



RESEARCH NEED STATEMENT

Call for Projects 2015

Project Research Title: Performance-based project identification and screening module

TDOT Sponsor Director: Tanisha J. Hall

List TDOT Research Team Lead: Nick Weander

List TDOT Research Team Members: Jack Qualls

1. Define the problem or research requested. What is the goal/objective of the research?

The proposed effort will develop and implement a web-based preliminary screening tool that will help stakeholders to identify and evaluate solutions to existing or anticipated roadway-related challenges and objectives, based on the same basic performance criteria used in the subsequent TDOT project selection processes. Among a number of outcomes, these criteria specifically include project contributions to freight mobility and regional air quality improvements. A successfully completed project will allow for an apples-to-apples comparison of benefits and costs associated with proposed new-start projects before these projects enter the full-scale project development phase. This pre-screening will save time and resources (human and monetary) by focusing attention on those projects that have documented merit.

2. Is this research a continuation of a past or present project?

No Yes

If yes, provide current research project title, RES # and reason for the project continuation.

3. Describe anticipated benefits/expected deliverables.

Accomplishing this primary objective will produce a number of desirable outcomes including, but not limited to:

- *An Increase in stakeholder orientation toward solutions rather than specific roadway projects;
- *An early and effective method for shaping stakeholder expectations;
- *A stakeholder's ability to focus project proposals on specific performance outcomes (i.e. safety, congestion mitigation, freight mobility);
- *The availability of a new performance-based metric for use in subsequent TDOT project evaluation processes;
- *A reduction in state and federal resources used to evaluate nonviable project proposals; and
- *Expedited project evaluation and delivery.

Success in the development and implementation of the proposed screening module will be measured in a number of ways, including but not limited to:

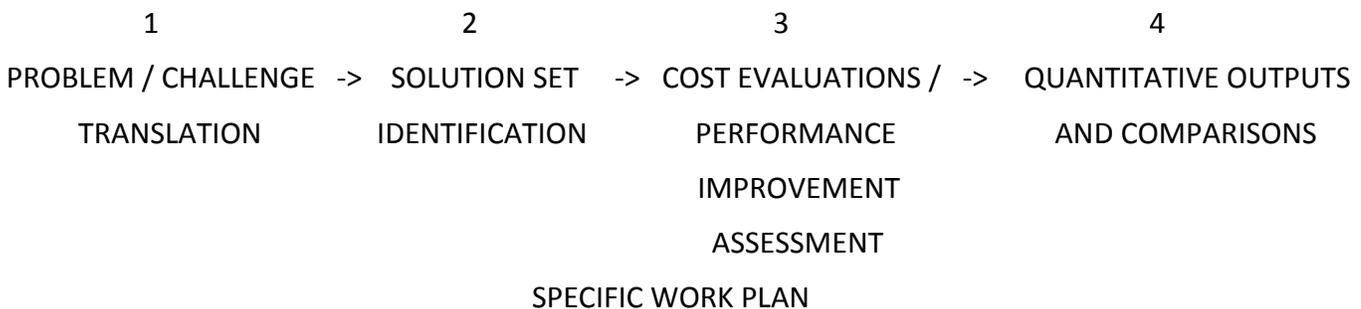
- *The degree of stakeholder engagement in the module’s development;
- *The degree of stakeholder use;
- *A reduction in the number of proposed, but rejected roadway projects;
- *A reduction in per-project resources used in the evaluation of projects; and
- *A reduction in overall project delivery times;

4. What is your timeline for completion of the research?

20-24 months

5. List the anticipated tasks for this research.

The web-based module will provide stakeholders and TDOT users with an efficient screening tool through which roadway challenges can be matched to potential solutions and the costs resulting from projects can be quickly evaluated against probable performance-based benefits including freight mobility and greenhouse gas emissions. The deliverable is depicted in the schematic provided below. Specific tasks necessary to the completion of this module and related milestones are discussed in the text that follows.



The performance-based project screening module will be data-intensive. These data exist and are in hand. Nonetheless, the early weeks (eight) will be spent gathering and preparing necessary data elements and acquainting stakeholders with the project. Work on the module elements noted above will be staggered. The duration of each development phase is noted in parentheses.

1. PROBLEM TRANSLATION (24 Weeks)

Stakeholders are sometimes unaware of potential roadway solutions. Therefore, the module will convert information provided through an existing TDOT GIS interface and related dropdown questions to translate users' roadway problems/challenges into a set of potential solutions and associated projects.

