NJ-2016-001

Research Process Improvement and Regulatory Compliance Updates

FINAL REPORT
October 2015

Submitted by

Jason Bittner and James Osborne
Cambridge Systematics, Inc.
New York, New York 10016

NJDOT Research Project Manager
Priscilla Ukpah

In cooperation with

New Jersey
Department of Transportation
Bureau of Research

DISCLAIMER STATEMENT

“The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the New Jersey Department of Transportation. This report does not constitute a standard, specification, or regulation.”

TECHNICAL REPORT
STANDARD TITLE PAGE

1. Report No. NJ-2016-001	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Research Process Improvement and Regulatory Compliance Updates FINAL REPORT		5. Report Date October 2015 6. Performing Organization Code
7. Author(s) Bittner, Jason and James Osborne		8. Performing Organization Report No.
9. Performing Organization Name and Address Cambridge Systematics, Inc. 38 East 32nd Street, 7th Floor New York, NY 10016		10. Work Unit No. 11. Contract or Grant No.
12. Sponsoring Agency Name and Address New Jersey Department of Transportation P.O. 600 Trenton, NJ 08625		13. Type of Report and Period Covered 14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

The New Jersey Department of Transportation identified critical issues related to compliance with changes to Federal regulations governing the distribution and expenditure of Federal funding used in transportation research activities. The Executive Office of Management and Budget (OMB) establishes uniform cost principles and audit requirements for all Federal awards to non-federal entities. Changes to the guidance provided under 2 CFR 200 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards) have impacts on existing policies and procedures for the NJDOT research enterprise. This report provides an assessment of existing business practices as they relate to compliance with 2 CFR 200 and offers recommendations for policy and documentation changes as needed. To assess these changes, the research team completed several activities, including a review of current business documents, a developed action plan to address the 2014 Research Subpart B Process Review findings, and the consideration of a process and tool for appropriately categorizing research projects.

17. Key Words Research Administration; Supercircular; Risk Monitoring	18. Distribution Statement		
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. 34 pages	22. Price

Form DOT F 1700.7 (8-69)

ACKNOWLEDGEMENTS

The authors of this report wish to thank in particular the customer, Research Bureau Manager Camille Crichton-Sumners and the Research Bureau staff of the New Jersey Department of Transportation (NJDOT), without whom completion of this report would not have been possible.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The New Jersey Department of Transportation (NJDOT) Bureau of Research identified a critical issue related to compliance with changes to Federal regulations governing the distribution and expenditure of Federal funding used in transportation research activities. Changes to the guidance provided under 2 CFR 200 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards) have impacts on existing policies and procedures for the NJDOT research enterprise.

As such, NJDOT contracted with Cambridge Systematics, Inc. (the "research team") to provide an independent assessment of existing business practices as they relate to compliance with 2 CFR 200 and offer recommendations for policy and documentation changes as needed. In response, the research team conducted a literature review, provided in-depth document and business process analysis, developed an action plan to address 2014 Research Subpart B Process Review Findings, and created guidance to assist NJDOT in appropriately categorizing research projects.

BACKGROUND

The Executive Office of Management and Budget (OMB) establishes uniform cost principles and audit requirements for all Federal awards to non-federal entities. The OMB published 2 CFR Part 200 to streamline government-wide guidance on administrative requirements, cost principles, and audit requirements for Federal awards. In relation to transportation, the Federal Highway Administration (FHWA) identified critical post-award regulations, cost principles, and audit policies as requiring updates for state DOTs receiving federal funding.

OBJECTIVES

The goal of this research was to provide the NJDOT with updated business process documents and supplemental information that reflect current regulatory and policy oriented preferences. To accomplish these goals, the research team completed the following:

- Reviewed, documented, and updated business process documents as a result of the modifications to federal regulations related to uniform cost principles and audit requirements for federal awards to non-Federal entities;
- Developed an action plan and documented the impacts of the 2014 Research Subpart B Process Review Findings for research business practices; and
- Developed guidance to appropriately categorize research projects as applied, advanced, basic research or other categories.

INTRODUCTION

The performed research was designed to provide the NJDOT Bureau of Research with a specific set of business practice improvements. The improvements include an overview of NJDOT Research Bureau's responsibilities in the current federal regulatory

environment, an action plan to respond to 2014 FHWA process review findings, a comparative analysis of DOT research practices related to project risk assessment, and guidance to classify research projects by general research categories.

SUMMARY OF THE LITERATURE REVIEW

In order to review to fully examine the impacts of changes to federal regulations, the research team conducted a literature review of case studies, academic journals and white papers from around the United States to gather information on a range of approaches and their applicability to NJDOT's research unit. The following documents were reviewed in depth:

- Elizabeth Deakin, Karen Trapenberg Frick, and Kathleen Phu. *Risk Assessment and Risk Management for Transportation Research*. University of California, Berkeley. Prepared for Caltrans. January, 2014.

- Doug Anderson, David Eixenberger, and Thomas LeHolm. *Streamlined Research Project Selection And Reporting*. T. Y. Lin International. Prepared for Utah Department of Transportation Research Division. July, 2011.

- Washington State Department of Transportation. *Project Risk Management Guide*. Engineering and Regional Operations, Development Division, Design Office, SAEO. November, 2014.

- Innovative Program Delivery. *Risk Assessment for Public-Private Partnerships: A Primer*. Prepared for US Department of Transportation, Federal Highway Administration. December, 2012

- Elissa K. Konove. *Memorandum: ACTION: 2 CFR 200 Implementation Guidance*. US Department of Transportation, Federal Highway Administration. December, 2014

- *Frequently Asked Questions for New Uniform Guidance at 2 CFR 200.* February, 2014.

- Council on Financial Assistance Reform – COFAR. *Frequently Asked Questions For The Office of Management and Budget's Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards At 2 CFR 200.* November, 2014.

- Washington State Department of Transportation. *Enterprise Risk Assessment Guide*. Strategic, Enterprise & Employee Services, Enterprise Risk Management Division. February, 2015.

- Office of Management and Budget (OMB). *Frequently Asked Questions for New Uniform Guidance at 2 CFR 200.* February, 2014.

SUMMARY OF WORKED PERFORMED

At the direction of NJDOT's Bureau of Research, the research team investigated best practices and policies to achieve compliance with 2 CFR 200 and offer recommendations for policy and documentation changes as needed. Specific work efforts included:

- Review, Document, and Update Business Process Documents – Examined the NJDOT Research Process, Strategic Plan, and other documentation in relation to compliance documentation and ensured that federal citations in the documents reflected the changes to the federal regulations;

- Develop Action Plan to Address 2014 Research Subpart B Process Review Findings – Reviewed Research Bureau's management and State Planning and Research (SPR) Programming recommendations and developed an action plan that addressed the findings; and

- Develop Guidance to Appropriately Categorize Research Projects – Developed a guidance document to evaluate the proper procurement mechanisms for the activities necessary to complete mission-critical tasks.

- Based upon the findings of the current practices review and interviews with DOTs, the research team prepared a final report containing a brief review of other state transportation research agencies use of risk monitoring practices.

