U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA

DOT HS 812 438 Summary of Statistical Findings January 2018

Occupant Fatalities in Law Enforcement Vehicles Involved in Motor Vehicle Traffic Crashes

Summary

From 1980 to 2015 there were 943 crashes involving at least one occupant fatality in a law enforcement vehicle. These 943 crashes involved 948 law enforcement vehicles. A total of 998 people were killed as occupants of law enforcement vehicles in these crashes. On an annual average, over the 6 years from 2010 to 2015, there were 24 fatalities, around 90 percent of whom were drivers of the law enforcement vehicles. This analysis examines the regional distribution of the occupant fatalities in law enforcement vehicles involved in motor vehicle crashes, and the crash characteristics using data from the Fatality Analysis Reporting System (FARS), which is maintained by the National Highway Traffic Safety Administration (NHTSA) and is currently the only database that contains detailed information on fatal crashes involving law enforcement vehicles.

Data and Limitation

FARS is a census of fatal traffic crashes within the 50 States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, and is the only database that includes detailed information about fatal crashes involving law enforcement vehicles.

In the FARS data, a police vehicle is defined as a vehicle equipped with police emergency devices (lights and siren) and owned or subsidized by any local, county, State, or Federal government entity. The police vehicle is presumed to be in special use at all times, although not necessarily in "emergency use." Vehicles not owned by government entities but that are used by law enforcement officers (e.g., undercover) are excluded. FARS only identifies law enforcement vehicles and does not contain any information indicating whether an occupant in a law enforcement vehicle is a member of law enforcement or not. Therefore, while the counts of occupants of law enforcement vehicles killed in traffic crashes should not be used as a direct number of law enforcement officers killed in traffic crashes, they may be used as an approximate indicator of the number of law enforcement officers' fatalities in motor vehicle crashes. Additionally, a law enforcement officer who may have been fatally injured in a non-law enforcement vehicle or as a pedestrian are not included in the analysis, as they cannot be identified as such in FARS. On the other hand, an occupant who was killed in a law enforcement vehicle but who may not be a law enforcement officer is included.

The Law Enforcement Officers Killed & Assaulted (LEOKA) data is another source that provides the total number of law enforcement officers killed in motor vehicle crashes. LEOKA data is collected and published annually by the FBI to provide information on the law enforcement officers who were killed feloniously or accidentally, as well as of those who were assaulted while performing their duties. Table 1 shows the number of law enforcement officers killed in automobile crashes, motorcycle crashes, or struck by vehicles during four time periods: 1980–1989, 1990–1999, 2000–2009, and 2010–2015. While LEOKA data reports a total count of law enforcement officers' fatalities, it does not contain the detailed crash information that NHTSA's FARS provides. This report analyzes law enforcement vehicle crashes with occupant fatalities using only FARS final files from 1980 to 2014 and the 2015 FARS Annual Report File. In comparison with the LEOKA data, the FARS data has a smaller number of fatalities in law enforcement vehicle crashes. The difference is primarily due to the following reasons.

- There are definitional differences between the two databases in describing law enforcement vehicles.
- FARS data has a requirement that the fatality must occur within 30 days of the crash, while the LEOKA data does not have such a requirement.
- FARS data depends on the State data filing requirements, while the LEOKA data does not.

FARS data is available at www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars, and LEOKA data is available at https://ucr.fbi.gov/leoka.

Table 1
Number of Law Enforcement Officers Killed by Automobile Crash, Motorcycle Crash, and Struck by Vehicle

