Geospatial Analysis of Rural Motor Vehicle Traffic Fatalities

- 2.5 Miles
- 5 Miles
- 7.5 Miles
- 10 miles
- 10+ Miles

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16. Abstract

In recent years, on average about 44 percent of traffic fatalities occurred in urban areas. NHTSA's Fatality Analysis Reporting System (FARS) codes the functional classification of land use by a binary indicator, i.e., if the location is a rural or urban area, as defined by the United States Census Bureau. However, this information is not enough to determine the spatial spread of the fatalities in the rural areas, i.e., are the fatalities occurring in suburban, exurban, or the outlying rural areas. The focus of this report is to determine the extent of fatalities that occur in rural areas that are close to urban areas. Some of these communities in rural areas that are close to urban areas have significant commuting ties with these urban areas. It would be of interest to law enforcement and highway safety planners involved in rural highway safety initiatives to quantify how many traffic fatalities occur in rural areas that are close to urban areas.

FARS has begun reporting latitude and longitude information recently that facilitates the type of geospatial analysis required to quantify fatalities that occur near urban areas as a function of distance from the urban boundaries. The distances (buffer distances) used in this spatial analysis are 2.5, 5.0, 7.5, and 10.0 miles.

While 44 percent of all traffic fatalities occur in urban areas, the percentage increases to 63 percent in an area that also includes the rural area within 2.5 miles of the urban boundary. The percentage increases to 73 percent 5.0 miles out, 81 percent 7.5 miles out, and 86 percent 10 miles out. In summary, about three-quarters of all traffic fatalities in the Nation occurred in an area that includes all the urban areas along with the rural areas that are within 5 miles of the urban boundaries.

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Table of Contents

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1. Executive Summary

In recent years, on average about 44 percent of traffic fatalities occurred in urban areas. NHTSA's Fatality Analysis Reporting System (FARS) codes the functional classification of land use by a binary indicator, i.e., if the location is a rural or urban area, as defined by the United States Census Bureau. However, given the vast area of rural land in the United States, what is not known is where in those rural areas highway fatalities are occurring. It would be of interest to law enforcement and highway safety planners involved in rural highway safety initiatives to quantify how many traffic fatalities occur in rural areas close to urban areas. Some of these communities in rural areas close to urban areas have significant commuting ties with these urban areas. Of considerable interest are rural areas close to urban areas (suburban, exurban) due to significant shifts in population in such areas. The focus of this report is to determine the extent of fatalities that occur in rural areas that are close to the urban areas using geospatial analysis that extends the binary reporting (rural versus urban) of roadway functional classification reported in FARS.

Puerto Rico was not included in this analysis as FARS did not code latitude/longitude information for Puerto Rico in 2006. Also, while the subsequent sections include tabulated data for Alaska and Hawaii, these States are not depicted in the map due to technical issues.

FARS has begun reporting latitude/longitude information recently that facilitates the type of geospatial analysis required to quantify fatalities that occur near to urban areas as a function of distance from the urban boundaries. The distances (buffer distances) used in this spatial analysis are 2.5, 5.0, 7.5, and 10.0 miles.

While 44 percent of all traffic fatalities occur in urban areas, the percentage increases to 63 percent in areas that also include the rural area within 2.5 miles of the urban boundary. The percentage increases to 73 percent 5.0 miles out, 81 percent at 7.5 miles out, and 86 percent 10 miles out. In summary, about three-quarters of all traffic fatalities in the Nation occurred in an area that includes all the urban areas along with the rural areas that are within 5 miles of the urban boundaries.

The percentage of speeding-related fatalities as well as alcohol-impaired-driving fatalities that occurred in urban areas as well as those for the various buffers around the urban areas are very similar to that of the trend for overall fatalities.

About 53 percent of motorcyclist fatalities occur in urban areas. The corresponding percentages for the various buffer distances are 71 percent (2.5 miles), 80 percent (5 miles), 86 percent (7.5 miles), and 90 percent (10 miles). A large majority (80%) of motorcyclist fatalities occur in urban areas as well as the immediate rural areas within 5 miles of the urban boundaries.

Pedestrian fatalities are highly likely to occur in urban areas. About 74 percent of pedestrian fatalities occur in urban areas. The corresponding percentages for the various buffer distances are 88 percent (2.5 miles), 92 percent (5 miles), 94 percent (7.5 miles), and 95 percent (10 miles). A large majority (88%) of pedestrian fatalities occur in the urban areas as well as the immediate rural areas within 2.5 miles of the urban boundaries.

About a third (35%) of the fatalities in crashes involving large trucks occur in urban areas – the lowest such percentage among all the categories analyzed in this report. The corresponding percentages for the various buffer distances are 55 percent (2.5 miles), 67 percent (5 miles), 75 percent (7.5 miles), and 81 percent (10 miles).

Unbelted passenger vehicle occupant fatalities have a lower percentage (37%) occurring in urban areas as compared to motorcyclist or pedestrian fatalities. The corresponding percentages for the various buffer distances are 56 percent (2.5 miles), 68 percent (5 miles), 76 percent (7.5 miles), and 83 percent (10 miles).

A higher percentage of interstate fatalities on interstate highways occurred in urban areas as compared to U.S./State highways (48% versus 36%). The corresponding percentages for a buffer of 2.5 miles around the urban areas was about 66 percent for interstate highways as compared to about 55 percent of the fatalities on U.S./State Highways.

The percentage of fatalities during weekends that occurred in urban areas followed patterns similar to that followed by overall fatalities. However, fatalities during the nighttime had a slightly higher percentage (49%) that occurred in urban areas. The corresponding percentages for the various buffer distances are 67 percent (2.5 miles), 77 percent (5 miles), 84 percent (7.5 miles), and 88 percent (10 miles).

The States also show a lot of variation in the percentages of fatalities that occur in urban areas as well the rural areas close to them. Some States are heavily urban and have very high percentages of their fatalities in urban areas (Massachusetts, New Jersey, Rhode Island, Connecticut) while other States are very rural and have low percentages of their fatalities in urban areas (North Dakota, Wyoming, Montana, South Dakota, etc.). The percentages for various buffer distances are presented in this report for the States.

The State with the biggest jump in percentage of overall fatalities that occurred in urban areas and buffers of 2.5 miles was South Carolina (a 42-percentage-point increase from 13% to 55%). This was followed by West Virginia (a 35-percentage-point increase from 13% to 48%), Delaware (a 34-percentage-point increase from 44% to 78%) and Ohio (a 33-percentage-point increase from 32% to 65%).

Apart from the District of Columbia, which is 100 percent urban, the jurisdiction with the smallest increase in percentage of overall fatalities that occurred in urban areas and buffers of 2.5 miles was North Dakota (a 2-percentage-point increase from 4% to 6%). This was followed by Nevada (a 5-percentage-point increase from 64% to 69%), Arizona (a 7-percentage-point increase from 52% to 59%), and South Dakota (an 8-percentage-point increase from 14% to 22%).

2. Introduction

There is a need to reduce fatalities on rural roads, which account for slightly more than half of the 43,000 roadway fatalities in the United States. In order to make headway in reducing fatalities and serious injuries, it is imperative to make safety improvements in rural roads. With this objective, the Highway Safety Improvement Program (HSIP), codified as section 148 of Title 23, U.S.C., (23 U.S.C. §148), was elevated to a core program as a result of the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Public Law 109-59. SAFETEA-LU introduced a new set-aside provision known as the High Risk Rural Roads Program (HRRRP), codified as 23 U.S.C. §148 (f). This program represents a significant step toward recognizing safety on rural roads. This report examines the spatial extent of the fatalities in rural areas, especially those adjacent to urban areas.

NHTSA's Fatality Analysis Reporting System is a census of all motor vehicle traffic crashes that resulted in a fatality. The land use (rural/urban) information is captured in FARS through a variable that indicates the type of roadway (interstate, streets, etc.) and the functional classification (rural/urban) of the area of the crash. While this binary indicator of land-use is useful in reporting out fatalities that occur in rural versus urban areas, it is not helpful in identifying fatalities that occur in newly populated suburban and exurban areas that have significant commuting ties to urban areas due to proximity. This report quantifies the extent of rural fatalities that occur in areas that are close to urban areas using geo-coded location information in the form of latitudes and longitudes ("lat-longs") available in FARS. Since 2001, FARS has been collecting the spatial location of fatal motor vehicle traffic crashes. These lat-longs facilitate rigorous spatial analysis of fatal crashes through geographic information system software. Figure 1 depicts the location of motor vehicle traffic crashes in the United States in 2006 by the land use classification.

Figure 1: Locations of Motor Vehicle Fatalities in the United States, by Land Use
(**Rural**/**Urban**)

Figure 2 depicts an example of the spatial extent of fatalities in the Washington, DC, metro area. The area shaded by the darker shade of beige represents the actual urban area boundaries. The areas around these represent 10-mile buffers around the urban area boundaries.

The dots in red represent all fatal crashes falling in these urban areas and 10-mile buffers, while the dots in blue represent those outside these buffers.

Figure 2: Motor Vehicle Traffic Fatalities in the Washington, DC, Urban Area as Well as Those in Surrounding 10-Mile Buffers
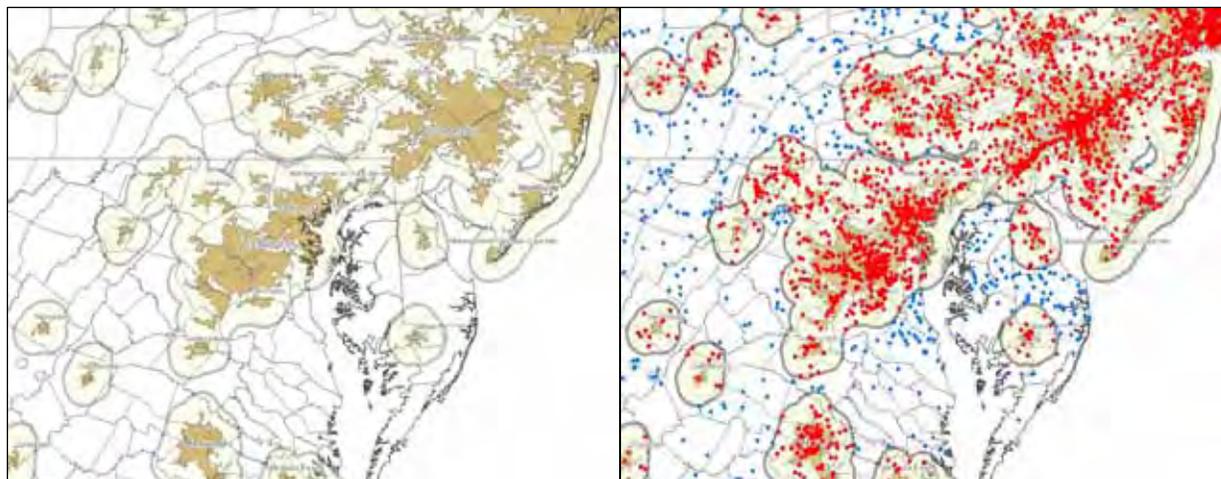

The main focus of this report is to quantify the spatial extent of rural crashes in the form of buffers around urban areas for the Nation as a whole and for each State. We hope this lets State and local law enforcement officials better organize and deploy their resources to tackle the rural fatality problem. Also presented in this report are the spatial extents of rural motorcyclist, pedestrian, and speeding-related fatalities. The results section (Section 4) discusses results on the national level and provides the corresponding results by State.

3. Data and Methods

The primary database used in this study is FARS. The lat-longs have been reported to FARS since 2001. However, in this report, the 2006 crash data was used as this represents the most recent year for which finalized FARS data was available. The lat-long information is still incomplete in some States for the 2007 FARS file, which is an Annual Report File version to be finalized later this year, which is why the 2007 data was not used in this analysis. In 2006, lat-longs were reported for 97 percent of traffic fatalities in the United States. This percentage showed a slight variation by States and might have a slight impact when fatality data is analyzed by urban area boundaries. Table A-1 in the appendix shows the percentage of fatalities for which lat-longs were reported to FARS. Figure 3 depicts the trend of the extent of reporting of lat-long information into FARS. As seen in Figure 3, the percentage of fatalities for which lat-long information was reported increased from about 91 percent in 2002 to 97 percent in 2006. The percentage for 2007 was significantly lower at 86 percent as this file was the Annual Report File and the Final File due to be released in August 2009 is likely to have a much higher rate of reporting of lat-longs. The State-by-State breakdowns of the analysis will only use the 2006 data as this data is now finalized and the reporting rate is higher as compared to 2007 where the lat-longs are still being reported and some of the States have significantly low rates of reporting lat-longs.

Figure 3: Percentages of Fatalities With Latitude/Longitude Infomation
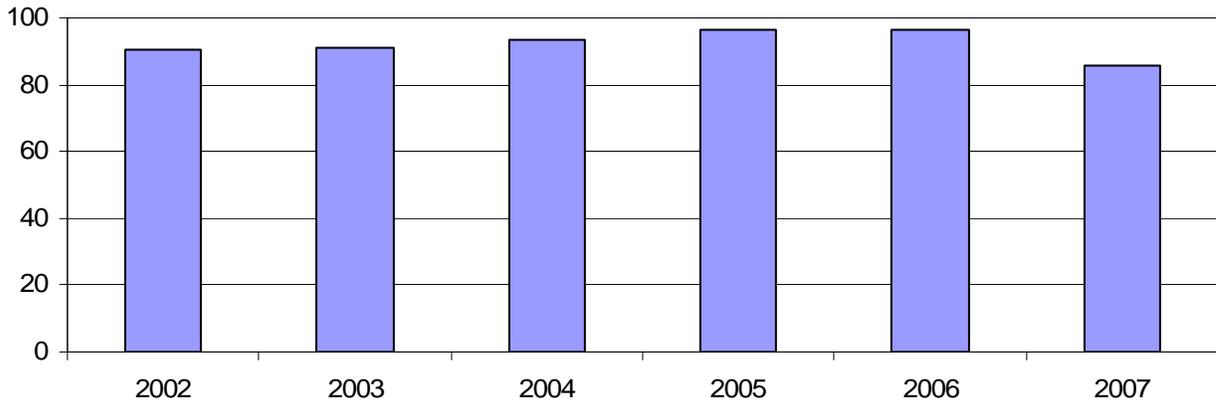
The spatial analysis of fatal crashes was done through Environmental Systems Research Institute's ArcView software. The underlying maps and data were provided as part of the software. Algorithms that conduct spatial joins by common locations between the crash data layer and urban boundary layer were used extensively in this work. Of particular interest are buffers and distances from the urban areas to see how many additional fatalities occur in a buffer of certain magnitude around urban areas, as that shown in the adjoining figure. ArcView incorporates spatial-analysis tools that provide counts of fatalities inside a certain buffer.
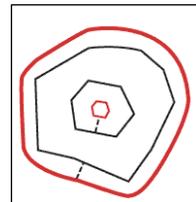
When interpreting percentage of fatalities for a State that falls within various buffers around areas, it is to be noted that buffers around urban areas in adjoining States could also fall within that State. This however does not apply to urban areas in Mexico and Canada along the shared borders with the United States.

This report uses the urban area data layer (shapefile) as provided by the U.S. Census Bureau. The Urban Areas shapefile provides information about the locations, names, and urban codes of urban areas primarily for national planning applications. U.S. Census Urban Areas represents the Census 2000 Urban Areas (UA) and Urban Clusters (UC). A UA consists of contiguous, densely settled census block groups (BGs) and census blocks that meet minimum population density requirements (1,000 people per square mile (ppsm)/500ppsm), along with adjacent densely settled census blocks that together encompass a population of at least 50,000 people. A UC consists of contiguous, densely settled census BGs and census blocks that meet minimum population density requirements, along with adjacent densely settled census blocks that together encompass a population of at least 2,500 people, but fewer than 50,000 people. The dataset covers the 50 States plus the District of Columbia in the United States.

FARS codes roadway function classification based on a combination of guidelines provided by the Federal Highway Administration as well as the U.S. Census Bureau. Minor differences might arise between fatalities classified as having occurred in rural or urban areas as contained in the Census Bureau shapefile and those coded in FARS. These discrepancies are more likely to occur among crashes that occurred in very close proximity just inside or just outside the urban boundaries. In such cases, due to the mechanism of coding this variable, a

crash occurring in an urban area may be coded as a rural crash and vice versa. In summary, counts and percentages of rural and urban crashes presented in this report might differ slightly from those reported in FARS due to:

- Coding resolution at the boundary of urban areas (borderline cases);
- Wide variance of lat-long reporting across States; or
- Discrepancies in shape and extent of urban boundaries.

Throughout the remainder of this report, fatality totals for urban areas will be those reported from FARS while those reported for the urban buffers will use the U.S. Census Bureau shapefiles. This approach will still use the reported FARS numbers as a benchmark and compare the numbers with those falling in the buffers around the urban areas. The error or discrepancy associated with the coding resolution at the boundaries is resolved with this approach. Figure 4 depicts the extent of the buffers for various buffering distances. Fatality totals are reported out for buffer distances of 1.0 miles, 2.5 miles, 5.0 miles, and 10.0 miles around the urban areas – which are a combination of urban areas and urban clusters, as defined in the introduction.

