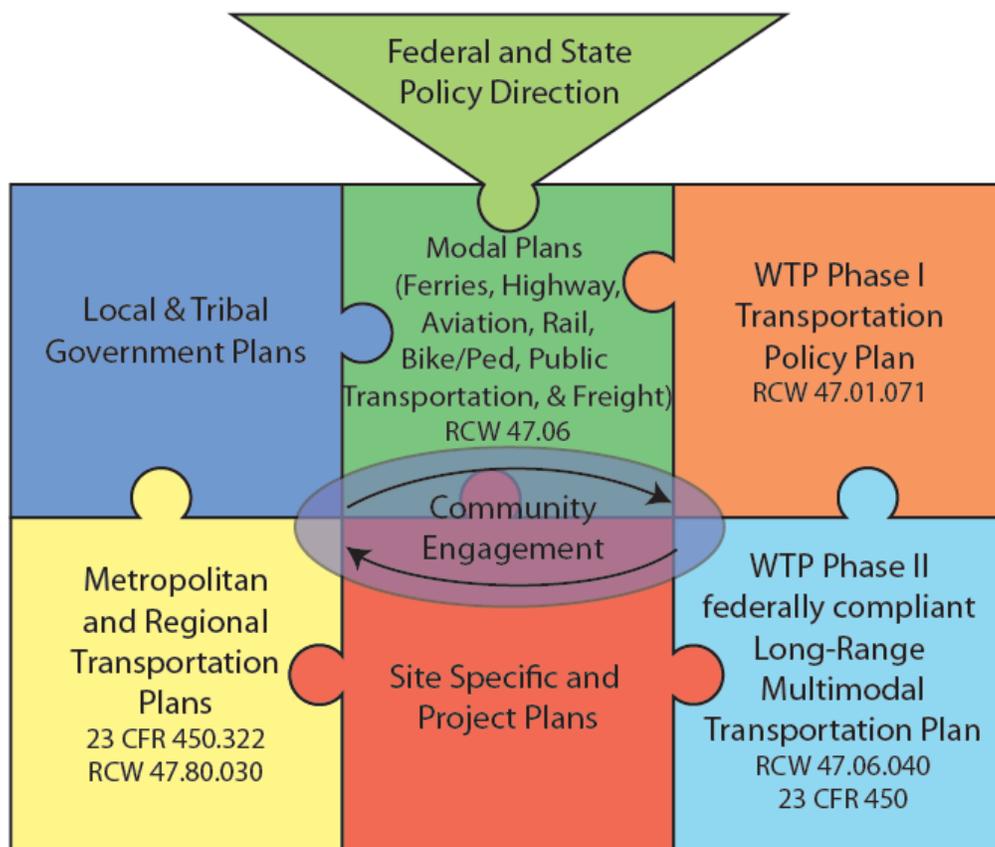
SPR	-0-	State	887,000	Total	887,000
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Area 2: Planning Partnerships

Plans in Washington state enrich one another, answering different questions to support decision-making. The Federal Government and State Legislature set policy, which guides planning efforts. Plans are conducted at different levels and by different jurisdictions, addressing different geographies, subject areas and stakeholders. Each answers unique questions from a unique perspective. Actively engaging in planning efforts led by Tribal, regional and local partners is a critical part of a comprehensive, cooperative and continuing planning process and is essential to achieve consistency among statewide, regional, and local plans.

Consistent with WSDOT’s Community Engagement Plan, staff will solicit and document feedback that provides clarification, transparency, accountability, and supports the linkage between planning and programming.

Transportation Planning Connections and Consistency



WSDOT invites local governments, tribes, regional organizations including Metropolitan Planning Organizations (MPOs), Regional Transportation Planning Organizations (RTPOs), community groups, affected citizens and the traveling public into the decision-making process. We place special emphasis on collecting input from populations traditionally underserved in transportation decision making. This approach is central to Results WSDOT and integral to many SPR work program activities.

This work element includes the following sub-areas:

- Subarea 2.1: MPO Program Management
- Subarea 2.2: Metropolitan Planning Funding
- Subarea 2.3 RTPO Planning Funding
- Subarea 2.4: Tribal & Regional Coordination
- Subarea 2.5: Enhanced Local Collaboration
- Subarea 2.6: Community Engagement Plan Implementation

Estimated Costs for WSDOT to conduct activities in Planning Partnerships

SPR	4,948,300	State	1,595,950	Total	6,544,250
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Estimated Federal Appropriations to 12 MPOs to conduct MPO planning:

FHWA PL/FTA 5303	18,540,216	State	-0-	Total	18, 540,216
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Estimated State Appropriation to 14 RTPOs to conduct RTPO planning:

SPR	-0-	State	4,400,000	Total	4,400,00
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Subarea 2.1: MPO Program Management

Major Activities for WSDOT's Management of the 12 MPOs include:

- Provide Guidance:
 - Designate a single point of contact for each MPO. This contact regularly checks in with their MPO and provides advice and administrative oversight. Advice is given by phone, email, conference call, or in person. WSDOT bases advice on regular review and analysis of existing and proposed federal requirements and through regular discussions with FHWA and FTA. (Ongoing).
 - Review and update (if necessary) Unified Planning Work Programs (UPWPs) development guidance in consultation with the MPOs. This guidance is followed at annual UPWP On-site Coordination Meetings (Annually and ongoing).
 - Meet with all MPO directors to share information, discuss guidance, and learn best practices. (Quarterly)
- Air Quality:
 - Participate in and provide technical and coordination assistance for the Air Quality Interagency Consultation Group to ensure regional conformity with air quality (Ongoing).
- Follow Ongoing Processes:
 - WSDOT and each MPO jointly certify that the metropolitan transportation planning process is being carried out in accordance with applicable requirements. Major activities associated with certification include:
 - Review and update (if necessary) worksheets for MPOs to document compliance
 - Review and comment on MPOs' Title VI, EJ, and LEP plans and contacting FHWA and/or FTA to discuss questions
 - Review and comment on MPO public involvement processes
 - Review self-certifications and recommend approval to FHWA and FTA
 - Agreements:
 - Facilitate agreements between WSDOT, MPOs, and public transportation operator(s) serving the MPA (As needed)
 - TIPs and TIP Amendments
 - Review and process Transportation Improvement Programs (TIPs). (Annually)
 - Review and process TIP amendments. (Monthly)
 - Fiscal:
 - Administer the Federal Highway Administration (FHWA) PL and Federal Transit Administration (FTA) 5303 pass-through funds for twelve MPOs. (Ongoing)
 - Determine new allocation formulas for planning funding distribution in collaboration with these organizations. (As needed, usually every 2 years)
 - Develop biennial money agreements. (Every 2 years)
 - Receive, review, and submit annual performance and expenditure reports to FHWA and FTA. (Annually)
 - Participate with FHWA and FTA in advanced planning reviews and in certification reviews of MPOs administering Transportation Management Areas (TMAs), which includes development and implementation of the Congestion Management Process. (As needed)
 - Reports

- Submit CMAQ Program Annual Report to FHWA as per CMAQ regulations. (Annually)
 - MTPs
 - Participate in the review of the updates to the Metropolitan Transportation Plans. (As needed)
 - Forward updates to FHWA and FTA. (As needed)
 - Prepare and submit MPO boundary changes. (As needed)
 - Review and comment on MPOs' Public Participation (Involvement) Plans. (As needed)
- Special Projects
 - Coordinate MPO discussions regarding the proposed WSDOT Statewide Travel Demand Model. (Ongoing)
 - Facilitate development of proposed MPO Performance Measures. This includes discussing MAP-21 target setting procedures and processes between WSDOT and the MPOs. (Ongoing)

Estimated Costs for WSDOT to manage MPO Program:

SPR	552,800	State	138,200	Total	691,000
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Subarea 2.2: Metropolitan Planning Funding

A **Metropolitan Planning Organization (MPO)** is a federally mandated organization of representatives from local government and transportation agencies in urbanized areas with 50,000 or more in population. MPOs provide a forum for local decision-making on transportation issues of a regional nature. The metropolitan planning process promotes consistency between transportation improvements and state and local planned growth and economic development patterns. MPOs cover urbanized areas only and receive federal funding in support of their planning efforts.

State law requires the MPO to be the planning lead agency when their boundaries overlap with an RTPO. Federal rules require WSDOT to provide fiduciary oversight and stewardship for the MPOs and state law and rules require WSDOT to perform similar functions for RTPOs. When an MPO is acting as lead for an RTPO it uses non-SPR funding. When it is acting as lead for an MPO it uses SPR funding. There are 12 MPOs in the state, and 8 of these serve as the RTPO lead agency.

