

**T2**Center  
Training and Technical Assistance

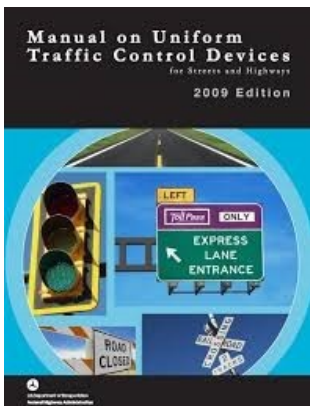
# TRAFFIC SIGNAL BRIEF

Tech Brief - 2019-5

## Retroreflective Backplates — A Proven Safety Countermeasure



Retroreflective backplates are an FHWA Proven Safety Countermeasure known to reduce total crashes at an intersection by 15%. Retroreflective backplates reduce crashes by providing greater visibility and conspicuity of traffic signal heads, particularly at night and for drivers with vision limitations.



### What is a Retroreflective Backplate?

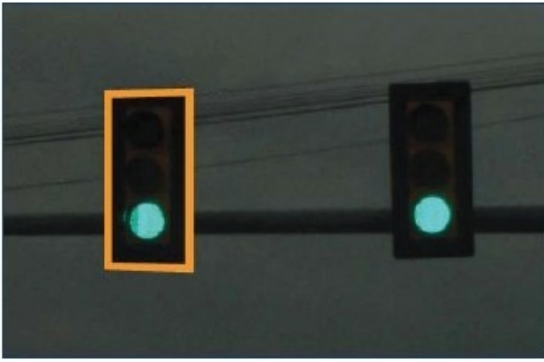
“A yellow retroreflective strip with a minimum width of 1 inch and a maximum width of 3 inches...placed along the perimeter of the face of the signal backplate to project a rectangular appearance at night.”

### Cost

This countermeasure is low-cost, ranging from about \$35 per head to add reflective tape to existing backplates up to \$110 per head to install new backplates with integral retroreflective material.



## Safety



*Traffic Signal Heads With and Without Retroreflective Borders.*

Source: FHWA

Retroreflective backplates help the driver distinguish between the signal head assembly and other objects in the background, increase visibility of the signal heads during periods of low visibility and power outages, and draw attention to a traffic signal after a long stretch of road without traffic signals. While the Crash Modification Factor (CMF) clearinghouse lists the reduction in total crashes to be 15%, several state DOTs have realized total crash reductions of up to 29%, reductions in angle crashes in excess of 40%, and reductions in late night and early morning crashes of 50%.

The countermeasure is most effective when implemented at all signalized intersections within a jurisdiction. In Connecticut, CTDOT installs retroreflective backplates at all intersections upgraded as part of a project.

## Installation and Maintenance

The City of Nashua, New Hampshire reports an installation time of 10 to 15 minutes per backplate when replacing backplates with new retroreflective backplates while the signal heads remain in place.

There are several methods for implementing retroreflective backplates. The table below summarizes the various options along with installation considerations:

Method	Where to Install	Installation Considerations
<b>Retroreflective Tape Applied to Existing Backplates</b>	Older existing signals where new backplates will not fit  Recently installed signals with untreated backplates	<ul style="list-style-type: none"> <li>Lower initial cost</li> <li>Effective when few backplates to treat</li> <li>No inventory of head brands needed</li> <li>May not be as durable</li> </ul>
<b>New Backplates - Retroreflective Tape Pre-applied</b>	New signals  Signal replacements  Existing signals where a new backplate will fit	<ul style="list-style-type: none"> <li>More durable than installing on existing backplate in the field</li> <li>May need to replace other equipment at locations without backplates to make new backplate fit</li> <li>May void warranty if backplate is cut to fit existing signal head without backplate</li> <li>Need to inventory signal head brands to order appropriate backplate</li> <li>Higher initial cost than backplates without pre-applied retroreflective tape</li> </ul>
<b>New Backplates - No Pre-application of Retroreflective Tape</b>	New signals  Signal replacements  Existing signals where a new backplate will fit	<ul style="list-style-type: none"> <li>More durable than installing on existing backplate in the field</li> <li>May need to replace other equipment at locations without backplates to make new backplate fit</li> <li>May void warranty if backplate is cut to fit existing signal head without backplate</li> <li>Need to inventory signal head brands to order appropriate backplate</li> <li>Higher labor cost than backplates with pre-applied retroreflective tape</li> </ul>

## Retroreflective Backplate Resources:

- MUTCD Section 4D.12: <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>
- FHWA Fact Sheet: <https://safety.fhwa.dot.gov/provencountermeasures/pdfs/fhwasa17051.pdf>
- FHWA Technical Summary: <https://safety.fhwa.dot.gov/intersection/conventional/signalized/backplates/tech/sa15007.pdf>
- Retroreflective Borders on Traffic Signal Backplates – A South Carolina Success Story: [https://safety.fhwa.dot.gov/intersection/conventional/signalized/case\\_studies/fhwasa09011/](https://safety.fhwa.dot.gov/intersection/conventional/signalized/case_studies/fhwasa09011/)
- CTDOT Fact Sheet: <https://portal.ct.gov/-/media/DOT/documents/dtrafficdesign/Safety/RetroreflectiveBackplates1pdf.pdf?la=en>



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