WSDOT Research Procedures Manual

June 2010

RESEARCH EXECUTIVE COMMITTEE
RESEARCH POLICY STATEMENT
March 5, 2010

WSDOT's transportation research program addresses specific needs, problems and questions that improve the agency's ability to deliver transportation projects and operate a safe and efficient system. The following policies instruct the identification of priority research needs, the procurement and management of research projects and the implementation and sharing of relevant results.

1. Research project inquiries will align with the WSDOT Strategic Plan and support the strategies of Moving Washington.

2. WSDOT is a leader in national research and helps shape the national research agenda by participating in the National Research Council's Transportation Research Board (TRB) activities. We contribute expertise and resources to support research conducted by the National Cooperative Research Programs (NCRP) and the American Association of State Highway Transportation Officials (AASHTO). WSDOT also pursues partnerships with other state departments of transportation to research topics that are of common concern. WSDOT employees are encouraged to pursue innovative ideas and solutions by participating in these research programs and other research activities.

3. WSDOT conducts research activities that are not duplicative of other efforts and that have a reasonable likelihood of producing useful results. Our research covers a wide spectrum of inquiries that range from the adaption of a new process, conducting applied and basic research, to seeking new ideas and knowledge. Research outcomes will provide timely information to support the understanding and use of innovative practices and technologies. WSDOT research addresses issues that relate to a multimodal transportation system and builds upon the knowledge gained in each modal area.

4. Research projects that are funded by WSDOT are identified by using a collaborative process that is directed by WSDOT business needs. Even though collaboration is encouraged, competition for funding is accomplished with transparency, fairness, and equity resulting in the best technical expertise assigned to projects.

5. WSDOT is a member of and works closely with our partners in the Washington State Transportation Center (TRAC), a cooperative transportation research organization. Its members, the University of Washington (UW), Washington State University (WSU) and the Washington State Department of Transportation (WSDOT), support TRAC to coordinate both public and commercial transportation research efforts and to develop research opportunities nationally and locally. TRAC provides a link among the state and other research clients, university researchers, and the private sector. TRAC's role as liaison connects those who need applied research at WSDOT with researchers from the universities, as well as other agencies. TRAC also serves as a conduit for researchers to the expertise, data and information sources housed at WSDOT.

6. WSDOT also partners with University Transportation Centers, other state DOT's, out of state universities with specialized expertise or facilities, federal and state agencies, and private companies to explore new ideas and to share funding resources and/or expertise.

7. The WSDOT Research Program helps attract student interest in transportation-related issues through research activities conducted by graduate and senior level students. When possible the research provides a "capstone" project for the student's academic pursuit.

ORGANIZATION OF THE DOCUMENT

Section One: Overview – Explains what constitutes WSDOT's Research Program.

Section Two: Roles and Responsibilities – Describes research committee, project participant, and research staff roles and responsibilities in carrying out WSDOT research activities.

Section Three: Procedures for Research Management – Describes specific procedures and protocols to assist WSDOT staff, Federal Highway Administration (FHWA) staff, Principal Investigators and other interested parties with the directions they need to participate in a particular research program or aspect of a research project.

Section Four: Research Implementation – Identifies the specific project requirements, from proposal development to final reporting, that promote implementation of relevant findings upon completion of the research project.

Section Five: Research Reports – Defines the WSDOT requirements for preparing research reports funded by WSDOT.

Section Six: Research Program Review – Describes the Research Program peer exchange requirements and process.

Section Seven: Research Resources – Provides a quick reference to ongoing research, projects, research reports, and research program information.

Acronym List for WSDOT Research Procedures Manual

AASHTO	American Association of State Highway and Transportation Officials
ACRP	Airport Cooperative Research Program
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality
COTR	Contracting Officer's Technical Representative
CRP	Cooperative Research Program
CSR	Client Sponsored Research
CTBSSP	Commercial Truck & Bus Safety Synthesis Program
FAPA	Federal Aid Project Authorization
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FMIS	Funds Management Information System
FTA	Federal Transit Administration
GCA	Governmental Contract
HMCRP	Hazardous Materials Cooperative Research Program
HRPD	FHWA Office of Program Development and Evaluation
HSIP	Highway Safety Improvement Program
IDEA	Innovations Deserving of Exploratory Analysis
IM	Interstate Maintenance
ITRD	International Transport Research Documentation
MG	Minimum Guarantee
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHS	National Highway System
NTIS	National Technical Information Service
NTL	National Transportation Library
OCLC	On-Line Computer Library Center

OFM	Office of Financial Management (State)
OMB	Office of Management and Budget (Federal)
ORLS	WSDOT Office of Research and Library Services
PI	Principal Investigator
PS&E	Plans, Specifications, and Estimates
RAC	Research Advisory Committee
RDT	Research, Development and Technology
REC	Research Executive Committee
RFQ	Request for Qualifications
RIP	Research in Progress
SCOR	Standing Committee on Research
SHRP	Strategic Highway Research Program
SPR	State Planning and Research
STEP	Surface Transportation Environmental and Planning Cooperative Research Program
STP	Surface Transportation Program
TAC	Technical Advisory Committee
TCRP	Transit Cooperative Research Program
TLCat	Transportation Libraries Catalog
TPF	Transportation Pooled Fund
TRAC	Washington Transportation Center
TRB	Transportation Research Board
TRIS	Transportation Research Information Services
TransNow	Transportation Northwest
UTC	University Transportation Center
UW	University of Washington
WA-RD	Washington Research Document
WASHTO	Washington Association of State Highway and Transportation Officials
WSDOT	Washington State Department of Transportation
WSU	Washington State University

SECTION ONE: OVERVIEW

The Office of Research and Library Services houses WSDOT's Research Program which conducts research and development projects to better understand why certain problems occur and how to prevent or correct them through improved information, technology, or processes. The program uses systematic inquiry to improve the agency's ability to deliver transportation projects and operate a safe and efficient transportation system.

The WSDOT Research Program includes:

- State Planning and Research (SPR) funded projects
- Quick Response Research
- Client Sponsored Research
- Graduate Fellowship Program
- Transportation Pooled Fund Studies
- Transportation Synthesis Reports
- Survey Support
- Experimental Features
- Federal Discretionary Funds
- Cooperative Research Program activities
- Strategic Highway Research Program 2 (SHRP2)
- Synthesis Programs
- Innovations Deserving of Exploratory Analysis (IDEA) activities
- University Transportation Centers
- Transportation Research Board Technical Committees

RESEARCH PROGRAM OVERVIEW

A variety of transportation research programs are available to help transportation agencies address their research needs. Programs vary by intent, geographic coverage, and the degree of competitiveness. WSDOT's intent is to use each of the programs for the maximum benefit to the agency. This section summarizes the programs that WSDOT uses to fund transportation research.

State Planning and Research (SPR)

Title 23, U.S. Code Section 505 (b) (1) requires at least 25% of the SPR apportionment (or its equivalent from other authorized sources) be used for research activities. A 20% state match is required. The state match is provided from the Motor Vehicle Fund and the Multimodal Fund.

The SPR research funding can be used for research, development, and technology transfer activities. The funding is managed by the Office of Research and Library Services with input from the Research Executive Committee and four Research Advisory Committees (RACs): Project Delivery; Operations;

Multimodal Transportation; and Information and Finance. Projects are selected on a biennial basis in the fall of even years.

States set aside 2 percent of the apportionments they receive from the Interstate Maintenance (IM), National Highway System (NHS), Surface Transportation Program (STP), Congestion Mitigation and Air Quality Improvement (CMAQ)**,** Bridge programs, and the Highway Safety Improvement Program (HSIP) as the Base Minimum Guarantee to fund the SPR Program.

Quick Response Research

The Quick Response Research program is a small set aside of the SPR program that is intended to address high-priority, opportunistic or emergent research needs. Projects are expected to be completed within approximately six months and are typically $20,000 or less.

Client Sponsored Research Projects

Some WSDOT Programs, Divisions, and Project Offices conduct research and experimental activities in addition to research funded by the SPR program. These projects may be administered by the Research Office upon request, are referred to as Client Sponsored Research (CSR) projects, and can be funded by various federal, state or local funding sources.

WSDOT Graduate Fellowship Program

The WSDOT Graduate Fellowship Program provides an opportunity for WSDOT employees to continue their education while employed by the agency. The program focuses on providing advanced training in technical disciplines required by the department. Employees approved for the program are provided full pay and benefits while attending school full time at an accredited institution. Students are encouraged to complete their graduate studies within nine months. The costs of tuition, books, and school fees are covered by the program. Students may opt to write a research paper as part of their studies. If this option is chosen, students are encouraged to contact the Research Office to discuss high priority research needs that fit within their area of study.

WSDOT employees may also participate in the Fellowship Program on projects funded by the WSDOT Research Office or Transportation Northwest (TransNow). TransNow is a University Transportation Center led by the University of Washington. The Washington State University is a partner in TransNow and may also receive TransNow funding. To receive funding through TransNow, students must be accepted by a faculty member with a funded TransNow project (see the description of TransNow below). To receive funding from the Research Office, an employee must be accepted by the faculty member selected as the Principal Investigator for a funded research project. Sponsoring Offices must also provide the additional costs of the employee's salary and benefits in excess of the Research Assistant salary and benefits covered by the Research Office.

Transportation Pooled Fund Program

The Federal Highway Administration (FHWA) facilitates the management of the Transportation Pooled Fund Program as a means for interested States, FHWA, and other organizations to partner when significant or widespread interest is shown in solving transportation-related problems. Partners may pool

funds, including SPR funding, and when approved by FHWA SPR funds may be used without matching state funds. Activities may include research, planning, or technology transfer activities and may be jointly funded by several federal, state, regional, and local transportation agencies, academic institutions, foundations, or private firms as a pooled fund study.

WSDOT estimates that for each dollar it contributes to TPF Studies, approximately ten dollars are gained from other contributors. More information about the Transportation Pooled Fund Program may be found at Turner Fairbanks or the Pooled Fund websites.

Transportation Synthesis Reports

Transportation synthesis reports (TSR's) grew out of interest of WSDOT Executives in "just-in-time" summaries of state of the practice information and literature on topics of prime interest. WSDOT's Synthesis Program is based on a similar effort available through the Wisconsin Department of Transportation Research and Library Services Office.

