

# Priority Level Two: Intersections

Intersections, where two or more roads join or cross, are a major source of encounters between road users. Intersections involve turning and crossing maneuvers that provide abundant opportunities for vehicle-vehicle, vehicle-pedestrian, and vehicle-bicycle conflicts, some of which will result in collisions.

Between 2006 and 2008, intersection-related collisions in Washington State resulted in 2,916 serious injuries and 356 fatalities, 35% of all serious injuries and 21% of fatalities. During this time period, intersections on city streets were involved in 51% of serious injuries and 39% of fatalities. On city-operated state routes, intersections were involved in 54% of serious injuries and 40% of fatalities.

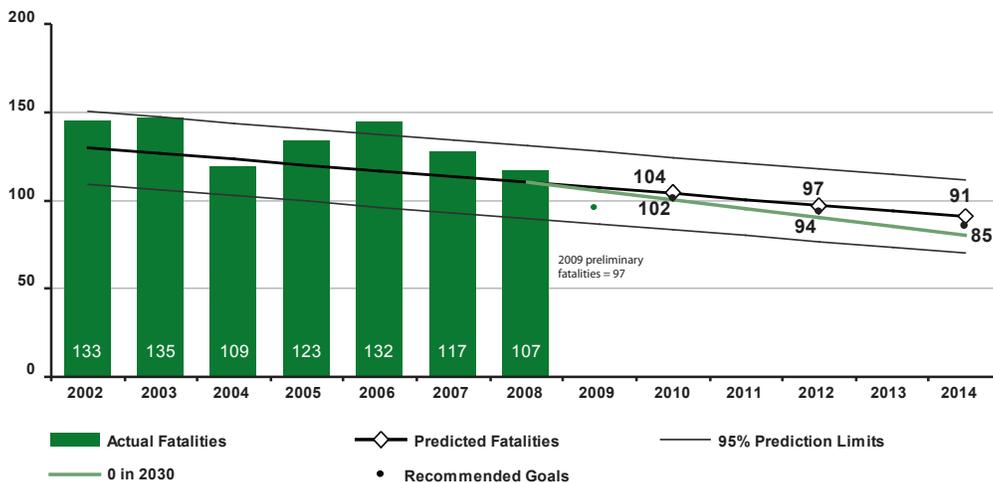
Angle crashes are the number one fatal or serious injury intersection-related crash type on all roadway facilities. Angle collisions usually involve vehicles turning in front of an oncoming vehicle, or vehicles entering an intersection at 90 degrees in front of an oncoming vehicle. Between 2006 and 2008, angle crashes were responsible for 184 fatalities and 1,345 serious injuries, 52% and 46%, respectively, of all intersection-related fatalities and serious injuries. Other common fatal and serious injury collisions at intersections

include pedestrian or bicyclist involved collisions (22%) and rear-end collisions (12%).

From 2006-2008, speed was a factor for 13% of drivers involved in fatal or serious injury intersection-related crashes; impairment was a factor 11% of the time. Addressing these issues with related strategies will help reduce fatalities and serious injuries involving intersections. It should be noted that, while significant, this is a relatively low percentage for these factors as compared to most other types of collisions in *Target Zero*.

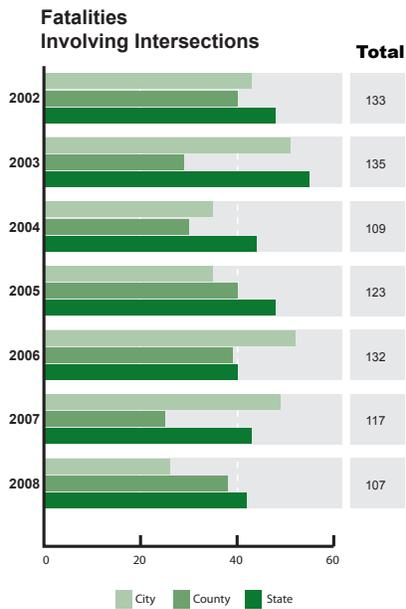
A major goal of intersection safety is not only to improve intersections for motor vehicles, but also for the pedestrians and bicyclists who use them. We can reduce the opportunities for pedestrian collisions by adjusting signal timing so pedestrians have enough lead time to cross ahead of turning vehicles, creating “refuge” islands in the middle of crossings, and installing lighting for pedestrians. Other solutions include providing more guidance to drivers at intersections, such as installing flashing yellow arrows, better signing and striping, and illumination at nighttime. Bicyclist safety at intersections can be improved with the installation of colored bicycle lanes and bicycle boxes.

## Fatalities Involving Intersections: Trends, Forecasts, and Goals

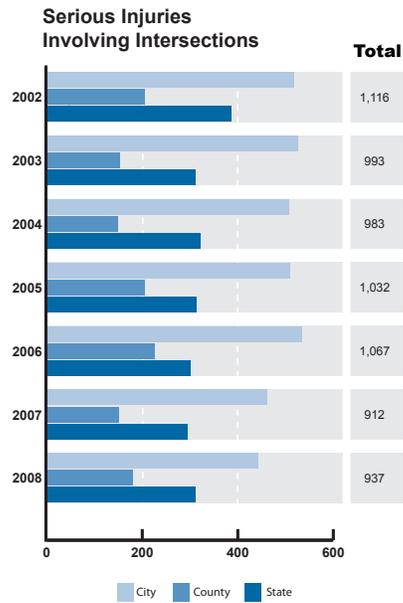


Reducing the number of conflict points for roadway users will also reduce collisions. This can be done with improvements like roundabouts and turn lanes, operational restrictions with signs or signals, and modifications in vehicle access, such as reducing the number of driveways in or adjacent to intersections.

