



Access Control Gates

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Photo: Courtesy of Natalie Villwock-Witte and Jaime Sullivan, WTI

Description: Access control gates can be automatically controlled in to divert traffic off of an entire route or a specific lane; to prevent traffic from entering an area; or to control access to an area, such as the entrance to public lands or a parking lot. An automatic gate can be remotely controlled, so that law enforcement or maintenance personnel do not have to travel to the area to manually close the gate. Access control gates can be used to close a route or a lane of traffic due to inclement weather, a crash, road maintenance, or other emergency situations. An access control gate can be used in coordination with a dynamic message sign (DMS) (see [#TT13](#)) or a sign with flashing beacons to alert the public where and why the route is closed up ahead.

Rural Transportation Critical Needs

- Crash Countermeasures
- Emergency Services
- Operations & Maintenance
- Rural Transit & Mobility
- Surface Transportation & Weather
- Tourism & Travel Information
- Traffic Management

Issues Addressed

- Congestion and Delays
- Inefficient Signal Operations
- Parking Challenges
- Vehicle Detection
- Road Closures
- Travel Time
- Speed
- Alternate Routes
- Dynamic Traffic Control/Operations
- Special Event Management
- Inefficient Use of Road Network

Strategies Achieved

- Road User
- Road
- Vehicle
- Safety Culture
- Engineering
- Emergency Response
- Enforcement
- Education





Applicability

- Access control gates are applicable to rural roads that may experience hazardous road conditions such as inclement weather or due to ongoing maintenance. An access control gate would allow an agency to quickly control access to a route remotely, which eliminates the need for maintenance personnel or law enforcement to drive out in potentially dangerous conditions to close a gate.

Partnerships

- Applications benefit from collaboration among numerous agencies, which may include:
 - Departments of Transportation (Federal, State, Local)
 - Law Enforcement
 - Public Lands Management Agencies

Key Components

- Remote Access Gate with Mechanical Closure
- Control Box
- Radio
- Antenna
- Central Location – Organization that can remotely close the gate.
- Camera (*Optional*)
- Dynamic Message Sign or Flashing Beacons/Sign (*Optional*)
- Integrated Traveler Information System (*Optional*)
- Highway Advisory Radio (HAR) (*Optional*)
- Social Media (*Optional*)

Examples of Implementation

• WY-22 Teton Pass Closure Gates

Teton Pass on WY-22 is consistently closed for hazardous winter driving conditions and avalanches. To increase safety, [automatic closure gates](#) were installed on Teton Pass as well as warning lights to allow the Wyoming Department of Transportation to remotely close WY-22 during hazardous driving conditions.

• Minnesota Department of Transportation (MnDOT) Automated Gate Testing

MnDOT installed [gates](#) along I-90 and I-94 to close the highways during snowstorms.

• Rocky Mountain National Park Entrance Gates

Rocky Mountain National Park has installed [automated entry lanes](#). These lanes allow national parks pass holders to skip the typical entry lane. Instead, pass holders drive up to an automated gate that will open once a pass is read. This automated entry lane reduces the wait time to enter the park and reduces the number of staff necessary at the entrance.

• Iowa Department of Transportation (DOT) Interstate Closure Gates

Iowa DOT installed [automated interstate closure gates](#) at the I-35/US 18 interchange and the I-35/US 30 interchange. These gates as well as pre-existing on-ramp gates are used to close the roadway due to inclement weather (winter storm events or floods), hazardous material spills, or other emergencies. Previously, Iowa DOT had to use snow plows and maintenance vehicles to block off the closed section of the interstate.





Implementation Considerations (General)

- An agency needs to determine under what conditions that they will close a route.
- An agency should consider creating guidelines and determining the roles and responsibilities of personnel in case of closures.

Implementation Considerations (Pro)

- Prohibits the public from entering hazardous driving conditions.
- Safer than manually accessed gates – does not require police or maintenance personnel to travel to location to move the gate.
- Reduces crashes due to hazardous road conditions.
- Reduces number of stranded vehicles.

Implementation Considerations (Con)

- The public may ignore gates and continue on a closed route, therefore there is a need to educate the public on road closures.

Opportunities for Future Expansion

- Connected vehicles could communicate with access control gates in the future. If a driver is approaching a gate that is activated (closed), a connected vehicle could alert the driver. A connected vehicle could re-route the driver ahead of time to avoid the area.

Additional Resources

- *Rural Intelligent Transportation System Natural-Hazard Management on Low-Volume Roads*, found here: <http://trrjournalonline.trb.org/doi/pdf/10.3141/1819a-37>
- *I-90 Gate Operations System Research Report*, found here: http://www.dot.state.mn.us/guidestar/1996_2000/i90_i94_gate_operations/gatejackson01.pdf





Useful Tip

Update a state's integrated traveler information system, DMS, HAR, and social media when access control gates have been activated as another means to alert the public that a route is closed and to avoid the area.

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 low (less than \$50,000). Minnesota Department of Transportation estimated the costs for different automatic closures. For a barrier gate with an automatic mechanism the estimated cost is \$16,354; for a barrier arm with an automatic mechanism the estimated cost is \$10,902¹. South Dakota Department of Transportation estimated the cost for an automatic gate with actuator, control box, radio, and antenna to be \$10,500².



Operations Costs: The operations and maintenance costs for this tool are expected to be low (less than \$50,000). Operations and maintenance costs should include the costs to maintain the automatic gate mechanism and communications system, the cost to power the system, as well as to periodically test the system to make sure that it is working properly.

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