Review, Document, and Update Business Process Documents

The Office of Management and Budget establishes uniform cost principles and audit requirements for all Federal awards to non-federal entities. Proposed changes to the guidance provided under 2 CFR 200 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards) will have impact on existing policies and procedures for the NJDOT research enterprise. To assess the impact of these changes, the research team reviewed the NJDOT Research Process, Strategic Plan, and other documentation.

Addressing Business Practice Changes Associated with New Federal Guidance

2 CFR 200

The US Office of Management and Budget (OMB) published 2 CFR Part 200 (referred to as the "Supercircular") to streamline government-wide guidance on administrative requirements, cost principles, and audit requirements for Federal awards. The Supercircular consolidates and eliminates duplicative guidance found in eight OMB circulars including A-50, Audit Follow-Up; A-87, Cost Principles for State, Local, and Indian Tribal Governments; A-102, Grants and Cooperative Agreements with States and Local Governments; and A-133, Audits of States, Local Governments, and Non-Profit Organizations. The Supercircular also expands requirements in some areas related to cash management and financial practices within agencies.

The following table outlines the consolidation and relevant sections under 2 CFR 200.

Table 1 – OMB circulars and Title 2 CFR

OMB Circulars and Title 2 CFR

If you are a: Then follow these Circulars: *Note: if you are a pass-through entity you are required to possess functional knowledge of the circular applicable to your subrecipient*	State, Local and Indian Tribal Governments	Institutions of Higher Education, Hospitals, and other Nonprofit Organizations	For Profit Organizations
Uniform Administrative Requirements	**A-102**; Common Rule	**2CFR Part 215** (formerly OMB Circular A-110)	**FAR 31.2**
Cost Principles	**2CFR Part 225** (formerly OMB Circular A-87)	**Higher Ed**: **2CFR Part 220** (formerly OMB Circular A-21) **Nonprofits**: **2CFR Part 230** (formerly OMB Circular A-122) **Hospitals** *(research & other activities)*: **45CFR 74, Appendix E** **Hospitals** (Medicare): **Title XVIII of the Social Security Act**	**48CFR 31.2**
Audit Requirements	**A-133**	**A-133**	**FAR 31.2**

In the transportation area, there are several emphasis areas that merit additional discussion. The Federal Highway Administration identified critical post-award regulations, cost principles, and audit policies as being the most germane for state DOTs receiving federal funding.

The sections below include the most relevant requirements for administering the NJDOT research program:

Post Federal Award Requirements (2 CFR 200 Subpart D) – the Supercircular includes:

- **Performance measurement (2 CFR 200.301)** – Recipients of Federal awards must relate financial data to the performance accomplishments of an award and provide cost information to demonstrate cost effective practices.

  NJDOT Current Practice – Based on our review of current practices for research monitoring, the financial practices of monthly and quarterly progress reporting comply with the mandates of the performance measurement section related to post-award requirements. Master contracts stipulate these performance measurement guidelines. In addition, the level of financial detail requested by the Department is sufficient to meet the 2 CFR 200.301 guideline.

- **Greater focus on internal controls (2 CFR 200.303)** – Federal award recipients must establish and maintain effective internal controls over Federal awards to

provide reasonable assurance that awards are being managed in compliance with laws and regulations.

NJDOT Current Practice – Based on a thorough review of current practices in the research procurement, monitoring, and management practices, the internal controls and monitoring in place comply with the mandates of the performance measurement section related to post-award requirements. Master contracts stipulate these guidelines. A 2014 review of NJDOT practices identified a series of activities that NJDOT should pursue and an action plan to address some internal controls was prepared and is in the process of being implemented.

- **Cost sharing or matching (2 CFR 200.306(a))** – For research grants, voluntary committed cost sharing cannot be used as a factor during the merit review of applications or proposals for discretionary awards, but may be considered if voluntary cost sharing is consistent with USDOT agency regulations and specified in a notice of funding opportunity.

  NJDOT Current Practice – Matching requirements do not appear in any of the reviewed documentation issued from the NJDOT research offices. Future requests for proposals or other procurement notices should be prepared in compliance with the cost-sharing policies. Since NJDOT does attempt to leverage research funding as much as possible, the practices related to documenting matching funding in compliance with 2 CFR 200.306 should be included in Department notices and Requests for Proposals.

- **Period of performance (2 CFR 200.309)** – Based on existing practices in the transportation research area, this modification does represent a significant change to the research program because it will impose a period when project costs can be incurred, including a specific project agreement start and end date. The new provision will require an end date to be included in the agreement after which no additional costs may be incurred and are not eligible for reimbursement.

  NJDOT Current Practice – Based on our review of current practices, the stipulation of expected end dates will not be a substantial change to existing business processes. However, as will also be addressed in the project closeout requirements, the limitation of a single time extension will be a factor in managing post-award functions. Current practice allows for multiple extensions and there are several examples of projects being extended beyond one year.

- **Greater responsibilities for subrecipient monitoring (2 CFR 200.331)** – States must ensure subrecipients comply with all Federal laws and regulations and monitor performance schedules to ensure they are achieved including award terms of subawards. Approved, federally recognized indirect cost rates negotiated between the subrecipient and its cognizant agency must be included in award documentation.

- **NJDOT Current Practice** – The current pool of university-based research award recipients associated with NJDOT all have established indirect cost documentation that can be included to comply with this requirement. Subrecipient monitoring was identified in the 2014 Program Review completed by FHWA. As this has been a past concern of the Department, continued attention to subrecipient monitoring will be included in future research management activities and is recommended for inclusion in the Research Procedures Manual updates currently underway.

- **Project closeout (2 CFR 200.343 thru 200.345)** – Recipients are required to submit all eligible incurred costs and required performance and financial reports or project records specified in the project agreement or stewardship and oversight procedures within 90 days after the agreement end date.

- **NJDOT Current Practice** – Based on interviews with research administration staff at NJDOT, and reflecting the findings of the FHWA Program Review in 2014, project end date within 90 days will require some changes to existing practice. While it is not a typical part of the research management process, there are multiple occurrences of project end date extending well beyond the 90 day window allowable under the new Uniform Guidance.

Cost principles (2 CFR 200 Subpart E and Appendix VII) – the Supercircular is generally consistent with previous cost principles requirements (formerly circular A-87). The Department is seeking clarification from OMB regarding applicability of 2 CFR 200 Subpart E to for-profit organizations. The following are some of the changes affecting FHWA:

- **Indirect costs (2 CFR 200.412 thru 200.417)** – All Federal and pass-through entities must accept a negotiated indirect cost rate if one exists, or negotiate a rate in accordance with Federal guidelines. There are exceptions when a statute or regulation requires it, or if the non-Federal entity receives $35 million or less in direct Federal funding.

  NJDOT Current Practice – Existing indirect rate structures will be used for contract documentation and will be submitted as part of the procurement and selection processes. All of the Department's university based research partners have approved indirect cost rate structures. Reduced state agency rate agreements apply in accordance with the Federal guidelines. FHWA is testing a narrative based cost allocation financial management approach to address specific cases of intergovernmental transfers, but this arrangement is unlikely to affect research practices.

