New Jersey
Department of Transportation

Research
Peer Exchange

June 21-22, 2006

Report

Foran Building, Training Center
NJDOT Main Office Complex
1035 Parkway Avenue
Trenton, NJ 08625

- Research Peer Exchange Report -

Location:	New Jersey Department of Transportation, Headquarters Foran Building Training Center 1035 Parkway Avenue Trenton, New Jersey
Date:	June 21-22, 2006
Peer Exchange Host Agency:	New Jersey Department of Transportation
Peer Exchange Team Participants:	**Wayne Kling** Delaware Department of Transportation **Ann McLellan** Minnesota Department of Transportation **Camille Crichton-Sumners** New Jersey Department of Transportation **Moy Biswas** North Carolina Department of Transportation **Rukhsana Lindsey** Utah State Department of Transportation **Joan Walters** Federal Highway Administration, New York Division **Patty Leech** Federal Highway Administration, New Jersey Division
Peer Exchange Attendees	Anne Reece, NJDOT Librarian, Janet Leli, LTAP, Computer Scribe Jill Parham, LTAP, Scribe Claudia Knezek, LTAP, Observer Nazhat Aboobaker, NJDOT Research Project Manager, Observer Robert Sasor, Research Project Manager, Observer

**Due to unforeseen circumstances, FHWA-NJ was only able to participate during the first discussion session.*

PEER EXCHANGE OUTLINE

1. **FHWA PEER EXCHANGE PROGRAM**
2. **OVERVIEW 2006 NJDOT RESEARCH PEER EXCHANGE**
3. **OBJECTIVES**
4. **PROCEEDINGS**
    a. **Meeting Format**
    b. **Agenda**
5. **SUMMARY OF SUBJECT DISCUSSIONS**
    a. **General Background**
    b. **Project Implementation and Technology Transfer**
    c. **Tracking Performance and Innovation**
    d. **Customer Relationship and Marketing**
6. **NEXT STEPS**
7. **APPENDIX**

1. FHWA PEER EXCHANGE PROGRAM

The State Department of Transportation (DOT) research peer exchange process facilitates the positive exchange of knowledge, which enhances States' management plans and work programs.

Formerly known as *peer review*, *peer exchanges* provide an instrument for sharing knowledge among professionals in the field. Each State is expected to conduct a peer exchange of its research program. This can be an exchange that examines either the full management process or a focused area within the State's program. The peer exchange panel of four to five people should include participants from other State research programs, Federal Highway Administration (FHWA) staff, universities, or others; at least one or two of the panel members.

As per the September 20, 1996, memo

The regulations (23 CFR 420 Subpart B) require that each State must agree to peer reviews of its Research, Development, and Technology Transfer (RD&T) management process to be eligible for the Federal Highway Administration's (FHWA) planning and research funds. A peer review (exchange) is to be conducted at least once every 3 years. The State is responsible for selecting and organizing the peer exchange team.

The Bureau of Research and Demonstration at New Jersey Department of Transportation is an active participant in the federally mandated peer exchange program. By both hosting and participating in peer exchanges the Bureau gains knowledge of other states' practices.

2. OVERVIEW 2006 NJDOT RESEARCH PEER EXCHANGE

The 2006 NJDOT Research Peer Exchange selected topics are:

- Implementation of Research Project Findings and Projects
- Tracking the Performance of the Innovations
- Marketing the Research Bureau and Program and Marketing Project Findings and Products

These topics were selected as a result of a Strategic plan initiative undertaken by the Bureau in 2004 in which Marketing, Implementation and Performance Tracking were identified as areas of opportunity.

3. OBJECTIVES

Specific Objectives were as follows:

- Identify methods utilized to ensure or initiate project/product implementation and technology transfer
- Identify methods utilized for Tracking Project/Product Performance and Innovation
- Generate ideas for a means of follow up on close out studies
- Discuss ways to improve unit/program/product marketing

4. PROCEEDINGS

A. Meeting Format

In alphabetically ordered, round robin format, each Peer Exchange Team Member made a presentation on each of the discussion topics listed in the agenda. Some participants provided sample documents from their respective DOT and are included in the appendix.

Each Team Member then offered his or her observations, list of accomplishments and identified potential areas of opportunities in response to learning of the host state's Research program and processes as relative to the discussion topics. At the close of each topic, each Team member prepared a list of take home items which they deemed noteworthy and may choose to incorporate elements into their respective programs.

B. Peer Exchange Agenda

June 21, 2006 8:30 AM

1. Introduction
    a. Welcome — Host
    b. Housekeeping (travel reimbursement, facilities)
    c. Peer Exchange Objectives — Team Leader
    d. Review Agenda & Meeting Process — Team Leader
    e. Team Introductions
    f. Official Welcome: Senior Leadership NJDOT
        Mark Stout, Assistant Commissioner Planning & Development
    g. Comments FHWA-NJ and FHWA-NY — Patty Leech & Joan Walters

Background Information

(Each state will present the following)

    h. Organization and function of Research Unit within organization Including staff, if any, that manages Technology Transfer initiatives
    i. Brief Overview of Program/Project Development Process

Mid Morning Break

2. **Project Implementation and Technology Transfer**
    a. Methods Used to ensure project/product Implementation/ Technology Transfer Including funding
    b. Documentation of Implementation Measures

Lunch Break

Continuation of Unfinished Discussion

3. **Tracking Performance and Innovation**
    a. Describe process for follow up on close out studies (meeting user/customer needs)

End of Day 1 Provide written statements to scribe

June 22, 2006 8:30 AM

4. **Customer Relationship and Marketing**
    a. Customer Climate
        i. Fiscal outlook relative to Research Program vs. other agency goals
    b. Method of marketing utilized to promote Research Unit/Program
    c. Methods utilized/project specific
        i. Discuss Tools used
    d. Research Finding Dissemination

Lunch Break

5. Peer Exchange Document Finalization

6. Peer Exchange Closeout Session
    a. Comments
    b. Presentation to Senior Leadership
    c. Senior Leadership Response
    d. Miscellaneous housekeeping items

Adjourn

5. SUMMARY OF DISCUSSIONS:

a. General Research Background

NJDOT Accomplishments

- Use concept of "pipelines" for different size projects (i.e. literature search, medium size, large size project)
- Rapid literature search type research projects differentiated. Rapid (short term) pace project is of special interest
- Proactive to customers' needs by responding to the need for quicker contracting methods (i.e. by beginning the process of procuring a pool of consultants)
- Meets face to face with project operatives at quarterly meetings
- Capital investment strategy is included in ranking process of problem statements; projects are categorized by strategies
- Color coded table of ranking form demonstrates what customers areas/units are represented. This provides an easy visual distinction
- Lump sum payments by task may alleviate

NJDOT Improvement Opportunities

- Consider closer correlation of time payment to quarterly reporting and deliverables
- Consider have progress meeting on each project based on quarterly report content (maybe meeting not needed)
- Project selection is only once a year. Can you be more responsive so there is a procedural change resulting in the times of year when a project can be selected?
- Align project selection process with NJDOT long range plan/goals
- At project close out, identify if it met with the long-range plan/goal or did it change during the process?
- Be involved with other DOT committee meetings (in NJ, the Change Control Board meeting) to extract information that may lead to research project statement ideas
- Have performance measures and resources feed into the state's long range plan
- Challenge each research staff member to generate at least 10 research project ideas in their respective subject area (i.e. bridge, safety & pavement)

Take Home Items: General Research Background:

Delaware

- For increasing number of research project ideas, use online proposal form and direct contact with key people who are potential customers.
- Market the success of quick research answers that is sometimes possible (when TRIS reveals that related research is completed).
- Schedule face to face meetings with Project Investigator and Manager as necessary.