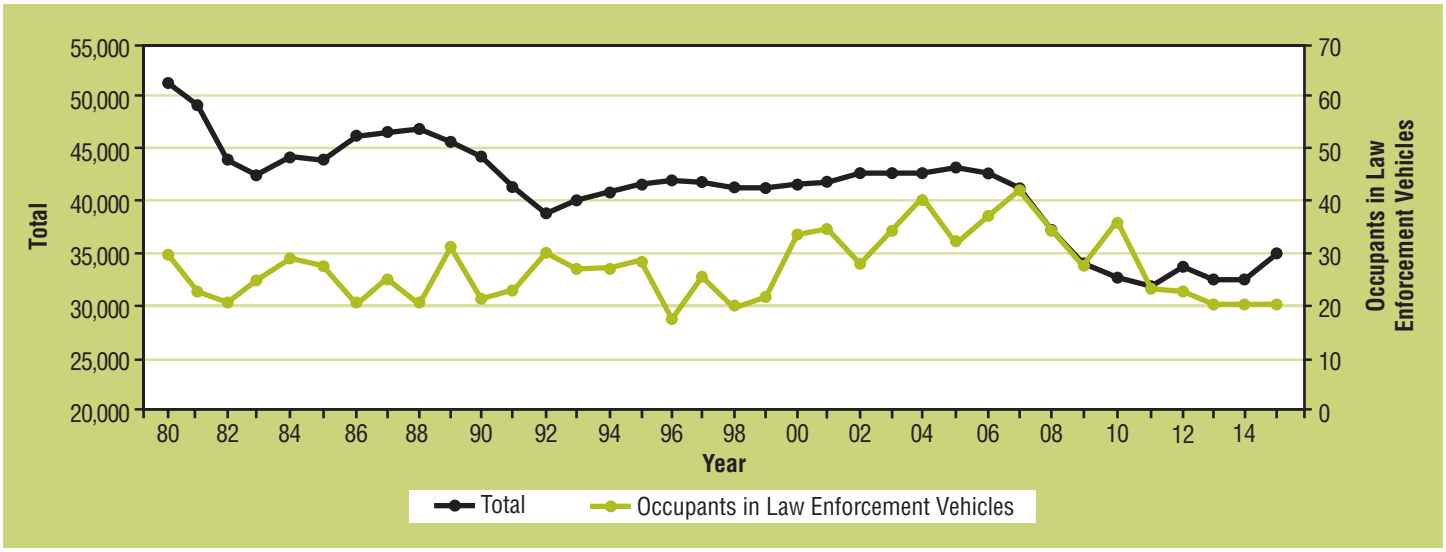
	Time Period				Total
	1980–1989	1990–1999	2000–2009	2010–2015	1980–2015
Automobile Crash	264	319	415	178	1,176
Motorcycle Crash	47	41	67	31	186
Struck by Vehicle	125	86	121	48	380

Source: LEOKA data, FBI, 1980–2015

Occupant Fatalities in Law Enforcement Vehicle Crashes

Figure 1 shows the number of occupant fatalities in law enforcement vehicles involved in traffic crashes, along with the total number of fatalities in the FARS data from 1980 to 2015. The number of occupant fatalities in law enforcement vehicles involved in traffic crashes was stable during the 1980s and 1990s, showed an increasing trend during the early and mid 2000s, and started decreasing at the end of the 2000s. Recently, the number returned to levels seen in the 1980s and 1990s.

Figure 1
Number of Fatalities in Motor Vehicle Crashes (1980–2015)



Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Summary Statistics of Occupant Fatalities in Law Enforcement Vehicles Involved in Traffic Crashes

Table 2 presents a summary of the motor vehicle crashes involving at least one occupant fatality in a law enforcement vehicle in FARS from 1980 to 2015, segmented into four time periods: 1980–1989, 1990–1999, 2000–2009, and 2010–2015. A total of 943 crashes each involved at least one occupant fatality in a law enforcement vehicle. Of those, 832 crashes had occupant fatalities in law enforcement passenger vehicles, and 111 crashes had fatalities on law enforcement motorcycles. These 943 crashes involved 948 law enforcement vehicles that each had at least one occupant fatality, and 36 law enforcement vehicles that had no occupant fatality. The crashes also involved 647 non-law enforcement vehicles, of which 78 vehicles had occupant fatalities, while 569 vehicles had no occupant fatalities. During the period of 1980 to 2015, a total of 998 people were killed as occupants of law enforcement vehicles, of which 887 were in passenger vehicles and 111 were on motorcycles. In addition, the law enforcement vehicle crashes with occupant fatalities resulted in fatalities of 101 people who were not in law enforcement vehicles.

As indicated in the trend shown in Figure 1, the number of occupant fatalities in law enforcement vehicles, which

increased in the 2000s, returned to the previous level in recent years. On average, 35 occupants of law enforcement vehicles were killed every year in motor vehicle crashes during the period of 2000 to 2009, which was a 40-percentage-point increase from the average of 25 occupant fatalities during the period of 1980 to 1999. In recent years, from 2010 to 2015, an average of 24 occupants of law enforcement vehicles were killed in motor vehicle crashes, which is the same level as the period of 1980 to 1999.

Table 2
Summary Statistics of the Motor Vehicle Crashes Involving at Least One Occupant Fatality in a Law Enforcement Vehicle

