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Cycling Past 50: A Closer Look into the World of Older Cyclists, Year 5 Survey

Carol Kachadoorian

MINETA TRANSPORTATION INSTITUTE

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REPORT 26-02

CYCLING PAST 50: A CLOSER LOOK INTO THE WORLD OF OLDER CYCLISTS, YEAR 5 SURVEY

Carol Kachadoorian

March 2026

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. 26-02	**2. Government Accession No.**	**3. Recipient's Catalog No.**
4. Title and Subtitle Cycling Past 50: A Closer Look into the World of Older Cyclists, Year 5 Survey		**5. Report Date** March 2026
		6. Performing Organization Code
7. Authors Carol Kachadoorian; ORCID - 0000-0003-3804-6867		**8. Performing Organization Report** CA-MTI-2443
9. Performing Organization Name and Address Mineta Transportation Institute College of Business San José State University San José, CA 95192-0219		**10. Work Unit No.**
		11. Contract or Grant No.
12. Sponsoring Agency Name and Address		**13. Type of Report and Period Covered** Final Report
		14. Sponsoring Agency Code
15. Supplemental Notes 10.31979/mti.2026.2443		

16. Abstract

This document reports on approximately 2,800 responses to a North American survey of older adults who cycle. The survey, open from March 2024 through February 2025, included questions that captured a person's cycling over their life course, as well as their current cycling styles, habits, and preferences. Responses reflect the impact of various factors on an older adult's cycling habits with respect to their ability and agility and their expectation to continue cycling. The survey asked about falls and near misses in the past year, coding fall descriptions into six categories and sorting them by the respondent's gender and age. The survey's Visual Preference questions offered photos of cycling contexts and asked respondents to select four to six options for traveling within each context, then scored its safety and comfort level between 1 and 5. Key takeaways include: many older adults can continue to cycle as they age by using a different bicycle, establishing a different expectation with regard to cycling, finding others to cycle with, and using safe and comfortable cycling facilities. Survey questions about e-bikes, adult trikes, and tandems show the variety of bicycle types available, but point to the need for higher-capacity bikeways and education about sharing bikeways safely. The report ends with several issues for further consideration, including ways that caregiving can enhance or reduce cycling benefits, and how injury recovery can affect a return to cycling, or not. The population of older adults is growing, and examining the needs of this group ensures a community's ability to create environments conducive to equitable mobility for all.

17. Key Words older adults, cycling, active mobility, aging, cycling infrastructure	**18. Distribution Statement** No restrictions. This document is available to the public through The National Technical Information Service, Springfield, VA 22161

19. Security Classif. (of this report) Unclassified	**20. Security Classif. (of this page)** Unclassified	**21. No. of Pages** 111	**22. Price**

Form DOT F 1700.7 (8-72)

10.31979/mti.2026.2443

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ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

PREFACE

Since I started the 50+ Cycling Survey in late 2017, I have aged. Barely 65 then, I am now 73 and am experiencing many of the things I hear from people who complete the survey. To say the survey has become personal is going too far. To say the survey helps inform my reactions to age-related changes in my cycling and to better understand what others experience is more accurate. This is one of the motivating factors for the change in approach to the Year 5 report. I'll start with a personal story.

Why I bought an e-bike.

In the end, it was an easy decision. And it wasn't quick. Ben at the bike shop thought I made the decision quickly, but maybe he was just talking about the e-bike I chose—not the fact of getting one at all.

So, why did I get an e-bike? The short answer is that I don't like cycling up hills (or too fast down them, as was evidenced when I did a cycling trip in Croatia). We are moving to a brand-new senior living apartment in a part of Washington, DC, with steeper hills than the ones around the current house. I want to continue to cycle, so finding a way to not use the topography as an excuse to not cycle made sense. Plus, the asthma which I so conveniently ignored for much of my life came to life in the spring 2024 when I got COVID. While I don't necessarily huff and puff while cycling, the e-bike makes a difference.

My plan is to use this cargo bike with 'city' panniers and front basket for daily errands, keeping my Belgian touring bike for riding on nearby trails. Fortunately, the place we are moving to has a first-floor bike storage room. Funny story about that: in one of our Town Hall meetings for the new and first residents, I thanked the company vice president who led the meeting for the bike storage room. He laughed and said that when he saw the bike storage room on the floor plans, he suggested to his staff that it was unneeded as none of the residents would cycle. They said to keep it, as someone would. He pointed to me and said in a friendly and joking way, "Now I know who that is!" So much for the ageism that places us all in a box of not cycling.

I also hope to be a model for other residents, eventually getting the community to establish a partnership with the Washington Area Bicycle Association so we can offer classes and trial rides. There is also a bikeshare station next to our building and wide sidewalks along the street the building faces. Connecting with Cycling Without Age is also an option. And I'll keep on cycling.

EXECUTIVE SUMMARY

This report provides the results of Year 5 of the 50+ Cycling Survey. The Cycling Survey, which began in late 2017, captures information on cycling habits, preferences, and experiences of older adults who cycle. The 2,732 responses included older adults living in countries around the world, with the greatest number of responses from the United States and Canada.

Taken as a whole, the surveys' responses help us think differently about older adults who remain physically active, specifically through cycling. The responses provide a rich database of information about older cyclists. They help answer questions such as who is cycling, when they cycle and where, how far they go, and how often. Further analyses help us answer a fundamental question about how to keep cycling in people's lives as they age by considering questions such as:

- How does the role cycling plays in their life course affect the amount of cycling an older adult does and how long they expect to continue cycling?

- How can the effects of the aging process be mitigated to support cycling as people age into their 70s, 80s, and even 90s?

- What is important for older adults when they cycle? What do they want from cycling?

- What infrastructure designs and operations benefit older cyclists?

Based on survey responses and analysis, older adults cycle for many reasons, including to remain fit, for socialization, and for daily errands. The survey offers two self-identifying frameworks. First, early in the survey, people identify as a regular or non-regular cyclist. Second, after answering a series of questions about their cycling habits, experiences, and preferences, respondents select from four types of cyclists: Interested but Concerned, Casual and Somewhat Confident, Experienced and Confident, and A Mix of All. The analysis for questions such as how a past-year crash affects their expectation to continue cycling and if they are comfortable cycling at night or alone uses these two frameworks to identify differences among older adults.

Older adults engage in various types of cycling, including for daily errands, local and longer distance tourism, and sport cycling, such as racing, and mountain and gravel biking. Cycling rates and distances for all types of cycling vary by gender, age, and life circumstances. Injury and illness may cause a temporary cessation to cycling, but all those responding to the survey resumed cycling as part of or after recovery. The survey also captured life course information related to cycling at four timepoints: (1) when the person learned to cycle, (2) times in the past when they stopped cycling for at least a year (temporary cessation), (3) past-year changes in cycling rates or distances, and (4) anticipating a time when they would stop cycling altogether (permanent cessation). An older adult's ability to cycle is typically affected by their physical health and the health of their family members. Caregiving responsibilities can reduce the amount of cycling, although cycling benefits these older adults as caregivers, especially for their mental health.

Both regular and non-regular cyclists adapt to changing health and life circumstances by the amount and location of their cycling and by the type of bike they ride. Adaptive bikes such as electric-assist, tandems, and tricycles offer older adults ways to cycle comfortably and safely. These bikes also allow older adults to begin cycling or continue cycling when circumstances change. Older adults responding to the survey identified why they ride these bikes and cite their pros and cons.

The survey includes a visual preference section consisting of a series of photos of cycling contexts. Respondents are asked to select from four to six options for cycling through each context, then rate it on safety and comfort on a scale of one to five.

Past-year near misses and falls capture how older cyclists travel through the built environment and negotiate with others who are walking, cycling, and driving a motor vehicle. In past years, all circumstances contributing to each fall were included in the analysis. This year's report only uses the primary factor, which allows for a better focus on the impact of a specific factor on falls. Fall descriptions were grouped into six categories: (1) operator error, (2) surface conditions and construction, (3) actions of others, (4) various bike issues (5) physical limitations (chronic conditions, effects of aging), and (6) weather. Overall, operator error and surface conditions caused the most falls with an overall decline in falls beginning at age 70.

The analysis is premised on the fact that cycling remains beneficial for older adults by contributing to their physical and mental well-being and offering mobility independence regardless of their ability to continue driving a motor vehicle. Thus, the survey responses analyzed in this report can be used by transportation planners and engineers, public health professionals, those working on physical activity and wellness for older adults, and advocates, as well as older adults themselves. Issues identified in the survey's responses needing further work include: the impact of caregiving on cycling rates, the impact of injury and chronic conditions on potential cycling cessation, the impact of social or cultural pressure on cessation, and cycling facility design and maintenance that benefit older cyclists.

1. INTRODUCTION

The 50+ Cycling Survey is a survey of older adults who cycle. First offered in 2017, the survey provides information about the cycling history, habits, and preferences of older adults. Now in its fifth round, the results shown here represent nearly 2800 respondents ages 50 to 81-plus and can be used by engineers, planners, public health and recreation professionals, advocates, decision-makers, and older adults themselves. The survey helps answer the question: how can our growing understanding of older cyclists affect policy, programs, design, and practice? A PDF of this year's survey is in Appendix A.

1.1 THE SURVEY IN A BROADER CONTEXT

1.1.1 Erikson's Theory of Aging

The 50+ Cycling Survey can be considered as one way to understand the aging process. Erik Erickson's work on the eight stages of life is based on the belief that each stage requires the person to achieve certain developmental goals.[1] The developmental task at the eighth stage, old age—which begins at 65 and ends at death—is to reconcile one's life and find peace with it: the battle between ego integrity and despair.[2] Thinking of the mental and physical health benefits of cycling as helping with this reconciliation process is not far-fetched. Among the things that Erikson recommends older adults do include socialization and physical activity, both of which older cyclists responding to this survey value.

1.1.2 What the Cycling Survey Offers

Certainly, part of the process of finding peace between ego integrity and despair as one ages is the sense of being part of a larger conversation; not left out of society. In this sense, the Cycling Survey allows older adults to share their cycling experiences and preferences. It is grounded in a commitment to finding various pathways that encourage and support quality of life goals as people age.

The survey's North American reach brings together older cyclists from different geographic areas. They cycle during a range of weather conditions, on varying topography and cycling infrastructure, and in different cycling cultures.

To begin, the Year 5 survey introduced new questions about the land-use context in which respondents live. The rationale behind this is that some land uses have infrastructure that is more conducive to cycling. Based on responses to this question, about one-fifth of respondents live in-town; about 38% live in a suburban context of either mostly residential or mixed use. See Figure 1.

