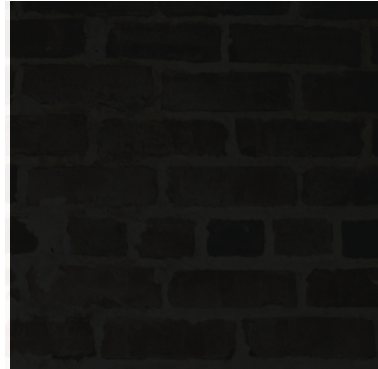


Understanding

Barriers to Bicycle Access & Use

in Black and Hispanic
Communities
in New Jersey



RUTGERS

Edward J. Bloustein School
of Planning and Public Policy





Figure 1. Young girl on bike. Photo Credit: Michigan DNR.

About

This report was written by Charles Brown, MPA, Elizabeth Harvey, and James Sinclair of the Alan M. Voorhees Transportation Center (VTC) at Rutgers, The State University of New Jersey.

The Alan M. Voorhees Transportation Center (VTC) is a national leader in the research and development of innovative transportation policy. Located within the Edward J. Bloustein School of Planning and Public Policy at Rutgers University, VTC has the full array of resources from a major research university on transportation issues of regional and national significance.

The New Jersey Bicycle and Pedestrian Resource Center (BPRC) assists public officials, transportation and health professionals, and the public in creating a safer and more accessible walking and bicycling environment through primary research, education and dissemination of information about best practices in policy and design. The Center is supported by the New Jersey Department of Transportation through funds provided by the Federal Highway Administration.

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Executive Summary

Research on identifying barriers to bicycling has become popular over the past decade. However, few studies have been conducted on barriers and solutions that are unique to bicycle use among Blacks and Hispanics. The purpose of the study was to ascertain barriers to and identify solutions to bicycle use among Black and Hispanic bicyclists and non-bicyclists. Primary data collection methods were intercept surveys of pedestrians in thirty-four geographically and typographically diverse municipalities in New Jersey and focus groups with exclusively Black and Hispanic participants. The intercept survey method was selected to obtain a high response rate that was representative of the selected municipalities. The focus groups obtained additional information that can be difficult to gather from an intercept survey.

A total of 2,061 surveys were collected, and 16 Blacks and 10 Hispanics participated in the focus groups. These data show that the three biggest barriers to bicycling for all respondents are fear of a traffic collision, fear of robbery and assault, and pavement condition. Other notable barriers include fear of being stranded with a broken bicycle, and fear of being profiled by the police. Solutions for both bicyclists and non-bicyclists include bicycle lanes and off-street bicycle paths between their respective origins and destinations, and secure bicycle parking at their destinations. Key findings from the study are being discussed with select agencies and organizations throughout NJ. These findings have led the authors to conduct a separate study focused specifically on minority women bicycle access and use.

Figure 2. A man rides a bicycle with a child trailer in New Brunswick, New Jersey.



Introduction

Figure 3. A family riding bicycles at the New Brunswick Ciclovía.

In 2015, the Alan M. Voorhees Transportation Center (VTC) undertook a study to investigate means to promote bicycling among Black and Hispanic populations in New Jersey, as well as identifying barriers to bicycling that these groups face. The study consisted of several focus groups and survey efforts to examine their bicycling habits, behaviors, and perceptions. The objective was to document bicycling perceptions and habits among Black and Hispanic populations in New Jersey and to identify potential initiatives to promote bicycling.

Studying bicycling habits and perceptions in Black and Hispanic communities is important for several reasons. Bicycling provides benefits to individuals and the broader community including exercise opportunities, less automobile congestion and pollution, and an affordable form of transportation. However, bicycle trips comprise only a very small portion of all trips in New Jersey. Only 0.4 percent of commute trips are made by bicycle in the state, which, while very low relative to commuting by car, is double the percentage seen in 1990. Understanding barriers to bicycling may help increase the portion of trips taken by bicycle, bringing benefits to individuals and communities alike.

These benefits are especially important for Hispanic and Black communities. These populations, in particular those considered low-income, have higher rates of obesity and poorer health outcomes. They also tend to have lower automobile ownership rates, lower household incomes, and are more likely to walk and to use public transportation for utilitarian trips. Bicycling can help relieve exercise-related health problems as well as provide an inexpensive form of transportation that is faster and more efficient than walking.

The necessity of this study is further underlined by the increasing number of New Jersey residents who identify as Black or Hispanic. In New Jersey, the Black population is 13.4 percent compared to 12.6 percent in 1980. The percentage who are Hispanic has increased even more dramatically, from 6.7

percent in 1980 to 18.6 percent today. Research on bicycling is relatively new, and research on bicycling amongst Black and Hispanic populations is especially limited. Available studies have shown, however, that bicycling rates are lower amongst Blacks and Hispanics than among other populations. This study seeks to corroborate these data and to understand why bicycling rates are so low.

This research consisted of two major data collection efforts. First, a comprehensive pedestrian intercept survey was conducted in 34 municipalities in New Jersey that have large Black and Hispanic populations. The survey asked about respondents' familiarity with bicycling, their perception of bicycling, local bicycling facilities, and reasons for bicycling or not bicycling, among other questions. Second, two focus groups were held, one with Black residents and one with Hispanic residents. The focus groups delved more deeply into the questions that were asked on the survey, with a particular focus on exploring differences in cultural norms that would help explain bicycling habits as well as to identify strategies that would encourage participants to bicycle.

This report contains six sections. The next section, Background, provides a review of recent literature on bicycling habits of different populations, including Black and Hispanic groups and women. The third section, Methodology, discusses the process of primary data collection through a pedestrian intercept survey and two focus groups. The fourth section, Data Analysis and Results, presents results from the analysis of the data collected by the survey and focus groups. The fifth section, Discussion, explores the importance of the results of the study, and provides recommendations for strategies to encourage bicycling among Blacks and Hispanics. Finally, the Conclusion summarizes the study's key findings and discusses implications for further research.

Literature Review



Figure 4. Man riding bicycle through Newark, New Jersey.

Introduction

Bicycling, as both a travel mode and source of physical activity, provides benefits to individual users and the broader community. Often characterized as a recreational activity, bicycling has recently attracted the attention of engineers and planners looking for solutions to growing transportation problems. Likewise, public health officials battling the global obesity epidemic have investigated ways to increase daily physical activity, including walking and bicycling.

In the United States, however, bicycle trips comprise only a very small portion of all trips, whereas the private automobile continues to dominate the transportation landscape. In 2010, over 86% of workers commuting in the United States did so by automobile (Pisarski 2014). However, numerous problems arise from high rates of auto use, including congestion, environmental effects, and dependence on foreign oil commodities. Many alternatives to the automobile have been considered, and these include bicycling. Understanding barriers to bicycling may increase the portion of trips taken by bicycle instead of by automobile, bringing benefits to users and the broader community alike.

The share of the U.S. population identifying as a “minority” has increased dramatically since the middle of the twentieth century. In fact, the term “minority” has become a misnomer in many areas. By 2010, the share of the population identifying as a minority in the United States represented a majority in many states including California and Texas (Humes et al. 2011). Many factors have influenced this demographic shift, including changes in immigration policy and birth rates. As minorities comprise an ever-growing share of the total U.S. population, their transportation habits strongly affect national trends and deserve further study.

Particularly in New Jersey in 2013 (the most recent year for

which reliable Census data exists), a large proportion of residents have so-called “minority” status. Figure 5 contains data from the American Community Survey (ACS), and demonstrate the large proportion of New Jersey residents who identify as non-white and/or Hispanic (Figure 5).

To increase the number of people who bicycle, a growing body of literature in the planning and health fields has studied reasons why people do or do not bicycle. However, focus on bicycling is relatively new in the transportation field. As a result, bicycle studies have not addressed potential barriers facing minorities, in particular Latin Americans and African-Americans. Especially given the higher rates of obesity and poorer health outcomes in these populations, they should receive a special focus for interventions designed to increase bicycling. Sporadic efforts, including a survey by the Community Cycling Center, a nonprofit organization in Portland, Oregon, have studied limited groups of minority residents to understand what may prevent them from riding bicycles (Community Cycling Center 2012). However, these sporadic efforts have been limited and remain regional in focus, as the issues in Portland, Oregon likely differ from those in urban and suburban New Jersey.

While the bulk of bicycle planning research has not focused on minorities, some previous studies have focused on other specialized groups, including women and children, and their barriers to bicycling and other modes of active transportation. The design and findings from such studies can provide guidance in the implementation of studies related to bicycling for minorities. What follows is a review of the existing literature related to bicycling, transportation habits of minorities, and their connections to health.

The literature review is structured as follows: Section 2 addresses general trends and barriers in bicycling internationally, with a secondary focus on the United States. Section 3 focuses on the divide between the consideration of bicycling as either a

Figure 5. Race and ethnicity in New Jersey (U.S. Census Bureau 2014).

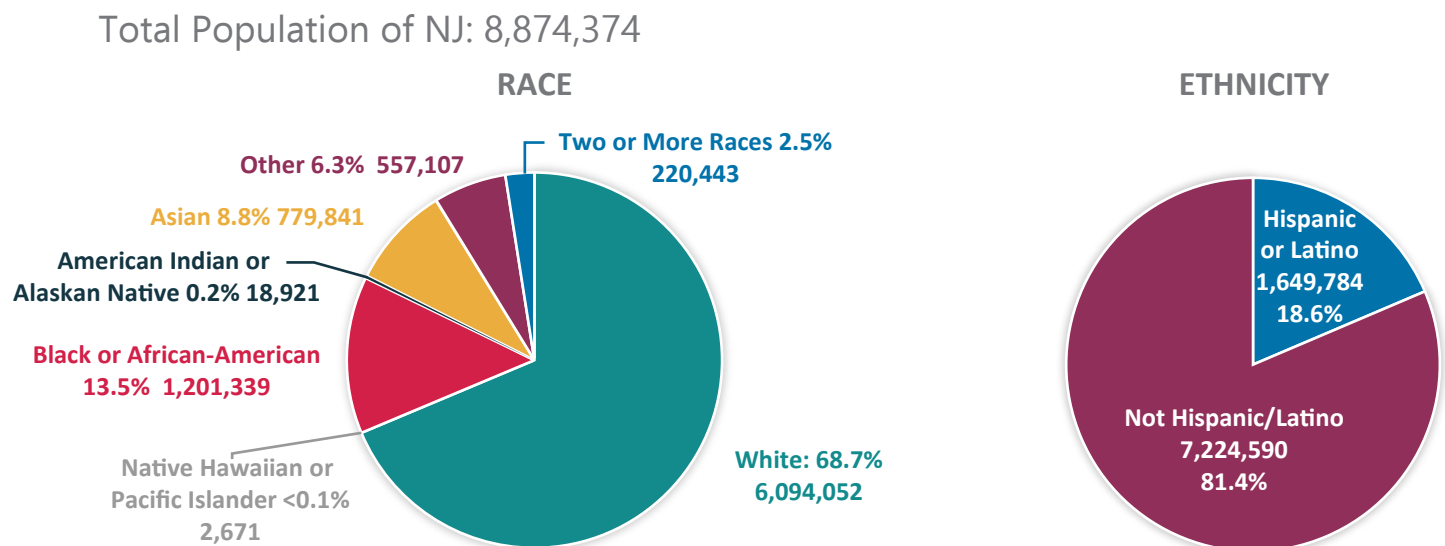




Figure 6. Man getting on bicycle in Newark, New Jersey.



Figure 7. Women bicycling in New Brunswick, New Jersey.



Figure 8. Man riding on sidewalk in Newark, New Jersey.

recreational activity or a mode of transportation, as well as studies related to safety and bicycling. Section 4 discusses various findings on women, children, and bicycling. Section 5 discusses transportation trends of immigrants and minorities in the United States, as well as studies related to heightened health risks, including obesity, for minorities. Section 6 discusses the various methodologies used to gather information about cycling behavior and factors affecting bicycling rates, and finally Section 7 provides concluding remarks and a summary of some of the major research findings that will inform the current study.

General Bicycling Studies

Various studies have focused on the benefits of bicycling and its integration into transportation planning. In the United States, large increases over the last decade led some researchers to predict a new era in transportation, particularly as young people bicycle at higher rates than previous generations (Pucher et al. 2011).

Numerous benefits have been attributed to bicycling. This includes benefits that are health-related (Oja et al. 1998), economic (Gotschi 2011), environmental (Komanoff et al. 1993), and related to traffic congestion. Because of potential benefits, some policymakers and transportation professionals view bicycling as a solution to various problems associated with the transportation system (Black et al. 2002).

Some Western and Northern European countries have already achieved high rates of bicycling. Countries like Denmark and the Netherlands report a non-motorized travel rate (including both walking and bicycling) as high as 40 percent (Pucher & Dijkstra 2003). Such rates clearly were affected by concerted policies to make bicycling infrastructure a planning priority. For example, the Netherlands has almost 22,000 miles of designated cycle paths in a country a little more than twice the size of New

Jersey (den Broeder et al. 2015). Due to the success of bicycling policies in parts of Europe, many American researchers look to these countries as models for promoting bicycling in the United States (Pucher & Beuhler 2008).

In the United States, bicycle use represents less than one percent of all commuter trips (Pucher et al. 2011). This has led many researchers to study reasons for the limited use of the bicycle. Researchers have identified many factors, including the sprawling land use pattern in the United States (Rashad 2009), the relative low cost of owning and operating an automobile (Buehler 2010), and a lack of bicycle infrastructure (Daley et al. 2007).

However, the percentage of total trips in the United States taken by bicycle increased from 2000 to 2010, with certain cities having made great strides. In New York City, bicycle commuting doubled over the period of 2009 to 2014 (Miller 2014). New York City's high-profile bicycle share program, Citi Bike, has also generated interest and praise (Parkes et al. 2013). In Washington, D.C., another large city with high residential and commercial

density, bicycling increased 208 percent between 2000 and 2010 (Bratman & Jadhav 2014). While bicycling continues to represent a very small portion of the mode share, the percentage has increased, especially in key cities with national influence.

Finally, in countries like the United States and the UK, Caucasian males take a disproportionate number of total bicycle trips and are high-profile users in key cities (Steinbach et al. 2011). Other segments of the population, including women and minorities, bicycle at lower rates. Even in cities, such as in Seattle, where 3.6% of commuter trips are done by bicycle, 70% of those bicycle commutes are done by men (Broache, 2012). Increasing the number of bicycle trips requires outreach to groups who have not adopted the bicycling culture in large numbers. Many researchers have begun to study groups including women,

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Some policymakers and transportation professionals view bicycling as a solution to various problems.

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children, and minorities to understand specific barriers to bicycling for these groups.

Recreational Versus Commuting Behavior and the Roles of Safety and Infrastructure

Before addressing barriers to bicycling, this section examines researchers' divergent characterizations of bicycling as either a recreational activity or transportation mode. Bicycling for recreation on a Saturday, for example, is a different activity from bicycling daily to commute to work. These different purposes generate different study concerns. At the same time, researchers in bicycle policy and behavior have studied various safety issues and the role of infrastructure in addressing bicyclists' physical vulnerability.

Transportation planners sometimes view bicycling as a possible substitute for automobile or transit use. When considered as an alternative, particularly to serve utilitarian purposes, bicycling can have economic and environmental benefits. However, a study of small U.S. cities found that only 10% of people who bicycle in the United States do so purely for utilitarian purposes (i.e., with the sole intent of reaching a destination, not as a form of exercise or leisure) (Kroesen & Handy 2014).

If officials conceive of bicycling as a health intervention, then the purpose of a bicycle trip does not matter. However, if one intends to decrease the number of automobiles on the road, then the purpose of a bicycle trip matters a great deal. Other studies have found that most "commuter cyclists" actually first begin as "leisure cyclists," noting an opportunity for bicyclists who begin as recreational users to replace some of their

automobile trips with bicycle trips (Park et al. 2011).

While medical research often focuses on the health benefits of recreational physical activities, a study of bicyclists in Australia shows socioeconomic differences between those who bicycle for "utilitarian" (non-recreational, such as shopping or commuting to work) purposes and those who bicycle for recreation or exercise (Heesch et al. 2014). Unsurprisingly, people with consistent access to an automobile are far more likely to engage in recreational bicycling than bicycling for utilitarian purposes. However, automobile access is inversely correlated with both recreation-only and utility-only bicycling (Heesch et al. 2014). This suggests one method to increase bicycle commuting is to decrease access to automobiles.

Recent research has looked into focusing on both utilitarian and recreational bicycle trips when evaluating locations to build new bicycle facilities. One study's GIS-based framework, built for the Los Angeles County Metropolitan Transportation Authority, provides methods to analyze the impact of facilities on the recreational habits of bicyclists (Proussaloglou et al. 2014). Such initiatives suggest that planners seek to understand the relationship between recreational and utilitarian trips. New models can capture how purpose affects factors including travel times, distances, and users' bicycling abilities.

Furthermore, safety is a primary concern for bicyclists, especially for countries with very high rates of automobile use. Bicyclists are especially vulnerable in crashes with automobiles. Safety continues to be a major barrier for all users, as physical risk and perception of risk deter many people from bicycling in urban areas. Indeed some groups, including women and children,



Figure 9. Bike to Work Day in Washington, DC. Photo Credit: *US DOT*.



Figure 10. Recreational bicyclists at the New Brunswick Ciclovía.



Figure 11. Family bicycling at the New Brunswick Ciclovía.



Figure 12. Child participating in bicycle training in Piscataway, New Jersey.

prove most susceptible to perceived safety risks.

Accordingly, many studies seek to understand the impact of helmets on reducing mortality (Rivara et al. 2015) (Persaud et al. 2012). Also, other studies have assessed the general health impacts of mandatory bicycle helmet laws (De Jong 2012) and the prevalence of helmet use by public bike share program users (Fischer et al. 2012).

Additionally, studies show that separated bicycle paths, which increase physical separation between bicyclists and automobile traffic, decrease the risk of injury (Lusk et al. 2011). The introduction of these lanes has increased ridership in various American cities, including New Orleans (Parker et al. 2013). A study of buffered bike lanes (which offer a higher level of separation) in Portland, Oregon, found that both bicyclists and motorists preferred more ample space separating the different modes (Monsere et al. 2012). Increased quantity and quality of bicycling infrastructure may present solutions to bicyclists' safety concerns.

Bicycling infrastructure amenities often appear in higher-income neighborhoods of cities, and many residents view the presence of bicycle infrastructure as a sign of gentrification (Hoffman & Lugo 2014). However, a study of bicycle lanes in a mixed-income area in Brooklyn found that a large proportion of the bicyclists using the lanes were low-income and non-white, and reported better health than non-bicyclists (Noyes et al. 2014). The research also suggests that with improved infrastructure, bicycling may attract a large user group other than Caucasian males. This indicates many different bicyclists, especially non-white and low-income people, would benefit from the expansion of bicycle infrastructure into diverse neighborhoods.

Safety concerns pose a major barrier to bicycling for the average person contemplating bicycle use. Interventions that decrease

risk of physical injury, including helmet laws, separated bicycle lanes and other types of infrastructure, continue to engage governments and researchers from different disciplines.

Children and Bicycling

Similar to studies of women and bicycling, other research has sought to identify and account for barriers to bicycling for children. Children attract special attention from bicycle researchers because of their physical vulnerability. Additionally, children are more malleable with respect to transportation habits, meaning that they may represent better candidates

for intervention than adults. Research into parent and child perceptions of bicycling has revealed changing perspectives on behavioral norms and safety concerns. Additionally, recent government programs such as Safe Routes to School seek to make bicycling and walking to school safe and attractive options.

In the United States, rates of children walking and bicycling have declined and some studies attempt to account for this phenomenon. In 1969, 48% of US children walked or bicycled to school while only 16% did so in 2001 (Davison et al. 2008).

However, the decline in children walking and bicycling cannot be solely attributed to changing residential patterns such as increased suburbanization. In 2004, almost 35% of U.S. children lived within a mile of their school, yet less than half of these children bicycled or walked to school at least one day per week (Martin et al. 2007). This suggests other impetuses, such as safety concerns, for the decline of children walking and bicycling to school.

Notably, the decline in children commuting to school by themselves correlates with an increase in parents driving children to school and other activities (McDonald & Aalborg 2009). Also, studies show that parent perceptions of safety strongly influence likelihood of children to actively commute

“ In 1969, 48% of US children walked or bicycled to school while only 16% did so in 2001... Almost 35% of children live within a mile of their school. ”

(Timperio et al. 2006). Therefore, parents may be key allies in interventions to increase active transportation among children and young people.

Social factors may bear some responsibility for the changes in children's travel behavior. These factors reflect general shifts in the relationship between children and the built environments in which they live. Researchers in Australia studied the perceptions and networks of children and adolescents who commuted to school in various ways. They found that children who knew more people in their communities were more likely to utilize active transportation modes. Also, adolescents whose parents perceived safety issues in the neighborhood were less likely to increase active transportation use over the study period (Timperio et al. 2004). This suggests safety concerns and social networks affect the transportation behavior of children. These findings also reiterate previous findings that social and family norms strongly influence children with respect to the commute to school.

Meanwhile, a policy innovation occurred with the expansion of the Safe Routes to School (SRTS) in the United States. The Safe Routes to School program is based on a program from Denmark started in the 1970s. The Danish program sought to reduce the number of children killed while walking or bicycling to school (Hubsmith 2006). Currently, local chapters are active in all fifty states. The Federal Highway Administration funds

the program, and to-date has administered over a billion dollars to state programs (Cradock et al. 2012). An evaluation of the California Safe Routes to School program found increases in walking and bicycling for children who had completed the program (Boarnet et al. 2005). SRTS, as a significant bicycle outreach program receiving federal funding, signifies increased interest in helping children travel to school using active modes.

Finally, the health benefits of bicycling and physical activity may have especially strong impacts on American children. Child obesity has reached the level of a public health epidemic in the United States, with 17 percent of youths under 18 meeting criteria for obesity (Ogden et al. 2014). Many health programs seek to increase physical activity for young people, including the high-profile program Let's Move, which aims to combat childhood obesity, spearheaded by First Lady Michelle Obama. Other state and federal programs aim to motivate children to engage in physical activities, including bicycling, at higher rates. However, preliminary research into the association between active transportation (including bicycling) and BMI suggests that active commuting may not provide enough activity to significantly change high BMIs (Heelan et al. 2005).

U.S. Minorities' and Immigrants' Travel Behavior and Health Outcomes

While few studies have identified specific barriers to bicycling



Figure 13. Family poses in the middle of intersection during the New Brunswick Ciclovía.



Figure 14. Woman bicycling at the New Brunswick Ciclovía.



Figure 15. Young girl on bicycle. Photo Credit: Michigan DNR.



Figure 16. Child learning to bicycle at the New Brunswick Ciclovía.

for minorities in the United States, others have examined the travel habits of immigrants in the U.S., who represent a sizeable proportion of the minority population. In particular, researchers have identified an “immigrant effect” that distinguishes the travel behavior of immigrants’ from that of the U.S. population at large. Both cultural explanations (cultural and language differences) and structural explanations (lower incomes, barriers to auto ownership, and residence in denser cities) underlie hypotheses as to the source of the immigrant effect.

