# RESEARCH, DEVELOPMENT AND TECHNOLOGY TRANSFER

# MANUAL OF PROCEDURES

# Research, Development and Technology Transfer

# Manual of Procedures

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# PURPOSE OF MANUAL

The purpose of this manual is to describe the Illinois Department of Transportation's (IDOT's) Research, Development, and Technology Transfer (RD&T) program and explain its policies and procedures. The manual documents the processes involved in developing, managing, and conducting the IDOT's Department's Research, Development, and Technology Transfer (RD&T) program. It is designed to be a source of guidance and instruction for those in the transportation community who wish to know more about the program and better understand the life of a research need, from idea to implementation.

This manual is designed to meet the requirements of 23 CFR 420.09(b), which notes that States must document their management process and procedures for selecting and implementing RD&T activities.

## ORGANIZATION OF THE MANUAL

Chapter 1 – General includes basic information about the IDOT research program. It defines research and identifies those who benefit from research, those who participate in research, the types of agencies that conduct research, and the various funding scenarios utilized by IDOT's research program.

Chapter 2 – Roles and Responsibilities identifies and outlines the responsibilities of the various Offices and staff within IDOT, as well as those outside of IDOT, who participate in IDOT's research program.

Chapter 3 – National Program Development and Administration describes the process for IDOT's participation in national level research activities such as AASHTO Technical Service Programs, FHWA Transportation Pooled Funds, etc.

Chapter 4 – Project Selection describes processes for identifying research needs and developing a research plan to address Illinois's specific needs. This chapter also provides an overview of how IDOT's in-house and contract research programs are developed.

Chapter 5 – Research Project Management describes IDOT and ICT's oversight and management of contract research projects as well as IDOT's oversight and management of in-house research projects. The chapter discusses the development and evaluation of research problem statements and the selection of researchers. It also discusses procedures for requesting contract modifications and making travel and equipment purchases, and outlines requirements for reporting and presenting on projects by researchers and IDOT staff.

Chapter 6 – Research Program Management outlines legal requirements and describes how IDOT administers the SPR Part 2 RD&T Work Program.

Chapter 7 – Implementation discusses the process used to capture the results of research. It outlines the process for tracking implementation activities of beneficial findings.

Chapter 8 – Technology Transfer outlines activities that lead up to the adoption of new or improved techniques or products by users. This chapter identifies ways, means, and resources available to assist in disseminating information, demonstrating use, training, and other means of implementing a new technology.

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Ohio Department of Transportation Research Program and AASHTO Research Advisory Council members who served as resources on best practices in research program management.

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| **AASHTO** | American Association of State Highway Transportation Officials |
| **AASHTO TSPs** | American Association of State Highway Transportation Officials Technical Services Programs |
| **ATLAS** | Accelerated Transportation Loading Facility |
| **ATREL** | Advanced Transportation Research and Engineering Laboratory |
| **DOTs** | Departments of Transportation |
| **FHWA** | Federal Highway Administration |
| **ICT** | Illinois Center for Transportation |
| **IDOT** | Illinois Department of Transportation |
| **ITRC** | Illinois Transportation Research Center |
| **IGA** | Inter-Governmental Agreement |
| **NCHRP** | National Cooperative Highway Research Program |
| **PI** | Principal Investigator |
| **PRR** | Physical Research Report |
| **RAC** | Research Advisory Committee |
| **RD&T** | Research, Development, and Technology Transfer |
| **RFP** | Request for Proposal |
| **RiP** | Research in Progress Database |
| **SCRI** | Special Committee on Research and Innovation |
| **SPR** | State Planning and Research |
| **$T^2$** | Technology Transfer |
| **TAG** | Technical Advisory Group |
| **TRP** | Technical Review Panel |
| **TRID** | Transport Research International Documentation database |
| **TPF** | Transportation Pooled Fund |
| **TRB** | Transportation Research Board |
| **UI** | University of Illinois |
| **UIUC** | University of Illinois at Urbana-Champaign |
| **UTC** | University Transportation Center |

# Chapter One – General

## 1.0 – OVERVIEW OF PROGRAM

The Illinois Department of Transportation's (IDOT's) research program is involved in all areas of transportation research. Research needs are managed using State and Federal funds and in-house oversight expertise in collaboration with our transportation stakeholders and academic partners. Research allows IDOT to achieve its mission of providing safe, cost-effective transportation for Illinois in ways that enhance quality of life, promote economic prosperity, and demonstrate respect for our environment. The research program, managed by the Bureau of Research and located in the Office of Planning and Programming, works to anticipate and address transportation concerns before they become critical problems and to utilize cutting edge technology to ensure the safe, sustainable, cost-effective operation of the Department and its facilities.

IDOT employs a variety of strategies to leverage its research funding. The main transportation research options utilized include:

- Contract Research Projects
- In-House Research Projects
- AASHTO Technical Service Programs
- FHWA Transportation Pooled Fund Studies
- National Cooperative Highway Research Program Projects
- TRB Core Services

Other national options exist for funding a research idea, each with its own eligibility criteria. Please contact the Bureau of Research for additional information.

### 1.0.1 CONTRACT RESEARCH PROJECTS

The primary customers for research are the offices within IDOT, which have the responsibility to plan, design, construct, operate, and maintain the transportation networks in the State. Proposed Research Idea Statements are accepted annually to address projects that have been identified by the offices as well as by university researchers and industry representatives. Problem statements may be submitted by any person, including public citizens. For more information on contract research projects, refer to Chapters 4 and 5.

### 1.0.2 IN-HOUSE RESEARCH PROJECTS

The Bureau of Research houses staff knowledgeable on all aspects of pavement, including design, materials, construction, maintenance, rehabilitation, and preservation; pavement field testing programs; and instrumentation techniques. Projects in these areas may sometimes be conducted internally by departmental staff. Problem statements are reviewed jointly by the Research Program Manager in consultation with the Pavement Programs Section in the Bureau of Research to determine the feasibility and potential benefits/limitations of an in-house study versus a contract research project and assign accordingly. When assigned as an in-house study, the Bureau of Research staff serves as the Lead or Co-Principal Investigator of the investigation, and they coordinate research efforts with other staff having expertise in the topic.

### 1.0.3 AASHTO TECHNICAL SERVICE PROGRAMS

The American Association of State Highway and Transportation Officials (AASHTO) offers various Technical Service Programs (TSPs) to provide resources to state departments of transportation. Each of these programs addresses a specific need that may be too large for any one state to accomplish individually. The programs are intended for states to use directly or complement their own program.

### 1.0.4 TRANSPORTATION POOLED FUND STUDIES

The Federal Highway Administration (FHWA) operates the Transportation Pooled Fund (TPF) Program to allow States, FHWA, and other organizations the ability to partner on transportation-related research projects. By joining together to research areas of common interest, research entities are able to leverage their funding. A pooled fund study may be used to jointly fund research, planning, and/or technology innovation activities. Federal and State transportation agencies may initiate pooled fund studies. Local and regional transportation agencies, private industry, foundations, colleges and universities may then partner with the sponsoring agencies in such projects. For more information on pooled fund studies, refer to Chapter Three, or visit the FHWA Transportation Pooled Fund website

### 1.0.5 NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM PROJECTS

The National Cooperative Highway Research Program (NCHRP) provides a forum for coordinated and collaborative research, gathering together State DOTs and transportation professionals at all levels of government and the private sector. The NCHRP provides practical, ready-to-implement solutions to pressing problems facing the transportation industry.

The NCHRP is administered by the Transportation Research Board (TRB) and sponsored by the member departments (i.e., individual State DOTs) of the American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the FHWA. Individual projects are conducted by contractors with oversight provided by volunteer panels of subject matter expert stakeholders.

Research proposals for the NCHRP may be submitted by State DOTs, AASHTO committees, and FHWA. AASHTO's Research Advisory Committee (RAC) votes on the proposed projects and sends recommendations to AASHTO's Special Committee on Research and Innovation (SCRI), who ultimately determines which projects are funded and the levels of funding for those projects. The Research Program Manager within the Bureau of Research serves as IDOT's representative to the AASHTO RAC and to TRB. NCHRP's volunteer technical panels review project proposals, recommend contract awards, monitor research in progress, provide technical guidance, and determine the acceptability of the final reports. For more information on NCHRP projects, refer to Chapter 3.

### 1.0.6 TRB CORE SERVICES

Transportation Research Board (TRB) is a division of the National Research Council, a private nonprofit institution that is the principal operating agency of the National Academy of Sciences. TRB/State partnership has been in place since 1920, with States providing direct financial support beginning in the 1940s. States are billed in relation to their SPR Part 2 funding level. IDOT funds this partnership, which promotes the development and implementation of innovations that save countless lives; improves mobility and access; and vastly increases the cost-effectiveness of materials, designs, construction practices, and operations; using SPR Part 2 funds.

## 1.1 – AUTHORITY

Specific statutory authority regarding research is shown below.

### 1.1.1 - STATE OF ILLINOIS

605 ILCS 5/4-303 in the Illinois Compiled Statutes provides the state authority to carry out the department's transportation research program. addresses research.

### 1.1.2 - FEDERAL

There are several chapters of the Code of Federal Regulations that address research. The main regulations for the federally funded research program management can be found in:

23 CFR 420 – Planning and Research Program Administration;

23 CFR 505 – Projects of National and Regional Significance Evaluation and Ranking; and

2 CFR 200 - Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

## 1.2 – DEFINITION OF RESEARCH

Research can be defined as the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. For the purposes of this manual, "research" means contract projects, in-house projects, Transportation Pooled Fund studies, NCHRP projects, or AASHTO Technical Service Programs (TSPs) that improve the safety and cost-effectiveness of Illinois' transportation system by resolving problems, developing policy, or advancing technology. Research may include, but is not limited to: engineering and economic surveys and investigations; development and implementation of management systems; studies in connection with the planning, design, construction, management, and maintenance of highways, public transportation, and intermodal transportation systems; and studies on engineering standards and construction materials for transportation systems including the evaluation and accreditation of inspection and testing and regulation and taxation of their use. For more information, please refer to Title 23 of the United States Code, Section 505.

## 1.3 – BENEFITS OF RESEARCH

Innovation is a hallmark of all IDOT's work. Research is a catalyst for innovation. The ultimate goal of research is to implement transformative solutions for the State of Illinois. Today, research impacts all aspects of work at IDOT, providing innovative, evidence-based improvements, ideas, and solutions that help provide a cost-effective, efficient, and safe transportation system that is consistent in quality and reliability for all of Illinois. The beneficiaries of IDOT's research program include not only the Department, but local governments, FHWA, other states, and most importantly, the citizens of the State of Illinois.

## 1.4 – PARTNERS

IDOT partners with various organizations and agencies in the conduct of research on topics of common interest. These entities include, but are not limited to:

- American Association of State Highway and Transportation Officials (AASHTO): (see **Glossary**) IDOT staff members participate in a full range of AASHTO committees and panels. Additionally, IDOT funds membership in various AASHTO Technical Service Programs (TSPs) to pool resources to build national programs.

- Federal Highway Administration (FHWA): (see **Glossary**) In addition to working closely with IDOT on the administration of the research program, FHWA has conducted various studies with IDOT including demonstration, test, and evaluation projects.

- Illinois Center for Transportation (ICT): The Illinois Center for Transportation, a research partnership between IDOT and the University of Illinois at Urbana Champaign (UIUC), administers IDOT's contract research program.

- Industry: IDOT actively cultivates partnerships with Illinois industry. Input is sought from individuals in the transportation industry on active and proposed studies.

- National Cooperative Highway Research Program (NCHRP): (see **Glossary**) IDOT participates in NCHRP studies by proposing project ideas and by staff serving as technical panel members on active NCHRP projects. For information on NCHRP projects refer to Chapter 3.

- Transportation Pooled Fund (TPF) Studies: (see **Glossary**) These types of projects leverage funding from two or more agencies or entities that cooperate and contribute to study topics of common interest. Illinois is not able to function as the lead agency in such studies, but may participate in studies led by other agencies. For more information on Transportation Pooled Fund studies, see Chapter 3.

- Transportation Research Board (TRB): (see **Glossary**) IDOT is involved in a variety TRB activities. Numerous personnel serve on TRB committees providing technical input on a variety of topics. For more information on TRB activities refer to Chapter 3.

## 1.5 – RESEARCHERS

IDOT's contract research program consists exclusively of contracted projects administered through the department's intergovernmental agreement with the Illinois Center for Transportation (ICT). The administration of the program and projects is in accordance with the regulations for the procurement of services for the State of Illinois. Funds associated with research projects are not distributed as grants; rather, they are payments for the performance of a specified service to be completed during a specific period of time.

Through ICT, IDOT contracts with both public and private entities for the conduct of research. For detailed information on the administration of the program refer to Chapter 6. For detailed information on the administration of individual projects, refer to Chapters 4 and 5.

### 1.5.1 - UNIVERSITIES

IDOT research conducted by ICT utilizes in-state, out-of-state, public, and private universities. The university environment is very conducive to research. Universities

have extensive facilities and faculty proficient in diverse areas of study. Research conducted for IDOT allows students to gain valuable experience by working on real-world problems. The faculty also benefit by being introduced to practical problems and being able to gain national exposure in specific areas of study. Universities receive the same consideration as consultants, governmental agencies, and not-for-profit agencies when they submit a response to requests for proposals. In the event that requests for proposals from in-state and out-of-state educational institutions have identical scores upon review by the Technical Review Panel, the in-state institution will be given preferential treatment.

### 1.5.2 - CONSULTANTS

IDOT research conducted by ICT also utilizes private consulting firms that are headquartered within and outside of Illinois. Consulting firms receive the same consideration as universities, governmental agencies, and not-for-profit agencies when they submit a response to requests for proposals. In the event that requests for proposals from an in-state educational institution and a consultant have identical scores upon review by the Technical Review Panel, the in-state institution will be given preferential treatment.

### 1.5.3 – GOVERNMENTAL AGENCIES

IDOT research conducted by ICT also utilizes governmental agencies within and outside of Illinois. Some examples of governmental agencies that have conducted contract research for IDOT include the U.S. Army Corps of Engineers Construction Engineering Research Laboratory, the U.S. Geological Survey, the Illinois State Geological Survey, and the Champaign County Regional Planning Commission. Governmental agencies receive the same consideration as universities, consultants, and not-for-profit agencies when they submit a response to requests for proposals.

### 1.5.4 – NOT-FOR-PROFIT AGENCIES

IDOT research conducted by ICT occasionally has utilized not-for-profit agencies such as the Lake Michigan Air Director's Consortium. Not-for-profit agencies receive the same consideration as universities, consultants, and governmental agencies when they submit a response to requests for proposals. In the event that requests for proposals from an in-state educational institution and a not-for-profit agency have identical scores upon review by the Technical Review Panel, the in-state institution will be given preferential treatment.

## 1.6 – FUNDING

Title 23 of the United States Code, Section 505 requires that a minimum of 25 percent of the State's Federal-Aid highway apportionment of SPR funds must be spent on RD&T activities. This portion is commonly referred to as SPR Part 2 funds. The other 75 percent (referred to as Part 1 funds) is typically used for planning studies, although these funds have been made available from time to time to provide additional support to high priority research projects and programs such as SHRP2 Implementation.

Scenarios for the funding of research include:

- Contract Research: Federal monies with State matching dollars, typically in the ratio of 80 percent Federal to 20 percent matching funds provided by the ICT.

- TPF projects: Within FHWA's TPF Program, the typical source of funding is SPR Part 2 funds. The normal match for SPR funds is 80 percent Federal funding to 20 percent non-Federal funding. However, Section 505(b) (2) of 23 USC allows the U.S. Secretary of Transportation to waive the funds match requirement for a project administered under FHWA's TPF Program. Due to limited State funding, IDOT research typically only funds participation in those pooled fund studies which allow 100 percent Federal funding. Participation in a research project requiring a match can be submitted for approval through the Bureau of Research, and will be approved on an as-needed basis.

- NCHRP: The State DOTs are the primary sponsors of the NCHRP. Support is voluntary and funds are drawn from the States' Federal-Aid Highway apportionment of SPR funds. Each State's allocation amounts to 5-½ percent of its SPR Part 2 apportionment and is set forth in supplementary tables issued with each year's Federal-Aid highway apportionments. The funds can be spent only for the administration of projects prioritized by the AASHTO SCRI and approved on ballot by at least two-thirds of the States CEOs.

- TRB Core Services: TRB is a division of the National Research Council, a private nonprofit institution that is the principal operating agency of the National Academy of Sciences. TRB/State partnership has been in place since 1920, with States providing direct financial support beginning in the 1940s. States are billed in relation to their SPR Part 2 funding level. IDOT funds this partnership, which promotes the development and implementation of innovations that save countless lives; improves mobility and access; and vastly increases the cost-effectiveness of materials, designs, construction practices, and operations; using SPR Part 2 funds.

- AASHTO Technical Services Programs (TSPs): AASHTO TSPs allow States to pool resources to build a much stronger national program than any one State could create on its own or to utilize as a complement to that State's existing programs and processes. TSPs which have been jointly approved by FHWA and AASHTO as having research or technology transfer aspects to them can be funded using SPR Part 2 funds. Due to limited State funding, IDOT typically only participates in those TSPs which qualify for 100 percent Federal funding. TSPs requiring a match will be considered for funding by the Bureau of Research on an as-needed basis.

- University Transportation Centers (UTCs): UTCs requiring matching funds may solicit State DOTs for support through the SPR program. IDOT reviews UTC projects for applicability and potential benefits to Illinois and may provide matching funds on a project-by-project basis. Typically, Illinois' participation in UTC projects is limited to in-kind support.

# Chapter Two – Roles and Responsibilities

## 2.0 – GENERAL

The employees and Offices and employees within IDOT play a large role in the success of the research process. Some project-related duties such as project definition, monitoring, and evaluation fall within the scope of individual projects and are primarily the responsibilities of the Technical Review Panel (TRP) Chair, Principal Investigator (PI), and the Illinois Center for Transportation (ICT). Other duties (e.g., project prioritization, funding approval, and implementation) have department-wide impact and require the involvement of the ICT Executive Committee, IDOT's Technical Advisory Groups (TAGs), TRPs, and the Technical Research Section within the Bureau of Research. General roles and responsibilities for key groups involved in the research process are described in the following sections of this chapter. Additional details can be found in the chapters that describe the specific phases of the process.

## 2.1 – BUREAU OF RESEARCH

Organizationally, the Bureau of Research is part of the Office of Planning and Programming, as shown in Figure 2-1. IDOT's Mission and Guiding Principles are as follows:

**IDOT's Mission**
We provide safe, cost-effective transportation for Illinois in ways that enhance quality of life, promote economic prosperity, and demonstrate respect for our environment.

**IDOT's Guiding Principles**
We will accomplish our mission while making the following principles the hallmark of all our work:

**Safety Integrity Responsiveness Quality Innovation**

The Bureau of Research actively supports IDOT's Mission and Guiding Principles through all components of its RD&T program, which is overseen by the Technical Research Section. The role of the Technical Research Section staff includes, but is not limited to:

- Developing, managing, implementing, and marketing all aspects of IDOT's RD&T program.
- Coordinating all research activities for IDOT, including some research funded without SPR Part 2 funds such as in-house research. In addition to contract and in-house research, this also includes all of IDOT's activities with TRB, NCHRP, AASHTO TSPs, AASHTO RAC, and FHWA's TPF Program.
- Coordinating TAG meetings and membership.
- Organizing and managing ICT Executive Committee meetings and membership.
- Soliciting and screening Research Needs and Research Idea Statements for all contract and in-house research projects, including special studies and off-cycle projects.
- Creating TRPs and assisting members with questions and concerns.
- Approving travel and equipment requests, budget increases, and time extensions for contract research projects.

