RUTGERS
Edward J. Bloustein School
of Planning and Public Policy

BICYCLE ACTIVITY AND ATTITUDES SURVEY

Funded by the NJDOT through the Federal Highway Administration

SUBMITTED TO:

STATE OF NEW JERSEY
Department of Transportation (NJDOT)
Trenton, New Jersey
1035 Parkway Avenue
P.O. Box 600
Trenton, NJ 08635-0600

SUBMITTED BY:

ALAN M. VOORHEES TRANSPORTATION CENTER
Edward J. Bloustein School of Planning and Public Policy
Rutgers, The State University of New Jersey
33 Livingston Avenue
New Brunswick, NJ 08901

New Jersey Bicycle and Pedestrian Resource Center

This page is intentionally left blank

BICYCLE ACTIVITY AND ATTITUDES SURVEY SUMMARY REPORT

Alan M. Voorhees Transportation Center
Edward J. Bloustein School of Planning and Public Policy
Rutgers, the State University of New Jersey
New Brunswick

April 2011

This page is intentionally left blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

This page is intentionally left blank

INTRODUCTION

This report contains results from the Bicycle Activity and Attitudes Survey conducted by the Bloustein Center for Survey Research for the Alan M. Voorhees Transportation Center (VTC) at Rutgers University with auspices from the New Jersey Department of Transportation (NJDOT). The report is prepared with two primary purposes: (a) to generate basic statistical tables that can be used to understand the survey data for further research and analysis, and (b) to provide NJDOT some basic information that is useful for making policy decisions.

The Bicycle Activity and Attitudes Survey was a random-digit dialing anonymous telephone survey of households in the state of New Jersey, conducted between November 12 and December 18, 2008. Data were collected from a sample of 2019 adults (18 years or over). The sample is representative of the state's population with regard to basic demographic and socioeconomic characteristics. The survey questionnaire was designed to fulfill some of the broader research objectives, including (a) identifying the association between demographic and socioeconomic characteristics and bicycling propensity, (b) examining the relationship between the built environment and bicycling behavior, (c) exploring individuals' perceptions about safety as it relates to bicycling, (d) examining bicyclists' adherence to safety practices, (e) and analyzing bicyclists' perceived need for infrastructure improvement.

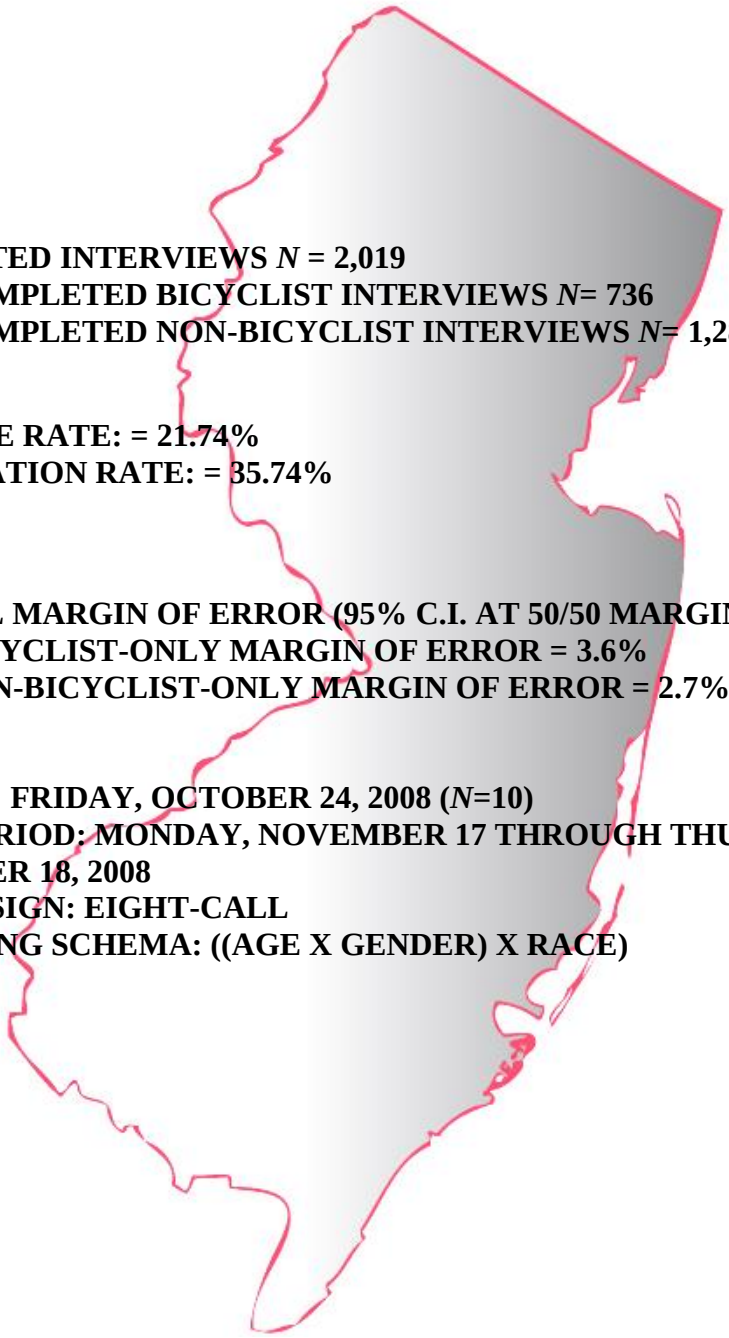
The survey included several questions on perceived access to facilities and land uses that are commonly associated with bicycling by researchers, such as parks and playgrounds and educational institutions. To obtain objective measures of the built environment in the areas where the respondents lived and bicycled, respondents were asked about a street intersection near their homes and the places where they bicycled. This information was geocoded and the surrounding land uses were cataloged to examine the relationship between some of the objective measures of the built environment and bicycling behavior. In addition to land uses, information on pedestrian/bicyclist fatalities and injuries was also cataloged to examine the relationship between safety and bicycling.

This report, however, does not include any analysis of association between the variables studied. At best, it provides some cross tabulations between potentially independent and dependent variables. To be consistent with the report's objective of assisting sophisticated statistical analysis at a later stage, it mainly contains a large number of charts and tables so that other members of the research team could have at their disposal readily available basic information on

the respondents, their characteristics, their bicycling behavior, and their safety perceptions. The report includes analysis of most, but not all, of the survey questions.

To a certain extent, the organization of the report is affected by the design of the survey instrument. However, an effort has been made to provide the most basic information first. For example, the initial tables and charts of the report pertain simply to bicycling propensity, frequency, and trip purpose. The section is followed by bicycling propensity for persons with different socioeconomic characteristics. Data on safety perceptions, perceived need for facilities, etc., are provided subsequently. Data from still finer questions are analyzed towards the end of the report. The lists of tables and charts provide a good indication about the detailed organization of the report.

SUMMARY OF SURVEY PARAMETERS:



COMPLETED INTERVIEWS *N* = 2,019
- **COMPLETED BICYCLIST INTERVIEWS *N*= 736**
- **COMPLETED NON-BICYCLIST INTERVIEWS *N*= 1,283**

RESPONSE RATE: = 21.74%
COOPERATION RATE: = 35.74%

OVERALL MARGIN OF ERROR (95% C.I. AT 50/50 MARGINS) = 2.2%
- **BICYCLIST-ONLY MARGIN OF ERROR = 3.6%**
- **NON-BICYCLIST-ONLY MARGIN OF ERROR = 2.7%**

PRETEST: FRIDAY, OCTOBER 24, 2008 (*N*=10)
FIELD PERIOD: MONDAY, NOVEMBER 17 THROUGH THURSDAY, DECEMBER 18, 2008
CALL DESIGN: EIGHT-CALL
WEIGHTING SCHEMA: ((AGE X GENDER) X RACE)

KEY FINDINGS

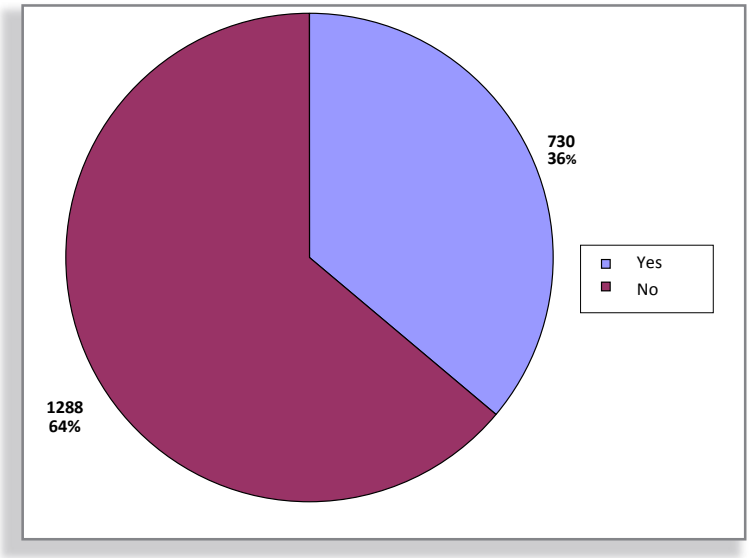
BICYCLE USE

Over a third of the respondents 18 years or older (36%) have bicycled within the past six months.

TABLE 1: BICYCLE USE

	Yes	No	Total
Count	730	1288	2018
Percentage	36%	64%	100%

FIGURE 1: BICYCLE USE



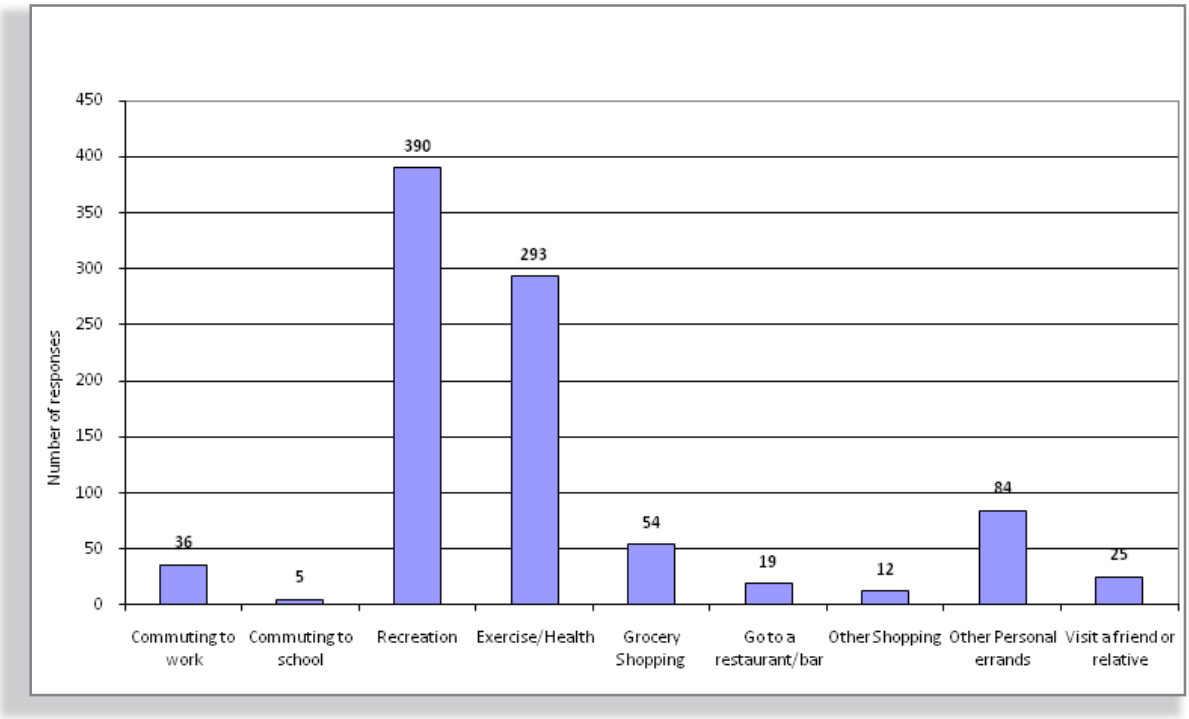
TRIP PURPOSE

Basically the results show that most bicycling trips in New Jersey are non-utilitarian. Nearly three quarters of bicycling trips are non-utilitarian in nature. Non-utilitarian trips are those that do not necessarily have a specific destination (or purpose at the destination), goal or timeframe, meaning that most of these trips are discretionary. For these trips, individuals are free to choose their routes and are generally able to cancel a trip altogether without difficulty. The survey results show that non-utilitarian bicycling trips in New Jersey are primarily made for the purposes of recreation and health or exercise (42% and 32% respectively, 74% total). The remaining trips are made for utilitarian or transportation purposes. These trips primarily consisted of personal errands (9%), grocery shopping (6%), and commuting to work (4%).

TABLE 2: MOST COMMON REASON FOR BICYCLE TRIPS

	1st Response	2nd Response	3rd Response	4th Response	TOTAL	
Recreation	343	36	9	2	390	42%
Exercise/Health	243	42	6	2	293	32%
Other Personal Errands	39	27	14	4	84	9%
Grocery Shopping	26	22	4	2	54	6%
Commuting to Work	30	5	1	0	36	4%
Visit a Friend or Relative	8	8	6	3	25	3%
Go to a Restaurant/Bar	7	5	4	3	19	2%
Commuting to School	4	0	1	0	5	1%
Other Shopping	3	4	3	2	12	1%
Total	703	149	48	18	918	100%

FIGURE 2: MOST COMMON REASONS FOR BICYCLE TRIPS



BICYCLE USE & DEMOGRAPHICS

AGE

The 35-44 age range included the highest proportion of bicyclists (52%), followed by those under age 25 (48%). The relatively lower bicycling rate among those in the 25-34 age group may be due to lifestyle changes associated with starting new careers and having young

families. The high propensity of bicycling in the 35-44 age group may be due to recreational family activities involving children.

