

Section 2 Research Program Development

2.1 Introduction

Caltrans has developed and implemented a coordinated process to identify research needs, conduct research, and deploy research results. The coordinated process is iterative and includes input from committees representing all functional areas of Caltrans and all levels of staff ranging from technical experts to executive management.

2.2 Caltrans Executive Board

Caltrans Executive Board advises DRISI of Caltrans strategic needs and priorities, and provides guidance on implementing research and new innovations.

The Executive Board draws on DRISI as a resource for options such as preliminary investigations, workshops, national programs, specialized transportation related conferences, and academic guidance. Further information on the Executive Board can be found at:

<http://www.dot.ca.gov/ExecutiveBoard/>

2.3 Research Committees and Panels

DRISI's research process emphasizes customer participation along with effective deployment through customer ownership of the deployed research products.

The research committees are an important way of involving the customers in the research selection, project management, and implementation process. The related committees and panels are described briefly below.

Further information of the Research Committees membership and functions can be found at: [DRISI Research Committees](#).

2.3.1 Research and Deployment Advisory Committee

The Research and Deployment Advisory Committee (RDAC) advises DRISI on potential research objectives and priorities, recommends an annual program of research projects, and

actively sponsors research products that are ready for implementation.

2.3.2 Program Steering Committees

The Program Steering Committees (PSC) are representatives from various Caltrans programs requesting research. PSCs identify program-level research priorities, annually approve multi-year research roadmaps, and support implementation of research products.

2.3.3 Technical Advisory Panels

The Technical Advisory Panels (TAP) are composed of technical experts from Caltrans divisions, districts, DRISI, and external partners. They recommend research priorities and new research needs to the PSC and identify implementation opportunities.

The PSC, TAP, and DRISI relationship is shown in the PSC/TAP matrix, which can be found at: [PSCs-TAPs_Matrix](#).

2.4 Research Program Development Responsibilities

In support of the research program development, DRISI updates the Strategic Research Plan, and coordinates the selection process of the annual program of projects. Some of the responsibilities include:

- Providing staff support to the Executive Board and RDAC
- Advising the PSC and TAP
- Working with PSC and TAP to coordinate development of research roadmaps
- Preparing the annual program of projects
- Managing the contingency approval process
- Soliciting research proposals
- Coordinating Caltrans research activities with the University Transportation Centers (UTC) and with national transportation organizations such as TRB and AASHTO
- Leveraging partnered-research activities through Transportation Pooled Fund research

2.5 Funding Sources for the Research Program

The research program is funded by state and federal funds, reimbursed work, and grant funds.

2.5.1 State Funds

The principal source of state funding for Caltrans research is the State Highway Account (SHA). The state budget act authorizes the SHA, which is a transportation funding source generated from the state tax on motor vehicle fuels.

2.5.2 Federal Funds

The Federal Highway Administration (FHWA) SP&R Part II is the main federal funding source for Caltrans research. SP&R Part II is regulated by Title 23, CFR, Part 420, which identifies the administrative requirements that apply to the use of FHWA planning and research funds.

2.5.3 Reimbursed Work

Research projects are sometimes reimbursed through the request of a partner agency. Normally, this work is performed in conjunction with a state project or activity for the mutual benefit of the State and the partner agency.

2.5.4 Grant Funds

The FHWA, Federal Transit Administration (FTA), or other federal agency acting as research contracting parties, may negotiate with Caltrans (as the contractor) to conduct research through grant processes. Agreements of this kind typically provide 50 percent to 100 percent federal reimbursement of Caltrans costs.

2.6 State Planning and Research, Part II Annual Work Program

In order for the research program to expend federal funds, FHWA approval is required through the SP&R Part II Annual Work Program (AWP).

2.6.1 SP&R Overview

USC Title 23 Highways, Chapter 5 Research and Technology, provides for SP&R funding. Two percent of the total funds apportioned to

the states each year, including California, are designated for planning and research activities.

Of this amount, not less than 25 percent must be spent on research, development, and technology transfer activities relating to highway, public transportation, and intermodal transportation systems.

Federal funds typically provide for 80 percent of the cost of the research projects in the SP&R Part II AWP, and state funds provide for the remaining 20 percent. FHWA has the ability to waive the state match if the interests of the Federal aid highway programs are met by Title 23 CFR 420.119(d).

2.6.2 Caltrans SP&R, Part II AWP

DRISI reports to FHWA on the research projects and administrative costs that will be funded using the SP&R Part II AWP, as required by Title 23, CFR Section 420.111.

The SP&R Part II AWP is developed and approved before the beginning of each new state fiscal year. It describes the research work to be performed and estimated costs for that year.

Modifications to the SP&R Part II AWP may occur as a result of project scope and/or funding level changes. These modifications are transmitted to FHWA through amendments.