Minnesota

- Pipeline- rapid- hire a consultant (NJDOT & UDOT).
- Project members from FHWA steering committee, federal and state resource agencies (many different people on research projects) (NCDOT).
- Attend Standard Committee meetings (UDOT).
- Link to asset management (FHWA-NJ).
- Research project evaluation has a question: "Is there a solid implementation plan?" and use it to evaluate if the project should be funded (UDOT).
- TRIS search and give to customer/do a state survey to see if other states already did a project on the subject (DelDOT & UDOT).
- Washto-X videoconferencing (UDOT).

North Carolina

- Categorization of research projects into 3 pipelines.
- Capital management and asset management concepts.
- Performance measure concept (UDOT).
- Engage stakeholders outside of DOT for generating research ideas.

Utah

- Poster session on active projects.
- New product evaluation to make recommendations to the standard committee to change to update standard to wither allow or disallow a certain product.
- More library personnel in other states (including a librarian) than Utah.
- Separate money set aside for local research ($200k).
- Quarterly meeting with university and projects status.
- Focus groups with Research staff and customers to solicit problem statements.
- If the project is important enough "we will find the money to do it" by tying the projects to construction projects that are funded (NCDOT).
- Green light, red light voting for 1st cut.

FHWA-NJ

- DelDOT: universities hold a research forum for solicitation of problem statements.
- NJDOT: Capital Investment Strategy incorporated with Research Users Committee to get a snapshot view for ranking.
- MNDOT: link program with local government.
- NCDOT: broadcast ideas; owner of project must champion the project or it will not be selected.

FHWA-NY

- UDOT: holds a one-day workshop to evaluate and prioritize research project ideas with 140-150 attendees.
- NCDOT: personally reaches out to different customers (internal NCDOT employees) to solicit research ideas and, in some cases, helps them write-up the proposals.

- MNDOT: has the office specialists (bridge, pavements, etc) review the problem statements and proposals submitted on their particular topics, rather than having the research administrative staff do the evaluation/ranking.

New Jersey

- DelDOT: consideration will be given to customer satisfaction survey.
- DelDOT: ensure that we invite legislators to poster session (Research Showcase).
- DelDOT: consider University forum every 2 years.
- DelDOT: keep track of items that are not formal, i.e. construction projects; consider green light/red light approach to project ranking process.
- MNDOT: consider conducting focus groups for problem statement solicitation.
- NCDOT: develop subject matter expert focused emails and personal unit visits.
- NCDOT: greater alignment of quarterly payment with quarterly report.
- UDOT: look into Washto-X videoconferencing.
- UDOT: linking of performance measures to project selection process.

SUMMARY OF DISCUSSIONS:

b. Project Implementation and Technology Transfer

NJDOT Accomplishments

- Research Implementation Database
- Having Implementation included in the contract (designated monies up front in each contract to address implementation)
- Elements of New Jersey's technology transfer list (list of Technology Transfer activities)
- Annual Research Showcase
- Research reports in their entirety are available on the NJDOT Research website
- Eliminating distribution of hard copies of final reports to state library for cost savings
- Brown bag lunches
- Submission of articles to NJDOT Transporter newsletter

NJDOT Improvement Opportunities

- Use Technology Transfer to implement other state's research
- Prepared write ups for the media to use for news filler
- To link the research implementation database to the *prompts* database
- Publish the annual report that is prepared but has not been distributed
- Survey the benefits of research implementation

Take Home Items: Project Implementation and Technology Transfer

Delaware

- Combine research poster showcase with the brainstorming of new items.
- Use trading cards and white papers (abstracts).
- Develop and maintain research implementation database; include 4-level value indicator; survey benefits/measure value for several years after completion.
- Use closeout memo listing champions and buy-in participants for project.
- Use Technology Transfer to supplement research products.

Minnesota

- Use NJ's implementation database format (NJDOT).
- Training on product use; pay researcher to do training up to 80 hours (NCDOT).
- After 3-4 years, ask champion to give status of implementation and cost savings, and publish benefits (UDOT).
- Attend every region meeting once a year (UDOT).
- Require researcher (Principal Investigator) to deliver a Power Point presentation along with the final report (UDOT).
- Identify any DOT policy/procedure/specifications that would need to be changed to "institutionalize" (FHWA-NY).
- Start at the beginning for implementation (FHWA-NY).
- Research project implementation status report (UDOT).

North Carolina

- Technologies transfer elements of NJDOT (activities list).
- Consider using components of research implementation database of NJDOT.
- Consider using components of the NJDOT research web site.
- Close out memo part of implementation database on MNDOT.
- Use other people's research and do Technology Transfer (UDOT).
- Submit articles to Department newsletter.

Utah

- Annual Research Showcase conference and poster session.
- Research project implementation form (NJDOT).
- Send final reports to Barbara Post to input into TRIS (we input into RIP records).
- We use internal department article to have a research section to market.

FHWA-NY

- NJDOT has very detailed research implementation database not currently being used.
- MNDOT sets aside part of their overall research budget for implementation of projects.
- NCDOT's technical teams for each project are called the "Steering and Implementation Committee".
- UDOT requests power point presentations along with final reports for all research projects.
- UDOT research staff follows up on research projects three or four years after they have been completed to determine implementation status and calculate cost savings.

New Jersey

- Consider hiring a consultant to prepare a project implementation plan. They may be able to produce promotional videos, etc.
- Prepare post-project implementation at 1 year and 5 year intervals.
- Consider dedication of staff to preparing a marketing survey.
- Consideration should be given to conducting a kick off meeting for implementation.
- Solicit and utilize customer feedback for a Research Implementation Database (RID).
- Quantify dollar saving, i.e. UDOT's "for every $1 spent, there is $12 saved" and accident reduction should also be converted to a cost savings.
- Marketing through a Power Point for all projects.

SUMMARY OF DISCUSSIONS:
c. Tracking Performance and Innovations

NJDOT Accomplishments

- Evaluate the Principal Investigator
- Identify the need for tracking performance measures
- 360 degree evaluation

NJDOT Improvement Opportunities

- Meet with management to discuss what is important regarding research and what should be tracked. What do they want to measure? Define a successful research program.
- Research and implementation tracking to measure the implementation.
- Identify what the research products were and if they were used.
- Create a culture such as at NCDOT where there is ultimate support and trust.