- **Audit Requirements (2 CFR 200 Subpart F)** – The Supercircular is generally consistent with previous single audit and other audit requirements (formerly circular A-133). The primary changes affecting how transportation awards are audited include an increased threshold for single audit requirements (from

$500,000 to $750,000 in total federal awards) and modifications to the guidance documentation prepared by FHWA to meet the changes.

- **NJDOT Current Practice** – Typical research awards are made to organizations that meet the higher thresholds for audit compliance. Nearly all of New Jersey's University based partners comply with the single audit requirements and it is not expected to directly impact the research unit's operations or research monitoring practices. In cases where awards are made to organizations not reaching the federal award threshold, appropriate measures should be established (including risk monitoring practices) in the updated Research Procedures Manual.

Other Issues arising from the 2 CFR 200 Policy Revisions

- **Federal Research Terms** – Previous Federal research terms and conditions have not yet been re-released under the uniform guidance provided through 2 CFR 200. As such, the June 2011, terms and conditions remain in effect. Most Federal agencies (with the exception of the Department of Defense) will migrate to the Federal Research Terms and Conditions when finalized.

- **Travel and Meal Costs** – Changes to definitions of allowable costs for travel and provision of meals and food items were included. Some consideration of additional childcare costs are now allowable items for Federally-funded travel while the new uniform guidance also provides for the ability of recipients to provide meal related conference expenses as an allowable cost.

Documents Updated to Reflect Federal Regulatory Changes

Following the business process review, the research team updated documents that reflect the changes to the federal regulations. The following research documents were reviewed for appropriate federal citations:

- NJDOT basic agreements
- NJDOT general provisions
- Regulations summary spreadsheet
- Research process forms (including contract modification, research requests and quarterly report templates); and
- 2016 Draft Research Procedures Manual

Develop Action Plan to Address 2014 Research Subpart B Process Review Findings

The Cambridge Systematics, Inc. (CS) research team reviewed the FHWA's research management and State Planning and Research Programming recommendations from September 2014 and developed an action plan to address the findings. CS research

team personnel met with NJDOT Bureau of Research staff and other managers to gauge reaction to the development of a strategic research framework or updated plan for the agency. The research team also conducted a best practices review of other states that have developed risk identification measures in their research programs or provide training to assist in program monitoring activities.

Research Monitoring Best Practices

Following interviews with Research Bureau staff documented in the Appendix, the CS research team reviewed existing practices within the research unit. The intent of this high level review was to understand existing processes and compare them with best practices in place in a variety of state and local research agencies.

The research team also reviewed the existing research project databases and provided automation for certain forms that previously required manual manipulation for data collection. These process changes will allow NJDOT to increase efficiency in its research management practices.

In order to assess the best practices in research monitoring, the research team consulted several example states, existing literature on preferred practices, and federal agency representatives.

Transportation research includes deciding which new products to develop, continue to research, terminate, and invest in. These decisions include trading off risks, returns, and time horizons for future payoffs. For state DOTs, research efforts that support service innovation is highly desired. DOT research bureaus represent a focal point for new and improved ways of doing business.

Establishing detailed practices for routine research monitoring and reporting is essential for improving overall decision making. For transportation research, where project funding decisions are made under uncertain circumstances (such as identifying potential outcomes, possible changes to existing practices, or operating under dynamic financial settings) the following successful concepts for research assessment and monitoring were identified as preferred practices:

- **Ensure Legibility** – Develop a clear set of common definitions, a conceptual framework, and strategic goals. This allows a consistent understanding between all parties and ensures that there is common agreement at the beginning of the project on expectations and deliverables.

- **Public Performance Reporting** – Require annual reporting of research products, listing Department investments that are classified by strategic goals. Matching the existing themes and priorities of executive leadership also projects the importance of the research activities in the Department's overall mission. The public aspect of the documentation allows for increased recognition. In limited cases, this increased attention also could highlight potential activities requiring cautionary approaches.

- **Support Implementation** – Establish a clear relationship between Research and Capital projects planning, so that applied research projects are connected to implementable planning efforts. This best practice is paramount – researchers, and the customers supporting research activities, are not expecting the products to "sit on the shelf."

- **Require Implementation Plans** – In order to support implementation, all projects should include an implementation plan. For consideration, a plan that includes some type of project screening to select candidate projects is preferred. High priority implementation activities can be identified early in the research life cycle.

- **Identify Research Product Markets** – Understanding of research product market is vital for project success. Research customers should be surveyed to elicit their preferences for products and to clearly identify the audience for future research products. This also develops a structure for how research products may be used in the future, further supporting the implementation activities.

- **Develop "Red Flag" List –** This is a simplified technique to use institutional knowledge to identify risks and focus attention on critical items with respect to critical cost and schedule impacts to the estimate. Not all projects will require a comprehensive and quantitative risk management process. A red flag item list can be used in a streamlined qualitative risk management process based primarily on engineering judgment or historical records of problems. This list should be compiled during the earliest stages of project development and updated at each major milestone or as new items are identified. Specific practices for risk monitoring was presented in a Technical Memorandum to the Research Bureau based upon US Department of Interior procedures.

- **Develop Processes for Research Project Selection and Reporting** – Research best practices include opportunities to respond quickly to emerging priority items. If projects meet developed criteria for a fast-track schedule, then they can utilize streamlined procedures (such as simplified applications, proposals, reporting requirements, documentation) to deliver research products. As part of the review process, the research team completed interviews with three leading states to understand their research practices. The Utah Department of Transportation developed a framework to assess project selection. The graphic below shows this flowchart for project selection.