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1   https://www.ncbi.nlm.nih.gov/books/NBK556096/
2   https://www.verywellmind.com/integrity-versus-despair-2795738

- In-town with a mix of single and multi-family homes, offices, shops, etc.
- In-town in a mostly residential area.
- Suburban area, mostly residential.
- Suburban area with a mix of residential, businesses, shops, etc.
- Rural Area
- Small Town or Village
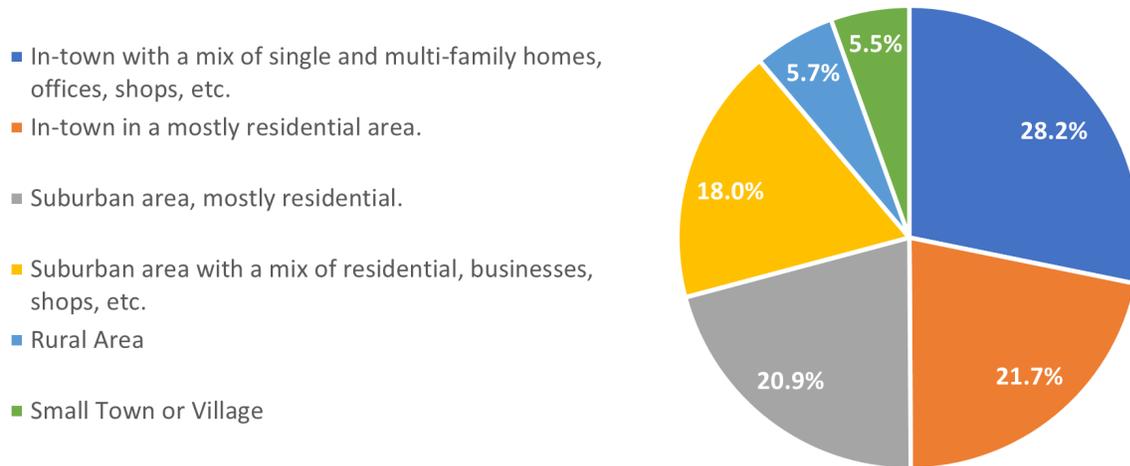
Figure 1.   Distribution of Resident Area Type, N=2621

Cycling is one way that people can remain physically active and socially engaged as they age, while improving their overall wellness. This fits into a larger framework shown in Figure 2 that begins with Foundational Influencers that lead to Supportive Programs, Infrastructure, and Land Use, and leads to the "Optimum Outcome for Older Adults." The model includes the survey as a Foundational Influencer, as it provides information about older cyclists that can be used for program development, infrastructure design and operation, and land development.

The 2,732 survey responses provide a large database of information about older cyclists. These data answer questions such as who is cycling, when do they cycle and where, how far do they go, and how often. Further analyses help us answer a fundamental question about how to keep cycling in people's lives as they age by considering questions such as:

- How does the role cycling plays in their life course affect the amount of cycling an older adult does and how long they expect to continue cycling?

- How can the effects of the aging process be mitigated to support cycling as people age into their 70s, 80s, and even 90s?

- What is important for people when they cycle? What do they want from cycling?

- What infrastructure designs and operations benefit older cyclists?
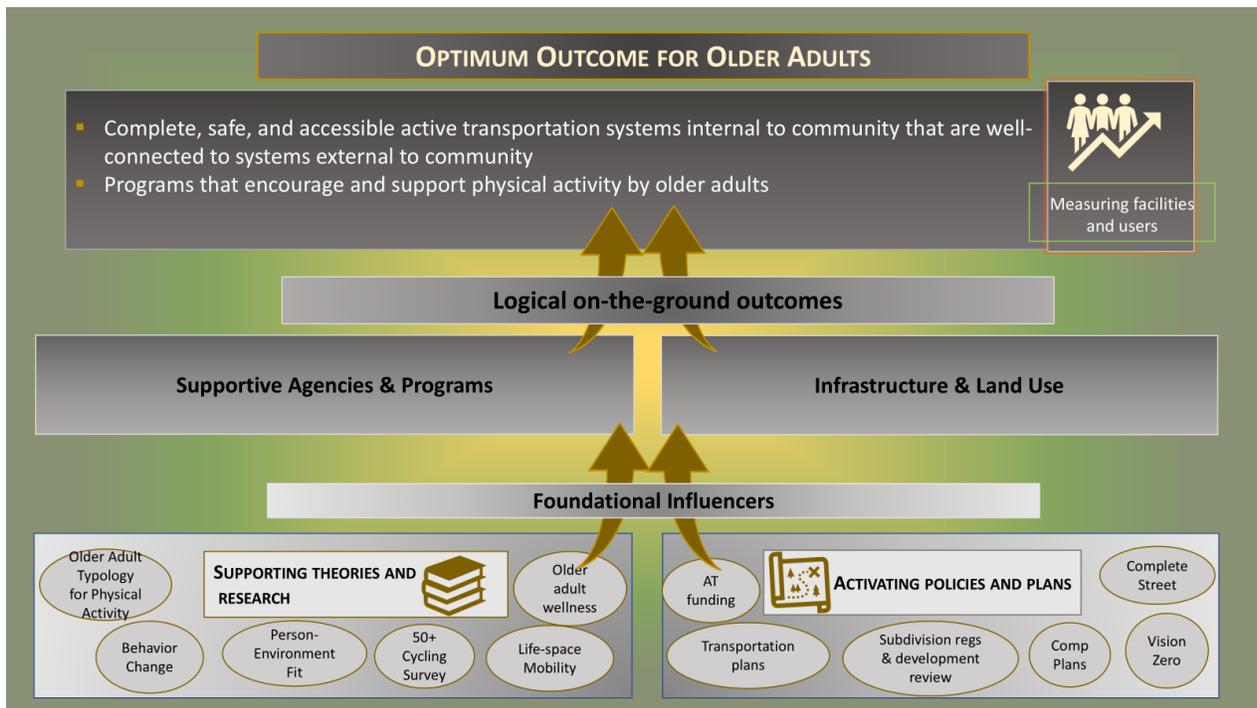
Figure 2. Optimum Outcome for Older Adults

1.2 THE SURVEY TIMEFRAME AND PROMOTION

The survey was open from August 2023 through March 2024, with links to the online survey form on the Mineta Transportation Institute and dblTilde CORE websites. The Mineta Transportation Institute and dblTilde CORE, Inc. led promotional efforts, reaching out to national, regional, and local organizations in the United States and Canada via e-newsletters, social media, and websites. National organizations in addition to the Mineta Transportation Institute included the American Planning Association, the National Safe Routes Partnership, the Rails to Trails Conservancy, Adventure Cycling, and the U.S. and Canadian Associations of Retired People (AARP and CARP, respectively). Regional organizations include various Metropolitan Planning Organizations (MPOs), bicycle clubs, and advocacy organizations. Local organizations included local governments, non-profits, and active transportation organizations (walking and cycling or just cycling). Organizations whose audiences were specifically lower income or racially diverse were asked to promote the survey. Given the low percentage of respondents fitting either of these two factors, this outreach was not especially successful.

For more information about the survey, to ask about specific analyses, and to offer opportunities to share the survey results, contact info@dblTildeCORE.org.

1.3   DIFFERENCES BETWEEN YEAR 4 AND YEAR 5 SURVEY

While to a large extent the Year 5 survey duplicated the Year 4 survey, there were two key differences:

- Questions about cycling at night and cycling alone were combined into a single question with a matrix answer format.

- The Visual Preference Survey was revised to provide more details about cycling contexts to reduce speculation about responses. Several of the photos have links to Google Street View so people can 'cycle around' to see the broader context.

Finally, note that not all the analyses included in the Year 4 survey report are included here. The survey dataset is available for further analysis to satisfy needs of those using the survey as a resource.

2. THE BASICS

This section of the report provides a profile of those completing the survey: age, gender, and geographic location (by state or province).

2.1 WHO ANSWERED THE SURVEY

Those answering the survey are not asked where they live specifically. However, the survey platform, Alchemer, reports geographic information such as the country where responses were entered. Based on this information, it appears that people living in 33 countries answered the survey. Figure 3 shows the response rate for the United States and Canada. But Figure 4 shows responses from all countries, totaling 2,732.

13.0%

82.8%

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- 0.07%
- 0.26%
- 0.04%
- 0.15%
- 13.01%
- 0.33%
- 0.51%
- 0.40%
- 0.11%
- 0.92%
- 82.81%

Figure 3. Response Rate for the United States and Canada

Figure SEQ Figure * ARABIC 3. Percentage Split of Survey Responses between Canada and the United States

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Figure 4. Responses from all countries

Nearly ninety-nine percent of those responding to the question, *Do you describe yourself as a woman, a man*, *or in some other way?* selected either "Woman" or "Man." About 1.5% answered "Non-binary" or "Prefer not to answer." Just over one-third of respondents are women, with just under two-thirds being men. The difference is those who are either non-binary or did not provide a gender. See Figure 5. Because of the low response rate for these two answer options and the focus of this survey on gender and age differences (even for non-binary older adults), responses from these older adults are included in some but not all analyses.

This year's survey asked people to identify their age in one of seven 5-year age groups. See Figure 6.

Figure 5.   Responses by Gender
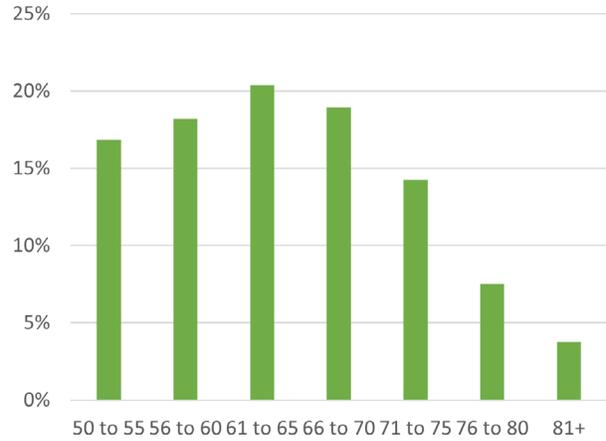
Figure 6.   Responses by Age Group

Figure 7 combines age group and gender, including those who did not provide their gender. The figure shows differences in response rates between 50 and 70, with lower response rates beginning at age 71. As might be expected, the lowest response rates are for people aged 81 and older.
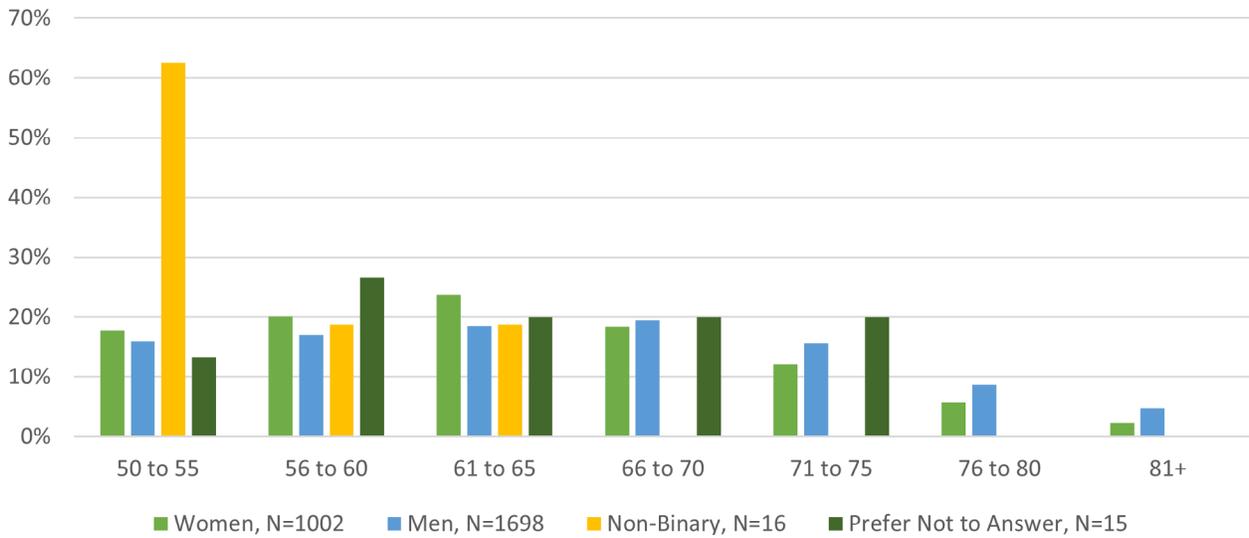
Figure 7.   Responses by Age Group and Gender

