
California Department of Transportation
Peer Exchange Report
March 16-18, 2011

IMPLEMENTING RESEARCH RESULTS
CHARACTERISTICS OF ORGANIZATIONS
AND SKILL SETS OF INDIVIDUALS SUCCESSFUL
AT ACCELERATING ADOPTION OF INNOVATION



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**Implementing Research Results: Characteristics of Organizations and
Skill Sets of Individuals Successful at Accelerating Adoption of Innovation**
A Peer Exchange hosted by the California Department of Transportation
March 16-18, 2011

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Introduction

The California Department of Transportation (Caltrans) hosted a peer exchange in Sacramento, California on March 16-18, 2011 to discuss best practices for implementing research results and to identify the characteristics of organizations and skills sets of individuals successful at accelerating adoption of innovation.

The Requirement for a Peer Exchange

Under 23 United States Code of Federal Regulations 420.209 (a)(7), as a condition for approval of Federal Highway Administration (FHWA) planning and research funds for research activities, each state's department of transportation (DOT) is required to periodically conduct a peer exchange. FHWA defines "periodic" as once every three to five years. The use of peer exchanges was established to provide state DOT research, development, and technology programs with an opportunity to examine and evaluate their own programs with a collaborative team of peers, experts, and colleagues. The process encourages the exchange of visions, ideas, and best practices that could be fostered for the benefit of the host agency and peer team participants.

The basic approach is to invite an outside panel of managers from state DOT research divisions, FHWA, other public agencies, and the private sector to meet with the host agency to discuss and review a specific focus area. During the peer exchange, the group analyzes the agency's policies and practices, shares case studies and experiences, and develops recommendations for improvements. The information gathered from the exchange is presented to agency and FHWA management, and is documented in a written report.

Attendees

The Caltrans Division of Research and Innovation (DRI) hosted the Peer Exchange on March 16-18, 2011. Attendees included invited participants from other DOTs, FHWA, and the Transportation Research Board (TRB), a group of observers from DRI, as well as a facilitator and an observer from the California Local Technical Assistance Program (LTAP) Center.

Peer Exchange Team Leader

- **Lawrence (Larry) Orcutt**, Chief, Division of Research and Innovation, California Department of Transportation

Peer Exchange Team

- **Rhonda Brooks**, Research Manager, Washington Department of Transportation
- **Mark Bush**, Senior Program Manager, SHRP 2, Transportation Research Board (formerly with Michigan DOT and the American Association of State Highway and Transportation Officials (AASHTO))
- **Jennifer Gallagher**, Research Manager, Ohio Department of Transportation
- **Jack Jernigan**, Director, Research and Technology Program Development & Partnership Team, Federal Highway Administration

- **Cameron Kergaye**, Director of Research, Utah Department of Transportation
- **Harold “Skip” Paul**, Director, Louisiana Transportation Research Center, Louisiana Department of Transportation & Development
- **James Sime**, Manager of Research, Connecticut Department of Transportation
- **Linda Taylor**, Director of Research Services, Minnesota Department of Transportation

Peer Exchange Facilitator

- **Laura Melendy**, Director, Technology Transfer Program, Institute of Transportation Studies, University of California, Berkeley (CA LTAP Center)

Peer Exchange Observers from the Caltrans Division of Research and Innovation

- Juan Araya
- Azzeddine Benouar
- Rebecca Boyer
- Bob Buendia
- Nick Burmas
- Nancy Chinlund
- Mandy Chu
- Debra Hoffmann
- David Ly
- Wes Lum
- Homar Noroozi
- Kamal Sah
- Jean Vedenoff
- Randy Woolley
- Pete Zaniewski

Additional Peer Exchange Observers

- Alyssa Sherman, Technology Transfer Program, Institute of Transportation Studies, University of California, Berkeley (CA LTAP Center)



Photo 1. Peer Exchange participants and attendees.

Back Row: Mark Bush (TRB), Linda Taylor (MNDOT), Jim Sime (CTDOT), Larry Orcutt (Caltrans), Pete Zaniewski (Caltrans). Front Row: Wes Lum (Caltrans), Jennifer Gallagher (ODOT), Jack Jernigan (FHWA), Rhonda Brooks (WSDOT), Harold “Skip” Paul (LTRC), Cameron Kergaye (UDOT), Laura Melendy (CA LTAP).

