Title:	Evaluate the Importance of Fine Aggregates in Achieving Adequate Skid Resistance in TxDOT Hot Mix Asphalt Mixtures
The Problem:	The contribution to the long-term skid resistance of fine aggregates in any hot-mix asphalt (HMA) mix is not well understood and it will be the focus of this research study. Obtaining and sustaining adequate skid resistance throughout the service life of HMA pavements has been a challenge for Districts throughout Texas. Unsatisfactory skid values have been reported soon after the placement of HMA pavements, even those placed where the coarse aggregate was specified to be Surface Aggregate Classification A (SAC A).

Skid resistance is a function of the aggregate quality together with the macro and micro texture of the selected mix. The low skid value is partly attributed to Districts selecting finer HMA dense-graded and Superpave mixture types to get more asphalt into their pavements to mitigate cracking. These mixes often have lower macro texture than the premium mixes such as Stone Matrix Asphalt (SMA) or Permeable Friction Course (PFC). However, with the trend to thinner mixes, studies conducted in Houston found excellent long-term skid resistance with their fine Thin Overlay Mixture (TOM-F) when placed as the surface mix. These finer HMA mixture types have more than 90 percent passing the 3/8-inch sieve and use 100 percent granite materials.

Higher quality fines from SAC A sources may improve the skid resistance of these fine HMA mixture types. There is laboratory equipment available to evaluate the long-term skid resistance of HMA mixtures made with different qualities of fines. This includes the construction of small test slabs, use of the dynamic friction tester, and wet polishing equipment which typically applies 100,000 repetitions on the test slabs. A study is needed to document the impact of different HMA mixture types, gradation blends within the master gradation limits, blends of aggregate with different SACs, and potential characteristics of fine aggregate. |
| **Technical Objectives:** | This research shall evaluate the use of fine aggregates in achieving adequate skid resistance in TxDOT hot mix asphalt mixtures. The work to be performed shall include:
1. Review literature on the importance of fine material properties on skid resistance.
2. Conduct an extensive laboratory study on different mix types and surface textures to document the significance of fines quality.
3. Identify sections already in existence where the higher quality fines were used, measure their skid resistance, and evaluate performance.
4. Develop plans to construct test sections around Texas.

The expectation of the project end product(s) shall attain a Technology Readiness Level of 7. |
| **Anticipated Deliverables:** | 1. Technical memorandum for each task completed.
2. Monthly progress reports.
3. Value of Research (VoR) that includes both qualitative and economic benefits, to be included in the final research report; not a stand-alone deliverable.
4. Research report documenting the findings of the research, including comprehensive laboratory test results on a variety of different mixes with varying qualities of fine materials.
5. Field test results on existing sections and recommendations for future experimental sections.
6. Project Summary Report |
| **Proposal Requirements:** | 1. Utilize the "Proj/Agre" and "PA_Form" templates located at the TxDOT RTI website.
2. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's University Handbook, which is also located at the RTI website.
3. Proposals should be submitted in PDF format, 1 PDF file per proposal. File name should include project name and university abbreviation.
4. This project will be tracked during the life of the project using a Technology Readiness Level (TRL) scale. For more information about the use of a TRL, click. |