Adult Bicyclists in the United States
Characteristics and Riding Experience in 1996

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In December 1996, 20 percent (4,712) of the League of American Bicyclists members were surveyed about their cycling experiences during calendar year 1996. The 33 questions included bicycle type and equipment, distribution of bicycle trips by purpose (e.g., work, on-road recreation), total distance cycled, commuting habits, accidents, and demographic data. The survey was designed to update one done by Kaplan in 1975. By the March 31, 1997, deadline over 2,400 (51 percent) had been returned. Of these, 19 percent were rejected due to incompleteness or inconsistent responses, leaving 1,956 valid surveys. The "average" respondent was a 48-year-old, married (66 percent) male (80 percent) professional (48 percent) who rode 4670 km in 1996. Just over 9 percent reported having had a serious crash (resulting in at least $50 of property damage or medical expense) in 1996. Based on the experience reported by these cyclists, the average cyclist in this group could be expected to ride for 11 years before having such a crash. Falls accounted for 59 percent of the incidents, whereas running into a fixed object happened 14 percent of the time. Moving motor vehicles were involved in 11 percent of the crashes and another bicycle in 9 percent. A relative danger index is calculated that shows that streets with bike lanes have a significantly lower crash rate than either major or minor streets without any bicycle facilities (38 and 56 percent, respectively). Multiuse trails have a crash rate about 40 percent greater than would be expected based on the miles cycled on them, whereas cycling on the sidewalk is extremely dangerous.

The 1990s have observed a revival of interest in bicycling for recreation, health, and transportation. Adults, as well as children, continue to enjoy the fun of cycling. Public health officials regularly extol the virtues of vigorous aerobic exercise that can be easily obtained on a bike. And in many of our urban areas, we are experiencing ever increasing traffic congestion, which is motivating some travelers to use their bikes for commuting and utilitarian trips.

Over the past several years, there have been various public policy initiatives that have raised the visibility of cycling at all levels of government. One example is the Intermodal Surface Transportation Efficiency Act of 1991 (*1*), which mandates that cycling must be integrated into required transportation plans. Another example at the federal level is the Clean Air Act Amendments of 1990, in which nonattainment areas are required to develop specific plans to achieve compliance with the act. Substituting bicycling for automobile trips would contribute to reducing air pollution.

Growth management acts, which link land use and transportation, have been adopted in many parts of the country with the goal of containing urban sprawl. And, commute trip reduction programs are attempting to reduce vehicle traffic volumes during the peak hours. Although the average one-way commute trip is approximately 16 km in length, almost half of all trips are 5 km or less. Such distances are well within bicycling range for most adults in this country (*2*).

Lastly, in 1994, FHWA released *The National Bicycling and Walking Study*, which set a goal "to double the percentage of total trips made by bicycling and walking in the United States from 7.9 to 15.8 percent" (*3*).

Yet, in spite of all this interest, we know very little about the types of adults who cycle on a regular basis. The Consumer Product Safety Commission made an attempt to publish such information in 1994 (*4*). This study reports the results of two surveys that, unfortunately, targeted different age groups and used different metrics to assess "exposure"—perhaps better characterized as "use" since respondents were asked to estimate the number of hours they rode.

In each of the past several years, between 800 and 1,000 bicyclists have been killed and hundreds of thousands have been injured in the United States (*5*). Although fatalities are well documented, there are very few data concerning the far more frequent but less serious crashes typically experienced by cyclists. One glaring hole in the data is exposure information (e.g., crashes per kilometer) and, thus, the relative safety of various types of on- and off-road bicycle facilities is virtually unknown.

In 1975, Jerrold Kaplan (*6*) conducted a national survey of adult cyclists who were members of the (then) League of American Wheelmen [LAW—now known as the League of American Bicyclists (LAB)]. Kaplan's report attempted to not only develop a profile of *regular* adult cyclists during calendar year 1974, but also to gather mileage information from which to calculate crash rates per mile—both by activity (e.g., recreation versus commuting) and by facility type (e.g., major streets versus bike paths). His work stands alone in the literature, yet, it is now quite dated.

Since over 20 years has elapsed since Kaplan's work, it was decided to update and expand Kaplan's survey. The present study added questions on mountain biking, for example, and included data on the perceived safety of bicycle facilities, an assessment of motorists' attitudes toward cyclists, formal bicycle safety training, and some information on commuting habits. Gathering and analyzing crash data were of particular interest.

