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ROAD SAFETY IN NEW YORK AND LOS ANGELES: U.S. MEGACITIES COMPARED WITH THE NATION

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16. Abstract

This study examined road safety in the two U.S. megacities, New York and Los Angeles. Patterns of fatal and all crashes in these megacities were compared with those for the entire U.S. (Also included were data for the two respective states, New York and California.) The data on fatal crashes came from the Fatal Analysis Reporting Systems, and the data on all crashes from the General Estimates System and the states of New York and California. The period examined was 2002 through 2009.

The results indicate that crashes in the two megacities tend to differ in numerous aspects from typical crashes in the U.S. These included aspects related to when and where these crashed occur, nature of crashes, weather, light, involved persons, and driver actions.

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Introduction

The percentage of the world's population in urban areas has been increasing rapidly. For example, in 1950, about 29% of the population lived in urban areas, while in 2011 it was 52% (United Nations, 2012). By 2050, urban areas are expected to be the home for two thirds of all people (United Nations, 2012).

Recent urban growth has been especially pronounced in large cities. The largest of them, the megacities, have population of more than 10 million. In 1970, there were only two megacities, Tokyo and New York. By 2011, this number has jumped to 23 (see Table 1), accounting for 10% of the world's urban population (United Nations, 2012).

Of the 23 current megacities, 12 are in Asia, 3 each in Europe, North America and South America, and 2 in Africa. By 2025, the number of megacities is projected to be 37, accounting for 14% of the world urban population and 8% of the entire population (United Nations, 2012). Of these 37 megacities, 21 will be in Asia, 5 in South America, 4 each in Europe and North America, and 3 in Africa.

Because of this shift of population from rural to large urban areas, future trends in road transportation in megacities are of increasing interest. For example, Luoma, Sivak, and Zielinski (2010) examined the likely future trends in personal transportation in 15 megacities of the world. The projected future trends were based on population, wealth, level of motorization, public transportation, modal split, and urban transportation plans and strategies. Based on this analysis, projections through 2025 were made for each megacity for changes in ownership of personal vehicles, as well as distance traveled by personal vehicle within the megacity's inner core, for commuting, and for leisure.

The present study is a follow-up to the work of Luoma et al. (2010). The focus of the investigation is on crash patterns in the megacities of New York and Los Angeles in comparison with crash patterns for the entire U.S. Both fatal crashes and all crashes are of interest. A detailed level of analysis is possible because of the high quality of U.S. crash data. The hope is to extent this type of analysis to other megacities of the world, should quality of the data permit.

Table 1.
The largest metropolitan areas of the world, 2011 (United Nations, 2012).
(The U.S. metropolitan areas are in *italics*.)

Rank	Metropolitan area	Population (million)
1	Tokyo	37.2
2	Delhi	22.7
3	Mexico City	20.4
4	*New York*	*20.4*
5	Shanghai	20.2
6	São Paulo	19.9
7	Mumbai	19.7
8	Beijing	15.6
9	Dhaka	15.4
10	Calcutta	14.4
11	Karachi	13.9
12	Buenos Aires	13.5
13	*Los Angeles*	*13.4*
14	Rio de Janeiro	12.0
15	Manila	11.9
16	Moscow	11.6
17	Osaka	11.5
18	Istanbul	11.3
19	Lagos	11.2
20	Cairo	11.2
21	Guangzhou	10.8
22	Shenzhen	10.6
23	Paris	10.6

Method

Three sets of analyses were performed. The first set examined distributions of select demographic variables for New York and Los Angeles, and compared them with the distributions for the entire U.S., as well as with the distributions for the respective states (New York and California.) The data came from the U.S. Census Bureau (2012a), except for travel-to-work information (U.S. Census Bureau, 2012b, 2012c, and 2012d).

The second set of analyses involved examination of all fatal-crash data for an eight-year period from 2002 through 2009 using data from the Fatal Analysis Reporting System (NHTSA, 2012a). Again, the relevant comparison for both New York and Los Angeles was the entire U.S. However, also included were the data for New York State and California. A variety of variables related to the crashes, vehicles, and drivers involved were examined.

The third set of analyses was analogous to the second one, but here all crashes (as opposed to only fatal crashes) were of interest. The data for New York City and New York State came from New York (2011), the Los Angeles and California data were from California (2012), and the data for the entire U.S. came from the General Estimates System (NHTSA, 2012b). Again, data from eight years (2002-2009) were included.

