Research Report
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APPLICABILITY OF ANGLE PARKING FOR A MAJOR CITY STREET

by

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1.0 INTRODUCTION

There are competing demands for curb space on a city street. Among the uses are free flow of traffic, buses or taxis loading and unloading passengers, commercial vehicles making deliveries or service calls, people running errands to nearby businesses, and vehicles parking for various reasons. Roadway designers are required to balance the competing demands between the need to move traffic efficiently and the benefits gained by allowing curb parking. If parking is permitted, further decision-making is required after weighing the advantages and disadvantages of angle versus parallel parking. There have been efforts in the past to determine benefits of angle and parallel parking. Among the factors considered are the following:

1) Increased number of spaces when using angle parking,
2) More space for maneuvering when using angle parking,
3) Reduced visibility for drivers when backing into traffic from angle parking and the increased potential for accidents,
4) Increased time for maneuvering from a parallel parking space, and
5) Reduced roadway width for through traffic movements when using angle parking.

Angle parking has been considered an alternative design for the KY 1120 (12th Street) project in Covington, Kentucky. An evaluation was conducted and the results documented to determine the advantages and disadvantages of angle parking in comparison to parallel parking.

2.0 REVIEW OF LITERATURE

In general, the results of the literature review indicate both advantages and disadvantages of parallel and angle parking on city streets. However, most of the documented work appears to be quite old, with very little research being performed in recent years to address the issue. From the publication titled "Parking" by Weant and Levinson (1), the following disadvantages of angle parking were noted even though it was concluded that angle parking provided more parking per unit length of curb than parallel parking:

1) Angle parking requires more space for maneuvering, therefore increasing the exposure and hazard,
2) Angle parking creates a condition where there is inadequate visibility for drivers backing into traffic,
3) Oncoming drivers must stop for vehicles departing angle parking spaces, and
4) Drivers must proceed slowly to find vacant angle spaces.

Because of these safety hazards, the conversion form angle to parallel parking was credited with reducing crashes. The following before and after studies demonstrated accident reductions where angle parking was converted to parallel parking.

Study Location and Date	Accident Reduction
Minnesota City (1947)	41 %
Wichita (1950)	63 %
Utah (1966)	57 %
Grand Rapids, MI (1967)	19 %
Kansas City, MO (1967	50 %

As part of the summary prepared by Weant and Levinson (1) results from a similar study conducted in Maine in 1972 were documented. The study involved conversion of 1,523 parking spaces from angle to parallel parking; resulting in a 12 percent lower accident rate. Following are additional guidelines offered by Weant and Levinson (1) in their detailed study of parking characteristics.

1) Angle parking should be limited to streets that function primarily as parking lots. Where angle parking is used, restrictions should be provided at each end of the area to create conditions less than free flowing traffic.
2) Flat angle parking is a compromise between parallel and angle parking and should be limited to use on wide, lightly traveled, low-speed streets. Parking spaces are aligned at very low angles with several benefits associated with convenience, efficiency and safety resulting. Disadvantages are primarily associated with failure of drivers to properly align their vehicles in the angle spaces.
3) Curb parking generally should be prohibited along high-speed arterial roads, especially those lined with strip development and off-street parking lots.
4) It is generally desirable to prohibit parking on urban arterial streets; however, parallel parking should be used where parking is permitted on arterials or collectors.

A study was performed in Nebraska to determine the safest type of parking on urban sections of the state highway system (2). The accident analysis was used to determine the safest type of parking over a range of traffic, roadway and land use conditions on the urban system. The following conclusions were drawn from the accident analysis:

1) Parking results in more accidents on urban streets,
2) The safest type of parking on urban streets is parallel,
3) Low-angle parking may be safer than high-angle parking, but is not as safe as parallel parking.

Parallel parking was consistently found to have lower accident rates and lower percentages of parking accidents than low-angle or high-angle parking over the range of traffic, roadway and land use conditions.

Another study was performed in Nebraska to evaluate converting on-street parking from parallel to angle (3). The study was based on a project to increase the supply of parking in the central business district of Lincoln, Nebraska; where parallel parking was converted to angle over an area of 27 blocks. The conversion was made only on streets which were already wide enough to accommodate the extra space needed for angle parking; therefore, reconstruction was not necessary. In each case the adjacent lane was converted to parking space without any significant effects on the traffic congestion in the remaining lanes. Parallel spaces with dimensions of 8 feet by 22 feet were converted to angle spaces of 9 feet by 15 feet at a 55 degree angle. The conversion resulted in a significant increase in the number and rate of parking-related accidents. However, when the increase in accident exposure caused by the increase in parking activity was considered, there was no significant increase in the parking-related accident rate nor was there an increase in the severity of parking-related accidents. It was concluded that the conversion from parallel to angle parking was cost-effective because the increase in accident costs resulting from the conversion was lower than the cost of providing additional off-street parking spaces.