Figure 4: Urban Areas in the United States With 1.0-, 2.5-, 5.0-, 7.5-, and 10-Mile Buffers
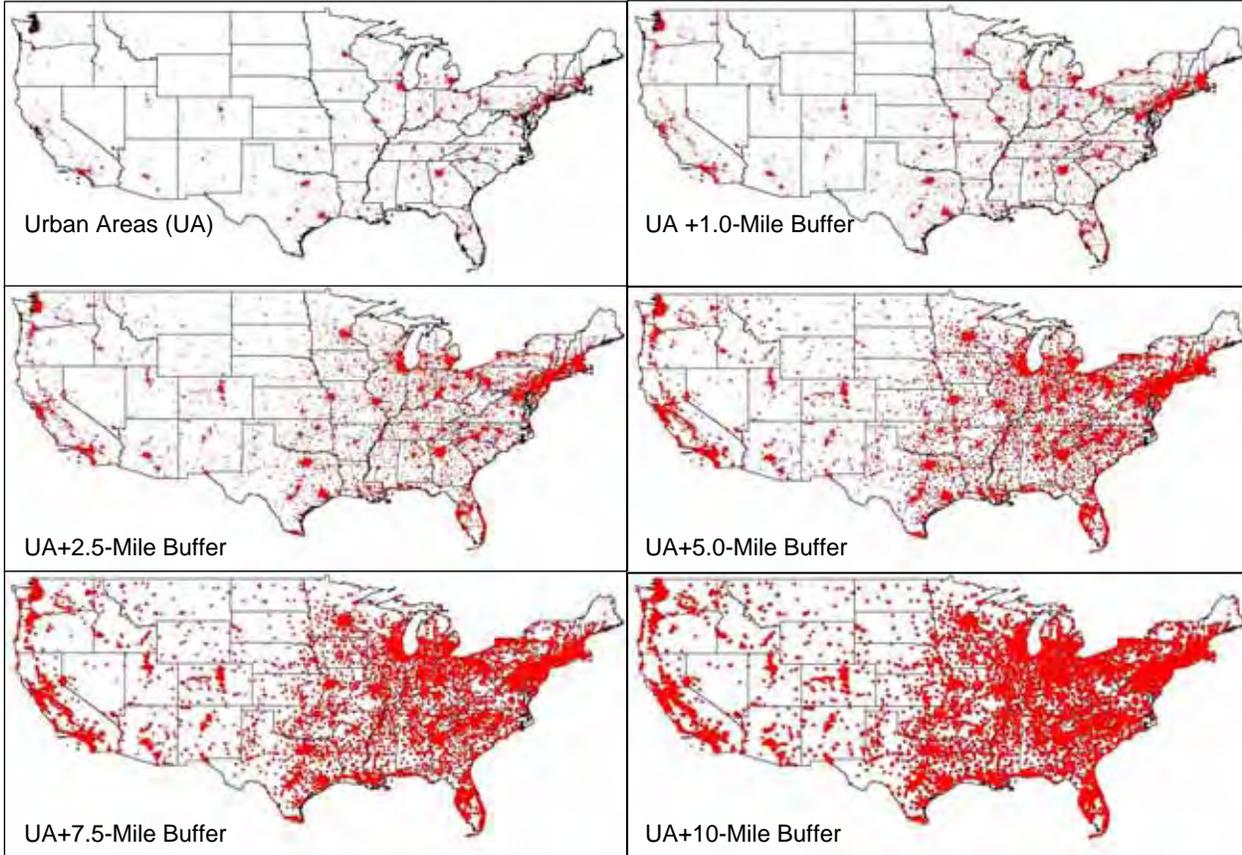
The results section is categorized by sub-categories of interest such as total fatalities, speeding-related fatalities, motorcyclist fatalities, alcohol-impaired-driving fatalities, pedestrian fatalities, fatalities in crashes involving large trucks, single-vehicle crashes, intersection crashes, etc. For each category of interest, maps of the fatalities and those in the various buffer zones are presented. These metrics are also presented by State. While an attempt was not made to quantify the area encompassed by these buffers, it is entirely conceivable that in some States almost the whole area of the State could be enveloped by these 10-mile buffer zones (e.g., Rhode Island, New Jersey).

4. Results

The main focus of this analysis is to not only determine the extent of fatalities in urban areas in the United States but also to determine how many more fatalities occur in rural areas that are just outside the boundaries of the urban areas. The metrics presented throughout this report are percentage of fatalities, in any given category, that occur in urban areas as well as the how these percentages increase when rural areas immediately adjacent to the urban areas are included. In this report, the rural areas that are within 2.5, 5.0, 7.5, and 10 miles of the boundary of the urban areas were added to the urban areas to assess the increase in percentage of fatalities in any given category. Table 1 shows these percentages by various categories of interest for the Nation as a whole. Overall, 44 percent of the fatalities occur in urban areas. However, when the rural areas that are within 2.5 miles of the urban boundaries are included, this percentage increases to 63 percent, as shown in Table 1.

Table 1: Percentages of Fatalities by Buffers Around Urban Areas, 2006, by Category of Fatalities					
Category	Urban	Urban+2.5 mi.	Urban+5.0 mi.	Urban+7.5 mi.	Urban+10 mi.
Total	44%	63%	73%	81%	86%
Speeding-Related	43%	61%	71%	79%	85%
Motorcyclist	53%	71%	80%	86%	90%
Pedestrian	74%	88%	92%	94%	95%
Involving Large Trucks	35%	55%	67%	75%	81%
Alcohol-Impaired-Driving Fatalities	44%	63%	73%	81%	86%
Unbelted Passenger Vehicle Occupants	37%	56%	68%	76%	83%
Fatalities During the Weekend	45%	64%	73%	81%	86%
Nighttime Fatalities	49%	67%	77%	84%	88%
Fatalities on Interstate Highways	48%	66%	75%	82%	86%
Fatalities on U.S./State Highways	36%	55%	67%	76%	82%
Source: FARS 2006 Final File.					

Subsequent sections in the report present recent trends in these percentages as well as how these percentages vary across States.

4.1 Total Fatalities

In 2006, 18,791 fatalities, or about 44 percent, of the total of 42,708 fatalities in the United States occurred in urban areas. As shown in Figure 5, this percentage increases to 63 percent in areas that encompass urban areas as well as the 2.5-mile buffers around the urban areas. The corresponding percentage for a 5.0-mile buffer was 73 percent, for a 7.5-mile buffer was 81 percent, and for a 10-mile buffer was 86 percent. In summary, about 86 percent of total fatalities in the United States in 2006 occurred in areas encompassing all the urban areas in the United States and the 10-mile buffers around these areas.

Figure 5: Percent of Total Fatalities by Urban Buffer Zones, U.S., 2006
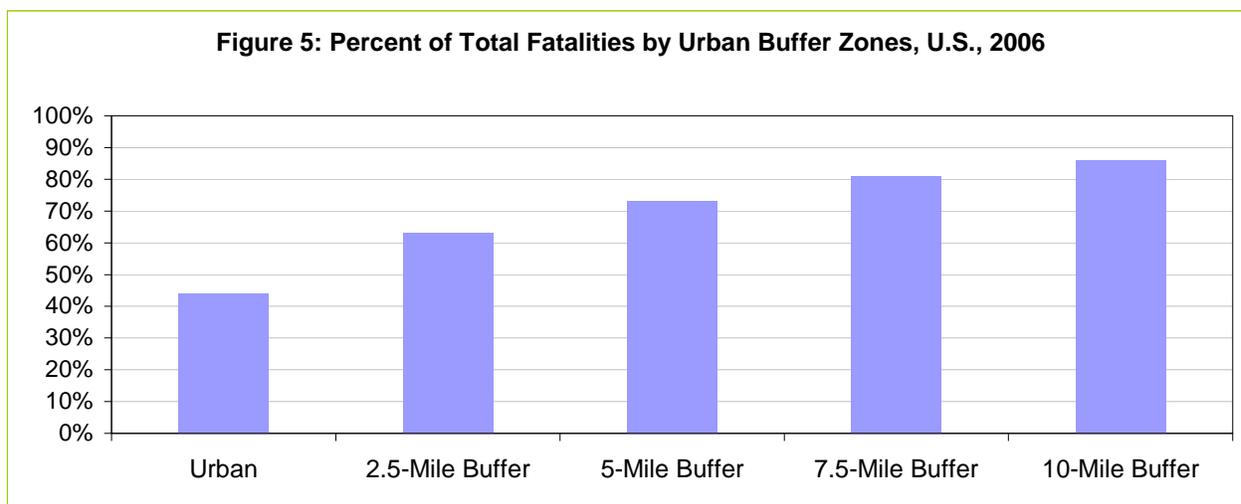
Table 2 depicts the distribution of percentages of total fatalities by the urban buffer distances, by State. **The first column depicts the percentage of total fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rates of lat-long reporting are 90 percent or below and hence percentage of fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In South Carolina, there was a 42-percentage-point increase (13% to 55%) in the percentage of total fatalities that were in urban areas and those that were in urban areas including 2.5-mile buffers around the urban areas. This was the largest percentage-point difference among all States when comparing fatalities in urban areas and those occurring in areas encompassing the urban areas as well as the areas in 2.5-mile buffers around them.

Some of the rural States with less than 10 percent of their total fatalities in urban areas include Montana (5%), North Dakota (4%), and Vermont (6%). States with a high proportion of fatalities occurring in urban areas include Massachusetts (90%), New Jersey (85%) and Rhode Island (89%). All of the District of Columbia's roadways are in a single urban area.

Table 2: Percentages of Total Fatalities by Buffers Around Urban Areas, 2006, by State					
State	Urban	Urban+2.5 mi.	Urban+5.0 mi.	Urban+7.5 mi.	Urban+10.0 mi.
Alabama	34%	44%	58%	69%	79%
Alaska	*43%*	*54%*	*61%*	*62%*	*66%*
Arizona	52%	59%	67%	73%	77%
Arkansas	24%	48%	60%	72%	81%
California	63%	77%	84%	88%	91%
Colorado	43%	56%	63%	69%	72%
Connecticut	84%	95%	98%	99%	99%
Delaware	44%	78%	90%	97%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*60%*	*83%*	*90%*	*93%*	*96%*
Georgia	44%	66%	78%	86%	93%
Hawaii	59%	82%	86%	89%	91%
Idaho	25%	39%	50%	58%	64%
Illinois	62%	71%	82%	90%	94%
Indiana	40%	62%	76%	87%	94%
Iowa	22%	37%	51%	62%	71%
Kansas	22%	46%	55%	64%	69%
Kentucky	25%	47%	61%	72%	81%
Louisiana	52%	68%	78%	88%	92%
Maine	13%	32%	44%	56%	68%
Maryland	56%	85%	92%	97%	99%
Massachusetts	*90%*	*98%*	*99%*	*99%*	*100%*
Michigan	39%	67%	78%	84%	89%
Minnesota	30%	48%	60%	70%	77%
Mississippi	26%	43%	58%	70%	77%
Missouri	31%	48%	59%	69%	77%
Montana	5%	23%	32%	40%	45%
Nebraska	22%	35%	45%	52%	57%
Nevada	64%	69%	74%	77%	80%
New Hampshire	41%	57%	69%	74%	83%
New Jersey	85%	94%	98%	100%	100%
New Mexico	25%	48%	56%	65%	69%
New York	59%	78%	86%	91%	95%
North Carolina	30%	58%	75%	84%	91%
North Dakota	4%	6%	14%	16%	19%
Ohio	32%	65%	81%	92%	97%
Oklahoma	23%	37%	52%	63%	75%
Oregon	31%	52%	63%	70%	73%
Pennsylvania	50%	72%	84%	91%	94%
Rhode Island	89%	98%	99%	99%	100%
South Carolina	13%	55%	68%	79%	86%
South Dakota	14%	22%	30%	39%	43%
Tennessee	44%	60%	72%	82%	89%
Texas	44%	61%	71%	79%	85%
Utah	39%	64%	70%	75%	77%
Vermont	6%	23%	45%	55%	66%
Virginia	*53%*	*63%*	*72%*	*80%*	*87%*
Washington	*45%*	*67%*	*75%*	*80%*	*85%*
West Virginia	13%	48%	61%	71%	80%
Wisconsin	33%	45%	59%	71%	78%
Wyoming	11%	20%	27%	32%	35%
U.S.	44%	63%	73%	81%	86%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

The percentages shown in Table 2 are representative of one year (2006). Table 3 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 3: Percentages of Total Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	41%	64%	74%	81%	86%
2003	42%	63%	74%	81%	87%
2004	41%	63%	73%	81%	86%
2005	43%	63%	73%	81%	86%
2006	44%	63%	73%	81%	86%
Source: NHTSA FARS 2002-2006 Final Files					

As seen in Table 3, the proportions of fatalities that are in the various buffer zones around the urban areas have increased marginally from 41 percent in 2002 to 44 percent in 2006. Figure 6 depicts the National maps for overall fatalities by buffer distances. The following sections will present the urban buffer analysis by various program areas of interest, such as, pedestrian, motorcyclist, and speeding-related fatalities.

Figure 6: Total Fatalities by Urban Buffer Zones, 2006

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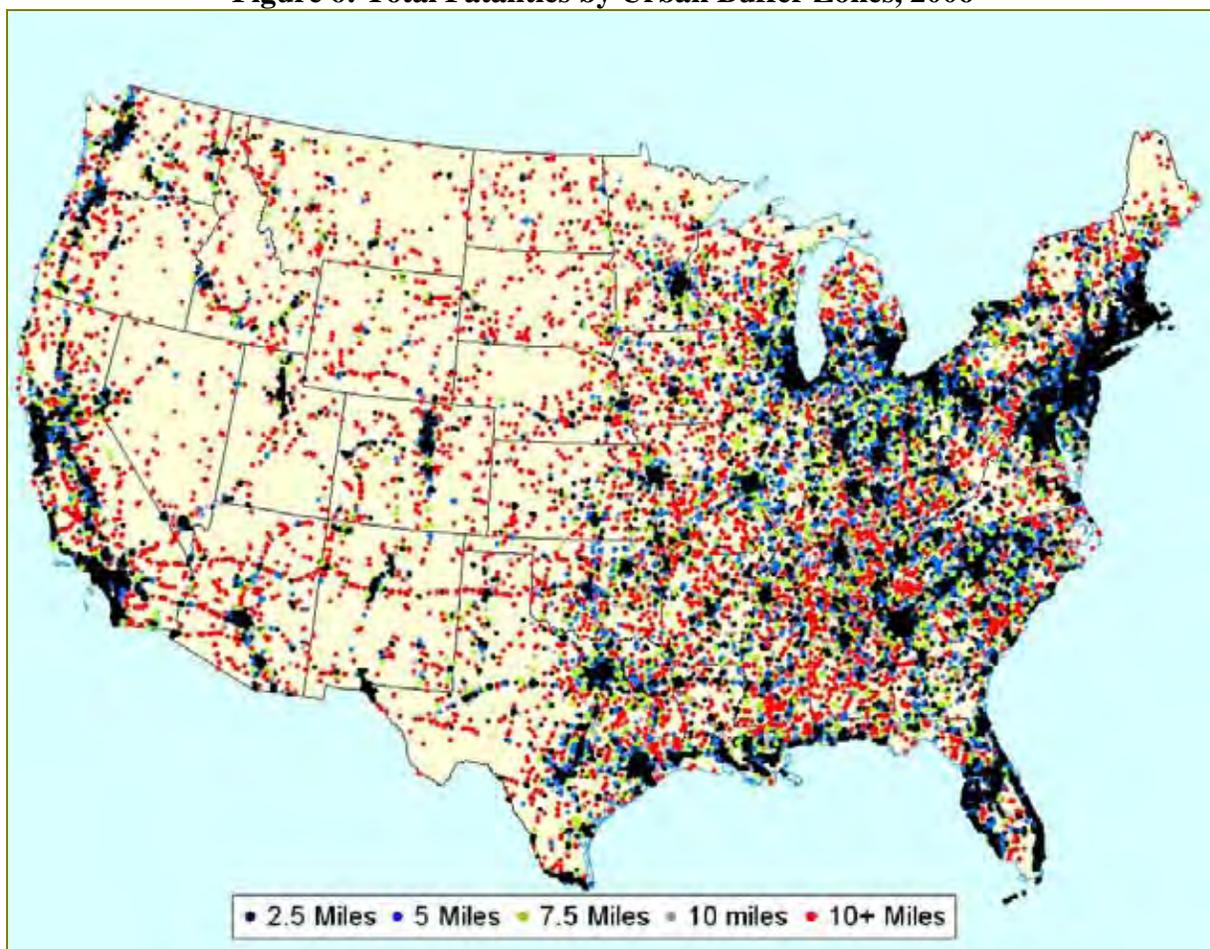
4.2 Speeding-Related Fatalities

NHTSA defines a crash to be speeding-related if any driver involved in the crash is charged with a speeding-related offense or if a police officer indicates that racing, driving too fast for conditions, or exceeding the posted speed limit was a contributing factor in the crash.

In 2006, 5,842 speeding-related fatalities, or about 43 percent, of the total of 13,609 speeding-related fatalities in the United States occurred in urban areas. As shown in Figure 7, this percentage increases to 61 percent in areas that encompass the urban areas as well as 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 71 percent, for a 7.5-mile buffer was 79 percent, and for a 10-mile buffer was 85 percent. In summary, about 85 percent of all speeding-related fatalities in the United States in 2006 occurred in urban areas as well as the 10-mile buffers around them.

