

SECTION 1: ADMINISTRATION

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CHAPTER 1: PURPOSE, MISSION STATEMENT, GOALS, AND GUIDELINE CONTEXT

1.1 Purpose

The purpose of the Guidelines is to provide a management process for the administration of the Research Center and to ensure all research reports conform to the Communication Reference Guide (updated April 12, 2012)¹ (Reference Guide) and the U.S. Governmental Printing Office Style Manual (GPO Manual)². The Guidelines are drafted to increase the effectiveness of research reports received by WYDOT, to identify the various administrative responsibilities of the Research Center, and to provide procedural instructions for research projects. The programs, projects, and products generated by the Research Center using these Guidelines are for the benefit of WYDOT, its employees, the citizens of Wyoming, and other transportation agencies and users.

The Guidelines further set out the regulations regarding digital data, data management, data storage, data archiving, metadata requirements, and open and public data sharing policies. The Research Center uses these guidelines to ensure that data, which are considered a state asset, are managed properly through their life cycle, improve data collection capabilities, and make data available to the public, when possible.

The categories of research performed by contractors for the Research Center fall into two areas: basic research, which involves the study of phenomena whose specific application has not been identified; and applied research, which involves the study of phenomena relating to a specific, known need in connection with the functional characteristics of a system.

1.2 WYDOT Mission, Goals, and Balanced Score Card

To ensure the effectiveness of the Research Center and the research management process, all research activities are aligned with the WYDOT Mission and Goals.³

The WYDOT mission is to provide a safe, high quality, and efficient transportation system. The WYDOT goals are as follows:

1. Improve safety on the state transportation system through education, engineering, enforcement, and other innovative methods.
2. Serve our customers by gathering feedback to anticipate and meet their needs.
3. Take care of all physical aspects of the state transportation system.
4. Improve agency efficiency and effectiveness by identifying opportunities to improve processes and reduce redundancy.
5. Develop and care for our people.
6. Exercise good stewardship of our resources by:

¹<http://www.fhwa.dot.gov/publications/research/general/03074/index.cfm>

² <https://www.gpo.gov/fdsys/pkg/GPO-STYLEMANUAL-2008/pdf/GPO-STYLEMANUAL-2008.pdf>

³ Wyoming Department of Transportation Strategic Plan 2012-2015, p. 4.

- a. Wisely caring for the resources with which we have been entrusted.
- b. Using Asset Management and Long-Range Planning to support a pavement preservation strategy with MAP-21 requirements.
- c. Ensuring Department grants are fully expended in accordance with requirements.
- d. Ensuring all projects stay on or under budget.
- e. Better communicating the stewardship and accomplishments of the Department.

The Balance Score Card (BSC) for the Planning Department, of which the Research Center is a subunit, sets out that:

1. The Planning Department shall improve program efficiency and effectiveness as follows:
 - a. Percentage of projects closed within three years of executed agreement date.
 - b. Close out projects in a timely manner.
 - c. **Seek new ways to ensure information is available to the public.**
 - d. **Improve data collection efficiency and effectiveness. [emphasis added]**
 - e. Utilize the latest technologies and best practices.
 - f. Improve communication to eliminate redundancy.
2. Develop and utilize a system wide approach to transportation planning.
3. Uphold present and future commitments.
 - a. Clarify, interpret, and disseminate regulations and laws.
4. Performance based planning and programming.
5. Value our employees.
6. Customer outreach.
 - a. Improve accessibility of data through ORACLE platforms.
 - b. Facilitate customer understanding by creating a visual representation of planning data.

1.3 Basic & Operating Policies for the Research Center

The Research Center's policies and procedures are detailed in WYDOT's Basic & Operating Policies manual at Policy Number 4-1 and all subparts thereto. Policy 4-1 sets out policies for the following areas:

- Purpose.
- Research Advisory Committee.
- Research Administration.
- Research Procedures.
- Research Results.
- Product Evaluation.

1.4 WYDOT Research Center

The core mission of the Research Center is to provide high quality research that aligns with the mission, values, and overall goals for WYDOT. The Research Center uses WYDOT’s overall goals to meet strategic performance measures; balance scorecard measures; chosen program goals and objectives; and the needs of the State of Wyoming.

