Peer Exchange May 3-5, 2016
Alaska Department of Transportation and Public Facilities
Research Development & Technology Transfer

Executive Summary

Members of the Peer Exchange Team identified actions Alaska should consider to improve effectiveness of the research program:

1. Conduct Research Strategic Visioning Workshop with Staff and Research Advisory Board in Fall, 2016
2. Develop a Two-tier Research Needs Submittal
3. Improve Marketing and Outreach
4. Implement Process Improvements

(Action item details on page 8-9 of this report)

Introduction

The Alaska Department of Transportation and Public Facilities hosted a research management peer exchange May 3-5, 2016, in Juneau. The Peer States attending were:

- Michael Bufalino, Oregon DOT
- Megan Swanson, Illinois DOT
- Ann Scholz, New Hampshire DOT
- Tanisha Hall, Tennessee DOT

Host Alaska DOT&PF Research and Technology Transfer attendees included:

- Carolyn Morehouse, Research Chief
- Janelle White, Research Engineer
- Anna Bosin, Research Engineer (participated remotely)
- Dave Waldo, Training Specialist/LTAP Manager (participated remotely)
- Simon Howell, Training Specialist (participated remotely)

FHWA Alaska Division Office:

- Peter Forsling, Structural Engineer & Research Advisory Board member

Pictured left to right Carolyn Morehouse (AK), Ann Scholz (NH), Tanisha Hall (TN), Michael Bufalino (OR), Megan Swanson (IL), Peter Forsling (FHWA-AK)

Contact information is in Appendix A.

Objectives

The objectives of this peer exchange were to explore:

- Overall program compliance
- Project selection/how to pick to "right" projects
- Learning about the Peer States' research programs

Panel Activities

The meeting agenda is included as Appendix B.

Day 1

The Peer Exchange began with introductions and a welcome message from Alaska's Chief Engineer Roger Healy. Next Alaska's Research, Development and Technology Transfer and Asset Management (Research) Section Chief presented an overview of Alaska DOT&PF and the Research Program. Presentation slides are available in Appendix C.

In summary:

- Research is part of Statewide Design and Engineering Services. The section has five permanent full time staff: a chief, two research engineers and two training specialists.

- RD&T2's new manual effective January 1, 2015, documenting new research procedures:http://www.dot.state.ak.us/stwddes/research/assets/documents/rtt-prog-man-150101.pdf
    - Advisory structure – Research Advisory Board restructuring from 13 members to 5 members. Of the five members, only two are "executive" level. The other two are regional managers and the last is FHWA liaison.
    - Project needs – how these are gathered and university outreach
    - Project selection criteria used
    - Program approval
    - Project development
    - Implementation
    - Program evaluation

Introduction to Technical Experts Group& Research Advisory Board

The available Research Advisory Board and Expert Advisors Committee members came to the meeting at 10:15 am and were introduced to the Peer State representatives.

The following members participated:

Research Advisory Board Members

- Roger Healy, Statewide Chief Engineer
- Frank Ganley, Northern Region Construction Engineer (participated remotely)
- Ken Morton, Central Region Preconstruction Engineer (participated remotely)

Missing Mike Coffey, Southcoast Regional Director

Expert Advisors Committee Members

- Steve Saboundjian, Pavement Engineer (participated remotely)
- Amanda Holland Administrative Services Director
- Eric McCormick, Information System and Services Division Operations Manager
- Mike Lukshin, Statewide Port Engineer
- Mike Knapp, Statewide Hydraulic Engineer
- Mark Neidhold, Chief Statewide Standards
- Jeff Jeffers, Statewide Traffic & Safety Engineer

Missing Mike San Angelo, Taylor Horne, Rich Pratt, Mike Crabb

Members were asked to describe their interaction with the Research Program including successful research projects, what works well and any improvement. A summary of their comments in provided in Appendix D.

Generally they were satisfied with the current research project selection process but offered some areas of improvement:

- Current process is streamlined and written down in a manual. The research group needs to communicate with all staff on what the process involves through webinars, technical meetings, websites, and newsletter.

- Members liked the idea of establishing a two tiered project needs selection process. The first tier would be simple request for research needs. The needs would be sent to the technical experts to further explore. Each discipline would take the top 2-3 needs and develop them into the more detailed Research Needs Statement to submit for further consideration.
- Innovation efforts should be coordinated and have a cost benefit for the department. Do not innovate for innovation sake.
- Research needs to fit the region's needs and support the larger picture.

Introduction to Alaska's Research Program Staff

Again, Alaska's research section is made up of five staff. This staff also supports other department initiatives: asset management tasks and results based budgeting. In the afternoon, each Research and T2 staff presented their area of expertise and example projects. Appendix E contains their power points in PDF format.

Carolyn Morehouse, P.E.

- Engineer IV
- Section Chief for Research, Technology Transfer, Asset Management
- Department TRB representative
- Manages the program include pooled funds
- Stationed in Juneau
- Specializes in
    - Program Management Compliance
    - Administrative
    - Information Systems
    - Planning

Anna Bosin, P.E.

- Technical Engineer I
- Stationed in Anchorage
- Specializes in
    - Safety
    - Materials
    - Central Region Contact

Dave Waldo

- Training Specialist II
- Stationed in Fairbanks
- LTAP Manager
- Department Training Manager for NHI and technical training
- Northern Region contact
- Specialized in rural issues and technology transfer
- Supervises one staff

Simon Howell

- Training Specialist II
- Stationed in Fairbanks
- Trainer for some courses
- Assist in the NHI and other technical transfer

Janelle White

- Engineer Assistant III
- Stationed in Juneau
- Specializes in
    - Bridge
    - Hydraulic
    - Environmental
    - Southcoast region Contact

Day 2

Each Peer State prepared a presentation in advance to highlight their research programs. The PDF version of their PowerPoint is available in Appendix F.

Peer State Presentation Summaries

Illinois

Essentially a pass through funding to the Illinois Center for Research located at Illinois University. There is a current reorganization that may expand the research staff to manage projects. Some program highlights are:

- $7.5 Million budget; two staff employed by and at IDOT. Illinois Center for Transportation has additional support staff located in Rantoul.
- Currently located in the Bureau of Materials & Physical Research but moving to Bureau of Research under Planning Division.
- 50 active projects.
- 2005 most research was materials based but has changed to more variety.
- Nine focus areas. Technical Advisory Groups (TAGS) for each focus area. TAGS have mixed DOT, university and industry staff.
- Research project types:
    - Regular – Part of the annual program cycle, approved by Exec. Comm.
        - In spring each TAG solicits research ideas. Post selected ideas to website by August for proposals. Proposals accepted until Oct 1, TAG meets again for top 2-3 projects. Executives selects which projects will be funded
    - Special - $30,000 and results in 6 months, approved by BMPR
    - Off cycle – bigger than a SP but too urgent to wait for the regular cycle, approved by Exec. Comm.
- Participation in FHWA Transportation Pooled Fund Program (~30 studies underway). Have more funding than obligation authority, so tend to participate in pooled fund studies to spend excess dollars.
- LTAP is not housed in research but in Illinois Bureau of Local Roads.

- Participation in Transportation Research Board (TRB)-9 staff on 14 committees. Leverage $27 in research related activities for every $1 invested in NCHRP activities.
- Participating in SHRP2 implementation.

Best Practices:

- Editor at the Illinois Center for Research edits reports prior to department staff comments. It is noted that most engineers and technical people have a hard time editing the report if it is not written and organized well.
- Many forms to manage program.

New Hampshire

Small research program leverage their funding with other state agencies such as the New England Transportation Consortium (NETC). They rely on close relationships between Department personnel.

- $800,000 budget, staff includes Research Engineer and Assistant Research Engineer
- Under Bureau Materials & Research.
- Project solicitation to Department for research needs every two to three years because of limited funding and personnel resources.
- Need statement review includes matching them up with FHWA's 6 priorities.
- Research project selection form similar to RNS.
- Research Advisory Council has 14 voting members and two non-voting members. Voting members are Bureau Administrators from Project Development and Project Operations
- Focus on applied research
- All contracts need to be approved by Governor and Legislative Council.
- Leverage funding with other involvement
    - New England Transportation Consortium
    - Pooled funds, SHRP2, and NCHRP
- Project management:
    - Establish Technical Advisory Group for each project.
    - Outreach required Principal Investigator to engage in technology transfer.
    - Review implementation status.
    - Provide seed funding for implementation.

Best Practices:

- Department outreach and tech briefs, posters, and presentations of final results.
- Use creative posters for research solicitation. These are sent out via email and hung up in conference rooms and bathrooms.
- Utilize in-person and off-site meetings during project selection to foster engagement of Department management into the program.

Oregon

A visionary state and tends to be on the leading edge of innovation. Oregon has a "top down then back up to the top to distribute" culture.

- Research is located in Program Development Highways.
- $5.2 Million, 11 staff includes Manager, Librarian, Admin support and eight research engineers.
- Library, T2 and Research
- Eight Technical Advisory Groups.
- RAC votes by e-mail for pooled funds.
- Two year FHWA work program that is updated every year.
- Stage 1 and 2 project selection timetable:
    - Review Topic Area Priorities Aug
    - Set Strategic Priorities in September
    - New Statements Due November
    - Stage 1 problem statements December
    - Expert Task Groups Review January
    - Stage 2 Refine Problem statements February
    - Research Advisory Committee Selects March
    - Prepare FHWA work program for executive approval April
    - Submit work program to FHWA May
    - Start new projects June-July

Best Practices:

- Foster innovation within department.
- Research's vision and mission is in step with executive management.
- Consistent timeline and process to sustain program.

Tennessee

- Reorganization under Long Range Planning, rebuilding group.
- Formerly combined Research, Policy, CMAQ and Administration..
- 4 staff (one supervisor, 3 planners).
- TTAP - 2 university staff working @ DOT.
- Project Selection:
    - Executive Committee and Technical Advisory Committee determine strategic focus.
    - Identify Research Need statement:
        - Select Interdisciplinary Project team to develop research need.
        - Select technical/implementation manager.
    - Assemble needs statement and solicit proposals from universities via website.

- TAC develops each project scope and cost with the university and begins work on preliminary contracts.
- Executive approvals final projects – may reject project.
- Amend FHWA work program to add approved projects.

In the afternoon there was an informal discussion on Alaska and the four peer states programs with many questions and answers. The group started discussing Alaska's Strengths, Weaknesses, Opportunity and Threats. In preparation for the report we brainstormed ideas and common themes.

Day 3

In the morning, the team continued discussion and summarized ideas in a PowerPoint. Carolyn Morehouse delivered the presentation of findings at 10:30 am to available Research Advisory Board and expert advisors members. After the presentation of the findings, there was some discussion. The Peer Exchange concluded on Thursday, May 5 at 11:30 am. A copy of the presentation is available in Appendix F.

Peer Exchange Team Observations

From discussions with research staff and customers, and through review of research procedures used in Alaska, and the other states participating in this Peer Exchange, the Peer Exchange Team recorded a number of observations that could potentially be used in their respective organizations. The group prepared the following Program Strengths, Weakness, Opportunities and Threats.

Strengths	**Weaknesses**
1) Leaders in following research areas: • Seismic verifying AASHTO guidance. • Geotechnical asset management. • Highway design in permafrost areas. 2) Staff • Connections to research instigators • Strong integration between T2/LTAP 3) Implementation • Look back on projects completed within three years.	1) Verify strategic direction from new Executive level. Realign process and expert advisors according to the strategic direction. Do this every 2-4 years to mesh with FHWA work program. 2) Tie project ranking and prioritization process to strategic vision. 3) Identify what the Department will need in 20 years - i.e. FAST act and beyond 4) No process for providing nomination to various national boards or committees.

Opportunities	**Threats**
1) Identify additional resources available for literature reviews. 2) Tie specific research to national via these NCHRP and TRB committees. 3) Build relationships to foster new participation. Younger staff from leadership development training program. 4) Chief Engineer may provide new direction. 5) Marketing Research program and individual projects. 6) Formalize process to nominate to national committees, pooled funds and project selection. 7) Start technology transfer at the project beginning. 8) Use LRTP as a base strategy for research program visioning with new Executive strategic plan. 9) Adopt Peer State forms as needed. 10) Compare program with FHWA program review checklist. 11) Invite Canadian Province or northern European country to next Peer Exchange. 12) TRB rep should update CEO at least annually. 13) Consider non-DOT staff on expert advisor teams, including TTAP. 14) Use TRB site visit to communicate with executives. 15) Coordinate NCHRP vote with all disciplines - truly a department wide vote. 16) Develop a two tiered research needs process. Simplify research needs statements to get more participation in phase 1 and focus on the selected 2-3 in each group for Phase 2. 17) Consider awards for participation.	1) No clear long term goal(s) 2) Global - paying for National dues or other items that take away from research. 3) May have disparity between regions, towns, rural & urban.

The group stated that Alaska needs to identify areas that we will lead National Research and other areas that we will look to National or Regional Research. Some areas, but not all, identified were:

- Climate Change
- Drones or remote sensing
- Autonomous Vehicles
- Intelligent Compaction/E-construction

Planned Actions

Members of the Peer Exchange Team identified actions Alaska should consider to improve effectiveness of their research program:

1. **Conduct Research Strategic Visioning Workshop with Staff and Research Advisory Board in Fall, 2016**
   - Using the Long Range Transportation Plan and the Department's new strategic vision (development starting June 15, 2016)
   - Determine our footprint and the makeup of the Technical Advisors via technical disciplines assigned to a team. Do we need more representation from operations and maintenance?
   - Which research areas are we are going to be leaders in and which we are not. Support National panel participation based on this strategic vision
     - Climate Change – what questions do we need answers to?

2. **Develop a Two-tier Research Needs submittal**
   - Tier 1. General screening of research needs or ideas
   - Tier 2. Develop the top 2-4 needs in each discipline and develop a full Research Needs Statement (RNS) for evaluation by the technical advisors and approval of the Research Advisory Board
   - RNS Sign off from managers of all effected divisions of a research project.

3. **Improve Marketing and Outreach**
   - Market new research strategic vision
   - Market new two-tiered research project needs submittal process
   - Recruit new members to the technical groups. Select from the Leadership Development graduates.

4. **Implement Process Improvements**
   - Compare Alaska's program to the FHWA Research Program Review checklist. Add to the Standard Operating Procedures.
   - Make changes to the Standard Operating Procedures based on Action Items 1-3 results.
   - Send NCHRP vote to department directors; coordinate their votes for a department wide vote.
   - Develop a FHWA Work Program similar to other states. Stop doing separate funding agreement for research projects.
   - Formalize national panel selection process and pooled fund participation
   - Evaluate and adopt Peer State and other states forms as needed to support all Action items.

Peer State Takeaways

Ann Scholz, New Hampshire

- Schedule a strategic visioning meeting with the Front Office Executives
- Award good performance of Technical Advisory Group members
- Reformat/expand annual report (include five-year look back)
- Improve the Transportation Pooled Fund request form
- Tap into using new department employees who show signs of leadership to participate on Technical Advisory Groups

Michael Bufalino, Oregon

- Develop a strategic framework for pursuing grant type funding of DOT research and innovation that focuses efforts on agency priorities.
- Update the research program's documents, if substantial changes need to be made to the Research Procedures Manual, have the FHWA Oregon Division Office review and approve the changes.
- Strengthen the Research Section's tie to the agency mission by convening a strategic direction meeting of the ODOT Research Advisory Committee.
- Develop a standardized Transportation Pooled Fund request form for ODOT
- All states' research programs need to encourage their respective CEOs to help protect the federal SPR funded research program.

Megan Swanson. Illinois

- Alaska handles own literature reviews. Discuss with IDOT Library the feasibility of utilizing them for more literature reviews.
- Review AKDOT&PF slides on implementation. Could we make these into a checklist?
- Consider moving to task based payments – AK and NH both do this.
- Add the SP&R checklist to the end of the Work Program and end of Process Manual.
- Go back and add references to our Process Manual to show where we meet the various requirements.