	Time Period				Total
	1980–1989	1990–1999	2000–2009	2010–2015	1980–2015
Crashes With Occupant Fatalities in Law Enforcement Vehicles	**231**	**233**	**335**	**144**	**943**
in Passenger Vehicle	207	203	297	125	832
on Motorcycle	24	30	38	19	111
Law Enforcement Vehicles With Occupant Fatalities	**233**	**233**	**337**	**145**	**948**
Passenger Vehicle	209	203	299	126	837
Motorcycle	24	30	38	19	111
Law Enforcement Vehicle Without Occupant Fatalities	8	8	13	7	36
Non-Law Enforcement Vehicle With Occupant Fatalities	22	23	29	4	78
Non-Law Enforcement Vehicle Without Occupant Fatalities	145	137	187	100	569
Occupant Fatalities in Law Enforcement Vehicle (Annual Average)	**255 (26)**	**248 (25)**	**349 (35)**	**146 (24)**	**998 (28)**
in Passenger Vehicle	231	218	311	127	887
on Motorcycle	24	30	38	19	111
Fatalities by Occupant Type					
Driver	209	212	308	133	862
Passenger	46	36	37	9	128
Occupant of a Motor Vehicle Not in Transport	–	–	4	4	8
Fatalities (Not Occupant of Law Enforcement Vehicle)	27	28	39	7	101

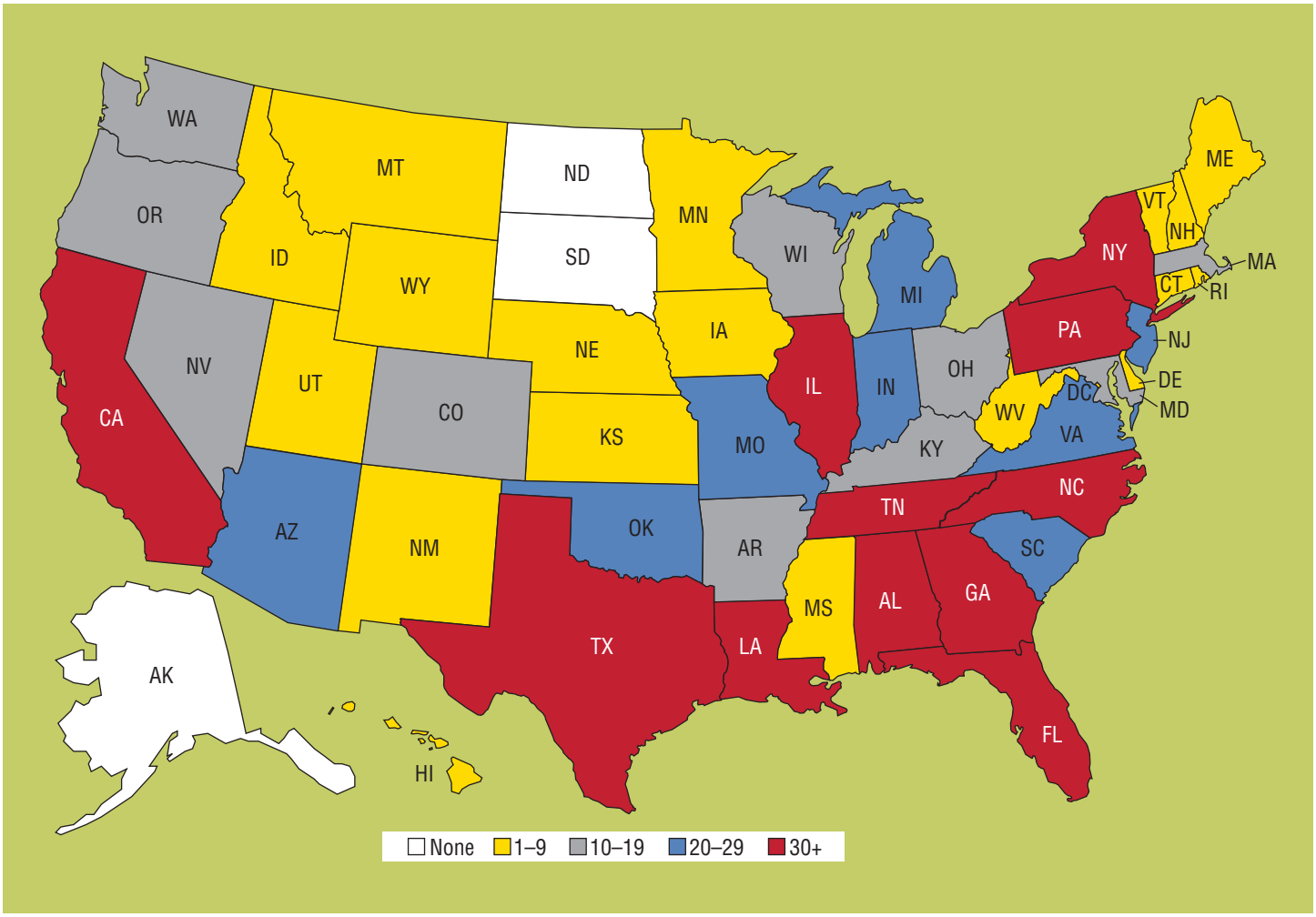
Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Regional Distribution of Occupant Fatalities in Law Enforcement Vehicles Involved in Traffic Crashes

Figure 2 shows the geographic distribution of occupant fatalities in law enforcement vehicles involved in traffic crashes in the United States from 1980 to 2015. California recorded the highest number (117, 11.7%), followed by Texas (95, 9.5%), Georgia (57, 5.7%), Florida (46, 4.6%), New York (45, 4.5%), Alabama (42, 4.2%), and Tennessee (40, 4.0%).