Transportation Synthesis Reports (TSR's) are brief summaries of currently available information on topics of interest to WSDOT staff. Online and print sources may include newspaper and periodical articles and research project reports, as well as information about the practices of other state DOTs and organizations. State of the practice information may include quick surveys of all other DOTs or phone interviews with select states.

For more information, you may view the Transportation Synthesis Report Program (PDF 37kb).

Survey Support

The Research Office offers simple surveys of other state DOTs and AASHTO member agencies and affiliates. The surveys are intended to support agency employees by providing information about state of the practice in other, similar organizations.

If a more robust survey effort is needed, we contract these services through our academic partners.

Experimental Features Program

The Experimental Features program is sponsored by FHWA to allow state departments of transportation to evaluate new or innovative highway technology or alternative standard technology under actual construction and operating conditions. An experimental feature can include the use of materials, processes, methods, equipment items, traffic operational devices, or other features that have not sufficiently been tested under actual service conditions or needs to be compared to an alternative for determining cost-effectiveness. Experimental Features are incorporated into federal-aid highway construction projects to determine the suitability of the features as regular construction items. More information can be found at FHWA's Experimental Features website.

Federal Discretionary Funds

Research activities may also be funded through federal discretionary programs, more commonly known as "earmarks" that are identified and approved by Congress. These projects are sponsored by one or more members of Congress and may be research oriented. Requests for possible earmarks may be made at the

beginning of each year. Requests for Congressional support of proposed earmarks are approved by Executive Management prior to being submitted to individual Congressional members. Other transportation partners, such as the state's universities, may also request federal earmarks for research.

Cooperative Research Program

The Cooperative Research Programs are managed by the Transportation Research Board (TRB) and are applied, contract research programs that develop near-term, practical solutions to problems facing transportation agencies. WSDOT may recommend problem statements for study and nominate employees for oversight panels. Cooperative Research Programs include:

- Airport Cooperative Research Program (ACRP) Problem statements are solicited periodically but may be submitted to TRB by anyone at any time.
- National Cooperative Freight Research Program (NCFRP) Problem statements are solicited periodically but may be submitted to TRB by anyone at any time.
- Hazardous Materials Cooperative Research Program (HMCRP) Problem statements may be submitted at any time by stakeholders.
- National Cooperative Highway Research Program (NCHRP) Problem statements are due September 15 of each year.
- Transportation Cooperative Research Program (TCRP) Problem statements are solicited periodically but may be submitted to TRB by anyone at any time.
- Surface Transportation Environmental and Planning Cooperative Research Program (STEP) Proposal requests are made periodically on their website.

All Cooperative Research Programs except STEP are managed by the Transportation Research Board (TRB).

Strategic Highway Research Program 2

SHRP2 is managed by TRB and is a targeted, short-term, results-oriented program of strategic highway research designed to advance highway performance and safety for U.S. highway users. SHRP2 focuses on applied research in four areas in order to meet the following goals:

- **Safety**: Significantly improve highway safety by understanding driving behavior in a study of unprecedented scale
- **Renewal**: Develop design and construction methods that cause minimal disruption and produce long-lived facilities to renew the aging highway infrastructure
- **Reliability**: Reduce congestion and improve travel time through incident management, response, and mitigation
- **Capacity**: Integrate mobility, economic, environmental, and community needs into the planning and design of new transportation capacity

The Expert Task Groups (ETGs) prepare the proposals which are then posted for solicitation on the website. WSDOT may nominate employees to serve on the ETGs.

Synthesis Programs

The Synthesis Programs prepare summaries of current practice in four areas of transportation:

- Airport Cooperative Research Program (ACRP)
- Commercial Truck and Bus Safety Synthesis Program (CTBSSP)
- National Cooperative Highway Research Program (NCHRP)
- Transit Cooperative Research Program (TCRP)

Synthesis topics can be proposed at any time via each of the program's websites. The reports are prepared under the guidance of a technical panel, with the assistance of an expert in the topic area who serves as the project consultant.

WSDOT may submit proposals for synthesis studies and nominate employees for oversight panels.

Innovations Deserving Exploratory Analysis

Innovations Deserving Exploratory Analysis (IDEA) is a TRB program to fund investigations of promising but unproven innovations for highways, transportation safety, and transit.

- NCHRP-IDEA – seeks proposals with potential to advance the construction, safety, maintenance, and management of highway systems. The program nurtures new concepts for technologies, methods, and processes for application to highway systems in broad technical areas such as highway design and construction, materials, operations, and maintenance.
- Safety-IDEA – provides funding for projects that promote innovative approaches to improving intercity bus, truck, or railroad safety. The program encompasses vehicle improvements, operator performance, and alertness improvements; operational practices; and hazard reduction, among other interest areas.
- Transit-IDEA – seeks proposals on (1) increasing transit ridership, (2) improving transit safety, security, and emergency preparedness, (3) improving transit capital and operating efficiencies, and (4) protecting the environment and promoting energy independence.

WSDOT may submit proposals for innovations to study. IDEA proposals are reviewed in March and September of each year.

University Transportation Centers

The United States Department of Transportation (USDOT) provides funding to advance U.S. technology and expertise in the many disciplines comprising transportation through the mechanisms of education, research and technology transfer at university-based centers of excellence. These centers each facilitate a program of research in theme areas. It may be possible to partner with a university professor to submit your research problem statement for funding to a University Transportation Center (UTC). If you are successful in partnering with a professor to submit a proposal, you will likely be expected to provide match funding. To determine if your research idea is appropriate for a UTC, please contact the Research Manager responsible for research in your area of interest.

Transportation Research Board Technical Standing Committees

The Transportation Research Board (TRB) is a division of the National Research Council — a private, nonprofit institution that is the principal operating agency of the National Academies in providing services to the government, the public, and the scientific and engineering communities. The National Research Council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The Transportation Research Board's mission is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal.

In addition to SHRP2 and the Cooperative Research Programs, TRB manages over 200 Technical Standing Committees on topics covering all modes and aspects of the transportation industry. WSDOT employees may volunteer to serve on any of the committees. The committees:

- Provide for a mutual exchange of information among committee and task force members on socioeconomic and technological developments
- Identify research needs
- Stimulate needed research
- Advise on research priorities and procedures
- Evaluate and interpret research findings
- Review papers for presentation at TRB meetings and for publication
- Encourage the adoption of appropriate research findings into practice
- Arrange special programs, conferences, and workshops

SECTION TWO: ROLES AND RESPONSIBILITIES

The WSDOT Research Program relies on individuals and committees for the development of a strategic, multi-modal program of research activities. Anyone within the agency may submit a research need to the Office of Research and Library Services Director. Research needs will be forwarded to Research Advisory Committees for consideration.

Roles are described for:

- Office of Research and Library Services
- Research Executive Committee
- Research Advisory Committees
- Technical Advisory Committee
- Assistant Secretary, Chief Engineer, Engineering and Regional Operations
- Director, Office of Research and Library Services
- TRB State Representative
- Research Manager
- Technical Monitor
- Principal Investigator
- Librarian
- Office Coordinator
- Business Manager
- Implementation Manager

WSDOT Office of Research and Library Services

The WSDOT Office of Research and Library Services (ORLS) manages two program functions known as the Research Office and the WSDOT Library.

The Research Office organizes, manages, and disseminates the results of research conducted within the Department. It coordinates the process for identifying, selecting, and managing research projects funded through the federal state planning and research program. It helps develop and manage research funded by other agency programs or by legislative direction.

The WSDOT Library supports staff, consultants and contractors by finding information on a topic, developing search strategies, conducting literature searches, locating facts and statistics, identifying information and additional sources, and obtaining articles and books through a state and national library network.

Some of the key functions that the ORLS performs are: maintaining master agreements with research institutions, giving approvals for new projects and research task agreements, making revisions to the program's projects, funding or schedules, helping to identify and foster research partnerships, setting priorities for research, and tracking implementation activities for research results.

Research Executive Committee

The Research Executive Committee (REC) provides consultative oversight to ORLS and the Research Program. The REC sets the strategic direction for the solicitation of project proposals.

The role of the Research Executive Committee includes:

- Defining research goals that are the basis for project and principal investigator selection
- Establishing the problem statement selection committees
- Approving the funded research program
- Reviewing program progress
- Reviewing key research findings
- Evaluating and finalizing recommendations for implementation of research findings

Membership

The membership includes:

- Assistant Secretary, Engineering and Regional Operations Division (Chair of the REC)
- Director, Strategic Planning and Program Management
- Director, Aviation Division
- Co-Directors, Maintenance and Operations Programs
- State Materials Engineer, Materials Laboratory
- Director, Terminal Engineering, Ferries
- Administrator, Urban Corridors
- Regional Administrator, Olympic Region
- Regional Administrator, Eastern Region

Regional Administrators will serve for three years. Member rotation is staggered, as feasible, to provide continuity. Members other than the Regional Administrators serve continuously as long as they hold their current position.

Research Advisory Committees

The Research Advisory Committees promote understanding of agency research needs, clarify priorities, and promote multi-modal results, where applicable.

Four Research Advisory Committees (RACs) provide input to the Research Program: Project Delivery; Operations; Multimodal Transportation; and Information and Finance. Each committee is comprised of nine to twelve members. The RACs are chaired by members of the Research Executive Committee and supported by the ORLS staff. The role of the RACs includes:

- Identify and prioritize research needs in a manner that addresses critical agency issues and aligns with the strategic direction of the agency. Recommend to the Research Executive Committee research projects to be funded.
- Recommend technical monitors for the selected projects
- Receive reports and presentations on research results, discuss the recommendations of technical monitors for implementation, and make recommendations on funding for implementation
- Provide input for national research participation (i.e., NCHRP, TCRP, ACRP, NCFRP, STEP, TPF, and other programs). Through AASHTO and other regional and national forums, help obtain resources to address critical research needs.

