Washington State Department of Transportation Research Procedures Manual

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Washington State Department of Transportation

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FOREWORD
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The Washington State Department of Transportation (WSDOT) Office of Research and Library Services (RLS) oversees WSDOT's transportation research program. The research program addresses specific agency needs, problems and questions in order to discover ways to improve WSDOT's ability to bring about its vision that Washington travelers have a safe, sustainable and integrated multimodal transportation system. This manual describes how the research program is administered and provides instructions for identifying priority research needs, information on how research projects are solicited, selected and managed, and identifies methods of technology transfer used to share research results and deliverables to inspire implementation and advance agency practices.

This manual fulfills the Federal Highway Administration (FHWA) requirement ([23 CFR 420.209(b)](#)) that each state DOT must document management processes and procedures for "selecting and implementing RD&T (Research, Development and Technology Transfer) activities."

ORGANIZATION OF THE DOCUMENT

Acronym List

AID   Accelerated Innovation Deployment

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

CRP   Cooperative Research Program

CSR   Client Sponsored Research

EDC   Every Day Counts

FFY   Federal Fiscal Year

FHWA   Federal Highway Administration

FRA   Federal Railroad Administration

FTA   Federal Transit Administration

HSIP   Highway Safety Improvement Program

IDEA   Innovations Deserving of Exploratory Analysis

ITRD   International Transport Research Documentation

NCHRP   National Cooperative Highway Research Program

NHS   National Highway System

NTIS   National Technical Information Service

NTL   National Transportation Library

OECD   Organisation for Economic Co-operation and Development

PacTrans   Pacific Northwest Transportation Consortium (Region 10 UTC)

PI   Principal Investigator

QR   Quick Response Research

R&I   AASHTO Special Committee on Research and Innovation

RAC   AASHTO Research Advisory Committee

RDT/RD&T   Research, Development and Technology Transfer

RFQ   Request for Qualifications

RiP   Research in Progress

RLS	WSDOT Research and Library Services
RNS	Research Needs Statements
SHRP2	Second Strategic Highway Research Program
SME	Subject Matter Expert
SPR	State Planning and Research
STIC	State Transportation Innovation Council
STP	Surface Transportation Program
TAC	Technical Advisory Committee
TCRP	Transit Cooperative Research Program
TPF	Transportation Pooled Fund
TRAC	Washington State Transportation Center
TRB	Transportation Research Board
TRID	Transport Research International Documentation
TriDurLE	National Center for Transportation Infrastructure Durability & Life-Extension
TRIS	Transportation Research Information Services
USDOT	United States Department of Transportation
UTC	University Transportation Center
UW	University of Washington
WA-RD	Washington Research Document
WSDOT	Washington State Department of Transportation
WSU	Washington State University

SECTION ONE: OVERVIEW

Research and Library Services (RLS) administers the Washington State Department of Transportation's (WSDOT's) Research Program of transportation-related research and development projects and related activities. Most research projects are undertaken to investigate and understand specific issues of concern to the department, with the aim of solving problems through improved information, technology, or processes. Additionally, in alignment with the agency's Strategic Plan, research is conducted to advance our practices in key goal areas and to support innovation and emerging trends.

In alignment with federal regulations concerning research, development and technology transfer (RDT), the program uses systematic inquiry to produce implementable research results that improve the agency's ability to deliver transportation projects and conduct agency activities that contribute to the planning, design, construction, management and maintenance of a multimodal transportation system that is safe, resilient, equitable and efficient.

Key components and partners that comprise WSDOT's Research Program include:

- State Planning and Research (SPR) funded projects:
  - Applied Research
  - Innovative Research
  - Quick Response (QR) Research
- Client Sponsored Research (CSR)
- Transportation Pooled Fund (TPF) Studies
- Research Surveys
- Cooperative Research Program (CRP) activities
- FHWA Center for Accelerating Innovation (CAI)
- Every Day Counts (EDC)
- State Transportation Innovation Council (STIC)
- Technology and Innovation Deployment Program (TIDP)
- Second Strategic Highway Research Program (SHRP2)
- Accelerated Innovation Deployment (AID)
- Synthesis Programs
- Innovations Deserving of Exploratory Analysis (IDEA) activities
- Washington State Transportation Center (TRAC)
- University Transportation Centers (UTC)
- Pacific Northwest Transportation Consortium (PacTrans)
- National Center for Transportation Infrastructure Durability & Life-Extension (TriDurLE)
- AASHTO Special Committee on Research & Innovation and Research Advisory Committee
- Transportation Research Board (TRB) and Standing Technical Committees
- Other research partners

Please see below for more detailed information on the key components and partnerships that comprise WSDOT's research program.

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 intends to use each of the programs to the extent possible for the maximum benefit to the agency. This section summarizes current programs that WSDOT uses to fund, inform and support transportation research.

State Planning and Research (SPR)

Per 23 U.S. Code Section 505 (a), states set aside 2 percent of the federal 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 State Planning and Research Program.

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.

SPR research funding can be used for research, development, and technology transfer activities. The funding is managed by the Program Administrator of Research and Library Services. Applied and Innovative Research projects (defined below) are selected on a biennial basis in the fall of even years, to begin on or after July 1 of the following year. The selection process includes an agency-wide solicitation of problem statements from these two categories:

- **Applied Research** traditionally addresses the agency's high priority research needs and typically involves a consultant or university principal investigator(s) to perform research in conjunction with a WSDOT Subject Matter Expert (SME) and/or Technical Advisory Committee (TAC).

- **Innovative Research** takes a more creative, inventive approach to address department needs, utilizing innovative research concepts and strategies. This type of research may have higher risk but generally promises a significant return on investment, and/or transformational or systemic change if successful. This research could also utilize a university or consultant to perform research in conjunction with a WSDOT SME and/or TAC or could be performed entirely in-house.

Applied and Innovative Research Problem statements are scored on a variety of measures including alignment with agency goals, value in terms of potential return on investment, and implementability. A WSDOT Technical Advisory Group recommends projects for funding to agency executives, who review the problem statements and make the final selections for which projects to fund.

- **Quick Response (QR) Research** is a set-aside of the SPR program that is intended to address high priority, emergent research needs as they arise outside of the biennial SPR project selection schedule. Projects are expected to be completed within approximately one year and typically cost $50,000 or less.

Client Sponsored Research (CSR) Projects

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

Transportation Pooled Fund (TPF) 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 collaborate 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. One partner state, or FHWA itself, is identified as the Lead, and is responsible for coordinating all financial, contracting, and administrative duties related to managing the Pooled Fund. 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.

For the FY 2014 to FY 2020 time period, WSDOT estimates that for each dollar it contributed to TPF Studies, the agency benefitted from $24 dollars of research output, combined with contributions from our TPF study partners. This is compelling evidence of the value and return on investment of participation in the TPF program. More information about the Transportation Pooled Fund Program may be found at the Pooled Fund website.