3.0 ANALYSIS OF PARKING-RELATED ACCIDENTS

In an attempt to determine whether angle or parallel parking would be expected to result in a higher frequency of parking-related accidents, an analysis was performed by accessing a computer file of accidents for the years 1993-1995. Criteria used to determine which accidents would be meaningful in an analysis were based on four categories of accidents as recorded on the police report. From the codes for "Pre-Accident Vehicle Actions" recorded on the police report form, the following two categories of information were used to identify the accident as being related to parking.

1) Starting from parking
2) Entering parked position

Similarly, the following two categories of "Directional Analysis" codes were used to identify an accident as begin related to parking.

1) One vehicle entering parked position (not in a parking lot)
2) One vehicle leaving parked position (not in a parking lot)

When summarizing the 1993-1995 accident data, the number of accidents coded as being one of the four categories ranged from 2,988 in 1993; to 1,508 in 1994; to 1,393 in 1995. A change in the procedure for coding and processing parking-related accidents was made in 1993; resulting in a significant reduction in the number of accidents being included in the computer file for 1994 and 1995. Any parking-related accidents occurring within a parking lot were excluded. The objective of this analysis of parking-related accidents was to determine which streets and highways had the

highest number of accidents related to some type of parking maneuver. In addition, an accident rate was calculated based on the volume of traffic for each roadway section, where volume data were available. Each year was analyzed separately and the results were compiled for highway and street sections meeting the following criteria:

1) locations with 3 or more accidents in a 1.0-mile section, and
2) locations with 3 or more accidents on a single street where route and milepoint were unknown.

The results of this summary indicated there were 231 locations in a three-year period which met at least one of the parking-related criteria. A listing of those locations in order by highway district and alphabetical listing of counties within the district is presented in Table 1. Also included in Table 1 in the following information; city name, route number, route name, milepoint range, year, number of accidents, and average annual daily traffic. Of the 231 locations, there were 112 which had a route number and milepoint; which meant traffic volume data were available and an accident rate could be calculated. For those 112 locations, the average accident rate, in terms of accidents per million vehicle miles (MVM), was calculated to be 5.32. These sections with traffic volume data were primarily sections on the state-maintained system of highways. For those highway sections not on the state-maintained system, typically only the street name and the number of accidents were known. As stated previously, the streets listed were those with 3 or more accidents where the route number and milepoint were unknown. Of the 231 highway sections, 119 did not have a route number and milepoint; therefore, only the number of accidents could be linked to a specific road or street name. The average number of parking-related accidents per year for these roads or streets was 5.7.

As expected, a high percentage of locations with high rates or numbers of parking-related accidents occurred in the urban areas of Louisville, Lexington, Covington, and Newport. A separate tabulation was prepared which listed only those locations with parking-related accident rates greater than the average of 5.32 accidents per MVM and number of accidents greater than the average of 5.7 per year. The result was a much smaller number of locations which had either a high frequency or number of parking-related accidents in a one year period. A summary of these data are presented in Table 2. As can be seen in Table 2, there are some sections with relatively high rates of parking-related accidents such as US 150 in Danville, KY 32 in Flemingsburg, and US 150 in Stanford; however, none of these highway sections within the small urban areas had angle parking.

3.1 SURVEY OF HIGHWAY DISTRICTS

A telephone survey was conducted of the highway districts to further evaluate the parking-related accident data presented in Tables 1 and 2. The objective was to determine if any patterns existed which would indicate a greater accident involvement rate when angle parking was used, as compared to locations with parallel parking. It was found that relatively few locations exist in Kentucky where angle parking is used. Following is a summary of the results when each

highway district traffic engineer was questioned concerning the extent of usage of angle parking.

District 1

Angle parking is used in Fulton on Lake Street and in Benton around the town square. The location on Lake Street, with 3 parking-related accidents in 1993, was included in the summary of highway sections or streets presented in Table 1.

District 2

Angle parking is used around the courthouse square in Henderson and Madisonville. Both of these locations were included in Table 1 with 8 accidents on First Street in Henderson in 1993 and 4 accidents on Court Street in Madisonville in 1993.

District 3

Angle parking is used around the city squares in Bowling Green, Glasgow, and Franklin. Even though there were several locations in Bowling Green included in Table 1, apparently none were on the streets around the city square. In Glasgow, there were 4 accidents at the location on US31E. In Franklin, there were 4 accidents on US 31W in 1993 and 3 accidents on KY 100 in 1993.

District 4

Angle parking exists in Munfordville on US 31W in the northbound lanes and in Campbellsville on Main Street around the courthouse. Both locations were included in Table 1 with 4 accidents on US 31W in Munfordville in 1993 and 3 accidents in Campbellsville on Main Street in 1994.

District 5

Angle parking is used on short sections of Market Street and Jefferson Street in downtown Louisville. In addition, angle parking is used in the business section of St. Matthews. Angle parking is also used in the downtown areas of Lagrange and Shelbyville. In Lagrange, there were 10 parking-related accidents on Main Street in 1993. In Shelbyville, there were 3 accidents in 1993 and 5 accidents in 1994 on sections of US 60 or Main Street.

