

# STAYING SAFE

## REDUCING TRAFFIC STOP INJURIES



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# INTRODUCTION

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Police and highway patrol officers put their lives on the line every day. They accept this risk as part of their duty to serve and protect. Law enforcement administrators remain committed to doing all they can to reduce possible risks to the lives of their officers. A rising threat to officer safety is the danger of being hit by passing vehicles during traffic stops.

Reports issued by the FBI state that the number of law enforcement officers who died in 2012 and 2013 from being struck by passing vehicles was double the level of those in 2011. This fact is surprising and discouraging, given the implementation of move-over/slow-down laws in most states, as well as the initiatives taken to improve traffic stop training and techniques.

In this guide, we examine the problem of officer deaths and injuries due to being hit during traffic stops. We will also explore how administrators can increase on-the-job safety for officers who continually face this risk.

The first steps to increasing safety for police officers are understanding the problem and raising awareness. In order to facilitate this, a study was conducted to investigate prior report data and also to gather new research through awareness surveys completed by law enforcement professionals.

# PRIOR REPORTS REGARDING HIGHWAY PATROL OFFICER SAFETY

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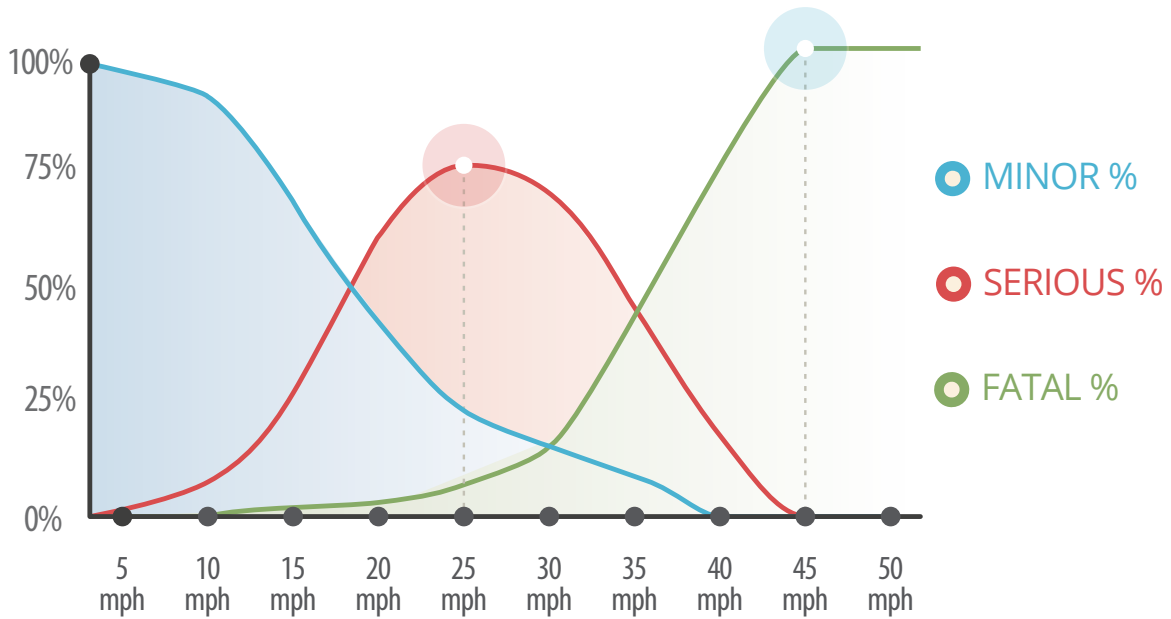
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The **Law Enforcement Officers Killed and Assaulted (LEOKA)**<sup>1</sup> report is an annual report published by the FBI, which provides information about the officers who were killed, feloniously or accidentally, and those officers who were assaulted while performing their duties.

The most recent LEOKA data (2014) includes a list of accidental officer death causes in the last decade. According to the report, being hit by a vehicle is the second most frequent accidental cause of officer deaths. The number of officers lost due to being struck by a vehicle while performing duties outside of their patrol vehicle was 96 in the past ten years. Among total accidental officer deaths, one in six were found to be the result of being struck by a passing vehicle.