Estimated Funds Distributed to MPOs for MPO Planning

Metropolitan Planning Organization	SFY 2016		SFY 2017		2015 - 2017 Biennium total
	FHWA PL Funds	FTA Section 5303	FHWA PL Funds	FTA Section 5303	
Benton-Franklin Council of Governments	\$313,275	\$101,659	\$313,275	\$101,659	\$829,868
Chelan-Douglas Transportation Council	\$188,866	\$47,083	\$188,866	\$47,083	\$471,898
Cowlitz - Wahkiakum Council of Governments	\$165,023	\$35,956	\$165,023	\$35,956	\$401,958
Lewis Clark Valley MPO	\$60,076	\$11,361	\$60,076	\$11,361	\$142,874
Puget Sound Regional Council	\$3,945,464	\$1,517,329	\$3,945,464	\$1,517,329	\$10,925,586

Skagit MPO	\$193,689	\$48,944	\$193,689	\$48,944	\$485,266
Southwest Washington Regional Transportation Council	\$548,171	\$183,239	\$548,171	\$183,239	\$1,462,820
Spokane Regional Transportation Council	\$590,949	\$201,614	\$590,949	\$201,614	\$1,585,126
Thurston Regional Planning Council	\$271,667	\$67,989	\$271,667	\$67,989	\$679,312
Walla Walla Valley MPO	\$127,153	\$25,522	\$127,153	\$25,522	\$305,350
Whatcom Council of Governments	\$266,201	\$74,989	\$266,201	\$74,989	\$682,380
Yakima Valley Conference of Governments	\$229,467	\$54,422	\$229,467	\$54,422	\$567,778
TOTAL Metropolitan Planning Organizations*					\$18,540,216

Estimated Federal Appropriations to 12 MPOs to conduct MPO planning:

FHWA PL/FTA 5303	18,540,216	State	-0-	Total	18,540,216
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The estimated MPO appropriation is based on the FFY 2015 allocations from FHWA and FTA.

Subarea 2.3 RTPO Planning Funding

A **Regional Transportation Planning Organization (RTPO)** is a state funded, voluntary association of local governments within a county or contiguous counties that includes membership from cities, counties, WSDOT, tribes, ports, transportation service providers, private employers and others. RTPOs were authorized by Washington State’s 1990 Growth Management Act to ensure local and regional coordination of transportation plans. RTPOs can cover both urban and rural areas.

MPOs and RTPOs serve the same basic transportation planning functions – develop a long-range plan, coordinate within a region, and prepare a transportation improvement program. The federal MPO and state RTPO requirements of these organizations are complementary. The lead agency for an RTPO is also the lead agency for the MPO within the region (except Lewis-Clark Valley MPO because it is a bi-state organization).

State law requires the MPO to be the planning lead agency when their boundaries overlap with an RTPO. Federal rules require WSDOT to provide fiduciary oversight and stewardship for the MPOs and state law and rules require WSDOT to perform similar functions for RTPOs. When an MPO is acting as lead for an RTPO it uses non-SPR funding. When it is acting as lead for an MPO it uses SPR funding. WSDOT recognizes RTPOs as nonmetropolitan local officials representing units of general purpose local government and/or local officials with responsibility for transportation. The process WSDOT uses to consult with RTPOs as required in 23 CR 450.210 (b) is located at <http://www.wsdot.wa.gov/NR/rdonlyres/610774DA-C5FB-4323-8B54-C9790D1F104F/0/2011NonMetroLocalOfficialConsultationFinal.pdf>

There are 14 RTPOs in the state. 4 RTPOs are stand-alone and do not have an MPO as a lead agency.

Estimated State Appropriation to 14 RTPOs to conduct RTPO planning:

SPR	-0-	State	4,400,000	Total	4,400,00
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Subarea 2.4: Tribal & Regional Coordination

Tribal Coordination

Tribal Coordination: The following are statewide planning activities funded with SPR funds.

- Participate in tribal conferences and trainings, and provide guest speakers if required.
- Coordinate periodic tribal/WSDOT regional meetings.
- Continue to ensure tribal transportation goals and projects are considered in WSDOT transportation planning.
- Attend Tribal Transportation Planning Organization (TTPO) to share information and coordinate planning activities.

TTPO Support: The following are SPR-eligible activities that are funded with 100% state funds due to the lack of adequate SPR funds.

- Support Tribal Transportation Planning Organization (TTPO), a forum for increasing tribal transportation planning capacity.
- Analyze policies, develop guidance, and provide technical assistance to TTPO.
- Reimburse tribal governments' travel expenses to the TTPO quarterly meetings and the periodic State Tribal Transportation Conferences, symposiums, and Affiliated Tribes of the Northwest Indians (ATNI) events for trainings
- Provide assistance and participate in Tribal planning project discussions; to include assistance to tribes, as it relates to state facilities, in the development of their Tribal Transportation Program (TTP) inventory system
- Work with tribes individually to conduct planning analysis and pursue grant funding.
- Attend quarterly Tribal Transportation Planning Organization meetings.
- Develop and provide letters of agreement for inclusion of State Highways into the BIA Tribal Transportation Program (TTP) inventory as required.

Regional Coordination

In Washington State, regional planning is performed by 12 Metropolitan Planning Organizations and 14 Regional Transportation Planning Organizations. WSDOT has a long history of working with these organizations individually and collectively through the quarterly meetings of the MPO/RTPO/WSDOT Coordinating Committee. Regional coordination includes coordinating WSDOT's planning activities with MPOs and with RTPOs in their capacity as nonmetropolitan local officials. It does not include WSDOT's state-required duties to manage the RTPO Program.

WSDOT will perform the following regional coordination activities:

- Serve as member and/or alternate member of MPO and local government agencies' transportation technical advisory committees. As a member, participate in regional planning activities, grant proposal review/selection, MTP development, public transportation coordination/development, Human Services Transportation Plan development, and other activities.
- Attend technical and policy team meetings, provide information from WSDOT, review and assist on planning studies. Provide input or review on various other plans such as MTP, UPWP and Human Services Transportation Plan.

- There are number of tasks associated with MPO and RTPO coordination including, but not limited to, regular monthly meetings, regular contact to deal with issues, and congestion management.
- Continue to advocate for the interest of the state in metropolitan/regional transportation decisions. Enhance the planning process in the regions by ensuring the connection of regional transportation plans and the statewide multimodal transportation plan and multimodal plans.
- Attend MPO/RTPO/WSDOT coordinating meetings.
- Represent WSDOT at meetings of subarea boards in the Puget Sound region counties.

Regional Plan Development

- Coordinate WSDOT planning efforts with MPOs and nonmetropolitan local officials (RTPOs) that are working on long-range transportation plans for bicycle/pedestrian, freight, and public participation, aviation, rail, highway/road/street plans.
- Develop input for regional plans including policy input that reflects state transportation goals and objectives.

Estimated Costs for Tribal & Regional Coordination

SPR	1,758,600	State	439,650	Total	2,198,250
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The state match in this table does not include the state funds WSDOT uses to manage the RTPO Program.

Subarea 2.5: Enhanced Local Collaboration

Local comprehensive planning in the State of Washington is the foundation for all other planning, including that of WSDOT and the regional and metropolitan organizations. Once local decisions are made, they are difficult to reconsider later. Local governments are updating their comprehensive plans in 2015-2017 and the state has a limited window to influence those decisions. It is less productive to engage later on a project-by-project basis. Federal planning requirements [23usc 135 and 49usc5304] also recognize the critical role of local-level planning for statewide and metropolitan levels of transportation planning that “fosters economic growth and development” [23CFR200].

Governor’s Executive Order 14-04, Washington Carbon Pollution Reduction and Clean Energy Action, also sees local comprehensive planning as foundational, directs WSDOT to support the update of local comprehensive plans to produce travel and land-use patterns that maximize efficiency in movement of goods and people, and reduce costs and greenhouse gas emissions.

Local jurisdictions regularly initiate local planning efforts that require WSDOT engagement and response and on-going action. Understanding the local concerns developed through years of regular contact, we anticipate and respond to those requests through collaboration with local jurisdictions and local advocacy groups. These collaborative efforts help achieve mutual benefits for the local interests and fulfill our responsibility to the citizens of the State for the operation and management of the state transportation system and the sustainable management of the physical assets we have long invested in. Collaboration many times requires extensive conversations with local agencies over periods of time in addition to review of plan draft and emerging implementing legislation. Many local and regional planning efforts may be active at any given time.

Consistent with WSDOT engages with local jurisdictions in order to ensure that statewide transportation perspectives are considered, distinct from the more regional or urbanized area perspective of regional and metropolitan organizations. Transportation planning priorities [23CFR450.206(d)] for Washington supported by local collaboration include: multi-jurisdictional and multimodal integration, community engagement, and strategic investment. Collaboration at this level also ensures that WSDOT meets its federal responsibilities to consider and analyze factors in the transportation planning process such as “systems development, land use, employment, economic development, human and natural environment, and housing and community development” [23CFR450.206(b)]

What are WSDOT’s objectives for participating in local plans?

- To understand the existing context and future vision for the areas our state transportation facilities serve, including supporting the economic vitality, safety, security, accessibility and mobility of people and freight [23CFR450.206(a)].
- To integrate local and state information for roadways, non-motorized facilities, transit operations, freight, and other transportation modes to identify common problems and solutions.
- To work with communities toward a common understanding of the desired performance, condition, and needs of our shared transportation system which helps WSDOT implement a performance-based practical approach to planning and management the transportation system in the State.

- To progress toward a consistent framework for analysis of transportation deficiencies and solutions for state transportation facilities in the city or county that reflect our agency's more flexible approach to design.
- To explore conceptual solutions to transportation needs, identify mutually beneficial opportunities for further collaboration, and make a plan for how partnership can meet our mutual needs.
- To implement least cost, practical solutions that support community, economy, and the environment.
- To share the opportunities WSDOT's new Practical Solutions approach provide for more flexibility in highway design and tools to address our common goals.
- To identify opportunities to align our efforts and leverage resources to accomplish more than either of us can achieve alone.