- Reviewing and editing technical papers, presentations, and products from research projects.
- Compiling, reviewing, and sending quarterly reports to FHWA.
- Developing, managing, and administering research implementation policies.
- Tracking implementation progress for contract and national research projects.
- Creating technology transfer materials for all research efforts and marketing to the Department, industry, other States, other governmental agencies, and the public.
- Assessing the value of research and sharing that information with the Department, industry, other States, other governmental agencies, and the public.
- Ensuring compliance with all applicable Federal and State statutes regarding the expenditure of Federal and State research funding.
- Funding, managing, and administering IDOT's participation in FHWA's TPF program.
- Funding, managing, and administering IDOT's participation in TRB's Core Services Program, including organizing and supporting annual TRB visits and promoting and managing staff membership on TRB committees.
- Funding, managing, and administering IDOT's participation in NCHRP, coordinating IDOT's annual NCHRP ballot, and promoting and managing staff membership on NCHRP technical panels.
- Funding, managing, and administering IDOT's SPR Part 2 funded participation in AASHTO TSPs.
- Actively participating in all AASHTO RAC activities, both on a regional and national basis.
- Managing IDOT's participation in TRB's other Cooperative Research Programs: Transit Cooperative Research, Airport Cooperative Research, National Cooperative Freight Research, Hazardous Materials Cooperative Research, and National Cooperative Rail Research Programs; soliciting problem submittals from IDOT staff; and promoting and coordinating Cooperative Research Program technical oversight panels.
- Developing and submitting annual RD&T Work Program for SPR Part 2 funds to FHWA by May 30th each year.
- Developing and submitting annual actual expenditure report for SPR Part 2 funds to FHWA by September 30th each year.
- Developing and submitting annual equipment status report for purchases using SPR Part 2 funds to FHWA by September 30th each year.
- Maintaining project files for all research studies which include the proposal, contract, implementation plan, travel and equipment requests, and other general correspondence relating to the project.

## 2.2 – TECHNICAL ADVISORY GROUPS

Technical Advisory Groups (TAGs) consist of IDOT and FHWA subject-matter experts, industry representatives, and an academic representative from ICT. Their responsibilities include, but are not limited to:

- Identifying and prioritizing research needs.
- Developing, reviewing, and selecting research project proposals.
- Recommending TRP Chair and members and PI(s) for selected projects.
- Monitoring implementation status of completed research projects and assisting as needed.

## 2.3 – TECHNICAL REVIEW PANELS

Technical Review Panels (TRPs) are comprised of IDOT subject-matter experts as well as representatives from FHWA, industry, and other governmental entities. TRPs are responsible for:

- Reviewing proposals and selecting researchers. In some instances, researchers are selected through a Request for Proposal (RFP) process, with the TRP scoring the RFPs.
- Reviewing and approving project work plans and budgets.
- Identifying field test locations, providing data, and sharing departmental knowledge as needed to aid the PI in the completion of the work.
- Overseeing the research project and working with the PI to ensure that the project returns the desired objectives on-time and on-budget.
- Reviewing and commenting on quarterly progress reports prepared by the PI.
- Reviewing and revising the research deliverables.
- Creating, revising, and putting into action an implementation plan.

## 2.4 – IDOT/ICT EXECUTIVE COMMITTEE

The IDOT/ICT Executive Committee is comprised of appointed upper-level IDOT staff with a vested interest in research, including Directors of Offices and Bureau Chiefs, as well as non-voting members from the Bureau of Research, FHWA, and ICT. The committee meets once a year and their responsibilities include:

- Voting on which contract research projects to fund.
- Ensuring that the contract research program aligns with the mission of the Department.
- Reviewing the overall health of and providing feedback on the contract research program.
- Reviewing the status of contract research implementation.

## 2.5 – ICT STAFF

The ICT was created in 2005 as a result of an intergovernmental agreement between IDOT and UIUC. Located at the Advanced Transportation Research and Engineering Laboratory (ATREL) in Rantoul, Illinois, ICT is tasked with administering IDOT's contract research program. Specifically, ICT staff is responsible for:

- Selecting a representative to serve on each TAG and taking minutes at each TAG meeting.
- Posting research needs as prioritized by TAGs on the ICT website.
- Soliciting Research Idea Statements, and sending all Research Idea Statements submitted by October 1st to IDOT in a timely fashion.
- Providing a representative to serve as a non-voting member on the IDOT/ICT Executive Committee.
- Taking minutes at IDOT/ICT Executive Committee, TAG, and TRP meetings.
- Contacting Research Idea Statement submitters with outcome of ICT Executive Committee meeting.
- Updating ICT's project database with information on contract research projects, including TRP Chair and members, PIs, budget, length of study, etc.
- Assisting IDOT in identifying project PIs and/or soliciting proposals via requests-for-proposals (RFPs).
- Sharing solicited proposals with IDOT.
- Working with selected PIs to outline IDOT research guidelines and PI responsibilities and relationship with TRP.
- Coordinating project work plan and budget and providing to IDOT.
- Managing contracting process, by administering sub-awards with partner research entities, preparing contracts, and dealing with associated legal issues.
- Providing IDOT with suitable candidates for short-term special studies.
- Administering budget process and compliance for projects, including assisting PIs with work plans and budgets.
- Establishing and administering separate spending accounts for all contract research projects.
- Attending project meetings, taking minutes, assisting with developing and updating implementation plans, and monitoring projects for compliance with work plans and budgets.
- Collecting quarterly progress reports on all contract research projects and submitting to IDOT within three weeks after the end of each quarter.
- Managing the review, editing, publishing, and dissemination of contract research products according to the schedule developed by IDOT.

- Updating TRB's Transport Research Information Documentation (TRID) database and Research in Progress (RiP) database with information on IDOT's contract research projects.
- Meeting monthly with IDOT staff and weekly via telephone calls to report on the status of contract research program management.
- Preparing technology transfer materials as directed by IDOT.
- Providing IDOT with planned project spending for the next fiscal year for inclusion in the Annual RD&T Work Program.
- Providing IDOT with annual actual expenditure accounting reports for each contract research project by August 31st of each year.
- Providing IDOT with annual equipment status report for purchases using SPR Part 2 and IDOT administrative funds by August 31st each year.

## 2.6 – FEDERAL HIGHWAY ADMINISTRATION DIVISION OFFICE

The role of the FHWA Division Office figures prominently in the performance of a State DOT's research program. The FHWA Division Office assists the State DOT by:

- Approving the annual RD&T Work Program (see Section 6.2).
- Appointing an FHWA staff representative to each TAG.
- Appointing an FHWA staff representative to each TRP, thus ensuring that there is FHWA oversight of each contract research project, from project initiation through implementation.
- Attending monthly IDOT - ICT administrative meetings.
- Providing guidance to IDOT on the Federal statutes and regulations regarding the expenditure of SPR Part 2 funds.

# Chapter Three – National Program Development & Administration

## 3.0 – GENERAL

The Bureau of Research's Technical Research Section is responsible for directing and managing a research program consistent with the Department's needs. In addition to IDOT's contract research and in-house research projects, the Department also participates in a variety of national research efforts. Participation in national research efforts allows the State to pool resources with other Federal, State, and Local agencies having similar research goals in an efficient and cost-effective manner. IDOT works with the following organizations on national research efforts: the American Association of Transportation Officials (AASHTO), the Transportation Research Board (TRB), the National Cooperative Highway Research Program (NCHRP), and FHWA's Transportation Pooled Fund (TPF) program. Since these activities are funded all or in part with Federal SPR Part 2 funds, they are included in IDOT's annual RD&T Work Program submitted to and approved by FHWA.

## 3.1 – AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS

AASHTO is a nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia, and Puerto Rico. It represents all five transportation modes: air, highways, public transportation, rail, and water. Its primary goal is to foster the development, operation, and maintenance of an integrated national transportation system.

AASHTO serves as a liaison between State DOTs and the Federal government. AASHTO is an international leader in setting technical standards for all phases of highway system development. Standards are issued for design, construction of highways and bridges, materials, and many other technical areas.

AASHTO's policy development, standards setting, and technical activities are the product of volunteer State DOT personnel who work together through the AASHTO committee structure. The committees collaborate throughout the year and typically meet annually. These committees, which represent the highest standard of transportation expertise in the country, address virtually every element of planning, designing, constructing, and maintaining transportation services.

AASHTO offers a number of Technical Service Programs (TSPs) in which IDOT participates, including:

- AASHTO Environmental Technical Assistance Program (ETAP)
- AASHTO Innovation Initiative (AII)
- AASHTO Product Evaluation List (APEL)
- AASHTO resource (formerly known as AASHTO Materials Reference Laboratory (AMRL)
- AASHTOWare Bridge Design and Rating Modernization Cooperative Software Development Project (BrDR)
- Design Publication Maintenance (DPM)

- Development of AASHTO Materials Specification (DAMS)
- Load and Resistance Factor Design Specification Maintenance (LRFDSM)
- Multi-State Transit Technical Assistance Program
- National Transportation Product Evaluation Program (NTPEP)
- Rail Resource Center (RRC)
- Highway Safety Policy and Management (SAFETY)
- Snow and Ice Cooperative Program (SICOP)
- Transportation Curriculum Coordination Council (TC3)
- Transportation and Civil Engineering/Roadways into Developing Elementary Students (TRAC/RIDES)*
- Transportation Performance Management (TPM)
- Transportation System Preservation Technical Services Program (TSP-2)

  ** Denotes TSPs not eligible for 100% SPR Part 2 funding. If IDOT participates in these, they are paid for by Offices or Bureaus outside of the Bureau of Research with non-SPR Part 2 funds.*

IDOT pays for participation in these TSPs using Federal State Planning and Research (SPR) dollars, both Part 1 and Part 2. Since the research program has no State funding available for this purpose, the Research Program Manager pays only for those TSPs that are eligible for 100 percent funding with Federal SPR Part 2 dollars. AASHTO applies to FHWA for the waiver of non-Federal matching funds when SPR Part 2 funds are used. The Research Program Manager maintains a list of existing AASHTO TSPs eligible for 100 percent SPR funding, and can contact AASHTO and FHWA to determine eligibility for new TSPs.

IDOT participates in AASHTO TSPs in the following manner:

- Invoices for AASHTO TSPs IDOT is currently participating in, as well as information on new AASHTO TSPs, are received by the Secretary of Transportation's Office and cc'd to the Bureau Chief of Research.
- The Technical Research Coordinator reaches out to affected Bureaus to identify interest in participating in new/existing AASHTO TSPs. For new or continued participation in AASHTO TSPs, Form BR RC007 must be completed and signed by the impacted Bureau Chief and returned to the Technical Research Coordinator. The Bureau Chief of Research has final approval authorizing the payment of these program invoices.

IDOT is also part of the AASHTO research community. The Bureau Chief of Research (non-voting), Research Program Manager (voting), and the Technical Research Coordinator (non-voting) serve as members on AASHTO's RAC. The mission of RAC is to promote quality and excellence in research and the application of research findings to improve state transportation systems. The RAC is an advisory committee to AASHTO's SCRI. While every State is allowed up to three members on the RAC (only one is a voting member), membership on SCRI is limited to 16 States. There are four members per AASHTO Region, with two members coming from

among the State DOT chief officials, and two members from among the State DOT research managers. Members must be nominated and are selected by the AASHTO Board of Directors to serve on a 3-year term(s). When IDOT does not have a member serving on SCRI, the Bureau of Research may contact the regional representatives for assistance promoting IDOT issues on the national level. SCRI interacts with other organizations conducting national research.

SCRI responsibilities include the following:

- Encourage and assist other AASHTO committees and subcommittees to identify research needs, define research emphasis areas, and utilize research findings.
- Solicit research problem statements from the member State DOTs, AASHTO committees, and FHWA; screen the submittals; prioritize them; and recommend annual programs of NCHRP for consideration by AASHTO's Board of Directors.
- Monitor the TRB's performance as program manager for the NCHRP.
- Monitor the NCHRP and make appropriate recommendations and reports to AASHTO.
- Review, observe, and encourage the effective use of research funding and recommend appropriate funding levels.
- Serve as a forum, coordinating committee, and advocate for highway and other transportation research on behalf of AASHTO and its member State DOTs.
- Review, monitor, and foster coordination of the various national programs of highway and other transportation research.
- Study and foster the role of industry in highway and other transportation research.

## 3.2 – TRANSPORTATION RESEARCH BOARD

TRB is a unit of the National Research Council, a private nonprofit institution that is the principal operating agency of the National Academy of Sciences. The partnership of TRB and the State DOT research community has been in place since 1920, with States providing direct financial support beginning in the 1940s. This TRB/State partnership promotes the development and implementation of innovations that save countless lives, improve mobility and access, and vastly increase the cost-effectiveness of materials, designs, construction practices, and operations.

Every three years, a triennium agreement is developed among the supporting members of the TRB (the State DOTs, FHWA, and AASHTO) which outlines the TRB's Core Services program activities and budget. IDOT invests in TRB's Core Services program, which allows State DOTs to collaborate with transportation professionals from other organizations and to share information on research and issues of interest. IDOT pays for participation in TRB using Federal SPR Part 2 funds. The bill is directed to the IDOT Secretary of Transportation, generally in March, with the AASHTO RAC voting member copied on the correspondence. The bill can be paid via the FHWA fund transfer process, using the state-to-federal (Form FHWA 1576, Appendix C) transfer.

TRB provides a report each year quantifying the benefits of participation in TRB activities, including NCHRP. This report can be requested from the Technical Research Coordinator in the Bureau of Research.

IDOT contributes annually to the TRB Core Services program which provides IDOT staff:

- Free registration to the TRB Annual Meeting
- Complimentary, unlimited attendance in online TRB Webinars
- Complimentary printed copies of TRB publications and electronic access to the TRR Journal Online
- Reduced fees to TRB-sponsored specialty conferences
- Reimbursement for TRB State Representative Meeting travel
- Access to research collaboration tools such as the Research Needs Statements (RNS), Research in Progress (RiP), and Practice Ready Papers (PRP) databases, and the Transport Research International Documentation (TRID) database.
- Weekly notices on TRB Activities via TRB E-Newsletter
- In-state, annual access to TRB staff

TRB conducts annual field visits to each State DOT to exchange knowledge about research activities and findings. Visits are organized by IDOT's TRB State Representative, the Research Program Manager. TRB hosts the state visit program in order to:

- Identify problems/issues of importance to the State DOTs
- Provide any assistance/information that TRB currently has that can help State DOTs address these problems/issues
- Identify problems/issues that TRB needs to address in the future in order to be in a position to continue to provide assistance to the State DOTs
- Identify other existing and potential activities that TRB should consider continuing or undertaking in order to provide the best service to their sponsors and other customers

During their visits, the TRB staff members also discuss TRB activities; encourage potential candidates to serve on TRB committees, task forces, and panels; urge researchers to report on their work through papers for the TRB annual meeting and specialty conferences; and, finally, encourage implementation of appropriate findings.

## 3.3 – NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Sponsored by the member State DOTs of AASHTO in cooperation with FHWA, NCHRP was created in 1962 as a means to accelerate research on acute problems that affect highway planning, design, construction, materials, operation, and maintenance nationwide. All of the member State DOTs contribute to an annual cooperative pool of approximately $40 million which funds the program's activities. The bill for the annual NCHRP contribution is directed by the FHWA Division Office to the Technical Research Section for payment. The bill can be paid via the FHWA fund transfer process, using the state-to-federal (Form FHWA 1576, Appendix C) transfer. The NCHRP sometimes requests the state contribution.

IDOT annually contributes annually to the NCHRP and participates by:

- Submitting problem statements for research projects.
- Rating and voting on problem statements.
- Participating on and/or chairing NCHRP panels overseeing research projects. TRB reimburses State employees for travel and lodging expenses related to participation in panel meetings.

IDOT benefits by implementing research results developed through NCHRP, using information from the research projects underway and published research products.

AASHTO committees, State DOTs, and FHWA can recommend research problem statements each year. The deadline for NCHRP problem statement submittals is October 15, for projects expected to begin two years later.

As a member State DOT, IDOT can submit problem statements to NCHRP for consideration for funding. The Research Program Manager is responsible for coordinating Department submittals to NCHRP. S/he will share the solicitation notice from NCHRP with Directors from all of IDOT's Offices, assist with preparation of the standard format NCHRP problem statement, and then submit the problem statement directly to NCHRP, along with an endorsement. Problem statements submitted by State DOTs that are endorsed by a number of States around the country often have a good chance of being selected for funding. The Research Program Manager can work with his/her counterparts in other States to assess interest and support for IDOT submittals and gather endorsements.

AASHTO committees can also submit problem statements to NCHRP. Any IDOT staff member who is involved in submitting a problem statement on behalf of an AASHTO committee should also copy IDOT's Research Program Manager on the submission. This will enable the Research Program Manager to track all problem statements that have IDOT sponsors and help ensure that IDOT priorities are well-supported during the selection and funding process.

Submitted problem statements are evaluated by NCHRP and FHWA staff in November. Very late in the calendar year, NCHRP sends out the ballot of problem statements, including commentary from NCHRP and FHWA staff, to AASHTO RAC voting members and SCRI members. The Research Program Manager shares problem statements with various Offices and Bureaus within IDOT to gather their rankings and comments on problem statements of interest to their area. The Research Program Manager, who serves as IDOT's voting RAC member, then casts a vote on behalf of IDOT. If there is an AASHTO SCRI representative from IDOT, s/he coordinates their vote with the Research Program Manager to ensure consistent IDOT support for projects. Ballots are due to NCHRP in February.

When IDOT does not have a staff member serving on SCRI, the Bureau of Research may contact the regional AASHTO SCRI representatives for assistance in promoting IDOT issues. SCRI selects and prioritizes projects in March, then sends the slate of NCHRP projects for the upcoming fiscal year to the States for endorsement in May. The program must be endorsed by at least two-thirds of the States before projects can be initiated.

Once the preliminary NCHRP program of projects is announced, NCHRP will solicit nominations for State DOT staff to serve on project oversight panels. The Research Program Manager will share notice of this event with Directors from all of IDOT's Offices asking for potential departmental candidates.

Participation on an NCHRP oversight panel can be a rewarding experience that offers direct benefits to staff as well as the Department. However, panel nominations are limited to Subject Matter Experts endorsed by an IDOT Bureau Chief or higher to ensure that qualified candidates are representing Illinois in this national forum. The Research Program Manager will submit all panel nominations directly to NCHRP, along with an endorsement.

The participation of experienced practitioners from State DOTs, FHWA, academia, and industry serving on project panels help ensure the application of completed NCHRP study results. A close working relationship with AASHTO during execution and implementation of the projects is essential when studies relate to materials and the design and construction of highways and bridges, as AASHTO develops the technical standards used by many member State DOTs.

## 3.4 – TRANSPORTATION POOLED FUND STUDIES

FHWA's TPF program has existed for more than 20 years. It is a popular means for State DOTs, commercial entities, and FHWA program offices to combine resources and achieve common research goals. Pooling resources reduces costs and provides efficient use of taxpayer dollars. It also provides greater benefits to participating interests as compared to individual entities conducting or contracting for research on their own.

Notification that proposed pooled funds studies are available for consideration may occur at any time throughout the year on the TPF website. In order to allow for participation in these studies, IDOT will set aside a specific amount of funds in the research budget for TPF study participation each fiscal year.

There are three categories of participants in pooled fund studies: (1) lead agencies, (2) participating agencies, and (3) research teams. The lead agency (typically FHWA, TRB, or a State DOT) for a pooled fund study is the organization that conducts or contracts for the research and performs the administrative functions of the study. Generally, the lead agency takes the initiative in developing the problem statement, soliciting for interest from other agencies, and obtaining FHWA approval of the study. Within each State DOT and the FHWA, specified individuals are authorized to post a project solicitation on the TPF website. Typically, the authorized users are the AASHTO RAC members in the State DOT. Participating agencies provide technical and financial assistance to the study, and are generally offered an opportunity to provide input into the development of the scope of work and selection of the researcher. Each participating agency designates a technical contact to actively participate in the TPF study. IDOT's technical contacts are expected to be proactive and engage the technical contacts at the lead agency to make certain IDOT's interests are appropriately represented and promised deliverables are provided. Research teams are the groups conducting the actual scope of work.

Due to financial procedures inherent in serving as a lead state, IDOT is not equipped to act as a lead agency for any pooled fund, although IDOT often joins as a participating agency. All deliverables from TPF studies that IDOT participates in will be evaluated for potential implementation within IDOT. For more information on implementation, see Chapter 7.

IDOT determines involvement and, once approved, participates in new TPF studies in the following manner:

- The Bureau of Research receives solicitations for TPF studies.
- The Technical Research Coordinator or staff sends potential TPF solicitations to the appropriate staff in the area of interest, along with supporting information and approval form BR RC004.

- The Bureau staff determines interest in TPF participation, and if interested, coordinates with Bureau Chief to select the IDOT technical contact, completes BR RC004, and returns to the Technical Research Coordinator.

- Technical Research Coordinator collects approval forms and sends to the Bureau Chief of Research for signature, and then to the Director of the Office of Planning and Programming for final funding approval.