TABLE 3: BICYCLE USE BY AGE

	Yes		No		Total
Under 25	76	48%	81	52%	157
25-34	114	31%	258	69%	372
35-44	165	52%	155	48%	320
45-64	287	40%	427	60%	714
65 and older	47	14%	278	86%	325
Total	689	36%	1199	64%	1888

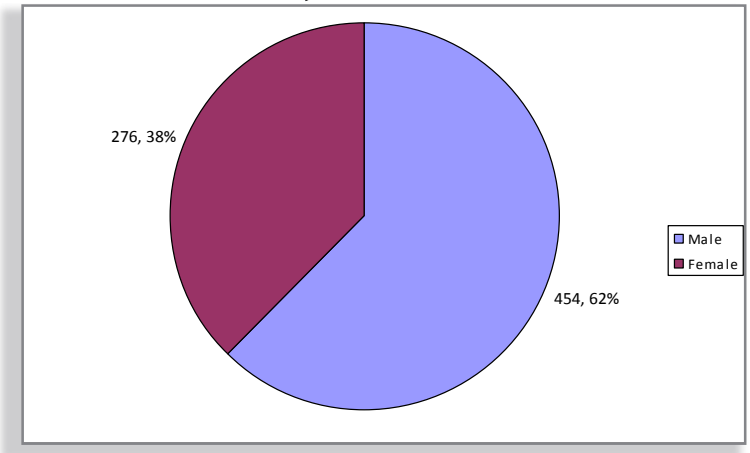
GENDER

Among bicyclists, 62 percent were male and 38 percent were female. Twenty-seven percent of female respondents reported bicycling within the past 6 months compared to 46 percent of men. This finding supports national patterns that have shown that men are more likely to bicycle and bicycle more frequently.[1] The results illustrate the need for focused research on the barriers preventing women from bicycling.

TABLE 4: BICYCLE USE BY GENDER

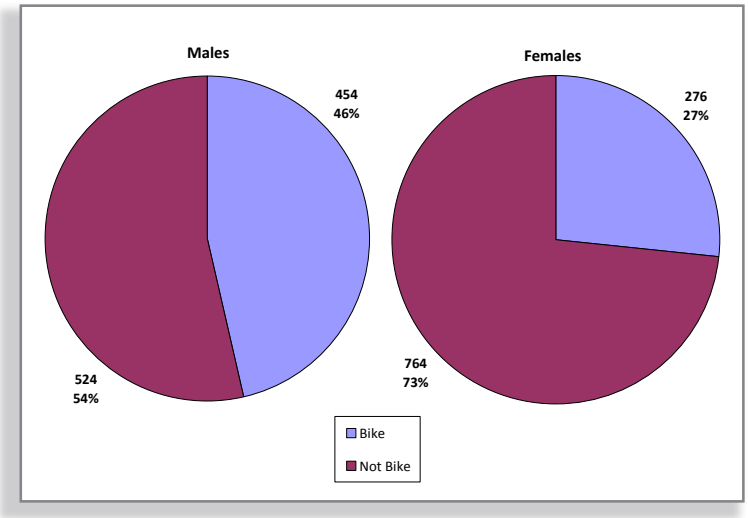
Gender	Yes		No		Total
Male	454	46%	524	54%	978
Female	276	27%	764	73%	1040
Total	730	36%	1288	64%	2018

FIGURE 3: BICYCLE USE, GENDER COMPARISON



[1] http://www.bts.gov/publications/omnistats/volume_02_issue_06/pdf/entire.pdf

FIGURE 4: BICYCLE USE BY GENDER



CAR OWNERSHIP

According to survey data, households with more cars are more likely to make bicycle trips. Forty-nine percent of households with three or more cars reported bicycle use within the past six months, compared to 34 percent of households with one or two cars and 20 percent of households without any cars. The results suggest that automobiles and bicycles are not substitutes. Given that the largest proportion of bicycling trips are for health/exercise/recreation, the results are not surprising.

TABLE 5: BICYCLE USE BY NUMBER OF VEHICLES

# of Cars	Yes		No		Total
0	27	20%	108	80%	135
1-2	449	34%	889	66%	1338
3+	236	49%	245	51%	481
Total	712	36%	1242	64%	1954

INCOME

Forty seven percent of those from households earning more than $100,000 annually reported bicycling within the past six months. Bicycle use increases steadily with income, as 20 percent of households earning less than $25,000 reported bicycling, a rate that increased to 25 percent for those earning between $25,000 and $50,000, and 39 percent of those earning $50,000 to $100,000. One of the reasons for the seemingly positive relationship between income and propensity to bicycle may be due to bicycle ownership rate. Another reason could be a greater consciousness about the health benefits from bicycling among the affluent. Yet another reason could be easy access to facilities for recreational bicycling, such as bicycling lanes and trails.

TABLE 6: BICYCLE USE BY HOUSEHOLD INCOME

Income Level	Yes		No		Total
Less than $25,000	43	20%	167	80%	210
$25,000-$50,000	87	25%	256	75%	343
$50,000-$100,000	205	39%	314	61%	519
$100,000 or more	280	47%	313	53%	593
Total	615	36%	1050	64%	1665

EDUCATION

While not a linear relationship, the survey data suggests that people bicycle more as education levels increase. Twenty-four percent of those who did not graduate high school reported bicycling, while 42 percent of those with at least a four-year degree reported bicycling. The reason for greater propensity to bicycle among those with higher education could be because of a greater consciousness about health benefits. This could also be the result of a positive association between income and education.

TABLE 7: BICYCLE USE BY EDUCATION

Education Level	Yes		No		Total
Less than high school graduate	25	24%	79	76%	104
High school graduate (or GED)	124	31%	279	69%	403
Some college (or technical/vocational)	87	33%	176	67%	263
Two-year degree	59	32%	125	68%	184
Four-year degree	222	42%	311	58%	533
Some Graduate work	20	35%	37	65%	57
Graduate degree	181	42%	254	58%	435
Total	718	36%	1261	64%	1979

ETHNICITY

According to survey data, White Non-Hispanics bicycle more than other groups (41%). African Americans and Asians have the lowest bicycling rates, at 24 percent and 25 percent, respectively.

TABLE 8: BICYCLE USE BY ETHNICITY

Ethnicity	Yes		No		Total
White Hispanic	64	32%	138	68%	202
Black Hispanic	12	35%	22	65%	34
White not Hispanic	510	41%	739	59%	1249
Black not Hispanic	56	24%	182	76%	238
Asian	30	25%	90	75%	120
Native American	9	33%	18	67%	27
Other	10	20%	40	80%	50
Total	691	36%	1229	64%	1920

TABLE 9: BICYCLE TRIP PURPOSE BY ETHNICITY

Trip Purpose	White Hispanic		Black Hispanic		White Not Hispanic		Black Not Hispanic	
Commuting to work	1	1%	3	13%	23	4%	7	13%
Commuting to school	0	0%	0	0%	4	1%	0	0%
Recreation	33	42%	7	30%	295	45%	17	31%
Exercise/Health	19	24%	2	9%	219	34%	16	30%
Grocery Shopping	12	15%	4	17%	26	4%	5	9%
Go to a restaurant/bar	4	5%	0	0%	10	2%	0	0%
Other Shopping	3	4%	0	0%	7	1%	0	0%
Other Personal errands	6	8%	3	13%	55	8%	9	17%
Visit a friend or relative	1	1%	4	17%	13	2%	0	0%
Total	79	100%	23	100%	652	100%	54	100%

Trip Purpose	Asian		Native American		Other		Total	
Commuting to work	0	0%	0	0%	0	0%	34	4%
Commuting to school	0	0%	0	0%	0	0%	4	0%
Recreation	9	26%	6	67%	5	50%	353	44%
Exercise/Health	13	38%	2	22%	1	10%	257	32%
Grocery Shopping	5	15%	0	0%	0	0%	47	6%
Go to a restaurant/bar	1	3%	0	0%	0	0%	14	2%
Other Shopping	0	0%	0	0%	0	0%	10	1%
Other Personal errands	2	6%	0	0%	4	40%	73	9%
Visit a friend or relative	4	12%	1	11%	0	0%	18	2%
Total	34	100%	9	100%	10	100%	812	100%

For almost all ethnic groups, recreation and exercise/health were the most widely reported reasons for making bicycle trips. The amount of trips that recreation accounted for ranged from 67 percent for Native Americans to 26 percent for Asians; the latter being the only group that reported another more frequent reason for bicycle trips (38 percent of trips were for exercise/health). Exercise/health was generally the second most common reason for bicycle trips for all groups; the only group to report otherwise being Black Hispanics, who bicycled for recreation most frequently (30%). This group was also more likely to ride a bike for grocery shopping (17%), visiting a friend (17%), commuting to work (13%) or doing another errand (13%) than exercise/health. Beyond the two primary purposes for bicycling, other purposes tended to vary among the different ethnic groups.

HOMEOWNERSHIP

Twenty-six percent of renters and 39 percent of homeowners reported bicycling in the last six months. Further research is needed on dwelling type (i.e. apartment building or single family home) and its association with the propensity to bicycling. The availability of bicycle parking

might be an issue that needs to be investigated as it may relate to both dwelling tenure and dwelling type.

TABLE 10: BICYCLE USE BY HOME RENTAL/OWNERSHIP

Status	Yes		No		Total
Rent	123	26%	357	74%	480
Own	587	39%	905	61%	1492
Total	710	36%	1262	64%	1972

HOUSE TYPE

Respondents living in single family homes had the highest proportion of reported bicycle usage (39%) followed by those living in townhouses (36%). The lowest reported levels were for respondents living in apartments (24%).

TABLE 11: BICYCLE USE BY DWELLING TYPE

Dwelling Type	Yes		No		Total
Single-family home	568	39%	872	61%	1440
Townhouse	31	36%	56	64%	87
Condominium	27	31%	59	69%	86
Multi-family home	37	28%	95	72%	132
Apartment Building	60	24%	189	76%	249
Other	3	23%	10	77%	13
Total	726	36%	1281	64%	2007

NUMBER OF CHILDREN

Nearly half of the respondents with two or more children reported bicycling within the past six months. The proportion decreases for those with fewer children, falling to 39 percent for those with one child and then to 28 percent for those with no children. Although one might think that the presence of children would interact with the availability of parks/playgrounds when it comes to bicycling propensity, the evidence is weak. It seems that the likelihood of living near parks/playgrounds is only slightly higher for those with children (91%) than for those without (85%). This might suggest that the likelihood of a household with children to make bicycle trips is more closely related to the number of children than to whether there is a recreational destination nearby. Looking at the effect of living near a park on the likelihood of bicycling shows that 38 percent of respondents that live near a park reported bicycling, an amount very similar to overall reported level of bicycling (36%). Comparatively, only 23 percent of those that do not live near a park reported bicycling, 13 percent less than the average. Thus, proximity to parks does play a role in an individual's tendency to bicycle.

TABLE 12: BICYCLE USE BY THE NUMBER OF CHILDREN IN THE HOUSEHOLD

# Children in Household	Yes		No		Total
0	324	28%	816	72%	1140
1	133	39%	206	61%	339
2	165	50%	162	50%	327
3	65	50%	66	50%	131
4+	32	49%	33	51%	65
Total	719	36%	1283	64%	2002

TABLE 13: RECREATIONAL DESTINATION PROXIMITY BASED ON NUMBER OF CHILDREN, ALL RESPONDENTS

#Children in Household	Park/Playground /Field within biking distance					
	Yes			No		Total
0	973	85%		167	15%	1140
1	313	92%	91% avg.	26	8%	339
2	298	91%		30	9%	328
3	119	91%		12	9%	131
4+	55	85%		10	15%	65
Total	1758	88%		245	12%	12%

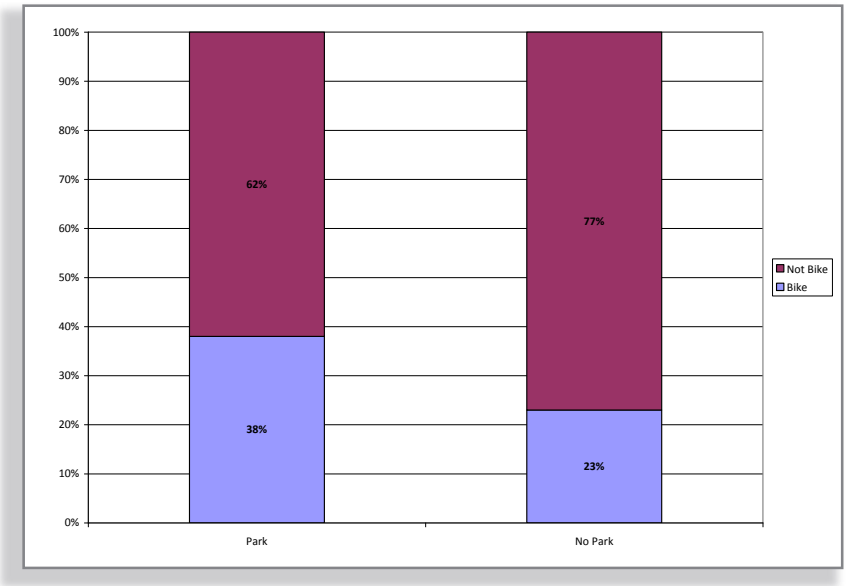
RECREATIONAL DESTINATION PROXIMITY AND BIKING

Proximity to a park may provide important insights into the motivations to bicycle, especially for recreation or exercise related purposes, which account for a majority of the bicycling trips. Having a park, playground or field within biking distance could be a key to biking for many, as 38 percent in close proximity of parks and playgrounds bicycle but only 23 percent that do not live near such facilities bicycle. It thus seems that perceived proximity to parks/playgrounds is important for bicycling.