In selecting RAC members, consideration is given to both the level of expertise of the individuals and balanced representation among the interested functional areas. FHWA's Division Office is also represented on each RAC. Participants are expected to:

- Have an understanding of the agency goals, activities, and priority management issues in their Office and the agency
- Be able to discuss knowledgeably the relative urgency of research and development needs across the agency
- Be interested in research and development
- Have time to proactively participate
- Have the ability to influence budget decisions in support of implementation of research results

The meeting schedule for the RACs:

> Even year – Two meetings: Spring - to announce the beginning of the project selection process and review the current research portfolio in each RAC. Fall - to select projects and develop the funding recommendation for the REC.
>
> Odd year - One meeting that focuses on research project results (portfolio review, status update) and what are the emerging issues (to help identify topics for forums).

In addition to meetings, committee members are expected to facilitate communication on the topics within their functional area.

Technical Advisory Committees

Each project is encouraged to develop a Technical Advisory Committee to provide additional perspective and advice for the research project. Technical Advisory Committee members may include the Technical Monitor, the Research Manager responsible for the subject area, agency representatives from other offices with a vested interest, FHWA representatives, and regional/local/or Tribal governments. Technical Advisory Committees will:

1. Finalize the project scope of work
2. Receive updates on project progress
3. Provide technical and policy guidance for the projects

The Technical Advisory Committees are maintained for the life of the project. Meetings are scheduled to provide assistance at strategic milestones in the project.

Chief Engineer, Engineering and Regional Operations

The Chief Engineer supervises the ORLS Director and chairs the Research Executive Committee.

Director, Office of Research and Library Services

The Director is responsible for the day-to-day management of the Research Program. Research management includes developing and conducting research activities within the strategic objectives and

policies of the Department, developing policy and procedures, initiating specific projects, participating in research sponsored from non-WSDOT funding sources, providing liaison with executive, university and legislative personnel, and communicating the value of research findings. The priorities, policies, and direction of the research are recommended to the Research Executive Committee by the Director.

The Director approves all research budgets and ensures that research activities are conducted within the constraints of available resources. The Director also approves all revisions to approved research projects and any extensions required to complete the research within the limits of the approved work program. A budget change that involves an increase in the total federal funds authorized for the work program requires prior FHWA approval and authorization. Similarly, changes in the work program (adding a line item, contracting out, etc.) as specified in 49 CFR 18.30(d) require prior FHWA approval.

Research Manager

The Research Manager is a staff person in the ORLS and is responsible for managing the research functional areas and project process. The Research Manager ensures that project milestones are reached in a timely fashion.

1. Responsible for developing, administering, and marketing the research programs in his/her functional area.
2. Maintains knowledge of and understands research activities and needs in the functional areas assigned, including monitoring of national and international research for potential application within WSDOT.
3. Works with the Technical Monitor to develop research problem statements for research needs identified by the Research Advisory Committees.
4. Helps identify researchers with appropriate skills to conduct research.
5. Acts as a liaison between the Technical Monitor and the Principal Investigator on contracts.
6. Facilitates development of a scope of work and task agreement/contract for the research project.
7. Maintains contact with the Principal Investigator and Technical Monitor to ensure that project milestones are met and documented.
8. Reviews and approves invoices.
9. Manages research project budgets.
10. Approves all contractual changes related to project scope, budget, and time extensions.
11. Coordinates meetings of technical advisory committees.
12. Reviews and comments on draft final reports and other products of the research.
13. Collaborates with the Technical Monitor to formulate strategies for implementing research results.
14. May or may not conduct or assist in research activities.

Technical Monitor

Technical Monitors are WSDOT staff with technical knowledge of the research subject. The Technical Monitor ensures that the research project addresses WSDOT business needs. The Technical Monitors are assigned by the WSDOT Office Manager designated as the lead for a research need by the Research Advisory Committee.

1. Develops, in coordination with the Research Manager, research problem statements for research needs identified by the Research Advisory Committees.
2. Reviews and comments on the scope of work for the research project.
3. Identifies intended implementation outcomes of the research project.
4. Identifies and provides a list to the Research Manager, before the scope is finalized, of WSDOT Offices and Regions that will be users of research findings, if appropriate, or will be affected by changes as a result of research findings.
5. Establishes and maintains communication with representatives of these user and customer groups to ensure research products achieve the most comprehensive outcome possible for the resources provided.
6. Remains in contact with the Research Principal Investigator and Research Manager throughout the project. Notifies the Principal Investigator and Research Manager of questions or concerns regarding project scope or work methods. This may include pre-proposal meetings with prospective PI(s), a project meeting soon after the official start, and in-progress reviews conducted on an as needed basis, but at least quarterly, as a minimum.
7. Provides a list to the Research Manager of users and customers that should be invited to Progress and Final Review Meetings.
8. Reviews and comments on interim, draft final and final reports and other products of the research.
9. Drafts a summary statement of how the research project findings will/could affect WSDOT business processes for input into a research note.

Principal Investigator

The Principal Investigator is a university professor, a consultant, or agency employee with expertise in the subject area to be studied. The Principal Investigator manages the day-to-day activity of the research project.

1. Develops a scope of work and a work plan for the project.
2. Identifies/hires staff to perform the research.
3. Provides progress and final reports.
4. Manages the project budget and schedule.
5. Maintains contact with the Technical Monitor, TRAC Director (if applicable), and Research Manager.
6. Participates in outreach activities such as publication, presentation, and summary document (e.g. research note) development.

Librarian

The WSDOT Library staff supports agency staff, consultants and contractors by finding information on a topic, developing search strategies, answering reference questions, conducting literature searches, locating facts and statistics, identifying additional information sources and obtaining articles and books through inter-library borrowing.

Office Coordinator

The Office Coordinator provides administrative support to the ORLS. Specific duties include:

1. Receive and document the receipt of research proposals, contracts, and reports.
2. Maintain and actively manage project files.
3. Manage and maintain the office website.
4. Assign WA-RD Report numbers.
5. Facilitate the production, posting, and distribution of research reports.
6. Develop and maintain a mail/project log book.
7. Manage mail services for ORLS.

Business Manager and Fiscal Analyst

The Business Manager, with the assistance of the Fiscal Analyst performs the actions necessary to:

1. Prepare, execute and close research contracts.
2. Maintain research project accounts in compliance with standard audit and accounting practices including equipment purchases.
3. Develop the ORLS biennial budget and federal aid work program, including modification, if necessary, during the biennium.
4. Serve as a resource to other ORLS staff regarding WSDOT fiscal and contract procedures and maintain up to date records on all Office expenditures.
5. Ensure timely payment of all project invoices.
6. Manage a continuously updated database for all research projects.

RESEARCH PARTNERS

Washington State Transportation Center (TRAC)

TRAC is a cooperative transportation research partnership. Its members include the University of Washington, Washington State University and the Washington State Department of Transportation. The WSDOT Director of ORLS serves as the Executive Director of TRAC and Directors are appointed by each university. Member organizations support TRAC to coordinate transportation research efforts and to develop research opportunities nationally and locally.

TRAC's most important function is to provide a link between the state, university researchers and the private sector. Much of TRAC's research is funded by WSDOT. TRAC acts as a liaison, connecting those who need applied research at WSDOT with those best suited for conducting it at the universities. From its offices at the University of Washington in Seattle and Washington State University in Pullman, TRAC coordinates resources for the research, serves as a focal point for student involvement in transportation research, and provides resources such as report editing and graphics.

Transportation Northwest (TransNow)

TransNow is the University Transportation Center for Federal Region 10 which consists of Alaska, Idaho, Oregon and Washington State. It is one of ten regional transportation research centers administered by the Research and Innovation Technology Administration (RITA) of the USDOT. It is a consortium comprised of the University of Washington (UW) and Washington State University (WSU) and is led by the UW.

The research theme of TransNow is Transportation Operations and Infrastructure. It includes the major theme areas of Traffic Operations, with a strong focus on Intelligent Transportation Systems (ITS); Freight Operations and Logistics with an emphasis on freight mobility; and Infrastructure Construction with an emphasis on smart infrastructure.

Transportation Research Board

The Transportation Research Board (TRB) is a division of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance. The mission of the TRB is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Director serves as the TRB State Representative and acts as a liaison to represent interests of WSDOT.

AASHTO Standing Committee on Research and Research Advisory Committee

The AASHTO Standing Committee on Research (SCOR) provides oversight to the transportation research community and develops research priorities for the National Cooperative Highway Research Program (NCHRP). The Research Advisory Committee (RAC) includes research managers from each state department of transportation and provides input on research needs and priorities. In addition, RAC facilitates surveys that support research and provides a link between Research Directors. The Director serves on the AASHTO RAC.

Other Partners in Research

Other organizations that WSDOT partners with on research includes: research institutions (including universities and other government research labs); state and federal agencies; local and tribal governments; non-profit organizations; and private consultants and colleges. These partnerships currently occur on a project-by-project basis but may become programmatic partnerships on an as needed basis.

SECTION THREE: PROCEDURES FOR RESEARCH MANAGEMENT

The process of developing the research program involves the collection of research needs and potential solutions from many sources including WSDOT employees, FHWA, FTA, university researchers, local agencies and members of private industry. This subsection outlines the specific actions that make up this process.

RESEARCH PROGRAM DEVELOPMENT

The conceptual research needs and problem statements will be prioritized by the Research Advisory Committees. The Research Executive Committee will approve a final list of problem statements to be funded. Once priority problems are identified, the Research Office and technical staff will work with principal investigators to develop the scopes of work for each project.

Schedule

Even year

April	Research Advisory Committees (RAC) meetings to announce the beginning of the project selection process and review the current research portfolio
May	Research needs solicitation initiated from RAC members for each functional area represented on the committee
June to September	RAC functional areas may hold workshops with interested parties to identify research needs
September 10	Functional area problem statements are submitted to ORLS
October/November	RAC meetings held to select projects and develop the funding recommendation for the REC
December	REC reviews recommendations and develops final project list

Odd year

January	Research Institutions identified and Principal Investigators selected
February to June	Project scopes developed
April	RAC meetings to review research portfolio, status updates, and emerging issues
July to September	Establish project contracts for new projects

The research needs gathered through this process provide possible topics for other research programs in addition to the WSDOT research program. This includes the National Cooperative Highway Research Program (NCHRP), Transit Cooperative Research Program (TCRP), Transportation Pooled Fund Program, Federal earmark requests, Innovations Deserving Exploratory Analysis (IDEA), and other funding opportunities.