1.5 Wyoming Enterprise Technology Services (ETS)

Wyoming ETS assists in the core computing and communication needs of the State of Wyoming. Electronic records and transactions fall under the domain of ETS. Pursuant to Chapter 5, Sec. 3(a), *Electronic Transactions Electronic Records*, of the ETS current rules, agencies shall adopt procedures to protect the “reliability, authenticity, integrity, and usability of records.” Section 3(b) goes on to state that:

To accept, create, and store an electronic record, **a State agency must ensure the integrity of the information from the time it is first received and accepted, throughout the life cycle of the record.** The criteria for assessing integrity shall be whether the information has remained complete and unaltered... [**emphasis added**]

Section 4, *Retention of Electronic Records*, of Chapter 5 of the current ETS Rules states:

State agencies shall comply with all statutes and rules related to public records.

- a) For public records created and/or stored exclusively in electronic format, a State agency shall:
 - i. **Maintain records so they are accessible, accurate, authentic, reliable, legible, and readable throughout the life cycle.** [**emphasis added**]
 - ii. Prescribe a procedure for converting information transmitted electronically to paper for persons requiring paper copies.

ETS’ internal policies set out the following requirements for data.

ETS 8100-P166 – Data Protection for Electronic Government Services

Agencies shall make available upon request, information about how data is protected, restricted, and used in e-Government transactions. A link or other access to the State of Wyoming Privacy Policy would satisfy this requirement. [**emphasis added**]

1.6 Data Policies, Wyo. Stat. §9-21-101 (2016)

Every agency shall adopt, enforce, and maintain a policy regarding the collection, access, security, and use of data. The policies should include:

- i. An inventory and description of all data required of, collected, or stored by an agency;
- ii. Authorization and authentication mechanisms for accessing the data;
- iii. Administrative, physical, and logical security safeguards, including employee training and data encryption;
- iv. Privacy and security compliance standards;
- v. Processes for identification of and response to data security incidents, including breach notification and mitigation procedures; and
- vi. In accordance with existing law, processes for the destruction and communication of data.

1.7 Wyoming Public Records Act

The Wyoming Public Records Act (Wyo.Stat. §§16-4-201 through 205), defines what constitutes a public record and details the responsibility for protection and disposition of those records.

1.8 Overview of the Manual

The Guidelines are set out in four sections and nine Appendices.

Section 1 Administration

- Chapter 1 Purpose, Mission Statement, Goals, and Guideline Context
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- Chapter 4 Annual Research and Development Work Program Cycle and Requirement
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- Chapter 6 National and Regional FHWA Pooled Fund Programs and Other National Research Projects

Section 2 Operating Policies

- Chapter 7 State Planning & Research (SP&R) Administration Process Research, Development and Technology Interaction

Section 3 Proposals and Reports

- Chapter 8 Research Project Development Flow Chart
- Chapter 9 Research Problem Statements and Proposals
- Chapter 10 Research Reports and Formatting

Section 4: Data Management Plan and Meta Data

- Chapter 11 Federal Requirements

Chapter 12 Data Management Policies for the WYDOT Research Center

Appendix - Templates

- 1 Progress Report Template
- 2 Data Management Plan Template
- 3 Metadata Schema
- 4 Data Dictionary
- 5 Proposal Checklist Template for RAC Members
- 6 Research Project Feedback Form Template
- 7 WYDOT Research Project Evaluation Phase 1 Template
- 8 WYDOT Research Project Evaluation Phase 2 Template
- 9 Library Research Request Form Template

Glossary of Terms

CHAPTER 2: STAKEHOLDERS

Pursuant to Chapter 5, *Research Technology, and Education* of Title 23, United States Code⁴:

Federal surface transportation research and development activities shall address the needs of stakeholders. Stakeholders include States, metropolitan planning organizations, local governments, tribal governments, the private sector, researchers, research sponsors, and other affected parties, including public interest groups.

The success of a research program is influenced by the Research Manager's ability to develop strong and lasting interactive relationships with all participants and stakeholders. In fact, the goals of WYDOT and the Research Center cannot be met without involvement and interaction with stakeholders, which include: WYDOT employees; university and college level staff and professors; other Wyoming state agencies; companies affiliated with transportation matters, such as vendors and contractors; private engineering firms; other State Departments of Transportation; local governments in Wyoming and other states; FHWA; AASHTO; and the general public.