Research Surveys

RLS has the capability to survey other state DOTs and AASHTO member agencies and affiliates on behalf of WSDOT customers. Typically, surveys are intended to gather information about state of the practice in other transportation organizations, primarily state DOTs.

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

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 Highway Research Program (NCHRP) -- problem statements are due in the fall of each year (November 1 for 2023).

- Transit Cooperative Research Program (TCRP) -- problem statements are solicited periodically but may be submitted to TRB by anyone at any time.

- Behavioral Traffic Safety Cooperative Research Program (BTSCRP) -- problem statements are solicited periodically but may be submitted to TRB by anyone at any time.

For more information on these programs, see TRB's [Cooperative Research Programs](#) website. For details on how WSDOT participates, see Section Three.

FHWA Center for Accelerating Innovation (CAI)

In April 2012, the FHWA established the [Center for Accelerating Innovation (CAI)](#) to serve as the focal point for coordination of internal and external efforts to identify and prioritize innovations by developing, launching, and administering strategic innovation deployment programs such as [Every Day Counts (EDC)](#). In the administration of these cross-cutting programs, the CAI is responsible for developing a national network for innovation deployment and for stakeholder collaboration within the highway transportation community, most notably through the [State Transportation Innovation Council (STIC)](#) network.

Every Day Counts (EDC)

The Federal Highway Administration (FHWA) launched Every Day Counts (EDC) in cooperation with the American Association of State Highway and Transportation Officials (AASHTO) to speed up the delivery of highway projects and to address the challenges presented by limited budgets. EDC is a state-based model to identify and rapidly deploy proven but underutilized innovations to shorten the project delivery process, enhance roadway safety and durability of roads and bridges, reduce congestion and improve environmental sustainability. Through the EDC model, FHWA works with state and local transportation agencies and industry stakeholders to identify a new collection of innovations to champion every two years. Innovations are selected collaboratively by stakeholders, taking into consideration market readiness, impacts, benefits and ease of adoption of the innovation.

For more information about EDC, please contact the Technology Transfer and Implementation Manager.

State Transportation Innovation Council ([STIC](#))

FHWA's STIC Incentive program provides resources to help STICs foster a culture for innovation and make innovations standard practice in their states. A STIC brings public and private transportation stakeholders together to evaluate innovations and spearhead deployment in their state. This puts each state's transportation community in the driver's seat when it comes to selecting innovations that best fit their program needs and then putting those innovations into practice quickly.

The STIC Incentive program offers federal funding of up to $100,000 per state, per federal fiscal year to support or offset some of the costs of standardizing innovative practices in a state transportation agency or other public-sector STIC stakeholder. Funding is administered by the FHWA Center for Accelerating Innovation through the Technology and Innovation Deployment Program (TIDP). STIC incentive funds for eligible projects provide the federal share of 80 percent. The 20 percent non-federal match may come from project sponsors or other allowable funding sources.

STIC Incentive funding may be used to conduct internal assessments; build capacity; develop guidance, standards, and specifications; implement system process changes; organize peer exchanges; offset implementation costs; or conduct other activities the STIC identifies to address TIDP goals and to foster a culture for innovation in the states. For more information about STIC, please contact the Technology Transfer and Implementation Manager.

Technology and Innovation Deployment Program ([TIDP](#))

TIDP funding helps turn research products into proven technologies and demonstrated practices, to benefit all components of highway transportation. By supporting the development and deployment of new

tools, techniques and practices, the TIDP accelerates adoption of innovation by the surface transportation community to improve highway safety, efficiency, environmental protection, sustainability, reliability and more.

Accelerated Innovation Deployment (AID) Demonstration Program

The AID Demonstration program provides funding as an incentive for eligible entities to accelerate the implementation and adoption of innovation in highway transportation. The AID Demonstration program is one initiative under the multi-faceted Technology and Innovation Deployment Program (TIDP) approach providing funding and other resources to offset the risk of trying an innovation.   The AID Demonstration funds are available for highway transportation projects in any phase between project planning and project delivery: planning, financing, operation, structures, materials, pavements, environment, and construction. Projects eligible for funding shall include proven innovative practices or technologies such as those included in the EDC initiative. Eligible entities include state departments of transportation (DOTs), Federal Land Management Agencies, and tribal governments as well as metropolitan planning organizations (MPOs) and local governments which apply through the state DOT as sub recipients. WSDOT has successfully applied for and received awards under this program.

Second Strategic Highway Research Program (SHRP2)

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

- **Safety**: Identifying the behaviors that cause and avert collisions.

- **Renewal**: Enabling faster, minimally disruptive, and longer-lasting improvements.

- **Reliability**: Championing predictable travel times.

- **Capacity**: Bringing greater collaboration to decision making.

Now that the research phase of SHRP 2 has ended, FHWA and AASHTO are responsible for implementing the resulting products, known as SHRP2 Solutions, which are available for implementation by state departments of transportation, metropolitan planning organizations, local and tribal agencies and FHWA's Federal Lands divisions.

Synthesis Programs

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

- Airport Cooperative Research Program (ACRP)

- 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 in highway and intermodal surface transportation systems. Each IDEA program listed below supports two types of projects: Proof-of-concept projects and prototype projects.

- NCHRP Highway-IDEA –Sponsored by AASHTO, the program is focused on innovation in design, safety, construction, operations, maintenance and management of highway systems.

- Rail Safety-IDEA –The program fosters innovative approaches to improving railroad safety or performance.

- Transit-IDEA – The program is part of the Transit Cooperative Research Program (TCRP) and aims to support innovative concepts with potential to enhance security, increase ridership, and improve efficiency for transit systems.

WSDOT may submit proposals for each of these areas. For program details and proposal deadlines go to: IDEA Program | IDEA Program (trb.org)

Washington State Transportation Center (TRAC)
The Washington State Transportation Center (TRAC) is a cooperative, interdisciplinary transportation research agency comprised of WSDOT, the University of Washington, and Washington State University. TRAC was formed in 1983 to coordinate research efforts across the transportation sector in Washington – state, commercial, public and private – and to develop research opportunities locally and nationally. TRAC acts as a link among government agencies, university researchers and the private sector.

WSDOT frequently collaborates with researchers from UW and WSU to carry out research projects.

University Transportation Centers (UTCs)
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. In November 2021 the UTC Program was reauthorized, with research to be focused on these seven thematic areas: 1. Improving Mobility of People and Goods; 2. Reducing Congestion; 3. Promoting Safety; 4. Improving the Durability and Extending the Life of Transportation Infrastructure; 5. Preserving the Environment; 6. Preserving the Existing Transportation System; and 7. Reducing Transportation Cybersecurity Risks.