2.6.3 AWP Approval

The SP&R Part II AWP is submitted to the local FHWA Division Administrator for review and approval. No work shall begin prior to having approval by FHWA.

2.7 Additional Research Resources

Caltrans utilizes the National Cooperative Research Programs to leverage its financial and staff resources.

2.7.1 Transportation Pooled Fund Program

When significant or widespread interest is shown in solving transportation-related problems, research and technology transfer activities may be jointly funded by several federal, state, regional,

and/or local transportation agencies, academic institutions, foundations, or private firms as a Transportation Pooled Fund study (TPF). Additional information on the TPF Program can be found at: <http://www.pooledfund.org>.

2.7.2 National Cooperative Highway Research Program

National Cooperative Highway Research Program (NCHRP) is administered by the TRB and sponsored by the member departments (i.e., individual state departments of transportation) of AASHTO in cooperation with FHWA.

NCHRP was created in 1962 as a means to conduct research in acute problem areas that affect highway planning, design, construction, operation, and maintenance nationwide.

Each state's allocation amounts to five and one half percent of its total SP&R apportionment and is set forth in supplementary tables issued with each year's Federal-Aid Highway apportionments.

Additional NCHRP information can be found at: <http://www.trb.org/NCHRP>.

2.7.3 Transit Cooperative Research Program

The Transit Cooperative Research Program (TCRP) was established under FTA sponsorship in July 1992.

The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands.

Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The TCRP serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

Additional TCRP information can be found at: <http://www.trb.org/TCRP>.

2.7.4 Airport Cooperative Research Program

The Airport Cooperative Research Program (ACRP) was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act.

The ACRP is sponsored by the Federal Aviation Administration and managed by the National Academies, acting through TRB, with program oversight and governance provided by representatives of airport operating agencies.

ACRP is an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators.

Additional ACRP information can be found at: <http://www.trb.org/ACRP>.

2.7.5 Hazardous Materials Cooperative Research Program

The Hazardous Materials Cooperative Research Program (HMCRP) focused on hazardous materials transportation was authorized in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users.

HMCRP is sponsored by the U.S. Department of Transportation (US DOT) Pipeline and Hazardous Materials Safety Administration and managed by the National Academies, acting through the TRB.

The HMCRP is intended to complement other US DOT research programs as a stakeholder-driven, problem-solving program, researching real-world, day-to-day operational hazardous waste transportation issues with near - to mid-term time frames.

Additional HMCRP information can be found at: <http://www.trb.org/HMCRP>.

2.7.6 National Cooperative Rail Research Program

The National Cooperative Rail Research Program (NCRRP) was authorized as part of the Passenger Rail Investment and Improvement Act of 2008. Program oversight and governance are provided by representatives of rail operating

agencies, state departments of transportation and others.

NCRRP conducts applied research on problems important to freight, intercity and commuter rail operators. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the rail industry

The NCRRP is sponsored by the Federal Railroad Administration and managed by the National Academies, acting through the TRB, with program oversight provided by an independent governing board including representatives of rail operating agencies, state departments of transportation, and others.

Additional NCRRP information can be found at: <http://www.trb.org/NCRRP/>.

2.7.7 University Transportation Centers

The UTCs are nationally-designated centers of excellence, fully integrated within institutions that serve as a vital source of leaders who are prepared to meet the nation's need for safe, efficient, and environmentally sound movement of people and goods.

The UTCs mission is to advance U.S. technology and expertise in the many disciplines comprising transportation through the mechanisms of education, research, and technology transfer.

The UTCs provide a critical transportation knowledge base addressing vital workforce needs for the next generation of transportation leaders at university-based centers of excellence.

Information on California research centers currently designated as a UTC can be found at: [California University Transportation Centers](#).

2.8 Peer Exchange of the Research Program

Peer exchanges, as required under 23 CFR, Section 420.207(b), are a practical and effective tool to foster excellence in Research and Technology (R&T) program management. Peer exchanges provide an opportunity for participants to share best practices and management innovations through an open exchange of ideas, knowledge, and brainstorming.

A peer exchange is an information exchange among transportation research colleagues through which a host state may find the means to restructure or fine tune research program processes.

Both staff and management from the host state and a group of invited top-level state and federal managers exchange information particularly relevant to the host state's R&T program over two to four days.

With periodic peer exchanges, a State's Department of Transportation (DOT) helps ensure that its research program remains viable, vibrant, and productive. When invited, Caltrans also participates in peer exchanges for other states and the FHWA.

2.9 FHWA Review of the Research Program

FHWA reviews all state programs for effectiveness and compliance with Federal-aid requirements for continued state certification. FHWA also ensures compliance with all federal laws, regulations, and policies.

Caltrans cooperates with the FHWA to ensure that these research program criteria meet the requirements under CFR, Title 23, Part 420, for the administration of planning and research funds.