Table 2 lists the number of crashes examined in both sets of crash analyses.

Table 2.
Number of crashes examined in the analyses of fatal crashes and all crashes.

Analysis	New York	Los Angeles	U.S.A.	NY (state)	CA (state)
Fatal crashes	2,366	2,086	295,781	10,312	28,361
All crashes	647,546	449,498	48,218,016	2,354,520	4,054,652

Three technical notes: (1) In this report "New York" stands for New York City. (2) The data labeled New York and Los Angeles include information only for each of the two cities, and not for the entire metropolitan areas. (3) The data for New York State does not exclude the data for the city of New York; analogously, the data for California does not exclude Los Angeles, and the data for the U.S. does not exclude either city.

Results

Demographic aspects

Table 3 presents distributions of select demographic variables in the five units of interest (New York, Los Angeles, the entire U.S., New York State, and California.) The main findings (highlighted in color in Table 3) are as follows. Relative to the U.S., both New York and Los Angeles (unless noted otherwise) have the following characteristics:

- more people who speak language other than English at home
- higher level of education
- fewer homeowners
- higher income per capita (only in New York)
- more people under the poverty level
- more time spent travelling to work
- more households with no vehicle
- fewer people who drive to work alone (especially in New York)
- fewer people who carpool to work (only in New York)
- more people who carpool to work (only in Los Angeles)
- more people who use public transportation (especially in New York)
- more people who walk to work (only in New York)

Table 3
Distributions of select demographic variables in the five geographical units of interest.

Demographic	New York	Los Angeles	U.S.A.	NY (state)	CA (state)
POPULATION					
Population (2010)	8,175,133	3,792,621	308,745,538	19,378,102	37,253,956
Pop. < 18	22%	23%	24%	22%	25%
Pop. > 64	12%	10%	13%	14%	11%
Females	52%	50%	51%	52%	50%
Persons/sq mile	27,012	8,092	87	411	239
LANGUAGE					
Non-English speaking at home	48%	60%	20%	29%	43%
EDUCATION					
≥ Bachelor's	33%	30%	28%	32%	30%
HOUSING					
Homeowner	33%	39%	67%	55%	57%
Persons/household	2.6	2.8	2.6	2.6	2.9
INCOME					
Income/capita	$30,498	$27,620	$27,334	$30,948	$29,188
Below poverty level	19%	20%	14%	14%	14%
TRAVEL TO WORK					
≤ 29 minutes	35%	54%	66%	54%	61%
30-59 minutes	41%	35%	26%	30%	29%
60-89 minutes	17%	7%	5%	11%	7%
≥ 90 minutes	7%	3%	3%	5%	4%
Mean travel time	40 minutes	30 minutes	26 minutes	32 minutes	28 minutes
Household with no vehicle	56%	16%	10%	30%	10%
Drove alone	25%	66%	76%	56%	72%
Carpooled	8%	15%	12%	9%	14%
Public transport (including taxis)	53%	10%	5%	24%	5%
Walked	10%	4%	3%	6%	3%
Other means	1%	2%	1%	1%	2%
Worked at home	3%	4%	3%	3%	4%

Patterns of fatal crashes and of all crashes

Tables 4 through 22 present crash analyses that compare New York and Los Angeles with the entire U.S. on 19 variables. (Also included are the data for the states of New York and California.) All tables include fatal-crash comparisons (relying on the FARS data); comparisons for all crashes are included if the variable in question was coded in an analogous manner to that in FARS for all three relevant data sets (GES, New York State, and California). The text above the tables highlights the main findings for the two megacities in relation to the entire U.S. *In this text, relative phrases (such as "more crashes") should be interpreted as involving comparisons between the two megacities and the entire U.S. (i.e., "proportionally more crashes in New York and Los Angeles than in the U.S.").* The main findings are also highlighted in color in the respective tables.

Day of the week (Table 4)

- More crashes on Saturdays.
- Fewer fatal crashes on Saturdays.
- These two patterns suggest that the crashes on Saturdays tend to have less severe consequences.

Table 4
Day of the week. (The entries are percentages.)