SURVEY GOALS AND POPULATION

The goals of this survey were to (*a*) gather detailed data on U.S. adults who cycle regularly, (*b*) develop a demographic profile of these cyclists, (*c*) analyze their crash experience in several ways, and (*d*) compare these results with Kaplan's (and with a similar survey conducted by the author in 1995 of adults in Washington State involving 957 adult cyclists) (*7*).

Since a national sample was desired, it was decided to, again, use the membership of LAB as was done in 1975. In 1975, the league had 8,400 plus member households, and each one received a survey. Kaplan achieved a response rate of about 39 percent, which yielded a sample of 3,270. By 1996, league membership had nearly tripled to about 23,500. Since many national surveys use a sample of about 1,000, it was clearly unnecessary to include all of the members.

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TABLE 1 Breakdown of Sample by State

STATE	COUNT	% MBRS	STATE	COUNT	% MBRS	STATE	COUNT	% MBRS
AK	10	15.4	KY	70	39.1	NY	341	19.2
AL	77	51.7	LA	80	46.0	OH	205	18.0
AR	45	84.9	MA	114	6.5	OK	60	51.3
AZ	69	19.4	MD	91	8.1	OR	54	19.2
CA	564	25.6	ME	23	18.4	PA	225	15.8
CO	62	11.7	MI	176	19.9	RI	19	20.9
CT	62	10.4	MN	83	19.8	SC	66	41.3
DC	12	9.0	MO	96	26.4	SD	13	48.1
DE	13	10.2	MS	49	100.0	TN	92	27.8
FL	245	26.2	MT	15	32.6	TX	322	41.5
GA	122	32.3	NC	126	30.1	UT	33	30.0
HI	21	34.4	ND	12	66.7	VA	117	12.1
IA	53	18.5	NE	30	25.6	VT	11	10.1
ID	19	32.2	NH	21	13.1	WA	92	15.8
IL	216	15.6	NJ	146	15.3	WI	93	19.2
IN	105	23.3	NM	29	18.8	WV	34	38.2
KS	47	18.8	NV	23	26.4	WY	9	24.3
Subtotal	1742		Subtotal	1184		Subtotal	1786	
					GRAND	TOTAL	4712	

STUDY METHODOLOGY

Selecting Potential Participants

Kaplan's survey was distributed and returned along with a ballot for a board election, thus substantially reducing his mailing costs. No such opportunity existed for the present survey. In light of the $6,500 available for the present project, a smaller sample had to be created.

One problem with simply selecting every *n*th member was that several states had disproportionally large fractions of the membership when compared with 1990 U.S. census data. (Note a similar problem existed in 1975, but the geographic distribution of the membership has also changed markedly since then.)

It was decided to design a selection process that would (*a*) yield approximately 2,000 responses (assuming a 40 percent or more response rate) and (*b*) sample from each state in proportion to that state's share of the U.S. population. As a result, 20 percent of the overall membership (4,712) was selected. Individual state fractions ranged from as low as 6.5 percent for Massachusetts (which had 7.5 percent of the membership but represents only 2.4 percent of the U.S. population) to a high of 100 percent for Mississippi (0.2 percent and 1.0 percent, respectively). Within each state, members were first sorted by ZIP code and then every *m*th one was selected, where *m* was designed to yield the desired number for that state. Table 1 presents the breakdown by state.

Mailing and Retrieval

The surveys were mailed on December 31, 1996, using first-class postage to increase the likelihood of delivery and to be able to track how many were undeliverable. A business reply panel was included to encourage responses. A deadline of March 31, 1997, was indicated. (Kaplan's were mailed in mid-March 1975, and the ballot and survey had to be returned by April 15 in order to be counted.)

Survey Format

A printed survey was selected to minimize costs and to replicate the method used by Kaplan (and this researcher in the 1994 Washington study). Note that the survey was designed to be anonymous with the ZIP code the only possible means of identifying the respondent. (A copy of the survey is available from the author.)

The questions were designed to capture information similar to that gathered in the earlier surveys, as well as to ask additional questions. It was also laid out to facilitate data entry.

Period Covered

Respondents were asked to report their riding and experiences for calendar year 1996. (Kaplan covered calendar year 1974, whereas the Washington survey covered calendar year 1994.)