TABLE 14: AFFECT OF PARKS ON BICYCLING

	Bike	%	Not Bike	%	Total
Park	676	38%	1096	62%	1772
No Park	53	23%	175	77%	228
Total	729	36%	1271	64%	2000

FIGURE 5: BICYCLE USE BY PRESENCE OF PARK/PLAYGROUND/FIELD



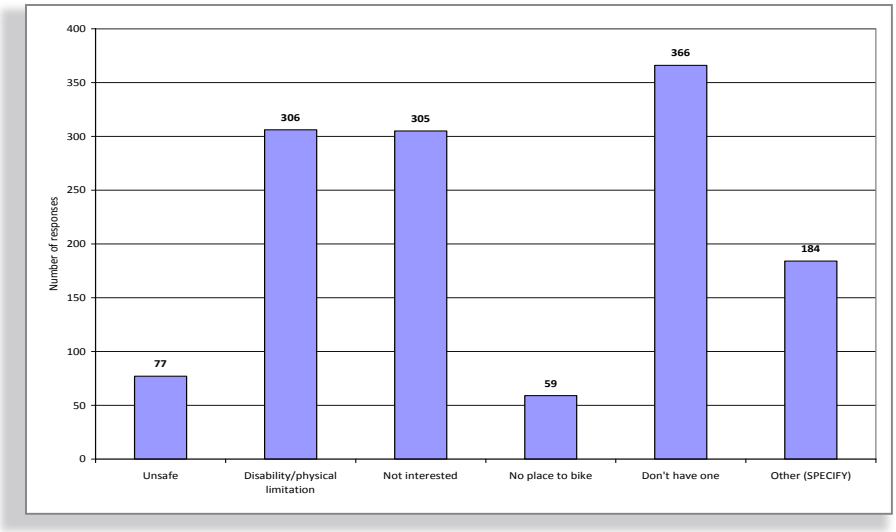
NON BICYCLISTS

When asked why they did not ride a bicycle, non-bicycling respondents were given the opportunity to provide multiple responses. The three most common responses for not bicycling were: "don't have a bicycle" (28%), "disability/physical limitation" (24%), and "not interested" (24%). Interpretation of the results is complicated. For example, a respondent's lack of interest in bicycling may be due to a disability, or the fact that a bicycle is not available to the respondent. Similarly, an individual may not have a bicycle because she/he is not interested.

TABLE 15: REASONS FOR NOT RIDING A BICYCLE

	Frequency	%
Don't have one	366	28%
Disability/physical	306	24%
Not interested	305	24%
Other	184	14%
Unsafe	77	6%
No place to bike	59	5%
Total	1297	100%

FIGURE 6: REASONS FOR NOT RIDING A BICYCLE



By examining the reasons given for not riding a bicycle, with regards to income, we see that those in the lowest income bracket were the least likely to mention that their lack of a bicycle is the main reason for not riding. Only 24 percent of the households earning less than $25,000 gave that response, compared to 28 percent, 34 percent and 27 percent for the three higher income brackets, respectively. Those in the lowest income bracket were also least likely to report that safety concerns prevented them from bicycling (3%), as they were most likely to claim that a disability or physical limitation prevented them from bicycling.

TABLE 16: REASONS FOR NOT RIDING BY INCOME

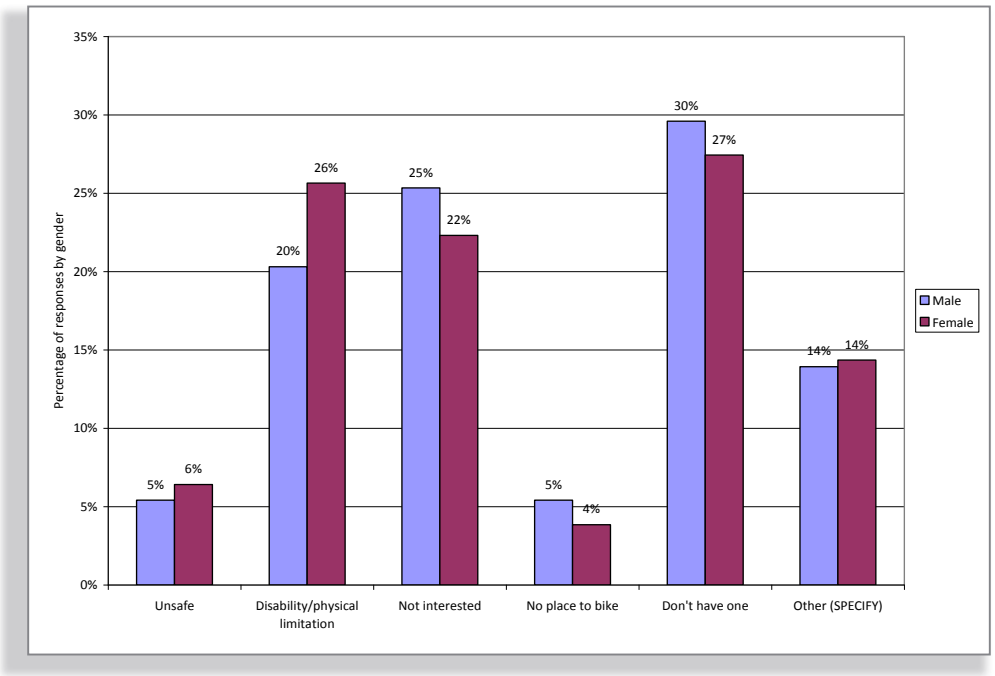
Reason	Less than $25,000		$25,000-$50,000		$50,000-$100,000		$100,000 or more		Total
Don't have one	42	24%	72	28%	105	34%	84	27%	29%
Not interested	36	21%	67	26%	83	27%	79	25%	25%
Disability/ physical limitation	60	35%	71	28%	63	20%	43	14%	22%
Unsafe	6	3%	9	4%	18	6%	27	9%	6%
No place to bike	1	1%	10	4%	13	4%	24	8%	5%
Other	28	16%	27	11%	31	10%	55	18%	13%
Total	173	100%	256	100%	313	100%	312	100%	100%

Male and female respondents were generally similar in their responses about not bicycling. Lack of a bicycle was the most common response for both, while lack of interest and disability/physical limitation followed for both men and women, although in a different order (25 percent and 20 percent for men; 22 percent and 26 percent for women, respectively).

TABLE 17: REASONS FOR NOT RIDING BY GENDER

Reason	Male		Female	
Disability/physical limitation	105	20%	200	26%
Don't have one	153	30%	214	27%
No place to bike	28	5%	30	4%
Not interested	131	25%	174	22%
Unsafe	28	5%	50	6%
Other	72	14%	112	14%
Total	517	100%	780	100%

FIGURE 6: REASONS FOR NOT RIDING A BICYCLE BY GENDER



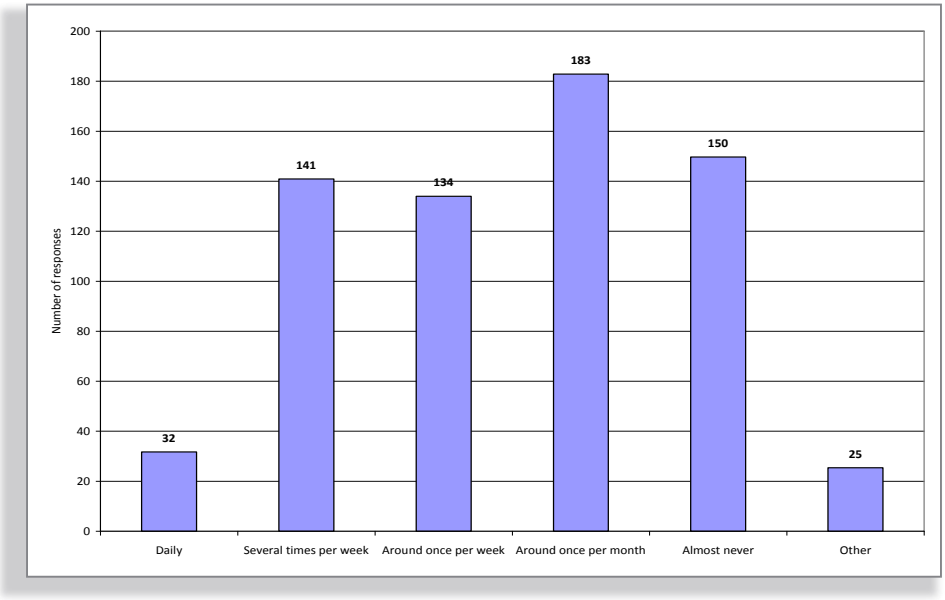
FREQUENCY OF BICYCLING

Of those respondents who were bicyclists, nearly half (46%) bicycled "around once a week" or more, an amount usually considered frequent. Five percent bicycled daily, 21 percent bicycled several times a week and 20 percent bicycled around once per week. More than half of the respondents (54%) can be considered irregular bicyclists, with 28 percent bicycling around once per month and 23 percent almost never. This indicates a fairly even split between those who bicycle frequently and those who bicycle infrequently. Of all respondents, bicyclists and non-bicyclists, only 17 percent can be considered frequent bicycle riders (once per week or more).

TABLE 18: FREQUENCY OF BICYCLE TRIPS

Frequency	Bicyclists	%	% All Respondents
Daily	32	5%	3%
Several times per week	141	21%	7%
Around once per week	134	20%	7%
Around once per month	183	28%	10%
Almost never	150	23%	8%
Other	25	4%	1%
Total	664	100%	36%

FIGURE 7: FREQUENCY OF BICYCLE TRIPS AMONG BICYCLISTS



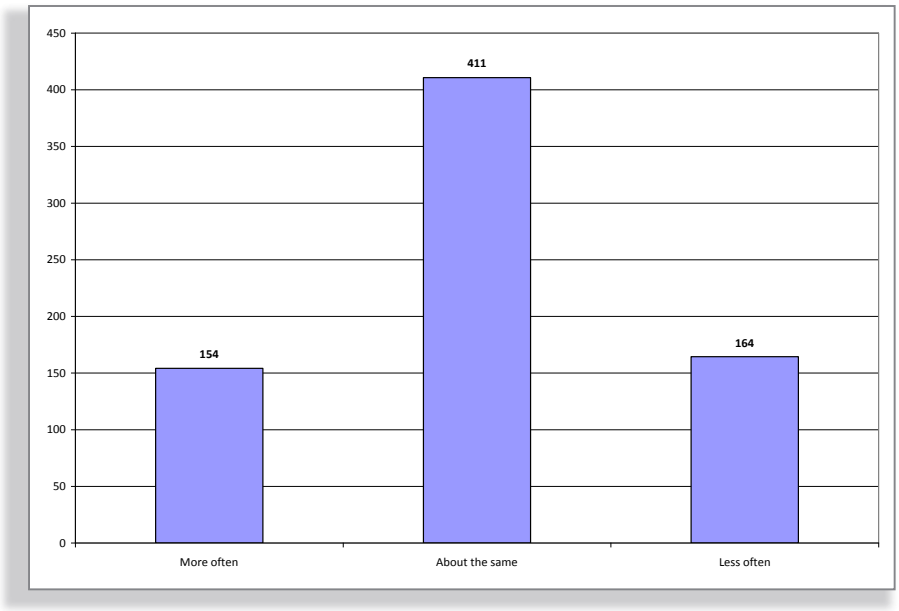
CHANGE IN BICYCLISTS' BEHAVIOR

According to the survey data, bicyclists did not report bicycling more in the current year than the previous year, as the proportion of responses of "more often" (21%) were similar to that of "less often" (23%). The majority of respondents bicycled the same amount (56%).

TABLE 19: CHANGE IN BICYCLISTS' BEHAVIOR

Compared to Last Year		
About the same	411	56%
Less often	164	23%
More often	154	21%
Total	729	100%

FIGURE 8: CHANGE IN BICYCLISTS' BEHAVIOR



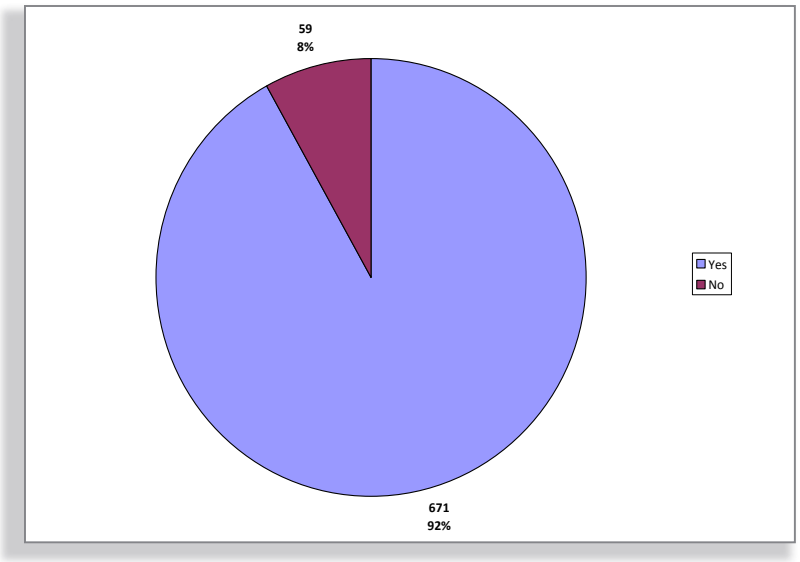
BICYCLE AVAILABILITY

Among bicyclists, 92 percent had a bicycle in their household available to use. Non-bicycle users were not asked about the availability of bicycles, although some did state that not owning a bicycle was a reason for not bicycling. Future surveys should directly ask all respondents about bicycle availability, as it would provide information on how many people have bicycles but do not ride them.