- Once approval is received, Research staff enters commitment information on TPF website. The information includes the amount of funding committed for the study, the name and contact information for the technical contact, and the name and contact information for the Bureau of Research funding contact.

- Bureau of Research will monitor solicitation status until notified that study funding level has been achieved and study is awarded TPF study number. At that time, Bureau of Research will respond to requests to contribute funds through state-to-state (Form FHWA 1575, Appendix C) or state-to-federal (Form FHWA 1576, Appendix C) transfer as appropriate.

- Bureau of Research notifies Bureau Chief and IDOT technical contact of study initiation.

Once TPF studies are underway:

- IDOT technical contact monitors TPF study progress, attends conference calls and travels to meetings (travel paid for with TPF study funding), and informs Research staff of any issues.

- Research staff conducts annual surveys for each active TPF study. The technical contact is contacted and asked to assess study's benefit to IDOT via BR RC005. Since TPF studies should follow Federal fiscal year, annual surveys are generally conducted in March and April to determine if IDOT's continued funding and participation for the next fiscal year are warranted. This also allows the continuing studies to be included in the RD&T Work Program for the next fiscal year.

- Research staff adds the next year's fiscal commitment to TPF website, verifies that IDOT technical and financial contact information is current, and completes the state-to-state (Form FHWA 1575) or state-to-federal (Form FHWA 1576) transfer form as appropriate.

- At the conclusion of the TPF study, Research staff reaches out to IDOT technical contact and his/her Bureau Chief to complete BR RC006, assess benefit of IDOT's participation, and discuss implementation strategies.

# Chapter Four – Project Selection

## 4.0 – GENERAL

The success of a research program depends on selecting projects that meet the needs of Department staff, managing the projects to ensure that the desired objectives are met, and then implementing the research deliverables and sharing the information with all interested parties. This process, the life of a research need, is illustrated in Figure 4-1. This chapter describes how IDOT's research program is developed. Subsequent chapters describe research project management (Chapter 5), how the research program is administered (Chapter 6), how research deliverables are implemented (Chapter 7), and how the results of the research effort are widely disseminated (Chapter 8).

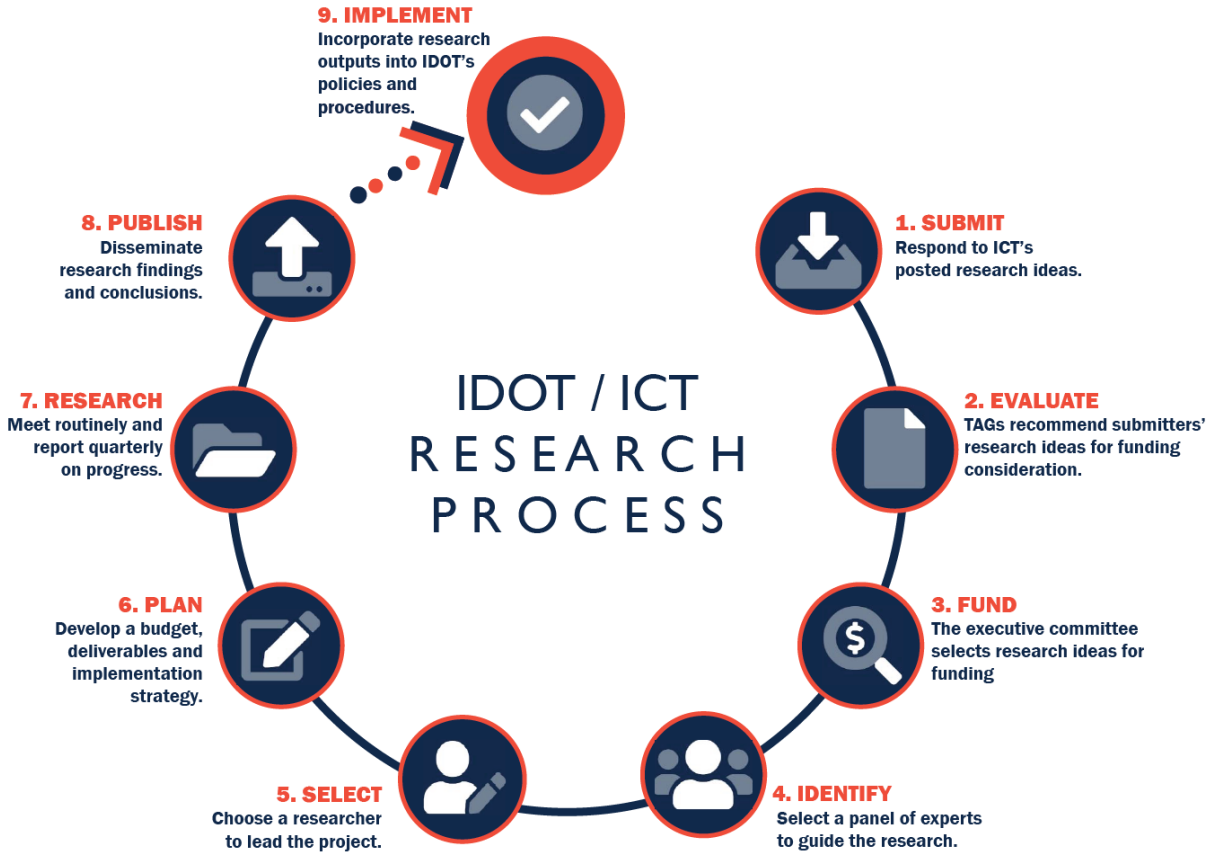


*Figure 1 The Life of a Research Need*

IDOT - ICT Research Process

**Call for IDOT research ideas**

Technical Advisory Groups identify specific transportation research needs as IDOT priorities. ICT invites interested parties to submit their research ideas annually during the call for research ideas. Submitters should use the Proposed Research Idea Statement to submit their idea(s).

**Evaluation of submitted research ideas**

TAGs review and discuss the proposed research idea statements in their focus areas. They prioritize statements with implementable outputs and recommend top statements to the IDOT-ICT executive committee for funding consideration.

**Research project selection**

The executive committee selects proposed research ideas for funding, and ICT administers the approved research.

**Technical Review Panel selection**

A Technical Review Panel oversees and guides the research project. TRPs are chaired by an IDOT staff member and include a diverse group of subject-matter experts. Each TRP is responsible for oversight of the research, providing regular feedback to researchers and ensuring implementable outputs from the project.

**Research team selection**

The Principal Investigator can be a researcher from any university or government agency or a consultant. While some projects are directly assigned to University of Illinois researchers, other PIs are selected through ICT's request for proposals process.

RFPs are widely advertised and are open to any researcher. Each project's TRP reviews all proposals received and recommends a proposal for development of a contract. In cases of equivalent proposals, preference will be given to in-state educational institutions.

**Work plan preparation**

Once a PI is selected for a research project, they work with the TRP to develop a detailed work plan, which includes a budget, deliverables and implementation strategy.

**Project research**

The PI and TRP meet at least every three to six months to discuss the project's progress. PIs must keep accurate records of data analysis and work performed as well as submit quarterly reports on their research progress. Each project's status and most recent quarterly report is available from IDOT upon request.

### Completed projects

After the PI completes their project and is ready to disseminate the findings and conclusions, they work with the TRP and ICT Project Management team to publish the project's report. The report is published to ICT's website and submitted to the Transportation Research International Database.

### Implementation

Throughout the project, IDOT and the PI work to identify implementable deliverables and expected benefits. The PI assists in providing deliverable outputs that can be incorporated into IDOT's policies and procedures. IDOT's staff spearheads the research implementation.

## 4.1 – TAG COMPOSITION

The first step in the research process is selecting the projects that make up the research program. IDOT's research program is involved in all areas of transportation research. Currently, there are eight Technical Advisory Groups (TAGs):

- Sustainable Construction,
- Environmental Impacts,
- Pavements and Materials,
- Planning, Policy and Asset Management
- Mobility and Freight Modes,
- Mobility Safety,
- Bridges and Foundations, and
- Operations and Maintenance.

IDOT has established these TAGs, which are comprised of IDOT personnel, an ICT academic representative, industry or outside agency representatives (as appropriate), and at least one representative from the FHWA Division Office. The Technical Research Coordinator solicits information on TAG membership changes annually, and updates TAG Charters with the Bureau of Business Services. All IDOT TAG members are voting members with individual votes, while industry, outside agency, ICT, and FHWA representatives are allowed one vote per organization.

The Bureau of Research appoints the TAG chair and other IDOT employees with subject matter expertise to each TAG, and also requests industry and other agency representatives when appropriate. The FHWA Division Office appoints the FHWA representative(s) to each TAG.

ICT appoints an ICT academic representative to each TAG. ICT appoints representatives with expertise in the subject area of the TAG and/or experience in transportation research. No person may serve as the ICT TAG representative on more than one TAG. Beginning July 1, 2009, the ICT representative appointment is for one 2-year term and may be renewed one time. No ICT appointment may exceed four years on a TAG.

TAG meetings are open to TAG members only. In cases where the named member cannot attend, s/he may identify a designee to attend in her/his place. Non-members may attend only by invitation of the TAG chair in cases where they may be needed to provide information on an issue. Non-members are not able to cast any vote.

TAGs identify research needs, and review and prioritize research proposals to be presented to the IDOT/ICT Executive Committee.

## 4.2 – TAG RESEARCH NEEDS AND IMPLEMENTATION MEETING

The TAGs meet each year in the late spring or early summer to discuss both potential future research ideas and to discuss the implementation status of research projects that are underway or recently completed. This meeting is the kick-off to the annual research cycle.

To identify future research, the TAGs brainstorm areas of IDOT interest, practice, or policy that would benefit from research, and they format these ideas into Research Needs. A Research Need states the issue to be addressed, why research is necessary, and potential deliverable outcomes of the project. These TAG Research Needs are posted to the ICT website by August 15 annually, and are advertised to potential researchers to encourage the submission of Research Idea Statements that will meet IDOT's current needs. Posting the Research Needs on the ICT website helps to ensure that IDOT will receive Research Idea Statements that are clearly expected to be implemented to the benefit of the department.

At this meeting, the TAGs also set aside time to discuss the status of projects underway as well as current and future implementation plans for the projects assigned to that TAG. This allows for the TAG members to share their research successes, describe new policies and procedures, and to solicit feedback on how to best implement policies and procedures.

## 4.3 – SOLICITING RESEARCH IDEA STATEMENTS

Each year, the ICT Research Idea Statement form is reviewed and updated as necessary. The Research Idea Statement form is posted on the Research Needs page on the ICT website. Potential researchers and others who wish to suggest a specific research topic can download and fill out the form. IDOT encourages all potential researchers to reach out to the appropriate IDOT staff to discuss and garner support for the proposal prior to submittal. IDOT staff is encouraged to discuss the department's research needs candidly, and to answer any questions that the potential researcher has about both the research idea and potential implementation.

In order to support the implementation of research ideas, potential researchers who submit ideas are encouraged to identify an IDOT sponsor willing to champion the research. Additionally, Research Idea Statements are required to address the potential application of anticipated research results. The Research Idea Statement form specifically requests an expected implementation outcome, and asks submitters to:

> **"**Describe the expected quantitative outcomes in terms of policy advances, cost savings, increased life cycle, safety, environmental impacts and sustainability, user benefits, and/or other appropriate metrics. At a minimum, explicitly list the benefits to IDOT regarding life-cycle cost and sustainability. Please note that IDOT is interested in immediate implementation of research outcomes."

ICT encourages the submission of specific research ideas by:

- alerting the current and former ICT PIs of the deadline,
- posting a notice on the ICT website,
- sending an e-mail to all Illinois colleges and universities with civil engineering or transportation programs,

- including a notice in the quarterly ICT newsletter, and
- emailing a notice to those who have signed up for the ICT RFP notification listserv.

Although IDOT and ICT encourage research ideas based on the priorities the TAGs have identified, Research Idea Statements on any transportation-related topic are considered. Submitting a Research Idea Statement does not guarantee that the idea submitter will be the PI if the project is selected for funding by the IDOT/ICT Executive Committee.

All Research Idea Statement forms are submitted to ICT no later than October 1 annually, and ICT forwards them to IDOT for distribution and review by the TAGs. Research Idea Statements submitted to ICT after October 1 are held until the next research cycle.

## 4.4 – TAG EVALUATIONS OF RESEARCH IDEA STATEMENTS

IDOT receives all Research Idea Statements from ICT and determines which TAG(s) should receive each form for review and consideration. Each Research Idea Statement submitted by the deadline is sent to one or more TAG chairs, depending upon the subject of the proposed research. Research Idea Statements are disseminated to all TAGs that may be impacted by the proposal to allow for feedback from all impacted Bureaus.

At this time, the TAG chairs schedule meetings of the TAGs to review and discuss all Research Idea Statements submitted and forwarded to the TAG. At these TAG meetings, the Research Idea Statements are discussed and prioritized, according to the perceived benefits of the research. IDOT encourages selection of Research Idea Statements which will allow IDOT to meet the basic tenets of its mission statement through the use of implementable research outcomes.

It is important to note that in order to select the best Research Idea Statements for funding, the TAG members must be able to have a candid and vigorous discussion of each project. In cases where a TAG member or invited guest has submitted a Research Idea Statement, s/he may present the idea to the TAG and answer questions on the Research Idea Statement, but will be asked to leave the meeting while the TAG members discuss and debate the merits of the Research Idea Statement.

A TAG has several options when considering a research idea, including:

- **RECOMMEND**: The TAG recommends this Research Idea Statement for funding by the IDOT/ICT Executive Committee.
- **DECLINE**: The TAG does not support the funding of this Research Idea Statement as it does not meet the needs of the Department at this time.
- **SUPPORT**: The TAG feels that this Research Idea Statement may be beneficial to the Department, but does not have the ability to recommend it for funding (i.e., lack of staff, time, etc.). However, the TAG does support the selection of this Research Idea Statement for funding by another TAG.
- **NO RECOMMENDATION**: The TAG feels that this Research Idea Statement does not have any direct impact on this TAG. This Research Idea Statement should be reviewed by a different TAG that is impacted by the Research Idea Statement.

If multiple Research Idea Statements are submitted on one topic, the TAG may either select the best of the Research Idea Statements to recommend for funding, or they may take the best parts of each Research Idea Statement and merge them into a new/revised Research Idea Statement that will meet the Department's needs. Additionally, if no Research Idea Statements are submitted on a topic that the TAG would like to pursue, the TAG may draft their own Research Idea Statement addressing the topic, and recommend it to the IDOT/ICT Executive Committee for funding.

If a TAG feels that a Research Idea Statement could be investigated by departmental staff, they may recommend the Research Idea Statement to the Technical Research Coordinator for in-house research. In-house research is generally only conducted on pavement-related topics and by the Pavement Programs Section of the Bureau of Research. In-house research ideas are not brought forward to the IDOT/ICT Executive Committee as they are not federally funded. Contact the Technical Research Coordinator for additional information.

The TAG develops specific recommendations as to which Research Idea Statements should be funded. They also identify the IDOT staff member that will serve as the TRP chair (if co-chairs are assigned, at least one individual must be an IDOT staff member), identify potential TRP members from each affected stakeholder, recommend whether the PI should be selected from the University of Illinois or by RFP, and rank their Research Idea Statement recommendations in priority order. The TAG chair transmits these recommendations to the Technical Research Coordinator for presentation to the IDOT/ICT Executive Committee at its annual meeting.

## 4.5 – IDOT/ICT EXECUTIVE COMMITTEE PROJECT SELECTION PROCESS

Per IDOT's Inter-Governmental Agreement (IGA) with ICT, IDOT has established the IDOT/ICT Executive Committee to review and select contract research projects for funding and to discuss and support the goals of IDOT's contract research program with ICT. The IDOT/ICT Executive Committee is chaired by the Deputy Secretary for Program Development, or by the Vice-Chair, the Director of the Office of Programming and Planning. The Directors of the Office of Program Development, Office of Highways Project Implementation, and Office of Intermodal Project Implementation also serve on this committee. Each of the TAG chairs, the Bureau Chief of Research (non-voting), a representative from FHWA (non-voting), and the Director of ICT (non-voting) also serves on the committee. If any of these staff are unable to attend, they may send a designee to represent them.

The IDOT/ICT Executive Committee meets annually to discuss the overall activities of the ICT and the TAGs' recommendations for funding various proposed Research Idea Statements and vote on whether each Research Idea Statement should be funded or not. Decisions are based on the amount of available funding, staff workload, implementability of the research, and relation to IDOT's mission statement. Research Idea Statements receiving a majority of the votes of committee members are funded.

Research Idea Statements that are approved by the IDOT/ICT Executive Committee for funding are referred to ICT to administer the research project. The PI is selected by IDOT, in consultation with ICT, or by issuing an RFP.

Additionally, the implementation potential of Research Idea Statements is thoroughly discussed during the ICT Executive Committee meeting. As of November 2012, implementation was included as part of the project selection guidance adopted by the IDOT/ICT Executive Committee. In addition to the initial TRP member selection by the TAG, and to further support implementation, the IDOT/ICT Executive Committee may suggest additional TRP members for the TRPs, ensuring that all stakeholders are represented.

## 4.6 – ESTABLISHMENT OF SPECIAL PROJECTS

When an immediate need for a study of narrow scope but extreme urgency arises, the Bureau Chief of Research will notify ICT that IDOT requires a Special Project. The ICT Director, or the Director's designee, will work with IDOT personnel to develop the scope, timeline, and deliverables for the Special Project. ICT assists IDOT in identifying a PI to carry out the research. Per the IDOT/ICT Executive Committee, Special Projects must provide the initial, usable, research deliverable in six months of the start date, and are limited to a maximum funding of $36,000. The total time frame of a Special Project, including the report editing process, is 10 months. See Section 5.1.6.6.1 for additional information on the time frame of a Special Project. When the details of the Special Project are finalized, the administration of the Special Project will follow standard procedures.

## 4.7 – ESTABLISHMENT OF OFF-CYCLE PROJECTS

Because of the length of the research project cycle, there are situations when the need for a regular study arises outside of the regular project cycle. When the need is of such urgency that it cannot be postponed for consideration during the next project cycle, the Bureau Chief of Research will notify the ICT Director and IDOT/ICT Executive Committee chair that IDOT requires an Off-Cycle Project. The ICT Director, or the Director's designee, will work with IDOT personnel to develop the scope, timeline, and deliverables for the Off-Cycle Project, as well as to secure the approval of the Bureau Chief of the area requesting the project. ICT assists IDOT in identifying a PI to carry out the research. Off-Cycle Projects have no time or budget limit, but must be approved by a majority of the voting members of the IDOT/ICT Executive Committee. The ballot is sent to the committee members by the IDOT/ICT Executive Committee chair. When the Off-Cycle Project has been approved by the IDOT/ICT Executive Committee, the administration of the project will follow standard procedures.

## 4.8 – OPEN MEETINGS ACT

Questions regarding whether IDOT/ICT Executive Committee and TAG meetings fall under the Open Meetings Act have been raised in the past. The Bureau of Research contacted IDOT's Office of Chief Counsel for clarification. The Office of Chief Counsel determined that mandatory compliance with the Open Meetings Act is not necessary for IDOT/ICT Executive Committee or TAG meetings for the following reasons:

- Neither the IDOT/ICT Executive Committee nor the TAGs are subject to the control of a public body that must comply with the Open Meetings Act, but are accountable to the Bureau of Research and IDOT in general.
- IDOT/ICT Executive Committee and its subgroups such as TAGs are appointed through the IGA between
- IDOT and UIUC, not through an official statute or regulation, and neither the IDOT/ICT Executive Committee nor the TAGs have an official place within IDOT as a larger organization.
- Members are not paid for their tenure, and their assigned duties are not defined in an official statute or regulation.
- The IDOT/ICT Executive Committee does not have its own budget, although it does make budgetary decisions.

- The IDOT/ICT Executive Committee does have a deliberative function whereby it makes decisions about which ICT projects will be funded and which ones will be put off. However, the TAGs are solely advisory in nature, and the TAGs' decisions have no direct impact on State business.

# Chapter Five – Research Project Management

## 5.0 – GENERAL

Research Project Management is a function overseen by IDOT and administered by ICT for contract research projects; and overseen and administered by IDOT for in-house research projects. This chapter follows up on the life of a research project (Figure 4-2) and describes the project management process.