Fatalities are only one part of the problem, as many officers are also injured by passing vehicles. An important study performed in the UK by **Ashton and MacKay**<sup>2</sup> provides insight into the injury level associated with vehicle collisions with pedestrians. This study provides data on the severity of the pedestrian injuries vs. the collision speed (See [Figure 1](#)).

**Figure 1: Type of injury sustained by pedestrian vs. vehicle speed**



The study then re-examined data on the severity of collisions of pedestrians with the fronts of vehicles. Using their Abbreviated Injury Scale (AIS), Ashton and Mackay assign a numeric score to levels of injury (See Figure 2).

- Below 15 mph - collisions result mostly in minor injuries, corresponding to AIS level 1.
- From 15 mph to 30 mph - most collisions result in serious injury, as shown in AIS levels 2 - 5.
- Above 30 mph, the level of fatal injuries increases dramatically, and at 40 mph, more than 80% of injuries result in death.
- In speed zones 45 mph and up, where most traffic stops occur, the collision fatality rate jumps to nearly 100%.

**Figure 2: Abbreviated Injury Scale**

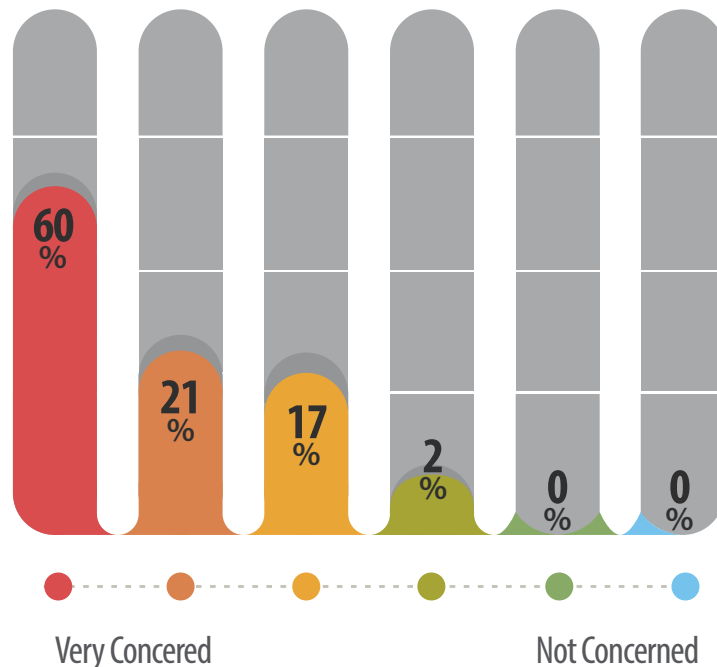
AIS SCORE	INJURY LEVEL
1	Minor
2	Moderate
3	Serious
4	Severe
5	Critical
6	Fatal

While the Ashton and Mackay study examined injuries caused by the fronts of vehicles, many of the injuries suffered by officers working traffic stops result from glancing blows.

# LAW ENFORCEMENT PROFESSIONALS PERCEPTIONS SURVEY

In the interest of gaining a more comprehensive view of the overall incidence of officers being killed or injured by passing vehicles, a survey was conducted to review officer experiences and perceptions. Participants were asked to rate their level of concern regarding the risk of being struck by a vehicle during a traffic stop.

