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

TRAFFIC SAFETY FACTS
Research Note

NHTSA

DOT HS 812 205 Summary of Statistical Findings March 2018

Pedestrian and Bicyclist Data Analysis

By Heidi Coleman and Krista Mizenko

The National Highway Traffic Safety Administration publishes separate Traffic Safety Fact Sheets annually titled Pedestrians[1] and titled Bicyclists and Other Cyclists.[2] The most recently published Traffic Safety Fact Sheets contain 2015 data from the Fatality Analysis Reporting System (FARS)[3] and were published in 2017 (DOT HS 812 375 and DOT HS 812 382).

This Research Note presents fatality and injury data regarding both pedestrians and bicyclists in a single document, and identifies similarities and differences between these two types of non-motorist road users. The first section (Fatality Trend Data From 1980 to 2015) examines long-term trends for both pedestrian and bicyclist fatalities over a period of 35 years, from 1980 to 2015. It focuses especially on fatality numbers and percentages, gender and age, and considers changes that have taken place over time. The second section (Fatalities in 2010 to 2015 combined) examines selected characteristics of both pedestrian and bicyclist fatalities, based on a recent "snapshot." The characteristics include land use (urban or rural), hours of the day, light conditions, month of the year, day of the week, location, and non-motorist actions prior to the crash. These analyses use combined data over a 6-year period, 2010 to 2015. These two sections use data from FARS.

The third section (Analysis of Speed Based on Fatalities and Injuries in 2010 to 2015 combined) focuses on pedestrian and bicyclist safety issues not previously included in NHTSA Traffic Safety Fact Sheets. These issues include posted speed limits on roadways where fatal and non-fatal injury crashes took place, and the involvement of speeding (driving over the posted speed limit or driving too fast for conditions). These issues have great relevance to recent efforts in the United States and around the world in setting goals consistent with *Vision Zero*, described below. This section uses data from FARS and the National Automotive Sampling System (NASS) General Estimates System (GES).[4]

Fatality Trend Data From 1980 to 2015

This section of the Research Note examines long-term trends for both pedestrian and bicyclist fatalities from 1980 to 2015. Over the last 35 years, there has been a dramatic decline in motor vehicle fatalities, from 51,091 in 1980 to 35,092 in 2015. Pedestrian and bicyclist fatalities also have declined during this time (Figures 1 and 2; additional details in Table A-1 in the Appendix).

Pedestrian fatalities declined by nearly 50 percent, from 8,070 in 1980 to a low of 4,109 in 2009. They have increased, however, since 2009, reaching 5,376 in 2015. Similarly, bicyclist fatalities declined by more than one-third, from 965 in 1980 to a low of 623 in 2010. They have increased since 2010, reaching 818 in 2015 (Figure 2 and Table A-1).

From 1980 to 1985, pedestrian fatalities represented 16 to 17 percent of total motor vehicle fatalities. Two decades later, from 1999 to 2009, the percentage had declined to about 11 to 12 percent. Since then, the percentage of pedestrian fatalities has increased, reaching 15 percent of total motor vehicle fatalities in 2015. Bicyclist fatalities have represented 2 percent of total motor vehicle fatalities every year from 1980 to 2015 (Figure 2 and Table A-1).

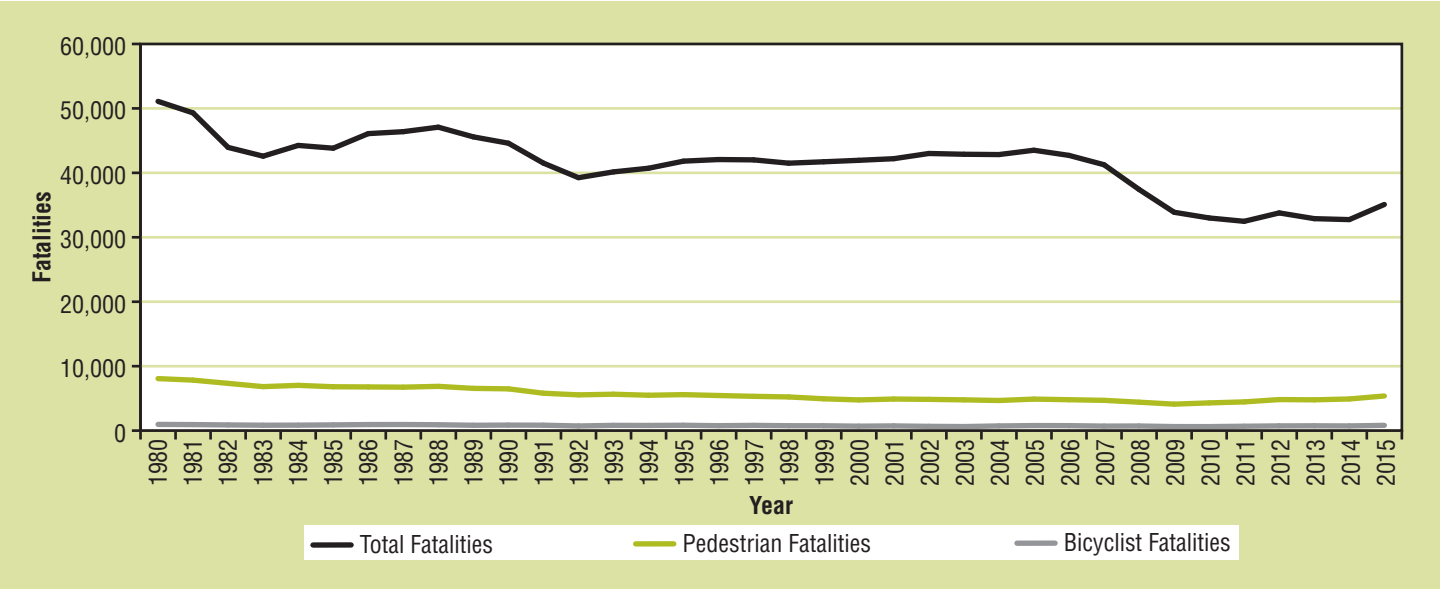
[1] Pedestrians are defined as any person on foot, walking, running, jogging, hiking, sitting, or lying down who is involved in a motor vehicle traffic crash or event (NCSA, 2017).

[2] "Bicyclists and other cyclists" are defined as riders of two-wheel, non-motorized vehicles, tricycles, or unicycles powered solely by pedals. In this Research Note, these riders are referred to as bicyclists, but the term includes cyclists on non-motorized vehicles that have other than two wheels (NCSA, 2017).

[3] FARS is a census of fatal motor vehicle crashes in the 50 States, the District of Columbia, and Puerto Rico (Puerto Rico is not included in U.S. totals) (NCSA, 2017).

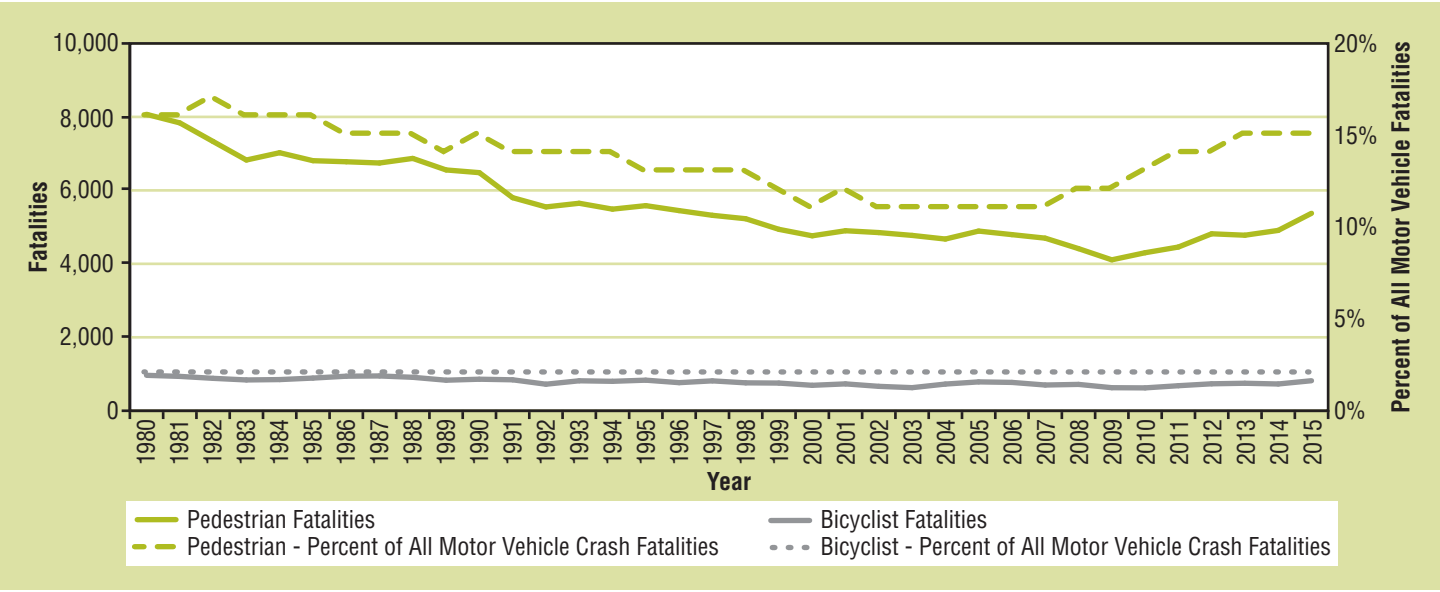
[4] The NASS GES is a probability-based sample of police-reported motor vehicle crashes on public roadways from 60 locations across the country, from which estimates of national totals for injury and property damage-only motor vehicle crashes are derived (NCSA, 2017).

Figure 1
Total, Pedestrian, and Bicyclist Fatalities in Motor Vehicle Crashes From 1980 to 2015



Source: FARS 1980 - 2014 Final, 2015 ARF

Figure 2
Pedestrian and Bicyclist Fatality Numbers and Percentages of All Motor Vehicle Crash Fatalities From 1980 to 2015



Source: FARS 1980 - 2014 Final, 2015 ARF

Fatality Trend Data From 1980 to 2015 by Gender

In 2015, about 70 percent of pedestrian fatalities were male and 30 percent were female. This proportion of pedestrian fatalities by gender has been remarkably consistent over the last 35 years (Figure A-1 and Table A-2 in the Appendix). In 2015, some 85 percent of bicyclist fatalities were male and 15 percent were female. This proportion of bicyclist fatalities by gender has varied over the last 35 years, ranging from 80 percent to 90 percent for males, and 10 percent to 20 percent for females (Figure A-2 and Table A-2).

Fatality Trend Data From 1980 to 2015 by Age Group

Figures 3 and 4 depict pedestrian fatalities (with known ages) by age group from 1980 to 2015. Each age group is comprised of 5-year "cohorts" (e.g., under 5, 5-9, 10-14, and so on). Figure 3 presents stacked age groups, from youngest to oldest, and shows the number of pedestrian fatalities by age group in each calendar year. Figure 4 presents the same data, but unstacks the age groups, and instead contains vertical bars for the calendar years, from earliest to latest (left to right),

and shows the number of pedestrian fatalities by calendar year for each age group.

There were sizeable and consistent declines in the numbers and percentages of pedestrian fatalities from 1980 to 2015 in the youngest age groups (under 5, 5-9, 10-14, and 15-19) and oldest age groups (70-74, 75-79, and 80+). The declines were most pronounced for young people (birth to age 19). In 1980 there were 2,089 young pedestrians (birth to 19) who were fatally injured in traffic crashes, representing 26.5 percent of pedestrian fatalities with known ages in that year. In 2015 there were only 456 young pedestrian fatalities (birth to 19), amounting to only 8.2 percent of pedestrian fatalities with known ages (Figure 4 and Table 1). Young adult age groups (20-24, 25-29, and 30-34) and older adult age groups (50-54, 55-59, 60-64, and 65-69) experienced declines, followed by increases. Other age groups (35-39, 40-44, and 45-49) experienced increases, followed by declines (Figure 4 and Table 1).

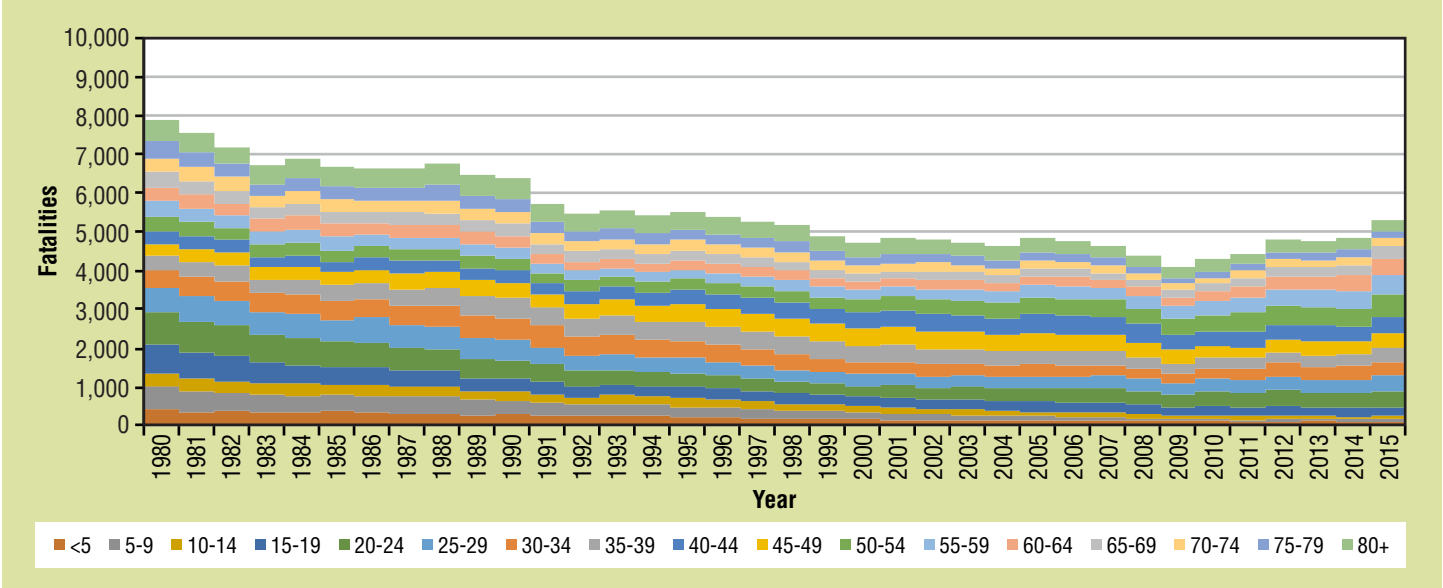
Table 1 provides the numeric data presented in Figures 3 and 4 (pedestrian fatalities, with known ages, by age group from 1980 to 2015). Table 1 contains cells for the number and percentage of pedestrian fatalities for each age group in each calendar year. The age group with the largest percentage of pedestrian fatalities in each calendar year is shaded green and the age group with the second largest percentage of pedestrian fatalities in each calendar year is a lighter shade of green.

The age group with the largest percentage of pedestrian fatalities has increased roughly every 5 years over time (Table 1). For example, the age group with the largest percentage of pedestrian fatalities was:

- 20-24 in 1980 – 1987 (tied with age group 25-29 in 1986);
- 25-29 in 1986, 1988, and 1989 (tied with age group 20-24 in 1986 and age group 30-34 in 1989);
- 30-34 in 1989 – 1993 (tied with age group 25-29 in 1989);
- 35-39 in 1994 – 1999 (tied with age group 40-44 in 1999);
- 40-44 in 1999 – 2003 (tied with age group 35-39 in 1999);
- 45-49 in 2004 – 2009; and
- 50-54 in 2010 – 2015.

This pattern shows that certain age cohorts (notably, pedestrians born in the mid-1950s to mid-1960s) are most highly represented, perhaps due to increased exposure, as discussed in further detail on the following page.