Key Findings for Implementation at Caltrans

1. The Division of Research and Innovation (DRI) needs to be the advocate for innovation for the Department.
2. DRI needs to lead by example.
3. Focus on Deployment. Need to assess all the resources needed for innovation implementation.
4. Adopt a Risk Assessment process.
5. Assess risk and implementation possibility on all existing and new projects.
6. Provide training to staff on the skill sets needed to implement new ideas in Caltrans.
7. Develop a Performance Measure for staff.
8. Establish a better connection between DRI and the Districts.
9. District Director or Deputy Director should sign off on research projects and commit to implementation of research results.

Objectives, Scope, and Process

The overlying objective of the peer exchange program is to give state DOTs the means to improve the quality and effectiveness of their research program.

The theme for the peer exchange was how to best accelerate the implementation of research results, with an emphasis on analyzing the characteristics of organizations and skill sets of individuals who successfully translate research results into practice.

The expressed objectives of the peer exchange were:

1. To learn about other research programs' direct experiences with translating and implementing research results.
2. To identify the characteristics of organizations and skill sets of individuals who are successful at accelerating adoption of innovation.
3. To identify opportunities for Caltrans to apply the experiences of others to create a more effective research organization that can accelerate innovation implementation.
4. For all participants to identify useful ideas to apply within their agency.

At the outset of the peer exchange, participants were given a folder with a meeting agenda (Appendix A) and a copy of *Implementing Research Results: Highlighting State and National Practices*, a detailed report prepared by CTC and Associates for Caltrans to describe the state of the practice of DOT innovation deployment in the United States.

The exchange began with introductions, and the peer exchange team leader and facilitator described the objectives, schedule, and format for the meeting. The meeting took place over the course of three days. On the first day, participants made presentations illustrating the innovation deployment process at their agencies. On the second day, participants engaged in active discussions about the policies and practices that are successful for implementing research results, and formulated "lessons learned" with "take away" notes that each participant will consider for implementation at their own agency. On the final day, the participants prepared and delivered a presentation outlining their findings for Caltrans'

Deputy Directors and Division Chiefs, District Directors (via video conference), and FHWA's California Division Administrator. The audience for that presentation included:

- Walter "Butch" Waidelich, FHWA California Division Administrator
- Jody Jones, Caltrans District 2 Director
- Rick Land, Caltrans Chief Engineer & Deputy Director for Project Delivery
- Steve Takigawa, Caltrans Deputy Director for Maintenance and Operations
- Marty Tuttle, Caltrans Deputy Director for Planning
- Robert Copp, Caltrans Division Chief of Traffic Operations
- Tony Tavares, Caltrans Division Chief for Maintenance
- Karla Sutliff, Caltrans Division Chief for Project Management
- Terry Abbott, Caltrans Division Chief for Design
- Coco Briseno, Caltrans Division Chief of Transportation Systems and Information

Discussion of Key Objectives

Key Objective #1: To learn about other research programs' direct experiences with translating and implementing research results.

To meet Key Objective #1, the Peer Exchange Team engaged in a series of presentations and discussions of best practices, case studies, and observations regarding their experiences implementing research results. An overview of these presentations and discussions follows.

Rhonda Brooks (Washington Department of Transportation)

The Washington State DOT used a solar, fiber optic lighting system to replicate natural lighting under some of its overwater structures in an attempt to alleviate damage to fish habitats caused by over-water structures. Although the research was well-done, it was aborted during the pilot phase because researchers realized that the equipment used wasn't designed for outdoor applications or for seawater. The time invested in the project was worthwhile and instructive because the risks were low (the research was relatively inexpensive), collaboration high, and if it had succeeded, it would have been easily implemented and very beneficial.

Mark Bush (Transportation Research Board – SHRP2)

The mission of SHRP2 is to carry out a program of strategic research. Although the long term responsibility for managing the implementation of SHRP2 products will likely fall to others – including state and local transportation agencies, AASHTO and its various associated committees, and the USDOT – the SHRP2 oversight committee decided to devote the majority of additional funds and time allocated to early implementation activities. The four Technical Coordination Committees identified actions to move the research products nearing completion to the next step of readiness for implementation. The Oversight Committee then selected and approved a slate of activities to refine and strengthen research results and move them forward to practice. No new research was approved; rather, activities were selected to identify knowledge gaps and other barriers to implementation, conduct pilot tests, construct demonstration projects, and undertake additional similar efforts to advance research results to produce the tools and products that are most useful to transportation practitioners.