Figure 2

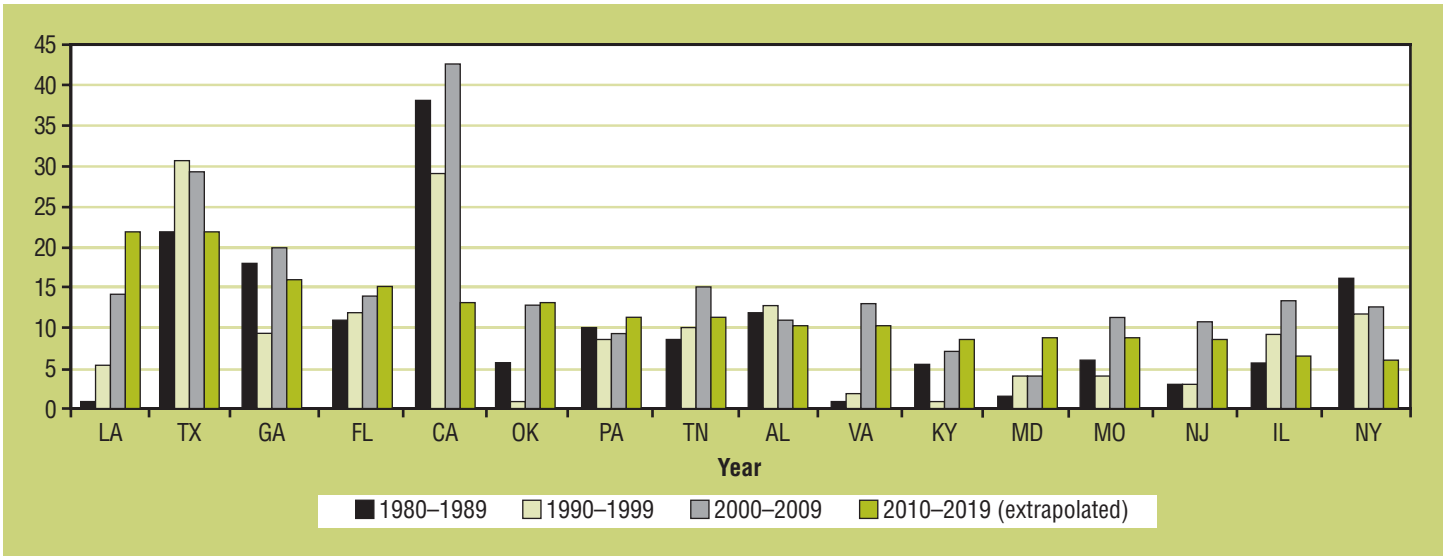
Number of Occupant Fatalities in Law Enforcement Vehicles Involved in Traffic Crashes (1980–2015)



Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Figure 3 shows the number of occupant fatalities in law enforcement vehicles involved in traffic crashes by four time periods for 16 States that have at least 4 fatalities from 2010 to 2015. (For all 50 States and the District of Columbia, see the Appendix: Number of Occupant Fatalities in Law Enforcement Vehicles Involved in Traffic Crashes, by State). In this figure, the number of occupant fatalities in law enforcement vehicles involved in traffic crashes during the 6 years from 2010 to 2015 was extrapolated to the numbers in 10 years from 2010 to 2019 by multiplying a factor of 10/6 to compare with the numbers during the other time periods which have a 10-year span. Texas and Georgia have high frequencies of occupant fatalities in law enforcement vehicles involved in traffic crashes over all four time periods. On the other hand, California, which had the highest or the second highest number for the past three time periods, showed a sharp decrease in recent years. The number of occupant fatalities in law enforcement vehicles involved in traffic crashes shows increasing trends in Louisiana and Florida, while it has decreased gradually in New York and Alabama.

