Rural Intelligent Transportation Systems (ITS) Toolkit

Rural Traffic Management Center (TMC)/Traffic Operations Center (TOC)

TM 9

Photo: Courtesy of Ian Turnbull (formerly of Caltrans)

Description: Rural traffic management centers (TMC)/traffic operations centers (TOC) assist with managing or coordinating technology and other transportation resources. For example, a rural TMC/TOC may assist with managing special events (see #TM8), like a county fair. As a result of the typically less congested nature of rural areas, some entities have made use of virtual TMC/TOCs or a hybrid of a rural TMC/TOC and a virtual one.

Rural Transportation Critical Needs	Issues Addressed	Strategies Achieved
☑ Crash Countermeasures	☑ Congestion and Delays	☑ Road User
☑ Emergency Services	☑ Inefficient Signal Operations	☑ Road
☑ Operations & Maintenance	☐ Parking Challenges	☑ Vehicle
☑ Rural Transit & Mobility	☐ Vehicle Detection	☐ Safety Culture
☑ Surface Transportation & Weather	☑ Road Closures	☑ Engineering
☑ Tourism & Travel Information	☑ Travel Time	☑ Emergency Response
☑ Traffic Management	☑ Speed	☑ Enforcement
	☑ Alternate Routes	☑ Education
	☑ Dynamic Traffic Control/Operations	
	☑ Special Event Management	
	☑ Inefficient Use of Road Network	

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Applicability	Partnerships	Key Components

• The needs for a traffic management/traffic operation center in a rural area are different than those in an urban area. For example, there may be more limited time periods during which the center operates. It may also be more extreme weather/road closure dependent than congestion dependent (as in an urban area). A rural traffic management center/traffic operations center can help motorists avoid extreme weather, thereby potentially preventing crashes.	• Applications benefit from collaboration among numerous agencies, which may include:
	  • Departments of transportation (local, state, federal)
	  • National Weather Service
	  • Law enforcement agencies
	  • Emergency services
		• Physical space
		• Communications equipment
		• Software
		• Cameras
		• Trained personnel

Examples of Implementation

- **Traffic Management Center for Snoqualmie Pass, Washington State Department of Transportation (WSDOT)**

WSDOT has a multitude of traffic management centers including one for winter operations on Snoqualmie Pass.

- **New Hampshire Traffic Management Center**

From December through March, the New Hampshire Department of Transportation maintains a TMC 24/7. From April through November, the TMC is open during regular office hours. (See Section 2.5.6 here.)

- **District 2, California Department of Transportation (Caltrans)**

District 2 of the Caltrans implemented the first rural TMC in the state. The TMC is primarily driven based on the occurrence of incidents and inclement weather. During such occurrences, the TMC operates 24/7; otherwise, the TMC operates during extended business hours, which are approximately 12 hours a day. The TMC makes use of approximately seventy-five closed-circuit televisions throughout the district. Furthermore, it disseminates information regarding chain control and like through highway advisory radios and dynamic message signs.

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Implementation Considerations (General)	Implementation Considerations (Pro)	Implementation Considerations (Con)
•Utilizing open-source software, like Intelligent Roadway Information System developed by the Minnesota Department of Transportation, could reduce costs.	•Can help to disseminate information on weather conditions and road closures. •Allows for the creation of one point-of-contact. •Enables 24/7 information. •Better multi-state coordination. •Enables formal, consistent operating procedures. •Allows for identification of problems throughout the state(s) and highway system. •Enables real-time "picture" of traffic conditions. •Enables coordination with state patrol, other law enforcement, and emergency response crews for incidents. •Assists with disseminating information about AMBER Alerts and Silver Alerts.	•TMCs are typically staffed 24/7, which can be expensive. •Securing the data can be challenging and create barriers to full implementation. •Network integration and device communication issues can create challenges.

Additional Resources

- *Transportation Management Centers: ITS Benefits, Costs, and Lessons Learned: 2014 Update Report*, found here: https://www.itskrs.its.dot.gov/sites/default/files/executive-briefings/2014/BCLL_2014_Combined_JPO-FINAL.pdf
- *One Stop Shop (OSS)*, found here: http://westernstates.org/Projects/OSS/Default.html
- *Traffic Operations Center, Concepts for South Dakota*, found here: https://trid.trb.org/view/804664
- *Enhancement of Statewide Operations, Concept of Operations Study*, found here: https://westerntransportationinstitute.org/wp-content/uploads/2016/08/4W0337_ConOps_Final.pdf
- *Guidelines for Virtual Transportation Management Center Development*, found here: https://ops.fhwa.dot.gov/Publications/fhwahop14016/fhwahop14016.pdf
- *Intelligent Roadway Information System*, found here: http://aii.transportation.org/Pages/Intelligent-Roadway-Information-System.aspx
- *Multi-State Open Advanced Traffic Management System Lowers Cost*, found here: http://ahmct.ucdavis.edu/projects/traffic-management-system/

Opportunities for Future Expansion

- With vehicle-to-infrastructure (V2I) in the future, data from a vehicle will be sent to a traffic management center and information from the center will be sent to vehicles.

Useful Tip

Coordinating rural TOC/TMCs with the National Weather Service (NWS) can be mutually beneficial because they can share data. Rural TMC/TOC can obtain more precise weather data that may impact roadways from the NWS, and the National Weather Service can obtain information from cameras and other tools operated by the TOC/TMCs.

Cost Range

(Cost/financial information, where noted, is based on 2016 dollars (unless otherwise specified). Cost/financial information is estimated, and will vary based on size and scope of project, number of units, etc. In general, capital costs include initial purchase costs of hardware, software, and other required equipment. Maintenance and operations costs include staff time to operate, monitor and maintain systems; data collection; system upgrades; evaluation; etc.)

Capital Costs: The total capital costs for this tool are higher (above $250,000). The total capital cost for a small area (population less than 250,000) was reported as $4,400,000[1].

Operations Costs: The operations and maintenance costs for this tool are higher (above $250,000). The operations and maintenance costs for this tool range from $630,000 to $660,000[1].

National Center for Rural Road Safety

A Federal Highway Administration Center for Excellence