Setting RAC Allocations

The Research Executive Committee considers the Department's business needs and sets research goals and funding allocations for each RAC for the biennium.

Identifying Research Needs

Each Research Advisory Committee is divided into functional areas. Each functional area within a RAC is responsible for identifying their research needs. Each RAC member identifying research needs must ensure that identified needs align with identified agency and gubernatorial strategic directions for their functional area. It is up to the RAC member to define how they identify needs but it is anticipated that they may hold a research session with interested parties (Regions, Modes, Universities, federal and local partners, etc.) to identify research needs. Solicitations for input are to be inclusive.

From Research Need to Proposed Research Project

Research problem statements will be developed for research needs by functional areas (Maintenance, Bridge and Structures, etc.). Input on priorities for funding may be made to the RAC member responsible for that function for consideration. Recommended Principal Investigators may be identified but no commitment will be made to the Principal Investigator at this time and RAC members are strongly encouraged to discuss research needs with at least both the University of Washington and Washington State University professors. Research Managers and TRAC Directors will help identify appropriate professors to contact if assistance is needed.

Out of these efforts, each RAC member responsible for their functional area will propose no more than three (unless approved by the RAC chair) fully developed research problem statements to the fall RAC meeting every even year. The RAC will rank problem statements for submission to the Research Executive Committee (REC) for funding from the SPR research program. For each research need recommended to the REC, the RAC will identify the lead office and other offices with an interest in the topic. From the lead office, a technical monitor will be assigned and if the project is funded, a technical advisory committee may be formed with the interested offices.

Each of the proposed projects and additional priorities identified by the RACs may be submitted to other applicable funding programs including but not limited to the CRP and the Transportation Pooled Fund program. Research needs should be captured in sufficient detail to propose as projects and a Technical Monitor assigned for follow through.

Role of the Universities and Consultants

Researchers may be involved in the functional area research sessions and contribute to the discussion of needs and innovations that may be of interest to WSDOT. Inclusion is at the discretion of the RAC member but involvement of the researchers is encouraged. If researchers are invited, every attempt should be made to have representatives from both WSU and UW. Research Managers, working with the Washington Transportation Center (TRAC) Directors, will help functional area managers identify appropriate members to invite.

Establishing the SPR Research Work Program

The Research Executive Committee retains final approval of the WSDOT Research Program. The Director compiles the prioritized and budget constrained RAC problem statements and presents the recommendations of the RACs to the Research Executive Committee.

The Research Executive Committee will review the RACs proposed projects and recommended priorities and develop the final research plan for the SPR Research Program. The Research Executive Committee will review the constrained program proposed by each RAC for their anticipated allocation and a list of the other committee interests.

In selecting projects for funding, the REC will also review the recommended Principal Investigators and assist in balancing the program between the UW, WSU and other institutions.

Items that may be taken into consideration as a final research plan is prepared include:

- RAC recommended priorities
- Costs for proposed projects
- Balance of the program across functional areas
- Reasonable workloads
- Expertise of researcher(s)
- How research activities support agency goals
- Urgency for results

An informational copy of the approved research statements is furnished to FHWA following Program approval. The Research Work Program includes SPR Research and funded Transportation Pooled Fund projects. Research funded from sources other than SPR, experimental features, federal earmarks and cooperative research program participation are not included in the Work Program.

RESEARCH MANAGEMENT

Research Management provides direct management and supervision of specific research projects under the approved research program, including both SPR funded research projects and research projects contracted through the ORLS using other funding sources. Research Managers are responsible for coordinating the development of proposals to conduct research with Principal Investigators, the WSDOT Technical Monitor, Technical Advisory Committees, and the Contract and Finance Manager.

Research Managers administer the conduct of the research by facilitating the proposal development; communicating regularly with the Principal Investigator, Technical Monitor, and Technical Advisory Committee; approving invoices; tracking project progress; reviewing and approving progress reports; conducting on-site visits; coordinating a review of the research, the final product, and/or report; supporting the role of the Technical Monitor in developing an Implementation Plan; and coordinating the reporting of project results to the Research Advisory Committee.

Each research project is assigned a Principal Investigator, Technical Monitor and Research Manager.

SPR Research Projects

The Director notifies the RACs and Research Managers when the research program is approved and assigns a Research Manager to a specific research task or project.

Identifying Technical Monitors

The office that is the most direct potential beneficiary or user of the research findings assigns the Technical Monitor. The Technical Monitor will be provided information on their responsibilities and project contacts. Should other work duties prevent timely support of the research project, the Technical Monitor will notify the RAC member or Research Manager and request a replacement.

Selecting Principal Investigators

After the research project list is finalized by the REC:

A. Continuing projects will continue with the same principal investigator unless the Technical Monitor requests otherwise.

B. Principal Investigators approved by the REC may proceed to project development.

C. For all other projects:

1. A Request for Qualifications will be distributed to government institutions. The RFQ will request the qualifications, resources, and a brief statement of research approach from interested parties. RFQs will be distributed in early January and be due within 2-3 weeks.
2. Research Managers and Technical Monitors will rate the proposals for: experience, qualifications (credentials), resources, and research approach and select the principal investigators.
3. The Principal Investigator recommendation will be forwarded to the Director for approval. The final program will be developed.
4. A letter will be sent by the Director to the selected PI and TRAC Director notifying them of their selection, the earliest start date possible, and providing contact information for the Research Manager and Technical Monitor as well as requesting a full proposal.
5. E-mails will also be sent to the proposers not selected.

D. If qualified researchers are not found through this solicitation, a RFQ will be distributed for proposals from other organizations.

The Research Manager responsible for the subject area and the assigned Technical Monitor review the responses of the RFQ. Principal Investigators are selected based on recommendations of the Research Executive Committee, Research Advisory Committee, Research Managers and Technical Monitors.

Developing Proposals

The selected Principal Investigator, in cooperation with the Technical Monitor, prepares a draft research proposal according to the Research Proposal Preparation Guide. The draft proposal is forwarded to the assigned Research Manager. In some cases, a pre-proposal meeting is held with the Research Manager, the Principal Investigator and the Technical Monitor to determine the research approach, define the objectives of the draft research proposal, and create a Technical Advisory Committee, if necessary. The Principal Investigator and the Technical Monitor are also made aware of the Research in Progress and TRIS databases.

Once the Principal Investigator, Technical Monitor and Research Manager agree on the draft proposal, an electronic version of the document is submitted to the TRAC Office at their university or, for

organizations not in TRAC, to the ORLS. If the document is submitted to the university TRAC office, it is reviewed and forwarded to the ORLS.

Proposal Review

The Research Manager coordinates the review, modification and approval of the draft proposal.

The Research Manager works with the Technical Monitor to determine the appropriate technical review required to evaluate the draft proposal. It is intended that the affected offices within WSDOT will be provided the opportunity to review the proposal.

The Research Manager distributes the draft proposal to the Technical Monitor and other appropriate reviewers, including the appropriate local federal office if the project includes federal funds. Proposal reviewers return their comments to the Research Manager by the date indicated. The Research Manager consolidates the review comments and provides them to the Principal Investigator.

The Principal Investigator incorporates the appropriate review comments into the draft proposal and submits a final proposal to the ORLS (an electronic version and two unbound paper copies). The final proposal is maintained by the Business Manager, while copies of the final proposal are provided to the Research Manager to complete the review process. If the changes to the draft proposal were extensive, the Research Manager may elect to have the proposal reviewed again.

The Research Manager determines that the final proposal is ready for contract. The Research Manager sends the proposal and relevant information to the Research Office to prepare the contract documentation. The Proposal documents and research contract are approved by the Director.

SPR Project Management

The Research Manager is the main point of contact for the Principal Investigator. The Research Manager strives to enhance the value of the research project by encouraging and, when necessary, facilitating open and meaningful communication between the Principal Investigator and the Technical Monitor from the functional area.

Research Managers provide direction and oversight for all active research projects. This requires continuous interaction between the Principal Investigator, Technical Monitor, and Research Manager.

The Research Manager ensures that the Principal Investigator is in compliance with all contract terms. High standards of excellence in the conduct of research are encouraged by the Research Manager.

Close project supervision is maintained with the Principal Investigator by the Research Manager to ensure that appropriate research techniques and methodologies are used, time schedules are met and that progress reports are received and reviewed. Meetings and on site visits with Principal Investigators and Technical Monitors are encouraged and may be arranged by the Research Manager. There is a minimum of one meeting for short-term projects (nine months or less). Long-term project meetings are conducted every six to nine months, or more often, if needed.

The following items may be reviewed by the Research Manager and Technical Monitor at any meeting with the Principal Investigator or during the review of the Research Project Status Reports:

1. Project Status
2. Project Objectives

3. Project Scope
4. Personnel
5. Problems
6. Schedules
7. Equipment
8. Funding
9. Products
10. Findings
11. Travel/presentations
12. Safety
13. Research Result Expectations

If, through review, the Research Manager, the Technical Monitor, and/or the Principal Investigator determine that there is a need to make changes to the research project scope, term, funding or personnel, the Principal Investigator is directed to request a contract modification in writing.

The Research Manager, in conjunction with the Technical Monitor, maintains an on-going dialog with appropriate WSDOT offices, regions and other constituents to ensure that the research project is meeting identified needs.

Project Completion

Upon completion of a research project, the Research Manager coordinates the review of the products and research results and works with the Principal Investigator, Technical Monitors, sponsoring RACs, Business Manager and the Director to ensure that all required contractual terms and financial matters are completed.

The Principal Investigator, along with the Technical Monitor, develops a summary of the research results and their impact on business processes via the research note. It is the responsibility of the Research Manager to ensure that the Technical Monitor clearly understands his/her role.

Research projects are conducted according to the terms specified in the research contract. The following subsection outlines the process for completing a project.