Figure 7: Percent of Speeding-Related Fatalities by Urban Buffer Zones, U.S., 2006
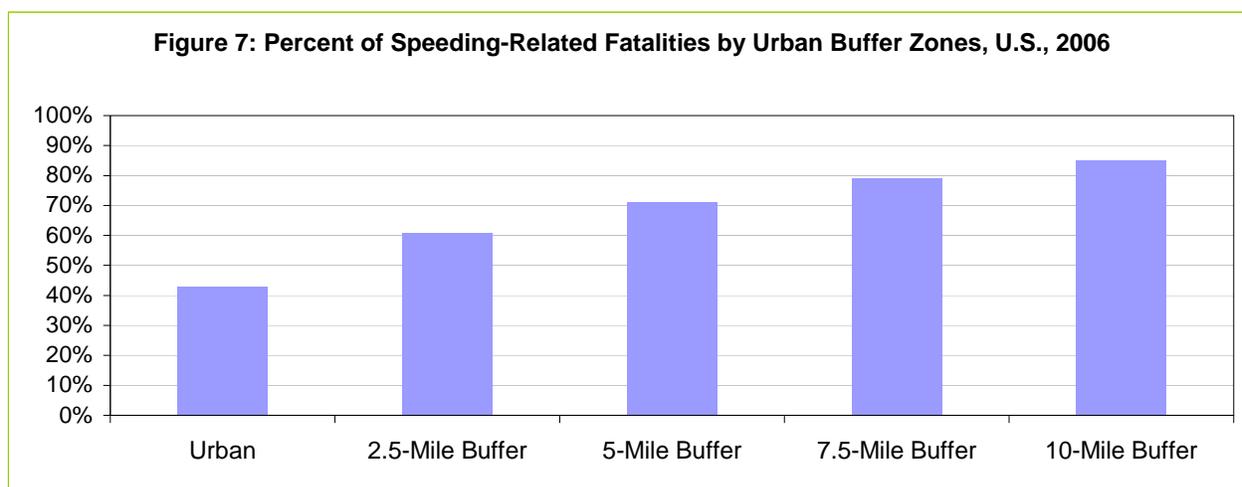
Table 4 depicts the distribution of percentages of total fatalities by the urban buffer distances, by State. **The first column depicts the percent of speeding-related fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available. Some of the States are italicized as their rate of lat-long reporting is 90 percent or below and hence percentage of speeding-related fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** The first column depicts the percent of total fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available. In South Carolina, there was a 41-percentage-point increase (10% to 51%) in the percentages of total fatalities that were in urban areas and those that were in urban areas including 2.5-mile buffers around the urban areas. This was the largest percentage-point difference among all States when comparing speeding-related fatalities in urban areas and those occurring in urban areas along with 2.5-mile buffers around them.

Some of the rural States, with less than 10 percent of their total fatalities in urban areas include Montana (5%), North Dakota (0%) and Vermont (6%) and Wyoming (9%). States with a high proportion of fatalities occurring in urban areas include Massachusetts (86%), New Jersey (93%) and Rhode Island (88%).

State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	25%	36%	51%	63%	75%
Alaska	*50%*	*54%*	*63%*	*63%*	*67%*
Arizona	52%	54%	60%	69%	74%
Arkansas	19%	48%	55%	69%	80%
California	67%	81%	86%	90%	92%
Colorado	48%	61%	65%	69%	72%
Connecticut	85%	95%	99%	99%	100%
Delaware	53%	74%	88%	94%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*52%*	*81%*	*89%*	*91%*	*94%*
Georgia	45%	69%	81%	91%	95%
Hawaii	56%	82%	84%	84%	87%
Idaho	26%	37%	50%	61%	65%
Illinois	64%	74%	83%	91%	95%
Indiana	51%	73%	83%	91%	96%
Iowa	39%	52%	61%	71%	77%
Kansas	37%	63%	67%	77%	78%
Kentucky	22%	44%	63%	71%	82%
Louisiana	51%	66%	74%	85%	90%
Maine	11%	31%	46%	61%	75%
Maryland	58%	84%	93%	97%	98%
Massachusetts	*86%*	*95%*	*98%*	*98%*	*99%*
Michigan	31%	55%	69%	77%	84%
Minnesota	35%	50%	59%	71%	75%
Mississippi	23%	36%	52%	63%	71%
Missouri	30%	44%	55%	65%	76%
Montana	5%	21%	39%	44%	50%
Nebraska	30%	38%	47%	55%	56%
Nevada	64%	71%	76%	81%	84%
New Hampshire	50%	64%	71%	74%	76%
New Jersey	93%	99%	100%	100%	100%
New Mexico	23%	40%	53%	64%	68%
New York	56%	75%	85%	91%	94%
North Carolina	24%	54%	72%	83%	90%
North Dakota	0%.	0%	3%	8%	13%
Ohio	31%	67%	83%	94%	97%
Oklahoma	25%	40%	55%	66%	78%
Oregon	26%	46%	60%	68%	71%
Pennsylvania	42%	67%	79%	89%	93%
Rhode Island	88%	100%	100%	100%	100%
South Carolina	10%	51%	64%	76%	86%
South Dakota	15%	27%	27%	40%	42%
Tennessee	52%	68%	78%	87%	92%
Texas	44%	60%	69%	77%	84%
Utah	36%	62%	74%	77%	77%
Vermont	6%	18%	39%	61%	70%
Virginia	*45%*	*57%*	*67%*	*75%*	*87%*
Washington	*49%*	*71%*	*78%*	*81%*	*85%*
West Virginia	18%	51%	68%	75%	79%
Wisconsin	32%	45%	57%	66%	75%
Wyoming	9%	14%	23%	26%	32%
U.S.	43%	61%	71%	79%	85%

Table 4: Percentages of Speeding-Related Fatalities by Buffers Around Urban Areas, 2006, by State

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 5 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 5: Percentages of Speeding-Related Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	39%	61%	71%	79%	84%
2003	41%	62%	72%	80%	85%
2004	39%	61%	71%	79%	84%
2005	41%	61%	71%	79%	85%
2006	43%	61%	71%	79%	85%

As seen in Table 5, the proportions of speeding-related fatalities that are in the various buffer zones around the urban areas are fairly consistent over the years. Figure 8 depicts the national maps for speeding-related fatalities by buffer distances.

Figure 8: Speeding-Related Fatalities by Urban Buffer Zones, 2006

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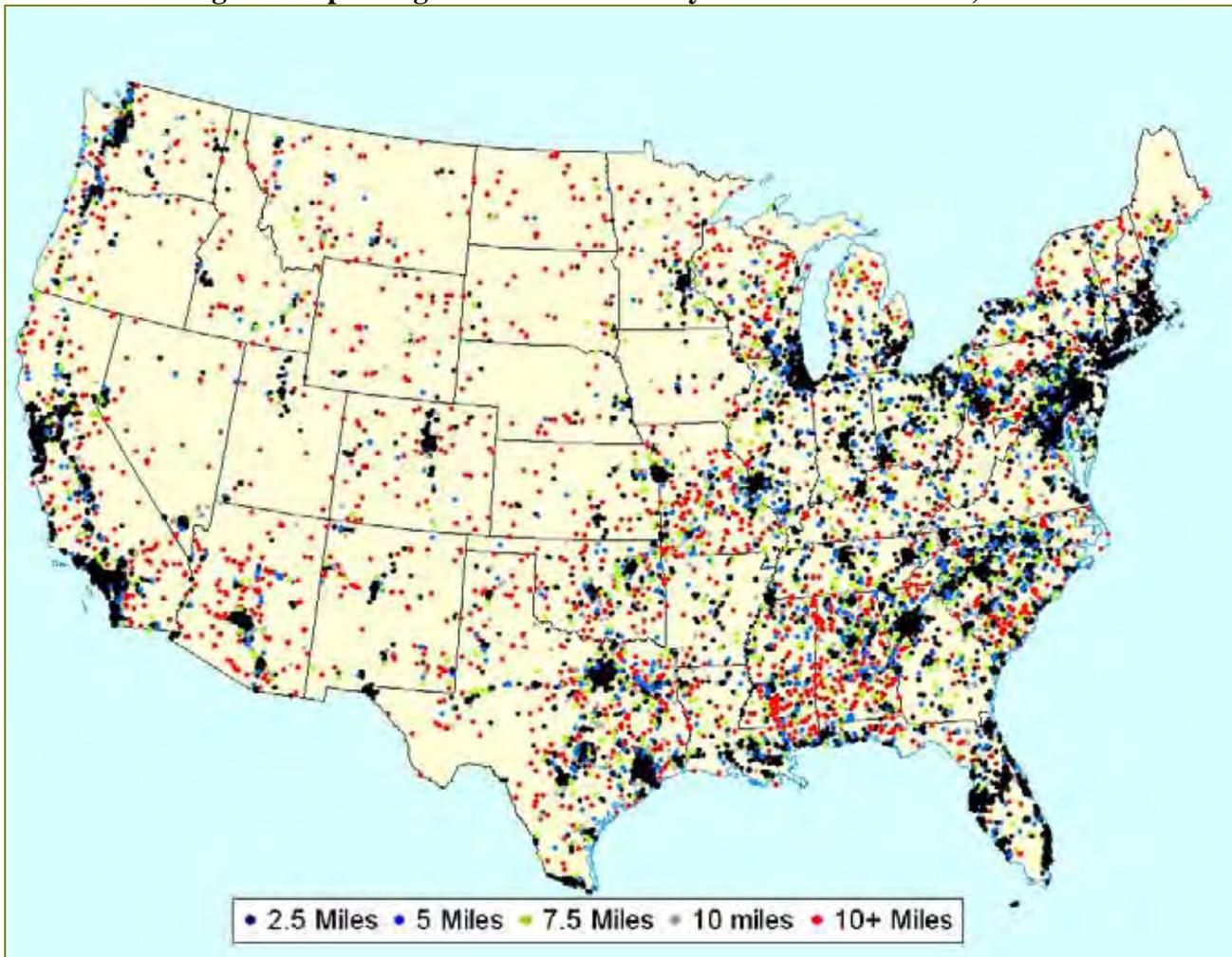
4.3. Motorcyclist Fatalities

In 2006, 2,544 motorcyclist fatalities, or about 53 percent, of the total of 4,837 motorcyclist fatalities in the United States occurred in urban areas. As shown in Figure 9, this percentage increases to 71 percent in an area that encompasses the urban area as well as 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 80 percent, for a 7.5-mile buffer was 86 percent, and for a 10-mile buffer was 90 percent. In summary, about 90 percent of all motorcyclist fatalities in the United States in 2006 occurred in urban areas as well as the in a 10-mile buffers around them.

Figure 9: Percent of Motorcyclist Fatalities by Urban Buffer Zones, U.S., 2006
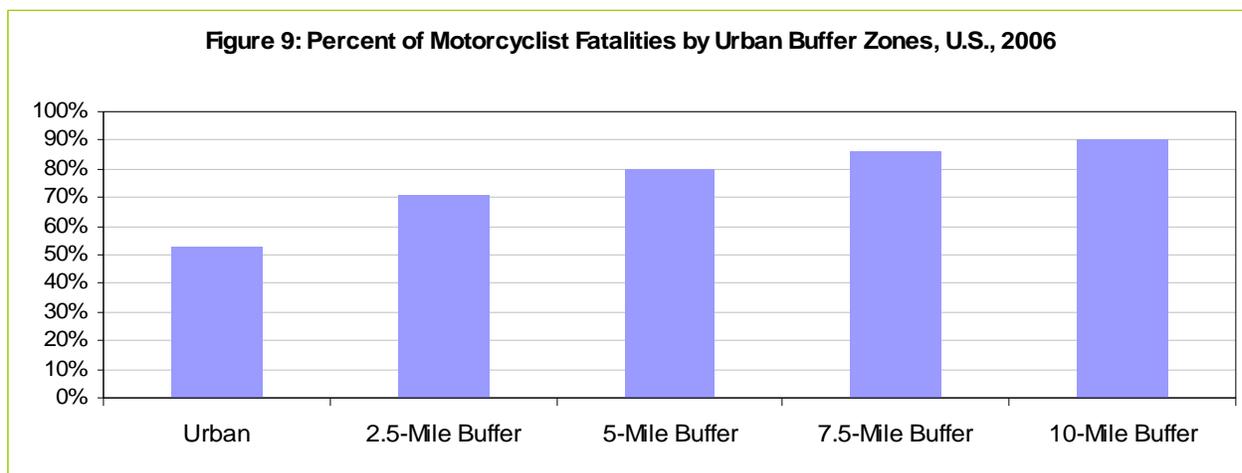
Table 6 depicts the distribution of percentage of motorcyclist fatalities by the urban buffer distances, by State. The first column depicts the percent of motorcyclist fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available. **The first column depicts the percent of motorcyclist fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rate of lat-long reporting is 90 percent or below and hence percentage of motorcyclist fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In South Carolina, there was a 57-percentage-point increase (15% to 72%) in the percentage of motorcyclist fatalities that were in urban areas and those that were in urban areas including 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing motorcyclist fatalities in its urban areas and those occurring in urban areas along with 2.5-mile buffers around them.

Some of the rural States, with less than 10 percent of their motorcyclist fatalities in urban areas include Montana (4%) and North Dakota (0%). States with a high proportion of motorcyclist fatalities occurring in urban areas include Connecticut (88%) and Massachusetts (91%).

Table 6: Percentages of Motorcyclist Fatalities by Buffers Around Urban Areas, 2006, by State

State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	48%	59%	77%	83%	86%
Alaska	*63%*	*63%*	*63%*	*63%*	*63%*
Arizona	65%	70%	76%	83%	87%
Arkansas	38%	66%	70%	78%	84%
California	65%	79%	85%	89%	91%
Colorado	54%	64%	68%	74%	77%
Connecticut	88%	95%	100%	100%	100%
Delaware	67%	83%	100%	100%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	66%	87%	93%	96%	98%
Georgia	47%	67%	81%	87%	91%
Hawaii	69%	85%	88%	92%	96%
Idaho	34%	42%	45%	47%	53%
Illinois	65%	75%	86%	92%	95%
Indiana	*42%*	*72%*	*84%*	*89%*	*93%*
Iowa	35%	51%	54%	72%	75%
Kansas	47%	70%	78%	83%	84%
Kentucky	29%	49%	64%	73%	81%
Louisiana	65%	76%	83%	88%	96%
Maine	30%	48%	52%	70%	74%
Maryland	59%	87%	91%	96%	99%
Massachusetts	91%	98%	98%	98%	98%
Michigan	38%	64%	76%	82%	87%
Minnesota	39%	54%	64%	75%	82%
Mississippi	38%	58%	67%	75%	82%
Missouri	46%	57%	66%	75%	88%
Montana	4%	27%	42%	46%	58%
Nebraska	56%	56%	56%	56%	56%
Nevada	78%	80%	86%	94%	98%
New Hampshire	19%	29%	43%	57%	76%
New Jersey	83%	91%	97%	99%	100%
New Mexico	42%	67%	74%	81%	81%
New York	60%	79%	85%	88%	95%
North Carolina	42%	64%	79%	87%	90%
North Dakota	0%	25%	50%	50%	50%
Ohio	34%	63%	77%	90%	94%
Oklahoma	49%	56%	68%	70%	81%
Oregon	30%	57%	75%	84%	84%
Pennsylvania	53%	76%	86%	90%	95%
Rhode Island	75%	94%	100%	100%	100%
South Carolina	15%	72%	83%	90%	96%
South Dakota	45%	45%	50%	64%	68%
Tennessee	48%	57%	69%	79%	89%
Texas	54%	72%	79%	85%	90%
Utah	54%	71%	79%	79%	79%
Vermont	20%	60%	70%	70%	80%
Virginia	76%	82%	88%	94%	96%
Washington	*57%*	*80%*	*86%*	*87%*	*90%*
West Virginia	15%	51%	69%	82%	87%
Wisconsin	35%	49%	61%	77%	83%
Wyoming	35%	47%	47%	53%	53%
U.S.	53%	71%	80%	86%	90%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 7 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 7: Percentages of Motorcyclist Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	50%	72%	80%	85%	89%
2003	51%	72%	81%	86%	90%
2004	52%	72%	80%	86%	89%
2005	51%	70%	78%	85%	89%
2006	53%	71%	80%	86%	90%

As seen in Table 7, the proportions of motorcyclist fatalities that are in the urban areas have increased from 50 percent in 2002 to 53 percent in 2006. Figure 10 depicts the national maps for motorcyclist fatalities in 2006 by buffer distances.