A total of $90 million in funding will be distributed in Federal Fiscal Years 2022 to 2026 to 35 UTCs: 5 National, 10 Regional and 20 Tier 1 centers. These UTCs, groups of higher education institutions throughout the nation, will work with regional, state, and local transportation agencies and private sector partners to help find solutions to challenges that directly impact their communities and affect the efficiency of the nation's transportation system, as well as to educate the next generation of transportation leaders.

It may be possible for WSDOT staff to partner with a university professor to submit a research problem statement for funding to any University Transportation Center (UTC). If successful, match funding will likely need to be provided. To determine if your research idea is appropriate for a UTC, please contact the Research Manager responsible for research in your area of interest. `

WSDOT supports the UTC program and staff sit on a number of UTC Executive Advisory Boards.

The Pacific Northwest Transportation Consortium (PacTrans)

The Pacific Northwest Transportation Consortium (PacTrans) is the Region 10 University Transportation Center (UTC) and a primary partner WSDOT collaborates with on transportation research. PacTrans is a coalition of transportation professionals and educators from Oregon State University (OSU), the University of Alaska, Fairbanks (UAF), University of Idaho (UI), University of Washington (UW), Washington State University (WSU), Gonzaga University and Boise State University. With its focus area of improving mobility of people and goods, PacTrans serves as an engine and showcase for transportation research, education, and workforce development in the Pacific Northwest.

National Center for Transportation Infrastructure Durability & Life-Extension (TriDurLE)

TriDurLE was established in 2019, one of seven National UTCs funded by the University Transportation Center Program of USDOT, and is focused on enhancing the durability of multimodal transportation infrastructure and ensuring its safety, accessibility and sustainability. The 11 Consortium universities, including Washington State University, represent diverse geographic and climatic regions across the country and are well positioned to explore cost-effective and whole-life-cycle solutions to issues related to infrastructure durability and resilience, topics of critical importance to WSDOT.

AASHTO Special Committee on Research and Innovation (R&I) and Research Advisory Committee (RAC)

The AASHTO Special Committee on Research and Innovation promotes high-value transportation research, technology, and innovation to enhance the safe and efficient movement of people and goods. The R&I committee also oversees the National Cooperative Highway Research Program (NCHRP). The AASHTO Research Advisory Committee (RAC) is a subcommittee of R&I that includes research directors and 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 across the country. The Program Administrator of RLS serves on the AASHTO RAC.

Transportation Research Board and Standing Technical Committees

As part of the National Academies of Sciences, Engineering, and Medicine, the Transportation Research Board (TRB) provides leadership in transportation improvements and innovation through trusted, timely, impartial, and evidence-based information exchange, research, and advice regarding all modes of transportation.

TRB's mission is divided into three primary roles: Research, Convene, and Advise. TRB manages 170+ Standing Technical 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 forums for transportation professionals to identify, facilitate, and share research and information related to transportation

- 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

The Program Administrator for RLS serves as WSDOT's TRB state representative.

Other Research Partners

Other organizations that WSDOT partners with on research include research institutions at colleges, universities and other government research labs throughout the country; state and federal agencies; local and tribal governments; non-profit organizations; private companies; and private consultants. These partnerships currently occur on a project-by-project basis but may become programmatic partnerships as needed.

SECTION TWO: RESEARCH ROLES AND RESPONSIBILITIES

Research and Library Services (RLS) relies on collaboration among agency subject matter experts and external principal investigators, often convened in research workshops, for the development of a strategic, multi-modal program of research activities, in partnership with FHWA Washington Division staff. Anyone within the agency may submit a research problem statement to the Program Administrator of RLS. Roles are described for:

- Research and Library Services
- Technical Advisory Committee
- Program Administrator of Research and Library Services
- Research Managers
- Subject Matter Experts
- Principal Investigators
- Technology Transfer and Implementation Manager
- Librarians
- Business Manager and Fiscal Analyst
- FHWA Washington Division

WSDOT Research and Library Services (RLS)

Research and Library Services provides specialized research, information and innovative solutions to support the work of the agency, guided by WSDOT's Strategic Plan. The RLS Program Administrator manages two program areas, the Research Office and the WSDOT Library.

The Research Office organizes, manages, and disseminates the results of three main categories of research conducted on behalf of the Department: Applied, Innovative and Quick Response. It coordinates the process for identifying, selecting, and managing research projects funded through the federal State Planning and Research (SPR) program. It also helps develop and manage research funded by other agency programs or by legislative direction.

The WSDOT Library provides support to agency employees, consultants, contractors and citizens with a collection of print and digital resources representing a wide variety of topics related to transportation. A staff of professional librarians provide requested information that aids agency practitioners in their work. This support includes developing search strategies and conducting specialized literature searches, locating facts and statistics, and performing historical research. Librarians improve access to information by digitizing historical agency publications, cataloging and indexing publications, and obtaining articles and books through a state and national library network when necessary. Library staff also create and disseminate information products and resources such as daily and weekly news alerts and subject bibliographies to keep abreast of trends and topics of interest to WSDOT employees.

Key functions that RLS performs include 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, facilitating research technology transfer and tracking research implementation.

Technical Advisory Committee (TAC)

In most cases, a research project team will include a TAC to provide additional perspective and advice for the research project. TAC members include the project's Principal Investigator, WSDOT Subject Matter Expert, the Research Manager responsible for the subject area, and may include agency staff from other offices with a vested interest, FHWA staff and representatives from 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

4. Recommend implementation of research results if appropriate

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

Program Administrator of Research and Library Services (RLS)

The Program Administrator of RLS is responsible for its day-to-day operations and ensures that program administration complies with applicable federal requirements related to State Planning and Research funding, as well as state and agency guidelines. 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 FHWA, WSDOT executives, university and legislative personnel, and communicating the value of research.

The Program Administrator of RLS approves all research budgets and ensures that research activities are conducted within the constraints of available resources. The Program Administrator of RLS 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. The work program is prepared and submitted to FHWA every biennium and is updated annually in compliance with Title 23 CFR 420.

Additionally, the RLS Program Administrator serves as the agency's Transportation Research Board (TRB) state representative, communicating information about TRB's activities, programs and research opportunities to the agency, as well as informing TRB of WSDOT's research activities and challenges.

Research Managers (RMs)

Research Managers (RMs) report to the Program Administrator of RLS. Research Managers are responsible for:

1. Developing, administering, and marketing the research programs in their functional area.

2. Maintaining knowledge and understanding of research activities and needs in the functional areas assigned to them, including monitoring of national and international research for potential application within WSDOT.