Figure 3
Number of Occupant Fatalities in Law Enforcement Vehicles Involved in Traffic Crashes, by State*



*These States have at least four occupant fatalities in law enforcement vehicles involved in traffic crashes during 2010 to 2015 and are sorted by those numbers.
Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Characteristics of Crashes With Occupant Fatalities in Law Enforcement Vehicles

Month of the Crash

The monthly frequency distributions of the motor vehicle crashes with occupant fatalities in law enforcement vehicles are shown in Table 3. Over the entire period from 1980 to 2015, the month of May saw the highest number (97, 10.3%) of those crashes. This was followed by July (93, 9.9%) and October (92, 9.8%). The lowest number (59, 6.3%) of those crashes was recorded in December. The monthly frequency distribution of the crashes with occupant fatalities in law enforcement vehicles shows a different pattern during the period of 2010 to 2015. In this period, the highest number of crashes (15, 10.4%) occurred in June, September, and December, while the lowest number (8, 5.6%) of crashes occurred in November. On the other hand, May had the second lowest number of crashes (10, 6.9%), along with February and August.

Table 3
Crashes With Occupant Fatalities in Law Enforcement Vehicles, by Month

	1980–1989	1990–1999	2000–2009	2010–2015	Total
January	18	20	27	13	78
February	17	23	25	10	75
March	14	23	24	13	74
April	14	22	22	12	70
May	28	23	36	10	97
June	17	12	27	15	71
July	26	22	33	12	93
August	18	21	29	10	78
September	24	15	30	15	84
October	21	21	39	11	92
November	19	19	26	8	72
December	15	12	17	15	59
Total	**231**	**233**	**335**	**144**	**943**

Source: FARS 1980–2014 Final Files, 2015 Annual Report File

First Harmful Event, and Manner of Collision of the Crash

In FARS, the "first harmful event" is defined as the first property damage (including to vehicles) or injury-producing event in a fatal crash. Table 4 shows the frequency distribution of the first harmful event of the crashes with occupant fatalities in law enforcement vehicles during the period of 1980 to 2015. "Collision with motor vehicle

in transport" accounted for 52 percent of the crashes with occupant fatalities in law enforcement passenger vehicles, followed by "collision with fixed object" (37%), and "rollover" (5%). In the case of the crashes with occupant fatalities on law enforcement motorcycles, "collision with motor vehicle in transport" (82%) was much higher compared to that of the passenger vehicle crashes, while "collision with fixed object" (10%) was much lower. Here "motor vehicle in transport" means that the motor vehicle is in motion or on the roadway portion of a trafficway.

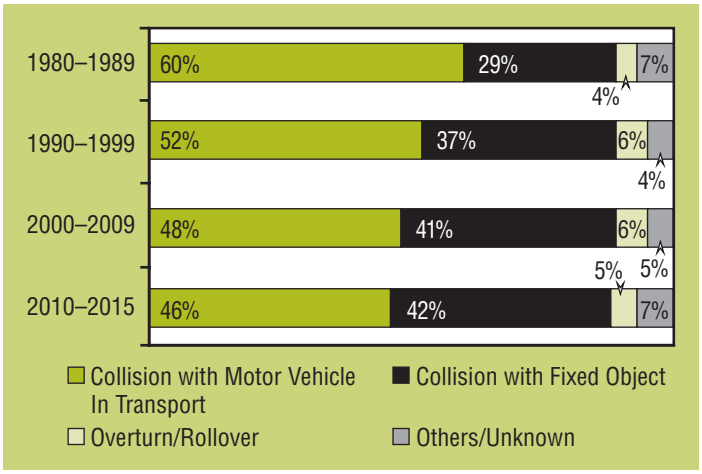
Figure 4 shows the percentages of the crashes with occupant fatalities in law enforcement passenger vehicles by the first harmful event for the four time periods: 1980–1989, 1990–1999, 2000–2009, and 2010–2015. "Collision with motor vehicle in transport" decreased gradually from 60 percent in the 1980s, to 52 percent in the 1990s, to 48 percent in the 2000s, and to 46 percent in the 2010s. On the contrary, "collision with fixed object" increased from 29 percent to 37 percent, to 41 percent, and then to 42 percent, respectively, in these four time periods. "Rollover" remained around 5 percent over the entire period.

For crashes in which the first harmful event is "collision with motor vehicle in transport," the distribution over the manner of the collision is shown in Table 4. More than half of the passenger vehicle crashes were angle crashes (56%), followed by head-on crashes (26%), rear-end crashes (13%), and sideswipe crashes (5%). On the other hand, motorcycle crashes had mostly angle collisions (63%), followed by rear-end (14%), head-on (13%), and sideswipe (10%).

