

# Transportation Safety by the Numbers

By Matthew Chambers

For the majority of Americans, driving or being a passenger in a motor vehicle is the most dangerous daily activity he or she will be undertaken.<sup>1</sup> However, everyone can take steps to drive safely, such as avoiding the deadly “Ds”—distracted or drunk driving. That is one of the reasons why transportation safety is a strategic priority of the U.S. Department of Transportation.

According to the Centers for Disease Control, accidents (unintentional injuries) are the 5<sup>th</sup> leading cause of death in the United States. Transportation accidents account for 31.9 percent of the accidental deaths reported in 2010.<sup>2</sup> Motor vehicle accidents or highway fatalities are responsible for the largest share, accounting for 93 percent of transportation-related deaths.<sup>3</sup> However, motor vehicle crashes have been trending downward, decreasing by 20.2 percent over the past 10 years, which has resulted in fewer motor vehicle fatalities and injuries.<sup>4</sup> Many safety factors, including the safety measures, have contributed to this decline.<sup>5</sup>



A MOTORCYCLIST IN FULL PROTECTIVE GEAR,  
INCLUDING A HELMET

Photo taken by M. Chambers

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<sup>1</sup> National Safety Council, *National Safety Month: Week 4*, available at <http://www.nsc.org/> as of June 2012.

<sup>2</sup> Centers for Disease Control, *National Vital Statistics Reports* (Volume 6, Number4), *Deaths: Preliminary Data for 2010* (Jan. 11, 2012), available at <http://www.cdc.gov/> as of June 2012.

<sup>3</sup> Centers for Disease Control, *National Vital Statistics Reports* (Volume 6, Number4), *Deaths: Preliminary Data for 2010* (Jan. 11, 2012), available at <http://www.cdc.gov/> as of June 2012.

<sup>4</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, *Fatality Analysis Reporting System*, available at <http://www.nhtsa.gov/fars>, as of June 2012.

<sup>5</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, *Fatality Analysis Reporting System*, available at <http://www.nhtsa.gov/fars>, as of June 2012. U.S. Department of Transportation, National Highway Traffic Safety Administration, *Transportation Safety Facts: Research Notes, 2010 Motor Vehicle Crashes: Overview* (February 2012), available at <http://www.nhtsa.gov/fars>, as of June 2012.

## Transportation Fatalities

Table 1 provides a breakdown of fatalities by mode of transportation. Overall, transportation fatalities have been declining with few exceptions such as motorcycle. For-hire<sup>6</sup> carriers and transportation professionals have better safety records than private operators. For instance, commercial ships and their seasoned crews accounted for 41 vessel-related fatalities while recreational boating experienced 672 fatalities. Transit fatalities have stayed about the same while transit ridership has significantly increased.<sup>7</sup>

**TABLE 1: Transportation Fatalities by Mode: Select Years 1990-2010**

Mode	1990	2000	2009	2010
Air (in aircraft and ground fatalities)				
Large U.S. air carrier	39	92	52	2
Commuter air carrier	6	5	0	0
On-demand air taxi	51	71	17	17
General aviation	770	596	478	450
Highway (in vehicle and non-occupants) <sup>a</sup>	44,599	41,945	33,883	32,885
Pipeline, gas and hazardous liquid	9	38	13	25
Railroad (on train and non-occupants) <sup>b</sup>	729	631	544	601
Transit <sup>c</sup>	235	208	224	215
Waterborne				
Vessel-related, commercial ship	85	53	49	41
Nonvessel-related <sup>d</sup> , commercial ship	101	69	58	43
Recreational boating	865	701	736	672

<sup>a</sup> Includes fatality at railroad crossings. <sup>b</sup> Incidents and accidents; includes commuter rail; excludes public highway-rail grade crossings involving motor vehicles. <sup>c</sup> All reportable incident and accident fatalities. <sup>d</sup> For example, a person on board stumbles falls overboard and drowns.