In many studies, researchers have consistently found lower rates of auto use and ownership among immigrants. One survey of people living in New Jersey found lower auto use among immigrants, most of whom were born in Asia or Latin-America (Chatman 2014). The study found that lower auto was not due to cultural preferences of immigrants, but rather that low rates of auto use are highly correlated with immigrants’ residential patterns. Such residential patterns, according to researchers, lead immigrants to live in built environments more conducive to life without an automobile. According to this research, structural aspects of immigrants’ lives, especially where they live and work, explain their divergent transportation behaviors.

In New Jersey, focus groups with Latin American and Asian immigrants offer evidence as to why patterns of auto ownership among immigrants change over time. According to these focus groups, immigrants own and use automobiles after continued residence in the United States because of changes in residential location over time. The move from the city to the suburbs, for example, often requires use of an automobile. As to why immigrants make the move to the suburbs, explanations include a lower reliance on social ties to ethnic enclaves, other employment opportunities, and superior schools outside of the central city (Chatman & Klein 2013).

The “immigrant effect” also includes increased bicycle commuting among non-native born people living in the United States. Analysis of data from the National Household Travel Survey (NHTS) identified a higher level of bicycle commuting among immigrants than the native-born. In contrast to other

findings, bicycle researchers have posited that the “immigrant effect” may not arise solely from the built environment. After controlling for factors including income and location, regression analysis indicates that immigrants still bicycle at higher rates than the native-born. This suggests that this “immigrant effect” may in fact be influenced by cultural factors (Smart 2010).

Cultural factors that have been explored include the travel habits of “sending countries,” or the countries from which individuals emigrated. If, for example, an individual emigrates from a country with low car ownership rates, they may not have learned how to drive and therefore have little comfort doing so. Information about the immigrant effect remains in its infancy. However, knowing how and why culture influences transportation habits can help policymakers design better interventions or policies to shape travel behavior.

Literature from both the transportation and public health disciplines has documented the possible ways of increasing physical activity among minorities. Minorities, in particular those with low-incomes, have higher rates of obesity and poorer health outcomes than the general population (Kumanyika 2002). Recently, health interventions have targeted these groups because of their elevated risk. Logically, then, research into bicycling and other active transportation modes should focus particularly on these groups. To date, however, it has not.

With respect to bicycling, a strong correlation exists between countries with high levels of active transportation and low levels of obesity. This reflects general strong trends of bicycling and walking in parts of Europe, which are less prevalent in the United States and Canada. Researchers, of course, do not conclude causation between these facts. However, they note that this strong association indicates a role for walking and bicycling in health-focused transportation policies (Bassett et al. 2008).

The United States experiences very high levels of obesity, especially compared to countries with similar economic profiles. However, in the United States, minorities such as African-Americans and Hispanics bear an even larger health burden,

with much higher rates of obesity (Flegal et al. 2010). Other studies have found that African-American and Hispanic women are more likely to be inactive than white women: 46 percent of African-American women were inactive in 1994, compared to 30 percent of White women (Eyler et al. 2002). Other studies have sought to design interventions to prevent obesity among African-American girls, who suffer from a high risk of obesity (Story et al. 2003).

Other studies have also examined the level of physical activity of specific groups, including middle-aged African-American women. One study in South Carolina examined the correlates of African-American women who did and did not meet recommended physical activity standards. They found the most frequently cited reason for low rates of exercise was lack of time (Ainsworth et al. 2003). Understanding why certain racial, gender, and age group do not meet physical activity guidelines can guide interventions specific to their challenges and preferences.

However, in another study of American women, Hispanic and African-American women were asked to keep a diary of their daily activities. Researchers found no link between the perceived lack of time by the women (and expression), and their actual time commitments (Heesch & Masse 2004). This suggests that lack of physical activity, then, may be due to other, unknown factors. Though such groups' perceptions may not match actual time constraints, the perception of lack of time remains important, as it influences behavior and subsequent health outcomes.

Furthermore, regression analyses of the built environment and health have found that neighborhood characteristics may influence health outcomes. One study of adolescent health used information about participants' residences to examine the availability of facilities for physical activities, such as parks, youth organizations, and YMCAs. The study found a strong negative correlation between presence of physical activity facilities and the risk of being overweight (Gordon-Larson et al. 2006). This does not suggest that building one bike lane will reduce obesity rates in the surrounding community. However, it does support public health interventions that place greater

emphasis on physical infrastructure in neighborhoods struggling with health issues such as obesity.

Other studies have noted that neighborhoods with increased walkability and access to healthy food are associated with lower rates of obesity and better health. Also, other studies have found that low socioeconomic status of a neighborhood is consistently associated with higher obesity rates (Black & Macinko 2008). This complicates the standard wisdom that an individual's poverty status increases likelihood of obesity. Rather, the study suggests that physical and social environments can directly influence health outcomes.

The direct relationships between physical activity, obesity, and bicycling remain unclear. However, in the United States minorities comprise a larger share of the physically inactive and overweight and those whose health situations are most often

dire. Therefore, given the health benefits of bicycling, further research should focus on finding and removing barriers to bicycling for groups with the greatest health risks.

Methodologies

Researchers have used different methodologies to identify the travel behaviors of certain groups, and to learn about factors influencing the choice of bicycling over other transportation mode options. Different methods of data collection and analysis have advantages and disadvantages. Thus, research questions should utilize a variety of methods to obtain

the most relevant information.

Some researchers have looked at existing data collected by the federal government, including the NHTS, the Census, and the American Community Survey. Many of these studies run multiple regression analysis to identify factors that may or may not influence the propensity of an individual to bicycle. The information gleaned from these processes can be quite powerful because of the sheer size of the datasets – often the entire U.S. population – available for analysis. However, bicycling represents only a small share of total mode use, and the amount of minority individuals represents an even smaller share (Pucher

“ The United States experiences very high levels of obesity, especially compared to countries with similar economic profiles. ”



Figure 17. Pedestrians watch as bicyclists ride down the street at the New Brunswick Ciclovía.

& Renne 2003). Finding a large and robust sample of bicyclists for analysis can prove challenging, even using Census data (Barnes & Krizek 2005).

Other issues arise while using data the Census and American Community Survey to investigate travel behavior. For example, the Census only asks about transportation mode choice for the work commute – meaning that all other trips are not captured. As a result, certain modes suffer from being underreported in the data. Walking and bicycling, which are less commonly used for the work commute, often suffer from underrepresentation in the Census and American Community Survey (Pucher et al. 2010).

Additionally, the Census and ACS ask the respondent to choose one mode for each trip. Many trips, however, involve more than one mode. For example, a person commuting to work may walk from his home to the train station, take the train, and then walk to his office. With the Census, this likely would be coded simply as “train.” Again, this leads to simplification of multimodal trips, and potential undercounting of certain transportation modes (McKenzie 2014).

The NHTS captures greater detail and specificity of modes than the Census, including trip chaining, but is conducted at intermittent years. The most recent versions were conducted in 2001 and 2009, which leaves large gaps in the interim. Also, the NHTS surveys only one percent of the U.S. population, a much smaller proportion than does the Census. This somewhat reduces the ability to generalize any results in comparison to the Census (Clifton & Krizek 2004).

In contrast to using large datasets, many researchers interested in bicycling conduct intercept surveys with users in a restricted geographic area, such as Susan Handy’s work, which focuses

often on Davis and other cities in Northern California (Emond & Handy 2012). The number of people represented in such surveys is much lower than the amount captured by the Census. However, surveying proves beneficial because researchers can select questions specific to bicycling, instead of the general questions asked in the Census.

Surveys can also gather more detail with respect to a particular mode. Previous surveys about bicycle usage have revealed, for example, that women place a higher value on safety and infrastructure than men (Pucher, Dill & Handy 2010). This information was not available from the NHTS or Census. In such a case, the NHTS reveals the gender gap in bicycling, and the survey seeks an explanation for this gap.

Finally, focus groups present an opportunity to collect in-depth, qualitative data from specialized groups (Kitzinger 1995). Focus groups can only be conducted with a limited number of participants. However, they often provide the most detail, and generate the narratives behind certain behaviors or phenomena (Hinyard & Kreuter 2006). In the example mentioned above, perhaps the survey reveals that women value safety in bicycling more highly than men. In a focus group, then, researchers could solicit policy suggestions and specific examples of safety concerns from a smaller group of women.

Combining different sources of information – including quantitative datasets, interviews, and qualitative and detailed focus groups – may capture the greatest amount of information with respect to travel behavior and potential barriers to bicycling, especially for minority groups. Given the limitations associated with the small proportion of people who bicycle, the use of different methods may prove particularly helpful in investigating and confronting the many barriers to bicycling for minorities.



Figure 18. Women take a break from bicycling on a quiet street.

Conclusion

This literature review explored some of the previous studies conducted on bicycling, and in particular the factors that affect certain non-majority groups in the United States. Some of the key findings from the literature review include the following, which inform the design and implementation of the current study to investigate barriers to bicycling for minorities in New Jersey:

- Studies have shown the positive benefits of bicycling for the environment, society, and the health of individuals. Bicycling has received increasing interest from both the transportation and public health disciplines.
- However, bicycling remains an underutilized mode of transportation in the United States and many other developed countries, with trip rates hovering below two percent nationally. A significant number of people bicycle recreationally only, while a small portion of Americans bicycle to work or for other utilitarian purposes.
- Safety remains an important aspect of bicycle policy and research, as bicyclists are especially vulnerable in accidents with automobiles.
- Certain groups, including women, bicycle less than the general population. Studies have shown that women are particularly sensitive to perceptions of danger in bicycling, and greatly favor increased infrastructure such as separated bicycle lanes.
- Children are another group that receive much attention

in the bicycling literature, as the habits they develop at a young age may influence later travel behavior. However, the percentage of children walking or bicycling to school has declined precipitously since the 1960s.

- Immigrants seem to bicycle more than the general U.S. population, and lower rates of car ownership and different residential patterns explain much of this difference. However, cultural preferences may also affect travel behavior.
- Minorities, including African-Americans and Hispanics, suffer from the highest rates of obesity among all groups in the United States. Explanations for this include higher rates of poverty and lack of access to healthy food.
- Minorities also participate in lower levels of physical activity than their non-minority counterparts do. Studies have found strong links between poor health outcomes and the lack of neighborhood resources for physical activity, such as parks and YMCAs.

Ultimately, this large volume of literature presents African-Americans and Hispanics as prime candidates for interventions to increase levels of bicycling. Particularly because of health issues, these groups would benefit the physical activity involved in bicycling. However, such interventions require information as to why African-Americans and Hispanics do not bicycle at higher rates. Unfortunately, few studies have investigated the specific barriers to bicycling for African-American and Hispanics. The current study will identify and explore some of these barriers.



Figure 19. Man walking bicycle down sidewalk.

Study Methodology



Figure 20. Bicycles parked outside of the train station in Newark, New Jersey, one of the cities where intercept surveys were conducted.

This report section describes the methodology used to conduct a survey and focus groups of adults 18 and older who represented the target audience of this study, namely Black and Hispanic residents of New Jersey. A pedestrian intercept survey was conducted at select New Jersey municipalities between June and August of 2015. (See Appendix A and B for the survey instrument.) The objective was to understand if and the bicycling behaviors and perceptions of the target audiences, and to identify any barriers they experience that limits their opportunity for or interest in bicycling.

Two focus groups were also held, the objectives of which were to better understand if and how the views and opinions regarding bicycling of Black and Hispanic residents differ from each other and from the general populace. The first, which was for survey respondents who identified as Black or African American, was held on December 3, 2015, in New Brunswick, New Jersey. Sixteen attended this focus group. The second focus group, which was targeted to survey respondents who identified as of Hispanic origin, took place on December 16, 2015, also in New Brunswick. Eleven people attended this focus group. The remainder of this section will describe in detail the methodology used to conduct the survey and the two focus groups.

Pedestrian Intercept Survey

A pedestrian intercept survey was chosen as the surveying instrument in order to ensure a high response rate, with the assumption that pedestrians would be representative of the resident populations of the municipalities that were selected to be surveyed. The survey instrument was distributed at 34 municipalities throughout New Jersey. The objective of the selection process was to receive responses that were representative of the target demographics. With this in mind, several characteristics of the municipalities were considered during the selection process: locations with high populations of the target demographics; locations representative of New Jersey's wide of range of geography (north, central, south, and coast); and locations representative of different development typologies (urban, suburban, and rural).

Initially, the 20 municipalities with the highest number of Black and Hispanic residents were chosen. There was significant overlap between those municipalities that fell into both categories (eight), resulting in not enough diversity with regards to the geographical and typological diversity goals stated above. The research team thus expanded the selection of municipalities to include several that were more geographically and typographically representative: Dover, a small suburb in the northwest, is 22nd for Hispanic population; Linden, a small city in central New Jersey, is 21st for Black population and 24th for Hispanic population; and Bridgeton, a small city in southern New Jersey, is 23rd for Hispanic population. The result was 34 municipalities, evenly divided between those with the highest Hispanic population (12), with the highest Black population (11), and with the highest both Hispanic and Black populations (11) (Table 1 and Figure 21). The municipalities also sufficiently represented geographically and typographically diverse locales.

Two separate surveys were developed: the first for respondents who had ridden a bicycle in the last year, a proxy for regular bicycle riders, and the second for those who had not ridden a bicycle in the last year, a proxy for those who do no bicycle regularly. The first had 39 questions, and the second 41. They were both translated to Spanish. Prior to creating the survey, the research team compiled a list of topics that the survey was to cover, all of which fell into one of two categories: "community"

Table 1. Target population(s) in each municipality surveyed.

Municipality	Black	Hispanic
Atlantic City	■	■
Belleville		■
Bridgeton		■
Camden	■	■
Clifton		■
Dover		■
East Orange	■	
Elizabeth	■	■
Franklin (Somerset Co.)	■	
Hackensack		■
Hillside	■	
Irvington	■	
Jersey City	■	■
Kearny		■
Linden	■	■
New Brunswick	■	■
Newark	■	■
North Bergen		■
Orange	■	
Passaic		■
Paterson	■	■
Perth Amboy		■
Piscataway	■	
Plainfield	■	■
Roselle	■	
Trenton	■	■
Vineland		■
West New York		■
West Orange	■	
Willingboro	■	
Winslow	■	
Woodbridge	■	■

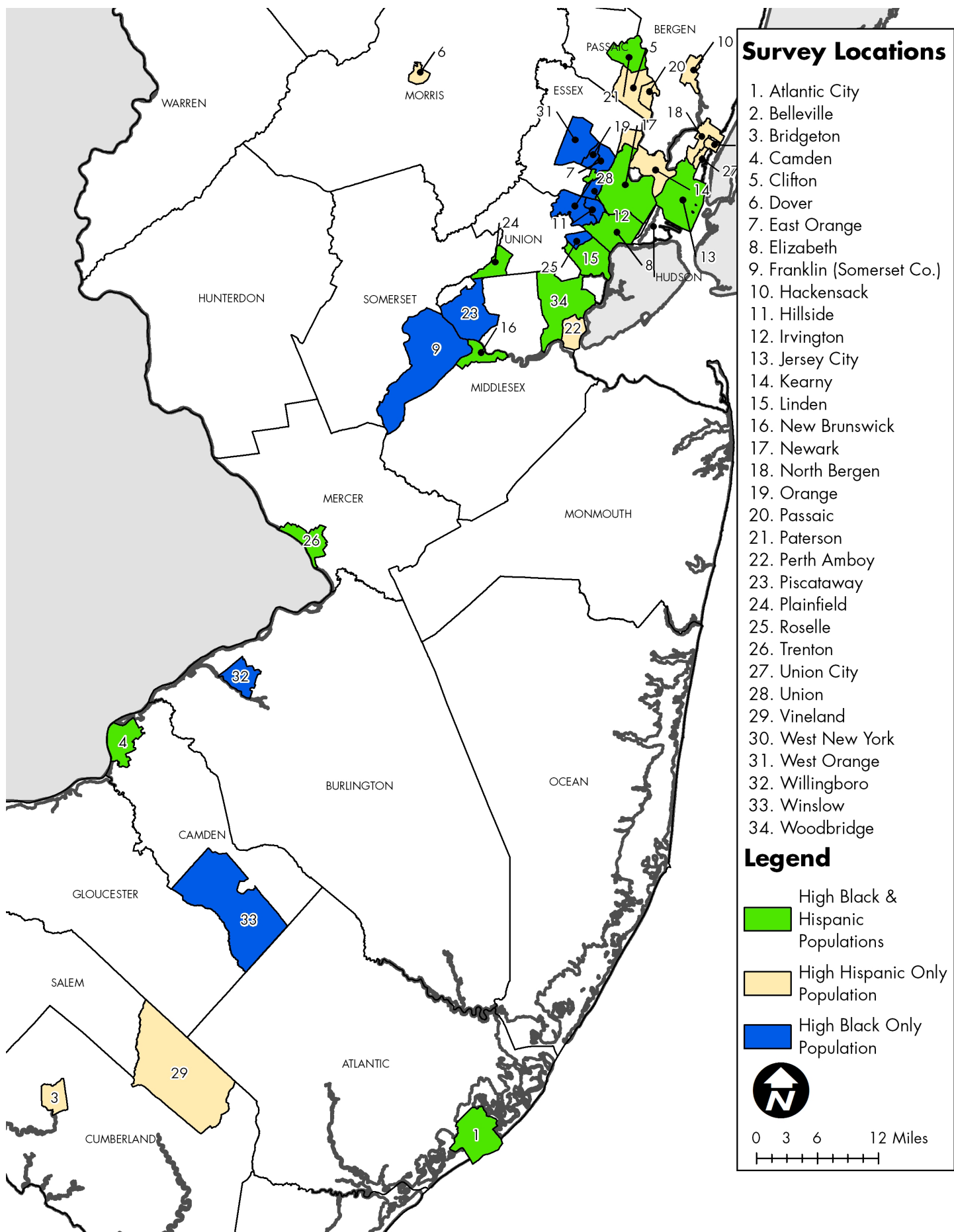


Figure 21. Municipalities where surveying was conducted.

questions – those that were about the physical and cultural environments that respondents encounter – or “individual and family” questions – those that were about individuals’ habits, lifestyle, and demographics. As the survey questions were developed, the research team ensured that each topic was addressed by at least one question in order to make the survey as comprehensive as possible. Respondents were only given the option to complete the survey by paper at the survey site in order to maximize the number of respondents; web-based surveys were not made available.

Because the research team could not practically survey entire municipalities, multiple intersections were chosen within each municipality where high pedestrian volumes were likely. They were focused near train stations and commercial corridors, within neighborhoods that Census data showed had high concentrations of Hispanic and/or Black residents. The intersections were chosen based on the experiences of research team members, scouting out of municipalities that were less familiar, and utilizing Google Maps when an unfamiliar municipality was too far to be visited prior to surveying.

Teams of trained graduate students distributed the paper surveys, primarily on weekdays between June and August of 2015. The survey was distributed primarily during the afternoon hours, between 1:00 PM and 5:30 PM; the exception was Atlantic City, which was surveyed between 10:00 AM and 5:00 PM. Each municipality was surveyed once. In municipalities without a main commercial corridor and which were primarily residential, surveys were distributed on weekends and sometimes at other locales that were likely to have high numbers of residents, such as parks. This was the case at Franklin, Piscataway, Woodbridge, Willingboro, Bridgeton, Vineland, and Winslow. Atlantic City was surveyed on a weekend as well due to its distance from the surveyors’ workplace. Surveyors were instructed not to consider potential respondents’ race or ethnicity when distributing the survey; however, the large number of respondents enabled the research team to collect enough data on the target audiences for a meaningful analysis. A total of 2,062 surveys were collected and entered in survey software to be analyzed.



Figure 22. A green-painted bicycle lane in Newark, New Jersey.

Focus Groups



Figure 23. Young women with bicycles on an open street. Photo Credit: *Bike East Bay*.

As part of the effort to understand why New Jersey minority populations do or do not bicycle, the research team conducted two focus groups, one for Black New Jersey residents and one for Hispanic New Jersey residents. To host the focus group, the research team partnered with a community organizer in New Brunswick who assembled participants that represented a broad range of ages, backgrounds, and sex. The first focus group, for Black participants, was held at Rutgers University on December 3rd, at 6:30 PM. The second focus group, for Hispanic participants, was held on December 16th, at 6:30 PM, also at Rutgers University. Twenty-nine questions were prepared for the focus group, along with follow-up questions. At the conclusion of the focus groups, participants completed a demographic questionnaire.

Black Focus Group

Demographics

Sixteen individuals participated in this focus group, evenly split between male and female participants. Eleven resided in New Brunswick. The other five lived in Newark, Highland Park, Perth Amboy, and Mansfield. Figure 24 below shows the demographic characteristics of the participants. Fifteen were single, and one was married or in a civil union. Participants ranged in age from 18 to 64, with a median age of 22. As the focus group was designed for Black New Jersey residents, all participants marked their race as Black. The highest level of education of eight participants was some college, while for five the highest level completed was high school or GED. One person had completed a two-year college degree, one had completed a four-year college degree, and one had completed graduate school. Six participants' household incomes were between \$25,000 and \$49,999, while four participants' were between \$50,000 and \$99,999.

Bicycle Ownership and Knowledge

The focus group began by asking participants if they knew how to bicycle, how long they had been bicycling, and if they currently owned a bicycle. Only one participant did not know how to bicycle. Of the fifteen that did, all had been bicycling for at least eleven years, having learned to use a bicycle as a

child. Three participants had been bicycling for over 50 years. However, six participants stated that they do not currently own a bicycle. None knew that New Jersey law requires bicycles to be equipped with a bell and lights.

Five participants thought a bicycle was expensive to purchase and maintain, though participants said that it depended on the context of the person. One said that if she had a lot of bills and expenses, adding a bicycle on top of them would be too much. Another agreed, saying that if a car was necessary to get to work, owning a bicycle was would be an expensive luxury.

Participants were also asked if they had been a victim of bicycle theft. Ten had been; three of those who had not been a victim did not own a bicycle. However, none of the participants said that the theft of the bicycle had stopped them from bicycling.

Reasons for Bicycling

The most common reason for the participants to bicycle was for exercise, fun, or leisure. Many of the older participants bicycled to accompany their children or extended family in the park or at events such as the New Brunswick Ciclovía. One participant said that bicycling was a good alternative to taking a taxi, while another said that a bicycle could be useful because it can reach all the stores in New Brunswick. Finally, one participant bicycled for the adrenaline rush.

Figure 24. Demographics of Black focus group participants.

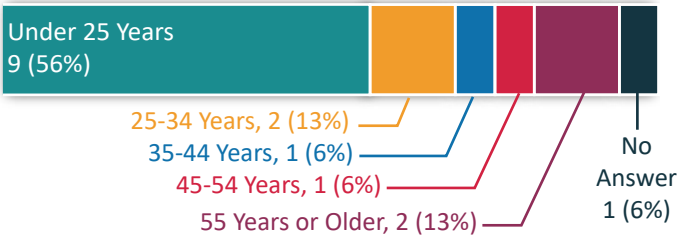
GENDER



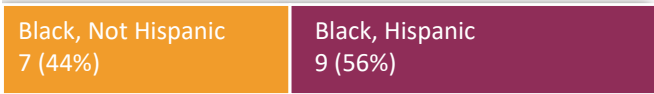
MARITAL STATUS



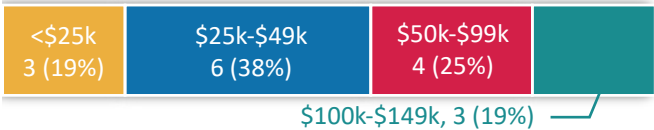
AGE



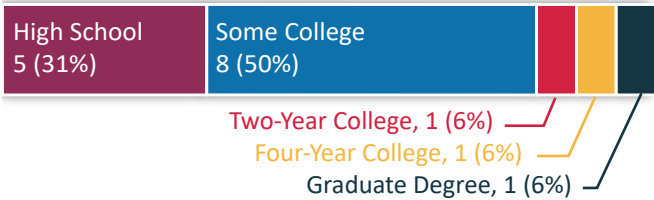
ETHNICITY



INCOME



EDUCATION



As a follow-up, participants were asked if they ever bicycle to work. One respondent answered affirmatively, as it allowed them to avoid traffic and parking complications. Another respondent said that they work far from home, so bicycling to work was neither safe nor practical. Specifically, Route 1 was mentioned as an important commuting corridor that was not hospitable to bicycling.