## 5.1 – CONTRACT RESEARCH PROJECTS

### 5.1.1 – SELECTION OF THE TRP FOR APPROVED PROJECTS

For each new contract research project, IDOT appoints a TRP to oversee and guide the research. This step is frequently done during the TAG's review of the proposed research ideas. TRP members can be IDOT employees, FHWA representatives, local government representatives, private contractors, private citizens, etc., but the TRP chair or co-chair shall be an IDOT employee.

### 5.1.2 – SELECTION OF THE PI FOR APPROVED CONTRACT RESEARCH PROJECTS

ICT consults with IDOT personnel, e.g., the TAG, the TRP chair, and the Bureau of Research, regarding the selection of the PI(s) for each contract research project.

Under the terms of the IGA, IDOT can approve a PI from one of the UI campuses: Urbana-Champaign, Chicago, or Springfield, without using the RFP process. If IDOT and ICT identify a UI researcher(s) to perform a new contract research project, the PI will be invited to submit a research work plan and detailed budget for review and approval by ICT and the TRP.

Alternatively, IDOT may direct ICT to solicit proposals from researchers outside the UI's three campuses. This is commonly done if the UI does not have faculty or research assistants that are knowledgeable and available to perform the subject research. IDOT and ICT may also solicit proposals outside of the UI system to allow alternative research approaches to be considered by the TRP. Additionally, ICT must meet the outsourcing requirements of 20% of funds over $2,000,000 as stated in the IGA.

Additionally, all new proposed research ideas submitted by someone outside the UI system that are funded by the IDOT/ICT Executive Committee will be put out for RFP to ensure that the submitter has the opportunity to bid on the proposed research idea that s/he submitted. UI system PIs are also allowed to respond to these RFPs. For additional information about the RFP process, refer to Chapter 1, Section 5.

Specific scenarios for the selection of PI(s) are noted below:

- If a proposal recommended for funding was submitted only by a UI system researcher, that researcher is typically assigned to be the PI for the project. If there is a concern about that researcher based on past performance, or if expertise from outside academia is desired, the TAG should note that during the TAG meeting. In such a case, ICT will coordinate an RFP process for that research. The TRP for the project will review all proposals received and select the winning proposal.

- If a proposal recommended for funding was submitted only by a non-UI system researcher, ICT will coordinate an RFP process for that research. The TRP for the project will review all proposals received and select the winning proposal. Submitting a proposed research idea that is ultimately selected for funding by the IDOT/ICT Executive Committee does not guarantee the submitter s/he will be selected as the PI to conduct the research.

- If a new or combination proposal is recommended for funding, ICT will coordinate an RFP process for that research. The TRP for the project will review all proposals received and select the winning proposal.

- Phase II research is typically assigned to the Phase I researcher, unless serious issues occurred during the Phase I research and it is determined that a new PI is needed. IDOT/ICT must receive approval from FHWA to assign Phase II research to PIs outside of the UI system.

### 5.1.3 – PREPARING, ADVERTISING, AND ADMINISTERING RFPs

For those research projects that IDOT proposes to outsource, ICT solicits formal research proposals to select a PI and the best research approach using a process modeled after the NCHRP RFP process. This process ensures that the TRP is insulated from the proposers, and that all proposers are dealt with uniformly by ICT. ICT follows these steps to prepare and advertise via RFPs:

- IDOT, in consultation with ICT, determines which IDOT/ICT Executive Committee-approved research projects will be advertised via RFP. This has typically been determined prior to IDOT/ICT Executive Committee funding approval.

- ICT drafts an RFP based upon the specific research needs identified within the proposed Research Idea Statement approved by the IDOT/ICT Executive Committee. All RFPs include identical instructions about the content and format for ICT research proposals and a list of the responsibilities of ICT PIs. Each RFP outlines the project scope and budget and includes guidelines for preparing and submitting the completed proposal to ICT.

- The draft RFP is sent to the TRP chair for revisions, if needed. The TRP will generally need two weeks to one month to review and edit/approve the draft RFP, depending on whether or not the TRP needs to meet and discuss the draft RFP.

- ICT finalizes the RFPs and posts them on the ICT website. When this occurs, ICT highlights the posting on its homepage, sends an email to its RFP notification listserv, and advertises the postings in its newsletter, if the timing is appropriate.

- While the RFP is posted on the ICT website, any questions that are submitted by potential researchers will be posted, along with the response, so all individuals are aware of the information in preparing their submittal.

- Research proposals in response to RFPs are typically due to ICT no less than one month after they are posted to the ICT website. Research proposals are not accepted after the deadline advertised in the RFP for submitting proposals.

### 5.1.4. – SELECTION OF PIs FOR OUTSOURCED PROJECTS

ICT forwards the proposals received in response to the RFPs to the appropriate TRP chair, who sets up a meeting with his/her panel to review and discuss the proposals. ICT provides guidance to the TRP chair on how to carry out the RFP review and scoring process, and provides the TRP chair with the appropriate scoring forms. ICT usually asks the TRP to complete its review of the research proposals and make a recommendation for action within 30 days. If the TRP has questions about one or more proposals, it is allowed to write follow-up questions for the researcher(s), but the questions and answers must be forwarded to/from the researcher(s)/TRP through ICT.

The TRP rates the proposals using an evaluation process similar to that of NCHRP. The TRP can either recommend one research team and proposal from among the proposals received by ICT or it can recommend that none of the proposals received be funded by ICT. If none of the proposals are recommended, the RFP may be revised and/or reissued at a later date. Questions from research teams concerning their selection are handled by ICT, who utilizes information from the TRP's evaluation forms.

### 5.1.5 – REVIEW AND APPROVAL OF WORK PLAN AND BUDGET

For each newly approved ICT research project, the PI must prepare a work plan that includes a timeline and budget in the format approved by ICT. Additional information on the PI's responsibility can be found in the PI Research Guidebook on the ICT website. The PI works with the TRP to develop an acceptable work plan, including timeline, scope, deliverables, implementation strategy, reporting requirements, sustainability information, and budget, for the approved project. The use of interim deliverables, such as a literature review, software, technical memos, testing plan, etc., allows the TRP to monitor progress and direction throughout the project. Use of these interim deliverables is encouraged to facilitate timely completion of projects which meet the intended objectives. An editing period of three months at the end of the project shall be included in the timeline for all research projects to allow for reviewing and publishing the project report. PIs should refer to Report Guidelines on the ICT website for additional information. Projects are considered to be completed when the final report is published to the ICT website.

During this stage, the researcher and TRP chair should discuss the potential for implementation so that implementation products and activities may be included in the work plan. The TRP should stress the need for implementable deliverables such as draft policy statements, specifications, standard drawings, test procedures, etc., as appropriate. Final reports should include recommendations for implementation, potential barriers to implementation and how to overcome them, as well as how the implementable deliverables should be utilized. IDOT's needs regarding specific uses, file formats, software, or hardware, etc. should also be addressed. Additionally, work plans for new projects are required to include the following tasks:

- *Benefit Analysis Task*: The PI(s) will work throughout the research project to identify the expected benefits of the research in the following areas: Construction Savings, Operation and Maintenance savings, Increased Life-cycle, Decrease in Life-cycle Cost, Safety, Decreased Engineering/Administrative Costs, Environmental Aspects, Technology, User Benefits, or Other. All areas that are pertinent to the study shall be either qualitatively or quantitatively evaluated. The PI will work with IDOT to assess the value of quantifiable benefits.

- *Implementation Task:* The PI(s) shall provide the TRP with Implementation Potential and Implementation Strategies. Both should be incorporated into the work plan prior to the beginning of the research projects, considered throughout the project, and revised upon completion of the research. The TRP and the PI will develop implementation activities and develop an implementation cost estimate. It is the responsibility of the TRP chair to make sure all parties necessary for implementation are informed of the research. Also, it is the responsibility of the TRP chair to promote implementation within the Department with the aid of the Research Development Unit.

In addition, ICT works with the PI to ensure that the budget complies with the ICT agreement. The budget must be consistent with the total budget approved by the Executive Committee for the research project, and it must include the appropriate cost share. Specific budget requirements are available from ICT, as cost share varies between UI and outsourced projects.

Before any project can begin, the budget must be reviewed and approved by ICT, and the TRP assigned to the project must approve both the proposal/work plan and budget for the project. Written authorization from the TRP chair and Bureau Chief of Research is required for the project to proceed. The TRP chair should return a signed and dated copy of the ICT Work Plan and Budget Approval form to the Technical Research Coordinator.

When the TRP approves the research work plan and budget, ICT will set up a UI spending account (for UI researchers) or request a UI subaward (for outsourced projects). **Research may not begin until the work plan and budget have been approved by IDOT, received by ICT, and the PI provided notice to proceed by ICT.** Once a project has been approved, ICT staff enters the project's information into the Research In Progress (RiP) database.

### 5.1.6 – ONGOING OVERSIGHT OF ICT PROJECTS

The TRP chair will maintain contact with the PI and they will hold quarterly to semi-annual TRP meetings to review research progress and implementation strategies. Given IDOT travel restrictions, web-based meetings are encouraged. However, face-to-face meetings are recommended for the first and final project meetings, and at least one meeting annually. An ICT staff member is assigned to each TRP to actively assist with the management of the research project.

During the conduct of the research, the PI and TRP Chair will maintain communication regarding the progress and any problems that may develop. They should routinely discuss implementation of research outcomes, and update implementation strategies accordingly. When appropriate, the TRP chair will communicate special needs to the ICT staff member overseeing their project. This would include items such as change in scope and budget, project extensions, etc.

#### 5.1.6.1 – TRP Meeting and Minutes Process

The ICT staff member assigned to the project will assist with taking minutes at TRP meetings:

- TRP Chair emails meeting request to TRP, including ICT (ICT-TRPminutes@illinois.edu ) and to Research Coordination (DOT.BR.RESEARCH@illinois.gov) at least 2 weeks prior to meeting.

- ICT responds to TRP Chair, cc: BR Research Coordination group email, with name of staff member who will be able to take minutes.

- ICT Research Coordinator assigned to the meeting shall attend in person, whenever possible. In person attendance is the preferred method, and encourages better interaction with the TRP resulting in more comprehensive meeting minutes.

- ICT will provide the draft minutes, marked with the DRAFT watermark, and the updated IPW to the TRP Chair and the Bureau of Research typically within 2 weeks of the meeting. ICT will also provide the Bureau of Research with PowerPoint presentations from the meeting, when possible.

- The TRP Chair will review the minutes, ask the TRP to review the minutes, and provide any clarifications or changes to ICT within 2 weeks.

- ICT will incorporate any changes and finalize the minutes. The DRAFT watermark will be removed, and document will include a line that states “Final Minutes – <DATE>”. Final minutes, PowerPoint, and IPW will be added to the ICT database/project files.

- Final minutes will be sent to the TRP Chair for dissemination to TRP and to the Bureau of Research for inclusion in the project file.

Meeting Minutes will include:

- Attendance

- Overview of presentation – includes main findings, future plans, and implementation plans

- Summary of Discussion – includes highlights of discussion and lists major decisions, as well as revisions to the IPW

- Action Items

### 5.1.6.2 – Progress Reports

Federal regulations governing the use of Federal SPR Part 2 funds lay out strict requirements concerning periodic progress reports. Per 29 CFR 420.117(b) (1): “The State DOT must submit performance and expenditure reports, including a report from each sub-recipient, that contains as a minimum:

(i) Comparison of actual performance with established goals;

(ii) Progress in meeting schedules;

(iii) Status of expenditures in a format compatible with the RD&T Work Program, including a comparison of budgeted (approved) amounts and actual costs incurred;

(iv) Cost overruns or underruns;

(v) Approved RD&T Work Program revisions; and

(vi) Other pertinent supporting data.”

Additionally, these reports are “due 90 days after the end of the reporting period for annual and final reports and no later than 30 days after the end of the reporting period” (29 CFR 420.117(c)) for quarterly reports.

Since ICT manages IDOT’s contract research program, IDOT requires that ICT comply with these same reporting requirements, as shown below.

1st Quarter (January 1 – March 31)

- PI Deadline to submit QPR to ICT: April 14
- ICT Deadlne to submit QPR to IDOT and FHWA: April 30

2nd Quarter (April 1 – June 30)

- PI Deadline to submit QPR to ICT: July 14
- ICT Deadlne to submit QPR to IDOT and FHWA: July 30

3rd Quarter (July 1 – September 30)

- PI Deadline to submit QPR to ICT: October 14
- ICT Deadlne to submit QPR to IDOT and FHWA: October 30

4th Quarter (October 1 – December 31)

- PI Deadline to submit QPR to ICT: January 14
- ICT Deadlne to submit QPR to IDOT and FHWA: January 30

At least quarterly, the PI must update the project information shown on the ICT website to show the progress of the research project. ICT has instituted an on-line quarterly progress report system that notifies PIs and TRP Chairs of their reporting obligations. Detailed information to assist PIs and TRP Chairs with filling out the on-line quarterly progress reports can be found on the ICT Resources and Guidelines page. Quarterly progress reports are modelled after those developed for FHWA’s TPF program, and are due per the dates listed in Table 5-1. In the event that a Quarterly Progress Report is not finalized and submitted by the PI and/or IDOT TRP Chair prior to this deadline, ICT will retain a record of follow-up contacts with the PI and TRP chair. ICT will also provide to IDOT a listing of Quarterly progress reports that were not submitted by the deadline.

When Quarterly progress reports are received and reviewed by IDOT, IDOT will acknowledge the receipt and subsequent review of the reports by IDOT staff via email back to ICT. This email will be saved as a PDF document and stored in a shared folder for future reference.

#### 5.1.6.3 – Work Plan/Budget Changes

When a necessary change in research effort is required, the PI and the TRP must mutually agree and sign and submit a Time Extension and Budget Change Request Form on the ICT Resources And Guidelines page to change the work plan and/or budget. The ICT staff member shall assist with the effort. Specific situations are discussed below.

#### 5.1.6.3.1 – Budget Increases

TRP chairs or PIs interested in requesting a budget increase should contact ICT staff as soon as the need for an increase is known. ICT staff will facilitate and review the completion of the appropriate forms and documents.

The percent amount of the increase is based off of the original ICT Executive Committee approved budget for the project. Budget increases of 20% or less of the original approved budget may be approved by the Bureau Chief of Research. However, cumulative budget increases of more than 20% of the original approved budget must be approved by the ICT Executive Committee.

For any budget increase, the following information must be provided:

- Time Extension and Budget Change Request Form located on the ICT Resources And Guidelines page, clearly stating the reason(s) for the increase (and time needed, if applicable).
- Document with brief supplemental work plan focusing on information on the additional work scheduled (and time needed, if applicable) funded through the budget increase and supplemental budget, focusing on the additional budget's breakdown and including one summary line with the total amounts for the entire budget.
- The Time Extension and/or Budget Change Request Form must be signed by the TRP Chair, PI, ICT Administrator, and returned to the Technical Research Coordinator for signature.
- ICT will attach the approved Time Extension and/or Budget Change Request Form to the budget and work plan summary document for posting on the ICT website.
- If budget increase includes the purchase of equipment, an Equipment Purchase Request Form, located on the ICT Resources And Guidelines page should also be completed at this time.
- The Equipment Purchase Request Form must be signed by the TRP Chair and returned to the Technical Research Coordinator for signature.

#### 5.1.6.3.2 – No Cost Time Extension

TRP chairs or PIs interested in requesting a no cost time extension should contact ICT staff as soon as the need for an increase is known. Ideally, time extensions will be requested well in advance of the original end date of the project. ICT staff will facilitate and review the completion of the appropriate forms and documents. No cost time extensions may be approved by the Technical Research Coordinator or the Bureau Chief of Research.

It is important to note that time extensions generally will not be granted solely for the purpose of allowing additional time for report writing, editing, and review. As the three-month report review period must be incorporated into all work plans, PIs should work accordingly.

For any no cost time extension, the following information must be provided:

- Time Extension and/or Budget Change Request Form located on the ICT Resources And Guidelines page, clearly stating the reason(s) for the extension and information on additional work and modified or additional deliverables.

- The Time Extension and/or Budget Change Request Form must be signed by the TRP Chair, PI, ICT administrator, and returned to the Technical Research Coordinator for signature.

- ICT will attach the approved Time Extension and/or Budget Change Request Form to the budget and work plan summary document for posting on the ICT website.

### 5.1.6.4 – Travel

Per FHWA's Guidance on Use of FHWA Planning & Research Funds for Travel and Training, travel out-of-state and to conferences for the purposes of technology transfer is an expense eligible for Federal reimbursement. To the extent possible, such travel shall be itemized in the project's work plan and budget. In recognition of travel budget restrictions, travel funded with Federal research money should be limited to faculty and IDOT representatives who provide direct benefit to IDOT's research program. Travel must be approved by the TRP chair in advance of the travel using the Travel Request Form found on the ICT Resources And Guidelines page.

The following guidelines apply specifically to the TRB Annual Meeting:

- IDOT will only authorize payment for TRB meeting registration fees at the early registration rates.

- IDOT has determined that research project funds may only be used to reimburse expenses for PIs and Research Assistants if they are presenting on their IDOT-funded project at the meeting and are not just a co-author of a paper being presented by someone else. Travel for a TRP chair or TRP member can also be paid from project funds, if the chair/member is presenting on his/her project.

- IDOT will only authorize payment for a maximum of four nights of lodging at the TRB Annual Meeting. Those staying for additional nights will be required to pay for any additional nights from their own funds.

- When PIs and Research Assistants send their travel request form to the TRP chair for approval, it must be accompanied by a copy of the paper that will be presented at the TRB Annual Meeting.

- IDOT will only approve travel when requested in advance of actual travel date.

### 5.1.6.5 – Equipment

Purchase or rental of specialized equipment for an individual research project or a series of related projects may be eligible for Federal funding.

2 CFR 200.439(b)(2) states that "Capital expenditures for special purpose equipment are allowable as direct costs, provided that items with a unit cost of $5,000 or more have the prior written approval of the Federal awarding agency or pass-through entity." To ensure compliance with 2 CFR 200.439(b) (2), and the current IGA, IDOT's written approval must be obtained prior to equipment purchases or rental equal to or greater than $500.

In 2014, the FHWA Division Office received guidance from the FHWA Office of the Chief Financial Officer (OCFO) with regards to equipment purchases and use. The OCFO stated that equipment should only be purchased with SPR Part 2 funds when it is specialized and its predominant use would be for a specific research project or the federally-funded research program. For example, it would not be appropriate to purchase a compression machine, a scale, or other type of common laboratory or materials testing equipment that is not specialized for the individual project.

To the extent possible, equipment purchases shall be itemized in the project's work plan and budget and tracked separately throughout the life of the equipment. Equipment costing more than $500 requires a signed equipment approval form. Equipment purchases must be approved by the TRP chair in advance of the purchase using the Equipment Purchase Request Form found on the ICT Resources And Guidelines page.

### 5.1.6.6 – ICT Research Reports

23 CFR 420.117(e), "Suitable reports that document the results of activities performed with FHWA planning and research funds must be prepared by the State DOT or subrecipient and submitted for approval by the FHWA Division Administrator prior to publication. The FHWA Division Administrator may waive this requirement for prior approval. The FHWA's approval of reports constitutes acceptance of such reports as evidence of work performed but does not imply endorsement of a report's findings or recommendations. Reports prepared for FHWA-funded work must include appropriate credit references and disclaimer statements."

All ICT project research reports should be drafted following the guidelines and format prescribed on the ICT Resources And Guidelines page. As stated in ICT's guidelines, all ICT project reports must be written in good scientific English. Poor sentence structure and grammar lead to delays in ICT's technical editing process, the TRP's review, and final publication. Reports containing excessive errors in grammar, syntax, spelling, and punctuation will be returned to the principal investigator for improvement. The PI is responsible for ensuring that the report conforms to standards of good writing. Therefore, if someone else writes a report (such as a co-author or student), the PI should review the report before submitting it to ICT for editing.

IDOT stresses implementable deliverables as research products and requires a discussion of implementation strategies and potential barriers to implementation in all ICT project reports. PIs and TRPs should allow three months from the time the report is submitted for the preliminary edit until it is ready for publication. This three-month report review period must be incorporated into all work plans.

After drafting, the PI must send the report to the ICT Editor for review before forwarding it to the TRP for review. The ICT Editor will return the report to the PI or send it to the TRP chair, as requested by the PI.

