Travel Time Reliability Implementation

Florida Department of Transportation Pilot Project

Introduction

The Second Strategic Highway Research Program (SHRP 2) was established by Congress to investigate the underlying causes of highway crashes and congestion in a short–term program of focused research. The result is more than 100 research projects designed to meet the most pressing problems facing our Nation's highway system. New technologies, processes, and innovations developed through SHRP 2 are ready for implementation. The SHRP 2 Reliability Program produced several analytic products for monitoring, predicting, and using travel time reliability. Use of these products is vital to integrating reliability into standard practice, especially for estimating the benefits of transportation improvements.

SHRP 2 Reliability Program Products

The SHRP 2 Reliability Program is nearing completion of five analytical products that can aid in diagnosing the nature of reliability problems, identifying possible corrective actions, and analyzing the probable effect on travel time reliability when implementing those actions. A project called SHRP 2 L38 has just started to provide feedback to SHRP 2 on the applicability and usefulness (benefits and value) of the products tested, suggest potential refinements, and assist agencies in moving reliability into their business practices. The SHRP 2 L38 project will test the following data integration and analytical tools developed by SHRP 2.

L02 Report

The **L02** report describes how to develop and use a **Travel Time Reliability Monitoring System (TTRMS)**. The purpose of L02 is to create methods for agencies to monitor travel time reliability, understand what makes systems unreliable, and to pinpoint mitigating actions. To accomplish this, L02 produced a guidebook on implementing a TTRMS. The TTRMS indicates how traffic incidents, weather, and other non-recurring events affect reliability. The system reports on how operational improvements (e.g. shoulder widening or additional roadside assistance trucks) mitigate the impacts.

The three major modules of the TTRMS are a data manager, a computational engine, and a report generator. The data manager assembles information from weather feeds, incident reports, and traffic monitoring sites. This information is loaded into the computational engine that determines when the facility is reliable (or not), to what extent, and under what conditions.

L05 Project

The **L05** project provides directions for **incorporating travel time reliability into the transportation planning and programming processes**. It also describes how to use reliability measures to evaluate facility performance. This technique for assessing mobility needs allows operational investments to be considered in programming along with traditional capacity improvements. The L05 project applies to long-range planning, corridor planning, operations planning, and congestion management processes. Agency staff responsible for project prioritization and budgeting is the intended audience.

L07 Project

The **L07** project focuses on **geometric design treatments** that can be used to reduce delays caused by nonrecurring congestion. The L07 report identifies a full range of possible roadway design features to reduce delays caused by nonrecurring congestion and improve travel time reliability. For each improvement type the report evaluates project costs as well as operational and safety effectiveness. Recommendations for roadway design use including incorporation of reliability mitigation design plans into appropriate design guides are provided in L07.

L08 Project

The **L08** project incorporates travel time reliability into the Highway Capacity Manual (HCM). It demonstrates **how to apply travel time reliability methods for freeways, urban streets, and corridors analysis using travel time reliability at a detailed operational level.** Definitions of reliability, reliability metrics, and guidance on incorporating travel time reliability are provided. The intention of the project is to foster new chapters in the HCM dedicated to computing and analyzing travel time reliability. Typical HCM users will have the ability to understand, apply, and interpret results from travel time reliability computational engines. The L08 project will update existing computational engines to automate the generation of reliability scenarios and calculate reliability results.

C11 Project

The **C11** project provides **tools for assessing economic benefits of improving travel time reliability**. It is structured as a sketch-planning tool that involves minimal data development and model calibration. The results of the other SHRP 2 products are used in its methodology. The procedure is based on making estimates of recurring and nonrecurring congestion, combining them, and using predictive equations to develop reliability metrics. Outputs of the tool include current and future-year congestion costs, delay, and reliability metrics, i.e. travel time index, percentile travel time index, and percent of trips occurring at unacceptable speeds.

These products represent the state-of-the-art in travel time reliability analysis. Several pilot test sites were chosen by the SHRP 2 program to test the above products (SHRP 2 L38). These include Washington State DOT, Caltrans/Southern California Association of Governments, Minnesota DOT and Florida International University (in association with FDOT District 6, AECOM, and HNTB).

Florida DOT and SHRP 2

Florida DOT is conducting a review of all the SHRP 2 products mentioned above (L02, L05, L07, L08, and C11) through the FDOT Statistics Office's Multimodal Mobility Performance Measures contract. The review will include a summary of data requirements, software requirements, relevant applications, types of outputs, and additional work needed to make them "implementation ready." Products will be selected for implementation partially based on the level of effort needed to incorporate them into FDOT's and local agencies' existing processes. To accomplish this implementation and testing, FDOT is developing detailed implementation plans for selected SHRP 2 products.

As a leader in travel time reliability analysis and performance measures, FDOT plans to test and implement these products independently of (but coordinated with) the SHRP 2 program (SHRP 2 L38). The concept for implementation is to work closely with FDOT and local agency personnel to add reliability analysis to specific applications. **FDOT Central Office will coordinate closely with all Districts (4 and 6 in particular) regarding testing and implementation of these SHRP products.**

Prepared by Cambridge Systematics, Inc.
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