Information about how different contexts affect cycling rates as people age has not been included in past surveys. To begin to answer this question, the Year 5 survey asked people about which of six areas they lived in called a Residential Area-Type. See Figure 1 in above Section 1.1.2. While this does not provide information about the areas in which a person cycles, their inclination to cycle and to continue cycling as they age may be inferred from the question. Where someone lives may change as they age, especially if they move from the home they lived in while raising children (assuming they had children) to one more suitable for empty nesters or a senior living community. Figure 8, which breaks this out by age group, shows the *In-town with a mix of single and multi-family homes, offices, shops,*

etc. Residential Area-Type has the greatest number of respondents living there for ages 50 to 75, with *In-town mostly residential* Area-Type having the highest percentage after that.
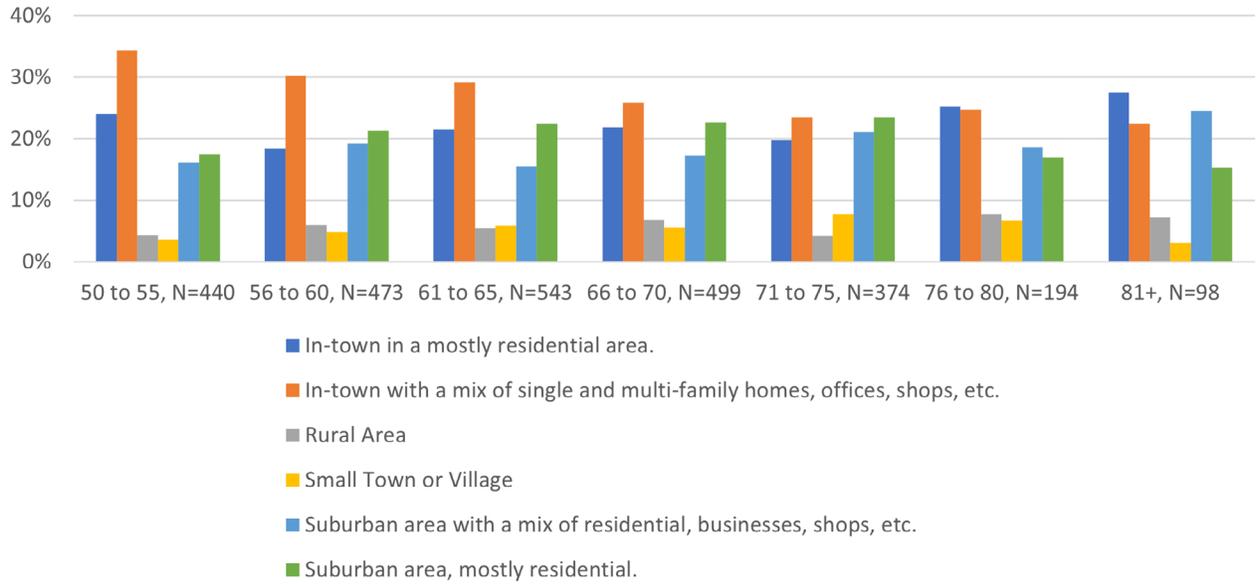
Figure 8.   Distribution of Residential Area-Type by Age Group

3. HOW PEOPLE THINK OF THEMSELVES AND CYCLING

The Year 5 survey continues to include two questions asking about how people think of themselves with respect to cycling. The first question, which comes early in the survey, asked people if they cycled regularly, with "Yes" or "No" answer options. The answer was self-defined so that people who cycle once a month could consider themselves equally as a "regular" or "non-regular" cyclist. People who answered "No" were asked what prompted them to cycle. Those answering "Yes" were asked about their cycling frequency. The second question comes at the end of the first part of the survey (just before Part 2, Visual Preference), asking people to identify with one of four types of cyclists. The results from the two questions and their accompanying follow-up questions are detailed below. We also included Residential Area-Type answers in the analysis of some questions.

3.1 COMPARISON OF REGULAR AND NON-REGULAR CYCLISTS

When asked to identify themselves as a regular or non-regular cyclist, respondents determined what "regular" meant to them and identified as one or the other. Just under 89% identified as regular cyclists (88.8%), with the remainder as non-regular. See Figure 9. More men identified as regular, 92.0%, compared to 83.4% of women, and both non-binary and those who preferred not to answer are 88.2% and 86.7%, respectively. See Figure 10.
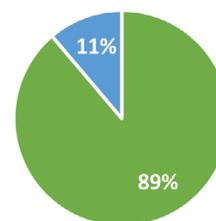
Figure 9. Responses for Regular and Non-Regular Cyclists N=2711

Figure 11 compares a person's Residential Area-Type to their identification as a regular or non-regular cyclist. More regular cyclists selected the *In-town with a mix of single and multi-family homes, offices, shops, etc.*, the *In-town in a mostly residential area*, and the *Suburban area, mostly residential* Area-Types. More non-regular cyclists live in the *Suburban area with a mix of residential, businesses, shops, etc.,* the *Rural Area*, and the *Small Town or Village* Area-Types.
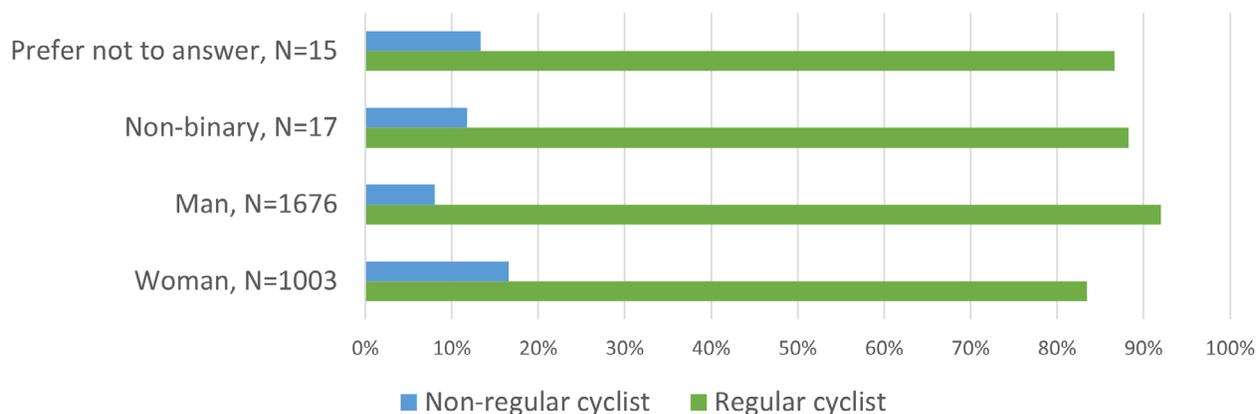
Figure 10. Regular and Non-Regular Cyclists by Gender
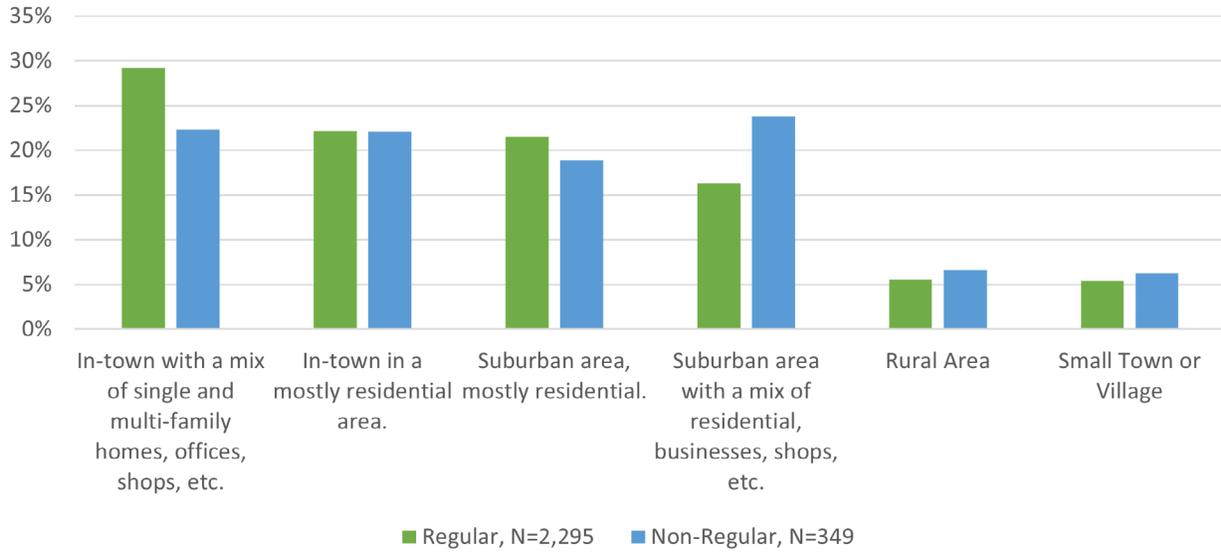
Figure 11. Residential Area-Type by Regular and Non-Regular Cyclist

Age and gender differences between regular and non-regular cyclists are shown in Figures 12 and 13. For women, the rate of regular cyclists is lowest for those aged 50 to 55 at 79%, rising to 84.2% for those aged 61 to 65. For men, the rate of regular cyclists is relatively flat, with a low of 90.7% for those 76 and older and a high of 93.9% for those 66 to 70 years old. Rates for non-regular cyclists by age and gender are typically opposite those for regular cyclists. In other words, if the rate of regular cyclists for one age group and gender rises, the rate for non-regular cyclists for that age group and gender drops.
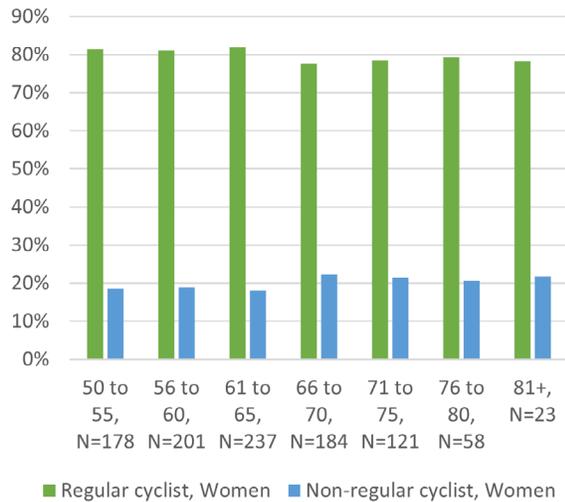
Figure 12. Women, Rates by Age Group for Regular and Non-regular
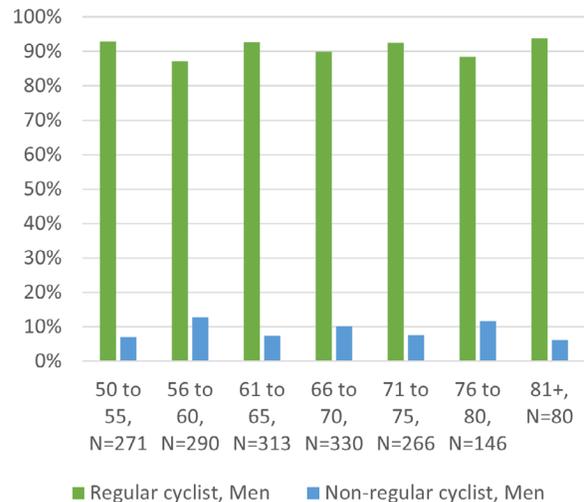
Figure 13. Men, Rates by Age Group for Regular and Non-regular