Tanisha Hall, Tennessee

- For programming purposes, investigate "bundling" research projects to one federal number
- Try to reduce the number of projects under development in future years by funding larger strategic research initiatives
- Tech Transfer is needed to increase transparency of program and sharing knowledge
- Consider developing "rapid response" program to address quick, inexpensive projects.
- Consider hiring technical editor to ensure research papers can be understood beyond subject matter experts.
- Consider two-tier needs statements to reduce barriers to entry for research needs statements

Appendix A: Contact Information for 2016 Peer Exchange

Alaska DOT&PF

Juneau

Carolyn Morehouse, P.E., Statewide Research and Technology Transfer Chief
Email: Carolyn.morehouse@alaska.gov Phone: 907-465-8140

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Anchorage

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Fairbanks

Dave Waldo, LTAP Manager and Training Specialist
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Simon Howell, Training Specialist
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Federal Highways Administration-Alaska Division

Mr. Peter Forsling, P.E. Structural Engineer
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Peer States

Megan Swanson, Research Coordinator Illinois Department of Transportation
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Ann Scholz, P.E., Research Engineer New Hampshire Department of Transportation
Bureau of Materials and Research Email: ascholz@dot.state.nh.us

Michael Bufalino, Oregon DOT Research Manager
Email: Michael.Bufalino@odot.state.or.us Phone: 503-986-2845

Tanisha J. Hall, AICP | Director, Long Range Planning Division
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Key Alaska Research Personnel for this Exchange

Juneau

Mr. Roger Healy, P.E. Chief Engineer, Statewide Design and Engineering Services
Replaced by Lance Mearig, PE on 5-16-2016
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Fairbanks
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Anchorage
Ken Morton, P.E. Central Region Preconstruction Engineer
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Steve Saboundjian, P.E. Pavement Engineer
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Appendix B: 2016 Peer Exchange Agenda

JUNEAU
Tuesday, May 3, 2016
DOT&PF HQ
JNU 3132 Channel Dr. Room 140; ANC Fishbowl; FAI T2 room

8:00 am pickup at the hotel

8:30 am – 8:45am	**Welcome from Leadership** **Introductions** Roger Healy, PE
8:45 am– 9:00 am	**FHWA Alaska Division Office** **Pete Forsling, PE**
9:00 am – 9:45 am	**DOT&PF Organization and** **Introduction to the Alaska Research and Technology Transfer Program via Standard Operations Procedures** Carolyn Morehouse, PE
9:45 am – 10:15 am	**Break**
10:15 am – 11:00 am	**Introduction to Technical Experts Group& Research Advisory Board**
11:00 am – Noon	**Focus: Project Needs Evaluation, Identification & Selection Criteria**
Noon – 1:00 pm	**Lunch**
1:00 pm – 1:45 pm	**Central Region, Statewide Materials and Safety** Anna Bosin, PE
1:45 pm-2:30 pm	**Northern Region, Permafrost, Rural Issues & T2** Dave Waldo and Simon Howell
2:30 pm-2:45 pm	**Break-stretch**
2:45 pm-3:30 pm	**Southcoast Region, Bridge, Hydraulics, Environmental, Planning** Carolyn Morehouse and Janelle White
3:30 pm-4:00 pm	**Recap today and review Tomorrow's Agenda**

Whale Watching at 6:00 pm

Wednesday, May 4, 2016
DOT&PF HQ
JNU 3132 Channel Dr. Room 140; ANC Fishbowl; FAI T2 room
9:00 am – 5:00 p.m.

9:00 am – 9**:15 am**	**Program Overview: Region 1 rep**
9:15 am - 9:30 am	**Program Overview: Region 2 rep**
9:30 am - 9:45 am	**Program Overview: Region 3 rep**
9:45 am-10:00 am	**Program Overview: Region 4 rep**
10:00 am – 10:15 am	**Break**
10:15-Noon	**Implementing National and State Research**
12:00 p.m.-1:30 p.m.	**Lunch & Discussion**
1:30 p.m.-5:00 p.m.	**Identifying Strengths, Weakness, Opportunity Threats and any Best Practices from the other regions.** **Draft Peer Exchange Report**

Group Dinner tba

JUNEAU

Thursday, May 5, 2016

JNU 3132 Channel Dr. Room 140; ANC Fishbowl; FAI T2 rooms:

9:00 a.m.-12:00 p.m.	**Presentation of Peer Exchange Report to Management**	Rm 140
12:00 p.m.	**Meeting Adjourned** Depart for Home	

Governor's Mansion and Downtown Juneau Tour (if interested)

Appendix C: DOT&PF Research Program

Alaska Department of Transportation & Public Facilities

Research Peer Exchange
May 3-5, 2016

Welcome

About DOT&PF & RD&T2 program

- Process
- Project Selection
- Performance goals
- Oversight (Advisory Structure)

Goals for Research Peer Exchange

- New Chief, Compliance
- Project Selection
- Project Implementation (national & state projects)

About AKDOT&PF

Vital Statistics 2016

- ~3500 Employees
- 254 Airports
- 11 Ferries
- 30 Ports
- ~14,800 Lane-miles Highway
- 766 State owned Bridges
- 660 Public Facilities
- $640 Million Operating Budget
- >$800 Million Capital Budget (mostly federal$)

Note: Alaska Railroad a separate agency

Organization Charts

- Alaska DOT&PF
  - Statewide Design & Engineering Services
    - Research, Development & Technology Transfer

DOT&PF Organization

Administrative Services;
Legislative Liaison;
Contracting & Appeals

Commissioner
Marc Luiken

Aviation Advisory Board

Marine Transportation Advisory Board

Deputy Commissioner

Deputy Commissioner

Deputy Commissioner

Northern Region

Central Region

Southcoast Region

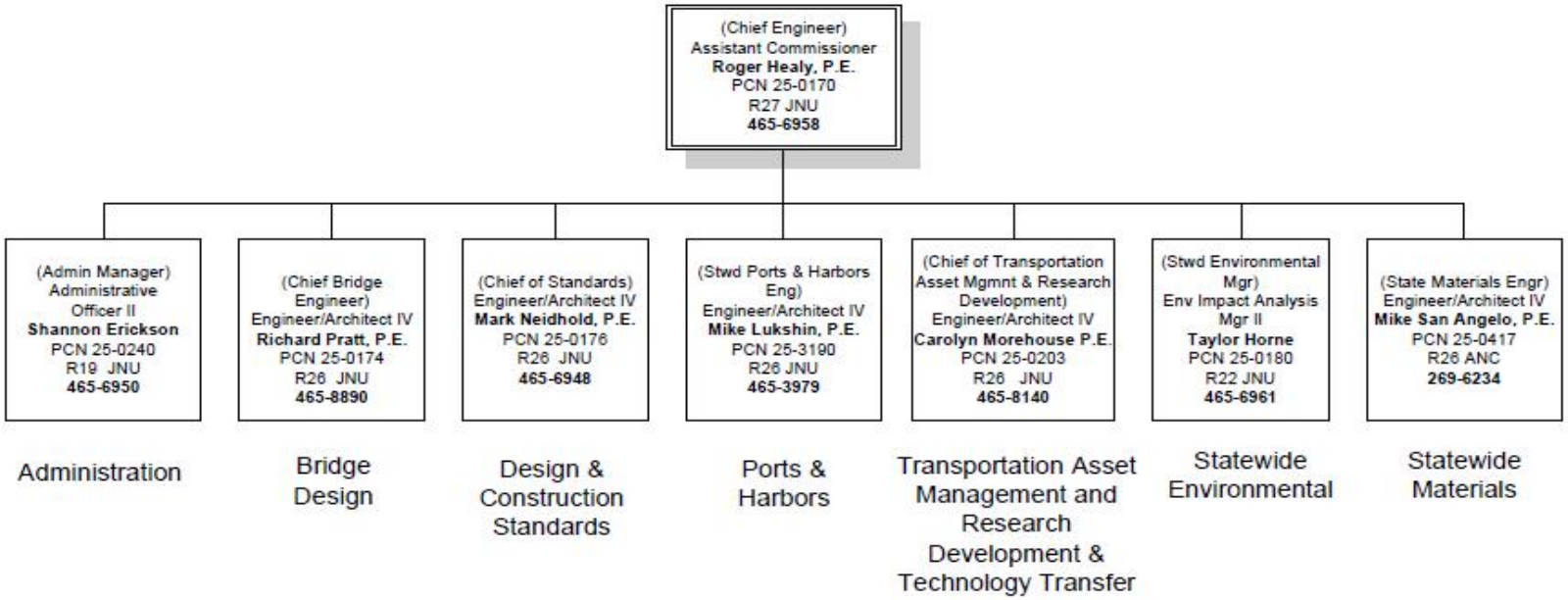
Design & Engineering Services ;
Program Development;
Statewide Maintenance & Operations ;
Statewide Facilities ;
Statewide Equipment Fleet

Statewide Aviation;
Alaska International Airport System;
Airport Leasing;
Measurement Standards and Commercial Vehicle Enforcement/MSCVE

Alaska Marine Highway System; Special Projects

Planning; Design; Construction; Maintenance and Operations; Right of Way Management; Utility Permitting

CHIEF ENGINEER'S OFFICE



3/10/2015

RD&T2

RD Mission & Money

- Money STIP line annually $2 Million
  - -Mandatory National Dues
  - -Pooled Funds
  - -Rapid Research
  - -Deployment
  - = “big” research projects.
- Mission – Projects that can be implementable and continuously improve our infrastructure

What we do

- Provide latest technology, materials, and procedures for conducting business.
- Assists Department staff with problem solving by providing information to solve a particular problem or assisting in the development of research to solve problems.
- Provides statewide technical training program
- Provides education and technical assistance outreach to local governments and DOT&PF

Who does it

- Research Advisory Board (RAB) – Executive
  - chief engineer
  - regional preconstruction chief
  - regional construction chief
  - Maintenance representative**
  - FHWA Alaska Division Representative
  - Research Chief (facilitation only)
- Expert Advisors Committee

Expert Advisors Committee

- Ports & Harbors
- Program Development and Planning
- Director Information Systems
- Administration
- Research (RAC liaison)
- Bridges
- Standards
- Hydraulics
- Pavement
- Materials
- Environmental
- Safety & Traffic

RD&T2 Staff

Research

- Solicit, compile, evaluate research needs
- Develop & Manage
- Implementation Plans
- Outreach
- Track Research
- Serve on national committees

Technology Transfer

- Solicits complile evaluate training needs
- Develop & Manage
- Training Plan
- Training Clearinghouse
- Outreach
- Track National program
- Serve on National Committees

Project Needs Statement

- http://www.dot.state.ak.us/stwddes/research/research.shtml
- Form coordinated with DOT Research Contact
- Champion (internal)
- Brief Literature Review
- Objectives and Summary-Applied research
- Benefits
- Estimate and potential match $

How we do it

RAB approves Research Need Criteria and Program Goals By October 1

3.

Outreach to Staff and Universities to Solicit Research Needs by November 15

Technical Experts Committee Meeting to Rank Research Needs By March 31

Summarize Technical Experts Ranking to the RAC and hold meeting to approve by May 15

Prepare Proposed Work Plan for FHWA Approval June 15

Follow Project Development for Individual Federal Aid Project Projects

Project Initiated and Manage to completion and Closeout. Implementation Plan submitted.

How we did it this year

- Research Workshop to discuss ideas was held on December 1
- Solicited Research Needs and prioritize within each discipline
- March 11 Research technical advisors meeting
- March 28 Scoring sent to RAB
- April 1 RAB meeting to review projects and technical recommendations
- RAB Approval by April 7th FHWA April 18th

10 Questions (yes = 1; no = 0)

1) Statewide importance

2) Has champion and high likelihood for implementation (new process, specification, process, policy)

3) Strategic Highway Safety Plan

4) Infrastructure preservation

5) Cost savings for M&O

10 Questions (yes = 1; no = 0) Cont.

6) Efficient project delivery
7) Improve quality of M&O services or projects
8) Improve intermodal continuity
9) Match University, multi-agency or local
10) Economic development within the state

FFY 17/18 Need Statements Summary

Category	# Need Statements
Administration & Policy	0
Bridges & Structures	3
Environmental	1
Hydraulics & Hydrology	0
Materials	5
Maintenance & Operations	0
Safety & Traffic	4

Total 13

Microsurfacing- Exp. Feature #3/13

Submitted by (**Champion)**: Ken Morton, P.E.

Research Need:

Rutted pavement is primarily a problem in Central Region on higher volumes roadways (&SC Egan DR). Alaska needs cost effective maintenance treatments for rutted pavements. There has been recent nationwide advancements in thin surface treatments to an Alaskan roadway with the objective to assess the cost effectiveness of the treatment here in Alaska.

Using microsurfacing with a 64-40 asphalt binder and hard aggregate could provide Alaska with an alternative to traditional 1R mill/fill projects to fix rutting problems on higher volume roads while providing a 5-year design life.

Scope: Researcher TBD

Cost: $75K

Objectives:

- test various mix designs using 64-40 asphalt binder for Alaskan application,
- install a mix design as Experimental Feature and monitor the site(s) post-construction for life-cycle cost-effective evaluation.

Expected Implementation:
Provide AK specific design and construction guidelines and draft specifications.

Value to the state:
Cost-effective pavement preservation treatments could save AKDOT&PF $Millions in future Capital Project spending that could then be redirected towards other infrastructure needs.

Research Project Development

- Select Project Manager/Principal Investigator
- Funding for FHWA/Contract (RSA or PSA)
- Formation of Technical Advisory Group
- Project Progress Reports/Interim Report
- Publication/Distribution Final Report
- Technology Transfer and Outreach
- Project Implementation Plan

Implementation

- Our projects from inception
- Experimental features built as part of construction projects
- Projects conducted by other State of Alaska agencies or local governments
- Projects conducted by other states, federal agencies, or foreign governments
- Projects conducted by the private sector, following all copyright and patent laws

Implementation Continued

- What are the “products” expected?
- How and where can findings be applied within the Department?
- Who is the audience or “market” for this product?
- Will findings require a revision or new process?
- Will the findings be economically justifiable?
- Will findings improve service to the citizens of the State of Alaska?

Implementation Techniques

- Production and distribution of Final Reports
- Seminars
- T2 Trainings/Workshops/Tech Briefs
- T2 Newsletter
- FHWA experimental feature
- Change Department policy and procedures

Program Evaluation

- Program – all Projects
  - Contact or PI Evaluation
  - Monitor implementation efforts for three years.
- Program
  - External Peer Review
  - Performance Measures - % meet goals. % implemented, %On budget, schedule


N264M

Appendix D: Responses from DOT&PF Staff

Name	Position	Team	national committee participation	Comments
Ken Morton	Central Region Preconstruction	Executive	None	Generally is in favor of the new Research Process. Research features for projects should be done in the design process. The research plan needs to be well defined and include what is the deliverable.
Steve Saboundjian	Statewide Pavement Engineer	Advisory	Behavior of Unsaturated Geomaterials (APF 50) Geological and Geoenvironmental Engineering (APF 0). Standing Committee on Seasonal Climatic Effects on Transportation Infrastructure (APF 60) - Chair**	Previous position was in the Research program so he is familar with the program. He coordinates all the research efforts for Materials (Statewide and regional). The best research projects have contracts/agreements that are clear and have "dollars tied to deliverables". He is responsible for the software the regions used for design.
Amanda Holland	Administration Services Director	Advisory	National Task Force on Knowledge Management (AB010T)	Generally is favor of the new research process and likes being part of the team. Led Workforce Planning for the department. Research helped gather information from over 300 previous staff to develop the department's Leadership Development Program. She was part of a Peer exchange in Colorado focusing Adaptive Work Force. There were some intriguing ideas exchanged from alternative work spaces, downsizing department footprint, creating a culture attractive to Millennials, combining M&O and construction to improve infrastructure quality. The public is expecting transportation agencies to be smaller and streamlined. She likes being part of the research expert advisors but research needs to reach out to more staff so the same people are not making the requests all the time. She recommends putting the process in Pinnacle (software that documents work flow) with examples of good research needs statement

Name	Position	Team	national committee participation	Comments
Frank Ganley	Northern Region Construction	Executive	none	Northern Research is used to research and experimental features and likes them. It is difficult for staff to complete the Project Needs statements. He agrees a likes the idea of a two tied approach. It would be an improvement. Research/FHWA needs to push some innovations. An example is Safety Edge. If we were not pushed we would probably not have tried.
Mark Neidhold	Statewide Standards Chief	Advisory	None	Struggles with funding agencies advancing EDC counts and other initiatives. Sometimes feels like trying to put a square peg in a round hole. Likes the idea of a simplied process. Research encourages advance technology. Keep researchs in line. Need to consider a cost benefit of these innovations.
Eric McCormick	Operations Manager	Advisory	None	New division. Need to coolaborate of all projects that have any IT components. Any purchase of IT related items over $25K need "big" admin approval. We have new $2 Million in infrastructure to support our information systems. Working on a department data and IT governance structure to support Information systems for business units that was started as a research project.
Mike Lukshin	Ports & Harbors	Advisory	None	New to research just learning about it and happy to be in the process.
Mike Knapp	Hydraulics	Advisory	None	Like ths process feels that we are doing projects that are applied to day to day needs.

