Staff summary

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Interstate 64 Traffic Response Assessment

A research study by Organizational Results in cooperation with the I-64 Traffic Response Study, St Louis Area District Traffic and the Traffic Division

MoDOT Summary Statement

Based on the results from this research, the following benefits were realized from the I-64 Traffic Response approach:

- *I-64 Traffic Response conservative benefit-cost ratio was 8.3:1*
- *I-64 Traffic Response reduced an estimated 183 secondary crashes per year*
- *I-64 Traffic Response reduced $1,034,000 in annual congestion cost*
- *Safer and Quicker Incident Response and Clearance*
- *Reduction in ER resources for TIM freeing them for other community needs*

Background

An evaluation was conducted of the implemented mobility strategy on the New I-64 construction project. This construction project will improve more than 10 miles of an urban Interstate that carries daily traffic volumes approaching 170,000 vehicles. During the regional traffic management planning process, moving of traffic onto adjacent arterials was recognized as a potential concern based on the full closure construction approach being used on this project. This evaluation was further augmented by evaluating the arterial service patrol (I-64 Traffic Response) deployed during the I-64 major construction project to demonstrate the value of Traffic Incident Management (TIM) practices on major arterials.

A high level evaluation of the I-64 Traffic Response (TR) Study was performed by examining representative arterial segments. TR is an arterial service patrol that travels and monitors major adjacent arterials near I-64 within the triangle area of I-70 (North) – I-44 (South) and Missouri Route 141 (West).

When incidents (stalled vehicles, crashes, etc.) occur that block roadway lanes or adjacent shoulder areas, the roadway's capacity to handle traffic flow is reduced. This reduction in traffic flow, especially during peak travel times, causes delay and increases the potential for secondary crashes. With the potential of increased traffic on arterial corridors, the I-64 Traffic Response was developed and implemented as a mobility strategy of the New I-64 construction project. The following factors were identified and evaluated in determining potential benefits associated with an arterial service patrol program:

1. Reduction in traffic delays
2. Reduction in fuel and emission savings
3. Reduction in secondary crashes
4. Reduction Response Staff

Results

The I-64 Traffic Response has played a part in making this happen. Conservative estimates in the four assessment areas – traffic delay costs, emission impact costs, secondary crash costs, and response staff savings shows a benefit/cost of 8.3:1.

Results *(cont'd.)*

Volume to Capacity (v/c) ratio, Level of Service (LOS), Travel Time Index (actual speed divided post speed), crash rates and incident information are performance measurements that indicate potential impacts that could be used in determining the corridors that would benefit most from TR services.

Traffic delay costs were developed by traffic modeling based on change in traffic flows between the pre-construction 2007 year and construction 2008 year. One-lane closures were modeled and several model runs were made to get a better understanding of total corridor delay. The output from these models helped in the assessment of additional costs associated with lost production (labor cost) and fuel cost.

These same traffic model runs provided the emission impact costs for the region based on increased emissions. A very conservative $1,034,078 savings was determined for traffic delay and congestion savings.

Impacts from secondary crashes that result from another incident were assessed on state-only roadways in 2008. The I-64 Study will be updated in the future to reflect county roadways served in the region by the arterial service patrol program along with 2009 crashes. The $4,980,468 potential savings were based on the following:

1. A crash reduction estimation of 5% that all crashes are secondary crashes. This reduction estimation was based the 2003 St. Louis Motorist Assist Study.
2. From information gathered in handout service surveys and the output of traffic models developed to assess impacts from incident lane closures, the study concluded that about 50% of secondary crashes could be reduced. This was based on quicker responses to incidents would reduce associated secondary crashes.

Comparing 2008 (7,323 total crashes) to the annual average of the four pre-construction years 2004 through 2007 (8,086 total crashes), the estimated 183 secondary crashes that could have been potential reduced are reasonable.

The efficiency and effectiveness of the I-64 Traffic Response, provides other agencies, including MoDOT and local and state police, a reduction in staff hours toward responding to traffic incidents. The agencies use the estimated time saved to focus on other duties, saving approximately $57,977.

Recommendations

The I-64 Traffic Response Study as mobility strategy for I-64 construction project can be considered a successful component of the region's mobility plan during the closure of I-64. Traffic movement along adjacent arterial corridors has seen peak period traffic demand increases up to 50% with only minor impacts.

TR enhances the overall Traffic TIM strategy. Interviews with police agencies consistently affirm the MA/TR service patrol's have excellent working relationships with police, and the service patrol's value in handling traffic control in TIM-related incidents which enables police to focus on other high priority duties. As a result of the benefit-cost analysis, evaluators recommend, in future projects, arterial TR should be considered as mobility strategy for all major construction with extended periods of full closures or major reduction of traffic capacity along the corridor under construction.

Recommendations *(cont'd.)*

The study team concluded that an arterial TR program could be a valuable mobility strategy to address non-recurring congestion along major arterials. Additionally, the following characteristics should be a consideration when determining the deployment possibilities for the TR program:

- Regional and corridor characteristics that should serve as a guideline in selecting potential corridors for inclusion into a regional arterial TR program.
- Regional characteristics should take a holistic regional view of the importance a corridor plays in managing and moving traffic during peak periods or during major incidents. Does the corridor serve as a major arterial in moving commuter traffic, or does the corridor serve as a major alternative route during an incident on adjacent higher-level roadways?
- Corridor characteristics should take a segmental corridor view that considers corridor traffic demand, roadway capacity, and historical crash and incident information. Volume to Capacity (v/c) ratio, Level of Service (LOS), Travel Time Index (actual speed divided post speed), crash rates and incident information are performance measurements which indicate potential impacts that could be used in determining the corridors that would benefit most from TR services.
- Priority corridors should be determined and standard operating procedures (SOP's) developed based on regional and corridor characteristics. A dispatch service approach using TMC or 911 Center operators to dispatch TR services based on known TR operators' availability and response time to the incident. The availability of regional ITS components could further assist in the dispatch process in determining the potential impact of the incident.