3.1.1 Cycling frequencies for regular cyclists

Those indicating they were a regular cyclist were asked about how often they cycle, responding to answer options of "*6+ times a week*," "*3-5 times a week*," "1-*2 times a week*," "*1-3 times a month*," and "*Weather-dependent*." Figures 14 through 17 show cycling frequencies for regular cyclists by gender and age group. The lowest weekly cycling rate of one to two times a week decreases as people age, perhaps because they have more time to cycle as they age. Generally, weather-dependent cycling increases with age.
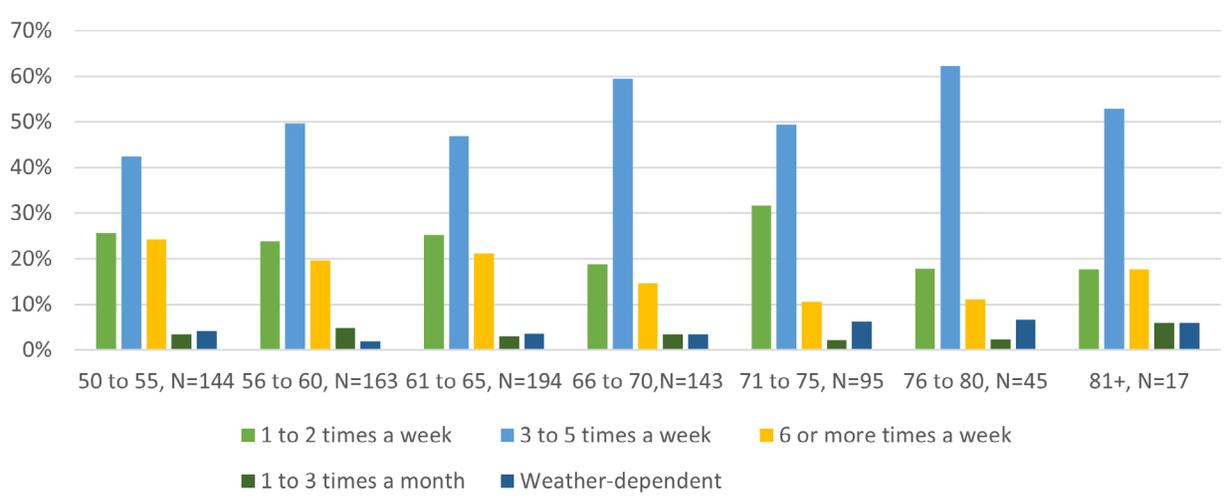
Figure 14. Cycling Frequency for Regular Women Cyclists by Age Group, N=801
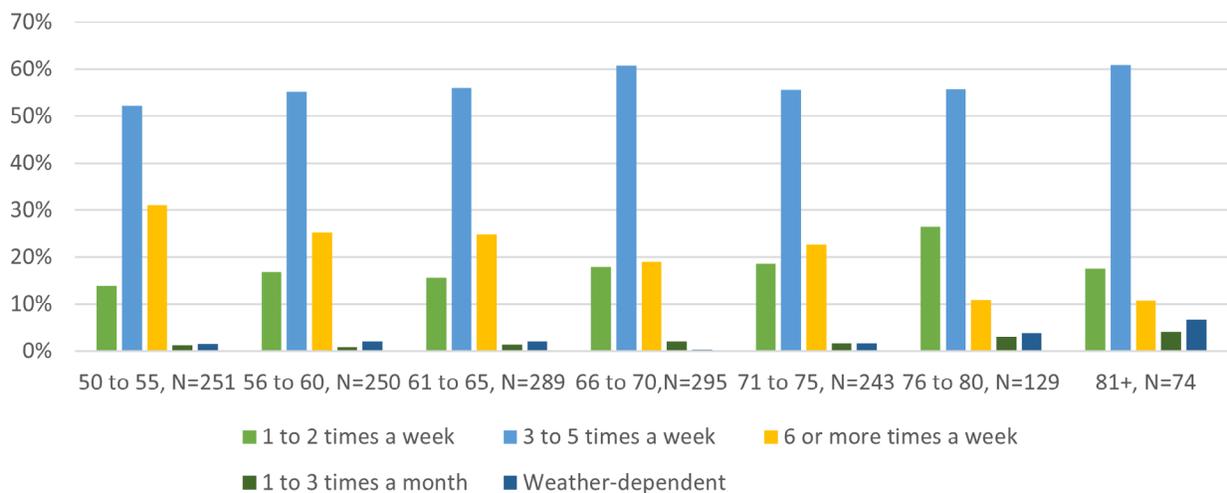
Figure 15. Cycling Frequency for Regular Men Cyclists by Age Group, N=1531
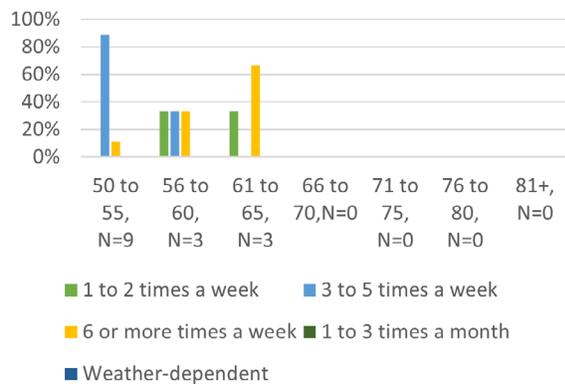
Figure 16. Cycling Frequency for Regular Non-Binary Cyclists by Age Group, N=15
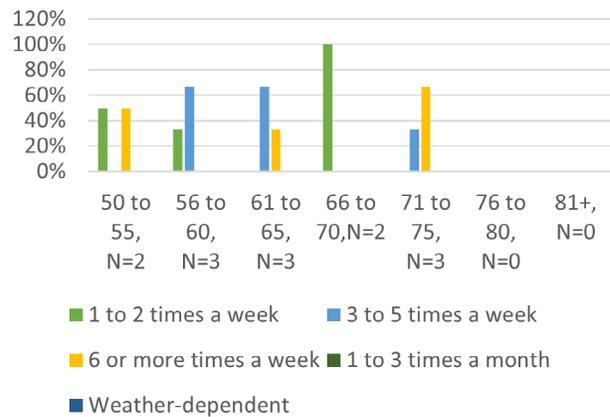
Figure 17. Cycling Frequency for Regular Prefer Not to Answer Cyclists by Age Group, N=14

3.1.2 Cycling patterns for non-regular cyclists

The survey treated non-regular cyclists differently than regular cyclists. Instead of asking how frequently they cycled, non-regular cyclists were asked what prompted them to cycle. Nine answer options, as well as "Other" with a response required, resulted in 15 different prompts, grouped into five categories as shown in Table 1. Overall, non-regular cyclists are prompted to cycle most often for Personal-Lifestyle reasons, averaging 40.4%%, then for Health and Safety, averaging 27.6%.

Table 1. Factors by Category Affecting Cycling for Non-Regular Cyclists

Personal-Lifestyle 40.4%	Social Relations 12.1%	Health & Safety 27.6%	Cycling Environment 19.8%
• When I feel like it or to enjoy being outdoors • For transportation, especially to save on gas or time • To go to local destinations • To simplify the trip by not using a car • When on vacation	• When there is someone to ride with • When visiting family • When someone pushes me or a planned activity	• To be physically active or for training • When there are no limiting health issues • When it feels safe	• When a working or better-fitting bike is available • When the weather is right or mostly right

Note: Unallocated "other" responses were .2% and are not shown here.

3.2 TYPOLOGY OF CYCLISTS

After completing questions about their cycling habits and experiences, the survey asks respondents to identify themselves as one of four types of cyclists. The typology presented in the survey is a modification of the one developed by Roger Geller and used widely for infrastructure planning, in that it replaces the non-cyclist type (No Way, No How) with *Varies by Situation* (A Mix of All). As with the Year 4 survey, this question was augmented by a brief definition of each type shown in Table 2. The table also shows the breakout of how respondents identified with the four types by gender and all responses combined.

Table 2. Distribution of Four Types of Cyclists

Interested, but Concerned	Casual and Somewhat Confident	Experienced and Confident	Varies by Situation
I ride a bike but am concerned about safety and my ability to ride	*I am comfortable cycling, especially where there are good bicycling facilities*	*I am very comfortable cycling most days and in most places*	*The type of cyclist I am varies by the situation*
6.5% Women	21.7% Women	42.4% Women	29.4% Women
2.8% Men	9.9% Men	69.2% Men	18.1% Men
7.1% Non-Binary	7.1% Non-Binary	57.1% Non-Binary	28.6% Non-Binary
0.0% Prefer not to answer	14/3% Prefer not to answer	50.0% Prefer not to answer	42.9% Prefer not to answer
4.2% Combined	14.2% Combined	59.1% Combined	22.5% Combined

Most people answering this question selected *Experienced and Confident*, averaging 59.1%, with *Varies by Situation* the second highest, averaging 22.5%. When comparing just women and men, more women selected *Varies by Situation* than men, with the percentage for the remaining three types higher for women than men, as shown in Figure 18.
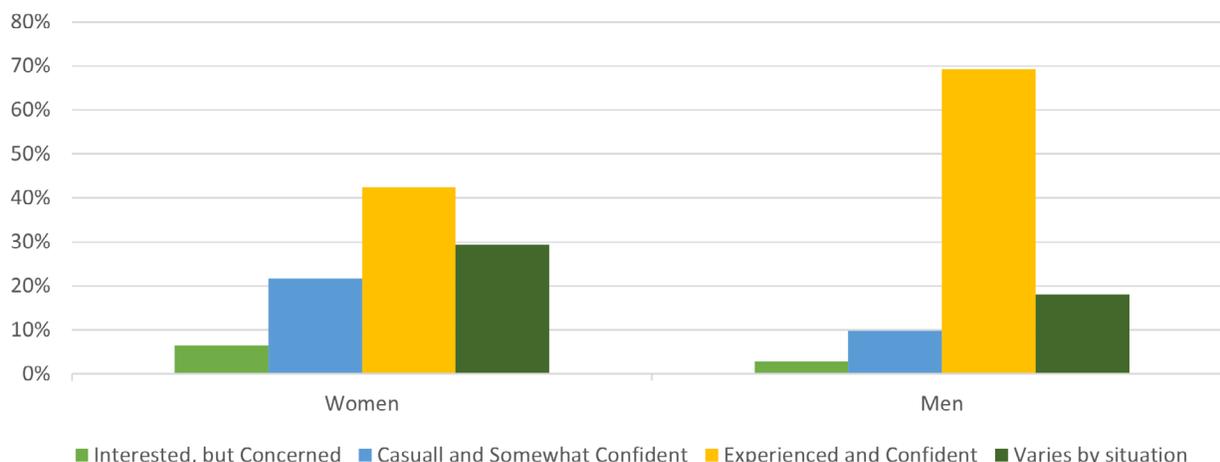
Figure 18. Type of Cyclist by Gender