Appendix E: Alaska Research Projects

Alaska Department of Transportation & Public Facilities

Traffic, Safety & Materials Research

Traffic and Safety

- Technical Advisors:
  - Statewide Traffic Engineer Jeff Jeffers*
  - Matt Walker Ast. Traffic Engineer
  - Regional Traffic Engineers Scott Thomas, David Epstein, Pam Golden
- Target projects that meet the goals of the SHSP
  - Roadways emphasis areas- SVROR, moose, intersections, head-on, hot spot analysis, special users

*Technical Expert Scorer

ACTION 4.3

Conduct research on Alaska-specific issues related to roadway collisions

Background and Purpose

Much research on highway safety across the 4 Es of engineering, enforcement, education, and emergency response has taken place across the United States and worldwide. However, the relevance of these studies to Alaska is uncertain in some cases. Alaska has its own unique set of traveling conditions which may be difficult to replicate elsewhere, therefore, opportunities exist for research projects to investigate Alaska-related highway safety issues.

Objective

Improve Alaska-related highway safety knowledge base.

Lead Agency

Alaska Research Advisory Board

Traffic and Safety (Cont.)

Past Research Implemented:

Nighttime Visibility of In-Service Pavement Markings, Pavement Markers, and Guardrail Delineation in Alaska (with and without Continuous

Lighting)

Results:

1. Continuous lighting provides sufficient illumination for inlaid markings to meet min Federal retroreflectivity requirements for markings as old as 7 years in urban environments;

2. In this study, six year old guardrail delineation tabs provided equivalent visibility as one year old centerline RRPMs and both were more visible than the pavement markings in rural unlighted roadways.

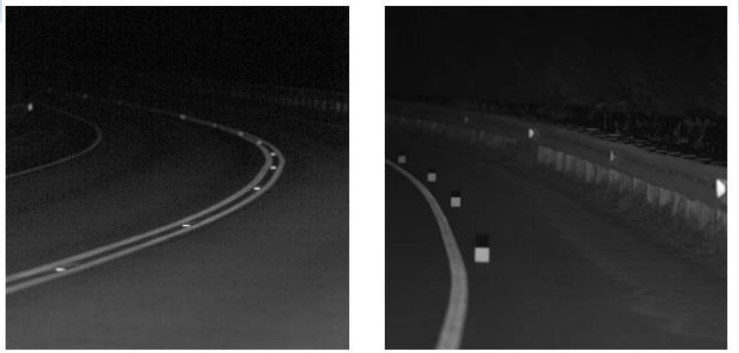


Figure 11. Images from MP2 on Rezanof Drive on Kodiak.

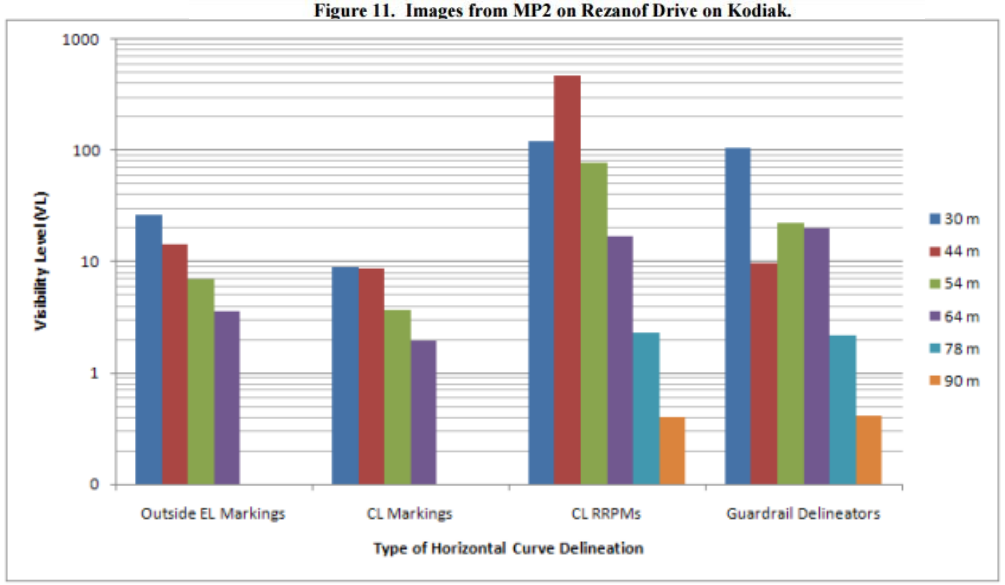


Figure 10. Visibility Levels of Delineation Treatments at MP2 on Rezanof.

Traffic and Safety (Cont.)

High-Mast Light Poles Anchor Nut Loosening In Alaska

An Investigation Using Field Monitoring and Finite-Element Analysis

Results:

1. Inspections indicate that the flange plate

foundations (both double nut and flange-flange type) are far more likely to experience clamp-load loss in the anchor nuts. FE modeling indicates that an applied wind load of approximately 93 mph (3 sec gust, static bluff body) will cause complete clamp-load loss in one anchor rod on a 12-rod foundation. Stretching rather than loosening is most likely the cause of the reduced pre-tension.

2. proposed design solutions:

• Grade 105 rods are less likely to permanently deform than grade 55 rods.

• Doubling the thickness of the flange and base plates in 12-rod flange-flange foundations did significantly increased the resistance to clamp-load loss

Figure 4.9: Rod Blohm (AKDOT&PF Bridge Crew) turning an Anchor Nut 20 Degrees

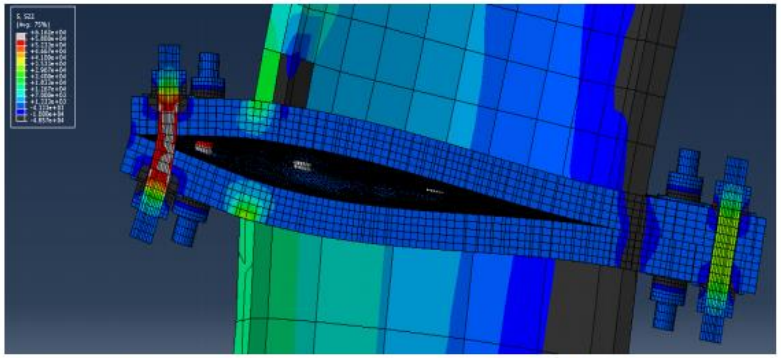


Figure 5.17: Z-axis (vertical) stress results of scenario A: twelve-rod flange-flange subjected to a 6800 k-in (768 kN-m) moment

Traffic and Safety (Cont.)

Current Research Under Contract (FFY15/16)

1. Value of Depressed Medians on Divided Highways in Alaska (UAA);
2. Optimizing Highway Patrol Investments (UAA);
3. Frequency and Potential Severity of Red Light Running in AK (UAA);
4. Icefall Hazard Assessment (Scarptec Inc.);
5. HSM Calibration Factors for Alaska (UAA)*;
6. ARFs for Moose Vehicle Collision Treatments (UAA)*;
7. Modeling Passing Zone Behavior on 2-Lane Rural Highways (UAF);
8. Phase II Differential Speed Signs within Passing Lanes (UAA)**;
9. Carbon Fiber De-Icing Literature Review (CFT Solutions/UAA).

*HSIP funded

** Implementation

Traffic and Safety (Cont.)

Future Research (FFY17/18)

1. Identification of Ped-Involved Risk Locations and Cost Effective Solutions (UAA);
2. Effects of Pavement Surface Characteristics on Crash Frequency & Severity (UAA);
3. Development of Design Guidelines for Non-Motorized Road Users in AK (UAF);
4. Analysis of Motorcycle Crash Severity Outcomes in the Pacific Northwest (UAA)

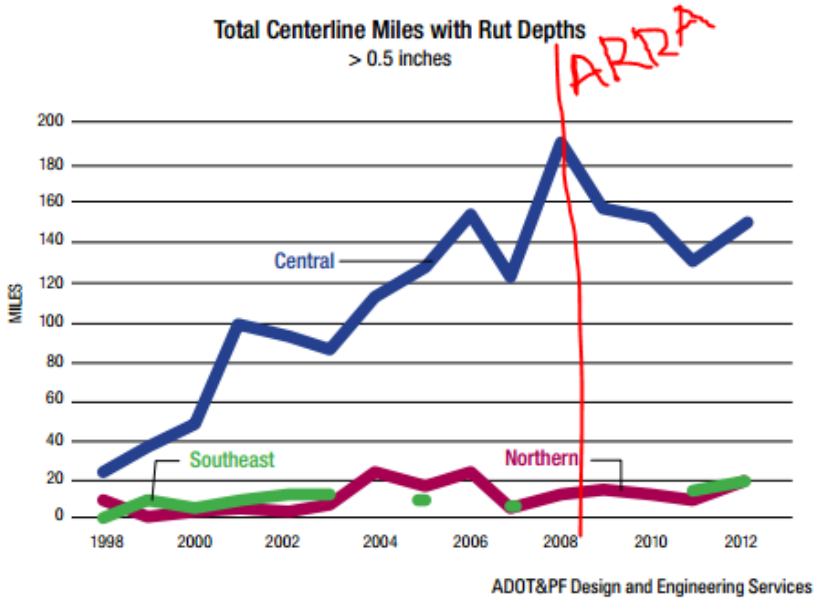
Materials

Technical Advisors:

- Statewide Materials Engineer Mike San Angelo*;
- Statewide Pavement Engineer Steve Saboundjian*;
- Statewide Geologist Barry Benko;
- Statewide Pavement Management Engineer Jim Horn;
- Regional Materials Engineers Newt Bingham, Jeff Currey, Bob Trousil;

*Technical Expert Scorer

ADOT&PF Division of Program Development



ADOT&PF Design and Engineering Services

Materials (Cont.)

Past Research Implemented:

COST-EFFECTIVENESS OF HARD AGGREGATE SOURCES

Results:

- High quality aggregates are not readily available throughout Alaska, therefore a cost-effectiveness study of aggregate transportation was needed. Performance models, based upon the existing wear rates within the Anchorage, Fairbanks and Juneau regions were developed.
- Areas of greatest concern are the Anchorage and Juneau regions. Performance models, relating pavement wear to the Nordic Abrasion value of aggregates, were developed. A methodology for evaluating the cost-effectiveness of transporting improved aggregates is provided. Based upon cost and performance data gathered, asphalt pavement wear caused by studded tires can be reduced, resulting in increased pavement performance in a cost-effective manner.
- Policy and Procedure implementing hard aggregate requirement for projects on roadways with AADTs above 5,000 per lane.

Materials (Cont.)

Evaluating the Need to Seal Thermal Cracks in Alaska's Asphalt Concrete Pavements

This study of 91 sites on 20+ year old AC pavements in DOT&PF's Central and Interior Regions identified two distinct types of thermal cracks- Major and Lesser Thermal Cracks. Based on the field observations during 2012, researchers conclude that significant maintenance funds can be saved or redirected by not sealing or reduced sealing of thermal cracks in AC pavements. Furthermore, the authors suggest that thermal crack maintenance be significantly reduced without negatively influencing general long-term pavement performance.

Figure VI.1 25+ year old major transverse thermal cracks, precut (left) natural (right)

Implementation:
Test section of pre-sawn thermal cracks were incorporated into Parks Highway MP 239-252 Rehabilitation Project. Alaska experience suggests that this controlled form of thermal cracking result in a "better thermal crack" in terms of ride roughness and visual appearance.

The work plan includes long term monitoring and maintenance methods that will be used to evaluate the performance of the experimental sections.

Materials (Cont.)

Current Research Under Contract (FFY15/16)

1. Thermal Modeling of ACE Embankment for Dalton Highway (DOT&PF);
2. Characterization of HMA with RAP in AK (UAF);
3. Field Evaluation of Precut Thermal Cracks (UAF)*;
4. Steel Fiber Reinforced Rubberized Concrete (UAA)**;
5. HFST Monitoring(UAA)**;

*Implementation

** Experimental Feature

Materials (Cont.)

Future Research FFY 2017/18

1. Lab and Field Eval of Modified Asphalt Binder in AK Pavements (UAF);
2. Microsurfacing- Experimental Feature (DOT&PF);
3. Survey and Econ Analysis of Pavement Impacts from Studded Tire Use in AK (TBD);
4. NHS Pavement Data (Mix Design, Structural Section Review) Collection Effort (DOT&PF);
5. High Abrasion Resistant & Long Lasting Concrete (UAF)

Alaska Department of Transportation & Public Facilities

Alaska T2

Dave Waldo & Simon Howell

About Alaska T2

- Fairbanks
- Research Section
- Simon Howell

& Dave Waldo

T2's 2016 Budget

Local Technical Assistance Program(LTAP) – SP&R match

- $300,000
- Salaries and local government participation

National Highway Institute(NHI) – STP funds

- $350,000
- Alaska DOT training funds

T2 program total $650,000

T2 Program Delivery

Training Delivery Average

- Total Training Events 100
- Total Participants 2100

Transportation Customers

- State DOT (80%)
- Local governments
- Contractors/consultants (on Federal Aid projects)
- Other state, FHWA, U.S. Military, Tribal, University

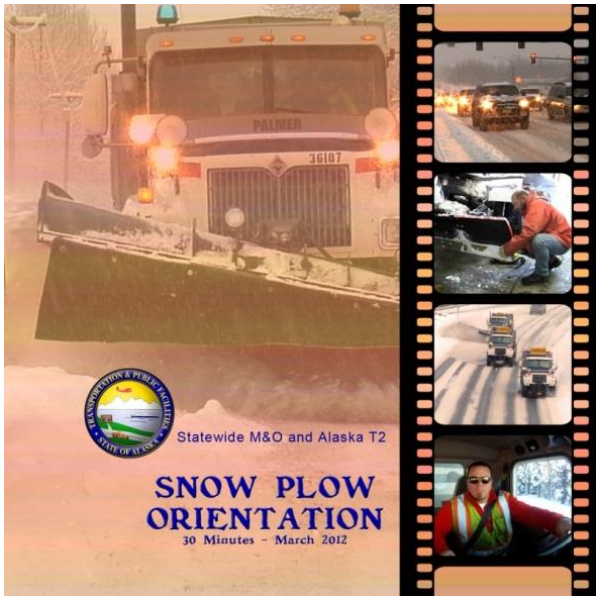
Besides training?

- Video Productions
- Library
- Road Commissioner's Academy
- Newsletter
- LTAP Related Research & Implementation

Video Production - Hwy

Operations: Loader, Grader, Truck

Snow Plow Orientation: Attachments



Video Production - Airport

- AK DOT has 253 Rural airports – most maintenance under contract with local governments/contractors

Aviation Construction Safety

Airport Maintenance – Contractor's Orientation

Library – T2 online

- Research Reports
- Newsletters
- DVDs
- Software
- Guides & Manuals

Research, Development, & Technology Transfer

DOT&PF Library Search

Search Keywords	Snow Removal
Field	Subject
Format	DVD
Year Created	

Submit Search | Reset Form

This library is maintained by the Research and Technology Transfer Section. It has over 1100 resources available for checkout or download. An additional 35,000 resources are maintained for us at the Keith B. Mather (Fairbanks - GI - IARC) Library on the UAF campus. They can be searched using Goldmine.

Need Help?

- Use a key word in the search field(s) rather than exact titles or phrases.
- Select the proper format of the document you want rather than the default "ALL".
- Use a last name for Author/Creator.
- Call or email simon.howell@dot.alaska.gov (907) 451-5482 for additional help.

Road Commissioner's Academy

Assist volunteer road managers with strategies to conduct good pre and post contract inspections/safety evaluations.

Evening courses/consulting

- Road Management Planning and Basic Asset Management
- Low Volume Gravel Roads in Alaska – A Practical Guide for Owners and Others
- Site visits – retired materials engineer

Three boroughs have large road service areas (Fairbanks, Mat-Su, and Kenai Peninsula)






RD&T2 Newsletter

TECHNOLOGY FOR Alaskan Transportation

DOT Statewide Research, Development, & Technology Transfer
Local Technical Assistance Program

Keeping Alaska moving through service and infrastructure with applied research, training, and technology transfer

Spring 2016, No. 90

In this issue . . .

A UAV gives a bird's-eye view of the Gerstle River Bridge.

What is up with Unmanned Aerial Vehicles at DOT.

If you follow the news, then you have heard about unmanned aerial vehicles (UAVs).

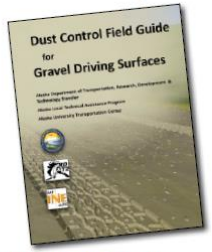
Commonly called drones, UAVs have been used in the military for many years but usually for tasks considered too dangerous for piloted aircraft. In recent years, UAV use has expanded to nonmilitary activities such as security, firefighting, inspections, and data collection.