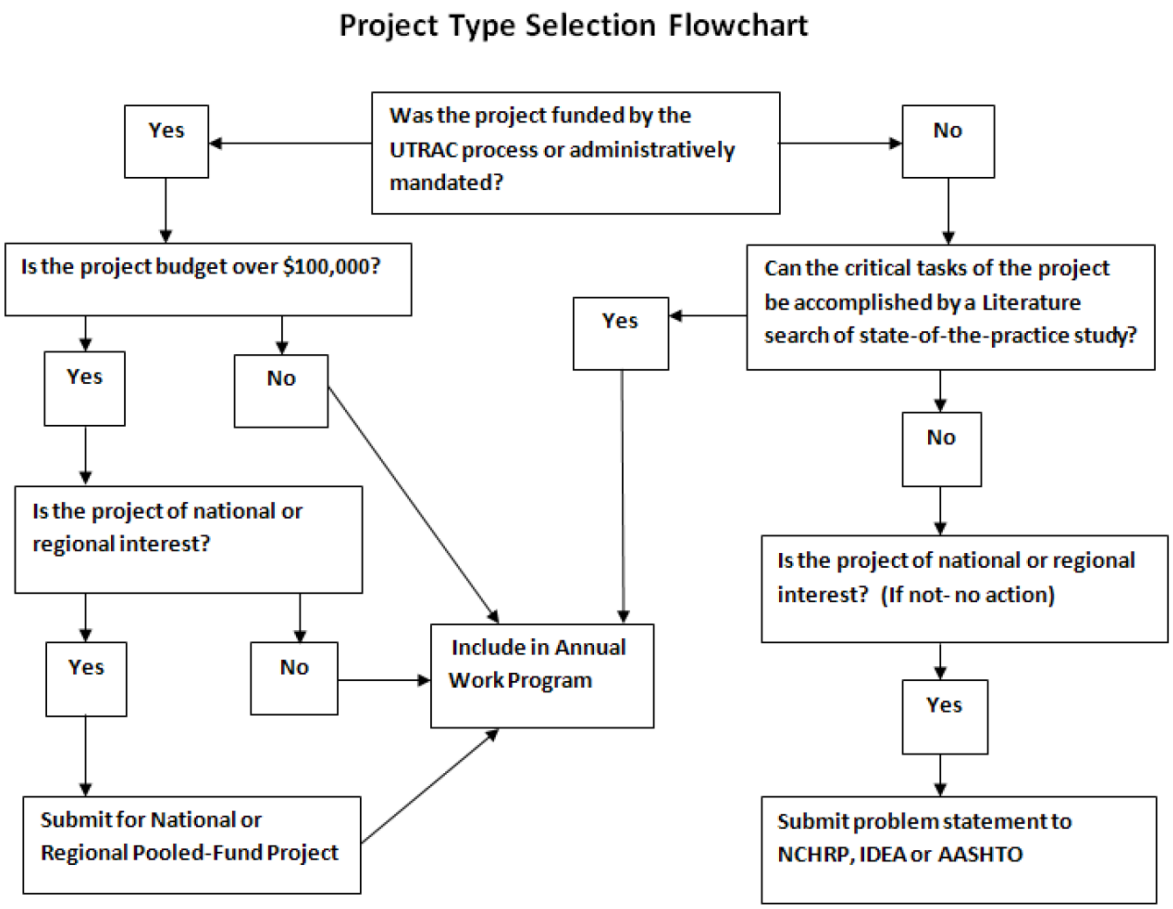


Figure 1. Utah DOT research project selection process

- **Utilize National and International Surveys** – To acquire information on topics of interest, such surveys greatly enhance State-of-the-Practice studies, Policy Research, and Scanning Tours. The results provide the most current and accurate information on transportation related ready-to-use technologies, products, or processes. This allows the Department to benefit from ongoing activities and leverage existing funding. The American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC) produces regular surveys on a variety of organizational and operational practices. In addition, the recently launched Research Program and Project Management (RPPM) web community (rppm.transportation.org) provides a forum for information on best practices related to contracting, research management, risk, performance reporting, and other information targeted at research program managers.

- **Recognize Institutional Challenges** – To improve state DOT organizational capacity to innovate through sponsored research and development, the organization's capacities and limitations must be recognized. Each must be prioritized so that short term and long term strategies can be developed to impact

organizational change. This will include regular consultation with the research customers – an activity that NJDOT currently conducts regularly. The Transportation Research Board (TRB) has launched the "Ahead of the Curve: Mastering the Art of Research Management" initiative to provide new resources and education to transportation research managers. This training program is one of several opportunities that the NJDOT Bureau of Research could pursue to help understand the context of its research activities.

- **Failure Must Be Expected** – Even when research projects meet budgetary and timelines goals, the project findings may not be implementable. Failure can be a combination of many factors outside of the control of the research team (technology, economic, institutional, policy changes, etc.). In private businesses, failure is built into the cost of product development. Researchers must recognized that failures offer helpful insights into refocusing or discontinuing projects. Especially in public research there is pressure to ignore the positive implications of project failures and focus on short term, reliable products.

These general principles can be incorporated into strategic discussions on NJDOT Bureau of Research efforts. The list is provided as potential guidance for future efforts and to help communicate the bureau's responsibilities and guiding principles to senior management as necessary.

Risk Monitoring

NJDOT is assessing a process for managing and monitoring risk in its research processes. This is in part, related to the findings of the FHWA Program Review in 2014. This subject was expanded upon in Technical Memorandum 2 presented to the Research Bureau. The risk monitoring process NJDOT is considering for adoption is based on US Department of the Interior practices.

The research team further recommends incorporating the risk management and monitoring framework and methodology developed by the University of California's Elizabeth Deakin. It includes addressing the following questions to assess the risks to the sponsoring agency:

1. What type of project is it? Is it basic or applied research, and what is the time frame in which it might deliver practical results?

2. Research initiation / supporters of the project: Where did the proposal originate?

3. Markets for the research: Who is the product ultimately for?

4. Costs of research: What is the budget - How certain is it that the research proposal will produce projects on budget?

5. Other efforts underway: How will the research products be compared to the products of similar work?

6. Other stakeholder perspectives and institutional coordination: Who are key stakeholders who would have an interest in the research and what are key concerns and interests?

7. Legal / regulatory / process issues: Do existing requirements impact the research or the implementation of its products?

8. Organizational behavior and culture issues: What is the culture of the group that would be expected to make use of the findings?

9. Monitoring and Evaluation: What methods and processes are needed to monitor and evaluate the project's tangible outcomes?

10. Benefit / Cost Analysis: Do benefits outweigh the costs? What are possible revisions to research plan that would make it net beneficial?

Addressing these questions allows the agency to assess the viability of the project from its outset and do not pose onerous documentation requirements on the research performer or manager.

In addition, the research team recommends identifying approaches that will make the research monitoring process minimally onerous on the research providers and research oversight professionals as possible. It is recommended that the modified Department of the Interior approach is utilized as a pilot for the current fiscal year and that time requirements be measured to determine the efficiency of such a monitoring process.

FHWA Process Review and Action Plan

FHWA completed a process review on the NJDOT research processes and related expenditures. The genesis of said review included a potential illegal channeling of resources through contract mechanisms, mostly unrelated to the NJDOT research unit but involving critical research university partners and others.

The FHWA provided the observations presented in Table 2.

Table 2 – FHWA observations

ID	Finding
1	Complexity in NJDOT processes make monitoring State Planning and Research Part II Research Obligations challenging and counter to regulations.
2	NJDOT has not looked further into alleged improprieties involving university based subrecipients.
3	There are a high number of time extensions granted to NJDOT University Partners.
4	Resource centers may require competitive procurement – they're not currently part of the tracked information by NJDOT research unit.

To address these findings and observations the FHWA offered the following process review actions.

FHWA Recommendations:

1. NJDOT should develop processes to monitor obligations

    a. This recommendation should include processes to discontinue the current practice of obligating uncommitted resources for contingency.

2. NJDOT should follow-up with audit recommendations arising from the state audit related to the illegal award processing at partner institutions.

3. NJDOT should develop monitoring procedures and close projects more timely manner.

4. NJDOT should follow general procurement standards, and comply with qualification-based selection procedures and principles for full and open competition when utilizing Federal funds, as it pertains to Resource Centers, universities, and other organizations.