Figure 3
Pedestrian Fatalities by Age Group From 1980 to 2015



Source: FARS 1980 - 2014 Final, 2015 ARF

Table 1

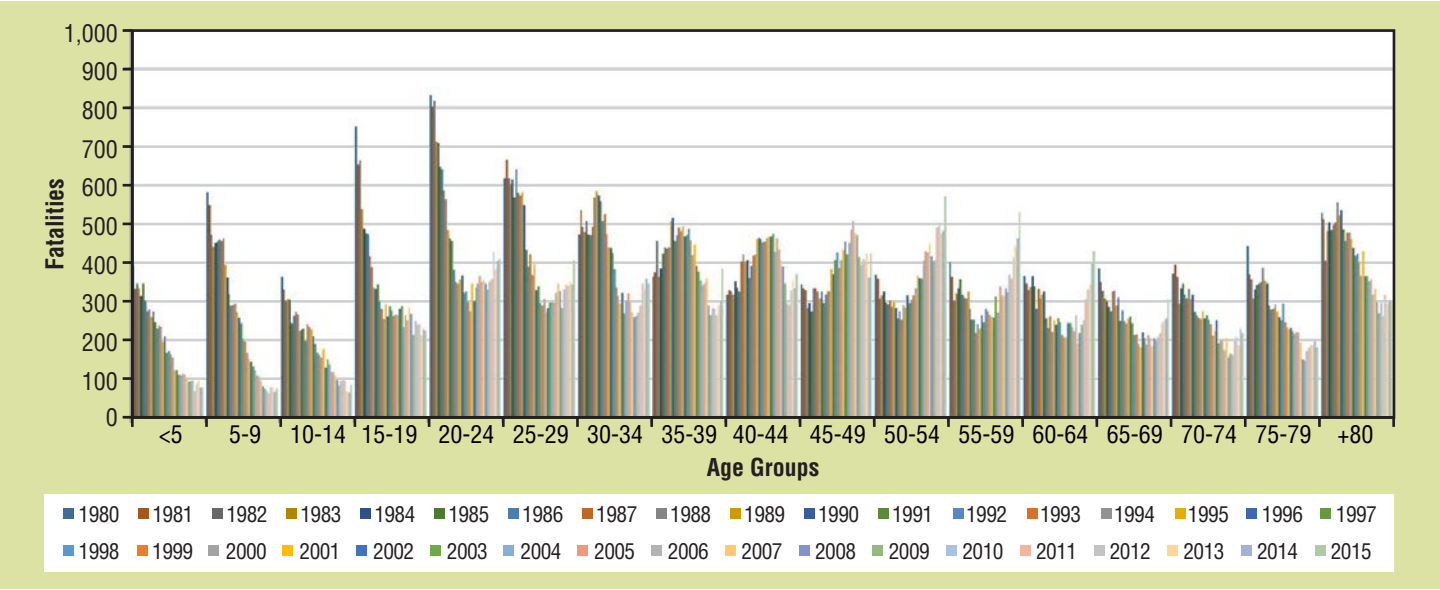
Pedestrian Fatality Numbers and Percentages by Age Group and Year From 1980 to 2015*

Year	Pedestrian Fatalities: Highest and Second Highest Proportion of Fatalities by Each Year 1980 - 2015																																		Total
	<5 (No.)	<5 (%)	5-9 (No.)	5-9 (%)	10-14 (No.)	10-14 (%)	15-19 (No.)	15-19 (%)	20-24 (No.)	20-24 (%)	25-29 (No.)	25-29 (%)	30-34 (No.)	30-34 (%)	35-39 (No.)	35-39 (%)	40-44 (No.)	40-44 (%)	45-59 (No.)	45-59 (%)	50-54 (No.)	50-54 (%)	55-59 (No.)	55-59 (%)	60-64 (No.)	60-64 (%)	65-69 (No.)	65-69 (%)	70-74 (No.)	70-74 (%)	75-79 (No.)	75-79 (%)	80+ (No.)	80+ (%)	
1980	393	5.0%	582	7.4%	363	4.6%	**751**	**9.5%**	**830**	**10.5%**	617	7.8%	472	6.0%	363	4.6%	316	4.0%	343	4.3%	369	4.7%	401	5.1%	366	4.6%	384	4.9%	372	4.7%	444	5.6%	528	6.7%	7,894
1981	330	4.2%	549	7.2%	329	4.3%	653	8.6%	**802**	**10.6%**	**665**	**8.8%**	535	7.0%	375	4.9%	328	4.3%	332	4.4%	359	4.7%	364	4.8%	347	4.6%	350	4.6%	395	5.2%	371	4.9%	512	6.7%	7,596
1982	344	4.4%	472	6.6%	301	4.2%	**662**	**9.2%**	**816**	**11.3%**	617	8.6%	492	6.8%	455	6.3%	324	4.5%	328	4.6%	307	4.3%	301	4.2%	328	4.6%	325	4.5%	363	5.0%	356	4.9%	405	5.6%	7,196
1983	332	4.2%	441	6.6%	304	4.5%	538	8.0%	**711**	**10.6%**	**602**	**9.0%**	479	7.1%	363	5.4%	316	4.7%	280	4.2%	314	4.7%	318	4.7%	336	5.0%	307	4.6%	293	4.4%	307	4.6%	481	7.2%	6,722
1984	311	3.9%	450	6.5%	303	4.4%	486	7.0%	**708**	**10.3%**	**614**	**8.9%**	507	7.4%	384	5.6%	351	5.1%	294	4.3%	324	4.7%	333	4.8%	366	5.3%	299	4.3%	332	4.8%	329	4.8%	503	7.3%	6,894
1985	345	4.4%	454	6.8%	242	3.6%	476	7.1%	**647**	**9.7%**	**567**	**8.5%**	473	7.1%	423	6.3%	334	5.0%	274	4.1%	297	4.4%	357	5.3%	337	5.0%	284	4.3%	346	5.2%	341	5.1%	483	7.2%	6,680
1986	302	3.8%	459	6.9%	262	3.9%	474	7.1%	**641**	**9.6%**	**640**	**9.6%**	470	7.1%	439	6.6%	324	4.9%	333	5.0%	291	4.4%	315	4.7%	279	4.2%	273	4.1%	315	4.7%	346	5.2%	496	7.4%	6,659
1987	273	3.5%	455	6.8%	272	4.1%	416	6.2%	**585**	**8.8%**	**580**	**8.7%**	491	7.4%	436	6.5%	404	6.1%	332	5.0%	301	4.5%	308	4.6%	331	5.0%	323	4.8%	307	4.6%	349	5.2%	504	7.6%	6,667
1988	277	3.5%	462	6.8%	265	3.9%	388	5.7%	**563**	**8.3%**	**573**	**8.5%**	567	8.4%	440	6.5%	420	6.2%	323	4.8%	284	4.2%	306	4.5%	307	4.5%	325	4.8%	331	4.9%	386	5.7%	554	8.2%	6,771
1989	258	3.3%	394	6.1%	221	3.4%	334	5.2%	483	7.5%	**581**	**9.0%**	**584**	**9.0%**	507	7.8%	404	6.2%	306	4.7%	298	4.6%	324	5.0%	316	4.9%	287	4.4%	305	4.7%	354	5.5%	**521**	**8.0%**	6,477
1990	273	3.5%	362	5.7%	226	3.5%	330	5.2%	463	7.2%	**549**	**8.6%**	**572**	**8.9%**	515	8.0%	407	6.4%	323	5.0%	281	4.4%	278	4.3%	323	5.0%	308	4.8%	315	4.9%	345	5.4%	535	8.4%	6,405
1991	244	3.1%	317	5.5%	228	4.0%	343	6.0%	455	7.9%	432	7.5%	**557**	**10%**	456	7.9%	360	6.3%	294	5.1%	254	4.4%	251	4.4%	254	4.4%	248	4.3%	272	4.7%	287	5.0%	**485**	**8.5%**	5,737
1992	228	2.9%	287	5.2%	197	3.6%	299	5.4%	381	6.9%	390	7.1%	**507**	**9.2%**	**471**	**8.6%**	392	7.1%	316	5.8%	274	5.0%	251	4.6%	230	4.2%	275	5.0%	264	4.8%	277	5.0%	456	8.3%	5,495
1993	237	3.0%	290	5.2%	241	4.3%	278	5.0%	350	6.3%	420	7.6%	**524**	**9.4%**	**490**	**8.8%**	418	7.5%	325	5.8%	252	4.5%	217	3.9%	259	4.7%	247	4.4%	256	4.6%	279	5.0%	477	8.6%	5,560
1994	234	3.0%	293	5.4%	234	4.3%	253	4.6%	347	6.4%	369	6.8%	474	8.7%	**482**	**8.9%**	420	7.7%	324	6.0%	290	5.3%	240	4.4%	220	4.0%	243	4.5%	253	4.6%	291	5.3%	**477**	**8.8%**	5,444
1995	196	2.5%	272	4.9%	227	4.1%	291	5.3%	356	6.4%	397	7.2%	439	7.9%	**493**	**8.9%**	**461**	**8.3%**	382	6.9%	282	5.1%	229	4.1%	249	4.5%	255	4.6%	274	4.9%	273	4.9%	**461**	**8.3%**	5,537
1996	208	2.6%	257	4.8%	208	3.9%	259	4.8%	367	6.8%	327	6.1%	438	8.1%	**468**	**8.7%**	**464**	**8.6%**	370	6.9%	314	5.8%	263	4.9%	239	4.4%	259	4.8%	255	4.7%	258	4.8%	438	8.1%	5,392
1997	167	2.1%	243	4.6%	189	3.6%	285	5.4%	321	6.1%	338	6.4%	424	8.0%	**471**	**8.9%**	**461**	**8.7%**	406	7.7%	294	5.6%	245	4.6%	254	4.8%	243	4.6%	264	5.0%	249	4.7%	418	7.9%	5,272
1998	171	2.2%	202	3.9%	167	3.2%	275	5.3%	323	6.2%	294	5.7%	382	7.4%	**487**	**9.4%**	**451**	**8.7%**	426	8.2%	303	5.9%	278	5.4%	244	4.7%	211	4.1%	251	4.8%	292	5.6%	422	8.1%	5,179
1999	163	2.1%	196	4.0%	162	3.3%	261	5.3%	298	6.1%	288	5.9%	334	6.8%	**457**	**9.3%**	**454**	**9.3%**	386	7.9%	313	6.4%	274	5.6%	212	4.3%	213	4.4%	240	4.9%	244	5.0%	**401**	**8.2%**	4,896
2000	154	2.0%	166	3.5%	155	3.3%	265	5.6%	274	5.8%	305	6.5%	311	6.6%	**419**	**8.9%**	**462**	**9.8%**	406	8.6%	333	7.1%	263	5.6%	207	4.4%	189	4.0%	210	4.5%	232	4.9%	365	7.7%	4,716
2001	122	1.5%	149	3.1%	175	3.6%	263	5.4%	347	7.1%	271	5.6%	293	6.0%	**446**	**9.2%**	**466**	**9.6%**	433	8.9%	367	7.6%	258	5.3%	207	4.3%	180	3.7%	222	4.6%	227	4.7%	429	8.8%	4,855
2002	121	1.5%	142	3.0%	128	2.7%	279	5.8%	299	6.2%	281	5.8%	321	6.7%	392	8.2%	**467**	**9.7%**	**453**	**9.4%**	360	7.5%	257	5.3%	242	5.0%	219	4.6%	249	5.2%	231	4.8%	365	7.6%	4,806
2003	109	1.4%	131	2.8%	149	3.1%	286	6.0%	335	7.1%	296	6.2%	268	5.7%	377	8.0%	**475**	**10.0%**	**421**	**8.9%**	359	7.6%	310	6.5%	243	5.1%	204	4.3%	190	4.0%	222	4.7%	365	7.7%	4,740
2004	108	1.4%	121	2.6%	137	3.0%	232	5.0%	346	7.5%	298	6.4%	301	6.5%	353	7.6%	**428**	**9.2%**	**450**	**9.7%**	405	8.7%	271	5.8%	233	5.0%	188	4.1%	197	4.3%	214	4.6%	352	7.6%	4,634
2005	112	1.4%	107	2.2%	117	2.4%	263	5.4%	365	7.5%	296	6.1%	319	6.6%	341	7.0%	463	9.6%	**484**	**10.0%**	430	8.9%	337	7.0%	222	4.6%	211	4.4%	200	4.1%	220	4.5%	357	7.4%	4,844
2006	109	1.4%	105	2.2%	117	2.5%	250	5.3%	350	7.4%	321	6.8%	302	6.4%	344	7.2%	434	9.1%	**508**	**10.7%**	426	9.0%	313	6.6%	263	5.5%	204	4.3%	173	3.6%	218	4.6%	316	6.6%	4,753
2007	102	1.3%	94	2.0%	108	2.3%	282	6.1%	354	7.6%	344	7.4%	272	5.8%	359	7.7%	406	8.7%	**476**	**10.2%**	**449**	**9.6%**	311	6.7%	190	4.1%	184	4.0%	204	4.4%	192	4.1%	330	7.1%	4,657
2008	92	1.2%	80	1.8%	97	2.2%	266	6.1%	347	7.9%	325	7.4%	258	5.9%	287	6.5%	389	8.9%	**470**	**10.7%**	**416**	**9.5%**	333	7.6%	216	4.9%	205	4.7%	155	3.5%	150	3.4%	298	6.8%	4,384
2009	94	1.2%	73	1.8%	81	2.0%	212	5.2%	329	8.0%	280	6.8%	261	6.4%	263	6.4%	344	8.4%	**413**	**10.1%**	**405**	**9.9%**	322	7.9%	239	5.8%	197	4.8%	165	4.0%	145	3.5%	268	6.6%	4,091
2010	96	1.2%	69	1.6%	94	2.2%	248	5.8%	350	8.2%	329	7.7%	271	6.3%	281	6.6%	294	6.9%	**394**	**9.2%**	**407**	**9.5%**	369	8.6%	249	5.8%	206	4.8%	162	3.8%	172	4.0%	294	6.9%	4,285
2011	68	0.9%	63	1.4%	97	2.2%	239	5.4%	357	8.0%	342	7.7%	287	6.5%	278	6.3%	289	6.5%	**411**	**9.3%**	**490**	**11.0%**	359	8.1%	304	6.9%	216	4.9%	198	4.5%	179	4.0%	260	5.9%	4,437
2012	85	1.1%	76	1.6%	95	2.0%	241	5.0%	427	8.9%	339	7.1%	345	7.2%	264	5.5%	328	6.8%	403	8.4%	**504**	**10.5%**	**412**	**8.6%**	329	6.9%	242	5.0%	206	4.3%	186	3.9%	315	6.6%	4,797
2013	95	1.2%	76	1.6%	67	1.4%	211	4.4%	382	8.0%	350	7.4%	329	6.9%	287	6.0%	355	7.5%	423	8.9%	**474**	**10.0%**	**443**	**9.3%**	342	7.2%	248	5.2%	186	3.9%	187	3.9%	293	6.2%	4,748
2014	76	1.0%	66	1.4%	65	1.3%	227	4.7%	405	8.3%	343	7.1%	359	7.4%	301	6.2%	332	6.8%	362	7.4%	**481**	**9.9%**	**463**	**9.5%**	398	8.2%	255	5.2%	229	4.7%	197	4.1%	303	6.2%	4,862
2015	77	1.0%	73	1.4%	83	1.6%	223	4.2%	411	7.7%	407	7.6%	344	6.5%	384	7.2%	370	6.9%	422	7.9%	**571**	**10.7%**	**529**	**9.9%**	430	8.1%	304	5.7%	216	4.1%	180	3.4%	302	5.7%	5,326
Total	**6,906**	**87.5%**	**9,028**	**4.5%**	**6,706**	**3.4%**	**12,039**	**6.0%**	**16,125**	**8.1%**	**14,987**	**7.5%**	**14,562**	**7.3%**	**14,351**	**7.2%**	**14,111**	**7.1%**	**13,626**	**6.8%**	**12,878**	**6.5%**	**11,403**	**5.7%**	**10,111**	**5.1%**	**9,111**	**4.6%**	**9,165**	**4.6%**	**9,530**	**4.8%**	**14,769**	**7.4%**	**199,408**

Source: FARS 1980 - 2014 Final, 2015 ARF

*Based on pedestrian fatalities with known ages.

Figure 4
Pedestrian Fatalities From 1980 to 2015 by Age Group



Source: FARS 1980 - 2014 Final, 2015 ARF

Figures 5 and 6 depict bicyclist fatalities (with known ages) by age group from 1980 to 2015. Like Figures 3 and 4, each age group is comprised of 5-year cohorts (under 5, 5-9, 10-14, and so on). Figure 5 presents stacked age groups, from youngest to oldest, and shows the number of bicyclist fatalities by age group in each calendar year. Figure 6 presents the same data, but unstacks the age groups, and instead contains vertical bars for the calendar years, from earliest to latest (left to right), and shows the number of bicyclist fatalities by calendar year for each age group.

There were sizeable and consistent declines in the numbers and percentages of bicyclist fatalities from 1980 to 2015 in the youngest age groups (under 5, 5-9, 10-14, and 15-19). These declines was very pronounced. In 1980 there were 643 young bicyclists (birth to 19) who were fatally injured in traffic crashes, representing 67.0 percent of bicyclist fatalities with known ages in that year. In 2015 there were only 91 young bicyclist fatalities (birth to 19), amounting to only 11.1 percent of bicyclist fatalities with known ages (Figure 6 and Table 2).

There were sizeable and consistent increases in the numbers and percentages of bicyclist fatalities from 1980 to 2015 in some older age groups (50-54, 55-59, 60-64, and 65-69). These increases also were very pronounced. In 1980 there were only 67 bicyclists 50 to 69 years old who were fatally injured in traffic crashes, representing only 7.0 percent of all bicyclist fatalities with known ages in that year. In 2015 there were 335 bicyclist fatalities (50 to 69), amounting to 41.3 percent of bicyclist fatalities with known ages (Figure 6 and Table 2).

Some age groups (e.g., 20-24 and 25-29) experienced declines, followed by increases. Other age groups (30-34, 35-39, 40-44, and 45-49) experienced increases, followed by declines (Figure 6 and Table 2).