Take Home Items: Tracking Performance and Innovations

Delaware

- Evaluate Principal Investigators in terms of implementation of the project.
- To show you recognize your customer's needs, capture their success stories, and highlight them.

Minnesota

- Uses detailed sheet of implementation notes on project status (NCDOT).
- Annual customer service survey of current and potential customers (UDOT).
- Chart of Technology Transfer at DOT shows number of library sessions, number of literature demonstrations, etc (UDOT).
- Charts of research projects implementation status (UDOT).
- Charts of TRIS searches (UDOT).
- Evaluate Principal Investigator and 360 degree evaluation (NJDOT).
- Meet face to face to see how things are progressing (NCDOT).

North Carolina

- Consider performance measure dashboard (MNDOT).
- Implementation tracking form (UDOT).
- Performance measure/scoreboard/dashboard (UDOT).

Utah

- Number of projects completed vs. implementation plan.
- Plan for implementation- consultant or principal investigator.
- Each research has a product- 5 of products used.

- Create a culture such as at NCDOT with ultimate support and trust- no measures.
- Project close out- 360-degree survey.

FHWA-NY

- UDOT completes an annual customer service survey.
- NCDOT uses a follow-up interview form to track project implementation.
- MNDOT prepares three dashboards related to performance measures for research: implementation ranking score; number of research projects completed vs. number of projects with implementation plans completed; and % of research projects addressing MNDOT's strategic goals (this is being revised to be evaluated after the project was completed).

New Jersey

- Conducts contractor performance evaluation (MNDOT).
- Market research unit with dedicated staff (MNDOT).
- Consider the dashboard- performance measuring report.
- Adopt performance measures such as % implemented in each subject area; track until 100% implementation is achieved; number of TRIS requests that are completed.
- Conduct an annual customer service survey.
- Preparation of follow up interview form.

Summary of Discussions:

d. Customer Relationship and Marketing

NJDOT Accomplishments

- NJ recognizes customer relationship is consistent with earlier Research Strategic Plan
- Participation in Project Management Day
- Development of training course for internal staff
- Dissemination of Transportation Research Board information in the office
- Website has a lot of information
- Annual Research Showcase

NJDOT Improvement Opportunities

- Know your direct customer; develop closer relationships with customers
- Link to research on web pages of different divisions to show ownership of "my research projects" and help encourage solicitation of research problem statements
- Orient new senior management of SPR and state funds needs in research so they understand how things work
- Find out about other division's annual conferences/meetings and become part of their agendas to share research
- New employee orientation
- On the website, the services provided by Research are noted
- Add streaming video into Power Point presentations for each project

Take Home Items: Customer Relationship and Marketing

Delaware

- Enlarge "circle of influence" by engaging stakeholders, such as other state agencies and universities.
- Create ownership of research projects and provide support to assure success.
- Found out how customers would like to get their information- tailor communication methods to match their preferences.

Minnesota

- Competing interests with customers when they are partners (NJDOT).
- New employee orientation (DelDOT).
- Keep customers as friends and make new friends (NCDOT).
- Tailor method of communication to each customer (NCDOT).
- Brainstorm with staff on what projects are ready for media write-up and provide this list to the media (UDOT).
- Place newsletter on RAC/TRB listserv.
- Meet with different regions at their staff meetings- provide information, discuss research projects and convey the message that Research is their staff, too (UDOT).
- One on one interaction with customers, brainstorming, and quick returns (UDOT).
- Educate upper management of SPR and state funds needs in Research- let them know how things work (UDOT).
- Have "My Research Projects" for each division (UDOT).

- Get industry involved at the beginning of the project and market and also market to industry (FHWA-NY).
- Ask associates to choose who to have on Research panels (DelDOT).

North Carolina

- Consider publishing a Bureau of Research brochure (MNDOT).
- Customer survey, also considering unknown customers (use the market research group).
- Orientation of new senior managers about research.
- Include "Research News" in the Department newsletter and also email it.
- Orient new university personnel.
- Orient headquarters functional units and field divisions.
- Prepare a Research book with all information.
- Identify media ready project and prepare media release.
- Attend functional unit meetings.
- Include "Research" as a link on the functional units' websites.
- Include industry representative as members of research committees.

Utah

- Research Coordinator in each division office.
- Streaming video of professor explaining the project is embedded within the Power Point presentation tom market research facts.
- Dedicated marketing staff.
- Branding through a standard research format for all publications, trading cards, Power Points, newsletters, etc. Work with community relations to accomplish this.
- Facilitation for a state funded project for Research Administration as a project to encompass travel funds, publications, trading cards, and the review of publications prior to distribution.
- Tour of Research efforts, labs, library, etc.

FHWA-NY

- Delaware DOT hosts poster sessions on completed and active research projects and invites executive management and legislators.
- Minnesota DOT holds a project orientation meeting once a year for MNDOT research staff, project management, and university researchers to discuss project administration preparing proposals, invoices, etc.
- Minnesota DOT has marketing wall of brochures and completed projects.
- NCDOT and DelDOT have industry representatives on project technical panels, where appropriate participation is solicited through industry associations to minimize concerns about fairness/favoritism.
- UDOT prepares write-ups and graphics for selected research projects and submits them to their communication relations group for their use in the media.

New Jersey

- Target unknown customers, i.e. other states (DelDOT).
- Touring Research Lab or finished projects with customers and partners (DelDOT).
- Seek out new employees to apprise them of what Research does (DelDOT).
- Research topics from Design or Maintenance topics; presenters look at their agenda and topics and attend their meetings or seminars (DelDOT).
- Market Research unit and do surveys for any customers through 2 dedicated staff (MNDOT).
- Email alert on specific subjects under development (MNDOT).
- Project orientation meeting one time a year for universities and local government on how to run a research project and how to administer contracts (MNDOT).
- Feedback on newsletter and website from customers. People tend to like websites and email (MNDOT).
- Targeting a more broad audience (MNDOT).
- Closeout memos (MNDOT).
- Workforce toolkit video package and brochure to interest high school students to go into civil engineering (MNDOT).
- Color-coded trading card with identity logos (branding) by unit (MNDOT).
- Matching project information sheets with mottos and mission (MNDOT).
- Two brochures- one internal and one external, as well as a library brochure including a bookmark or business card or borrowers card (MNDOT).
- Different "brand" for each entity (MNDOT).
- A marketing wall in the office with publications (MNDOT).
- Twenty-minute video on each project under development in lieu of Power Point presentation (MNDOT).
- Know customers- use methodology they prefer, whether it be meetings, email, fax, etc (NCDOT).
- Attend annual meetings and/or workshops from other divisions to get on their agendas and provide the status of projects so they are aware of Research services (NCDOT).
- At NCDOT, all customers utilize the Research Unit to contract with universities because they know how to control the contract best (NCDOT).
- Brainstorm when completed project is ready for media so there is a write up with pictures or Power Point ready. Invite communications/community relations' people to present projects for the media (UDOT).
- Show positive research projects to the media for local television channels on cable (UDOT).
- Publish newsletter on the TRB listserv and/or RAC (UDOT).
- Attempt to get each Division website linked to Research, which would link their projects for a feeling of ownership and also include the link to "requests for research" (UDOT).
- DOT should involve people from industry as a customer and a resource by including them on panels, i.e. Asphalt Pavement Association, and ask them for a representative (FHWA-NY).
- Include a line item in the SPR Program for future contracts (FHWA-NY) or contingency line item (NCDOT).