The TRP will review the draft report and provide comments or approve the report. The PI will work with the TRP to revise the report, as appropriate.

When the PI and TRP reach agreement on the technical content of the final report(s), the PI will re-send the report to the ICT Editor to check the format and finalize the report. The final report should be accompanied by the completed Report Information Page and the completed Documentation Page. This information can be found in the Template for ICT Reports on the ICT Resources And Guidelines page.

When the report has been finalized to the satisfaction of the TRP, the TRP chair should sign the TRP Chair Final Report Approval form found on the ICT Resources And Guidelines page and return it to ICT.

ICT will print/make CDs of the final report using the current distribution list, and will provide copies to including to IDOT staff (including the TRP, if requested), UIUC Library, FHWA libraries, TRISNET libraries, and the authors. Copies of final reports are available in PDF format on the ICT and IDOT websites. When the final report is posted, ICT will enter the report information into TRID, and will remove it from the Research In Progress (RiP) database.

#### 5.1.6.6.1 – Special Projects Reports

Because Special Projects are only six months in length, special procedures relate to the timing of the deliverables and final report:

The start date for a Special Project will be the date of the kick-off meeting (or the start of the nearest UIUC pay period). The TRP and PI will identify interim deliverables, due at the 6-month mark or before, at the kick-off meeting.

The total contract time frame of a Special Project is 10 months, which includes:

- Six months active work
- Draft interim deliverable is due to ICT for editing at five months – this might be a list of action items, executive summary, screen captures, etc., and it will be used to address the immediate needs of the Special Project
- Final interim deliverable provided by six months
- Report writing at seven months, due to ICT at end of month seven
- Regular editing process from months eight through 10
- Final report posted by month 10

### 5.1.6.7 – Presentations and Publications

Each PI and TRP chair shall understand and follow the specific details regarding presenting and publishing ICT research that are outlined in the IGA for ICT. General guidelines are provided here.

Per 23 CFR 420.117(e):

> "Suitable reports that document the results of activities performed with FHWA planning and research funds must be prepared by the State DOT or subrecipient and submitted for approval by the FHWA Division Administrator prior to publication. The FHWA Division Administrator may waive this requirement for prior approval. The FHWA's approval of reports constitutes acceptance of such reports as evidence of work performed but does not imply endorsement of a report's findings or recommendations. Reports prepared for FHWA-funded work must include appropriate credit references and disclaimer statements."

The FHWA Illinois Division has a longstanding practice, predating the IGA with ICT, of waiving the Division Administrator's approval of reports prior to publication. This is allowed as there are FHWA Division staff on each TRP, and they review the report as part of the normal report review process. The FHWA Illinois Division Office has confirmed its intent to continue waiving the approval of final reports for contract research reports given that an FHWA representative sits on every TRP overseeing contract research.

Contract research projects funded with SPR Part 2 funds must include appropriate credit references and disclaimer statements as set forth by IDOT in the current IGA.

Additional details about research data, publications, and confidentiality are available in the IGA.

### 5.1.7 - IMPLEMENTATION PLANNING WORKSHEET

A discussion on implementation will be included at each project's kick-off meeting. For this effort, an Implementation Planning Worksheet (IPW) was developed to aid TRPs in the identification of implementation goals as well as the process to deploy intended products. The Research Implementation Engineer will be the main contact for the PI and TRP on this effort, but ICT may assist as necessary in ensuring that the form is completed and then revisited at each TRP meeting.

The TRP and PI working together, shall complete form BR RC001, Implementation Planning Worksheet, within 2 weeks of the first project meeting. The IPW asks for the TRP to identify Offices or individuals which would be affected by the implementation of the research findings, allowing the TRP Chair as well as the PIs to reach out to the necessary personnel to achieve implementation. It also identifies tasks specific for implementation, as well as the individual or Office in charge, and the expected completion date. This information will allow the Research Development Unit to track the status of implementation and provide assistance as needed.

The IPW is intended to be a living document to be reviewed and revised to reflect changes in research findings during all meetings held for any given project. All revisions shall be submitted to the Research Implementation Engineer within two weeks of being updated.

The Research Implementation Engineer will work closely with the TRP Chair to develop the plan to ensure that the necessary information is captured to properly track and evaluate the effective and timely application of research results throughout IDOT. Actual implementation need not be delayed until the research is complete or the final report issued. At any stage where a project is close to producing results, the TRP Chair should evaluate findings for possible early implementation. Contact the Research Implementation Engineer for additional information.

## 5.2 – IN-HOUSE RESEARCH PROJECTS

In-house research projects are managed by IDOT. In-house research is generally only conducted on pavement-related topics and by the Pavement Programs Section of the Bureau of Research.

### 5.2.1 – SELECTION OF IN-HOUSE RESEARCHER AND TRP

The Engineer of Pavement Programs works with the Pavement Technology Engineer and the Pavement Properties Engineer to select an appropriate in-house researcher. Formal TRPs are not established for in-house research projects; however, close collaboration between the Technical Research Section and the Pavement Programs Section ensures proper project oversight.

### 5.2.2 – REVIEW AND APPROVAL OF WORK PLAN

The in-house researcher works with a Research Program Specialist and his/her supervisor to develop a workplan, including a timeline, which is reviewed by the Engineer of Pavement Programs and the Technical Research Coordinator. No budget is required for in-house research projects.

### 5.2.3 – OVERSIGHT OF IN-HOUSE RESEARCH PROJECTS

Progress on in-house research projects is monitored by the researcher's supervisor and a Research Program Specialist. Meeting notes and action items are recorded in project files.

#### 5.2.3.1 – Work Plan Changes

When a necessary change in research effort is required, the in-house researcher, his/her supervisor, and the Research Program Specialist must agree and change the work plan accordingly. The Engineer of Pavement Programs must approve of the change.

#### 5.2.3.2 – Travel

Per FHWA's Guidance on Use of FHWA Planning & Research Funds for Travel and Training, travel out-of-state and to conferences for the purposes of technology transfer is an expense eligible for Federal reimbursement. In recognition of travel budget restrictions, travel requests must be approved by the Engineer of Pavement Programs and submitted per Department policy.

#### 5.2.3.3 – Research Reports

All in-house research reports should be drafted in the format prescribed on ICT Resources And Guidelines page. The Technical Research Coordinator should be contacted for additional information regarding report review.

In-house research projects must include appropriate credit references and disclaimer statements as set forth by IDOT in the current IGA. In-house research reports are published as Physical Research Reports (PRR). The in-house researcher works with the Technical Research Coordinator to finalize and publish the report. Publishing a PRR requires approval from all impacted Bureau Chiefs via the PRR Approval form (BR RC 008).

The Technical Research Coordinator will oversee the distribution of the final report to the appropriate entities, including IDOT staff, FHWA libraries, TRISNET libraries, and the authors. Copies of final reports will be made available on the IDOT website.

# Chapter Six – Research Program Administration

## 6.0 – GENERAL

The authority for a State to administer its SP&R funds through the research program is found in 23 CFR 505 and 23 CFR 420. Financial issues for research are governed by 2 CFR 200.

IDOT is the direct recipient of the Federal SPR funding. As such, IDOT has the primary authority over and responsibility for all aspects of its research program (23 CFR 420.117 and 23 CFR 420.205). IDOT manages and administers all of its national research efforts. However, IDOT has elected to outsource specified aspects regarding the management and administration of its contract research program via an IGA with ICT at UIUC. The initial ICT IGA was executed August 22, 2005, for the term of July 1, 2005, through June 30, 2008; the second ICT IGA was executed June 27, 2008, for the term of July 1, 2008, through June 30, 2011; the third ICT IGA was executed June 8, 2011, for the term of July 1, 2011 through June 30, 2016 (since amended to run through June 30, 2017); and the current ICT IGA was executed July 5, 2017, for the term of July 6, 2017 through June 30, 2022. The current IGA and subsequent amendments can be viewed at the ICT Resources and Guidelines page . IDOT funds ICT mainly with SPR Part 2 funds, as well as a small amount of State funding for administrative staff.

Federal regulations require IDOT to perform the necessary management, monitoring, and documentation of the separate RD&T activities being undertaken by and through ICT. Although IDOT outsources specified aspects of its contract research management and administration to an outsourced entity (ICT), IDOT holds ICT to the same requirements required of IDOT as outlined in the *Code of Federal Regulations.*

IDOT also utilizes State funding for the administration and management of its contract research program. IDOT holds ICT to the same requirements required of IDOT as outlined in the regulations governing use of its State funding. Therefore, ICT is required to conduct all administration and management activities in compliance with all applicable State statutes and regulations including, but not limited to, Public Act 098-0675.

ICT's administration of IDOT's federally funded contract research follows the terms and provisions of the current ICT IGA. ICT and IDOT have developed additional guidelines, processes, and procedures to supplement the IGA. These are intended to provide guidance for the administrators of and participants in IDOT-funded research on the administration of the IGA and the ICT research program. If there is any conflict between any guidelines, processes, and procedures and the current IGA, it should be noted that the IGA supersedes the guidelines, processes, and procedures.

## 6.1 – PROGRAM MONITORING AND REPORTING REQUIREMENTS

The Federal SPR Part 2 funds utilized by the Bureau of Research are eligible for use only for RD&T activities relating to highway, public transportation, and intermodal transportation systems in accordance with the provisions of 23 U.S.C. 505(b). Per 23 CFR 420.203, these terms are defined as follows:

> *"Research* means a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research can be basic or applied."
>
> *"Development* means the systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems or methods, including design and development of prototypes and processes."

*"Technology transfer* means those activities that lead to the adoption of a new technique or product by users and involves dissemination, demonstration, training, and other activities that lead to eventual innovation."

### 6.1.1 – QUARTERLY PROGRESS REPORTS

The TRP chair will maintain contact with the PI and they will hold quarterly to semi-annual TRP meetings to review research progress. Given IDOT travel restrictions, web-based meetings are encouraged.

The required program monitoring and reporting requirements of the State are detailed in 23 CFR 420. ICT, through the IGA, shall fulfill these requirements and report the required information to IDOT as detailed below:

> 23 CFR 420.117(b)(1) "The State DOT must submit performance and expenditure reports, including a report from each subrecipient, that contain as a minimum:
>
> (i) Comparison of actual performance with established goals;
>
> (ii) Progress in meeting schedules;
>
> (iii) Status of expenditures in a format compatible with the work program, including a comparison of budgeted (approved) amounts and actual costs incurred;
>
> (iv) Cost overruns or underruns;
>
> (v) Approved work program revisions; and
>
> (vi) Other pertinent supporting data."
>
> 23 CFR 420.117(c) "Reports required by paragraph (b) of this section shall be annual unless more frequent reporting is determined to be necessary by the FHWA Division Administrator. The FHWA may not require more frequent than quarterly reporting unless the criteria in 49 CFR 18.12 or 49 CFR 19.14 are met. Reports are due 90 days after the end of the reporting period for annual and final reports and no later than 30 days after the end of the reporting period for other reports."

It should be noted that 49 CFR 18 - *Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments* and 49 CFR 19 – *Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations* have been superseded by 2 CFR 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*, effective December 26, 2014. However, 23 CFR 420 - *Planning and Research Program Administration*, as of this publication date, has not been updated to reflect the elimination of 49 CFR 18 and 49 CFR 19. As 49 CFR 18.12, "Special Grant or Subgrant Conditions for "High-Risk" Grantees" and 49 CFR 19.14, "Special Award Conditions" do not apply in this circumstance; the standard reporting requirements under 23 CFR 420.117(c) are acceptable.

To satisfy 23 CFR 420.117(c), IDOT provides quarterly reports to the FHWA. Quarterly reports are for the periods from January 1st through March 31st, April 1st through June 30th, July 1st through September 30th, and October 1st through December 31st. As noted previously in Section 5.1.6.2, ICT shall provide quarterly progress reports for all contract

research projects to IDOT and FHWA no later than 30 days after the end of a quarterly reporting period.

### 6.1.2 – ANNUAL EXPENDITURE REPORTS

Additionally, ICT provides a summary of actual expenditures for the period from July 1st through June 30th to IDOT no later than August 31st of each year, including estimated cost, actual cost, cost overruns or underruns, and cost share amount and percentage as outlined in the current IGA found in Appendix B. IDOT compiles the actual fiscal year expenditures for its entire research program and provides it to the FHWA Division Office by September 30th, allowing IDOT to meet the required 90-day reporting requirement outlined under 23 CFR 420.117(c) above.

### 6.1.3 – EVENTS OF SIGNIFICANT IMPACT

> 23 CFR 420.117(d), "Events that have significant impact on the work must be reported as soon as they become known. The types of events or conditions that require reporting include: problems, delays, or adverse conditions that will materially affect the ability to attain program objectives. This disclosure must be accompanied by a statement of the action taken, or contemplated, and any Federal assistance needed to resolve the situation."

To satisfy 23 CFR 420.117(d), ICT shall, via its Project Management staff, report to IDOT any problems, delays, or adverse conditions that will significantly impact its ability to attain administrative and/or RD&T activity objectives as soon as they become aware, as well as the proposed course of action. Examples of problems, delays, or adverse conditions include, but are not limited to, ICT staff departures, information technology security breaches, projected budget shortfalls, etc. IDOT will evaluate ICT's recommendations, determine the final course of action, and relay the pertinent information to the FHWA Division Office.

IDOT and ICT will hold weekly meetings/conference calls with the ICT Project Management Group and monthly administration meetings with the Director and Financial Administrator of the ICT. This is in addition to reporting required above.

### 6.1.4 – OTHER REPORTS

When Monthly Status Reports are received and reviewed by IDOT, IDOT will acknowledge the receipt and subsequent review of the report by IDOT staff via email back to ICT. This email will be saved as a PDF document and stored in a shared folder for future reference.

### 6.1.5 – RESEARCH DATABASES – TRANSPORT RESEARCH INTERNATIONAL DOCUMENTATION AND RESEARCH IN PROGRESS

According to 23 CFR 420.209(a)(4), conditions for approval of a State DOT's SPR RD&T Work Program include:

> "Support and use of the Transportation Research Information Services TRIS database for program development, reporting of active RD&T activities, and input of the final report information"

The Transportation Research Board (TRB) TRIS database has been integrated into the TRB Transport Research International Documentation (TRID) database. To comply with 23 CFR 420.209(a)(4), ICT shall enter project information for all new projects into the Research in

Progress (RiP) database at the start of a project. Upon project completion, ICT shall enter project and report information into the TRID database and remove the same from the RiP database. IDOT will perform these activities for its in-house research projects.

Additionally, ICT maintains an in-house databases to track research project information.

### 6.1.6 – FISCAL REQUIREMENTS – INDIRECT COSTS

Certain fiscal requirements related to indirect costs when used as cost share must comply with 2 CFR 200.306 (c) as follows:

> (c) Unrecovered indirect costs, including indirect costs on cost sharing or matching may be included as part of cost sharing or matching only with the prior approval of the Federal awarding agency. Unrecovered indirect cost means the difference between the amount charged to the Federal award and the amount which could have been charged to the Federal award under the non-Federal entity's approved negotiated indirect cost rate.

ICT shall provide applicable unrecovered indirect cost information for program management and research project activities for UIUC to IDOT. ICT shall also provide applicable unrecovered indirect cost information for all other university research project sub-awardees to IDOT. IDOT will forward this information to the FHWA Illinois Division Office for approval. Changes to the UIUC's and all university research project subawardees' Facilities and Administration rate for organized research will require ICT to provide IDOT and FHWA with a copy of the new rate agreement.

### 6.1.7 – FISCAL REQUIREMENTS – THIRD PARTY IN-KIND CONTRIBUTIONS

Certain fiscal requirements related to third party in-kind contributions must comply with 23 CFR 420.119 as follows:

> 23 CFR 420.119(b) "The value of third party in-kind contributions may be accepted as the match for FHWA planning and research funds, in accordance with the provisions of 49 CFR 18.24(a)(2) or 49 CFR 19.23(a) and may be on either a total planning work program basis or for specific line items or projects. The use of third party in-kind contributions must be identified in the original work program/scope of work and the grant/subgrant agreement, or amendments thereto. The use of third-party in-kind contributions must be approved in advance by the FHWA Division Administrator and may not be made retroactive prior to approval of the work program/scope of work or an amendment thereto. The State DOT or subrecipient is responsible for ensuring that the following additional criteria are met:
>
> (1) The third party performing the work agrees to allow the value of the work to be used as the match;
>
> (2) The cost of the third-party work is not paid for by other Federal funds or used as a match for other federally funded grants/subgrants;
>
> (3) The work performed by the third party is an eligible transportation planning or RD&T related activity that benefits the federally funded work;
>
> (4) The third-party costs (*i.e.,* salaries, fringe benefits, etc.) are allowable under the applicable Office of Management and Budget (OMB) cost principles (*i.e.,* OMB Circular A–21, A–87, or A– 122);

(5) The third-party work is performed during the period to which the matching requirement applies;

(6) The third party in-kind contributions are verifiable from the records of the State DOT or subrecipient and these records show how the value placed on third party in-kind contributions was derived; and

(7) If the total amount of third party expenditures at the end of the program period is not sufficient to match the total expenditure of Federal funds by the recipient/subrecipient, the recipient/subrecipient will need to make up any shortfall with its own funds."

49 CFR Parts 18 and 19 have since been replaced by 2 CFR 200; OMB Circular A-21 by 2 CFR 220; OMB Circular A-87 by 2 CFR 225; and OMB A-122 by 2 CFR 230. The current governing regulation is 2 CFR 200.306(b):

2 CFR 200.306(b): "For all Federal awards, any shared costs or matching funds and all contributions, including cash and third party in-kind contributions, must be accepted as part of the non-Federal entity's cost sharing or matching when such contributions meet all of the following criteria:

(1) Are verifiable from the non-Federal entity's records;

(2) Are not included as contributions for any other Federal award;

(3) Are necessary and reasonable for accomplishment of project or program objectives;

(4) Are allowable under Subpart E—Cost Principles of this part;

(5) Are not paid by the Federal Government under another Federal award, except where the Federal statute authorizing a program specifically provides that Federal funds made available for such program can be applied to matching or cost sharing requirements of other Federal programs;

(6) Are provided for in the approved budget when required by the Federal awarding agency; and

(7) Conform to other provisions of this part, as applicable."

To ensure compliance with 23 CFR 420.119(b) and 2 CFR 200.306(b), ICT shall provide all in-kind contribution information to IDOT. Third-party, in-kind contributions must be submitted to IDOT in time to allow for 10 business days review and approval by IDOT and FHWA. Third-party, in-kind contributions not submitted in time will not be approved. Third-party, in-kind contributions not approved by the FHWA Division Office prior to the start of the project will not be allowed.

### 6.1.8 – PARTICIPATION IN THE ANNUAL RD&T WORK PROGRAM

ICT will assist IDOT by providing an annual report showing all projects that will be active in each new fiscal year, including those projects with no new funds allocated for that year. This information will be incorporated into IDOT's Annual RD&T Work Program. Approval of the RD&T Work Program by FHWA is required prior to any contract research work taking place for that fiscal year. Additional information on the Annual RD&T Work Program can be found in Appendix A.

Additionally, 23 CFR 420.209(b) in part states:

> "….Significant changes in the management process also must be submitted by the State DOT to the FHWA for approval."

To ensure IDOT compliance with this regulation, ICT shall submit any proposed changes to its management process including, but not limited to, staffing changes, reorganizations, etc., in writing, to IDOT for approval prior to implementation.

### 6.1.9 – ELIGIBLE EXPENSES – FEDERAL FUNDS

23 CFR 420.205(f) states the State DOTs will have primary responsibility for managing RD&T activities supported with FHWA planning and research funds carried out by other State agencies and organizations and for ensuring that such funds are expended for purposes consistent with this subpart. Further, 2 CFR 200.403 states except where otherwise authorized by statute, costs must be necessary and reasonable for the performance of the Federal award and be allocable thereto under these principles to be allowable under Federal awards.

The key phrases are necessary, reasonable, and allocable.

#### 6.1.9.1 – RD&T Activity Invoices

In order to ensure that costs are necessary, reasonable, and allocable, invoices for contract research projects should contain adequate documentation of the invoices and supporting reports shall, at a minimum, clearly show the following:

a) the total obligated amount of the award to date for the Project or RD&T Activity;
b) the amount expended for the billing period;
c) the cumulative amount expended to date;
d) the remaining balance;
e) salary and fringe benefits charges per person;
f) tuition remission expenses per student;
g) travel per staff member/student;
h) equipment/supplies;
i) Facilities and Administration expenses; and
j) cost share.