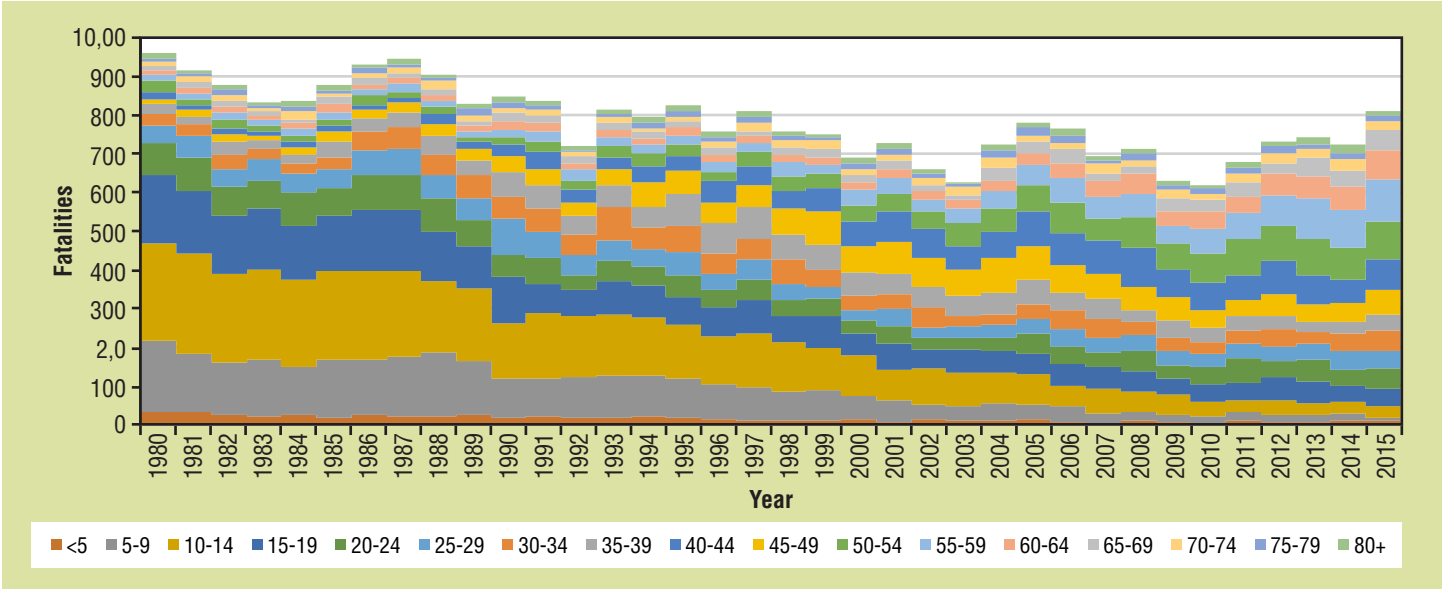
Table 2 provides the numeric data presented in Figures 5 and 6 (bicyclist fatalities, with known ages, by age group from 1980 to 2015). Table 2 contains cells for the numbers and percentages of bicyclist fatalities for each age group in each calendar year. The age group with the largest percentage of bicyclist fatalities in each calendar year is shaded gray and the age group with the second largest percentage of bicyclist fatalities in each calendar year is a lighter shade of gray.

With only one exception (2001), age group 10-14 experienced the largest percentage of bicyclist fatalities from 1980 to 2003. After that, the age group with the largest percentage of bicyclist fatalities increased every few years, following a pattern similar to pedestrian fatalities (Table 2). For example, the age group with the largest percentage of bicyclist fatalities was:

- 40-44 in 2001 and 2004;
- 45-49 in 2005 to 2009;
- 50-54 in 2010 to 2012; and
- 55-59 in 2013 to 2015.

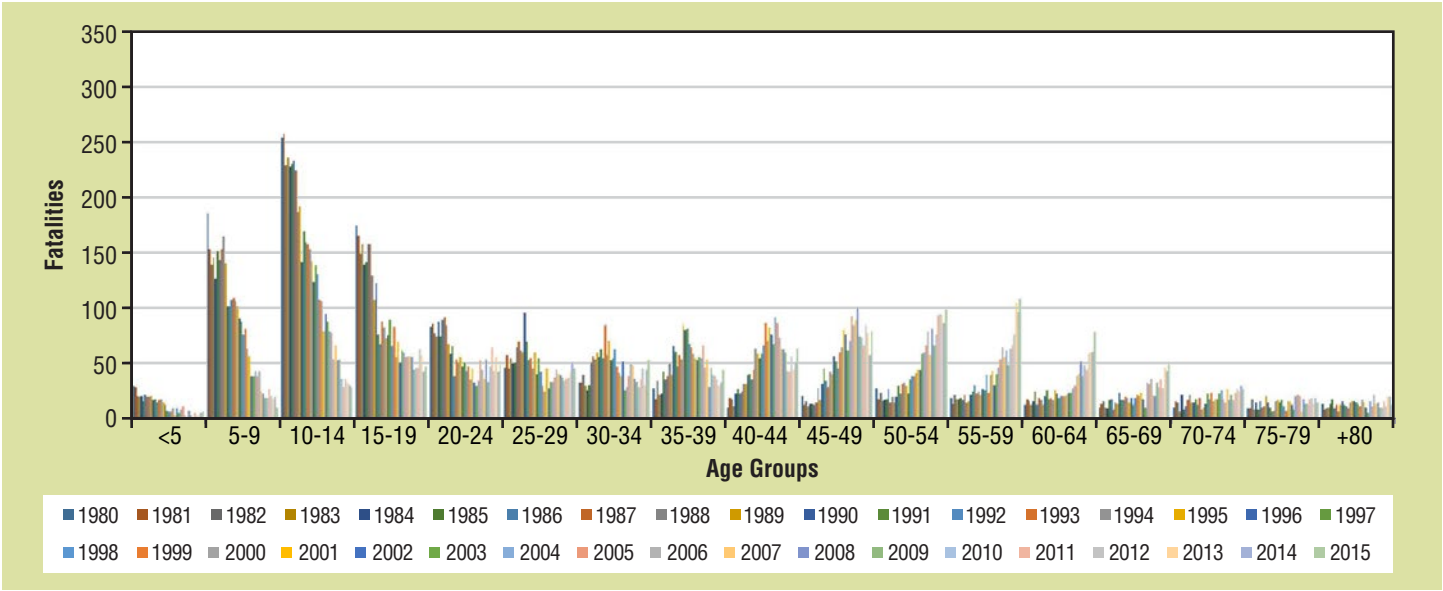
This age cohort of bicyclists also was born in the mid-1950s to the mid-1960s. Their high representation in bicyclist fatalities also may be due to increased exposure, as discussed in further detail below.

Figure 5
Bicyclist Fatalities by Age Group From 1980 to 2015



Source: FARS 1980 - 2014 Final, 2015 ARF

Figure 6
Bicyclist Fatalities From 1980 to 2015 by Age Group



Source: FARS 1980 - 2014 Final, 2015 ARF

Table 2

Bicyclist Fatality Numbers and Percentages by Age Group and Year From 1980 to 2015*

Year	Bicyclist Fatalities: Highest and Second Highest Proportion of Fatalities by Each Year 1980 - 2015																																	Total
	<5 (No.)	<5 (%)	5-9 (No.)	5-9 (%)	10-14 (No.)	10-14 (%)	15-19 (No.)	15-19 (%)	20-24 (No.)	20-24 (%)	25-29 (No.)	25-29 (%)	30-34 (No.)	30-34 (%)	35-39 (No.)	35-39 (%)	40-44 (No.)	40-44 (%)	45-59 (No.)	45-59 (%)	50-54 (No.)	50-54 (%)	55-59 (No.)	55-59 (%)	60-64 (No.)	60-64 (%)	65-69 (No.)	65-69 (%)	70-74 (No.)	70-74 (%)	75-79 (No.)	75-79 (%)	80+ (No.)	80+ (%)	
1980	29	3.0%	186	19.4%	254	26.5%	174	18.1%	83	8.6%	46	4.8%	32	3.3%	27	2.8%	10	1.0%	20	2.1%	27	2.8%	18	1.9%	12	1.3%	10	1.0%	10	1.0%	9	0.9%	13	1.4%	960
1981	28	3.1%	153	16.7%	258	28.1%	165	18.0%	85	9.3%	57	6.2%	32	3.5%	17	1.9%	18	2.0%	12	1.3%	17	1.9%	13	1.4%	17	1.9%	13	1.4%	15	1.6%	9	1.0%	8	0.9%	917
1982	20	2.3%	139	15.8%	229	26.1%	149	17.0%	77	8.8%	45	5.1%	39	4.4%	34	3.9%	17	1.9%	15	1.7%	23	2.6%	21	2.4%	15	1.7%	15	1.7%	14	1.6%	17	1.9%	9	1.0%	878
1983	19	2.3%	145	17.4%	236	28.3%	157	18.8%	74	8.9%	54	6.5%	29	3.5%	21	2.5%	11	1.3%	11	1.3%	15	1.8%	17	2.0%	12	1.4%	10	1.2%	6	0.7%	8	1.0%	10	1.2%	835
1984	20	2.4%	126	15.1%	228	27.3%	139	16.6%	87	10.4%	49	5.9%	25	3.0%	22	2.6%	22	2.6%	13	1.6%	16	1.9%	17	2.0%	15	1.8%	9	1.1%	21	2.5%	14	1.7%	13	1.6%	836
1985	15	1.7%	151	17.2%	230	26.1%	141	16.0%	74	8.4%	50	5.7%	30	3.4%	42	4.8%	26	3.0%	13	1.5%	17	1.9%	18	2.0%	24	2.7%	16	1.8%	8	0.9%	8	0.9%	17	1.9%	880
1986	21	2.3%	143	15.3%	233	25.0%	157	16.8%	89	9.5%	64	6.9%	50	5.4%	35	3.8%	22	2.4%	12	1.3%	26	2.8%	16	1.7%	12	1.3%	17	1.8%	11	1.2%	15	1.6%	9	1.0%	932
1987	19	2.0%	153	16.2%	225	23.8%	157	16.6%	91	9.6%	69	7.3%	56	5.9%	38	4.0%	24	2.5%	14	1.5%	14	1.5%	21	2.2%	18	1.9%	8	0.8%	16	1.7%	10	1.1%	12	1.3%	945
1988	19	2.1%	164	18.1%	187	20.7%	129	14.3%	84	9.3%	61	6.7%	53	5.9%	49	5.4%	31	3.4%	27	3.0%	19	2.1%	14	1.5%	16	1.8%	14	1.5%	21	2.3%	11	1.2%	6	0.7%	905
1989	20	2.4%	140	16.9%	192	23.1%	107	12.9%	67	8.1%	59	7.1%	59	7.1%	39	4.7%	31	3.7%	16	1.9%	14	1.7%	15	1.8%	12	1.4%	13	1.6%	14	1.7%	20	2.4%	12	1.4%	830
1990	16	1.9%	101	11.9%	141	16.6%	122	14.4%	58	6.8%	95	11.2%	55	6.5%	65	7.7%	39	4.6%	31	3.7%	19	2.2%	21	2.5%	20	2.4%	23	2.7%	14	1.6%	14	1.6%	15	1.8%	849
1991	17	2.0%	101	12.1%	169	20.2%	76	9.1%	65	7.8%	69	8.2%	62	7.4%	60	7.2%	40	4.8%	45	5.4%	29	3.5%	24	2.9%	25	3.0%	16	1.9%	17	2.0%	10	1.2%	12	1.4%	837
1992	14	1.9%	107	14.8%	159	22.1%	67	9.3%	38	5.3%	52	7.2%	54	7.5%	47	6.5%	35	4.9%	34	4.7%	22	3.1%	30	4.2%	17	2.4%	16	2.2%	12	1.7%	6	0.8%	11	1.5%	721
1993	16	2.0%	109	13.4%	157	19.3%	87	10.7%	53	6.5%	54	6.6%	84	10.3%	57	7.0%	44	5.4%	28	3.4%	31	3.8%	22	2.7%	18	2.2%	19	2.3%	18	2.2%	7	0.9%	9	1.1%	813
1994	17	2.1%	106	13.3%	153	19.2%	82	10.3%	50	6.3%	45	5.7%	57	7.2%	53	6.7%	63	7.9%	42	5.3%	32	4.0%	24	3.0%	16	2.0%	18	2.3%	8	1.0%	15	1.9%	14	1.8%	795
1995	14	1.7%	101	12.2%	142	17.2%	72	8.7%	55	6.7%	59	7.2%	70	8.5%	84	10.2%	58	7.0%	40	4.8%	29	3.5%	21	2.5%	25	3.0%	14	1.7%	10	1.2%	16	1.9%	15	1.8%	825
1996	12	1.6%	90	11.9%	123	16.2%	75	9.9%	47	6.2%	40	5.3%	52	6.9%	80	10.5%	54	7.1%	56	7.4%	22	2.9%	26	3.4%	22	2.9%	18	2.4%	13	1.7%	14	1.8%	15	2.0%	759
1997	7	0.9%	87	10.7%	138	17.0%	89	11.0%	50	6.2%	54	6.7%	54	6.7%	81	10.0%	58	7.2%	51	6.3%	35	4.3%	25	3.1%	18	2.2%	12	1.5%	22	2.7%	16	2.0%	14	1.7%	811
1998	6	0.8%	76	10.0%	130	17.2%	65	8.6%	43	5.7%	42	5.5%	62	8.2%	67	8.8%	66	8.7%	45	5.9%	38	5.0%	39	5.1%	20	2.6%	18	2.4%	17	2.2%	11	1.5%	13	1.7%	758
1999	6	0.8%	81	10.8%	107	14.2%	83	11.0%	47	6.3%	29	3.9%	47	6.3%	64	8.5%	86	11.4%	59	7.8%	38	5.1%	23	3.1%	20	2.7%	21	2.8%	23	3.1%	7	0.9%	11	1.5%	752
2000	9	1.3%	63	9.1%	106	15.3%	55	8.0%	35	5.1%	24	3.5%	41	5.9%	58	8.4%	70	10.1%	64	9.3%	41	5.9%	39	5.6%	20	2.9%	20	2.9%	15	2.2%	15	2.2%	16	2.3%	691
2001	3	0.4%	56	7.7%	79	10.9%	69	9.5%	45	6.2%	45	6.2%	38	5.2%	54	7.4%	82	11.3%	80	11.0%	44	6.0%	43	5.9%	21	2.9%	23	3.2%	17	2.3%	15	2.1%	14	1.9%	728
2002	9	1.4%	38	5.8%	94	14.3%	50	7.6%	32	4.9%	27	4.1%	51	7.8%	52	7.9%	76	11.6%	76	11.6%	44	6.7%	30	4.6%	23	3.5%	17	2.6%	17	2.6%	12	1.8%	10	1.5%	658
2003	5	0.8%	38	6.1%	87	13.9%	61	9.7%	29	4.6%	33	5.3%	25	4.0%	55	8.8%	67	10.7%	61	9.7%	58	9.3%	40	6.4%	23	3.7%	10	1.6%	22	3.5%	8	1.3%	5	0.8%	627
2004	8	1.1%	43	5.9%	79	10.9%	59	8.2%	34	4.7%	33	4.6%	28	3.9%	54	7.5%	91	12.6%	70	9.7%	59	8.2%	46	6.4%	27	3.7%	32	4.4%	25	3.5%	20	2.8%	15	2.1%	723
2005	11	1.4%	38	4.9%	77	9.9%	55	7.1%	52	6.7%	37	4.7%	38	4.9%	66	8.5%	86	11.0%	92	11.8%	66	8.5%	53	6.8%	29	3.7%	31	4.0%	17	2.2%	21	2.7%	11	1.4%	780
2006	3	0.4%	43	5.6%	53	6.9%	56	7.3%	44	5.7%	44	5.7%	49	6.4%	46	6.0%	73	9.5%	84	11.0%	79	10.3%	64	8.3%	38	5.0%	36	4.7%	14	1.8%	20	2.6%	21	2.7%	767
2007	1	0.1%	24	3.5%	66	9.5%	56	8.1%	36	5.2%	40	5.8%	48	6.9%	53	7.6%	63	9.1%	89	12.8%	57	8.2%	55	7.9%	40	5.8%	21	3.0%	26	3.7%	6	0.9%	13	1.9%	694
2008	7	1.0%	22	3.1%	52	7.3%	55	7.7%	53	7.4%	39	5.5%	36	5.0%	28	3.9%	62	8.7%	100	14.0%	81	11.3%	61	8.5%	51	7.1%	20	2.8%	16	2.2%	17	2.4%	14	2.0%	714
2009	3	0.5%	18	2.9%	53	8.4%	44	7.0%	33	5.3%	37	5.9%	33	5.3%	46	7.3%	59	9.4%	74	11.8%	66	10.5%	48	7.6%	38	6.1%	32	5.1%	21	3.3%	13	2.1%	10	1.6%	628
2010	1	0.2%	18	2.9%	36	5.8%	46	7.4%	47	7.6%	34	5.5%	28	4.5%	39	6.3%	43	6.9%	73	11.8%	76	12.3%	63	10.2%	48	7.8%	28	4.5%	16	2.6%	13	2.1%	10	1.6%	619
2011	5	0.7%	26	3.8%	28	4.1%	46	6.8%	64	9.4%	36	5.3%	35	5.2%	38	5.6%	42	6.2%	66	9.7%	93	13.7%	66	9.7%	44	6.5%	35	5.2%	23	3.4%	17	2.5%	15	2.2%	679
2012	2	0.3%	20	2.7%	36	4.9%	62	8.5%	43	5.9%	37	5.1%	45	6.2%	35	4.8%	56	7.7%	84	11.5%	94	12.9%	76	10.4%	58	7.9%	27	3.7%	26	3.6%	18	2.5%	11	1.5%	730
2013	3	0.4%	17	2.3%	32	4.3%	57	7.7%	55	7.4%	42	5.6%	30	4.0%	29	3.9%	44	5.9%	77	10.3%	93	12.5%	104	14.0%	59	7.9%	46	6.2%	24	3.2%	13	1.7%	19	2.6%	744
2014	5	0.7%	19	2.6%	30	4.2%	42	5.8%	42	5.8%	50	6.9%	44	6.1%	32	4.4%	50	6.9%	57	7.9%	86	11.9%	96	13.3%	60	8.3%	43	6.0%	29	4.0%	18	2.5%	19	2.6%	722
2015	6	0.7%	10	1.2%	28	3.4%	47	5.8%	51	6.3%	45	5.5%	52	6.4%	44	5.4%	63	7.8%	79	9.7%	99	12.2%	108	13.3%	78	9.6%	50	6.2%	26	3.2%	14	1.7%	12	1.5%	812
Total	**416**	**1.5%**	**2,952**	**10.5%**	**4,627**	**16.4%**	**3,153**	**11.2%**	**2,012**	**7.1%**	**1,696**	**6.0%**	**1,623**	**5.8%**	**1,711**	**6.1%**	**1,782**	**6.3%**	**1,810**	**6.4%**	**1,619**	**5.8%**	**1,417**	**5.0%**	**1,011**	**3.6%**	**771**	**2.7%**	**624**	**2.2%**	**477**	**1.7%**	**453**	**1.6%**	**28,154**

Source: FARS 1980 - 2014 Final, 2015 ARF

*Based on bicyclist fatalities with known ages.