**Figure 3: Patrol officer level of concern that him/herself or a fellow officer will be struck by a passing vehicle during a traffic stop.**

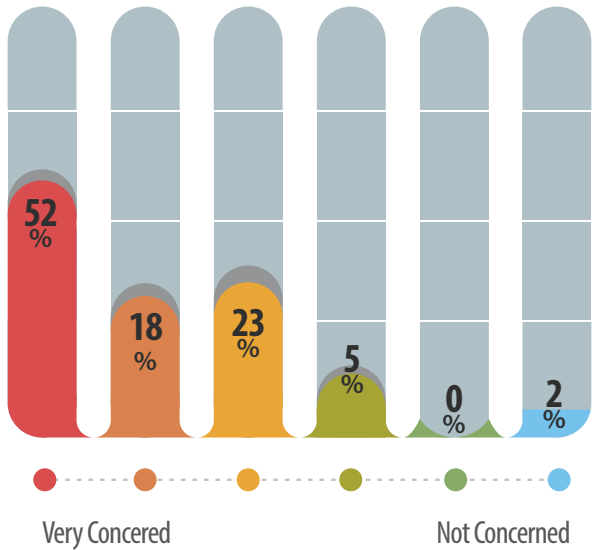


In breaking down the respondents, a difference in perception was noted between command personnel and patrol officers in terms of the risk of being killed or injured by a passing vehicle. (See [Figures 3 and 4.](#))

Overall, the concern for injury to themselves or to a fellow officer was greater

for patrol officers than it was for the command personnel. 81% of patrol officers rated their concern as high, while only 70% of the command-level respondents rated their concern at the same levels. This difference in perception demonstrates the need for further discussion to ensure that proper safety techniques and equipment are in place to protect officers. Command staff who are not accurately informed of patrol officer concerns are unlikely to lead the department in making necessary changes until an incident or a tragedy occurs.

**Figure 4: Command staff level of concern that him/herself or a fellow officer will be struck by a passing vehicle during a traffic stop.**

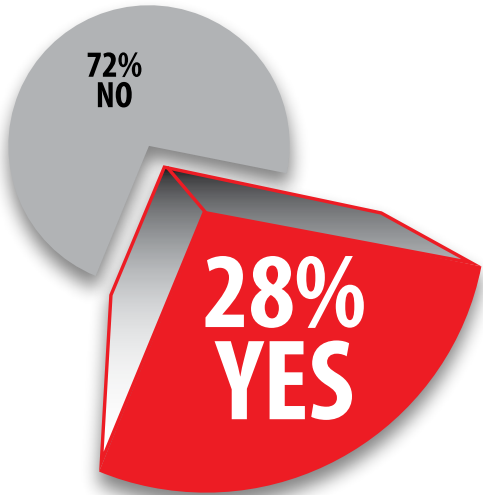


This survey also revealed that 28% of the participants reported that either they or an officer they know had been struck by a vehicle while conducting a traffic stop (See Figure 5).

The severity of the injuries that were sustained to themselves or to fellow officers were then categorized into three levels:

- Minor injuries, not requiring hospitalization
- Injuries that involved some level of hospital care
- Fatal injuries

The level of injury reported by the respondents is shown in Figure 6.



**Figure 5: Respondents who had been injured or have coworker who had been injured by being struck by vehicle during traffic stop**



Informal conversations with officers indicate that a large number of minor injuries were not reported and not widely known to fellow officers. For example, a large percentage of commercial vehicle officers interviewed reported being “grazed” or “clipped” by passing vehicles.