3. Working with the Subject Matter Expert to develop research problem statements for identified research needs.

4. Helping identify researchers with appropriate skills to conduct research.

5. Acting as a liaison between the Subject Matter Expert and the Principal Investigator on contracts.

6. Facilitating development of a scope of work, budget and task agreement/contract for the research project.

7. Maintaining contact with the Principal Investigator and Subject Matter Expert to ensure that project milestones are met and documented.

8. Reviewing and approving research project invoices.

9. Managing research projects to ensure scope, schedule and budgets are adhered to.

10. Securing approval for all contractual changes related to project scope, budget, and time extensions.

11. Coordinating meetings of technical advisory committees.

12. Reviewing and commenting on draft final reports and other products of the research.

13. Collaborating with the Subject Matter Expert to formulate strategies for implementing research results.

14. Potentially conducting or assisting in research activities.

Subject Matter Experts (SMEs)

Subject Matter Experts (SMEs) are WSDOT staff with technical knowledge of the research subject. The SME ensures that the research project addresses WSDOT business needs. Each SME:

1. Develops, in coordination with the Research Manager, research problem statements for identified research needs.

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 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.

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.

10. Advises WSDOT managers on implementation of research recommendations or results.

Principal Investigators (PIs)

The Principal Investigator (PI) is a university professor, a consultant, or agency employee with expertise in the subject area to be studied. In managing the research project activities, the Principal Investigator:

1. Develops a scope of work, budget and a work plan for the project.

2. Identifies/hires staff to perform the research.

3. Provides progress and final reports to WSDOT.

4. Manages the project budget and schedule.

5. Maintains contact with the Subject Matter Expert, Technical Advisory Committee, TRAC Director (if applicable), and Research Program Manager.

6. Participates in outreach activities such as publication, presentation, and summary document development.

7. Prepares final report and supporting documentation.

Technology Transfer and Implementation Manager

Working with Research Managers, the Technology Transfer and Implementation Manager identifies and publicizes research results/technology transfer opportunities to inspire implementation and further innovation within the agency and beyond. The position supports WSDOT's technology transfer efforts as defined in the FHWA State Planning and Research (Subpart B) program and coordinates the agency's participation in FHWA's Every Day Counts, State Transportation Innovation Council and Accelerated Innovation Deployment (AID) Demonstration programs, among others.

Librarians

As noted previously, WSDOT Librarians support agency staff, consultants, contractors and citizens with a variety of services. Direct support for the Research Program includes participating in workshops to inform researchers and subject matter experts of library services available to them, developing search strategies and conducting specialized literature searches required for research problem statement submittals, and locating related publications, facts and statistics (obtaining information through a state and national library network when needed information is not available within the Library's collection).

The librarians also catalog final research reports and make them available online and provide further support for research dissemination by co-hosting the *Webinar Wednesday* research results series.

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 RLS biennial budget and federal aid work program, including modification, if necessary, during the biennium.

4. Serve as a resource to other RLS staff regarding WSDOT fiscal and contract procedures and maintain up to date records on all RLS expenditures.

5. Ensure timely payment of all project invoices.

6. Manage and update research projects tracking worksheet in the RLS-SharePoint site through Microsoft Teams.

7. Manage, coordinate, and monitor the fiscal aspects of the Transportation Pooled Fund Program.

FHWA Washington Division staff

FHWA Division staff provide guidance and oversight for WSDOT's SPR work program development and reporting, and review and approval of agency research program management and documentation.

Additionally, the FHWA EDC/STIC coordinator works with their counterpart in WSDOT's Research Office to support WSDOT's participation in those programs, as well as other FHWA programs associated with transportation research.

See the links below for more information on FHWA's research programs:

Center for Accelerating Innovation (CAI): https://www.fhwa.dot.gov/innovation/

CAI resources: https://www.fhwa.dot.gov/innovation/resources/

Every Day Counts (EDC): https://www.fhwa.dot.gov/innovation/everydaycounts/

State Transportation Innovation Councils (STIC): https://www.fhwa.dot.gov/innovation/stic/

Technology and Innovation Deployment Program (TIDP): https://www.fhwa.dot.gov/innovation/ (scroll down the page)

Accelerated Innovation Deployment (AID) Demonstration: https://www.fhwa.dot.gov/innovation/grants/

SECTION THREE: PROCEDURES FOR RESEARCH PROGRAM DEVELOPMENT AND MANAGEMENT

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

RESEARCH PROGRAM DEVELOPMENT

Key Principles and Parts of the WSDOT Research Program Development Process:

Inclusive: The process is open to all WSDOT employees and offices.
Transparent: The process to select projects is well defined, documented and criteria based.
Rating Criteria: Reflect WSDOT's Strategic Plan Goals.
Technical Workshops: An option to promote collaborative identification of research needs.
Research Problem statements: Are submitted by WSDOT staff and may identify a preferred Principal Investigator (PI). For funded problem statements that do not identify a preferred PI, an RFQ will be initiated to recruit a PI and/or consultant.
Funding from other sources: May be identified in research problem statements to leverage WSDOT research resources.

Conceptual research needs and problem statements are developed according to criteria for Applied or Innovative research, prioritized by WSDOT Senior Managers and reviewed by the responsible Assistant Secretary prior to submission to RLS. Submitted problem statements are reviewed, evaluated and rated by RLS and reviewed and rated by a Technical Advisory Group (TAG) chaired by the Transportation Safety and Systems Analysis (TSSA) Director. A list of recommended projects is then presented to WSDOT Executives for approval. Upon final approval for funding, Research Managers and Subject Matter Experts will work with Principal Investigators to develop scopes of work for each project.

Schedule for Development of WSDOT's Biennial Research Program

Even year

Spring	Research needs solicitation initiated by the Program Administrator of RLS
Summer	Research Managers may schedule workshops with interested parties to identify research needs and provide instructions for problem statement submittals and deadlines
Late Summer/Fall	Applied and Innovative problem statements, prioritized by the submitting senior manager and reviewed by appropriate Assistant Secretary, are submitted to RLS
Fall	RLS and TAG review, evaluate and rate problem statements and develop a list of recommended projects to fund
Late Fall to December	Recommended projects presented to WSDOT Executives for approval

Odd year

January   Research institutions identified, and Principal Investigators are selected
                        for approved projects

February to June   Project scopes developed and start dates established

July to December   Contracts for new projects established and projects initiated

Because the research needs gathered through this process may be greater than what WSDOT is able to fund, non-funded needs provide possible topics for other research institutions and programs in addition to the WSDOT research program. These include University Transportation Centers, the National Cooperative Highway Research Program (NCHRP), the Transit Cooperative Research Program (TCRP), Transportation Pooled Funds, Federal earmarks, Every Day Counts, Innovations Deserving Exploratory Analysis (IDEA), STIC and others.