FATAL CRASHES

Day	New York (N = 2,366)	Los Angeles (N = 2,086)	U.S.A. (N = 295,725)	NY (state) (N = 10,312)	CA (state) (N = 28,356)
Monday	13.1	12.2	12.4	12.5	12.2
Tuesday	12.9	12.1	12.0	12.6	12.0
Wednesday	13.8	12.2	12.4	12.9	11.7
Thursday	12.8	13.6	12.8	13.2	12.4
Friday	14.7	15.7	15.7	15.2	15.6
Saturday	16.3	15.9	18.4	17.1	18.5
Sunday	16.3	18.3	16.2	16.4	17.6

ALL CRASHES

Day	New York (N =647,546)	Los Angeles (N = 449,498)	U.S.A. (N = 48,218,016)	NY (state) (N =2,354,520)	CA (state) (N = 4,054,652)
Monday	12.4	13.7	14.5	11.4	14.0
Tuesday	14.1	14.1	14.8	14.2	14.6
Wednesday	14.4	14.2	14.8	14.6	14.6
Thursday	14.5	14.3	14.9	14.8	14.6
Friday	14.6	16.2	17.2	14.8	16.6
Saturday	15.9	14.7	13.2	16.7	13.8
Sunday	14.1	12.8	10.4	13.6	11.7

Crash time (Table 5)

- More crashes and more fatal crashes at night.

Table 5
Crash time. (The entries are percentages.)

FATAL CRASHES

Crash time	New York (N = 2,258)	Los Angeles (N = 1,974)	U.S.A. (N = 280,688)	NY (state) (N = 9,834)	CA (state) (N = 26,774)
6:00 - 9:59	13.1	11.6	13.2	13.8	123
10:00 - 15:59	25.9	21.2	26.4	28.1	25.0
16:00 - 19:59	18.5	21.3	22.5	21.8	22.8
20:00 - 5:59	42.6	45.8	37.9	36.3	39.8

ALL CRASHES

Crash time	New York (N = 610,916)	Los Angeles (N = 447,616)	U.S.A. (N = 46,500,464)	NY (state) (N = 2,209,582)	CA (state) (N = 4,020,402)
6:00 - 9:59	16.8	17.4	17.3	17.5	17.2
10:00 - 15:59	33.5	32.6	37.0	36.1	35.1
16:00 - 19:59	24.3	24.6	28.0	25.1	26.1
20:00 - 5:59	25.4	25.4	17.8	21.3	21.6

Roadway alignment (Table 6)

- Fewer fatal crashes on curves.

Table 6
Roadway alignment. (The entries are percentage.)

FATAL CRASHES

Alignment	New York (N = 2,347)	Los Angeles (N = 2,060)	U.S.A. (N = 293,945)	NY (state) (N = 10,283)	CA (state) (N = 28,023)
Straight	90.5	91.0	73.4	73.5	77.5
Curve	9.5	9.0	26.5	26.5	22.5

Trafficway flow (Table 7)

- More fatal crashes on divided highways.
- More fatal crashes on one-way roadways (only in New York).
- More fatal crashes on entrance/exit ramps (only in Los Angeles).

Table 7
Trafficway flow. (The entries are percentages.)

FATAL CRASHES

Flow	New York (N = 2,012)	Los Angeles (N = 2,045)	U.S.A. (N = 293,330)	NY (state) (N = 9,600)	CA (state) (N = 27,940)
Not physically divided	49.6	58.8	67.2	67.3	57.9
Divided highway	40.9	37.4	30.7	29.0	39.3
One way	8.2	0.7	0.9	2.5	0.6
Entrance/exit ramp	1.4	3.1	1.2	1.2	2.2

Roadway relation to junction (Table 8)

- More fatal crashes at intersections (especially in New York).

Table 8
Roadway relation to junction. (The entries are percentages.)

FATAL CRASHES

Junction	New York (N = 2,319)	Los Angeles (N = 2,030)	U.S.A. (N = 290,369)	NY (state) (N = 10,166)	CA (state) (N = 27,800)
No junction	43.7	59.8	73.2	64.1	74.6
Intersection	54.9	36.0	22.0	34.0	22.1
Driveway Access	1.0	2.6	2.8	1.5	2.1
Interchange area	0.3	1.5	1.0	0.1	0.8

Speed limit (Table 9)

- More fatal crashes on roads with speed limit 35 mph or less (especially in New York).

Table 9
Speed limit. (The entries are percentages.)