Jennifer Gallagher (Ohio Department of Transportation)

Ohio recently deployed pre-and-post construction strategies for preventing the “bump at the end of the bridge.” The research was successfully deployed because the DOT's pavements, materials, construction, geotechnical, structures, and production divisions were involved in the process from the outset. Throughout the process, there was interdisciplinary communication and strong project management. The project resulted in a paradigm shift from “smoothness” to the connection of the pavement and the bridge and an increased emphasis on safety. To deploy the technology, the department developed a comprehensive specification, and training for bridge and pavement contractors.

Jack Jernigan (Federal Highway Administration)

Jack described his experiences implementing research results as part of FHWA's Every Day Counts innovation deployment initiative. This project was a success because it was an initiative from FHWA Administrator Victor Mendez – the directive came straight from the top of the organization, so funding and high-level support were secured. The initiative also included proven new technologies, and the agency partnered with AASHTO to hold innovation summits across the country, which educated transportation staff on the benefits of the technologies and how to use them.

Cameron Kergaye (Utah Department of Transportation)

Utah recently started using a Self Propelled Modular Transport (SPMT) system to reconstruct bridges. This system utilizes a computer operated, multi-axle platform that pivots 360 degrees to lift, carry, and set large and heavy loads at walking speed. The use of this system drastically reduces road closures associated with bridge replacements and saves millions of dollars. The state DOT was very successful in communicating the benefits of the system to put it in agency use and to inform the public. However, the state did experience an internal problem with staff support that will represent a lesson learned for the department going forward.



Photo 2. Discussion during the peer exchange.

Larry Orcutt, California Department of Transportation

California developed “See-Through” bridge rail technology to create a more aesthetically pleasing safety rail alternative for application in Coastal Zones in compliance with California Coastal Commission regulations, as part of Context Sensitive Solutions processes, and on bridges or roadsides. The benefits of using see-through rails include enhanced visibility, more optimal rail heights, and improved aesthetics. The department’s Bridge Rail Policy Committee is a multi-disciplinary body composed of representatives from Caltrans’ headquarters design,

district design, landscape architecture, environmental, research and innovation, traffic operations, and structure maintenance divisions. The Committee is in the process of deploying the technology through development of a design information bulletin and additional guidance, and is conducting further studies to determine bicycle rail heights.

Harold “Skip” Paul (Louisiana Transportation Research Center)

Louisiana deployed high strength concrete, which potentially permits either reduction of girders or longer girders with a reduction in foundation elements. In addition, the high strength concrete is denser, providing corrosion resistance of reinforcing steel and therefore enhancing lifespan. The technology uses one less girder/span in each direction, which in a recent application on the Twin Span Bridge resulted in a Return On Investment of \$17.1 million. Other benefits include lower foundation costs and a longer lifespan. This technology is now specified for all bridges in a marine environment. The research for this technology was initiated at a TRB committee meeting that resulted in four research projects that cost \$1.3 million over a sustained 10-year period. This project indicates that it is worthwhile for agencies to stick with long-term research that supports a vision.

Louisiana also places a heavy emphasis on implementation of research results. LTRC has an exclusive staff position for technology transfer and implementation, and the agency reviews each research proposal for implementation potential, issues biannual implementation assessment reports during the conduct of the study, and addresses implementation opportunities in the final report. The agency utilizes a quantifiable Project Risk Assessment process at the outset of research to analyze the importance of the research as a solution to a transportation problem and the implementation potential.

James Sime (Connecticut Department of Transportation)

Connecticut has developed several low-cost technologies that improve roadway safety and performance. The department implemented the Longitudinal Notched Wedge Joint, which improved the performance of Hot Mix Asphalt longitudinal joints. The research successfully transferred into practice because its use had a proven safety benefit (it kept longitudinal joints together), it was fast to implement, and it had limited risks. This project indicates that implementation doesn't need to be difficult or expensive.

Linda Taylor (Minnesota Department of Transportation)

The Minnesota Department of Transportation dedicated funding (\$1m/year) for implementation of a project for field testing the calibration of snow plows (to measure how sand and salt are dispensed). Implementation dollars were used to purchase calibration scales from the Iowa Research Program. The work was done through the Clear Roads Pooled Fund Program and was customized for Mn/DOT. The department then deployed the technology for local agencies by developing a training course for MNDOT maintenance staff, creating a controller calibration guide, and implementing training through the LTAP Program.