**Note** - for all expenses of $500 or more, including but not limited to equipment purchases greater than $500 and ATLAS use, and for all conference expenses, overnight travel and out-of-state travel expenses, the appropriate documentation (e.g., the approved ICT travel and/or equipment forms) must be attached to the invoice. The current ICT travel and equipment forms can be found on the ICT Resources And Guidelines page.

#### 6.1.9.2 – Equipment

For the purposes of this program, equipment is defined as an item of nonexpendable, tangible personal property with a useful life of more than one year and a value equal to or greater than $500.

Equipment and supplies purchased with Federal FHWA SPR funds are governed by the rules and regulations of 23 CFR 420 and 2 CFR 200 as well as any related CFR and/or

OMB Circulars referenced therein. These rules and regulations are subject to change. The current version of the rules and regulations will be enforced.

Purchase or rental of specialized equipment for an individual research project or a series of related projects may be eligible for Federal funding.

2 CFR 200.439(b)(2) states that:

> "Capital expenditures for special purpose equipment are allowable as direct costs, provided that items with a unit cost of $5,000 or more have the prior written approval of the Federal awarding agency or pass-through entity."

To ensure compliance with 2 CFR 200.439(b)(2), and with IDOT's unit cost limit of $500, written approval from IDOT must be obtained prior to equipment purchases or rental equal to or greater than $500.

In 2014, the FHWA Division Office received guidance from the FHWA Office of the Chief Financial Officer (OCFO) with regards to equipment purchases and use. The OCFO stated that equipment should only be purchased with Federal SPR Part 2 funds when it is specialized and its predominant use would be for a specific research project or the federally-funded research program. For example, it would not be appropriate to purchase a compression machine, a scale, or other type of common laboratory or materials testing equipment.

To the extent possible, equipment purchases shall be itemized in the project's work plan and budget and tracked separately throughout the life of the equipment. Equipment costing more than $500 requires a signed equipment approval form.

ICT is required to maintain an inventory record of each item of nonexpendable equipment purchased or built with Federal funds. Information recorded for each item shall include the date of purchase, total cost, serial number and model identification, inventory number, and Project number under which the equipment was acquired. ICT will provide a copy of the equipment inventory to IDOT on a quarterly basis. When equipment records are received and reviewed by IDOT, IDOT will acknowledge the receipt and subsequent review of the report by IDOT staff via email back to ICT. This email will be saved as a PDF document and stored in a shared folder for future reference.

Upon completion of a contract research project, IDOT and ICT shall make a decision on retention of equipment.

When equipment is purchased with Federal funds, it may be used for purposes outside the federally-funded SPR program only when there are no associated labor charges and the work is not being sponsored by a non-Federal source. For example, the equipment may be used during down time for academic pursuits (e.g. student working on thesis) not involving outside funding.

If a piece of equipment purchased with Federal funds is no longer being used on the project or the federally-funded SPR program, there are three options:

1) IDOT may take ownership of the equipment. The equipment would then be removed from ICT's inventory, received by the Bureau of Research, and added to IDOT's inventory in the specific Bureau in which it is used to provide for ongoing tracking. The Bureau of Research will keep a record of equipment transferred to other IDOT

bureaus. This is the default option in the IGA.

2) ICT can maintain possession, but must track use of the equipment. Equipment purchased with Federal funds can be used by students or on other federally-funded research. If the equipment is used for non-Federal research, ICT must document usage, charge a fair rate for use of the equipment, and reimburse IDOT accordingly.

3) Upon IDOT's approval, ICT can either purchase the equipment from IDOT or sell the equipment to a third party and return the selling price to IDOT. In either case, the equipment should be removed from ICT's inventory.

#### 6.1.9.3 – Travel

Per FHWA's *Guidance on Use of FHWA Planning & Research Funds for Travel and Training* (http://www.fhwa.dot.gov/hep/guidance/sprt.cfm), travel out-of-state and to conferences for the purposes of technology transfer is an expense eligible for Federal reimbursement. To the extent possible, such travel shall be itemized in the project's work plan and budget. In recognition of travel budget restrictions, travel funded with Federal research money should be limited to faculty and IDOT representatives who provide direct benefit to IDOT's research program. Travel must be approved by the TRP Chair in advance of the travel using the travel forms found on the ICT Resources And Guidelines page.

#### 6.1.9.4 – ATLAS USAGE/RECORDKEEPING

The Accelerated Transportation Loading System (ATLAS) is a state-of-the-art, full-scale accelerated pavement testing machine located at the ATREL facility in Rantoul, Illinois.

ICT shall maintain a daily journal documenting the use of the ATLAS for any Research Project, which shall be made available upon request. Journal entries shall include:

- the number of the Research Project for which the equipment was utilized;
- time frame equipment was in use; and
- idle time due to location change, and/or repairs.

For IDOT research projects, payment will only be made to move the ATLAS into place for a Research Project.

#### 6.1.9.5 – Federally-Funded Line Items

Federally-funded line items were originally established in the FY2009 to cover costs of work conducted by ICT that impacted all projects. A history of these federally-funded line items can be found in Appendix B.

The federally-funded line items reflect the following parts of the CFR:

2 CFR 200 405(d) states:

> (d) "Direct cost allocation principles. If a cost benefits two or more projects or activities in proportions that can be determined without undue effort or cost, the cost must be allocated to the projects based on the proportional benefit. If a cost benefits two or more projects or activities in proportions that cannot be determined because of the interrelationship of the work involved, then, notwithstanding paragraph (c) of

this section, the costs may be allocated or transferred to benefitted projects on any reasonable documented basis."

and

2 CFR 200.413 (c) states:

(c) "The salaries of administrative and clerical staff should normally be treated as indirect (F&A) costs. Direct charging of these costs may be appropriate only if all of the following conditions are met:

(1) Administrative or clerical services are integral to a project or activity;

(2) Individuals involved can be specifically identified with the project or activity;

(3) Such costs are explicitly included in the budget or have the prior written approval of the Federal awarding agency; and

(4) The costs are not also recovered as indirect costs."

A review of specific tasks performed by the ICT Research Coordinators, ICT Editor and Technology Transfer staff was conducted by IDOT, ICT, and the FHWA IL Division Office. These positions are integrally involved with every research project, and the FHWA IL Division Office has ruled that salaries for these positions can be considered direct costs and that they will approve a federally-funded line item to be used in the IGA for these positions. In the interests of clarity, these will be designated as separate line items: 1) Project Coordination, 2) Editorial Support and Technology Transfer and Research Dissemination and Implementation. While some technology transfer tasks are federally eligible, not all are. As such, Technology Transfer activities will be coordinated on a work order basis.

These line items are regularly reviewed to ensure that IDOT and ICT continue to be in compliance with the CFR.

#### 6.1.9.5.1 – Project Coordination

This line item includes project level coordination of ICT/IDOT research project activities through direct involvement. The staff working in project coordination will be intimately involved with each research project from inception to completion, and will be the main contact for Principal Investigators and Technical Review Panel Chairs throughout the project. Because these responsibilities will be a part of each project, IDOT has worked with FHWA to provide a line item for the two full time positions that will carry out these responsibilities. The federally eligible tasks of the Research Coordination staff include:

- Research Coordinators assist with TAG Process, both the identification of research needs and the selection of projects for funding:
    - Attends, participates in, and takes minutes of each TAG meeting as well as facilitates finalization and distribution of minutes
    - Assists with dissemination of Research Needs
    - Assists with collection of proposals

- Tracks approval of projects and facilitates notification to PIs on proposal outcome (approved, denied, tabled, etc.)

- Research Coordinators assist with project Technical Review Panels:
  - Facilitates creation of project work plan and budget, including creation of RFP as necessary.
  - Review of work plans prior to IDOT approval to verify that the time, budget, equipment and testing needs are valid.
  - Assists TRP chair and PI with scheduling TRP meetings every 4-6 months, including facilitation of web conferencing or conference calls for meetings as necessary.
  - Provides notification to IDOT Research Coordination staff of upcoming meeting dates and locations.
  - Attends and participates in each TRP meeting, including:
    - taking minutes of each TRP meeting, facilitating finalization, posting and distribution of minutes, and ensuring that accurate meeting dates, TRP membership and student researchers are included on the QPR;
    - addressing any potential issues such as budget or time concerns and upcoming travel or presentations during the project, and working with the PI and TRP chair to ensure completion and submittal of the appropriate forms (e.g., time and budget extensions, equipment requests, and travel requests) to ICT administration;
    - monitoring relationship between PI and TRP and making IDOT and ICT management aware of any issues or concerns; and
    - ensuring the IDOT Implementation Planning Worksheet is discussed at each TRP meeting.
  - Acts as liaison between technical editor and TRP chair to manage flow of upcoming reports and deliverables
  - If any project experiences significant delays and/or significant change in workplan, the Research Coordinator or Implementation Engineer may be asked to provide testimonial input during a specific weekly meeting.
  - Creates monthly update reports provided to IDOT
  - Assists with potential tech transfer activities that may come from the project by attending and taking pictures or videos of field work and working with the editorial and technology transfer staff to develop technical transfer documents such as project spotlights and summaries
  - Reviews QPRs for accuracy, addresses any errors, and updates the QPR website for ICT/IDOT project information

- Prepares, maintains and updates ICT's IDOT equipment inventory for the group of projects to which the Research Coordinator is assigned. Provides to ICT administration for finalization.

  - In the event that ICT engineering staff must assist in Research Coordinator review of work plans to verify that the equipment and testing needs are valid, this may be charged to Project Coordination.

#### 6.1.9.5.2 – Editorial Support and Technology Transfer

Federal regulations are clear: there is a difference between "public relations" and "technology transfer". Under a cooperative agreement, IDOT provides Federal SPR Part 2 funds to ICT. These funds can only be used for RD&T activities. The definition of technology transfer is provided in Section 6.1 above. These funds cannot be used for public relations functions, as defined in 2 CFR 200.421(c):

> (c) "The term "public relations" includes community relations and means those activities dedicated to maintaining the image of the non-Federal entity or maintaining or promoting understanding and favorable relations with the community or public at large or any segment of the public."

To ensure that IDOT is only utilizing SPR2 funds for appropriate Technology Transfer, all Technology Transfer requests will be handled on a work order basis at the request of IDOT. Only items submitted under a work order will be eligible for reimbursement. Items not requested by IDOT shall be deemed independent technology transfer, and will not be eligible for reimbursement.

This line item includes editorial support and technology transfer for ICT/IDOT research project activities. The staff working in this area will be involved in each project, but not to the same extent as the research coordinators. Because these responsibilities relate to each project, IDOT has worked with FHWA to provide a line item for the one full time position that will carry out these responsibilities. The federally eligible tasks of the Editorial Support and Technology Transfer staff include:

- Facilitates communications among IDOT and ICT project coordination staff, TRP chairs, and PIs regarding the report editing process.

  - Performs initial and final edits on all ICT/IDOT research reports and deliverables funded by IDOT. Examples include: technical research reports, including interim reports as requested; project spotlights; and newsletter articles.

  - Additionally, ICT will make editing services available to all Principal Investigators and students working on IDOT funded research and submitting a paper on this research to TRB or other peer reviewed publications. This will be coordinated by ICT and must be requested in advance by the PI.

- Prints and distributes ICT/IDOT final research reports to libraries, PIs, TRP members, etc.

- Enters preliminary project information for funded projects into the Research in Progress (RiP) database.

- Enters final report information into TRID and removes from RiP databases

- Works with the research coordination staff to develop technical transfer documents per mutually agreed upon work orders.

- If project coordination staff is unavailable, assists with potential tech transfer activities that may come from the project by attending and taking pictures or videos of field work

#### 6.1.9.5.3 – Research Dissemination and Implementation

Research Dissemination and Implementation activities are conducted by IDOT or ICT, and provide dissemination and implementation of research findings. These activities shall be in the form of demonstration, training, and other activities approved by IDOT that lead to eventual innovation. (23 CFR §420.203) These activities include, but are not limited to, the following:

This line item includes funds for sharing information with other state and national level research staff, as well as practitioners in the research project area. This line item does not directly fund staff, but instead supports activities for research dissemination and implementation activities. Because these responsibilities may relate to any and all IDOT funded research projects, IDOT has worked with FHWA to provide a line item for the following Research Dissemination and Implementation activities:

- Travel for technology transfer opportunities on projects that have previously ended as allowed in FHWA's Guidance on Use of FHWA Planning & Research Funds for Travel and Training

- Pilot implementation efforts.

- IDOT technical conference sponsorship, which covers technical conference support as approved by the GRANTOR.

- IDOT agreed upon updates to QPR system or website to improve technology transfer and information sharing.

#### 6.1.9.5.4 – Other Eligible Activities

As part of research projects conducted at ATREL, engineering activities may occur that are federally eligible, but that may not be charged to any of the broad line items above. These project specific engineering assistance costs should be directly charged to the individual project for reimbursement.

- Development and optimization of ICT/IDOT research project protocols as needed.

- Oversight and execution of research experiments, including coordination of materials and supplies, for IDOT/ICT projects in the lab at ATREL and in the field.

- Inspection of equipment prior to use on an IDOT funded project, including necessary calibration, repair, and user training.

- Maintenance and recordkeeping for ATLAS use on IDOT funded projects, if not already included in the ATLAS fee.

### 6.1.10 – UNALLOWABLE EXPENSES – FEDERAL FUNDS

The cost principles and eligibility of direct and indirect cost items relative to federally-funded research activities are set forth in the Uniform Guidance provided in 2 CFR 200. Direct costs may be claimed for reimbursement when in the form of expenses for personnel, travel, and equipment, rental of special space, and materials and services, as further defined in the IGA.

An indirect cost rate for UIUC is set in the IGA. Indirect costs are reimbursable only as a part of the federally-established overhead rate. Indirect costs include items not used solely for IDOT's contract research program. UIUC can either develop a separate cost pool for ICT or include ICT in UIUC's federally-established cost pool. Costs which are included in UIUC's federally-established cost pool rate cannot be billed to IDOT as a direct cost. Examples of indirect costs include, but are not limited to:

- Office supplies, including phones and furniture;
- Computers or servers for ICT's management and administrative staff (Specialized computers (e.g., a rugged laptop required for field data collection) may be billed as a direct cost on a specific research project, but dissemination of the equipment will be according to Section 6.1.9.2 above.);
- Generalized laboratory equipment or building modifications to laboratory or office space at ICT;
- Maintenance and upkeep of ICT website;
- ICT website modifications, unless specifically requested by IDOT. (Such modifications could then be appropriately charged to the Project Management line item.); and/or
- Since ICT conducts research for other entities and the laboratory facilities and equipment are used for purposes outside of the federally-sponsored program, staff time related to general laboratory upkeep, ordering supplies, calibration of equipment, and other tasks that are not specifically related to sponsored research are not eligible under the SPR RD&T program.

### 6.1.11 – ELIGIBLE EXPENSES – STATE FUNDS

State funds provided to ICT may be used for "maintenance, traffic, and physical research purposes" per Public Act 098-0675. Due to limitations in State funding, Federal funds will be utilized to the maximum extent possible. Prior approval from IDOT is required for all purchases intended to be made with State funds. Costs must be necessary, reasonable, and allocable. Invoices for administrative costs should contain the same information shown in Section 6.1.9.1 above.

### 6.1.12 – IDOT - ICT ADMINISTRATIVE MANAGEMENT

Per 29 CFR 420.117 (a) "In accordance with 49 CFR 18.40, the State DOT shall monitor all activities performed by its staff or by subrecipients with FHWA planning and research funds to assure that the work is being managed and performed satisfactorily and that time schedules are being met."

The contents of 49 CFR 18.40, “Monitoring and Reporting Program Performance”, have since been incorporated into 2 CFR 200.328, “Monitoring and Reporting Program Performance”. Per 2 CFR 200.328(a),

> “The non-Federal entity is responsible for oversight of the operations of the Federal award supported activities. The non-Federal entity must monitor its activities under Federal awards to assure compliance with applicable Federal requirements and performance expectations are being achieved. Monitoring by the non-Federal entity must cover each program, function or activity.”

Additionally, 2 CFR 200.328(b)(1) states:

> “The non-Federal entity must submit performance reports at the interval required by the Federal awarding agency or pass-through entity to best inform improvements in program outcomes and productivity. Intervals must be no less frequent than annually nor more frequent than quarterly except in unusual circumstances, for example where more frequent reporting is necessary for the effective monitoring of the Federal award or could significantly affect program outcomes. Annual reports must be due 90 calendar days after the reporting period; quarterly or semiannual reports must be due 30 calendar days after the reporting period. Alternatively, the Federal awarding agency or pass-through entity may require annual reports before the anniversary dates of multiple year Federal awards. The final performance report will be due 90 calendar days after the period of performance end date. If a justified request is submitted by a non-Federal entity, the Federal agency may extend the due date for any performance report.”

Further, 2 CFR 200.328(d) states:

> “Events may occur between the scheduled performance reporting dates that have significant impact upon the supported activity. In such cases, the non-Federal entity must inform the Federal awarding agency or pass-through entity as soon as the following types of conditions become known:
>
> (1) Problems, delays, or adverse conditions which will materially impair the ability to meet the objective of the Federal award. This disclosure must include a statement of the action taken, or contemplated, and any assistance needed to resolve the situation.
>
> (2) Favorable developments which enable meeting time schedules and objectives sooner or at less cost than anticipated or producing more or different beneficial results than originally planned.”

In order to fulfill these responsibilities, IDOT and ICT have agreed to a list of items required for the execution of the entire program. These are not project specific items that are allocable to a specific project, and must be done for each project as part of the management and administration of the IDOT/ICT IGA at UIUC. These items are not eligible for federal funding and include:

- General oversight of the IDOT research program under the ICT/IDOT IGA, projects and programs executed through the IGA, and interpretation of IGA.
- Budget/financial oversight for ICT/IDOT IGA including but not limited to: review of project budgets for validity, facilitation of project funding, final review and processing of work plans, budgets, time extensions/budget increases, and general project contracting process.

- Provision of quarterly IDOT BOBS 2832 form required per Exhibit G of FY18+ IGA, and annual financial reports.

- Attendance at all ICT/IDOT administrative, executive committee meetings, or similar meetings related to the administration of the program.

- Identification of potential Principal Investigators, guidance and assistance to PIs on issues related to execution of IDOT/ICT projects.

- Oversight and guidance of ICT administrative support, engineering, project management, and communications staff assigned to assist with the administration of the ICT/IDOT research program.

- Review and submittal of ICT's IDOT equipment inventory.

- IT support to staff, PIs, TRPs and other website users as related to ICT/IDOT projects and issues. This includes but is not limited to: QPR website forms updates, password recovery, routine maintenance of website, overhauls to the IDOT website content not agreed upon by IDOT, assistance to computer users at ATREL and acting as a technical liaison between CITES and ATREL.

- Maintenance of adequate network efficiency and reliability for ICT/IDOT related projects, files, website, etc., and planning for future needs (e.g. network servers, work stations, software, etc.).

- Administrative support for the Director of ICT or any IDOT sponsored staff of ICT.

- General engineering support at ATREL

- Inventory, maintenance and calibration recordkeeping for all testing equipment at ATREL.

- Maintenance of qualified lab status for ATREL lab and testing equipment used on IDOT projects. (If ICT changed to a billing per use system for this equipment, this could be a direct cost allocable to a specific project utilizing the equipment. Since ICT is currently unable to bill equipment fees, this is not allocable to a specific project and cannot be federally reimbursed.)

#### 6.1.12.1 – Monthly ICT Administrative Meetings

Management personnel from the IDOT Bureau of Research meet monthly either in person or via conference call with the ICT Director and staff to discuss the ICT research program. IDOT's upper management and FHWA staff may also be included in these meetings, as needed. The location of the in-person meetings alternates between the Bureau of Research in Springfield and ATREL in Rantoul. IDOT provides a draft agenda to all participants prior to the meeting. ICT staff takes meeting notes, including action items that are revisited until they are adequately addressed.

#### 6.1.12.2 – Weekly Group Leader's Meeting

IDOT's Technical Research Coordinator and ICT staff conference call weekly to briefly discuss ongoing project management issues. Responsibility for meeting notes is shared between the IDOT and ICT. Action items or concerns that cannot be resolved at these weekly meetings may be discussed at the monthly administrative meeting.