Participants were also asked about the importance of hygiene and how that related to their decision to use a bicycle. Most agreed that hygiene was very important, with many saying that good hygiene was especially valued in the Black community. One participant argued that hygiene did not come into play if the bicycling was done at a slow, controlled pace, but others disagreed. One participant added that the destination is key: arriving sweaty to work at a labor-intensive job was not a problem, but he would never bicycle to a social event where his friends expected him to arrive clean.

Most participants said that in New Brunswick bicycling to run errands was not necessary because most destinations are within walking distance. However, one participant thought that bicycling would be useful in Newark, where destinations were more dispersed.

When asked what would encourage them to bicycle more, most respondents cited events such as Ciclovía. One said that these types of events give bicycling positive exposure. Another agreed, since the more people who ride, the less harassment there will be toward bicyclists. One participant suggested giving people demonstrations of how and where they can bicycle to increase the number of people who bicycle. They stated that wayfinding is good, but training is even better.

Perception

Participants engaged in a lively discussion on whether bicycling for utilitarian purposes is considered cool. How participants responded varied by age. Many of those who were college-aged found it cool. One said that if they saw someone on a bicycle they would simply assume they were going to class. Another agreed and said that they rather see someone bicycling to work than sitting around at home. One respondent talked about how people are too dependent on cars, and using a bicycle indicated that they weren't relying on the easy way to get things done.

On the other hand, one of the older participants said that if someone saw her bicycling to work, they would assume something was wrong with her car. A second person agreed, and said that if a woman outside the college-age bracket saw him on a bicycle, she'd assume that "this brother is broke." A third person said that at his age, with a family, relying on a bicycle was not practical. However, one older participant thought elderly people on bicycles were cool, because it suggested that they

cared about their health.

Safety and Infrastructure

The most common places where participants were comfortable bicycling were places of leisure. Others noted that certain residential neighborhoods and college campuses were also safe.

Participants were shown a picture of a protected bicycle lane, and asked if they supported the concept. Six were familiar with it, and most agreed that they would ride a bicycle on a protected lane. One participant noted that she would be much more comfortable riding with her granddaughter if she knew that they would be in a space separate from cars. Another participant was concerned about the recent construction of bicycle lanes near parked cars, stating that he had had negative experiences with them, including being hit by opening doors.

To follow up, participants were asked if they supported the construction a bicycle lane on their street, to which five answered yes. One who agreed said that they live near a school and lots of the children ride bicycles. Of those who said no, three said that they lived on dead-end streets where a bicycle lane would not be useful. Another said that they did not see enough people riding bicycles to warrant the installation of lanes.

Participants were asked whether they felt that politicians supported or opposed bicycle infrastructure. Two replied that the New Brunswick government was supportive, and as examples they pointed to

the hosting of Ciclovía and the addition of new bicycle lanes. One participant knew that the New Brunswick city planner rides a bicycle to work. Another participant thought elected leaders support bicycling because it leads to gentrification. Two people thought that bicycle infrastructure and gentrification were linked. Because of the perception that bicycling leads to gentrification, several participants said that the problem was that the message supporting bicycling was not being spread to the Black community, creating a rift.

Police

Participants were also asked about their experience with the police. The first question was regarding bicycle theft, and whether they felt the police took it seriously. Most said that police did not take bicycle theft seriously. Of the ten who had experienced bicycle theft, only three reported it to the police. One said that a police report was filed, but the bicycle was recovered due to their own efforts.

Another question was about participants being stopped by a police officer while bicycling. Four said that they had been, and others said that they avoided bicycling in a nearby town (Highland Park) because they were worried about being

“

The most common places where participants were comfortable biking were places of leisure.

”

stopped. One participant said that going from New Brunswick to Highland Park, there was a 90% chance of being stopped, regardless of mode of transportation, due to being Black. Others agreed that they avoided Highland Park as much as possible, especially at night and on weekends due to that same concern. One participant who had been stopped by police stated that it was because she was out after youth curfew. Another stated that he had been stopped because the officer had been “amped up” after an unrelated chase. Two said they had been stopped due to the value of the bicycle, with the police assuming that it was stolen because they were Black and therefore could not afford it.

Bicycle Share

Most of the respondents had not heard of bicycle share, although a couple did recognize the concept when presented with pictures. The majority said they would not use it because of concerns about the price. When asked if it would work in New Brunswick, one participant stated that he felt the local population was not large enough to support a system.

Helmets

None of the participants in the focus group said that they wear a helmet. Most thought that helmets look unattractive and mess up their hair. Others stated that helmets reduce visibility, and do not guarantee safety.

Reasons for Not Bicycling

Reasons given for not bicycling included the weather (rain and temperature), and fear of a collision with a car. One person said that after witnessing a hit and run, they no longer felt

comfortable bicycling. Another participant stopped bicycling after being hit by a distracted driver.

Conclusions

For most of the participants, bicycles were seen as a useful tool for certain situations, especially for recreation or socialization. No participant displayed any hostility towards bicycling or bicyclists. Any negativity towards bicycling was framed as bicycles being impractical for necessary trips. The questions related to personal hygiene and interactions with the police elicited the most responses directly related to matters of race. Many of the respondents said that personal hygiene was valued more highly in the Black community than among other populations. Most of the participants also had experiences related to being profiled due to their race, and while that did not appear to impact the decision to use a bicycle, it did appear to impact where the participants chose to bicycle to. The focus group was unanimous in their lack of use of bicycle helmets. However, it was not clear if this decision is related to race in any way.

Participants agreed that protected bicycle lanes would get them to bicycle more often. Many cited bicycle-specific events such as Ciclovía (where cars are banned) as good places to bicycle. Others noted that they were only comfortable bicycling on low-volume streets, parks, and trails. Most agreed that new infrastructure, such as protected bicycle lanes, would encourage them bicycle around their community. Further, the group agreed that new infrastructure should be promoted through community engagement and training.



Figure 25. Man bicycling in dedicated bicycle lane in Indianapolis. Photo Credit: GLP.



Figure 26. Man bicycling at the New Brunswick Ciclovía, where bicycling is provided positive exposure and attendees are encouraged to ride on car free streets in Black and Hispanic communities in New Jersey.

Hispanic Focus Group

Demographics

Ten individuals participated in the Hispanic focus group, of which two were male and eight were female (Figure 27). Eight were single, one was married, and one lived with a partner. Participants ranged in age from 24 to 48, with a median age of 31. Five participants marked their race and ethnicity as White Hispanic, three as Puerto Rican, one as Black Hispanic, and one as Native American. Eight of the ten participants lived in New Brunswick, one person lived in North Brunswick, and one person lived in Edison. Three participants were high school graduates or had a GED and three had some college education. Two had a two-year college degree and two had a four-year college degree. Two respondents had household incomes of less than \$25,000, five had household incomes between \$25,000 and \$49,999, and three had household incomes between \$50,000 and \$99,999.

Bicycle Ownership and Knowledge

The focus group began by asking the participants if they knew how to bicycle, how long they had been bicycling, and if they currently owned a bicycle. All the participants knew how to bicycle, most having had learned when they were children. Six of the participants did not own a bicycle, and of the four that did, all were operational. Four participants had also bicycled in the past year. The participants were also asked if they thought bicycles were expensive to purchase and maintain. Most thought that it depended, due to the wide array of bicycles available. One person noted that some bicycles get quite expensive, and quoted \$300 as a lot to pay for a bicycle.

Reasons for Bicycling

Participants gave several reasons why they bicycled. One bicycled for fun, and another for fitness. Three said they bicycled because of family – one to bond, another to prove that they were not too

old to ride, and the third with family during the New Brunswick Ciclovía. One person bicycled for work; her job involved giving bicycle tours. The participants were also asked if they thought riding a bicycle to save money was important, and most agreed, although none bicycled specifically for that reason.

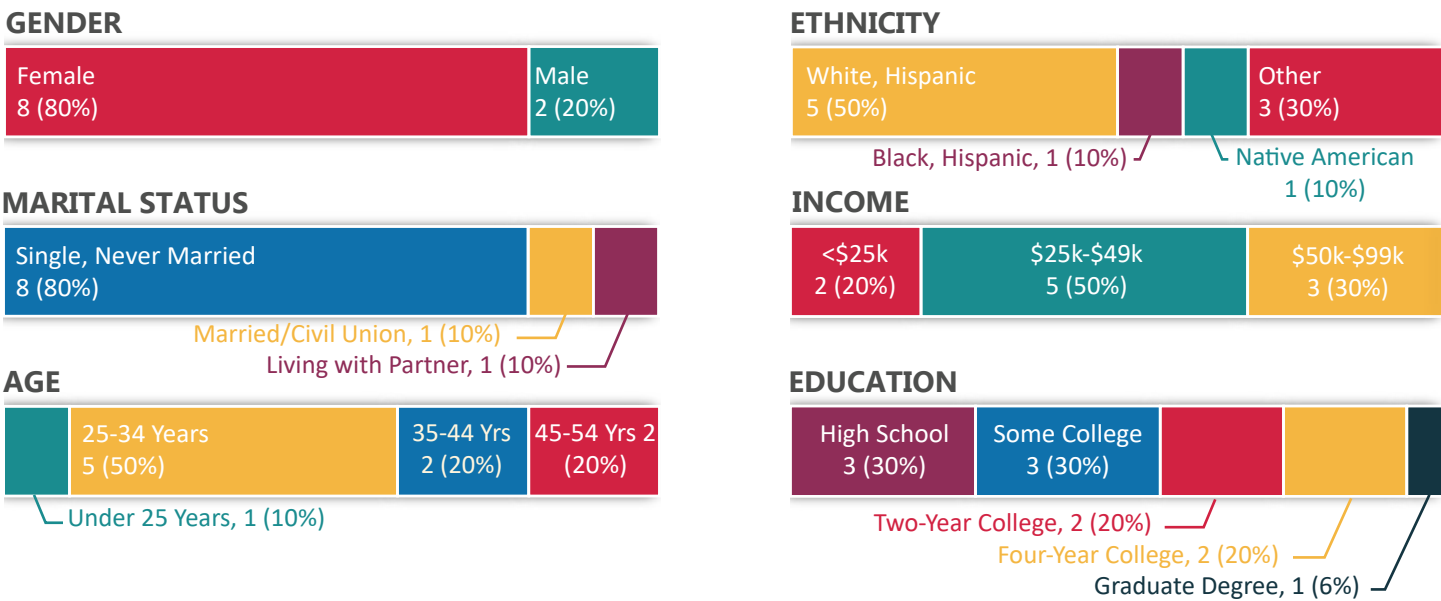
Only one of the participants bicycled to work. One had tried it once, but did not feel safe bicycling through a high-crime neighborhood. Other reasons for not bicycling to work included distance, the need to have a car on hand for family emergencies, and not having time to use a bicycle to reach a second job. One person mentioned hygiene as an issue, although hygiene did not appear to be as important a consideration as it was for participants in the Black focus group. None of the participants used a bicycle to run errands, for similar reasons given as to why they do not bicycle to work.

As was the case with the Black focus group, most of the participants said the New Brunswick Ciclovía was a positive influence in their community, and one said that encouraged them to bicycle. One participant said that even though she didn’t ride, her son loved it and she now lets him participate in the Ciclovía alone after she had seen how safe the event was. In general, the participants loved the community aspect of the event.

Perception

Participants were asked if they thought bicycling was cool. At first, the respondents all stated that it was, but after some thought several contrary opinions emerged. Reasons for thinking that it was cool included convenience and being less of a hassle than driving. On the other hand, one person thought that they would think someone with a bicycle did not have a driver’s license. When participants were then asked how their coworkers would react if they were seen bicycling, most assumed the coworker would have a negative opinion. One participant said that their coworker would laugh, while others thought they would be

Figure 27. Demographics of Hispanic focus group participants.



asked if their car had broken down, or if they'd gotten a DUI. Only the participant who bicycled as part of her job said that bicycling to work would be expected of her, and that everybody thinks of her "as a hippy."

Regarding the perceived social status of people who bicycle, the group agreed that it depended on the area and on the attire of the person bicycling. They felt that bicycling in a community like New Brunswick indicated a poor financial situation. On the other hand, they said that if they saw someone dressed in a "bicycle outfit" they would assume that person was a professional on an expensive bicycle, and was out to train or get exercise.

Participants were also asked how their families felt about bicycling. One participant said that their mother thought that bicycling was only for boys, and that girls weren't supposed to ride bicycles. Others in the room agreed, saying that the surrounding area was not safe for girls to be out alone, and that they would probably feel the same way with their own children.

Safety and Infrastructure

The places participants were most comfortable bicycling were places of leisure, such as parks and trails. One person said that they had only ever ridden on the street in front of their house. Two participants noted that the time and date were important when deciding where to ride. For example, one said that she would be comfortable bicycling on George Street (New Brunswick's main street) only on Sundays, and not on other days. Participants also mentioned certain streets they would avoid if they had to bicycle, primarily because drivers were especially "crazy" and because of concerns about crime.

When asked if they would like to see a bicycle lane on their street, seven participants said yes and three said no. Two participants opposed a bicycle lane on their street because of speeding cars, while another thought that there was no point because he lived on a dead-end street. There was no agreement within the group as to whether bicycle lanes cause more people to ride. While some agreed that providing the extra space gave the riders more security, others thought that a bicycle lane was not enough, or that someone who wanted to ride a bicycle would do so regardless of the presence of a bicycle lane.

None of the participants were familiar with protected bicycle lanes. However, when shown a picture, many did recognize the concept. Most were very receptive to the concept and said that it would encourage them to ride more, or to let their kids ride.

Police

Only one participant had had their bicycle stolen; another had a relative who had had his bicycle stolen. The police were not

involved in either case. All agreed that bicycle theft is a problem in New Brunswick, and that locks do not guarantee safety. None of the participants had ever been stopped by the police when riding a bicycle, although one person had been approached by an officer and told that her son needed to have a helmet on.

As the Black focus group had spoken at length about their negative experiences in Highland Park, participants were asked if they had similar experiences. One person said that they would not drive through Highland Park, and another said that she felt uncomfortable there. However, the rest of the participants were not as concerned. Many of the participants did cite Milltown as a municipality they avoided due to worries of being stopped by police due to their race or ethnicity.

Bicycle Share

None of the participants were familiar bicycle share; however, they did recognize the concept when shown a picture. Only one participant had used a bicycle share system (CitiBike in New York City), but all stated that they would be interested in doing so. Further questioning revealed that they saw bicycle share as a good leisure or tourist opportunity, but would be unlikely to use it in their neighborhood.

Reasons for Not Bicycling

Most of the reasons for not bicycling in general were the same as those given for not bicycling to work: weather, crime, traffic, and the peace of mind that came with having a car in the case of an emergency.

Conclusions

None of the participants of the Hispanic focus group were avid bicyclists. Although there was little negativity expressed towards bicycling, most did not appear to have any desire to ride. One person thought that a financial incentive, such as a reduced insurance premium, would encourage him to ride a bicycle. This focus group was more concerned with crime than the Black focus group. Most participants said that they were uncomfortable going out at night, and that bicycling made them vulnerable to both traffic crashes and crime. In contrast to their concerns about safety, only one of the participants said that they used a helmet, and none used lights or bells. Most of the participants were also unfamiliar with New Jersey bicycle laws. Like the Black focus group, participants agreed that separation between bicycles and vehicles, such as a protected bicycle lane, would get them to bicycle more often. Many also cited the New Brunswick Ciclovía as a positive initiative; two of them had participated in the planning process. When asked for their final thoughts on bicycling, two participants repeated that weather was the most important thing, one thought that less crime would result in more people riding, and another really liked the protected bicycle lanes.

“Most [participants] were very receptive to the concept [of protected bike lanes] and said that it would encourage them to ride more, or to let their kids ride.”

Survey Results



Figure 28. A young girl bicycles with help during the New Brunswick Ciclovía.

The Nature of the Surveys

All survey respondents were pre-screened prior to receiving one of the two surveys designed for bicyclists and non-bicyclists. If respondents stated that they had not bicycled within twelve months of receiving the survey, they were given the non-bicyclist survey instrument and were categorized and counted as “non-bicyclists.” Similarly, if respondents had bicycled within twelve months of receiving the survey, they were given the bicyclist survey instrument and were categorized and counted as “bicyclists.” There were 2,661 surveys collected, of which 54 percent of the survey respondents were categorized as non-bicyclists and 46 percent as bicyclists. It is important to note, however, that being categorized as a non-bicyclist does not imply inability to bicycle. In fact, the majority (84%) of the respondents that took the non-bicyclist survey knew how to ride a bicycle. This finding becomes even more important as comparisons between bicyclists and non-bicyclists are made in other sections of the report.

The bicyclist survey instrument included 39 questions, and the non-bicyclist survey instrument contained 41 questions (see Appendix A). While both surveys included identical questions that allowed comparisons to be made between bicyclists and non-bicyclists, the bicyclist survey instrument differed from the non-bicyclist survey instrument in that it asked questions intended specifically for bicyclists. Questions unique to the bicyclist survey instrument centered on bicycle frequency, purpose, and behavior in the past twelve months. Therefore, since non-bicyclists reported not having ridden a bicycle within twelve months of receiving the survey, these questions were excluded from their survey instrument.

Demographic Characteristics of Survey Respondents

There were several identical questions included in both survey instruments to ascertain the demographics of all respondents. These questions inquired about the survey respondents’ race and ethnicity, age, sex, total annual household income and education, as well as the number of adults, children, bicycles and vehicles present and available in their respective households. The surveys also inquired about the respondents’ countries of origin; that is, the country where they spent the first twelve years of their lives.

Race and Ethnicity

As shown in Table 2, the racial and ethnic proportions of the survey respondents (i.e., Black, Hispanic, and Mixed Race populations) are significantly higher than the racial and ethnic proportions of New Jersey as a whole and differ significantly from the places where the surveys were administered. However, the proportion of White and Asians are significantly lower in the study area in comparison to that of New Jersey. For example, 38 percent of the survey respondents are Black, 32

percent are Hispanic, 16 percent are White, three percent are Asians, and four percent are Mixed Race, whereas in the study area 30 percent of the population are Black, 38 percent are Hispanic, 22 percent are White, eight percent are Asians, and two percent are Mixed Race. Similarly, Blacks constitute only 13 percent, Hispanics 19 percent, Asians 9 percent, and Mixed-Race two percent whereas Whites constitute a majority (58%) of New Jersey’s population as a whole. Important to note here that comparisons with Native American respondents were omitted, since there were only ten respondents who identified themselves as Native Americans, which still was much higher in percentage than those in the study area and that of New Jersey as a whole.

The majority of both Black and Hispanic survey respondents are also non-bicyclists, whereas the majority of White, Asian and Mixed Race survey respondents are bicyclists. While these findings are not surprising when taking into consideration the aforementioned purpose and locations where the surveys were administered, it is worth noting that, although Blacks constitute only 30 percent of the population within the study area, they make up 38 percent of survey respondents.

Age

Persons in the age group 18-24 constitute the largest share of survey respondents (21%), followed by those in the age group 25-34 (21%). This is also true for both bicyclists and non-bicyclists; the largest proportion of survey respondents were in the 18-24 age group. Comparatively, bicyclists are younger than non-bicyclists. The majority of bicyclists (58%) are under age 35, whereas the majority of non-bicyclists (50%) are above age 35. In contrast, the largest proportion of the population within the study area (not including those under age 18 as those respondents were not the target audience and not included in the analysis) are in the 25 to 34 age group (see Table 2).

Sex

As shown in Table 2, **54 percent of all survey respondents identified as male and 38 percent as female.** In contrast, the majority of residents living in the study area identify as female (51%) and less than half identify as male (49%). The same is true for the majority of New Jersey’s population, which is made up of 51 percent female and 49 percent male. As expected, males are more likely to be bicyclists. An overwhelming majority of bicyclist survey respondents are male (68 percent of bicyclists versus 45 percent of non-bicyclists) and a majority of females are non-bicyclists (66 percent of non-bicyclists versus 34 percent of bicyclists).

Education

The educational attainment of the survey respondents is lower than the population of New Jersey as a whole but similar to the population living within the study area (see Table 2). Only exception being the percentage of respondents with a high school degree or higher is similar to that of New Jersey’s population as a whole at 88 percent but only 80 percent

Table 2. Demographics of all survey respondents.

