

# NIATT *Research Summary*

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## Development of a Gyrotory Stability Index to Evaluate Variation of RAP Content and Rutting Resistance of Asphalt Mixtures

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### Description

Currently the Superpave mix design is conducted without performance tests to evaluate the resistance of asphalt mixtures to rutting. The ITD RP 175 developed a mathematical algorithm for determining a Gyrotory Stability (GS) index for asphalt mixtures. The GS index describes the ability of asphalt mixtures to resist rutting, and it is determined during the mix design stage using the gyrotory compaction data. However, the current GS index algorithm was developed for the Servopac gyrotory compactor. Currently, ITD uses the Pine gyrotory compactor that includes a shear measurement device. Therefore, it is essential — for the evaluation of mixes by means of the Pine Gyrotory Compactor — to develop a modified mathematical algorithm for GS index applicable to the Gyrotory compactor with model AFG2AS. The GS index can then be used to evaluate the resistance of Idaho mixtures to rutting during the mixture design stage. More importantly, the researchers will examine the sensitivity of this index to the RAP content in asphalt mixtures. If proved successful, this index can then be used as an indirect indicator of variation of RAP content in asphalt mixtures when placed in the field. Thus, the material engineers can use the GS index as a tool to find out if the RAP content in a given mixture exceeds the allowable percentage.



The main objective of this project is to develop GS index for asphalt mixtures using Pine compactor. The researches will evaluate the use of GS index as a tool to check the variation of the RAP content in the mix. Thus, one can use the GS index to detect if an asphalt mixture contains higher percentage of RAP than the design content. In addition, the researchers will evaluate the use of the GS index to evaluate the resistance of asphalt mixture to rutting. Project: 851721