Figure 10: Motorcyclist Fatalities by Urban Buffer Zones, 2006

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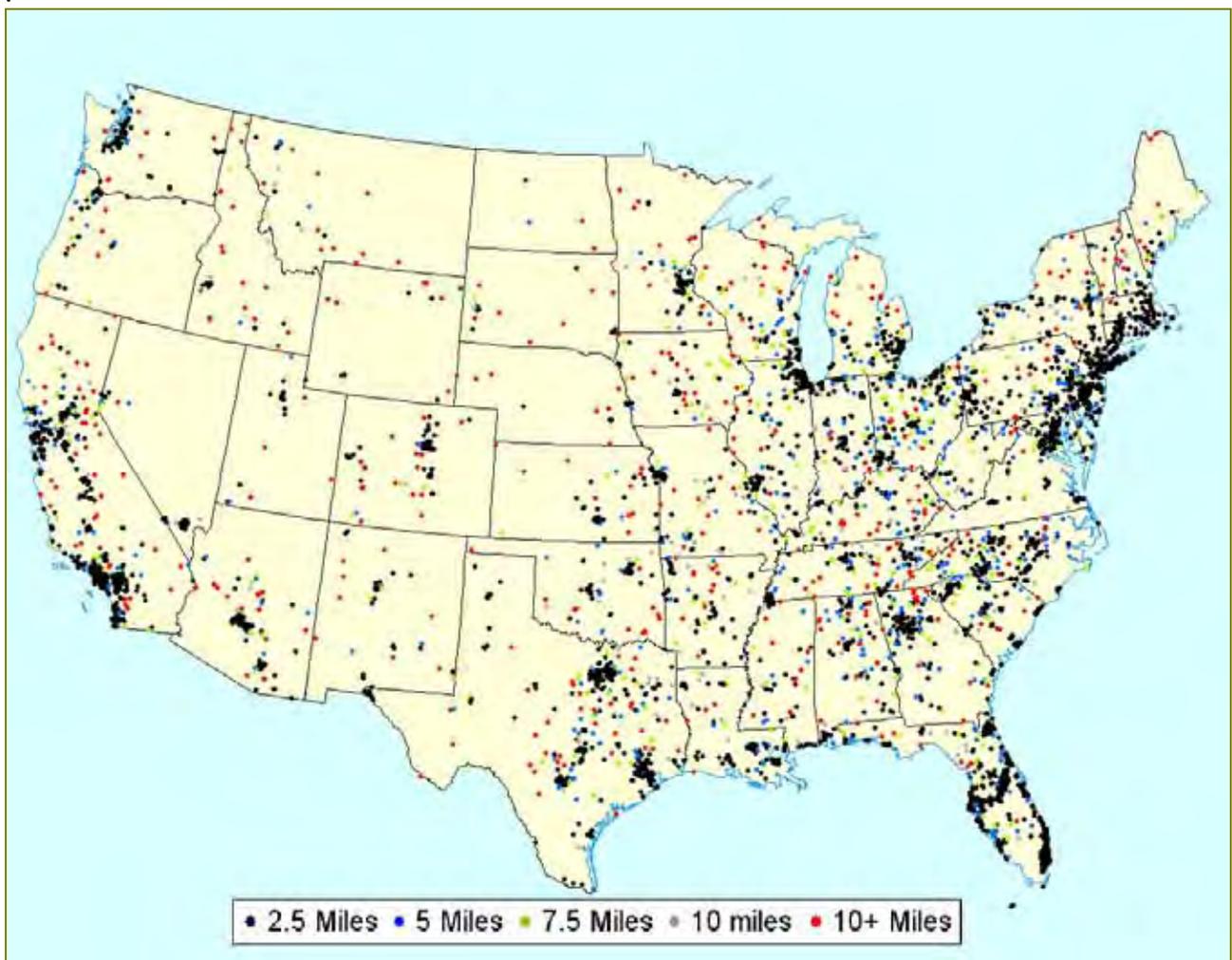
4.4. Pedestrian Fatalities

In 2006, 3,521 pedestrian fatalities, or about 73 percent, of the total of 4,793 pedestrian fatalities in the United States occurred in urban areas. As shown in Figure 11, this percentage increases to 88 percent in an area that encompasses the urban area as well as 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 92 percent, for a 7.5-mile buffer was 94 percent, and for a 10-mile buffer was 96 percent. In summary, about 96 percent of all pedestrian fatalities in the United States in 2006 occurred in urban areas as well as the in a 10-mile buffers around them.

Figure 11: Percent of Pedestrian Fatalities by Urban Buffer Zones, U.S., 2006
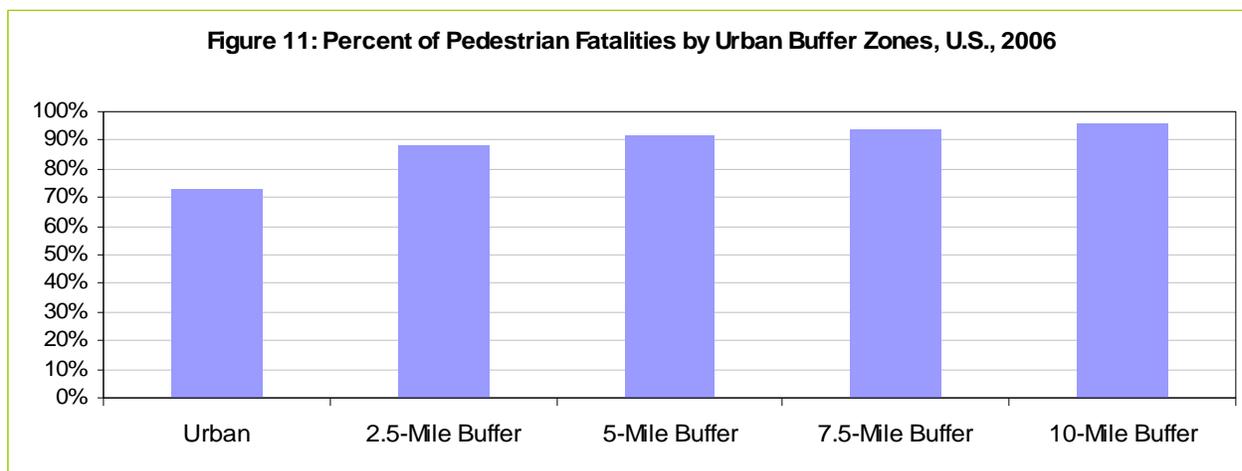
Table 8 depicts the distribution of percentage of pedestrian fatalities by the urban buffer distances, by State. **The first column depicts the percent of pedestrian fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available. Some of the States are italicized as their rate of lat-long reporting is 90 percent or below and hence percentage of pedestrian fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In West Virginia, there was a 47-percentage-point increase (24% to 71%) in the percentage of pedestrian fatalities that were in urban areas and those that were in urban areas including 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing pedestrian fatalities in its urban areas and those occurring in urban areas along with 2.5-mile buffers around them.

None of the States had less than 10 percent of their pedestrian fatalities in urban areas. States with a high proportion of pedestrian fatalities occurring in urban areas include Connecticut (92%), New Jersey (96%) and Massachusetts (98%). There were no pedestrian fatalities in Vermont in 2006.

Table 8: Percentages of Pedestrian Fatalities by Buffers Around Urban Areas, 2006, by State					
State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	60%	76%	79%	87%	90%
Alaska	67%	67%	78%	78%	78%
Arizona	74%	79%	86%	89%	90%
Arkansas	45%	65%	68%	81%	84%
California	88%	97%	99%	99%	99%
Colorado	76%	90%	95%	95%	95%
Connecticut	92%	97%	100%	100%	100%
Delaware	56%	96%	96%	96%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	78%	95%	97%	98%	99%
Georgia	64%	93%	96%	98%	99%
Hawaii	87%	93%	97%	100%	100%
Idaho	50%	50%	75%	75%	88%
Illinois	89%	91%	94%	97%	99%
Indiana	37%	77%	83%	93%	94%
Iowa	58%	67%	71%	71%	79%
Kansas	52%	83%	83%	87%	87%
Kentucky	73%	85%	87%	92%	92%
Louisiana	77%	87%	94%	96%	97%
Maine	20%	30%	30%	50%	70%
Maryland	80%	95%	98%	100%	100%
Massachusetts	*98%*	*100%*	*100%*	*100%*	*100%*
Michigan	66%	86%	93%	96%	96%
Minnesota	58%	74%	79%	84%	84%
Mississippi	52%	71%	80%	88%	91%
Missouri	72%	78%	82%	88%	89%
Montana	33%	50%	50%	67%	67%
Nebraska	44%	44%	44%	44%	56%
Nevada	86%	94%	94%	94%	96%
New Hampshire	50%	50%	67%	67%	83%
New Jersey	96%	98%	100%	100%	100%
New Mexico	49%	77%	80%	84%	84%
New York	82%	93%	95%	98%	99%
North Carolina	52%	75%	87%	90%	95%
North Dakota	25%	25%	25%	25%	25%
Ohio	57%	86%	94%	97%	99%
Oklahoma	53%	64%	67%	80%	84%
Oregon	72%	79%	81%	85%	87%
Pennsylvania	88%	94%	97%	99%	99%
Rhode Island	80%	93%	93%	93%	100%
South Carolina	30%	72%	81%	84%	88%
South Dakota	29%	43%	43%	43%	43%
Tennessee	72%	81%	91%	92%	96%
Texas	74%	88%	91%	93%	94%
Utah	69%	93%	93%	93%	93%
Vermont	-	-	-	-	-
Virginia	*78%*	*84%*	*89%*	*89%*	*97%*
Washington	89%	92%	97%	97%	97%
West Virginia	24%	71%	76%	76%	81%
Wisconsin	67%	73%	78%	82%	87%
Wyoming	17%	17%	33%	33%	33%
U.S.	74%	88%	92%	94%	95%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 9 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 9: Percentage of Pedestrian Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	72%	88%	92%	94%	96%
2003	73%	87%	92%	94%	96%
2004	73%	88%	91%	94%	96%
2005	74%	87%	92%	94%	96%
2006	74%	88%	92%	94%	95%

As seen in Table 9, the proportions of pedestrian fatalities in the urban areas have increased marginally from 72 percent in 2002 to 74 percent in 2006. Figure 12 depicts the national maps for pedestrian fatalities in 2006 by buffer distances.

Figure 12: Pedestrian Fatalities by Urban Buffer Zones, 2006

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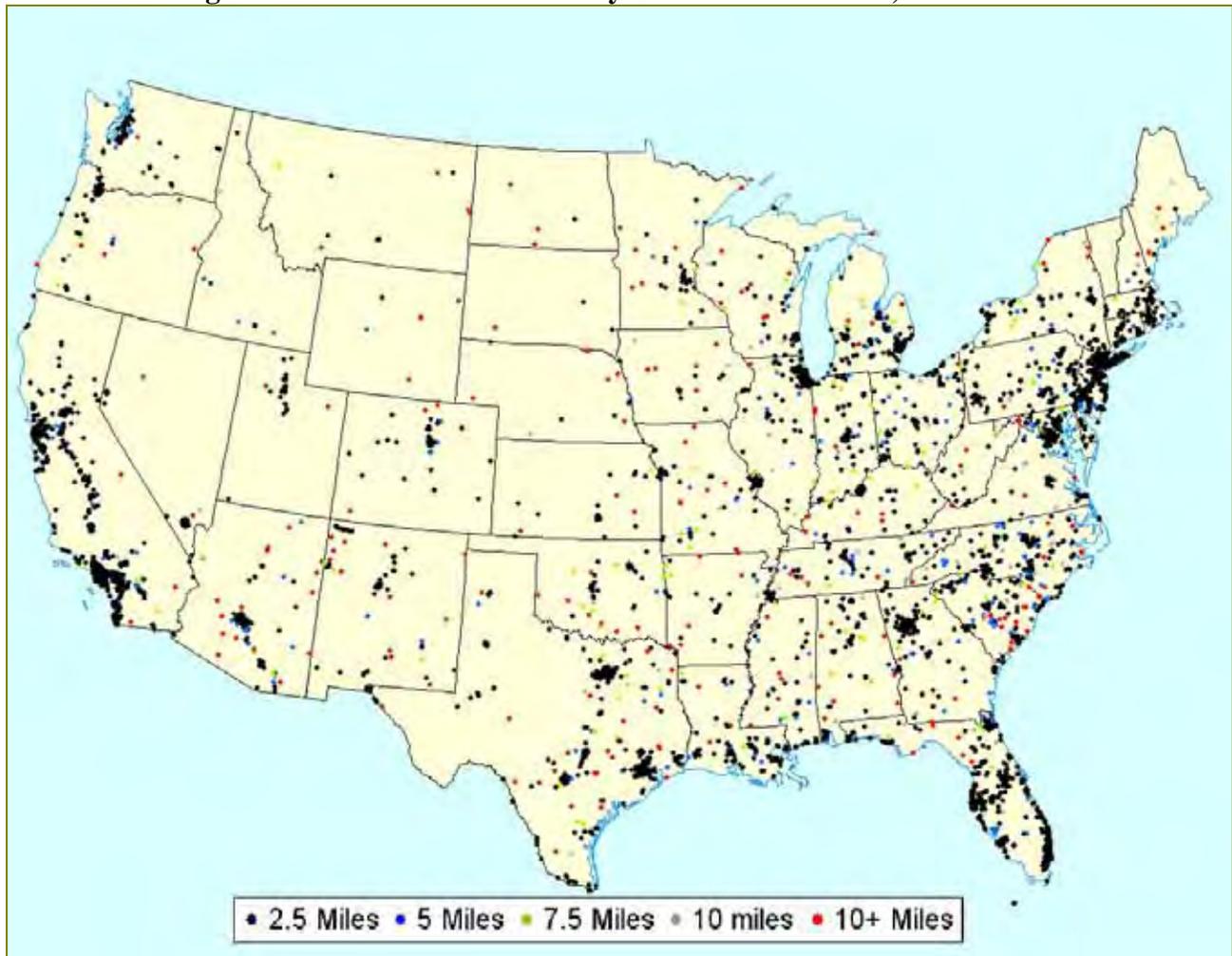
4.5. Fatalities in Crashes Involving Large Trucks

In 2006, 1,776 fatalities, or about 35 percent of the total of 5,027 fatalities in crashes involving large trucks in the United States, occurred in urban areas. As shown in Figure 13, this percentage increases to 55 percent in areas that encompass the urban area as well as 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 67 percent, for a 7.5-mile buffer was 75 percent, and for a 10-mile buffer was 81 percent. In summary, about 81 percent of all fatalities in crashes involving large trucks in the United States in 2006 occurred in areas that includes all the urban areas as well as the 10-mile buffers around them.

Figure 13: Percentages of Fatalities Involving Large Trucks in Crashes, by Urban Buffer Zones, 2006
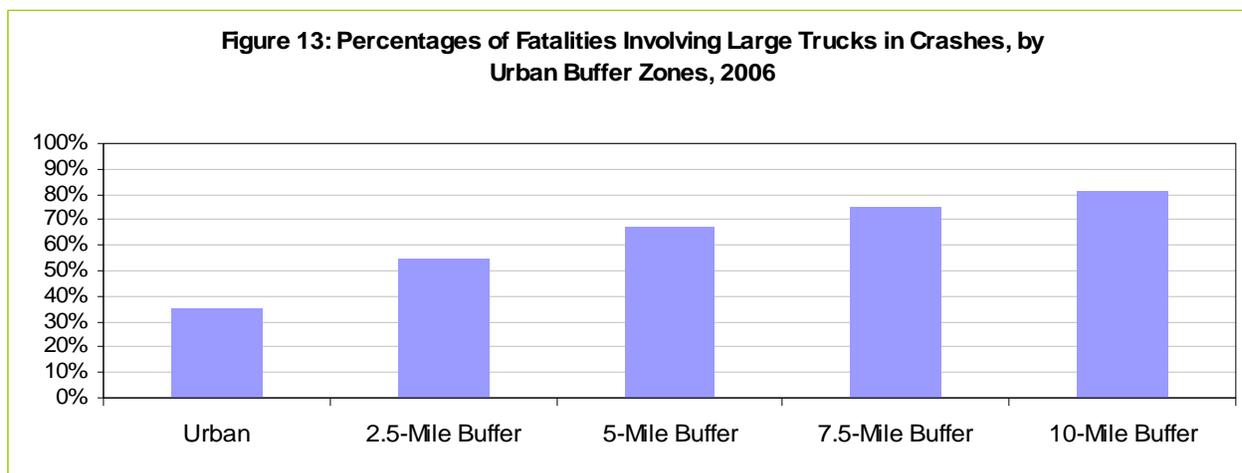
Table 10 depicts the distribution of percentage of fatalities in crashes involving large trucks, by the urban buffer distances, by State. **The first column depicts the percentage of fatalities in crashes involving large trucks that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rate of lat-long reporting is 90 percent or below and hence percentages of fatalities in crashes involving large trucks in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In West Virginia, there was a 42-percentage-point increase (42% to 84%) in the percentage of fatalities in crashes involving large trucks in urban areas and those that were in the urban areas and the 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing fatalities in crashes involving large trucks in urban areas and those occurring in urban area with 2.5-mile buffers around them.

Some of the rural States with less than 10 percent of their fatalities in crashes involving large trucks in urban areas include Nebraska (3%), West Virginia (6%), and Vermont (9%). States with a high proportion of fatalities in crashes involving large trucks that occurred in urban areas include Connecticut (92%), Rhode Island (88%), and New Jersey (85%).