Variable	Category	Study Area		All Respondents		Bicyclists		Non-Bicyclists	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Age	Under 18	539,727	24.1%	116	8%	69	59%	47	41%
	18 to 24	241,888	10.8%	348	23%	174	50%	174	50%
	25 to 34	364,978	16.3%	339	22%	161	47%	178	53%
	35 to 44	318,684	14.3%	256	17%	116	45%	138	54%
	45 to 54	301,710	13.5%	260	17%	111	43%	148	57%
	55 to 64	230,759	10.3%	161	10%	64	40%	97	60%
	65 or older	238,219	10.7%	58	4%	11	19%	47	81%
	Total	2,235,965	100%	1538	100%	706	46%	829	54%
Sex	Female	1,138,963	50.9%	636	41%	205	32%	430	68%
	Male	1,097,002	49.1%	898	58%	508	57%	387	43%
	Other	-	-	6	0%	1	17%	5	83%
	Total	2,235,965	100.0%	1540	100%	714	46%	822	53%
Race and Ethnicity	Black/African American	666,861	29.8%	777	51%	343	44%	430	55%
	Hispanic/Latino	847,588	37.9%	656	43%	308	47%	348	53%
	Mixed Race	40,444	1.8%	83	5%	46	55%	37	45%
	Total	1,554,893	70%	1516	100%	697	46%	815	54%
Education	Less than High School Graduate	345,306	20.4%	221	15%	110	50%	109	49%
	High school Graduate or GED	552,415	32.6%	510	35%	244	48%	266	52%
	Some College, No Degree	349,084	20.6%	310	21%	130	42%	180	58%
	Associates Degree	87,478	5.2%	136	9%	53	39%	83	61%
	Bachelor's Degree	239,356	14.1%	211	14%	98	46%	111	53%
	Graduate or Professional Degree	122,599	7.2%	68	5%	31	46%	37	54%
	Total	1,696,238	100%	1456	100%	666	46%	786	54%
Income	Less than \$14,999	124,779	16.5%	340	26%	159	47%	179	53%
	\$15,000 to \$24,999	86,297	11.4%	244	19%	109	45%	135	55%
	\$25,000 to \$49,999	174,323	23.1%	331	25%	146	44%	185	56%
	\$50,000 to \$74,999	125,055	16.6%	185	14%	90	49%	94	51%
	\$75,000 to \$99,999	85,532	11.3%	85	7%	42	49%	43	51%
	\$100,000 to \$149,999	92,118	12.2%	60	5%	28	47%	32	53%
	\$150,000 to \$249,999	36,748	4.9%	41	3%	22	54%	19	46%
	\$250,000 or more	29,344	3.9%	17	1%	10	59%	7	41%
	Total	754,196	100%	1303	100%	606	47%	694	53%
Adults in Household	None	-	-	13	1%	3	23%	10	77%
	One	-	-	277	18%	120	43%	157	57%
	Two	-	-	535	35%	255	48%	280	52%
	Three or More	-	-	683	45%	320	47%	363	53%
	Total	-	-	1,508	100%	698	46%	810	54%
Children in Household	None	-	-	657	45%	294	45%	363	55%
	One	-	-	323	22%	147	46%	176	54%
	Two	-	-	274	19%	139	51%	135	49%
	Three	-	-	155	11%	72	46%	83	54%
	Four	-	-	35	2%	16	46%	19	54%
	Five or More	-	-	19	1%	11	58%	8	42%
	Total	-	-	1,463	100%	679	46%	784	54%
Bicycles in Household	None	-	-	457	28%	75	16%	382	84%
	One	-	-	443	27%	243	55%	200	45%
	Two	-	-	411	26%	233	57%	178	43%
	Three or More	-	-	300	19%	198	66%	102	34%
	Total	-	-	1,611	100%	749	46%	862	54%
Motor Vehicles in Household	None	-	-	409	27%	180	44%	229	56%
	One	-	-	472	32%	227	48%	245	52%
	Two	-	-	380	26%	177	47%	203	53%
	Three or More	-	-	229	15%	111	48%	118	52%
	Total	-	-	1,490	100%	695	47%	795	53%
Country of Origin	United States of America	1,492,925	66.8%	1,054	63%	512	49%	542	51%
	Outside of USA	743,040	33.2%	606	37%	246	41%	360	59%
	Total	2,235,965	100%	1,660	100%	758	46%	902	54%

of the study area's population are high school graduates or higher. However, 21 percent of the survey respondents are graduates of four-year colleges or higher, whereas 34 percent of New Jersey's population and 21 percent of the study area's population are four-year college graduates or higher. Of the survey respondents, non-bicyclists are slightly more educated than bicyclists, with 89 percent of non-bicyclists being high school graduates or higher and 87 percent of bicyclists being high school graduates or higher. While the proportion of non-bicyclists that are high school graduates or higher is slightly lesser than New Jersey's population, the percentage of the survey respondents with a bachelor's degree or higher is significantly less, 21 percent versus 34 percent of New Jersey's population as a whole.

Income

Respondents are poorer than the population within the study area and the New Jersey population as a whole. As shown in Table 2, the proportion of New Jersey households and households within the study area with an annual income of less than \$15,000 is nine percent and 17 percent, respectively, whereas the proportion of survey respondents' earning within that income group is 19 percent. This is also true regardless whether the survey respondent identified as a bicyclist or non-bicyclist, as 19 percent of bicyclist and 20 percent of non-bicyclist populations earned less than \$15,000. Moreover, 18 percent of New Jersey's population and nine percent of the

study area's population earn more than \$150,000 annually, whereas only four percent of the survey respondents earn that amount. There are, however, no major differences in earnings between bicyclists and non-bicyclists. For example, a slightly larger share of bicyclists than non-bicyclists earn more than New Jersey's median household income of \$72,062, 16 percent versus 14 percent, respectively.

Adults in Household

The largest proportion of survey respondents' households (44%) contains three or more adults, followed by 36 percent of households that contain two adults. By comparison, fewer adults reside in non-bicyclists' households than in bicyclists' households. For instance, 21 percent of non-bicyclists' households contain at least one adult whereas only 16 percent of bicyclists' households contain the same number of adults.

Children in Household

There are no children in the households of nearly half (49%) of all survey respondents. As shown in Table 2, 49 percent of all survey respondents reported no children in the household, followed by 21 percent with one child in the household, and 30 percent with two or more children in the household. By comparison, there is a slightly larger proportion of non-bicyclist households (51%) without children than bicyclist households (47%). On the other hand, there are larger proportions of bicyclist households with two (52%) or five or more children (58%) than non-bicyclist households.

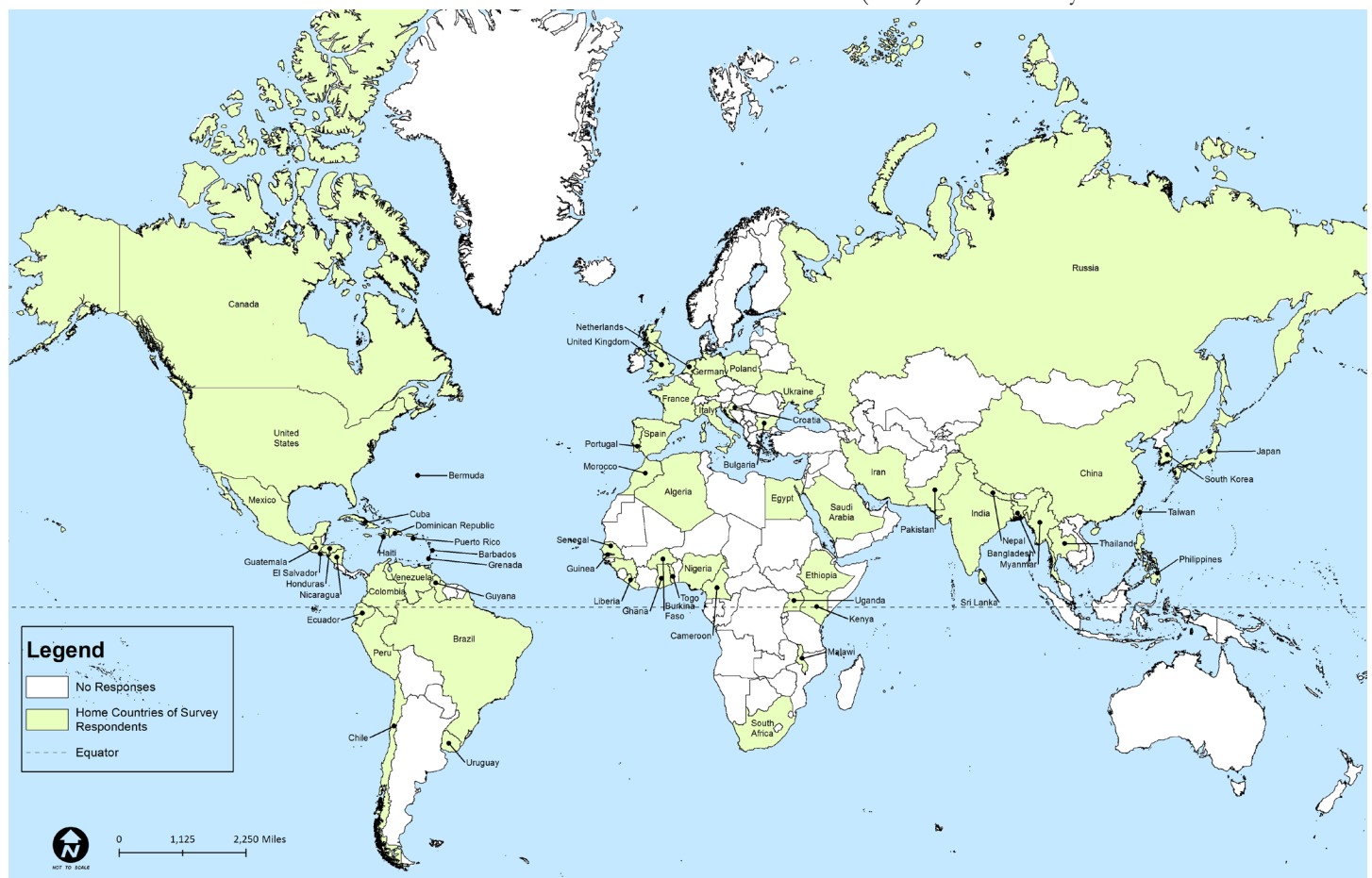


Figure 29. Countries in which all survey respondents spent the first twelve years of their lives.

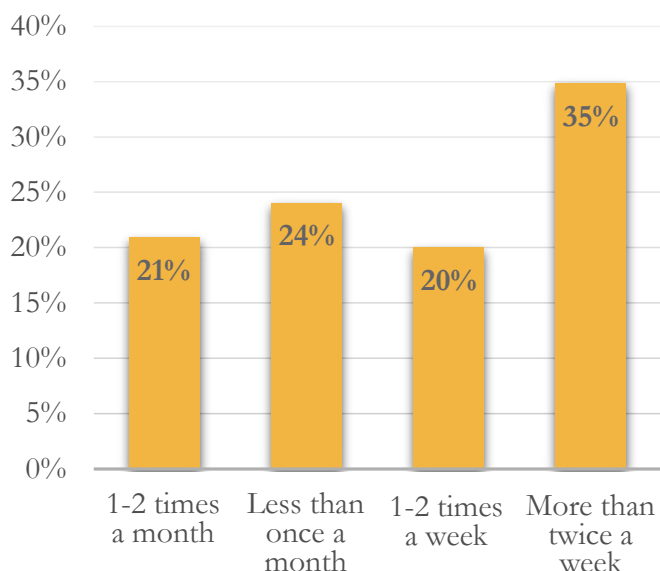


Figure 30. The frequency of bicycling by bicyclist survey respondents.

Bicycles in Household

The majority of survey respondents have at least one bicycle in the household. However, the largest proportion—slightly more than a quarter—of survey respondents reported not having bicycles in the household (27%). Comparatively, a larger proportion of non-bicyclists (43 %) reported not having at least one bicycle in the household, as opposed to 9 percent of bicyclists. As expected, an overwhelming majority of bicyclist households (91%) have at least one bicycle present in the household

Motor Vehicles

Survey respondents have fewer motor vehicles available in the household than the population within the study area and New Jersey’s population as a whole. For example, while 23 percent of survey respondents do not have a motor vehicle available in the household, only 16 percent of the population

within the study area and seven percent of New Jersey’s population as a whole do not. Of note, the differences in vehicle availability between bicyclists and non-bicyclists are much less prominent with 21 percent bicyclists having no vehicles in the household compared to 24 percent of non-bicyclists.

Country of Origin

An overwhelming majority (68%) of survey respondents reported having spent the first twelve years of their lives in the United States of America, whereas a sizeable minority (21%) grew up in countries outside of the US. As shown in Table 2, the proportion of survey respondents that spent their formative years outside the US is lesser than those in the study area, 21 percent versus 33 percent, respectively. Comparatively, a larger proportion of non-bicyclists spent their formative years outside the US than bicyclists. Figure 29 highlights the countries where survey respondents spent their formative years. Results from Questions Unique to Bicyclists in the Bicyclist Survey

Results from Questions Unique to Bicyclists in the Bicyclist Survey

This section highlights the findings from the questions unique to the bicyclist survey, including questions on bicycle frequency and purpose, bicycle club membership, and where respondents can safely bicycle to and from home. Comparisons between the identical questions included on both the bicyclist and non-bicyclist survey are covered later in the report.

Bicycle Frequency

Each respondent was asked to state how often they bicycle, with their options ranging from less than once a month to more than twice a week. As shown in Figure 30, **the respondents are fairly active as a whole with 35 percent bicycling more than twice a week.** The largest proportion of bicyclists (35%) bicycle more than twice a week, followed by 20 percent who bicycle 1-2 times a week. There is a sizable minority (24 percent) who bicycles less than 1-2 times a month, however.

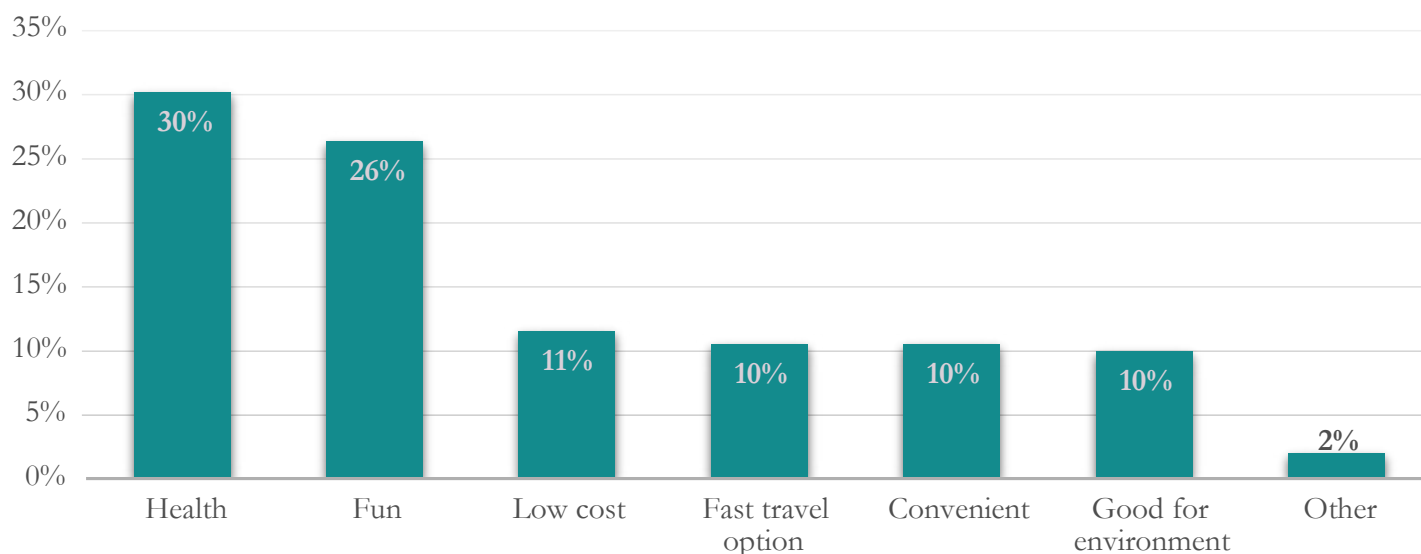


Figure 31. Reasons for bicycling for bicyclist survey respondents.

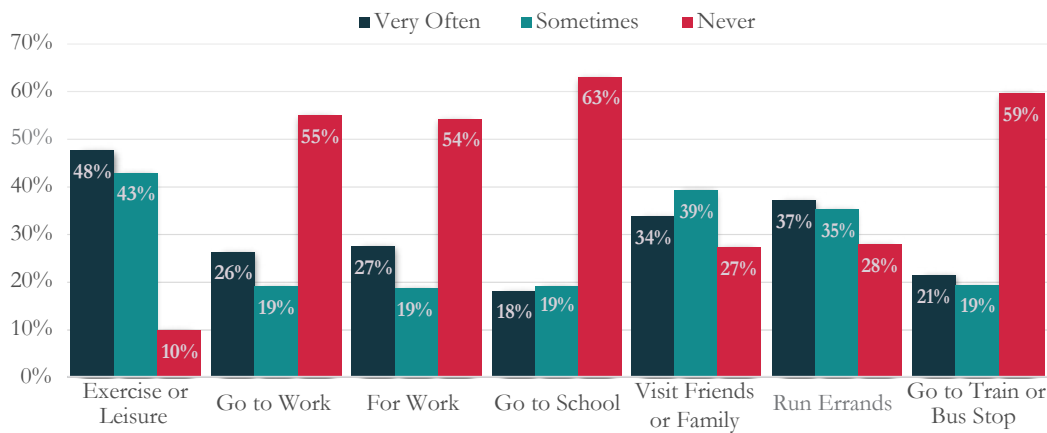


Figure 32. The frequency to which bicyclists choose to bicycle for a particular purpose.

Reasons for Bicycling

The survey respondents were asked why they bicycle and were given an option to select more than one reason for bicycling from a pre-determined list, including health/exercise, fun/excitement, fast travel option, etc. As shown in Figure 31, **the majority (56%) do so for health/exercise and fun/excitement.** Of that majority, the largest proportion of respondents (30%) do so for health and exercise and 26 percent do so for fun and excitement. Fewer respondents bicycle because it is a low cost travel option (11%), a fast travel option (10%), because it is convenient (10%), or good for the environment (10%).

Respondents were asked how often they bicycle for a particular purpose, with their options ranging from very often to never for each purpose. As shown in Figure 32, **the largest proportion of respondents bicycles most often for exercise or leisure (48%), for running errands (37%), or for visits to see friends and family (34%).** By comparison, larger proportions of bicyclists do not bicycle to go to school (63%), to catch the train or bus (59%), to work (54%), or to bicycle for work (54%). The former are findings that are consistent with Figure 31, where the majority of respondents (56%) stated that they bicycle for health/exercise and fun/excitement.

Safe Places to Bicycle to and from Home

The survey also asked respondents about their perception of whether it is safe to bicycle to/from particular locations in their neighborhoods. As shown in Figure 33, **the largest proportion of bicyclists (22%) feels that they can safely bicycle to parks or trails from their homes, followed by to work (14%), to shopping destinations (14%), to social activities (13%), and to school, daycare or church (11%).** By comparison, fewer bicyclists felt that they could safely bicycle from their homes to nearby colleges and universities, medical and dental services, and transit stations. Four percent felt that they had no safe place to bicycle to at all.

Comparatively, **a larger proportion of Black bicyclists reported being able to safely bicycle to and from home than Hispanic and Mixed-Race bicyclists in each category except “to work” and “to parks.”** A larger proportion of Mixed Race bicyclists than Black and Hispanic bicyclists do not have a place to safely bicycle to and from home. There are minor differences in regards to age, income and all bicyclists but noticeable differences between males and females. For example, a larger proportion of females than males report being able to safely bicycle to and from home to school, social settings, and parks.

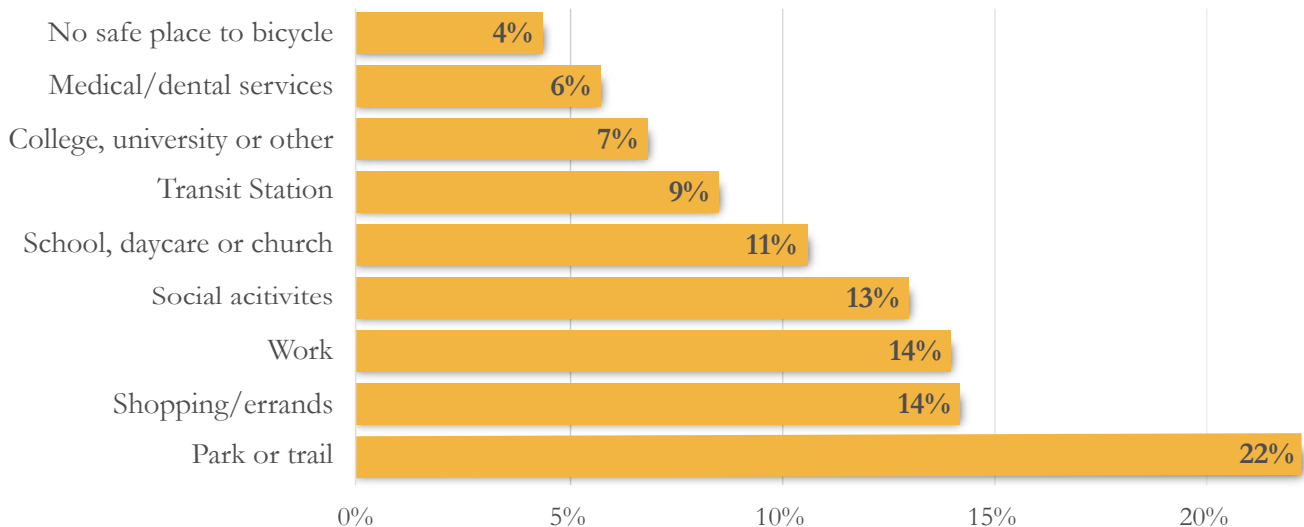


Figure 33. Bicyclists' perception of whether it is safe to bicycle to/from particular locations in their neighborhoods.

Bicycle Club Membership

An overwhelming majority (93%) of bicyclists are not active in bicycle clubs or organizations. By comparison, a higher proportion of Mixed Race bicyclists are members of bicycle clubs than are Blacks and Hispanics, as well as all survey respondents earning \$100,000 or more a year. There are, however, no noticeable differences in bicycle club memberships in regards to age or gender.

Results from Questions Unique to Non-Bicyclists in the Non-Bicyclist Survey

This section highlights the findings from the questions unique to the non-bicyclist survey, including questions on bicycling ability and interest, negative bicycling experiences and their impact, and reasons for choosing not to bicycle. As stated earlier, comparisons between the identical questions included on both the bicyclist and non-bicyclist survey will be covered later in the report.

Bicycle Ability and Interest

Eighty-four percent of the respondents know how to bicycle. Of the 16 percent that reported not knowing how to ride a bicycle, more than half (52%) stated that they are interested in learning, while 48 percent stated that they would not be interested in learning to bicycle. A higher proportion of males than females reported knowing how to ride a bicycle; however, a larger proportion of females than males reported being interested in learning. Similarly, a larger proportion of Hispanics and Mixed Race non-bicyclists reported interest in learning to bicycle than Black non-bicyclists.

Negative Bicycle Experiences

More than one-quarter of non-bicyclists reported having had a negative bicycling experience. Of those, a sizable minority reported that the negative bicycling experience limits

how often they bicycle. A larger proportion of males reported having negative bicycling experiences than females, and the same is true for Mixed-Race non-bicyclists versus Black and Hispanic non-bicyclists. While negative bicycling experiences impacted males and females equally, it impacted Hispanic non-bicyclists more so than Blacks and Mixed Race non-bicyclists.

Reasons for Choosing not to Bicycle

Non-bicyclists were asked to select from a pre-determined list of eleven reasons that may prevent them from bicycling. The list included variables such as physical limitations, bicycle ownership, pregnancy/small children, etc. As shown in Figure 34, their two main reasons for not bicycling were not owning a bicycle (28%) and not having time to bicycle (15%), followed by disabilities/physical limitations (11%), concerns for safety (11%), and disinterest (11%). Traumatic experiences, pregnancy/small children, bicycle affordability and disrepair did not significantly factor into why they do not bicycle.

Comparatively, more Black non-bicyclists do not bicycle due to disabilities/physical limitations, not owning a bicycle, and not having a place to bicycle than Hispanic non-bicyclists. The top five reasons for not bicycling for females were not owning a bicycle, not feeling safe, time constraints, having a disability or physical limitation and disinterest, whereas for the men the top five reasons were not owning a bicycle, time constraints, disinterest, having a disability or physical limitation, and not feeling safe were the top five reasons for not bicycling for men. Of note, not feeling safe ranked in the top three reasons females chose to not bicycle whereas it ranked fifth for men.