Identifying Research Needs

Any WSDOT staff person identifying research needs must ensure that they align with identified agency and state strategic directions and have the support of their division manager. It is up to the staff person to define how they identify needs, but it is anticipated that they may hold a research workshop with interested parties (regions, modes, universities, federal and local partners, etc.) to identify research needs, which Research Managers can facilitate, as needed. Solicitations for input are to be inclusive.

From Research Need to Proposed Research Project

Research problem statements are developed for research needs by functional areas (Maintenance, Bridge and Structures, etc.). Input on priorities for funding are identified by the WSDOT Senior Manager responsible for that function. Recommended Principal Investigators may be identified but no commitment will be made to Principal Investigators until projects are approved for funding. Research Managers and Subject Matter Experts are always encouraged to discuss research needs with University of Washington and Washington State University professors, WSDOT's TRAC partners. Research Managers and TRAC Directors will help identify appropriate professors to contact if assistance is needed. We are not limited to working with UW or WSU, however.

Although the majority of WSDOT research is conducted by researchers at the University of Washington and Washington State University, WSDOT also contracts with other institutions in Washington state (e.g., St. Martin's University, Central Washington University) and other states, in order to enlist the required subject matter expertise needed for a given project. At this writing, WSDOT has active master agreements for transportation research with 12 universities, in Washington and across the country, and is able to contract with others on an as-needed basis.

Every even year, each WSDOT section, branch, program, office or region is allowed to submit one problem statement to RLS for Applied Research and Innovative Research. Each problem statement will identify the lead office and other offices with an interest in the topic and a proposed Subject Matter Expert. If the project is funded, a technical advisory committee will be formed with the interested offices.

Role of the Universities and Consultants

Researchers are invited to functional area research workshops or other meetings with WSDOT staff, where they may contribute to the discussion of needs and innovations that may be of interest to WSDOT. Every attempt should be made to have representatives from both WSU and UW involved. Research Managers, working with the Washington Transportation Center (TRAC) Directors, will help functional

area managers identify appropriate members to invite. Researchers from other universities and consulting firms are also welcome to attend.

Establishing the SPR Research Work Program

WSDOT Executive Management retains final approval of the WSDOT Research Program. The Transportation Safety and Systems Analysis (TSSA) Division Director and Program Administrator of RLS compile the prioritized and budget constrained problem statements and present the recommended research program to WSDOT Executive Management for final approval.

In selecting projects for funding, the Program Administrator of RLS will also review the list of recommended Principal Investigators and assist in balancing the program between the UW, WSU and other institutions to the degree possible.

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

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

An informational copy of approved research problem statements is furnished to the FHWA Division Office following Program approval. The Research Work Program includes SPR Research and SPR funded Transportation Pooled Fund projects.

RESEARCH MANAGEMENT

Research Management provides direct oversight and supervision of specific research projects under the approved research program, including both SPR funded research projects and research projects contracted through RLS using other funding sources. Research Managers are responsible for coordinating the development of proposals to conduct research with Principal Investigators, Subject Matter Experts, Technical Advisory Committees, and the Business Manager.

Research Managers administer the conduct of the research by communicating regularly with the Principal Investigator, Subject Matter Expert, and Technical Advisory Committee; approving invoices; tracking project progress; reviewing and approving progress reports; conducting possible on-site visits; coordinating a review of the research, the final product, and/or report; supporting the role of the Subject Matter Expert in implementing the research results where appropriate; and coordinating the reporting of project results.

Each research project is assigned a Principal Investigator, Subject Matter Expert and Research Manager.

SPR Research Projects

The Program Administrator of RLS notifies Research Managers when the research program is approved and assigns a Research Manager to each specific research task or project.

Identifying Subject Matter Experts

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

Selecting Principal Investigators

After the research project list is finalized:
A. Continuing projects will continue with the same Principal Investigator unless the Subject Matter Expert requests otherwise.
B. Principal Investigators approved by the Program Administrator of RLS may proceed to project development.
C. For all other projects:
1. A Request for Qualifications (RFQ) will be distributed. 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 Subject Matter Experts will rate the proposals for: experience, qualifications (credentials), resources, and research approach and select the principal investigators.
3. A letter will be sent by the Program Administrator of RLS to the selected PI notifying them of their selection and the earliest possible project start date, requesting a full proposal, and providing contact information for the Research Manager and Subject Matter Expert.
4. E-mails will also be sent to the proposers not selected.

Developing Contract Scopes of Work

The selected Principal Investigator, in cooperation with the Subject Matter Expert, prepares a draft contract scope of work according to the Research Scope of Work Preparation Guide available from the Research Office. This draft contract scope of work 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 Subject Matter Expert to determine the research approach, define the objectives of the draft contract scope of work, and create a Technical Advisory Committee.

Once the Principal Investigator, Subject Matter Expert 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 Program Administrator of RLS. If the document is submitted to the university TRAC office, it is reviewed and forwarded to the Program Administrator of RLS.

Contract Scope of Work Review

The Research Manager coordinates the review, modification and approval of the draft contract scope of work.

The Research Manager works with the Subject Matter Expert 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 Subject Matter Expert 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 an electronic version of the final proposal to the Program Administrator of RLS. The final proposal is maintained by the Business Manager and shared with 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 Business Manager to prepare the contract documentation. The proposal documents and research contract are approved by the Program Administrator of RLS. The Business Manager obtains WSDOT Contract Office and Attorney General review and approval for all new contracts and contract modifications that amend the scope of work. For no-cost time extensions, only the WSDOT Contract Office review is necessary.

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 Subject Matter Expert from the functional area.

Research Managers provide direction and oversight for all active research projects. This requires continuous interaction between the Principal Investigator, Subject Matter Expert, 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 Subject Matter Experts 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 Subject Matter Expert 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/Implementation

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

Changes to Research Project Scope, Schedule and Budget

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. If, through review, the Research Manager, the Subject Matter Expert, and/or the Principal Investigator determine that there is a need to make changes to the research project scope, schedule or budget, the Principal Investigator must submit a modification to the Research Manager in writing. Such modifications are then passed along to the RLS Program Administrator for review and approval.

Quarterly Reviews

Research projects will be reviewed by the Research Managers on at least a quarterly basis. Principal Investigators, Research Managers and Subject Matter Experts will exchange information on the status of the projects. The project review may 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/Subject Matter Expert?
    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 Program Administrator of RLS can opt to withdraw funding from a project that has not yet begun. If a project is dropped, the funding for that project will be used by the Program Administrator of RLS to:

- Initiate another project from the list of biennial problem statements
- Solicit new problem statements from the functional area of the dropped project
- Fund other high priority activities such as Quick Response Research or Transportation Pooled Fund contributions.