**SOURCES:** *Air:* National Transportation Safety Board. *Highway:* U.S. Department of Transportation, National Highway Traffic Safety Administration. *Rail:* Highway-rail grade crossings: U.S. Department of Transportation, Federal Railroad Administration. *Transit:* Highway-rail grade crossings: U.S. Department of Transportation, Federal Transit Administration. *Water: Vessel- and nonvessel-related:* U.S. Department of Homeland Security, U.S. Coast Guard. *Recreational boating:* U.S. Department of Homeland Security, U.S. Coast Guard. *Hazardous liquid and gas pipeline:* U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration as cited in U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics*, table 2-1, available at [http://www.bts.gov/publications/national\\_transportation\\_statistics/](http://www.bts.gov/publications/national_transportation_statistics/) as of December 2011.

<sup>6</sup> Refers to a vehicle operated on behalf of or by a company that provides transport services to its customers.

<sup>7</sup> Based upon Federal Transit Administration of the *National Transit Database Report Years 2000 to 2010 —Transit Safety and Security Statistics and Analysis Reporting*.

## Transportation Injuries

Table 2 shows injured persons by mode of transportation. The total number of injured persons has been declining. For instance, recreational boating injuries decreased by 6.1 percent in 2010. Transit-related injuries ticked upward by nearly 9.3 percent in 2010. This reduction could be attributed to the fact that the U.S. Coast Guard and its partners have taken efforts to educate boaters, especially since operator error accounts for 70 percent of boating accidents.<sup>8</sup>

**TABLE 2: Injured Persons by Transportation Mode: Select Years 1990-2010**

<b>Mode</b>	<b>1990</b>	<b>2000</b>	<b>2009</b>	<b>2010</b>
Air				
Large U.S. air carrier <sup>a</sup>	29	29	23	15
Commuter air carrier <sup>a</sup>	11	7	1	2
On-demand air taxi <sup>a</sup>	36	12	4	6
General aviation <sup>a</sup>	409	309	273	256
Highway <sup>b</sup>	3,230,666	3,188,750	2,217,000	2,243,000
Pipeline, gas and hazardous liquid	76	81	67	111
Railroad <sup>c</sup>	22,736	10,424	7,227	7,376
Transit <sup>d</sup>	54,556	56,697	21,420	23,414
Waterborne				
Vessel-related, commercial ship	175	150	196	139
Nonvessel-related, commercial ship <sup>e</sup>	U	607	377	417
Recreational boating	3,822	4,355	3,358	3,153

<sup>a</sup> Serious injuries only. <sup>b</sup> Vehicle occupants, motorcyclists, pedestrians, pedalcyclists, and other nonmotorists.

<sup>c</sup> Injuries from train accidents, train and nontrain incidents, and occupational illness. Includes Amtrak. Also includes train occupants and nonoccupants except motor vehicle occupants at grade crossings. <sup>d</sup> All accidents and reportable incidents. Since 2008, only injuries requiring immediate medical treatment away from the scene are reportable. Previously, any injury was reportable. Includes commuter rail. <sup>e</sup> Injuries unrelated to vessel operations.

**KEY:** U = unavailable.

**NOTE:** Reporting criteria and/or estimation methods for injuries are not standardized across modes.

**SOURCES:** *Air:* National Transportation Safety Board. *Highway:* U.S. Department of Transportation, National Highway Traffic Safety Administration. *Rail:* Highway-rail grade crossings: U.S. Department of Transportation, Federal Railroad Administration, *Transit:* Highway-rail grade crossings: U.S. Department of Transportation, Federal Transit Administration. *Water: Vessel- and nonvessel-related:* U.S. Department of Homeland Security, U.S. Coast Guard. *Recreational boating:* U.S. Department of Homeland Security, U.S. Coast Guard. *Hazardous liquid and gas pipeline:* U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration as cited in U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics*, table 2-2, available at [http://www.bts.gov/publications/national\\_transportation\\_statistics/](http://www.bts.gov/publications/national_transportation_statistics/) as of December 2011.