Table 4
Crashes With Occupant Fatalities in Law Enforcement Vehicles, by First Harmful Event and Manner of Collision (1980–2015)

	Passenger Vehicle		Motorcycle		Total	
	Number	Percent	Number	Percent	Number	Percent
First Harmful Event						
Collision With Motor Vehicle In Transport	432	51.9%	91	82.0%	523	55.5%
Collision With Fixed Object	307	36.9%	11	9.9%	318	33.7%
Overturn/Rollover	44	5.3%	8	7.2%	52	5.5%
Others	49	5.9%	1	0.9%	50	5.3%
Total	832	100.0%	111	100.0%	943	100.0%
Manner of Collision With Motor Vehicle In Transport						
Angle	241	55.8%	57	62.6%	298	57.0%
Head-On	113	26.2%	12	13.2%	125	23.9%
Rear-End	55	12.7%	13	14.3%	68	13.0%
Sideswipe	20	4.6%	9	9.9%	29	5.5%
Others/Unknown	3	0.7%	–	–	3	0.6%
Total	432	100.0%	91	100.0%	523	100.0%

Figure 4
Crashes With Occupant Fatalities in Law Enforcement Passenger Vehicles, by First Harmful Event



Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Emergency Use, Fire Occurrence, and Rollover of the Vehicle

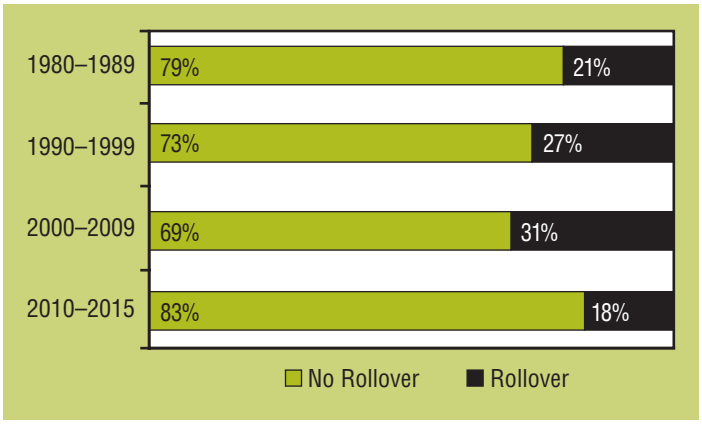
Emergency use, fire occurrence, and rollover of the law enforcement vehicles with occupant fatalities at the time of the crashes are shown in Table 5. Emergency use refers to a vehicle that is traveling with physical emergency signals in use such as red lights blinking and siren sounding, etc. Forty-two percent of the law enforcement passenger vehicles and 36 percent of law enforcement motorcycles with occupant fatalities were emergency-use vehicles in the FARS data. Fire occurred in 11 percent of the law enforcement passenger vehicles and 5 percent of the law enforcement motorcycles with occupant fatalities. Rollover data shows that 25 percent of the law enforcement passenger vehicles with occupant fatalities rolled over.

Figure 5 shows that 21 percent of the law enforcement passenger vehicles with occupant fatalities rolled over in the 1980s. It increased to 27 percent in the 1990s and to 31 percent in the 2000s. However, rollover of the law enforcement passenger vehicles with occupant fatalities decreased to 18 percent in the 2010s, which is the lowest level among the four time periods.

Table 5
Law Enforcement Vehicles With Occupant Fatalities, by Emergency Use, Fire Occurrence, and Rollover (1980–2015)

	Passenger Vehicle		Motorcycle		Total	
	Number	Percent	Number	Percent	Number	Percent
Emergency Use						
No/Unknown	486	58.1%	71	64.0%	557	58.8%
Yes	351	41.9%	40	36.0%	391	41.2%
Total	837	100.0%	111	100.0%	948	100.0%
Fire Occurrence						
No	747	89.2%	106	95.5%	853	90.0%
Yes	90	10.8%	5	4.5%	95	10.0%
Total	837	100.0%	111	100.0%	948	100.0%
Rollover						
No Rollover	625	74.7%	111	100.0%	736	77.6%
Rollover	212	25.3%	–	–	212	22.4%
Total	837	100.0%	111	100.0%	948	100.0%

Figure 5
Law Enforcement Passenger Vehicles With Occupant Fatalities, by Rollover



Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Restraint System Use and Ejection