### 6.1.12.3 – Semi-Annual Evaluations

IDOT, in coordination with the ICT, is responsible for establishing an evaluation process as agreed to by both parties to measure the effectiveness of the management and administration of the Program.

IDOT will provide ICT a semi-annual evaluation of its administration and management of ICOT's contract research program as outlined in the IGA. This evaluation is shared with the Director of ICT, IDOT upper management, and the FHWA Division Office representative overseeing IDOT's SPR RD&T research program.

### 6.1.12.4 – ICT Staff Hiring and Accountability for Staff Time

All salaried ICT staff members are UIUC Academic Professional personnel. Their hiring is governed by UIUC personnel policies and procedures. All personnel are hired through a search committee procedure with Equal Employment Opportunity Commission representation. Their pay and benefits are governed by the UIUC.

ICT administration and other ICT staff, whether funded with Federal SPR Part 2 funds or State funds, must complete quarterly reports of their activities. These quarterly reports are submitted to IDOT with the quarterly progress reports for all ICT research projects. ICT also provides IDOT with a quarterly update listing staff in each IDOT/federally-funded position and showing the percentage of each salary from the individual IDOT/federally-funded line item(s).

### 6.1.12.5 – Contract Research Project Performance Evaluations

Twice annually each TRP Chair is asked to evaluate the performance of the PI for each project, and the PI is asked to evaluate the performance of the TRP.

- The feedback is usually provided in late May to early June and late November to early December.
- The TRP uses a "TRP Evaluation of PI" form to perform its evaluation and the PI uses an "Administrative Performance Evaluation" form to perform his/her evaluation.
- The evaluation forms are on the ICT Research Forms and Guidelines website at the ICT Resources And Guidelines page and in Appendix C.

These reports are used as an indicator of the success of the relationship between the TRP and PI. If any negative issues are identified by either the TRP Chair or the PI, ICT and IDOT will work with them to resolve the issues.

### 6.1.12.6 – Contract Research Project Closeout Evaluation

At the end of the project, the TRP will be asked to collaborate on a final evaluation of the PI(s) using form BR RC003. This evaluation will help IDOT and ICT to gauge the level of satisfaction that the TRP had with the PI(s) throughout the project and also identifies the type and quality of the various deliverables that were provided to the TRP.

# Chapter Seven – Implementation

## 7.0 – GENERAL

The ultimate goal of research is implementation. Implementation is the use, adoption, dissemination, or standardization of research findings to modify, create, or support new or current policy, standards, or products for the Department.

For implementation to become a reality, it must be actively considered during all phases of a research project. The following sections describe how implementation is addressed throughout the various stages of a research project.

The implementation process begins with the identification of IDOT Research Needs, which identify the most pressing needs of the Department that can be addressed through research, emphasize the goals of the research, and indicate the desired application of the project's outputs. Problem Statements/Proposals are required to address the potential application of anticipated research results. IDOT's Proposed Research Idea form (Appendix C), used to solicit proposals from all interested parties, requests an expected implementation outcome and asks submitters to:

> **"**Describe the expected quantitative outcomes in terms of policy advances, cost savings, increased life cycle, safety, environmental impacts and sustainability, user benefits, and/or other appropriate metrics. At minimum, explicitly list the benefits to IDOT regarding life-cycle cost and sustainability. Please note that IDOT is interested in immediate implementation of research outcomes."

Consideration of implementation continues throughout the project. Work plans developed for approved research projects should include implementable deliverables. IDOT needs regarding specific uses, file formats, software, or hardware, etc. should be discussed up front and throughout the study. Additionally, In-house researchers and TRPs and PIs working together are encouraged by Research Development Unit to develop and update implementation strategies during the research project via form BR RC001, *Implementation Planning Worksheet* (Appendix C). Final reports should include recommendations for implementation, potential barriers to implementation and how to overcome them, as well as implementable deliverables such as draft policy statements, specifications, standard drawings, test procedures, etc., as appropriate.

Actual implementation need not be delayed until the research is complete or the final report issued. At any stage where a project is close to producing results, the TRP chair or in-house researcher should evaluate findings for possible early implementation. Whenever feasible, the TRP chair or in-house researcher should work with the Research Implementation Engineer to solidify the implementation plan developed via the *Implementation Planning Worksheet* to ensure effective and timely application of the research results throughout IDOT. Implementation of project results, whether interim or final, is at the discretion of IDOT.

Results of research projects will be monitored and evaluated by the Research Development Unit. The Research Implementation Engineer tracks implementation activities for all contract and in-house research, and is working toward tracking the implementation of national research. Close communication between in-house researchers, TRP Chairs and PIs, IDOT technical contacts for national research studies, and the Research Development Unit is critical to the success of implementation tracking and help determine the value of research.

## 7.1 – IMPLEMENTATION DEFINITION AND CLASSIFICATION

The Technical Research Section has standardized the way in which research projects are categorized depending on their potential for implementation and/or actual implementation status. This approach has allowed the Technical Research Section to identify the status of most research projects and better provide assistance with deployment when needed, even after the completion of the research effort.

Clearly defined implementation statuses were developed as follows:

- **Implemented:** The research findings were deployed through one or more products.
- **Implementation Underway:** Implementable products have been identified and implementation activities have begun.
- **Implementation Expected:** The potential products to be implemented have been identified but implementation activities are not yet underway.
- **Not implemented:** Even though an implementable product was identified from the research findings, it was decided not to implement due to a given reason, i.e. political pressure, lack of resources, economics, etc.
- **Not applicable**: The project did not produce an implementable product.

Along with these definitions, a work flow, Figure 7-1, was developed to identify the status of any project.

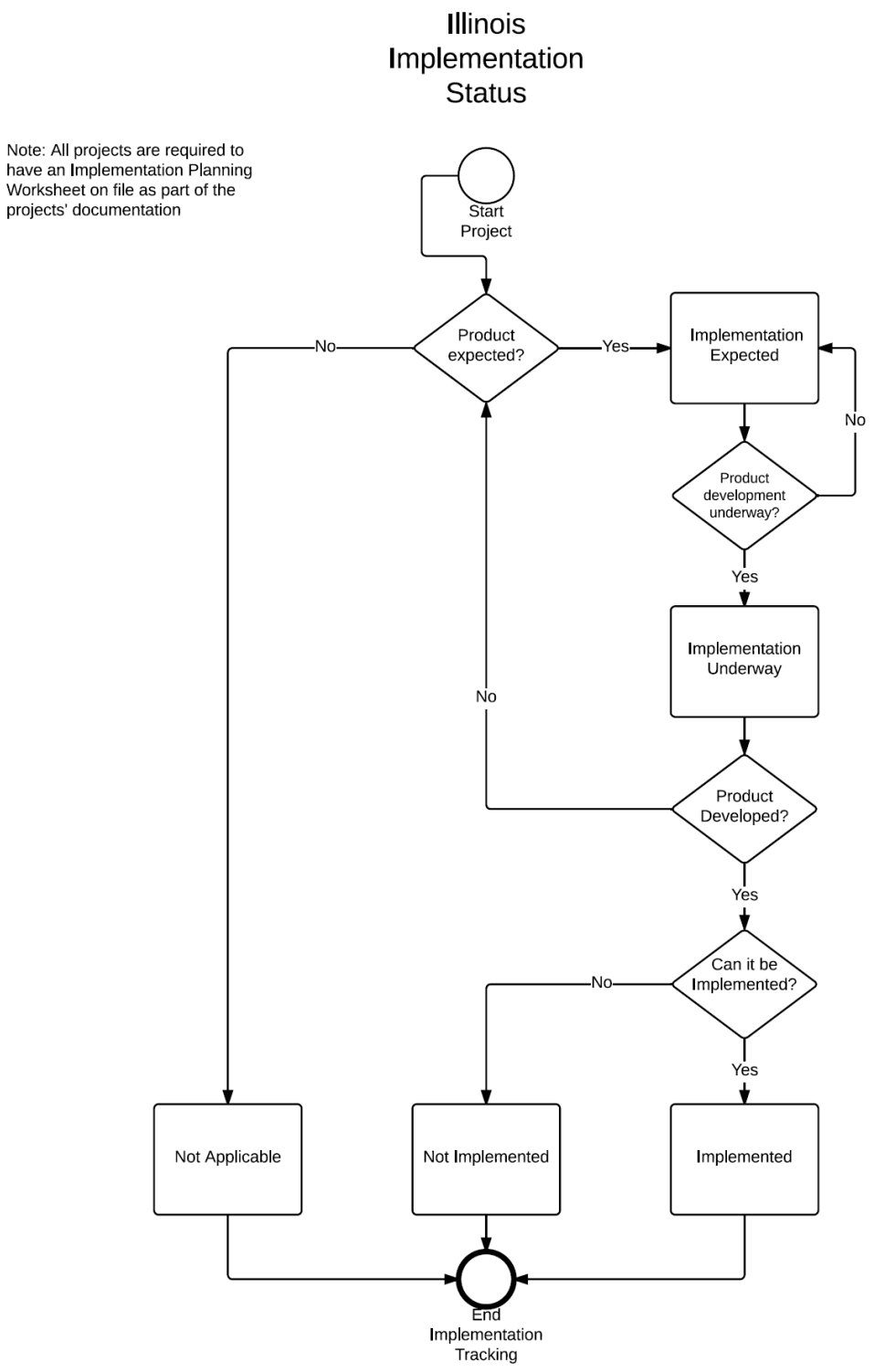


*Figure 2 Implementation Flow Chart*

## 7.2 – MONITORING

The responsibility for tracking implementation activities for individual research projects ultimately lies with the Research Development Unit, the sponsoring TAG, and the TRP Chair. Close communication between TRP Chairs and PIs, IDOT technical contacts for national research studies, and the Research Implementation Engineer is critical to the success of implementation tracking and help determine the value of research.

The Research Development Unit will review the IPW at the onset of the project and throughout the life of the project.

Six months prior to the end of the project, the Research Development Unit will review the IPW with the TRP chair to assess necessary implementation assistance. This will allow the TRP chair, TRP panel, and PIs to work together to make sure deliverables are usable and implementable for the Department. This review will also allow the Research Implementation Engineer to provide assistance in planning and logistics of deployment by encouraging/setting meetings, securing managerial support, and reviewing products that will be delivered.

The review of the IPW upon completion of the research project is intended to finalize details of the products being delivered by the researcher, and provide guidance to the Department staff on which steps to take next towards deploying the products. Roughly one year after project completion, the Research Development Unit will revisit the project to verify the project findings were fully implemented and to identify how they have impacted IDOT practice.

For some projects, the Research Development Unit will work to further quantify the benefits of the project(s). Additional quantification may also occur after a longer time period, depending on the project.

## 7.3 – REPORTING

The Technical Research Section will provide periodic reporting to the FHWA Division Office regarding the status of research completed and underway, as well as the impacts and advancements resulting from research projects. Additional assistance may be requested from in-house researcher, ICT, TRP chairs and members, and PIs to provide supplemental information as needed.

### 7.3.1 – ANNUAL SUMMARY

At the end of each fiscal year, the Technical Research Section will prepare a summary of implementation progress. This summary will:

- Discuss implementation decisions/activities which occurred during the given fiscal year on completed and/or active projects.
- Highlight implementation on the horizon in regards to:
    - active projects that show good potential for implementation, and
    - proposed projects that are probable candidates for implementation.
- Address research being conducted in other States that could potentially be beneficial to Illinois.

The annual summary will be distributed to IDOT's upper management, the IDOT/ICT Executive Committee and FHWA. The report will also be available on IDOT's research website. An email notification with a link to the report will be sent to all research managers at other State DOTs.

In the event that IDOT staff is unable to prepare such a report, they will reach out to the FHWA Illinois Division Office for additional direction on ways to share the information in lieu of a written report.

# Chapter Eight – Technology Transfer

## 8.0 – DEFINITION

Technology transfer is required by 23 CFR 420.203, and is a key to a successful research program. Per 23 CFR 420.203, technology transfer is defined as follows:

> *"Technology transfer* means those activities that lead to the adoption of a new technique or product by users and involves dissemination, demonstration, training, and other activities that lead to eventual innovation."

IDOT has a responsibility to let internal and external partners, as well as the general public, know what our research has shown. The Research Resource Sub-Unit is tasked with creating technology transfer products for IDOT's research program, and works closely with the Office of Communications to assess how best to show the value and benefit of research efforts conducted by IDOT. NCHRP Report 610, *Communicating the Value of Transportation Research*, is an excellent resource for information on effective technology transfer strategies.

## 8.1 – HOW TO PROVIDE EFFECTIVE TECHNOLOGY TRANSFER

Technology transfer takes many different forms, and for these product(s) to be effective, it is important to do the following:

- Determine the audience.
- Identify the tangible benefits or impacts that you want to communicate.
- Determine the best time to communicate with your audience.
- Build coalitions.
- Build two-way relationships.
- Tailor packaging to your audience.

These concepts are explored in further detail below.

### 8.1.1 – DETERMINE THE AUDIENCE

Depending upon the information being transferred, different mediums and methods may be employed. Therefore, it is important to begin by determining who makes up the target audience(s). Audiences may include administrators, legislators, IDOT staff, other State DOTs, local agencies, industry, the general public, etc., or any combination thereof.

Next, determine what key messages will resonate with the target audience. Varied audiences may have different key messages, so it may be necessary to develop different technology transfer products that address their different interests. The traveling public may be greatly most in research that results in faster construction openings, while IDOT decision makers will want to know of improved designs that result in longer-lasting pavements. Taking the time to identify the target audience and the key message you wish to transmit to each group will facilitate the development of effective technology transfer products in a timely fashion.

### 8.1.2 – IDENTIFY TANGIBLE BENEFITS

In order for the audience to relate to your message, you need to define the tangible benefits that they will realize from the research you are presenting. Without tangible benefits that they can appreciate, the intended audience will have little interest in the message. Examples of tangible benefits could include savings for IDOT in terms of materials, labor, and/or time; improved quality; increased life cycle; decreased cost; improved safety; environmental aspects; user benefits; new technology; etc.

Work plans developed for contract research are required to identify the expected benefits of the research in the following areas: Construction Savings, Operation and Maintenance Savings, Increased Lifecycle, Decrease in Lifecycle Cost, Safety, Decreased Engineering/Administrative Costs, Environmental Aspects, Technology, User Benefits, or Other. Further, the PI is expected to work with IDOT to assess the value of quantifiable benefits, making this information readily available. Identifying the benefits most important to an audience is simply a matter of assessing the audience to determine which benefits from a research effort will resonate with them.

### 8.1.3 – DETERMINE TIMING

The timing of a technology transfer product release can matter. Therefore, it is necessary to determine the best time to communicate with your intended audience. For some products, there is no single best time, as informational value from the research effort is the main goal. On the other hand, if the technology transfer product contains information that administrators or legislators involved in the decision-making and budgeting process need in order to make their decision, the timing of the release can be critical. The Technical Research Section, in conjunction with IDOT management, may need to make the ultimate decision on the timing of the release of technology transfer products.

### 8.1.4 – BUILD COALITIONS

Sometimes there is an opportunity to leverage coverage of a research product by getting involved with others who have an interest in promoting the same or a similar message(s). Other entities that have credibility with your audience can be good partners. Consider the membership of the TRP to see if there are partners with whom IDOT can leverage their message. Material specification changes that result from a research study may be better received by industry if they understand that one of their own board members participated in the research effort and shared industry concerns with the researcher. Further, transmitting the message via an industry newsletter or by a presentation at an industry conference (maybe even by the industry TRP member) may be helpful in ensuring the message is well-received. The Office of Communications is a critical partner in determining potential partners for technology transfer products.

### 8.1.5 – BUILD TWO-WAY RELATIONSHIPS

Staff members in the Bureau of Research have daily interactions with staff throughout IDOT, other State agencies, other State DOTs, local agencies, universities and colleges, FHWA, national transportation agencies, industry, and consultants. These daily interactions ensure that Bureau of Research staff maintains contact with members of many different potential audiences for our technology transfer products. Such relationships are important, as they enable the creators of technology transfer products to relatively easily reach out to representatives of different potential audiences to make sure that they understand their values and needs and to “test drive” marketing strategies. These contacts offer an opportunity to lay the foundation for communicating the value and benefits of IDOT’s

research program via effective technology transfer products that resonate with different audiences.

### 8.1.6 – TAILOR THE PACKAGING

Given the various audiences and key messages that need to be addressed by research technology transfer products, it is crucial to tailor the package. The same technology transfer product will not work for all audiences or all messages. Creators of technology transfer products need to consider the formats that are available in order to determine what format a specific communication should take. Certain visual styles may work for one audience but not another. For example, administrators and legislators will more readily peruse a one-page brief with graphics, while technical staff might prefer a more detailed summary of the key findings. Facebook postings might not be the best way to reach an elderly audience. The list below includes some of the technology transfer formats available:

- Published report
- Specification
- Policy
- Manual/guidebook
- Research brief
- Newsletter
- Pamphlet
- Class
- Conference
- Training/workshop
- On-line course
- Website posting
- News release
- Webinar
- You Tube video
- Facebook posting, Twitter feed, or Instagram image

## 8.2 – SUMMARY

Effective technology transfer is not a case of one size fits all. Recipients of the intended technology transfer products vary, as do the key messages they need to hear. Different groups might perceive the benefits of the research outcomes differently, and the time at which they receive your message may or may not influence the value of that message. Building coalitions to assist you in sharing your message and utilizing existing relationships with potential audience members to assess the effectiveness of your technology transfer strategies may take time initially, but in the end, will help you get the product done right the first time. Tailoring the package to the audience helps ensure that IDOT effectively communicates the value and benefit of its research program in a user-friendly manner.

# GLOSSARY

## American Association of State Highway and Transportation Officials (AASHTO)

The American Association of State Highway and Transportation Officials (AASHTO) is a standards setting body which publishes specifications, test protocols, and guidelines which are used in highway design and construction throughout the United States. AASHTO represents not only highways but air, rail, water, and public transportation.

## AASHTO Technical Service Programs (TSPs)

A series of national programs run by AASHTO that states may choose to participate in. IDOT participates in certain TSPs that are eligible for 100% SPR Part 2 funding as approved by FHWA. Example TSPs that IDOT participates in include the re:source ( formerly known as the AASHTO Materials Reference Laboratory), the AASHTO Products Evaluation List, and the AASHTO National Transportation Products Evaluation Program.

## Code of Federal Regulations (CFR)

The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the Federal Register by the departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal regulation.

## Cooperative Agreement

A Cooperative agreement is a legal instrument of financial assistance between a Federal awarding agency or pass-through entity and a non-Federal entity that, consistent with 31 U.S.C. 6302-6305:(a) Is used to enter into a relationship the principal purpose of which is to transfer anything of value from the Federal awarding agency or pass-through entity to the non-Federal entity to carry out a public purpose authorized by a law of the United States (see 31 U.S.C. 6101(3)); and not to acquire property or services for the Federal Government or pass-through entity's direct benefit or use; and (b) Is distinguished from a grant in that it provides for substantial involvement between the Federal awarding agency or pass-through entity and the non-Federal entity in carrying out the activity contemplated by the Federal award. (2 CFR §200.24)

## Cost Share

The portion of project costs not paid by Federal funds. (2 CFR §200.29)

## Development

Development is the systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems or methods, including design and development of prototypes and processes. (23 CFR §420.203)

## Direct Cost

Direct costs are those costs that can be identified specifically with a particular final cost objective, such as a Federal award, or other internally or externally funded activity, or that can be directly assigned to such activities relatively easily with a high degree of accuracy. Costs incurred for the same purpose in like circumstances must be treated consistently as either direct or indirect (F&A) costs. (2 CFR §200.413(a))

## Federal Highway Administration (FHWA)

The Federal Highway Administration (FHWA) is a branch of the U.S. Department of Transportation that administers the federal-aid Highway Program, providing financial assistance to states to construct and improve highways, urban and rural roads, and bridges. The FHWA also administers the Federal Lands Highway Program, including survey, design, and construction of forest highway system roads, parkways and park roads, Indian reservation roads, defense access roads, and other Federal lands roads. The FHWA became a component of the Department of Transportation in 1967 pursuant to the Department of Transportation Act (49 U.S.C. app. 1651 note).

## Federally-Funded Line Items

Targeted Technology Transfer and Project Management activities conducted by the Illinois Center for Transportation that have been requested by the Department and are funded using SPR Part 2 funds.