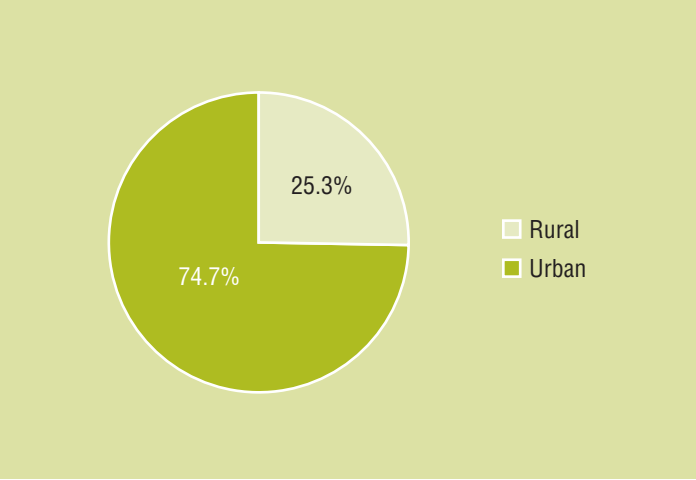
Fatalities in 2010 to 2015 Combined

This section of the Research Note examines additional characteristics of interest regarding pedestrian and bicyclist fatalities, and combines FARS data from 2010 to 2015.

Fatalities in 2010 to 2015 Combined – Land Use

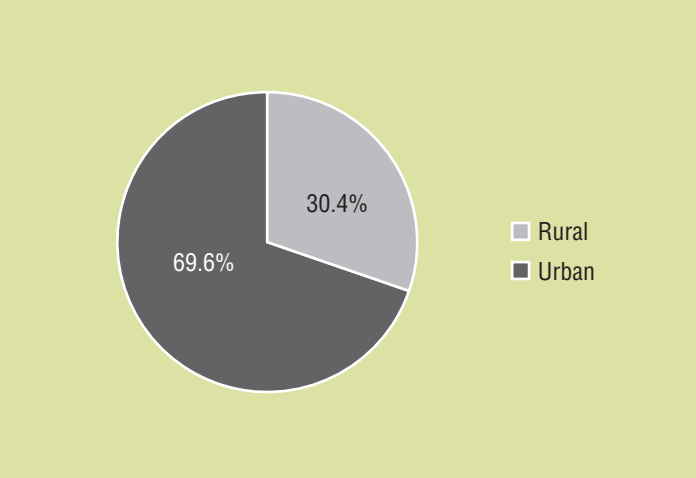
Non-motorist traffic fatalities occur most often in urban areas. In 2010 to 2015 combined, 75 percent of pedestrian fatalities occurred in urban areas and 25 percent occurred in rural areas. During those years combined, 70 percent of bicyclist fatalities occurred in urban areas and 30 percent occurred in rural areas (Figures 7 and 8; additional details in Table A-3 in the Appendix).

Figure 7
Pedestrian Fatalities by Land Use for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 8
Bicyclist Fatalities by Land Use for 2010 to 2015 Combined

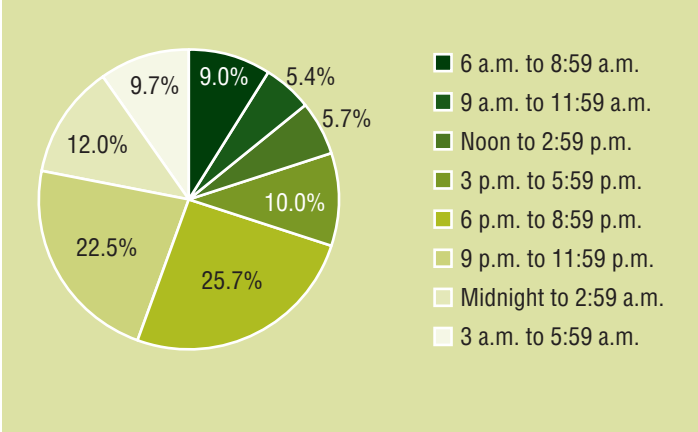


Source: FARS 2010 - 2014 Final, 2015 ARF

Fatalities in 2010 to 2015 Combined – Hour of Day and Light Conditions

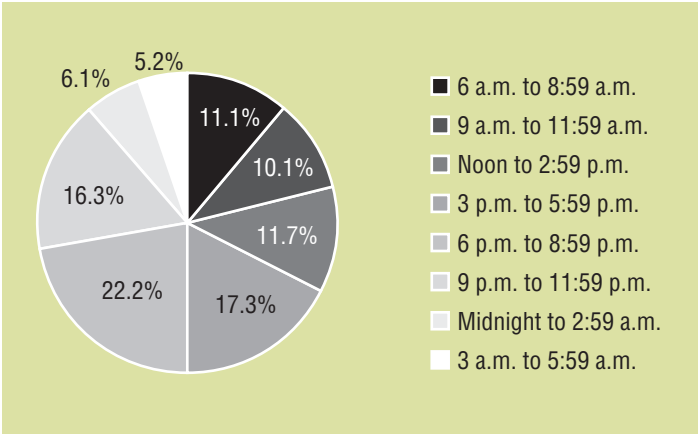
Figures 9 and 10 examine the hours of the day when non-motorist traffic fatalities most often occur. Days are divided into eight 3-hour time intervals: 6 a.m. to 8:59 a.m.; 9 a.m. to 11:59 a.m.; and so on. In 2010 to 2015 combined, 6 p.m. – 8:59 p.m. was the 3-hour period during which the greatest percentage of fatalities occurred for both pedestrians (25.7%) and bicyclists (22.2%). However, pedestrian fatalities were more common later at night and bicyclist fatalities were more common earlier in the day. More than half (60%) of pedestrian fatalities occurred from 6 p.m. to 2:59 a.m., while more than half (55%) of bicyclist fatalities occurred from 3 p.m. to 11:59 p.m. The hours of the day when non-motorist traffic fatalities least often occurred were 9 a.m. to 2:59 p.m. for pedestrians and midnight to 5:59 a.m. for bicyclists (Figures 9 and 10; additional details in Table A-4 in the Appendix).

Figure 9
Pedestrian Fatalities by Hour of Day for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

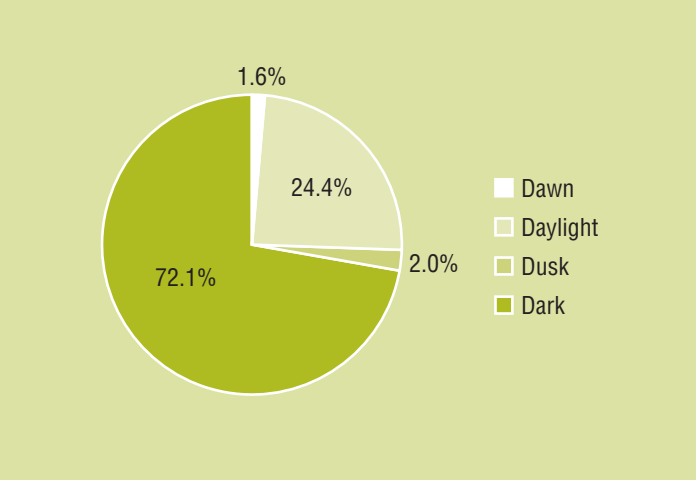
Figure 10
Bicyclists Fatalities by Hour of Day for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

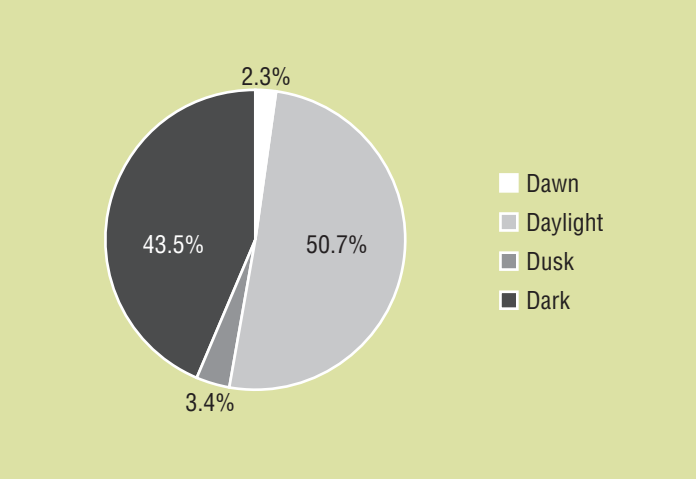
Figures 11 and 12 examine light conditions, which vary by time of day, season, location of the crashes, and other environmental conditions. The light conditions include dawn, daylight, dusk, and dark. Nearly three-quarters (72.1%) of pedestrian fatalities occur when it's dark; nearly one-quarter (24.2%) occur during daylight. Bicyclist fatalities are more evenly split, with 43.5 percent occurring when it's dark and 50.7 percent occurring during daylight (additional details in Table A-5 in the Appendix).

Figure 11
Pedestrian Fatalities by Light Conditions for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 12
Bicyclist Fatalities by Light Conditions for 2010 to 2015 Combined

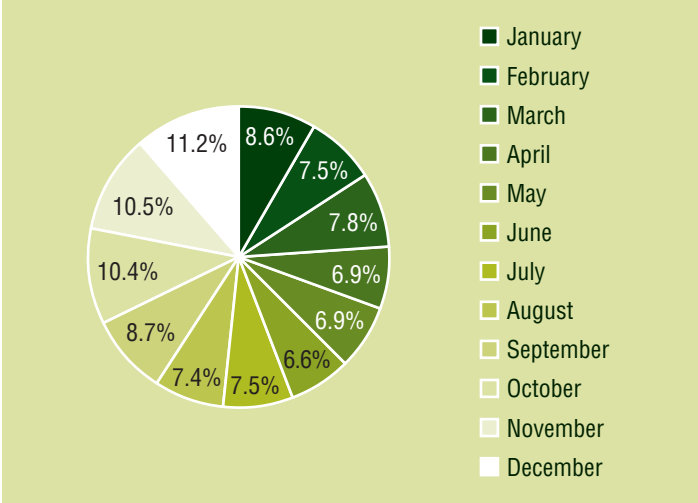


Source: FARS 2010 - 2014 Final, 2015 ARF

Fatalities in 2010 to 2015 Combined – Month of the Year and Day of the Week

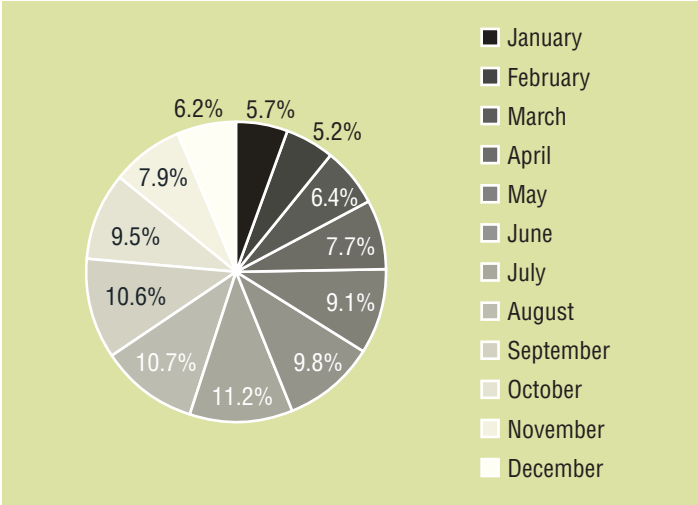
In 2010 to 2015 combined, the highest percentage of pedestrian fatalities occurred in October (10.4%), November (10.5%), and December (11.2%). These months coincide with declining daylight hours. The highest percentage of bicyclist fatalities occurred in June (9.8%), July (11.2%), August (10.7%), and September (10.6%). The increase in prevalence for bicyclists during these months may relate to increased exposure, as discussed in further detail below (Figures 13 and 14; additional details in Table A-6 in the Appendix).

Figure 13
Pedestrian Fatalities by Month of the Year for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

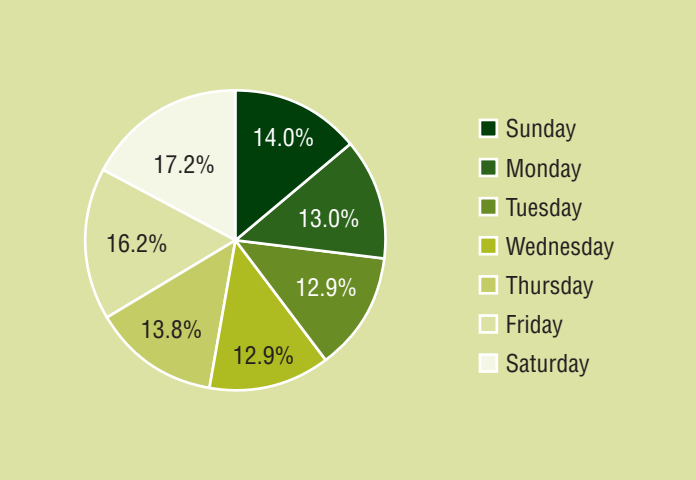
Figure 14
Bicyclist Fatalities by Month of the Year for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

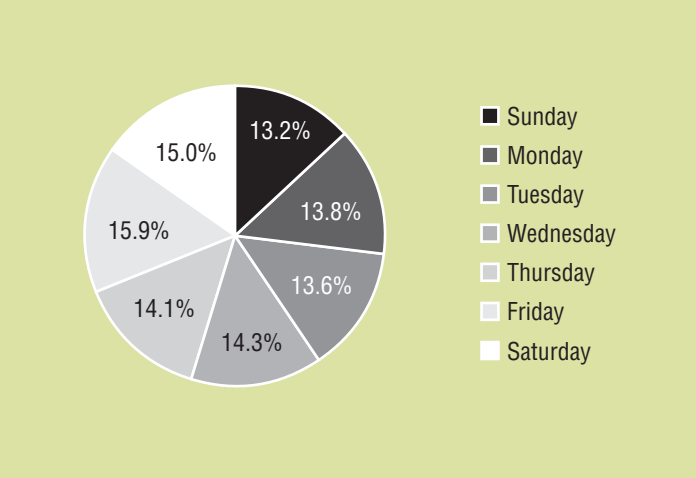
In 2010 to 2015 combined, pedestrian and bicyclist fatalities were spread more evenly across the days of the week, ranging from 12.9 percent (on Tuesdays and Wednesdays) to 17.2 (on Saturdays) for pedestrians and from 13.2 percent (on Sundays) to 15.9 percent (on Fridays) for bicyclists. The highest percentage of fatalities occurred on Fridays and Saturdays for both pedestrians (16.2% on Friday and 17.2% on Saturday) and bicyclists (15.9% on Fridays and 15.0% on Saturdays) (Figures 15 and 16; additional details in Table A-7 in the Appendix).

