

# Incorporating safety into 3R

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*Editor's note: Two recent articles in Technology News addressed the benefits of and suggestions for rural agency roadway safety programs. One recommendation was to integrate safety enhancements into programmed roadway improvements.*

A SPECIFIC CATEGORY of roadway improvement projects—rehabilitation, restoration, and/or resurfacing, commonly referred to as 3R—can provide excellent opportunities to correct or mitigate existing safety-related issues, often at lower cost than addressing the safety issues independently.

### Potential safety improvements during 3R projects

Many potential roadway safety improvements may not be good candidates for correction during 3R projects because of relatively high cost and the need to acquire additional right-of-way. However, lower-cost mitigation strategies that can result in a high benefit-cost return should be considered. Some of these strategies might include

- removing trees,
- relocating or delineating utility poles,
- modifying driveways/entrances,
- flattening slopes in critical locations,
- replacing outdated guardrail,
- adequately marking or shielding narrow structures,
- removing high headwalls from culvert ends,
- replacing non-crashworthy signs supports and mail boxes, and
- upgrading signs.



Curve signs and chevrons should be used consistently on the same road.

Other safety benefits can be realized from a variety of low-cost traffic safety enhancements. For example, consider

- installing rumble strips in advance of STOP signs at problem intersections,
- outlining site-specific locations like sharp curves with chevrons or delineators,
- marking T-intersections with double-arrow signs, W1-7, and, if possible, constructing safety ramps, or
- installing durable pavement markings that will provide desired visibility longer than will standard markings.

All of these potential safety improvements are located within the roadway clear zone, and thus will not require additional right-of-way.

### Planning 3R safety improvements

The ideal time to consider appropriate safety enhancements is before or during the concept stage for a future road or street improvement.

Using a previously compiled list of roadway safety concerns or one developed specifically for the project, agency staff can select possible options for mitigation, with removal or relocation of potential hazards the most ideal choices.

As with higher cost improvements, review crash history carefully as part of the process. In addition, some desired modifications will require consulting with other interested parties, like property owners for mailbox supports, driveway slope flattening, and/or tree removals near farmsteads, or utility companies for pole relocation or delineation.

### Consistency promotes safety

Consistent application of safety enhancements is critical; treat similar situations uniformly. For example, if a curve with a certain degree of curvature and superelevation is marked with chevrons in response to a crash recorded at that location, then a similar curve on the same road should probably also be marked with a chevron, even if no crashes have been noted during the study period.

### Urban improvements

Safety improvements can also be beneficial on some urban street projects:

- Larger signs, especially street name signs, might be needed.
- Check the adequacy of existing traffic signals. Larger lens and/or backing plates can be added at minimal cost. Re-timing signals according to formulae in the *ITE Traffic Engineering Handbook* may improve intersection safety (see "Optimizing traffic signal phases for safety," *Technology News*, July–August 2003).
- Determine if any non-crashworthy obstacles such as utility poles or light bases in the clear zone should be removed, relocated, or modified with breakaway supports.
- Install durable pavement markings when possible to provide a longer period of desired visibility.

### For more information

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