3.2.1   Type by gender and age

Figures 19 to 22 show each type of cyclist by gender and age. Overall, as people age, they identify as what may be considered a more conservative or safe type of cyclist, especially for the *Varies by Situation* and *Interested but Concerned* types. The rates for both women and men drop beginning at age 66 for *Experienced and Confident*.
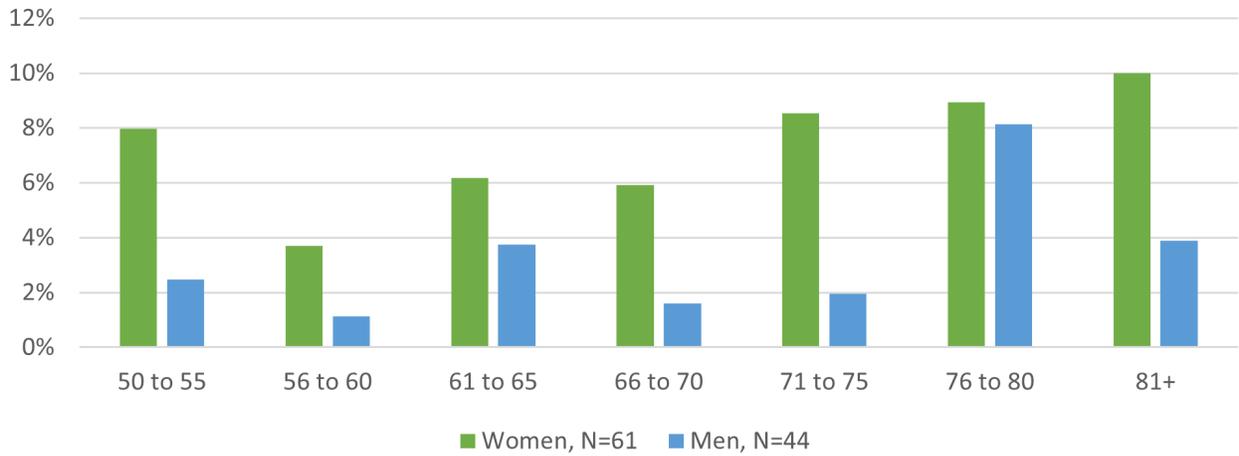
Figure 19. Interested but concerned Type by Gender and Age
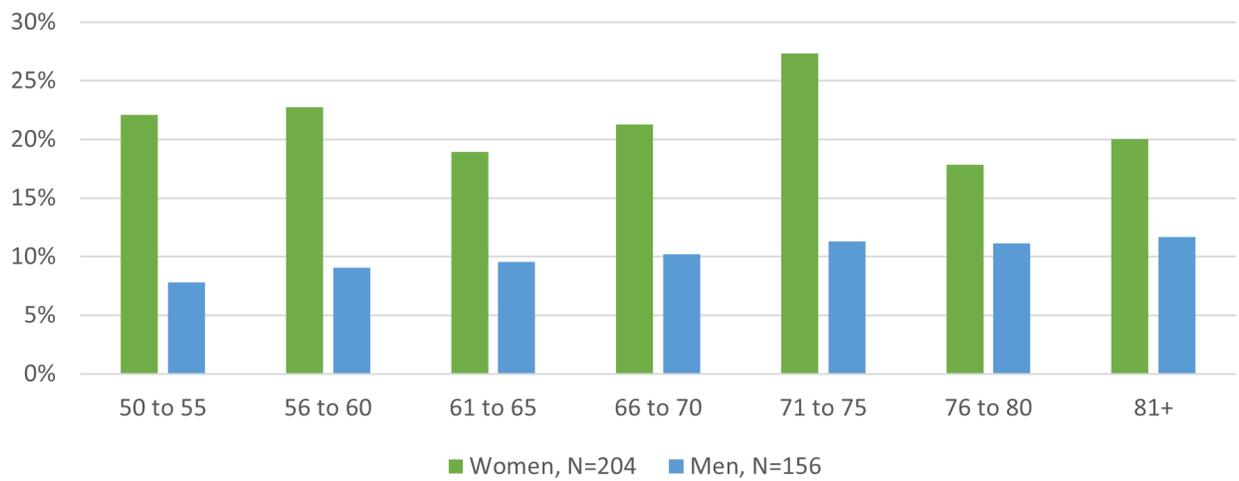
Figure 20. Casual and somewhat confident Type by Gender and Age
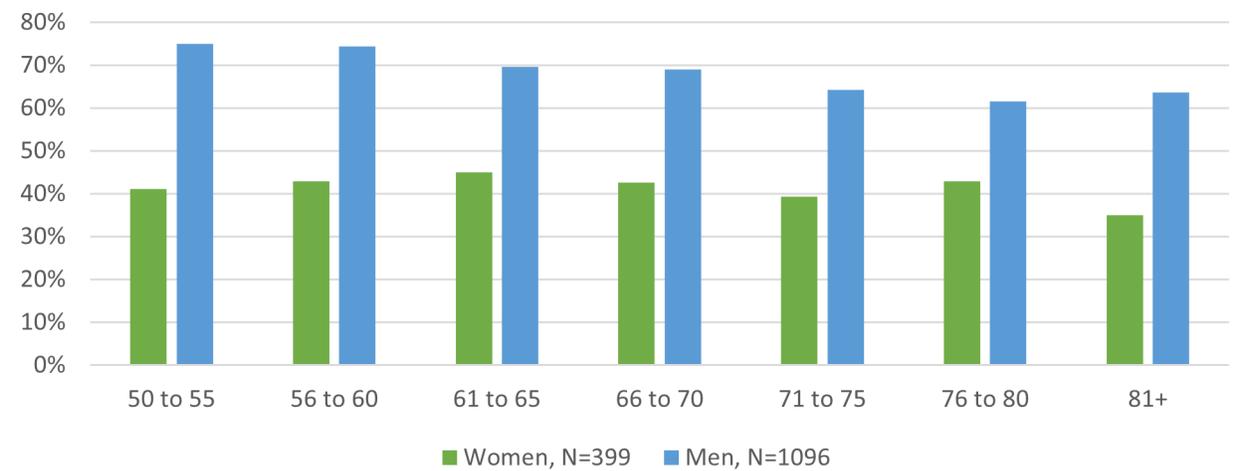
Figure 21. Experienced and confident Type by Gender and Age
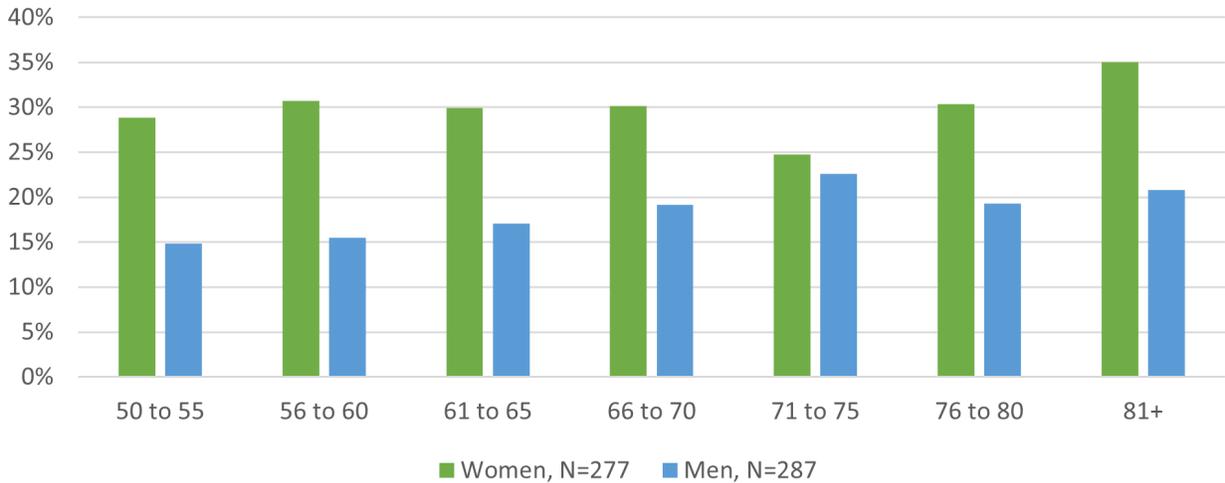
Figure 22. Varies by situation Type by Gender and Age Group

3.2.2   Comparing regular and non-regular cyclists by type of cyclist

There are differences between the type of cyclist selected based on whether the respondent considers themselves to be a regular or non-regular cyclist. Non-regular cyclists lean more towards being situational, with lower rates of identifying as a *Casual and Somewhat Confident* or *Experienced and Confident* cyclist. The rate for *Varies by Situation* is closer for regular and non-regular cyclists than other types. See Figure 23.
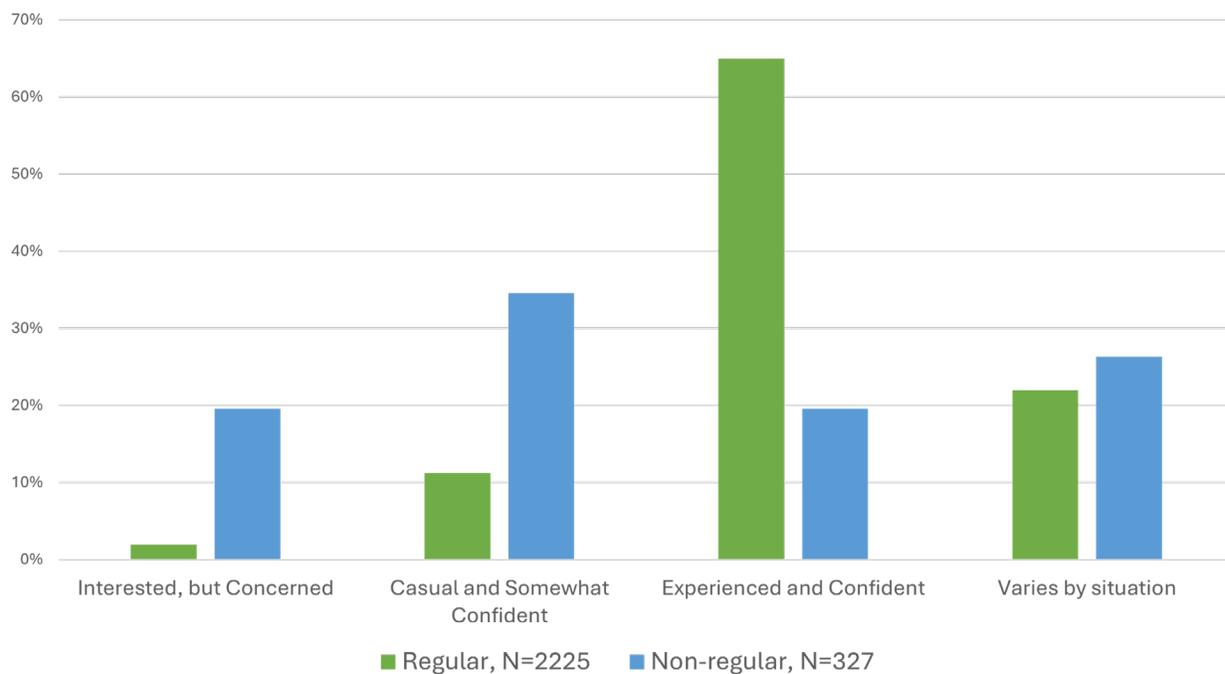
Figure 23. Type of Cyclist by Reular and Non-regular

3.2.3   Comparing residential area-type by type of cyclist

Figure 24 shows the type of cyclist within each Residential Area-Type. As with the regular and non-regular cyclists there are more *Interested but concerned* types for the three Residential Area-Types. *Experienced and Confident* types are highest in the *Suburban area with a mix of residential, businesses, shops, etc*. and *Small Town or Village* Area-Types with *Casual and Somewhat Confident* highest in the *Rural Area* Area-Type.
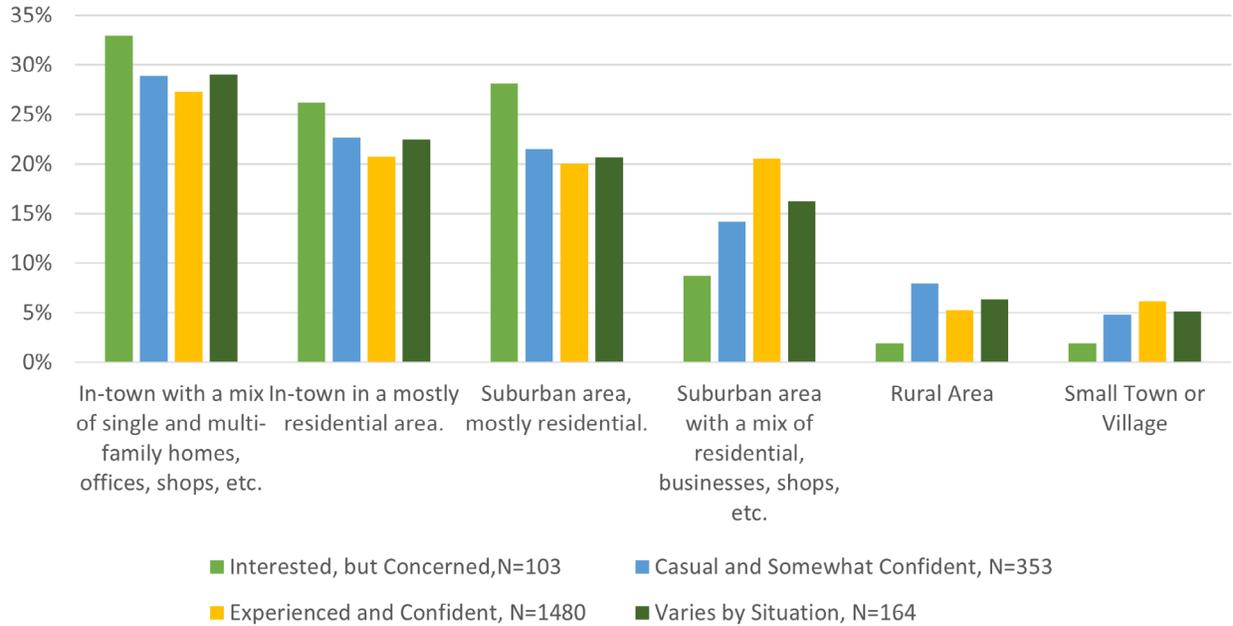
Figure 24. Residential Area-Type by Type of Cyclist