FATAL CRASHES

Speed limit (mph)	New York (N = 802)	Los Angeles (N = 2,060)	U.S.A. (N = 288.217)	NY (state) (N = 7,574)	CA (state) (N = 27,961)
5 – 35	77.6	66.5	21.8	28.5	23.6
40 – 55	22.4	16.1	57.3	66.3	50.5
> 55	0.0	17.4	20.9	5.2	25.9

Number of involved vehicles (Table 10)

- More multi-vehicle crashes.
- More multi-vehicle fatal crashes (especially in Los Angeles).

Table 10
Number of involved vehicles. (The entries are percentages.)

FATAL CRASHES

Vehicles	New York (N = 1,417)	Los Angeles (N = 1,303)	U.S.A. (N = 180,368)	NY (state) (N = 6,161)	CA (state) (N = 17,248)
1	66.8	53.3	57.3	58.8	57.2
2	23.9	31.2	35.4	33.3	33.2
>2	9.3	15.5	7.3	7.9	9.6

ALL CRASHES

Vehicles	New York (N =647,546)	Los Angeles (N = 449,498)	U.S.A. (N = 48,218,016)	NY (state) (N =2,354,517)	CA (state) (N = 4,023,003)
1	22.9	31.8	31.1	29.5	32.9
2	66.9	56.7	62.8	62.8	57.1
>2	10.2	11.5	6.1	7.7	10.0

Crash manner (Table 11)

- More fatal crashes not involving another vehicle (especially in New York).
- Fewer head-on crashes (especially in New York).

Table 11
Crash manner. (The entries are percentages.)

FATAL CRASHES

Crash manner	New York (N = 2,360)	Los Angeles (N = 2,082)	U.S.A. (N = 294,721)	NY (state) (N = 10,298)	CA (state) (N = 28,308)
Not with a vehicle	75.2	63.0	60.6	63.3	63.8
Angle	13.6	20.2	20.7	20.0	17.5
Head on	3.6	5.9	10.2	10.0	8.5
Rear end	5.6	7.6	5.8	5.2	7.0
Sideswipe	1.8	3.2	2.4	1.3	3.3
Rear sideswipe	0.3	0.1	0.2	0.2	0.2

First harmful event (Table 12)

- More crashes with non-fixed object.
- Many more fatal crashes with non-fixed objects (especially in New York).
- These two patterns suggest greater severity of crashes with non-fixed objects.

Table 12
First harmful event. (The entries are percentages.)

FATAL CRASHES

First harmful event	New York (N = 2,366)	Los Angeles (N = 2,085)	U.S.A. (N = 295,497)	NY (state) (N = 10,310)	CA (state) (N = 28,356)
Vehicle in transport	23.3	34.2	37.7	35.6	34.2
Non-fixed objects	58.0	39.1	16.5	28.5	23.9
Fixed object	16.6	23.0	33.6	31.8	30.3
Non-collision event	2.1	3.6	12.2	4.1	11.5

ALL CRASHES

First harmful event	New York (N =640,820)	Los Angeles (N = 441,107)	U.S.A. (N = 48,176,606)	NY (state) (N = 2,325,690)	CA (state) (N = 3,948,822)
Vehicle in transport	77.2	70.4	68.1	70.5	68.4
Non-fixed objects	17.6	17.2	13.0	13.5	12.8
Fixed object	4.3	11.6	15.8	14.2	15.9
Non-collision event	1.0	0.8	3.1	1.9	3.0

Atmospheric condition (Table 13)

- Fewer crashes and fewer fatal crashes in rain (only in Los Angeles).
- More crashes and more fatal crashes in rain (only in New York).
- Fewer crashes and fewer fatal crashes in snow (especially in Los Angeles).

Table 13
Atmospheric condition. (The entries are percentages.)