Figure 15
Pedestrian Fatalities by Day of the Week for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 16
Bicyclist Fatalities by Day of the Week for 2010 to 2015 Combined

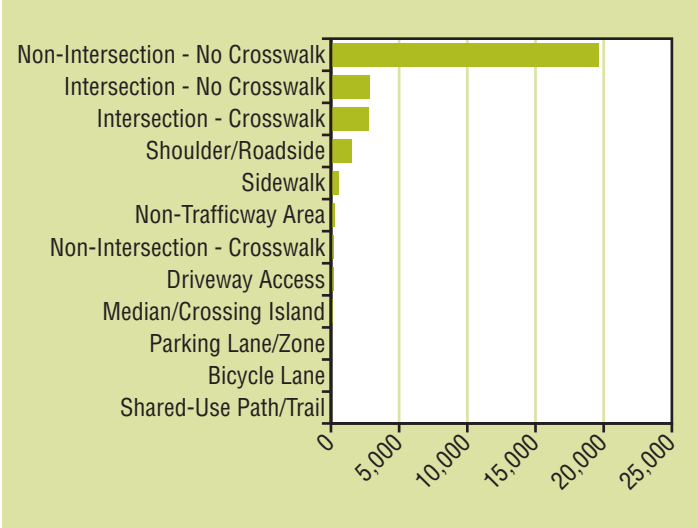


Source: FARS 2010 - 2014 Final, 2015 ARF

Fatalities in 2010 to 2015 Combined – Location and Action Prior to the Crashes

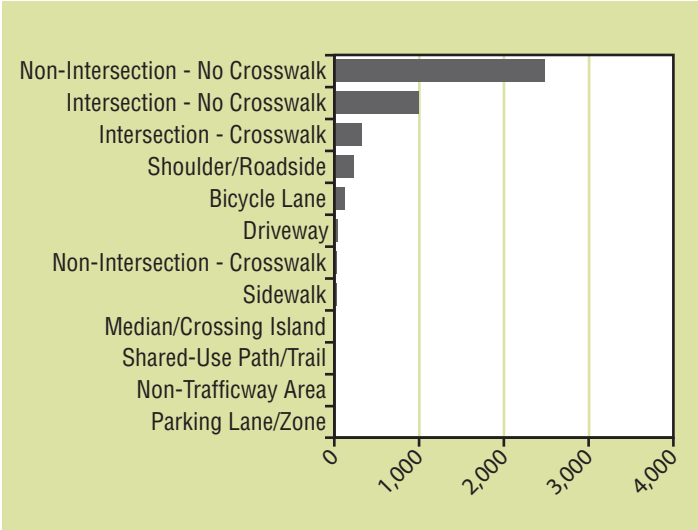
In 2010 to 2015 combined, the most common locations for both pedestrians and bicyclists to sustain fatal injuries in crashes were non-intersections with no crosswalks (68.4% of pedestrian fatalities and 57.3% of bicyclist fatalities), followed by intersections with no crosswalks (9.8% of pedestrian fatalities and 23.1% of bicyclist fatalities) and intersections with crosswalks (9.6% of pedestrian fatalities and 7.4% of bicyclist fatalities) (Figures 17 and 18; additional details in Table A-8 in the Appendix).

Figure 17
Pedestrian Fatalities by Location for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 18
Bicyclist Fatalities by Location for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figures 19 and 20 examine pedestrian and bicyclist actions that occurred prior to the non-motorist fatal crashes. It is important to note that more than one action can be reported for each non-motorist fatality. For example, a single pedestrian fatality may report "failure to yield right-of-way," "improper crossing of roadway or intersection" (jaywalking), and "not visible (dark clothing, no lighting, etc.)." Similarly, a single bicyclist fatality may report "wrong-way riding" and "failure to obey traffic signs, signals or officer" (additional details in Table A-9 in the Appendix).

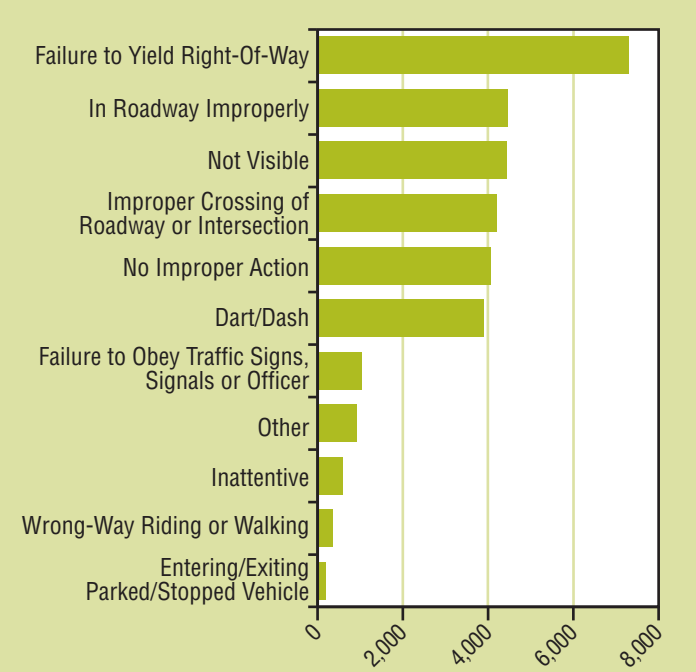
In the FARS data set for 2010 to 2015 combined, there were 4,793 pedestrian fatalities that did not report any actions (none noted, not reported or unknown). Among the 23,849 pedestrian fatalities that reported one or more actions, 17,418 reported just one action, 5,233 reported two actions, 1,117 reported three actions, 73 reported four actions, 7 reported five actions and 1 reported six actions, for a total of 31,568 actions. Since there are more actions than pedestrian fatalities with known actions (due to the number of pedestrian fatalities that reported more than one action), the percentages in Table A-9 add up to more than 100 percent (Table A-9).

A similar pattern can be seen with the bicyclist fatalities. In the FARS data set for 2010 to 2015 combined, there were 862 bicyclist fatalities that did not report any actions (none noted, not reported or unknown). Among the 3,473 bicyclist fatalities that reported one or more actions, 2,569 reported just one action, 678 reported two actions, 211 reported three actions, 12 reported four actions and 3 reported five actions, for a total of 4,621 actions. As with pedestrian fatalities, since there are more actions than bicyclist fatalities with known actions (due to the number of bicyclist fatalities that reported more than one action), the percentages in Table A-9 add up to more than 100 percent (Table A-9).

In 2010 to 2015 combined, the most common pedestrian actions prior to pedestrian fatalities were failure to yield right-of-way (7,301 at 30.6%), followed by in roadway improperly (e.g., standing, lying, working) (4,476 at 18.8%), not visible (4,436 at 18.6%), improper crossing of roadway or intersection (jaywalking, 4,216 at 17.7%), and no improper action (4,073 at 17.1%). The most common bicyclist actions prior to bicyclist fatalities were failure to yield right-of-way (1,213 at 34.9%), followed by no improper action (891 at 25.7%) (Figures 19 and 20). Figure 19 lists all reported pedestrian actions prior to pedestrian fatalities. Figure 20 lists the most commonly reported bicyclist actions prior to bicyclist fatalities (actions ≥ 100) (Table A-9).

Figure 19

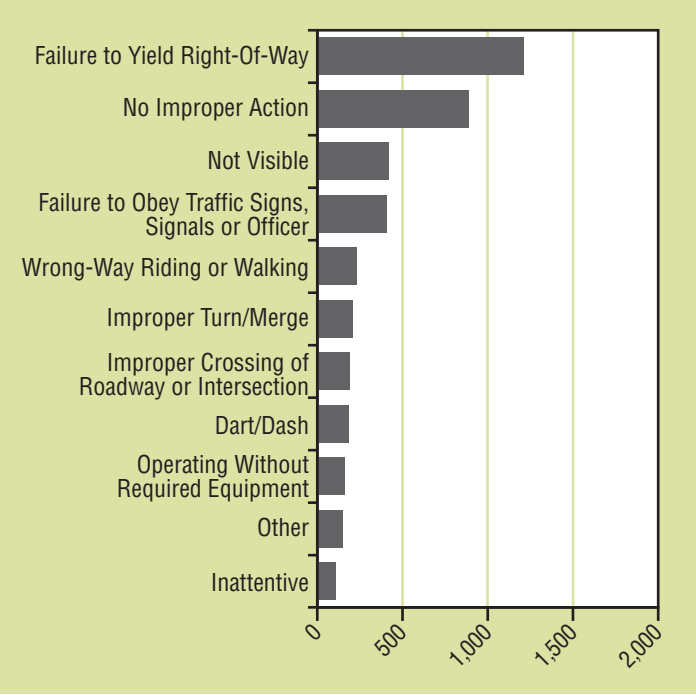
Pedestrian Actions Prior to Pedestrian Fatalities for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 20

Bicyclist Actions Prior to Bicyclist Fatalities for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Analysis of Speed Based on Fatalities and Injuries in 2010 to 2015 Combined

This section of the Research Note focuses on speed-related issues regarding pedestrian and bicyclist safety. Specifically, this section examines the posted speed limits on roadways where fatal and non-fatal injury crashes took place, and the involvement of speeding (driving over the posted speed limit or driving too fast for conditions) in those crashes. These issues have great relevance to recent efforts in the United States and around the world in setting goals consistent with the concept of *Vision Zero*.

Vision Zero

Vision Zero is a relatively new approach to highway safety that was first developed in Sweden in 1997, and has led to dramatic declines in serious injuries and fatalities. It has since been adopted in other European nations and, more recently, in some States and communities in the United States. Washington State adopted a Target Zero plan in 2000. New York City became the first municipality in the United States to adopt *Vision Zero* in 2014. As of October 2017, there were 31 jurisdictions that have joined the *Vision Zero* Network and additional jurisdictions are considering adoption of *Vision Zero*. (VisionZeroNetwork.org, 2017).

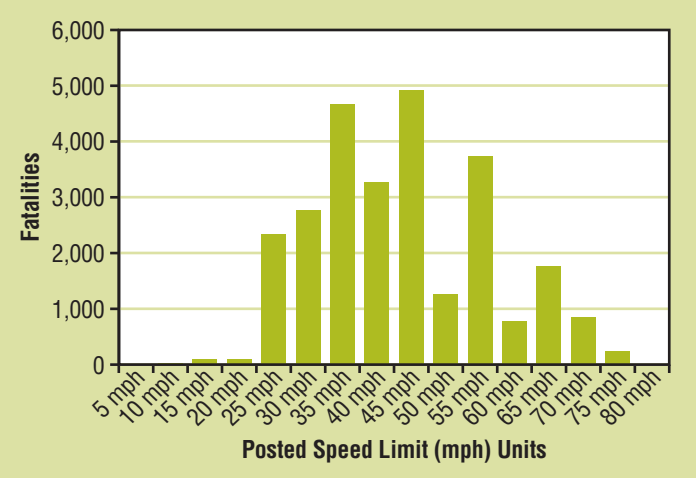
Vision Zero does not involve "doing the same old thing" or even "doing more of the same" and hoping for different (and better) results. *Vision Zero* is based on a few important and relatively new concepts, as a means toward improving highway safety, including the following.[5] [6]

- Traffic deaths and serious injuries are preventable and unacceptable; the only acceptable highway safety goal is zero serious injuries and fatalities.
- People make mistakes and poor choices, and these can (and inevitably will) lead to traffic crashes; however, those human errors and choices should not result in serious injury or death.
- There is shared responsibility among all who are involved in designing, building, maintaining, and managing a "safe system" so that crashes (when they occur) will be survivable.
- Motor vehicles and human bodies can tolerate only certain levels of crash forces before the crash results in serious injury or fatality.
- Speed is a fundamental predictor of crash survival; the transportation system should be designed for speeds that protect human life.

Fatalities in 2010 to 2015 Combined – Posted Speed Limit and Speeding Involvement

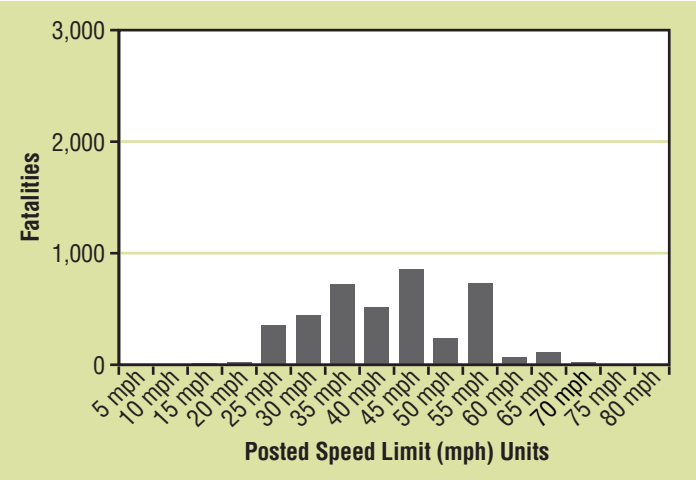
Figures 21 and 22 examine the posted speed limit on the roads where fatal crashes occurred. In 2010 to 2015 combined, the most common posted speed limits for pedestrian fatalities were 45 mph (18.3%), followed by 35 mph (17.4%) and 55 mph (13.9%) (Figure 21). In these years combined, the most common posted speed limits for bicyclist fatalities were 45 mph (20.9%), followed by 55 mph (17.9%) and 35 mph (17.6%) (Figure 22; additional details in Table A-10 in the Appendix).

Figure 21
Pedestrian Fatalities by Posted Speed Limit for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 22
Bicyclist Fatalities by Posted Speed Limit for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

[5] International Transport Forum. (2016). *Zero road deaths and serious injuries: Leading a paradigm shift to a safe system*. Paris: Organisation for Economic Co-operation and Development (OECD) Publishing. Available at www.towardszerofoundation.org/wp-content/uploads/2016/10/Zero_road_deaths-SafeSystems.pdf

[6] Vision Zero Network. (2017). What is Vision Zero? Retrieved from http://visionzeronetwork.org/about/what-is-vision-zero/

Table 3 identifies the number and percentage of total, pedestrian and bicyclist fatalities that were speeding-involved (i.e., one or more drivers in the crash was reported to be driving over the posted speed limit or driving too fast for conditions). In 2010 to 2015 combined, speeding-involvement was a factor in nearly 30 percent of all motor vehicle fatalities. Speeding involvement was much less common among pedestrian and bicyclist fatalities (8.0% for pedestrians and 8.6% for bicyclists) (Table 3).

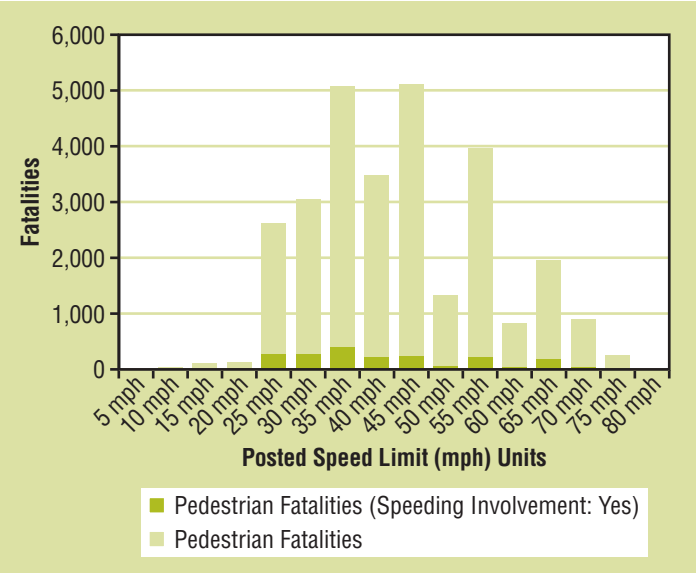
Table 3
Total, Pedestrian, and Bicyclist Fatalities by Speeding Involvement for 2010 to 2015 Combined

Speeding Involvement	Total Fatalities	%	Pedestrian	%	Bicyclist	%
No	140,615	70.3%	24,208	92.0%	3,763	91.4%
Yes	59,374	29.7%	2,105	8.0%	355	8.6%
Reported Total	**199,989**	**100%**	**26,313**	**100%**	**4,118**	**100%**
Unknown			2,329		217	
Total			**28,642**		**4,335**	

Source: FARS 2010 - 2014 Final, 2015 ARF

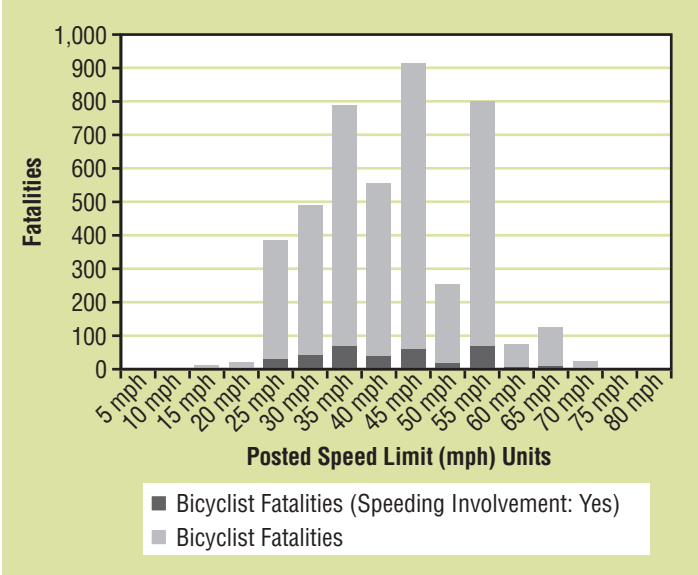
Figures 23 and 24 identify the numbers and percentages of fatalities that were speeding-involved at each posted speed limit. Speeding-involved pedestrian fatalities occurred most often on roads with posted speed limits of 35 mph (19.9%), following by 25 mph and 30 mph (14.0% and 13.7%, respectively) (Figure 23). Speeding-involved bicyclist fatalities occurred most often on roads with posted speed limits of 35 mph and 55 mph (both at 19.6%), following by 45 mph (16.7%) (Figure 24; additional details in Table A-11 in the Appendix).

