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## **ENHANCEMENT OF FREEWAY INCIDENT TRAFFIC MANAGEMENT AND RESULTING BENEFITS**

### **Problem**

To improve traffic conditions on major highways plagued by non-recurrent congestion, most highway agencies have invested their resources in two principal operational programs: incident response and clearance as well as traffic impact management. However, even with the wide-spread implementation of such programs, effectively minimizing the traffic impact caused by multi-lane blocked incidents remains a critical and challenging issue for most highway agencies.

### **Objective**

This research, proposed in response to the need to enhance the efficiency of the Coordinated Highway Action Response Team's (CHART's) Freeway Incident Traffic Management (FITM) operations, has two primary objectives: (1) understand the nature of those incidents that triggered implementation of the FITM plan over the past five years; and (2) develop a decision-support system that enables traffic engineers to determine whether any detour operation can be justified.

### **Description**

Because of diminishing resources as well as the pressing need to minimize the impacts of highway accidents, potential areas where CHART could enhance its traffic incident management, especially during implementation of the FITM plan, were examined. Tasks for this research included: (1) analyzing the spatial distribution and nature of recent incidents that required the implementation various FITM plans; (2) understanding the interrelationships between the duration of detected incidents, the congestion level, and the decision to trigger a FITM plan; and (3) estimating the costs and benefits associated with past FITM operations.

Due to the additional resources needed and costs involved in detouring traffic, it is also imperative to have a reliable decision-support tool that can assist traffic engineers in making a reliable and timely decision in a real-time operational environment. This tool should be based on the detected incident severity, with and without implementing the FITM plan, as well as the resulting costs and benefits for various traffic management strategies.

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It is important to note that the byproduct of such a decision-support tool includes the estimated travel times on the primary and detour routes and the resulting benefits such as reduction in delay, fuel consumption, and emissions. Thus, with some additional traffic information such as volumes on the primary and detour routes during the incident clearance period, CHART can further estimate the operational benefits produced from annual FITM operations and include these potentially large benefits in the annual CHART performance evaluation report.

### **Results**

This research developed a multi-criteria decision-support system for determining the necessity of detour operations during incident management from an overall socio-economic benefit perspective. The developed system enables decision makers to consider all associated critical factors with preferred weights, which include the direct benefits and operational costs, safety and reliability, accessibility of detour, and acceptability by travelers.

This research is part of an integrated incident managing system developed for Maryland that has various functions, ranging from prediction of incident duration to estimation of operational benefits. This decision module, based on the Analytical Hierarchical Process (AHP) methodology, features computing efficiency and operational flexibility, which thus allow users to make necessary revisions if more data becomes available or if more criteria are required.

### **Report Information**

Dr. Gang-Len Chang, Professor  
Department of Civil Engineering  
University of Maryland-College Park

gang@umd.edu