Minnesota also developed guidelines for implementation of research results as part of the project development process. The steps in that process include:

- Choosing research that addresses a problem or a need
- Demonstrating how the research is applicable to the department
- Identifying internal champions to support the research within the department

- Conducting a pilot or a small demonstration in districts

Key Objective #2: To identify the characteristics of organizations and skill sets of individuals who are successful at accelerating adoption of innovation.

To identify the characteristics of organizations and skill sets of individuals who are successful at accelerating adoption of innovation, the peer exchange team focused on discussion of two primary questions:

- How do you create an organizational culture that supports and implements innovation?
- How do you engage and motivate individuals to accelerate adoption of innovation?

The peer exchange team’s observations on these points are as follows.

How do you create an organizational culture that supports and implements innovation?

CULTURE

- The organization’s leadership should be committed to promoting a culture that supports and implements innovation, and establishes and reinforces the importance of innovation as a core value for the organization.
- Empower, recognize and motivate employees to embrace change, or at least promote and accept change.
- Support risk-taking.
 - Empower staff. Give them the time and resources needed. Make it clear that it’s okay to take risks and okay to fail. Lessons learned from the failures must be reported and incorporated into future processes and decision-making.
 - Reward and celebrate successes and don’t punish people or groups when research is non-implementable.
 - Provide recognition from peers and management.
 - Understand that early failure is not a sign of permanent failure.
- Promote a mindset that research is purpose driven and solves problems.
- Support research objectives at high levels of the organization’s administration.
 - Research initiatives support strategic objectives.
 - Research is not a luxury, but a necessary core activity.
- Envision short-term and long-term views of what’s important to the organization.
 - Mix fast/easy success with longer-term projects. Leadership must balance research that solves today’s problems with research that supports the long-term goals of the organization and also considers potential future needs.
 - iPad analogy – have the vision to say “you don’t know you need this” but we are going to invest in the research and development, because we’re confident that once you have it, you won’t know how you lived without it.
- Form partnerships between the central office staff who are spearheading the research and district offices that will implement results in the field.

PROCESS

- Establish and follow a formalized process where stakeholders are involved in research decisions from early stages throughout the implementation process.

- Set the research agenda by evaluating each research proposal based on the problem it solves and the likelihood that the research will produce implementable results.
- Set performance indicators for communicating with internal and external organizations.
- Use integrative management principles—bring people from different expertise together to form research statements/perform research/implement research (the “non-silo” approach).
- Engage partners/stakeholders (public and process owners)
- Involve technical staff with the potential to be champions for the research from the outset.
- Encourage constant communication and strong project management.
- A good research department will earn credibility and the trust and respect of those that it serves (the rest of the organization) and become the “go to” department to solve problems.
 - People are more likely to trust focused information that comes from trusted sources.

How do you engage and motivate individuals to accelerate adoption of innovation?

PERSONAL SKILL SET/TRAITS OF PEOPLE WHO MOTIVATE OTHERS

- Technology Transfer Champions:
 - Have strong marketing and communication skills.
 - Are able to plan and run effective, efficient meetings.
 - Are good brokers of information and resources.
 - Are strong negotiators.
 - Have persistence, passion, and drive.
 - Have people skills.
 - Understand the technical aspects of a project, but can also create and implement a successful marketing plan.
 - Serve as a conduit between technology experts and all others – including stakeholders within the organization, potential adopters of innovation, and the public.
 - Are able to recognize gatekeepers and what drives them to accept or reject change.
 - Are trustworthy and credible; have strong personal working relationships.
 - Are empowered to work across organizational lines and are in a position that offers access to many different levels of the organization.
 - Are comfortable working within chaos – have public relations skills.
 - Are able to think outside the box (understand that there is more than one way to get from A to B).
- To gauge these characteristics, an organization should apply a DISC analysis. DISC is a quadrant behavioral model used to examine the behavior of individuals in their environment.