TABLE 20: BICYCLE AVAILABILITY

Availability		
Yes	671	92%
No	59	8%
Total	730	100%

FIGURE 9: BICYCLE AVAILABILITY



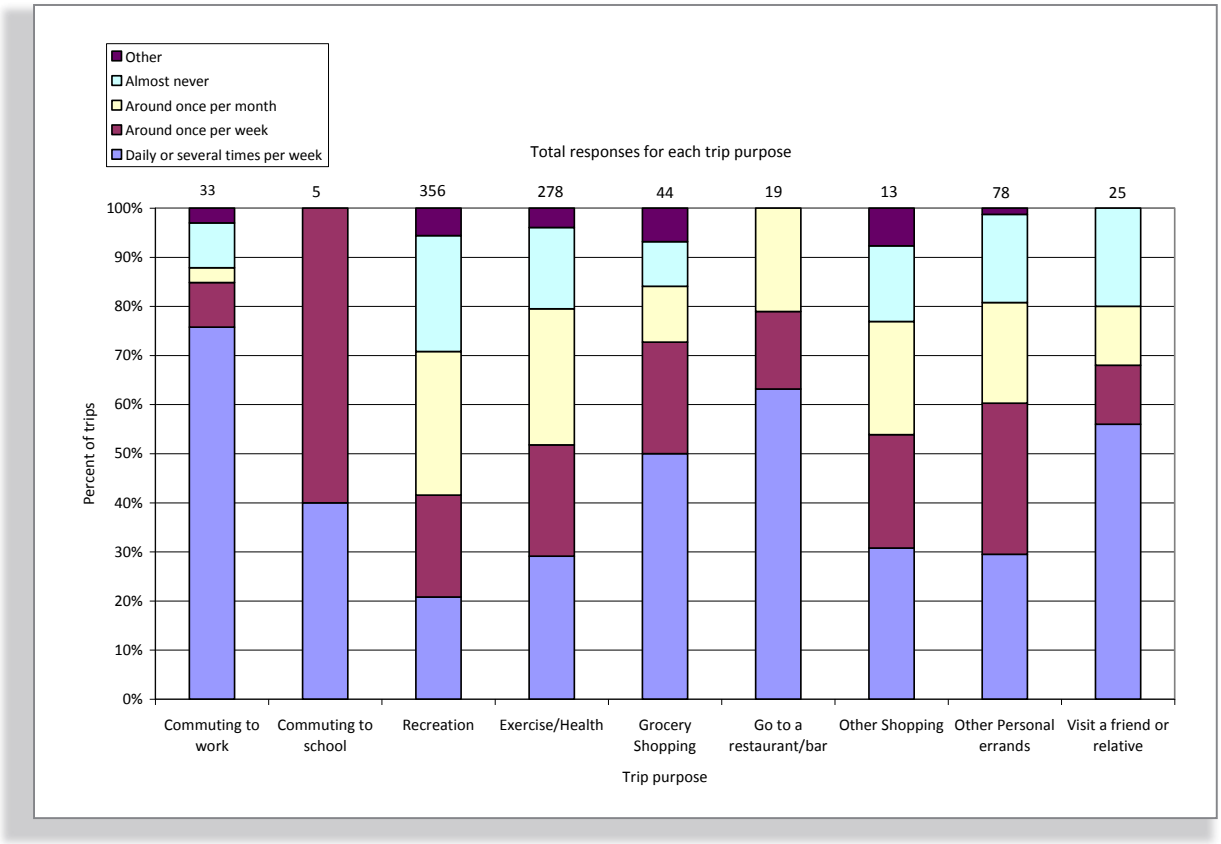
TRIP PURPOSE AND FREQUENCY

A close examination of the relationship between frequency of bicycle trips and trip purpose reveals that the most popular trip type is the one made around once per month for recreation, as this combination was the most widely reported. Generally, non-daily trips for recreation and exercise accounted for a majority (76%) of the responses. Respondents were given the option of providing up to four responses regarding their reasons for making bicycle trips, although most chose to give only one or two responses (Table 2). Table 21 and Figure 11 are based on the first two responses given.

TABLE 21: TRIP FREQUENCY BY TRIP PURPOSE

	Daily	Several times per week	Around once per week	Around once per month	Almost never	Other	Total
Recreation	14	60	74	104	84	20	356
Exercise/Health	13	68	63	77	46	11	278
Other Personal errands	6	17	24	16	14	1	78
Grocery Shopping	5	17	10	5	4	3	44
Commuting to work	6	19	3	1	3	1	33
Visit a friend or relative	0	14	3	3	5	0	25
Go to a restaurant/bar	0	12	3	4	0	0	19
Other Shopping	1	3	3	3	2	1	13
Commuting to school	0	2	3	0	0	0	5
Total	45	212	186	213	158	37	851

FIGURE 10: AMOUNT OF BICYCLING BY TRIP PURPOSE



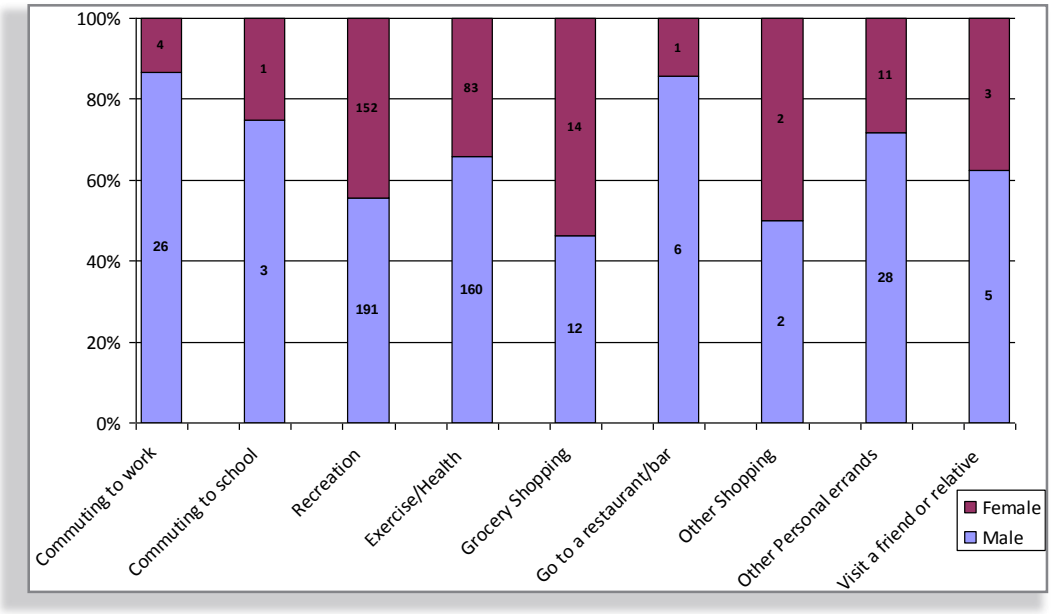
GENDER

Table 22 shows the differences between men and women regarding the purpose of their bicycling trips. Both sexes are most likely to bicycle for recreation (44% of men and 56% of women), and exercise/health (37% of men and 31% of women), with other purposes generating a few responses each. It is interesting to note that, even though there is a significant amount of overlap among what constitutes bicycling for recreation as opposed to exercise/health; men are more likely to bicycle for exercise/health, while women are more likely to bicycle for recreation. Also of note is that men appear to be much more likely to commute to work by bicycle (6%) than women (1%).

TABLE 22: REASONS FOR BICYCLING BY GENDER

	Male		Female	
	Count	%	Count	%
Commuting to work	26	6%	4	1%
Commuting to school	3	1%	1	0%
Recreation	191	44%	152	56%
Exercise/Health	160	37%	83	31%
Grocery Shopping	12	3%	14	5%
Go to a restaurant/bar	6	1%	1	0%
Other Shopping	2	0%	2	1%
Other Personal errands	28	6%	11	4%
Visit a friend or relative	5	1%	3	1%
Total	433	100%	271	100%

FIGURE 11: REASONS FOR BICYCLING BY GENDER



LAND USE AND BIKING

Land use intensity was derived by looking at land uses that were reported to be within biking distance of respondents' homes. Areas with between one and five activities were considered low intensity, those with between six and nine activities were considered medium intensity, and those with between ten and twelve were considered high intensity. Responses seem to indicate that bicycle use increases as land use intensity increases. On its face, this finding seems logical, as those who live in areas with more destinations to bicycle to would be more likely to make a bike trip. However, it might also be the case that those who actively bicycle have a better idea about what "bicycling distance" means, and are also more aware of the destinations that are within that distance. A further analysis of this finding is necessary.

TABLE 23: BICYCLE USE BY LAND USE INTENSITY

Intensity	Yes		No		Total	
	Count	%	Count	%	Count	%
Low	86	24%	267	76%	353	100%
Medium	202	33%	417	67%	619	100%
High	441	42%	604	58%	1045	100%
Total	729	36%	1288	64%	2017	100%

Figure 12: Land Use Intensity and Number of Bicyclists

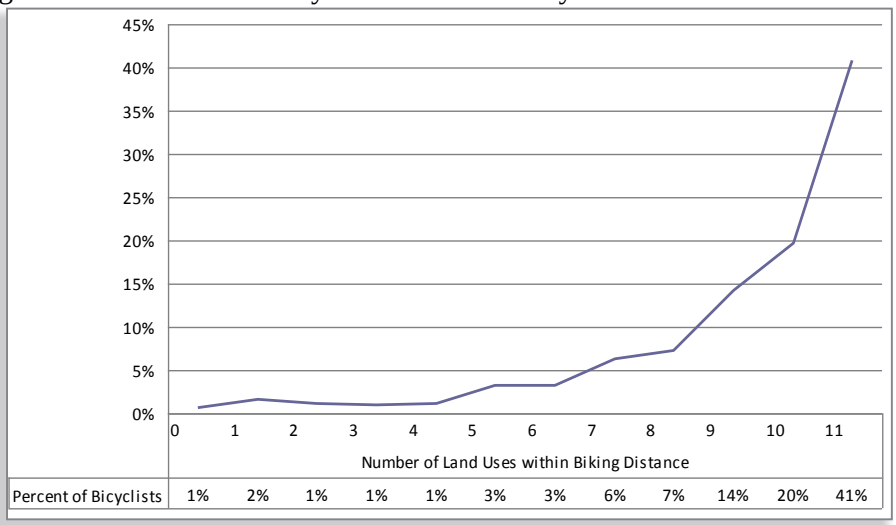
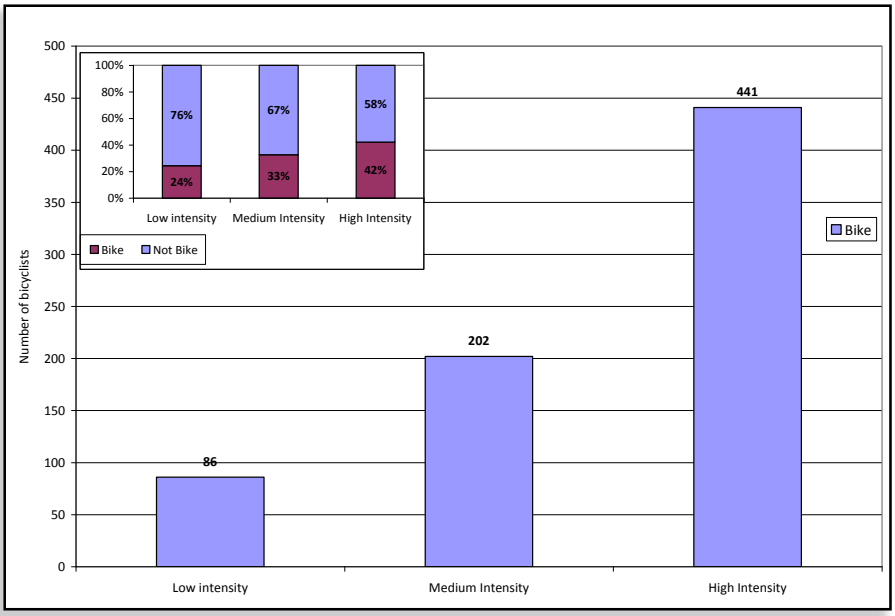


FIGURE 13: BICYCLE USE BY LAND USE INTENSITY



CHOOSING TO BICYCLE

TRANSPORTATION AVAILABILITY

Eighty percent of bicyclists had other types of transportation available to them; the primary alternatives being single personal vehicles. Transit was typically not an alternative for the reported trips. This finding is not surprising considering the high vehicle ownership rate of the sample (illustrated in Table 25) and more generally of New Jersey residents.

TABLE 24: EXISTENCE OF ALTERNATIVE MODES OF TRAVEL FOR BICYCLISTS

Available Alternative	Count	%
Yes	559	80%
No	142	20%
Total	700	100%

FIGURE 14: ALTERNATIVE MODES FOR BICYCLISTS

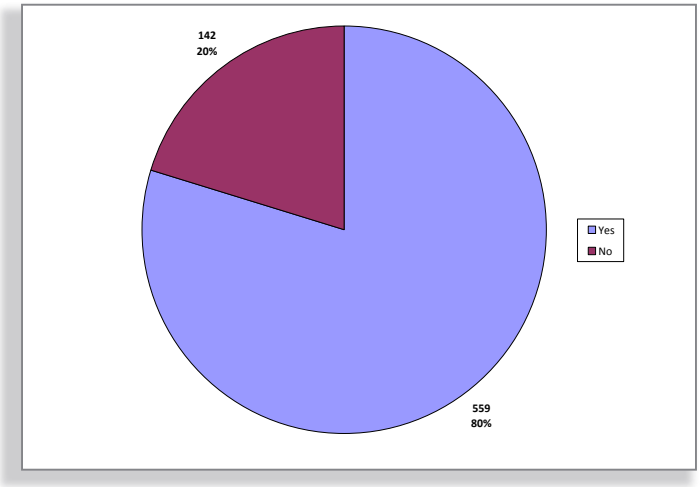
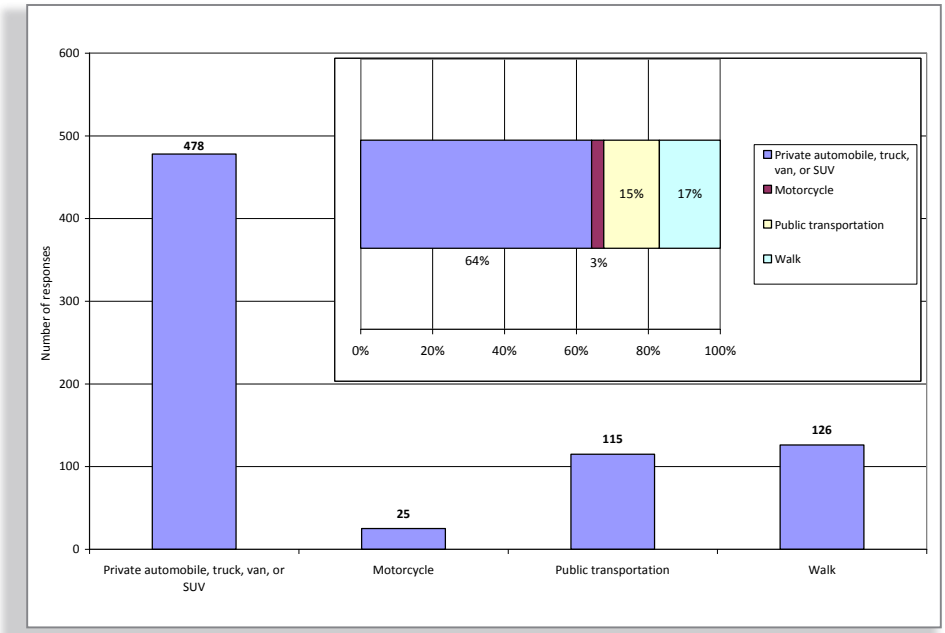