Project Completion

On completion of a research project, the Research Manager coordinates the review of the products and research results and works with the Principal Investigator, Subject Matter Expert, Business Manager and the Program Administrator of RLS to ensure that all required contractual terms and financial matters are completed.

Research projects are conducted according to the terms specified in the research contract. The following subsection summarizes 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. The draft report will be distributed to the SME and other appropriate parties for review and comment. The Principal Investigator will address any comments or questions and incorporate needed edits into the final report, which should also be compliant with accessibility guidelines per the Americans with Disabilities Act and Section 508 of the Rehabilitation Act of 1973 as amended. (See Section Five of this document and a separate publication, *WSDOT Research Report Guidelines*, for additional information on research report requirements).

3. Final Presentation: The Research Manager may arrange a final conference with the Principal Investigator, Subject Matter Expert, WSDOT Technical Staff, and other interested parties.

4. Final Invoice: On receipt of the reviewed and accepted 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, Program Administrator of RLS and TRAC Directors, as applicable, that the project is complete. When the final invoice has been paid, the Research Manager notifies the Principal Investigator that the project is complete.

QUICK RESPONSE (QR) RESEARCH

Quick Response Research projects are initiated by contacting the appropriate Research Manager. These projects address emergent research needs that arise outside of the usual project solicitation window. The projects typically are completed in less than a year (oftentimes in a few months), and funding cannot exceed $50,000.

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 Program Administrator of RLS. This request should include:
   a) What the funding will be used for (project title and objective);
   b) How much funding is required;
   c) The date by which an outcome is needed;
   d) Who is requested to conduct the work;
   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; and
   g) Who supports it.

The Program Administrator of RLS approves requests for Quick Response funding.

CLIENT SPONSORED RESEARCH (CSR) 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 are intended to address specific questions. Offices should notify the Research Manager for their functional area of interest regarding research and experimental activities.

If offices seek external funding (such as FHWA Research Funds), they should notify the appropriate Research Manager with a copy of the request for funding and verify when funds are received or not.

Offices conducting research projects or operational activities may request support for project administration from RLS. The office requesting support must notify their Research Manager and provide needed 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.

SURVEY SUPPORT

RLS can assist in conducting simple surveys to gather information from other DOTs by distributing questions through the AASHTO Research Advisory Committee listserv. These surveys gather state of the practice information.

WSDOT staff interested in fielding a survey would provide the following information to the Research Manager responsible for their functional area to get started:

- A brief paragraph describing the need;
- The questions to be answered;
- Who the responses should be sent to;
- The appropriate contact information for the individual who can answer questions and receive responses; and
- The deadline for receiving the information.

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

TRANSPORTATION POOLED FUND (TPF) PROGRAM

The TPF program is administered by FHWA in coordination with state DOTs and offers an opportunity for partners to pool their funds, subject matter expertise, and resources to conduct high-priority research beyond the capabilities of a single organization. TPF studies focus on national and regional transportation-related issues, shared concerns and/or problems that need solutions. RLS coordinates WSDOT's participation in pooled fund studies and provides some funding. To qualify as a pooled fund study, at least two state transportation agencies or a transportation agency and 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, associations, regional and local agencies and academic institutions can partner with 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 provides detailed information on projects and enables states to commit to pooled fund projects, enter project information, and/or check the status of all active pooled fund projects. For more information, go to www.pooledfund.org.

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, although the contributing fund source may not yet be identified. Commitments may be made for one or more years. An agency commitment means the agency intends to provide funding, whether from their research office or another office within the DOT.

Cleared – A TPF Project is cleared after sufficient commitments have been made to meet the required funding level set for the project. (Prior to that time, the proposal is in *Solicitation* status). 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 plan 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 participating partners may transfer the Obligation Authority(O/A) to the lead state. The lead state will then obligate funds to the project, making the funds available to be expended by the TPF Project.

Pooled Fund Program Management

FHWA administers the Transportation Pooled Fund Program on behalf of the states. Within WSDOT, funding sources are either from RLS or the office interested in the project. No matter the source of the funds, WSDOT's participation in the Transportation Pooled Fund Program is managed by the Research Office. Research Managers may provide project tracking and management of Transportation Pooled Fund projects, if requested by the funding office. 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.

Pooled Fund Project Funding

During each year, WSDOT Offices may request SPR funds from RLS to contribute to TPF projects in which they would like to participate. Requests are made to the Research Managers and will be forwarded to the Program Administrator of RLS for consideration in the next Federal Fiscal Year (FFY). RLS usually sets aside some funding for pooled fund participation.

Alternatively, any WSDOT office may wish to participate in a TPF project utilizing their own program funds. Interested offices should contact their Research Manager to coordinate the commitment and contribution process through RLS.

Procedures to Create a New Pooled Fund Project to be Led by WSDOT

For WSDOT Offices wanting to create and lead a pooled fund project, the general process to be followed is described below. For more detailed information, see FHWA's Research Pooled Fund Checklist, the TPF website, and the Procedures Manual posted to that website.

TPF Project Development and Management for WSDOT-led TPF Projects:

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 for review. The final approval for submission of a Pooled Fund Solicitation is made by the Program Administrator of RLS.

2. *Contributions by Pooled Fund Project Partners*: The RLS Business Manager will track the project contributions from other states. Authority to expend contributions will be through a federal appropriation in the state 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.***

3. *Quarterly reporting:* The Research Manager will assure that Quarterly Reports are posted to the Pooled Fund Website and a Final Report is posted once the project is completed.

4. *State Funds Payment:* When a WSDOT Program/Division wishes to contribute to a Transportation Pooled Fund, and the Program/Division does not have federal funds to contribute to the TPF, RLS can assist in making the contribution occur through coordinating a state funds payment directly to the TPF lead state.

TPF 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 state 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 state will use the plan of work to initiate the investigator selection process. The contracting laws and regulations of the lead state 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 state 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 FHWA.

TPF Project Completion

1. *Deliverables Received*: The lead state, 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 state 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 state for the remaining costs of the project up to the obligation limits of the project. At the discretion of the lead state, an After Action Review may be conducted with the investigator to measure the project's processes and outcomes.

4. *Closing the Project:* The lead state Project Manager informs the FHWA 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 state 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 including the project partners.

Questions regarding FHWA's Pooled Fund Program?

See the website below for more information:
TPF - Home (pooledfund.org)

Cooperative Research Programs (CRP)

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. Overall, management of each of TRB's Cooperative Research Programs is very similar. However, problem statement solicitation and project selection processes vary among the programs.

The National Cooperative Highway Research Program (NCHRP) project selection process is largely directed by the state departments of transportation as sole sponsors of the program. Supporting funds are

drawn from the state's Federal Aid Highway apportionment of 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 online by TRB and are freely available to WSDOT employees. If an office (print) copy is needed it may be requested by the employee through the myTRB portal or through the WSDOT Library. Copies are currently free to employees of sponsoring agencies.