Table 10: Percentage of Fatalities in Crashes Involving Large Trucks, by Buffers Around Urban Areas, 2006, by State					
State	**Urban**	**Urban+2.5**	**Urban+5.0**	**Urban+7.5**	**Urban+10.0**
Alabama	26%	31%	44%	58%	71%
Alaska	*67%*	*67%*	*67%*	*67%*	*100%*
Arizona	37%	44%	54%	65%	71%
Arkansas	21%	46%	58%	71%	76%
California	52%	68%	75%	81%	86%
Colorado	19%	31%	43%	49%	54%
Connecticut	83%	90%	97%	100%	100%
Delaware	35%	76%	88%	88%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*56%*	*73%*	*84%*	*88%*	*92%*
Georgia	38%	62%	75%	83%	93%
Hawaii	58%	92%	92%	92%	92%
Idaho	21%	28%	48%	62%	66%
Illinois	56%	69%	86%	92%	96%
Indiana	23%	58%	74%	85%	90%
Iowa	15%	36%	51%	59%	71%
Kansas	12%	28%	38%	51%	59%
Kentucky	24%	49%	64%	76%	82%
Louisiana	39%	56%	74%	88%	91%
Maine	29%	33%	57%	62%	62%
Maryland	42%	84%	91%	96%	100%
Massachusetts	*79%*	*96%*	*96%*	*96%*	*96%*
Michigan	34%	68%	78%	80%	88%
Minnesota	12%	33%	47%	62%	72%
Mississippi	21%	39%	56%	71%	77%
Missouri	22%	48%	59%	67%	74%
Montana	0%	6%	15%	26%	26%
Nebraska	3%	12%	24%	29%	44%
Nevada	55%	51%	63%	65%	65%
New Hampshire	57%	71%	71%	71%	71%
New Jersey	85%	97%	97%	99%	100%
New Mexico	19%	38%	44%	55%	65%
New York	47%	69%	85%	92%	95%
North Carolina	26%	55%	68%	75%	84%
North Dakota	0%	5%	21%	21%	26%
Ohio	26%	63%	85%	91%	97%
Oklahoma	16%	26%	46%	66%	80%
Oregon	26%	42%	60%	60%	63%
Pennsylvania	48%	73%	86%	90%	93%
Rhode Island	88%	100%	100%	100%	100%
South Carolina	12%	43%	58%	65%	73%
South Dakota	16%	26%	37%	47%	47%
Tennessee	49%	62%	74%	81%	87%
Texas	31%	51%	63%	71%	77%
Utah	31%	49%	49%	59%	62%
Vermont	9%	9%	36%	45%	55%
Virginia	*49%*	*58%*	*67%*	*82%*	*82%*
Washington	*42%*	*62%*	*79%*	*81%*	*83%*
West Virginia	6%	27%	52%	73%	77%
Wisconsin	28%	45%	64%	82%	86%
Wyoming	10%	10%	19%	21%	24%
U.S.	35%	55%	67%	75%	81%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 11 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 11: Percent of Fatalities in Crashes Involving Large Trucks by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	32%	58%	69%	77%	83%
2003	33%	55%	67%	77%	83%
2004	33%	55%	68%	77%	83%
2005	36%	56%	68%	77%	83%
2006	35%	55%	67%	75%	81%

As seen in Table 11, the proportions of fatalities in crashes involving large trucks that occurred in urban areas have increased marginally from 32 percent in 2002 to 35 percent in 2006. Figure 14 depicts the national maps for fatalities in crashes involving large trucks in 2006 by buffer distances.

Figure 14: Fatalities in Crashes Involving Large Trucks by Urban Buffer Zones, 2006

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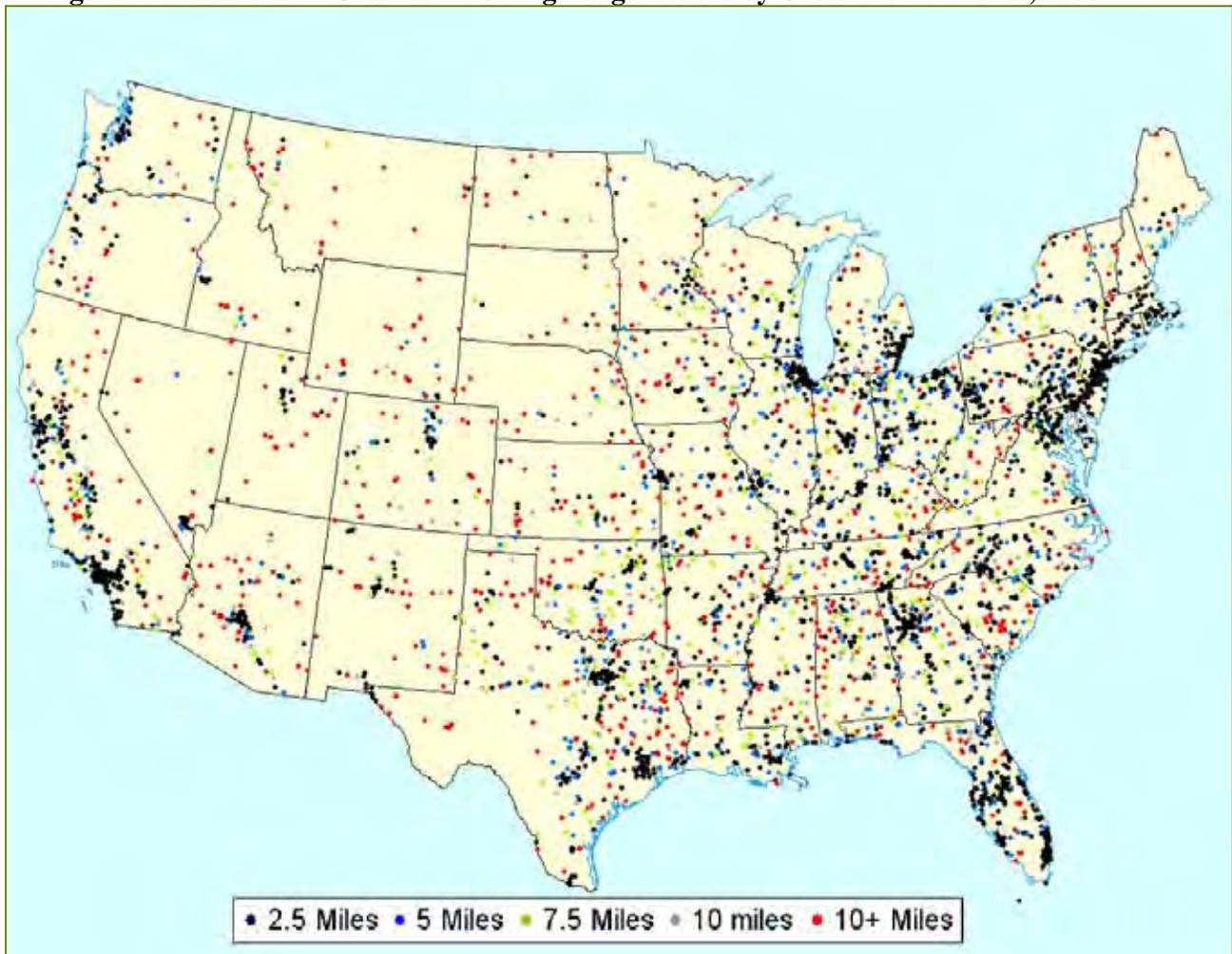
4.6. Alcohol-Impaired Driving Fatalities

Alcohol-impaired-driving fatalities are those that occur in crashes involving at least one driver or a motorcycle operator with a blood alcohol concentration (BAC) of .08 grams per deciliter or above. Not all drivers or motorcycle operators involved in fatal crashes have BACs reported in FARS. NHTSA uses an imputation procedure to estimate BACs when they are missing. A determination of a specific crash being alcohol-impaired or not cannot be made in most fatal crashes and this determination is only made on an aggregate or summary level. So while specific location maps cannot be generated for alcohol-impaired-driving fatalities, estimates for a group of crashes, e.g., those occurring in urban areas and 2.5-mile buffers around them can be made.

In 2006, 5,741 fatalities, or about 44 percent of the total of 13,491 alcohol-impaired-driving fatalities in the United States, occurred in urban areas. As shown in Figure 15, this percentage increases to 63 percent in urban area as well as 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 73 percent, for a 7.5-mile buffer was 81 percent, and for a 10-mile buffer was 86 percent. In summary, about 86 percent of all fatalities in crashes involving alcohol-impaired-driving in 2006 occurred in urban areas as well as the 10-mile buffers around them.

Figure 15: Percentages of Alcohol-Impaired-Driving Fatalities by Urban Buffer Zones, 2006
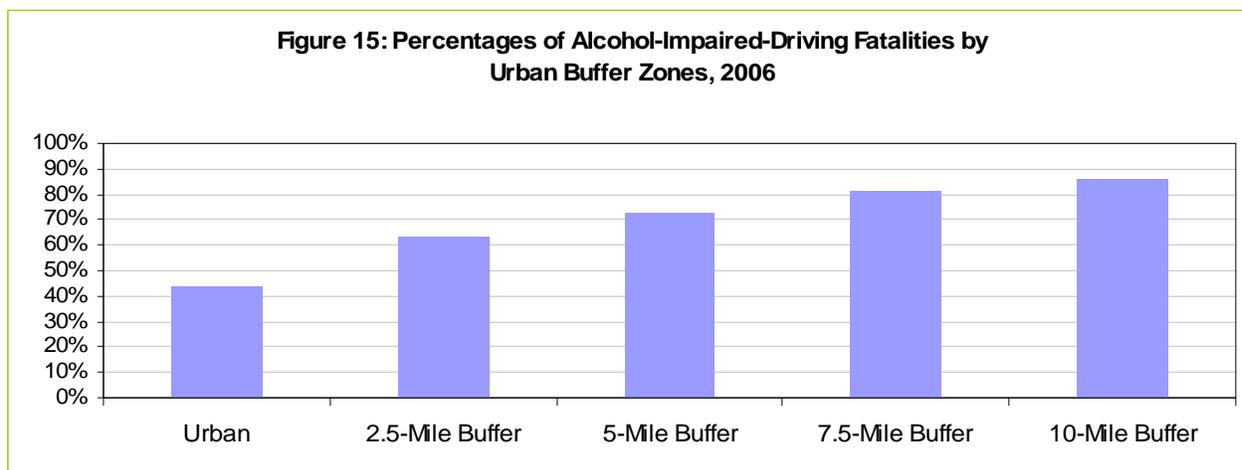
Table 12 depicts the distribution of percentages of alcohol-impaired-driving fatalities, by the urban buffer distances, by State. **The first column depicts the percentage of alcohol-impaired-driving fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available. Some of the States are italicized as their rates of lat-long reporting is 90 percent or below and hence percentage of alcohol-impaired-driving fatalities in the urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In South Carolina, there was a 43-percentage-point increase (12% to 55%) in the percentage of alcohol-impaired-driving fatalities in urban areas and those that were in urban areas and the 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing alcohol-impaired driving fatalities in their urban areas and those in urban areas along with the 2.5-mile buffers around them.

State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Table 12: Percentage of Alcohol-Impaired-Driving Fatalities, by Buffers Around Urban Areas, 2006, by State					
Alabama	32%	45%	58%	68%	77%
Alaska	*56%*	*63%*	*69%*	*69%*	*69%*
Arizona	57%	63%	70%	77%	81%
Arkansas	25%	49%	64%	74%	83%
California	63%	78%	84%	89%	91%
Colorado	49%	61%	66%	70%	74%
Connecticut	84%	96%	97%	98%	98%
Delaware	35%	70%	88%	98%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*56%*	*83%*	*90%*	*93%*	*95%*
Georgia	45%	66%	77%	87%	93%
Hawaii	50%	79%	81%	81%	83%
Idaho	20%	43%	47%	53%	62%
Illinois	60%	70%	80%	88%	94%
Indiana	*47%*	*66%*	*77%*	*84%*	*93%*
Iowa	22%	36%	50%	59%	68%
Kansas	25%	53%	61%	71%	74%
Kentucky	28%	47%	62%	69%	80%
Louisiana	54%	70%	80%	89%	92%
Maine	13%	27%	46%	56%	77%
Maryland	59%	85%	92%	97%	99%
Massachusetts	*89%*	*98%*	*99%*	*99%*	*100%*
Michigan	37%	63%	78%	84%	88%
Minnesota	31%	48%	58%	68%	75%
Mississippi	23%	41%	57%	70%	77%
Missouri	34%	50%	62%	71%	79%
Montana	5%	27%	45%	56%	62%
Nebraska	32%	45%	54%	59%	62%
Nevada	70%	74%	78%	78%	82%
New Hampshire	43%	57%	67%	70%	80%
New Jersey	84%	91%	98%	100%	100%
New Mexico	22%	54%	60%	69%	72%
New York	57%	77%	85%	91%	93%
North Carolina	29%	56%	72%	84%	90%
North Dakota	2%	5%	10%	10%	12%
Ohio	33%	66%	81%	92%	96%
Oklahoma	22%	34%	51%	60%	76%
Oregon	32%	59%	67%	73%	77%
Pennsylvania	43%	65%	81%	89%	94%
Rhode Island	83%	100%	100%	100%	100%
South Carolina	12%	55%	68%	79%	86%
South Dakota	7%	15%	21%	25%	33%
Tennessee	45%	64%	74%	84%	90%
Texas	46%	64%	73%	80%	86%
Utah	40%	58%	70%	74%	74%
Vermont	0%	15%	38%	54%	62%
Virginia	*51%*	*60%*	*70%*	*77%*	*85%*
Washington	*41%*	*65%*	*71%*	*77%*	*83%*
West Virginia	17%	46%	58%	67%	76%
Wisconsin	32%	43%	54%	66%	76%
Wyoming	10%	19%	24%	32%	37%
U.S.	44%	63%	73%	81%	86%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Some rural States with less than 10 percent of their alcohol-impaired-driving fatalities in urban areas include North Dakota (2%), Montana (5%), South Dakota (7%), and Vermont (0%). Massachusetts had the highest proportion of alcohol-impaired-driving fatalities in crashes that occurred in urban areas (89%).

Table 13 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 13: Percent of Alcohol-Impaired Driving Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	40%	63%	73%	80%	86%
2003	42%	63%	73%	81%	86%
2004	41%	63%	73%	81%	86%
2005	43%	63%	73%	81%	86%
2006	44%	63%	73%	81%	86%

As seen in Table 13, the proportions of alcohol-impaired-driving fatalities that occurred in the urban areas have increased marginally from 40 percent in 2002 to 44 percent in 2006. Alcohol-impaired-driving fatalities are statistical estimates of an aggregate of crashes and not of a specific crash and hence maps of locations of alcohol-impaired-driving fatalities cannot be plotted.

4.7. Unbelted Passenger Vehicle Occupant Fatalities

In 2006, 6,678 fatalities, or about 37 percent of the total of 17,976 unbelted passenger vehicle occupant fatalities in the United States occurred in urban areas. As shown in Figure 16, this percentage increases to 56 percent in urban areas as well as the 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 68 percent, for a 7.5-mile buffer was 76 percent, and for a 10-mile buffer was 83 percent. In summary, about 83 percent of all unbelted passenger vehicle occupant fatalities in the United States in 2006 occurred in urban areas as well as the 10-mile buffers around them.

Figure 16: Percentages of Unbelted Passenger Vehicle Occupant Fatalities by Urban Buffer Zones, 2006
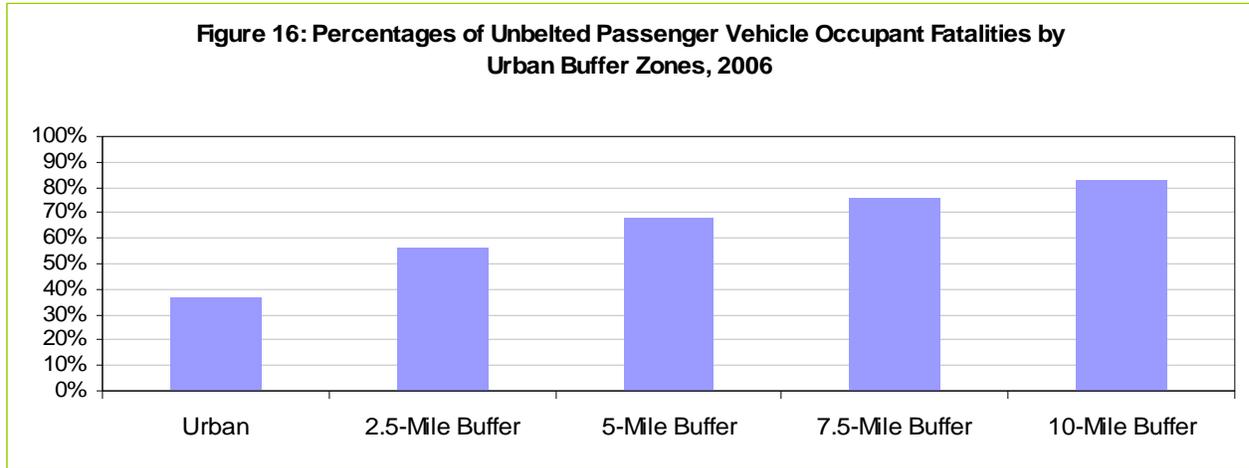
Table 14 depicts the distribution of percentages of unbelted passenger vehicle occupant fatalities by the urban buffer distances, by State. **The first column depicts the percentage of unbelted passenger vehicle occupant fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rates of lat-long reporting is 90 percent or below and hence percentage of unbelted passenger vehicle occupant fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In Delaware, there was a 44-percentage-point increase (30% to 74%) in the percentage of unbelted passenger vehicle occupant fatalities that were in urban areas and those in urban areas including the 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing unbelted passenger vehicle occupant fatalities in urban areas and those occurring in urban areas with 2.5-mile buffers around them.

Some of the rural States with less than 10 percent of their unbelted passenger vehicle occupant fatalities in urban areas include Maine (6%), Montana (4%), North Dakota (7%), and Vermont (7%). States with high proportions of unbelted passenger vehicle occupant fatalities occurring in urban areas include Rhode Island (97%), New Jersey (84%), and Massachusetts (88%).