Activities: WSDOT is coordinating with local jurisdictions and regional transportation agencies to assist in our continuing, cooperative, and comprehensive efforts to provide a resilient transportation network. We will be continuing our efforts throughout the biennium, including:

- Exchanging information on current conditions and travel forecasts for a variety of transportation modes with emphasis on cost effective and efficient multimodal solutions when developing these plans in conjunction with state facilities. This work will require our participation in the assessment, education and strategizing of ways to implement plans that support their land use and development expectations and community visions while meeting statewide needs.
- Developing partnerships through knowledge and understanding of local concerns.
- Coordinating collaboration with modal and specialty offices to provide the opportunity for a well-rounded review of comprehensive plans that impact WSDOT's interests.
- Continuing collaborative efforts with MPO/RTPOs and local governments to ensure bicycle and pedestrian, freight, planning, research, and data collection supports their planning and modeling efforts.
- Supporting enhanced collaboration efforts with local governments through continuation of the comprehensive plan review workgroup; analysis of policy issue and proposed resolution; development of tools, training, guidance and information resources; and periodic reporting on enhanced collaboration efforts.
- Providing specialized GIS tools for analysis and visualization to support decision-making (Community Planning Portal).
- Providing state transportation system information to inform transportation planning alternatives assessment.
- Reviewing and commenting on WSDOT's interests to comprehensive plan updates and amendments, sub-area plans, planned actions, development regulations, etc..
- Participating in the enhanced collaboration of the development, review and comment on updates of comprehensive plans and associated documentation.
- Assisting in the development of regional plans. Help assure consistency among jurisdictions and between state, regional, and local plans.
- Reviewing and responding to cities and counties on their comprehensive plans and implementing legislation that affect WSDOT's interests, as required.
- Participating in discussions with local transportation advocacy groups.
- If needed, assisting the Washington State Department of Ecology in updating the State Implementation Plan consistent with the Clean Air Act.

Estimated Costs for Enhanced Local Collaboration

SPR	1,353,200	State	696,800	Total	2,050,000
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Subarea 2.6: Community Engagement Plan Implementation

The Washington State Department of Transportation’s Strategic Plan for 2014 to 2017, Results WSDOT – Moving Washington Forward, emphasizes greater community involvement and partnerships, agency efficiency and innovation, and a multimodal approach to our transportation system. WSDOT’s 2015 Community Engagement Plan <http://www.wsdot.wa.gov/planning/> is an important milestone in achieving the Community Engagement goal of Results WSDOT and in meeting the federal requirements for a documented public involvement process for statewide planning.

The Community Engagement Plan guides how WSDOT engages with partners, stakeholders, tribes, communities, and the public for all WSDOT efforts “stem to stern.” WSDOT is implementing this plan to increase consent on decisions, enhance understanding, and improve public access to information and decision making. It focuses on outcomes and useable guidance rather than process, and enhances agency accountability and transparency.

Implementation Activities:

Headquarters will:

- Submit a schedule to FHWA Washington Division Office no later than July 31, 2015 that details how WSDOT will revise the Community Engagement Plan.
- Review and if necessary, update the Community Engagement Plan in the fall of 2016.
- Lead the agency-wide Community Engagement Team to share best practices and develop guidance, tools and resources.

Headquarters and Regions will:

- Develop and follow communication plans that describe internal and external outreach for appropriate planning activities.
- Provide point of contact for transit agencies on transit issues and coordination of issues.
- Provide point of contact for bicycle and pedestrian issues and coordination of issues.
- Migrate web content to a new platform.
- Respond to requests for information
- Respond to community concerns.
- Develop external outreach such as fact sheets, maps, and webpages.
- Coordinate activities and share information. This includes participating in the Community Engagement Team and in other regular internal forums.
- Participate in external and internal meetings and forums to share information on planning activities

Estimated Costs for Community Engagement Plan Implementation

SPR	1,283,700	State	321,300	Total	1,605,000
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Area 3: System Performance and Analysis

Consistent with WSDOT’s Community Engagement Plan, staff will solicit and document feedback that provides clarification, transparency, accountability, and supports the linkage between planning and programming.

This work element is:

- Focused on translating infrastructure, operational and financial data into meaningful information to support budgeting, planning, operations and asset management.
- Increasingly important under MAP-21, which requires states to set and track performance targets.

This work element includes the following sub-areas:

- Subarea 3.1: Performance & Accountability Analysis
- Subarea 3.2: Financial Planning
- Subarea 3.3: Economic Forecasting & Analysis
- Subarea 3.4: Modeling & Analysis

Estimated Costs for System Performance and Analysis

SPR	2,997,000	State	2,503,650	Total	5,500,650
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Subarea 3.1: Performance & Accountability Analysis

Work in this subarea assures agency-wide strategic alignment, enhance partnerships, and increase efficiencies by providing tactical guidance in support of Results WSDOT, the strategic plan, WSDOT reforms, Results Washington, MAP-21, and other initiatives.

This subarea:

- Facilitates processes that lead to strategically aligned performance measures, policy recommendations and agency-wide strategic direction
- Provides tools for articulating policy decisions, building trust, supporting collaboration and increasing efficiency by leveraging resources.
- Assures that WSDOT tactically aligns its agency priorities with state and federal priorities.
- Provides best practices to other states, MPOs, AASHTO and USDOT on federally-required performance management.

Activities in this subarea include:

Statewide, Modal, Program, and Project Analysis:

- WSDOT's Results Washington Program: Lead WSDOT's Results Washington Program through coordination with WSDOT Programs and other state agencies to develop and maintain measures that align with Governor's and national goals. Lead cross-agency teams to coordinate and develop content for the Results Washington program reports and action plans. Supply and support the reporting requirements in the Results Washington reporting system (Open Performance). Provide policy direction and recommendations for WSDOT programs that contribute to the Results Washington process. Work with the respective programs to develop and review periodic reports published in the Gray Notebook, WSDOT's quarterly performance report. Participate in and prepare WSDOT executives for each of the Governor's five goal councils. WSDOT is directly responsible for nine measures in the Goal 2: Prosperous Economy Goal Council and has interest in several measures in three other Goal Councils. Contribute to Goal Council 2's cross-agency research team efforts.
- Lead WSDOT's Analysis and Performance Reviews for OFM Reports: This activity includes the quarterly update of the Results through Performance Management (RPM) report, the biennial update of the Transportation Attainment Report, and the annual Ferries Performance Report.
 - RPM is an OFM managed web-based program that state agencies use to meet the state requirement (RCW 43.88.090) to submit data to update their respective measures. Update RPM quarterly as a part of the Gray Notebook process.
 - The biennial Transportation Attainment Report, required by RCW 47.04.280, is a legislative report published by OFM. The purpose of this report is to assess progress toward the goals and contribute to the overall performance of the transportation system. Rather than report on agency-specific performance, the focus is on overall system performance. Many of the measures and supporting data are being used to make investment decisions, develop strategies and programs, provide accountability, and promote stronger internal management. Provides extensive research, review, and input into the final report. This research requires working with multiple WSDOT programs to ensure their performance information is accurately reflected in the report. Perform a comprehensive review of the report and provide OFM with suggested edits prior to publication.

Agency Accountability & Analysis:

- Prepare and publish WSDOT's nationally recognized quarterly performance report. Participating in the "Gray Notebook Process" provides policy direction and recommendations for the agency and its respective programs, builds collaboration between programs and engenders public trust. The Gray Notebook (GNB) development process assures fully vetted performance information that demonstrates alignment with Results WSDOT, agency reforms, the Secretary's State of Transportation Address, and Results Washington. Produced quarterly, The Gray Notebook and the Gray Notebook Lite (summary) are posted online and provide performance information focusing on capital project delivery, performance highlights, notable results, and budget information when possible. The GNB and GNB Lite are distributed to more than 1,800 subscribers electronically and through the mail each quarter.
- Provide technical assistance and expertise that enables and empowers WSDOT programs to articulate performance that may result in collaborative engagement, identify and align priorities and program deliverables, strengthen quality assurance, efficiently leverage resources; and implement more cost-effective operations that follow the principles of Lean.
- Facilitate processes providing technical assistance that promote program performance, reflect priorities, best practices, efficiency improvements and project delivery measures. Provide technical outreach to internal and external partners including, but not limited to, coordination of meetings, data analysis, and assistance in report development.
- Assure agency-wide strategic alignment, enhance partnerships, and increase efficiencies by providing tactical guidance in support of Results WSDOT, the strategic plan, WSDOT reforms, Results Washington, MAP-21, and other initiatives.
- Include facilitation of processes that lead to strategically aligned performance measures, policy recommendations and agency-wide strategic direction. Provide tools for articulating policy decisions, building trust, supporting collaboration and increasing efficiency by leveraging resources. Assure that WSDOT tactically aligns its agency priorities with state and federal priorities.
- For Office of Fiscal Management (OFM), the Governor's office, TIGER grant application, and other customers, conduct economic analysis on WSDOT's agency budget and individual programs such as highway projects, ferries, and rail, to quantify jobs created by programs and projects. Deliverables include assessment of comprehensive jobs impact specific to the request.