Figure 23
Speeding-Involved Pedestrian Fatalities by Posted Speed Limit for 2010 to 2015 Combined



Source: FAR S 2010 - 2014 Final, 2015 ARF

Figure 24
Speeding-Involved Bicyclist Fatalities by Posted Speed Limit for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

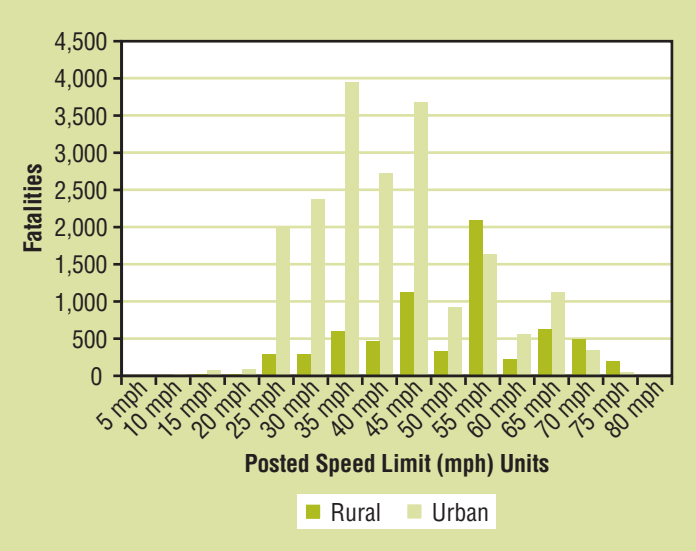
Fatalities In 2010 to 2015 Combined – Posted Speed Limit and Land Use

Figure 25 examines the posted speed limits in fatal pedestrian crashes, by land use. Fatal pedestrian crashes were more likely to occur on roads with lower posted speed limits in urban areas than in rural areas. In 2010 to 2015 combined, the most common posted speed limits for pedestrian fatalities in urban areas were 35 mph (20.2%), followed by 45 mph (18.8%). The most common posted speed limits for pedestrian fatalities in rural areas were 55 mph (30.7%), followed by 45 mph (16.6%) (additional details in Table A-12 in the Appendix).

Figure 26 examines the posted speed limit in fatal bicyclist crashes, by land use. Fatal bicyclist crashes also were more

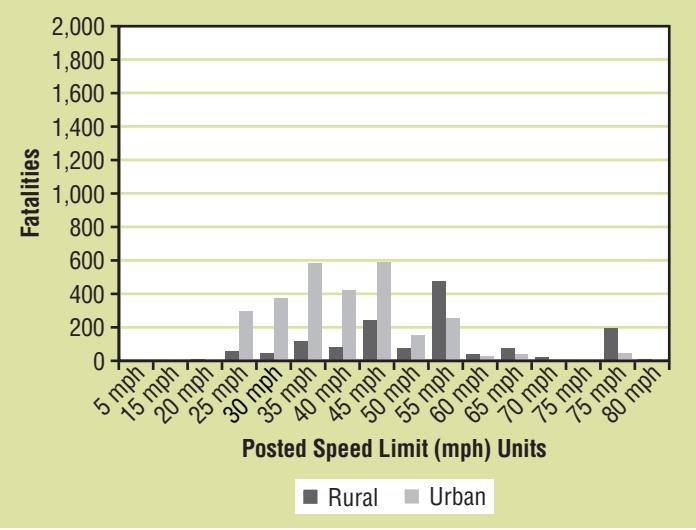
likely to occur on roads with lower posted speed limits in urban areas than in rural areas. In 2010 to 2015 combined, the most common posted speed limits for bicyclist fatalities in urban areas were 45 mph (21.4%), followed by 35 mph (21.2%). The most common posted speed limits for bicyclist fatalities in rural areas were 55 mph (38.3%), followed by 45 mph (19.4%) (additional details in Table A-13).

Figure 25
Pedestrian Fatalities by Posted Speed Limit and Land Use for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Figure 26
Bicyclist Fatalities by Posted Speed Limit and Land Use for 2010 to 2015 Combined



Source: FARS 2010 - 2014 Final, 2015 ARF

Survivability – Fatalities and Non-Fatal Injury Crashes in 2010 to 2015 Combined

Studies have estimated the survivability of crashes for non-motorists, based on the motor vehicle speed upon impact. For example, in a 2011 study, Brian Tefft of the Automobile Association of America (AAA) Foundation for Traffic Safety determined that:

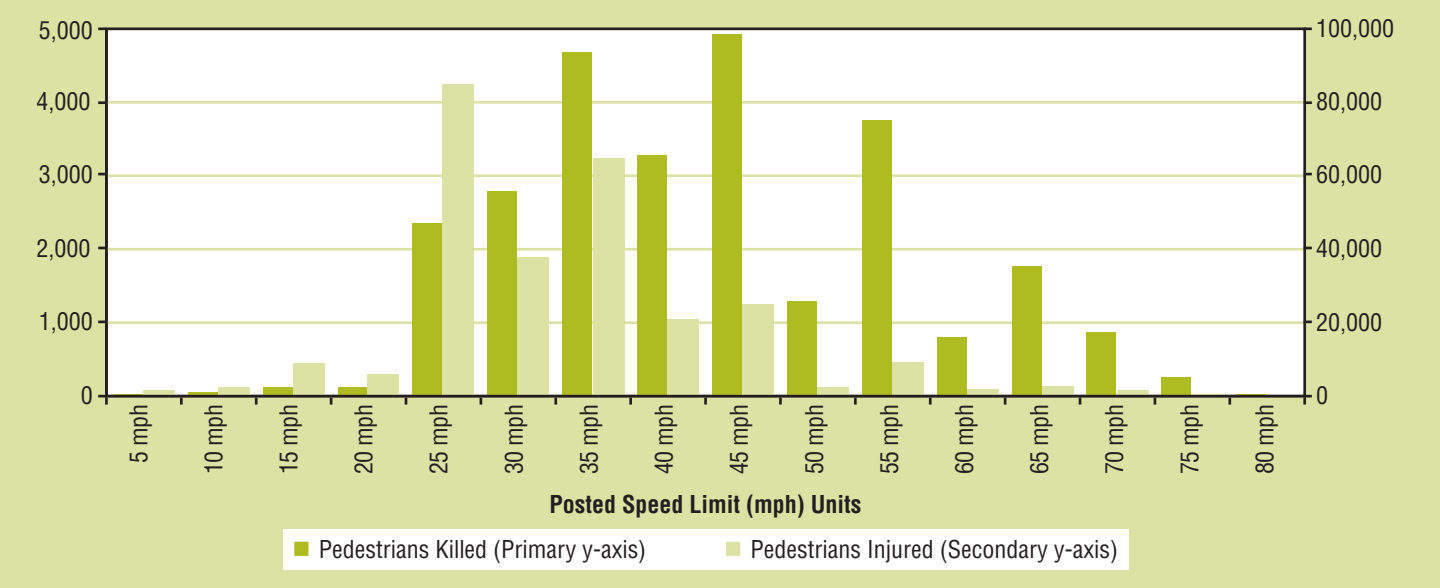
- In a crash at 20 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 18 percent;
- In a crash at 30 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 50 percent;
- In a crash at 40 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 77 percent (Tefft, 2011; see also Rosen & Sander, 2009, and Leaf & Preusser. 1999).[7]

This Research Note considers the survivability of pedestrian and bicyclist crashes, using posted speed limit as a surrogate for travel speed. The analysis examines data regarding fatally injured non-motorists from FARS and non-motorists who were injured (but not fatally) from NHTSA's National Automotive Sampling System General Estimate System.

Figure 27 examines the posted speed limit in fatal and non-fatal injury crashes involving pedestrians. Fatal pedestrian crashes were more likely to occur on roads with higher posted speed limits, compared with non-fatal injury pedestrian crashes. While the most common posted speed limits for pedestrian fatalities were 45 mph (18.3%), 35 mph (17.4%), and 55 mph (13.9%), the most common posted speed limits for pedestrian non-fatal injuries were 25 mph (31.9%), 35 mph (24.3%), and 30 mph (14.1%) (Figure 27; additional details in Tables A-10 and A-14 in the Appendix).

[7] Tefft, B. C. (2011). *Impact speed and a pedestrian's risk of severe injury or death*. Retrieved from the AAA Foundation website: www.aaafoundation.org/pdf/2011PedestrianRiskVsSpeed.pdf. Rosen, E., & Sander, U. (2009). Pedestrian fatality risk as a function of car impact speed. *Accident Analysis and Prevention*, 41, 536–542. Leaf, W. A., & Preusser, D. F. (1999). *Literature review on vehicle travel speeds and pedestrian injuries* (Report No. DOT HS 809 021). Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.dot.gov/people/injury/research/pub/HS809012.html.

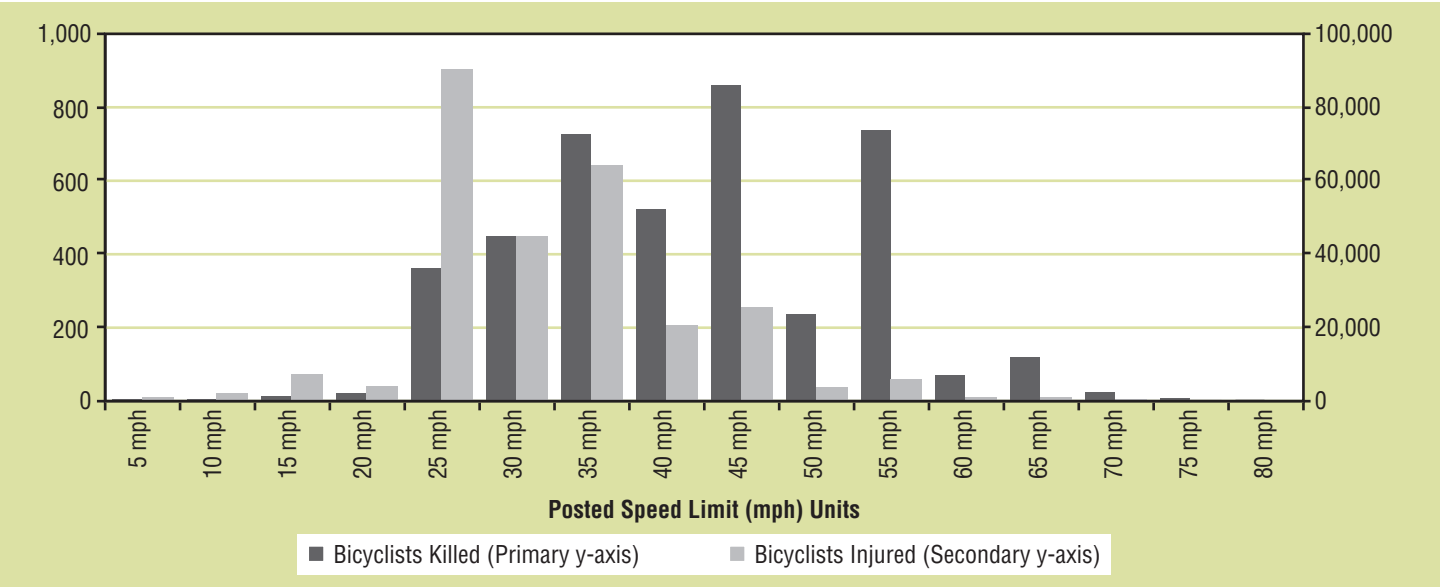
Figure 27
Pedestrian Fatalities and Pedestrians Injured by Posted Speed Limit for 2010 to 2015 Combined



Source: FARS 1980 - 2014 Final, 2015 ARF

Figure 28 examines the posted speed limit in fatal and non-fatal injury crashes involving bicyclists. Fatal bicyclist crashes also were more likely to occur on roads with higher posted speed limits, compared with non-fatal injury bicyclist crashes. While the most common posted speed limits for bicyclist fatalities were 45 mph (20.9%), 55 mph (17.9%), and 35 mph (17.6%), the most common posted speed limits for bicyclist non-fatal injuries were 25 mph (33.7%), 35 mph (23.9%), and 30 mph (16.6%) (Figure 28; additional details in Tables A-10 and A-14).

Figure 28
Bicyclist Fatalities and Bicyclists Injured by Posted Speed Limit for 2010 to 2015 Combined



Source: FARS 1980 - 2014 Final, 2015 ARF

Discussion

Fatality Trend Data From 1980 to 2015

Over the last 35 years, there has been a dramatic decline in motor vehicle fatalities. Pedestrian and bicyclist fatalities also have declined during this time.

Pedestrian fatalities declined by nearly 50 percent, from 8,070 in 1980, to a low of 4,109 in 2009, declining more sharply than motor vehicle fatalities during this period. As a result, the proportion of pedestrian fatalities (compared with total traffic fatalities) also declined. Bicyclist fatalities declined by more than one-third, from 965 in 1980, to a low of 623 in 2010, and remained at 2 percent of total motor vehicle fatalities throughout these years.

The decline in pedestrian and bicyclist fatalities has been encouraging and most pronounced for young people (birth to 19). In 1980 young pedestrians (birth to 19) who were fatally injured in traffic crashes represented 25.9 percent of pedestrian fatalities with known ages in that year. In 2015 young pedestrian fatalities (birth to 19) amounted to only 8.6 percent of pedestrian fatalities with known ages. Similarly, in 1980 young bicyclists (birth to 19) who were fatally injured in traffic crashes represented 67 percent of bicyclist fatalities with known ages in that year. In 2015 young bicyclist fatalities (birth to 19) amounted to only 11.1 percent of bicyclist fatalities with known ages.

These remarkable improvements may reflect efforts that have taken place to reduce pedestrian and bicyclist fatalities, including many activities that have focused especially on youth. (See nhtsa.gov/road-safety/pedestrian-safety, pedbikeinfo.org, saferoutespartnership.org.) It also may reflect a decline in walking and bicycling among young people.[8] [9]

In the last decade, the number of pedestrian and bicyclist fatalities has increased. The largest increases in pedestrian and bicyclist fatalities have been among adults, especially among adult bicyclists 50 to 69 years old. In 1980 bicyclists 50 to 69 who were fatally injured in traffic crashes represented only 7.0 percent of bicyclist fatalities with known ages in that year. In 2015, bicyclist fatalities (50 to 69) amounted to 41.3 percent of bicyclist fatalities with known ages.

The age group with the largest percentage of pedestrian fatalities has increased roughly every 5 years over time. With only one exception (2001), the age group 10 to 14 experienced the largest percentage of bicyclist fatalities from 1980 to 2003. After that, the age group with the largest percentage of bicyclist fatalities increased every few years, following a pattern similar to pedestrian fatalities. This pattern shows that certain age cohorts (notably, pedestrians born in the mid-1950s to mid-1960s) are most highly represented. Their high representation may be due to the size of this "baby boom" population.[10] It also may be due to a propensity of this age cohort to engage more in active transportation (that is, walking and bicycling) than other generations. These findings suggest that safety efforts should focus especially on these older adult populations.

In 2015, about 70 percent of pedestrian fatalities were male and 30 percent were female. This proportion of pedestrian fatalities by gender has been remarkably consistent over the last 35 years. In 2015, about 85 percent of bicyclist fatalities were male and 15 percent were female. The proportion of bicyclist fatalities by gender has varied over the last 35 years, ranging from 80 percent to 90 percent for males, and 10 percent to 20 percent for females.

There is a lack of data, however, regarding the extent to which people walk and bike, equivalent to vehicle miles traveled, which applies to motor vehicles. This limits our ability to provide context for changes in fatalities. There is tremendous interest in this information, and efforts are underway to attempt to collect more of this type of data (http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa14014/).

Fatalities in 2010 to 2015 Combined

Non-motorist traffic fatalities occur most often in urban areas. In 2010 to 2015 combined, 74 percent of pedestrian fatalities and 68 percent of bicyclist fatalities occurred in urban areas; 25 percent of pedestrian fatalities and 30 percent of bicyclist fatalities occurred in rural areas.

In 2010 to 2015 combined, the greatest proportion of fatal crashes for both pedestrians and bicyclists occurred from 6 p.m. to 8:59 p.m. However, pedestrian fatalities were more common later at night and bicyclist fatalities were more common earlier in the day. Nearly three-quarters of pedestrian fatalities occur when it's dark; nearly one-quarter during daylight. Bicyclist fatalities are more evenly split, with 43.4 percent occurring when it's dark and 50.6 percent during daylight.

In 2010 to 2015 combined, the highest percentages of pedestrian fatalities occurred in October, November and December. These months coincide with declining daylight hours. The highest percentages of bicyclist fatalities occurred in June, July, August, and September, when the weather is more conducive to bicycle-riding. The increased risk for bicyclists during these months may relate to increased exposure. Pedestrian and bicyclist fatalities were spread more evenly

[8] Santos, A., McGuckin, N., Nakamoto, H. Y., Gray, D., & Liss, S. (2011). *Summary of travel trends: 2009 National Household Travel Survey* (Report No. FHWA-PL-11-022). Washington, DC: Federal Highway Administration. Retrieved from http://nhts.ornl.gov/2009/pub/stt.pdf

[9] Pedestrian and Bicycle Information Center. (2015). Safe *Routes to School online guide*. Retrieved from guide.saferoutesinfo.org/index.cfm

[10] Colby, S. L. & Ortman, J. M. (2014). *The Baby Boom Cohort in the United States 2012 to 2060* (U.S. Census Bureau). Retrieved from www.census.gov/prod/2014pubs/p25-1141.pdf

across days of the week. The highest percentage occurred on Fridays and Saturdays for both pedestrians and bicyclists.

