

ITS Field Operational Test Summary

During Incidents Vehicles Exit to Reduce Time

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Introduction

The During Incidents Vehicles Exit to Reduce Time (DIVERT) ITS Field Operational Test was previously named the St. Paul Incident Management. Minnesota Guidestar, Minnesota Department of Transportation's ITS project, conceived the test to demonstrate the feasibility and effectiveness of diverting freeway traffic onto pre-planned diversion routes along surface streets during freeway incidents. The specific goals of the project include:

- Improving traffic flow management
- Applying new technologies
- Improving institutional interaction and cooperation.

The project encompasses the I-94/I-35E 'Common Section' and parallel streets within the Central Business District (CBD) of St. Paul, Minnesota. Figure 1 shows the project location. The test became operational in December 1996. Originally planned for completion in December 1997, the test has been extended for nine months to provide a longer evaluation period. The final evaluation report is expected in September 1998.

Project Description

The DIVERT field operational test provides traffic guidance and control during freeway incidents. If a major incident occurs on the test freeway section, traffic managers will divert traffic to arterial bypass routes. Traffic managers will control the flow using specially designed surveillance and guidance equipment and coordinated signal timing plans. Under this controlled diversion, managers add and accommodate the diverted traffic to the surface streets in a planned fashion, rather than having traffic randomly entering the St. Paul CBD in an uncontrolled fashion. The project area includes the tested freeway section, arterial diversion routes, and applicable signalized intersections and entrance ramps. Figure 1 shows the general location of the project.

The project serves as a trial for assessing the effectiveness of several technologies. The test applies these technologies to augment freeway capacity by alerting motorists to alternate travel routes. The test then monitors network performance during major freeway incidents.

The DIVERT project components include:

- Existing freeway changeable message signs
- Cellular telephone-based portable changeable message signs positioned prior to freeway exit ramps to serve as a traveler notification system
- Unique fiber-optic based blank-out signs, activated only during incident diversions, to guide motorists along the diversion routes and minimize confusion or conflict with the existing static signs

- Static trailblazer signs to designate diversion routes
- A surveillance camera system including video feed from the traffic management system
- Existing inductive loops along the freeway system
- Traffic responsive operations incorporating pre-developed, incident-based timing plans.

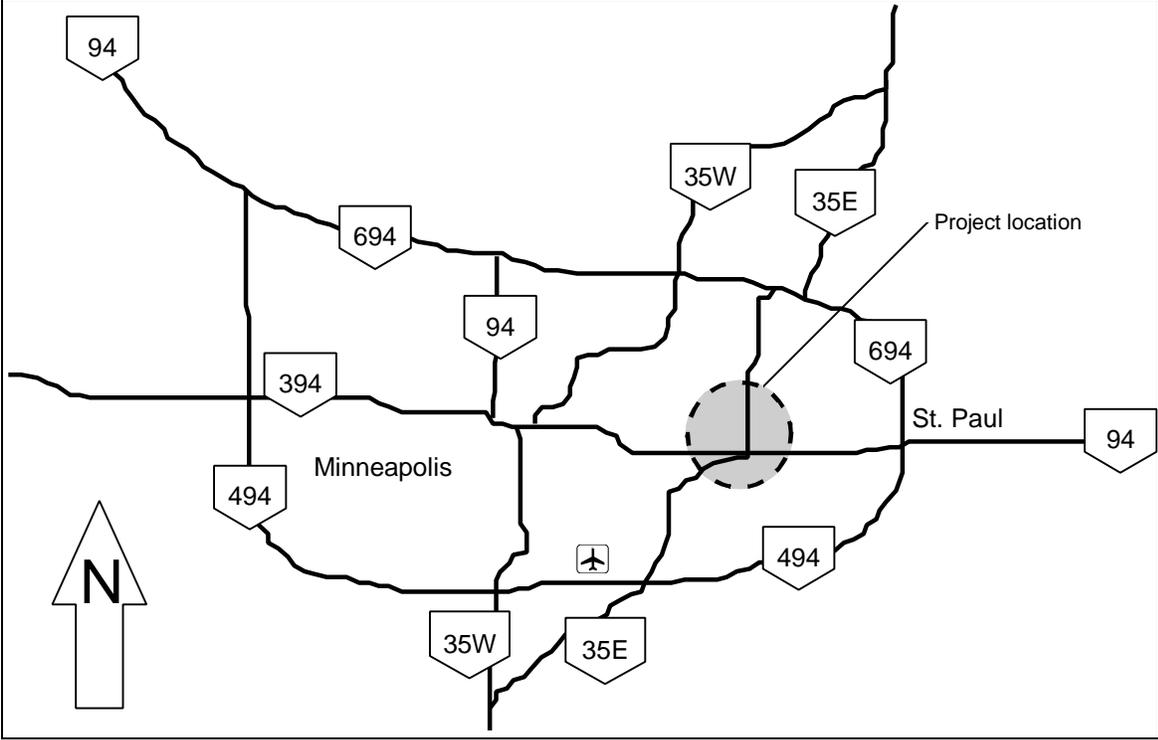


Figure 1: General Project Location

The test collects real-time traffic flow data (volume, occupancy, and speed) from inductive loops strategically located along the freeway system. Software-based algorithms use this data to detect “congestion.” When the system detects a congestion condition, it alerts the DIVERT operator through a paging system. The operator visually verifies traffic conditions on both the freeway and the proposed diversion routes using a CCTV surveillance system. The operator decides if a traffic diversion is required and feasible depending on the level of congestion along the diverted routes. If warranted, the operator deploys appropriate traveler information and traffic flow management strategies. The operator continues to monitor system operation and network flow conditions as the basis for selecting next steps.

In addition to notifying motorists of incident conditions and “bypass” opportunities, DIVERT adjusts the timing plans of traffic signals along the diversion routes. DIVERT's adjustment of the signal timing plans optimizes the capacity of the diversion routes while not unduly penalizing other traffic movements. As part of the DIVERT development process, traffic managers conducted a limited sensitivity analysis of the arterial network. This analysis indicated that accommodating the diverted traffic through the diversion routes would be feasible.

The evaluation of the test focuses on various aspects of the DIVERT system including the system architecture, surveillance system, communication system, control system, system benefits, system cost, user satisfaction, system transferability, and institutional and legal issues.

Test Status

The test is currently operational. Test personnel are collecting evaluation data. An extension of the test was deemed necessary since geometric improvements on the test freeway section have minimized the frequency of major incidents requiring traffic diversion.

Test Partners

Federal Highway Administration

Minnesota Department of Transportation

City of St. Paul

Safetran Traffic Systems, Inc.

References

None published.