Submitting Problem Statements

Each year RLS distributes the NCHRP solicitation announcement to WSDOT Senior Managers and their staff with an invitation to submit problem statements to NCHRP at TRB. Problem statements proposed by WSDOT staff should be approved by their supervisor and Division Directors before being submitted to NCHRP. WSDOT supported problem statements may also be submitted through AASHTO Committees or be developed by a TRB Committee in which a WSDOT employee is a member. These projects require a state DOT, AASHTO Committee, or FHWA sponsor for submittal. RLS appreciates receiving a copy of WSDOT supported problem statements in order to document the agency's interest in the project.

The CRPs are very competitive programs. To improve the probability of success in obtaining funding, 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 for related literature through TRID (TRB's database of transportation research information) and for on-going research through TRB's Research in Progress database. You can also request a literature search to gauge the state of the practice 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 excellent venues in which to solicit interest. RLS can help 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 for submittals.

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

Problem statements received by each CRP are reviewed by committees of technical experts. The membership of the committees varies for each CRP. 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.

RLS facilitates the rating of NCHRP problem statements by WSDOT employees. Final NCHRP problem statements are distributed to the AASHTO Special Committee on Research and Innovation (R&I) and the AASHTO Research Advisory Committee (RAC) for rating. The problem statements are received by RLS 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 R&I. Meetings are held annually in late March where R&I reviews the list, identifies priorities and formulates a recommended program that meets the constraints of the anticipated NCHRP revenue. At least two thirds of the state DOTs must approve a problem statement for funding. The recommended program is submitted to the AASHTO Board of Directors for final approval.

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 also made by AASHTO Committees. RLS 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, WSDOT staff must be alert for potential conflict of interest when determining what part they would like to play in a project. They cannot be both a panel member and a participant in the proposal. They can contact the Program Administrator of RLS if they would like additional information.

Synthesis Programs

The purpose of TRB's Synthesis programs is to compile information, often scattered and elusive, on current knowledge and practices related to topics of interest in the transportation sector. This information is gathered, evaluated and published in a compact report format widely used by practitioners and researchers. Each report is prepared by a consultant who has expertise in the topic area, with assistance provided by a technical panel.

Synthesis Program Management

TRB currently manages Synthesis Studies for three programs:

- Airport Cooperative Research Program (ACRP)

- National Cooperative Highway Research Program (NCHRP)

- Transit Cooperative Research Program (TCRP)

The Cooperative Research Programs of the Transportation Research Board will announce opportunities to suggest synthesis topics for each program periodically and provide instructions to do so.

Synthesis Project Management

The Cooperative Research Program solicits panel members for Synthesis projects. Panel members are appointed by the Transportation Research Board and provide technical guidance and counsel throughout the life of the project. WSDOT employees interested in participating in a Synthesis project may self-nominate or be nominated by a manager or co-worker.

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, transit, and railroad safety and performance. Funding is offered at the early stages of innovation development, a critical stage when funding is typically difficult to obtain. Two types of projects are supported by the IDEA program: proof of concept projects, and prototype projects.

Detailed information about each program, including program goals, proposal format, important dates/deadlines, and selection criteria can be found at their corresponding websites, noted below.

- NCHRP-IDEA – Program is sponsored by AASHTO as part of NCHRP and seeks to foster innovative concepts related to the design, construction, safety, maintenance, operation and management of highway systems.

- Transit-IDEA – Sponsored by the Federal Transit Administration (FTA), as part of the TCRP, to support creative approaches that have the potential to enhance security, increase ridership and improve efficiency of transit systems. Differing from traditional research programs, Transit IDEA projects are initiated by researchers rather than by a request for proposals, and funding can support initial testing of unproven concepts.

- Rail Safety IDEA – Sponsored by the Federal Railroad Administration (FRA) to provide funding for projects focused on innovations that improve rail safety or performance for any type of rail, including intercity passenger rail, high speed rail or freight rail. This IDEA program differs from traditional research programs in two ways: projects are initiated by researchers rather than by a request for proposals, and funding can support initial testing of unproven concepts.

WSDOT may submit proposals for innovations to study. Please contact the Research Office if you have questions about any of these programs.

SECTION FOUR: RESEARCH TECHNOLOGY TRANSFER AND IMPLEMENTATION

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 transfer of technology and knowledge gained by the research and the implementation of applicable results has been accomplished.

Responsibility

Research Manager: Each Research Manager is responsible for working with Principal Investigators and Subject Matter Experts to support technology transfer and appropriate implementation of research results from SPR projects in their subject area. This includes identifying potential candidates for WSDOT's *Webinar Wednesday* research results series.

Subject Matter Expert: Because successful implementation is dependent on 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 Subject Matter Expert'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 Subject Matter Expert 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? The Principal Investigator will work with the Subject Matter Expert to understand these intended uses and prepare recommendations for appropriate use of research results at the completion of the project.

Technology Transfer and Implementation Manager: Research deliverables and results are important products of research projects, and their potential to foster technology transfer and implementation increases the more they are shared. The Technology Transfer and Implementation Manager is responsible for helping to make that happen. Final research reports document the findings and recommendations from research investigations. Per federal requirements, final research reports of SPR-funded projects are to be distributed to designated federal agencies/digital repositories, where they are accessible to anyone with an internet connection. State statutes also require agency reports to be submitted to the Washington State Library, for permanent inclusion in the state's Digital Archives. The Technology Transfer and Implementation Manager facilitates the required distribution of final reports, in addition to disseminating them via topical subscriber lists and other means. Additionally, in support of technology transfer and to encourage implementation, research results will be publicized in a variety of channels to include the

TRAC eNews, WSDOT intranet articles, *TRB Weekly* newsletter, and in various national settings such as the Innovation Community of Practice and Transportation Lean Forum.

Working with recommendations from Research Managers, the Technology Transfer and Implementation Manager will select research projects and results with the potential for broad application to be presented in our *Webinar Wednesday* series, co-hosted by the Research Office and Library Services. The webinars feature researchers and SMEs presenting findings to attendees from our agency and beyond, including practitioners from other state DOTs, federal agencies, and the private sector. Our webinar series is a very effective method of technology transfer, with a large following, and our intent is that it inspires implementation of research results and sparks further innovation. Each session includes an interactive Q&A segment, and recordings of the webinars are archived online for continued access.

Procedures for Implementation and Technology Transfer

Guidelines

The role of the Subject Matter Expert and the implementation approach will depend greatly upon the nature of the research project. To help direct the conduct of a research project toward successful implementation of results, SMEs should consider the following items when developing the research proposal.