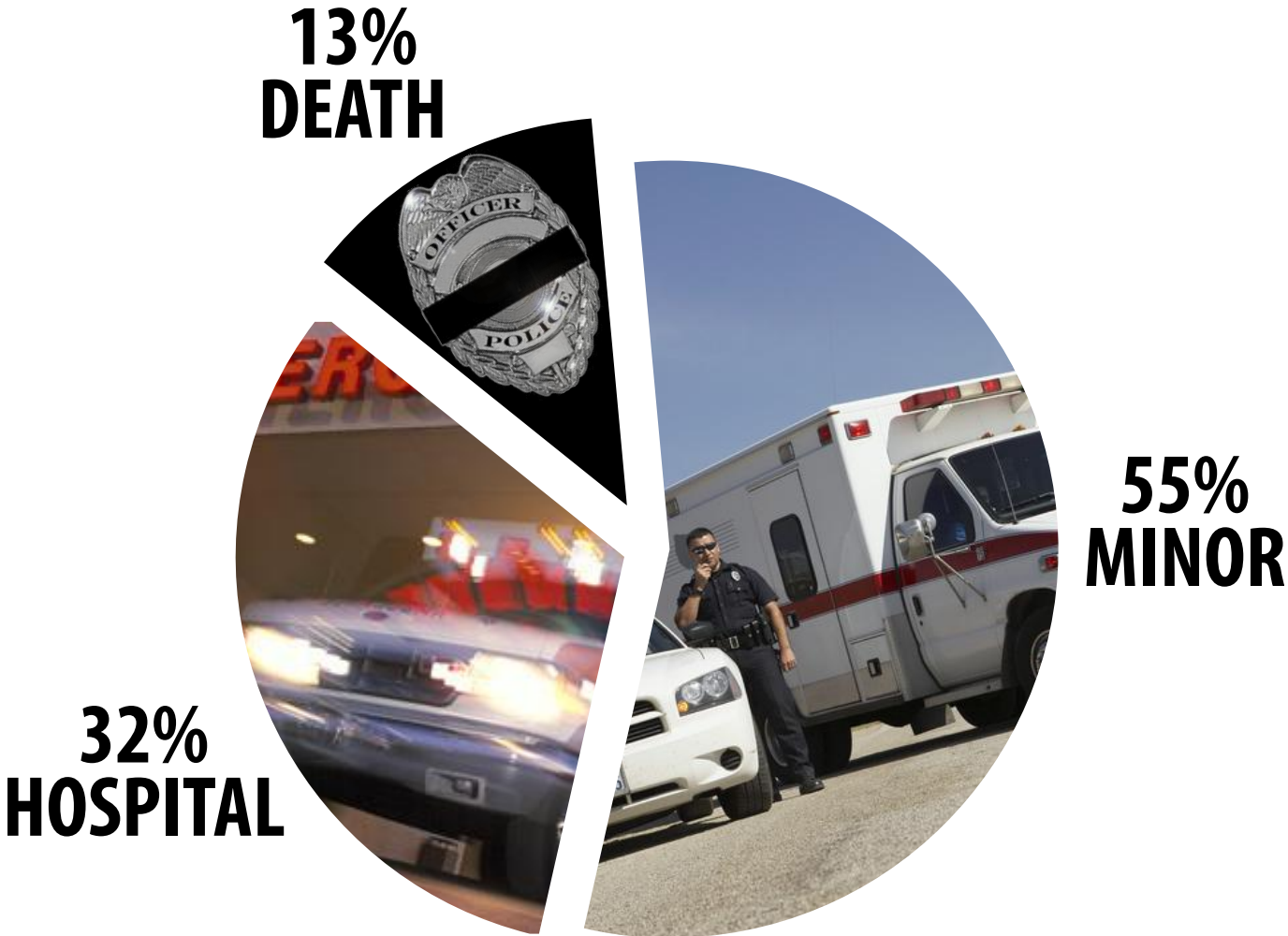


Figure 6: Level of injury, officer injuries reported in survey

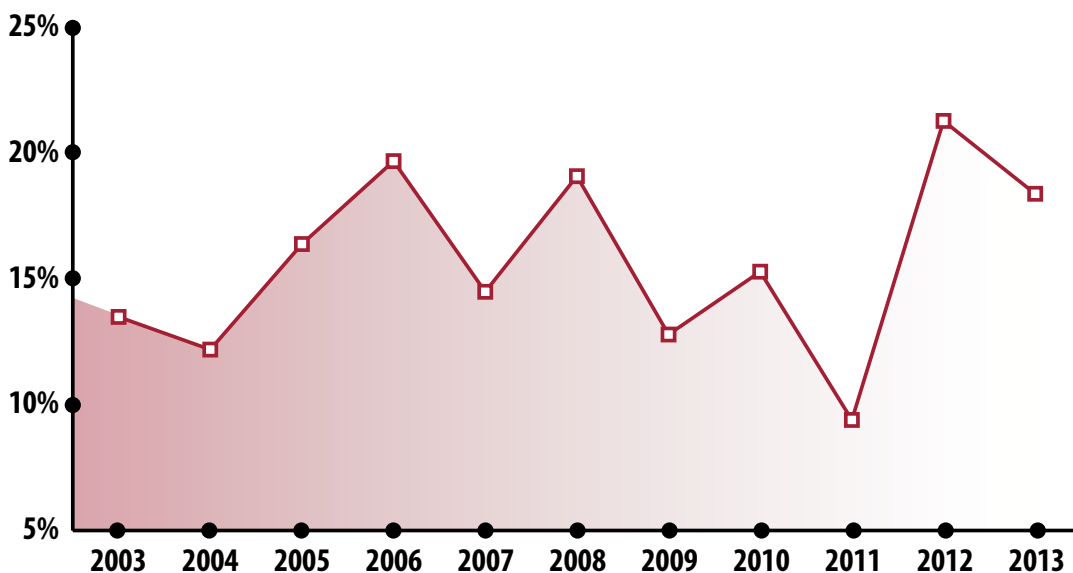
# LEGISLATIVE MEASURES AND TRAINING NOT HAVING ENOUGH IMPACT

Since 2003, the International Association of Chiefs of Police (IACP) Law Enforcement Stops and Safety (LESS) Subcommittee has led efforts to reduce officer deaths and injuries with new training and modified procedures for traffic stops. Many law enforcement agencies have adopted these new guidelines.

As of 2012, all 50 states have enacted laws requiring drivers to reduce speed and, if possible, move in the presence of an emergency vehicle. A majority of states have had these laws for over a decade.

Having laws and procedures in place is a start, however, it is necessary to examine how effective these changes have been. We would anticipate seeing a reduction in the number of injuries and fatalities as a result of these initiatives, however the data from the LEOKA study does not bear that out (See [Figure 7](#)).

**Figure 7: Percentage of Accidental Officer Deaths Attributed to Being Struck by A Vehicle**



Following a decline between 2008 to 2011, the percentage of deaths due to being struck by a vehicle actually increased in 2012 and 2013. There are several reasons why this might be the case:

- Drivers are failing to slow down for emergency vehicles on the roadside at rates higher than before the laws were enacted.
- The drivers who are most likely to hit an officer may not heed these laws, due to driver impairment, inattention or some other cause.

# SAFETYZONE™ OFFERS A TECHNOLOGY BASED SOLUTION

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In order to meet the challenge of keeping law officers safe during traffic stops, law enforcement agencies have looked to technology to offer a solution. A system that would warn the officer of a threatening vehicle or impending collision could provide officers with sufficient warning time to move out of the way of danger.