These findings were presented in a document in February 2015. An action plan to address the findings was developed by NJDOT in response. This section of the final report details observations from the research team to these FHWA findings. This material was presented to the NJDOT Project Manager for use in subsequent conversations and response to the FHWA Process Review members.

Research Monitoring

With respect to the research monitoring processes, the research team recommended the creation of a university/DOT monitoring committee. This committee would allow issues to be addressed rapidly as they emerge and is based on similar models in place in Wisconsin and California. A representative from each university would be empowered to address issues related to overdue deliverables or extended time frame. A single point of contact removes the burden from the research unit and creates project

monitors similar to other existing task order contractors. The requirement to only allow a single permissible extension under 2 CFR 200 can be used to help initiate this committee as well. Another benefit of establishing such a committee will be to address emerging changes and updates. This model is already in place informally with Rutgers Center for Advanced Infrastructure in Transportation (CAIT). Adopting the model permanently would provide the research unit with a clearly defined process for adjusting to project challenges with its university partners.

The research team disagreed with the assertion that NJDOT needs to provide additional monitoring for university time extension requests. This issue is not endemic to NJDOT and the research team did not identify systemic issues outside of optimistic scheduling and review calendars.

Many mechanisms are in place within NJDOT to monitor the research process at university partner institutions. These include monthly project updates, quarterly project reporting, and invoicing review and approval. Should NJDOT wish to adopt additional monitoring practices, the research team recommends three minor changes:

1. NJDOT *could consider including representatives from university-level Sponsored Research in communications processes*. This addition allows the NJDOT research project managers with an additional point of contact at the University to monitor research progress and employ guidance for projects that are not closed within a reasonable time frame.

2. Establishing guidance that prevents new projects *with principal investigators that are repeatedly over time schedules could also be investigated*. This policy is currently in place in Montana, California, Wisconsin, and other states.

   The research team cautions that these types of preclusion arrangements have mixed results and details need to be considered if such a policy were adopted. In some cases, project expertise is concentrated among a core group of researchers within the state. Penalizing researchers can lead to delays in addressing pressing issues or require the agency to use out-of-state consultants or researchers to develop the project materials. In addition, in cases where groups of researchers are used, some groups could be disqualified due to the status of “late” research assignments. These negative consequences may be additionally burdensome to research project staff.

3. Wider use of “penalty” provisions to force compliance, *including holding back the final twenty percent of project awards until final approval of the final report can be adopted*. This strategy has proven successful in some areas and states; including Wisconsin, Ohio, and Washington state. Exceptions can be considered for delays caused by NJDOT staff review delays or personnel changes.

Reserve Funding

With respect to reserve funding from the SP&R program, many states use reserves to address opportunities as they arise. Florida uses state funds to address mid-year

opportunities; Wisconsin annually reserves some and moves funding mid-year as needed to address emerging opportunities. Over a dozen other states have some contingency provisions to pursue "off-cycle" funding opportunities. The research team agrees with the NJDOT action plan item of maintaining current practices to address mid-cycle opportunities.

In order to address FHWA concerns with such practices, the NJDOT could consider establishing pooled fund mechanisms and commitments to work with regional University Transportation Center programs on other continuing topics. To pursue this activity, it will be essential to understand the volume of historical mid-cycle research requests and address critical questions including, but not limited to:

- How pervasive have mid-cycle funding requests been?
- Is it possible to re-train research customers to fit the regular cycle?
- What is the impact of not having funding available to pursue off-cycle opportunities?

These queries and the subsequent recommendations were presented to the NJDOT Research Bureau Manager and further research into these areas will be developed. Once these questions are addressed, NJDOT will present a formal recommendation for addressing the FHWA concerns.

Audit

One of the audit related issues raised in the FHWA Process Review was that the NJDOT Bureau of Research had not taken additional action in response to the state audit findings. The research team recommends continued vigilance and trust; the illegal activity that occurred is an unfortunate situation but not one that would have been avoided through research office interactions. The activities were hidden from appropriate oversight. The prevention of such arrangements in the future should follow Inspector General guidance.

The research team does agree that additional resources could be provided to address formal pre-, post-, and mid-award risk assessment processes. This recommendation however, needs to strike a careful balance between onerous activities [affecting research staff, research customers, and researchers] and compliance necessities. If the cost of administrative overhead exceeds the benefits gained from such oversight, an investment in additional oversight may be unnecessary and inefficient. The research team recommends a further assessment of best practices in research monitoring to include some cost-benefit analysis. Following such a practice review, NJDOT could consider adopting strategies that other states or agencies follow that appropriately balance administration costs with the performance of research. In the interim, the research team recommends a pilot test of the modified Department of Interior (DOI) practices refined as part of this study. After two years, the Bureau of Research should revisit the process to determine if the processes should continue or be further streamlined.

Resource Centers

The NJDOT has several resource centers available for research and technical assistance. These centers have developed over time and serve critical service roles for NJDOT subject matter experts. Based on a review of the FHWA findings and analysis of preferred practices in other states, NJDOT should establish a regular process for competitive renewals of these centers as a good business practice. This re-competition will allow the existing centers to prove their utility and also provide for creativity and new approaches or innovations. The burden should be on the research customer (e.g. pavement management staff) to coordinate the process and not the NJDOT research staff. If NJDOT funding is being provided to serve a particular subject matter need, the staff burden should not be on research staff to coordinate the competitive process (especially if there are training and other resources being committed). The research team recommends continued discussions with the research customers for each of these resource centers and require a competitive renewal. NJDOT should consider adopting a standard renewal period of at least five years to allow university based infrastructure and personnel investments and stability. By-laws and operating principles, perhaps in the form of a formal memorandum of understanding, should also be considered.

Additional information on the NJDOT resource centers and their procurement recommendations was presented in a memorandum to resource center customers and subject matter experts in May 2015.

To assist the NJDOT in its ability to respond to the FHWA Process Review comments, the research team prepared a detailed memorandum highlighting these recommendations and responses. The memorandum was submitted for FHWA comment and approval. As of this report date, there has not been further response.

Review of Other State Practices

As noted above, the research team was asked to consider the use of risk monitoring practices in other state transportation research agencies. The research team compiled a brief review of other state practices based on soliciting a subset of states identified through the AASHTO Research Advisory Committee Communication and Collaboration Task Force members. Nine states were contacted for information on their processes and four provided detailed information. The four providing detailed information included California, Washington, Montana, and Utah. After the quarterly meeting of the research project in August, the state of Minnesota was also included as a potential case study.

California

The California Department of Transportation (Caltrans) Division of Research, Innovation and System Information (DRISI) manages a comprehensive program to research, develop, test, and evaluate transportation innovations sought by its customers. These innovations in methods, materials, and technologies enable Caltrans to promote safety, enhance mobility and sustainability, improve the management of public facilities and services, and protect public investment in transportation infrastructure. CS staff reached out to DRISI's chief Coco Briseno to discuss their approach to research management.

DRISI's research management practice does not include a specific process dedicated to assessing or monitoring risks through the life of a project. In practice, project managers routinely access and manage risks through the quarterly status reports. These quarterly reports include financial and project schedule conversations. Project managers utilize the comment section in DRISI's Research Program Management Database to document issues, including risks.

