QUANTIFYING TRAVELER DIVERSION AND ITS IMPACT DURING A WEEKEND FULL FREEWAY CLOSURE: CASE STUDY WITH I-894

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Abstract

Short-term full freeway closure is a work zone strategy that is attracting more consideration by DOTs in order to allow for accelerated construction time and shorter duration of traveler impacts. Such closures are very often limited to weekends or night times. Because of the potential for large impacts on adjacent arterials, there is a need for a good understanding of traveler’s diversion patterns in response to detour guidance. Although studies have shown that many drivers will choose alternate routes when they are aware of work zone delays, quantifying such patterns has not been sufficiently addressed, either in the professional literature or in practice.

This paper presents a case study on quantifying driver diversion and impacts during the I-43/I-894 full freeway closure event in October 2010 at Milwaukee, based on an effective integration and fusion of multi-source data collected with existing traffic surveillance systems along the target study region which include Volume, Speed, and Occupancy Application Suite (VSPOC) loop detectors, I-94 N/S Corridor microwave detectors, Statewide Traffic Operations Center (STOC) video surveillance, TRAffic DAbase System (TRADAS) Automatic Traffic Recorder (ATR), and Traffic Responsive Signal System (TRSS). Extensive analysis on the obtained comprehensive dataset has offered a reliable estimate of the actual traffic demand distribution over various designated detour routes and assess of effectiveness of the planned mitigating strategies. A set of rules, assumptions and guidelines based on research findings and lessons learned from the case study are also developed to better assist state DOT engineers to estimate the response of travelers, quantify the resulting impacts, design traffic mitigating plans, and assess cost-benefit before implementing future short-term full closure construction plans.

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