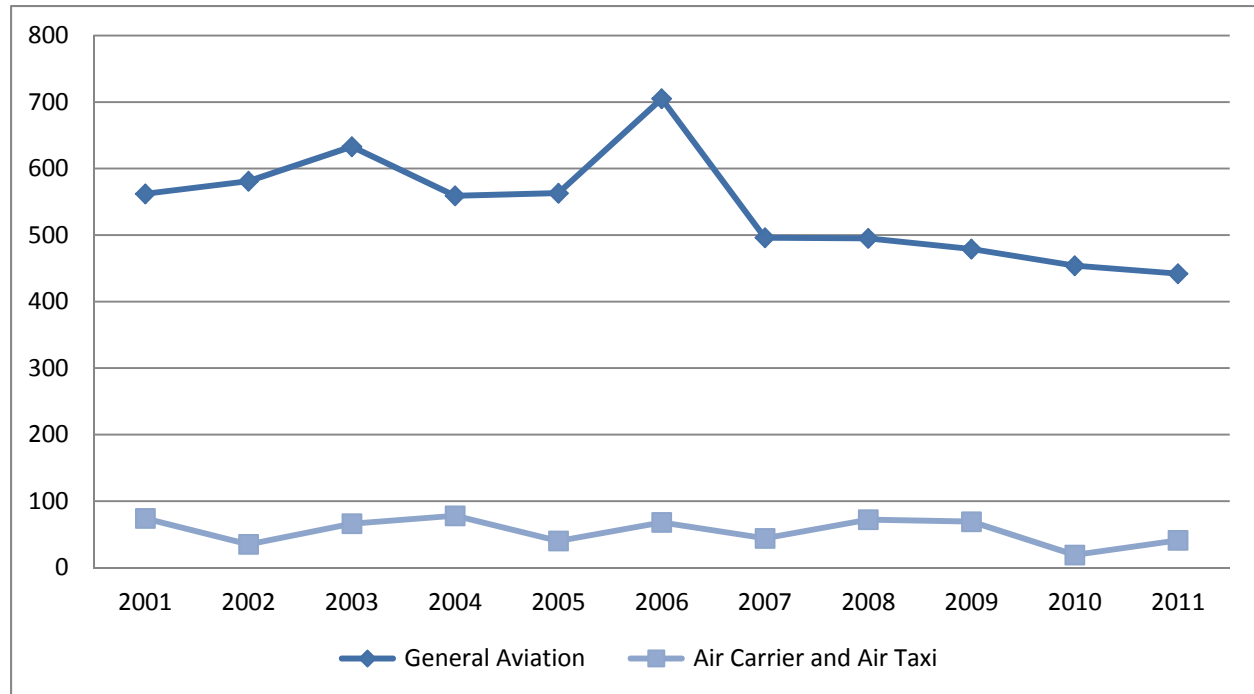
<sup>8</sup> U.S. Department of Homeland Security, U.S. Coast Guard, *Boating Safety Resource Center*, available at <http://www.uscgboating.org/safety/default.aspx> as of June 2012.

## Aviation Fatalities

Aviation fatalities mark the stark contrast between commercial air carriers and general aviation. Figure 1 shows aviation fatalities for commercial air carriers and taxis versus general aviation. Further, just 2 fatalities are attributed to large U.S. air carriers, whereas general aviation accounts for 450 fatalities in 2010 (as shown in table 1). Loss of control in flight is the leading cause of death, accounted for 41 percent of the fatal personal flying accident.<sup>9</sup>

**FIGURE 1: Aviation Fatalities: 2001-2010**

Annual data



**NOTES:** 2001 figures exclude two events—the September 11<sup>th</sup> Attacks and the Flight 587 crash. General Aviation data for September 2006 excludes 154 persons killed aboard a foreign-registered aircraft operated by Gol Airlines in a collision with U.S.-registered general aviation aircraft over Brazil. This incident is otherwise recorded as 154 fatalities for U.S. general aviation in the source database. General Aviation excludes FAR Part 121, 129, and 135 operations, as well as "Non-U.S., Commercial" (NUSC) and "Public Use" (PUBU). Air Carriers are Part 121, and Air Taxis are Part 135.