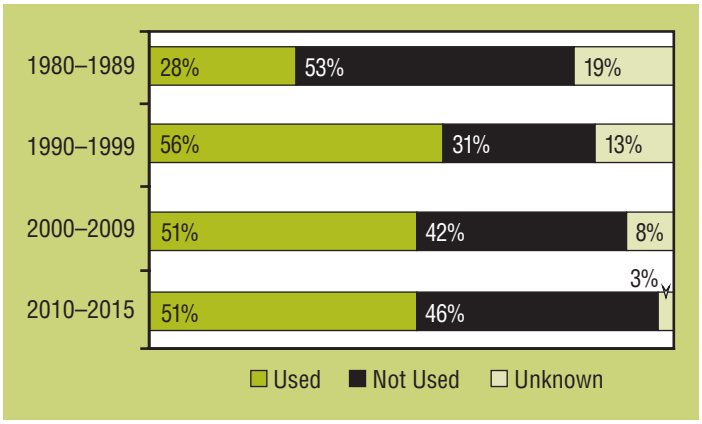
Table 6 shows the frequency distribution of restraint system use (seat belts or helmets) and ejection status for the occupant fatalities in law enforcement vehicles from 1980 to 2015. Restraint system use data shows that 46 percent of the occupants killed in law enforcement passenger vehicles involved in traffic crashes used restraint systems such as shoulder belts, lap belts, lap-and-shoulder belts, or other types, while 43 percent did not use any restraint system. Of the occupants killed on law enforcement motorcycles, 93 percent were wearing helmets at the time of the crashes, but 4 percent were not. Ejection refers to a person being thrown from a compartment of a motor vehicle during the course of the crash. Of the 887 occupants killed in law enforcement passenger vehicles, 18 percent were ejected. When reviewed by ejection types, 15 percent were totally ejected and 3 percent were partially ejected.

As shown in Figure 6, of occupants killed in law enforcement passenger vehicles, 28 percent used restraints and 53 percent did not use restraints in the 1980s. In the 1990s, the restraint system use increased by 28 percentage points, resulting in 56 percent of "used" and 31 percent of "not used." Restraint system use data of occupant fatalities in law enforcement passenger vehicles showed that restraint system use decreased to 51 percent in the 2000s and remained at the same level in the 2010s, while the percentage of not using restraint system use increased from 42 percent in the 2000s and to 46 percent in the 2010s.

Table 6
Occupant Fatalities in Law Enforcement Vehicles, by Restraint System Use and Ejection (1980–2015)

	Passenger Vehicle		Motorcycle		Total	
	Number	Percent	Number	Percent	Number	Percent
Restraint System Use (Belts or Helmets)						
Used	410	46.2%	103	92.8%	513	51.4%
Not Used	378	42.6%	4	3.6%	382	38.3%
Unknown	99	11.2%	4	3.6%	103	10.3%
Total	887	100.0%	111	100.0%	998	100.0%
Ejection						
Not Ejected	723	81.5%	111	100.0%	834	83.6%
Totally Ejected	131	14.8%	–	–	131	13.1%
Partially Ejected	30	3.4%	–	–	30	3.0%
Unknown	3	0.3%	–	–	3	0.3%
Total	887	100.0%	111	100.0%	998	100.0%

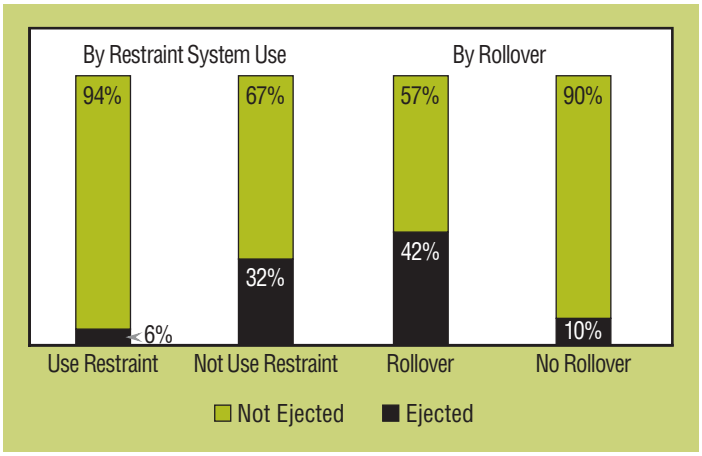
Figure 6
Occupant Fatalities in Law Enforcement Passenger Vehicles, by Restraint System Use



Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Ejection data of occupant fatalities in law enforcement passenger vehicles was analyzed, along with restraint system use and rollover that are considered to be associated with ejection. Figure 7 shows that 6 percent of the occupant fatalities who used restraint systems in law enforcement passenger vehicles were ejected. However, 32 percent of those who did not use restraints were ejected. On the other hand, 42 percent of the occupant fatalities in law enforcement passenger vehicles that rolled over were ejected, while 10 percent of those in the passenger vehicles that did not roll over were ejected.

