rtment of Transportation

Systemic Safety Measures

Basic Intersection Upgrades

General Information

Upgrades at stop-controlled intersections can include many different elements. The upgrades that result in the greatest reduction in crashes are those that bring conspicuity to the intersection.

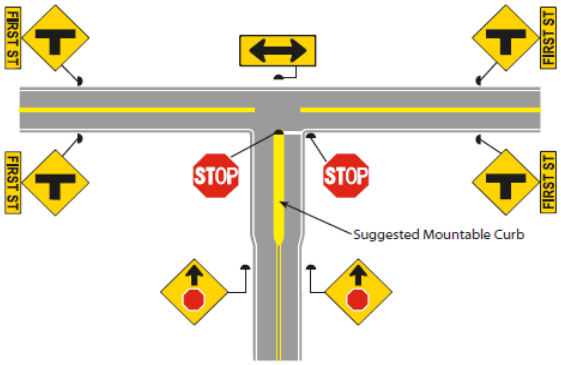
Increasing the visibility of the intersection allows the driver more time to properly react. There are many low-cost options to add visibility to the intersection. Some of the more common ways are:

- ✓ Intersection Warning Signs with a Street Name Plaque – These signs are placed in advance of the intersection, usually on the non-stopped leg(s). This warns the mainline drivers they are approaching an intersection.
- ✓ Stop Ahead Signs- These signs are placed on the stopped controlled leg(s) of the intersection, warning drivers of needed action.
- ✓ Double Stop Signs- Stop signs are placed on both the left and right side of the roadway (lane) to reinforce the need for the driver to stop.
- ✓ Oversize Stop Sign(s)- Oversized signs are usually used on high-speed roadways, or at intersections with a history of crashes being attributed to drivers running the stop sign.
- ✓ Stop Bar- This is a pavement marking on the stop-controlled leg(s) of the intersection to supplement the stop sign(s).
- ✓ Transverse Rumble Strips- These are usually used on high-speed roadways, or at intersections with a history of crashes related to drivers' unawareness of the intersection.
- ✓ Stop Beacons – These are flashers placed on top of the stop sign, and can be integrated with a solar panel for power.

By the Numbers

These countermeasures are low-cost approaches to mitigating intersection related crashes. Many are related to the stop controlled leg(s). Below are the appropriate cost and crash reductions associated with some countermeasures.

- ✓ Intersection Warning Signs with a Street Name Plaque: $600-$800 per sign, 22% reduction in overall crashes, and 35% reduction in right-angle crashes.
- ✓ Stop Ahead Signs: $500-$700 per sign, 35% reduction in angle crashes.
- ✓ Double Stop Signs: $500-$700 per sign, 11% reduction in overall crashes, 55% reduction in angle crashes.
- ✓ Oversized Stop Sign: $500-$700 per sign, 19% reduction in overall crashes.
- ✓ Stop Bar: $4.00-$7.00 per sq. ft. of stop bar, 16%* reduction in angle crashes.
- ✓ Transverse Rumble Strips: $500-$600, 28% reduction in overall crashes.



Credit: Oregon Intersection Safety implementation Plan

Helpful Resources

- ✓ FHWA *Toolbox of Countermeasures and Their Potential Effectiveness for Intersection Crashes*, 2009
  http://safety.fhwa.dot.gov/intersection/resources/fhwasa10005/docs/brief_8.pdf
- ✓ *Highway Safety Manual*, 2010
- ✓ FHWA Safety Website
  http://safety.fhwa.dot.gov/
- ✓ Crash Modification Clearinghouse
  http://www.cmfclearinghouse.org/

* There is currently no CRF associated with Stop bar only. One study showed a 33% reduction in angle crashes from adding a centerline and a stop bar and attributed half the reduction to stop bars. Hence a 16% reduction.