Results from Questions Identical on the Bicyclists and Non-Bicyclists Surveys

This section highlights the findings from the questions in both the bicyclist and non-bicyclist surveys. The surveys included questions on bicycle cost and maintenance, bicycle-share

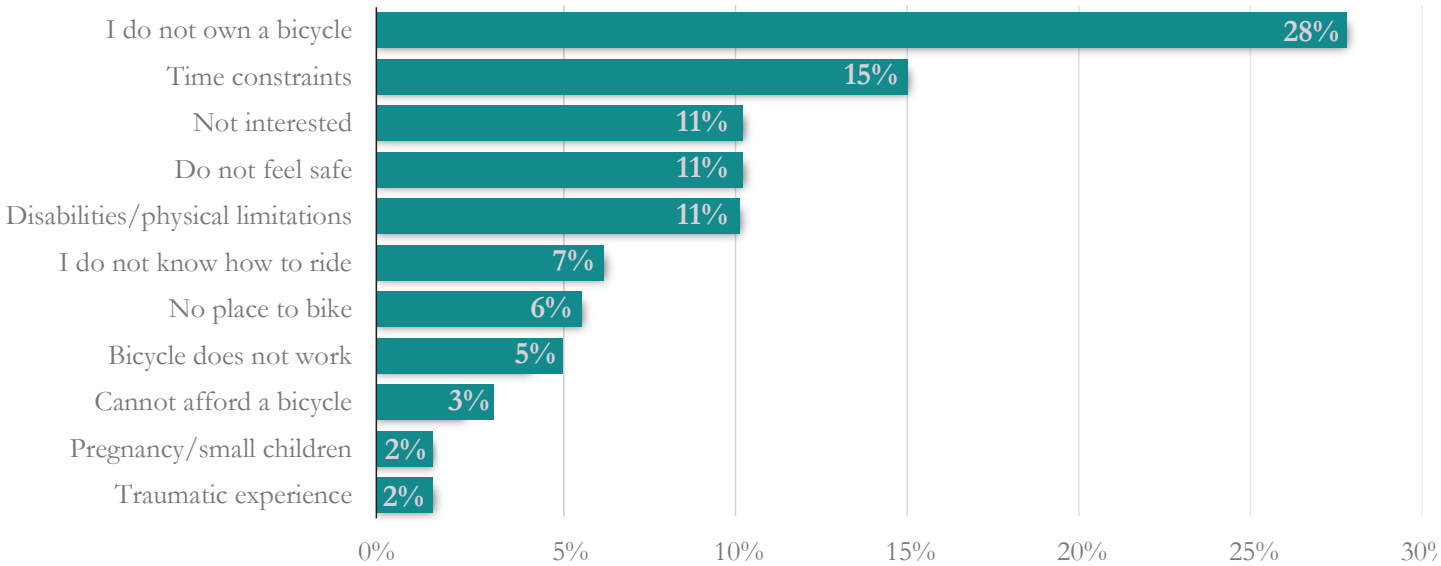


Figure 34. Reasons why non-bicyclists choose not to bicycle.

programs, perceptions, harassment, government support and investment, bicycle lanes, bicycle theft, storage, and several other key themes to ascertain minority bicycle access and usage. This section includes relevant comparisons between bicyclists and non-bicyclists, as well as comparisons between age, gender, and income groups when appropriate.

Bicycle Cost and Maintenance

Respondents were each given the option of answering yes, no, or not sure as to whether they thought a bicycle was expensive to purchase and maintain. Excluding those that answered “not sure” to the question, slightly more than one-quarter (28%) of all respondents feel that bicycles are expensive to purchase and maintain, regardless of race/ethnicity and gender, or whether respondents are bicyclists or non-bicyclists (see Figure 36). By comparison, a larger proportion of all Blacks than all Hispanic, White, Asians, and Mixed-Race respondents feel that bicycles are expensive to purchase and maintain.

When comparing bicyclists and non-bicyclists within each racial and ethnic group, **a larger proportion of Black and Hispanic bicyclists feel that bicycles are expensive to purchase and maintain than Black and Hispanic non-bicyclists.** However, among Mixed-Race survey respondents, 36 percent of non-bicyclists versus 24 percent of bicyclists and among Asian survey respondents 35 percent of non-bicyclist versus 23 percent bicyclists feel that bicycles are expensive to purchase and maintain. While among White survey respondents, 33 percent of non-bicyclists feel that bicycles are expensive to purchase and maintain compared to 22 percent bicyclists (see Figure 36). And, while there are minor differences between the proportion of females and males in regards to the overall affordability and maintenance of bicycles, there are noticeable differences across income groups. For example, with slight variations, higher proportions of those earning less than the state average believe that bicycles are expensive to purchase and maintain than those earning more than the state average.



Figure 35. Costs associated with bicycle access and maintenance can prove to be a barrier to potential bicycle users.

Awareness of Bicycle-Share Program

The expansion and popularity of bike-share systems within the U.S. provide opportunities for Black and Hispanic residents to increase physical activity, improve health outcomes, and commute to and from work. Many of these systems however are located outside of minority communities. To ascertain the awareness of local bicycle share systems, respondents were asked if they are aware of CitiBike (NYC) or Indego (Philadelphia). **The majority (57%) of all respondents indicated that they have not heard of these systems even though all the respondents live within an hour of either programs** (Figure 37). By comparison, a larger proportion of Asians (61%), White (55%), all bicyclists (49%), and all females (48%) have heard of these programs than their respective

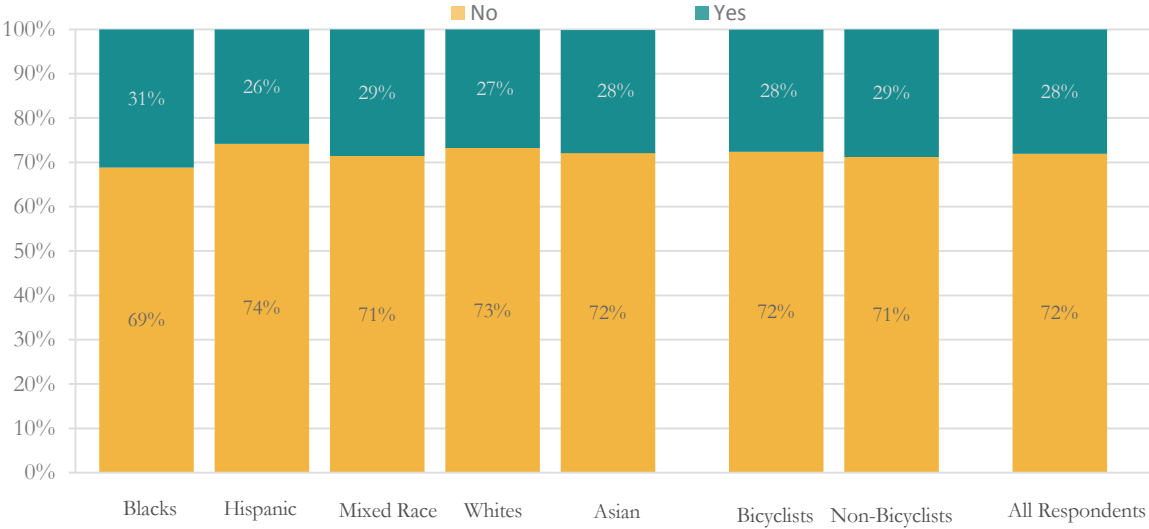


Figure 36. Respondents' views on whether bicycles are expensive to purchase and maintain, according to race and gender.

counterparts and respondents as a whole. Asian bicyclists are also more aware of the programs than all other bicyclists, with Black non-bicyclists and Mixed-Race bicyclists being the least aware of all non-bicyclists and bicyclists. However, Mixed-Race non-bicyclists were the most aware among all non-bicyclists; this might be in part due to limited number of respondents. There is a statistically significant difference in response according to income, with an increase in awareness as household earnings increase. The only exception, in terms of awareness, are those earning \$250,000 or more; this may be in part due to the limited number of respondents in that income group.

Prospective Use of Bicycle-Share Programs

When asked if they would use a bicycle-share system if one was available in their community, an overwhelming majority (85%) stated that they would (Figure 38). A higher proportion of bicyclists, Hispanics, females, and those earning between \$25,000 and \$49,000 annually responded affirmatively than their counterparts. The difference in responses between females, males and others is statistically significant, as well as the responses between bicyclists and non-bicyclists. While a larger proportion of males are aware of the bicycle-share programs than females, a higher proportion of females than males stated that they would use the system if one were available. Prospective use of the program was higher among Hispanics than any other

group and only one out of ten Hispanic bicyclists reported they would not be interested in using the system.

Perceptions Surrounding Who Bicycles in New Jersey

As shown in Figure 39, the majority of all respondents believe that bicycling is done by the middle class. This view is also shared by all bicyclists, regardless of race/ethnicity or gender. There are, however, differences within each income group. An overwhelming majority of each income group believes that bicycling is done by the middle class and poor, but unlike all others less than one-quarter of those earning between \$100,000 and \$149,000 believe that bicycling is done by the poor. Among the racial and ethnic groups, a higher proportion of Asians (66%) believe that bicycling is done by the middle class than all other groups while a higher proportion of Hispanics (31%) believe that bicycling is done by the poor than all other groups.

Perceived Police Harassment

Over a tenth (15%) of all respondents have been unfairly stopped by a police officer while riding a bicycle. Comparatively, higher proportions of Mixed-Race and Black respondents have been unfairly stopped by police officers while bicycling than Hispanic respondents. Similarly, a higher

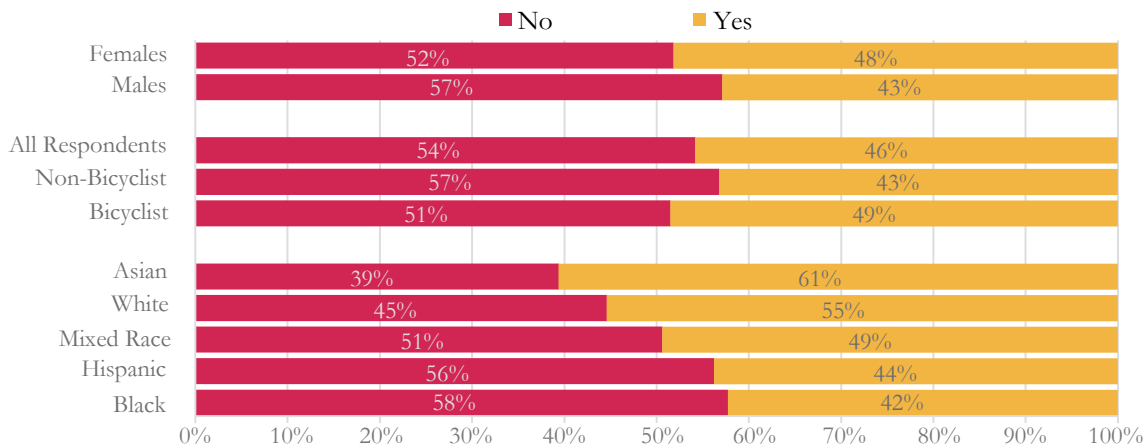


Figure 37. Respondents’ awareness of bicycle-share programs, according to race and gender.

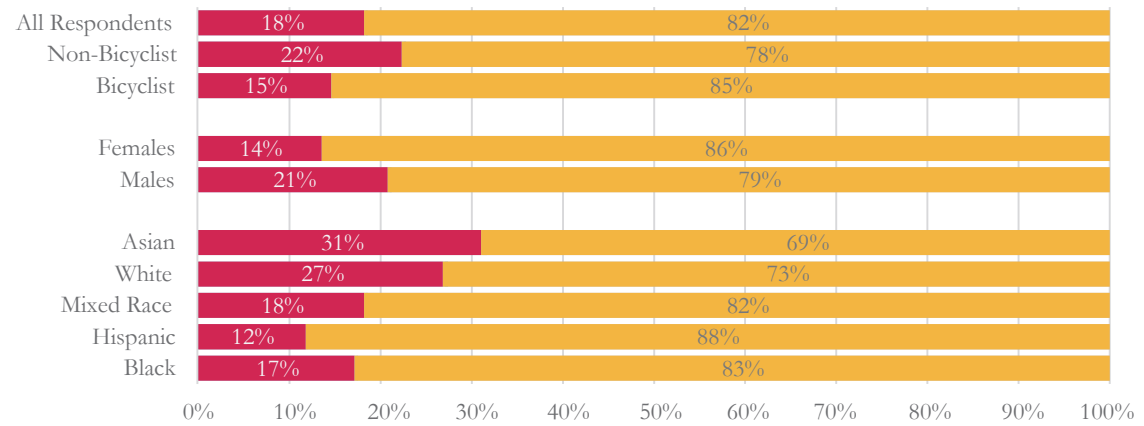


Figure 38. Respondents’ prospective use of bicycle-share programs, according to race and gender.

proportion of Mixed Race bicyclists have been unfairly stopped while bicycling than Black and Hispanic bicyclists, as well as all bicyclists as a whole (Figure 40).

A disproportionate number of males reported being unfairly stopped by police officers. Males reported being stopped at a rate close to seven times than that of females, 20 percent versus three percent, respectively. Those earning \$250,000 or more reported being stopped at a higher rate than those earning less than that amount. The latter, however, may have more to do with the limited number of respondents in that income group, which makes up only three percent (15 respondents) of the total number of respondents who answered “yes” to the question.

Access to Political Power

Using a five-point scale, respondents were asked to state the perceived likelihood their government would build bicycles lanes or paths in their communities if they requested them. The majority of all respondents (56%) believe that it is unlikely to very unlikely that the government would do so (Figure 41). Higher proportion of Asians and Mixed-Race respondents than Blacks and Hispanics believe this to be true, while the proportion of Whites were the highest among all the groups (65%). There are statistically significant differences in the responses to the question in regards to user, gender, and income. Hispanic and Mixed-Race bicyclists are less optimistic than Hispanic and Mixed-Race non-bicyclists. Respondents belonging to households earning less than \$15,000 a year were also more optimistic than those earning more, with

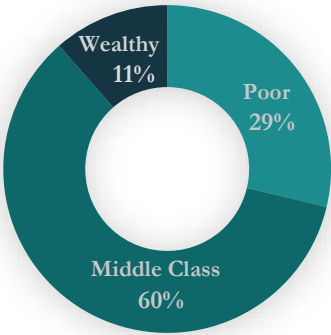


Figure 39. Respondents' perceptions regarding who bicycles in New Jersey.

the exception of households earning above \$250,000 which may be attributed to limited number of responses in that category.

Government Support of and Investment in Bicycling

Respondents were asked to state whether they felt their government supports and invests in bicycle infrastructure and facilities. An overwhelming majority of all respondents (63%) disagreed (Figure 42). A higher proportion of men (38%) than women (34%) believe their government supports and invests in bicycle infrastructure and facilities. The difference in the responses are statistically significant. By comparison, larger proportions of non-bicyclists than bicyclists, across all groups, believe this to be the case, with one exception: Mixed Race bicyclists. Among Mixed-Race respondents, 67 percent of bicyclists do not think their government supports and invests

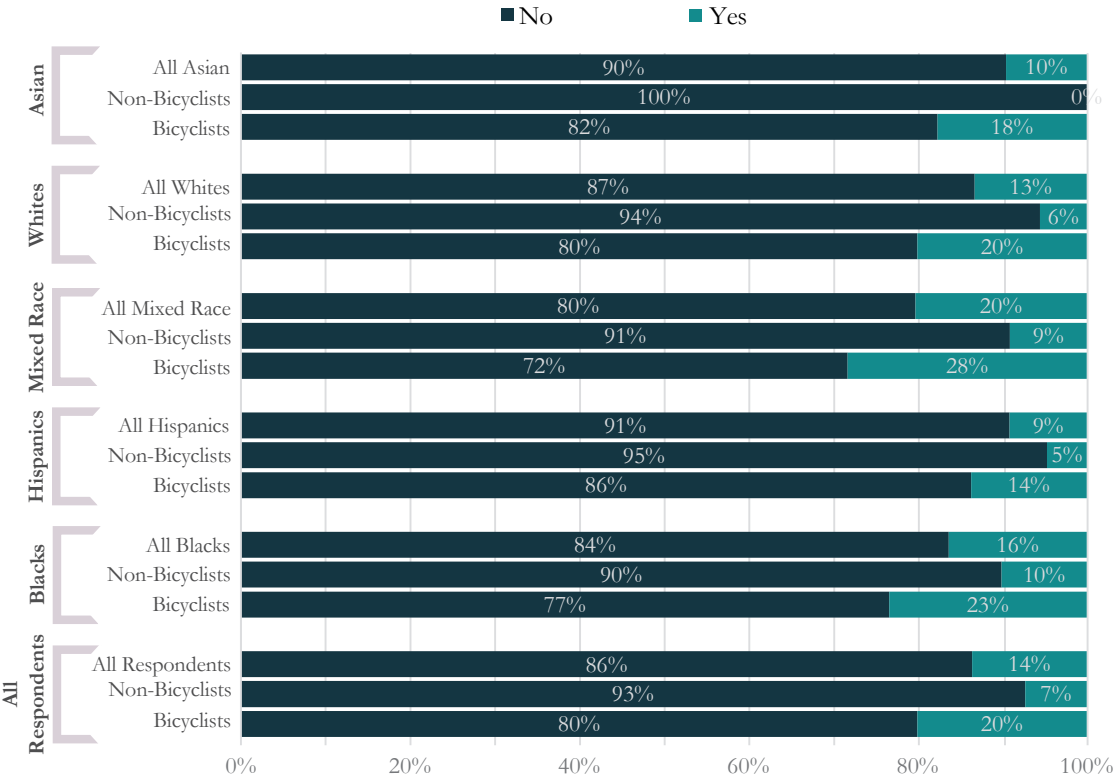


Figure 40. Percentage of respondents by race and ethnicity that reported being unfairly stopped by police officers while bicycling in New Jersey.

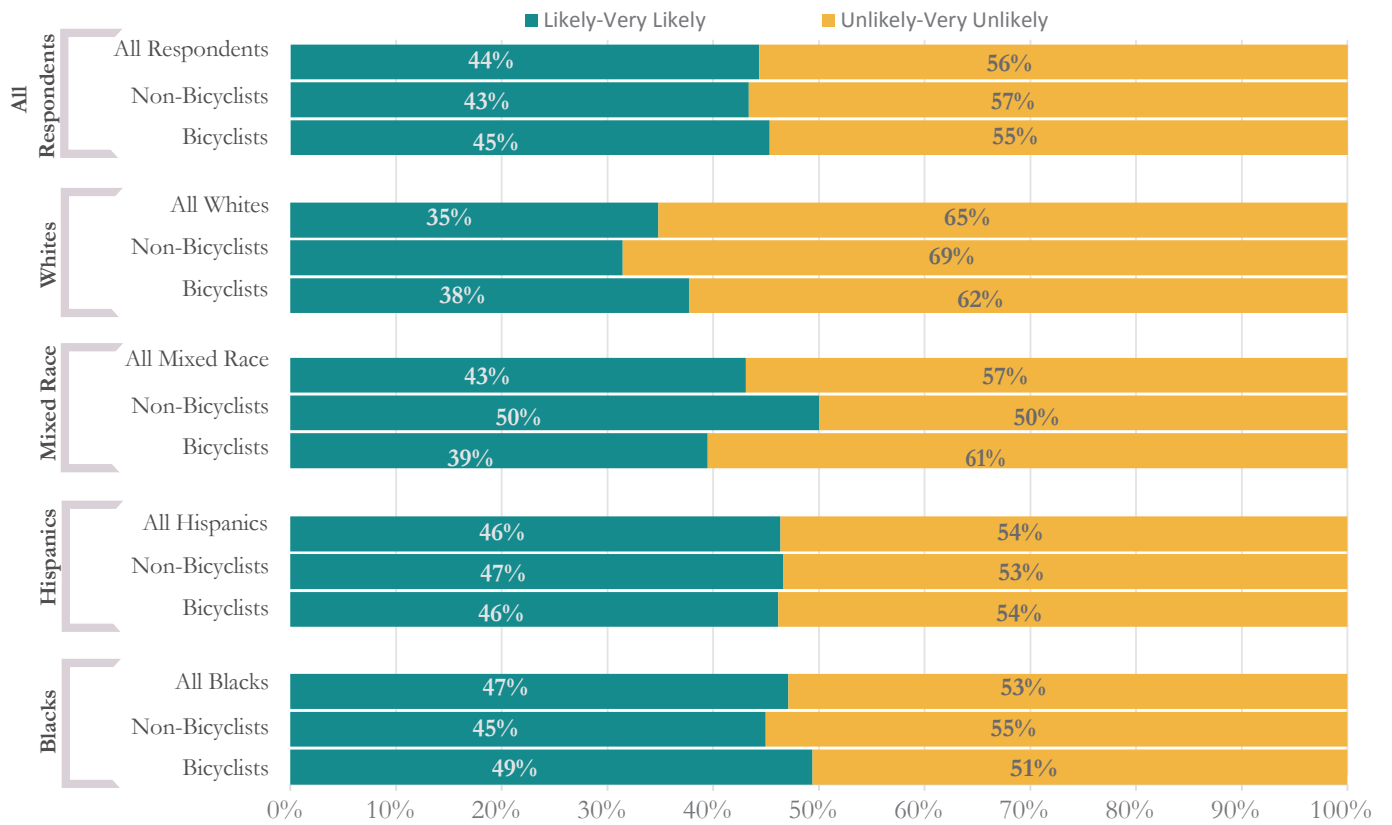


Figure 41. Percentage of respondents who believe their government would build bike lanes if requested.

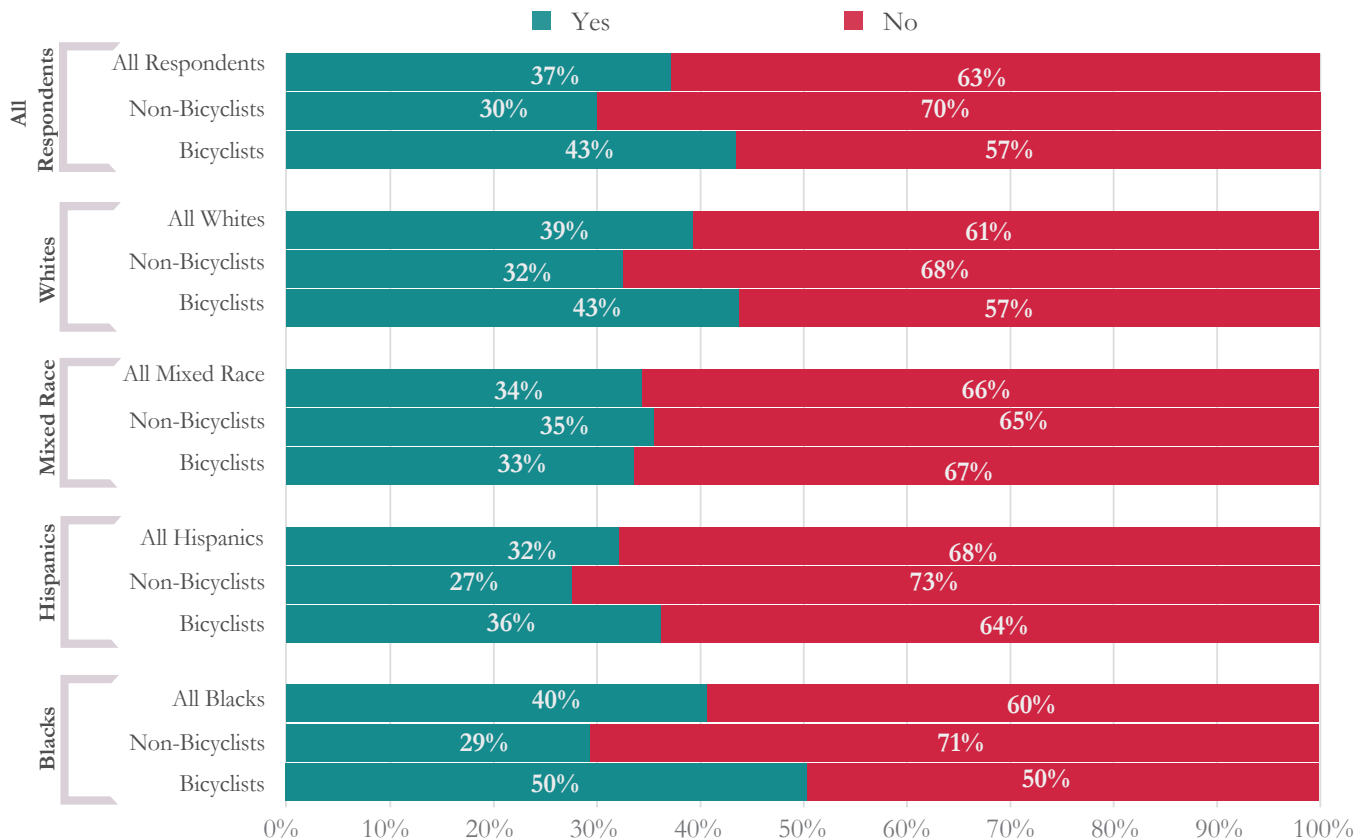


Figure 42. Percentage of respondents who believe their government supports and invests in bicycle infrastructure.

in bicycle infrastructure, whereas 65 percent of non-bicyclists do, and 66 percent of all Mixed Race respondents. A higher proportion of Asians and households earning \$250,000 or more were also much more optimistic than their counterparts.