District 6

There is currently no location with angle parking in District 6. However, the reconstruction project on KY 1120 or 12th Street in Covington is the location which prompted this evaluation because of the proposed use of angle parking. KY 1120 is in an urbanized area which is expected to carry relatively high volumes of traffic in a commercial district.

District 7

The only location with angle parking is US 62 in downtown Georgetown. Data from Table 1 show there are two sections of US 62 with sufficient accidents to be included. On these two short sections, there were 6 accidents in 1993 and 3 accidents in 1994.

District 8

Angle parking exists around the town squares in Somerset and Columbia. In Somerset, there were 3 accidents in 1993 and 3 in 1995 on sections of KY 80. In Columbia, there were 3 accidents on Guardian Street in 1993.

District 9

There is angle parking in Morehead on University Boulevard and in Flemingsburg on KY 57. University Boulevard in Morehead had 3 parking-related accidents in 1993.

District 10

There is angle parking in Irvine around the courthouse square and in Hazard on Main Street. In Hazard, there were 5 parking-related accidents on Main Street in 1995.

District 11

Angle parking exists only in London on Broad Street behind the Courthouse. Data summarized in Table 1 indicate there were 3 parking-related accidents in 1995 on Broadway.

District 12

There is angle parking on Court Street in Paintsville. Data from Table 1 indicate there were 4 accidents on Main Street in Paintsville, but none on Court Street.

Other observations from the telephone survey of district traffic engineers and planners indicate that nearly all of them discourage the use of angle parking and are willing to allow angle parking only in those locations where it has been in place for several years. Most of those interviewed also noted that safety was the primary factor which caused them to be unwilling to support the use of angle parking. Specific concerns were expressed related to the problem of high profile vehicles in angle parking spaces and the difficulty of drivers in adjacent vehicles being able to see to the rear when attempting to back from an angle parking space. It was noted that the prevalence of vans and trucks/utility vehicles in the traffic stream, and therefore using angle parking spaces, resulted in a significant hazard. A driver attempting to back from angle parking

space is often placed in the position of having to back blindly into the traffic stream and are at the mercy of approaching vehicles to provide right-of-way or offer a gap for the backing vehicle.

3.2 CASE STUDY OF ANGLE PARKING IN GEORGETOWN

An evaluation of angle parking was conducted for US 62/460 in downtown Georgetown. The location had been evaluated by the Department of Highways' Division of Traffic in 1995 and was noted as having a high frequency of accidents associated with angle parking during a three-year period. Based on the accident data summarized from the directional analysis codes and pre-accident vehicle action, there were 11 accidents in a three-year period on the short section of Main Street (US 62/460) in Georgetown. This section of US 62/460 has a traffic volume over 12,000 vehicles per day. Based on accident data presented in Table 1; there were 6 accidents in 1993, and 4 accidents in 1994 (there was one accident in 1995 which was not recorded in Table 1). For a 0.175-mile section in 1993, there were 6 accidents which was calculated to be an accident rate of 7.83 accidents per MVM. For a 0.180-mile section in 1994, there were 4 accidents with a rate of 4.91 accidents per MVM. Only the 6 accidents in 1993 exceeded the average rate of 5.32 accidents per MVM.

There are approximately 40 parking spaces at 45 degree angles in this section of Georgetown, and they are located on the south side of the street for use by eastbound traffic. From information collected during a site inspection, it was observed that the angle parking spaces did present a safety problem when drivers attempted to back from the spaces into the traffic stream. The safety problem had been recognized and the local police were patrolling the area to provide assistance to drivers who did not have a clear view to back into traffic. It appears that a decision has been made to accept the safety problems associated with angle parking in order to increase the number of parking spaces on Main Street in Georgetown. There also seems to be a perception that angle parking increases the ease of entering a parking space and therefore increases the probability of use by customers of businesses along Main Street.

4.0 SUMMARY AND RECOMMENDATIONS

The results of this evaluation indicate angle parking has been used and evaluated at several locations in the United States, with most of the evaluation work being quite old. It has been shown that angle parking meets the need of increased number of parking spaces for limited curb area; however, safety must be compromised when considering the difficulty of backing from the parking space into the traffic stream. Use of angle parking should be limited to areas where traffic speeds are sufficiently low to not create a significant problem for vehicles backing into the traffic stream and street width should be wide enough to allow drivers to easily avoid vehicles backing from parking spaces.

Angle parking is used around town squares in several small cities in Kentucky; however,

overall usage of angle parking is infrequent. It appears that the most usage of angle parking is where the traffic is constrained and accidents, when they occur, are relatively minor. Angle parking is also used frequently in various types of parking facilities. The benefits are primarily associated with increased number of parking spaces per unit of curb compared to parallel parking. Most traffic engineers interviewed were not in favor of the use of angle parking and were not anxious to consider additional locations where angle parking could be used.

With the prevalence of pickup trucks, utility vehicles, and vans in the traffic stream, it appears that and increasing number of drivers using angle parking will be required to back into traffic without sufficient sight distance to see approaching traffic. Considering this potential hazard which requires some drivers to enter the traffic stream blindly, angle parking should not be used on streets where traffic volumes are heavy and where the streets are not wide enough to allow drivers on the through street to easily provide right-of-way to drivers of parked vehicles who are attempting to back from an angle parking space.