SUPPORT FROM THE ORGANIZATION

- Should be top-down, leader-influenced (organizational).
- At the public sector level, recognition and rewards (from peers and management) can be motivational for employees.
 - The difference between public and private sector innovation
 - In the private sector, you get a bonus when you exceed expectations.
 - In the public sector, you are recognized for exceeding expectations.
 - People respond to incentives such as jackets or mugs.
 - In the public sector, risks of failure (ie – lack of respect/no promotion) are often greater than rewards of success. This should change.
- Provide clearly articulated benefits.
- Make your stakeholders look good (especially industry).
- Information sharing should be encouraged.



Photo 3. Peer Exchange participants and observers listen to the discussion.

Key Objective #3: To identify opportunities for Caltrans to apply the experiences of others to create a more effective research organization that can accelerate innovation implementation.

Each member of the peer exchange team shared lessons and ideas that Caltrans could apply to more successfully implement research results. These recommendations are:

Rhonda Brooks (Washington Department of Transportation)

1. Implementation is incremental, so the deployment branch is a critical resource for the organization.
2. If the agency wants to be innovative, the research office needs to be innovative. DRI needs to adopt innovative practices and policies if it expects others to do the same.
3. To address the communications issue between Caltrans Headquarters and District Offices, there should be a pot of money for district research projects, which are initiated by and for the districts to solve district problems. If the districts had a piece of the pie, they could become a larger part of the research process.
4. Showcase research results at meetings: show how research is making a difference. Look for opportunities to piggyback on other gatherings. Build coalitions and advocacy.

Mark Bush (Transportation Research Board – SHRP2)

1. Write implementation plans into research statements. Then, identify the most strategic opportunities and determine which ones can be held back for future implementation.
2. Explore the use of new forms of communication—such as webinars—internally and externally.

Jennifer Gallagher (Ohio Department of Transportation)

1. Begin the implementation plan during the scoping of the project.
2. Rate ongoing projects based on risk assessment and implementation possibility and then determine which to move forward with.

Jack Jernigan (Federal Highway Administration)

1. Reach out to districts and departmental leadership to promote innovation.
2. The department has structural strength, which is a benefit.
3. Remember to go after the low hanging fruit- fast and easy successes that can help build trust and respect with leaders (so you have an answer when they ask “what have you done for me lately”?).
4. Articulate the benefits and costs of a course of action with clear communication in layman’s terms.
5. Engage stakeholders early in the process.
6. Enhance internal and external communications-look for training opportunities and use media as appropriate (help media make the case for you).
7. Consider the audience and their interest in the topic when choosing a communication medium (report, newsletter, webinar, teleconference, video conference, etc...)

Cameron Kergaye (Utah Department of Transportation)

1. To address the communication gap between Caltrans Headquarters and the District Offices, plant an idea for conducting research in the districts so that they feel the research is their idea and thus something they can embrace and support.

Larry Orcutt (California Department of Transportation)

1. Research office needs to be the advocate for innovation for the department. If you have an idea, here is the place to do it. We are here to get ideas into practice.
2. Be Innovative. If you want to be innovative, the research needs to be innovative. DRI needs to do it inside before expecting other divisions to do the same.
3. Focus on Deployment. Resources need to consider innovation implementation as incremental; the deployment branch is critical for success and dedicated deployment resources are essential.
4. Adopt a Risk Assessment process and/or a tool that helps determine if a project can be implemented (particularly for IT and the specifications process).
5. Rate ongoing projects based on risk assessment and implementation possibility and then determine which to move forward with.
6. Provide training to staff on the skills and knowledge needed to implement new ideas in Caltrans.
7. Develop a Performance Measure for staff. Include implementation goals using a 5 point scale.

8. Establish a better connection between Research and Innovation and the Districts.
9. District Director or Deputy Director should sign off on research projects and commit to implementation of research results.

Harold “Skip” Paul (Louisiana Transportation Research Center)

1. Market selected successes internally. This can be done through: publications, field visits, webinars, PennDOT’s tech transfer packages, workshops or conferences (which put people with similar interests together in a room to share ideas and problem solve).
2. Consider research success in a broader application than implementation of innovation. There are multiple ways to consider success – LTRC is now using a standard design template, with performance indicators, which can be measured and modified as necessary.
3. Identify potential implementation sponsors before beginning research studies. It is helpful to try to identify the audience, and based on that the document is dynamic and can be modified as needed.
4. Be selective; select projects that could be successful.