System Performance Analysis:

- Refine Mobility Analysis Software: Continue to refine the new computer software program to process, analyze, and streamline vast amounts of travel time data (private sector data and WSDOT loop data) for the Corridor Capacity Report (CCR) and provide additional analysis to improve efficiency and quality while supporting agency initiatives such as Least Cost Planning and Practical Design. The mobility analysis software is used to pioneer research on new mobility measures (for example, commute congestion cost, Greenhouse gas emissions, etc.) introduced into the report prior to incorporating them into the Digital Roadway Interactive Visualization and Evaluation Network (DRIVE Net) platform.
- Perform quality assurance tests on Digital Roadway Interactive Visualization and Evaluation Network (DRIVE Net) to assure the results published in past reports align with WSDOT's performance story. Additionally, this software program has saved the agency approximately \$204K per biennium, equivalent to TPS 4 FTE.
- Continue to refine and enhance graphing capabilities through software automation for travel time reporting.

- Continue to refine multimodal measures such as greenhouse gas emissions.
- Continue to develop workflow templates for improved accuracy and efficiency in producing the agency's corridor-based multimodal system performance report.
- Work with software improvements and streamlined template development which are expected to capture the societal costs associated with trip-based and facility-based (person, corridor) measures while providing efficient reporting of greenhouse gas and transit measures. These improvements also allow for probe data analysis along with the WSDOT loop data.
- Integrate WSDOT's research project on DRIVE Net applications as a 2015-17 agency funded mobility research effort. For example, WSDOT corridor-sketch process, SHRP 2 projects, Transportation System Management and Operations (TSMO) etc., which include TDM strategies as well. In the 2015-17 biennium, this tool will be integrated for broader use across agency divisions for such projects and programs as corridor sketch plans, TSMO, Least Cost Planning, Practical Design, and integrating the multimodal performance measures published in the annual Corridor Capacity Report.
- Support and lead Congestion Working Group. The Congestion Working Group delivers the agency's annual CCR while making critical decisions on appropriate performance measures for mobility related needs. This group also recommends measures for other mobility measure needs such as Results Washington. Participating in various mission critical work groups helps facilitate the discussion around performance measures, targets and goals for the agency.
- Support the development of the agency's mobility performance measures for various internal and external audiences while serving as an expert panel for communicating system performance through various venues such as Results Washington, Corridor Capacity Report, MAP-21, and other venues.
Participate in and support WSDOT workgroups on multimodal safety, sustainable transportation, climate change, accessibility, Practical Design, Least Cost Planning, Moving Washington, etc. to assure strategic alignment and collaboration.
- Facilitate Peer Exchange, Research, Innovations, and Best Practices: Supporting FHWA requests for peer exchange. Research special topics related to transportation system performance to determine innovations and trends from other states and countries for implementation of best practices. Prepare professional papers related to transportation system performance analysis, reporting and accountability. Continue to support FHWA, USDOT, TRB, AASHTO, and NCHRP systems analysis and performance measurement activities. Continue to provide leadership in performance measurement research arena, develop materials for and chair committees. Provide assistance and guidance to state DOTs and international peers that approach WSDOT for support and input in the development of their own performance management systems.
- Provide strategic direction, analysis and coordination of MAP-21:
 - Conduct analysis of draft and final federal rules for MAP-21 performance measures for safety, pavement, bridge, freight, congestion, and on-road mobile source emissions. Understand and communicate the rule-making process with WSDOT program leads. Coordinate and collaborate with other DOTs, MPOs, and AASHTO on specific aspects of each rule.
 - Establish coordination processes with WSDOT program leads for each draft rule (safety, pavement, bridge, freight, congestion, and on-road mobile source emissions) including developing timelines, creating supporting documents, and specifying deliverables applicable to each program lead. In addition, conduct rigorous analysis evaluation and development of initial comments to AASHTO and final comments to the federal docket,

and prepare materials for executive review and approval prior to federal docket submittal.

- Coordinate and develop a target setting process in collaboration with MPOs and program leads. Develop a MAP-21 target setting process, develop supporting documents for draft rules and target setting processes for MPOs, tribes and other stakeholders, develop and establish a target setting framework schedule in line with MAP-21 performance measures; develop WSDOT's approval process for target setting recommendations; develop a formal recommendation process. Develop and provide communication materials including data for MPOs. Develop and conduct WSDOT's Executive review and approval process.
- Provide MAP-21 rule analysis for each performance measure: safety, pavement, bridge, freight, congestion, and on-road mobile source emissions, etc. Conduct initial analysis of draft rules for AASHTO. Coordinate with program leads and review MPOs and other state comments. Provide technical assistance to program leads for draft and final comment document submitted to FHWA-USDOT. Provide on-going input to FHWA-USDOT through conference calls, webinars with AASHTO and FHWA-USDOT regarding MAP-21 coordination processes and technical details.
- Continue to research, coordinate, develop, and implement multimodal system analysis methods in the annual CCR (aka Congestion Report), WSDOT's comprehensive annual analysis of multimodal state highway system performance. In addition to producing the CCR, develop interactive web based application to communicate CCR performance data to internal and external stakeholders and the public. Providing online access to data, analysis and performance measures helps engineers and planners implement Least Cost Planning and Practical Design initiatives. Utilize ArcGIS Online implementation for communicating performance stories (see also GIS Services in this category). Publish corollary Corridor Capacity Evaluation handbook to serve as the one-stop-shop for WSDOT's CCR methodology. Continue to work with transit and planning agencies to develop and implement multi-modal capacity methods.
The CCR helps inform WSDOT policy makers, planners and engineers as they examine multimodal capacity opportunities for state highways. This report supports WSDOT's Practical Solutions and performance-based planning initiatives. It also appraises WSDOT, the legislature, stakeholders, educational and research institutions, the media, and the public about highway system conditions and how we can work together to reduce congestion. Some of the other highlights include semiannual CCR updates, Corridor Capacity Evaluation Handbook, web presence, ArcGIS Online element, press releases, and presentations on request.
- Develop and Publish Annual Systems Reports including:
 - Asset Management Performance Reports: address WSDOT assets such as bridge, pavement, safety rest areas, ferry vessel and terminals, ITS, and more. Asset Management Reports provide performance information on transportation infrastructure assets.
 - Multimodal Safety Reports: address WSDOT safety performance measurement in such areas as highway, transit, rail, ferries, bike, pedestrian, and aviation. Multimodal Safety Reports provide safety performance information for various modes of travel.
- Conduct Before and After Studies: Develop and publish before and after evaluations of mobility, safety, and other projects to articulate WSDOT's program delivery record in support of the agency's strategic policy directions and needs assessments. For example, Before and After mobility project case studies focus on sustained project benefits over years after project completion using Nickel and TPA funds. Report in the Gray Notebook, CCR and develop folios to highlight WSDOT project benefits to travelers/tax payers.

Estimated Costs for Performance & Accountability Analysis

SPR	2,234,400	State	558,600	Total	2,793,000
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Subarea 3.2: Financial Planning

- Provide financial planning to support the development and implementation of the state transportation budget, including the planning for long-term debt issuance and tolling.
- Analyze and recommend the size of bond sales and developed related Official Statements and Rating Agency presentations. Monitor and analyze the agency’s cash flow requirements.
- Responsible for compliance with the Master Bond Resolutions, certificates, and federal loan agreements. Prepared Official Statements for the sale of general obligation bonds, various purpose general obligation bonds, and bonds sold for SR 520 Floating Bridge and Eastside Project.
- Ensure compliance with Internal Revenue Service (IRS) regulations as they relate to the assignment and use of bond proceeds.
- Maintain the financial plans for transportation accounts as a tool for cash management.
- Develop new enterprise-wide financial planning system.
- Manage debt service payments for outstanding bond issues.
- Prepare presentation materials for the Secretary of Transportation.
- Production of Fuel taxes: A State-by-State Comparison and assist in development of the Gray Notebook.
- Forecast WSDOT business revenues on a quarterly basis.
- Monitor monthly tax collections.
- Support in analyzing toll-rate setting and other tolling issues.
- Analyze state and national fee revenue issues to assess the impacts on transportation policies, plans, and programs.
- Coordinate preparation of grant applications for STP, CMAQ, and other funding sources.