1. Notification: When the draft final report for a research project is received by the Research Manager, they notify the Business Manager who notifies other WSDOT personnel as required by the type of contract.
2. Final Presentation: The Research Manager is encouraged to arrange a final conference with the Principal Investigator, Technical Monitor, sponsoring RAC, WSDOT Technical Staff, and other interested parties.
3. Final Invoice: On receipt of the Final Report, the Research Manager notifies the Principal Investigator that final invoices should be submitted as soon as possible. The Research Manager notifies the Business Manager, sponsoring RAC, ORLS Director and TRAC Directors that the project is complete. When the final invoice has been paid, the Research Manager notifies the Principal Investigator that the project is complete.

SPR Funded Research Project Review and Change Management

The Research Manager is responsible for managing the delivery of the projects assigned to them according to the contracted scope, schedule and budget. However, adjustments to the projects are sometimes required for the reasons included, but not limited to:

- Products from other projects upon which the study is contingent have not yet been produced
- Similar research is being conducted by another organization and the project is delayed to determine relevance to WSDOT
- Data is not available due to either processing or difficulties providing researchers access
- Weather disruptions
- Equipment failure
- Lack of student availability

Biannual Reviews

Funded research projects will be reviewed on a biannual basis at the Research Executive Committee meetings. Research Managers and Technical Monitors will provide information on the status of the projects. The project review will include:

1. Status of the project:
    a. Is it under contract?
    b. Is it on schedule?
    c. Have any problems surfaced?
2. If the project has not started:
    a. Is the planned start date passed and, if so, what is the cause of the delay?
    b. Is the planned start date still feasible and if not what is the reason?
    c. Has a similar project been funded through another source that is addressing, or potentially addressing, the needs identified in the problem statement?
    d. Has a scope for the project been developed?
    e. Is there an active project proponent/technical monitor?
    f. Are the resources (data, prequel reports or activities) anticipated to be provided so the project can begin soon?
    g. Are researchers still available to conduct the work in a timely fashion?
    h. Is the funding amount still appropriate?

The Research Executive Committee can opt to withdraw funding from a project that has not yet begun. If a project is dropped, the funding originally intended for that project will return to the RAC from which it originated. The RAC Chair can decide to:

- Initiate another project from the list of biennial problem statements
- Solicit new problem statements from the whole committee
- Solicit new problem statements from the functional area of the dropped project
- Or use funding for other high priority activities such as Quick Response Research, Student Research, or Transportation Pooled Fund contributions

QUICK RESPONSE RESEARCH

Quick Response Research projects are initiated by contacting the Research Manager for their topic of interest. If funding is available and the research need is appropriate for the Quick Response Research Program, the Research Manager will forward a request for funding to the Director. This request should include:

a) What the funding will be used for (project title and objective)
b) How much funding is needed
c) The date by which an outcome is needed
d) Who is requested to conduct the work, if known
e) Why this is time sensitive and should be conducted as quick response
f) How this project helps the agency address a strategic goal or business need
g) Who supports it

Once the Director approves the need, approvals will also be requested from the RAC member responsible for the research functional area and the REC Chair. Project management will be similar to that for SPR RESEARCH PROJECTS but scaled to fit the nature of the quick response activity.

CLIENT SPONSORED RESEARCH PROJECTS

Program Development and Project Procedures

WSDOT Program and Project Offices develop research projects to address specific issues confronting them in their work. These projects may or may not reflect priorities identified by the RAC but are intended to address specific questions. Offices should notify the Research Manager for their topic of interest regarding research and experimental activities.

If offices seek external funding (such as FHWA Research Funds), they should consider the research priorities identified by the RACs when developing the proposal. The Director should receive a copy of the request for funding and be notified of whether funds are received or not.

Offices conducting research projects or operational activities may request support for project administration from the ORLS. The office requesting support must complete a Request form (ask your Research Manager). This form requests information to clarify the level of contract management, project oversight and reporting requested. When project oversight is requested, the procedures will be the same as those described under SPR RESEARCH PROJECTS.

Federal Discretionary Funds

Program Development and Project Procedures

Federal funding may be requested to address priority research projects. Project proposals will be developed to address priority research needs identified by the WSDOT RACs. The forms to be completed for submitting proposals will be distributed by the Federal Liaison each winter. The ORLS will compile project proposals and forward them to the REC. The REC will approve the final list of projects that will be submitted to the Congressional Delegation.

When federal earmarks are received for research, the ORLS will administer the funds and provide project oversight. Procedures for projects funded with Federal Discretionary Funds are the same as those described under SPR RESEARCH PROJECTS.

TRANSPORTATION SYNTHESIS REPORTS

If you have a research need that you think could be accomplished successfully through a synthesis please contact a Research Manager and provide the following information:

1. Description of the research topic in specific terms and with context on the subject.
2. The time frame the final product must be completed.
3. Any related terms or sources of information that may be useful.

The Research Manager will provide an initial point of contact with the WSDOT Synthesis Program Manager. Further discussion may be needed to clarify or narrow the synthesis subject.

SURVEY SUPPORT

If you're trying to conduct a simple survey to gather information about other DOTs, the Research Office can distribute your request through AASHTO's Research Advisory Committee or Standing Committee on Highways list serves. Simple surveys have been conducted to gather state of the practice information.

Please provide the following information to the Research Manager responsible for your functional area to get started.

- A brief paragraph about what you're looking for
- The questions you would like to have answered
- Who the responses should be sent to
- The appropriate contact information for the individual who can answer questions and receive responses
- Your deadline for information

After your deadline and unless otherwise discussed, a summary of the survey results will be posted on the AASHTO's Standing Committee on Research/Research Advisory Committee website.

TRANSPORTATION POOLED FUND PROGRAM

To qualify as a pooled fund study, two state transportation agencies or a transportation agency and the Federal Highway Administration (FHWA) must find the subject important enough to commit funds or other resources.

FHWA or a state transportation agency may initiate pooled fund studies. Private companies, foundations, and colleges/universities may partner with any or all of the sponsoring agencies to conduct pooled fund projects.

If a subject has been studied previously, the new study should provide new information that will complement or advance previous investigations of the subject matter.

The Federal Highway Administration maintains a Transportation Pooled Fund (TPF) website that enables the states to commit to pooled fund projects, enter state-led pooled fund project information, and check the status of all the active pooled fund projects.

Definitions

There are three common words that have very specific meaning within the TPF Program. They are:

Commitment – A commitment is made when an agency posts an *intent* to provide funding for a specific project. At this time the contributing fund source may not be identified. Commitments may be made for one or more years. An agency commitment means the agency intends to provide funding, not necessarily ORLS. It is WSDOT's practice to commit for only one year at a time.

Cleared – A TPF Project is cleared after sufficient commitments have been made to meet the required funding level set for the project. After the project is cleared, funds can be obligated to the project and the project can begin. It is important to note that a multi-year project should consider setting the required level of funding to cover initial tasks rather than the whole project. Because the process for determining which project to fund varies substantially between organizations and some may only to make one year commitments, a phased project may allow the project to get underway sooner.

Obligation – Once a commitment is made to a TPF Project and that project is cleared, the agency may obligate funds. At this point, the source of funding is identified.

Pooled Fund Program Management

The FHWA administers the Transportation Pooled Fund Program on behalf of the states. The TPF website enables users to initiate a new pooled fund project, commit funds to a specific project, and check the status of all pooled fund projects. Within WSDOT, funding sources are either the ORLS or the office interested in the project (see below for more information on funding TPF projects). No matter the source of the funds, WSDOT's participation in the Transportation Pooled Fund Program is managed by the ORLS. Research Managers will provide project tracking and management of Transportation Pooled Fund projects, if requested by the funding office.

Pooled Fund Project Funding

Once per year, recommendations for projects to be funded by SPR funds through the ORLS will be forwarded to the Director and the Research Executive Committee for the next Federal Fiscal Year (FFY).

Priority projects for ORLS Funding are:

1. Ongoing and new TPF projects led by WSDOT.
2. Ongoing and new TPF projects led by other organizations. These projects will receive a maximum of $20,000 per year for no more than three years.

Since FFY 07, a project will be eligible to receive no more than three years of funding from ORLS. A continuing project will receive no more than three additional years of funding. In addition, any office may fund a TPF project, either as a lead agency or a contributing state agency, as long as it aligns with WSDOT research priorities. Because of the limited funding available from ORLS, offices requesting funds are encouraged to use other sources of funding if they are available.

Pooled Fund Project Procedures

Project management for Pooled Fund projects is coordinated by the lead state. When participating as a contributing state, WSDOT may or may not be asked to serve on the technical advisory committee for the project.

Procedures for Pooled Fund Program projects led by WSDOT

If a WSDOT Office desires to lead a pooled fund project, the procedures listed below describe the process that is to be followed. The TPF website has additional information and a Procedures Manual with more detailed information.

Project Development

1. *Project Proposal Developed*: A problem statement is developed and includes a project title, project description, budget, project goal, estimated project duration, deliverables, and sponsor contact for further information. The project proposal is submitted to the responsible Research Manager.
2. *Solicitation for partners*: The proposed project is posted on the TPF website to solicit project partners. Concurrently, WSDOT submits the proposed project to FHWA requesting approval of a waiver of the non-federal match for SPR funds, if desired. Projects may be posted at any time during a calendar year. Project solicitations include a deadline at which time solicitations will expire. The posting of the proposed project will activate the AASHTO Research Advisory Committee (RAC) Listserv with an alert that a new project is available for review.
3. *Commitment by Interested Parties*: Interested partners submit a commitment to the sponsoring agency through the Pooled Fund website indicating their intent to formally obligate funding to the Pooled Fund project once initiated. Commitments include the intended amount of funding for one or more years.
4. *Ensure Project Viability*: As the deadline of the solicitation is reached, the sponsor of the proposed research project makes the determination, after consulting with other interested parties, if the project, as proposed, is viable based on the level of commitment that has been indicated by the project partners. If the commitment from project partners is sufficient, the sponsoring agency staff may request FHWA to formally establish the project. If the level of commitment is not sufficient for the proposed project to be established, the sponsoring agency may choose to renew the project solicitation on the website, modify or withdraw the project.
5. *Formal Project Commitment:* Once a project is formally established by the Research Manager, a formal project **commitment** is made. The commitment denotes intent to provide funding but does not obligate the funds or specify a funding source. Most WSDOT-led projects request a waiver of the SPR match requirements.
    a. *Approval of 100 Percent Federal Funds for a Project:* The normal match for SPR funds is 80 percent federal and 20 percent non-federal funding, but the FHWA has the authority to approve the use of 100 percent federal SPR funding for pooled fund projects at the request of a lead State if it is in the interest of the Federal-aid highway program. The lead State requests FHWA Office of Research, Development, and Technology (RDT's) approval of the waiver of the non-Federal match for SPR funds used on the project. This request is forwarded to RDT through the FHWA Division Office. The request is made as a memo from the Division Office and includes a copy of the proposed project. Once the project is approved by the FHWA, a TPF project number is assigned and the project can officially begin.
6. *Submission of Obligation Authority Transfer*: Each federal, state, regional, or local agency prepares the forms that are used to obligate funds for research, planning, or technology innovation projects using federal funding sources. This process is the official **obligation** of funds on behalf of the project partners to the lead state or FHWA, documents the funding source, and is the means by which these funds are made available for use for the pooled fund study. For private industry,

foundations, and colleges/universities, the obligation of funds will need to be directly handled with the lead agency.