**SOURCES:** National Transportation Safety Board, *Aviation: Accident Database & Synopses*, available at <http://www.nts.gov/aviationquery/index.aspx> as of April 2012 as cited by U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics in their Multimodal Indicators: Air Fatalities, available at <http://www.bts.gov> as of June 2012.

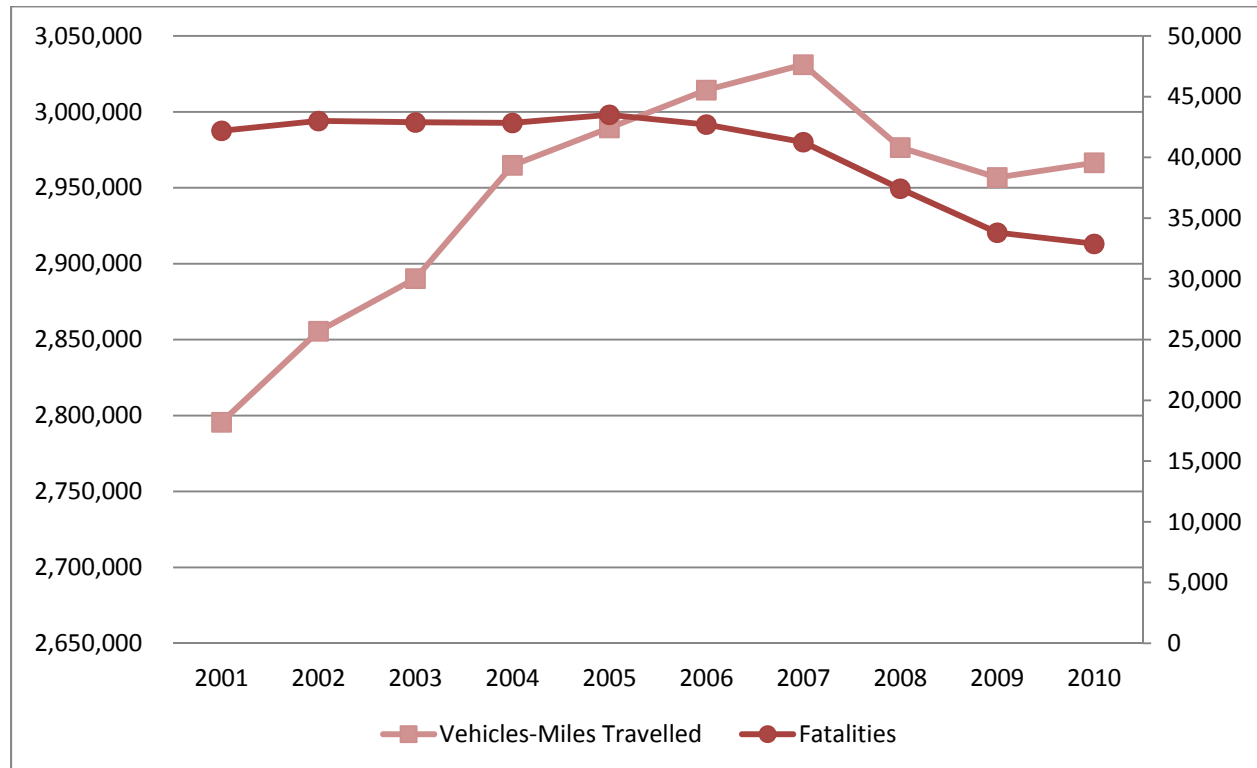
<sup>9</sup> National Transportation Safety Board, *Review of U.S. Civil Aviation Accidents, 2007–2009*, available at <http://www.nts.gov/> as of June 2012.

