



# RESEARCH NEED STATEMENT

Call for Projects 2015

Project Research Title: Inverted Pavements

TDOT Sponsor Director: Jennifer Lloyd

List TDOT Research Team Lead: Sampson Udeh

List TDOT Research Team Members: Ataur Rahman, Darrell Bridges, James Maxwell, Mark Woods

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

This research is to conduct long time evaluation of the performance, longevity and cost-effectiveness of inverted pavements as an alternative pavement structure in the state of Tennessee for State Industrial Access projects. The evaluation will be performed in comparison to flexible and rigid pavements with the same traffic level. Findings will be used to validate the method, construction and maintenance procedures that work for Tennessee. Inverted pavements were invented and have been successfully used in South Africa for over 30 years mainly due to cost benefits it provides. The Department wanted to try this initiative on more than three projects in the past, each time the push has not gone beyond letting stage due to lack of confidence. This research will bring/built that confidence needed.

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.

This innovative pavement design method research would compare the cost and Tennessee will take advantage of the cost savings it provides.

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

24 months

5. List the anticipated tasks for this research.

1. Nationwide State DOT survey and Literature review

2. Identify other States inverted pavement projects through the survey.

3. Compare the performance of inverted pavement and conventional pavement builds within the project proximity. Compute life cycle saving compared to asphalt base pavements.
4. Stress and strain data collection, short term pavement evaluation
5. Analysis of results
6. Final report
6. Describe how the project results will be implemented?

TDOT will use this research to implement the subsequent inverted pavement project in TN.

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:

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:

Pavement design will always be a deliverable for transportation projects. TDOT must continue to research the best pavement designs and always be the lead in new pavement types and technology. Continuous improvements to pavement designs will enable TDOT to maintain our transportation system by providing more efficient, longer lasting pavement designs which will require less maintenance on our transportation network which in turn decreases the amount of workers on projects sites thus increasing safety for both the public and our workers.

For additional information, please contact:

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