The Research Center hosts a Research Advisory Committee (RAC) meeting each quarter that is open to the public. This is a way for WYDOT and stakeholders to interact, and for stakeholders to learn more about which projects have been finalized, the progress on projects, and new and upcoming projects. The RAC's October meeting is held at the University of Wyoming, College of Civil, and Architectural Engineering.

The Research Center is involved with, and in support of, the activities performed by the Wyoming Technology Transfer (T²) Center, located at the University of Wyoming.⁽⁵⁾ The Local Technical Assistance Program (LTAP), within the T² Center, transfers research findings and new technology to Wyoming agencies and individuals by providing information on new and developing technology, responding to direct requests, providing reference materials, and conducting T²/LTAP workshops. The T²/LTAP Center is sponsored by FHWA, WYDOT, and Wyoming cities/municipalities and counties. Fifty percent of the funding for the T²/LTAP Center comes from the FHWA Technical Transfer Program. WYDOT, Wyoming cities/municipalities and counties, and the University of Wyoming provide the necessary matching funds.⁽⁶⁾ The T²/LTAP Center may also submit proposals for SP&R funded research.

⁴ <https://www.gpo.gov/fdsys/pkg/USCODE-2010-title23/pdf/USCODE-2010-title23-chap5-sec502.pdf>

⁵ <http://www.eng.uwyo.edu/wyt2/>

⁶ *Wyo. Stat.* §21-7-115

CHAPTER 3: RESEARCH CENTER LIBRARY

A vast amount of research information is housed in the WYDOT Research Center Library (Research Library) and is available for loan to stakeholders and the public. This information is coded, catalogued, and entered into the Research Center's electronic intranet database by title, author, abstract, etc. The Research Center Manager also has access to federal and state databases, which house research reports, synthesis, digests, and other research materials. The Research Library is housed in the Planning office on the WYDOT Complex. Further, stakeholders and WYDOT employees may search the web for transportation related publications.

3.1 In-House Library

Materials found in the in-house portion of the Research Library include federal and state publications, manuals, circulars, and other reference material. The Research Center staff can assist stakeholders in accessing any publication housed in the Research Library and on the web. The Research Manager will provide electronic and/or hard copies of publications, and/or conduct research upon request. (See Library Research Request Form, Appendix 9).

3.2 Electronic Library

3.2.1 Internet

For publications found on the web, there are many different databases available. Under the publication link on the Transportation Research Board website, cooperative research program series, TRB series, periodicals, annual reports, and other documents can be accessed.

<http://www.trb.org/Publications/Publications.aspx>.

The resources link for the Federal Highway Administration web page has publications, laws, policies, and a link to the resource library. <http://www.fhwa.dot.gov/>.

The Research and Innovative Technology Administration (RITA) website houses state and federal research publications, data and statistics, and links viewers to various federal and state websites. <http://www.rita.dot.gov/>.

The USDOT Research Hub allows access to FMCSA, FAA, MARAD, FHWA, FRA, FTA, PHMSA, OST, and NHTSA, plus numerous other research sites.

<http://ntlsearch.bts.gov/researchhub/index.do>

3.2.2 WYDOT Library Database

An e-library, which contains abstracts from the research materials, can be accessed by WYDOT employees, in the WYDOT intranet at:

<http://employees.dot.state.wy.us/ResearchLibrary/Home.jsp>.

CHAPTER 4: ANNUAL RESEARCH AND DEVELOPMENT WORK PROGRAM CYCLE AND REQUIREMENTS

In accordance with the requirements set forth in *Title 23 of the Code of Federal Regulations, Parts 420.207(a)(b), and 420.209(a)(b)*, the Research Center will prepare a Research and Development (R&D) Annual Research and Development Work Program report (Work Program) which will cover each study conducted in a fiscal year. Information on the study remains in the Work Program until either the study's final report has been accepted, or the study has been terminated. The Work Program is based on WYDOT's fiscal year, which begins on October 1 and ends on September 30 of the following year. Work Program is presented in four parts: a) the yearly budget summary; b) the FHWA Pooled Fund Projects Summary; c) the State Research Projects Summary, demonstration projects, federal aid experimental evaluation studies, and other special studies; and d) a listing of research projects completed within the last three years. The Work Program includes the following for each current research project:

- State study number.
- Study type.
- Study title.
- Budget estimate for the program year.
- Estimated cost for prior years of continuing studies.
- Principal investigator's name.
- Project Champion's information.
- Period of study.
- Scope.
- Present status.
- Funding levels and share (Federal, State, and other sources) for RD&T activities for the program year.