## Motor Vehicles Fatalities

There were 32,885 motor vehicle fatalities counted across the country in 2010.<sup>10</sup> While the amount of driving continues to increase, the number of highway fatalities has been trending downward over the past 10 years, decreasing by 21.6 percent during this period (as shown in figure 2). Notably, motor vehicle fatalities in 2010 reached record lows last reported in 1949.<sup>11</sup>

**FIGURE 2: Motor Vehicle Fatalities: 2001-2010**

Annual data



**SOURCES:** *Fatalities:* 2001-2009—U.S. Department of Transportation, National Highway Traffic Safety Administration, Fatality Analysis Reporting System, available at <http://www.nhtsa.gov/fars>, as of June 2012. 2010—U.S. Department of Transportation, National Highway Traffic Safety Administration, Transportation Safety Facts: Research Notes, *2010 Motor Vehicle Crashes: Overview* (February 2012), available at <http://www.nhtsa.gov/fars>, as of June 2012. *VMT*—U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> as of June 2012.

<sup>10</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, Traffic Safety Facts: Research Notes, *2010 Motor Vehicle Crashes: Overview* (February 2012), available at <http://www-nrd.nhtsa.dot.gov>, as of June 2012

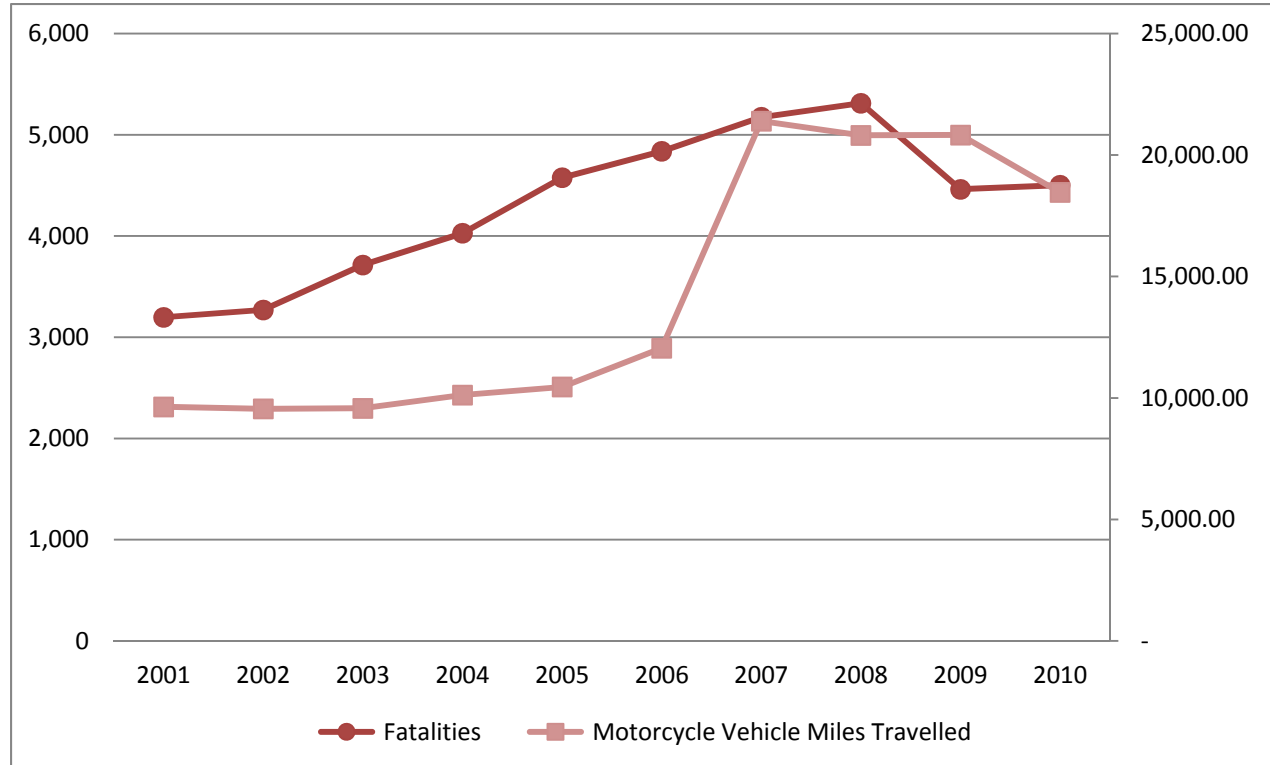
<sup>11</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, Traffic Safety Facts: Research Notes, *Early Estimate of Motor Vehicle Traffic Fatalities in 2010* (April 2012), available at <http://www-nrd.nhtsa.dot.gov>, as of June 2012

