

JOINT TRANSPORTATION RESEARCH PROGRAM

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Synthesis Study of Best Practices for Mapping and Coordinating Detours for Maintenance of Traffic (MOT) and Risk Assessment for Duration of Traffic Control Activities

Introduction

Maintaining traffic flow during construction periods is crucial for successful project delivery and the overall mission of transportation agencies. Maintenance of Traffic (MOT) plans include partial and/or full closures of corridors, as well as mapping and coordinating detours near construction areas. In the case of closures, traffic needs to be rerouted through detour routes. Using an extensive literature review, a nationwide survey, and a series of interviews with INDOT and other state DOTs, this project explored the best practices to (1) identify a comprehensive set of Key Performance Indicators (KPIs) for detour route mapping, (2) understand how other state DOTs address qualitative criteria, (3) identify how risks associated with the planning, service time, and closure of the detour routes are managed, and (4) recommend process improvements for INDOT's detour mapping guidelines.

Findings

The best practices can be summarized in four main categories:

(1) *Avoiding closures in the first place:* most DOTs reported that they avoid full closures and detours of major highways in the first place through adding road capacity, using crossovers, extra work staging and consecutive weekend closures during the construction season, and using accelerated construction methods, such as prefabrication of elements. Where detours are

unavoidable, DOTs stagger their project schedules to proactively avoid creating conflicts by staging different types of work at different times. When necessary, they use creative scheduling involving local authorities, such as nighttime and weekend work scheduling, to monitor planned and ongoing work at different jurisdictions.

(2) *Mapping and coordinating the detour route:* Table 4.2 of the report presents seven key criteria (i.e., operational, technical, environmental, safety, financial, political, and social) and associated identifiers for use in detour planning, based on existing guidelines and common practices.

(3) *Maintenance of traffic:* Table 2.3 of the report presents common MOT strategies and considerations in the design of temporary traffic control plans including travel time; coordination with agencies, contractors, and nearby projects; vehicle mix; sight distance; parking; land use; and access to nearby facilities. The interviews revealed that ensuring travel efficiency and service quality is an essential part of the practice of state DOTs and can be achieved using intelligent work zone systems that perform speed monitoring, queue detection, and backup analysis and communicate travel time information as well as downstream speed notifications via portable message signs to the drivers so that they can adjust their path accordingly.

(4) *Risk management:* the common risks and best practices at the three stages of a detour route's life cycle were identified. (a) *At the planning stage:* the identified best practices include providing a driving environment like the closed route; monitoring the load-carrying

capacity of the pavements and bridges; and considering truck needs and emergency responders. (b) *At the implementation/operations stage:* establish an incident management plan and a committee of vital stakeholder representatives to enable transparency and quick responses. Table 2.4 and Table 2.5 of the report present the most feasible alternatives for incident management on detour routes and enhancing work zone safety. (c) *At the closing stage:* inter-governmental agreement in sharing the liabilities and mobile push notifications help provide restoration updates to the community.

Implementation

Sections 4.3 and 4.4 of the report provide recommendations for enhancing INDOT's current detour planning practice. Sections 4.2.1 and 4.2.2 present a list of criteria, identifiers, and applicable thresholds for selecting detour routes. Section 4.2.3 presents two case studies to demonstrate how the proposed KPI table can be used to develop a decision-support tool to assist detour route mapping. In future projects, a GIS-based automated tool could be developed to automatically identify the best detour route among the possible candidates based on the criteria proposed in this study, coordinates of the work zone on the map, and project characteristic—including the duration and location (urban/rural) of

the work and the traffic volume and composition. This can be useful to INDOT's Management Information Systems. The interviews revealed that the 1996 Detour Policy is currently under revision by INDOT. Section 4.3 provides recommendations for enhancing the policy based on (a) the recommendations from INDOT experts regarding the shortcomings of the current detour policy in terms of its practical use, and (b) the practices of other state DOTs that were identified from the interviews.

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