1. Think about the end results: Know what you hope to gain from your project when you are done. Work with your Technical Advisory 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 will 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 informational webinars, 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(s) 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, the documents or manuals in which a finding might need to be included, 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 Managers and the Technology Transfer and Implementation Manager are available to provide advice regarding research technology transfer and implementation at any point in the research lifecycle.

SECTION FIVE: RESEARCH REPORTING

Research project reports are required from all Principal Investigators conducting SPR and WSDOT-led Pooled Fund research projects, with few exceptions. Each Principal Investigator of an SPR project will be required to submit Monthly or Semi-Annual Progress Reports and will be required to submit 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.

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 may require Semi-Annual Project Progress Reports. 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.

If required, these web-based reports are due on January 31 and July 31 of every year. The Progress Report will include:

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

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

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

Draft and Final Research Reports

Principal Investigators 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 available from the Research Office, including guidance for making reports compliant with Americans with Disabilities Act (ADA)/Section 508 requirements for accessibility.

1. For each final report, the responsible TRAC Office or the Research Manager requests a WA-RD report number from the Tech Transfer and Implementation Manager. The PI submits an electronic version 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 Subject Matter Experts, and other interested parties for review and comment. For projects funded with federal funds, the appropriate federal agency or agencies is/are 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 addresses and incorporates reviewers' comments, as appropriate, and provides a final report in electronic format to the Research Manager with a completed Technical Report Standard Documentation Page. At least one project photo should be included for the report cover. 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.

6. The Research Manager fills out the Final WSDOT Research Report Checklist and submits the report to management for review and approval to publish, and also to the Technology Transfer and Implementation Manager to check for ADA/Section 508 compliance and create the report cover.

7. Upon approval to publish, the Tech Transfer Manager submits the report to required recipients and works with the WSDOT Library for distribution to the Washington State Library and inclusion in the State Library online catalog and Digital Archives.

Report Distribution

Distribution of the final report is electronic only. Instructions for online access to WSDOT research reports are posted on the WSDOT RLS website. You may also sign up for E-mail updates to receive announcements and links to new reports by research topic area.

All final Research Reports are distributed electronically to project participants, the UW TRAC Office, the WSDOT Library, the Washington State Library, and others as identified by the Research Manager. Reports of SPR funded research are sent to the National Transportation Library's ROSA P digital repository, the Transportation Research Board's TRID database and other required recipients.

Reports of Client Sponsored Research are submitted to the Washington State Library, and upon request of the researchers, to the National Transportation Library and TRID.

SECTION SIX: RESEARCH PROGRAM REVIEW

RLS 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.

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 (23CFR 420.209(d)). The FHWA Division Office must also approve the State's Research Procedures Manual (23 CFR 420.209(b) and may conduct a compliance review. Normally, however, program compliance will be evaluated through routine involvement and report reviews.

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 RLS. It is updated annually.

Peer Exchange

State transportation agencies are required to conduct periodic peer exchanges of their research programs (23 CFR 420.209(a)(7). 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. The intent of the peer exchange is to foster vision, ideas, and best practices for the host agency(ies) to benefit their program(s) as well as the programs of the participants.

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.

Peer exchange panels include 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.

Guidance for conducting Peer Exchanges can be found on the AASHTO Special Committee on Research & Innovation website. Additional information can be found in 23 CFR 420.209(a)(7).

WSDOT strives to follow the guidance for conducting peer exchanges within recommended time frames. We hosted our most recent peer exchange in October 2021.

SECTION SEVEN: RESEARCH RESOURCES

Transportation Research Resources

It is important to investigate existing knowledge when planning research activities to build upon rather than duplicate it. The information listed below provides resources where ongoing and published research can be found.

WSDOT Research Website

The WSDOT Research website provides information on:

- Current research projects
- WSDOT research reports
- Research results webinars
- Contact information for Research Managers, and their areas of responsibility.

WSDOT Library

The WSDOT Library holds the largest collection of Washington state transportation-related information in the state. WSDOT librarians also identify additional information sources outside of the WSDOT Library and obtain articles and books through interlibrary borrowing from transportation and academic libraries throughout the country.

Portions of the WSDOT Library collection that are particularly relevant to researchers include:

- WSDOT publications, including research reports and project reports

- Transportation Research Board Publications

- Selected publications from other state DOTs, USDOT, and FHWA.

- Online resources such as the in-house WSDOT Library Digital Collections or subscription resources like the ASCE Library. Access to these resources can vary. Some are freely available via the Internet, while some require access through the WSDOT network; a few are accessed by librarians only. Contact the WSDOT Library for details.

The WSDOT HQ Library and Materials Laboratory Library collections are part of the Washington State Library Online Catalog.

Online Research Citation Databases

TRID

TRID is an integrated database that combines the records from TRB's Transportation Research Information Services (**TRIS**) Database and the OECD's Joint Transport Research Centre's International Transport Research Documentation (**ITRD**) Database. TRID is the world's largest and most comprehensive bibliographic database of transportation research information, providing access to more than one million records of transportation research worldwide published in journal articles, technical reports, conference proceedings and books. The database is produced and maintained by the

Transportation Research Board of The National Academies of Sciences, Engineering and Medicine with sponsorship from State Departments of Transportation, including WSDOT, and other organizations.

TRID covers all modes of transportation, although highways and surface transportation are the strongest areas. Citations and/or abstracts comprise the majority of the TRID database records, but an increasing number of publications cited have links to full text, particularly TRB publications. TRID is freely available on the Internet at https://trid.trb.org/ .

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.

Research Needs Statements

The Research Needs Statements (RNS) database is another resource produced by TRB, in support of stimulating research that addresses issues, concerns and problems confronting the transportation community. TRB's Technical Activities standing committees develop research needs statements for use by practitioners, researchers and others. Database users can search by keywords and subject terms to see if a research needs statement exists for a particular issue of interest. Retrieved records offer detailed descriptions of research that is needed, and why, and also provide contact information should users want to follow up with the RNS developer or share information about the topic. This can be a way to locate research partners.

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 or by phone at 360-705-7750.

FHWA Research Programs

Center for Accelerating Innovation (CAI): https://www.fhwa.dot.gov/innovation/

CAI resources: https://www.fhwa.dot.gov/innovation/resources/

Every Day Counts (EDC): https://www.fhwa.dot.gov/innovation/everydaycounts/

State Transportation Innovation Councils (STIC): https://www.fhwa.dot.gov/innovation/stic/

Technology and Innovation Deployment Program (TIDP): https://www.fhwa.dot.gov/innovation/ (scroll down the page)

Accelerated Innovation Deployment (AID) Demonstration: https://www.fhwa.dot.gov/innovation/grants/

If you have questions or would like more information about anything in this manual, please feel free to contact WSDOT's Research and Library Services at 360-705-7961.