Jim Sime (Connecticut Department of Transportation)

1. Caltrans should put more emphasis on how to use new forms of media to communicate internally and externally, such as streaming media.
2. We know that communication about mobility is important to the public so that they know how and when they can get to their destinations. They want information delivered through their smart phones and by other means. An agency that doesn’t have control of its information systems will struggle to meet these challenges and public demands.

Linda Taylor (Minnesota Department of Transportation)

1. Leverage existing department committees, councils, and meetings to solicit research needs and get feedback on research projects and implementation ideas, etc...
2. Mine/explore implementation opportunities from other sources such as NCHRP, TRB, other DOTs or public agencies (such as AASHTO-RAC High Value Research Projects).
3. Consider adopting the use of a formalized innovation implementation process, such as MNDOT’s implementation checklist or LTRC’s scale for project evaluation.
4. Consider adopting use of a performance measure for staff, such as a DISC personality analysis (DISC is a quadrant behavioral model used to examine the behavior of individuals in their environment).
5. Establish a formalized project close-out process to evaluate implementation, marketing, and technology transfer opportunities.
6. Identify recognition opportunities for employees who are involved in innovation or deploying new research results – such as authorizing attendance at professional development conferences, or issuing small tokens such as caps, jackets, or mugs (which credit unions could provide).
7. Use Louisiana’s CPT technology in lieu of soil boring tests – saves \$ 11,000 per boring.

Key Objective #4: For all participants to identify useful ideas to apply within their agency.

Each member of the peer exchange team shared lessons and ideas that they plan to apply to their agency to more successfully implement research results. The opportunities for application are:

Rhonda Brooks (Washington Department of Transportation)

1. Would like to participate in a pooled fund for innovation- it would provide an opportunity for cross fertilization, and a forum for researchers and technical experts to exchange ideas.

Mark Bush (Transportation Research Board)

1. Make sure the SHRP2 research program is in tune with each of the individual states so they can use it and tweak it for their use.
2. Develop performance measures for the program- such as indentifying or quantifying the benefits of the implemented projects/products, and the overall success rate.
3. Hold technical workshops and webinars, use new media, produce newsletters and one-page research summaries, and educate the general public.
4. Consider the implementation plan before embarking on a project.

Jennifer Gallagher (Ohio Department of Transportation)

1. Take research that other states are doing and tweak it to benefit Ohio.
2. Create performance measures for both the program and the individuals.
3. Create a one-pager on implementation and give to management 2 to 3 times a year.
4. Do a better job of sharing research results internally and with the media.
5. Quantify return on investments for implemented projects.
6. Host technology transfer workshops/webinars on topics that offices within ODOT have implemented (even if not done with research), which can be a tool that offices can use to share ideas with other states.

Jack Jernigan (Federal Highway Administration)

1. FHWA needs to be the national leader for implementation.
2. FHWA needs to survey Division research contacts and determine the top 2 or 3 candidates for implementation from state research programs. (“national brown bags”).
3. Relay information on visualization.
4. Consider joining TPF-5 (239).
5. Tap into LTAP/TTAP (research program needs to tap into these).
6. Consider audience and their interest in topic when choosing a communication medium (report, newsletter, webinar, teleconference, videoconference, etc...)

Cameron Kergaye (Utah Department of Transportation)

1. How do I do more with less?

Harold “Skip” Paul (Louisiana Transportation Research Center)

1. Many research solutions require new ways to do business. Consider research implementation/deployment as a change management process. There may be tools available from the change management process that are applicable.
2. Consider the possibility of a separate line item/program for funding implementation.
3. Consider PennDOT’s technology transfer packages, which include everything in one package.
4. Review Caltrans’ research management database.
5. Review Caltrans’ maintenance innovation TPF.

Jim Sime (Connecticut Department of Transportation)

1. Involve leadership in recognition of success in implementation.
2. To lead your implementation effort, you must be in tune with the culture of your organization.
3. Know how much you’re supposed to be drawing attention to yourself and how much you should be silent (in the background).
4. Always make your boss look good; research has many bosses and you’re helping them, so make sure they get credit because they have to implement the change.
5. Be supportive of others and check your ego at the door.

