

Guidance for Safety Improvements for PRR Projects

In general, PRR projects contain inherent low cost safety improvements such as providing a skid resistant surface, installing new pavement markings, replacing deficient signs, and providing a smoother riding surface. In addition, other low cost improvements can be applied in the projects either by contract forces or District forces. If required to be performed by contractor, items must be included in the design plans. All low cost safety improvements should adhere to existing EDSMs and Department policies.

For all applicable projects referred to on the "Guidance for Preservation/Rehabilitation/Replacement (PRR) Projects" as "**Required**" for baseline countermeasures, a baseline of safety improvements is **required to be considered** regardless of the project limit's crash history. For each PRR project, a Safety Assessment Process Checklist must be completed based on three years of crash data to identify abnormal locations or overrepresented crash types. If any intersection, roadway section or spot section is determined to be abnormal (according to DOTD's Highway Safety Section definition) or shows an overrepresented crash type, overrepresented/abnormal countermeasures must be considered. On replacement, major and minor rehabilitation, and light minor rehabilitation projects with abnormal locations or overrepresented crash types, a copy of the Checklist shall be sent to DOTD's Highway Safety Section for coordination of the DOTD's Road Safety Assessment process. Recommended improvements identified through the RSA process should be included in the project when feasible.

Resources:

For additional information, refer to the following documents:

"Guidance for Preservation/Rehabilitation/Replacement (PRR) Projects" (LA DOTD Document)

"Safety Assessment Process" (LA DOTD Document)

"Road Safety Assessment" (LA DOTD Document)

"Mitigation Strategies for Design Exceptions" (FHWA publication)

"Low-Cost Treatments for Horizontal Curve Safety" (FHWA publication)

"Good Practices: Incorporating Safety into Resurfacing and Restoration Projects" (FHWA Publication)

"Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections" (FHWA Publication)

"Guide for Pavement Friction" (AASHTO Publication)

Highway Safety Manual

LADOTD Traffic Signal Design Manual

Manual on Uniform Traffic Control Devices (MUTCD - FHWA publication)

Note: Any signs or pavement markings recommended for local road approaches should be submitted to the Local Road Safety Program for funding.

SUGGESTED SAFETY IMPROVEMENTS FOR PRR PROJECTS

SECTION TYPE	BASELINE COUNTERMEASURES	OVERREPRESENTED/ABNORMAL COUNTERMEASURES
<p>STANDARD ROADWAY SECTION</p>	<ul style="list-style-type: none"> - Replace mailboxes and supports with crashworthy elements, as applicable - Re-evaluate and replace signing as needed - Replace deficient guard rail. - Deficiencies include type of rail, condition of rail and posts, height, length, end treatment, grading in front of guard rail and bridge attachments. - Delineate with reflective markings and signs as per standard plans. - Reflective stripe and/or indentation reflectors or post top reflectors on the guard rail may be used. - Delineate lone obstacles with reflective tape or object markers. - Markers may be strapped to objects, if applicable. - Relocate single standing obstacles. If not possible, consider shielding them. - Delineate narrow bridges with reflective striping, post delineators and/or additional signing. A narrow bridge is one not meeting the minimum widths in the design guidelines or requiring narrow bridge signing per MUTCD. - Use shoulder wedge where possible to construct within existing roadway crown 	<ul style="list-style-type: none"> - Apply Baseline Countermeasures, as applicable - Flatten foreslopes - Use shoulder wedge. Minor widening of crown and minor ditch relocation is acceptable. - Re-evaluate additional advance warning signs and provide as needed - Re-evaluate no passing zones and provide pavement markings as needed - Widen lane and/or pave full shoulder width - Round ditches if no environmental issues exist - Extend cross drains and/or provide end treatments - Provide rumble strips (edgeline and/or centerline) - Add left or right turn lanes if no utility conflicts exist - Minor adjustments to curve alignments are permissible - Add raised pavement markers inside edge line where needed - Evaluate and make necessary changes to driveways to meet current DOTD policies - Evaluate and make necessary changes to median openings. This may include closing median openings or changing the design of the opening to not allow left outs or adding left turn lanes.

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<p align="center">HORIZONTAL/ VERTICAL CURVES</p>	<ul style="list-style-type: none"> - Remove obstacles or delineate areas with advance signing when Stopping Sight Distance (SSD) < required for posted speed minus 20 mph. This could include cutting vegetation near intersections and around horizontal curves or providing advance warning of a driveway within a horizontal or vertical curve. - Delineate curves with raised reflective pavement markers, post delineators, and/or signing when advisory speed is 15 mph less than posted speed. Pavement markers are only to be used if width is adequate and delineators are not used. Raised reflective pavement markers may also be installed at reduced intervals to enhance visibility. - DTOE to re-evaluate curve advisory speed, as applicable, using ball-bank method. - For rural classifications, consider desirable superelevation values where existing foreslope rates can be maintained within existing right-of-way - Use shoulder wedge where possible to construct within existing roadway crown 	<ul style="list-style-type: none"> - Apply Baseline Countermeasures, as applicable - Widen lanes and/or pave shoulders in addition to Minimum Design Guideline recommendations - Use shoulder wedge. Minor widening of crown and minor ditch relocation is acceptable.

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SIGNALIZED INTERSECTION	<ul style="list-style-type: none"> - Back plates on all signal heads (optional reflectorized border) on mast arm - Traffic signal yellow change interval and all red interval timing adjusted to be in accordance with the LADOTD Traffic Signal Design Manual 	<ul style="list-style-type: none"> - Apply Baseline Countermeasures, as applicable - 12 inch LED lenses on all signal heads - A minimum of one traffic signal head per approach lane - Elimination of any late night flashing operations - Change of permitted and protected left-turn phases to protected-only. - Advance left and right "Signal Ahead" oversize warning signs as per the MUTCD - Advance Intersection Street Name (Next Signal) signs - Install advance overhead or ground mounted lane use signing on multilane approaches - Supplemental signal heads where normally placed signal heads may be difficult to identify due to: sight distance limitations, horizontal curvature, or other obstructions; or, exceptionally wide intersections where a near side signal is needed - Advance detection control systems at isolated high-speed signalized intersections that have red-light running angle crashes - Signal coordination countermeasures on high-volume arterials with closely spaced traffic signals and frequent mainline stopping due to poor or no signal coordination - Pedestrian countdown signals, higher visibility cross walks and advanced pedestrian warning signs where appropriate as determined by the DTOE - Re-examine warrants, sight distance - Remove signals - Perform traffic counts, re-analyze and implement signal timing

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<p>STOP CONTROLLED INTERSECTION</p>	<p>Through Approach –</p> <ul style="list-style-type: none"> - Apply state standard sign treatment At state-state intersections <p>Stop Approach -</p> <ul style="list-style-type: none"> - Properly placed stop bar - Removal of any foliage or parking that limits sight distance - Double arrow warning sign at stem of T-intersections - Replace stop sign as needed 	<ul style="list-style-type: none"> - Apply Baseline Countermeasures, as applicable - Doubled up (left and right), oversize advance intersection warning signs, with street name sign plaques - Doubled up (left and right), oversize advance "Stop Ahead" intersection warning signs - Doubled up (left and right), oversize Stop signs - Installation of a minimum 6 ft. wide raised splitter island on stop approach which requires pavement widening - Flashing beacons to supplement advance intersection warning signs and Stop signs - Transverse rumble strips across the stop approach lanes or through lanes - Reflective strips on sign posts

Approved: *David L. Dornier* 9/30/10
 DOTD Chief Engineer Date