

RESEARCH PROBLEM STATEMENT

DATE: 09/07/2018	PROJECT AREA: Pavement
TITLE: Determining Layer Coefficients for HIR and CIR	
PROBLEM STATEMENT:	
<p>There are many innovative pavement maintenance treatments that are seeing an increase of use. Two such maintenance treatments are Hot In-place Recycling (HIR) and Cold In-place Recycling (CIR). When these two treatments are applied at two inches, they are considered pavement maintenance as they primarily restore the surface of the pavement structure. However, there is a wide range of accepted values for in-place recycling. Currently, ArDOT assumes that HIR and CIR have approximately 1/2 the layer coefficient of hot mix (ACHM). The layer coefficient of ACHM is 0.44 for ArDOT, and the assumed layer coefficient for HIR and CIR is 0.22. However, when looking at the 1993 AASHTO design guide, the layer coefficient for in-placed recycled material is given as a range from 0.15-0.42. While 0.22 certainly falls within this range, it appears that the in-placed recycled material layer coefficient could actually be essentially equal to that of ACHM. Therefore, this research will look to obtain a smaller range of coefficients using material from Arkansas so that more accurate pavement structural design can be achieved.</p>	
OBJECTIVES:	
<p>There are two objectives to this research. First, layer coefficients for CIR and HIR will be estimated by examining a minimum of four projects in the southeast. Second, layer coefficients for CIR and HIR (both asphalt emulsion and asphalt foam) will be determined in the lab for four existing roadways in Arkansas that are in need of maintenance. Samples of the roadway will be taken in the field and mixtures will be designed and compacted in the lab and the layer coefficients will be estimated.</p>	
FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:	
<p>The primary form of research implementation will be a recommendation of more accurate CIR and HIR layer coefficients for structural design. In addition, an HIR and CIR manual will be developed to cover the project selection, design, and construction of HIR and CIR. In 2017, if we assume that 50% of the asphalt pavement milled was used for mill and fill, over \$1,300,000 could have been saved by using HIR or CIR.</p>	
Estimated Project Duration: 24 Months	
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Standing Subcommittee
Ranking

3/7

Advisory Council
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Statement Combined with
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