General Comments:

- Name of group as Research and Demonstration is different than most DOTs.
- Dedicated staff of 6 people to direct projects.
- "Branding" of products
- Recognition that Research is competing with customers' funding when they are Research's partners

5. NEXT STEPS

Many of the aforementioned discussion items can be categorized as long term, short term, or not implementable action items for the NJDOT Research Bureau.

The following action items can be implemented with little expenditure of resources in a relatively short time frame.

- Consider closer correlation of time payment to quarterly reporting and deliverables
- Consider conducting focus groups for problem statement solicitation.
- Develop subject matter expert focused emails and personal unit visits. (initiated previously)
- Employ Research implementation database (RID) for tracking/and measure the research successes.
- Publish the annual report that is prepared but has not been distributed
- Prepare post-project implementation at 1 year and 5 year intervals.
- Meet with management to discuss what is important regarding research and what should be tracked/measured and to define a successful research program.
- On the website, ensure that the services provided by Research are noted (underway)
- Conduct contractor performance evaluation (under development).
- Consider the dashboard- performance measuring report.
- Align project selection process with NJDOT long range plan/goals. At project close out, identify if it met with the long-range plan/goal or did it change during the process (CIS linked, consider other means as well)

The next series of recommendations or take home items may be implemented with additional resources and will be explored within the next year.

- Project selection is only once a year. Create mechanisms to enable more responsiveness in this area affecting procedural changes resulting in increased opportunity for Research project commencement. (under development)
- Consider participation in Pooled Fund Study *Washto-X videoconferencing*.
- Consider linking of identified performance measures to project selection process.
- Link the research implementation database to the *prompts* database (requested cost estimate)

Other items will be selected from the myriad of suggestions and take home items for future exploration.

APPENDIX

- Peer Exchange Team Photos
- Peer Exchange Team Brief Biographies
- Peer Exchange Handouts

THE PEER EXCHANGE TEAM PHOTOS AND BIOGRAPHIES

Peer Exchange Team Members seated at the table.
Left to right: Joan Walters, Camille Crichton-Sumners, Moy Biswas, Shana Lindsey, Ann Mclellan, and Wayne Kling. (Janet Leli, LTAP, seated in the rear corner)

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BSCE from Lehigh University, Bethlehem, PA

Over 30 years as a public sector employee (DelDOT), with experience in construction inspection, materials inspection, research, and management of engineers and technicians. Construction projects ranged from urban and suburban streets to major intersection of arterials and interstate widening. During materials inspection career, duties included terms in the positions of Soils Engineer, Concrete/HMA Engineer, and Chief Materials and Research Engineer. Currently, as Research Engineer (within the Materials Section), continue to be DelDOT's SHRP State Coordinator (Delaware has SPS-1 and SPS-2 sites next to each other). Serve on DelDOT's Research Committee and as Project Manager for several on-going research projects conducted at the University of Delaware. Serve on a NCHRP Panel managing a Self Consolidating Concrete research project. Active in Delaware's Quality Partnership, a state-wide organization fostering the Baldrige National Quality Program criteria that includes continuing quality improvement, efficiency, and high customer service.

Live in Dover, DE (an airbase town of 23,000) with wife of 29 years; this fall, daughter will be a junior environmental engineer student and son will be a freshman computer engineer student, both at the University of Delaware in Newark (about 50 miles away).

Mrinmay "Moy" Biswas
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Moy Biswas received his Ph.D. in Applied Mechanics from the University of Virginia, where he researched for the Virginia Transportation Research Council and the National Radio Astronomy Observatory.

Moy worked in New York City for consulting engineers. He designed conventional civil engineering facilities, nuclear power plants, and nuclear fusion reactor systems.
Moy taught structural engineering at Texas A&M University and researched at the Texas Transportation Institute. He then taught at Duke University, where he founded the Transportation & Infrastructure Research Center.

Currently, Moy is the Manager of Research with North Carolina DOT. He is the Vice-Chair and Chair Elect of the AASHTO RAC Region II. He is a registered professional engineer. He has participated in research peer exchanges of Alabama, South Carolina, Missouri, Connecticut, and of course, North Carolina.

Moy is married and has three grown children. His vices include hunting and fishing, among others.

Ann McLellan
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Ann received her BS in Chemistry from the University of Wisconsin-River Falls and her MBA with a concentration in Marketing from the University of St. Thomas, St. Paul, Minnesota.

Ann has been working at the Minnesota Department of Transportation for the past 5 years in the Research Services Section. She worked in the research development area and the finance area and for the last year has developed a marketing program. She also is responsible for the Performance Measurement reports for the Research Services Section and is the Chair of the New Products Evaluation Committee.

Prior to Mn/DOT, Ann worked at The Pillsbury Company and Andersen Windows in research and development.

Rukhsana (Shana) Lindsey, P.E.
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Shana is currently the Director of Research and Bridge Operations at the Utah Department of Transportation. She has been with UDOT for 16 years. Her responsibilities include the development of business strategies and management for UDOT's Research & Development, and Bridge Management programs. Currently under Shana's direction, the Research Division has received the 2006 AASHTO Presidential Award for its UTRAC (Utah Transportation Research Advisory Council) process.

Over the years, Shana has held a variety of leadership positions within UDOT, ranging from Maintenance Planning, Traffic Operations, and Region Operations Engineer. During this time she was instrumental in several large projects including the implementation of UDOT's new Traffic Operations Center and management of operations functions during the 2002 Olympic Winter Games in Salt Lake City.

Shana received her BS in Civil Engineering from the University of Utah and is a licensed PE with the State of Utah, and is the proud parent of two children.

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Joan received her Bachelors Degree in Civil Engineering form Clarkson University. She is currently the Research and Technology Transfer Engineer for the Federal Highway Administration New York Division Office. She was an Area Engineer for the FHWA division office prior to holding this position.

Prior to joining FHWA, Joan worked as a traffic engineer for consulting firms in Rochester, New York and Boston, Massachusetts; and as a Project Manager for the Institute of Transportation Engineers in Washington, D.C.

Joan is married with two young children, and a third expected in early fall.

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Camille Crichton-Sumners graduated from Drexel University with dual bachelor degrees in Civil Engineering and Architectural Engineering. She received her Masters in Engineering Management from the New Jersey Institute of Technology's College of Engineering. In 2003 she completed the requirements of Farleigh Dickinson University to become a Certified Public Manager in New Jersey and is a member of NJDOT's Succession Planning Leadership Pool.