TABLE 25: TYPES OF AVAILABLE TRANSPORTATION FOR BICYCLISTS

Available Transportation Type	Count	%
Private automobile, truck, van, or SUV	478	64%
Walk	126	17%
Public transportation	115	15%
Motorcycle	25	3%
Total	744	100%

FIGURE 15: TRANSPORTATION OPTIONS FOR BICYCLISTS



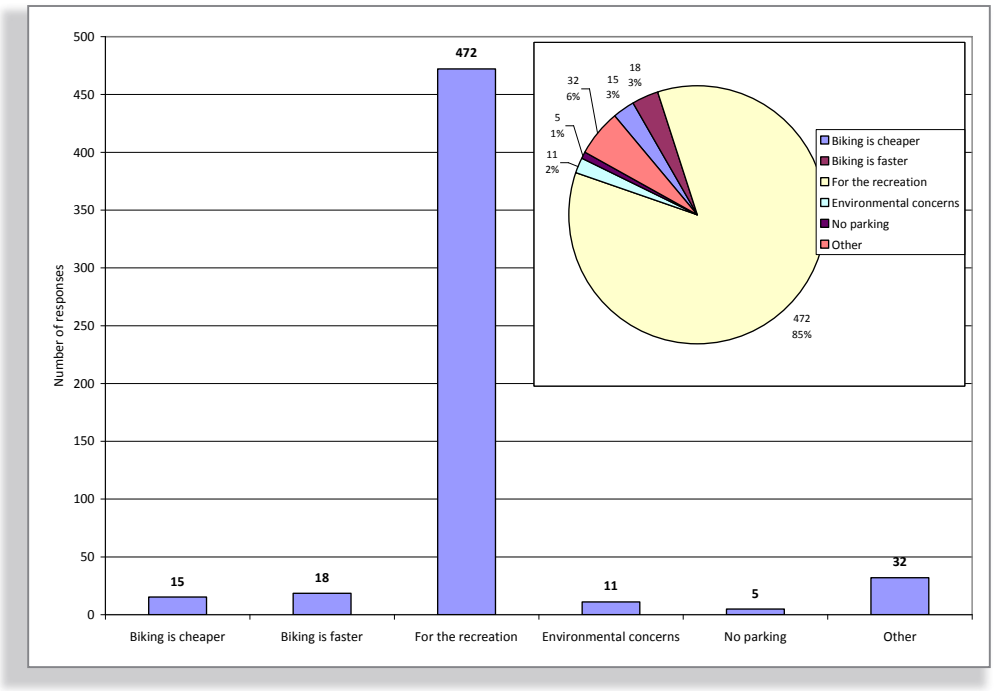
CHOOSING TO BICYCLE

Even when bicycling for commuting purposes, errands, etc; the primary motivation to bicycle is for exercise, enjoyment, and recreation. These were the primary motivations for every bicycling trip, regardless of trip purpose. This illustrates that bicycling provides a sense of well being and the benefit of exercise even for utilitarian trips.

TABLE 26: REASON FOR CHOOSING TO BICYCLE

Reason		
For the exercise/recreation/enjoy biking	472	85%
Biking is cheaper	15	3%
Biking is faster	18	3%
Environmental concerns	11	2%
No parking for cars	5	1%
Other	32	6%
Total	553	100%

FIGURE 16: REASONS FOR CHOOSING TO BICYCLE



TRIP PURPOSE AND CHOOSING TO BICYCLE

FIGURE 17: TRIP PURPOSE AND CHOOSING TO BICYCLE

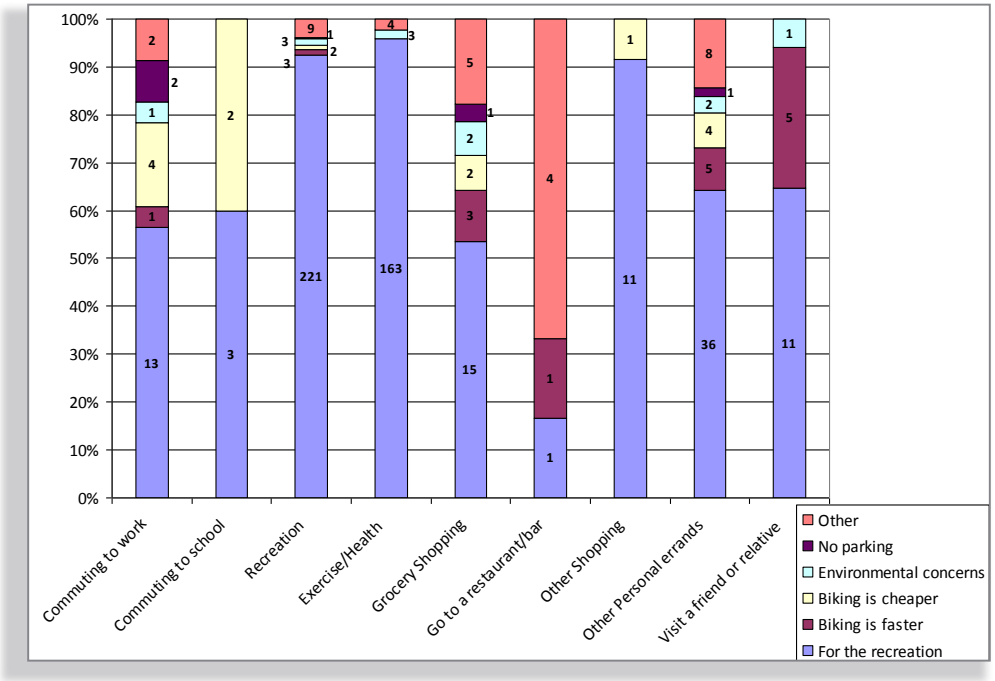


TABLE 27: TRIP PURPOSE AND CHOOSING TO BICYCLE

Trip Purpose	Biking is cheaper	Biking is faster	For recreation/ enjoyment	Environmental concerns	No parking	Other	Total
Recreation	2	3	221	3	1	9	239
Exercise/Health	0	0	163	3	0	4	170
Other Personal errands	4	5	36	2	1	8	56
Grocery Shopping	2	3	15	2	1	5	28
Commuting to work	4	1	13	1	2	2	23
Visit a friend or relative	0	5	11	1	0	0	17
Other Shopping	1	0	11	0	0	0	12
Go to a restaurant/bar	0	1	1	0	0	4	6
Commuting to school	2	0	3	0	0	0	5
Total	15	18	474	12	5	32	556

QUESTIONS ON SAFETY

Ninety percent of bicyclists perceive bicycling as safe. However, it is important to note that the bicyclists surveyed were considering this question in relation to their exposure and experience. Since most respondents bicycled for recreation, they had a safe route and time of day in mind. We notice that when bicycle commuters are isolated, only 77 percent feel safe biking compared to 92 percent for overall bicyclists (Table 29). This indicates that biking for commuting may be less safe as it is more likely to be on roads with automobile traffic, whereas recreational bicycle riding may largely take place on separated paths, parks, or in residential neighborhoods. Those that felt unsafe while biking were also given the opportunity to provide several responses as to what made them feel that way. The most popular response was “the way people drive” (47%), followed by “uneven surfaces” (32%). Respondents were also given the option of providing an alternate response, as shown in Table 32.

When asked how safe one feels biking in his or her neighborhood (Table 30), the majority of respondents feel “very safe” (58%) or somewhat safe (29%). Only 13 percent of respondents do not feel safe while bicycling (either “somewhat unsafe” or “very unsafe”). Notions of safety tend to decline after dark, as bicyclists feel less safe overall, although the majority of respondents still reported feeling safe (26% “very safe” and 26% “somewhat safe”). Thirty-eight percent of bicyclists feel either “somewhat unsafe” or “very unsafe” when bicycling after dark and ten percent do not bicycle after dark at all. Also, women feel less safe biking after dark than men: 57 percent of men reported feeling either “very safe” (31%) or

"somewhat safe" (26%) biking after dark, while only 45 percent of women had similar feelings (19% felt "very safe", 26 % felt "somewhat safe").

TABLE 28: PERCEPTION OF THE SAFETY OF BICYCLING, ALL BICYCLISTS

Perception	Count	%
Safe	625	90%
Unsafe	73	10%
Total	697	100

TABLE 29: PERCEPTION OF THE SAFETY OF BICYCLING, BICYCLE COMMUTERS ONLY

Perception	Count	%
Safe	28	77%
Unsafe	8	23%
Total	36	100%

FIGURE 18: PERCEPTION OF THE SAFETY OF BICYCLING

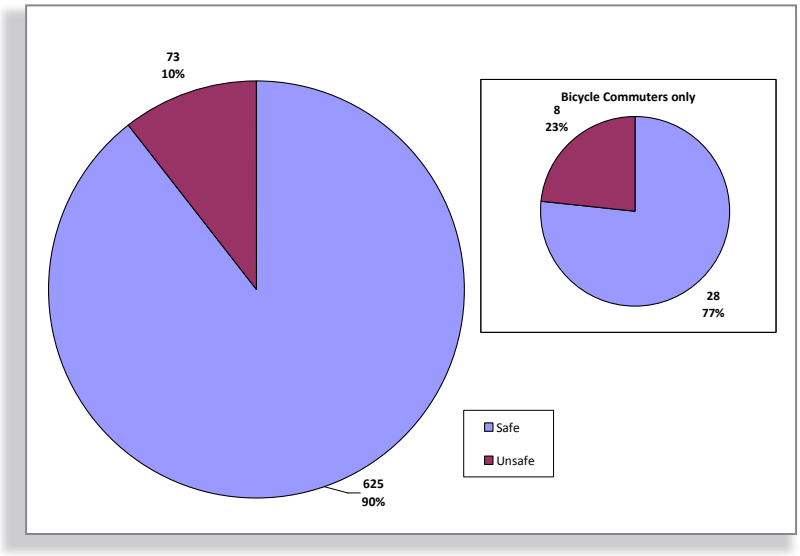


TABLE 30: SAFETY OF NEIGHBORHOOD FOR BICYCLING (BICYCLISTS ONLY)

Perception		
Very Safe	423	58%
Somewhat Safe	211	29%
Somewhat Unsafe	62	9%
Very Unsafe	30	4%
Total	727	100%

FIGURE 19: SAFETY OF NEIGHBORHOOD FOR BICYCLING (BICYCLISTS ONLY)

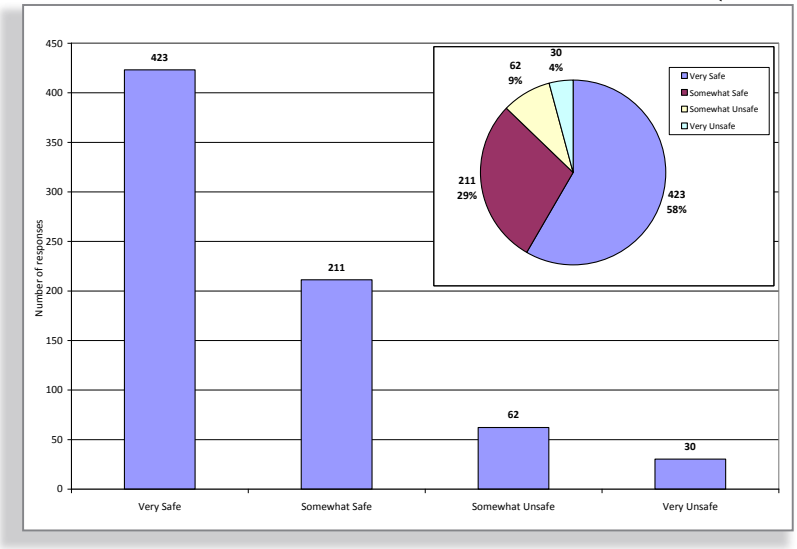


TABLE 31: REASONS FOR FEELING UNSAFE

Reason	Count	%
The way people drive	61	47%
Uneven roadway /path/trail surfaces	41	32%
Too much bicycle or pedestrian traffic	12	9%
Dogs or other animals	8	6%
The potential for crime	7	5%
Total	129	100%

TABLE 32: ALTERNATE REASONS FOR FEELING "UNSAFE"

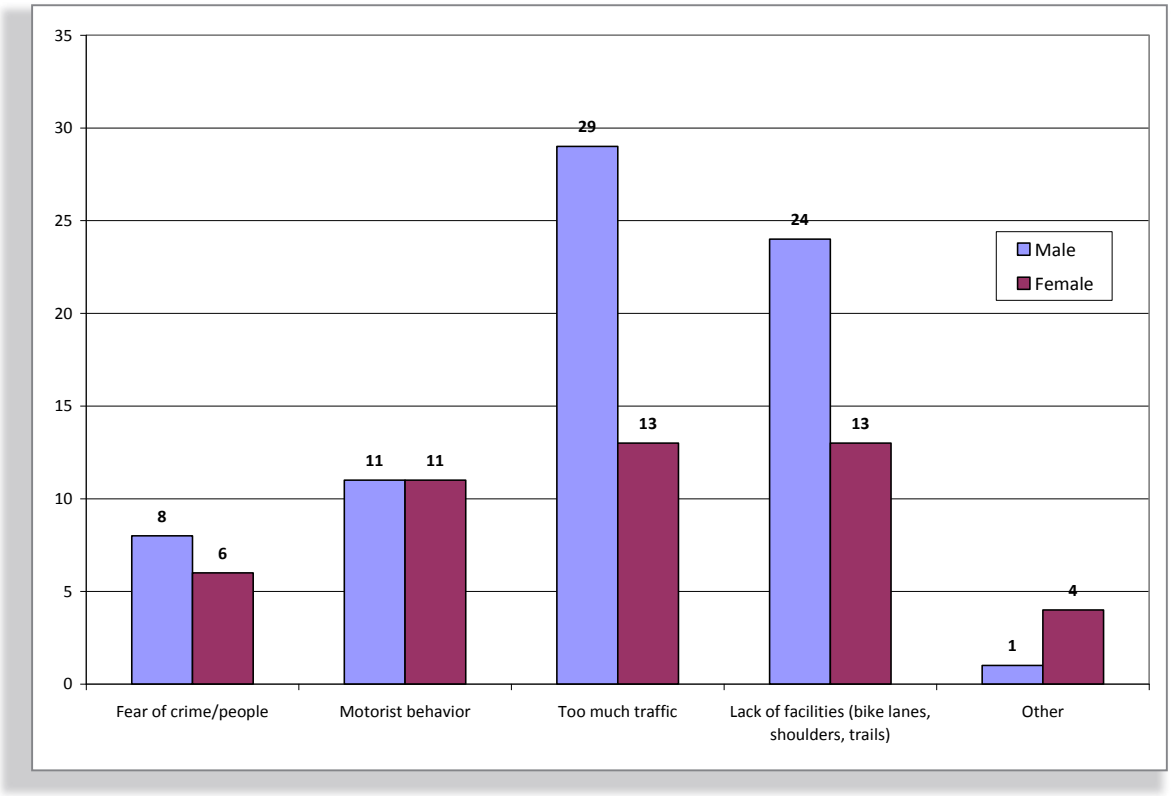
• Drivers driving too fast	• There are hills and bears
• I live across a major highway	• Very narrow, up and down hills
• Lack of sidewalks	• We have bears
• Lighting	• Careless motor vehicle drivers
• Loose dogs running around	• No shoulders
• Narrow mountainous roads	• Too much risk
• Narrow roads and traffic	• Not enough sidewalks
• The community is bad, especially from Bloomfield Ave and North.	