According to a March 2016 survey by the American Association of State Highway and Transportation Officials, 33 state departments of transportation have or are exploring, researching, testing, or using UAVs to inspect bridges and assist with clearing vehicle crashes, among other innovative applications. Now there have been some promising UAV use in our own department for research projects. Recently the University of Alaska Fairbanks (UAF) conducted flights for the Alaska DOT&PF through the Alaska Center for Unmanned Aircraft Systems Integration (ACUASI). ACUASI is established under the Geophysical Institute.

For this research, Keith Cunningham, a research assistant professor at the International Arctic Research Center (IARC) at UAF, worked closely with the FAA and obtained the required permits for each flight. Mike Cook, operator and owner of M2 Flight Solutions, operated a DJI Phantom quad copter UAV for our bridge inspectors at the Gerstle River Bridge in July 2015. The UAV was equipped with a high-resolution 4-K camera on a triple-axis gimbal that can be pointed by the operator as well as compensate for the motion of the aircraft. Billy Connor, Alaska University Transportation Center (AUTC) director at UAF, said of the setup: "Impressive quality. I'm particularly impressed with the stability of the platform—like it is on a tripod. There is a lot of potential here."

(continued on page 2)

UAF/DOT Dust Study Leads to Development of Dust Control Field Guide



Fugitive dust poses threats to public health in Alaska's rural communities and costly infrastructure repair needs for the Alaska Department of Transportation and Public Facilities. It is also a significant safety hazard by limiting driver visibility. Managing dust provides a means of reducing these impacts.

The Alaska University Transportation Center (AUTC), in partnership with Alaska DOT, completed a study in 2014, introducing new techniques for measuring and monitoring dust in rural Alaska. The findings also discuss dust management practices and application information on palliatives and stabilizers.

Managing Dust on Unpaved Roads and Airports

To help rural practitioners have better access to the information in AUTC's research report and other sources, Research, Development, and Technology Transfer hired Bob McHattie to develop a condensed field guide. The *Dust Control Field Guide for Gravel Driving Surfaces* is intended for readers who have been assigned the task of dust control or dust management.

AUTC created the DUSTM. Mounted to the back of an ATV, the system has an air intake, opacity measurement device, and data logging capabilities. AUTC has deployed this versatile monitoring system on unpaved roads and runways in 23 communities across rural Alaska.

Dust Control Field Guide for Gravel Driving Surfaces

More than 50% of Alaska's state-owned roads are unpaved, as are nearly all other private and local roads. Traffic can remove as much as 750 tons of gravel per mile in a single year. At this rate, expenses for replacing the lost road surface can reach $15,000 per mile annually, based on a $20 per-ton unit cost of gravel. Dust-reducing palliatives like calcium chloride cost roughly $8,000 per mile, yielding a savings of $7,000 per mile over untreated roads. About 82% of Alaska's communities are outside the state road system and rely on local unpaved roads and 255 state-owned airports—many with unpaved runways—notable sources of fugitive dust. Dust brings health risks, impairs quality of life, and imposes costly maintenance needs on limited local budgets.

Information in this guide can help communities manage dust by properly constructing and maintaining the unpaved surface, reducing vehicle speed on roads, and with the proper use of dust palliatives. The proper gradation of aggregate, the right profile, and good drainage are all necessary for reducing fugitive dust from unpaved roads and runways.

The pdf can be downloaded from http://www.dot.state.ak.us/stwddes/research/assets/pdf/dust-cntrl-fg.pdf

Tencate Wicking Fabric Design - Experimental Feature

Fabric installed at MP 197-209, has proven successful in addressing embankment moisture problems and has been substantially cheaper than traditional methods.

Embankment with H2Ri™ at wet/dry transition - 2013

July 2015, two years after paving

Tencate Wicking Fabric Design Experimental Feature

Fabric used at Beaver Slide on Dalton – M&O

Tencate Wicking Fabric Design Specification

- Efficiency of H2Ri is a function of soil suction. Max design suction is ~ 200kPa
- Soil can be dried to around optimum moisture content. Silt content appears to reduce the effectiveness slightly.
- H2Ri can wick moisture at least 73 ft. No reason to expect considerably more.
- H2Ri not effective in soils containing high organic clays.
- Overlap splices not as efficient as desired.
- Specifications including wicking tests suggested by Tencate appear appropriate.

Dust Control Product Mix Design and Quality Assurance Tests

- Develop a mix design procedure for site specific use of dust palliatives and liquid stabilizers.
- Develop a laboratory test method that can be used to select the appropriate palliative and the correct application rates for each site.

Silt

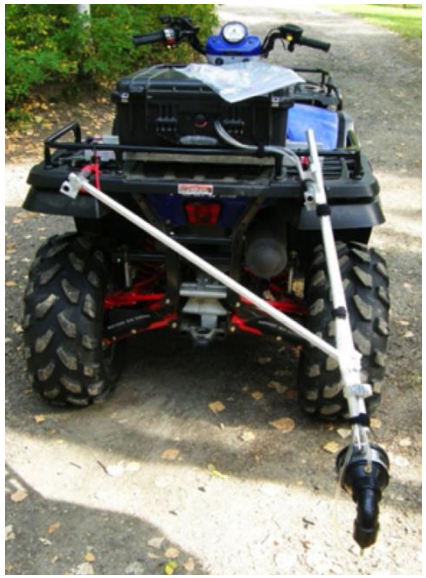
Untreated E-1

Treated E-1

DustTrak™ Aerosol Monitor

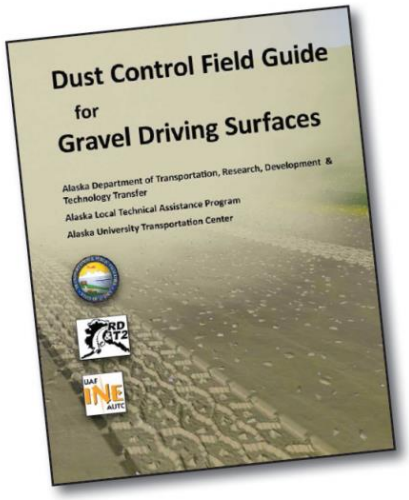
Completed: Performance of Dust Palliatives on Unpaved Roads in Rural Alaska

- Measuring & monitoring
- Palliatives for Alaska
- Portable application



Help communities manage dust by proper construction and maintenance, reducing vehicle speed, and proper use of dust palliatives – all necessary for reducing fugitive dust from unpaved roads and runways.

Portable applicator developed by AK DOT



AUTC created the DUSTM. ATV mounted system has an air intake, opacity measurement device, and data logging capabilities. Deployed on unpaved roads and runways in 23 communities across rural Alaska.

Wavetronix Radar Detection - Experimental Feature

1. Evaluate constructability in terms of time, ease and disruption to traffic.
2. Evaluate detection performance in varying conditions and compare to performance of existing loop and video systems.
3. Determine cost-effectiveness and technical effectiveness of radar detection in two different types of roadways.

Winter of 2014/2015, was good test case for extreme variations. NR M&O and Traffic Safety continue to observe improvement in detection accuracy for all intersections which translates to improved cycle times.

T2 focus 2016/2017

- Increase access to traditional classroom courses via VTC, GoTo Webinar, etc..
- Record VTC and webinars for archive in a “training portal” or “one-stop” on-line resource
- Increase Just-in-time learning
  - Targeted, succinct, high value topics delivered by webinar, on-line, or video
  - E.g. on-line flagger, plan reading

Alaska Department of Transportation & Public Facilities

RD&T2 Research Peer Exchange
Southcoast Region

Alaska DOT&PF

- Most of the communities in the region are not connected by roadways
- Air and ferry travel required

Southcoast Region DOT&PF

- Ferry Terminal/harbor projects
- Road projects & airport projects
  - 45 projects 2016 STIP $127 million
  - 113 current design projects
  - 95 current construction projects
  - 150 employees total

Statewide Bridge Unit

- Provides design services and consultant oversight for bridge construction projects
- Provides services for the existing inventory

New and Old Tanana River Bridges

Bridge Research

- Impacts of frozen soil on bridge response
- Impacts of cold climate on construction materials
- Concrete-filled steel pipe pile extension piers
- Other research includes: post earthquake repair, all steel piers, and seismic load history

Statewide Hydraulics Unit

Bridge Section

- Provides design services for hydraulic analysis for large structures statewide
  - Bridges
  - Large Culverts

Brotherhood Bridge – Juneau, Alaska

Hydraulic Research

- Scour Studies
- Hydraulic Analyses
- Hydraulic 2D Modeling
- Other research includes: aufeis, fish passage and deck drainage

Statewide Environmental Unit

Statewide office

- Development and implementation of environmental policy and procedures
- CE Assignment
- Applying for full NEPA assignment

Eagle Monitoring in Douglas, Alaska

Environmental Research

- Streamlining through data collection
  - Underwater Pile Driving Noise Study
  - Paperless NEPA
  - Bald Eagle Monitoring (Rapid Research & large project)

Admin/Policy Projects

- AASHTOWare investigation
- Asset Management TAMIS and pavement modeling
- Improving Quality-Materials Based
- Two SHRP2 Projects
- RWIS power sources

Experimental Features

- Bridge Polyester Concrete Approach Slabs
- Bridge Spray applied MMA bridge deck waterproofing
- Materials Steel fiber reinforced rubberized concrete
- Materials High friction surface treatment
- Traffic Wavetronics as signal detection

Rapid Response

- Literature Reviews. Striping, Lighting Curfews, Stormwater, etc.
- Specialized Material Testing – Waste Oil Present
- Bald Eagle monitoring

Appendix F: Peer States' Presentations

Performance Measures: Roadmap to a Successful Research Program

Megan Swanson

Illinois Department of Transportation

Overview

Who We Are, What We Do and How We Do It…

- IDOT's Physical Research Program
- Research Coordination
- State Research
- National Research
- Discussion

IDOT Research Program

ILLINOIS DEPARTMENT OF TRANSPORTATION

Bureau of Materials and Physical Research

- Physical Research Unit
  - Bridge Investigation Unit — Research related to structural materials & components of bridges & structures.
  - Pavement Technology Unit — Studies/ services related to design & physical components of pavements and highways
  - Research Coordination Unit — Administers contract research, national research, and technology transfer
  - Technical and Product Studies Unit — Evaluation and development of new products, materials & processes with potential for improving highway construction, maintenance and operations
- Materials Unit

Total FY16 Work Program: $8.5M

Funding Sources

- Federal SPR, Part 2 funds (FY16)
  - $6.7M for Contract Research $134,200 for AASHTO Technical Service Programs (includes 25% match)
  - ~$134,200 for AASHTO Technical Service Programs
  - ~$212,900 for annual TRB contribution
  - ~$1.2M for annual NCHRP contribution
  - ~$600,000 for current Pooled Funds
  - $500,000 contingency for new Pooled Funds
- State funds (FY16)
  - Administrative expenses for contract research program ($480,000 for FY16)
  - State line item appropriation

Goal:

To provide innovative, implementable solutions to transportation problems, to work collaboratively with FHWA, IDOT subject matter experts, and to utilize expertise within academia.

Contract research is administered by the Illinois Center for Transportation (ICT) in Rantoul, IL

- Intergovernmental agreement (IGA) between IDOT and University of Illinois Board of Trustees
- 3 Intergovernmental Agreements since 2005
- Current IGA is for $33M from FY12 through FY16
- New 2-3 year IGA being negotiated

ILLINOIS CENTER FOR TRANSPORTATION

Contract Research

Focus Areas & Structure

ICT Executive Committee

BMPR Research Coordination

Construction | Environment | Pavement | Planning | Public & Intermodal | Safety | Structures | Sustainability | Traffic Ops

Technical Review Panels

Research Coordination

50 active projects as of September 1, 2015

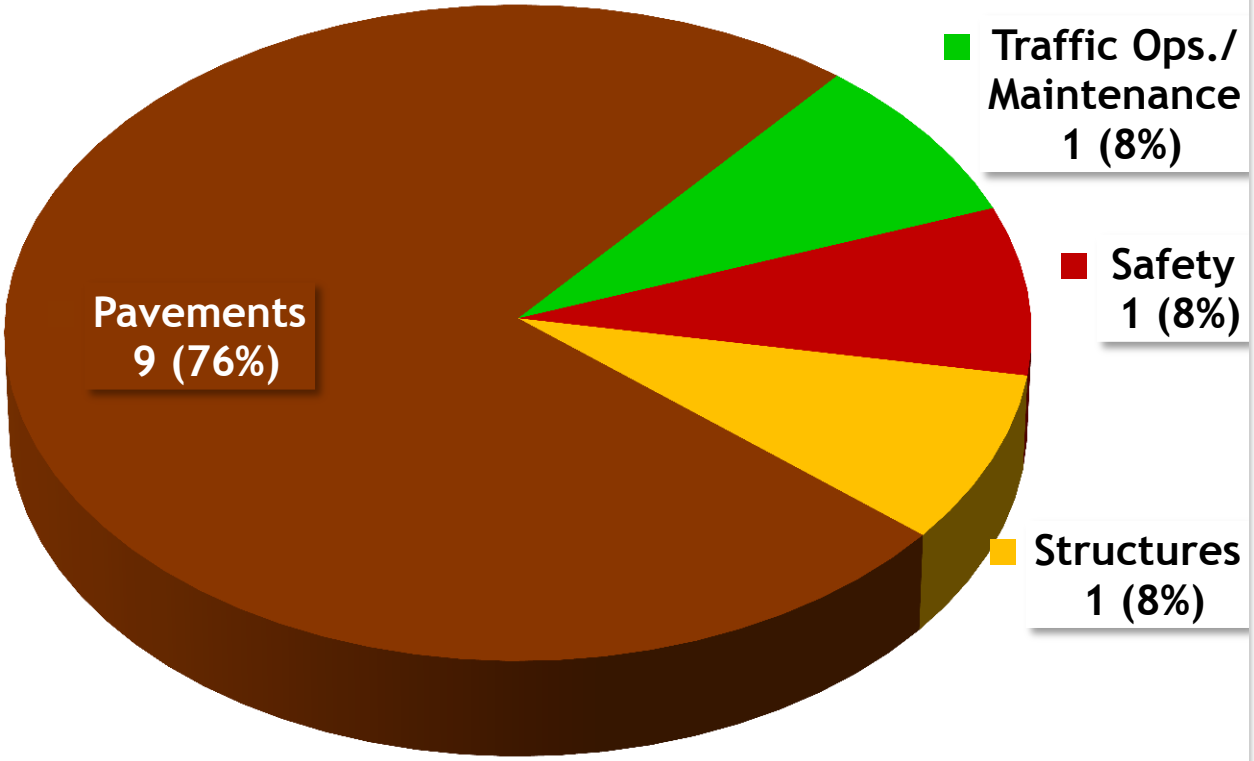
Nine focus areas

- Construction
- Environment
- Pavement Design, Management & Materials
- Planning
- Public & Intermodal Transportation
- Safety
- Structures, Hydraulic & Geotechnical
- Sustainability
- Traffic Operations and Roadside Maintenance

Research Project Types

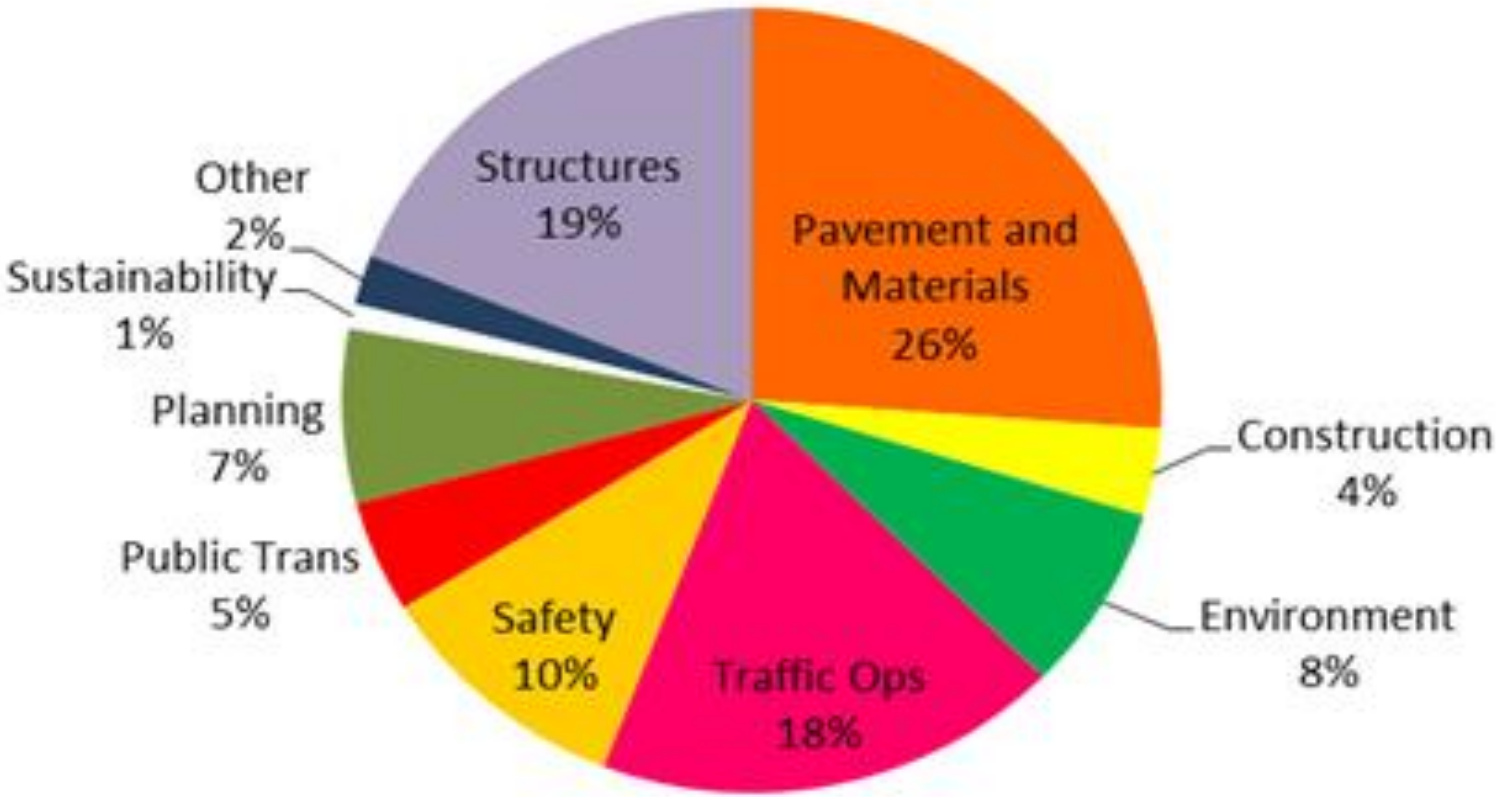
- Regular – Part of the annual program cycle, approved by Exec. Comm.
- Special - $30,000 and results in 6 months, approved by BMPR
- Off Cycle – bigger than a SP but too urgent to wait for the regular cycle, approved by Exec. Comm.