DRISI uses a risk assessment tool that measures the risk of implementation. This tool is a survey consisting of 25 short questions that are grouped under six categories (Level of support, Short-lived concepts & products, Required resources, Level of complexity, IT involvement, and Contracting difficulties) to screen project proposals. A complete list of the quarterly report requirements is posted on the Caltrans website and is accessible by researchers and available at: http://www.dot.ca.gov/research/research_manual/docs/Quarterly_Report_Guidelines.pdf.

To maximize the potential of each research investment and avoid the risk of failure, DRISI conducts preliminary investigations, literature search and survey of best practices, before embarking on a research project. To address risks that are created by unrealistic expectations, DRISI conducts applied research that delivers a product described by one (or more) of nine categories. DRISI also offers implementation assistance to address risks that are related to the capabilities of staff members. Caltrans is currently taking steps to encourage a culture of innovation, which will help reduce risks related to organizational structure and culture.

Currently, DRISI is exploring the Multi-Objective Decision Analysis (MODA) methodology to apply to their research program. Utilizing MODA may help prioritize research project requests as well as document the value of the portfolio of research that they intend to move forward. DRISI currently favors MODA for research management because they are already using the MODA methodology as part of our asset management efforts. DRISI is also exploring developing a research implementation plan. They anticipate that their risk assessment tool will be used in the new implementation plan and the MODA methodology for research.

Utah

Utah Department of Transportation (UDOT) Research Division supplies a valuable service to the UDOT divisions and regions, as well as other key customers in the transportation community. Innovation within the Department is highly desired, and the Research Division is the focal point for new and improved ways of doing business. The Research Division exists to promote, conduct and implement research activities and initiatives, to aid UDOT in achieving its mission. The division works in collaboration with the Federal Highway Administration, other public agencies, academic institutions, and many private sector partners.

UDOT Research Division utilizes a Project Management (PM) checklist that provides a protocol for project managers to set up, assess risks, and guide projects through completion. The basic structure includes defined phases for project initiation, planning, execution, and closeout. Project risks are assessed in the project planning phase. For

UDOT, accurate risk assessment and the entire PM process relies on an active Technical Advisory Committee (TAC) that is formed for each project to provide oversight of the project along with an assigned project manager. The lead TAC member is generally the project champion, typically a UDOT division leader or delegate who helps steer the research project toward successful implementation.

A project management worksheet includes the following table for assessing project risk:

Table 3 – Sample Utah project risks table

Risk	Impact (H,M,L)	Probability (H,M,L)	Trigger*	Counter Measure*
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

* Trigger and Counter Measures apply to significant risks

Risk assessment is focused in the project planning phase but is also important for the execution phase of the UDOT PM protocol. Monitoring significant risks and triggers is an important step in the "Monitor, Investigate, Take Action, Report (MITAR)" process.

CS staff reached out to UDOT's research director, Cameron Kergaye, to discuss their approach to research management. He indicated that UDOT has integrated the Project Management Principles (PMP) protocol into much of what they do. The PMP is a set of project management methodologies that have been developed by the Project Management Institute[1], a not-for-profit professional organization provides services including the development of standards, research, education, publication, networking-opportunities in local chapters, hosting conferences and training seminars, and providing accreditation in project management.

Washington State DOT (WSDOT)

WSDOT Research is managed by the WSDOT Office of Research and Library Services within the Engineering Policy and Innovation Division. In November 2014, WSDOT released a Project Risks Management Guide and developed an online guide for project management (See: http://www.wsdot.wa.gov/projects/projectmgmt/pmog.htm). This document provides an overview of risk management strategies and practices that can be applied across the agency. In the guide, emphasis is placed on qualitative and quantitative risk analysis, as well as monitoring and managing project risk. Templates for developing a project risk plan and for gauging the performance of project risk management practices are also included. The second half of the document offers

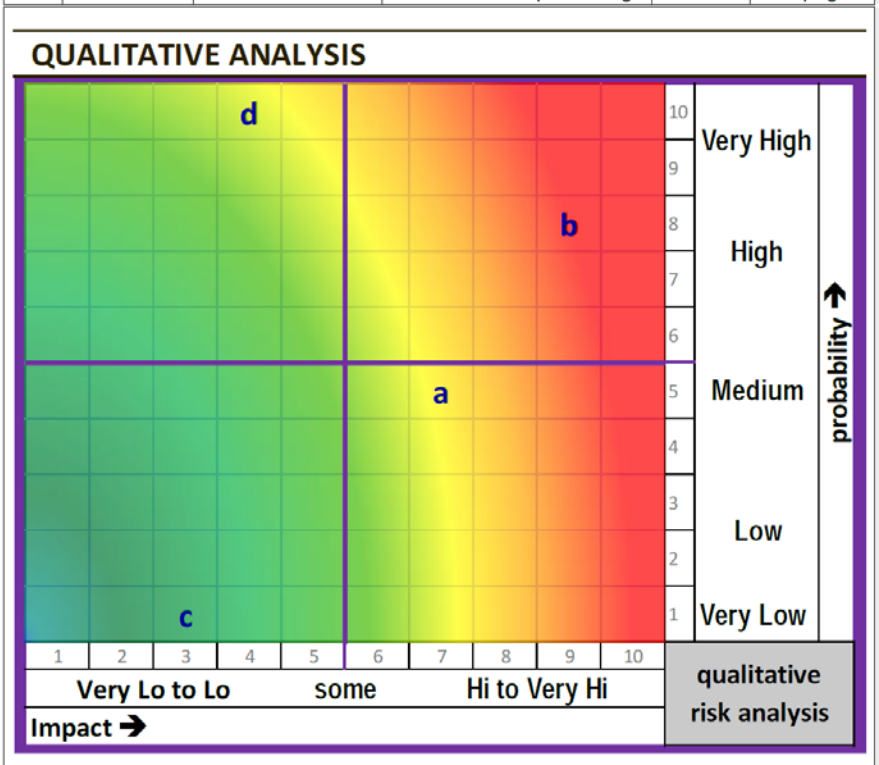
[1] http://www.pmi.org/

specific instruction for staff certification and training on Cost Risk Assessment (CRA) and Cost Estimate Validation Process (CEVP) methods.

While these practices are meant to be useful agency-wide, they provide especially helpful guidance for research management. The WSDOT qualitative risk analysis in particular would be of assistance as it provides a convenient and "user-friendly" way to identify, describe, and characterize project risks. Qualitative techniques include the definition of risk, the recording of risk details and relationships, and the categorization and prioritization of risks relative to each other. Once a risk is identified, qualitative analysis utilizes relative degrees of probability and consequence for each identified project risk event in descriptive non-numeric terms. WSDOT's guide offers the following sample qualitative risk matrix (Figure 2).