Qualifications to Participate

The instructions asked that only current league members over the age of 15 respond. Further, if the household had more than one member, then the one who rode the most miles should fill out the survey. Both of these provisions duplicate those used by Kaplan. It should be noted that a few female cyclists sent notes complaining that those instructions discriminated against them because, although they were active cyclists, their male housemate cycled more than they did. It had been recognized in the design that these instructions might bias the sample toward men, but this was the same approach used by Kaplan.

SURVEY DESIGN

Information was requested in four areas:

- About riding,
- About commuting,
- About safety and accidents, and
- About the respondent.

A space for comments was provided at the end of the survey.

The most likely answers to multiple-choice questions were provided and assigned numerical codes to facilitate data entry and analysis. Yes/no responses were entered as 1/0, respectively.

About Your Riding

The first 11 questions attempted to characterize the equipment cyclists use, the amount spent on cycling during 1996, traffic law obedience, whether they ride mostly on weekends or weekdays and after dark or in the rain, and how long they have been riding. The final five questions dealt with the types of riding they do (trip purpose), the types of facilities used, total miles and hours ridden, and, finally, how these cyclists perceive the motorists with whom they share the road.

Commuting by All Modes

The survey gathered commute trip information (mode, distance, time), as well as attempted to determine for those not usually bike-commuting, the most significant reason for that decision.

Safety/Accidents

One question sought cyclists' perceptions of the safety of various bicycle facilities. The remaining questions dealt with collisions or falls during 1996. Since many crashes experienced by cyclists do not result in significant injury or property damage, an attempt was also made to capture data on the more serious crashes. Note that Kaplan did not define what constitutes a "serious" fall, leaving it to the reader to decide. In the present survey (as well as the 1994 Washington survey), a $50 threshold was established to reduce the ambiguity in that definition. The remaining questions attempted to characterize both serious and nonserious crashes by severity, activity, facility, and mode.

About You and Your Household

Five questions sought standard demographic information (e.g., age and sex). A question on bicycle safety training, if any, was also included. This was followed by a few questions about additional cyclists in the home and the number of bikes and motor vehicles available, and a question about cyclists' general health since they started cycling regularly. Finally, years of LAW/LAB membership and ZIP code were requested.

Comments

A space was provided for any additional information the respondent wished to provide.

RESPONSE RATE

The response was nothing short of phenomenal. Within 14 days, 35 percent of the surveys had been returned, and 2 weeks later, we were at 46 percent. At the deadline, just over 2,400 (nearly 52 percent) had responded, whereas 74 had come back undeliverable. Return rates varied from 47 percent in New England to 65 percent in the Northwest.

SCREENING RESPONSES AND DATA ENTRY AND CHECKING

Each survey was checked for completeness and consistency. Approximately 5 percent (121/2,403) were rejected because they were damaged beyond use, were incomplete (often one entire side was left blank), reported no riding in 1996, or failed to provide a breakdown of facilities use that totaled between 90 and 110 percent. This latter parameter was essential for the facilities crash analysis described below.

One problem with a survey of this type is assessing the validity of the responses since most cyclists do not keep records of their daily trips. Since there is no way to verify accuracy, it was decided to at least require some level of internal consistency in the responses. For example, the sum of the miles ridden per month by trip purpose multiplied by the claimed number of months ridden should (ideally) equal the total miles reported. The range of errors encountered was –97 percent to +2,345 percent. An acceptance range of ±40 percent was selected, which resulted in rejecting an additional 13.5 percent (326/2,403).

As a result, 1,956 surveys were included in the final data set, and the responses were entered into a Lotus 1-2-3 spreadsheet. Every entry was verified to be within bounds (e.g., months ridden between 1 and 12), and that all parts of multiple-part questions were completed (e.g., if a crash was indicated, then a response must appear in several related questions dealing with the type of crash and facility on which it occurred). Incomplete responses were removed.

ANALYSIS

Several types of analyses were applied to the final data set. Fractional responses were calculated for questions like bicycle type and equipment. For questions with numerical responses (e.g., years of regular cycling and age), the highest, average, median, and lowest values were calculated. In some of these cases, distributions were determined as well.

One of the major advantages of this type of study (in which users report distances ridden and crash experience) is the opportunity to determine crash rates (the number of crashes divided by the distance ridden in calendar year 1996). In addition, the crash rates and characteristics of various subpopulations (e.g., males versus females) can be evaluated. Finally, the crashes can be tabulated by activity, facility used, and nature of the crash.