Table 14: Percentages of Unbelted Passenger Vehicle Occupant Fatalities by Buffers Around Urban Areas, 2006, by State

State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	29%	39%	52%	64%	76%
Alaska	*40%*	*53%*	*60%*	*60%*	*67%*
Arizona	45%	51%	59%	67%	72%
Arkansas	21%	43%	58%	70%	80%
California	57%	74%	82%	86%	89%
Colorado	37%	52%	59%	66%	72%
Connecticut	82%	95%	97%	98%	99%
Delaware	30%	74%	85%	92%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*52%*	*77%*	*87%*	*90%*	*93%*
Georgia	38%	60%	73%	84%	91%
Hawaii	42%	71%	75%	78%	80%
Idaho	18%	35%	45%	56%	62%
Illinois	57%	69%	80%	89%	94%
Indiana	41%	56%	73%	85%	94%
Iowa	18%	32%	43%	50%	64%
Kansas	17%	39%	48%	59%	65%
Kentucky	20%	42%	56%	65%	77%
Louisiana	46%	62%	75%	86%	90%
Maine	6%	25%	40%	49%	62%
Maryland	54%	79%	89%	95%	99%
Massachusetts	*88%*	*98%*	*99%*	*99%*	*100%*
Michigan	34%	62%	74%	79%	87%
Minnesota	25%	42%	54%	65%	71%
Mississippi	23%	40%	54%	67%	74%
Missouri	25%	44%	56%	67%	75%
Montana	4%	22%	30%	39%	45%
Nebraska	21%	37%	47%	56%	61%
Nevada	53%	58%	64%	67%	70%
New Hampshire	42%	57%	70%	74%	83%
New Jersey	84%	93%	98%	100%	100%
New Mexico	16%	38%	50%	60%	66%
New York	57%	80%	87%	90%	94%
North Carolina	25%	52%	69%	81%	87%
North Dakota	3%	3%	11%	15%	18%
Ohio	32%	64%	79%	91%	97%
Oklahoma	15%	30%	47%	58%	72%
Oregon	24%	49%	55%	68%	71%
Pennsylvania	46%	68%	82%	89%	93%
Rhode Island	97%	100%	100%	100%	100%
South Carolina	9%	48%	61%	75%	83%
South Dakota	7%	15%	23%	32%	37%
Tennessee	39%	58%	71%	83%	89%
Texas	38%	55%	66%	74%	81%
Utah	32%	61%	66%	74%	77%
Vermont	3%	23%	49%	62%	69%
Virginia	*45%*	*58%*	*69%*	*77%*	*85%*
Washington	*37%*	*56%*	*64%*	*71%*	*79%*
West Virginia	14%	50%	62%	71%	79%
Wisconsin	29%	41%	56%	67%	76%
Wyoming	8%	20%	28%	35%	39%
U.S.	37%	56%	68%	76%	83%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 15 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 15: Percentage of Unbelted Passenger Vehicle Occupant Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	34%	58%	69%	78%	84%
2003	36%	57%	69%	77%	84%
2004	34%	56%	68%	77%	83%
2005	36%	56%	68%	77%	83%
2006	37%	56%	68%	76%	83%

As seen in Table 15, the proportions of unbelted passenger vehicle occupant fatalities in urban areas have increased marginally from 34 percent in 2002 to 37 percent in 2006. Figure 17 depicts the national maps for unbelted passenger vehicle occupant fatalities in 2006 by buffer distances.

Figure 17: Unbelted Passenger Vehicle Occupant Fatalities by Urban Buffer Zones, 2006

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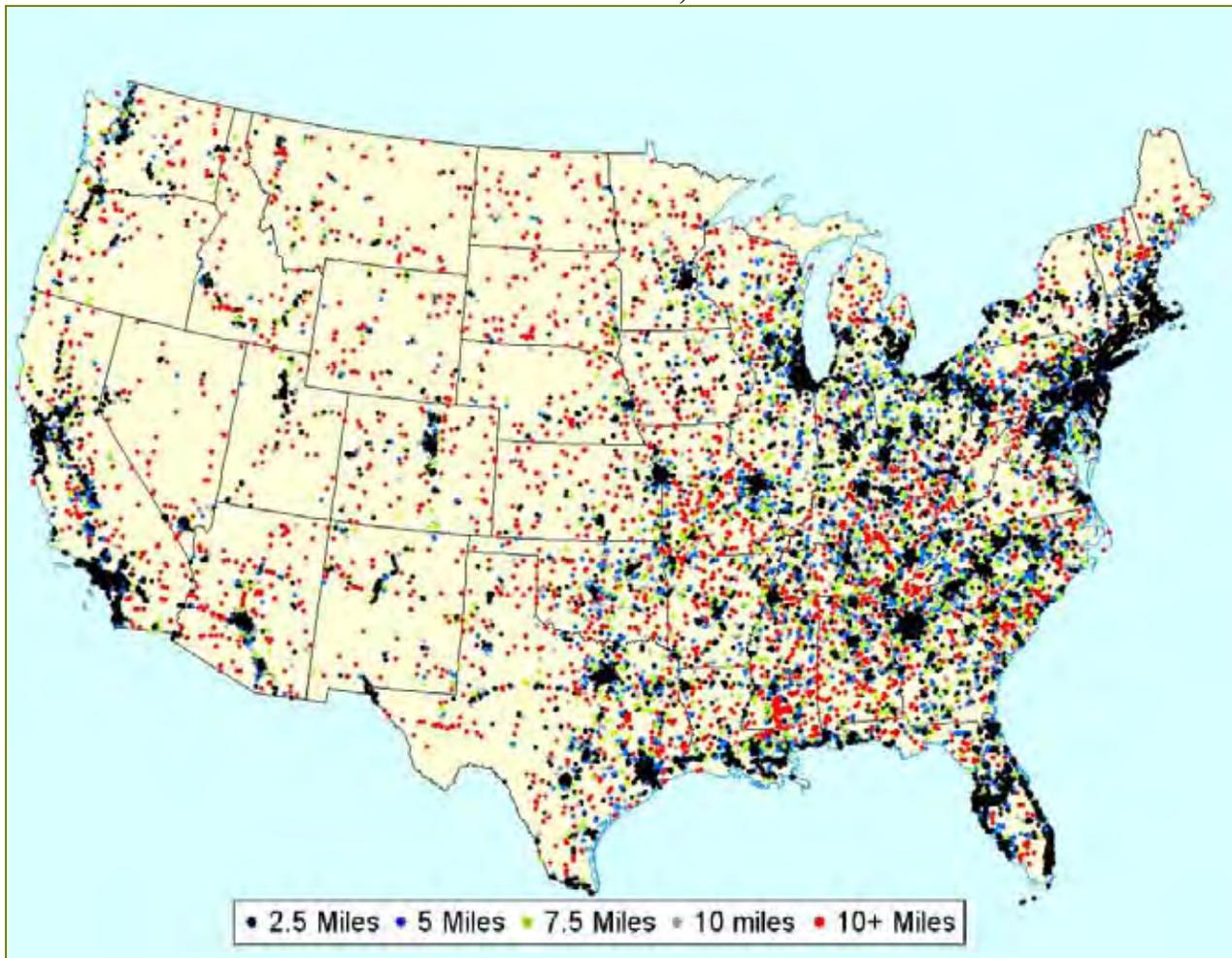
4.8. Fatalities During the Weekend

In 2006, 8,203 fatalities, or about 45 percent of the total of 18,319 weekend fatalities in the United States, occurred in urban areas. As shown in Figure 18, this percentage increases to 64 percent in urban areas as well as the 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 73 percent, for a 7.5-mile buffer was 81 percent, and for a 10-mile buffer was 86 percent. In summary, about 86 percent of all weekend fatalities in the United States in 2006 occurred in urban areas as well as the 10-mile buffers around them.

Figure 18: Percent of Weekend Fatalities by Urban Buffer Zones, U.S., 2006
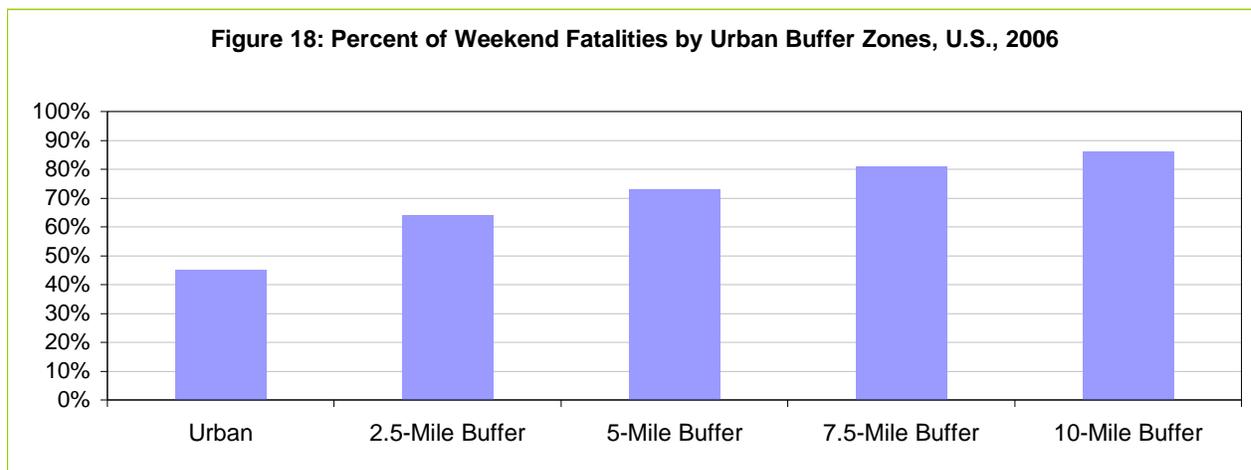
Table 16 depicts the distribution of percentage of weekend fatalities by the urban buffer distances, by State. **The first column depicts the percent of weekend fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rate of lat-long reporting is 90 percent or below and hence percentage of weekend fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In South Carolina there was a 44-percentage-point increase (13% to 57%) in the percentage of weekend fatalities in urban areas and those that were in urban areas including the 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing weekend fatalities in urban areas and those occurring in urban areas along with the 2.5-mile buffers around them.

Some of the rural States with less than 10 percent of their weekend fatalities in urban areas include Montana (4%) and North Dakota (3%). States with high proportions of weekend fatalities occurring in urban areas include New Jersey (85%) and Massachusetts (93%).

Table 16: Percentages of Weekend Fatalities by Buffers Around Urban Areas, 2006, by State

| State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	32%	44%	55%	66%	76%
Alaska	*40%*	*52%*	*64%*	*64%*	*64%*
Arizona	53%	59%	68%	73%	77%
Arkansas	25%	46%	61%	73%	83%
California	63%	77%	84%	88%	90%
Colorado	44%	58%	63%	67%	71%
Connecticut	82%	94%	98%	99%	99%
Delaware	47%	82%	93%	96%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*61%*	*84%*	*90%*	*94%*	*96%*
Georgia	46%	65%	77%	86%	92%
Hawaii	56%	80%	84%	87%	87%
Idaho	24%	37%	43%	52%	59%
Illinois	62%	72%	81%	90%	94%
Indiana	43%	61%	78%	86%	94%
Iowa	22%	37%	49%	62%	71%
Kansas	22%	50%	59%	68%	71%
Kentucky	27%	49%	61%	72%	82%
Louisiana	54%	71%	80%	89%	93%
Maine	16%	34%	50%	62%	74%
Maryland	62%	85%	92%	97%	99%
Massachusetts	*93%*	*98%*	*99%*	*99%*	*100%*
Michigan	38%	65%	78%	85%	88%
Minnesota	25%	46%	56%	70%	74%
Mississippi	26%	44%	60%	71%	78%
Missouri	31%	48%	58%	68%	78%
Montana	4%	26%	37%	47%	53%
Nebraska	26%	35%	43%	50%	52%
Nevada	66%	67%	71%	73%	79%
New Hampshire	41%	61%	77%	79%	88%
New Jersey	85%	93%	99%	100%	100%
New Mexico	28%	51%	58%	67%	69%
New York	59%	77%	85%	90%	95%
North Carolina	27%	57%	73%	84%	90%
North Dakota	3%	5%	8%	13%	16%
Ohio	31%	63%	79%	92%	96%
Oklahoma	23%	38%	55%	65%	75%
Oregon	34%	56%	64%	70%	74%
Pennsylvania	52%	72%	84%	90%	95%
Rhode Island	84%	95%	98%	98%	100%
South Carolina	13%	57%	70%	80%	87%
South Dakota	13%	21%	33%	35%	38%
Tennessee	43%	61%	72%	81%	89%
Texas	47%	63%	72%	80%	85%
Utah	39%	58%	62%	67%	71%
Vermont	10%	23%	38%	54%	67%
Virginia	*53%*	*64%*	*72%*	*79%*	*87%*
Washington	*45%*	*71%*	*77%*	*81%*	*85%*
West Virginia	15%	53%	66%	73%	81%
Wisconsin	30%	42%	56%	66%	74%
Wyoming	11%	22%	33%	35%	39%
U.S.	45%	64%	73%	81%	86%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 17 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 17: Percent of Weekend Fatalities by Buffers Around Urban Areas, 2002-2006, United States					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	41%	63%	73%	81%	86%
2003	42%	64%	73%	81%	86%
2004	41%	63%	73%	81%	86%
2005	43%	62%	72%	80%	85%
2006	45%	64%	73%	81%	86%

As seen in Table 17, the proportions of weekend fatalities in the urban areas have increased marginally from 41 percent in 2002 to 45 percent in 2006. Figure 19 depicts the national maps for weekend fatalities in 2006 by buffer distances.

Figure 19: Weekend Fatalities by Urban Buffer Zones, 2006
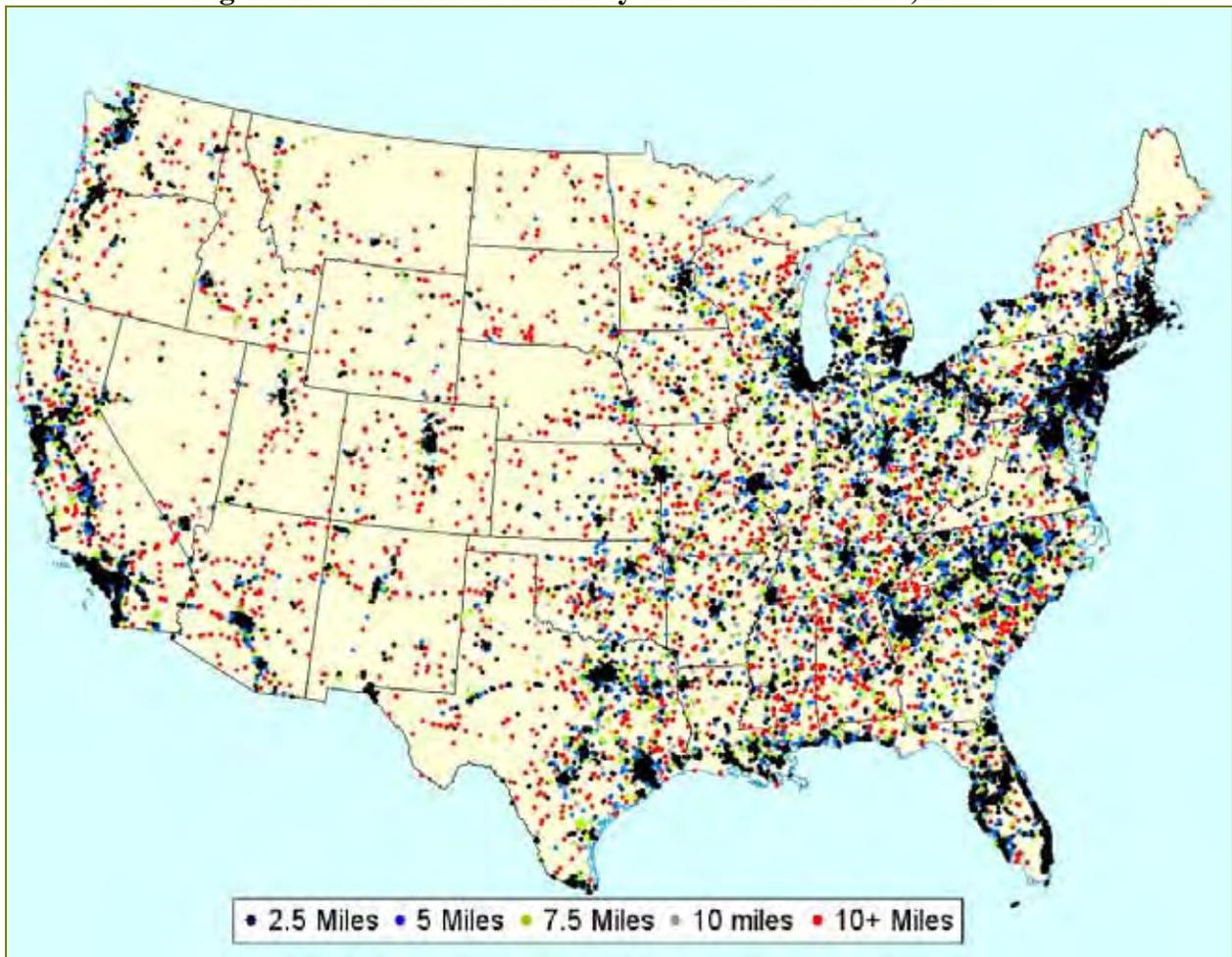
4.9. Nighttime Fatalities

In 2006, 10,624 fatalities, or about 49 percent of the total of 21,843 nighttime (6 p.m. to 5:59 a.m.) fatalities in the United States, occurred in urban areas. As shown in Figure 20, this percentage increases to 67 percent in an area that encompasses the urban area as well as 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 77 percent, for a 7.5-mile buffer was 84 percent, and for a 10-mile buffer was 88 percent. In summary, about 88 percent of all nighttime fatalities in the United States in 2006 occurred in urban areas as well as the in a 10-mile buffers around them.