## Motorcycle Safety

Motorcycle fatalities account for 13.7 percent of the motor vehicle fatalities in 2010. In contrast to motor vehicle fatalities, motorcycle fatalities have been trending upward (increasing by 55.4 percent) over the past 10 years. Several risk factors may be attributed to the increase, including changes in owner demographics, safety regulations, and types of motorcycles.<sup>12</sup> The number of states that require all riders to wear helmets has decreased from 26 in 1997 to 19 in 2012.<sup>13</sup>

**FIGURE 3: Motorcycle Fatalities: 2001-2010**

Annual data



**SOURCES:** *Fatalities:* 2001-2009—U.S. Department of Transportation, National Highway Traffic Safety Administration, Fatality Analysis Reporting System, available at <http://www.nhtsa.gov/fars>, as of June 2012. 2010—U.S. Department of Transportation, National Highway Traffic Safety Administration, Transportation Safety Facts: Research Notes, *2010 Motor Vehicle Crashes: Overview* (February 2012), available at <http://www.nhtsa.gov/fars>, as of June 2012. *VMT*—U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: Annual Issues), table VM-1, available at <http://www.fhwa.dot.gov/> as of June 2012.

<sup>12</sup> U.S. Department of Transportation, Bureau of Transportation Statistics, Special Report, *Motorcycle Trends in the United States* (May 2009), available at <http://www.bts.gov/> as of June 2012.

<sup>13</sup> Governors Highway Safety Association, *New Study: No Progress in Reducing Motorcyclist Deaths* (May 2012), available at <http://www.ghsa.org/> as of June 2012.

## Fatal Bus Crashes

Buses and motor coaches have recently captured the headlines and received press attention due to recent fatalities and multiple casualties. Crashes, fatalities, and injuries involving buses have increased by 460 (or 3.5 percent), 34 (or 12.6 percent), and 858 (or 5.5 percent), respectively in 2010.<sup>14</sup> The Federal Motor Carrier Safety Administration (FMCSA) and its partners have stepped up the inspections of commercial passenger buses, up significantly from 12,991 in 2005 to 25,705 in 2010. As a result of these efforts, the FMCSA shutdown 54 unsafe motor coach operators in 2011.<sup>15</sup>

## Deadly “Ds”—Distracted and Drunk Driving

Distracted and drunk driving may counteract the gains made in the number of lives saved made by the safety measures listed below.

Distraction was reportedly involved in 16 percent of the fatal crashes, resulting in an estimated 5,474 fatalities in 2009.<sup>16</sup> Many focus on talking on a cellphone or text messaging. However, distraction may include any of the following: texting, eating and drinking, talking to passengers, grooming, reading, using a navigation system, watching a video, and adjusting a radio, CD player, or MP3 player.<sup>17</sup> Distraction was reported in 18 percent of injury crashes in 2010.<sup>18</sup>

Alcohol is the leading contributor in pedestrian, vehicle occupant, pedal-cyclist fatalities.<sup>19</sup> Drunk driving was a factor in 13,365 (or 40.6 percent) of motor vehicle fatalities in 2010.<sup>20</sup> However, drunken driving awareness and enforcement efforts such as Zero Tolerance Laws may be having a positive impact.<sup>21</sup>

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<sup>14</sup> U.S. Department of Transportation, Federal Motor Safety Carriers Administration, *Carrier Safety Progress Report* (as of December 31, 2011), available at <http://www.fmcsa.dot.gov> as of June 2012

<sup>15</sup> U.S. Department of Transportation, Federal Motor Safety Carriers Administration, Press Release, *Federal Motor Carrier Safety Administration Conducts Bus Safety Inspection Sweeps in 13 States and the District of Columbia*, available at <http://www.dot.gov/> as of June 2012.

<sup>16</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, Traffic Safety Facts: Research Notes, *Distracted Driving 2009* (September 2010), available at <http://www-nrd.nhtsa.dot.gov>, as of June 2012

<sup>17</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, Available at <http://www.distraction.gov> as of June 2012.