Another way of looking at crashes versus facilities is to divide the fraction of crashes reported for a particular facility by the fraction of kilometers ridden on that facility type. The resulting number, here called the relative danger index (RDI), would be 1.0 if crashes occurred in proportion to the distance traveled. An RDI greater than 1.0 indicates a facility on which crashes occur at a higher rate

than would be expected based simply on distance. RDI is, thus, a convenient way to compare various facilities.

RESULTS

In the material that follows, the Washington State survey results will be referred to as WA 94 and Kaplan's results as LAW 74. Where comparable data exist in the WA 94 and the LAW 74 surveys, those results will be shown as [WA 94/LAW 74] immediately following the present results. If no such comparable data exist, a dash (–) will appear. Space simply does not permit a full presentation of the results for all three studies.

Demographics

The average respondent was a 48-year-old [45/38], married (66 percent) [62 percent/–] male (80 percent) [74 percent/88 percent] professional (48 percent) [48 percent/–] with a college degree (80 percent) [81 percent/–]. More than 53 percent [46 percent/–] reported a household income in excess of $60,000/year. Just under 4 percent [1 percent/5 percent] reported not owning a motor vehicle; of those, 90 percent [–/–] said they did so by choice. The average household had two or more cyclists [two or more/–], two or more motor vehicles [two or more/two or more], and 4.4 [3.7/–] bikes.

Figure 1, showing the age distribution for the three surveys, graphically demonstrates that the two more recent studies involved substantially older cyclists. Most notable is the large decrease in the fraction of respondents in the 16–35 age groups in these surveys.

Over 75 percent [–/–] reported that their general physical health had improved either greatly or somewhat since they started cycling regularly, whereas less than 1 percent thought their health had deteriorated (expect by age alone 7 percent).

About Their Cycling

Road (49 percent) [42 percent/–] and touring (21 percent) [25 percent/–] bikes were used most often, with mountain bikes at 12 percent [15 percent/–]. (Note: LAW 74's bike type question dealt with the number of speeds—1, 3, 5 plus—and thus is not comparable.) The majority of this group and the WA 94 sample were well equipped, reporting using or carrying mirrors, computers, panniers, pumps, spare tubes, and tools. Helmets were reportedly *worn* on every ride by 88 percent. For LAW 74, 31 percent reported *owning* a helmet, whereas for the WA 94 group, helmet *ownership* was 99.9 percent. Neither of these surveys asked about helmet *use.*

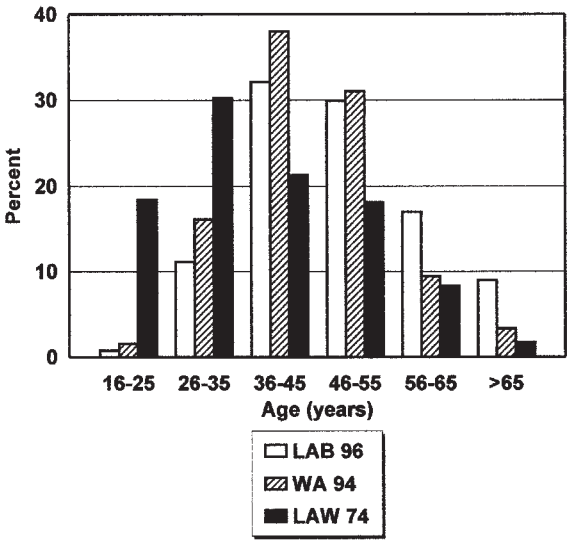

FIGURE 1 Distribution of respondents' ages.

Cycling was evenly split between weekends (52 percent) [51 percent/54 percent] and weekdays (48 percent) [50 percent/46 percent]. Nearly half (47 percent) [35 percent/35 percent] never ride after dark, whereas only 15 percent [5 percent/24 percent] never ride in the rain. The average respondent has been cycling regularly for 14.2 years and claims to have ridden 9 months in 1996. (Both WA 94 and LAW 74 binned experience into ranges with the following results: <1 year: 4 percent/3 percent; 1–4 years: 25 percent/48 percent; 5–10 years: 33 percent/28 percent; greater than 10 years: 39 percent/20 percent.)

