



WHRP

Wisconsin Department of Transportation Wisconsin Highway Research Program

Request for Proposal

Rubber Asphalt Study for Wisconsin

Questions submitted to research@dot.wi.gov regarding the Content of this RFP are due no later than 4:30 PM (CST) on December 12, 2017

Responses to questions will be posted to the WisDOT Research and Library website <http://wisdotresearch.wi.gov/rfps-and-proposals> by 4:30 PM (CST) by December 19, 2017

Researchers must submit a PDF version of their proposal by 4:30 PM (CST) by January 26, 2018
to: research@dot.wi.gov

Researchers will be notified of the proposal review decision by May 1, 2018

For more information regarding this RFP contact the WisDOT Research Program at: research@dot.wi.gov. This RFP is posted to the Internet at: <http://wisdotresearch.wi.gov/rfps-and-proposals>

**Wisconsin Highway Research Program
Request for Proposals
Flexible Pavement Technical Oversight Committee**

Rubber Asphalt Study for Wisconsin

I. Background and Problem Statement

Rubber modified asphalts have been used for years throughout the United States. Such products have indicated potential for improved pavement performance by delaying cracking and improving rut resistance. The use of recycled rubber also has the added benefit of responsible disposal waste material in a manner that may provide engineering benefits to asphalt pavements.

Wisconsin DOT (WisDOT) was invited to participate in a demonstration project in 2015 on the Illinois Tollway using a dry process rubber in a Wisconsin mixture design. The section, although still young, is performing well. The performance testing of the mix identified potential benefits in terms of decreased moisture sensitivity, increased rutting resistance (Hamburg Wheel Track), and reduced cracking potential (Disk-shaped Compact Tension).

Currently, there are Wisconsin suppliers of both the dry process and wet process rubber modifying systems. In order to take advantage of rubber availability, WisDOT needs to become more familiar with the products, how to work with these mixtures, how to specify them, and how to gauge performance.

II. Objectives

- Develop specifications for the use of rubber for pavements in Wisconsin test sections
 - Determine equivalent performance
 - Identify the performance and laboratory binder testing required to work with these mixtures, including specification limits for acceptance of materials
- Build test sections on a WisDOT project (WisDOT will identify a project and include construction of the test sections as part of a construction contract for the 2019 season), encompassing the following mixtures:
 - A dry process rubber modified asphalt mix
 - A wet process rubber modified asphalt mix
 - An asphalt mix with an H designation binder
- Identify the unique challenges of working with rubber modified mixtures
- Produce specification for the use of rubber in Wisconsin

III. Scope of Work

Field Demo

- Develop a work plan for a test strip, split into 1- to 2-mile sections to represent different mixes requested. *Please note: WisDOT will need to be part of the process to identify a project and include construction of the test section as part of a construction contract.*
 - Asphalt Binder Type, with a PG 58-28H as a control, to compare to rubber modified binders.
 - Mix Traffic Level (MT)
 - Timing of mixture sampling
- Assess and document pavement condition before placement
- Conduct one detailed pavement condition survey the spring season following the year of construction.
- The study will focus on surface mixtures.

Laboratory Phase

- Collect mixtures from the field for performance, volumetric, and laboratory testing.
- Collect binder samples from the project for laboratory binder testing.

Documentation Phase

- Develop straw specifications for WisDOT to use in allowing the use of rubber in projects.
- Specifications should include a system for acceptance of mixtures, modified with either rubber or polymer, in order to allow either modification system at the contractor's choice, without sacrificing performance.
- Specifications and testing protocols on how:
 - testing the rubber modified mixtures in the lab,
 - testing the rubber modified binder in the lab, and
 - conducting production quality control on rubber mixtures (both in the lab, and density testing in the field) are necessary.

IV. Required Testing

- General mixture volumetric testing
- Asphalt mixture performance testing
- Asphalt binder acceptance testing

Requirements for Laboratory/Technician Certifications: HTCP AGGTEC 1 and HMA IPT at a minimum.

V. WisDOT/TOC Contribution:

WisDOT will be required to find a project in the state of Wisconsin to construct the test strip for the project.

- The project will be constructed sometime in 2019.
- Costs of the construction project will be paid for by WisDOT.
- The variables of the researchers work plan will be included in a contract by special provision.

- The research team will have to work within the contractor's traffic control, and follow all directed safety procedures required of the contractor.
- Additional traffic control for testing and sampling outside the contractor's control will be the responsibility of the contractor.
- Expected level by staff/TOC members: Maximum of 40 hours.
- WisDOT Equipment: The research team will not assume the availability of WisDOT equipment in the proposal. If equipment is donated by WisDOT or another entity, a letter of commitment must be included in the proposal.
- It is not anticipated that any WisDOT equipment will be needed as part of this study.

VI. Required for Travel to Fulfill TOC Obligations

This project will require travel to collect samples, oversee the construction of the test strips, and review the performance of the project after 1 winter. The PI will also be required to give an in-person presentation in Madison summarizing the findings and recommendations of the research study.

VII. Specific Results, Findings, Tools, etc. (Deliverables)

- Submittal and reporting of progress as required by the WHRP and WisDOT
- Presentation Requirements: The project requires the PI to give an in-person presentation after submittal of the draft final report.
- Reporting Requirements: Six hard copies delivered to WHRP by the contract end date.

VIII. Budget and Time Frame

- Proposed project duration is **24 months**.
 - Deadline for submittal of draft final report is June 2020.
 - Deadline for submittal of Final Report is October 2020.
- Project Budget shall not exceed **\$165,000**

IX. Implementation

- This research project, at its conclusion, should provide the following, at a minimum:
 - Recommended changes in mix design specifications for use of rubber
 - Recommended specification limits for researched testing methods as part of this contract.
 - Recommended performance testing thresholds for acceptance of polymer modified and rubber modified mixtures that should deliver comparable performance and pavement life.
 - Standard specification language to allow the use of rubber modified (dry or wet process) or polymer modified asphalt mixtures at the contractor's choice.
 - Provide cost benefit estimates of the proposed recommendations.
 - Impacts and language changes to the Facilities Development Manual, Standard Specifications, Construction and Materials Manual, and any other manuals that may be impacted.
 - Draft SPV or STSP language, if needed.