FATAL CRASHES

Condition	New York (N = 2,343)	Los Angeles (N = 2,077)	U.S.A. (N = 292,790)	NY (state) (N = 10,237)	CA (state) (N = 28,250)
Clear/cloudy	88.5	95.7	88.1	86.2	94.1
Rain	10.1	4.0	7.6	8.9	4.3
Snow/sleet/hail	1.3	0.0	2.0	4.1	0.2
Fog	0.2	0.3	1.3	0.7	1.3
Other	0.0	0.0	0.5	0.2	0.1

ALL CRASHES

Condition	New York (N =526,196)	Los Angeles (N = 445,582)	U.S.A. (N = 47,451,092)	NY (state) (N = 2,010,898)	CA (state) (N = 4,028,172)
Clear/cloudy	84.4	96.4	84.7	81.2	95.6
Rain	13.3	3.3	10.6	11.6	3.6
Snow/sleet/hail	2.1	0.0	3.6	6.6	0.2
Fog	0.2	0.2	0.4	0.4	0.5
Other	0.1	0.1	0.6	0.2	0.1

Road surface condition (Table 14)

- Fewer crashes and fewer fatal crashes on wet roads (only in Los Angeles).
- More crashes and more fatal crashes on wet roads (only in New York).
- Fewer crashes and fewer fatal crashes with snow on the road (especially in Los Angeles).

Table 14
Road surface condition. (The entries are percentages.)

FATAL CRASHES

Condition	New York (N = 2,338)	Los Angeles (N = 2,073)	U.S.A. (N = 293,486)	NY (state) (N = 10,243)	CA (state) (N = 28,244)
Dry	82.7	94.2	84.0	77.8	91.3
Wet	15.9	5.8	12.8	16.6	7.8
Snow/ice	1.4	0.0	3.0	5.6	0.4
Other	0.0	0.0	0.2	0.0	0.1

ALL CRASHES

Condition	New York (N = 527,562)	Los Angeles (N = 442,659)	U.S.A. (N = 47,443,887)	NY (state) (N = 2,014,266)	CA (state) (N = 4,007,551)
Dry	77.9	93.5	77.6	71.6	90.8
Wet	19.1	6.3	16.3	19.6	8.5
Snow/ice	2.5	0.2	5.8	8.4	0.5
Other	0.4	0.1	0.2	0.4	0.2

Light condition (Table 15)

- Fewer crashes and fewer fatal crashes during darkness on unlighted roadways.
- More crashes during darkness on lighted roadways.
- Many more fatal crashes during darkness on lighted roadways.
- The last two patterns suggest that crashes during darkness on unlighted roadways tend to be more serious.

Table 15
Light condition. (The entries are percentages.)

FATAL CRASHES

Light condition	New York (N = 2,366)	Los Angeles (N = 2,082)	U.S.A. (N = 294,402)	NY (state) (N = 10,297)	CA (state) (N = 28,285)
Daylight	44.8	40.9	49.3	51.2	46.5
Dark, lighted	44.6	46.9	16.5	26.4	24.3
Dark, unlighted	5.0	9.6	30.0	17.9	25.0
Dark, lighting unknown	0.1	0.0	0.1	0.0	0.0
Dawn or dusk	5.5	2.6	4.1	4.5	4.2

ALL CRASHES

Light condition	New York (N = 494,468)	Los Angeles (N = 431,588)	U.S.A. (N = 47,726,192)	NY (state) (N = 1,889,686)	CA (state) (N = 3,879,994)
Daylight	63.4	64.8	69.1	66.4	68.1
Dark, lighted	29.2	28.2	15.3	19.1	20.7
Dark, unlighted	0.8	3.8	11.7	8.9	7.6
Dark, lighting unknown	-	0.1	0.1	-	0.1
Dawn or dusk	6.7	3.1	3.8	5.6	3.4

Number of fatalities per fatal crash (Table 16)

- Fewer fatal crashes with more than one fatality.

Table 16
Number of fatalities. (The entries are percentages.)

FATAL CRASHES

Fatalities	New York (N = 2,366)	Los Angeles (N = 2,086)	U.S.A. (N = 295,781)	NY (state) (N = 10,312)	CA (state) (N = 28,361)
1	96.1	93.9	91.4	93.5	91.5
2	3.2	5.2	7.0	5.6	6.7
>2	0.7	0.9	1.5	1.0	1.8

Person type of fatality (Table 17)

- More pedestrian and bicyclist fatalities (especially in New York).

Table 17
Person type of fatality. (The entries are percentages.)

FATAL CRASHES

Person type	New York (N = 2,488)	Los Angeles (N = 2,237)	U.S.A. (N = 327,508)	NY (state) (N = 11,134)	CA (state) (N = 31,524)
Driver	30.4	45.3	63.4	55.1	54.8
Passenger	13.2	18.3	22.9	18.9	24.4
Pedestrian	49.6	32.4	11.4	22.5	17.1
Bicyclist	6.1	2.8	1.7	3.0	2.9
Other	0.8	1.2	0.6	0.6	0.8

Driver gender (Table 18)

- More male drivers in crashes (especially in New York).
- More male drivers in fatal crashes (only in New York).