On-road recreation was reported by 93 percent [84 percent/84 percent], whereas 41 percent [41 percent/48 percent] claimed to have used their bikes for utility purposes, and 38 percent [51 percent/49 percent] did at least some work or school travel by bike in 1996 [1994/1974]. Thirty-five percent [20 percent/–] claimed to have mountain-biked as well. Table 2 shows these data, as well as the maximum and average monthly distances claimed for each trip purpose. Note the averages are calculated over the entire sample population (1,956 respondents) not just those reporting a particular type of trip.

The facility on which the most kilometers were ridden was minor streets without bike facilities (45 percent) [44 percent/58 percent], whereas 32 percent [26 percent/35 percent] of the kilometers were on major streets (again without bike facilities). Bike routes, bike lanes, and multiuse trails each accounted for 6–7 percent. (In WA 94 and LAW 74, signed bike routes and bike-laned streets were combined with 12 percent/3 percent of the kilometers reported, whereas multiuse trails had 17 percent/4 percent.) Off-road/unpaved facilities were 4 percent [2 percent/–]. An *Other* category appears in the present study, and nearly all responses indicated this meant sidewalks. They accounted for just 0.3 percent of the kilometers ridden.

Total cycling kilometers in 1996 were 9 160 000 [4 185 000/12 171 000] for an average of 4670 [4370/3760] per cyclist. One hearty soul claimed to have pedaled 38 700 [35 500/>16 000] km, whereas the lowest distance reported was 160 [50/–] km.

Figure 2 presents the distribution of annual cycling distance reported in the three surveys. Most notable here is that the present cyclists appear to be cycling more each year than 20 years ago.

Women had been cycling regularly an average of 12.4 years, compared with 14.6 for men and reported somewhat fewer months ridden (8.7 versus 9.6). Women's responses to distances traveled and trip purposes (as is depicted for the entire sample in Table 2) were very similar to men's except for the *road racing* category. Here, only 4 percent reported engaging in this activity versus 10 percent for the men, and the fraction of kilometers was 3 percent versus 8 percent. Fnally, average cycling distance in 1996 was about 4300 km for women versus 5000 for the men.

Commuting

Only 53 percent [56 percent/–] reported commuting to work or school; of those, 51 percent [41 percent/–] did so most often by car. Bicycle commuting was the next highest mode at 29 percent [40 percent/–].

TABLE 2 Trip Purposes and Monthly Distances Cycled for Each Type of Trip

Trip Purpose		LAB 96	WA 94	LAW 74
Work/School				
	Maximum kilometers	1667	1050	N/A
	Average kilometers	78	113	92
	Fraction of kilometers	15%	24%	22%
	% reporting this trip purpose	38%	51%	49%
Shopping/Personal Business				
	Maximum kilometers	1333	667	N/A
	Average kilometers	22	22	27
	Fraction of kilometers	4%	5%	6%
	% reporting this trip purpose	41%	41%	48%
Road Recreation + Exercise for WA 94/LAW 74				
	Maximum kilometers	2500	1500	N/A
	Average kilometers	330	242	277
	Fraction of kilometers	64%	51%	66%
	% reporting this trip purpose	93%	84%	84%
Mountain Biking Recreation				
	Maximum kilometers	667	667	N/A
	Average kilometers	23	12	N/A
	Fraction of kilometers	5%	2%	N/A
	% reporting this trip purpose	35%	20%	N/A
Road Racing				
	Maximum kilometers	3333	1000	N/A
	Average kilometers	35	20	27
	Fraction of kilometers	7%	4%	6%
	% reporting this trip purpose	9%	7%	9%
Mountain Bike Racing				
	Maximum kilometers	347	333	N/A
	Average kilometers	2	1	N/A
	Fraction of kilometers	0%	0%	N/A
	% reporting this trip purpose	3%	2%	N/A
	TOTAL FRACTION KILOMETERS	96%	86%	100%

