



# The National Intersection Safety Problem

## Identifying the Problem

In 2002 approximately 3.2 million intersection-related crashes occurred, representing 50 percent of all reported crashes. 9,612 fatalities (22 percent of total fatalities ) occurred at or within an intersection environment (See Table 1). The cost to society for intersection crashes is approximately \$96 billion a year. The number of fatal motor vehicle crashes at traffic signals is rising faster than any other type of fatal crash nationwide.



An intersection is, at its core, a planned point of conflict in the roadway system. With different crossing and entering movements by both drivers and pedestrians, an intersection is one of the most complex traffic situations that motorists encounter.

Add the element of speeding motorists who disregard traffic controls and the dangers are compounded.

Despite improved intersection design and more sophisticated applications of traffic engineering measures, the annual toll of human loss due to motor vehicle crashes has not substantially changed in more than 25 years.

Intersection safety is a national, state and local priority. Intersections represent a disproportionate share of the safety problem. As a result, organizations such as the Federal Highway Administration, the Institute of Transportation Engineers and AASHTO, AAA and other private and public organizations are devoting resources to help reduce the problem.

Table 1:  
Key 2002 National Highway and Traffic Administration (NHTSA) Statistics

	Number	Percentage	Societal Cost in Billion \$
Total fatality crashes	38,409		
Total intersection-related fatality crashes	8,760	22.8	22
Total injury crashes	1,929,000		
Total intersection-related injury crashes	1,066,000	55.3	69
Total property-damage-only (PDO) crashes	4,348,000		
Total PDO intersection-related crashes	2,092,000	48.1	5
All crashes	6,316,000		96
Total intersection-related crashes	3,170,000	50.2	
Total fatalities	42,815		
Fatalities at intersections	9,612	22.4	



U.S. Department of Transportation  
Federal Highway Administration



Institute of Transportation Engineers

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Figure 1 shows the 2002 percentage of fatal intersection crashes, by type of traffic control present at the intersection. As shown, there is a balanced distribution of fatal crashes occurring at a traffic signal and a stop sign (approximately one in three crashes each occur at a signal and stop sign.) It is noteworthy that almost one in three crashes occur in locations that have no traffic controls present. A street "with no traffic control" is one where there is no control signal or stop sign for traffic on the street being crossed.

Figure 2 shows the distribution of the 8,760 fatal intersection crashes by manner of collision. As shown, the side impact crashes are the most predominate crash type. Side impact crashes account for over 60 percent of the fatal intersection collisions. Rear-end and head-on crash types each account for five percent of fatal intersection crashes. Almost one in three fatal crashes at intersections do not involve a collision with another motor vehicle that is in motion.

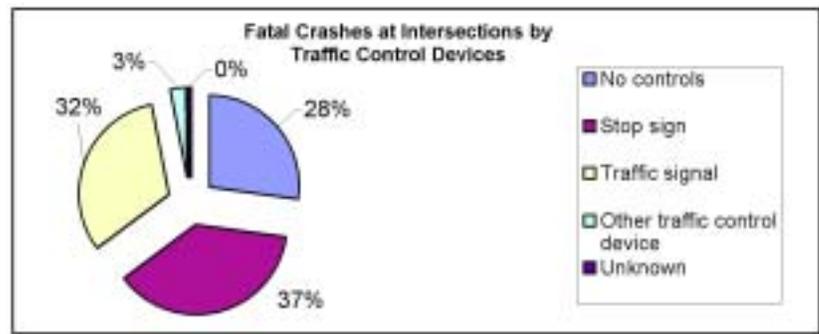


Figure 1



Figure 2

## Designing and Operating Intersections for All Users

Transportation engineers must design and operate intersections for all users including

- ◆ pedestrians
- ◆ bicyclists
- ◆ older drivers and younger drivers
- ◆ pedestrians of all ages and cognitive and physical abilities/disabilities
- ◆ transit/light rail/trolley vehicles
- ◆ trucks including loading/unloading maneuvers
- ◆ emergency vehicles
- ◆ proximate driveways serving commercial properties
- ◆ commuters

There *will* be tradeoffs regarding capacity, priority, and operations of an intersection—that is a given. These tradeoffs can only be made when good information is provided to policymakers regarding both dominant and special user populations within and proximate to an intersection.

## Tackling the Intersection Safety Problem Requires a Multi-disciplinary Approach

Intersection safety is a complex public health issue that cannot always be solved by making changes in signs and signals, but can be helped by a national comprehensive effort of improved intersection vehicle and pedestrian safety management.

The following actions address ways to achieve substantial reductions in annual crashes, injuries and fatalities:

- ◆ **Analyze the reasons for traffic conflicts at intersections.** Multi-disciplinary teams (engineers, enforcement, human factors professionals, etc) are recommended since they can have a broader perspective on crash causes.
- ◆ **Engage in innovative and strategic thinking.** Engineers

must delicately balance the requirement for efficient traffic movement and congestion reduction and, at the same time, the need to protect vehicle occupants and pedestrians from the consequences of dangerous vehicle maneuvers and unwise pedestrian behavior.

- ◆ **Modify the intersection design and operations** based on engineering analysis
- ◆ **Identify the safety benefits of reconstruction or construction projects and/or operational changes that are planned at intersections.** Select alternatives that have the greatest safety benefit. Integrate safety evaluations of projects into the planning and design processes.
- ◆ **Provide sustained and consistent law enforcement efforts.**
- ◆ **All levels of government must play a central role** by providing improved funding, and cooperation with highway and vehicle engineers, health care authorities, law enforcement, national safety organizations, and local citizen safety groups.