Figure 7
Ejection of Occupant Fatalities in Law Enforcement Passenger Vehicles, by Restraint System Use and Rollover* (1980–2015)

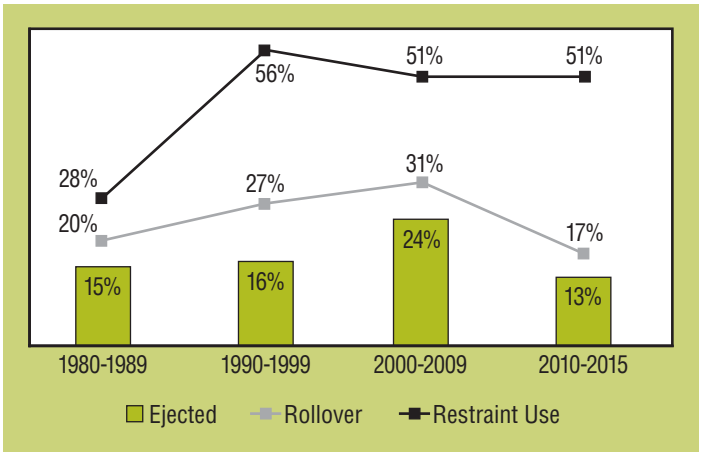


*Rollovers counted in person level.
Source: FARS 1980–2014 Final Files, 2015 Annual Report File

Figure 8 shows the percentage frequencies of the ejected, rolled over, and restrained occupant fatalities in law enforcement passenger vehicles for the four time periods. The ejected occupant fatalities from law enforcement passenger vehicles increased only 1 percentage point, from 15 percent in the 1980s to 16 percent in the 1990s, due to a large increase in restraint use (from 28% in the 1980s to 56% in the 1990s), while rollover increased 7 percentage points (from 20% in the 1980s to 27% in the 1990s). On the other hand, the ejected occupant fatalities from law enforcement passenger vehicles increased 8 percentage points, from 16 percent in the 1990s to 24 percent in the 2000s, because rollovers increased 4 percentage points (from 27% in the 1990s to 31% in the 2000s) and restraint use decreased 6 percentage points (from 56% in the 1990s to 50% in the 2000s). Recently, the ejected occupant fatalities from law enforcement passenger vehicles decreased 11 percentage points (from 24% in the 2000s to 13% in the 2010s) because rollovers decreased 14 percentage points (from 31% in the 2000s to 17% in the 2010s), but restraint use remained at 51 percent for both 2000s and 2010s.

Figure 8

Occupant Fatalities in Law Enforcement Passenger Vehicles by Rollover*, Restraint System Use, and Ejection



*Rollovers counted in person level.
Source: FARS 1980–2014 Final Files, 2015 Annual Report File

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U.S. Department of Transportation

National Highway Traffic Safety Administration

This research note and other general information on highway traffic safety may be accessed by Internet users at: www-nrd.nhtsa.dot.gov/CATS/index.aspx

Appendix: Number of Occupant Fatalities in Law Enforcement Vehicles Involved in Traffic Crashes by State*

	1980–1989	1990–1999	2000–2009	2010–2015	Total
Louisiana	1	6	14	13	34
Texas	22	31	29	13	95
Georgia	18	9	20	10	57
Florida	11	12	14	9	46
California	38	29	42	8	117
Oklahoma	6	1	13	8	28
Pennsylvania	10	8	9	7	34
Tennessee	8	10	15	7	40
Alabama	12	13	11	6	42
Virginia	1	2	13	6	22
Kentucky	6	1	7	5	19
Maryland	2	4	4	5	15
Missouri	6	4	12	5	27
New Jersey	3	3	11	5	22
Illinois	6	9	13	4	32
New York	16	12	13	4	45
Kansas	1	–	–	3	4
Massachusetts	4	5	4	3	16
Wisconsin	4	7	2	3	16
Arizona	9	9	8	2	28
Arkansas	7	3	1	2	13
Hawaii	1	2	2	2	7
Indiana	1	9	10	2	22
North Carolina	3	13	16	2	34
South Carolina	10	2	8	2	22
Colorado	2	2	5	1	10
Connecticut	1	2	4	1	8
District of Columbia	–	–	–	1	1
Iowa	1	1	–	1	3
Michigan	11	9	7	1	28
Mississippi	1	2	2	1	6
Ohio	5	4	7	1	17
Rhode Island	1	–	–	1	2
Utah	–	2	1	1	4
Washington	2	4	5	1	12
Delaware	–	1	–	–	1
Idaho	4	–	3	–	7
Maine	3	2	–	–	5
Minnesota	3	2	3	–	8
Montana	2	–	5	–	7
Nebraska	1	–	–	–	1
Nevada	–	2	8	–	10
New Hampshire	1	–	–	–	1
New Mexico	4	1	4	–	9
Oregon	5	6	2	–	13
Vermont	–	–	1	–	1
West Virginia	1	2	1	–	4
Wyoming	1	2	–	–	3
North Dakoda	–	–	–	–	–
South Dakoda	–	–	–	–	–
Alaska	–	–	–	–	–
Total	255	248	349	146	998

*States are sorted by the number of occupant fatalities in law enforcement motor vehicles involved in traffic crashes from 2010 to 2015.
Source: FARS 1980–2014 Final Files, 2015 Annual Report File