7. *Notification of Formal Commitment:* Partner funding commitments are accomplished on the TPF website by partners, both during the solicitation stage and during the life of the project.
8. *Contributions by Pooled Fund Project Partners*: The Business Manager will monitor the project contributions from other states. Authority to expend contributions will be through a federal appropriation in the biennial budget. ***No agreement to conduct research can begin without sufficient budget authority. When processing such an agreement the value of the agreement cannot exceed the amount of funding approved.***

Project Management

1. *Establish Technical Advisory Committee:* Each contributing partner may appoint a technical expert to serve on the technical advisory committee (TAC). The TAC will serve for the duration of the project. The roles of the committee include drafting and approving the project work statement, selecting the best qualified researchers to conduct the project, review of project progress and annual reports, acceptance of project deliverables and final reports, and completing implementation activities. TAC members should expect to participate in all project-related meetings and briefings.
2. *Work Statement Development*: The lead agency will work with the TAC to develop a work statement. The work statement will be incorporated into a plan of work that should include the following elements: list of partners, statement of problem, work statement, research requirements, project performance timeline, estimated budget, project communications requirements, deliverables, and implementation plan.
3. *Investigator/Contractor Selection:* The lead agency will use the plan of work to initiate the investigator selection process. The contracting laws and regulations of the lead agency will drive and govern the actual selection process. The TAC member input will be considered to the greatest extent possible in the selection of the successful investigator.

   Upon the successful selection of the best-qualified investigator, the project is initiated. The lead agency will usually include the members of the TAC in a project kick-off meeting.
4. *Quarterly Reports*: The lead state and/or the investigator will provide project status and progress reports quarterly. If necessary, the lead State or the TAC may request that these reports are issued more frequently. The quarterly reports are posted online at the TPF website. If they are not posted, then payment is delayed.
5. *Project Payments State-led Projects*: Invoicing occurs through the normal WSDOT approved process for federal billing. The quarterly reports must be posted on the website and up-to-date for the determination of satisfactory project progress so that payment will be made by the FHWA.

Project Completion

1. *Deliverables Received*: The lead agency, working with the TAC members, needs to ensure that the plan of work includes the delivery of useful and usable products. The investigator is expected to deliver these products. The TAC approves the acceptance of the project deliverables. Deliverables may include reports, models, recommendations, software, new/improved products, etc. Where applicable, technology innovation sessions should be scheduled for the investigator to demonstrate, explain, or provide instruction on

the project deliverables. Opportunities to showcase the project findings, recommendations and conclusions should be pursued by the TAC members.

2. *Final Report and Summary*: A final report of work processes, findings, and recommendations will be required for each project. An executive summary will accompany each final report and should provide concise and useful information on the study. The lead agency and TAC members, consistent with the project plan of work, may request additional elements.
3. *Final Invoice Payment:* Based on the delivery and acceptance of the products and reports included in the plan of work, the final invoice will be paid to the investigator. FHWA will reimburse the lead agency for the remaining costs of the project up to the obligation limits of the project. At the discretion of the lead agency, an After Action Review may be conducted with the investigator to measure the projects processes and outcomes.
4. *Closing the Project:* The lead state Project Manager informs the Division Office of the completion of the project and provides written documentation that all bills have been paid and the project can be closed. Additionally, the status of the project needs to be updated on the TPF website to indicate that the project is completed. If there are funds remaining once the project is closed, the lead agency will coordinate with the partner states and FHWA to return obligation authority.
5. *Report and Summary Distribution*: States are encouraged to distribute the project report and all or some of the project deliverables to TRIS, NTIS, and interested organizations the project partners.

Procedures for Participating as a Contributing State

1. WSDOT managers interested in participating in a solicited pooled fund project should notify the Research Manager responsible for the topic of interest. These projects will be considered for funding once each year. If funds remain available throughout the year, ORLS project obligations will be made in a manner consistent with the TPF prioritization process and with input from RAC and REC members.
2. The Research Manager will be notified when a pooled fund study has been cleared to receive funds from the participating states through the TPF website. Once this notice is received, transfer of the funds may proceed.

Cooperative Research Programs

WSDOT participates in research projects sponsored by the TRB's Cooperative Research Program (CRP). These projects are of national scope and interest. Problem statements are submitted annually as noted in Section 1. The process for TRB's Cooperative Research Programs is very similar. However, selection committees vary.

The National Cooperative Highway Research Program project selection process is largely directed by the state departments of transportation as the sole sponsors of the program. Support is voluntary and funds are drawn from the state's Federal Aid Highway apportionment of the State Planning and Research funds. Each state's allocation amounts to 5.5% of its SPR apportionment. Funds can only be spent for projects approved by at least two-thirds of the states.

Research findings of the Cooperative Research Program are published by TRB and are available to WSDOT employees through the WSDOT Library. If an office copy is needed it may be requested through the Library. Copies are currently free to employees of sponsoring agencies.

Submitting Problem Statements

Each year the ORLS distributes the solicitation to WSDOT Executives and Office Managers with an invitation to submit problem statements. The timing of the solicitation varies for each program. WSDOT proposed problem statements are submitted to the ORLS. Projects are reviewed and recommendations may be made to strengthen the proposal and merge topics. WSDOT supported problem statements may also be submitted through the AASHTO Committees. The ORLS appreciates a copy of these proposals in order to document the WSDOT interest in the project. As well, research problem statements may be developed by a TRB Committee. These projects require a state DOT, AASHTO Committee, or FHWA sponsor for submittal so, if WSDOT employees are members of TRB Committees that have developed proposals, it is beneficial to submit the proposal to the ORLS and to note whether WSDOT is willing to sponsor the project or not.

The CRPs are very competitive programs and only about one in five projects are selected for funding. To improve the probability of success, problem statements should clearly state:

1. The *national* need for this research.
2. The problem including the national scope and consequences of no action.
3. Related work and how this request augments it. Check related literature through TRISOnline and on-going research through Research in Progress. You can also request a literature review from the WSDOT Library.
4. The specific objective and schedule of work requested. For example: The product of this research is anticipated to result in X. The study will be conducted in # of phases (list what they are expected to be). This request is for phase 3. This helps reviewers understand the context and avoids the perception that outcomes are never achieved.
5. Support by other states and organizations. In addition, it is helpful to have the interest and even joint sponsorship of other states and transportation organizations. AASHTO and TRB Committees are an excellent way to solicit interest. The ORLS can help you identify contacts.
6. Particular program requirements. Some CRPs have unique requirements. For example, the TCRP requires a tie to the Federal Transit Authority's strategic goals

The solicitation notice will include current forms and procedures. However, the format for agency problem statements closely parallels the CRP process and can be used to begin shaping problem statements.

Response to Comments

Once TRB receives the problem statements, they are reviewed and comments are sent to the author. Authors may choose how to respond to the comments and are offered the opportunity to submit an updated proposal.

Rating Problem Statements

Each CRP is reviewed by committees of technical experts. The membership of the committees varies for each CRP program. State DOTs rate the NCHRP problem statements. The other CRP problem statements are not distributed to state DOTs for ratings. Additional information can be found on the TRB CRP website.

The ORLS facilitates the rating of NCHRP problem statements by WSDOT employees. Final NCHRP problem statements are distributed to the AASHTO Standing Committee on Research (SCOR) and the AASHTO Research Advisory Committee for rating. The problem statements are received by the ORLS in January and distributed to subject area experts in the agency for rating. Ratings are compiled and submitted. The NCHRP staff compiles ratings from all states, organizes them into a ranked list, and forwards this information to AASHTO SCOR. These meetings are held annually in late March. SCOR reviews the list, identifies priorities and formulates a recommended program that meets the constraints of the anticipated NCHRP revenue. The recommended program is submitted to the AASHTO Board of Directors for final approval. At least two thirds of the state DOTs must approve a problem statement for funding.

An Announcement of Research Projects is prepared each year in April. This Announcement details the preliminary scopes of work that will be considered in requests for proposals and can be found on the CRP website.

CRP Project Management

Each CRP project is assigned to a panel, appointed by the Transportation Research Board, which provides technical guidance and counsel throughout the life of the project. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including members representing the intended consumers of the research product. The panels prepare project statements and select contractors based on evaluation of the proposals received. As in other TRB activities, CRP project panels serve voluntarily without compensation.

Technical Panel Formation, Solicitation of Proposals, and Selection of Contractors

Once projects are selected, the Cooperative Research Program solicits nominations for individuals to participate in technical panels that provide oversight to the selected CRP projects. Individuals may be self nominated or nominated by co-workers or managers. Nominations are to be sent to the ORLS to be compiled and submitted to the Cooperative Research Program staff. Nominations are also made by AASHTO Committees and individuals. The ORLS appreciates notice of WSDOT nominees in order to help endorse employee participants and to track agency interest and involvement.

The author of the problem statement or their designated Project Monitor is typically asked to participate in the panel but not as the Chair of the panel. Panel composition usually includes representatives from public agencies, academia, and private industry.

If employees are selected to participate in a panel, travel costs will be covered by the CRP project. Employees should submit standard agency Travel Request forms for sponsored trips. Panels typically meet three times over the life of the project.