4. TRIP PURPOSE AND DISTANCE[3]

Older adults cycle for various reasons. A ride varies by the person making it and the purpose of the trip, both of which affect the distance traveled. The survey included a question about trip purpose with six options for trip distances ranging from a few blocks to more than 50 miles. Results from this matrix provide a picture of the variety of purposes and distances. Figure 25 shows response rates for each trip purpose for women and men. Overall, women tend to cycle more often for leisure or social activities and daily errands, while men cycle more often for fitness and slightly more often for transportation.
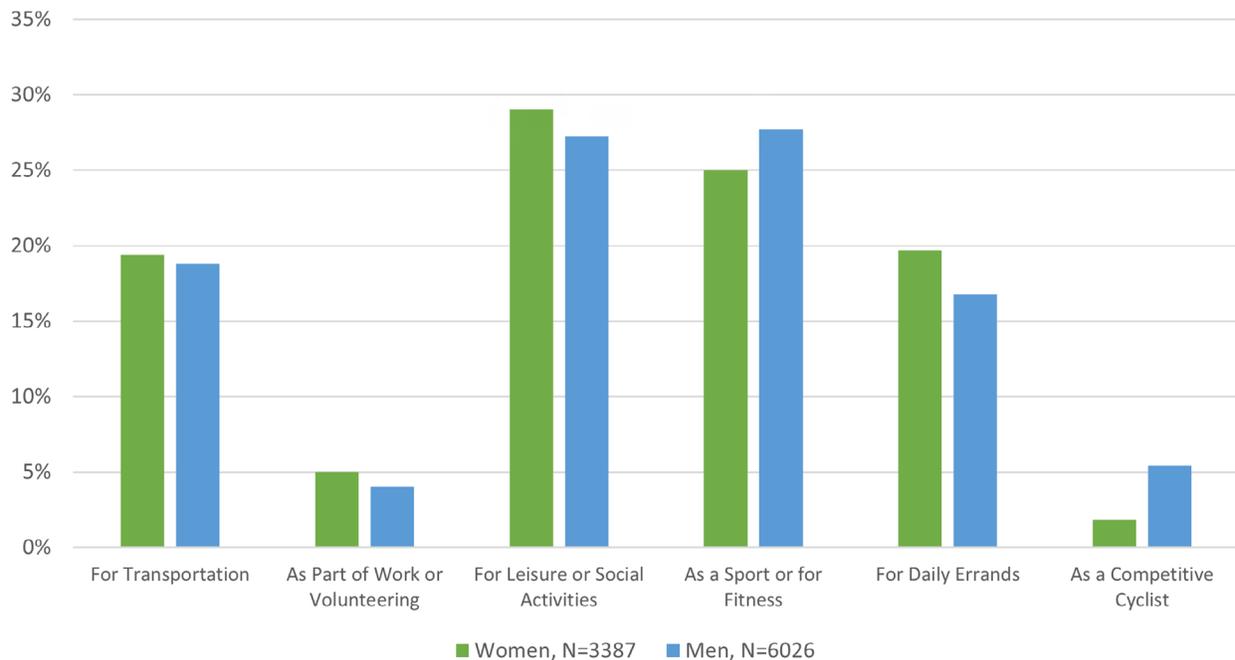
Figure 25. Comparison of Trip Purpose Responses between Women and Men

Figure 26 shows the combined trip purpose by distance for women and men. More people cycle longer distances (2 to 10 miles) for *Daily Errands*, *Work or Volunteering* trips, and *For Transportation*, with *As a Competitive Cyclist* distances greatest at over 50 miles. Distances traveled for other trip purposes vary.

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3 Two notes: First, the data here is for US and Canada responses only; second, the large number of responses is due to respondents answering for more than one trip purpose and more than one distance for some trip purposes.

a few blocks ■ **Not more than 2 miles** ■ **2 to 10 miles** ■ **10 to 25 miles** ■ **26 to 40 miles** ■ **41 to 50 miles** ■ **50+ miles**
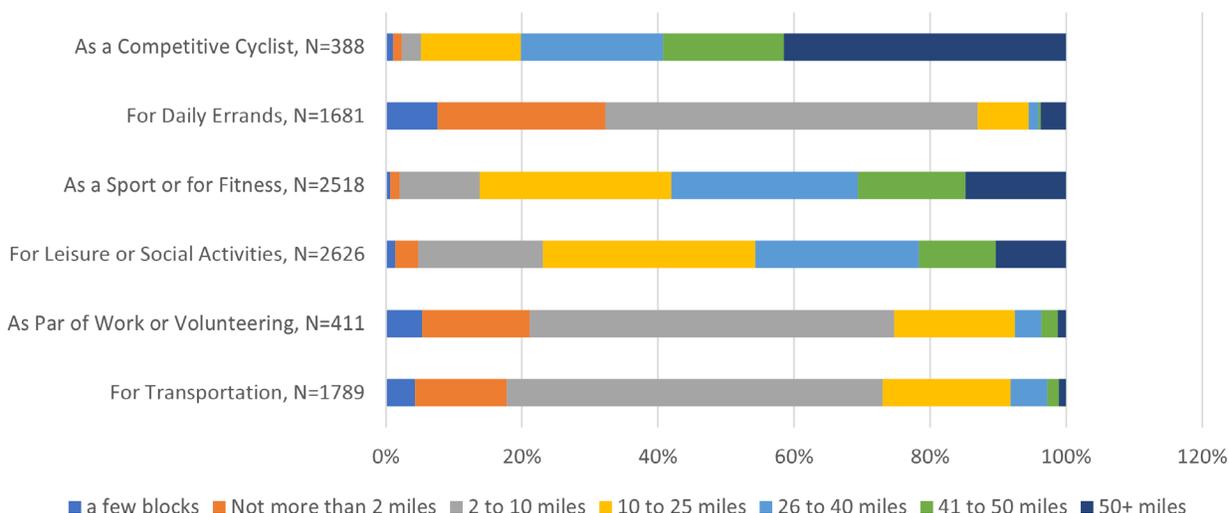
Figure 26. Combined Trip Purpose and Distance for Women and Men

Figures 27 and 28 below show distances traveled for women and men for the six trip purposes.

a few blocks ■ **Not more than 2 miles** ■ **2 to 10 miles** ■ **10 to 25 miles** ■ **26 to 40 miles** ■ **41 to 50 miles** ■ **50+ miles**
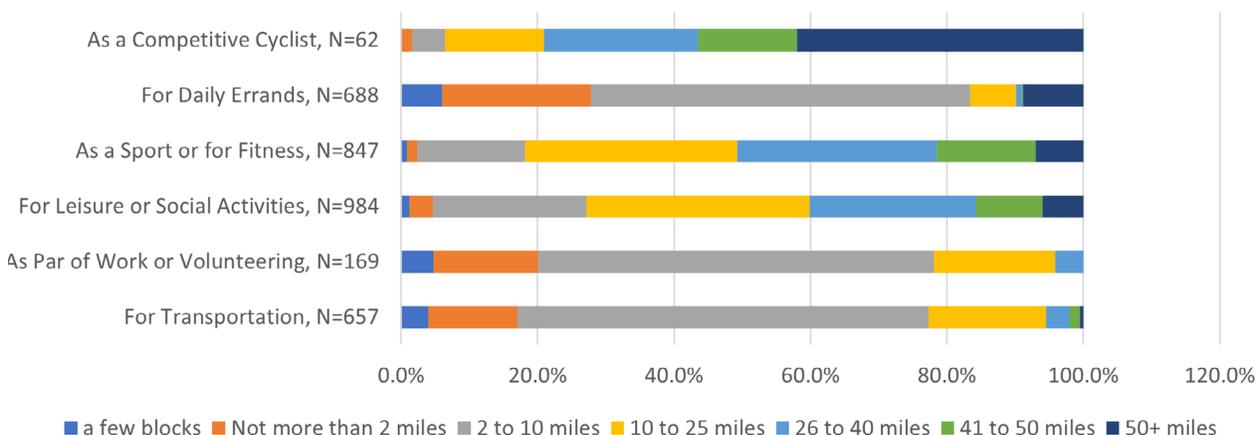
Figure 27. Trip Purpose and Distance for Women

a few blocks ■ **Not more than 2 miles** ■ **2 to 10 miles** ■ **10 to 25 miles** ■ **26 to 40 miles** ■ **41 to 50 miles** ■ **50+ miles**
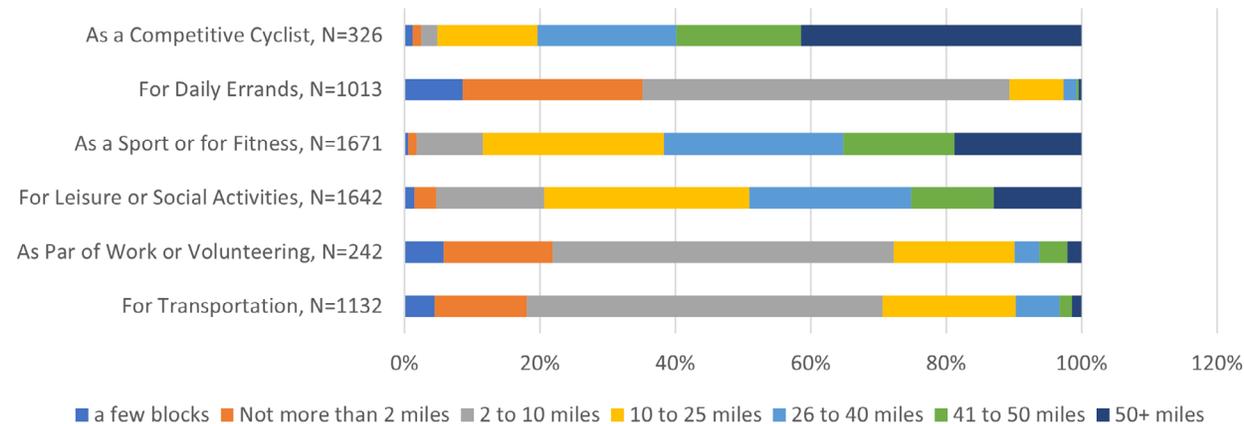
Figure 28. Combined Trip Purpose and Distance for Men