Qualitative Risk List

Risk	Threat or Opportunity	Risk Breakdown Structure RBS #	Risk Title	Impact	Probability
a	threat	ROW 40.1	managed access challenge	high	medium
b	threat	ENV 30.1	permits and permit appeals	very high	high
c	threat	UTL 20.1	unidentified utilities – conflicts	low	very low
d	threat	STG 20.4	substructure assumptions change	low	very high



Risk	Priority Ranking	Risk Breakdown Structure RBS #	Risk Title	Impact	Probability
a	2	ROW 40.1	managed access challenge	high	medium
b	1	ENV 30.1	permits and permit appeals	very high	high
c	4	UTL 20.1	unidentified utilities – conflicts	low	very low
d	3	STG 20.4	substructure assumptions change	low	very high

Figure 2. Example qualitative project risk analysis

Qualitative techniques include the definition of risk, the recording of risk details and relationships, and the categorization and prioritization of risks relative to each other. Prioritizing risks that present the highest potential for significantly affecting project objectives gives Project Managers the information necessary to focus project resources. Prioritization helps us make decisions in an uncertain environment and address project risk in a direct and deliberate manner. Using the WSDOT guide, qualitative analysis can be harnessed to prioritize project risks.

Another technique from the WSDOT guide for research management is the development of risk triggers for each identified risk. Risks rarely occur without warning of an imminent threat (or opportunity). Identifying and documenting potential causes, or precipitating events of risks occurring (i.e., risk triggers), will assist project managers in responding to and proactively avoiding future threats. As risk management is an iterative process, managers should continually review projects for triggers as well as risks.

As part of this project, the research team completed interviews with Ms. Leni Oman, Director of WSDOT's Research and Library Services Office and John Milton, Director of WSDOT's office of Enterprise Risk Management.

Minnesota

The Minnesota Department of Transportation (MnDOT) Research Services and Library unit helps solve transportation problems by administering research projects for MnDOT and the Local Road Research Board. The unit serves as a resource for MnDOT staff and city and county engineers, bringing research forward and shepherding projects to completion. At any given time, MnDOT staff manage approximately 190 research projects in progress, ranging from local initiatives to pooled-fund projects with other states, comprising both basic and applied research.

MnDOT manages a comprehensive research process that incorporates regular monitoring and committee oversight. Complete details on this process are available at http://www.dot.state.mn.us/research/process-and-docs.html. The use of Technical Advisory Panels (TAPs) is a cornerstone of the monitoring process. The TAP assigned to a project will include a technical liaison, project advisors, research and library staff members, additional subject matter experts as needed, and stakeholders or friends. The role and responsibilities of TAP members are clearly defined in a guide for TAP members available at the website noted previously.

Final Report

The final report for this project highlights the objectives, background, and goals of this research. It also includes a summary of literature reviewed and summarizes performed research and offers conclusions and recommendations for NJDOT Bureau of Research.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The research presented in this report indicates that NJDOT's Bureau of Research has some work to do to respond to the changing federal regulatory environment and FHWA process review findings. Based on the activities in place in other states, as noted in the previous section, the research team recommends a pilot approach using the Department of Interior practices in a pilot activity. While the team identified practices in other states and in other industries, none of these processes appear to be any more effective than the strategies proposed under the DOI framework. The balance between administrative costs to administer the process and its ultimate impact on the research process remains.

The relative success of the state programs noted here, including the questionnaire approaches followed by Utah, California, and Washington State hold promise. The simplicity of the UDOT approach monitors risks and requires active participation for both the researcher and the research project management team. The Monitor, Investigate, Take Action, Report (MITAR) process allows a quick response and corrective actions at the earliest possible times. The relatively complex TAP monitoring process used in Minnesota also provides substantial opportunities to monitor risk and adhere to good research management practices.

NJDOT should also closely monitor the Caltrans efforts related to Multi-Objective Decision Analysis during the two-year proposed pilot. The Caltrans MODA approach allows for multiple inputs and processes, while managing the risks and rewards of research practices. While based on Analytical Hierarchical Processes, the approach can be complicated to set up but provides value to the organization's multiple stakeholders and assists in an era of revolving staffing structures.

The research team determined that identifying research tasks by general research classifications (basic, applied, advanced) could not be accomplished retroactively given the descriptive data previously collected per each project. Moving forward, project intake forms can be updated to prompt applicants to self-classify.

Recommendations

Based on information collected during the previous four tasks, the research team believes the following general recommendations and best practices are applicable:

2 CFR 200 Compliance | Cost Sharing or Matching

NJDOT research unit documentation reviewed does not include any matching requirements. Future requests for proposals or other procurement notices should be prepared in compliance with the cost-sharing policies. Since NJDOT does attempt to leverage research funding as much as possible, the practices related to documenting matching funding in compliance with 2 CFR 200.306 should be included in Department notices and Requests for Proposals.

Research Monitoring

NJDOT should incorporate the general principles into strategic discussions on the Bureau of Research's efforts:

- Develop a clear set of common definitions, a conceptual framework, and strategic goals.
- Require annual reporting of research products, listing Department investments that are classified by strategic goals.
- Establish a clear relationship between Research and Capital projects planning, so that applied research projects are connected to implementable planning efforts.
- Require implementation plans for all projects. Identify high priority implementation activities early in the research life cycle.
- Identify research product markets through research customer surveys to elicit preferences for products and to clearly identify the audience for future research products.
- Develop a "Red Flag" list based on institutional knowledge to identify risks and focus attention on critical items with respect to critical cost and schedule impacts to the estimate. This list should be compiled during the earliest stages of project development and updated at each major milestone or as new items are identified.
- Develop processes for research project selection and reporting to respond quickly to emerging priority items. If projects meet developed criteria for a fast-track schedule, then they can utilize streamlined procedures (such as simplified applications, proposals, reporting requirements, documentation) to deliver research products.
- Utilize national and international surveys to acquire information on topics of interest. Take advantage of online resources targeted at research program managers for best practices related to contracting, research management, risk, performance reporting, and others.

- Recognize institutional challenges to improve state DOT organizational capacity to innovate through sponsored research and development. Each must be prioritized so that short term (low hanging fruit) and long term strategies can be developed to impact organizational change.

- Expect failure and non-implementable project findings. Build failure into the cost of research product development and recognize that failures offer helpful insights into refocusing or discontinuing projects. Do not focus on short term, sure things and ignore the positive implications of project failures.

Risk Monitoring

- Incorporate the risk management and monitoring framework and methodology developed by the University of California's Elizabeth Deakin.

FHWA Process Review and Action Plan

- Create a university/DOT monitoring committee to improve research monitoring processes, and address emerging changes and updates.

- Empower a single representative from each university to address issues related to overdue deliverables or extended time frame. A single point of contact removes the burden from the research unit and creates project monitors similar to other existing task order contractors.

- Permanently adopt the informal model in place with Rutgers Center for Advanced Infrastructure in Transportation (CAIT) to provide the research unit with a clearly defined process for adjusting to project challenges with all of its university partners.

- Consider including representatives from university-level Sponsored Research in communications processes.

- Establish guidance and prevent new projects with principal investigators that are repeatedly over time schedules could also be investigated.

- Utilize "penalty" provisions to force compliance, including holding back the final twenty percent of project awards until final approval of the final report can be adopted.