KY 1120 or 12th Street in Covington is being reconstructed and angle parking is being considered for use as one or more of the alternate designs. This section of KY 1120 is within an urban area with relatively high-density business development. Traffic volumes on KY 1120 are approximately 12, 000 vehicles per day in the section between I-75 and Banklick Street. There are several alternate designs being offered; ranging from one lane in each direction to two lanes in each direction with parking offered as either parallel or angle. In all designs, there is a need for additional right-of-way of at least 51 feet. Overall, the proposed designs do not appear indicate they would operate significantly different from US 62/460 in Georgetown. Considering the advantages and disadvantages of angle parking on an urban street, it appears that angle parking could only be used on KY 1120 in Covington if a decision is made to compromise safety in order to increase the number of spaces available and improve access to businesses.

5.0 LIST OF REFERENCES

1. Weant, R.A. And Levinson, H.S.; "PARKING"; The Eno Foundation for Transportation; Westport, Connecticut; 1990.

2. McCoy, P.T. et al.; "Safety Comparison of Types of Parking on Urban Streets in Nebraska"; Transportation Research Board, Record 1270; 1990.

3. McCoy, T.A. et al.; "Safety Evaluation of Converting On-Street Parking from Parallel to Angle"; Transportation Research Board, Record 127; 1991.

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Calloway	1	Murray		University	0.000	0.000	1993	3		
Crittenden	1			Carlisle	0.000	0.000	1993	3		
Fulton	1	Fulton		Lake	0.000	0.000	1993	3		
McCracken	1	Paducah		Broadway	0.000	0.000	1993	6		
	1	Paducah	US 60X	4th	1.899-1.972	0.073	1993	3	8690	12.96
	1	Paducah		Broadway	0.000	0.000	1994	3		
	1	Paducah		Broadway	0.000	0.000	1995	4		
Caldwell	2	Princeton	US 62	US Main	6.889-7.037	0.148	1993	6	6280	17.69
	2	Princeton		Harrison	0.000	0.000	1994	3		
	2	Princeton	US 62	Main	6.820-6.964	0.144	1995	3	5050	11.30
Christian	2	Hopkinsville	US 41	US	12.401-12.689	0.288	1994	5	10500	4.53
Daviess	2	Owensboro		18th	0.000	0.000	1993	4		
	2	Owensboro		3rd	0.000	0.000	1993	4		
	2	Owensboro		Allen	0.000	0.000	1993	4		
	2	Owensboro	US 60	4th	13.045-13.863	0.818	1993	6	17000	1.18
	2	Owensboro	US 431	US 431 Frederica	13.686-14.519	0.833	1993	3	23200	0.43
	2	Owensboro		St Ann	0.000	0.000	1994	3		
Henderson	2	Henderson		1st	0.000	0.000	1993	8		
	2	Henderson		2nd	0.000	0.000	1993	4		
	2	Henderson		Main	0.000	0.000	1993	3		
	2	Henderson	US 41	US 41N	18.500-19.500	1.000	1993	3	27200	0.30
	2	Henderson		1st	0.000	0.000	1994	4		
Hopkins	2	Madisonville		Court	0.000	0.000	1993	4		
	2	Madisonville	US 41	US 41A	14.59-14.692	0.102	1993	3	5320	15.15
	2	Madisonville	KY 70	KY	18.463-19.328	0.817	1994	3	10500	0.96

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Muhlenberg	2	Greenville	US 62	US 62 Main	10.500-11.200	0.700	1993	5	1240	15.78
	2	Central City		Broadway	0.000	0.000	1995	3		
	2	Central City	KY 70	Broadway	15.266-15.393	0.127	1995	3	10500	6.16
Ohio	2	Hartford		Center	0.000	0.000	1993	3		
Union	2	Sturgis		Adams	0.000	0.000	1993	4		
	2	Morganfield	KY 56	KY	12.400-13.150	0.750	1993	3	3900	2.81
	2	Morganfield	US 60	US 60	16.315-16.600	0.285	1993	3	11700	2.46
	2	Morganfield	KY 56	KY	13.130-13.400	0.270	1994	5	5540	9.16
Barren	3	Glasgow	US 31E	US 31E	1.455-1.620	0.165	1993	4	10100	6.58
Simpson	3	Franklin	US 31W	US31W	6.500-6.575	0.075	1993	4	14900	9.81
	3	Franklin	KY 100	KY 100 Cedar	9.110-9.450	0.340	1993	3	7460	3.24
Warren	3	Bowling Green		10th	0.000	0.000	1993	5		
	3	Bowling Green		College	0.000	0.000	1993	6		
	3	Bowling Green		Hilltop	0.000	0.000	1993	3		
	3	Bowling Green		11th	0.000	0.000	1994	3		
	3	Bowling Green		State	0.000	0.000	1994	3		
	3	Bowling Green		College	0.000	0.000	1995	3		
Hart	4	Munfordville	US 31W	US 31W	0.000-0.500	0.500	1993	4	7210	3.04
Marion	4	Lebanon	US 68	US Main	10.116-11.189	1.073	1994	4	*	
	4	Lebanon	US 68	Main	10.122-11.189	1.067	1995	3	*	
Meade	4	Brandenburg	KY 710	KY	7.899-8.243	0.344	1994	3	*	
Nelson	4	New Haven	US 31E	US	.500-1.500	1.000	1994	3	5900	1.39
Taylor	4	Campbellsville		Main	0.000	0.000	1994	3		

