

# EVALUATION OF A REAL-TIME TRAVEL TIME PREDICTION SYSTEM IN A FREEWAY CONSTRUCTION WORK ZONE

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## **Executive Summary**

A real-time travel time prediction system (TIPS) was evaluated in a construction work zone. TIPS includes changeable message signs (CMSs) displaying the travel time and distance to the end of the work zone to motorists. The travel times displayed by these CMSs are computed by an intelligent traffic algorithm and travel-time estimation model of the TIPS software, which takes input from microwave radar sensors that detect the vehicle traffic on each lane of the freeway. Besides the CMSs and the radar sensors, the TIPS system includes the computer and microcontroller computing the travel times, 220 MHz radios for transmitting data from the sensors to the computer and from the computer to the CMSs, and trailers with solar panels and batteries to power the radar sensors, CMSs, and radios. The evaluation included an accuracy analysis between the predicted and actual recorded travel times and a survey of the motoring public. Three crews driving independently of each other in the traffic stream recorded predicted and actual travel times at three CMSs to the end of the work zone for 12 hours each day for three consecutive days, resulting in 119 trial runs. The data recorder in each crew also recorded the license plate numbers of private non-commercial vehicles with Ohio license plates. A total of 3177 different license plate numbers were recorded and a questionnaire was sent to each one. A total of 660 completed surveys were returned and analyzed. Based on the regression analysis of actual times vs. predicted times, the system does on the average a reasonable job in predicting the travel times to the end of the work zone. About 88% of the actual times recorded for each sign, and for all the signs combined, were within a range of  $\pm 4$  minutes of the predicted time. However, a few differences (actual-predicted) as great as 18 minutes were observed. Survey responses indicated that the motoring public does perceive a certain inaccuracy in the travel times. However almost 97% of surveyed motorists felt that a system to provide real-time travel time information in advance of work zones is either outright helpful or maybe helpful. In summary we may conclude that the real-time TIPS system represents a definite improvement over any static non-real-time display system. It provides in general and most of the time useful and relatively accurate travel time predictions to the motoring public and appears to be perceived by the motoring public as a helpful addition to a freeway construction zone.