During her tenure at NJDOT, Camille has worked in the Bureaus of: Environmental Services, Project Management, Utilities, Project Scope Development and the Bureau of Research where she is a newly appointed Manager responsible for the solicitation, selection and conducting studies of varying research topics from NJ Transit, Motor Vehicle Commission, and NJDOT customers and developing an annual research work program utilizing federal and state funds. In this capacity she also serves as a Department liaison to the National Science Academies, Transportation Research Board (TRB) and the Regional Advisory Committee of The American Association of State Highway and Transportation Officials, (AASHTO) as well as coordinator for special programs such as Pooled Fund studies, and Cooperative Research Programs.

Camille is married and has one son.

Peer Exchange Handouts

Peer Exchange Format

NJDOT
Research User's Committee Member List
Research Newsletter *Research Record*
2001 Peer Exchange Report
2006 Peer Exchange Powerpoint Presentation

MNDOT

NCDOT

Utah DOT

NEW JERSEY DOT RESEARCH PEER EXCHANGE

June 21 – 22, 2006 Suggested Session Format for each Theme

Resources: 3 Flip Charts + Scribe, 1 Lap Top + Scribe, and 1 Lap Top + Projector
Each team member continually takes (paper & pencil/pen) notes on:
(1) KUDOS, (2) OPPORTUNITIES, (3) TAKE HOME, & (4) OTHER/

Typical Session

Discussions and Presentations

Team Leader recognizes New Jersey presents "Customer Relationship and Marke
and expresses interests and concerns.

Team Leader recognizes Delaware presents "Customer Relationship and Marketir

Team Leader recognizes North Carolina presents "Customer Relationship and
Marketing."

Team Leader recognizes Minnesota presents "Customer Relationship and Marke

Team Leader recognizes Utah presents "Customer Relationship and Marketing."

Team Leader recognizes FHWA-NJ presents "Customer Relationship and Marketi

Team Leader recognizes New Jersey makes closing comments

If time allows, Team Leader recognizes Team Members (in order) to ask questions, if any.

If time allows, Team Leader recognizes visiting participants to ask questions, if any.

Stretch Break

Documentation

- In a round-robin manner Team Leader recognizes Delaware, North Carolina, Minnesota, Utah, FHWA-NJ, and New Jersey. In a brainstorming format, Delaware, North Carolina, Minnesota, Utah, FHWA-NJ, and New Jersey offers one "bullet" per round ("kudos," "opportunities," or "other", in any order), until all bullets are fired. A state may choose to pass.
- The flip-charts scribe writes on three separate easels "(kudos, opportunities, or other/parking lot).
- The computer scribe writes on a laptop into a template, copying from flip-charts.
- Team members (in order) orally present take home items
- Team members submit take home items (hand written hardcopy) to the computer scribe

Document Finalization and Closing Thoughts
(Thursday, after review of documentation of Themes 1, 2, 3 and 4)

- Review and final edit the comprehensive draft document
- Each team member collects his / her thoughts and writes brief narratives of one or two paragraphs of general summary "Observations" on the peer exchange.
  (Later, team members use these and respective take home items to make brief oral presentations to the management at the close out session.)
- Members give respective handwritten hardcopy note to the computer scribe.

Review and wrap up

NJDOT Research User's Committee Members

03/29/06

Secretaries	Phone #	Member	Titles
Theresa Hatchett	530-2529	**Mark Stout**	Acting Chairman
Sue Hendersen	530-2868	Howard Immordino	Secretary of RUC
Bernie Shaw	530-2713	William Carter	Executive Director, Operations South
Karen Rittenhouse	530-2866	Brent Barnes	Director, Transportation Systems Planning
Frani Davis	530-2733	Brian Strizki	Director, Design Services
Charlotte Piccinetti 2-4121	609 292-4121	Donald Borowski	Director Driver Control & Regulatory Affairs
Terri Rackison	530-3640	David Kuhn	Director, Local Aid & Economic Development
Sue Lackey	(973) 770-5170	Aram Mardekian	Director, Operations North
Theresa Manna	530-2080		Director, Aeronautics & Freight Services
Lucy Sanderson	530-2488	Patricia Ott	Director, Traffic Engineering & Safety
Cindy Vitella	(856) 866-4980	Jim Hogan	Director, Traffic Operations
	984-6694	Mike Riley	Director, Maritime Services, 28 W. State St., PO Box 837, 08625 michael.reilly@dot.nj.us
Carol Hawkins	530-3811	Dave Sichik	Director, Construction Services & Materials
Jacki Campitelli	530-2589	Rich M. Shaw	Director, Operations Support
Donna Szwedo	530-4679	Richard Hammer	Director, Project Manager
Teri Abitz	530-8192	Ron Stewart	Director, MIS
Eileen Rainieri	530-8069	Tom Wospil	Director, Capital Investment Planning & Development
Linda Sudler	530-8075	Elkins Green	Director, Environmental Resources
Michele Wallace	530-5636	Lynn Rich	Director, QMS
Danielle Scannon	530-5262	Gary Toth	Director, Project Planning & Development
Cindy Price	(732) 409-3263	Bernard James	Executive Director, Operations Central
	530-5868 Ext. 4279	Harold Neil	Transportation Security
Connie Myers		James Lewis	SPR Oversight
	637-4211	Larry Cullari	FHWA, 840 Bear Tavern Rd., Trenton, NJ
Stephanie Nock	530-5637	Camille Crichton-Sumners	Manager, Research Bureau

New Jersey Department of Transportation
Bureau of Research & Demonstration

Research Record
Summer 2006

Mission

"We provide current and quality information, analysis, and value-added solutions to transportation professionals within New Jersey and throughout the nation."

RESEARCH HIGHLIGHTS

The Bureau of Research is a catalyst for innovation and change for the New Jersey Department of Transportation (NJDOT). Working with our research partners, the Bureau delivers quality research and technology transfer solutions that the Department can use to deal with the ever-increasing demand on our state's transportation systems. The Bureau strives to be a customer-focused broker of effective workable solutions for our customers. We are proud to highlight the following sampling of recent research findings. Full Report, Tech Brief, and Abstract can be downloaded from our website at www.state.nj.us/transportation/refdata/research/.

PROJECT TITLE **New Jersey Local Congestion, Safety, & Security Initiative**
PROJECT NUMBER FHWA-NJ-2005-001
PERFORMING ORGANIZATION Center for Advanced Infrastructure and Transportation, Rutgers

This project examined the relationship between effective national transportation congestion, security, and safety technology transfer applications. A comparison was made between national trends and the conditions found in New Jersey, and the most appropriate solution was implemented. When examining the national transportation congestion, security, and safety technology transfer trends, the findings showed that security and congestion were interrelated through safety. Specifically, reduction of roadway crashes, adjustment of driver behavior, and use of safety counter measure applications had impacted both congestion and security.