## Final Report

Final report means a report documenting a completed RD&T study or activity. (23 CFR §420.203)

## Indirect Cost

Those costs incurred for a common or joint purpose benefitting more than one cost objective, and not readily assignable to the cost objectives specifically benefitted, without effort disproportionate to the results achieved. To facilitate equitable distribution of indirect expenses to the cost objectives served, it may be necessary to establish a number of pools of indirect (F&A) costs. Indirect (F&A) cost pools must be distributed to benefitted cost objectives on bases that will produce an equitable result in consideration of relative benefits derived. (2 CFR §200.56)

## National Cooperative Highway Research Program (NCHRP)

The National Cooperative Highway Research Program (NCHRP) is the cooperative RD&T program directed toward solving problems of national or regional significance identified by State DOTs and the FHWA, and administered by the Transportation Research Board, National Academy of Sciences. (23 CFR §420.103)

## National Research

Research carried out through the National Cooperative Highway Research Program (NCHRP), Transportation Pooled Fund (TPF) Program, the Transportation Research Board (TRB), or the American Association of State Highway and Transportation Officials (AASHTO).

## Program

The Program refers to a broad range of activities funded under this intergovernmental agreement between IDOT and the University of Illinois, including all Research Projects and the supporting efforts performed by the Illinois Center for Transportation in administering and managing the IDOT's contract research program. The Program includes, but is not necessarily limited to, all responsibilities assumed by the outsourced entity and described under this Agreement.

## Public Relations

The term “public relations” includes community relations and means those activities dedicated to maintaining the image of the non-Federal entity or maintaining or promoting understanding and favorable relations with the community or public at large or any segment of the public. (2 CFR §200.421) Public Relations activities differ from Technology Transfer activities.

## Research

Research is a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research can be basic or applied. (23 CFR §420.203)

**Applied Research**: Applied research is the study of phenomena to gain knowledge or understanding necessary for determining the means by which a recognized need may be met; the primary purpose of this kind of research is to answer a question or solve a problem. (23 CFR §420.203)

**Basic Research**: Basic research is the study of phenomena, and of observable facts, without specific applications towards processes or products in mind; the primary purpose of this kind of research is to increase knowledge. (23 CFR §420.203)

## Research, Development, and Technology Transfer (RD&T) Activity

A Research, Development, and Technology Transfer (RD&T) Activity is a basic or applied research project or study, development, or technology transfer activity. (23 CFR §420.203) An example of an RD&T Activity is an individual Research Project (e.g. R27-172) or Program level activities (e.g. Research Coordinators).

## Research, Development, and Technology Transfer Work Program

A Research, Development, and Technology Transfer (RD&T) Work Program is a periodic statement of proposed work, covering no less than one year, and estimated costs that documents eligible activities to be undertaken by State DOTs and/or their subrecipients with FHWA planning and research funds. (23 CFR §420.103) The State DOT's RD&T work program must, as a minimum, consist of a description of RD&T activities to be accomplished during the program period, estimated costs for each eligible activity, and a description of any cooperative activities including the State DOT's participation in any transportation pooled fund studies and the NCHRP. The State DOT's work program should include a list of the major items with a cost estimate for each item. The work program should also include any study funded under a previous work program until a final report has been completed for the study. (23 CFR §420.207) The IDOT RD&T Work Program is submitted annually to the FHWA Division Office for approval, and includes all aspects of the Department’s research program, including the RD&T activities accomplished through the outsourced entity, pooled fund studies, national research efforts (TRB, NCHRP, SHRP2, etc.), and the AASHTO Technical Service Programs. For the purposes of this document and the IGA, Program is taken to mean all of the RD&T activities accomplished through the outsourced entity.

## Research Project

A Research Project is an undertaking by a State highway department for highway construction, including preliminary engineering, acquisition of rights-of-way and actual construction, or for highway planning and research, or for any other work or activity to carry out the provisions of the Federal laws for the administration of Federal aid for highways.” (23 CFR §1.2) For the

purposes of this Agreement, Research Project means an individual RD&T study focused on a specific issue (e.g. R27-172) that is approved and funded by IDOT.

**Research Project Work Plan**

A Research Project Work Plan is a detailed plan for completing a research project, e.g., scope, objectives, tasks, deliverables, implementation plan, timeline, and budget.

**State Funded Items**

State funds provided to ICT may be used for "maintenance, traffic, and physical research purposes". (Public Act 098-0675) Also referred to as Administrative Funds.

**State Planning and Research (SPR) Part 2 Funds**

State planning and research (SPR) funds are comprised of the two percent set aside of funds apportioned or allocated to a State DOT for activities authorized under 23 U.S.C. 505. (23 CFR §420.103) SPR Part 2 funds are FHWA planning and research funds restricted for use on RD&T activities, programs, and studies undertaken by State DOTs and their subrecipients. (23 CFR §420.201)

**State Planning and Research (SPR) Program**

The state planning and research program is defined as:

"Research, development, and technology transfer activities necessary in connection with the planning, design, construction, management, and maintenance of highway, public transportation, and intermodal transportation systems." (23 U.S.C. 505(a) (5))

The Code of Federal Regulations (CFR) describes the responsibilities of the State DOT. 23 CFR Part 420 is the governing regulation for the SPR program, with Subpart A covering the administration of SPR funds and Subpart B providing specific details for the SPR-RD&T program.

In particular, 23 CFR 420.205(f) states that "State DOTs will have primary responsibility for managing RD&T activities supported with FHWA planning and research funds carried out by other State agencies and organizations and for ensuring that such funds are expended for purposes consistent with this subpart."

Also, 23 CFR 420.117(a) states that "the State DOT shall monitor all activities performed by its staff or by subrecipients with FHWA planning and research funds to assure that the work is being managed and performed satisfactorily and that time schedules are being met."

23 CFR 420.209(b) states that "Documentation that describes the State DOT's management process and the procedures for selecting and implementing RD&T activities must be developed by the State DOT and submitted to the FHWA Division office for approval. Significant changes in the management process also must be submitted by the State DOT to the FHWA for approval."

These regulations require IDOT to perform the necessary management, monitoring, and documentation of the separate RD&T activities being undertaken by and through ICT.

**Strategic Highway Research Program (SHRP2)**

Congress authorized the second Strategic Highway Research Program (SHRP 2) in 2005 to investigate the underlying causes of highway crashes and congestion in a short-term program of focused research. To carry out that investigation, SHRP 2 targets goals in four interrelated focus areas: Safety, Renewal, Reliability, and Capacity.**Subaward**

An award provided by a pass-through entity to a subrecipient for the subrecipient to carry out part of a Federal award received by the pass-through entity. It does not include payments to a contractor or payments to an individual that is a beneficiary of a Federal program. A subaward may be provided through any form of legal agreement, including an agreement that the pass-through entity considers a contract. (2 CFR §200.92)

**Subawardee**

Entity receiving a subaward.

**Subrecipient**

A non-Federal entity that receives a subaward from a pass-through entity to carry out part of a Federal program. A subrecipient may also be a recipient of other Federal awards directly from a Federal awarding agency. (2 CFR §200.93)

**Technical Advisory Group (TAG)**

Group consisting of IDOT and Federal Highway Administration subject-matter experts, industry representatives, and an academic representative from ICT; tasked with identifying and prioritizing research needs, selecting proposals, and monitoring implementation.

**Technical Review Panel (TRP)**

Panel comprised of IDOT subject-matter experts as well as representatives from FHWA, industry, and other governmental entities, whose job is to oversee research projects and implement final products.

**Technology Transfer ($T^2$)**

Technology Transfer activities are activities conducted by the GRANTEE, as requested by the GRANTOR, to develop technical reports, presentations, and other documents or items agreed upon by the GRANTOR that promote research project efforts and findings. (23 CFR §420.203) These activities include, but are not limited to, the following:

- Technical course development activities.
- Development or assistance with development of technology transfer documents, targeted webinars, or videos.
- IDOT agreed upon updates to QPR system or website page content related to IDOT projects to improve technology transfer and information.
- Production of articles, newsletters, annual reports, and similar items.

## Third-Party In-Kind Contributions

The value of non-cash contributions (i.e., property or services) that benefit a federally assisted project or program and are contributed by non-Federal third parties, without charge, to a non-Federal entity under a Federal award. (2 CFR §200.96)

## Transportation Pooled Fund (TPF) Program

National research program administered by the Federal Highway Administration (FHWA). (23 CFR §420.103)

## Transport Research International Database (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 provides access to more than one million records of transportation research worldwide.

## Transportation Pooled Fund (TPF) Study

A Transportation Pooled Fund (TPF) study is a planning, research, development, or technology transfer activity administered by the FHWA, a lead State DOT, or other organization that is supported by two or more participants and that addresses an issue of significant or widespread interest related to highway, public, or intermodal transportation. A transportation pooled fund study is intended to address a new area or provide information that will complement or advance previous investigations of the subject matter. (23 CFR §420.103)

## Transportation Research Board (TRB)

Transportation Research Board (TRB) is one of seven program units of the National Academies of Sciences, Engineering, and Medicine, which provides independent, objective analysis and advice to the nation and conducts other activities to solve complex problems and inform public policy decisions. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. TRB administers a number of major research programs sponsored by other organizations including the National Cooperative Highway Research Program (NCHRP).

## Transportation Research Information Services (TRIS) Database

Transportation Research Information Services (TRIS) is the database produced and maintained by the Transportation Research Board and available online through the National Transportation Library. TRIS includes bibliographic records and abstracts of on-going and completed RD&T activities. TRIS Online also includes links to the full text of public-domain documents. (23 CFR §420.203) TRIS has been combined with the Joint Transport Research Centre's International Transport Research Documentation (ITRD) Database to form the Transport Research International Database (TRID).

# APPENDIX A. RD&T WORK PROGRAM NOTES

## A.1 – NEW CONTRACT

The following items happen only once a contract. Contract negotiation begins the final review process. At this time:

- State and Federal job numbers must be created by using the State Job Number Generator (SJNG). See hyperlink below.
- https://webapps.dot.illinois.gov/SJNG/
- The SJNG user manual is attached as appendix "X". The SJNG creates both the State and Federal job numbers and will stay the same for the whole contract.
- The Technical Research Coordinator completes the annual SPR Part 2 work program and submits to the FHWA Division Office for approval, using the State and Federal job numbers.
- The Technical Research Coordinator completes **OPP37, Federal-Aid Obligation Document** (In State Action, select **Authorized Project Agreement**, or **APA**) and submits to the Office of Planning and Programming, Project Control Section, for processing, using the State and Federal job numbers.
    - APA includes **State** and **Federal** funding amounts. It should also show any Local match.
    - The Bureau of Research will utilize the oldest funding first.
    - APA shows funding amount(s) for the first FY of the contract.
    - APA is signed by Bureau Chief of Research and submitted to the Office of Planning and Programming, Project Control, cc: to the Bureau of Design and Environment, Program Support Unit.
- Contract is signed.
- Formal Contracts staff (Bureau of Operations, Peggy Ford, with input from the Office of Planning and Programming) assigns an **obligation** number for the State funding.
- The Technical Research Coordinator supplies signed contract to Formal Contracts staff (Bureau of Operations, Peggy Ford), who then completes and submits the **contract** and **obligation** for the State funding within 30 days.

## A.2 – AMENDMENT TO EXISTING CONTRACT

If there is an amendment using State and/or Federal funds, the Technical Research Coordinator supplies the signed amendment to Formal Contracts staff (Bureau of Operations, Peggy Ford), who completes and submits the amended contract and updated **obligation** for the State funding within 30 days.

## A.3 – RESEARCH FUNDING

The Bureau of Research must annually request SPR Part 2 funds for its contract and national research projects. This is accomplished in the following manner:

- In September, OPP provides an allocation of $5M for the Bureau of Research's research program. Funding allocations are made one FY in advance. If additional funding is be needed for a fiscal year, the Bureau of Research would need to request it by September of the prior fiscal year.

- By June 1st, the Technical Research Coordinator completes the annual SPR RD&T work program and submits it to the FHWA Division Office for approval, using the **State** and **Federal** job numbers. **Note that the **State** and **Federal** project numbers will stay the same over the course of the contract. **

- Upon FHWA's approval of the annual SPR RD&T work program, the Technical Research Coordinator completes form **OPP37, Federal-Aid Obligation Document** (The State Action selected for the first year of a contract is **Authorized Project Agreement**, or **APA**, , while the State Actions elected for the second and subsequent years of a multi-year contract is **Modified Project Agreement**, or **MPA**).

- **APA**/**MPA** includes **State** and **Federal** funding amounts. It should also show any **Local** match.

- MPA shows funding amounts as cumulative, for prior and current contract years.

- The **APA**/**MPA** is signed by the Bureau Chief of Research and submitted to the Office of Planning and Programming, Project Control Section, with a cc to the Bureau of Design and Environment, Program Support Unit.

- Formal Contracts staff (Bureau of Operations, Peggy Ford) completes and submits the increased **BoBS 1964 Contract Obligation Document** for the **State** funding.

Completing MPA for Research:
8/2014

- Open prior FY form.

- Select that the form is an MPA.

- Check the Job Numbers. **State and Federal Project Numbers will stay the same over the course of the contract. **

- We do not need to be in the STIP (see email below)

- If using a new line item for funding, enter it in the Prog Code column. Use prior years as template for other columns.

- If using an existing line item for funding, add the current Federal funds amount to the former amount for that line item. Enter the former amount to the row at the bottom. This is most important for the Federal funding.

- Enter the additional ICT/UIUC funding in the State funds column. Follow instructions above for former amount.

- Add IDOT State funds separately. They do not need to be included in the former amount.

**Example from FY15 MPA:**

Federal Funds: Adding $5,050,000 to L56E ($7,389,631.80 + $5,050,000.00 = $12,439,631.80)

Fed % = 75

State Funds (this is ICT's "soft match"): Adding $1,608,333.00 to L56E ($2,463,210.60 + $1,608,333.00 = $4,071,543.60)

Also adding $480,000 in State Funds column. This is IDOT's administrative funding.

In the L56E Former Amount, I copied the number from the prior MPA so it now shows $7,389,631.80 in the Federal Funds Column.

I left $88,755.52 Federal and $29,585.17 in the 0860 Former Amount columns since we did not add any funding, and that was the amount shown on the prior MPA.

I left $55642.42 Federal and $18547.47 State in the Q560 Former Amount columns since we did not add any funding, and that was the amount shown on the prior MPA.

Renee said not to worry too much about the former State amount columns.

**A.4 – AASHTO TSPs**

The Bureau of Research can use SPR Part 2 funds to pay for AASHTO TSPs that have been deemed eligible by FHWA. (See Section 3.1 for additional information on AASHTO TSPs.) AASHTO TSPs need to be included in the annual SPR RD&T work program.

AASHTO TSPs use a different **State** and **Federal** job number than the ICT contract research. In order to pay for IDOT's participation in AASHTO TSPs, upon approval:

- State and Federal job numbers for AASHTO TSPs must be created by using the State Job Number Generator (SJNG). See hyperlink below.
- https://webapps.dot.illinois.gov/SJNG/
- The SJNG is attached as appendix "X". The SJNG creates both the State and Federal job numbers and are different from the ICT contract research job numbers. The State and Federal job numbers must be created each year when the TSP invoices are paid.
- The Research Resource Coordinator will set up a **BoBS 1964 Contract Obligation Document** for all AASHTO TSP payments. The COD should include the **State** and **Federal** job numbers.
- For participation in a new AASHTO TSP, upon FHWA's approval of the annual SPR RD&T work program:
    - The Technical Research Coordinator completes form **OPP37, Federal-Aid Obligation Document** (The State Action selected for the first year of a contract is **Authorized Project Agreement**, or **APA**, while the State Actions elected for the second and subsequent years of a multi-year contract is **Modified Project**

**Agreement**, or **MPA**).) and submits to Budget and Fiscal Management, Project Control for processing, using the **State** and **Federal** job numbers.

- The **APA/MPA** includes **State** and **Federal** funding amounts, and **Local** match, where applicable.
- The Bureau of Research utilizes its oldest funding first.
- The **APA/MPA** shows funding amount(s) for the first FY of participation in the new AASHTO TSP, and subsequent years as needed.
- The **APA/MPA** is signed by the Bureau Chief of Research and submitted to the Office of Planning and Programming, Project Control Section, with a cc to the Bureau of Design and Environment, Program Support Unit.
- The Research Resource Coordinator pays the invoice from the blanket obligation.

# APPENDIX B. A Brief History of Research at IDOT

IDOT has a long tradition of being nationally recognized in pavement design and highway-related research. The first experimental road constructed in Illinois was the Bates Test Road, west of Springfield, which was constructed in 1920 and studied until 1923 to determine the behavior of pavements under traffic. The AASHO Road Test, conducted by the National Academy of Sciences, was located along the I-80 alignment in Ottawa, Illinois. Additionally, a long-standing and exclusive relationship between IDOT and the University of Illinois at Urbana-Champaign's (UIUC) premier pavement engineering program dates back to the 1940s. Many students in the transportation facilities program at UIUC worked on pavement-related research funded by IDOT, and later came to work at IDOT. This strong IDOT-UIUC connection, coupled with a fully staffed Research Section, enabled IDOT engineers to adapt research into practice, developing and refining pavement design and rehabilitation policy through laboratory and field study, formulating pavement management strategies, and developing life-cycle cost analysis procedures. As a result of this strong research relationship, IDOT became one of the first states to adopt a mechanistic-empirical pavement design process, almost 15 years before the AASHTO Mechanistic-Empirical Pavement Design Guide was released.

A number of reasons led to the decline of the vibrancy of pavement research at IDOT: loss of staff with little to no ability to fill positions, no recruiting at UIUC, interest in widening the spectrum of research at IDOT, and an end to an exclusive contract research relationship with UIUC. For a period of time in the 1990s, contract research was conducted through the Illinois Transportation Research Center (ITRC). ITRC was managed by Southern Illinois University – Edwardsville. Approximately a dozen institutes of higher education in Illinois were a part of ITRC. An Executive Committee, formed of a representative from each university, as well as an IDOT representative, voted on projects to be conducted. Research areas diversified at this point, but the majority of research still focused on pavements. The voting strategy prohibited IDOT from filling their own research needs, often resulting in a cabal of smaller schools banding together to vote their idea forward. Funding for this contract research was required to be 100 percent state funds, which were capped at approximately $500,000. At the end of the year, 80 percent of the money spent was reimbursed by FHWA, but the money was returned to the General Fund, and not Research.

For a period of time after 2000, the Illinois Highway Research Council was in place. Council membership consisted of Division of Highways Deputy Directors and Bureau Chiefs, district staff, and an FHWA representative. The council was formed to piece together a contract research program rather than have the Office of Planning and Programming and the Bureau of Highways Administration award research projects through the Professional Transportation Bulletin and intergovernmental agreements on a case-by-case basis in addition to a small UIUC cooperative research program. The funding process was revised to allow FHWA SPR funds to be used for 80 percent of the cost of the research, with the state providing the remaining 20 percent. The same approximately $500,000 of state funds available under the ITRC now translated into contract research with the potential value of $2.5M. A listing of active projects in 2002 included studies on atmospheric dispersion of deicing salts, concrete deck sealers and laminates, aluminum sign trusses, instrumentation of bridge bearings and Load and Resistance Factor Design load factors, monitoring of the Kishwaukee bridge, and warrants for railroad crossings.

In 2005, recognizing the value of the long-time cooperative relationship between IDOT and UIUC, an expanded research program was developed through the creation of the Illinois Center for Transportation. This innovative partnership helps IDOT initiate more timely and effective transportation research, and enables IDOT managers and engineers to interact with world-class

researchers on solutions to complex, often longstanding transportation problems. The goal of such research, ultimately, is to implement transformative solutions for the state of Illinois.

Research is a catalyst for innovation. IDOT has been a leader in transportation research for more than a century, bringing the traveling public out of the mud and onto hard-surface roads in the 1910s, pioneering the scientific study of road design at the Bates Experimental Road Project near Springfield in the early 1920s, and serving as a host state to the interstate highway era with what was then called the American Association of State Highway Officials and their road test loop near Ottawa in the late 1950s. Today, research impacts all aspects of work at IDOT, providing innovative, evidence-based improvements, ideas and solutions that help provide a cost-effective, efficient and safe transportation system that is consistent in quality and reliability for all of Illinois.

# TABLE OF FIGURES