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Washington	4	Springfield	US 150	US 150 Main St	9.140-9.254	0.114	1993	4	7250	13.26
	4	Springfield	US 150	Main	9.109-9.344	0.235	1995	3	11600	3.02
Franklin	5	Frankfort	KY 2261	KY	.501-1.426	0.925	1994	4	10300	1.15
	5	Frankfort	KY 420	Main	0.000	0.000	1995	3	4330	0.00
Henry	5	Eminence	KY 55	KY	1.091-1.408	0.317	1994	5	7040	6.14
Jefferson	5	Louisville		26th	0.000	0.000	1993	4		
	5	Louisville		4th	0.000	0.000	1993	4		
	5	Louisville		5th	0.000	0.000	1993	3		
	5	Louisville		6th	0.000	0.000	1993	5		
	5	Louisville		7th	0.000	0.000	1993	6		
	5	Louisville		Barret	0.000	0.000	1993	3		
	5	Louisville		Broadway	0.000	0.000	1993	4		
	5	Louisville		Brook	0.000	0.000	1993	4		
	5	Louisville		Cherokee	0.000	0.000	1993	3		
	5	Louisville		Chestnut	0.000	0.000	1993	5		
	5	Louisville		Dumesnil	0.000	0.000	1993	3		
	5	Louisville		Jefferson	0.000	0.000	1993	7		
	5	Louisville		Main	0.000	0.000	1993	4		
	5	Louisville		Market	0.000	0.000	1993	3		
	5	Louisville		Muhammad Ali	0.000	0.000	1993	4		
	5	Louisville		Oak	0.000	0.000	1993	4		
	5	Louisville		Rockford	0.000	0.000	1993	4		
	5	Louisville		St. Catherine	0.000	0.000	1993	3		
	5	Louisville	US 31E	Bardstown	13.163-13.490	0.327	1993	3	29100	0.86
	5	Louisville	US 31E	Bardstown	14.235-15.125	0.890	1993	5	29100	0.53
	5	Louisville	US 31W	Main	21.435-21.567	0.132	1993	3	11000	5.66
	5	Louisville	US 31W	Market	21.574-21.994	0.420	1993	3	48300	0.41
	5	Louisville	US 42	Brownsboro	1.354-1.760	0.406	1993	3	*	
	5	Louisville	US 60	Frankfort	.398-1.238	0.840	1993	3	15900	0.62
	5	Louisville	US 60	Taylor	2.225-2.522	0.297	1993	4	15400	2.40

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Jefferson (cont'd)	5	Louisville	KY 61	Preston	10.566-11.525	0.959	1993	3	9470	0.91
	5	Louisville	US 150	Broadway	1.083-1.930	0.847	1993	3	18000	0.54
	5	Lousiville	US 150	Broadway	2.025-2.560	0.535	1993	6	27000	1.14
	5	Louisville	KY 1020	2nd	10.502-11.331	0.829	1993	3	11500	0.86
	5	Louisville	KY 1020	3rd	10.365-11.070	0.705	1993	3	11500	1.01
	5	Louisville	KY 1020	3rd	11.558-12.105	0.547	1993	3	10000	1.50
	5	Louisville		1st	0.000	0.000	1994	5		
	5	Louisville		4th	0.000	0.000	1994	5		
	5	Louisville		5th	0.000	0.000	1994	7		
	5	Louisville		26th	0.000	0.000	1994	3		
	5	Louisville		Brook	0.000	0.000	1994	4		
	5	Louisville		Chestnut	0.000	0.000	1994	4		
	5	Louisville		Dumesnil	0.000	0.000	1994	4		
	5	Louisville		Floyd	0.000	0.000	1994	6		
	5	Louisville		Gray	0.000	0.000	1994	3		
	5	Louisville		Hancock	0.000	0.000	1994	3		
	5	Louisville		Jefferson	0.000	0.000	1994	5		
	5	Louisville		Muhammad Ali	0.000	0.000	1994	10		
	5	Louisville		Oak	0.000	0.000	1994	5		
	5	Louisville		Ormsby	0.000	0.000	1994	3		
	5	Louisville		Park	0.000	0.000	1994	3		
	5	Louisville		Woodlawn	0.000	0.000	1994	7		
	5	Louisville	US 31E	Main	0.000	0.000	1994	3	25100	0.00
	5	Louisville	US 31E	Market	0.00-.27	0.270	1994	5	25100	2.02
	5	Louisville	KY 61	Preston	10.637-11.590	0.953	1994	3	6340	1.36
	5	Louisville	US 150	Broadway	0.000	0.000	1994	4	5910	0.00
	5	Louisville	US 150	Broadway	1.650-2.485	0.835	1994	3	18100	0.54
	5	Louisville	KY 3064	Portland	0-0.674	0.674	1994	3	870	14.02
	5	Louisville		4th	0.000	0.000	1995	4		
	5	Louisville		5th	0.000	0.000	1995	5		
	5	Louisville		6th	0.000	0.000	1995	4		
	5	Louisville		7th	0.000	0.000	1995	3		
	5	Louisville		Bardstown	0.000	0.000	1995	5		