BICYCLISTS' PERCEPTION OF NEIGHBORHOOD BY GENDER

TABLE 33: PERCEPTION OF NEIGHBORHOOD SAFETY BY GENDER

Safety Issue	Male	%	Female	%	Total	%
Too much traffic	29	40%	13	28%	42	35%
Lack of facilities (i.e., bike lanes, shoulders, trails)	24	33%	13	28%	37	31%
Motorist behavior	11	15%	11	23%	22	18%
Fear of crime/fear of threatening people	8	11%	6	13%	14	12%
Other	1	1%	4	9%	5	4%
Total	73	100%	47	100%	120	100%

FIGURE 20: PERCEPTION OF NEIGHBORHOOD SAFETY BY GENDER

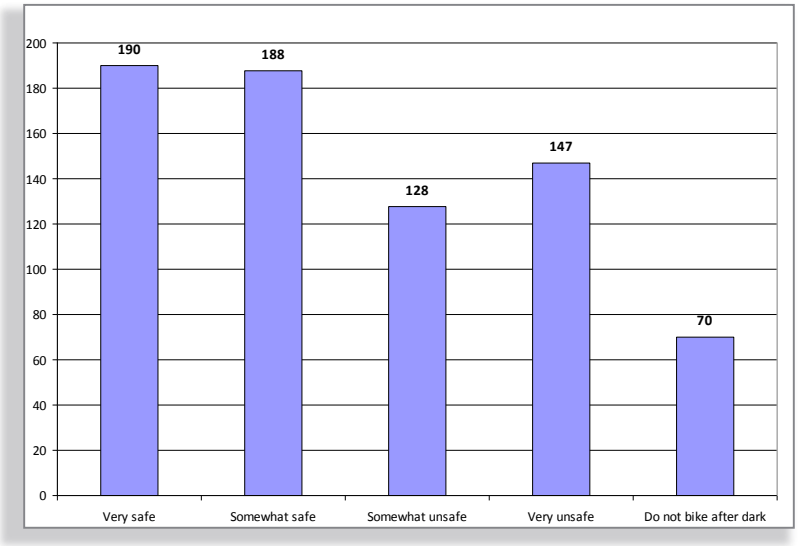


BICYCLING AFTER DARK

TABLE 32: SAFETY AFTER DARK

Perceived Safety		
Very safe	190	26%
Somewhat safe	188	26%
Somewhat unsafe	128	18%
Very unsafe	147	20%
Do not bike after dark	70	10%
Total	722	100%

FIGURE 21: SAFETY AFTER DARK

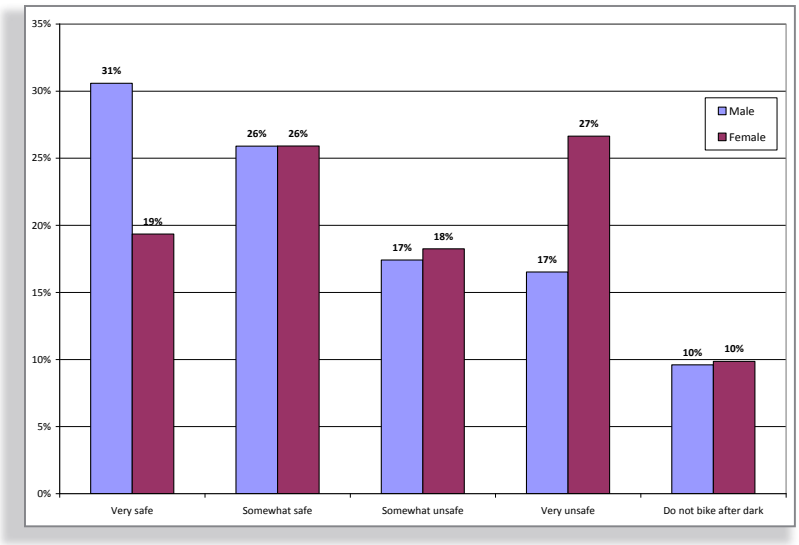


BIKING AFTER DARK BY GENDER

TABLE 33: SAFETY AFTER DARK BY GENDER

	Male	%	Female	%	Total
Very safe	137	31%	53	19%	190
Somewhat safe	116	26%	71	26%	187
Somewhat unsafe	78	17%	50	18%	128
Very unsafe	74	17%	73	27%	147
Do not bike after dark	43	10%	27	10%	70
Total	448	100%	274	100%	722

FIGURE 22: SAFETY AFTER DARK BY GENDER



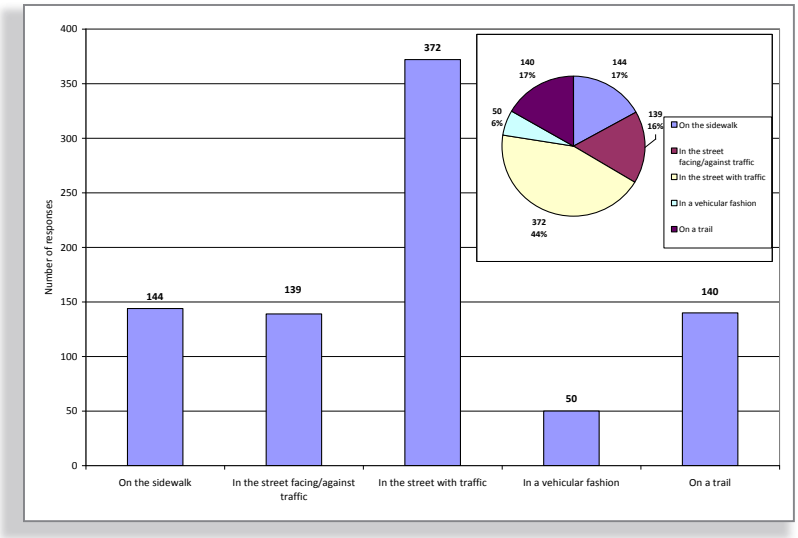
BIKING BEHAVIOR

A large proportion of trips take place in the street with traffic (44%), while only 17 percent take place on trails. This is surprising considering the high proportion of trips taken for recreational or exercise related purposes. However, streets used by the bicyclists could largely include residential streets since arterial and collector roads in New Jersey rarely provide bike lanes.

TABLE 34: BIKING BEHAVIOR

Behavior	Count	%
In the street with traffic	372	44%
On the sidewalk	144	17%
On a trail	140	17%
In the street facing/against traffic	139	16%
In a vehicular fashion	50	6%
Total	845	100%

FIGURE 23: BIKING BEHAVIOR



NEED FOR IMPROVEMENT

When asked whether or not their community needed to make any changes for bicyclists, respondents were allowed to give multiple responses. Generally, respondents found bicycle lanes on paved roads to be the most needed improvement (73% of bicyclists and 81% of bicycling commuters) and better enforcement and policing of crime areas the least pressing (32% of bicyclists and 39% of bicycling commuters). Respondents who bicycled for commuting purposes felt more strongly about improvements than all bicyclists, especially when it came to paved lanes and roads, although the results for both groups are very similar.

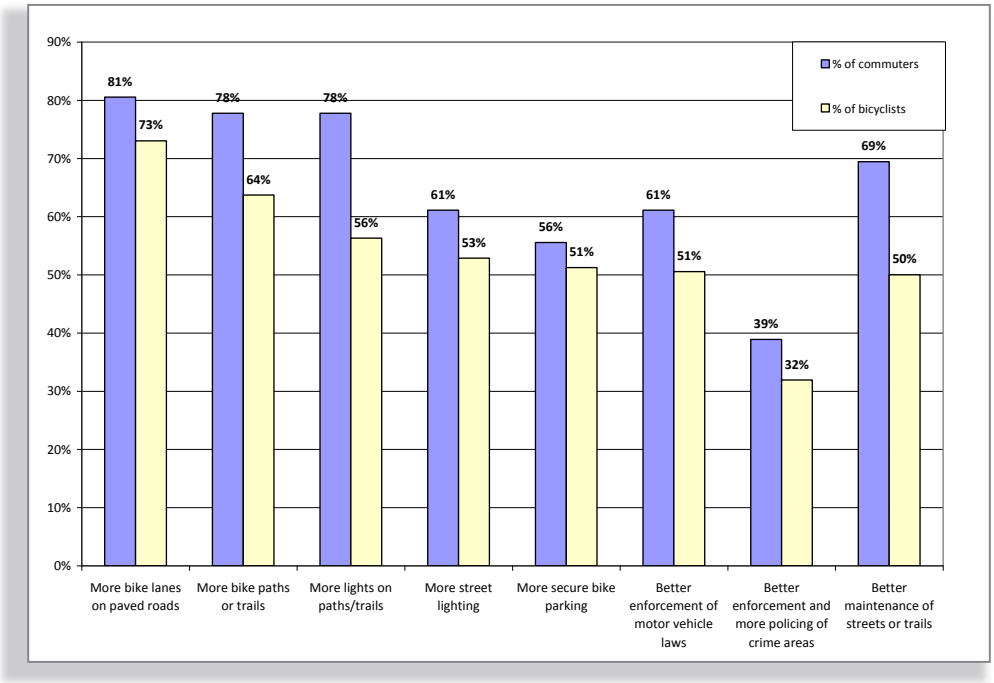
TABLE 35: DESIRED IMPROVEMENTS (BICYCLING COMMUTERS ONLY)

Improvement	Count	%
More bike lanes on paved road?	29	81%
More bike paths or trails?	28	78%
More lights on paths/trails?	28	78%
More street lighting?	22	61%
More secure bike parking?	20	56%
Better enforcement of motor vehicle laws?	22	61%
Better enforcement and more policing of crime areas?	14	39%
Better maintenance of streets or trails?	25	69%

TABLE 36: DESIRED IMPROVEMENTS (ALL BICYCLISTS)

Improvement	Count	%
More bike lanes on paved roads?	533	73%
More bike paths or trails?	465	64%
More lights on paths/trails?	411	56%
More street lighting?	386	53%
More secure bike parking?	374	51%
Better enforcement of motor vehicle laws?	369	51%
Better enforcement and more policing of crime areas?	233	32%
Better maintenance of streets or trails?	365	50%

FIGURE 24: DESIRED IMPROVEMENTS



BICYCLING BY MONTH

This question exposes a fundamental flaw in the survey. While trips peak in the late summer/early fall months, respondents were asked "In what month was your last bicycle trip?" This would logically be closer to the date the survey was conducted and would not include months more than 6 months prior to the survey date.

TABLE 37: BICYCLING BY MONTH

Month	Count	%
April	6	2%
May	3	1%
June	23	7%
July	31	9%
August	103	29%
September	105	29%
October	71	20%
November	14	4%
Total	358	100%

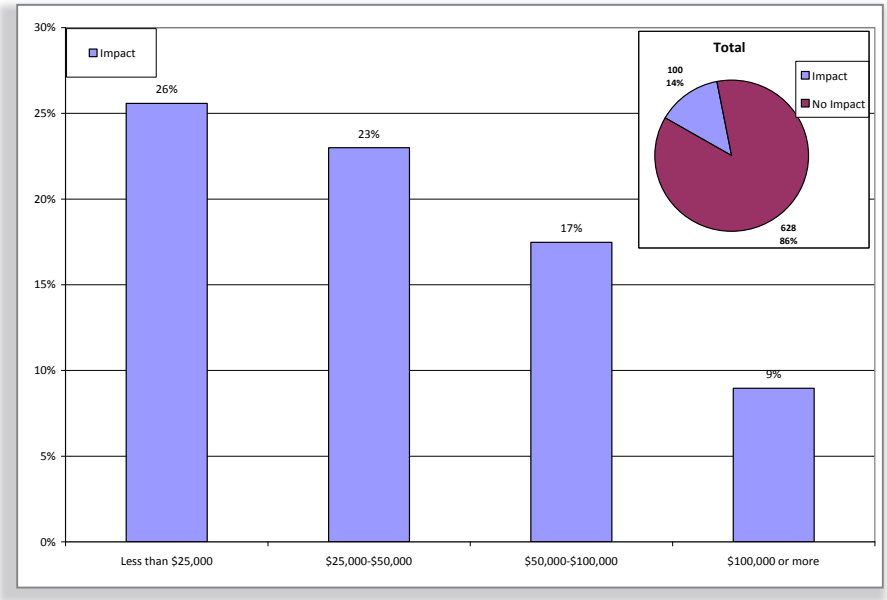
IMPACT OF GAS PRICE INCREASE

Fourteen percent of bicyclists reported that increased gas prices caused them to bicycle more. This percentage is relatively large given that only four percent of bicyclists overall were bicycling for utilitarian purposes. When considering respondents' income, there is a noticeable rise in the effect of gas prices on the decision to bicycle more. Twenty-six percent of respondents earning less than $25,000 reported biking more due to increased gas prices, only 9 percent of those earning $100,000 or more reported the same.