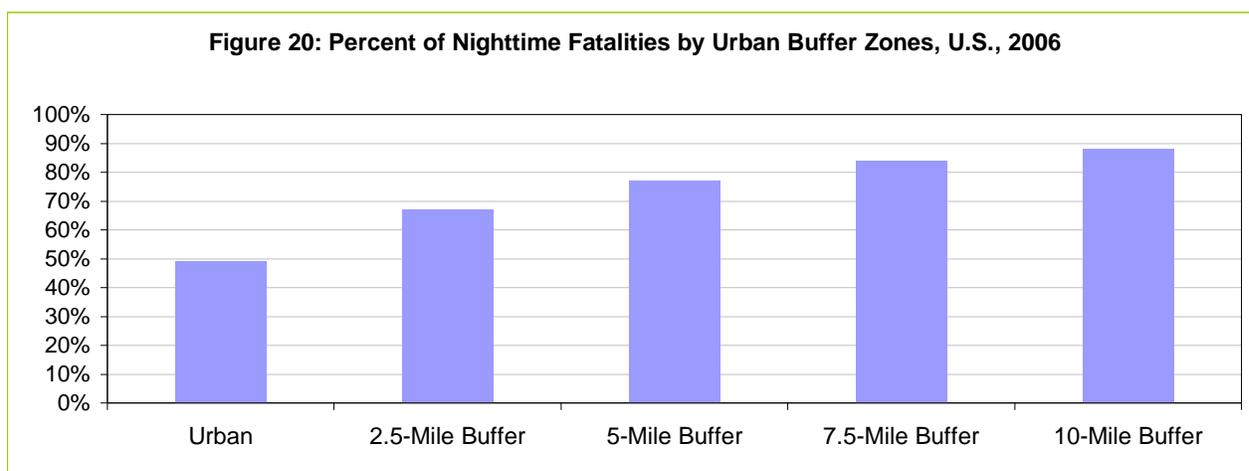Figure 20: Percent of Nighttime Fatalities by Urban Buffer Zones, U.S., 2006

Table 18 depicts the distribution of percentage of nighttime fatalities by the urban buffer distances, by State. **The first column depicts the percent of nighttime fatalities that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rate of lat-long reporting is 90 percent or below and hence percentage of nighttime fatalities in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In South Carolina, there was a 44-percentage-point increase (13 percent to 57%) in the percentage of nighttime fatalities that were in urban areas and those that were in urban areas including 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing nighttime fatalities in its urban areas and those occurring in urban areas along with 2.5-mile buffers around them.

Some of the rural States, with less than 10 percent of their nighttime fatalities in urban areas include Vermont (4%), North Dakota (4%), South Dakota (6%), and Montana (7%). States with high proportions of nighttime fatalities occurring in urban areas include New Jersey (89%) and Massachusetts (92%).

| Table 18: Percentage of Nighttime Fatalities by Buffers Around Urban Areas, 2006, by State					
State	**Urban**	**Urban+2.5**	**Urban+5.0**	**Urban+7.5**	**Urban+10.0**
Alabama	38%	47%	58%	68%	77%
Alaska	*46%*	*58%*	*67%*	*67%*	*67%*
Arizona	59%	65%	73%	79%	83%
Arkansas	27%	52%	65%	76%	81%
California	70%	84%	89%	92%	94%
Colorado	50%	62%	67%	73%	76%
Connecticut	87%	96%	98%	99%	99%
Delaware	43%	78%	92%	97%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*62%*	*85%*	*91%*	*94%*	*96%*
Georgia	46%	68%	80%	87%	92%
Hawaii	57%	81%	85%	88%	90%
Idaho	21%	40%	51%	61%	69%
Illinois	64%	74%	84%	92%	95%
Indiana	44%	63%	78%	88%	95%
Iowa	24%	39%	52%	65%	71%
Kansas	27%	54%	65%	74%	77%
Kentucky	30%	49%	63%	74%	82%
Louisiana	56%	71%	82%	89%	93%
Maine	19%	34%	52%	65%	81%
Maryland	61%	87%	94%	97%	99%
Massachusetts	*92%*	*98%*	*99%*	*99%*	*100%*
Michigan	44%	70%	82%	86%	91%
Minnesota	32%	49%	61%	73%	81%
Mississippi	27%	45%	62%	74%	81%
Missouri	34%	51%	60%	71%	79%
Montana	7%	26%	38%	46%	54%
Nebraska	30%	43%	54%	59%	62%
Nevada	70%	74%	80%	81%	84%
New Hampshire	50%	71%	81%	83%	90%
New Jersey	89%	95%	99%	100%	100%
New Mexico	28%	53%	62%	71%	75%
New York	62%	81%	88%	92%	94%
North Carolina	31%	60%	76%	85%	91%
North Dakota	4%	9%	15%	20%	22%
Ohio	35%	68%	80%	92%	97%
Oklahoma	24%	39%	54%	66%	79%
Oregon	42%	67%	76%	84%	86%
Pennsylvania	52%	72%	85%	92%	95%
Rhode Island	86%	98%	98%	98%	100%
South Carolina	13%	57%	70%	79%	85%
South Dakota	6%	16%	23%	36%	37%
Tennessee	49%	65%	76%	86%	92%
Texas	51%	68%	76%	83%	87%
Utah	44%	63%	72%	76%	80%
Vermont	4%	18%	50%	61%	64%
Virginia	*56%*	*65%*	*74%*	*82%*	*89%*
Washington	*51%*	*70%*	*77%*	*81%*	*85%*
West Virginia	15%	51%	63%	71%	80%
Wisconsin	35%	46%	57%	67%	76%
Wyoming	11%	23%	36%	42%	48%
U.S.	49%	67%	77%	84%	88%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 19 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 19: Percentages of Nighttime Fatalities by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	45%	68%	77%	84%	88%
2003	46%	67%	77%	83%	88%
2004	46%	67%	76%	83%	88%
2005	47%	67%	76%	83%	88%
2006	49%	67%	77%	84%	88%

As seen in Table 19, the proportions of weekend fatalities in urban areas have increased marginally from 45 percent in 2002 to 49 percent in 2006. Figure 21 depicts the national maps for nighttime fatalities in 2006 by buffer distances.

Figure 21: Nighttime Fatalities by Urban Buffer Zones, 2006
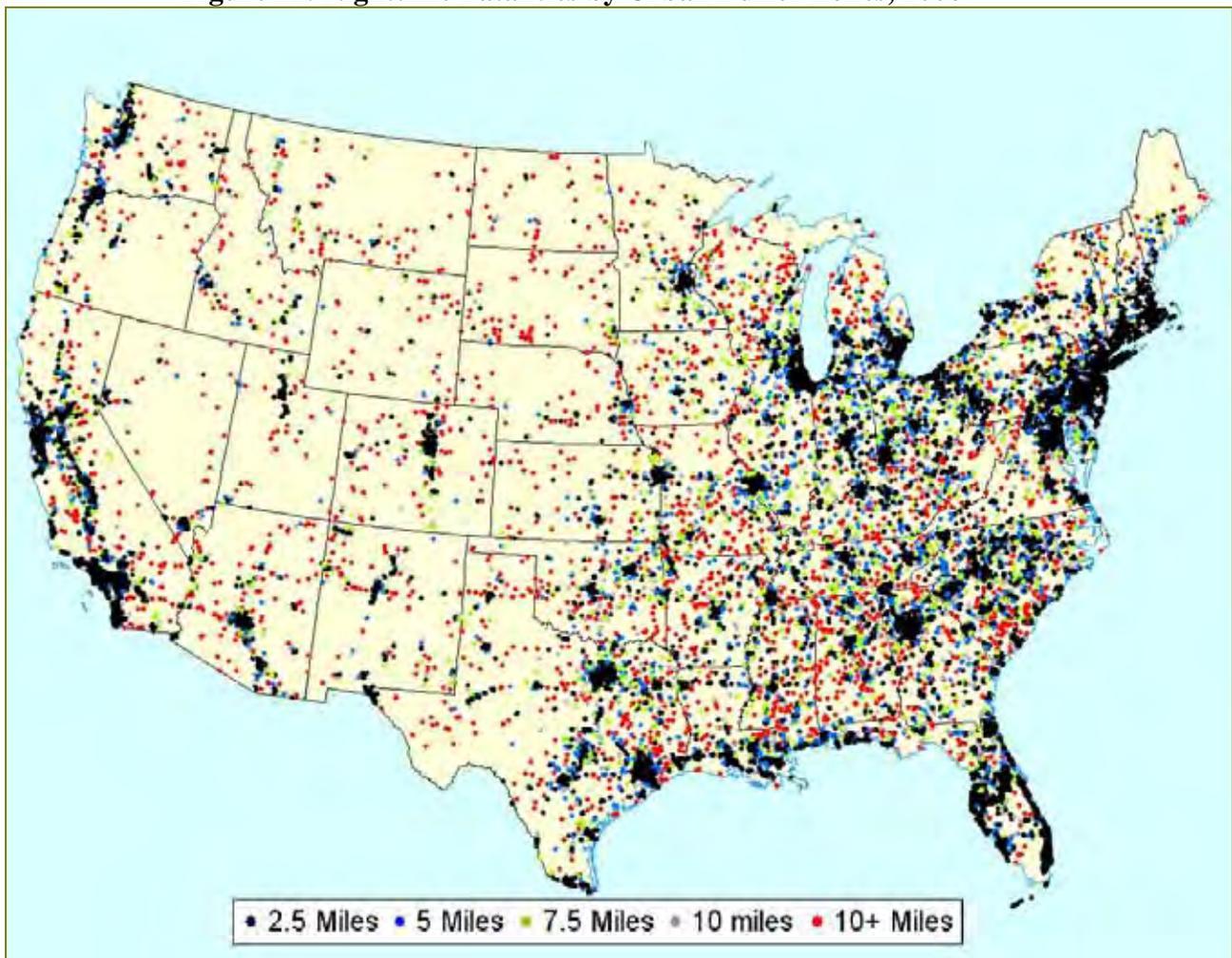
4.10. Fatalities on Interstate Highways

In 2006, 2,589 fatalities, or about 48 percent of the total of 5,432 fatalities on interstates in the United States, occurred in urban areas. As shown in Figure 22, this percentage increases to 66 percent in urban areas as well as the 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 75 percent, for a 7.5-mile buffer was 82 percent, and for a 10-mile buffer was 86 percent. In summary, about 86 percent of all fatalities on interstates in the United States in 2006 occurred in urban areas as well as the 10-mile buffers around them.

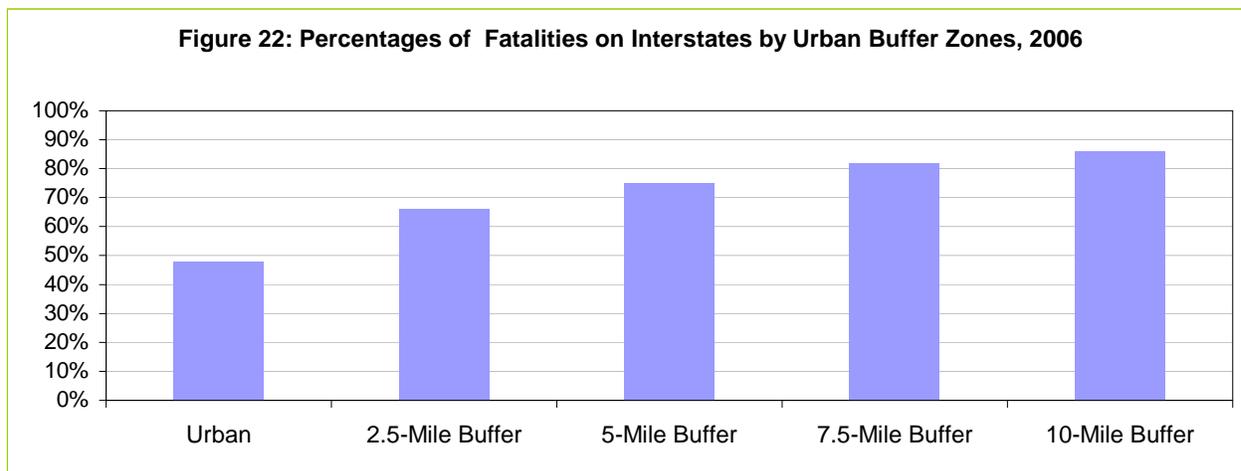Figure 22: Percentages of Fatalities on Interstates by Urban Buffer Zones, 2006

Table 20 depicts the distribution of percentage of fatalities on interstates by the urban buffer distances, by State. **The first column depicts the percentage of fatalities on interstates that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rates of lat-long reporting is 90 percent or below and hence percentage of fatalities on interstates in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In Kansas, there was a 61-percentage-point increase (2% to 63%) in the percentage of fatalities on interstates that were in urban areas and those that were in urban areas including the 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing fatalities on interstates in urban areas and those occurring in urban areas along with the 2.5-mile buffers around them.

Some of the rural States with less than 10 percent of their interstate fatalities in urban areas include Alaska (0%), North Dakota (0%), Kansas (2%), Nebraska (3%), New Mexico (7%), and Montana (8%). States with high proportions of fatalities on interstates in urban areas include Delaware (100%), Connecticut (96%), New Jersey (89%), and Massachusetts (88%).

Table 20: Percentage of Fatalities on Interstates by Buffers Around Urban Areas, 2006, by State					
State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	47%	50%	59%	71%	79%
Alaska	*0%*	*29%*	*29%*	*29%*	*29%*
Arizona	20%	29%	43%	55%	64%
Arkansas	40%	56%	68%	81%	94%
California	63%	76%	80%	84%	86%
Colorado	37%	56%	66%	74%	81%
Connecticut	96%	98%	100%	100%	100%
Delaware	100%	100%	100%	100%	100%
Dist of Columbia	100%	100%	100%	100%	100%
Florida	*63%*	*74%*	*86%*	*92%*	*95%*
Georgia	57%	73%	86%	89%	95%
Hawaii	100%	100%	100%	100%	100%
Idaho	24%	46%	51%	59%	59%
Illinois	66%	79%	90%	97%	99%
Indiana	26%	74%	88%	95%	98%
Iowa	15%	38%	50%	65%	70%
Kansas	2%	63%	71%	76%	78%
Kentucky	36%	64%	78%	90%	91%
Louisiana	55%	70%	83%	97%	99%
Maine	43%	79%	79%	79%	86%
Maryland	75%	93%	95%	95%	97%
Massachusetts	*88%*	*100%*	*100%*	*100%*	*100%*
Michigan	67%	89%	95%	95%	97%
Minnesota	69%	86%	90%	93%	93%
Mississippi	32%	64%	77%	87%	94%
Missouri	45%	65%	75%	82%	91%
Montana	8%	19%	25%	33%	44%
Nebraska	3%	13%	32%	45%	45%
Nevada	49%	41%	51%	54%	65%
New Hampshire	43%	79%	79%	93%	93%
New Jersey	89%	96%	99%	100%	100%
New Mexico	7%	39%	46%	53%	55%
New York	*37%*	*82%*	*86%*	*89%*	*92%*
North Carolina	38%	66%	86%	93%	98%
North Dakota	0%	0%	27%	27%	36%
Ohio	50%	89%	94%	97%	98%
Oklahoma	31%	48%	60%	72%	85%
Oregon	34%	76%	82%	82%	84%
Pennsylvania	52%	69%	90%	93%	95%
Rhode Island	86%	86%	86%	86%	100%
South Carolina	18%	51%	62%	69%	76%
South Dakota	21%	31%	45%	62%	66%
Tennessee	51%	61%	74%	87%	93%
Texas	53%	66%	75%	81%	84%
Utah	36%	59%	66%	70%	71%
Vermont	7%	27%	87%	87%	87%
Virginia	*52%*	*66%*	*73%*	*86%*	*90%*
Washington	*55%*	*82%*	*96%*	*96%*	*98%*
West Virginia	21%	62%	70%	74%	81%
Wisconsin	50%	61%	72%	86%	89%
Wyoming	7%	16%	28%	33%	37%
U.S.	48%	66%	75%	82%	86%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 21 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 21: Percentages of Fatalities on Interstates by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	45%	67%	76%	83%	87%
2003	47%	66%	76%	83%	87%
2004	46%	65%	75%	82%	86%
2005	46%	64%	73%	81%	85%
2006	48%	66%	75%	82%	86%

As seen in Table 21, the proportions of fatalities on interstates that are in the urban areas have increased marginally from 45 percent in 2002 to 48 percent in 2006. Figure 23 depicts the national maps for fatalities on interstates in 2006 by buffer distances.

Figure 23: Fatalities on Interstates by Urban Buffer Zones, 2006

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4.11. Fatalities on U.S./State Highways

In 2006, 6,806 fatalities, or about 36 percent of the total of 18,898 fatalities on U.S./State highways in the United States occurred in urban areas. As shown in Figure 24, this percentage increases to 55 percent in urban areas as well as the 2.5-mile buffers around them. The corresponding percentage for a 5.0-mile buffer was 67 percent, for a 7.5-mile buffer was 76 percent, and for a 10-mile buffer was 82 percent. In summary, about 82 percent of all fatalities on U.S./State highways in 2006 occurred in urban areas as well as the 10-mile buffers around them.