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Jefferson	5	Louisville		Broadway	0.000	0.000	1995	3		
(cont'd)	5	Louisville		Chestnut	0.000	0.000	1995	5		
	5	Louisville		Duncan	0.000	0.000	1995	3		
	5	Louisville		Eveyln	0.000	0.000	1995	3		
	5	Louisville		Jefferson	0.000	0.000	1995	5		
	5	Louisville		Market	0.000	0.000	1995	3		
	5	Louisville		Muhammad Ali	0.000	0.000	1995	9		
	5	Louisville		Ormsby	0.000	0.000	1995	6		
	5	Louisville		Powell	0.000	0.000	1995	3		
	5	Louisville		Woodlawn	0.000	0.000	1995	4		
	5	Louisville	US 31E	Baxter	15.582-16.255	0.673	1995	4	16400	0.99
	5	Louisville	US 31W	Main	21.567-21.944	0.377	1995	3	53800	0.41
	5	Louisville	US 31W	Market	21.574-22.035	0.461	1995	3	53800	0.33
	5	Louisville	KY 61	Preston	10.045-11.010	0.965	1995	3	9780	0.87
	5	Louisville	US 150	Broadway	1.930-2.650	0.720	1995	10	27500	1.38
	5	Louisville	KY 1865	Taylor	4.94-5.706	0.766	1995	3	23100	0.46
Oldham	5	Lagrange		Main	0.000	0.000	1993	10		
Shelby	5	Shelbyville	US 60	US 60 Main	10.015-10.700	0.685	1993	3	14100	0.85
	5	Shelbyville	US 60	US Main	10.076-10.870	0.110	1994	5	15700	7.93
Boone	6	Florence			0.000	0.000	1993	4		
	6	Florence		Terminal Airport	0.000	0.000	1994	11		
	6	Florence		Terminal	0.000	0.000	1995	3		
Campbell	6	Bellevue		Ward	0.000	0.000	1993	3		
	6	Bellevue	KY 8	St. Rt 8	1.550-1.800	0.250	1993	4	*	
	6	Newport		7th	0.000	0.000	1993	4		
	6	Newport		Riverboat Row	0.000	0.000	1993	4		
	6	Newport	US 27	Monmouth	21.483-21.939	0.456	1993	6	12600	2.86
	6	Newport	US 27	York	21.568-22.208	0.640	1993	4	5830	2.94
	6	Newport	KY 1120	10th	0.040-0.584	0.544	1993	3	*	

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
	6	Newport		8th	0.000	0.000	1994	3		
	6	Newport		9th	0.000	0.000	1994	4		
	6	Newport	US 27	Monmouth	21.562-21.853	0.291	1994	4	5630	6.69
	6	Newport	US 27	US	21.702-22.268	0.566	1994	3	5630	2.58
	6	Newport	KY 1120	10th	0.000-.763	0.763	1994	3	*	
	6	Newport		8th	0.000	0.000	1995	4		
	6	Newport		Ann	0.000	0.000	1995	3		
	6	Newport		Berry	0.000	0.000	1995	4		
	6	Newport		Washington	0.000	0.000	1995	4		
	6	Newport	US 27	Monmouth	21.553-21.939	0.386	1995	4	5430	5.23
	6	Newport	US 27	York	21.687-22.198	0.511	1995	3	5430	2.96
Carroll	6	Carollton		5th	0.000	0.000	1993	3		
Kenton	6	Covington		Banklick	0.000	0.000	1993	3		
	6	Covington		Garrard	0.000	0.000	1993	6		
	6	Covington		Holman	0.000	0.000	1993	3		
	6	Covington		Madison	0.000	0.000	1993	8		
	6	Covington		Park	0.000	0.000	1993	3		
	6	Covington		Pike	0.000	0.000	1993	3		
	6	Covington		Russell	0.000	0.000	1993	3		
	6	Covington		Western	0.000	0.000	1993	3		
	6	Covington	KY 17	Greenup	22.371-23.119	0.748	1993	3	*	
	6	Covington	KY 17	Greenup	23.350-23.804	0.454	1993	3	*	
	6	Covington		7th	0.000	0.000	1994	4		
	6	Covington	KY 17	Scott	23.036-23.796	0.760	1994	6	*	
	6	Covington	KY 17	Greenup	22.831-23.846	1.015	1994	4	*	
	6	Covington	US 25	Main	12.841-13.295	0.454	1994	4	*	
	6	Covington	KY 1120	12th	.156-1.00	0.844	1994	4	*	
	6	Covington		6th	0.000	0.000	1995	4		
	6	Covington		Holman	0.000	0.000	1995	3		
	6	Covington		Madison	0.000	0.000	1995	4		
	6	Covington	KY 17	Greenup	22.371-22.604	0.233	1995	3	*	