2005


Traffic Ops./
Maintenance
1 (8%)
Safety
1 (8%)
Structures
1 (8%)
Pavements
9 (76%)

Contract Research

2015



Illinois' Research Cycle

Annual Cycle

- May -July: Technical Advisory Groups (TAGs) discuss research needs and implementation
- August: Research needs posted to ICT website
- October 1: Deadline for problem statement submittal for current cycle (problem statements accepted year-round)
- October – November: Technical Advisory Groups review and vote on problem statements
- February: ICT Executive Committee approves projects for funding
- February – July: Select researcher, Technical Review Panel; sign off on work plan and budget
- August/January: Start work

Contract Research – TAGs & TRPs

Technical Advisory Groups:

- Chair
- District
- Central Office
- FHWA
- Academia
- BMPR
- Other Governmental Agencies
- Industry

- Determine Research Needs in Area
- Review and/or Create Problem Statements
- Prioritize/Recommend to Executive Committee
- Appoint Technical Review Panel (TRP) to Oversee Funded Research

Technical Review Panels:

- Chair
- District
- Central Office
- FHWA
- Academia
- BMPR
- Other Governmental Agencies
- Industry

- Subject Matter Experts – Administrative and Front Line
- Guide the Research
- Spearhead Implementation

IDOT RESEARCH NEEDS

The Illinois Department of Transportation's (IDOT's) nine Technical Advisory Groups (TAGs) have identified research needs for the upcoming research cycle. The purpose of these needs is to solicit potential researchers to submit research ideas that might fulfill these needs. TAGs will consider these ideas and write up formal RFPs based on these ideas. TAGs update these needs annually on August 15.

IDOT and the Illinois Center for Transportation (ICT) encourage potential researchers to review the research needs of each TAG and submit research ideas to address those needs. Proposed research ideas that are aligned with TAG research needs have an improved chance of being approved and funded.

Historically, research ideas that meet IDOT's needs or have an IDOT sponsor have a greater chance of being funded than those without an IDOT sponsor. Therefore, ICT strongly encourages each submitter to contact IDOT and secure an IDOT sponsor for the proposed research idea before submission.

If you need assistance identifying a potential IDOT sponsor, please contact the appropriate **Technical Advisory Group**.

The nine TAGs are listed below. Click on the name of each TAG to view the TAG's most recent research needs:

- Construction TAG Research Needs
- Environment TAG Research Needs
- Pavement Design, Management, and Materials TAG Research Needs
- Planning TAG Research Needs

Contract Research - Problem Statement

Illinois Department of Transportation

ILLINOIS CENTER FOR TRANSPORTATION

Request of Research Ideas – Due October 1, 2015

1. **Research Idea Title:**

2. **Research Literature Review:** Please describe the current state of knowledge and state of practice in this field, including studies underway in the TRID (http://trid.trb.org) and Research in Progress (http://rip.trb.org/search) databases, and how this relates to the research need. Limit: 1300 characters.

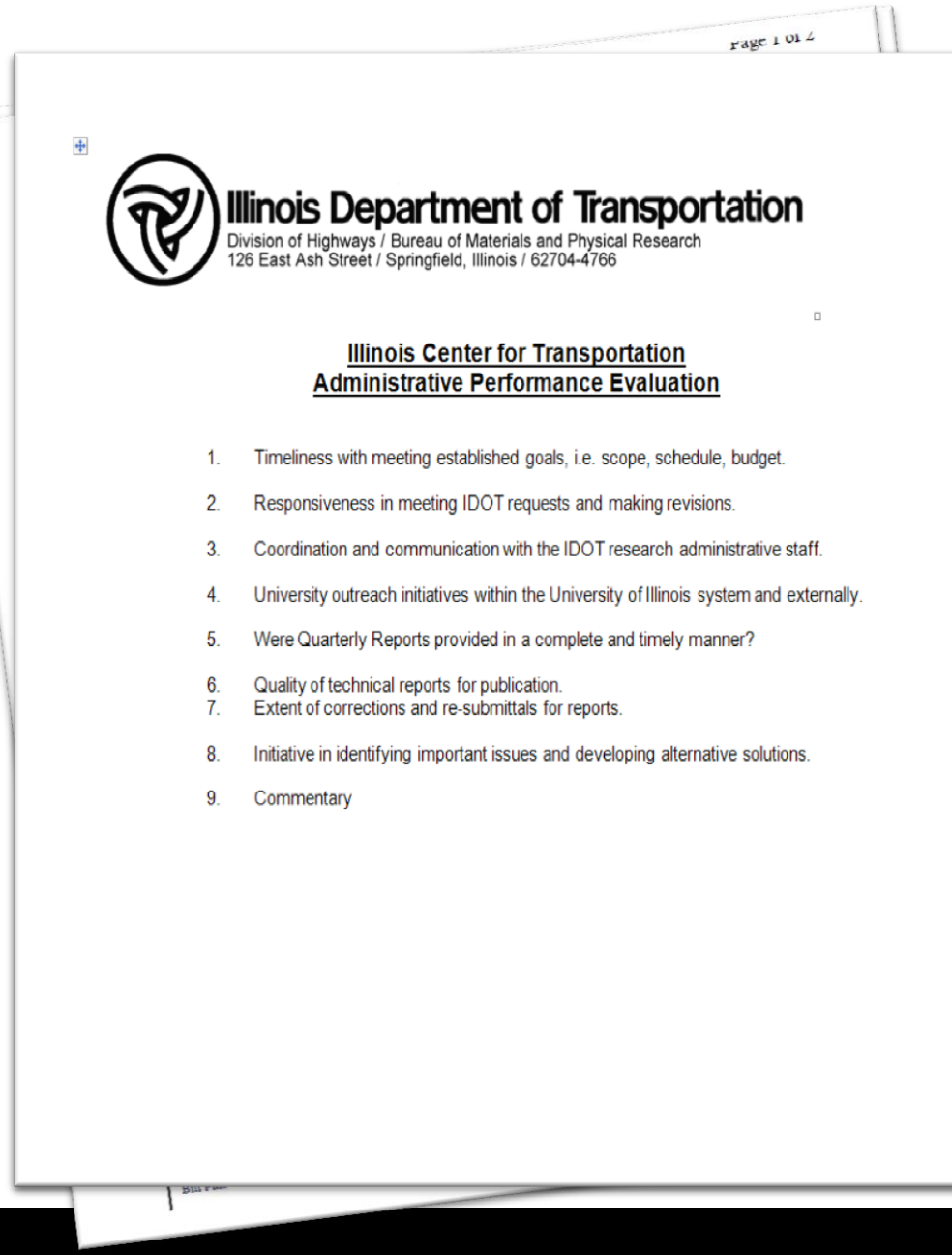
3. **Objective and Scope of the Proposed Research Idea:** Clearly state the objective of the proposed research and briefly describe how the proposed work will address the research needs. Limit: 975 characters.

4. **Justifications for the Proposed Research:** Please be specific as to how the research will benefit IDOT and the state of Illinois. Limit: 325 characters.

5. **Expected Implementation Outcome:** 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. Limit: 650 characters.

ICT Tracking and Evaluation

- Monthly Admin Meetings
- IDOT evaluates ICT semi-annually
- Online Quarterly Reporting
- Time and Budget Extensions



Illinois Department of Transportation
Division of Highways / Bureau of Materials and Physical Research
126 East Ash Street / Springfield, Illinois / 62704-4766

Illinois Center for Transportation
Administrative Performance Evaluation

1. Timeliness with meeting established goals, i.e. scope, schedule, budget.
2. Responsiveness in meeting IDOT requests and making revisions.
3. Coordination and communication with the IDOT research administrative staff.
4. University outreach initiatives within the University of Illinois system and externally.
5. Were Quarterly Reports provided in a complete and timely manner?
6. Quality of technical reports for publication.
7. Extent of corrections and re-submittals for reports.
8. Initiative in identifying important issues and developing alternative solutions.
9. Commentary

ICT Tracking and Evaluation

- TRP & PI Semi-annual Evaluations
- Implementation Planning Worksheet
- TRP Close-out Evaluation

Illinois Department of Transportation

Technical Review Panel (TRP)
Evaluation of Principal Investigator

Project Title:	**Date:** / /
	Project Number:
TRP Chair:	**TRP Co-Chair:**
Principal Investigator (PI): **University/Consultant:**	**Co-PI:** **University/Consultant:**

*Instructions: Please complete and provide comments as necessary. Any score of "Poor" or below **requires** an explanation.*

1. Effectiveness and Cooperation	Unsatisfactory	Poor	Fair	Good	Excellent
A. Ability to understand the purpose of the project, emphasize the important aspects of the project, and effectively use the research team:	☐	☐	☐	☐	☐
B. Investigator responded positively to requests for information, revisions, etc.:	☐	☐	☐	☐	☐
C. Research team coordinates and cooperates with Technical Review Panel:	☐	☐	☐	☐	☐

A.

B.

C.

2. Deliverables and Timeliness	Unsatisfactory	Poor	Fair	Good	Excellent
A. Quarterly Reports provided in a complete and timely manner:	☐	☐	☐	☐	☐
B. Quality of deliverables:	☐	☐	☐	☐	☐
C. Work accomplished on time and established schedules met:	☐	☐	☐	☐	☐

Three Month Editing Process

- ICT Technical Editor paid through IGA (Technology Transfer and Editorial Support)

- ICT Project Managers send reminders at 6 months and 4 months prior to project end date

- PI provides draft report to Technical Editor 3 months before the project end date for initial edit (1 month)
  - Spelling, Grammar, Missing Information

- TRP review
  - "Back and forth" to address any issues, concerns or to provide clarifications

- Final editing
  - Incorporating all changes, complete pagination, table of contents and Technical Report Documentation Page

National Research

- Participation in FHWA Transportation Pooled Fund Program (~30 studies underway)

- Participation in Transportation Research Board (TRB)
  - 9 staff represent IDOT on 14 Committees
  - 1 Task Force Member
  - We leverage approximately **$74** in research-related activity for every **$1** we invest in TRB activities (Donor State)

- Participation in National Cooperative Highway Research Program (NCHRP)
  - 10 staff represent IDOT on 11 panels
  - 6 staff chair 8 committees
  - We leverage approximately **$27** in research-related activity for every **$1** we invest in NCHRP activities (Donor State)

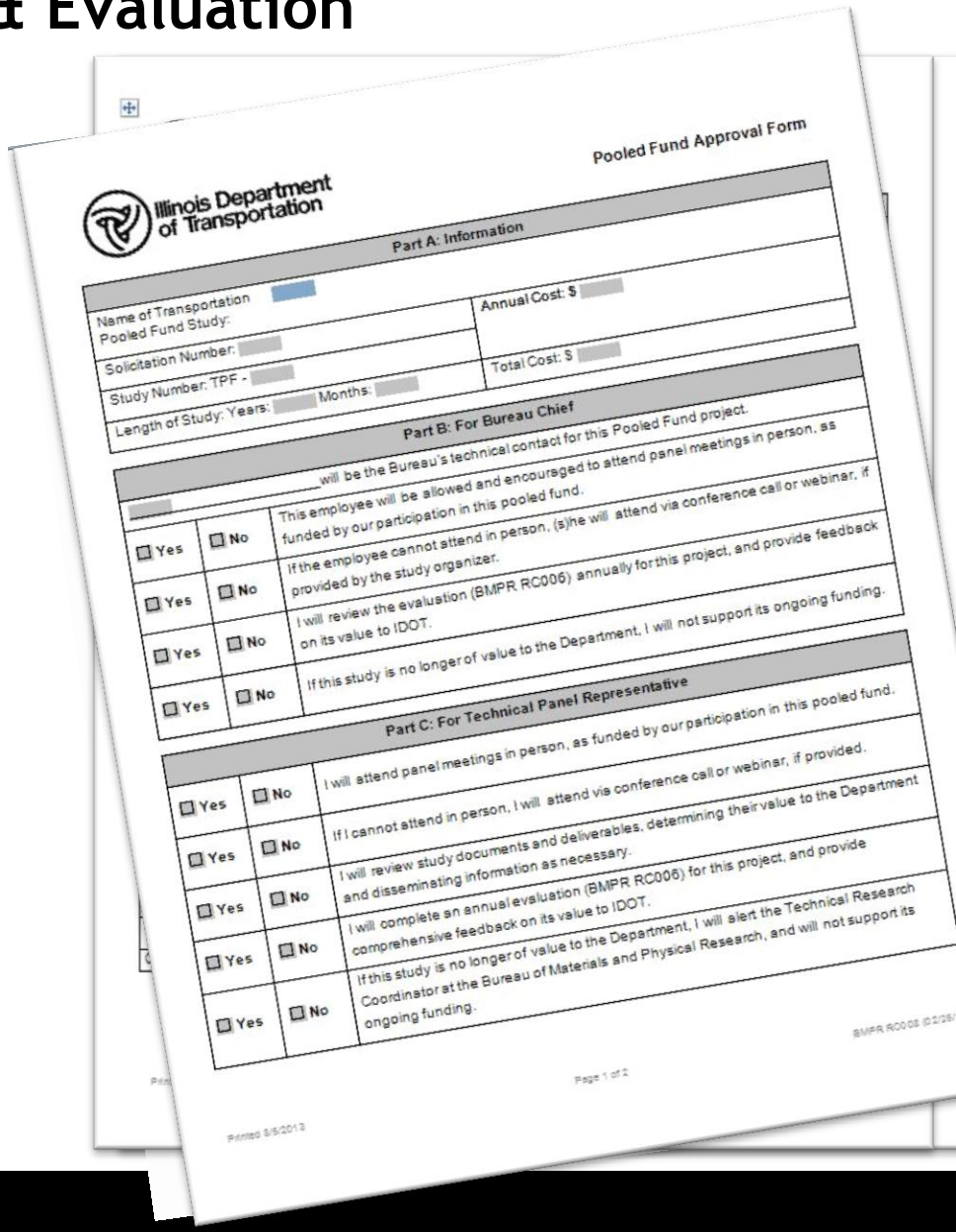
- Participating in SHRP 2 Implementation
  - WHAT PROJECTS

- AASHTO – RAC
  - Friends of Value of Research and Program Management and Quality Task Forces

Research Coordination

Pooled Funds - Tracking & Evaluation

- Pooled Fund Approval Form
- Annual Evaluation
- Close-out Evaluation



Illinois Department of Transportation

Pooled Fund Approval Form

Part A: Information

Name of Transportation Pooled Fund Study:

Solicitation Number:

Study Number: TPF -

Length of Study: Years: Months:

Annual Cost: $

Total Cost: $

Part B: For Bureau Chief

_____ will be the Bureau's technical contact for this Pooled Fund project.

☐ Yes	☐ No	This employee will be allowed and encouraged to attend panel meetings in person, as funded by our participation in this pooled fund.
☐ Yes	☐ No	If the employee cannot attend in person, (s)he will attend via conference call or webinar, if provided by the study organizer.
☐ Yes	☐ No	I will review the evaluation (BMPR RC006) annually for this project, and provide feedback on its value to IDOT.
☐ Yes	☐ No	If this study is no longer of value to the Department, I will not support its ongoing funding.