TABLE 38: IMPACT OF GAS PRICE

Impact	Count	%
Yes	100	14%
No	628	86%
Total	727	100

FIGURE 25: IMPACT OF GAS PRICES



IMPACT OF GAS PRICE BY INCOME

TABLE 39: IMPACT OF GAS PRICES BASED ON INCOME

	Impact	%	No	%	Total
Less than $25,000	11	26%	32	74%	43
$25,000-$50,000	20	23%	67	77%	87
$50,000-$100,000	36	17%	170	83%	206
$100,000 or more	25	9%	254	91%	279
Total	92	15%	523	85%	615

ORIGIN AND DESTINATION

Ninety-three percent of bicycle trips begin and end in the same location, indicating the recreational nature of the trips. Additionally, 78 percent of bicycle trips start at the home and 6 percent at a park or field.

TABLE 40: ORIGIN AND DESTINATION

Origin and Destination the same	650	93%
Origin and Destination different	52	7%
Total	702	100%

TABLE 41: BICYCLE TRIP ORIGINS

Origin	Count	%
Home	548	78%
Park/Field	45	6%
Friend or relative's home	29	4%
Trail	17	2%
Train/subway/ bus station	5	1%
Car	10	1%
Restaurant	5	1%
Work	5	1%
School/Campus	8	1%
Mall/Strip Mall/Shopping Center	6	1%
Grocery Store/Drug Store/Convenience Store	2	0%
Other	20	3%
Total	699	100%

TRIP DISTANCE

Trip distance was determined by geocoding responses to a question regarding the beginning and ending point of the most recent trip. However, because 70 percent of trips were "origin to origin," i.e., beginning and ending in the same place, it was impossible to determine their length. Fourteen percent of all reported trips were less than 8000 feet (approximately 1.5 miles), nine percent were more than 16,000 feet (approximately 3 miles) and seven percent were somewhere in between.

Respondents were also asked to provide an estimate for the distance of their most recent trip. Forty-three percent of respondents reported that their trip was 3-9 miles, 32 percent reported that it was less than two miles, 16 percent reported a trip of 10-19 miles and the remaining nine percent traveled 20 or more miles on their most recent trip.

TABLE 42: TRIP DISTANCE ESTIMATED BY GIS

Trip Distance	Count	%
Origin to origin trip (distance = 0 miles)	235	70%
Less than 8,000 feet (1.5 miles)	48	14%
8,000 feet-15,999 feet (3 miles)	24	7%
More than 16,000 feet	31	9%
Total	338	100%

FIGURE 26: TRIP DISTANCE ESTIMATED BY GIS

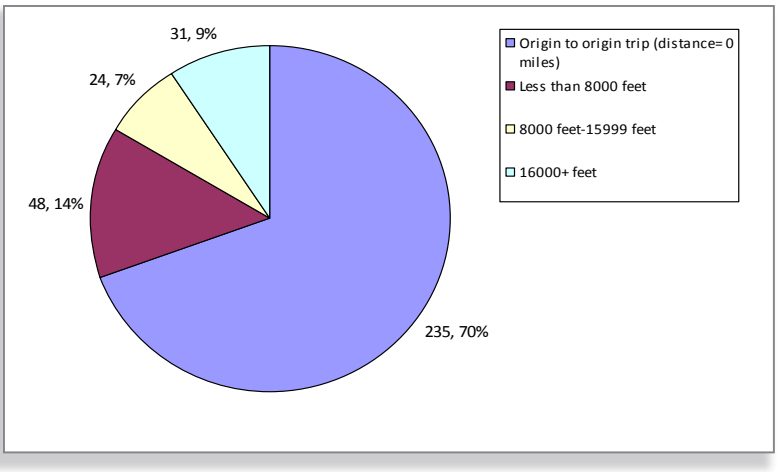
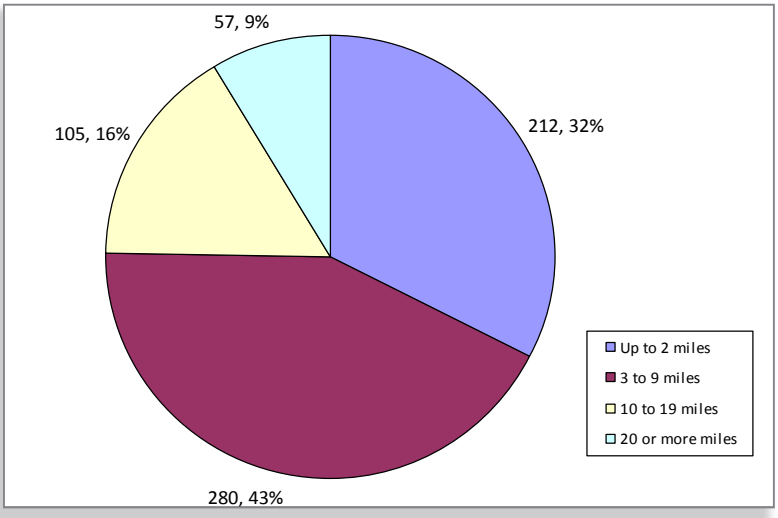


TABLE 43 : SELF REPORTED TRIP DISTANCE

Trip Distance		
Up to 2 miles	212	32%
3 to 9 miles	280	43%
10 to 19 miles	105	16%
20 or more miles	57	9%
Total	654	100%

MEDIAN: 4 miles

FIGURE 27: SELF-REPORTED TRIP DISTANCE



DURATION OF TRIP

The distribution of trip time fits well with our finding that the majority of trips are for recreational purposes. Responses are skewed towards longer trips, as 74 percent of trips are at least 30 minutes. Twenty-eight percent are between 30 and 59 minutes, 23 percent are between 60 and 89 minutes, and 23 percent are 90 minutes or more. Only 26 percent of trips are less than 30 minutes (14% are 15-29 minutes and 12% are 0-14minutes). Trip times are similar for men and women, although women more often reported that their last trip was more than 30 minutes (77% and 72%, respectively).

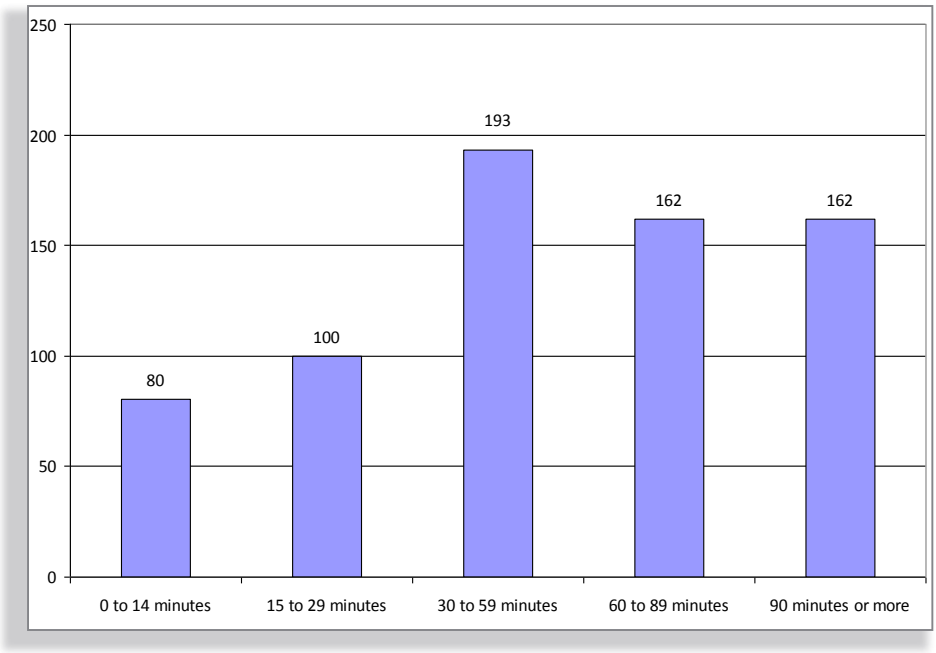
Examining trip times in relation to trip purpose shows us that the propensity for people to bicycle for exercise and recreation weighs heavily on the trip duration, as trips made for those purposes are generally meant to be enjoyed and thus last longer. The number of respondents reporting that their last bicycle trip was for exercise/health peaked at the 30-59 minute trip length range, whereas those reporting for recreation peaked at the 60-89 minutes range. This finding suggests that people take longer trips for recreational purposes than for exercise/health. Although the number of responses from bicycle commuters was low, it was interesting to see that the majority of bicycle trips to work took less than the 30 minutes that commuters average across all modes in New Jersey.[2]

TABLE 44: TIME OF TRIP

Length	Count	%
0 to 14 minutes	80	12%
15 to 29 minutes	100	14%
30 to 59 minutes	193	28%
60 to 89 minutes	162	23%
90 minutes or more	162	23%
Total	697	100%

[2] 2006-2008 American Community Survey 3-Year Estimates, www.census.gov

FIGURE 28: TIME OF TRIP

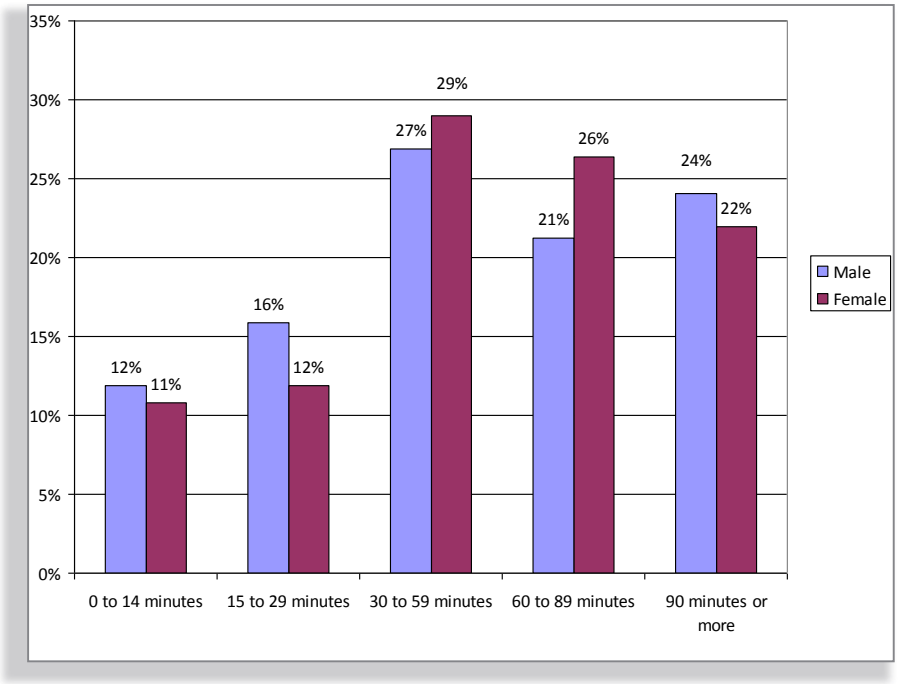


TIME OF TRIP BY GENDER

TABLE 45: TIME OF TRIP BY GENDER

	Male	%	Female	%	Total
0 to 14 minutes	51	12%	29	11%	80
15 to 29 minutes	68	16%	32	12%	100
30 to 59 minutes	115	27%	78	29%	193
60 to 89 minutes	91	21%	71	26%	162
90 minutes or more	103	24%	59	22%	162
Total	428	100%	269	100%	697

FIGURE 29: TIME OF TRIP BY GENDER

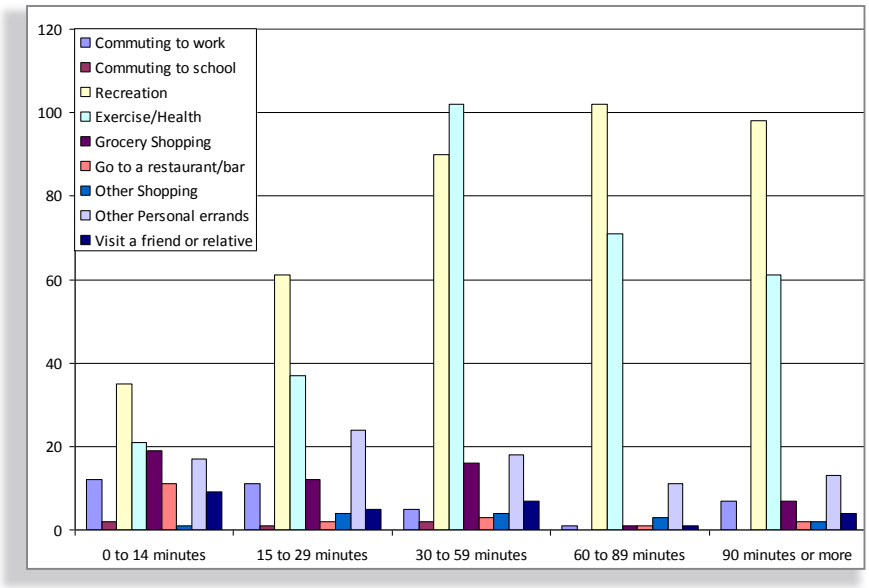


TRIP TIME BY TRIP PURPOSE

TABLE 46: TIME OF TRIP BY TRIP PURPOSE

	0 to 14 minutes	15 to 29 minutes	30 to 59 minutes	60 to 89 minutes	90 minutes or more	Total
Recreation	35	61	90	102	98	386
Exercise/Health	21	37	102	71	61	292
Other Personal errands	17	24	18	11	13	83
Grocery Shopping	19	12	16	1	7	55
Commuting to work	12	11	5	1	7	36
Visit a friend or relative	9	5	7	1	4	26
Go to a restaurant/bar	11	2	3	1	2	19
Other Shopping	1	4	4	3	2	14
Commuting to school	2	1	2	0	0	5
Total	127	157	247	191	194	916

FIGURE 30: TIME OF TRIP BY TRIP PURPOSE



CHILDREN

TRIPS TO SCHOOL

School buses and private automobiles provide the primary modes of transportation for children, with school bus being the most frequent. Only two percent of respondents reported allowing their oldest child to bike to school, and only one percent for the youngest child. It is interesting to note that "walk" has significantly more responses than "ride bicycle." For future surveys, it may be worth asking whether parents accompany children on their trips to school, as parents might be more willing to walk than to ride a bicycle with their children. Furthermore, when asked why their child does not bike, distance and traffic/no bicycle route were the predominant explanations.