Bicycle Lanes

Respondents were asked whether or not they would like a bicycle lane on their street. As shown in Figure 43, nearly eight out of every ten respondents stated they would like one. While the majority of both bicyclists and non-bicyclists are in favor of bicycle lanes being added to their street, a higher proportion of bicyclists—regardless of race or ethnicity—are in favor of bicycle lanes being added than non-bicyclists, with only one exception; Asian non-bicyclists were slightly more in favor of the bike lanes than Asian bicyclists. The addition of bicycle lanes are favored most by Hispanics followed by Mixed-Race, Asian, and Black respondents. The majority of all income groups are in favor of a bicycle lane, with the highest proportion being those households earning between \$150,000 and \$249,000.

Bicycle Theft

The fear and reality of bicycle theft in Black and Hispanic communities serves as a barrier to bicycle access and usage. To gauge the degree to which respondents had been victims of bicycle theft, **respondents were asked if they had ever had their bicycles stolen. One-third of all respondents responded affirmatively** (Figure 44), with a higher proportion of Mixed Race (39%) and Black respondents (34%) reporting being victims than Hispanic respondents (31%). There are statistically significant differences in responses in regards to gender, user, and income. Males reported being victimized more than twice as much as females (42% versus 20%), and bicyclists (42%) were victimized disproportionately more so than non-bicyclists (24%). Similarly, those households earning less than \$100,000 annually have been victimized at a higher rate than those earning more than \$100,000, while households earning \$75,000 to \$99,000 having been victimized at a higher rate than all other income groups.

Safe Bicycle Storage

A sizeable minority of respondents does not have a safe place to store their bicycles at home. While nearly nine out of ten bicyclists have a safe place to store their bicycles, nearly one out of every four non-bicyclists do not (Figure 45). There is a statistically significant difference in response to the question with regards to race and ethnicity. A higher proportion of Hispanics (19%) do not have a safe place to store their bicycles than Black (14 %) and Mixed Race respondents (14%). There are also statistically significant differences in responses to the question in regards to income, and users. A disproportionate amount of non-bicyclists do not have safe bicycle storage as opposed to bicyclists (22% versus 8%). An overwhelming

majority of Asian bicyclists (97%) reported they have a safe place to store their bicycles at home. The proportion of non-bicyclists who do not have a safe place to store bicycles at home is greater among Asian and Hispanic non-bicyclists, with 29 and 27 percent respectively reporting that they do not have a safe place to store the bicycle, followed by 26 percent of Mixed Race non-bicyclists and 18 percent of Black non-bicyclists. A higher proportion of Hispanic respondents do not have safe storage than Black and Mixed-Race respondents. A higher proportion of males have access to safe bicycle storage than females and “others” (15% versus 17.9% and 33%), and those earning between \$15,000 and \$24,000 (21%) have less access than their counterparts. As income rises, so does having a safe place to store bicycles, in particular, only less than one out of ten respondents with household earnings greater than \$75,000 had no safe storage for bicycles.

Child Safety

Respondents were asked whether they felt children were safe bicycling in their community. **Majority of all respondents (54%) do not feel that children are safe from traffic when bicycling in their neighborhoods (Figure 46).** There are statistically significant differences in responses in regards to user, race and ethnicity, gender, and income. Collectively, those earning less than the 2015 median household income in New Jersey (i.e., \$71,919) are less optimistic about the safety of children than those earning more. Non-bicyclists and females are also less optimistic (60%) about the safety of their children than their respective counterparts, with the exception of Asian non-bicyclists, mostly since Asians in general were the most optimistic among all other groups.

Family Views on Bicycling

The majority of all family members either encourage or are neutral about bicycling. Nearly 9 out of every 10 respondents reported that their family either encourages or is neutral about bicycling, with 56 percent encouraging and 40 percent remaining neutral. While the majority of all racial/ethnic groups reported that their family members encourage bicycling, a higher proportion of White respondents do so closely followed by Mixed Race respondents than Hispanic, Black, and Asian respondents. Bicyclists are also more encouraged than non-bicyclists, regardless of race or ethnicity. Bicycling is also encouraged more by those households earning at or higher than the 2015 median household income for New Jersey than those earning less. For example, whereas 62 percent of those earning more than \$100,000 encourage survey respondents to bicycle, only 52 percent of those earning from \$15,000 to \$24,000 do so. There was no noticeable difference in the encouragement of males and females by family members. However, female family members were twice as less likely (2% versus 4%) to discourage bicycling than their male counterparts.

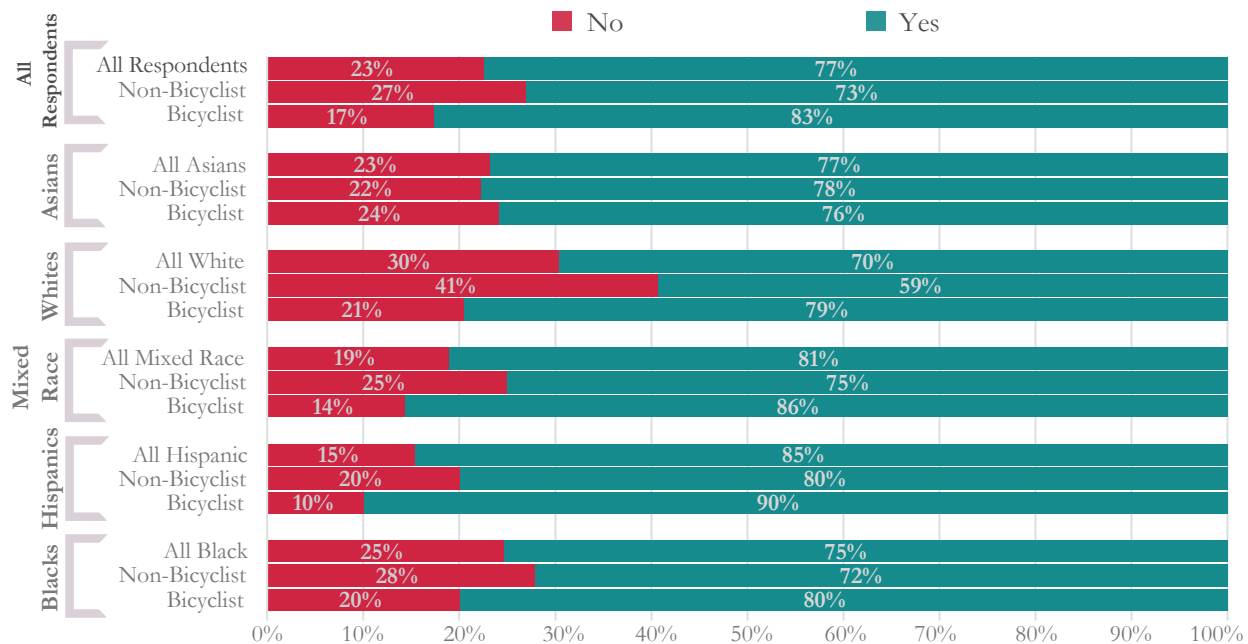


Figure 43. Percentage of survey respondents who would like a bicycle lane on their street.

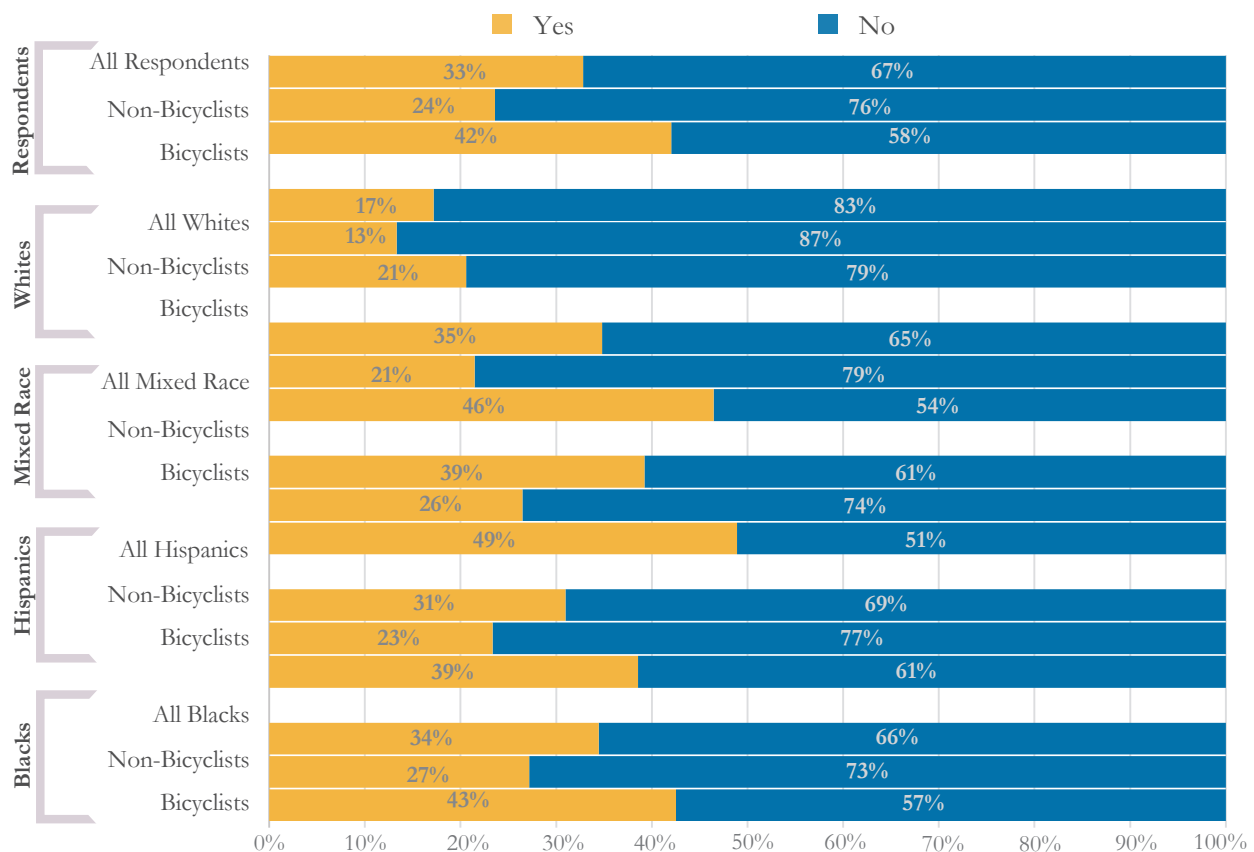


Figure 44. Percentage of respondents who reported being victims of bicycle theft.

Learning to Ride

Nearly three-fourths of all respondents were taught how to ride a bicycle by a family member, with 51 percent being taught by a parent/guardian, 16 percent by a brother or sister, and seven percent by another family member. With the exception of Black and Asian non-bicyclists, a higher proportion of all bicyclists under each racial and ethnic group received instruction from a parent or guardian than non-bicyclists. By comparison, the top three ways males and females learned how to bicycle are identical (i.e., parent/guardian, brother/sister, and self-taught). There are, however, other unique differences. For example, a higher proportion of females were taught by their brothers/sisters than males, whereas a higher proportion of males were self-taught than females. Proportion of individuals taught by their parents increases with the increase in household income, while it decreases for being self-taught with increase in household income with only exception of individuals with household income of \$250,000 and above.

Bicycle Acquisition

The majority of all respondents purchased their bicycle brand new. Nearly six out of ten of all respondents purchased their bicycles brand new, followed by 20 percent who purchased their used, and 17 percent that received them as a gift. While nearly one-quarter of bicyclists purchased used bicycles, only 16 percent of all non-bicyclists did so. Comparatively, higher proportions of non-bicyclists than bicyclists across all racial and ethnic groups purchased new bicycles with only one exception of Asian bicyclists. Of note, more than one-quarter of Mixed-Race non-bicyclists received their bicycles as a gift versus 20 percent of Hispanic non-bicyclists, and 17 percent of Black non-bicyclists.

The majority of all three racial and ethnic groups purchased their bicycles new; however, 62 percent of Blacks did versus 58 percent of Hispanics and 56 percent of Mixed-Race respondents. While the majority of both females and males purchased their bicycles new, a higher proportion of females received their bicycles as a gift than males. Conversely, a higher proportion of males bought their bicycles used than females. The majority of all income groups purchased their bicycles new except those earning less than \$15,000; nearly 30 percent of that population purchased their bicycles used.

Professional Bicycle Training

An overwhelming majority of all respondents have not received formal bicycle education. As shown in Figure 47, nine out of every ten respondents (90%) have not received formal bicycle education. Blacks, followed by Asians, and Whites. Asian non-bicyclists, Hispanic non-bicyclists, and Mixed Race non-bicyclists had the least proportion of formal bicycle training. Bicyclists reported receiving formal bicycle education at a higher rate than non-bicyclists (12% versus 7% respectively), regardless of race and ethnicity. Mixed-Race bicyclists received more formal bicycle education than any other group. A higher proportion of males received formal bicycle education than females (11% versus 7% respectively), and a higher proportion of those respondents earning more than 2014 median household income for New Jersey have received bicycle education than those earning less with only one exception of those earning less than \$14,999 (11%).

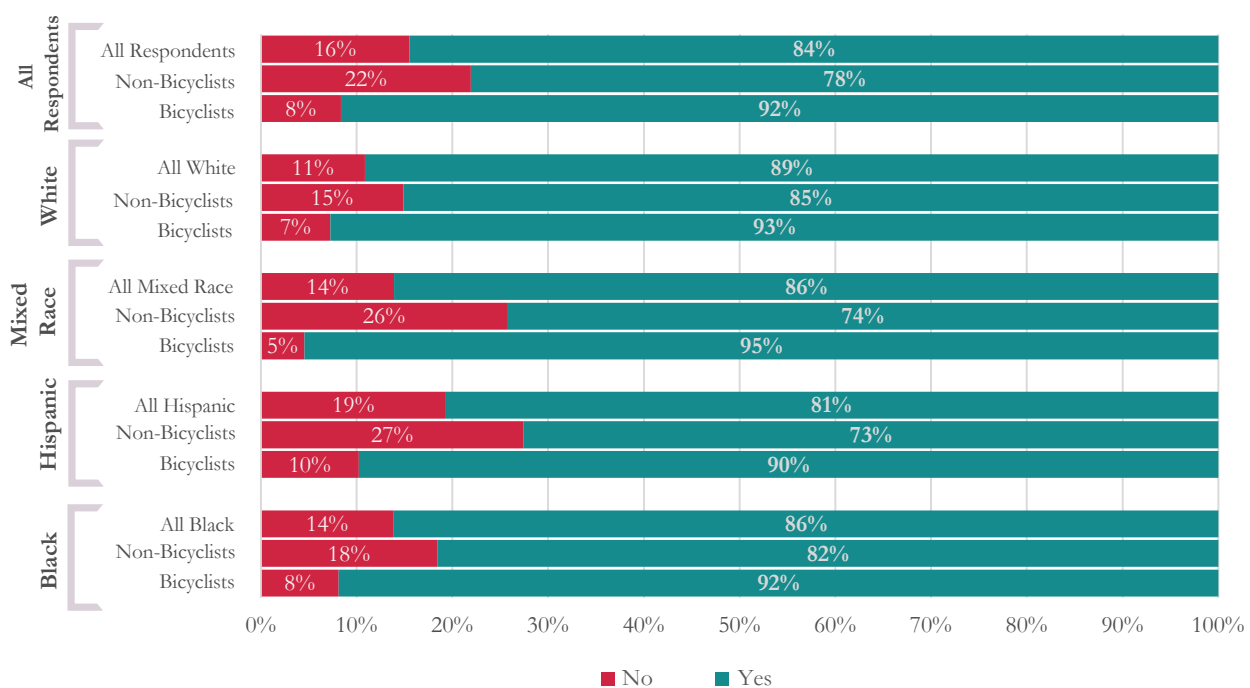


Figure 45. Percentage of respondents who reported having a safe place to store their bicycle.

Required Bicycle Equipment

Although New Jersey law requires bicyclists under age 17 to wear a helmet and all bicyclists to equip their bicycles with front and rear lights and a bell or horn while riding, the majority of survey respondents do not adhere to the law. Just 23 percent of respondents use a front light, 21 percent use a rear light, and 21 percent use a bell or horn. Additionally, even though adult bicyclists are not required to wear a helmet, only 35 percent of respondents reported doing so while bicycling. A higher percentage of non-bicyclists in comparison to bicyclists for all ethnic groups reported to wear a helmet and use a bell or horn while bicycling. There are minimal differences in the responses in terms of race and ethnicity. There are noticeable differences between females and males, however. For example, 39 percent of females reported using a helmet while bicycling whereas 31 percent of males reported doing so. Nearly a quarter of females also reported using a horn or bell, whereas only 19 percent of males reported doing so. However, a higher

proportion of males than females reported using a front and rear light. In terms of household income, a higher proportion of those earning \$150,000 to \$249,999 than the other income groups reported wearing helmets.

Comfortable Places to Bicycle

Respondents feel most comfortable bicycling in parks, on bicycle paths/trails, and on sidewalks. As shown in Table 3, the three places where respondents felt most comfortable bicycling are those without motor vehicle traffic, including parks, bicycle paths and trails, and sidewalks. This was true of all respondents regardless of race, ethnicity or whether the respondent is a bicyclist or non-bicyclists. Similarly, both males and females are most comfortable bicycling where there are no motor vehicles; however, a larger proportion of males are more comfortable bicycling on “any road or street” than are females. Those earning \$100,000 or more and less than \$15,000 were more comfortable bicycling adjacent to motor vehicle traffic than any other income groups.

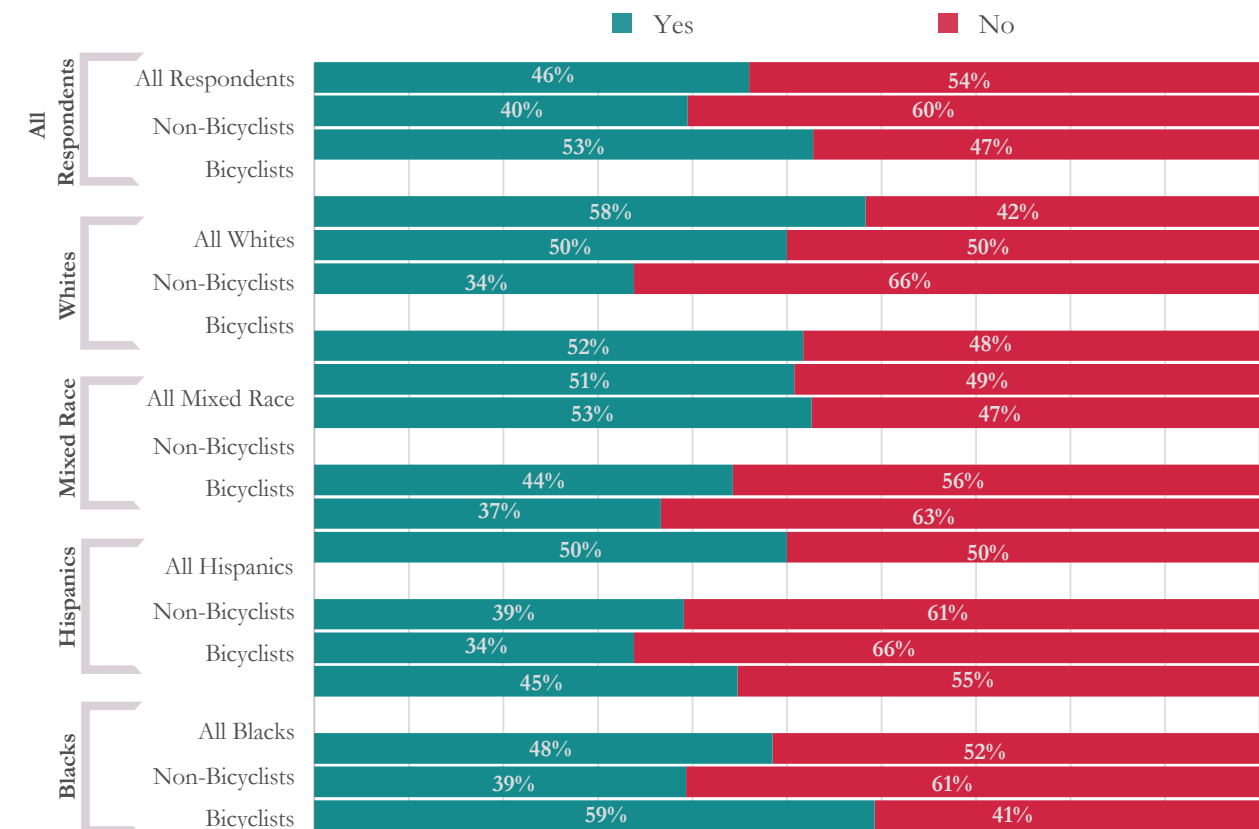


Figure 46. Percentage of respondents who believe children are not safe while bicycling in their neighborhoods.