Estimated Costs for Financial Planning

SPR	-0-	State	858,000	Total	858,000
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Subarea 3.3: Economic Forecasting & Analysis

- Produce and coordinate quarterly 16-year forecasts and monthly cash flow forecasts of transportation revenues
 - Motor fuel taxes.
 - License, permits, and fees.
 - Federal funds.
 - Fuel prices and other economic variables.
- Forecast quarterly various fuel prices and highway construction cost indices for use in setting budgets.
- Publish a quarterly forecast summary report and detailed tables describing the forecast, and make presentations.
- Complete quarterly fuel price and vehicle trends reports.
- Complete bi-monthly Vehicle Hybrid Report.
- Develop and update econometric models used in forecasting.
- Complete fiscal notes and bill analysis for legislative transportation revenue proposed changes.
- Create local government long-term forecasting guidelines document to assist local government with best “practices” for creating long-term forecasts and financial plans.
- Analyze upcoming issues
 - New federal and state legislation
 - New revenue proposals
- Assist other divisions of WSDOT with forecasting economic variables and performing economic impact studies including the economic impact of the Skagit River bridge closure.
- Secure a WSDOT-ESD data sharing agreement of employment data so WSDOT staff has access to employer level employment data.
- Proposed *Economic Impact Analysis of Selected Transportation Projects*
 - *Established a technical work group to review the selected transportation projects for the pilot economic impact study.*
 - *Train a group of WSDOT staff members on utilizing the Washington state REMI-Transight economic impact model for Washington state transportation.*
 - *Coordinate the approach in conducting economic impact analysis.*
 - *Complete economic impact analysis on numerous transportation projects and prepare final report on economic impacts.*

Estimated Costs for Economic Forecasting & Analysis

SPR	-0-	State	768,000	Total	768,000
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Subarea 3.4: Modeling & Analysis

- Support travel demand modeling and analysis, performance measurement, and reporting.
- Maintain software upgrades and maintenance for travel demand and operational modeling software.
- Provide expertise in cost-efficient and smart technology modeling methodologies.
- Conduct toll studies leading to toll rate optimization, gross-revenue potential forecast, traffic diversion and input for financial analysis.
- Conduct greenhouse gas emissions analysis using USEPA MOVES2014 or similar model <http://www.epa.gov/otaq/models/moves/> for transportation projects.
- Perform traffic simulation and operational analysis for transportation projects and corridor planning, congestion relief studies, toll modeling and analysis for mega-projects, etc. Provide support of Gray Notebook and corridor capacity activities by assembling, analyzing, and developing performance measures. Planning-level project cost estimation and benefit-cost analysis.
- Take incremental steps to investigate the feasibility of developing and maintaining a Statewide Travel Demand Model that could be used for developing future long-range statewide transportation plans. Activities include:
 - Continuing to convene a standing committee with representatives from WSDOT, MPOs, ports, and other stakeholders.
 - Reviewing the Statewide Multimodal Travel Demand Model: Blueprint Development Study for opportunities to implement strategies.
 - Continuing research, such as contacting other state DOTs for best practices.

Estimated Costs for Modeling & Analysis

SPR	762,600	State	319,050	Total	1,081,650
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Area 4: Data and Planning Applications

Consistent with WSDOT’s Community Engagement Plan, staff will solicit and document feedback that provides clarification, transparency, accountability, and supports the linkage between planning and programming.

Our data programs support WSDOT’s planning and research functions by collecting, processing, analyzing, and reporting crash, roadway and traffic data on over 7,000 miles of state routes and over 80,000 miles of public roadways. We also provide specialized GIS projects and services in support of WSDOT’s business operations.

This work program area:

- Meets critical federal requirements.
- Provides a foundation for planning and asset management.
- Provides service for WSDOT and partners statewide.

This work element includes the following sub-areas:

- Subarea 4.1: Travel Data Analysis
- Subarea 4.2: Federal Annual Reporting of Vehicle and Financial Statistics
- Subarea 4.3: Crash Data Analysis
- Subarea 4.4: GIS and Roadway Data

Estimated Costs for Data and Planning Applications

SPR	5,952,000	State	7,710,550	Total	13,662,550
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Subarea 4.1: Travel Data Analysis

- Install, maintain, update, and repair continuous traffic counting equipment, short duration travel data collection equipment, digital imagery equipment, and geographic coordinate data collection equipment, all used for our travel data collection and reporting program. Our travel data collection and reporting program includes both motorized and non-motorized modes of transportation. Pays for all service, utility, software, and equipment charges required to maintain this program.
 - Deliverables: Traffic volume, classification, speed, and weight data for the entire state route system. Travel time data for performance measures and origin destination surveys. State highway traffic volume and classification data for Highway Performance Monitoring System (HPMS); volume, classification, and weight data to State Highway Research Program/Long Term Pavement Performance (SHRP/LTPP); and traffic statistics and reports.
- Produce special data reporting such as Freight and Goods reports, data for statewide system congestion analysis, data and segment analysis for statewide system plan, travel time, origin destination studies, and traffic forecasting.
- Provide data products to WSDOT regions and divisions along with Federal Highways Administration, other state agencies, local governments, institutions, and the public.
- IT Data Support. This is dedicated IT support team that supports these planning functions. Work includes project management, business analysis, application development, and support services to the Transportation Data and GIS Office (TDGO). Support Coordinates and develops IT projects with Federal, State, and Local agencies for the assigned business area.
 - Deliverables: A portfolio of applications that meet the planning business needs for collecting, storing, securing, processing, and reporting crashes, rumble strip locations, traffic volumes, speeds, lengths, weights, and classifications. These applications are used by TDGO, the Washington State Patrol, and County Engineers while the data processed by these applications is used by all WSDOT Regions and Divisions, the Federal Highways Administration, other Federal, State and local agencies, institutions, and the public.

Estimated Costs for Travel Data Analysis

SPR	172,800	State	6,035,750	Total	6,208,550
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Subarea 4.2: Federal Annual Reporting of Vehicle and Financial Statistics

- Administer and update the financial reporting system for 280 local cities and 39 counties in the state. This provides WSDOT with local transportation related financial revenues and expenditures.
- Collect and evaluate data for FHWA financial and statistical reports in order to receive federal transportation funding.
- Update and maintain state and local financial and statistical information in databases in preparation of 12 required FHWA reports annually. Complete financial and statistical reports for FFY 2015 and FFY 2016:
 - State motor fuel tax collections and distributions.
 - Motor vehicle registrations and fees.
 - State bonding activities:
 - Transportation obligations issued.
 - Status of transportation debt.
 - Highway income and expenditures.
 - Highway capital outlays.
 - Toll facility income and expenditures – Washington State Ferries and toll facilities.
 - Driver licenses and fees.
 - Receipts from motor carriers.

Estimated Costs for Federal Annual Reporting of Vehicle and Financial Statistics

SPR	-0-	State	230,000	Total	230,000
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Subarea 4.3: Crash Data Analysis

Work in this subarea supports Highway Safety Improvement Program (HSIP) which is a data-driven process that requires and uses crash data to help identify safety improvement projects.

- Through the use of standard data coding methodologies, analyze data provided by law enforcement officers on the Police Traffic Collision Report (PTCR). The analysts utilize mapping tools, data linkages, and other resources to enhance the location and provide additional data elements to the crash record as defined by the federal Minimum Uniform Crash Criteria (MMUCC) guidelines to obtain the information required to analyze, identify and prioritize engineering, education and enforcement safety projects, and conduct performance measurements and analysis.
- Fulfills WSDOT Public Disclosure Requests for crash data within the legal boundaries of Chapter 23, Section 409. Requests for crash data come from the public, the media, legislature, research institutions, etc. Provides crash data to other WSDOT and engineering offices as well as providing data for the Target Zero, Washington State Highway Strategic Plan, and the Annual Collision Summary Report.
- Through data sharing agreements, provides crash data records back to the engineering organizations of the PTCR origin, local jurisdiction engineers, and other state agencies that require data recorded by the law enforcement officer on the PTCR (e.g., DOL for driver financial responsibility).

Estimated Costs for Crash Data Analysis

SPR	2,720,000	State	680,000	Total	3,400,000
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Subarea 4.4: GIS and Roadway Data

- Stewardship of GIS data resources (geometry, attributes, metadata). Develops new production data sets in support of planning operations. Provides technical support for GIS data products. Provides spatial data analysis. Evaluates, selects, and supports new data editing management tools and products. Coordinate with other state and local entities on statewide data development and support. Coordinate with the Information Technology Division (ITD) database and server Administrators in support of these activities. Deliverables: 50+ GIS databases, WSDOT business area support, support for FHWA ARNOLD reporting
- Stewardship of the statewide Distance Measuring Instrument (DMI) based state route Linear Referencing Systems (LRS). Stewardship of the statewide GIS-based state route LRS. Stewardship of roadway related inventory data. Management of the Transportation Information and Planning Support (TRIPS) LRS system. Provides Roadway Data Mart support. Deliverables: Functioning and up to date TRIPS system, WSDOT Roadway Data Mart reporting system, LRS consulting services.
 - *LRS is the state route measures which provide location information on each state highway necessary for planning.*
- Management of WSDOT's Highway Performance Monitoring System (HPMS). HPMS data collection, analysis and processing. Stewardship of the statewide HPMS GIS data products. Deliverables: Federally mandated data used to advise Congress of system condition and performance for apportionment purposes. These data represent Washington's 82,000 miles of public roads including the National Highway System and Federal Aid System. Also reported is a complete GIS of all Washington roads required to support the Federal All Roads Network of Linear Referenced Data (ARNOLD).
- Collection, analysis, processing, and reporting of data to support the functional classification of all public roads. Coordination with local agencies, other WSDOT and federal offices. Management of WSDOT's Functional Classification (FC) Program. Deliverables: Statewide GIS database of Functionally Classified public roads, consulting and reporting services.
- Design, develop, and support GIS custom software applications and systems across various platforms such as mobile, browser, server, and desktop in support of planning operations. Provides system hardware, software, and network architecture services and support, GIS and non-GIS software systems integration. Supports and integrate cloud-based services within WSDOT IT infrastructure necessary in order to develop and support systems and applications used for planning functions such as the Community Planning Portal.
- Develop and maintain enterprise cartographic map services to meet WSDOT planning business needs. Develop custom map products. Provides stewardship of cartographic products to the statewide GIS portal. Deliverables: GIS map services, custom printed and digital map products, and consulting services.
- Provides project management support for custom GIS solutions in support of planning activities.
- Represent the interests of WSDOT within the scope of the Washington Geographic Information Council (WAGIC) and the Geographic Information Technology (GIT), Collaborate and coordinate with other state and federal agencies and organizations on GIS activities. Deliverables: GIS strategic alignment with agencies outside of WSDOT necessary to conduct planning.
- Provide GIS technical support and training to WSDOT planners. Administration and management of WSDOT's cloud based ArcGIS Online Organization. Deliverables: GIS technical support to WSDOT GIS users. GIS training for WSDOT staff.