Part C: For Technical Panel Representative

☐ Yes	☐ No	I will attend panel meetings in person, as funded by our participation in this pooled fund.
☐ Yes	☐ No	If I cannot attend in person, I will attend via conference call or webinar, if provided.
☐ Yes	☐ No	I will review study documents and deliverables, determining their value to the Department and disseminating information as necessary.
☐ Yes	☐ No	I will complete an annual evaluation (BMPR RC006) for this project, and provide comprehensive feedback on its value to IDOT.
☐ Yes	☐ No	If this study is no longer of value to the Department, I will alert the Technical Research Coordinator at the Bureau of Materials and Physical Research, and will not support its ongoing funding.

Printed 8/5/2013

Page 1 of 2

BMPR RC006 (02/26/

Megan Swanson, Research Coordinator
Illinois Department of Transportation
Megan.Swanson@illinois.gov
217.782.3547

Implementation: Roadmap to a Successful Research Program

Megan Swanson

Illinois Department of Transportation

Overview

How We Implement – Success and Challenges

- Implementation Challenges
- Implementation Planning
- Implementation Tracking
- Ongoing Challenges

FHWA Process Review

- 2009/2010 joint venture between IDOT and FHWA Division Office

Three main findings related to implementation

- Implementation goals not clearly defined
- Difficulty with implementation because not all stakeholders were identified/involved
- No formal process to identify/monitor implementation

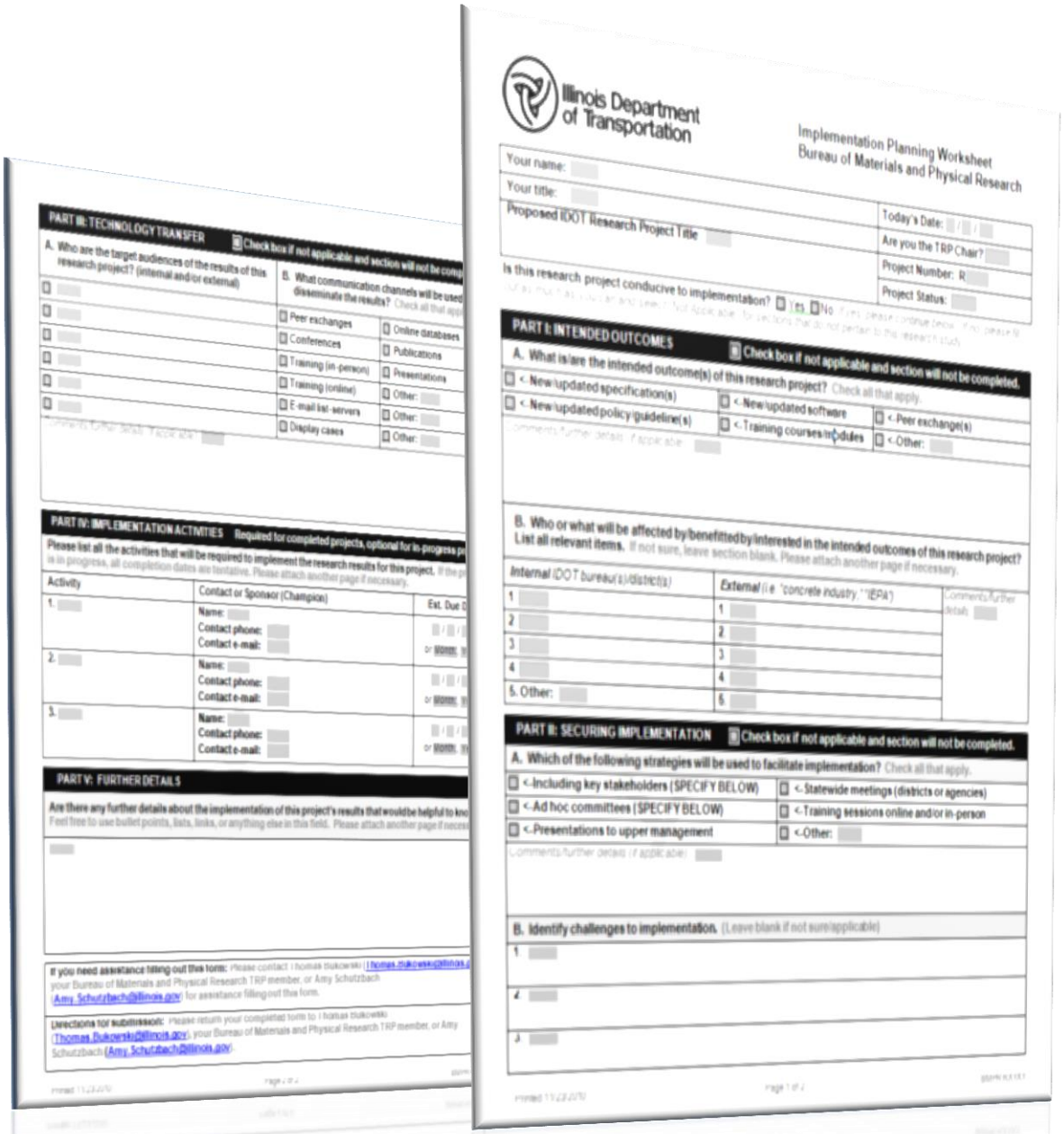
Next Step – Developing an Implementation Policy

- Literature review
- Survey RAC on implementation strategies; follow-up phone calls – Participating in Implementation Taskforce
- What works, what doesn't - Identify the necessary components for success
  - Consider implementation at the front end
  - Identify all stakeholders and include them in planning when appropriate
  - Include needed outcomes as deliverables
  - Recognize challenges to implementation and plan accordingly
  - Require accountability

Implementation Categories

- Implementation Categories
  - Implementation Expected – By default, all projects are expected to be implemented
  - Implementation Underway – Actions are being taken to train, implement policies or procedures
  - Implemented – The outcomes are being used by the department
  - Not Implemented – while implementable outcomes were provided, they were not implemented due to political or practical concerns
  - Not Applicable – The project was not designed to have implementable outcomes (e.g. peer exchange)

Implementation Planning Worksheet



Illinois Department of Transportation

Implementation Planning Worksheet
Bureau of Materials and Physical Research

Your name:

Your title:

Proposed IDOT Research Project Title

Today's Date:

Are you the TRP Chair?

Project Number: R

Project Status:

Is this research project conducive to implementation? ☐ Yes ☐ No

PART I: INTENDED OUTCOMES ☐ Check box if not applicable and section will not be completed.

A. What is/are the intended outcome(s) of this research project? Check all that apply.

☐ <- New/updated specification(s)	☐ <- New/updated software	☐ <- Peer exchange(s)
☐ <- New/updated policy/guideline(s)	☐ <- Training courses/modules	☐ <- Other:

Comments/further details if applicable:

B. Who or what will be affected by/benefitted by/interested in the intended outcomes of this research project? List all relevant items. If not sure, leave section blank. Please attach another page if necessary.

Internal IDOT bureau(s)/district(s)	*External* (i.e. "concrete industry," "EPA")	Comments/further details
1	1	
2	2	
3	3	
4	4	
5. Other:	5.	

PART II: SECURING IMPLEMENTATION ☐ Check box if not applicable and section will not be completed.

A. Which of the following strategies will be used to facilitate implementation? Check all that apply.

☐ <- Including key stakeholders (SPECIFY BELOW)	☐ <- Statewide meetings (districts or agencies)
☐ <- Ad hoc committees (SPECIFY BELOW)	☐ <- Training sessions online and/or in-person
☐ <- Presentations to upper management	☐ <- Other:

Comments/further details if applicable:

B. Identify challenges to implementation. (Leave blank if not sure/applicable)

1.

2.

3.

PART III: TECHNOLOGY TRANSFER ☐ Check box if not applicable and section will not be completed.

A. Who are the target audiences of the results of this research project? (internal and/or external)

B. What communication channels will be used to disseminate the results? Check all that apply.

☐	☐ Peer exchanges	☐ Online databases
☐	☐ Conferences	☐ Publications
☐	☐ Training (in-person)	☐ Presentations
☐	☐ Training (online)	☐ Other:
☐	☐ E-mail list-servers	☐ Other:
	☐ Display cases	☐ Other:

Comments/further details if applicable:

PART IV: IMPLEMENTATION ACTIVITIES Required for completed projects, optional for in-progress pr

Please list all the activities that will be required to implement the research results for this project. If the pr is in progress, all completion dates are tentative. Please attach another page if necessary.

Activity	Contact or Sponsor (Champion)	Est. Due D
1.	Name: Contact phone: Contact e-mail:	/ / or Ongoi
2.	Name: Contact phone: Contact e-mail:	/ / or Ongoi
3.	Name: Contact phone: Contact e-mail:	/ / or Ongoi

PART V: FURTHER DETAILS

Are there any further details about the implementation of this project's results that would be helpful to kno
Feel free to use bullet points, lists, links, or anything else in this field. Please attach another page if neces

If you need assistance filling out this form: Please contact Thomas Bukowski (Thomas.Bukowski@Illinois.g your Bureau of Materials and Physical Research TRP member, or Amy Schutzbach (Amy.Schutzbach@Illinois.gov) for assistance filling out this form.

Directions for submission: Please return your completed form to Thomas Bukowski (Thomas.Bukowski@Illinois.gov), your Bureau of Materials and Physical Research TRP member, or Amy Schutzbach (Amy.Schutzbach@Illinois.gov).

PART I: INTENDED OUTCOMES ☐ Check box if not applicable and section will not be completed.

A. What is/are the intended outcome(s) of this research project? Check all that apply.

☐ <-New/updated specification(s)	☐ <-New/updated software	☐ <-Peer exchange(s)
☐ <-New/updated policy/guideline(s)	☐ <-Training courses/modules	☐ <-Other:

Comments/further details (if applicable):

B. Who or what will be affected by/benefitted by/interested in the intended outcomes of this resear
List all relevant items. If not sure, leave section blank. Please attach another page if necessary.

Internal IDOT bureau(s)/district(s)	*External (i.e. "concrete industry," "IEPA")*	Comm details
1.	1.	
2.	2.	
3.	3.	
4.	4.	
5. Other:	5.	

PART II: SECURING IMPLEMENTATION ☐ Check box if not applicable and section will not be completed.

A. Which of the following strategies will be used to facilitate implementation? Check all that apply.

☐ <-Including key stakeholders (SPECIFY BELOW)	☐ <-Statewide meetings (districts or agencies)
☐ <-Ad hoc committees (SPECIFY BELOW)	☐ <-Training sessions online and/or in-person
☐ <-Presentations to upper management	☐ <-Other:

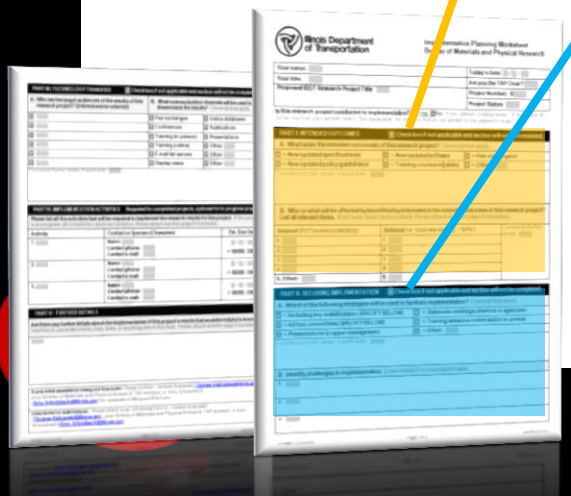
Comments/further details (if applicable):

B. Identify challenges to implementation. (Leave blank if not sure/applicable)

1.

2.

3.



Include needed outcomes as deliverables; Identify all stakeholders and include them in the research

Part I: Intended Outcomes

Recognize challenges to implementation and plan accordingly

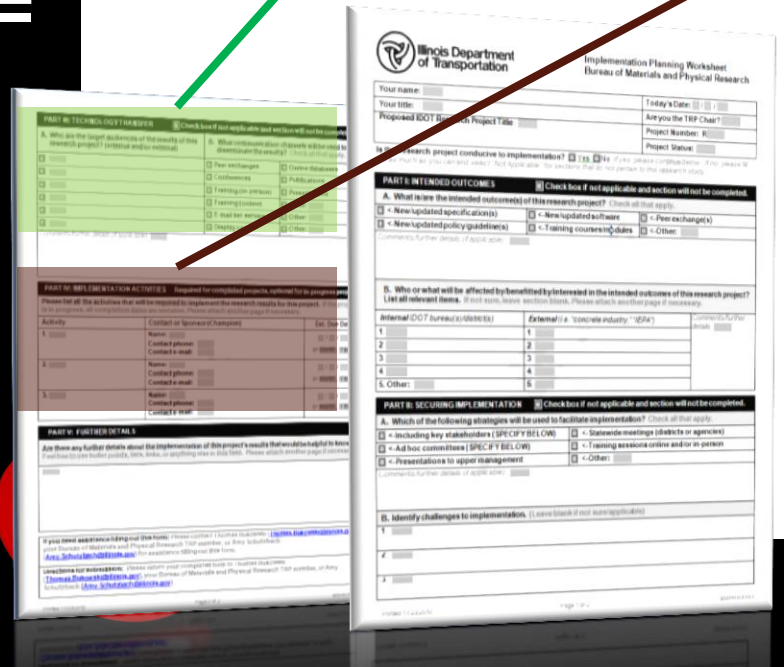
Part II: Securing Implementation

Implementation Planning

PART III: TECHNOLOGY TRANSFER ☐ Check box if not applicable and section will not be completed.

A. Who are the target audiences of the results of this research project? (internal and/or external)	B. What communication channels will be used to disseminate the results? Check all that apply.	
☐	☐ Peer exchanges	☐ Online databases
☐	☐ Conferences	☐ Publications
☐	☐ Training (in-person)	☐ Presentations
☐	☐ Training (online)	☐ Other:
☐	☐ E-mail list-servers	☐ Other:
☐	☐ Display cases	☐ Other:

Comments/further details (if applicable):



PART IV: IMPLEMENTATION ACTIVITIES Required for completed projects, optional for in-progress projects.

Please list all the activities that will be required to implement the research results for this project. If the project is in progress, all completion dates are tentative. Please attach another page if necessary.