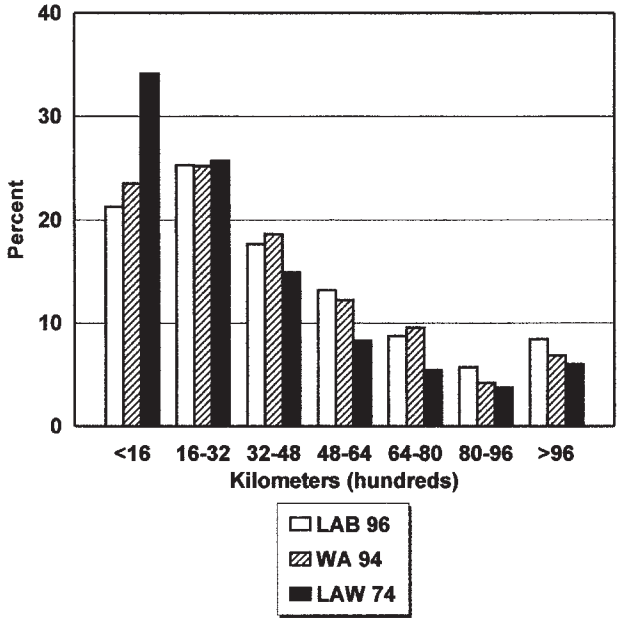

FIGURE 2 Distribution of annual cycling distances ridden.

Average one-way commute distances and times were 17 km [17/–] and 27 minutes [38/–]. Needing a car at work, dangerous roads, distance, and lack of facilities at work/school were the most often cited reasons for not bike-commuting for the present sample. For the WA 94 group, time, weather, and distance were most often cited. LAW 74 did not ask about commuting.

Crashes: Minor Versus Serious

Twenty-nine percent [32 percent/26 percent] reported having had some type of "accident" in the study year. Just over 9 percent [10 percent/21 percent] reported having had a serious crash (resulting in at least $50 of property damage or medical expense) in 1996 [1994/1974]. (Recall that LAW 74 left it to the reader to decide whether a crash was "serious," which might explain the significantly higher response to that question.)

Those reporting a serious crash had an average of 1.2 [1.2/1.2] such crashes during the year. Only 28 percent [27 percent/–] of such crashes were reported to the police. Such crashes resulted in average and median medical expenses of: $2,970 [$884/–] and $155 [$150/–], respectively. The maximum total medical expense reported was $250,000 [$17,500/–], but no details were provided by

TABLE 3 Collision or Fall Modality for All (Serious and Minor) Crashes

	LAB 96	WA 94	LAW 75
No other object - simple fall	59%	48%	41%
Moving motor vehicle	11%	11%	18%
Stationary motor vehicle	1%	1%	4%
Bicycle	9%	13%	17%
Pedestrian	2%	2%	1%
Animal	3%	1%	8%
Fixed object	14%	17%	N/A
Other	1%	7%	11%
Non-reported	N/A	1%	N/A
TOTAL	100%	101%	100%

that respondent. Clearly, such an amount will exert a strong upward bias on the average.

For reported property damage in serious crashes, the average and median expenses were $316 [$384/–] and $100 [$130/–]. The maximum total property damage was $5,000 [$5,000/–].

A slightly higher fraction of women reported having a serious crash than men—11 percent versus 9 percent—and their serious crash rates were also slightly higher—29 versus 22 per million kilometers. In most other respects, the crash results for both sexes were comparable.

Crashes: Modality

For all crashes, falls accounted for 59 percent [48 percent/41 percent], with running into a fixed object being the next most frequent at 14 percent [17 percent/Other: 11 percent]. Moving motor vehicles were involved in 11 percent [11 percent/18 percent] and another bicycle in 9 percent [13 percent/17 percent] of all crashes regardless of severity. See Table 3.

For serious crashes, falls remain the leading type at 38 percent, with moving motor vehicles (24 percent) the next most frequent type, whereas a fixed object and another bicycle each accounted for 13 percent.

Crashes: Activity

For all three studies, the most frequently reported activity at the time of the most recent crash was on-road recreation—54 percent [60 percent/64 percent]. This is not surprising given that most of the kilometers ridden were for recreation. For serious crashes, in the present study that fraction increases to 62 percent. Interestingly, although off-road mountain-biking is involved in 20 percent of all crashes, for nonserious crashes it jumps to 27 percent, whereas on-road recreation drops to 48 percent for these less serious crashes.