4.1 MOST POPULAR CYCLING PURPOSES: SOCIABILITY AND FITNESS

Cycling for leisure or sociability and for fitness received the most response. Both trip purposes serve older adults well, as they contribute to overall physical, mental, and emotional health. As noted above, women tend to cycle more often for leisure or social activities and daily errands, while men cycle more often for fitness and slightly more often for transportation. However, when they cycle for sociability or fitness, women tend to cycle 25 miles or fewer, and men prefer longer distances of up to 40 miles. See Figure 29.
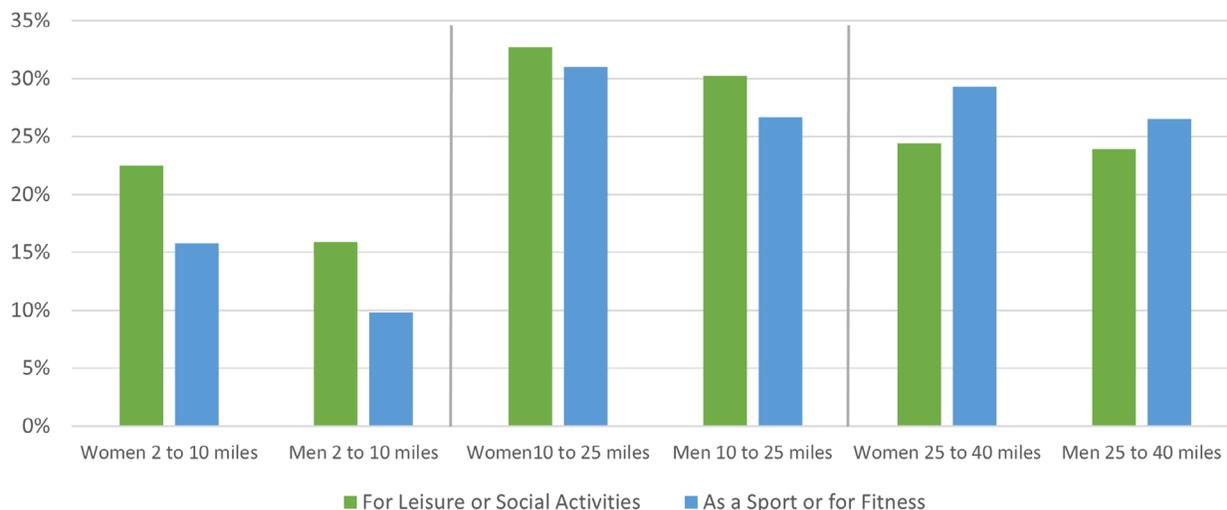
Figure 29. Comparison of Preferred Distances Between Women and Men for Social and Fitness Cycling

4.1.1 Cycling for Leisure or Sociability

The fact of cycling for a leisure or social activity may be as important as the distance traveled.[4] People may choose who they cycle with based on the companion's speed, distance to travel, and places to cycle. This will likely continue as people age. As Figures 30 and 31 below show, 10 to 25 miles for women and men is the most common distance cycled. Longer distances increase with age, perhaps surprisingly with distances up to 25 miles remaining popular for respondents' in their 80s, perhaps for fitness reasons.

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4 https://pmc.ncbi.nlm.nih.gov/articles/PMC8443045/; https://newsinhealth.nih.gov/2024/05/get-active-together; and
  https://www.sciencedirect.com/science/article/pii/S0277953623008110
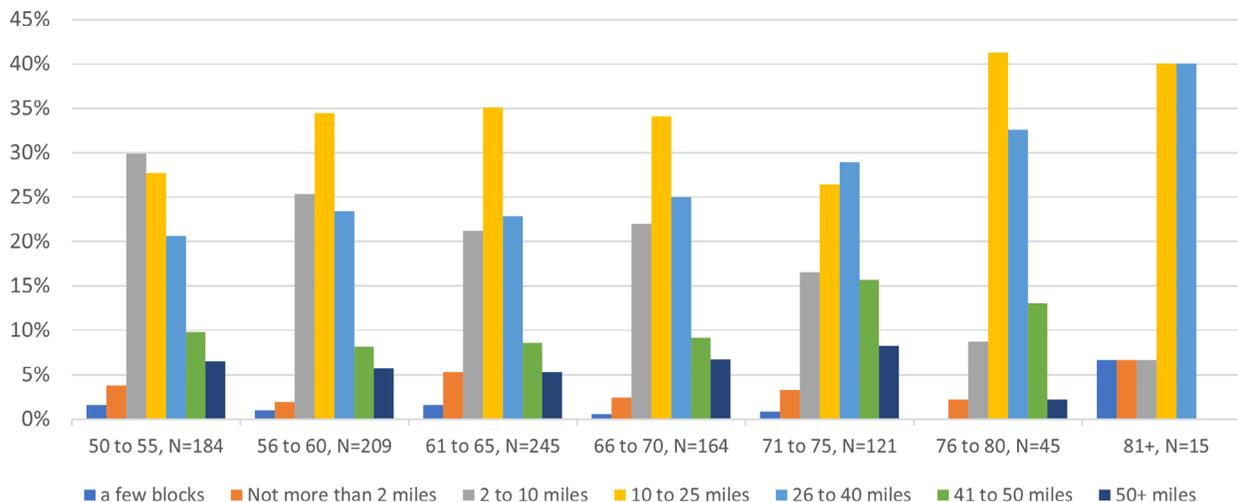
Figure 30. Leisure or Sociaiblity Cycling Distance for Women by Age
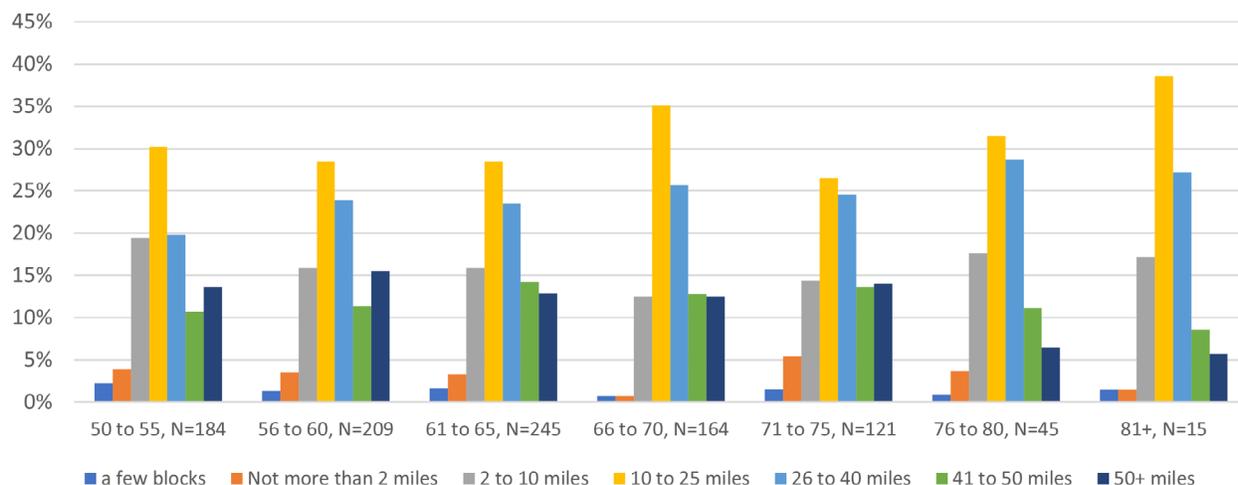
Figure 31. Leisure or Sociaiblity Cycling Distance for Men by Age

4.1.2 Cycling for Sport or Fitness

Cycling as a physical activity offers older adults a low-impact form of exercise. Assuming falls or crashes can be avoided, the benefits of cycling include both physical fitness and mental health, especially when considered hand-in-hand with the cycling as a form of socializing.[5] As Figures 32 and 33 below show, 10 to 25 miles and 26 to 40 for women and men are the most common distances cycled. For women, these two distance ranges are relatively the same through age 76. For men, cycling over 50 miles is the third most common distance until age 75 when shorter distances gain in popularity.

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5   https://pmc.ncbi.nlm.nih.gov/articles/PMC10338922/ and https://www.smalltownbikeco.com/blogs/ news/10-benefits-of-cycling-for-seniors?srsltid=AfmBOorM7C1vu1VnFbZao4YbG7buj23JzdjzBdfjx9-HQQbCDeTJQtsD
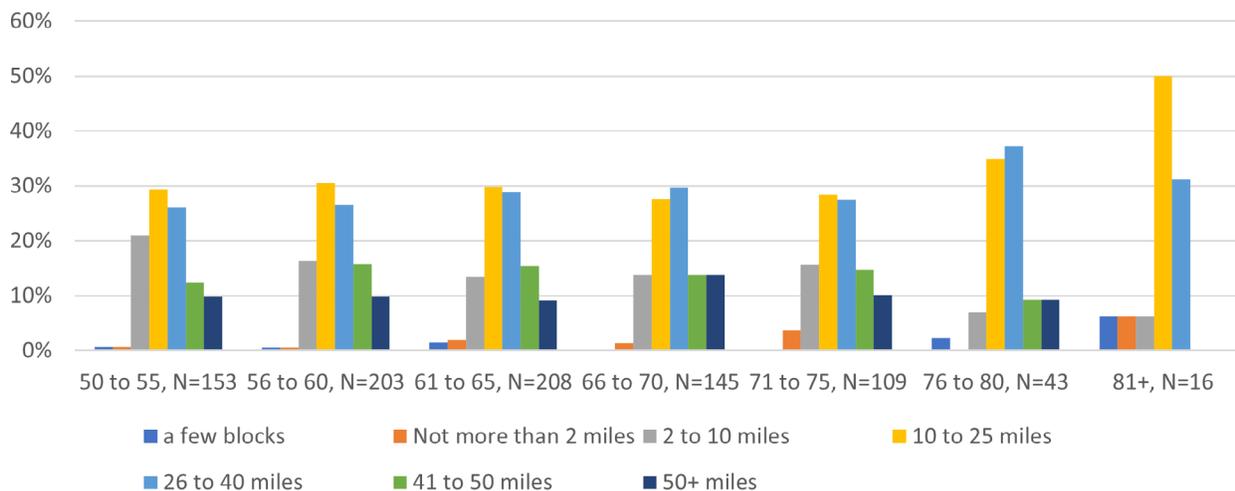
Figure 32. **Sport of Fitness Cycling Distances for Women by Age**
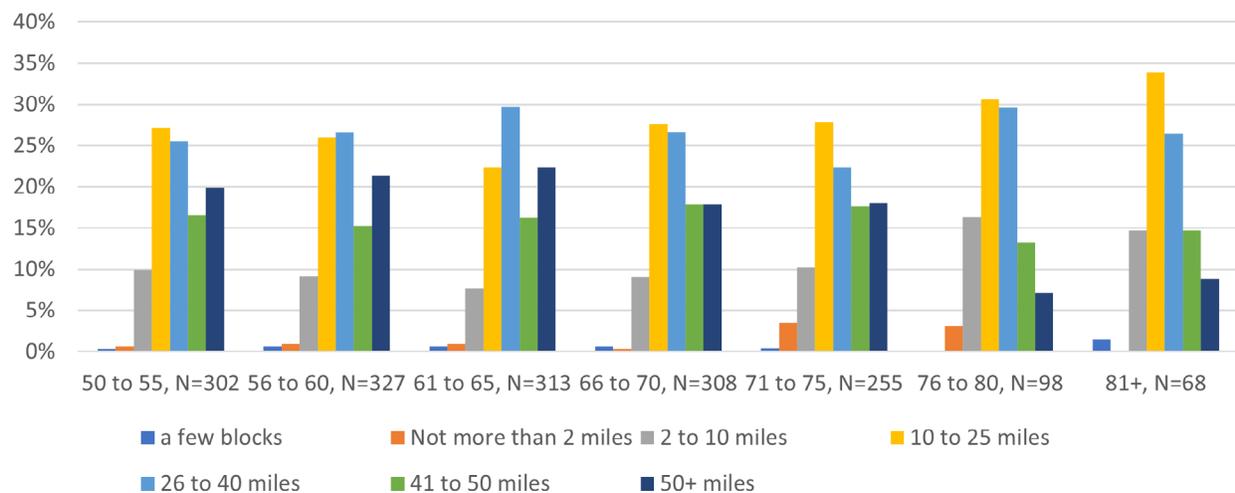
Figure 33. **Sport of Fitness Cycling Distances for Men by Age**