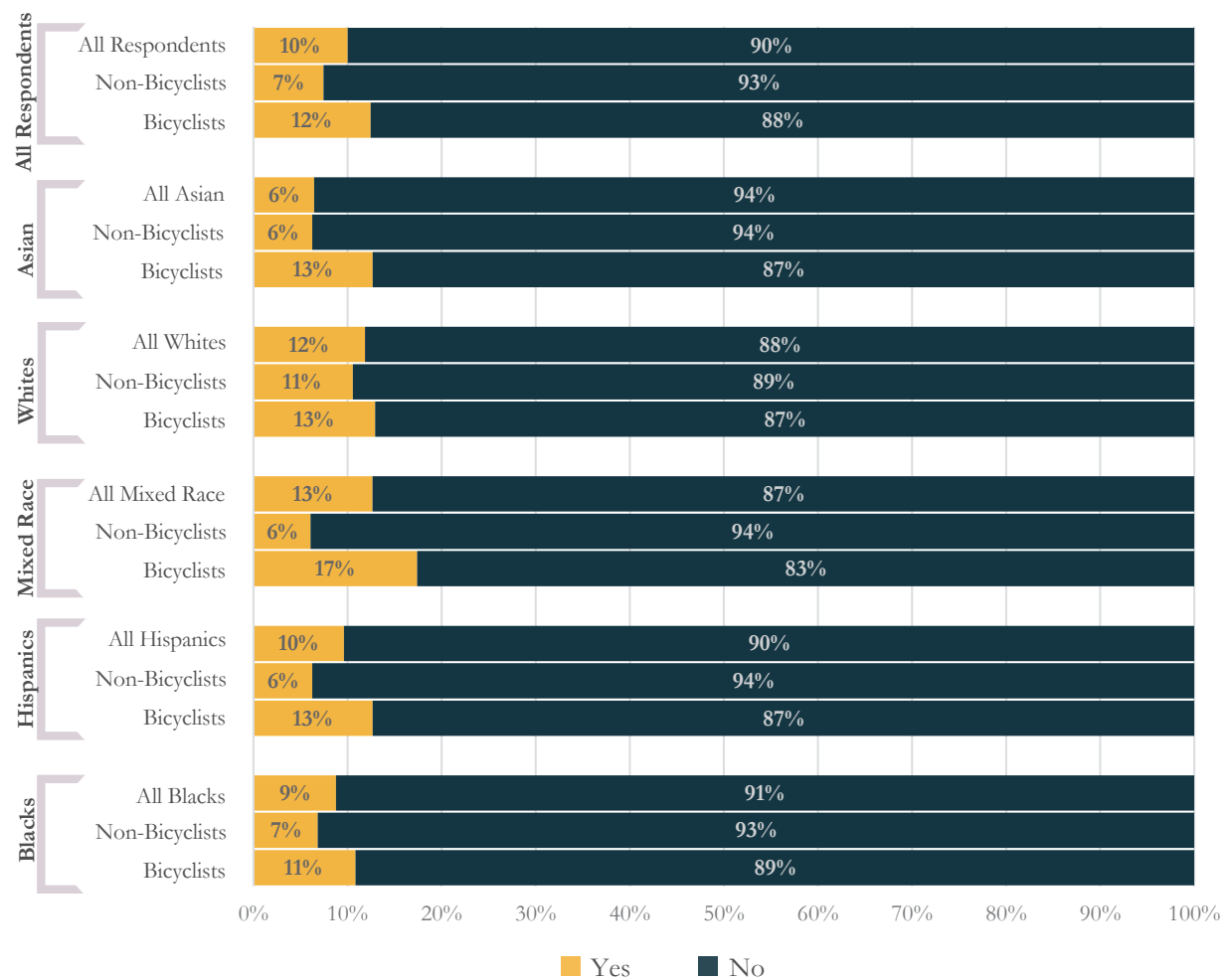


Figure 47. Percentage of respondents who have received formal bicycle training.

Table 3. Infrastructure where survey respondents are comfortable bicycling.

	Park	Bicycle path/trail	Sidewalk	In a protected bicycle lane, physically separated from cars	In a bicycle lane, not physically separated from cars	On any road/street	Total
All Respondents	27%	19%	15%	15%	8%	15%	100%
Bicyclists	25%	19%	16%	15%	9%	16%	100%
Non-Bicyclists	29%	19%	15%	16%	8%	14%	100%
All Blacks	26%	19%	16%	15%	8%	16%	100%
Bicyclists	26%	18%	15%	15%	9%	16%	100%
Non-Bicyclists	27%	19%	16%	14%	8%	16%	100%
All Hispanics	30%	18%	15%	16%	7%	13%	100%
Bicyclists	28%	17%	17%	15%	8%	15%	100%
Non-Bicyclists	33%	18%	13%	18%	6%	12%	100%
All Mixed-Race	26%	20%	16%	12%	7%	18%	100%
Bicyclists	23%	19%	18%	13%	6%	20%	100%
Non-Bicyclists	32%	23%	12%	11%	8%	15%	100%
All Whites	23%	20%	15%	16%	11%	15%	100%
Bicyclists	22%	20%	15%	16%	11%	15%	100%
Non-Bicyclists	25%	21%	14%	15%	10%	16%	100%
All Asians	25%	21%	16%	20%	10%	9%	100%
Bicyclists	23%	23%	18%	16%	10%	10%	100%
Non-Bicyclists	27%	18%	12%	26%	8%	8%	100%

Table 4. Percentage of respondents that live proximate to different types of bicycle infrastructure.

	Bicycle Path/Trail	Bicycle Lane	Bicycle Rack	Bicycle Locker
All Respondents	37%	31%	22%	9%
Bicyclist	48%	39%	29%	10%
Non-Bicyclist	28%	23%	15%	9%
All Blacks	36%	33%	22%	9%
Bicyclist	44%	41%	28%	7%
Non-Bicyclist	29%	27%	17%	10%
All Hispanics	32%	23%	18%	9%
Bicyclist	41%	30%	24%	11%
Non-Bicyclist	23%	17%	13%	7%
All Mixed-Race	38%	31%	19%	10%
Bicyclist	39%	38%	23%	10%
Non-Bicyclist	35%	20%	13%	11%
All Whites	53%	38%	30%	9%
Bicyclist	68%	49%	43%	13%
Non-Bicyclist	36%	26%	15%	6%
All Asians	41%	33%	20%	8%
Bicyclist	56%	36%	26%	3%
Non-Bicyclist	24%	29%	14%	14%



Figure 48. Men bicycle down a protected bicycle lane in Pittsburgh, PA. Photo Credit: GLP.

Proximity

More than one-third of all respondents live near a bicycle path or trail. Overall, respondents live closer to bicycle paths/trails than public bicycle racks and lockers. As shown in Table 4, higher proportions of bicyclists live closer to bicycle paths/trails and bike racks than non-bicyclists as a whole but White and Mixed-Race non-bicyclists live closer to bicycle paths/trails than their counterparts. Overall Hispanics and Asians live closer to bicycle paths/trails than Black and Mixed-Race respondents but slightly less than White respondents. The least proportion of Asian non-bicyclists live near bicycle paths/trails compared to other racial and ethnic groups, while a higher proportion of them live near a bicycle lane than their counterparts. Females live closer to bicycle paths/trails than males, whereas males live closer to bicycle lanes and bicycle racks than females.

Rate Facilities

When asked to rate the bicycle facilities and infrastructure in their communities, **nearly one-quarter of all respondents gave their bicycle infrastructure a “fair” rating out of a choice of excellent, fair, poor, and doesn’t exist** and over a tenth of them thought they were “excellent” with the exception for bicycle lockers and racks (close to one half of all respondents said they didn’t exist). More than third of all respondents did report bicycle infrastructures “doesn’t exist” in their communities. In every category, a higher proportion of non-bicyclists assigned unfavorable ratings than bicyclists and all respondents as a whole. Bicycle paths/trails received the highest overall rating followed by signage, bicycle lanes, roadway pavement, bicycle racks, and bicycle lockers (see Figure 49).

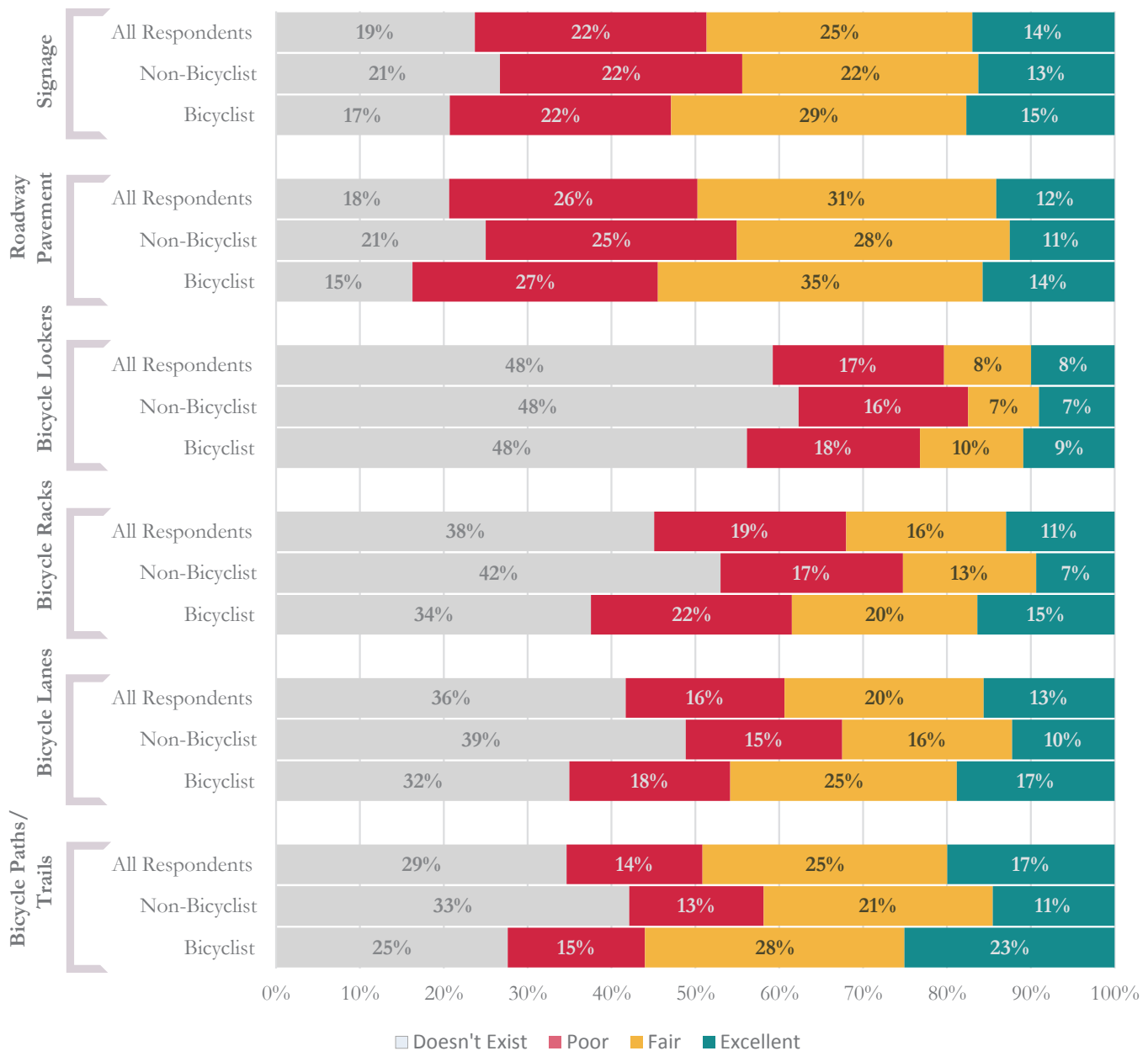


Figure 49. Ratings of bicycle facilities near respondents' homes.

As shown in Figure 50, higher proportions of males assigned a “poor” rating to every category of bicycle infrastructure than females. By comparison, bicycle lockers received the least favorable rating by both females and males. Bicycle paths/trails received the most favorable rating from both males and females, followed by bicycle lanes, signage, and roadway pavement.

By comparison, a larger proportion of Hispanics rated unfavorably bicycle paths/trails, bicycle lanes, and bicycle lockers than Blacks and Mixed Race respondents. On the other hand, a larger proportion of Blacks rated unfavorably

racks and roadway pavement than Hispanics and Mixed Race respondents. A higher proportion of Asian respondents than any other racial or ethnic groups rated majority of the bicycle facilities unfavorably with the exceptions of signage (rated most unfavorably by Whites), roadway pavement (rated most unfavorably by Blacks), and bicycle paths/ trails (rated most unfavorably by Hispanics). Almost a third of Whites rated bicycle paths/trails as excellent which was the most favorable rating for any facility by any racial or ethnic group, while the least was received by bicycle lockers from Asians(see Figure 51).

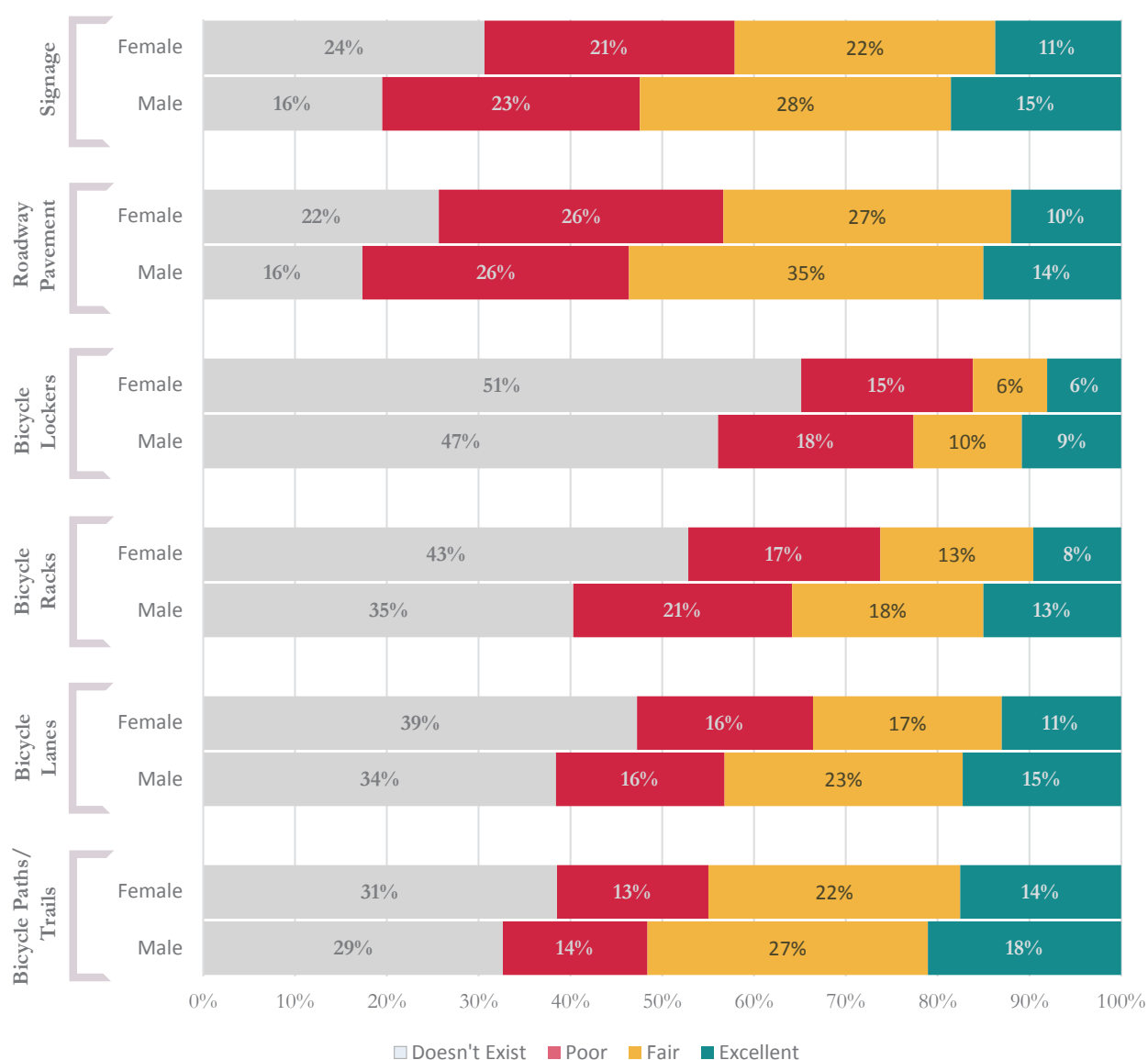


Figure 50. Ratings of bicycle facilities near respondents' homes by gender.

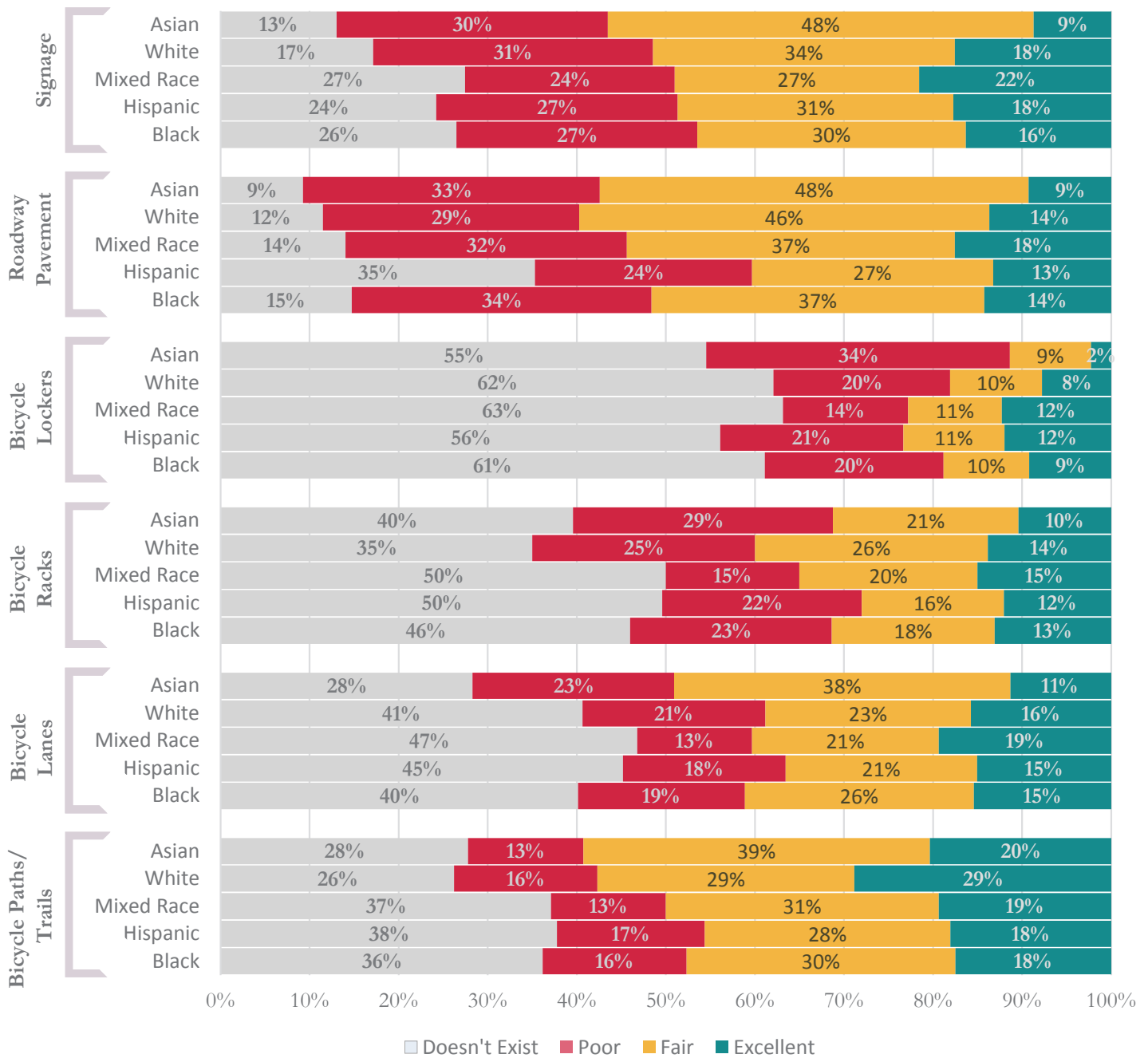


Figure 51. Ratings of bicycle facilities near respondents' homes by race and ethnicity.

Barriers to Bicycling

The three biggest barriers to bicycling as reported by all respondents are fear of traffic collision, fear of robbery/assault, and poor pavement condition. As shown in Table 5, nearly one out of three respondents (32%) stated that the fear of a traffic collision was the number one barrier to bicycling more, followed by a sizable minority who voiced concerns about the fear of being robbed or assaulted and poor pavement conditions. In comparison, non-bicyclists were more concerned than bicyclists with being involved in a traffic collision, verbal harassment, and being stranded with a broken bicycle; bicyclists are more concerned with pavement conditions, being robbed or assaulted, and being profiled by police. A higher proportion

of Blacks reported being more concerned than Hispanics and Mixed Race respondents with pavement conditions and the fear of being stranded with a broken bicycle out of the nine available options to select from. That list includes the fear of being robbed or assaulted, fear of being profiled by the police, fear of verbal harassment, fear of being stranded with a broken bicycle, pavement condition, and other reasons. On the other hand, a higher proportion of Hispanic respondents are concerned with fear of traffic collisions and fear of robbery or assault than Mixed-Race and Black respondents.

Fear of being profiled by the police were expressed the highest by Mixed-Race respondents, while they were the least concerned with fear of traffic collisions among all ethnic groups, even

Table 5. Ranking of variables that are barriers to bicycling for bicyclists and non-bicyclists.

Variables	All Respondents		Bicyclists		Non-Bicyclists	
	Percent	Ranking	Percent	Ranking	Percent	Ranking
Fear of traffic collision	32%	1	28%	1	35%	1
Fear of robbery/assault	14%	3	15%	3	14%	3
Fear of profiling by police	15%	2	16%	2	15%	2
Fear of verbal harassment	10%	4	9%	5	11%	4
Fear of being stranded with broken bicycle	7%	5	9%	6	6%	7
Cost of bicycle maintenance	5%	7	5%	8	6%	5
Pavement Condition	5%	8	5%	7	6%	6
Pregnancy/small children	6%	6	10%	4	2%	9
Other	4%	9	4%	9	4%	8
Total	100%		100%		100%	

though it was expressed by nearly one out of three Mixed-Race respondents. Whites were the most concerned with fear of traffic collisions, and other reasons while being the least concerned with pregnancy or small children compared to all other ethnic groups. Blacks, Hispanics, and Mixed-Race respondents were equally concerned with the fear of verbal harassment and pregnancy or small children, while Asians were the most concerned with pavement condition and least with the fear of being stranded with a broken bicycle.

Comparatively, females are more concerned with being involved in a traffic collision, verbal harassment, being stranded with a broken bicycle, cost of bicycle maintenance, and pregnancy/small children than males, who were more concerned with being robbed or assaulted and being profiled by police officers. Both males and females were equally concerned about poor pavement condition. Of note, a higher proportion of those earning less than \$15,000 annually than those in other income groups were also more concerned with being robbed or assaulted, being profiled by the police, being verbally harassed and being stranded with a broken bicycle.

Potential Solutions to Encourage Bicycling

All respondents were given an option to choose those things that would encourage them to bicycle more frequently by selecting one or more variables from a predetermined list. Options ranged from bicycle events and secure bicycle parking to better weather. **The number one thing that would encourage all respondents to bicycle more frequently is “bicycle lanes between them and their destinations.”** This holds true regardless of gender, number of vehicles per households, household income (one exception: bicycle lanes ranked fourth

for those with income between \$150,000 and \$249,999), and number of children within each household (two exceptions: bicycle lanes ranked second for households with three children and third for households with four children). Rounding off the top three are: off-street bicycle paths between them and their destinations and secure bicycle parking at their destinations.