In 2006 and 2008 the California Highway Patrol issued a Request for Information “to find a cost effective solution to alert a patrol officer on a traffic stop when an errant vehicle has entered the shoulder zone and is approaching his or her location at high speed”. Both times this call went unanswered. But new, recently released technology has delivered on the warning system they envisioned - a system that “would integrate with existing patrol vehicle systems (i.e., sound the horn or chirp the siren, to sound the alert.)”<sup>3</sup>

## SafetyZone™

MPH Industries has developed a new radar system, Ranger® EZ radar, which includes a new technology called SafetyZone<sup>4</sup>. SafetyZone is designed to alert officers to the presence of vehicles who fail to slow down in response to their emergency lights. SafetyZone uses distance measuring technology to alert officers of vehicles only when they are within a defined distance of the patrol

vehicle. This system helps minimize false alarms. The alert can be installed to integrate with existing systems (for example, to “sound the horn or chirp the siren”, as in the CHP case above). SafetyZone delivers sufficient warning time to allow the officer to identify the approaching vehicle, assess the threat and act accordingly.

## SafetyZone watches your back, making you less vulnerable to bad drivers

*SafetyZone can alert you to dangerous drivers and allow you to move to safety. It can help you avoid injury or death. SafetyZone<sup>1</sup> is a standard feature of the Ranger traffic radar.*

Ranger alerts the officer so he can assess the danger, and move to safety if necessary.