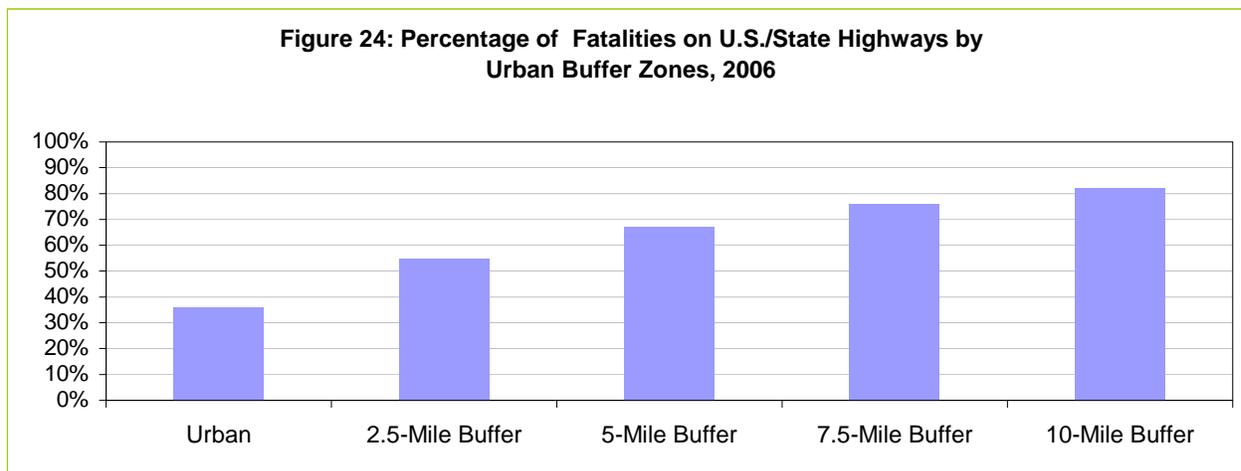**Figure 24: Percentage of Fatalities on U.S./State Highways by Urban Buffer Zones, 2006**

Table 22 depicts the distribution of percentage of fatalities on U.S./State highways by the urban buffer distances, by State. **The first column depicts the percentage of fatalities on U.S./State highways that occurred in urban areas as reported by FARS for those cases for which lat-longs were available**. **Some of the States are italicized as their rates of lat-long reporting is 90 percent or below and hence percentage of fatalities on U.S./State highways in urban areas in these States may not match up to that derived based on the roadway functional classification reported to FARS.** In South Carolina, there was a 43-percentage-point increase (13% to 56%) in the percentage of fatalities on U.S./State highways in urban areas and those in urban areas including the 2.5-mile buffers around them. This was the largest percentage-point difference among all States when comparing fatalities on U.S./State highways in urban areas and those occurring in urban areas along with the 2.5-mile buffers around them.

Some of the rural States with less than 10 percent of their fatalities on U.S./State highways in urban areas include Iowa (1%), Montana (1%), Maine (4%), North Dakota (4%), Kansas (6%), New Mexico (6%), Vermont (6%), and Wyoming (6%). States with high proportions of fatalities on interstates that occurred in urban areas include New Jersey (86%), Rhode Island (86%), and Massachusetts (85%). There were no fatalities on U.S./State highways in the District of Columbia in 2006.

| State	Urban	Urban+2.5	Urban+5.0	Urban+7.5	Urban+10.0
Alabama	32%	42%	54%	68%	78%
Alaska	14%	14%	14%	21%	29%
Arizona	28%	36%	45%	54%	59%
Arkansas	18%	46%	57%	69%	78%
California	42%	62%	72%	79%	83%
Colorado	38%	51%	57%	64%	67%
Connecticut	79%	92%	97%	99%	99%
Delaware	40%	79%	90%	96%	100%
Dist of Columbia	-	-	-	-	-
Florida	*76%*	*83%*	*90%*	*93%*	*95%*
Georgia	41%	56%	71%	82%	89%
Hawaii	48%	74%	80%	84%	88%
Idaho	13%	20%	41%	47%	56%
Illinois	64%	71%	82%	90%	93%
Indiana	21%	48%	64%	79%	92%
Iowa	1%	26%	43%	56%	66%
Kansas	6%	31%	41%	52%	58%
Kentucky	20%	44%	58%	69%	79%
Louisiana	50%	64%	76%	85%	90%
Maine	4%	16%	31%	45%	60%
Maryland	49%	82%	91%	97%	99%
Massachusetts	*85%*	*95%*	*98%*	*98%*	*99%*
Michigan	32%	60%	71%	80%	84%
Minnesota	26%	44%	54%	66%	73%
Mississippi	16%	27%	46%	60%	69%
Missouri	20%	36%	48%	60%	70%
Montana	1%	19%	28%	34%	37%
Nebraska	14%	28%	31%	39%	46%
Nevada	22%	39%	48%	52%	56%
New Hampshire	36%	47%	62%	67%	83%
New Jersey	86%	94%	98%	99%	100%
New Mexico	6%	31%	43%	56%	63%
New York	43%	71%	83%	89%	93%
North Carolina	18%	50%	67%	78%	86%
North Dakota	4%	9%	17%	17%	17%
Ohio	23%	55%	75%	90%	95%
Oklahoma	12%	23%	42%	56%	68%
Oregon	24%	40%	50%	58%	62%
Pennsylvania	48%	71%	83%	91%	95%
Rhode Island	86%	98%	100%	100%	100%
South Carolina	13%	56%	69%	76%	86%
South Dakota	10%	19%	32%	41%	42%
Tennessee	39%	57%	70%	79%	86%
Texas	31%	51%	62%	69%	78%
Utah	18%	49%	56%	65%	68%
Vermont	6%	29%	44%	56%	60%
Virginia	*51%*	*63%*	*72%*	*79%*	*86%*
Washington	*26%*	*55%*	*61%*	*72%*	*74%*
West Virginia	11%	46%	60%	72%	80%
Wisconsin	31%	43%	59%	69%	78%
Wyoming	6%	13%	18%	22%	25%
U.S.	36%	55%	67%	76%	82%

Note: Italicized rows represent States with reporting rates below 90% for latitude/longitude information and thereby percentages in urban areas may differ from those obtained using the roadway function classification reported to FARS. Source: FARS 2006 Final File.

Table 23 depicts the variation of the percentages for the Nation as a whole from 2002 to 2006.

Table 23: Percentage of Fatalities on U.S./State Highways by Buffers Around Urban Areas, 2002-2006					
Year	Urban	2.5 Miles	5.0 Miles	7.5 Miles	10 Miles
2002	31%	56%	67%	76%	83%
2003	32%	55%	67%	76%	83%
2004	32%	55%	67%	75%	82%
2005	35%	55%	67%	76%	82%
2006	36%	55%	67%	76%	82%

As seen in Table 23, the proportions of fatalities on U.S./State highways in the urban areas have increased from 31 percent in 2002 to 36 percent in 2006. Figure 25 depicts the national maps for fatalities on U.S./State highways in 2006 by buffer distances.

Figure 25: Fatalities on U.S./State Highways by Urban Buffer Zones, 2006

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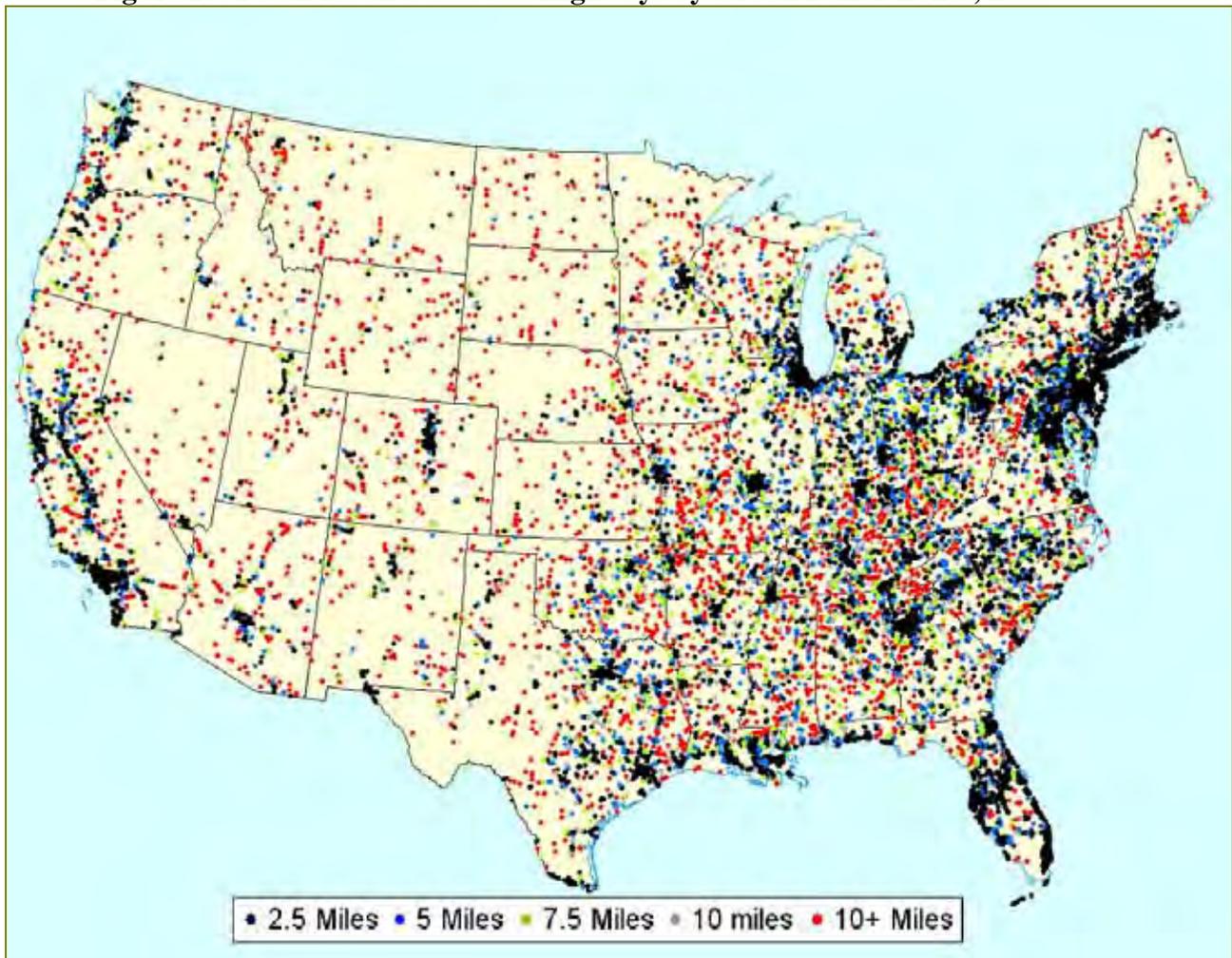
5. Conclusions

Law enforcement officials and highway safety planners who are involved in improving the safety of rural highways are faced with decisions about which parts of vast swathes of rural America to target their crackdowns and other safety countermeasures. NHTSA's FARS codes the land-use classification as rural or urban. While this binary classification is useful in determining the extent of the rural safety problem, it does not provide for the location of these rural crashes, i.e., are they concentrated along certain rural areas or are they spread out among the vast stretches of rural highways.

This analysis used the positional information (latitude and longitude) reported to FARS and determined that about two-thirds (63%) of all traffic fatalities occur in the area comprised of urban areas and rural areas that are in 2.5-mile buffers adjacent to them. In fact, about 44 percent of all traffic fatalities occur in urban areas. This percentage is also similar for alcohol-impaired driving fatalities and speeding related fatalities. If these percentages are true for their States, highway safety planners seeking to reduce fatalities in rural crashes in their State might want to target rural areas that are in immediate vicinity of urban areas.

The change in the spatial extent of fatalities going from urban areas to rural areas in the immediate vicinity of urban areas varies greatly across the States. In sparsely populated rural States with few urban areas (North Dakota, Montana, South Dakota, Wyoming), the change in the percentage of fatalities that occur going from urban areas to nearby rural areas is not significant, as expected. However, in certain other States like South Carolina, Delaware, and Ohio, there is a significant change in the percentages of overall fatalities that occur in urban areas and the percentages when immediate rural areas are also included. So highway safety planners seeking to reduce rural fatalities in these States should concentrate their resources in the rural areas adjoining urban areas.

The changes in the percentage of fatalities on interstate highways that occur in going from urban areas to the rural areas in the immediate vicinity of urban areas vary greatly across the States. In fact in Kansas, about 2 percent of the fatalities on interstates occur in urban areas. However, this percentage increases to 63 percent when the rural areas within 2.5 miles of the urban boundaries are included.

A significant proportion of the fatalities during nighttime as well as during the weekend tend to occur in urban areas as well as the rural areas in the immediate vicinity of the urban areas.

Fatalities in crashes involving large trucks, unbelted passenger vehicle occupant fatalities, and fatalities occurring on U.S./State highways are a bit more spread around and are not concentrated inside the urban areas or adjacent areas.

6. References

[1] NHTSA. *Traffic Safety Facts 2006: Speeding*. DOT HS 810 814. Washington, DC: National Highway Traffic Safety Administration.

[2] Liu, C., Chen, C-L., Subramanian, R., & Utter D. (2005, June). *Analysis of Speeding-Related Fatal Motor Vehicle Traffic Crashes*, NHTSA Technical Report, DOT HS 809 839. Washington, DC: National Highway Traffic Safety Administration.

[3] NHTSA. (2002, July). *State Data System Crash Data Report: 1990 – 1999*. DOT HS 809 504. Washington, DC: National Highway Traffic Safety Administration.

[4] Liu, C., Chen, C-L., & Utter, D. (2005, July). *Speeding-Related Crash Fatalities by Month, Day, and Selected Holiday Periods* NHTSA Crash•Stats, DOT HS 809 890. Washington, DC: National Highway Traffic Safety Administration.

[5] NHTSA. (2005, September). *Speed Management Strategic Initiative*. DOT HS 809 924.Washington, DC: National Highway Traffic Safety Administration.

Appendix

Table A-1 presents the extent of reporting for latitude and longitude for fatal crashes from 2002 to 2006, by State.

	2002	2003	2004	2005	2006
Alabama	94.7	95.7	93.2	95.8	100.0
Alaska	*96.6*	*98.0*	*71.3*	*56.2*	*82.4*
Arizona	48.2	43.7	87.1	97.8	94.4
Arkansas	99.2	99.2	99.2	99.7	100.0
California	97.9	97.4	97.2	99.9	99.9
Colorado	98.4	98.3	97.3	100.0	100.0
Connecticut	98.5	98.7	99.3	99.3	99.4
Delaware	98.4	100.0	100.0	100.0	100.0
Dist of Columbia	100.0	100.0	100.0	100.0	100.0
Florida	*95.1*	*91.6*	*94.1*	*93.7*	*88.8*
Georgia	*83.6*	*84.5*	*90.8*	*92.7*	*93.5*
Hawaii	95.8	99.3	97.2	98.6	98.1
Idaho	99.6	99.3	98.1	100.0	100.0
Illinois	76.4	75.1	79.8	99.7	100.0
Indiana	*92.7*	*88.1*	*81.3*	*88.8*	*92.6*
Iowa	96.8	98.4	97.2	100.0	99.8
Kansas	96.5	98.5	97.8	100.0	100.0
Kentucky	97.4	97.6	97.5	100.0	100.0
Louisiana	94.8	92.7	97.5	99.2	99.9
Maine	84.7	87.9	93.8	94.7	100.0
Maryland	98.6	97.9	96.9	94.6	96.5
Massachusetts	*97.6*	*96.3*	*96.4*	*99.6*	*75.5*
Michigan	97.9	96.8	95.6	99.3	99.8
Minnesota	89.7	93.7	90.8	90.3	97.4
Mississippi	72.5	81.8	98.2	99.0	100.0
Missouri	89.0	93.1	95.8	97.8	98.4
Montana	97.8	97.7	99.6	97.6	100.0
Nebraska	98.7	98.0	96.9	100.0	100.0
Nevada	45.1	41.6	48.1	99.5	100.0
New Hampshire	95.3	98.4	99.4	100.0	100.0
New Jersey	93.0	89.1	91.4	93.2	95.3
New Mexico	96.4	94.1	92.5	94.7	100.0
New York	90.6	93.8	94.0	98.9	95.1
North Carolina	76.1	96.2	94.1	97.4	100.0
North Dakota	99.0	99.1	97.0	100.0	100.0
Ohio	97.5	97.2	96.4	100.0	100.0
Oklahoma	96.6	97.6	96.9	96.8	99.0
Oregon	97.5	97.7	97.8	100.0	99.6
Pennsylvania	96.5	96.8	96.4	99.6	100.0
Rhode Island	100.0	99.0	100.0	100.0	100.0
South Carolina	88.1	97.7	97.7	100.0	100.0
South Dakota	99.4	98.5	97.5	100.0	100.0
Tennessee	95.4	93.3	93.0	85.9	100.0
Texas	97.2	98.1	97.5	98.6	98.6
Utah	26.8	21.0	94.6	97.2	100.0
Vermont	94.9	98.6	99.0	100.0	100.0
Virginia	*69.0*	*61.3*	*66.2*	*68.7*	*63.2*
Washington	*90.6*	*82.7*	*76.2*	*77.0*	*85.6*
West Virginia	89.1	90.9	96.1	99.7	100.0
Wisconsin	98.8	97.5	97.9	100.0	100.0
Wyoming	95.5	97.6	97.0	98.8	100.0
U.S.	90.5	91.1	93.4	96.4	96.7

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