TABLE 47: TRAVEL MODE TO SCHOOL: ONLY CHILD

Travel Mode	Count	&
School Bus	101	36%
Parent or other adult drives them to school	100	36%
Walk	48	17%
Public Transportation	7	3%
Ride Bike	7	2%
Other	16	6%
Total	279	100%

TABLE 48: TRAVEL MODE TO SCHOOL: YOUNGEST CHILD

Travel Mode	Count	%
Walk	71	16%
Ride Bike	4	1%
School Bus	192	43%
Public Transportation	3	1%
Parent or other adult drives them to school	172	39%
Other	1	0%
Total	442	100%

TABLE 49: TRAVEL MODE TO SCHOOL: OLDEST CHILD

Travel Mode	Count	%
Walk	81	17%
Ride Bike	9	2%
School Bus	206	43%
Public Transportation	5	1%
Parent or other adult drives them to school	161	33%
Other	21	4%
Total	483	100%

FIGURE 31: TRAVEL MODES FOR CHILDREN, SCHOOL TRIPS

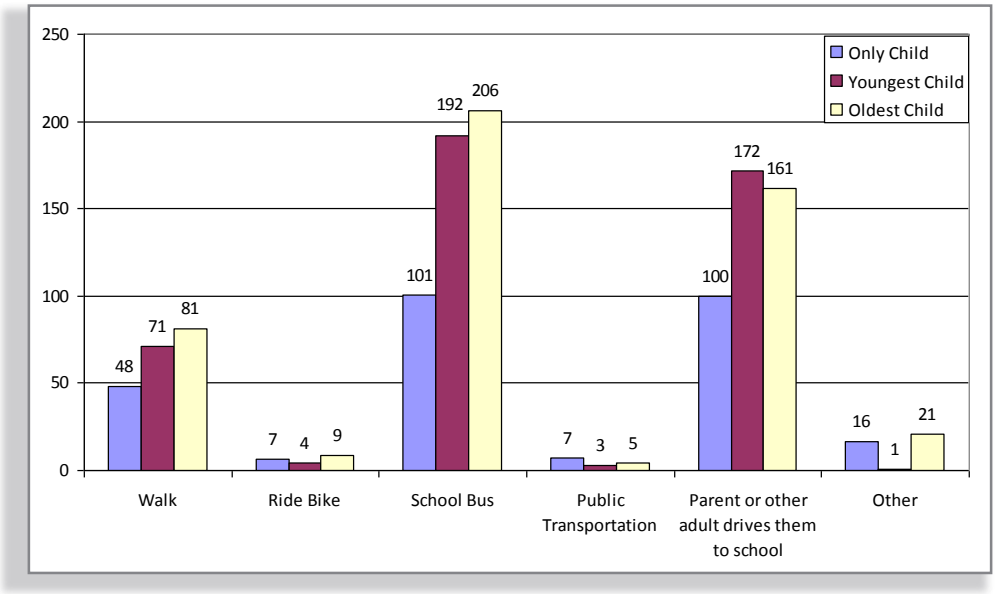


TABLE 50: WHY CHILDREN DON'T BIKE TO SCHOOL: ONLY CHILD

Reason	Count	%
School is too far away	82	30%
Too much traffic and no safe biking	40	15%
Fear of child being abducted	12	4%
Not convenient for child to bike	30	11%
Crime in your neighborhood	1	0%
Your child/children do not want to bike	17	6%
School policy against biking to school	2	1%
School provides busing	7	3%
Child would rather walk	11	4%
Other	72	26%
Total	274	100%

TABLE 51: WHY CHILDREN DON'T BIKE TO SCHOOL: YOUNGEST CHILD

Reason	Count	%
School is too far away	130	28%
Too much traffic and no safe biking	85	18%
Fear of child being abducted	24	5%
Not convenient for child to bike	41	9%
Crime in your neighborhood	1	0%
Your child/children do not want to bike	4	1%
School policy against biking to school	17	4%
School provides busing	15	3%
Child would rather walk	13	3%
Other	131	28%
Total	461	100%

TABLE 52: WHY CHILDREN DON'T BIKE TO SCHOOL: OLDEST CHILD

Reason	Count	%
School is too far away	175	35%
Too much traffic and no safe biking	81	16%
Fear of child being abducted	21	4%
Not convenient for child to bike	51	10%
Crime in your neighborhood	2	0%
Your child/children do not want to bike	19	4%
School policy against biking to school	12	2%
School provides busing	18	4%
Child would rather walk	18	4%
Other	96	19%
Total	493	100%

BICYCLING OUTDOORS

Respondents were also asked about the bicycling habits of their children. Whereas the responses regarding one's own habits were generally spread out evenly among the frequency options, it seems that children are of two groups: those that ride a lot and those that rarely ride. The majority of respondents (56%) reported that their children ride at least once a week, while 40 percent reported that their children ride about once a month or not at all. Similar to the respondent's reasons for bicycling, children used their bicycles mainly for recreation/health/exercise as well as general play (41% and 43%, respectively).

TABLE 53: FREQUENCY OF CHILDREN BIKING OUTDOORS

Frequency	Count	%
Daily	117	14%
Several times per week	216	26%
Once per week	118	14%
Once per month	105	13%
Almost never	220	27%
Other	53	6%
Total	829	100%

FIGURE 32: FREQUENCY OF BICYCLING OUTDOORS, CHILDREN

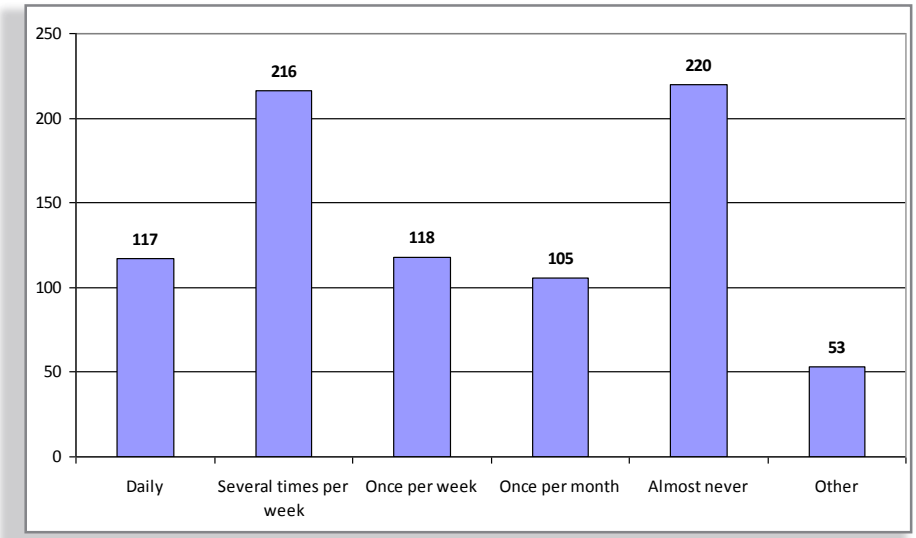
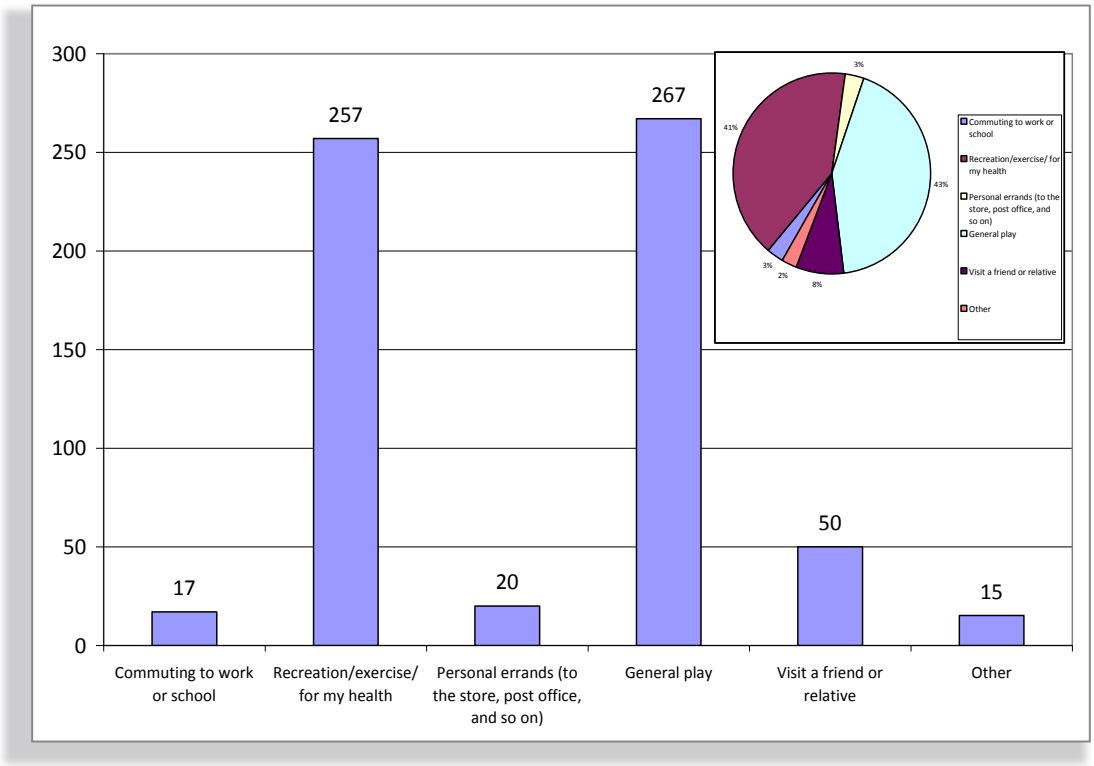


TABLE 54: WHY CHILDREN BIKE OUTDOORS

Reason	Count	%
General play	267	43%
Recreation/exercise/ for my health	257	41%
Visit a friend or relative	50	8%
Commuting to work or school	17	3%
Personal errands (to the store, post office, and so on)	20	3%
Other	15	2%
Total	626	100%

FIGURE 33: WHY CHILDREN BIKE OUTDOORS



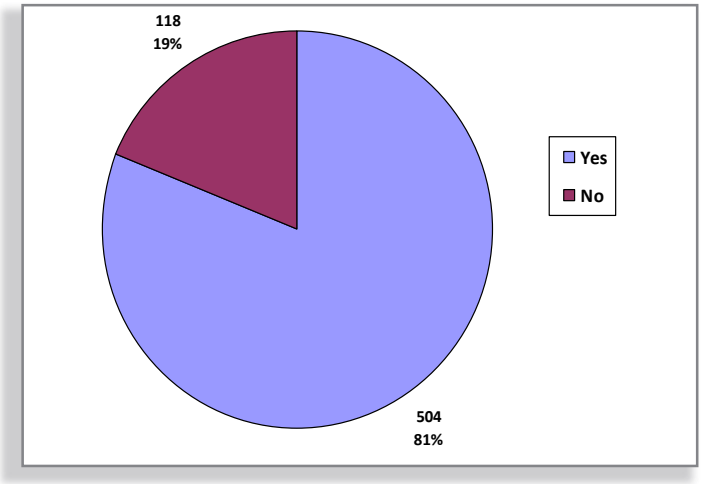
HELMET USE

A vast majority of respondents reported that their children use a helmet when riding a bicycle. Responses to questions about helmet use may be subject to some bias, as the associated safety issues may persuade respondents to report that their children use helmets, whether they actually do or not.

TABLE 55: HELMET USE BY CHILDREN

	Count	%
Yes	504	81%
No	118	19%
Total	622	100%

FIGURE 34: HELMET USE BY CHILDREN



BICYCLE USE BY COUNTY

The number of bicyclists is generally spread evenly across all 21 counties in the state. There may be a link between how congested the roadways are, since most bicycling is elective recreational/exercise trips on-road with vehicular traffic. Sample size is too small for some of the counties, and so data should be interpreted carefully. Further research is needed in this area.

TABLE 56: BICYCLE USE BY COUNTY

County	Yes	Yes%	No	No%	Total
Atlantic	29	45%	36	55%	65
Bergen	89	40%	131	60%	220
Burlington	50	46%	59	54%	109
Camden	28	33%	58	67%	86
Cape May	14	50%	14	50%	28
Cumberland	19	41%	27	59%	46
Essex	70	34%	138	66%	208
Gloucester	19	26%	55	74%	74
Hudson	62	39%	96	61%	158
Hunterdon	7	23%	23	77%	30
Mercer	23	31%	51	69%	74

County	Yes	Yes%	No	No%	Total
Middlesex	34	23%	113	77%	147
Monmouth	47	34%	93	66%	140
Morris	54	47%	60	53%	114
Ocean	42	32%	91	68%	133
Passaic	43	44%	55	56%	98
Salem	9	39%	14	61%	23
Somerset	23	35%	43	65%	66
Sussex	18	43%	24	57%	42
Union	43	32%	90	68%	133
Warren	7	28%	18	72%	25
Total	730	36%	1289	64%	2019

NEXT STEPS

The basic data analysis in this report provides some useful information about bicycling in New Jersey. However, the discussion also exposes several areas in which further data collection would be necessary in the future.

Some of the relationships that could be further studied using the current data include:

- The relationship between socioeconomic and demographic characteristics and bicycling for utilitarian and non-utilitarian trips.
- The relationship between perceived and objective measures of the built environment and bicycling behavior.
- The effect of socioeconomic characteristics and built environment characteristics on safety perceptions of bicyclists and non-bicyclists.