The most common locations for both pedestrians and bicyclists to sustain fatal injuries in crashes were non-intersections with no crosswalks, followed by intersections with no crosswalks and intersections with crosswalks. The most common actions prior to pedestrian fatalities were failure to yield right-of-way, followed by in roadway improperly (e.g., standing, lying, working), not visible, improper crossing of roadway or intersection (jaywalking), and no improper action. The most common actions prior to bicyclist fatalities were failure to yield right-of-way, followed by no improper action.

These findings can help inform engineering, education and enforcement efforts to improve pedestrian and bicyclist safety.

Analysis of Speed-Related Factors Based on Fatalities and Injuries in 2010 to 2015 Combined

As noted earlier in this Research Note, *Vision Zero* is a relatively new approach to highway safety that was first developed in Sweden in 1997, and has led to dramatic declines in serious injuries and fatalities. *Vision Zero* is based on a few important and relatively new concepts, as a means toward improving highway safety, including:

- *Speed is a fundamental predictor of crash survival; the transportation system should be designed for speeds that protect human life.*

Studies have estimated the survivability of crashes for non-motorists, based on the motor vehicle speed upon impact. For example, in a 2011 study, Brian Tefft of the AAA Foundation for Traffic Safety determined that the likelihood of a pedestrian sustaining a serious or fatal injury is:

- 18 percent in a crash at 20 mph
- 50 percent in a crash at 30 mph
- 77 percent in a crash at 40 mph

FARS does not contain data about the speed at which crashes occur. This Research Note examines posted speed limits as a surrogate for speed of travel. In 2010 to 2015 combined, the most common posted speed limits for pedestrian fatalities were 45 mph, followed by 35 mph and 55 mph. The most common posted speed limits for bicyclist fatalities were 45 mph, followed by 55 mph and 35 mph.

Speeding-involvement was a factor in nearly 30 percent of all motor vehicle fatalities, but was much less common among pedestrian and bicyclist fatalities (7.4% for pedestrians and 8.2% for bicyclists).

Fatal pedestrian and bicyclist crashes are more likely to occur on roads with lower posted speed limits in urban areas than in rural areas. In 2010 to 2015 combined, the two most common posted speed limits for pedestrian and bicyclist fatalities in urban areas were 35 mph and 45 mph. The most common posted speed limits for both pedestrian and bicyclist fatalities in rural areas were 55 mph, followed by 45 mph.

The frequency of fatalities occurring on roads of certain posted speed limits, however, does not necessarily mean that these roads are more dangerous. For example, there may be more road miles on roads with these posted speed limits, or pedestrian and bicycle travel may be more common on these roads.

To account for exposure, we examined data from both FARS (a census of all fatal motor vehicle crashes on public roadways in the United States) and NHTSA's NASS GES (a nationally representative sample of motor vehicle crashes on U.S. public roadways).

This examination shows that fatal pedestrian and bicyclist crashes are more likely to occur on roads with higher posted speed limits, compared with non-fatal injury pedestrian and bicyclist crashes. While the most common posted speed limits for pedestrian fatalities were 45 mph, 35 mph, and 55 mph, the most common posted speed limits for pedestrian non-fatal injuries were 25 mph, 35 mph, and 30 mph. Similarly, while the most common posted speed limits for bicyclist fatalities were 45 mph, 55 mph, and 35 mph, the most common posted speed limits for bicyclist non-fatal injuries also were 25 mph, 35 mph, and 30 mph. In other words, the pedestrians and bicyclists involved in crashes on roads with **higher** posted speed limits (and presumably were struck at higher speeds) were **less** likely to survive. The pedestrians and bicyclists involved in crashes on roads with **lower** posted speed limits (and presumably were struck at lower speeds) were **more** likely to survive.

These findings are not surprising, given the increased crash forces that tend to occur on roadways with higher posted speed limits, and their impact on non-motorists, who do not experience the protection of being enclosed in a motor vehicle.

Many States and communities, including especially *Vision Zero* cities (see VisionZeroNetwork.org), are considering the adoption of policies and implementation of engineering treatments that will lower posted speed limits and otherwise slow motor vehicle traffic, especially in locations where conflicts with non-motorists are likely. These findings can provide support for their decisions to do so.

Limitations

This Research Note presents data regarding both pedestrians and bicyclists. FARS data were used to examine trends in fatality numbers and rates, gender, age, land use (i.e., urban

or rural), hours of the day, light conditions, month of the year, day of the week, location, and actions prior to the crashes.

FARS data was used also to examine the posted speed limit on roadways where pedestrian and bicyclist fatal crashes took place and the involvement of speeding (driving over the posted speed limit or driving too fast or conditions) in those fatal crashes. Data from the NASS GES was used to examine posted speed limits on roadways where pedestrian and bicyclist crashes took place that resulted in non-fatal injuries.

Although FARS represents a census of traffic fatalities in the United States, some pedestrian and bicyclist fatalities are not included. For example, if a crash occurred on a trail or private roadway, and not on a public roadway, or if it involved a pedestrian and a bicyclist, but not a motor vehicle, it would not be included.

The NASS GES does not represent a census of traffic crashes, but rather is a probability-based sample of police-reported crashes on public roadways. However, many pedestrian and bicyclist crashes go unreported, especially if they involve minor or no injury. For this reason and others, GES may not be wholly representative of pedestrian and bicyclist crashes across the United States.

Some data elements are not reported for all cases contained in FARS and GES. In FARS, data was not reported for land use (in 585 pedestrian fatalities and 121 bicyclist fatalities), for hour of the day (in 145 pedestrian fatalities and 9 bicyclist fatalities), for light condition (in 118 pedestrian fatalities and 11 bicyclist fatalities), for location (in 432 pedestrian fatalities and 53 bicyclist fatalities), for posted speed limits (in 1,519 pedestrian fatalities and 202 bicyclist fatalities) and for speeding involvement (in 2,070 pedestrian fatalities and 214 bicyclist fatalities). Non-motorist actions prior to non-motorist fatalities in FARS were not noted, not reported or unknown (in 4,793 pedestrian fatalities and 862 bicyclist fatalities). In GES, the posted speed limit was not reported or unknown (in 135,000 pedestrian crashes and 68,000 bicyclist crashes). The data elements that were not reported or unknown create uncertainty regarding the findings.

In addition, as noted above, there is a lack of data regarding the extent to which people walk and bicycle. This limits our ability to provide context for changes in fatalities. For example, do increases or decreases in non-motorist fatalities reflect increased (or decreased) risk or just higher (or lower) exposure? There is tremendous interest in this information, and we encourage current efforts that are attempting to collect more of this type of data.

Conclusions

Fatality Trend Data From 1980 to 2015

Over the last 35 years, there has been a dramatic decline in motor vehicle fatalities. From 1980 to 2009, pedestrian fatalities declined by nearly 50 percent and, from 1980 to 2010, bicyclist fatalities declined by more than one-third. The decline in pedestrian and bicyclist fatalities has been encouraging and most pronounced for young people (birth to 19).

In the last decade, however, the number of pedestrian and bicyclist fatalities has increased. The largest increases in pedestrian and bicyclist fatalities have been among adults, especially among adult bicyclists 50 to 69 years old. The age group with the largest percentage of pedestrian fatalities has increased roughly every 5 years over time. A similar pattern can be seen for bicyclist fatalities, starting around 2001. This pattern shows that certain age cohorts (notably, pedestrians and bicyclists born in the mid-1950s to the mid-1960s) are most highly represented. These findings suggest that safety efforts should focus especially on these older adult populations.

A large majority of both pedestrian and bicyclist fatalities are male and have been over the last 35 years. In 2015, some 70 percent of pedestrian fatalities and 85 percent of bicyclist fatalities were male. There is a lack of data, however, regarding the extent to which people walk and bike. This limits our ability to provide context for changes in fatalities. There is tremendous interest in this information and efforts are underway to attempt to collect more of this type of data. These efforts should be encouraged and supported.

Fatalities in 2010 to 2015 Combined

An analysis of FARS data from 2010 to 2015 combined showed that non-motorist traffic fatalities occurred most often in urban areas. Nearly three-quarters of pedestrian fatalities occurred when it was dark; nearly one-quarter occurred during daylight. Bicyclist fatalities were split more evenly.

The highest percentage of pedestrian fatalities occurred in October, November, and December (which coincide with declining daylight hours). The highest percentage of bicyclist fatalities occurred in June, July, August, and September (during months when the weather is more conducive to bicycle-riding and there is increased exposure).

The most common locations for both pedestrians and bicyclists to sustain fatal injuries in crashes were non-intersections with no crosswalks, followed by intersections with no crosswalks and intersections with crosswalks. The most common pedestrian actions prior to pedestrian fatalities were failure to yield right-of-way, followed by in roadway improperly (e.g., standing, lying, working), not visible, improper crossing of roadway or intersection (jaywalking), and no improper action. The most common bicyclist actions prior to bicyclist fatalities in these years combined were failure to yield right-of-way, followed by no improper action.

These findings can help inform engineering, education and enforcement efforts to improve pedestrian and bicyclist safety.

Analysis of Speed-Related Factors Based on Fatalities and Injuries in 2010 to 2015 Combined

Vision Zero, which has led to dramatic declines in serious injuries and fatalities in Sweden and other locations, is based on a few important and relatively new concepts, including:

- *Speed is a fundamental predictor of crash survival; the transportation system should be designed for speeds that protect human life.*

Studies have estimated the survivability of crashes for non-motorists, based on the motor vehicle speed upon impact. FARS does not contain data about the speed at which crashes occur. This Research Note examines posted speed limits as a surrogate for speed of travel. We examined data from both FARS and NHTSA's NASS GES.

This examination shows that fatal pedestrian and bicyclist crashes are more likely to occur on roads with higher posted speed limits, compared with non-fatal injury pedestrian and bicyclist crashes. In other words, the pedestrians and bicyclists involved in crashes on roads with **higher** posted speed limits (and presumably were struck at higher speeds) were **less** likely to survive. The pedestrians and bicyclists involved in crashes on roads with **lower** posted speed limits (and presumably were struck at lower speeds) were **more** likely to survive.

These findings are not surprising, given the increased crash forces that tend to occur on roadways with higher posted speed limits, and their impact on non-motorists, who do not experience the protection of being enclosed in a motor vehicle.

Speeding-involvement was a factor in nearly one-third of all motor vehicle fatalities, but was much less common among pedestrian and bicyclist fatalities.

Many States and communities, including especially *Vision Zero* cities (see VisionZeroNetwork.org), are considering the adoption of policies and the implementation of engineering treatments that will lower posted speed limits and the speed of travel. The findings in this Research Note can provide support for their decisions to do so.

Appendix A

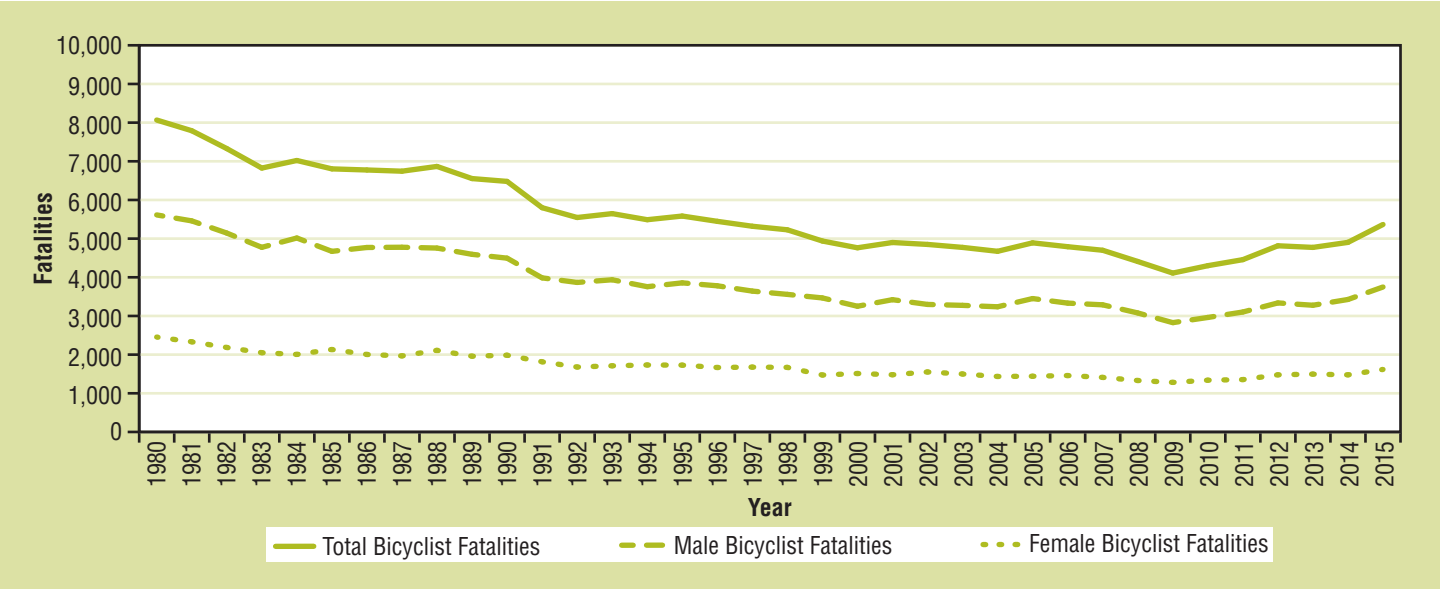
Table A-1

Total, Pedestrian, and Bicyclist Fatality Numbers and Percentages in Motor Vehicle Crashes From 1980 to 2015

Year	Total Fatalities	Pedestrian Fatalities		Bicyclist Fatalities	
		Fatalities	%	Fatalities	%
1980	51,091	8,070	16%	965	2%
1981	49,301	7,837	16%	936	2%
1982	43,945	7,331	17%	883	2%
1983	42,589	6,826	16%	839	2%
1984	44,257	7,025	16%	849	2%
1985	43,825	6,808	16%	890	2%
1986	46,087	6,779	15%	941	2%
1987	46,390	6,745	15%	948	2%
1988	47,087	6,870	15%	911	2%
1989	45,582	6,556	14%	832	2%
1990	44,599	6,482	15%	859	2%
1991	41,508	5,801	14%	843	2%
1992	39,250	5,549	14%	723	2%
1993	40,150	5,649	14%	816	2%
1994	40,716	5,489	14%	802	2%
1995	41,817	5,584	13%	833	2%
1996	42,065	5,449	13%	765	2%
1997	42,013	5,321	13%	814	2%
1998	41,501	5,228	13%	760	2%
1999	41,717	4,939	12%	754	2%
2000	41,945	4,763	11%	693	2%
2001	42,196	4,901	12%	732	2%
2002	43,005	4,851	11%	665	2%
2003	42,884	4,774	11%	629	2%
2004	42,836	4,675	11%	727	2%
2005	43,510	4,892	11%	786	2%
2006	42,708	4,795	11%	772	2%
2007	41,259	4,699	11%	701	2%
2008	37,423	4,414	12%	718	2%
2009	33,883	4,109	12%	628	2%
2010	32,999	4,302	13%	623	2%
2011	32,479	4,457	14%	682	2%
2012	33,782	4,818	14%	734	2%
2013	32,893	4,779	15%	749	2%
2014	32,744	4,910	15%	729	2%
2015	35,092	5,376	15%	818	2%

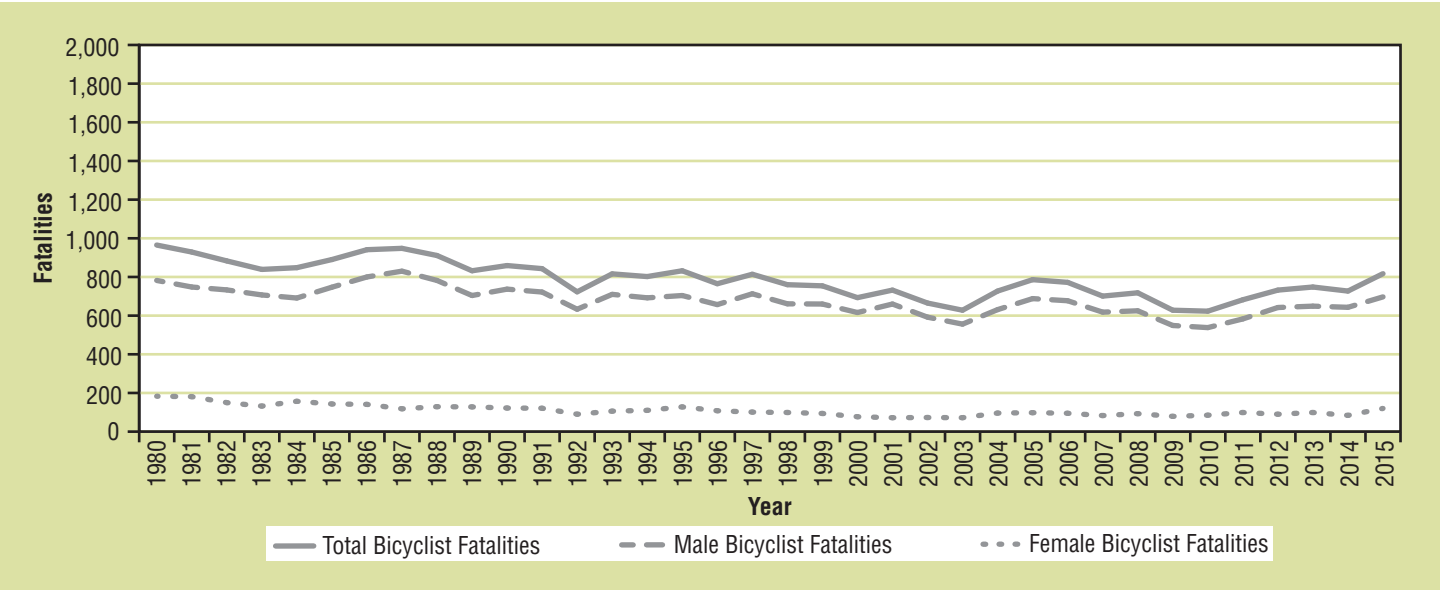
Source: FARS 1980 - 2014 Final, 2015 ARF

