

# JOINT TRANSPORTATION RESEARCH PROGRAM

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## Safety, Mobility, and Cost Benefits of Closing One Direction of the Interstate in Rural Areas During Construction Work

### Introduction

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The Indiana Department of Transportation (INDOT) expressed a need to investigate Maintenance of Traffic (MOT) at rural interstates, so the agency and contractor can make informed decisions on whether to establish crossover sections versus closing one direction with detouring. A number of studies have investigated the merits and demerits of various MOT strategies. However, INDOT's traffic and design engineers desire detailed guidance in the form of a framework that compares the direct and indirect benefits of crossovers and detours (full lane closures).

This research examined the advantages and disadvantages of closing entirely one direction of traffic over traditional work zone techniques (such as partial lane closure through median crossover). This was done based on Key Performance Indicators (KPIs) that reflect the perspectives of the agency, road users, and the community. In the case of full closure, the study (1) examined the alternative MOT strategies and best practices through an extensive literature review and survey of agencies (2) investigated the risks, benefits, and costs associated with potential detour routes (3) validated, from case studies in Indiana and at other states, decision factors that can be considered critical for the analysis, and (4) implemented the identified best practices in an actual road project in Indiana, to evaluate the safety, mobility, and cost benefits of closing one direction.

### Findings

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Through the literature review and four case studies, eleven KPIs for MOT strategy developments were identified. The results of the questionnaire survey of highway agencies helped prioritize the KPIs. The top five KPIs are (1) safety, (2) mobility, (3) budget constraint, (4) project duration, and (5) complexity of project sites. The findings of the case studies and the nationwide-distributed survey questionnaire suggest that the adoption of a well-defined and objective framework for choosing appropriate MOT strategies can be beneficial to all project stakeholders (the agency, road users, and the community). The survey and interview results suggest that the implementation of carefully-design MOT strategies leads to fewer complaints from road users and construction workers and enhances overall project safety.

### Implementation

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This study evaluated the benefits of closing one direction of an interstate road section located in a rural area. Based on these KPIs and other findings presented in this report, a tool (flow chart) was developed to facilitate the comparison of pre-determined prospective MOT strategies. The case study demonstrated that it is feasible to use the developed flow-chart tool and the identified KPIs to provide guidance for INDOT staff in their routine tasks of using spreadsheets for MOT strategy

evaluation and selection. The INDOT staff have discretion to choose which KPIs are relevant to the project in question. It is anticipated that implementation of the framework will contribute to faster execution of projects, reduced the cost of temporary traffic control, and ultimately lower overall project costs.

## **Recommended Citation for Report**

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