



# Federal Highway Administration

## Nine Proven Safety Countermeasures

Countermeasure	Description	Contact	Cost Range	Data, Benefits, and Additional Information
<p><b>#1</b></p> <p><b>Enhanced Delineation and Friction for Horizontal Curves</b></p>	<p>Installing chevron signs, curve warning signs, sequential flashing beacons, advisory speed signs or high friction surface treatments can have a positive affect on reducing vehicles that leave the roadway on horizontal curves.</p>	<p>Ken</p>	<p><b>Low-cost:</b> Safety treatments vary by the severity of the curvature and the operating speed, but in general are low-cost.</p>	<p>Recent data shows that 28% of all fatal crashes occur on horizontal curves and about three times as many crashes occur on curves than in tangential sections of roadways. The listed countermeasures can reduce crashes from 13% to 43%.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_009.htm">http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_009.htm</a></p>
<p><b>#2</b></p> <p><b>Pedestrian Hybrid Beacon</b></p>	<p>A pedestrian-activated warning device located on the roadside or on mast arms over midblock pedestrian crossings. (Flashing light intervals and sequences i.e. red, yellow lights indicate to drivers and pedestrians their clearance time to cross the roadway)</p>	<p>David</p>	<p><b>Low to Medium cost:</b> The equipment for a HAWK signal for a spot treatment typically costs about \$35,000 to \$40,000. If the installation of the signal is a part of a larger mid-block pedestrian crosswalk project, and with the addition of preliminary engineering, labor, and maintenance agreement costs, the overall cost could be higher.</p>	<p>This is a new, specialized traffic signal for pedestrian safety, and there may be an initial issue with addressing the Federal requirements for competitive bidding. At the local level, community outreach is required to educate and familiarize the public with the new signal operations.</p> <p>Safety benefits include up to a 69% reduction in pedestrian crashes at midblock crossings, and up to a 29% reduction in total roadway crashes.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_012.htm">http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_012.htm</a></p>
<p><b>#3</b></p> <p><b>Backplates with Retroreflective Borders</b></p>	<p>Backplates and retroreflective borders are added to a traffic signal head to improve visibility of the illuminated face of the signal.</p>	<p>Arianna</p>	<p><b>Low-cost:</b> Adding backplates or a retroreflective border to an existing signal backplate can be a very low cost safety improvement.</p>	<p>Per the study included in the Crash Modification Factor Clearinghouse, the use of backplates with retroreflective borders may result in a 15% reduction in all crashes at urban, signalized intersections.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_007.htm">http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_007.htm</a></p>
<p><b>#4</b></p> <p><b>Longitudinal Rumble Strips and Stripes On Two-Lane Roads</b></p>	<p>Most rumble strips and rumble stripes are ground into the pavement and are mainly installed along the centerline or shoulder. The latter are painted over with retroreflective striping to increase visibility.</p>	<p>Arianna</p>	<p><b>Low-cost:</b> Cost varies based on the application. Prices range between \$0.20 and \$3.00 per linear foot.</p>	<p>Over 50% of California's fatal crashes are a result of roadway departure. This application provides an audible warning and physical vibration to alert drivers they are leaving the roadway. The application of rumble strips or stripes has shown good results in reducing run off the road (ROR) crashes.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/">http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/</a></p>

<p><b>#5</b> <b>Corridor Access Management</b></p>	<p>Access management refers to the design, implementation, and control of entry and exit points along a roadway, i.e., highways and major arterials.</p>	<p>Jeff</p>	<p><b>Low to Medium cost:</b> In newly developing areas, public policy on access minimizes cost. Prohibiting existing access could involve financial damages to property owners.</p>	<p>The benefits of access management include improved movement of traffic, reduced crashes, and fewer vehicle conflicts, i.e., a 5-23% reduction in all crashes along two-lane rural highways, and a 25-31% reduction in severe (injury/fatal) crashes along urban/suburban arterials.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_006.htm">http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_006.htm</a></p>
<p><b>#6</b> <b>Medians and Ped Crossing Islands in Urban and Suburban Areas</b></p>	<p>Pedestrian crossing islands (raised islands) are placed on a street at intersections or midblock locations to separate crossing pedestrians from motor vehicles.</p>	<p>David</p>	<p><b>Low-cost:</b> These structures are very low-cost if incorporated into the initial design of a new roadway project. Costs are slightly higher for retrofits of existing facilities.</p>	<p>Medians and pedestrian crossing islands improve safety in many ways including: reducing pedestrian crashes by 46% and motor crashes by up to 39%, enhance the visibility of pedestrian crossings, reduce the speed of vehicles approaching pedestrian crossings, and may decrease delays (by greater than 30%) for motorists.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_011.htm">http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_011.htm</a></p>
<p><b>#7</b> <b>“Road Diet” Roadway Reconfiguration</b></p>	<p>A "road diet" typically involves the reduction of speed limits, gateway treatments to manage driver expectation, and the reconfiguration of travelled lanes which allows the roadway to more easily accommodate other uses such as bicycles, pedestrians and/or on-street parking.</p>	<p>David &amp; Jeff</p>	<p><b>Low-cost:</b> Road diets can be low cost if planned in conjunction with reconstruction or simple overlay projects.</p>	<p>Benefits of the new roadway configuration include an overall 29% reduction in all roadway crashes, reduced vehicle speeds, improved mobility and access, and reductions of collisions and injuries. Some pedestrian benefits include reducing crossing distance and fewer midblock crossing locations. Simple road diets may only consist of restriping.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_013.htm">http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_013.htm</a></p>
<p><b>#8</b> <b>Roundabouts</b></p>	<p>Roundabouts are circular intersections with design and traffic control features that ensure low travel speeds (&lt;30mph) through the circulatory roadway.</p>	<p>Jeff</p>	<p><b>Medium to High cost:</b> Installations may require additional R.O.W. A reduction in serious crashes may justify costs.</p>	<p>Roundabouts offer substantial safety advantages and can reduce the occurrence of right angle crashes and have the potential to reduce fatal and injury crashes from 60–87%. Geometric features provide a reduced speed environment and excellent operational performance.</p> <p>More information can be found at: <a href="http://www.tfhr.gov/safety/00068.htm">http://www.tfhr.gov/safety/00068.htm</a>.</p>
<p><b>#9</b> <b>Safety Edge<sub>SM</sub></b></p>	<p>Safety Edge is a paving technique where the interface between the roadway and graded shoulder is paved at a 30 degree angle to eliminate a vertical drop-off. This can be used on AC and PCC paving projects.</p>	<p>Ken</p>	<p><b>Very low cost:</b> The technique requires a slight change in the paving equipment (approximately \$3,000) and minimal material with the exception of PCC, which can add to the overall cost.</p>	<p>Research between 2002-2004 shows that pavement edges may have been a contributing factor in as many as 15-20% of ROR crashes. When a driver drifts off the roadway and tries to steer back onto the pavement the action may result in over-correcting. The Safety Edge minimizes this occurrence when settlement or erosion causes exposure of the pavement edge.</p> <p>More information can be found at: <a href="http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/">http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/</a> California specific information can be found at: <a href="http://www.dot.ca.gov/hq/esc/oe/standards.php">http://www.dot.ca.gov/hq/esc/oe/standards.php</a></p>

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