Estimated Costs for GIS and Roadway Data

SPR	3,059,200	State	764,800	Total	3,824,000
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Area 5: Management and Administration

- **Community and Economic Development:** Provide for the policy formulation and executive administration of Community and Economic Development Organization of WSDOT. Costs incurred to this item are salaries, benefits, travel expenses, materials, supplies, and other expenses of the Assistant Secretary and an executive assistant.
- **Multimodal Planning Division:** Provide for the policy formulation and executive administration of the Multimodal Planning Division. Provides policy, technical, and fiduciary oversight of planning activities including preparation of the federally required SPR Work Program. Other management and support activities include budget development and monitoring assistance, accounting services, and financial systems services for the Multimodal Planning Division. Costs incurred to this item are salaries, benefits, travel expenses, materials, supplies, and other expenses of the director, an executive assistant, and the division’s Communications & Engagement Planner. Also included are funds to support Transportation Data and GIS Office Management and Administration.
- **Budget Support:** Prepare and manage a transportation planning and research program plan which optimizes available revenue. Provide support to the Strategic Planning Division and the Office of Research and Library Services in the following areas: program development, accounting and financial management, budget support, work orders, contracts, and agreements.

Estimated Costs for Management and Administration

SPR	-0-	State	1,986,500	Total	1,968,500
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Part 2: Research

The WSDOT Office of Research and Library Services (ORLS) develops and manages innovative, specialized research studies to produce information to help inform strategic decisions, adapt new smart technologies, and create new products and work practices. The transportation library serves engineers, researchers, consultants, universities, and the general public with up to date information from the past to the present using a world network of resources to increase knowledge and provide answers to customers' inquiries.

Consistent with WSDOT's Community Engagement Plan, staff will solicit and document feedback that provides clarification, transparency, accountability, and supports the linkage between planning and programming.

ORLS partners with universities, national and regional transportation institutions, federal, state, and local agencies, and private companies to conduct research using the most knowledgeable experts. These researchers conduct studies that find solutions and recommendations that help WSDOT plan, construct, and operate a vast multimodal transportation system.

ORLS strategically aligns transportation research funding to maximize resources by sharing costs and information with federal, state, and local agencies that share similar research needs. In addition to the SPR funded projects that are described in this work program, other research programs are also funded. WSDOT leads 11 Transportation Pooled Fund (TPF) projects involving almost 40 other state transportation agencies in addition to participating in 26 other TPF projects.

Quick Response (QR) projects address emerging issues requiring research support. Student research studies bridge the need for limited research inquiries with college students to gain work experience in the transportation field. Funds and in kind resources are also used to provide matching requirements for research led by the three University Transportation Centers in our geographic region. The Washington Transportation Center (TRAC) is supported by a partnership with WSDOT, University of Washington, and Washington State University to link research needs with the knowledge and technologies at the universities.

Proposed Research and Library Activities

- Participate in solicitations from NCHRP, SHRP 2, AID, EDC and STIC and other funding opportunities to increase resources for research, library, and technology/knowledge transfer activities.
- Carry out efficiently and with 100% compliance all agreements, contracts, task orders, and other administrative requirements in the conduct of research and library services.
- Administer research funding for ongoing and new start SPR projects. Evaluate project requests for Quick Response Funding and assess match fund requests from University Transportation Centers.
- Continue support for Client Sponsored Research through contracting, study design, and knowledge transfer activities.
- Participate in Peer Exchanges with other States to broaden range of options for modernizing the research and library services.

- Launch the new Research Program Management Data Base as the primary source for accessing and managing research project funding, expenditures, contracting, and other details.
- Recruit college students to perform limited research studies to gain transportation related experience to enhance job opportunities and perform research that is unfunded across various transportation programs.
- Participate in the State Transportation Innovation Council (STIC) to seek ideas and innovative solutions to explore and share with other jurisdictions.
- Continue to develop and deploy technology and knowledge transfer activities to ensure research results are implemented and that information is readily accessible by a wide range of users.
- Continue to provide library services and assistance to customers. Begin the digitization of historical documents and videos to improve access to the collection.
- Develop and implement a research communication program to target audiences using a wide range of methods including internet, webinars, training and events, electronic documents, and printed media.

Research Connections to Federal Planning Factors and Statewide Transportation System Goals

Federal Planning Factors	
Support the economic vitality of the United States, the States, nonmetropolitan areas, metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.	x
Increase the safety of the transportation system for motorized and non-motorized users.	x
Increase the security of the transportation system for motorized and non-motorized users.	
Increase accessibility and mobility of people and freight.	x
Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.	x
Enhance the integration and connectivity of the transportation system, across and between modes, throughout the State, for people and freight.	x
Promote efficient system management and operation.	x
Emphasize the preservation of the existing transportation system.	x
Statewide Transportation System Policy Goals	
Economic Vitality	x
Preservation	x
Safety	x
Mobility	x
Environment	x
Stewardship	x

Estimated Costs for Research

SPR	9,173,000	State	1,090,000	Total	10,263,000
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Estimated costs for SHRP2: I-5 Accessibility Analysis in Lynnwood, Washington

Fed SHRP2	300,000	State	-0-	Total	300,000
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Area 1: Program and Research Management

The WSDOT Office of Research and Library Services (ORLS) develops and manages innovative, specialized research studies to produce information to help inform strategic decisions, adapt new smart technologies, and create new products and work practices. The transportation library serves engineers, researchers, consultants, universities, and the general public with up to date information from the past to the present using a world network of resources to increase knowledge and provide answers to customers' inquiries.

ORLS partners with universities, national and regional transportation institutions, federal, state, and local agencies, and private companies to conduct research using the most knowledgeable experts. These researchers conduct studies that find solutions and recommendations that help WSDOT plan, construct, and operate a vast multimodal transportation system.

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- Continue to develop and deploy technology and knowledge transfer activities to ensure research results are implemented and that information is readily accessible by a wide range of users.
- Continue to provide library services and assistance to customers. Begin the digitization of historical documents and videos to improve access to the collection.
- Develop and implement a research communication program to target audiences using a wide range of methods including internet, webinars, training and events, electronic documents, and printed media.
- Review and update WSDOT Research Manual as needed
- Certify the SPR Research Program

Area 2: Research Projects

Completed SPR Projects and Outcomes FY 2015-2017 Biennium Due by June 2015

LRFD Procedures for Geotechnical Seismic Design - Phase I

\$150,000

Load factors that properly represent the variability of seismic loading and characterize the uncertainties were identified. WA-RD-827.1.

Determination of Optimum HMA Density Based on Pavement Performance

\$100,000

The optimum in-place density for HMA pavements to prolong life was determined.

Optimal Timing of BSTs on HMA and BST Pavements

\$70,000

The BST and HMA cycle necessary to keep flexible pavements at their lowest life cycle cost was determined. WA-RD 837.1.

Determining Changes in Greenhouse Gas Emissions (GGE) (1990-Present) due to Pavement Technologies

\$100,000

GGE reductions due to WSDOT pavement design, management, materials, and construction were identified. WA-RD 838.1.

Effect of Fuel Prices on VMT, GHGs and Revenue

\$115,000

This research helped WSDOT assess the availability of future fossil fuel for transportation so that future travel demand, future fuel tax revenue, and future GHG emissions could be more accurately predicted. WA-RD 829.1

Extended Discharge Time/Revolution Count for Cast in Place Concrete

\$350,000

Significant factors to develop performance specifications were developed to replace current specifications on time and revolution count. WA-RD 831.1

Recycled Concrete Aggregate for PCCP

\$150,000

Determined the suitability of using recycled concrete aggregate for new concrete construction WA-RD 826.1

Maximizing Efficiency of Regional Park and Rides

\$48,000

This research obtained data on the use of park & ride facilities in the Central Puget Sound Region & prevailing travel patterns to inform the development of policies and programs. WA-RD 830.1

Enterprise Field Data Collection Application

\$250,000

Developed a mobile application to collect and reference project inspection information, activities and data so that inspector field time is reduced. WA-RD 840.1

Stormwater Storage

\$75,000

This project examined under pavement water storage and suggested design criteria for permeable pavement applications.

Bioswale BMP

\$108,000

This research resulted in acceptance by the state regulatory agency an approved BMP for stormwater management which will avoid building expensive detention ponds and infiltration systems.

Pile Driving Noise Attenuation Experiments

\$263,000

Two new underwater noise attenuation treatments for steel piles were created to achieve noise reductions 20% below the regulatory thresholds of harm to marine and mammal species. Project is scheduled for 6/15 completion.

Rumble Strip Noise Evaluation

\$60,000

Rumble strip designs were examined to determine if modifications could reduce road noise and also preserve the safety integrity of the road treatment.