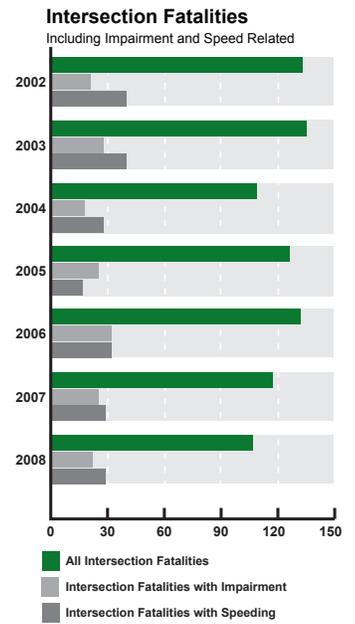
# Priority Level Two: Intersections



Source: WSDOT Collision Database

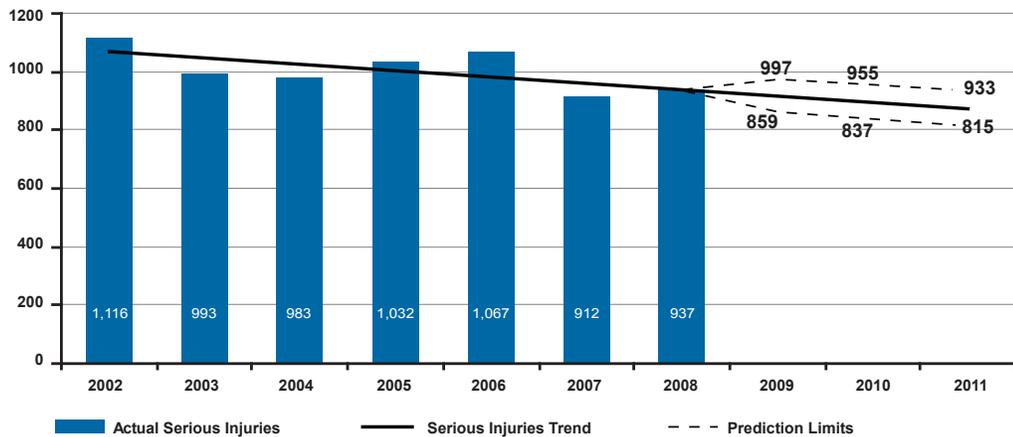


Source: WSDOT Collision Database



Source: WSDOT Collision Database

## Serious Injuries Involving Intersections: Trends and Forecasts



Source: WSDOT Collision Database

# Priority Level Two: Intersections

## 2.5 Strategies to Reduce Intersection-Related Collisions

### 2.5.A Reduce motor vehicle collisions at intersections

- 2.5.A1 Implement traffic control and operational improvements where appropriate:
- Optimize clearance intervals. (P)
  - Improve signal timing to reduce rear-end collisions.
  - Employ emergency vehicle preemption. (P)
  - Remove unwarranted signals. (P)
  - Employ flashing yellow arrows at signals. (E)
  - Limit turning movements at intersections to reduce conflict points.
  - Improve the pavement surface and/or establish better maintenance practices in regard to snow and ice control.

- 2.5.A2 Implement geometric improvements where appropriate:
- Provide left- and right-turn channelization when warranted. (P)
  - Reduce speeds at intersections through engineering.
  - Install roundabouts and educate drivers. (P)

- 2.5.A3 Install illumination where appropriate. (P)

### 2.5.B Reduce the occurrence of existing driveways, and discourage the use of new driveways, within or adjacent to intersections

### 2.5.C Improve driver compliance at intersections

- 2.5.C1 Implement automated enforcement (cameras) of red-light running. (P)
- 2.5.C2 Provide targeted enforcement at intersections and intersection approaches. (P)
- 2.5.C3 Provide public information and education, especially related to bicycles and pedestrians. (T)

### 2.5.D Improve driver awareness of intersections

- 2.5.D1 Improve visibility of intersections on approaches. (T)
- 2.5.D2 Improve visibility of signals and signs at intersections. (T)
- 2.5.D3 Improve sight distances at intersections. (P)
- 2.5.D4 Provide advance warning of intersections. Provide advance warning signs at strategic locations, including real time flashing lights warning of traffic signals ahead and transverse rumble strips.

### 2.5.E Reduce vehicle collisions involving pedestrians and bicyclists at intersections

- 2.5.E1 Improve intersection geometry to increase bicycle and pedestrian safety; provide refuge islands and raised medians for pedestrians. (P)
- 2.5.E2 Improve signal timing for pedestrians, such as providing countdowns and crossing lead-times. (P)
- 2.5.E3 Improve pavement markings with high visibility crosswalks and bicycle lanes. (T)
- 2.5.E4 Install colored bicycle lanes and bicycle boxes. (E)
- 2.5.E5 Improve visibility for all users through pedestrian scale lighting at intersections. (E)
- 2.5.E6 Accommodate non-motorized users through roundabouts. (T)

P=Proven, T=Tried, E=Experimental