PROJECT TITLE **Evaluation of Cross Median Crashes**
PROJECT NUMBER FHWA–NJ–2005-04
PERFORMING ORGANIZATION Rowan University

Cross-median accidents are one of the most dangerous types of highway crashes. In response to several widely publicized cross median crashes, NJDOT initiated a pilot program in which cross median barriers were installed along two interstate roadways: Interstate 78 (I-78) in Hunterdon County and Interstate 80 (I-80) in Morris County. Rowan University evaluated these median barriers as to their potential to prevent cross-median collisions without injuring vehicle occupants. The project goal was to evaluate the post-impact performance of two

different median barrier systems: the three strand cable median barrier system installed on I-78 and the modified thrie beam median barrier system installed on I-80. The results of this study are expected to provide new insight into the performance of and potential improvements to the design of future median barriers in New Jersey.

PROJECT TITLE Development of a Simulation/Assignment Model for the I-80 ITS Priority Corridor
PROJECT NUMBER FHWA-NJ-2005-011
PERFORMING ORGANIZATION National Center for Transportation and Industrial Productivity, NJIT

The objective of this study was to develop a prototype dynamic traffic simulation and assignment tool to assist NJDOT engineers, planners and policy makers in decision-making and effective design. The tool adopted for this purpose is the Visual Interactive System for Transport Applications, called VISTA, a simulation-based Dynamic Traffic Assignment model. The NJDOT I-80 Intelligent Transportation System (ITS) priority corridor was identified as the application corridor. As a result an Incident Management module was created that allows the user to emulate an incident (specifying the location, occurrence time, incident duration, capacity reduction) and emulate the functionality of Variable Message Signs.

PROJECT TITLE Development of a Performance Specification for Base and Subbase Materials
PROJECT NUMBER FHWA-NJ-2005-003
PERFORMING ORGANIZATION Rutgers University

Due to the importance of transportation infrastructure, great emphasis is placed on the long-term performance of pavements. This research study entailed sampling numerous NJDOT aggregate suppliers in order to evaluate performance of aggregate materials at the NJDOT gradation limits and provide guidance on how to modify the gradation specifications to promote better long-term performance. Aggregates such as: NJDOT I-3, DGABC, RAP, RCA, and virgin/recycled aggregate blends were subjected to pavement related loading conditions with laboratory tests such as: Permeability; California Bearing Ratio bearing capacity; Triaxial shear strength; Cyclic triaxial testing; and Resilient modulus. The study produced several recommendations to the NJDOT on how to modify the current gradation specifications to promote better performing base and subbase aggregates, as well as to provide recommendations on utilizing the maximum amount of recycled aggregates without sacrificing the pavement's performance.

PROJECT TITLE Finite Element Modeling of Bridge Approach and Transition Slabs
PROJECT NUMBER FHWA/NJ-2002-007
PERFORMING ORGANIZATION Center for Advanced Infrastructure and Transportation, Rutgers Univ.

The objective of this research study is to identify the probable causes of cracking in reinforced concrete bridge approach and transition slabs. Transverse and longitudinal cracking has led to distress of concrete approach slabs, which results in a decrease of their life expectancy and increased maintenance costs for the repair and stabilization of the system. The study focused on identifying the factors influencing crack development and to recommend new design alternatives that reduce or eliminate crack development. Several recommendations were made based on the results of the study including the use of two design alternatives, Embedded Beam and Constant Thickness.

PROJECT TITLE Survey of Transit and Rail Freight Interaction
PROJECT NUMBER FHWA-NJ-2004-002
PERFORMING ORGANIZATION New Jersey Institute of Technology

This research project modeled the impacts of proposed improvements to the Newark Penn Station pick-up/drop-off facilities and to the surrounding roadway infrastructure. A Paramics simulation model for the study area surrounding Newark Penn Station was built and calibrated to existing conditions. Analyses were conducted for the base 'No Build' condition, as well as for the planned NJDOT / City of Newark improvements and for multiple NJ TRANSIT recommendations. Analyses were also completed to determine the impact of large future developments in the immediate vicinity of Newark Penn Station.

PROJECT TITLE Alternative Performance Measures for Evaluating Congestion
PROJECT NUMBER FHWA-NJ-2004-006
PERFORMING ORGANIZATION National Center for Transportation and Industrial Productivity , NJIT

This research study first outlines existing approaches to looking at congestion. It then builds on the previous work in the area of evaluating congestion by incorporating the public's perception of what they consider to be congested through the use of a web-based survey. The idea of utilizing public input is not frequently seen in studies that look at congestion and its impacts. What makes this study more unique is the focus on drivers in the State of New Jersey. The results presented are specific to the area and allow for conclusions in terms of the entire state, various classifications throughout the state (age, income, etc.) as well as more disaggregated county level findings. The major findings of this effort are that New Jersey motorists are more tolerant of congestion than what is expected according to nationally used traffic engineering principles. The study also found that although New Jersey motorists are tolerant of congestion, they experience a very significant amount of stress while driving.

PROJECT TITLE Use of LED or Other New Technology to Replace Standard Overhead and Sign Lighting
PROJECT NUMBER FHWA-NJ-2005-029
PERFORMING ORGANIZATION Center for Advanced Infrastructure and Transportation, Rutgers

The intent of this study was to identify cutting-edge technology and quantify key issues of energy efficiency and associated cost in roadway lighting. The following lamps were investigated: Mercury Vapor, High Pressure Sodium (HPS), HPS retro-white, HPS Restrike, QL, Icetron, and LED with different wattages. As a result of the study NJDOT is installing nearly two thousand Restrikes on Route 78, one of the busiest corridors in the State. Restrike HPS will have a substantial labor savings to the department, potentially cutting the necessary relamping effort in half.

PROJECT TITLE Impact of Congestion on Bus Operations and Costs
PROJECT NUMBER FHWA-NJ-2003-008
PERFORMING ORGANIZATION University Transportation Research Center

Traffic congestion in Northern New Jersey imposes substantial operational and monetary penalties on bus service. The purpose of this project was to quantify the additional time and costs due to traffic congestion. A regression model was developed that estimates the travel time rate. The model was used to estimate the bus travel time rate if cars were traveling under free flow conditions, and the results were compared to the observed bus travel times. A second model was developed that estimated operating costs as a function of vehicle hours and peak hour vehicles. This model was used to estimate the cost of the additional time represented by the difference in current time minus travel time estimated under free flow conditions.

PROJECT TITLE Use of Neural Network/Dynamic Algorithms To Predict Bus Travel Times Under Congested Conditions
PROJECT NUMBER FHWA-NJ-2003-019
PERFORMING ORGANIZATION Dept. of Civil and Environmental Engineering; Rutgers University

Automatic Passenger Counter (APC) systems have been implemented in various public transit systems to obtain various types of real-time information such as vehicle locations, travel times, and occupancies. Such

information has great potential as input data for a variety of applications including performance evaluation, operations management, and service planning. In this study, a dynamic model for predicting bus arrival times is developed using data collected by a real-world APC system. The model consists of two major elements. The first one is an artificial neural network model for predicting bus travel time between time points for a trip occurring at a given time-of-day, day-of week, and weather condition. The second one is a Kalman filter based dynamic algorithm to adjust the arrival time prediction using up-to-the-minute bus location information.