Solar Effects on Navigational Systems

\$60,000

Study concludes that WSF GPS based navigation systems have the ability to adjust to significant solar events.

3D Numeric Evaluation of Seismic Forces on Bridge Abutments

\$150,000

A design methodology is developed to estimate earthquake-induced lateral spreading forces in embankments that take into considerations the 3D effects. Project is scheduled for 6/15 completion.

Liquefaction-Induced Downdrag on Shafts/Piles

\$150,000

Liquefaction-induced downdrag on piles and drilled shafts examined to understand the implication for new designs and remedial measures for existing structures. Project is scheduled for 6/15 completion.

Illumination for State Highways Including Crash Estimation and Modeling

\$125,000

By identifying the correct level of illumination necessary to meet safety and operational goals, WSDOT can reduce the resources dedicated to illumination or reallocate the resources to other business areas. Project scheduled for 6/15 completion.

Developing Guidelines for Incorporating Managing Demand into WSDOT Planning and Programming

\$125,000

New guides are developed to identify and select potential demand management strategies. The project is scheduled to be complete 6/15.

3D Numerical Evaluation of Seismically Induced Lateral Spreading Forces on Bridge Abutments - Phase II

\$120,000

This research developed and validated design methodology to estimate earthquake induced lateral forces in embankments that take into considerations the 3D effects. The project is scheduled to be complete 6/15.

Highway Stormwater Runoff - Steep Slopes Phase II and Bioswale Study

\$125,000

Steep slopes in Western Washington will be explored to ascertain effective BMP design for stormwater infiltration.

2 Lane Rural Road Prioritization

\$150,000

Safety Performance Factors (SPF) will be identified to apply to programming improvements to rural roads so that strategic countermeasures can be applied.

Suburban/Urban Arterial SPF

\$150,000

Safety Performance Factors (SPF) will be identified to apply to arterials for identifying priority project improvements.

Expected Life and Best Practices for Pavement Maintenance Treatments

\$150,000

Research will identify best practices for pavement maintenance and produce guidelines on how each maintenance treatment affects the pavement life.

DRIVE Net Phase II - Addition for safety performance assessment (\$50,000)

\$250,000

The DRIVE Net system will be expanded to include additional data sources and new, desired analytical functions.

Identification of Test Method(s) for Determining Wood Guardrail Post Integrity

\$75,000

This research will recommend a method of assessing the wooden guardrail post condition.

Design Guidance and Long-Term Monitoring of Flow Deflection Structures

\$125,000

This phase II work will field test the instrumentation to produce data for the development of design guidelines for flow deflection structures.

Assessment of Lube Oil Management and Self-Cleaning Oil Filter Feasibility in WSF Vessels

\$120,000

A new oil management system will be deployed and evaluated on Washington State Ferries (WSF) vessels. A cost benefit analysis will determine whether to switch to the new methods.

Compost Leachate Testing

\$75,000

Compost used in roadside treatments will be evaluated to establish a standard for roadside compost procurements to ensure proper infiltration capabilities.

Performance Measures for Chip Seals

\$160,000

The goal of this research is to look at performance indicators for chip seal roadways and develop trigger values for these indicators that will indicate the end of service life and the appropriate index values for resurfacing.

Shear Design Expressions for CFT and RCFT Bridge Components

\$250,000

The research objective is to develop design models to predict the shear resistance of CFT and RCFT members. It is expected that there will be different expressions for the elastic and inelastic behavior as well as different locations in the member. Results will be in a format that can easily be adopted into the Bridge Design Manual as well as the AASHTO LRFD Specifications.

Efficiency and Effectiveness of Winter Snow & Ice Control Using Tow Plow Technology

\$150,000

This research will determine if a tow plow is as effective as or more effective than our current plowing operations.

Optimizing HMA Performance for Climate Zones within Washington State

\$120,000

The goal of this research is to determine why pavements in the three general climate zones (western, eastern and the mountain passes) in Washington State are performing so differently and what we can do to improve the performance in each of the zones.

New Projects 2015-2017 Biennium

Benefits of Lighting Interstates

\$150,000

This research will use statistical models to evaluate safety performance of modification to lighting systems on the Interstate Highway System.

Steep Slopes Infiltration Rates

\$150,000

This research continues work on analyzing infiltration of measure infiltration of highway runoff into embankment side slopes to support future MGS Flood revisions to account for and get credit for infiltration. This analysis will help designers determine the proper Ksat and infiltration rates used in stormwater models to determine the right size of the stormwater BMPs in order to avoid environmental damage and improve stormwater runoff management.

Developing Connections for Longitudinal Joints between Deck Bulb Tees

\$200,000

The goal of the research is to minimize the cost and cracking potential at the longitudinal joint of the deck bulb tee girders so that the overall cost of bridge decks is minimized. The research is two-fold and will: 1) develop a mix with locally sourced materials for the ultra-high strength concrete used for the connection between the girders and 2) investigate the connection details for the deck bulb tee girders.

Connected Vehicles and Smart Cities

\$75,000

First, this work will define smart transportation centered on Connected Vehicles in the context of a smart cities environment. The second step will develop a technology access test corridor for collecting data from connected vehicles and other emerging sources and technologies. In the third step, this research will identify the data resources, both conventional and innovative, that will be relevant to smart transportation.

Pile Driving Noise Attenuation

\$300,000

WSDOT is required to attenuate impact pile driving noise and more recently vibratory pile drives due to the enactment of the Marine Mammal Act. This continuing research builds upon the knowledge of previous research and field testing by engineering pile designs that achieve required noise attenuation levels and also explores the use of composite pile materials as a strategy for noise reduction. New tools to collect underwater noise data will also be refined.

Project Inspection Using Mobile Technology – Phase II

\$300,000

Phase II of the research effort will evaluate the benefits of transitioning job and documentation functions that are performed by a project inspector to a mobile device data platform. The research will develop appropriate tools and methodologies to capture additional field data elements (Field Note Records, Pay Items, and Force Account) using the data collection platform developed during Phase I. Based on findings from Phase I, WSDOT inspectors are wasting over \$400,000 per month in lost productivity that could be prevented with broader usage of mobile applications.

Electronic Fare Transaction Data

\$225,000

This project will: dramatically increase the availability of data describing transit use and broaden the use of transit data in a variety of activities that WSDOT funds and supports; improve WSDOT's ability to plan and deliver community based multimodal solutions in corridors; provide data to evaluate the effectiveness of WSDOT's transportation demand management activities and make better use of limited funding.

Identify Multimodal (non-SOV) Enhancements

\$250,000

The project's goal is to identify and prioritize the most effective non-SOV solutions for mobility problems based on existing, objective data- and performance-driven third-party analysis.

Bicycle and Pedestrian Documentation Project

\$250,000.00

This project will develop a protocol and recommendations for WSDOT's community partners to help determine where automated bicycle/pedestrian counters should be located and how to conduct short-duration manual counts so as to maximize accuracy in estimating Annual Average Daily Bicycle and Pedestrian Traffic (AADT).

Best Practices of Using Concrete for Wall Fascia and Slope Stabilization

\$75,000.00

This proposed project aims to provide a thorough review of the state of academic and industry knowledge to ensure the proper use of shotcrete for wall fascia and slope stabilization. There is an urgent need to document the use of shotcrete for wall fascia and slope stabilization by highway agencies, assess the condition of such existing inventory, and identify best practices during various stages of the life cycle of such structures.

Determining Expected Life and Best Practices for Pavement Maintenance Treatments – Phase

\$150,000

The objective of this research is to determine the pavement performance and cost benefit of applying maintenance treatments early in the life of a pavement. This is an extension of the current work. By applying the treatments earlier in the pavement life, it is expected that the preventive treatments will last longer and therefore be more cost-effective.

Developing Girder Strands into the Cap Beam for a Positive Moment Connection

\$185,000

To maximize the seismic resistance in the longitudinal direction of a bridge made from precast, pre-stressed concrete girders, the columns, cap beam and girders must be connected in such a way as to provide flexural resistance. Therefore, the goal of the research is to determine a good method for anchoring the strands in the cap beam, and to verify it by testing.

Evaluation of Smart Technology

\$200,000

WSDOT needs a tool to streamline the screening and evaluation of new, smart technologies. A tremendous amount of new products from smart phone-based applications, radio communication devices for use in connected vehicle environments, and host of data collection devices are continuously in development. The lack of a systematic product screening and evaluation procedure and access-

friendly platform makes it difficult to identify worthwhile products, as well as stay on top of emerging trends and cutting-edge technologies.

Evaluate Risk-Based Asset Management Systems for WSDOT Implementation

\$250,000

WSDOT lacks coherent asset management plans agency-wide and is not successful communicating asset management financial information to decision makers. The goal would be to begin to incorporate risk-based asset management for our entire critical infrastructure by evaluating different systems and implementation of a plan.

Beautification/Landscape Area Plan Development

\$40,000

This research will identify a method to identify state highway right of way areas that are protected under federal law so that they are easily recognized, identified in project planning, and are managed as special areas for preservation.

Economic Benefit of Highway and Bridge Preservation Projects

\$175,000

The results of this research will give WSDOT the methods and tools to estimate and communicate the economic benefits of much needed highway and bridge system preservation.