2. SOLUTION SET IDENTIFICATION (24 Weeks)

The preliminary nature of the performance-based screening module requires that potential solutions be relatively generic in nature and that the overall number of potential solutions be kept manageable.

Nonetheless, it is important that users be provided with more than one corresponding solution from which to choose when more than one approach is feasible.

3. COST AND PERFORMANCE OUTCOME ASSESSMENT (24 Weeks)

The core of the module is comprised of two components. The first will provide basic cost estimates for the simplified user-selected solutions. The second provides equally simplistic estimates of monetized benefits based on associated project performance improvements within three groupings - (A) PRODUCTIVITY (motorist travel times, freight efficiency gains, etc.); (B) OPERATIONS / SAFETY (safety, greenhouse gas emissions, etc); AND (C) REGIONAL ECONOMICS (regional employment and earnings growth). While necessarily simple in their construct, these basic, monetized cost and performance values will facilitate the calculation of preliminary benefit-cost ratios.

4. QUANTITATIVE OUTPUTS (24 Weeks)

The final module development will include the actual calculations of preliminary benefit-cost ratios for user-selected solutions. Outputs will include final B/Cs, individual performance improvement values, and comparisons with values for similar projects evaluated by other users. In this way users can, self-screen potential solutions / projects, target specific performance outcomes, and their needs with those of other module users.

In addition to data preparation and module component development, the work plan devotes extensive resources to stakeholder interactions, including (A) ongoing consultation, (B) non-web-based beta testing, (C) extensive user training, and (D) early user evaluations.

6. Describe how the project results will be implemented?

To have any real value, it is essential that the project identification and screening module become a routine part of TDOT's project introduction and evaluation process and all design and implementation activities will be undertaken with that as an explicit and non-negotiable goal.

Toward this end there are two important factors to note. First, once designed, both the web-based module and the data on which it will rely will add very few additional costs to TDOT's planning and project evaluation process. Second, one of the expressed implementation goals is to reduce the overall use of state and federal resources used in roadway project evaluations, so that success in achieving this outcome should afford ample resources to maintain and even improve the module once it has been implemented.

Implementation of the module that results from the research would be as simple as adding a portal to the module on the TDOT webpage.

7. Will this study produce software, web page or other technology that will involve the Information Technology Division?

No Yes, please describe:

8. Will training be provided to employees as a result of this research?

No Yes, please describe:

Planning Division staff will need trained on the use of the module in order to assist in troubleshooting for the public and stakeholders who may utilize the module.

9. Will this research involve equipment or materials purchase?

No Yes, please describe:

10. Research must support the Long Range Transportation Plan Policy Recommendations **and/or** TDOT Operational Goals and/or Strategic Initiative. (*See attachments for additional information*)

Please indicate which categories the research will support:

Transportation Long Range Plan Policy Recommendations

- (A) Accessibility
- (B) Safety, Security, and Transportation Resilience
- (C) Coordination, Cooperation, and Consultation
- (D) Demographic and Employment Changes and Trends
- (E) Freight Logistics and Planning
- (F) Financial
- (G) Mobility

- (H) Travel Trends and System Performance

TDOT Operational Goals and/or Strategic Initiative

- (A) Deliver transportation projects on schedule and within budget
- (B) Maintain the state transportation system to protect the long term investment in our infrastructure assets
- (C) Operate and manage Tennessee's transportation system to provide a high level of safety and service to our customers and workers
- (D) Expanding mobility choices to maximize access
- (E) Dramatically change the paradigm for delivery of transportation products and service to improve the efficiency and effectiveness of Tennessee's transportation network

11. Please explain how the research supports the Long Range Transportation Plan Policy Recommendations **and/or** TDOT Operational Goals and/or Strategic Initiative selected above:

This planning module will allow for stakeholders and partners to identify and propose projects while seeing their potential outcomes in real time (in terms of cost, benefit, and effectiveness). This should allow more transparency into the existing project development processes.

The module will allow for all modal improvements to be evaluated efficiently and using similar factors. This should reduce the burden of staff time and monetary cost in developing proposed improvement projects. If successful, this project would represent a paradigm shift for the development and evaluation of new transportation projects in Tennessee.

For additional information, please contact:

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