Enhanced Traffic Signal Performance Measures - Pooled Fund Study-TPF-5(377)

WHAT IS THE NEED?

This is a pooled fund study (PFS) led by Indiana Department of Transportation (DOT) and with participation from Federal Highway Administration and State DOTs from California, Georgia, Minnesota, Mississippi, New Hampshire, Pennsylvania, Texas, Utah, and Wisconsin. This group expressed interest in developing the project to address two needs that had emerged:

1. Traffic Signal Data Logger Update: Update the data logger specification to provide secure file transfer, incorporate new enumerations that have emerged, and logging new connected vehicle messages.

2. Probe Data: Current probe data tools are focused on freeway data. There is a need to build upon the work of Indiana and Pennsylvania DOTs to develop methodologies and tools for using high resolution vehicle trajectory data to compute traffic signal performance measures.

Both initiatives would complement the previous work the multi-state team had done in traffic signal performance measures.

WHAT ARE WE DOING?

This is a PFS oriented toward traffic signal operations and management that would encourage a broad cross section of agencies on the leading edge of active traffic signal management. This study is a multi-agency team charged with developing modern management practices for traffic signal operations. All participating agencies provide feedback and participate in finalizing the updated specification. A key component of this process is ensuring the specification is acceptable to multiple states and they are committed to procuring controllers with the updated data logger specification.
WHAT IS OUR GOAL?

The project will address the following initiatives that complement and expand on the past work the multi-state team has done around traffic signal performance measures:

1. Traffic Signal Data Logger Update: Update the data logger specification to provide secure file transfer, incorporate new enumerations that have emerged, and logging new connected vehicle messages.
2. Probe Data: Current probe data tools are focused on freeway data. There is a need to build upon the work of Indiana and Pennsylvania DOTs to develop methodologies and tools for using high resolution vehicle trajectory data to compute traffic signal performance measures.

WHAT IS THE BENEFIT?

The benefit is that this will provide guidelines for Caltrans and other agencies to use to improve signal system operations. The intent is that agencies adopting the resulting recommendations will achieve a 10-15% reduction on motorist delay and emissions.

WHAT IS THE PROGRESS TO DATE?

1. PFS Members approved a 12 month no-cost extension to finish up remaining projects through June 30, 2023.
2. Traffic signal vendors began deploying the new enumerations in 2020. Inrix has now implemented the Purdue Probe Diagram developed in this project in their commercial signal analytic. Deployment of the trajectory based performance measures, based upon techniques described in TRBAM 21-01472, in several states in 2022 and 2023.
3. As of December 2022, the following papers have been published as a results of this Pooled Fund Effort:
   • The enhanced enumerations document has been published: https://docs.lib.purdue.edu/jtrpdata/4/
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