<sup>18</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, Available at <http://www.distraction.gov> as of June 2012.

<sup>19</sup> U.S. Department of Transportation, Bureau of Transportation Statistics, *Drunk Driving by the Number*, available at <http://www.bts.gov/> as of June 2012.

<sup>20</sup> Various sources as cited in U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *National Transportation Statistics*, table 2-20, available at [http://www.bts.gov/publications/national\\_transportation\\_statistics/](http://www.bts.gov/publications/national_transportation_statistics/) as of June 2012.

<sup>21</sup> U.S. Department of Transportation, Bureau of Transportation Statistics, *Drunk Driving by the Number*, available at <http://www.bts.gov/> as of June 2012.



## Safety Measures and Lives Saved

Many factors have contributed to the improvements in motor vehicles safety, such as safety awareness, education, traffic enforcement, and infrastructure-based and in-vehicle crash avoidance protection technologies. Table 3 shows motor vehicle safety belt and motorcycle helmet use rates. Safety belt and motorcycle helmet use have increased, until helmet use declined over the past year. Such devices, which can make the life and death difference in a crash, depend upon their user in order to be effective.

**TABLE 3: Motor Vehicle Safety Belt and Motorcycle Helmet Use: 2005-2010**  
Percent

	2005	2006	2007	2008	2009	2010
<b>Overall Safety Belt Use</b>	<b>82</b>	<b>81</b>	<b>82</b>	<b>83</b>	<b>84</b>	<b>85</b>
Drivers	83	82	83	84	85	86
Passengers	78	78	81	81	82	83
<b>Motorcycle Helmet Use<sup>b</sup></b>	<b>48</b>	<b>51</b>	<b>58</b>	<b>63</b>	<b>67</b>	<b>54</b>
Operators	56	57	59	64	69	55
Riders	29	33	56	54	55	51

<sup>a</sup> Seat belt use is as of the Fall each year except in 2005 (June). Motorcycle helmet use is as of the Fall each year except in 2005 (June).

<sup>b</sup> Only those operators and riders wearing safety helmets that met U.S. Department of Transportation (DOT) standards are counted. Those safety helmets that do not meet DOT standards are treated as if the operator/rider were not wearing a helmet.

**KEY:** U = data are unavailable.

**NOTE:** Occupants of commercial and emergency vehicles are excluded.

**SOURCES:** U.S. Department of Transportation, National Highway Traffic Safety Administration, *Seat Belt Use--Overall Results, Traffic Safety Facts* (Annual issues for specific year); and *Motorcycle Helmet Use--Overall Results, Traffic Safety Facts* (Annual issues for specific year), available at <http://www-nrd.nhtsa.dot.gov> as of March 2012.



## Transportation Safety by the Numbers

Safety belts, air bags, motorcycle helmets, minimum legal drinking age of 21, and child safety seats have saved many lives since their inception. Crash avoidance and protection technologies, such as advanced airbags, stability and traction control are being widely adopted and incorporated into motor vehicles.<sup>22</sup> Such technologies have and will continue to save even more lives in the future, especially since they may help reduce crashes.

**TABLE 4: Estimated Lives Saved by Occupant Protection, Motorcycle Helmets, and Drinking Age Laws: 2005-2010**

	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Safety belts	15,688	15,458	15,223	13,312	12,763	12,546
Air bags	2,752	2,824	2,800	2,557	2,387	2,306
Motorcycle helmets	1,554	1,667	1,788	1,836	1,486	1,550
Age 21 minimum legal drinking age	882	888	831	716	626	550
Child restraints	424	427	388	286	307	303

**SOURCE:** U.S. Department of Transportation, National Highway Traffic Safety Administration, *Lives Saved in 2010 by Restraint Use and Minimum Drinking Age Laws* (Washington DC: 2010), available at <http://www-nrd.nhtsa.dot.gov/> as of May 2012.

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<sup>22</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration, *Safety Technology*, available at <http://www.safercar.gov/> as of June 2012