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
	6	Covington	KY 17	Scott	22.78-23.796	1.018	1995	8	*	
	6	Covington	KY 1120	12th	0.00-.326	0.326	1995	4	*	
	6	Ludlow	KY 8	Rt 8 Elm	4.189-4.488	0.290	1995	3	*	
Bourbon	7	Paris	US 68X	US 68 Bus	1.120-1.678	0.558	1993	6	8240	3.58
	7	Paris	68	US 68 Main	1.5-1.665	0.165	1994	4	7140	9.30
Boyle	7	Danville	US 127	US	4.900-5.210	0.310	1993	3	21300	1.24
	7	Danville	US 127	US	13.729-13.903	0.174	1993	3	20600	2.29
	7	Danville	US 150	US 150	12.777-13.945	1.168	1994	6	8970	1.57
	7	Danville	US 150	US	13.952-13.957	0.005	1995	3	12200	134.74
Clark	7	Winchester		Broadway	0.000	0.000	1993	6		
	7	Winchester		Broadway	0.000	0.000	1994	4		
	7	Winchester		Broadway	0.000	0.000	1995	3		
Fayette	7	Lexington		7th	0.000	0.000	1993	3		
	7	Lexington		Maxwell	0.000	0.000	1993	3		
	7	Lexington		Short	0.000	0.000	1993	3		
	7	Lexington	US 25	US 25 Main	13.582-14.437	0.855	1993	8	21700	1.18
	7	Lexington	KY 1974	12.000-12.994	12.000-12.994	0.994	1993	4	21700	0.51
	7	Lexington	US 25	US	14.090-14.600	0.510	1994	8	23700	1.81
	7	Lexington	US 27	Limestone	6.548-7.302	0.754	1994	3	23300	0.47
	7	Lexington		ML King	0.000	0.000	1995	3		
	7	Lexington	US 25	Vine	14-14.166	0.166	1995	3	24100	2.05
	7	Lexington	KY 922	Ky 922 Newtown	0.000	0.000	1995	3	21300	0.00
Jessamine	7	Nicholasville	US 27X	US 27X Main	2.050-2.245	0.195	1993	3	14100	2.99
Madison	7	Richmond		Park	0.000	0.000	1993	3		
	7	Richmond	US 25	US 25 Main	16.620-17.172	0.552	1993	5	19700	1.26
	7	Richmond	US 25	US Main	16.980-17.235	0.255	1994	4	19700	2.18
	7	Richmond	KY 21	KY	9.159-9.513	0.354	1995	3	*	
	7	Richmond	US 25	US25 Main	16.945-17.229	0.284	1995	5	19800	2.44

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Montgomery	7	Mt. Sterling	US 60	US 60 Main	5.000-5.260	0.260	1993	3	6140	5.15
Scott	7	Georgetown		Hamilton	0.000	0.000	1993	3		
	7	Georgetown	US 25	US 25 Broadway	3.820-4.500	0.680	1993	3	12300	0.98
	7	Georgetown	US 62	US 62 Main	7.975-8.150	0.175	1993	6	12000	7.83
	7	Georgetown	US 62	US	.930-7.9808.16	0.180	1994	4	12400	4.91
	7	Georgetown		Hamilton	0.000	0.000	1995	3		
Woodford	7	Versailles	US 60X	US 60X	.930-1.000	0.070	1993	3	10300	11.40
	7	Versailles	US 60X	US 60	.979-1.34	0.361	1995	4	10100	3.01
Adair	8	Columbia		Guardian	0.000	0.000	1993	3		
Lincoln	8	Stanford	US 150	US Main	5.870-5.897	0.027	1993	3	6490	46.91
Pulaski	8	Somerset	KY 80	KY 80	20.200-20.300	0.100	1993	3	11800	6.97
	8	Somerest	KY 80	KY	20.10-20.80	0.700	1995	3	7360	1.60
Wayne	8	Monticello	KY 90X	KY 90X Main	1.300-1.690	0.390	1993	4	20100	1.40
	8	Monticello	KY 90x	Main	.928-1.250	0.322	1994	3	12900	1.98
Boyd	9	Ashland		Carter	0.000	0.000	1993	4		
	9	Ashland		Carter	0.000	0.000	1994	7		
	9	Ashland	US 23	US	1.335-1.400	0.065	1995	3	22100	5.72
Carter	9	Grayson	US 60	US 60 Main	23.928-24.000	0.072	1993	3	6820	16.74
Fleming	9	Flemingsburg	KY 32	KY Main	11.752-11.782	0.030	1993	3	3610	75.89
Mason	9	Maysville	KY 8	KY 8 2nd	11.647-11.962	0.315	1993	8	4690	14.84
	9	Maysville	KY 8	KY	11.845-12.100	0.255	1994	3	3190	10.10
	9	Maysville	KY 8	2nd	11.647-11.845	0.198	1995	3	4230	9.81