Bureau Services

Library

The NJDOT Research Library performs reference and referral services, offers online catalogue access, lends materials on site or by an interlibrary loan through local or agency libraries, provides photocopy services (fees are charged), conducts literature searches and routing of periodicals.

Library services are available to New Jersey state employees. The collection is accessible to the public by appointment.

The Research Library contains documents from a variety of sources. Among these are the publications of the following government agencies:

- Transportation Research Board
- US Department of Transportation and its subdivisions, such as the Federal Highway Administration and the Bureau of Transportation Statistics
- NJDOT, particularly the Research Bureau; and other
- National, state and international government agencies and organizations.

Website

The Bureau of Research and Demonstration maintains a public website. It contains a description of the

work the Bureau does, who its customers are, the research process and methods used, the types of research conducted, and a schedule of upcoming project meetings.

The website contains useful links to other local, state, and national research, as well as forms for requesting research, status reports for ongoing research projects, and guidelines and formats for preparing research reports. In addition, the website provides links to various organizations.

Visit our website at:
http://www.state.nj.us/transportation/refdata/research/

Upcoming Events

Research Showcase October 27, 2006

The Bureau of Research and Demonstration, in cooperation with its University Partners, hosts an annual showcase. The focus of this event is to highlight the broad spectrum of transportation topics being explored by the Bureau. The University Partners are encouraged to highlight ongoing projects as well as present panel discussions themed to a particular aspect of research. All NJDOT employees, customers, and private sector parties are invited.

About The NJDOT Bureau of Research & Demonstration

The Bureau of Research and Demonstration is part of the Division of Systems Planning and Research and contracts most its the research with its university partners at Rutgers University, the New Jersey Institute of Technology, Rowan University, Stevens Institute of Technology, and the University Transportation Research Center.

The Bureau is a "hub" of research activities for the NJDOT, the Motor Vehicle Commission, and NJ TRANSIT. We utilize our resources as a conduit to our research partners – research university centers, national and international research organizations, and industry-based institutions.

Through our efforts and those of our research partners, we will discover new materials, improve processes, refine systems, and generate innovative ideas that enhance the durability and efficiency of our transportation infrastructure, enhance public safety, improve mobility, reduce congestion, improve and protect the environment, and introduce new innovative technologies that can improve the quality of life in the Garden State.

The Bureau believes in professional collaborative relationships with all customers, partners and colleagues and in operating in an environment of mutual respect, integrity, collegiality and support. The Bureau believes in spanning boundaries, taking risks and championing new ideas, while producing the highest quality research and demonstration products that meet or exceed customer expectations.

For more information contact:

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Bureau of Research and Demonstration
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E-mail: research.bureau@dot.state.nj.us

NJDOT POWERPOINT PRESENTATION

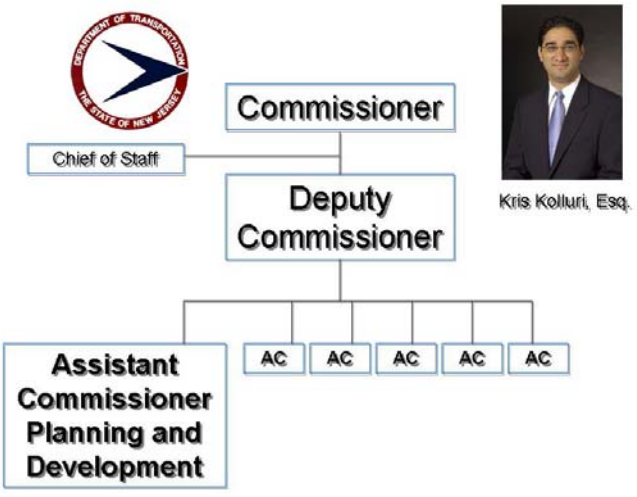
New Jersey Department of Transportation

BUREAU OF RESEARCH AND DEMONSTRATION

Research Peer Exchange

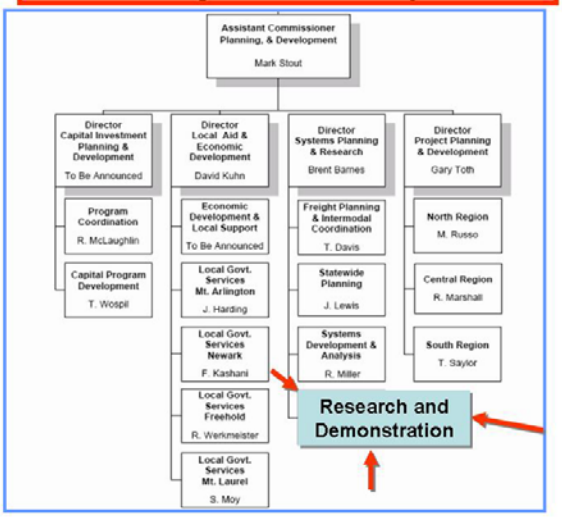
June 21-22, 2006

Kris Kolluri, Esq.

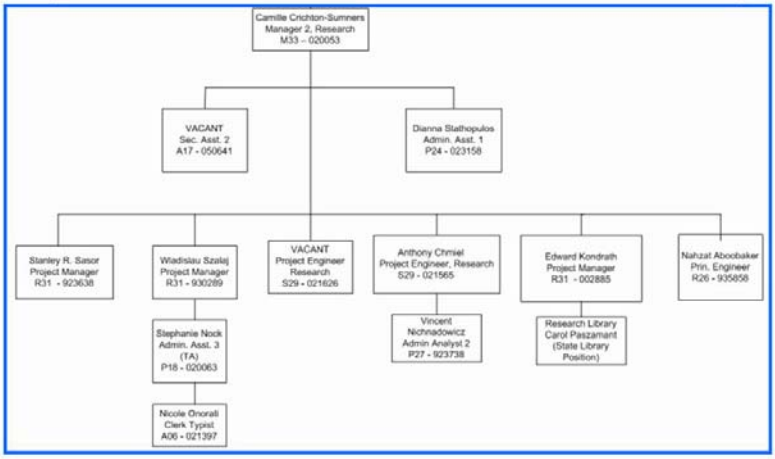


- **NJDOT**
- **Miles**
- Lanes8,371 Shoulders 4,503 Ramps 613 **Total 13,487**
- **Other Roads**
- **Center lane miles**
- NJ Turnpike Authority 323 South Jersey Transportation Authority 47 Palisades Interstate Parkway11 Bridges Authorities 28 County 7,335 Municipality 28,234 Parks 649 **Vehicle Miles Traveled (Annual)**
- **Billions**
- 199058.922199159.288199259.249199359.726199460.466199561.013199662.164199763.28019 9864.616199965.919200067.172200168.497200269.812200371.262
- **NJDOT Operations Total**
- Contractor plows1,369Contractor loaders, graders129Contractor spreaders220Dams owned24Drawbridges operated (2 or 3 shifts)17Drawbridge inspection (3 or 4 times annually)100Emergency service patrol responses60,733Emergency calls, Central Dispatch Unit23,573Lane miles resurfaced405Lights maintained, highway35,300Lights maintained, lanes, ramps shoulders15,829Mowings (acres)51,000Permits, access425Permits, highway3,100Salt storage (in tons)159,320Traffic signals maintained3,023Traffic signal management systems - systems8Traffic signal management systems - signals206Traffic signals inspected11,057
- **NJDOT Fleet Total**
- Autos302Trucks1,793Road equipment6,057
- **Annual Costs In millions**
- Litter pickup$3.5Snow/ice control$31.6Striping$7.2Trash removal$.6