This car is close enough, and fast enough to cause concern. It has not slowed down for his emergency lights.

Pickup is traveling in the other direction.

Truck is close enough, but not fast enough to cause concern

Semi is fast enough, but not close enough to cause concern

<sup>1</sup>SafetyZone cannot completely take the place of paying attention to the roadway. Even with SafetyZone, you need to pay attention to traffic and stay out of the path of vehicles.



**Figure 8: SafetyZone warning times are based on the distance setting and the speed of the approaching vehicle.**



**Figure 9: Alert time versus SafetyZone distance setting and vehicle speed**

SPEED	Vehicle Distance Setting							
	50 yds	100 yds	150 yds	200 yds	250 yds	300 yds	350 yds	400 yds
40 MPH	2.6 sec	5.1 sec	7.7 sec	10.2 sec	12.8 sec	15.3 sec	17.9 sec	20.5 sec
45 MPH	2.3 sec	4.5 sec	6.8 sec	9.1 sec	11.4 sec	13.6 sec	15.9 sec	18.2 sec
50 MPH	2.0 sec	4.1 sec	6.1 sec	8.2 sec	10.2sec	12.3 sec	14.3 sec	16.4 sec
55 MPH	1.9 sec	3.7 sec	5.6 sec	7.4 sec	9.3 sec	11.2 sec	13 sec	14.9 sec
60 MPH	1.7 sec	3.4 sec	5.1 sec	6.8 sec	8.5 sec	10.2 sec	11.9 sec	13.6 sec
65 MPH	1.6 sec	3.1 sec	4.7 sec	6.3 sec	7.9 sec	9.4 sec	11 sec	12.6 sec
70 MPH	1.5 sec	2.9 sec	4.4 sec	5.8 sec	7.3 sec	8.8 sec	10.2 sec	11.7 sec
75 MPH	1.4 sec	2.7 sec	4.1 sec	5.5 sec	6.8 sec	8.2 sec	9.5 sec	10.9 sec
80 MPH	1.3 sec	2.6 sec	3.8 sec	5.1 sec	6.4 sec	7.7 sec	8.9 sec	10.2 sec
85 MPH	1.2 sec	2.4 sec	3.6 sec	4.8 sec	6 sec	7.2 sec	8.4 sec	9.6 sec
90 MPH	1.1 sec	2.3 sec	3.4 sec	4.5 sec	5.7 sec	6.8 sec	8 sec	9.1 sec

MPH promotes SafetyZone as a major feature of its Ranger EZ radar, and many agencies have used the feature as a required specification item.

# CONCLUSION

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Improving officer safety is one of the highest priorities of law enforcement administrators. While many initiatives have been enacted to improve safety for highway patrol officers, studies show a clear need for further action to reduce fatalities and injuries. Additionally, research indicates that better communication within law enforcement agencies is needed to better understand the scope of the problem and risk.

We encourage command staff to review this information and to regularly meet with their patrol officers to determine the level of danger to which they are routinely subjected during traffic stops or other situations where officers are required to be outside their vehicles - (accidents, DWI checkpoints, etc.). Technology is available to assist patrol officers in these situations by alerting them to threatening vehicles and thereby giving them advance warning to take necessary action to avoid injury.

## REFERENCES

1. *Law Enforcement Officers Killed and Assaulted, Federal Bureau of Investigation. Reports available from FBI Uniform Crime Reports at <http://www.fbi.gov/about-us/cjis/ucr/ucr>.*
2. *Ashton, S.J and Mackay, G.M, Some Characteristics of the Population Who Suffer Trauma as Pedestrians When Hit by Cars and Some Resulting Implications, University of Birmingham, 1979.*
3. *Request for Information - High Speed Vehicle Alert Solution, 051-RFI-002, California Highway Patrol, 2008.*
4. *Information on MPH Industries' website: <http://www.mphindustries.com/safetyzone-technology/>.*