- Consider establishing pooled fund mechanisms and commitments to work with regional University Transportation Center programs to address concerns related to reserve funding.

- Provide additional resources to address formal pre-, post-, and mid-award processes. However, a careful balance must be found between onerous

activities (that affect research staff, research customers, and researchers) and compliance necessities.

- A pilot test of the modified Department of Interior (DOI) research monitoring practices is recommended with a planned re-evaluation after two years to allow for mid-course correction.

- Establish a regular process for competitive renewals of university resource centers. Adopt a standard renewal period of at least five years to allow university based infrastructure and personnel investments and stability.

- NJDOT implement all of the recommended changes to the forms updated per 2 CFR 200 compliance and research classification tasks.

APPENDIX

Summary of Interviews and Major Issues from Site Visit

On March 11, 2015 members of Cambridge Systematics' consultant team (Jason Bittner and Jamie Osborne) met with the NJDOT Research Bureau. The purpose of the meeting and day long visit was to outline the current expectations and deliverables for the research project as well as develop a basic understanding of existing processes and practices.

The schedule below shows the itinerary for the March 11 meetings.

Visit Schedule

- **9:30 AM** Arrive and Meet with Crichton-Sumners
  - Project overview and scope confirmation / document reporting templates / deliverable schedule
  - Meet research office staff
  - FHWA Research Process Review Findings
- **10:30 AM** Meet with Stefanie Potapa
  - Discuss pre-award and post-award risk considerations
- **11:30 AM** Meet with Research Office Technical Staff
  - Discuss categorization issues and tool development
- **12:15 PM** Lunch
- **1:30 PM** Meet with Sue Rizzo, Ed Kondrath
  - University procurements, SPR monitoring training opportunities, research implementation
- **2:30 PM** Meet with Research Bureau team Members including Priscilla Ukpah
  - Research Process Document
- **3:00 PM** Meet with Camille Crichton-Sumners
  - Closing issues/wrap up discussion
- **3:30 PM** Adjourn

The research team received the following information from the NJDOT. The following describes a summary of this meeting with critical observations and questions included.

NJDOT Process Notes

The initial meetings with Camille Crichton-Sumners were focused on the overall processes for research project selection and research management. The following summarizes the meeting highlights and discussion items.

- The Federal Highway Administration (FHWA) is pushing NJDOT to improve and consider its research processes in order to respond to a recently uncovered issue with non-compliance.
- Many of the day's conversations consistently raised an issue with time accountability and bandwidth available for responding to new challenges. NJDOT, NJDOT Research Customers, and University service providers all have professional

bandwidth problems. The research team needs to consider if there a process that makes it easier for all participants.

- Many interviews noted that project implementation tracking often falls through the cracks. It is the least supported step of the process.
- NJDOT participants noted that there is limited quality control for projects (risk assessment and implementation)
    - One observation that was made included that there are many bad projects (especially related to software) that are never utilized in the agency. Poor coordination between customer and the university provider is generally the cause of this lack of implementable outcomes (in the opinion of the research staff interviewed).
- Many of the critical conversations with Crichton-Sumners addressed the issue of 2-CFR-200 impacts on the research administration process. Namely, what are the key changes that must be made under 2-CFR-200 (for DOTs and University service providers) and do these required changes make the climate for additional changes in existing research processes more favorable?
- Research project classifications and terminologies are inconsistent in the agency. The definition of applied, basic, or advanced research is not well documented.
- NJDOT potential research projects are limited in scope by New Jersey Office of Information Technology requirements. Many interviewees indicated that they need better OIT integration for interactive and complex (beyond excel/access, web enabled, etc.) software solutions.
- NJDOT would like to develop a baseline and create consistent reporting process for distribution of research funds by classification (i.e. % Applied, % Basic, % Advanced, etc.) and by funding source (i.e. % Federal, % State, % Private/Other, etc.). Other basic reports to support the question: What is NJDOT research doing?
- NJDOT would like to parse research project descriptions (from e-PROMPTS database – currently being updated from Access to oracle by NJOIT) to automatically identify project classifications.
- NJDOT wants to make its research selection processes as accountable as possible. A key issue for the consultant team will be how to enforce fairness in awarding contracts. NJDOT requires a clear set of resources to determine which projects require a competitive process. ALL projects should require this, with state funded projects having a smaller net for who is eligible for bidding.
- Among its peers, NJDOT is 49th in terms of closing out research projects in a timely manner. They believe that this is due to their project structure and naming conventions within the Federal processes. Most projects are assigned a common federal research project ID number that causes some confusion when projects are completed. Thus, many projects may be completed, but the ultimate overall federal project is not complete. For the coming years, NJDOT intends to focus on closing the smaller scale projects.

NJDOT Risk Management in Research Processes

- NJDOT experiences difficulty accurately assessing the financial risk of proposals as they do not have certified accountants as part of the typical review process. NJDOT staff does not have skillsets that are needed to accurately assess financial risk of research proposals. While this issue appears to be an important concern of NJDOT, it is not common for DOT research programs to have such skill sets on staff.

- NJDOT desires to update to its internal risk process (2011 audit is most recent) and identify a standard approach that is effective and minimally intrusive to the research process and research management staff.

- NJDOT research projects require much oversight for approval. The AD-12 forms to establish research projects internally need 6 signatures (for comparison, the similar document in MD requires only one signature).

NJDOT Research Customers

- NJDOT experiences difficulty in recruiting and retaining its research customers. The time commitments may be an obstacle to participation. Many of the potential customer candidates are not willing to allocate resources for research projects. One interviewee indicated that some projects that cross agencies are often mired by political difficulties.

University Service Providers

A final part of the conversation focused on the relationship between research providers and the NJDOT, specifically university based programs. The following observations were made:

- The NJDOT has a good relationship with its university partners. However, there are times when the research projects raise questions about the positioning of university researchers in the DOT selection process. Are universities a partner or a client? How can this relationship be better defined / supported? Which payment agreements for research are the most favorable for NJDOT (Fixed-Fee, Cost-Plus, Etc.)? NJDOT needs an improved structure for pricing alternatives (for example if project is over $100k then cost plus).
- NJDOT staff indicated that university service provider procedures create challenges. These challenges include schedules are difficult to integrate with continuous grant development schedules and semester calendars. Additionally, there is an ongoing issue of how to address tuition and stipends for university student employees.
- One of the largest issues identified in the FHWA review reflected the practice of allowing no-cost time extensions. Under the new 2-CFR-200 guidance, one time exemption of 12 months is allowed for research service providers. This is rarely enforced, and many projects languish or surpass calendar deadlines.
- Universities typically will not share research projects between institutions. While there is no specific policy or requirement to ensure that research paid for by NJDOT is

openly available for public review, the lack of openness appears to be an issue that NJDOT would like to address.

- NJDOT does not assess the performance of university service providers individual PIs (for example, project management, communications, technical editing, value of research). However, NJDOT expressed interest in principal investigator ranking or feedback systems, so that NJDOT can assess the workload of each PI.