



RESEARCH NEED STATEMENT

Call for Projects 2015

Project Research Title: Traffic data input for Mechanistic Empirical Pavement Design Guide for Tennessee

TDOT Sponsor Director: Jennifer Lloyd and Tanisha Hall

List TDOT Research Team Lead: Sampson Udeh

List TDOT Research Team Members: Ataur Rahman, Darrell Bridges, Jeff Murphy

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

Mechanistic Empirical Pavement Design Guide (MEPDG) for New Rehabilitation and Pavement Structure was modeled using nationally database traffic inputs. State DOTs were advised to develop their own site specific and regional/District input values. To fully implement MEPDG in Tennessee, TDOT needs site- specific normalized truck classification counts, axle load spectra, regional adjustment traffic spectra in order to avoid over design or under design and forecasting method for truck class volume.

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.

Develop Typical Material Input Values for Mechanistic-Empirical Pavement Design in Tennessee Phase 1. RES2010-06. Develop Typical Material Input Values for Mechanistic Empirical Pavement Design in Tennessee, Phase II RES2011-15. Local Calibration of Mechanistic-Empirical Pavement Design in Tennessee, RES#: RES2013-33.

The reason is that traffic is a required component needed for full implementation of MEPDG in Tennessee.

3. Describe anticipated benefits/expected deliverables.

Traffic is one of the challenging parameters; initially TDOT wanted to import data from the neighboring states that has WIM stations, but utilizing Tennessee WIM data for MEPDG in Tennessee is more desirable. This project is expected to provide TDOT with normalized traffic load data collected from Tennessee WIM Stations. This will help in providing a more precise, cost effective and long lasting pavement design.

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

24 months

5. List the anticipated tasks for this research.

Provide traffic database network for levels 1, 2, and 3 (level 1 site specific, level 2 seasonal grouping and level 3 statewide averages). The site specific axle load spectra data should be analysed for both flexible and concrete

pavements including statewide vehicle class distributors forctors. Develop Implementation and management plan for MEPDG traffic data. Perform Sensitivity analysis .

6. Describe how the project results will be implemented?

The recommendation will provide a more means of designing and analyzing pavements which results in a more efficient cost effective optimal design.

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:

Employ WIM station / portable WIM station for collecting the large amount of traffic data needed tp develop inputs for the MEPDG design methodology.

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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