Planning & Development



Bureau of Research & Demonstration



University Research Partners

99% research contracted

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS

CAIT
LTAP

NJIT NEW JERSEY INSTITUTE OF TECHNOLOGY

NCTIP

STEVENS
Institute of Technology

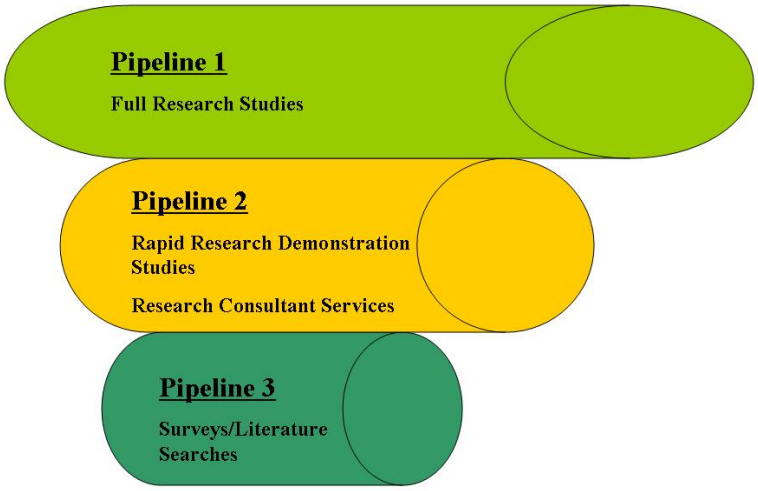
ROWAN
UNIVERSITY

What We Do…

Delivers customer-focused quality research and technology transfer solutions that:

- **Enhance the durability of our transportation infrastructure,**
- **Increase public safety,**
- **Reduce congestion,**
- **Improve and protect the environment, and**
- **Introduce new innovative technologies**

Research Study Types



How We Do It…

- Solicit problem statements
- Develop RFP's
- Review and select winning proposals
- Monitor/Conduct research studies
- Ensure technology transfer, training, and implementation

Solicitation

- Annual Research Showcase
- Solicitation Memo
- E-mail Solicitation

Research INTRAnet Web Site

http://njdotintranet.dot.state.nj.us/

- Announcements and Surveys
- Research Library Information
- Annual Research Problem Solicitation
- Annual Research Showcase

Research INTERnet Web Site

http://www.state.nj.us/transportation/refdata/research/

- Summaries of ongoing studies
- Full-text final reports and tech briefs
- Announcements of special events or research news
- Links to National, State, and Local transportation research sites

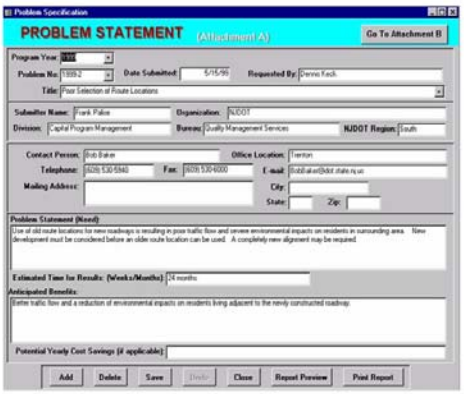
Online Research Problem Statement submission

Requests For Research

Internet → Group Wise E-mail → ProMPTS

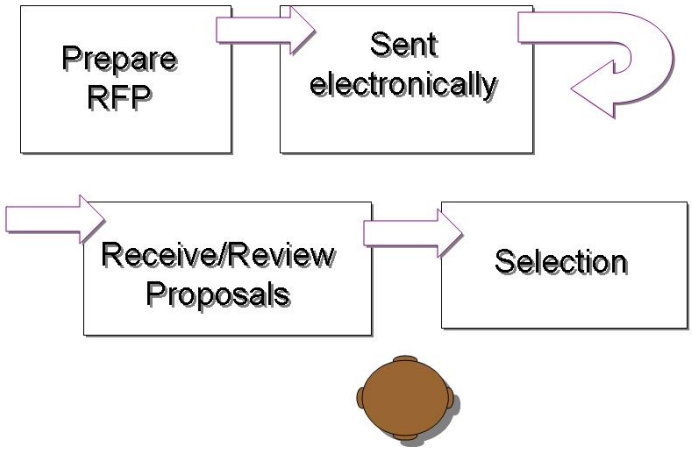
Research.Bureau@dot.state.nj.us

Problem Statements

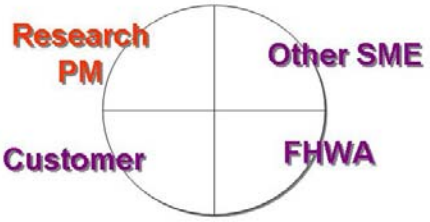


- Original Problem Statement information is entered here.
- A report can be printed from this information.

Research Program Development



Project Management



Research Project Selection and Implementation Panel

Project Management

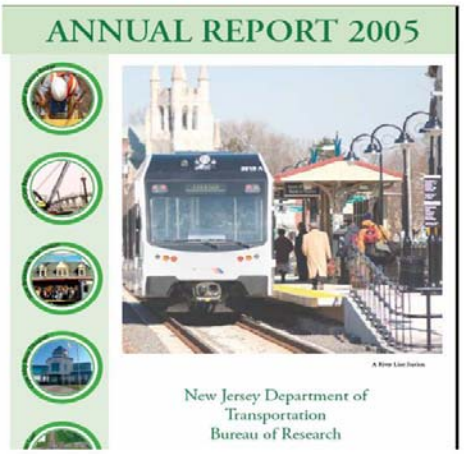
- ProMPTS
  Project Management and Progress Tracking System
- Document Tracking Database
- Research Implementation Database
- Final Reports Database
- Contract Status Spreadsheet
- FMIS (Mainframe)

Project Management

- Interim & Final Deliverables
  - Quarterly Meetings and Progress Reports
  - Literature Review
  - Tech Memorandum
  - Draft & Final Report (20 hard copies distributed)
  - Tech Brief
  - Abstract
  - Bureau Annual Report

Outreach and Implementation

- **Research Implementation Database**
- **Website Feature**
- **TRB News**
- **Technology Transfer**
  - **Brown Bag Luncheons**
  - **TRB Presentations**
  - **Transporter/Newsletter articles**
  - **Annual Bureau Report**
  - **LTAP**
  - **Training**
  - **Annual Research Showcase**



Technolgy Transfer

Outreach