Linda Taylor (Minnesota Department of Transportation)

1. Mine implementation opportunities from other sources: NCHRP, TRB, other DOTs, Scan Tours, High Value Research.
2. Establish performance measures for staff similar to Louisiana’s program
3. Share the following resources: Caltrans’ Terrestrial Laser Scanning Specifications and *Implementing Research Results: Highlighting State and National Practices* report, and CTC and Associates’ *Implementing Research Results: An Overview of Successful Practices*. (See Appendix D)
4. Review the report from the Michigan Peer Exchange on Implementation and review the AASHTO Technology Implementation Group’s (TIG) procedures: <http://tig.transportation.org>.
5. Establish research goals that clearly define goals (such as Montana case study in *Implementing Research Results: Highlighting State and National Practices*).
6. Create a risk assessment and/or a tool to determine if a project can be implemented.
7. Seek methods to engage districts into research and implementation process by direct marketing research results and dedicating implementation funds to address high needs.

Appendix A. Agenda

California Peer Exchange March 16 – 18, 2011

WEDNESDAY - March 16, 2011

7:30 – 8:30 am	Breakfast 1227 O Street, Veterans Affairs, 5th Floor, Room 513	
8:30 – 9:30 am	Welcome and Objectives Expectations and Logistics Brief Introductions Caltrans Communication and Outreach	Larry Orcutt Laura Melendy All Rebecca Boyer
9:30 – 10:30 am	Participant Experiences (5 – 8 minutes for each participant) What is your role? How are you organized for implementation? Do you have a process?	All
10:30 – 10:45 am	Break	
10:45 – 11:15 am	Preliminary Investigation on “State DOTs and How They Implement Research Results”	Kim Linsenmayer Chris Kline
11:15 – 12:00 pm	3D/4D Terrestrial Laser Scanning Implementation Experience	Tom Taylor
12:00 – 1:00 pm	Lunch	
1:00 – 2:30 pm	Project Discussion – Successful Implementation (Roundtable) Tell your story about a project. What worked? How was it done? What made it happen?	All
2:30 – 2:45 pm	Break	
2:45 – 5:00 pm	Project Discussion – Project Implementation and Encountering Difficulties What are or were the obstacles encountered?	All
6:15 pm	Dinner	

THURSDAY - March 17, 2011

7:30 – 8:30 am	Breakfast	
8:30 – 9:00 am	Recap of Wednesday Anything to add? Discussions you had last night, problems and solutions identified	Laura Melendy All
9:00 – 4:00 pm	Team Exercise: Develop a model organization What does this organization look like? Review characteristics and skill sets identified on Wednesday and incorporate.	All
4:00 – 5:00 pm	Develop information for Friday wrap-up Develop key messages to take back	All
6:00 pm	Dinner	

FRIDAY - March 18, 2011

7:30 – 8:30 am	Breakfast	
8:30 – 9:30 am	Synthesis: Discussion and key messages	Laura Melendy
9:30 – 10:00 am	Travel and sign-in at 1120 N Street, 2nd Floor, Room 2116	
10:00 – 12:00 pm	Wrap-up presentations with Caltrans Division Chiefs	All

Appendix B. Participants

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Appendix C. Glossary

What are we trying to implement?

- Research results
- Ideas/practices from other places
- Methods
- Procedures
- Equipment
- Technology
- Specifications
- Products and services

Innovation

- Improves what is known, changes processes
- Encompasses things that we think of as new innovations (new research) including research findings, and things that are done in other states.
- Could be an incremental change, could be adoption of something that has been slowly coming up.

Implementation

- Product/result is used

Success

- Saves money/time/lives
- Informs decision making
- Success = IMPACT
- Illustrates benefits

Characteristics of successful implementation

- People are using and applying the results
- Implementation is in line with the organization's strategic objectives
- Adopted in standard specifications
- Technical assistance/training provided
- Serves clear need/solves problem/is relevant
- Dedicated funding and time/staff
- Upper management support/involvement
- Communications/marketing
 - Medium
 - Message
- Stakeholder involvement (and early!)
- Technical/IT issues addressed

Appendix D. Resources

At the Peer Exchange, participants distributed or referred to the following resources:

California Department of Transportation, I-Team Brief: “Continuous Risk Profile,” California Department of Transportation, Department of Research and Innovation. October 2010.
www.dot.ca.gov/newtech/innovation/crp_final_october.pdf

California Department of Transportation, I-Team Brief: “Rapid Rehab,” California Department of Transportation, Department of Research and Innovation. October 2010.
www.dot.ca.gov/research/innovation/rapidrehab_ver22_final.pdf