Activity	Contact or Sponsor (Champion)	Est. Due Date
1.	Name: Contact phone: Contact e-mail:	/ / or Month: Year:
2.	Name: Contact phone: Contact e-mail:	/ / or Month: Year:
3.	Name: Contact phone: Contact e-mail:	/ / or Month: Year:

Identify all stakeholders and include them in planning when appropriate

- Part III: Technology Transfer

Require accountability

- Part IV: Implementation Activities

Require accountability
Implementation Tracking Database – Activities View

Illinois Department of Transportation - Bureau of Materials and Physical Research

Implementation Tracking Database - In-Depth Activities View

Project ID	Project Name	Project Contact/TRP Chair	Implementation Activities				
			Task	Due Date	Champion	Brief Description	Status
R27-99	Development of Procedures for Determining the Axial Capacity of Drilled Shafts Founded in Illinois Shales	William Kramer	TASK 1	August, 2012	William Kramer	Format and prepare new design spreadsheet from final report for implementation	Not started
Notes:			TASK 2	July, 2012	William Kramer	Format and prepare new design manual from final report for implementation	Not started
			TASK 3	September, 2012	William Kramer	Write memo to agency and district heads explaining new design spreadsheet and design manual	Not started
			TASK 4	September, 2012	Pending	Sbumit design guide and design spreadsheet to Illinois Department of Transportation Web page	Not started
			TASK 5	October, 2012	Pending	Research and contact bridge publications/journals	Not started
			TASK 6	June, 2013, ongoing	William Kramer	Findings published in bridge publications/journals (complete after one published article)	Not started
						Percent Complete:	0%
			TASK 1				
Notes:			TASK 2				
			TASK 3				
			TASK 4				

Progress-to-Date

- FHWA has approved process
- Focusing on implementation for all projects beginning in Spring 2010
- Implementation planning worksheets have been well-received
  - New TRP Chairs
  - Experienced TRP Chairs

Implementation Success

- Small steps lead to long-term benefits
- Answers “What have you done for me lately?”
- Documents innovation, progress
- Measures success of research program

- Implementation Stats
  - Implementation Expected:
  - Implementation Underway -
  - Implemented -
  - Not Implemented -
  - Not Applicable -

Ongoing Implementation Challenges

- Lack of Staffing
- Some implementation assistance from consultant
  - Annual Report, Highlight Documents
- No consistent implementation of CRP programs
- Difficulty quantifying value of research…

Megan Swanson, Research Coordinator
Illinois Department of Transportation
Megan.Swanson@illinois.gov
217.782.3547

New Hampshire DOT

Department of Transportation

Bureau of Materials and Research

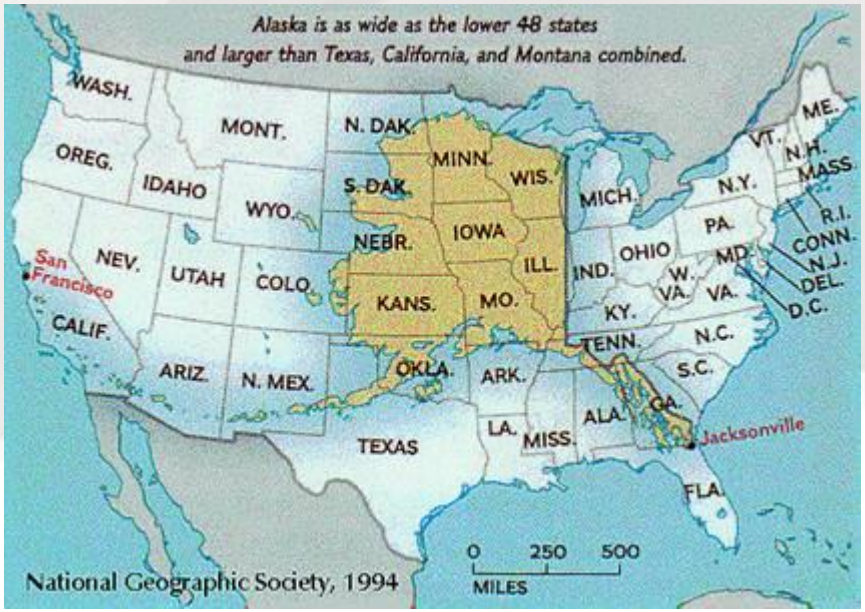
ALASKA RESEARCH PEER EXCHANGE
May 3 – 5, 2016

NHDOT Research Program

Ann Scholz, P.E., Research Engineer
ascholz@dot.state.nh.us

New Hampshire DOT Department of Transportation

General Information



New Hampshire DOT
Department of Transportation

General Information

New Hampshire DOT
Department of Transportation

General Information

Materials & Research – Four (4) Sections

Research (Under Admin.)	Materials
Geotechnical	Pavement Management

Ann Scholz, P.E. – Research Engineer

Beth Klemann, P.E. – Assistant Research Engineer

New Hampshire DOT
Department of Transportation

New Hampshire's SPR Part II - $800K/year Federal

New Hampshire DOT Department of Transportation

Project Solicitation

The NHDOT Bureau of Materials & Research wants to hear from you!

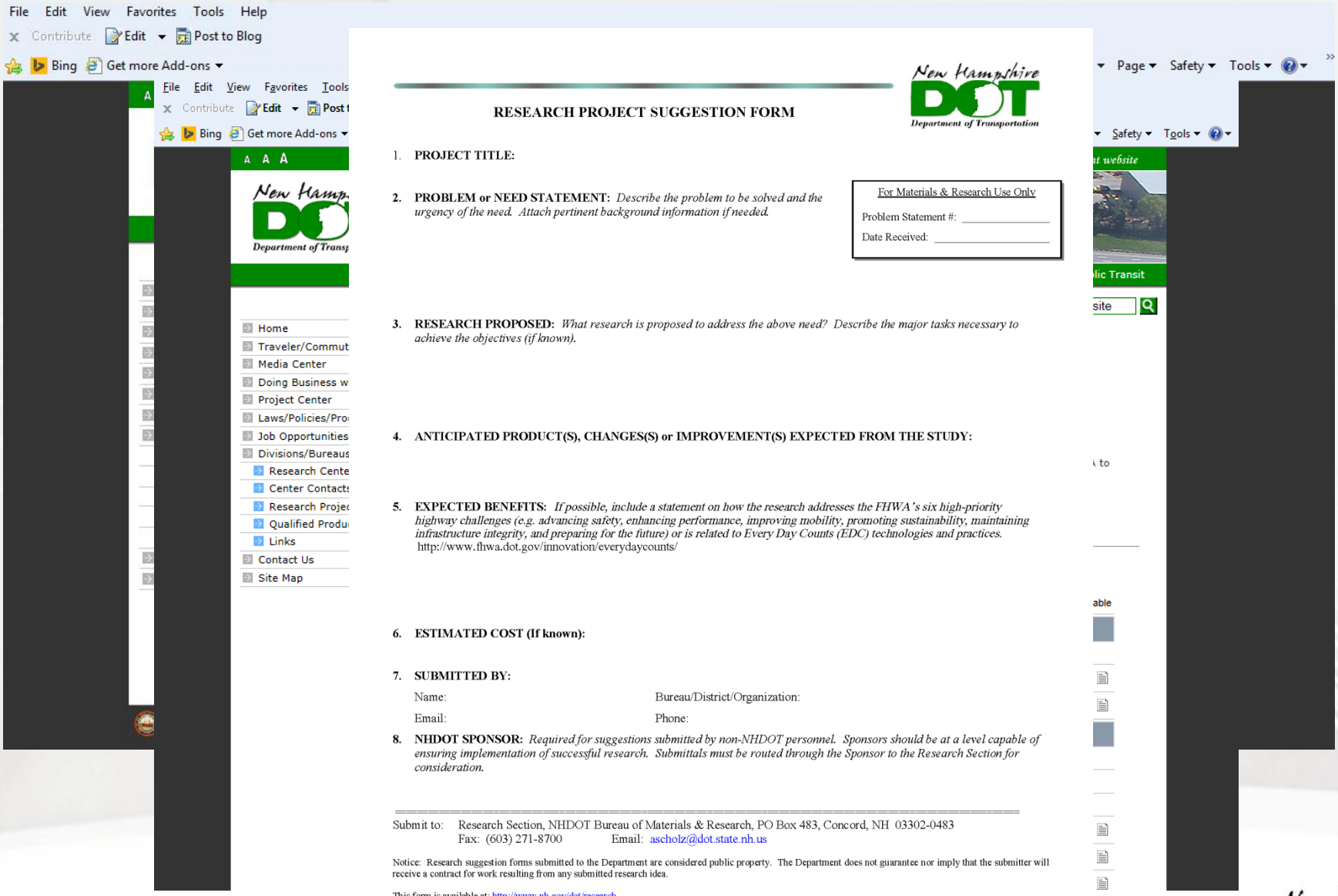
Research Project Suggestion Forms are available at:

- http://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/index.htm
- http://dotweb/organization/projectdevelopment/materialsresearch/index.asp
- Email: Ann Scholz ascholz@dot.state.nh.us

Submission deadline: March 15, 2016

New Hampshire DOT Department of Transportation

Project Solicitation



RESEARCH PROJECT SUGGESTION FORM

1. **PROJECT TITLE:**

2. **PROBLEM or NEED STATEMENT:** *Describe the problem to be solved and the urgency of the need. Attach pertinent background information if needed.*

For Materials & Research Use Only
Problem Statement #: _____
Date Received: _____

3. **RESEARCH PROPOSED:** *What research is proposed to address the above need? Describe the major tasks necessary to achieve the objectives (if known).*

4. **ANTICIPATED PRODUCT(S), CHANGES(S) or IMPROVEMENT(S) EXPECTED FROM THE STUDY:**

5. **EXPECTED BENEFITS:** *If possible, include a statement on how the research addresses the FHWA's six high-priority highway challenges (e.g. advancing safety, enhancing performance, improving mobility, promoting sustainability, maintaining infrastructure integrity, and preparing for the future) or is related to Every Day Counts (EDC) technologies and practices.* http://www.fhwa.dot.gov/innovation/everydaycounts/

6. **ESTIMATED COST (If known):**

7. **SUBMITTED BY:**

Name: Bureau/District/Organization:

Email: Phone:

8. **NHDOT SPONSOR:** *Required for suggestions submitted by non-NHDOT personnel. Sponsors should be at a level capable of ensuring implementation of successful research. Submittals must be routed through the Sponsor to the Research Section for consideration.*

Submit to: Research Section, NHDOT Bureau of Materials & Research, PO Box 483, Concord, NH 03302-0483
Fax: (603) 271-8700 Email: ascholz@dot.state.nh.us

Notice: Research suggestion forms submitted to the Department are considered public property. The Department does not guarantee nor imply that the submitter will receive a contract for work resulting from any submitted research idea.

This form is available at: http://www.nh.gov/dot/research

Research Advisory Council (RAC)

Established in 1993

Voting Members:

- M&R Administrator
- Asst. Dir. of Project Development

Bureau Administrators

- Aeronautics
- Highway Maintenance
- Planning & Community Asst.
- Right-of-Way
- Environment
- Rail & Transit
- Bridge Design
- Construction
- Highway Design
- Bridge Maintenance
- Turnpikes
- Traffic

Associate (non-voting) members:

FHWA-NH, DoIT

Research Section Chief

New Hampshire DOT Department of Transportation

Research Advisory Council (RAC)

~85% of Research Projects go through RAC Process

~60% of Problem Statements Funded

Number of Problem Statements Received:

2004 – 12
2006 – 11
2008 – 11
2010 – 13
2013 – 22
2016 – 19

New Hampshire DOT
Department of Transportation

NHDOT Identification/Prioritization Process

- Strengths
  - RAC is Predisposed to Practical, Applied Research
  - RAC Members Enjoy the Process. Excellent Attendance Record
  - Brings Credibility to the SPR2 Work Program
- Challenges/Opportunities
  - Process does not Always Produce Policy or Commissioner-Level Ideas
  - Heavy Skew toward Traditional Topics
  - Problem Statement Volume is Relatively Low
  - Submittal Success Rate too High?

New Hampshire DOT Department of Transportation

Distribution 2004 - 2013

- Materials – 29%
- Pavements – 18%
- Maintenance – 13%
- Structures – 11%
- Design – 8%
- Other Trans. modes – 8%
- Environment – 8%
- Traffic/Safety – 5%

More Recently, Projects Initiated to Address:

- The use of unmanned aircraft systems
- Mildly contaminated soil distribution assessment
- Hydroacoustic limits for deep foundation projects
- Gussett-less truss connection structural model

New Hampshire DOT
Department of Transportation

Program Oversight

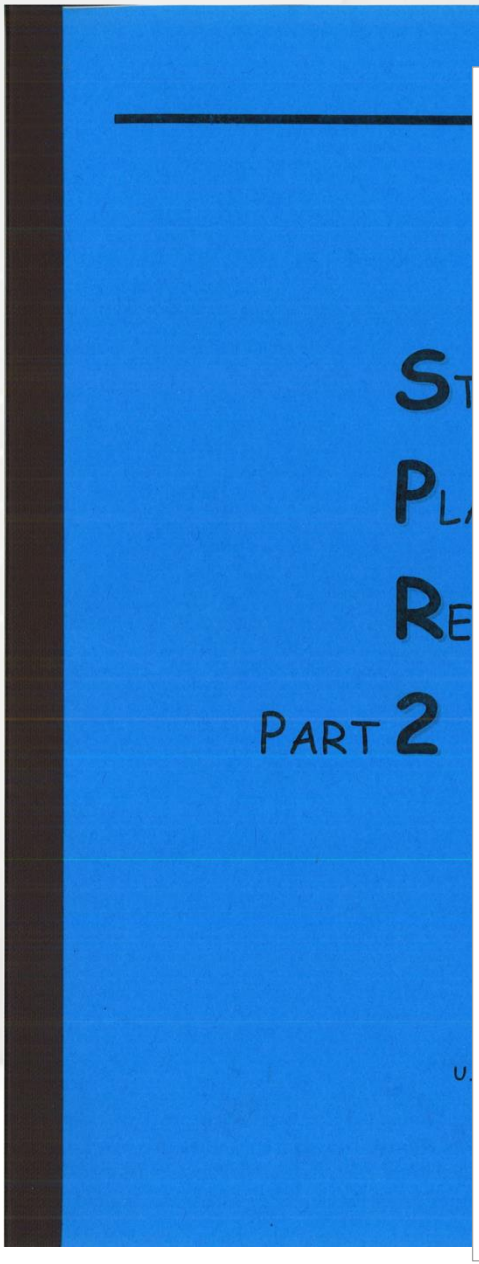


TABLE OF

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION
Bureau of Materials Research
FFY 2016 SPR2 Work Program
September 2015

ESTIMATED BUDGET - SPR2 Funds

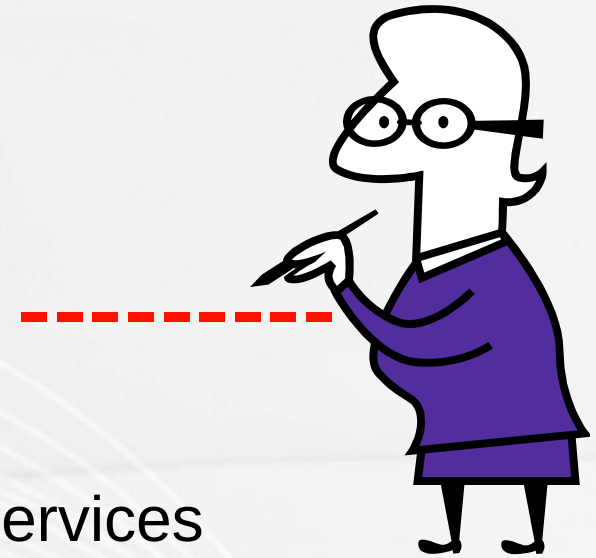
			Federal $
Uncommitted funds carried forward from previous biennium (from p. 3)		$	487,632.41
SPR2 Apportionment - FFY 2016		$	784,189.00
	A	$	1,271,821.41
Funds programmed for NCHRP, FFY 2016 (22% of estimated SPR2 apportionment)		$	172,521.58
Funds committed to existing/proposed Pooled-Fund Studies, FFY 2016 (from p. 2)		$	232,099.00
	B	$	404,620.58
Funds Available for SPR2 Work Program	C=A-B	$	867,200.83
Annual Administrative (includes 10% for indirect costs except as noted)			
15258E Administration of SPR2 Program		$	85,000.00
15260E Implementation of Research and Technology Transfer		$	75,000.00
15261E AASHTO Technical Service Programs*		$	54,000.00
15262E Research Related Expenses		$	148,000.00
	D	$	362,000.00
Research Projects (includes 10% for indirect costs)			
29729 Statewide Strategic Transit Assessment Study (formerly approved project 15680U)**		$	132,000.00
29337 Research Freight Information and Data in NH (formerly approved project 15680T)***		$	55,000.00
26962G Structural Support for Tidal Energy Conversion at the Memorial Bridge		$	110,000.00
26962H Peer Exchange		$	27,500.00
2I Stormwater Table		$	11,000.00
	E	$	335,500.00
Programmed Funds for SPR2 Work Program	F=D+E	$	697,500.00
Total of Programmed Federal Funds (FFY 2016)	G=B+F	**$**	**1,102,120.58**
Balance {Unprogrammed}	A-G	**$**	**169,700.83**

Program costs - No Indirect Costs, No State Match
by the Bureau of Rail and Transit
dministered by the Bureau of Planning and Community Assistance

1

New Hampshire DOT Department of Transportation

Contracting Process



USGS – Joint Funding Agreement

UNH – Cooperative Project Agreement

On-Call Transportation Research Services

MOA for capped overhead (35% - 2 year extendable)

CRREL – Cooperative Research and Development Agreement

Consultant – Statewide Agreement

State Agency – Memorandum of Agreement

New Hampshire DOT Department of Transportation

Contracting Process

Management Tracking System

1. Program Specialist in Finance: verifies documentation complete
2. Division Director: review and sign contract
3. Administrator III in Finance: reviews for funding approval
4. Finance Administrator: review and approve
5. Commissioner: review and approve by signing letterhead
6. Program Specialist in Contracts: forwards to Attorney General
7. Attorney General: approve and sign (for non-construction contracts)
8. Department of Administrative Services Business Supervisor: review and forwards to
9. Governor and Council: review and

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Project Management and Oversight

- Formation of Technical Advisory Group (TAG)
  - Three to six members including at least on NHDOT Research staff member. Key participants are personnel from the operating unit(s) of Department section most affected by the results of research.
  - Champion
- Require Project Principle Investigator (PI) to Engage in Technology Transfer
  - Presentations
  - Posters, etc.
- Periodic Review of Implementation Status of All Projects
  - Need to Institutionalize
- Provide Seed Funding for Implementation

New Hampshire DOT Department of Transportation

How do we remain viable at only $800,000/year ??