A yearly budget summary included in the Work Program, contains the following:

- Revenues for the current year.
- Funds carried over from previous years.
- Current revenue expenditures for prior years' projects, if any.
- TRB and NCHRP funding obligations, and any other program funds.
- Technology Transfer Center (T² Center) funding for the University of Wyoming.
- Administrative costs.
- Total remaining Federal funding available for research studies.

Finally, a certification letter attesting that the State of Wyoming is in compliance with all requirements set forth in *Title 23 of the Code of Federal Regulation §420.209(c)*, and contemplate no changes which would alter that compliance must be sent to the Federal Highway Administration yearly with the Work Program.

CHAPTER 5: AVAILABLE FUNDS FOR RESEARCH PROJECTS

The following are categories and various types of funding available or paid out by the Research Center to finance research activities to meet mandatory federal requirements.

5.1 SP&R – Federal⁷

Highway Trust Fund tax monies made available to the State of Wyoming under *Title 23 of the United States Code*, and the *Planning and Research Program Administration Federal Rules*⁸ (Rules), with appropriate state matching funds established by federal law, and are currently the main source of funding for the Research Center. The Rules allocate two percent of the total annual transportation disbursement to each state for State Planning and Research (SP&R) activities⁹. The law further stipulates a minimum of 25 percent of the SP&R funds be reserved for state transportation research, development, and technology transfer efforts¹⁰.

5.2 State Funds

Projects that are considered limited scope studies or local interest studies, or in case where there is a shortage of federal funds, are financed with state funds and not submitted to the RAC. These projects are undertaken independent of the research, development, and technology program, and are not required to follow the strict guidelines that projects that receive SP&R funds follow. This does not mean that districts or other divisions in WYDOT cannot use this document as a guide. It is recommended, however, that each branch or district notify the State Programming Engineer of the project for recordkeeping purposes.

State funds can also be used as matching funds for any federally funded projects

5.3 National Cooperative Highway Research Program (NCHRP)

The Research Center participates in the National Cooperative Highway Research Program and provides five and one-half percent of its SP&R funds yearly to NCHRP, which equates to approximately \$282,000. Studies performed with NCHRP funding do not require a state match, and are usually high cost projects that have national implications. Solicitation for NCHRP projects begin in July of each year with FHWA and NCHRP evaluating all proposals. NCHRP also uses evaluation panels to assess the problem statements submitted in some of the more popular subject areas. Full details on the NCHRP solicitation process can be found at

<http://www.trb.org/NCHRP/NCHRPOverview.aspx>. To obtain a copy of *Information and Instructions for Preparing Proposals for the Transportation Research Boards' Cooperative Research Programs*, go to

<http://onlinepubs.trb.org/onlinepubs/crp/docs/ProposalPrep.pdf>. Further, the *Procedural*

⁷ 23 U.S.C. §505; 23 C.F.R. 420 et seq.

⁸ 23 C.F.R. 420.103(a)(1)

⁹ 23 C.F.R. §420.103(1)

¹⁰ 23 U.S.C. 505(b)(1)

Manual for Contractors Conducting Research in the Transportation Research Board's Cooperative Research Program can be found at <http://onlinepubs.trb.org/onlinepubs/crp/docs/CRPProceduralManual.pdf>.

5.4 Pooled Fund Projects¹¹

The Transportation Pooled Fund (TPF) Program serves 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 use pool fund studies and other resources to solve these problems through research, planning, and technology transfer activities. To qualify as a pooled fund study, more than one state transportation agency, federal agency, or other agency, such as a municipality of metropolitan planning organization, college/university, or a private company, must find the subject important enough to commit funds or other resources to conduct the research, planning, and technology transfer activity. Federal and state transportation agencies may initiate pooled fund studies. Local and regional transportation agencies, private industry, foundations, and colleges/universities may collaborate with any or all of the sponsoring agencies to conduct pooled fund projects. Pooled funds are calculated at an 80/20 split just like SP&R projects, unless the pooled fund is set up for just federal funds or if the lead state requests a waiver for the state match requirement.