There are, however, differences according to income. There are, however, differences according to income. Those earning \$150,000 and \$249,999 chose not having a car as the number one thing that would encourage more bicycling among them.

Not having children, living in close proximity to transit, and bicycle events are least likely to encourage more bicycling among survey respondents. This is true for both bicyclists and non-bicyclists. However, the number one factor for bicyclists were access to off-street bicycle path between them and their destinations in comparison to a bicycle lane which was number one among non-bicyclists and all respondents as well.

As shown in Table 6, the top three things that would encourage more bicycling among Blacks, Hispanic, Whites, Asians and Mixed Race respondents varied. For instance, the number one thing to encourage more bicycling among Blacks is secure bicycle parking at their destinations, whereas lack of car ownership ranked first for Hispanics and Asians, while having an off-street bicycle path between them and their destination ranked first among Whites, and having a bicycle lane between them and their destinations ranked first for Mixed Race respondents. Consistent with all respondents, “not having small children” ranks last out of ways to encourage more bicycling. Unlike Blacks, Whites, Asians, and Mixed Race respondents, Hispanics also stated that having their destination closer would encourage more bicycling.

Table 6. Rankings of variables that would encourage respondents to bicycle more according to race and ethnicity

	Blacks		Hispanics		Mixed Race		White		Asian	
Variables	Number	Ranking	Number	Ranking	Number	Ranking	Number	Ranking	Number	Ranking
Bicycle lane between you and your destination	553	2	423	2	51	1	229	3	51	3
Off-street bicycle path between you and your destination	536	3	401	5	50	2	239	1	48	5
Secure bicycle parking at your destination	554	1	351	7	48	3	237	2	49	4
Better weather	485	4	404	4	42	4	206	4	52	2
If you did not have a car	450	6	426	1	42	5	201	6	54	1
If your destination was closer	471	5	405	3	34	7	204	5	47	6
Bicycle Events	430	7	367	6	39	6	156	7	34	7
If the bus/train was closer	328	8	340	8	31	8	127	8	21	9
If you did not have small children	294	9	306	9	30	9	101	9	27	8
Total	4101		3423		367		1700		383	



Figure 52. A senior bicycles in Cape May County, New Jersey.

Discussion



Figure 53. A man riding his bicycle on a green, buffered bicycle lane in Newark, New Jersey.

These data show that Black and Hispanic bicyclists most often cycle for exercise or leisure, followed by running errands or visiting friends or family. All focus group participants spoke of many reasons why using a bicycle to commute to work would be impractical, such as a long distance, concerns about hygiene, and the need for trip-chaining, especially families with children. It is imperative to shift the focus from planning and policies that is mostly concerned with promoting and encouraging bicycle use for utilitarian purposes in Black and Hispanic communities to discussions surrounding recreational infrastructure improvements and incentives for leisure or elective trips.

Many of the initiatives taken to increase bicycling in New Jersey have been done in the context of commuting, such as by promoting “Bike to Work Day” or focusing on bicycle infrastructure that links residents to jobs or train stations. This is mainly due to concerns about peak-hour traffic congestion. However, while fear of traffic was the most cited barrier to bicycling by all respondents, perfect bicycle infrastructure cannot overcome the challenge created by poor land-use planning, which has resulted in long distances between residents and their work-places. This problem of distance in turn creates the challenge of hygiene, obstructs trip-chaining, and increases exposure to crime.

To increase bicycling among minorities, focusing on infrastructure (such as protected bicycle lanes) which connects residents to parks and trails, or expanding those facilities may be more successful. Respondents stated that they felt most comfortable bicycling in parks and trails, but only 22% stated that they could safely access these facilities on their bicycle. Additionally, bicycling with family emerged as a theme within both the intercept survey and the focus groups. Seventy-four percent of respondents were taught how to ride a bicycle by a family members, and only 4% stated that their family members discouraged bicycling. During the focus groups, participants stated that they enjoyed bicycling with their children or extended family as a bonding experience. It follows that increasing access to these scenic, low-stress environments would result in more frequent bicycling.

The primary reason cited by respondents on why they do not bicycle was not owning one (28%). Additionally, one-third of respondents stated that they had been victims of bicycle theft, and more than one quarter of respondents cited bicycles as being expensive to purchase or maintain. One method to address this barrier is to support advocacy groups and organizations who make quality bicycles available to minority communities at affordable prices, such as a “Bicycle Exchange” or “Bicycle Library.” An additional solution to this issue can be expanding access to bike-share systems in minority communities. These systems not only address concerns about bicycle availability, maintenance, and theft, but also addresses the issue of lacking a safe space to store a bicycle (cited by nearly a quarter of non-bicyclists). While the majority of the respondents had not heard of bicycle share, more than 8 out of 10 stated that they would use the system if it was available to them.

Tensions between police departments and minority communities has emerged as a major issue in the last few years, and strengthening connections between police departments and minority communities could address multiple barriers identified in this research. Nearly 14% of all respondents stated that they had been unfairly stopped by a police officer while on a bicycle, with 23% of Black bicyclists and 28% of Mixed Race bicyclists affirming this experience. Additionally members of the Black focus group specifically cited harassment by police officers in certain municipalities as a reason to not bicycle. However, respondents identified fear of robbery and assault as a larger barrier to bicycling, and a stronger relationship between minorities and police departments could shift perceptions on neighborhood safety. A stronger relationship could also help address the concern about bicycle theft. Focus group respondents felt that police did not care about bicycle theft, however, if one were to depend on their bicycle as their only mode of travel to their job, theft could be catastrophic.

Additional actions that could be taken to address identified barriers include advertising and outreach to shift the perception that utilitarian bicycling is only done if something is wrong. Concerns about poor pavement conditions can be addressed with dedicated bicycle infrastructure, and the concern that bicycling is not safe for children should fade once the previous recommendations are implemented, and adults are confident in their ability to bicycle safely.

Recommendations

1. Install protected bicycle lanes. More than 80 percent of respondents, regardless of race, gender, or ethnicity, claimed they would like to see protected bicycle lanes in their neighborhoods. Where it is not possible to install new protected bicycle lanes contraflow lanes or shared bus-bicycle lanes may be installed. Contraflow lanes would allow cyclists to use one-way streets in the opposite direction reducing traveling distances and improving street network connectivity. Bus-bicycle lanes are particularly useful in downtown areas, providing safe space for bicyclists where there may not be adequate space for a new protected bicycle lane. In addition to bicycle lanes, it may be required to improve infrastructure at intersections by installing bicycle boxes, which improve visibility at lights.

2. Improve availability and safety of bicycle parking. Encourage installation of secure indoor bicycle storage for new residential and commercial spaces, which would better enable residents and commuters to use bicycles for trips. Installation of bicycle storage at transit stops would also promote trip chaining. Visibility of existing bicycle parking needs to be increased to reduce the chances of theft, especially given that 42 percent of all respondents who are bicyclists have been the victims of theft.

3. Increase the availability of bicycles. Work to identify existing recycle-a-bicycle programs that have been successful and

undertake analysis to understand why they have been successful. Expanding these programs to provide bicycles for disadvantaged and low income communities is an important step to increasing bicycle use.

4. Education and outreach is important both for drivers and bicyclists. Driver's education courses should include information on safely sharing the road with bicyclists, including safe passing and the need to be aware when opening doors near bicycle lanes. Encouraging bicyclists to join clubs and organizations that are targeted with bicyclists education would lead to expansion of knowledge, training, and alleviation of fear to ride (Community Cycling Center, 2012). These efforts would also go a long way in influencing the perception of bicycling, shifting it away from being only for middle and lower classes.

Opportunities for Additional Research

1. Develop a database of existing bicycle lanes, paths, and trails as a starting point for creating an interconnected network that will encourage bicycle use. While this database is being developed it will also allow researchers to identify gaps in the existing network, providing municipalities or counties knowledge on where to focus their funding.

2. Evaluate/survey the use of protected and off-street bicycle lanes to substantiate their importance in increasing the perceived safety and use of bicycles.

3. Survey and research bicycle-share systems in Jersey City, Hoboken, New York City, and Philadelphia to better understand the users of the programs, their trip behavior and purposes.

Combine research on how other bicycle-share systems across the country have modified their payment methods/plans and fare structure to improve affordability and access for low income populations, and how they addressed the liabilities in case of theft.

Conclusions and Implementation of Findings

The primary objectives of this study were to ascertain barriers to and identify solutions to bicycle use among Black and Hispanic bicyclists and non-bicyclists. These data show that the three biggest barriers to bicycling for all respondents are fear of a traffic collision, fear of robbery and assault, and pavement condition. Other notable barriers include fear of being stranded with a broken bicycle, and fear of being profiled by the police. Solutions for both bicyclists and non-bicyclists include bicycle lanes and off-street bicycle paths between their respective origins and destinations, and secure bicycle parking at their destinations.

Key findings from this study have been shared with the New Jersey Department of Transportation, New Jersey Bicycle and Pedestrian Resource Center, New Jersey Safe Routes to School Resource Center, New Jersey Division of Highway Traffic Safety, and New Jersey Bike and Walk Coalition. The discussions with these agencies has led the authors to conduct a study on minority women bicycle access and use in New Jersey. The authors are working with other state, regional, and local governments, as well as for-profit and non-profit organizations to discuss strategic ways to address the research findings. Once a strategic approach is agreed upon, the authors will distribute these recommendations through a series of webinars, trainings, and informational workshops.

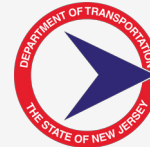
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Bicycling Survey

Complete for a chance to win a \$100 gift card!

The Alan M. Voorhees Transportation Center at Rutgers University is conducting a survey on bicycle use and attitudes towards bicycling in New Jersey. We will appreciate if you would spend a few minutes completing the following survey.

After completing the survey, you may choose to provide your contact information so we can enter you to win one of **three \$100 gift cards!** The responses you give to the questions in this survey will not be connected to your contact information, and will not affect your chances of winning.

This survey should take under 10 minutes. Participation is voluntary and there are no risks to participation. You may skip questions you are not comfortable answering. This research is confidential, meaning that the research records will include some information about you. However, the research team and the Institutional Review Board at Rutgers are the only parties that will be allowed to see the data, except as may be required by law.

Yes, I consent to take the survey.

Please initial here: _____

1. How often do you bicycle? (Select one)

- ☐ More than twice a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ Less than once a month

2. What age did you learn to bicycle?

_____ years old

3. Who taught you to ride a bicycle? (Select one)

- ☐ Parent / guardian
- ☐ Brother / sister
- ☐ Other family member
- ☐ Friend
- ☐ Self
- ☐ Professional

4. Have you received formal / professional bicycle education?

- ☐ Yes
- ☐ No

5. How does your family feel about bicycling? (Select one)

- ☐ They encourage it
- ☐ They discourage it
- ☐ They are neutral

6. Why do you bicycle? (Select all that apply)

- ☐ Health / exercise
- ☐ Fun / excitement
- ☐ Low cost travel option
- ☐ Fast travel option
- ☐ Convenient
- ☐ Good for environment
- ☐ Other, please specify _____

7. Do you belong to a bicycle club or organization?

- ☐ Yes
- ☐ No

8. How many bicycles are in your household? (Select one)

- ☐ None → Skip to question 11
- ☐ One
- ☐ Two
- ☐ Three or more

9. How did you acquire your bicycles? (Select all that apply)

- ☐ Bought new
- ☐ Bought used
- ☐ Received as gift
- ☐ Borrowed

10. How much did your primary bicycle cost?

- ☐ \$ _____
- ☐ I do not know

11. Is a bicycle expensive to purchase and maintain?

- ☐ Yes
- ☐ No
- ☐ Not sure

12. Have you ever been a victim of bicycle theft?

- ☐ No
- ☐ Yes → # _____ times

13. Do you have a safe place to store your bicycle at home?

- ☐ Yes
- ☐ No

14. Which of the following do you regularly use when bicycling? (Select all that apply)

- ☐ Helmet
- ☐ Front light (at night)
- ☐ Rear light (at night)
- ☐ Bell / horn

15. Where are you comfortable bicycling? (Select all that apply)

- ☐ Park
- ☐ Bicycle path / trail
- ☐ Sidewalk
- ☐ In a protected bicycle lane, physically separated from cars
- ☐ In a bicycle lane, not physically separated from cars
- ☐ On any road / street

16. How often do you use your bicycle for the following purposes? (Check one per row)

Activity	Very Often	Sometimes	Never	Not Applicable
Exercise or leisure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Go to work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Go to school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visit friends or family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Run errands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Go to train or bus stop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Where can you safely bicycle to and from your home? (Select all that apply)

- ☐ Work
- ☐ School, daycare, or church
- ☐ College, university, or other training
- ☐ Medical / dental services
- ☐ Shopping / errands
- ☐ Social activities
- ☐ Transit station
- ☐ Park or trail
- ☐ There is no safe place to bicycle to

18. Are children safe from traffic when bicycling in your neighborhood?

- ☐ Yes
- ☐ No
- ☐ Not sure

19. Which of the following is near your home? (Check one per row)

	Yes	No	Not Sure
Bicycle path/trail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle lane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle rack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle locker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. How would you rate the bicycle facilities in your community? (Check one per row)

	Excellent	Fair	Poor	Doesn't exist	I do not know
Bicycle path / trail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle lanes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle racks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle lockers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roadway pavement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Signage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Would you like a bicycle lane on your street? (Select one)

- ☐ Yes
- ☐ No
- ☐ I already have one on my street

22. Does your municipal government support and invest in bicycle facilities? (Select one)

- ☐ Yes
- ☐ No
- ☐ Don't know

23. How likely is the government to build bicycle lanes or paths if you asked? (Select one)

- ☐ Very likely
- ☐ Likely
- ☐ Unlikely
- ☐ Very unlikely
- ☐ Don't know

24. Would the following make you bicycle more frequently? (Check one per row)

	Yes	No
Bicycle lane between you and your destination	<input type="radio"/>	<input type="radio"/>
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Secure bicycle parking at your destination	<input type="radio"/>	<input type="radio"/>
If your destination was closer	<input type="radio"/>	<input type="radio"/>
If the bus / train station was closer	<input type="radio"/>	<input type="radio"/>
If you did not have a car	<input type="radio"/>	<input type="radio"/>
If you did not have small children	<input type="radio"/>	<input type="radio"/>
Better weather	<input type="radio"/>	<input type="radio"/>
Bicycle events (eg. Ciclovía, Summer Streets)	<input type="radio"/>	<input type="radio"/>

25. What prevents you from bicycling more? (Select all that apply)

- ☐ Fear of traffic collision
- ☐ Fear of robbery or assault
- ☐ Fear of being profiled by the police
- ☐ Fear of verbal harassment
- ☐ Fear of being stranded with broken bicycle
- ☐ Cost of bicycle maintenance
- ☐ Pavement condition
- ☐ Pregnancy / small children
- ☐ Other, please specify _____

26. Have you ever been unfairly stopped by a police officer while riding a bicycle?

- ☐ Yes
- ☐ No

27. Have you heard of bicycle-share programs, such as Citi Bike (NYC) or Indego (Philadelphia)?

- ☐ Yes
- ☐ No → Skip to question 29

28. Would you use bicycle-share if it were in your community? (Select one)

- ☐ Yes
- ☐ No
- ☐ Maybe

29. Which class of people do you think bicycle the most? (Select one)

- ☐ Wealthy
- ☐ Middle class
- ☐ Poor

30. What is your age? (Select one)

- ☐ Under 18
- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 or older

31. What is your gender? (Select one)

- ☐ Female
- ☐ Male
- ☐ Other

32. Which one race / ethnicity best describes you? (Select one)

- ☐ White
- ☐ Black / African American
- ☐ Hispanic / Latino
- ☐ Asian
- ☐ Native American
- ☐ Other, please specify _____

33. How many adults live in your household, including yourself?

_____ adults

34. How many children under age 18 live in your household?

_____ children

35. How many motor vehicles are in your household?

_____ motor vehicles

36. What education level did you attain? (Select one)

- ☐ Less than high school graduate
- ☐ High school graduate or GED
- ☐ Some college, or technical / vocational school
- ☐ Two-year college degree (AA, AS)
- ☐ Four-year college (BA or BS)
- ☐ Graduate degree (Masters, PhD, MD, JD)

37. What is the total annual income of your household? (Select one)

- ☐ Less than \$14,999
- ☐ \$15,000 to \$24,999
- ☐ \$25,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 to \$149,999
- ☐ \$150,000 to \$249,999
- ☐ \$250,000 or more

38. In which country did you spend most of your first 12 years of life?

_____ (country)

39. What is your current home zip code?

_____ (zip code)

Thank you for completing the survey!

Gift Card

If you would like to be entered to win a
\$100 gift card,
please complete the following information:

Name: _____

Phone: _____

Email
address: _____

Focus Group Participation

Later this summer, Rutgers University will be conducting focus groups. All focus group participants would be provided **\$50 for their time**, and a light meal.

Please check the box below if you would be interested in participating.

May Rutgers University contact you for a future focus group?

- ☐ Yes
- ☐ No

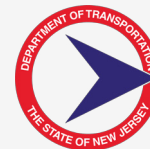
Contact Information

If you have any questions about this study, please contact the principal investigator:

Charles Brown, MPA
Alan M. Voorhees Transportation Center
Edward J. Bloustein School of Planning
and Public Policy
New Brunswick, NJ 08901
848-932-2846
charles.brown@ejb.rutgers.edu

If you have any questions about your rights as a research subject, you may contact the IRB Administrator at Rutgers University at:

Rutgers, The State University of New Jersey
Institutional Review Board for the
Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza, New Brunswick, NJ 08901-8559
848-932-0150
humansubjects@orsp.rutgers.edu



Bicycling Survey

Complete for a chance to win a \$100 gift card!

The Alan M. Voorhees Transportation Center at Rutgers University is conducting a survey on bicycle use and attitudes towards bicycling in New Jersey. We will appreciate if you would spend a few minutes completing the following survey.

After completing the survey, you may choose to provide your contact information so we can enter you to win one of **three \$100 gift cards!** The responses you give to the questions in this survey will not be connected to your contact information, and will not affect your chances of winning.

This survey should take under 10 minutes. Participation is voluntary and there are no risks to participation. You may skip questions you are not comfortable answering. This research is confidential, meaning that the research records will include some information about you. However, the research team and the Institutional Review Board at Rutgers are the only parties that will be allowed to see the data, except as may be required by law.

Yes, I consent to take the survey.

Please initial here: _____

1. Do you know how to ride a bicycle?

☐ Yes

☐ No →

1a. Are you interested in learning?

☐ Yes

☐ No

Please skip to question 7

2. How long has it been since you last used a bicycle?

_____ years

3. What age did you learn to bicycle?

_____ years old

4. Who taught you to ride a bicycle? (Select one)

☐ Parent / guardian

☐ Brother / sister

☐ Other family member

☐ Friend

☐ Self

☐ Professional

5. Have you received formal / professional bicycle education?

☐ Yes

☐ No

6. Where are you comfortable bicycling? (Select all that apply)

☐ Park

☐ Bicycle path / trail

☐ Sidewalk

☐ In a protected bicycle lane, physically separated from cars

☐ In a bicycle lane, not physically separated from cars

☐ On any road / street

7. Which of the following do you regularly use when bicycling? (Select all that apply)

☐ Helmet

☐ Front light (at night)

☐ Rear light (at night)

☐ Bell / horn

8. How does your family feel about bicycling? (Select one)

☐ They encourage it

☐ They discourage it

☐ They are neutral

9. How many bicycles are in your household?

(Select one)

- ☐ None → **Skip to question 12**
- ☐ One
- ☐ Two
- ☐ Three or more

10. How did you acquire your bicycles?

(Select all that apply)

- ☐ Bought new
- ☐ Bought used
- ☐ Received as gift
- ☐ Borrowed

11. How much did your primary bicycle cost?

- ☐ \$ _____
- ☐ I do not know

12. Is a bicycle expensive to purchase and maintain?

- ☐ Yes
- ☐ No
- ☐ Not sure

13. Do you have a safe place to store your bicycle at home?

- ☐ Yes
- ☐ No

14. Where would you like to bicycle to and from your home? (Select all that apply)

- ☐ Work
- ☐ School, daycare, or church
- ☐ College, university, or other training
- ☐ Medical / dental services
- ☐ Shopping / errands
- ☐ Social activities
- ☐ Transit station
- ☐ Park or trail
- ☐ There is no safe place to bicycle to

15. What prevents you from bicycling?

(Select all that apply)

- ☐ Disabilities/physical limitations
- ☐ I do not own a bicycle
- ☐ Bicycle does not work
- ☐ Do not feel safe
- ☐ Not interested
- ☐ Time constraints
- ☐ Traumatic experience
- ☐ Cannot afford a bicycle
- ☐ No place to bike to
- ☐ Pregnancy / small children
- ☐ I don't know how to ride → **Skip to question 20**

16. Have you had a negative bicycling experience?

- ☐ Yes
- ☐ No

17. Did a negative bicycling experience limit how often you bicycle?

- ☐ Yes
- ☐ No

18. Have you ever been a victim of bicycle theft?

- ☐ No
- ☐ Yes → # _____ times

19. Have you ever been unfairly stopped by a police officer while riding a bicycle?

- ☐ Yes
- ☐ No

20. If you were to bicycle, which of the following would concern you? (Select all that apply)

- ☐ Fear of traffic collision
- ☐ Fear of robbery or assault
- ☐ Fear of being profiled by the police
- ☐ Fear of verbal harassment
- ☐ Fear of being stranded with broken bicycle
- ☐ Cost of bicycle maintenance
- ☐ Pavement condition
- ☐ Pregnancy / small children
- ☐ Other, please specify _____

21. Would the following make you bicycle more frequently? (Check one per row)

	Yes	No
Bicycle lane between you and your destination	<input type="radio"/>	<input type="radio"/>
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Bicycle events (eg. Ciclovía, Summer Streets)	<input type="radio"/>	<input type="radio"/>

22. What would make you want to bicycle the most?

23. Would you like a bicycle lane on your street?**(Select one)**

- ☐ Yes
☐ No
☐ I already have one on my street

24. Which class of people do you think bicycle the most? (Select one)

- ☐ Wealthy
☐ Middle class
☐ Poor

25. Are children safe from traffic when bicycling in your neighborhood?

- ☐ Yes
☐ No
☐ Not sure

26. Which of the following is near your home? (Check one per row)

	Yes	No	Not Sure
Bicycle path/trail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle lane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle rack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle locker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. How would you rate the bicycle facilities in your community? (Check one per row)

	Excellent	Fair	Poor	Doesn't exist	I do not know
Bicycle path / trail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle lanes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle racks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycle lockers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roadway pavement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Signage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. Have you heard of bicycle-share programs, such as Citi Bike (NYC) or Indego (Philadelphia)?

- ☐ Yes
☐ No → Skip to question 30

29. Would you use bicycle-share if it were in your community? (Select one)

- ☐ Yes
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- ☐ \$100,000 to \$149,999
- ☐ \$150,000 to \$249,999
- ☐ \$250,000 or more

40. In which country did you spend most of your first 12 years of life?

_____ (country)

41. What is your current home zip code?

_____ (zip code)

Thank you for completing the survey!

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3 Rutgers Plaza, New Brunswick, NJ 08901-8559
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humansubjects@orsp.rutgers.edu