Selecting the Researcher

For each funded problem statement, TRB solicits research proposals from private and public research organizations that can demonstrate capability and experience in the problem area to be researched. These organizations include universities, nonprofit institutions, consulting and commercial firms, and individual consultants. WSDOT may send letters of support for a proposal or be identified as a technical resource within a proposal. However, be alert for potential conflict of interest when determining what role you would like to play in a project. You cannot be both a panel member and a participant in the proposal. Contact the ORLS if you would like additional information.

Synthesis Programs

Synthesis Program Management

TRB manages Synthesis Studies for four programs:

- Airport Cooperative Research Program (ACRP)
- Commercial Truck and Bus Safety Synthesis Program (CTBSSP)
- National Cooperative Highway Research Program (NCHRP)
- Transit Cooperative Research Program (TCRP)

The programs prepare syntheses of current practice in the aviation, commercial truck and bus, highway, and transit fields. The Cooperative Research Program of the Transportation Research Board solicits for synthesis topics. Synthesis suggestions may be submitted via the Synthesis Suggestion website.

Synthesis Project Management

Synthesis projects are assigned a panel, appointed by the Transportation Research Board, which provides technical guidance and counsel throughout the life of the project. The Cooperative Research Program does not formally solicit for panel members for Synthesis projects. WSDOT employees interested in participating in a Synthesis project panel should contact the Director.

Innovations Deserving Exploratory Analysis (IDEA) Program

Innovations Deserving Exploratory Analysis (IDEA) is a TRB program to fund investigations of promising but unproven innovations for highways, transportation safety, and transit. Information about each program, including program goals, proposal format, and selection criteria are found at their corresponding websites.

- NCHRP-IDEA – seeks proposals with potential to advance the construction, safety, maintenance, and management of highway systems. The program nurtures new concepts for technologies, methods, and processes for application to highway systems in broad technical areas such as highway design and construction, materials, operations, and maintenance.

- Safety-IDEA – provides funding for projects that promote innovative approaches to improving intercity bus, truck, or railroad safety. The program encompasses vehicle improvements, operator performance, and alertness improvements; operational practices; and hazard reduction, among other interest areas.
- Transit-IDEA – seeks proposals on (1) increasing transit ridership, (2) improving transit safety, security, and emergency preparedness, (3) improving transit capital and operating efficiencies, and (4) protecting the environment and promoting energy independence.

WSDOT may submit proposals for innovations to study. IDEA proposals are reviewed in March and September of each year.

Experimental Features

The Experimental Features program is sponsored by FHWA to allow state highway/transportation departments to use innovative or new highway technology, or alternative standard technology, under actual construction and operating conditions. An experimental feature is defined as a material, process, method, equipment item, traffic operation device, or other feature that meets the following criteria:

1. Has not been sufficiently tested under actual service conditions to merit acceptance without reservation for normal transportation construction; or
2. Has already been accepted but needs to be compared with alternative acceptable features for determining their relative merits and cost-effectiveness.

Experimental Features are incorporated into federal-aid highway construction projects to determine the suitability of the features as regular construction items.

Experimental Features Project Management

Headquarters or Regions originate an experimental features project by deciding to construct, install, or otherwise incorporate an experimental feature into an existing construction contract. The initiating Region or Headquarters office notifies Program Management of its intent to develop such a project.

1. The Research Manager works with the Regional or Headquarters office manager to develop a work plan for the proposed experimental feature. The work plan should include the following items:
   - Introduction
   - Study Plan
   - Scope of Work
   - Layout (includes Control Section and Experimental Feature)
   - Staffing
   - Testing
   - Reporting
   - Cost Estimate
   - Schedule
2. The Region or Headquarters office submits a final work plan to the Research Manager.

3. The Research Manager submits the work plan to FHWA for approval. FHWA will not approve plans, specifications, or estimates (PS&E) for a project that incorporates an experimental feature until a work plan is submitted and approved. The Research Manager assigns and includes the Experimental Feature number in the letter requesting approval.
4. Construction project funds are used for incorporating an experimental feature into a Federal-aid highway construction project. SPR funds cannot be used for constructing experimental features.
5. The Principal Investigator is responsible for all inspections and reporting requirements as set forth in the approved work plan during the active phase of the experimental project.
6. The Research Manager may request the FHWA Division Administrator to terminate a project if it becomes evident that no additional valuable information is likely to develop. The FHWA may also terminate a project for this reason or for failure to submit a final report.

SECTION FOUR: IMPLEMENTATION MANAGEMENT

The objective of the WSDOT research program is to produce findings that significantly enhance the operations of the Department. In many cases, research reports include specific recommendations for altering the procedures or methods of a functional area. In other cases, the findings contribute to the body of knowledge that serves as the basis for daily operational decisions, planning decisions and/or the prioritizing of future research options. In any case, the research process is not complete until the implementation of applicable results has been accomplished.

Responsibility

Research Manager: Each Research Manager is responsible for working with the Principal Investigators and Technical Monitors to develop an Implementation Plan for SPR projects in their subject area.

Technical Monitor: Because successful implementation is dependent upon relevant findings, preparation for implementation begins with the research problem statement and the proposal. The probability of relevant findings increases greatly when the users are involved in the research process. As a representative of the functional area, it is the Technical Monitor's responsibility to ensure that the research project team continuously considers the unique requirements of the functional area throughout the active stages of a project. The Technical Monitor is also responsible for communicating intended uses of research results and helping to manage the research to meet those needs. This is not to be construed with presupposing the outcome of research but is intended to include such fundamental issues as agency information technology requirements (if applicable to the project).

Principal Investigator: While the Principal Investigator will not be responsible for implementation of research results, the research approach and products influence the ability to implement the findings of a research project. Therefore, Principal Investigators are encouraged to understand how research results are intended to be used at the completion of the project. For example: will the results be incorporated into an agency policy, procedure, manual or existing data system? Will the product be used by agency staff in one program only, throughout the agency, or by users outside of WSDOT as well. The Principal Investigator will work with the Technical Monitor to understand these intended uses and prepare recommendations for appropriate use of research results at the completion of the project.

Procedures for Implementation

Guidelines

The role of the Technical Monitor and the functions of the Implementation Plan will depend greatly upon the nature of the research project. To help direct the research project, the following items should be considered when developing the research proposal.

1. Think about the end results: Know what you hope to gain from your project when you’re done. Work with your committee to spell it out in concrete terms.
2. Understand the Environment: No project exists in a vacuum. Gather as much information as possible about steps that will need to be taken to implement results. Ask questions such as: Will the project require specialized computer software or hardware? Who has to approve a decision to implement a result? What will the costs of implementation be?

3. Describe the potential benefits: Work with the Technical Advisory Committee established for the project to identify the potential benefits and how this will help address the need.
4. Know the customers: List everyone who might benefit from the project and include others who may influence those who benefit. Divide the list into two categories – those who benefit most and others. You'll want to spend more time reaching out to the first category.
5. Involve the right players: Don't go too far without making sure that you've got the right team. You'll want to have representatives of the groups who benefit the most helping you plan your course of action. If they aren't on your committee, you might want to expand your group, or figure out another way to gather their ideas.
6. Explore the most appropriate method for technology transfer: The methods of technology transfer may include the development of formal training programs, workshops, publications and one-on-one outreach efforts. Steps 1-5 help you in gathering information about what tool might be most effective for the project.
7. Define implementation: Be specific. As much as possible, write down your expectations of how you anticipate using research results, which documents a finding might need to be included in, whether software deployment will be needed, etc. Define what needs to happen to get there, how it will happen, when it will happen, and who will be involved.

Research Notes

Research Managers will work with the Principal Investigator and Technical Monitor to develop a Research Note for most SPR Projects and select CSR and TPF projects. Research Notes are a two to four page communication and marketing tool for the purpose of disseminating information gained through research to a broad audience. The Research Note is organized under the following headings:

- Background
- The problem
- What we did
- What we learned
- What the researcher's recommend
- How WSDOT plans to use the results
- Contact information for the Principal Investigator, Technical Monitor, and Research Manager

Research Advisory Committee(s)

Research Notes will be circulated to members of the sponsoring RAC. The RAC may make recommendations to address resources or decisions needed for implementation and priority of implementation actions.

On-going Evaluation of Implementation

The Implementation Manager, in collaboration with the Research Managers and Technical Monitors, will evaluate ongoing results of research for selective high value projects. If appropriate, the results will be submitted to TRB as a proposed "Research Pays Off" article.

Implementation Reporting

The implementation of results from research projects are reported on in WSDOT's Strategic Implementation Plan as well as The Gray Notebook, where applicable. Implementation of each research project is included in the TRAC Biennial Report (see Section Five).

SECTION FIVE: RESEARCH REPORTS

Research project reports are required from all Principal Investigators conducting SPR and WSDOT-led Pooled Fund research projects. Each Principal Investigator is required to submit Monthly or Semi-Annual Progress Reports, Draft Reports and Final Reports. Final Reports are published as Washington Research Documents (WA-RD). Additional information on reporting requirements is specified in the research contract.

Client Sponsored Research projects are encouraged to produce reports. At the discretion of the project sponsor, they may or may not be published as WA-RD reports. The decision about whether or not to produce a WA-RD report is identified in the CSR Research Support Request and included in Task Agreements with contracted research organizations.

In addition to the WA-RD report, a combination of other reports will be expected from the Principal Investigator or Technical Monitor. These reports include:

- Monthly Progress Reports
- Semi-Annual Project Status Reports
- Draft and Final WA-RD Reports
- Research Note

In addition, the ORLS works through the Washington State Transportation Center (TRAC) to produce a TRAC Biennial Report of active and completed projects.

Monthly Project Progress Reports

Principal Investigators conducting research projects that will be completed within a nine-month term may be required to submit Monthly Progress Reports to the Research Manager. The reporting requirements for short-term research projects are specified in the research contract.

Semi-Annual Project Status Reports

Research projects with a term of more than nine months require Semi-Annual Project Progress Reports unless otherwise specified. WSDOT seeks to manage projects within the planned time, scope and budget. These reports document the status of the project and deviations from the contracted scope or work plan. The progress reports are one of the tools WSDOT uses to manage projects and to anticipate necessary changes to scope, schedule and budget. Principal Investigators should include information relevant to potential changes in order to minimize unexpected contract extensions.