Crashes: Facility

Table 4 presents the fraction of crashes by facility type along with crash rates per million kilometers. Note, again, that in WA 94 and LAW 74, bike routes and bike-laned streets were combined into a

TABLE 4 Crashes by Facility Type

		LAB 96			WA 94	LAW 74
		Serious	Minor	Population		
Fraction of crashes on:						
	Major w/o bike facilities	29%	17%	21%	20%	35%
	Minor w/o bike facilities	41%	43%	42%	43%	54%
	Signed bike route only (BR)	6%	2%	3%	N/A	N/A
	On-street bike lanes (BL)	4%	2%	2%	N/A	N/A
	On-street bike fac (BR or BL)	N/A	N/A	N/A	7%	2%
	Multiuse trail	8%	9%	9%	18%	10%
	Off road/unpaved	8%	23%	18%	13%	N/A
	Other (most often 'sidewalk')	5%	4%	5%	1%	N/A
	Totals	100%	100%	100%	100%	100%
Crash rates per million kilometers						
	Major w/o bike facilities			41	69	71
	Minor w/o bike facilities			59	82	65
	Signed bike route only (BR)			32	N/A	N/A
	On-street bike lanes (BL)			26	N/A	N/A
	On-street bike fac (BR or BL)			N/A	38	36
	Multiuse trail			88	91	181
	Off road/unpaved			282	590	N/A
	Other (most often 'sidewalk')			1026	N/A	N/A

single category. Minor streets are by far the most likely place for a bicycle crash, but this should not be surprising since, as noted above, these facilities are used most heavily by these cyclists. The table also reveals that the more serious crashes are more likely to happen on major streets without bike facilities, and that off-road/unpaved trails are the scene of slightly less than one-quarter of the minor crashes. (Note that *Population* under LAB 96 refers to the entire data sample and is analogous to the WA 94 and LAW 74 data.)

Of additional interest is the experience of these cyclists (and, indeed, those in the two earlier studies) on streets either signed as a bike route or having bike lanes. Crash rates on these facilities are significantly lower than on all other facility types.

Table 5 presents the relative danger index (described earlier) for each facility type and all three studies. The RDI makes it easy to grasp the likelihood of experiencing a crash on the various facilities relative to the kilometers cycled on each facility and for comparing the facilities with one another. [Note: A common misconception is that LAW 74 concluded that streets with bike lanes were less safe than streets without bike facilities. This is untrue. See Kaplan (*6*, p.76, Table 13).]

Table 5 suggests that virtually all facilities have become *safer* since 1974. Several factors may be responsible. In 1974, multiuse trails and bike lanes were much less prevalent and often poorly designed. The 1996 group is older and has significantly more years of cycling experience. Thus, they may just be safer cyclists able to better handle a variety of road conditions. Major roads without bike facilities may have better shoulders or wider outside lanes today than 20 years ago. It is interesting that the performance of minor streets has remained very consistent over time.

DISCUSSION OF RESULTS

The respondents to all three of these studies are clearly U.S. adults who frequently use bicycles for recreation and transportation and who could be called *bicyclists* rather than just people who occasionally ride a bike. Although these results are not representative of the general adult population, they do suggest what adults in this country are capable of. Although a small fraction of this group engages in competitive cycling [road (9 percent) and off-road racing (3 percent)], the vast majority are primarily recreational riders.

Although the upward shift in the age distribution since LAW 74 might be cause for some concern about the future of cycling in the United States, it is also encouraging that more than half of this sample is over 45 years of age. The large fraction of respondents who are professionals and who report relatively high household incomes also indicates that serious cycling is not just the province of "poor college students" with few transportation options. By the way, they reported spending an average of $1,100 in 1996 on cycling, which, in many locales, also generated some sales tax revenue to the states and local governments.

These cyclists ride year-round, after dark, and in the rain. They wear helmets at a very high rate compared with the general cycling population.

When the crash experiences are combined with the average distance cycled, the average cyclist in this group could be expected to ride for 11 [6/14] years before having a crash.

TABLE 5 Facility Relative Danger Index

	LAB 96	WA 94	LAW 74
Major w/o bike facilities	0.66	0.75	1.00
Minor w/o bike facilities	0.94	0.98	0.92
Signed bike route only (BR)	0.51	N/A	N/A
On-street bike lanes (BL)	0.41	N/A	N/A
On-street bike fac (BR or BL)	N/A	0.54	0.53
Multiuse trail	1.39	1.03	2.71
Off-road/unpaved	4.49	8.58	N/A
Other (most often 'sidewalk')	16.34	N/A	N/A

CONCLUSION

This survey provides a snapshot of the cycling habits of adults across the United States who cycle on a regular basis. In many ways, this study is unique in that it acquired data from which to derive crash rates based on distance. Given that the sample was constructed to gather responses from across the country, and did so, its results should be of interest to a wide range of public and private groups.

Additional analysis will be performed on the data, including looking at the effect of such parameters as age, miles ridden per year, total years of cycling experience, and those reporting a crash to those who did not.

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