



# RESEARCH NEED STATEMENT

Call for Projects 2015

Project Research Title: Evaluating Recycling Efficiency of Asphalt Plants

TDOT Sponsor Director: Brian Egan

List TDOT Research Team Lead: Mark Woods

List TDOT Research Team Members: Hong J. Park

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

In recent years, the Department has gained significant knowledge on the limits of recycled materials in asphalt mixtures. Limits have been defined for the maximum allowable percentages of total recycled asphalt pavement (RAP) and recycled asphalt shingles (RAS) based on laboratory tests of mixture performance. The blending efficiency of asphalt mixtures, better described as the proportion of RAP/RAS binder that is reheated and reused when recycled, has more recently been determined to have a significant effect on mixture performance. It has also been determined that the method of mixing, mix time, and storage time can effect this blending efficiency. In other words, some asphalt plants may be able to more efficiently recycle asphaltic materials into mixtures than others, or some asphalt plants may be able to utilize higher recycle percentages than others. At current, the Department has 117 approved plants on its Approved Suppliers list, but minimal knowledge of any of these plants' ability to recycle materials. Consequently, State specifications for maximum allowable percentages of recycled materials but be conservative, ultimately limiting the ability of the more efficient facilities.

By studying mixtures from various plants and plant types and evaluating the variables of mix production that affect recycling efficiency, the Department can gain a better understanding of how to maximize recycled material use without compromising mixture quality and pavement performance.

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.

- Identify asphalt plant and production characteristics that affect recycling efficiency
- Make recommendations for modifying TDOT recycling specifications based on findings

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

3 years

5. List the anticipated tasks for this research.

- Collect samples from a diverse range of projects, mixture types, recycled material percentages, and plant types
- Evaluate the blending efficiency of collected samples
- Correlate various factors of asphalt production facilities to blending efficiency

6. Describe how the project results will be implemented?

Revised TDOT specification.

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:

A revised specification will more efficiently manage the use of recycled material use at the State, ultimately increasing the use if recycled materials and increasing the long term performance of the State's roadway network.

For additional information, please contact:

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