

Report 26-R48: Emergency Routing Signs Pilot on the I-81 Corridor in the Staunton Area

Background

Setting up temporary traffic control along detour routes often requires extensive staff time and resources, as well as significant coordination across jurisdictions. This process is often slowed by logistical delays and the same congestion that the detour sought to alleviate. To address these challenges, VDOT's Staunton District conducted a pilot project to test the permanently-installed emergency routing signs on the I-81 corridor in the Staunton area. The pilot represents the first use of permanent emergency routing signs in Virginia.

Research Objectives

- Assess how permanently-installed emergency routing signs affect detour activation time, staffing and resources needs, and incident management efficiency.
- Evaluate how the signs influence driver route choice during incidents and work zone detours.
- Document user experiences and identify opportunities to further improve detour operations.

Approach

This research adopted a mixed-methods approach that combined qualitative data from semi-structured interviews with quantitative metrics developed from traffic incident, speed, origin-destination, and volume data from VDOT and third-party sources. A before-and-after comparison was conducted for four case studies, followed by interviews with Staunton District staff.

Outcomes

- Time needed to activate the incident detour decreased significantly, from more than 1 hour with manual flip-signs to about 10 minutes.
- The use of permanent signs helps reduce the communication demands and logistical complications that previously slowed detour activation.
- Driver compliance with the official detour was highest in the first hour of the incident, with about 28% of all traffic and 38% of truck traffic following the designated route during the first deployment.

Research Benefits

- Reduced queuing delay costs ranging from \$8,700 to \$20,000 per detour operation, assuming driver compliance rates of 15% to 35%.
- Improved incident management practices such as enhanced responder safety, greater driver confidence in the detour route, and reduced legal risk to VDOT associated with inadequate signage during detour operations.

Emergency Routing Signs



*Emergency Routing Signs
Installed on Interstate 64*

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Research Findings

Significantly Improved Operational Efficiency

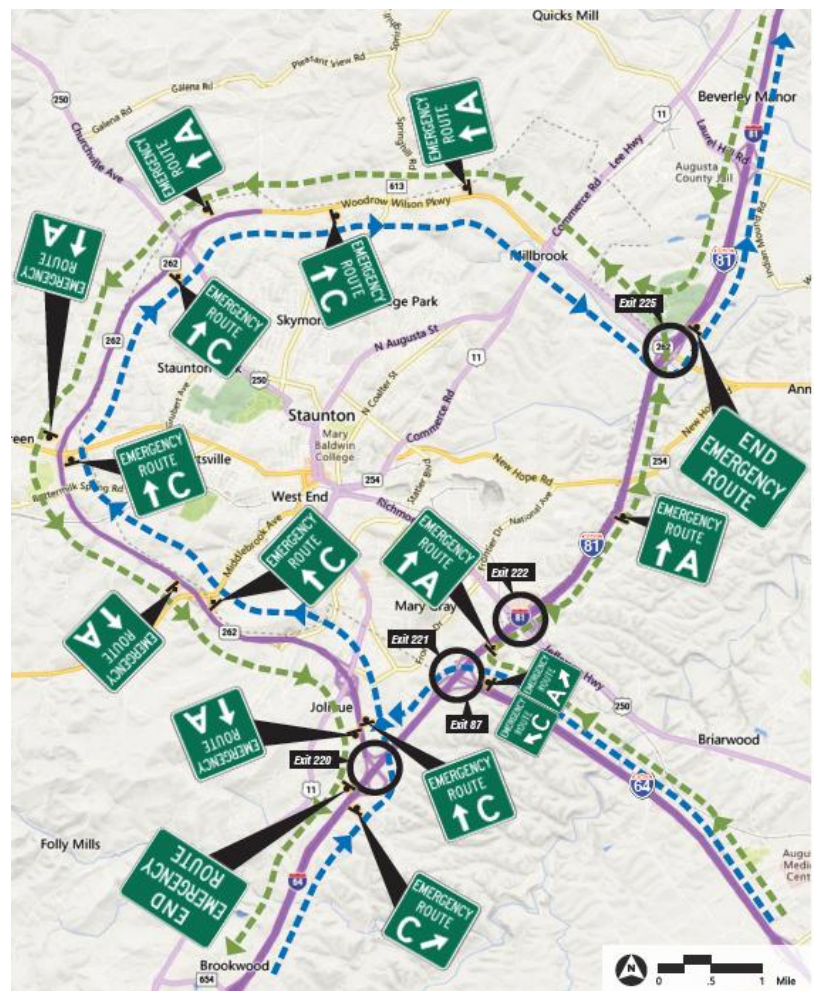
The permanently-installed emergency routing signs significantly reduce time and manpower required to activate the detour. The fast activation enhances VDOT's capability to manage traffic before extensive queues form.

Improved Responder Safety and Reduced Legal Risk

The permanent signage eliminates the need for responders to set up temporary signage and prevents inadequate signage caused by logistical delays, thereby improving responder safety and operational consistency and providing a legally defensible basis for incident detour operations.

Research Limitations

Although case studies strongly support operational benefits, limited after-period observations prevented statistical analysis to quantify the impact on traffic diversion. Continued evaluation is planned as additional data become available.



Detour Routes in the Staunton Area