Table 1. Highway Sections or Streets with 3 or More Accidents in a 1.0 Mile Section or Streets with 3 or More Accidents. (1993-1995) (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Rowan	9	Morehead		University	0.000	0.000	1993	3		
Lee	10	Beattyville	KY 52	KY 52	0.000	0.000	1993	3	*	
Perry	10	Hazard	KY 15	Main	0.000	0.000	1995	5	12800	0.00
Bell	11	Pineville		Walnut	0.000	0.000	1995	5		
	11	Pineville	KY 74	KY	15.97-16.189	0.219	1995	5	*	
Harlan	11	Harlan		Cumberland	0.000	0.000	1993	3		
Laurel	11	London		Broadway	0.000	0.000	1995	3		
Johnson	12	Paintsville		Main	0.000	0.000	1994	4		
Martin	12	Inez	KY 40	KY	10.080-10.900	0.820	1994	4	*	
	12	Inez	KY 40	KY	11.890-12.150	0.260	1994	3	*	

* AADT Unavailable

Table 2. Highway Sections or Streets with Number of Accidents Greater than or Equal to the Average Number (5.70), and/or Locations with Accident Rates Greater than or Equal to the Average Rate (5.32 acc/mvm).

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
McCracken	1	Paducah	US 60X	4th	1.899-1.972	0.073	1993	3	8690	12.96
Caldwell	2	Princeton	US 62	US Main	6.889-7.037	0.148	1993	6	6280	17.69
	2	Princeton	US 62	Main	6.820-6.964	0.144	1995	3	5050	11.30
Daviess	2	Owensboro	US 60	4th	13.045-13.863	0.818	1993	6	17000	1.18
Hopkins	2	Madisonville	US 41	US 41A	14.59-14.692	0.102	1993	3	5320	15.15
Muhlenberg	2	Greenville	US 62	US 62 Main	10.500-11.200	0.700	1993	5	1240	15.78
Union	2	Morganfield	KY 56	KY	13.130-13.400	0.270	1994	5	5540	9.16
Washington	4	Springfield	US 150	US 150 Main St	9.140-9.254	0.114	1993	4	7250	13.26
Henry	5	Eminence	KY 55	KY	1.091-1.408	0.317	1994	5	7040	6.14
Jeffeson	5	Lousiville	US 150	Broadway	2.025-2.560	0.535	1993	6	27000	1.14
	5	Louisville	KY 3064	Portland	0-0.674	0.674	1994	3	870	14.02
	5	Louisville	US 150	Broadway	1.930-2.650	0.720	1995	10	27500	1.38
Shelby	5	Shelbyville	US 60	US Main	10.076-10.870	0.110	1994	5	15700	7.93
Campbell	6	Newport	US 27	Monmouth	21.483-21.939	0.456	1993	6	12600	2.86
Kenton	6	Covington	KY 17	Scott	23.036-23.796	0.760	1994	6	*	
	6	Covington	KY 17	Scott	22.78-23.796	1.018	1995	8	*	
Bourbon	7	Paris	US 68X	US 68 Bus	1.120-1.678	0.558	1993	6	8240	3.58
Boyle	7	Danville	US 150	US 150	12.777-13.945	1.168	1994	6	8970	1.57
	7	Danville	US 150	US	13.952-13.957	0.005	1995	3	12200	134.74

Table 2. Highway Sections or Streets with Number of Accidents Greater than or Equal to the Average Number (5.70), and/or Locations with Accident Rates Greater than or Equal to the Average Rate (5.32 acc/mvm). (cont'd)

County	District Number	City	Route No.	Route Name	Milepoint	Range	Year	Number of Accidents	AADT	Accident Rate (acc/mvm)
Fayettte	7	Lexington	US 25	US 25 Main	13.582-14.437	0.855	1993	8	21700	1.18
	7	Lexington	US 25	US	14.090-14.600	0.510	1994	8	23700	1.81
Scott	7	Georgetown	US 62	US 62 Main	7.975-8.150	0.175	1993	6	12000	7.83
	7	Georgetown	US 62	US	7.930-7.980	0.050	1994	3	12400	13.26
Woodford	7	Versailles	US 60X	US 60X	.930-1.000	0.070	1993	3	10300	11.40
Lincoln	8	Stanford	US 150	US Main	5.870-5.897	0.027	1993	3	6490	46.91
Carter	9	Grayson	US 60	US 60 Main	23.928-24.000	0.072	1993	3	6820	16.74
Fleming	9	Flemingsburg	KY 32	KY Main	11.752-11.782	0.030	1993	3	3610	75.89
Mason	9	Maysville	KY 8	KY 8 2nd	11.647-11.962	0.315	1993	8	4690	14.84
	9	Maysville	KY 8	KY	11.845-12.100	0.255	1994	3	3190	10.10

* AADT Unavailable