The Freight Systems Division (FSD) will lead a research project to develop methods to quantify the economic impacts of WSDOT preservation projects in 2016 - 2017. This project will be funded by the WSDOT Research program and will be done in consultation with the Budget, Rail and CPDM Divisions. FSD will seek additional funding partnerships from the UW and WSU and other sources.

Area 3: SHRP2: I-5 Accessibility Analysis in Lynnwood, Washington

SHRP2 Implementation Assistance Program funds provided to the Washington State Department of Transportation for deploying products within the Planning Process Bundle (C02/C08/C09/C12/C15).

The I-5 Accessibility Analysis in Lynnwood will produce a collaborative mobility plan to increase auto, transit, bicycle and pedestrian accessibility to the Lynnwood Transit Center and future light rail station and reduce growing travel demand on I-5 and transportation-related greenhouse gas emissions. WSDOT will work with stakeholders to:

- Refine the scope of the collaborative planning effort based on the following general objectives:
 - Improving auto, bus, pedestrian, and bike access to the Transit Center and future light rail station, including supportive planning policies and development regulations
 - Better connecting the Lynnwood City Center, Transit Center, and Interurban Regional Trail under the I-5/44th St Interchange connecting to south Lynnwood and Mountlake Terrace
 - Providing multimodal connections across I-5 in a manner that supports the region’s long-range land use vision for vibrant, livable communities
 - Supporting the City Center street grid and traffic movement to facilitate a dense and walkable urban center
 - Leveraging WSDOT assets (including land WSDOT owns at the transit center) to support partnerships with Sound Transit, Community Transit, and the City of Lynnwood to further transit oriented development at the existing transit center
 - Removing barriers to safe, efficient, multimodal travel, with consideration for people with special needs and economically disadvantaged populations
 - Enhancing the community and environment and improving the resiliency of critical transportation facilities, including the Scriber Creek Park Trail
 - Identifying potential connections to and opportunities to build on other WSDOT work in the area (e.g., fish passage barrier removal in Scriber Creek)
- Define performance objectives, measures and targets, including measures related to multimodal accessibility and greenhouse gas emissions.
- Identify opportunities and constraints.
- Collect baseline data and information. Summarize relevant roadway, traffic and safety characteristics on streets and intersections proximate to the station, including the I-5/44th Street Interchange.
- Develop and apply a decision-making process to consider tradeoffs between performance objectives.
- Identify and evaluate strategies that optimize performance across selected objectives.
- All stakeholder engagement will be documented to satisfy requirements of 23CFR §§ 450.212 or 450.318 for the purpose of linking planning and the National Environmental Policy Act.
- Develop an implementation plan for recommended strategies, including next steps if appropriate for project delivery.

Estimated costs for SHRP2: I-5 Accessibility Analysis in Lynnwood, Washington

Fed SHRP2	300,000	State	-0-	Total	300,000
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Area 3: Transportation Pooled Fund (TPF) Projects

The following Transportation Pooled Fund projects are led by WSDOT:

TPF 5(114) Roadside Safety

Studies are conducted on a wide range of roadside safety features (guardrails, slopes, etc.) to ensure public safety and to inform and guide policies on roadside safety features. The research is directed by the Roadside Safety Committee.

TPF-5(181) Transportation Research Program Management Database (RPMD)

Research into state needs regarding tracking and monitoring research projects. Also develop a modified California DOT RPMD for use in other states.

TPF-5(241) Western States Rural Transportation Consortium

This consortium promotes innovative partnerships, technologies and educational opportunities to facilitate and enhance safe, seamless rural travel throughout the western U.S.

TPF-5(250) Executive Workshops on Strategies and Best Practices for State Departments of Transportation to Support Commercialization of Electric Vehicles (EV) and Infrastructure

This study establishes a community practice that can share information as the states develop strategies and best practices to support commercialization of electric vehicles and infrastructure.

TPF-5(276) Full-Scale Shake Table Testing to Evaluate Seismic Performance of Reinforced Soil Walls

The objective of this project is to perform numerical studies and use the LHPOST to investigate the dynamic performance of one or two full-scale (7m) reinforced soil retaining walls constructed using realistic materials and methods.

TPF 5(284) Near Road Air Quality

This study objective is to address current and future challenges resulting from newer EPA requirements associated with national air quality standards that will result in tighter emission standards and their influence on transportation project development.

TPF-5(287) Wildlife Passage Assessment

This project will develop a handheld device for state field personnel to use in identifying low cost improvements to existing structures that improve wildlife connectivity.

TPF-5(291) Development of an SPS-2 Pavement Preservation Experiment

The Strategic Study of Structural Factors for Rigid Pavements is the most comprehensive ongoing concrete research effort in the nation. It represents the largest a national investment of on the order of \$15-20 million for the construction, sampling and testing, monitoring, and analysis of concrete pavements.

TPF 5(323) Underwater Acoustic Pile Noise

These studies will test experiment attenuation treatments for structural pile driving to address environmental regulations protecting listed species and marine mammals.

Addendum: SPR Work Program Areas and Activities (WSDOT Orgs)

SPR Work Program Areas and Activities (WSDOT Orgs)	Multimodal Planning - Planning Operations	Multimodal Planning - Transportation Data & GIS	Region Planning	Engineering Policy & Innovation	Capital Program Development and Management	Budget & Financial Analysis	Strategic Assessment and Performance Analysis	Freight Systems	Public Transportation
<i>Division Director Contact</i>	<i>Kerri Woehler</i>			<i>Nancy Boyd</i>	<i>Jay Alexander</i>	<i>Doug Vaughn</i>	<i>Daniela Bremmer</i>	<i>Barb Ivanov</i>	<i>Brian Lagerberg</i>
Multimodal System Planning									
Washington Transportation Plan 2035 - Phase 2	x								
Statewide Modal Plan Integration	x			x				x	x
Corridor and Network Planning	x		x						
Prioritization and Programming of Capital Improvement Projects					x				
Planning Policy Development and Guidance	x								
Planning Analysis and Plan Development	x								
Planning Partnerships									
MPO Program Management	x								
Tribal & Regional Coordination	x		x						
Enhanced Local Collaboration	x		x						
Community Engagement Plan Implementation	x		x	x				x	x
System Performance and Analysis									
Performance & Accountability Analysis							x		
Financial Planning						x			
Economic Forecasting & Analysis						x			
Modeling & Analysis	x								
Data Planning and Application									
Travel Data Analysis		x							
Federal Annual Reporting of Vehicle and Financial Statistics						x			
Crash Data Analysis		x							
GIS and Roadway Data		x							
Management and Administration									
	x	x			x				
Research									
Program and Research Management				x					
WSDOT Library				x					
Research Projects				x					
Pooled Fund Studies				x					
SHRP-2: I-5 Accessibility Analysis in Lynnwood, Washington	x								
<i>This table shows primary responsibilities for each WSDOT organization corresponding to their Program T funding. It is not exhaustive or a full representation of each organization's involvement in SPR activities.</i>									

Addendum: Statewide Transportation Improvement Program

Objectives and Functions

WSDOT's Local Programs (LP) Division develops and manages the Statewide Transportation Improvement Program (STIP). The STIP is a four-year, fiscally constrained prioritized program of transportation projects, compiled from local and regional plans, along with the 2007-2026 Washington Transportation Plan (WTP). These projects have been identified through local, regional and state planning processes, as the highest priority for the available funding to preserve and improve the state's transportation network. The STIP lists state and local projects that have secured federal funds and/or are regionally significant over the next four years. The 2015-2018 STIP includes more than 1,000 projects statewide, representing Washington's highest priority projects.

Included in the STIP are state and local roadway, bridge, safety, bicycle, pedestrian, and public transportation (transit) projects, funded with revenues from federal, state, and local sources. The STIP is developed by WSDOT working in cooperation with Metropolitan Planning Organizations, Rural Transportation Planning Organizations, county lead agencies, tribes, and others, as applicable. Projects included in the STIP are funded by a combination of federal, state, and/or local funds per 23 CFR 450.

Activities, 2015-2017 Biennium

- Continue to work with FHWA, FTA, MPOs, RTPOs, and other partners in meeting the federal STIP requirements (from four- year programming to fiscal constraint by year).
- Develop, prepare and submit the 2015-2018 and 2016-2019 STIP to FHWA and FTA for approval.
- Develop monthly amendments for the STIP as applicable throughout this timeframe.
- After federal approval, continue to provide public access via the web <http://www.wsdot.wa.gov/LocalPrograms/ProgramMgmt/STIP.htm>. Provide annual training, best practices and on-call training for the web-based STIP. Provide on-call assistance and troubleshooting as issues arise with the program for all users.
- Continue to review and update the public involvement process, as applicable.

Addendum: Future SPR Work Program Development

Development of the SPR Work Program for 2017-2019

This future work program will be built within the appropriation levels established by the legislature. The draft work program reviewed by federal partners in May will be based on the WSDOT's budget request to the legislature. The final work program submitted to federal partners in June will, if possible, reflect the appropriation levels and priorities as passed by the legislature. WSDOT needs to have an approved work program in place by July 1 in order to proceed with forecasted set of activities. If timing does not allow for the final work program to be adjusted for legislative decisions, then the first update that is prepared will reflect the required legislative changes.

- February 2017 – outline.
- April 2017 – draft.
- June 2017 – final.