These web-based reports are due on January 31 and July 31 of every year. The University of Washington (UW) TRAC Office will notify Principal Investigators of the due date and direct them to the website for completion of the reports. The Principal Investigator completes the Project Status Report online and notifies the UW TRAC Office. The Progress Report will include:

Project Progress – describe concisely, the work accomplished on work tasks planned for the reporting period. The progress report will also include actual expenditures to date compared with planned expenditures to date.

New Period Proposed Activity – identify tasks elements planned for the next reporting period and any proposed changes in the scope and schedule.

Problems/Changes – describe concisely problems encountered and those that will affect scope, schedule, and budget.

Other Relevant Information

After a review for completion, the UW TRAC Office notifies Research Managers that the progress report is ready for review. If Research Managers have revisions, they will contact the Principal Investigator and request the report be updated. After final acceptance, the Research Managers will notify the Director, the Technical Monitor and, if federal funds are involved, the appropriate local federal office. Access the Semi-Annual Progress report here.

Draft and Final Research Reports

Principal Investigators usually submit a draft and final report upon completing a research project. Approved final reports must be submitted before the contract end date. Final invoices will not be paid until completion of final reports. All research reports shall be prepared using the Research Report Guidelines.

1. The responsible TRAC Office requests a WA-RD report number from the Office Coordinator and submits an electronic version and/or paper copy of the draft final report to the Research Manager. Project schedules should include two months between submission of the Draft Report and Final Report to accommodate review and editing.
2. The Research Manager distributes the draft report to the Director, Technical Monitors, and other interested parties for comment. For projects funded with federal funds, the appropriate federal agency (ies) is included in the review process.
3. Report reviewers return their comments on the draft to the Research Manager by the completion date provided.
4. A meeting may be scheduled by the Research Manager with the Principal Investigator to discuss the comments received by the report reviewers. At the meeting, or if no meeting is required, the Research Manager furnishes the comments to the Principal Investigator by email documenting the completion of the review.
5. The Principal Investigator incorporates the appropriate review comments and provides a final report in electronic and paper format to the Office Coordinator and Research Manager with a completed Technical Report Standard Page. The Research Manager reviews the final report to ensure that the review comments have been addressed. If comments have not been adequately addressed, the Research Manager will contact the Principal Investigator for additional editing.

Report Production

Distribution of the final report is electronic only and is posted on the WSDOT Research Office website. You may sign up (click on E-mail updates) to receive these electronic reports.

All final Research Reports are distributed electronically to project participants, the UW TRAC Office, the WSDOT Library, the Washington State Library, the Transportation Research Information Service, the National Transportation Information Service, federal and state transportation libraries, and others as identified by the Research Manager.

Research Notes

Research Notes are a two to four page communication and marketing tool for the purpose of disseminating information gained through research to a broad audience. They are intended to provide a non-technical overview of the research project to attract broader awareness. They include an implementation plan from the sponsoring office. See Section 4 for more information.

Research Notes are distributed to the WSDOT Executives, members of the sponsoring Research Advisory Committee, relevant technical specialists within WSDOT, the FHWA Division Office, the Principal Investigator, the TRAC Directors, the AASHTO Research Advisory Committee, and others identified by the Technical Monitor and Research Manager. Recipients of the Research Note may download a copy of the final report or request a paper copy from the Office Coordinator.

TRAC Biennial Report

The Washington State Transportation Center (TRAC) produces a biennial report summarizing projects that were active or completed during the biennium being reported on. Any transportation-related research project may be included if it was conducted or funded by the University of Washington, Washington State University or the Washington State Department of Transportation.

For each active project, the report includes a brief description of the problem statement, research activities conducted, and the how the project results may be used. Completed project descriptions include the problem statement, the findings, and how the results will be used.

The TRAC Biennial Report is distributed to state and federal transportation agency research programs, transportation libraries, Washington Legislature Joint Transportation Committee, WSDOT Executives, University Transportation Centers, Principal Investigators, and other interested parties.

SECTION SIX: RESEARCH PROGRAM REVIEW

The Research Office is responsible for monitoring the progress of WSDOT research activities and evaluating the effectiveness of the research program. The following reports and forums provide a summary of program performance.

Biennial Report

The Research Office ensures that a biennial report of activities conducted by the Washington Transportation Center (TRAC) and other research entities is completed each biennium. The report is developed following the end of the biennium is published no later than December. The biennial report summarizes research projects conducted within the previous two years. The review focuses on, but is not limited to:

- Relationship of research activities to agency strategic goals
- The results of each research project
- The intended use of research results for each project
- Summarizes implementation plans and actions needed

The Biennial Report will summarize implementation plans for each of the reports completed within the previous two years and implementation actions for previous projects. It will also include types of results achieved and actions needed to implement research.

Peer Exchange

State transportation agencies are required to conduct periodic peer exchanges of their research programs. Exchanges are to be held at least once every five years. Peer exchanges are intended to examine and evaluate the research program or elements of the program through a collaborative team of peers, experts, and persons involved in the process. Peer exchanges may be hosted by one or multiple states. Virtual peer exchanges may be held but not consecutively. The outcome of the peer exchange is intended to foster vision, ideas, and best practices for the host agency(ies) to benefit their program as well as the programs of the participants.

The peer exchange panel includes representatives from the host and other state DOT research programs as well as stakeholders and customers who can provide input on the topic of the exchange. States are encouraged to include a representative from FHWA.

It is the State's responsibility to initiate its peer exchange. The composition of the peer exchange team, the breadth of the issues covered, the duration of the peer exchange, and other issues are at the States' discretion.

Guidance for conducting Peer Exchanges can be found on the AASHTO SCOR/RAC website. Additional information can be found in 23 CFR 209(a)(7) and NCHRP Report "Guide for Developing a State Transportation Research Manual."

Federal Review

The FHWA Division Administrator is required to periodically review the State DOT's management process to determine if the State is in compliance with federal requirements for research, development, and technology transfer. The FHWA Division Office must also approve the State's Research Procedures Manual and may conduct a compliance review. Normally, however, program compliance will be evaluated through routine involvement and report reviews (23 CFR 209(d)).

The FHWA Division Administrator also reviews and approves the State Planning and Research Work Program. The Work Program is produced at the beginning of each biennium and provides a summary of administrative and project activities of the ORLS. It is updated every six months.

SECTION SEVEN: RESEARCH RESOURCES

Transportation Research Resources

It is important to use existing knowledge when planning research activities. The information listed below provides resources where you can find out about ongoing and published research.

WSDOT Research Website

The WSDOT Research website provides information on:

- WSDOT Research Reports
- Research results and future research needs
- Current research projects
- Research funding sources
- Search tools for national research projects and reports
- Research partners
- List serve

WSDOT Library

The WSDOT Library holds the largest collection of transportation related information in the state. The WSDOT Library supports staff, consultants and contractors by finding information on a topic, developing search strategies, conducting literature searches, locating facts and statistics, identifying additional information sources and obtaining articles and books through inter-library borrowing. Portions of the collection that are particularly relevant to researchers include:

- WSDOT publications, including research reports and project documents
- Transportation Research Board Publications
- Some publications from other state DOTs, USDOT, and FHWA.
- Online resources. Permissions to access these resources vary. Some may be accessed by librarians only, while others allow WSDOT employee access or public access.

The WSDOT Library Catalog is part of the Washington State Library Online Catalog. In addition, the WSDOT Library networks with transportation libraries throughout the nation and may be able to access other relevant information.

Online Research Citation Databases

TRISworld

TRISworld is a resource for Transportation Research Board (TRB) Sponsors, such as WSDOT, that combines records from TRB's TRIS Database (Transportation Research Information Services) with the English language records from the Organization for Economic Cooperation and Development's International Transport Research Documentation (ITRD) database. Research literature from 23 countries is represented in ITRD.

The TRISworld database contains more than 700,000 records of transportation research published worldwide in books, technical reports, conference proceedings and journal articles. It is updated daily. While the majority of records are citations and/or abstracts, many of the more recent TRB publications are available as full-text. All modes of transportation are covered, although highway and surface transportation are the strongest areas. Access to TRISworld is authenticated by IP address, which requires users to be on the WSDOT network.

Research in Progress

The Research in Progress (RiP) database contains thousands of records documenting current or recently completed transportation research projects. While most projects represented are those funded by Federal and State Departments of Transportation, university transportation research is also included. The RiP database serves as the clearinghouse for ongoing research by University Transportation Centers. Records for international research projects are included in the RiP database as well, from the ITRD Database and the Canadian Surface Transportation Research Database.

The database can be searched by subject area, by organization conducting the research, by persons involved in conducting the research, and a number of other ways. Current research projects can be submitted to the database, and you can subscribe to receive subject-specific monthly e-mails on new RiP records.

TRISOnline

TRISOnline is a free Internet resource that contains *most* of the Transportation Research Information Services database, the world's largest and most comprehensive bibliographic resource on transportation research. The database is updated monthly and does not contain international materials or Research in Progress materials. It is available through the National Transportation Library of the Bureau of Transportation Statistics. Standard records contain citations and abstracts, but more and more records have links to the full text of the documents. TRIS*Online* users have access to this baseline resource wherever they have Internet access.

TLCat

Coordinated by the National Transportation Library (NTL), the Transportation Libraries Catalog (TLCat) enables users to simultaneously search multiple transportation library collections held in the Online Computer Library Center's (OCLC) database. This union catalog reflects the collections of over 40 transportation libraries nationwide, and more are being added on a quarterly basis.

TLCat provides access to a customized union catalog of transportation libraries' bibliographic records. Researchers may search the collections of participating libraries in a single click, or they may limit their search to a specific group of transportation libraries: Eastern, Midwest, or Western transportation libraries; Government transportation libraries; University transportation libraries (all in the U.S.); or transportation libraries (Canada). Search results show which participant libraries hold the various materials found. Searches can be limited by various criteria, or expanded to include WorldCat, OCLC's online catalog of thousands of libraries worldwide.

Contact the WSDOT Library for assistance with any database or information access issue. The library can be reached via e-mail at library@wsdot.wa.gov.