Table 18
Driver gender. (The entries are percentages.)

FATAL CRASHES

Gender	New York (N = 2,916)	Los Angeles (N = 3,002)	U.S.A. (N = 437,795)	NY (state) (N = 14,645)	CA (state) (N = 41,723)
Male	86.1	74.9	73.9	76.1	74.5
Female	13.9	25.1	26.1	23.9	25.5

ALL CRASHES

Gender	New York (N = 1,047,324)	Los Angeles (N = 703,367)	U.S.A. (N = 81,494,684)	NY (state) (N = 3,536,706)	CA (state) (N = 6,750,804)
Male	70.3	62.3	57.6	60.4	60.9
Female	29.7	37.7	42.4	39.5	39.1

Driver age (Table 19)

- More crashes and more fatal crashes involving drivers 25-34 years of age.
- More crashes involving drivers 35-55 years of age.
- The above was not the case for fatal crashes.
- The last two patterns suggest that drivers 35-55 years of age tend to get involved in less serious crashes.

Table 19
Driver age. (The entries are percentages.)

FATAL CRASHES

Age	New York (N = 3,044)	Los Angeles (N = 3,136)	U.S.A. (N = 435,152)	NY (state) (N = 14,649)	CA (state) (N = 41,919)
<16	0.1	0.3	0.5	0.2	0.3
16, 17	1.6	1.5	3.8	3.2	2.6
18 - 24	18.1	20.9	20.2	20.0	21.9
25 - 34	24.4	22.8	19.8	19.0	20.6
35 - 55	33.8	31.8	32.8	33.8	33.5
>55	21.9	22.7	22.9	24.8	21.1

ALL CRASHES

Age	New York (N = 1,035,074)	Los Angeles (N = 677,624)	U.S.A. (N = 78,298,284)	NY (state) (N = 3,520,014)	CA (state) (N = 6,424,791)
<16	2.0	0.2	0.3	1.1	0.3
16, 17	1.1	1.7	5.5	3.1	3.4
18 - 24	13.9	20.8	21.7	17.8	22.5
25 - 34	23.9	26.5	21.4	19.5	22.7
35 - 55	42.9	36.5	33.5	39.3	35.2
>55	16.3	14.3	17.6	19.3	15.9

Driver alcohol use (Table 20)

- Less alcohol use among drivers involved in fatal crashes (only in Los Angeles).

Table 20.
Driver alcohol use. (The entries are percentages.)

FATAL CRASHES

Alcohol use	New York (N = 709)	Los Angeles (N = 2,249)	U.S.A. (N = 283,014)	NY (state) (N = 3,994)	CA (state) (N = 31,402)
No	74.5	83.9	76.4	64.8	78.3
Yes	25.5	16.1	23.6	35.2	21.7

Driver use of safety belts (Table 21)

- Fewer drivers in fatal crashes were completely unbelted (especially in Los Angeles).
- More drivers in fatal crashes used safety belts as designed (especially in Los Angeles).
- More drivers in fatal crashes used only lap or shoulder components (only in New York).

Table 21
Driver use of safety belts. (The entries are percentages.)

FATAL CRASHES

Safety-belt use	New York (N = 2,127)	Los Angeles (N = 2,595)	U.S.A. (N = 315,237)	NY (state) (N = 11,575)	CA (state) (N = 34,671)
Yes, as designed	65.6	84.9	62.1	71.8	79.6
Yes, only lap or shoulder component	6.6	2.3	2.6	3.2	2.7
No	27.7	12.9	35.3	24.9	17.6

Driver avoidance maneuver (Table 22)

- More fatal crashes in which drivers did not make an avoidance maneuver (especially in New York).

Table 22
Driver avoidance maneuver. (The entries are percentages.)