California Department of Transportation, I-Team Brief: “ShakeCast,” California Department of Transportation, Department of Research and Innovation. October 2010.
www.dot.ca.gov/research/innovation/shakecast_ver5_final.pdf

California Department of Transportation, I-Team Brief: “Warm Mix Asphalt,” California Department of Transportation, Department of Research and Innovation. October 2010.
www.dot.ca.gov/research/innovation/warmmix_ver6_final.pdf

California Department of Transportation, I-Team Brief: “WeatherShare,” California Department of Transportation, Department of Research and Innovation. October 2010.
www.dot.ca.gov/newtech/innovation/weathershare_ver5_final.pdf

California Department of Transportation, “Preliminary Investigation: Implementing Research Results: Highlighting State and National Practices,” California Department of Transportation, Division of Research and Innovation. March 2011.

California Department of Transportation, “See-Through Bridge Rails,” presentation handout, California Department of Transportation, Division of Research and Innovation. March 2011.

California Department of Transportation, “Terrestrial Laser Scanning Specifications,” *California Department of Transportation Surveys Manual*. January 2011.
www.dot.ca.gov/hq/row/landsurveys/SurveysManual/15_Surveys.pdf

Connecticut Department of Transportation trading cards:
CIAS: Connecticut Impact-Attenuation System
CTMA: Connecticut Truck-Mounted Attenuator
Longitudinal Joint Performance
NCIAS: Narrow Connecticut Impact-Attenuation System

CTC and Associates, LLC, “Implementing Research Results: An Overview of Successful Practices.” March 2011. www.ctcandassociates.com

Louisiana Transportation Research Center, "Fact Sheet: Evaluation of Field Projects Using Crumb Rubber Modified Asphaltic Concrete." September 2009.

Louisiana Transportation Research Center, "Fact Sheet: Impact of Left Lane Restrictions on Multilane Highways in Louisiana." May 2009.

Louisiana Transportation Research Center, "Implementation Update: Construction & Comparison of LA's Conventional and Alternative Base Courses Under Accelerated Loading." 2008. www.ltrc.lsu.edu/pdf/2007/riu_347.pdf

Louisiana Transportation Research Center, "Implementation Update: Evaluation of Bearing Capacity of Piles from Cone Penetration Test Data." December 2007. www.ltrc.lsu.edu/pdf/2008/riu_334.pdf

Louisiana Transportation Research Center, "Implementation Update: Use of High Performance, High Strength Concrete (HPC) Bulb-Tee Girders Saves Millions on I-10 Twin Span Bridge in New Orleans District." 2009. www.ltrc.lsu.edu/pdf/2009/riu_310.pdf

Louisiana Transportation Research Center, Sample Research Assessment & Implementation Report: Project 10-1C, "Evaluation of the Surface Resistivity Measurements as an Alternative to the Rapid Chloride Permeability Test for Quality Assurance and Acceptance."

Louisiana Transportation Research Center, Sample Research Assessment & Implementation Report: Project LTRC 03-3P, "Comparative Evaluation of Subgrade Resilient Modulus from Non-destructive, In-situ, and Laboratory Methods."

Transportation Pooled Fund Program, "Accelerating Maintenance Innovation Implementation and Technology Transfer Across State Boundaries." www.pooledfund.org

Transportation Research Board, "Building a Better Driving Experience," Transportation Research Board of the National Academies, Strategic Highway Research Program (SHRP2). December 2010. <http://onlinepubs.trb.org/onlinepubs/shrp2/buildingabetterdrivingexperience.pdf>

Transportation Research Board, *Emerging Answers: 2009-2010 Annual Report*, Transportation Research Board of the National Academies, Strategic Highway Research Program (SHRP2). September 2010. www.trb.org/Publications/Blurbs/Emerging_Answers_SHRP_2_Annual_Report_20092010_164706.aspx

Transportation Research Board, "Updating Renewal Research in SHRP 2: Renewal Program Brief," Transportation Research Board of the National Academies, Strategic Highway Research Program (SHRP2). December 2010.

Washington State Department of Transportation, "Transportation Research Annual Report."
From *Washington State Department of Transportation Gray Notebook 40* for the quarter
ending December 31, 2010. <http://wsdot.wa.gov/accountability>