Figure A-1
Total, Male, and Female Pedestrian Fatalities From 1980 to 2015



Source: FARS 1980 - 2014 Final, 2015 ARF

Figure A-2
Total, Male, and Female Bicyclist Fatalities From 1980 to 2015



Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-2

Total, Male, and Female Pedestrian and Bicyclist Fatality Numbers and Percentages in Motor Vehicle Crashes From 1980 to 2015*

Year	Pedestrian Fatalities					Bicyclist Fatalities				
	Male Fatalities	%	Female Fatalities	%	Total Fatalities	Male Fatalities	%	Female Fatalities	%	Total Fatalities
1980	5,613	70%	2,454	30%	8,067	782	81%	183	19%	965
1981	5,459	70%	2,332	30%	7,791	748	80%	181	19%	929
1982	5,144	70%	2,185	30%	7,329	733	83%	150	17%	883
1983	4,775	70%	2,050	30%	6,825	707	84%	132	16%	839
1984	5,016	71%	2,005	29%	7,021	691	81%	157	19%	848
1985	4,671	69%	2,133	31%	6,804	747	84%	143	16%	890
1986	4,771	70%	2,004	30%	6,775	800	85%	141	15%	941
1987	4,777	71%	1,967	29%	6,744	830	88%	118	12%	948
1988	4,756	69%	2,111	31%	6,867	782	86%	129	14%	911
1989	4,594	70%	1,959	30%	6,553	704	85%	128	15%	832
1990	4,495	69%	1,985	31%	6,480	737	86%	122	14%	859
1991	3,985	69%	1,815	31%	5,800	722	86%	121	14%	843
1992	3,867	70%	1,679	30%	5,546	633	88%	90	12%	723
1993	3,936	70%	1,711	30%	5,647	710	87%	106	13%	816
1994	3,757	68%	1,732	32%	5,489	692	86%	110	14%	802
1995	3,856	69%	1,728	31%	5,584	704	85%	128	15%	832
1996	3,780	69%	1,667	31%	5,447	657	86%	108	14%	765
1997	3,643	69%	1,677	32%	5,320	713	88%	101	12%	814
1998	3,558	68%	1,670	32%	5,228	661	87%	99	13%	760
1999	3,466	70%	1,472	30%	4,938	660	88%	94	13%	754
2000	3,251	68%	1,512	32%	4,763	616	89%	77	11%	693
2001	3,421	70%	1,479	30%	4,900	660	90%	72	10%	732
2002	3,298	68%	1,552	32%	4,850	592	89%	73	11%	665
2003	3,274	69%	1,499	31%	4,773	556	88%	72	11%	628
2004	3,237	69%	1,435	31%	4,672	631	87%	96	13%	727
2005	3,450	71%	1,441	30%	4,891	688	88%	98	13%	786
2006	3,332	70%	1,459	30%	4,791	677	88%	95	12%	772
2007	3,288	70%	1,411	30%	4,699	618	88%	83	12%	701
2008	3,078	70%	1,331	30%	4,409	625	87%	93	13%	718
2009	2,827	69%	1,282	31%	4,109	549	87%	79	13%	628
2010	2,961	69%	1,339	31%	4,300	538	86%	85	14%	623
2011	3,102	70%	1,354	30%	4,456	583	86%	99	15%	682
2012	3,337	69%	1,478	31%	4,815	642	88%	90	12%	732
2013	3,277	69%	1,496	31%	4,773	649	87%	99	13%	748
2014	3,426	70%	1,477	30%	4,903	643	88%	84	12%	727
2015	3,749	70%	1,617	30%	5,366	697	85%	120	15%	817

Source: FARS 1980 - 2014 Final, 2015 ARF
*Based on fatalities with known gender.

Table A-3
Non-Motorist Fatalities by Land Use for 2010 to 2015 Combined

Land Use	Pedestrian	%	Bicyclist	%
Rural	7,106	25.3%	1,280	30.4%
Urban	20,951	74.7%	2,934	69.6%
Total	**28,057**	**100%**	**4,214**	**100%**
Unknown	585		121	
Total	**28,642**		**4,335**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-4
Non-Motorist Fatalities by Hour of Day for 2010 to 2015 Combined

Hour of Day	Pedestrian	%	Bicyclist	%
6 a.m. to 8:59 a.m.	2,570	9.0%	481	11.1%
9 a.m. to 11:59 a.m.	1,528	5.4%	439	10.1%
Noon to 2:59 p.m.	1,628	5.7%	504	11.7%
3 p.m. to 5:59 p.m.	2,862	10.0%	750	17.3%
6 p.m. to 8:59 p.m.	7,310	25.7%	959	22.2%
9 p.m. to 11:59 a.m.	6,416	22.5%	707	16.3%
Midnight to 2:59 a.m.	3,429	12.0%	263	6.1%
3 a.m. to 5:59 a.m.	2,754	9.7%	223	5.2%
Total	**28,497**	**100.0%**	**4,326**	**100.0%**
Unknown	145		9	
Total	**28,642**		**4,335**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-5
Non-Motorist Fatalities by Light Conditions for 2010 to 2015 Combined

Light Condition	Pedestrian	%	Bicyclist	%
Dawn	467	1.6%	100	2.3%
Daylight	6,899	24.2%	2,194	50.7%
Dusk	582	2.0%	148	3.4%
Dark	20,558	72.1%	1,882	43.5%
Total	**28,506**	**100.0%**	**4,324**	**100.0%**
Unknown	136		11	
Total	**28,642**		**4,335**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-6
Non-Motorist Fatalities by Month of the Year for 2010 to 2015 Combined

Month	Pedestrian	%	Bicyclist	%
January	2,473	8.6%	249	5.7%
February	2,143	7.5%	224	5.2%
March	2,230	7.8%	278	6.4%
April	1,965	6.9%	334	7.7%
May	1,964	6.9%	393	9.1%
June	1,904	6.6%	426	9.8%
July	2,135	7.5%	485	11.2%
August	2,129	7.4%	465	10.7%
September	2,492	8.7%	460	10.6%
October	2,990	10.4%	411	9.5%
November	3,010	10.5%	343	7.9%
December	3,207	11.2%	267	6.2%
Total	**28,642**	**100.0%**	**4,335**	**100.0%**

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-7
Non-Motorist Fatalities by Day of the Week for 2010 to 2015 Combined

Day of Week	Pedestrian	%	Bicyclist	%
Sunday	4,000	14.0%	573	13.2%
Monday	3,736	13.0%	599	13.8%
Tuesday	3,682	12.9%	589	13.6%
Wednesday	3,702	12.9%	620	14.3%
Thursday	3,943	13.8%	612	14.1%
Friday	4,641	16.2%	690	15.9%
Saturday	4,938	17.2%	652	15.0%
Total	**28,642**	**100.0%**	**4,335**	**100.0%**

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-8
Non-Motorist Fatalities by Location for 2010 to 2015 Combined

Location	Pedestrian	%	Bicyclist	%
Bicycle Lane	31	0.1%	123	2.9%
Driveway Access	198	0.7%	45	1.1%
Intersection - Crosswalk	2,761	9.6%	322	7.5%
Intersection- No Crosswalk	2,801	9.8%	1,001	23.4%
Median/Crossing Island	112	0.4%	6	0.1%
Non-Intersection - Crosswalk	226	0.8%	30	0.7%
Non-Intersection - No Crosswalk	19,604	68.4%	2,483	58.0%
Non-Trafficway Area	249	0.9%	3	0.1%
Parking Lane/Zone	58	0.2%	0	0.0%
Shared-Use Path/Trail	10	0.0%	5	0.1%
Shoulder/Roadside	1,492	5.2%	235	5.5%
Sidewalk	591	2.1%	29	0.7%
Reported Total	**28,133**	**100.0%**	**4,282**	**100.0%**
Unknown	509		53	
Total	**28,642**		**4,335**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-9
Actions Prior to Non-Motorist Fatalities for 2010 to 2015 Combined

Actions Prior to Non-Motorist Fatalities	Pedestrian	%	Bicyclist	%
Dart/Dash	3,913	16.4%	184	5.3%
Driving on Wrong Side of Road	0	0.0%	55	1.6%
Entering/Exiting Parked/Stopped Vehicle	203	0.9%	0	0.0%
Failing to Have Lights on When Required	0	0.0%	77	2.2%
Failure to Keep in Proper Lane or Running Off Road	0	0.0%	74	2.1%
Failure to Obey Traffic Signs, Signals or Officer	1,051	4.4%	407	11.7%
Failure to Yield Right-of-Way	7,301	30.6%	1,213	34.9%
Improper Crossing of Roadway or Intersection	4,216	17.7%	193	5.6%
Improper or Erratic Lane Changing	0	0.0%	72	2.1%
Improper Passing	0	0.0%	21	0.6%
Improper Turn/Merge	0	0.0%	211	6.1%
In Roadway Improperly	4,476	18.8%	26	0.7%
Inattentive (Talking, Eating, etc.)	606	2.5%	108	3.1%
Making Improper Entry to or Exit From Trafficway	0	0.0%	62	1.8%
No Improper Action	4,073	17.1%	891	25.7%
Not Visible (Dark Clothing, No Lighting, etc.)	4,436	18.6%	419	12.1%
Operating in Erratic, Reckless, Careless or Negligent Manner	0	0.0%	10	0.3%
Operating the Vehicle in Erratic, Reckless, Careless or Negligent Manner	0	0.0%	18	0.5%
Operating Without Required Equipment	0	0.0%	163	4.7%
Other	927	3.9%	150	4.3%
Passing with Insufficient Distance/Inadequate Visibility/Failing to Yield	0	0.0%	6	0.2%
Wrong-Way Riding or Walking	366	1.5%	261	7.5%
Total Non-Motorist Fatalities with Known Actions	**23,849**	**100.0%**	**3,473**	**100.0%**
None Noted/Not Reported/Unknown	4,793		862	
Total Non-Motorist Fatalities	**28,642**		**4,335**	
Total Known Actions Prior to Non-Motorist Fatalities	**31,568**		**4,621**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-10

Non-Motorist Fatalities by Posted Speed Limit for 2010 to 2015 Combined

Posted Speed Limit	Pedestrian	%	Bicyclist	%
5 mph	12	0.0%	1	0.0%
10 mph	29	0.1%	1	0.0%
15 mph	104	0.4%	11	0.3%
20 mph	105	0.4%	19	0.4%
25 mph	2,341	8.2%	358	8.3%
30 mph	2,767	9.7%	445	10.3%
35 mph	4,661	16.3%	722	16.7%
40 mph	3,263	11.4%	518	11.9%
45 mph	4,911	17.1%	856	19.7%
50 mph	1,271	4.4%	233	5.4%
55 mph	3,744	13.1%	734	16.9%
60 mph	788	2.8%	66	1.5%
65 mph	1,756	6.1%	115	2.7%
70 mph	848	3.0%	21	0.5%
75 mph	235	0.8%	4	0.1%
80 mph	12	0.0%	0	0.0%
Total	**28,642**	**100%**	**4,335**	**100%**
No Statutory Limit	276		29	
Unknown	1,519		202	
Total	**28,642**		**4,335**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-11

Speeding-Involved Pedestrian and Bicyclist Fatalities by Posted Speed Limit for 2010 to 2015 Combined

Posted Speed Limit	Pedestrian	%	Bicyclist	%
5 mph	1	0.0%	0	0.0%
10 mph	2	0.1%	0	0.0%
15 mph	11	0.5%	2	0.6%
20 mph	19	0.9%	3	0.9%
25 mph	282	14.0%	29	8.4%
30 mph	276	13.7%	43	12.4%
35 mph	400	19.9%	68	19.6%
40 mph	213	10.6%	38	11.0%
45 mph	236	11.7%	58	16.7%
50 mph	58	2.9%	19	5.5%
55 mph	219	10.9%	68	19.6%
60 mph	41	2.0%	7	2.0%
65 mph	191	9.5%	9	2.6%
70 mph	49	2.4%	3	0.9%
75 mph	16	0.8%	0	0.0%
80 mph	1	0.0%	0	0.0%
Total	**2,015**	**100%**	**347**	**100%**
No Statutory Limit	11		1	
Unknown	79		7	
Total	**2,105**		**355**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-12

Pedestrian Fatalities by Posted Speed Limit and Land Use for 2010 to 2015 Combined

Posted Speed Limit	Rural	%	Urban	%	Unknown	%
5 mph	2	0.0%	8	0.0%	2	0.4%
10 mph	7	0.1%	14	0.1%	8	1.5%
15 mph	23	0.3%	75	0.4%	6	1.1%
20 mph	20	0.3%	81	0.4%	4	0.8%
25 mph	291	4.3%	2,011	10.3%	39	7.5%
30 mph	289	4.3%	2,373	12.1%	105	20.1%
35 mph	602	8.9%	3,945	20.2%	114	21.8%
40 mph	457	6.7%	2,723	13.9%	83	15.9%
45 mph	1,128	16.6%	3,678	18.8%	105	20.1%
50 mph	333	4.9%	924	4.7%	14	2.7%
55 mph	2,083	30.7%	1,637	8.4%	24	4.6%
60 mph	222	3.3%	560	2.9%	6	1.1%
65 mph	624	9.2%	1,123	5.7%	9	1.7%
70 mph	496	7.3%	349	1.8%	3	0.6%
75 mph	192	2.8%	43	0.2%	0	0.0%
80 mph	11	0.2%	1	0.0%	0	0.0%
Total	**6,780**	**100.0%**	**19,545**	**100.0%**	**522**	**100.0%**
No Statutory Limit	51		203		22	
Unknown	275		1,203		41	
Total	**7,106**		**20,951**		**585**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-13
Bicyclist Fatalities by Posted Speed Limit and Land Use for 2010 to 2015 Combined

Posted Speed Limit	Rural	%	Urban	%	Unknown	%
5 mph	1	0.1%	0	0.0%	0	0.0%
15 mph	4	0.3%	6	0.2%	1	0.9%
20 mph	7	0.6%	11	0.4%	1	0.9%
25 mph	56	4.5%	293	10.6%	1	0.9%
30 mph	44	3.6%	371	13.5%	9	8.0%
35 mph	119	9.6%	584	21.2%	30	26.8%
40 mph	81	6.6%	421	15.3%	19	17.0%
45 mph	239	19.4%	591	21.4%	16	14.3%
50 mph	74	6.0%	155	5.6%	26	23.2%
55 mph	473	38.3%	256	9.3%	4	3.6%
60 mph	39	3.2%	27	1.0%	5	4.5%
65 mph	74	6.0%	41	1.5%	0	0.0%
70 mph	19	1.5%	2	0.1%	0	0.0%
75 mph	4	0.3%	0	0.0%	0	0.0%
Total	**1,234**	**100.0%**	**2,758**	**100.0%**	**112**	**100.0%**
No Statutory Limit	51		203		2	
Unknown	275		1,203		7	
Total	**1,560**		**4,164**		**121**	

Source: FARS 1980 - 2014 Final, 2015 ARF

Table A-14
Pedestrians and Bicyclists Injured by Posted Speed Limit for 2010 to 2015 Combined

Posted Speed Limit	Pedestrians	%	Bicyclists	%
5 mph	1,333	0.5%	562	0.3%
10 mph	2,032	0.8%	1,419	0.7%
15 mph	8,707	3.3%	5,196	2.6%
20 mph	5,514	2.1%	2,773	1.4%
25 mph	84,589	31.9%	67,535	33.7%
30 mph	37,374	14.1%	33,384	16.6%
35 mph	64,408	24.3%	47,955	23.9%
40 mph	20,543	7.7%	15,255	7.6%
45 mph	24,704	9.3%	18,830	9.4%
50 mph	2,173	0.8%	2,638	1.3%
55 mph	8,826	3.3%	4,189	2.1%
60 mph	1,393	0.5%	486	0.2%
65 mph	2,201	0.8%	427	0.2%
70 mph	1,121	0.4%	25	0.0%
75 mph	227	0.1%	0	0.0%
Reported Total	**265,145**	**100%**	**200,674**	**100%**
No Statutory Limit/Non-Trafficway or Driveway Access	15,826		23,559	
Not Reported/Unknown	134,659		68,492	
Total	**415,630**		**292,725**	

Source: FARS 1980 - 2014 Final, 2015 ARF

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This research note and other general information on highway traffic safety may be accessed at: https://crashstats.nhtsa.dot.gov