FATAL CRASHES

Maneuver	New York (N = 951)	Los Angeles (N = 1,358)	U.S.A. (N = 284,908)	NY (state) (N = 3,840)	CA (state) (N = 23,945)
None	88.6	72.7	68.8	80.3	55.8
Steering	6.1	8.3	14.1	12.3	18.8
Braking	3.9	15.1	10.3	5.5	15.6
Steering and braking	1.4	3.9	7.0	2.0	9.8

Conclusions

Crashes and fatal crashes in the two U.S. megacities—New York and Los Angeles—tend to differ in several aspects from typical crashes and fatal crashes in the entire U.S. The main differences are summarized below (with "more crashes" meaning "proportionally more crashes in each of the two megacities than in the entire U.S.").

When

- More crashes on Saturdays, but fewer fatal crashes on Saturdays. These two patterns suggest that the crashes on Saturdays tend to have less severe consequences.
- More crashes and more fatal crashes at night.

Where

- Fewer fatal crashes on curves.
- More fatal crashes on divided highways.
- More fatal crashes on one-way roadways (only in New York).
- More fatal crashes on entrance/exit ramps (only in Los Angeles).
- More fatal crashes at intersections (especially in New York).
- More fatal crashes on low-speed roads (especially in New York).

Nature of crash

- More multi-vehicle crashes and more fatal multi-vehicle crashes.
- More fatal crashes not involving another vehicle (especially in New York).
- Fewer head-on crashes (especially in New York).
- More crashes and many more fatal crashes with non-fixed object. These two patterns suggest that crashes with non-fixed objects tend to have more severe consequences.

Weather

- Fewer crashes and fewer fatal crashes in rain and on wet roads (only in Los Angeles). More crashes and more fatal crashes in rain and on wet roads (only in New York).
- Fewer crashes and fewer fatal crashes during snowfall and with snow on the road (especially in Los Angeles).

Light

- Fewer crashes and fewer fatal crashes during darkness on unlighted roadways.
- More crashes and many more fatal crashes during darkness on lighted roadways. These two patterns suggest that crashes during darkness on lighted roadways tend to have more severe consequences.

Who

- Fewer fatal crashes with more than one fatality.
- More pedestrian and bicyclist fatalities (especially in New York).
- More male drivers in crashes (especially in New York) and more males in fatal crashes (only in New York).
- More crashes and more fatal crashes involving drivers 25-34 years of age. More crashes but not more fatal crashes involving drivers 35-55 years of age. These two patterns suggest that drivers 35-55 years of age tend to get involved in less serious crashes.

Driver actions

- Less alcohol use among drivers involved in fatal crashes (only in Los Angeles).
- Fewer drivers in fatal crashes were completely unbelted (especially in Los Angeles). More drivers in fatal crashes used safety belts as designed (especially in Los Angeles). More drivers in fatal crashes used only lap or shoulder components (only in New York).
- More fatal crashes in which drivers did not make an avoidance maneuver (especially in New York).

References

California (2012). *The statewide integrated traffic records system (SWITRS)* [data file]. Sacramento: State of California Business, Transportation and Housing Agency, Department of California Highway Patrol. Available from The University of Michigan Transportation Research Institute (UMTRI), Center for the Management of Information for Safe and Sustainable Transportation (CMISST), www.cmisst.org.

Luoma, J., Sivak, M., and Zielinski, S. (2010). *The future of personal transportation in megacities of the world* (Report No. UMTRI-2010-2). Ann Arbor: The University of Michigan Transportation Research Institute.

New York (2011). *Statewide traffic accident files* [data file]. Albany: The New York State Department of Motor Vehicles. Restricted availability from The University of Michigan Transportation Research Institute, Center for the Management of Information for Safe and Sustainable Transportation (CMISST), www.cmisst.org.

NHTSA [National Highway Traffic Safety Administration]. (2012a). *Fatality Analysis Reporting System.* Available at http://www-fars.nhtsa.dot.gov.

NHTSA [National Highway Traffic Safety Administration] (2012b). *General Estimates System*. Available at ftp://ftp.nhtsa.dot.gov/GES/.

United Nations (2012). *World urbanization prospects, the 2011 revision*. Available at http://esa.un.org/unup/.

U.S. Census Bureau (2012a). *State and county QuickFacts*. Available at http://quickfacts.census.gov/qfd/index.html.

U.S. Census Bureau (2012b). *Journey to work: 2000* (QT-P23). Available at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

U.S. Census Bureau (2012c). *Profile of selected housing characteristics: 2000* (DP-3). Available at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

U.S. Census Bureau (2012d). *Profile of selected economic characteristics: 2000* (DP-4). Available at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.