Generally, FHWA, TRB, NCHRP, or a state will act as the contracting agency for the pooled fund study. An advisory committee composed of representatives of each participating state and agency will be established to provide overall project direction and permit consideration of the cooperating states' views. This procedure is followed for national pooled fund projects.

5.5 Collaborative Research and Development

Collaborative Research and Development is a cost sharing process that includes states and local governments, foreign governments, colleges and universities, corporations, institutions, partnerships, sole proprietorships, and trade associations.¹² The federal share for these projects shall not exceed 50 percent. For the non-federal share, all costs directly incurred, including personnel, travel and hardware development costs, are included.

5.6 Apportionment¹³

Title 23 of the United States Code Section 104 *et seq.* sets out the apportionment rules of all federal funding streams.

¹¹ <http://www.pooledfund.org/>

¹² 23 U.S.C. 502 §(c)

¹³ 23 U.S.C. 104

5.7 Future Strategic Highway Research Program Funds¹⁴

All programs established with these funds are based on National Research Council Special Report 260, entitled *Strategic Highway Research: Saving Lives, Reducing Congestion, Improving Quality of Life* and the results which are identified in the National Cooperative Research Program Project 20-58.⁽¹⁵⁾ The purpose of this program is to promote research results and products developed under the future strategic highway research program administered by TRB. Funding may come from SHRP 2 implementation or a percentage of a state's SP&R funds. Eligible activities are based on the report submitted to Congress by the TRB on the strategies and administrative structure to be used for implementation of F-SHRP results. The federal share shall be 80 percent.

¹⁴ 23 U.S.C. §503(a)(6)

¹⁵ 23 U.S.C. 510

CHAPTER 6: NATIONAL AND REGIONAL FHWA POOLED FUND PROGRAMS AND OTHER NATIONAL RESEARCH PROJECTS

6.1 POOLED FUNDS

6.1.1 National Pooled Fund Program

FHWA sponsors the National Pooled Fund Program, and when a new project becomes available, a letter describing the proposed pooled fund projects is distributed to each state research center. The Research Center solicits opinions and comments from technical staff within the agency regarding the relevancy of the pooled fund project. Notices of pooled fund studies shall be sent out to RAC members as they are received by the Research Manager. If the RAC determines that it would be in the best interest of WYDOT to participate, the RAC determines the amount of financial support the project will receive and for what fiscal year the money will be obligated. The FHWA Regional Research Engineer is responsible for executing the funding transfer documentation. As a subscriber, the state may have a representative on the project panel that meets to determine the scope of work for the project, to evaluate proposals, if the research is performed by contract, and to review the final report of the effort. The total amount of annual pooled fund financial support is a line item in the SP&R budget.

6.1.2 Regional Pooled Fund Program

FHWA sponsors a Regional Pooled Fund Program that is more of a bottom-up than top-down Program. A group of states may determine there is a problem of mutual interest to them and join together to investigate the matter. The state DOT that champions the idea performs the initial and ongoing administrative duties. Each regional pooled fund effort varies in its financial protocol, which is based on the requirements of the lead state.

Although federal-aid funding of pooled fund efforts is at the traditional 80 percent level, if the project is determined to be of national interest, the FHWA Associate Administrator for Research and Technology may determine that the project is a 100 percent federal-aid funded project. Most regional projects are funded at the 100 percent level. As with national efforts, reimbursable travel funding may be included in the study funds.

6.2 NCHRP

State DOTs are the sole source of funding for NCHRP. The process for funding and proposing projects at the NCHRP level follows the following process. In July, AASHTO Standing Committee on Research (SCOR) solicits problems from a) AASHTO member transportation departments; b) the chairs of AASHTO committees and subcommittees; and c) the Federal Highway Administrator. Problem statements are accepted in September of each year. FHWA and NCHRP evaluate the problem statements. Evaluations are sent back to the Principle Investigators in November, and the Principle Investigator has until the end of December to decide whether he/she wishes to move forward or not. A report on the new problem statements is sent to the SCOR and the AASHTO RAC with a ballot for rating the statements according to priority. The ratings are returned to the SCOR secretary and are translated into priority rankings

based on the average ratings of SCOR and AASHTO RAC. A summary of this report is sent to the SCOR for review prior to its meeting in Washington DC. SCOR makes the final determination on which completed or ongoing projects should receive additional funding for further work, and which new problem statements should be funded. Announcements are sent out in April.