- Focus on Applied Research
- Supplement and Leverage SPR Funding
  - Other NHDOT funds
  - Pooled-Fund partnerships
  - New England Transportation Consortium
  - FHWA Grant Programs
  - Other Fed/State Agency Partnerships
  - NCHRP

New Hampshire DOT
Department of Transportation

NHDOT Research in Summary

- Strengths
  - Size of Agency allows for Close Relationship with other NHDOT Offices
  - Focus on Applied Research
  - Control & Flexibility of Program
  - Good Rapport with FHWA Division Project Manager
  - Many Success Stories
- Challenges/Opportunities
  - Not Always Perceived as Core Element of Agency. Need to Continually Demonstrate Value
  - Competing Workload & Priorities – Internal & External Personnel
  - Inability to Say “No”. Doing Too Many Things, Not Necessarily Well
  - Completing Projects in Timely Manner

New Hampshire DOT Department of Transportation

Other Duties and Responsibilities of Resea

New Hampshire DOT Department of Transportation

N

REUSE OF ALUMINUM SIGNS

Often signs are replaced due to the reflective qualities. The reflective sh mounted on aluminum which, will us

the sheeting practice of s the sheeting the aluminu cost savings

Contract Sa

OPEN ROAD TOLLING

The Hampton and Hooksett Open Ro Projects are a shining example of hov investments in New Hampshire infrast improve our lives and economy.

Travel hours saved per toll plaza: 269

Gallons of fuel saved per toll plaza: 4

WOOD BOILER INSTALLATION

As of May 2013, 21 Patrol Sheds are n wood burning boilers. Installation pay however, the reduction in BTUs used v fossil fuels has translated into substant

2012 Savings: $54,513

New Hampshire DOT Department of Transportation

NH DOT's Green Initiatives

ENERGY USE AND GREEN HOUSE GAS EMISSIONS OF PAVEMENT PRESERVATION PROCESSES FOR AC PAVEMENTS

Pavement preservation processes require less energy and generate less greenhouse gas emissions due to strategic use of specific materials in greatly reduced quantities compared with new construction or rehabilitation.

Warm Mix Asphalt (WMA) reduces plant emissions and energy costs by approximately 15% less than Hot Mix Asphalt (HMA). It was used in 45.2% of 2012 paving projects.

The current study on ecoefficiency analysis of preventive maintenance demonstrates that **Microsurfacing** is more "Ecoefficient" than the hot mix overlay.

TREATMENT	DETAILS	ENERGY USE	GHG EMISSIONS
New Construction	4" AC/6" Base	156,820 BTU/yd^2	24.1 lb CO_2/yd^2
Hot Mix Asphalt (HMA)	Thickness 4"	112,800 BTU/yd^2	20.9 lb CO_2/yd^2
Warm Mix Asphalt (WMA)	Thickness 4"	108,500 BTU/yd^2	20.5 lb CO_2/yd^2
Chip Seal	Emulsion 0.35 g/yd^2 Aggregate 28 lb/yd^2	7,030 BTU/yd^2	0.9 lb CO_2/yd^2
Micro-surfacing	Type III, 12%Emulsion 24 lb/yd^2	3,870 BTU/yd^2	0.4 lb CO_2/yd^2
Crack Seal	0.25 lb./yd^2	870 BTU/yd^2	0.14 lb CO_2/yd^2

Chehovits, J & Galehouse, L. (2010) Energy Usage and Greenhouse Gas Emissions of Pavement Preservation Processes for Asphalt Concrete Pavements, 7th ISSA World Congress, Lyon

Asphalt rubber gap graded HMA benefits include use of recycled tire rubber and longer service life.

A three mile section of RT 38 in Pelham utilized an asphalt rubber modified binder .

Three miles of RT 101 are paved with asphalt rubber gap graded mix, which contains RAP and recycled rubber from about 35,000 scrap tires.

TURNING THIS... → INTO THIS.....

NHDOT use of Recycled Asphalt Pavement (RAP)

E-ZPass and OPEN ROAD TOLLING

Air pollution, a major consequence of our transportation system, is made worse by vehicles idling in tollbooth queues and the accelerating and decelerating vehicles in tollbooth bottlenecks. This extra combustion, in turn, produces greater amounts of carbon dioxide.

Advantages of high-speed tolls:

- Reduce vehicle emissions due to a reduction in the number of vehicles braking, stopping and accelerating at the barrier.
- Reduce traffic congestion and travel delays both for motorists using ORT and those using a staffed toll lane.
- Reduce the overall noise associated with a Toll Barrier by reducing the volume of traffic decelerating, stopping and accelerating to highway speeds.

REUSE and RECYCLE INITIATIVES

Roadway Base Course
- Crushed concrete pavement
- Crushed asphalt pavement

Reuse as pozzalons in concrete to mitigate Alkalized Silica Reactivity (ASR

- Class C Flyash from MA coal burning power plant
- Slag from steel mills

NHDOT Qualified Products List includes:
- Guardrail spacer blocks from composite material
- Permanent channel stabilization manufactured from green/brown bottles
- Temporary slope stabilization made from compostable plastics

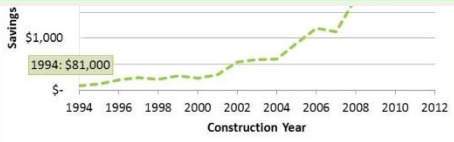
Paper, glass bottles, aluminum cans, plastics, ink cartridges
- All DOT offices have recycling program in place.
- DOT District sheds on voluntary measure to collect and drop at transfer stations.

Reuse or recycling of material in Right of Way construction projects:

Guardrail posts	Railroad ties	Signs
Delineators	Markers	Gates
Cables	Wire	
Light pole bases	Fence	

Average Difference in Wattage used from Incandescent to LED: 96 Watts

Average Savings per Year: $303,315



New Hampshire DOT Department of Transportation

New Hampshire DOT
Department of Transportation

Oregon DOT Research Program

Alaska Research Peer Exchange

Michael Bufalino, Oregon DOT, Research Manager

May 4, 2016

ODOT Research Section

ODOT Research Program

http://www.oregon.gov/ODOT/TD/TP_RES/Pages/Research-Program-2.aspx

T2 Center

http://www.oregon.gov/ODOT/TD/TP_T2/Pages/index.aspx

ODOT Library

http://www.oregon.gov/ODOT/TD/TP_RES/Pages/ODOT-Library.aspx

ODOT Research Program

Fosters innovation within ODOT

Researching, developing, testing & evaluating	New & innovative	Products, materials, methods & processes

Research Overview

Research is novel

Research is uncertain

Research is structured

Research creates solutions

Our 2015 Research Annual Report is available online at:
www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/2015/Annual_Report_2015.pdf

Library and Technology Transfer

Provides technical resources and assistance to ODOT and partners

Provides assistance, materials and technology transfer to local agencies

ODOT Research

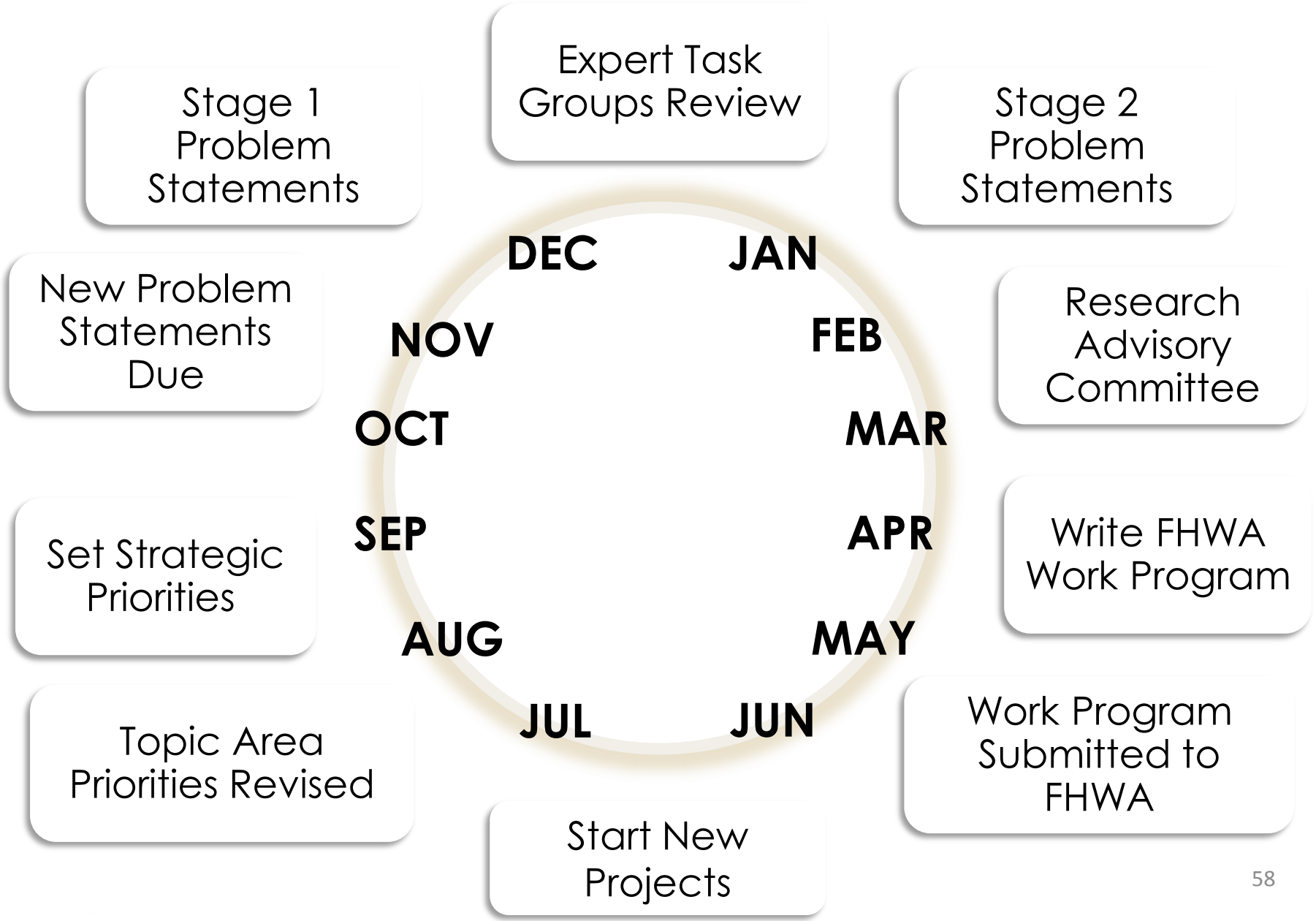
Federal Research Funding

Part of transportation since the Federal Aid Highway Act of 1921

Today FHWA dedicates funds specifically for research

FHWA approved selection process and work plan

ODOT Research Project Selection Timetable

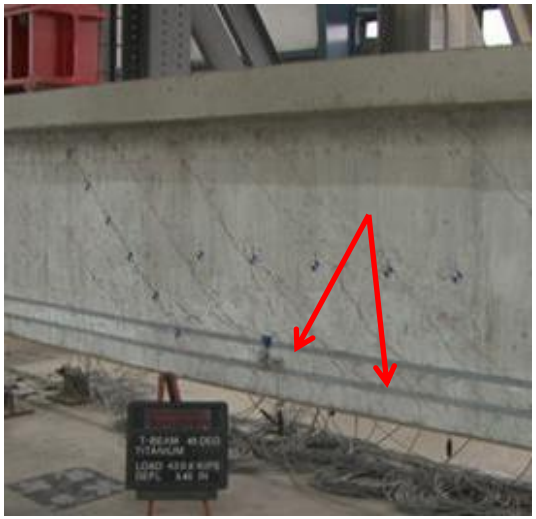


Budget and Expenditures Summary

	Federal			Oregon		
Program	**SPR Research**	**SPR Planning**	**LTAP**	**Highway Funds**	**Local Gov**	**Total**
SPR Research Program	$2,873,623	$85,816		$86,459		$3,045,899
LTAP Program		$39,084	$174,012		$174,012	$387,108
TRB Subscription	$208,171					$208,171
NCHRP	$442,176	$87,510				$529,686
Pooled Fund led by Oregon	$193,175					$193,175
Other States Pooled Fund	$252,500	$85,000				$337,500
Indirect and State Research				$510,562		$510,562
TOTAL	$3,969,645	$297,410	$174,012	$597,021	$174,012	$5,212,101

Examples of Recent Work

Truck parking



Titanium alloy to strengthen bridges

Guidance for bicycle-specific traffic signals

10 Projects Under Development

Expected to start July - September

Watersheds

LIDAR

Rumble Strips

Asphalt

Bridges

Public Transit

Daily Traffic

Steel & Shear Friction

Safety in Crosswalks

Climate Change

In Summary

Research serves transportation needs

Focused on delivering timely, intellectually robust work

Library and technology transfer efforts engage turn research into practice

Thank you.

Appendix G: Peer Exchange Presentation to Management

Alaska Department of Transportation & Public Facilities

RD&T2 Research Peer Exchange
Summary

Why

- Peer exchange required every 5 years. 2011
- Objectives
  - Overall program compliance
  - New process evaluation
  - Strategies in picking the “right” projects
  - Learning about the Peer States

Who

- Michael Bufalino – Oregon DOT
- Megan Swanson – Illinois DOT
- Ann Scholz -New Hampshire DOT
- Tanisha Hall – Tennessee DOT
- Pete Forsling – FHWA Division Office

Alaska DOT

- Carolyn Morehouse
- Anna Bosin
- Janelle White
- Dave Waldo
- Simon Howell
- Roger Healy*
- Ken Morton
- Frank Ganley
- Amanda Holland
- Steve Saboundjian
- Eric McCormick
- Mike Lukshin
- Mike Knapp
- Mark Neidhold

*Lance Mearig

Strengths

Leaders in the following research areas

- Seismic verifying AASHTO guidance
- Geotechnical asset management
- Highway design in permafrost areas
- Mitigation for moose/vehicle accidents

Staff

- Connections to research instigators
- Strong integration between T2/LTAP

Implementation

- Look back on projects completed within three years

Weaknesses

- Verify strategic direction from Executive level
- Improve process to rank and prioritize projects

Threats (challenges)

- No clear long term goal(s)
- Global - paying for National dues or other items that take away from research

Opportunities

- Strategic visioning workshop to align with overall Department goals
- Tie specific research to national via these NCHRP and TRB committees
- Build relationships with more participation - bring new people in the group
- Leadership change good opportunity to learn to more efficiently

More Opportunities

- Use the Checklist FHWA Research Compliance Review
- Establish and implement marketing plan for the research program and individual projects eg. Research showcase with UTC(s) and other partners
- Tie Alaska specific research to national via these committees

More Opportunities

- Consider a process for providing nomination to various national boards or committees
- Formalize pooled fund selection process
- Develop a strategic vision including Alaska universities and UTC(s)
- Better define our organization position and role
- Start technology transfer at the beginning of a project

More Opportunities

- Visioning workshop to develop strategic direction
- Strengthen your relationship with Planning- eg. Use LRTP as base for research strategy
- Operations technical advisor
- Next peer exchange invite a Canadian province or northern climate countries
- Peer state forms
- Compare our program with FHWA research program review

Alaska Research

What areas should we rely on national or regional research?

- Climate Change
- Drones or remote sensing
- Autonomous Vehicles
- Intelligent Compaction/E-construction

Best Practices from Other States

- Research showcase
- Outreach examples
- Research work plan
- NCHRP vote coordinate with all disciplines so it is a Department-wide vote
- Requesting academic resume
- Tier 1 and tier 2 project needs
- Sign offs for tier 2 RNS

Best Practices from Other States

- Awards to staff for “best project” and “best technical expert”
- Recruit younger leaders to be part of research
- Find all sources to do literature reviews

Research Words of Wisdom

- You might not get the answer that you want, but you will get an answer you can trust

  -Michael Bufalino – Oregon DOT

Research is novel; it increases our knowledge of the subject
Research is uncertain; the solution isn't obvious to an expert
Research is structured; uses specific methodology to answer a research question
Research creates solutions useful to others.