5. TYPES OF BICYCLES AND THEIR CONFIGURATION

This year's survey used a matrix format to learn about the types of bicycles people use. The change was prompted by responses to the year 3 survey that showed the various configurations of bicycles. The question offered 18 types and four configurations: normal pedal, electric (pedal assist) recumbent, and folding. People could select up to two types and indicate the configuration for each. An *Other* field was available for a type not included. Some people selected more than two bike types, but only the first two are included in the analysis. Examples from the *Other* responses are a bikeshare bike, an elliptical bike, and the newest Elf bike. These are not included either. Figure 34 shows 18 bike types for women and men, all ages, and all configurations. Road bikes remain the most owned, followed by touring and hybrid. Mountain and gravel bikes are also popular but are more often owned along with a road or hybrid.
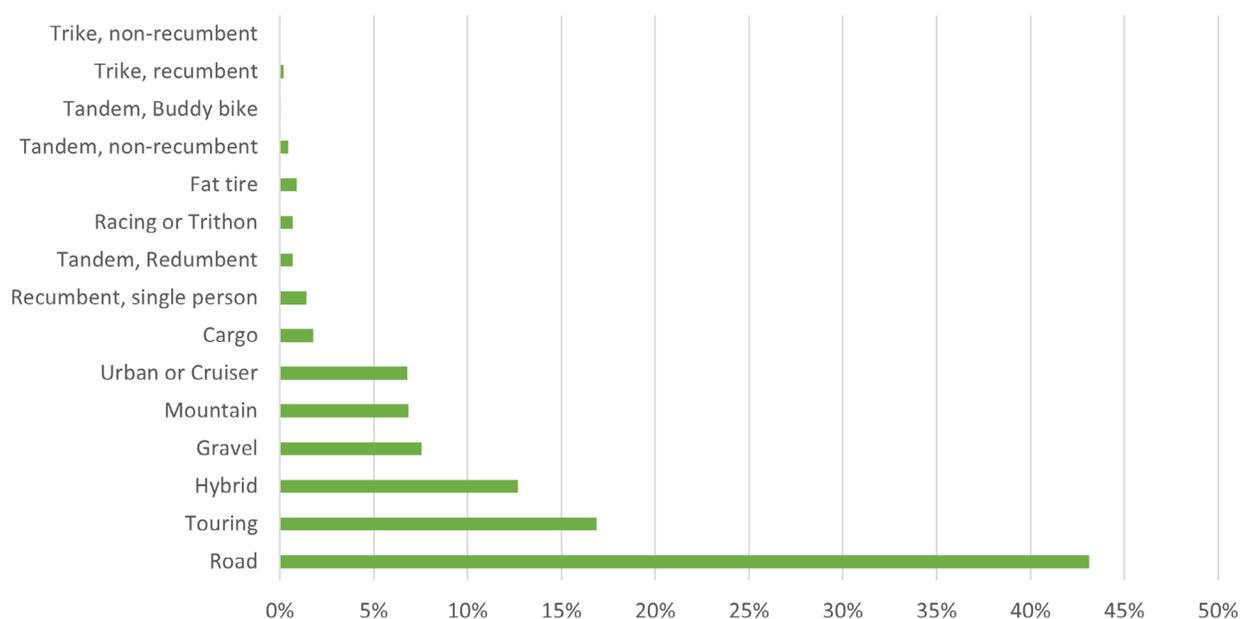
Figure 34. Types of Bicycles Ridden for Women and Men Combined

Figure 35, which shows the configuration by bicycle type, suggests that normal pedal bikes remain popular. Survey answers about purchasing an e-bike are typically divided between the 'never' and 'love my e-bike' and 'waiting to get one' groups. Still, it is hard to know how long people have owned each bicycle. The expense of purchasing a new bicycle, especially e-bikes and various other such as cargo or tandems, may dissuade. It may also be difficult to find a new home for an old bike if storage is difficult.
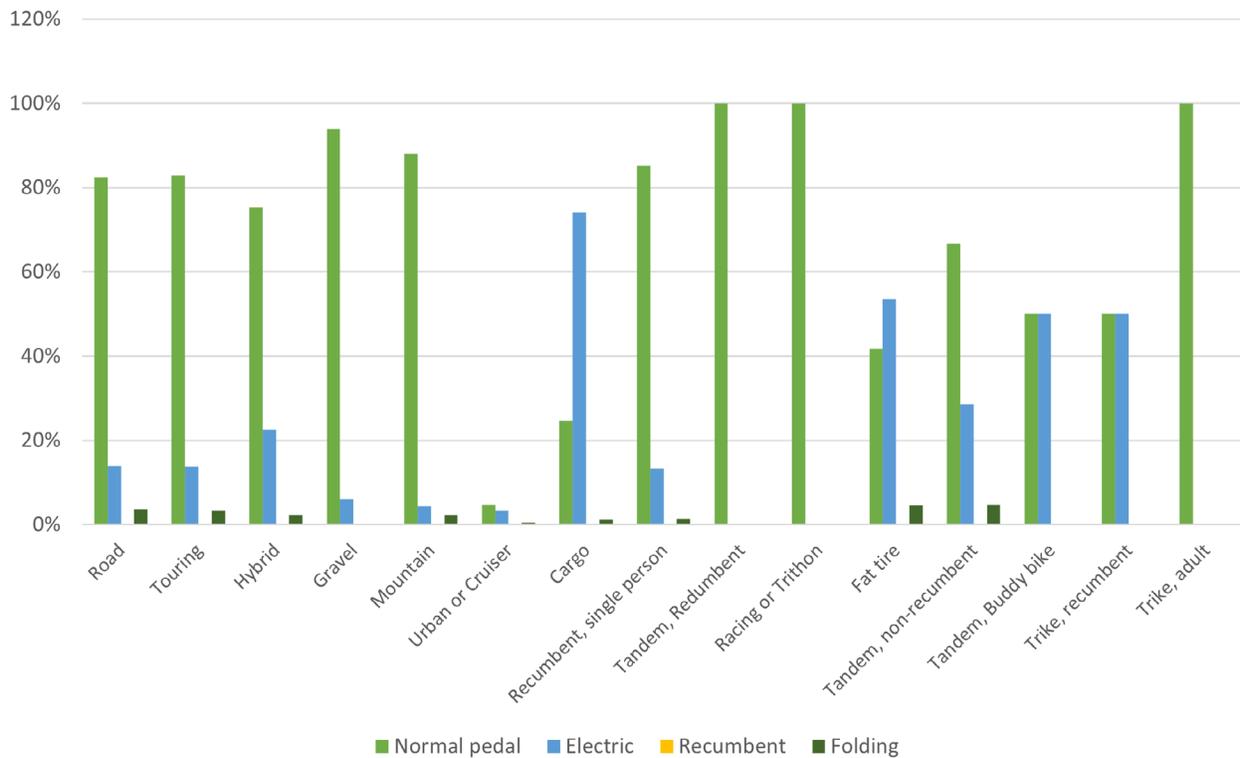
Figure 35. Bicycle Type by Four Configurations

Figure 36 shows responses for normal and electric bicycles by age group and gender using the first bicycle type shown in the data. While there is an increasing number of electric (i.e., pedal-assist) bicycles sold to older adults, normal pedal bikes remain strong. Reasons for this may vary, but we speculate that those without e-bikes may not have purchased one yet. Section 5.1.2 provides information on this question. Regardless of age, more men have a normal pedal bike, but more women for all ages have an e-bike. The most noticeable increase in e-bike ownership begins at age 76, with a sharp decline in normal pedal bikes after age 80. Overall, however, the trend lines show declining normal pedal bicycle ownership and increasing e-bike ownership as people age.

The survey does not ask which bicycle is used most often, so it is difficult to speculate how an e-bike purchase affects the type, frequency, and location of cycling. Anecdotal evidence suggests that some use the e-bike as a second car or replacement for a car; or the normal pedal bicycle is rarely used for all cycling trips.
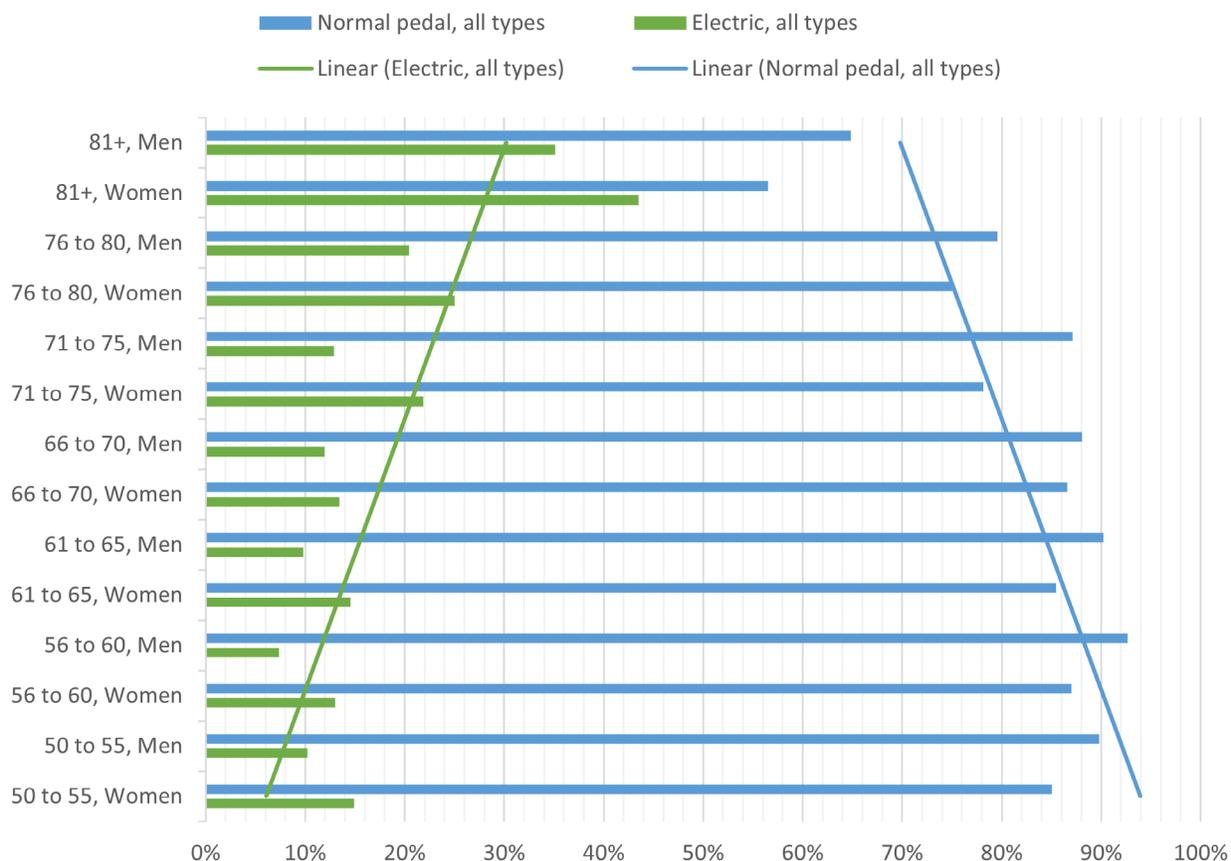
Figure 36. Comparison of Normal Pedal and Electric Bike Ownership by Age and Gender

More information about older adults with e-bikes and adult trikes is included in this report in the next section: Section 5.3, Tandems, e-Bikes, and Trikes.

5.1 TANDEMS, E-BIKES, AND TRIKES

As people age, they often consider a different type of bike that will allow them to continue cycling. The survey asked about three of these "adaptive" bikes: tandems, e-bikes, and trikes.

5.1.1   Tandems

Tandems are a unique form of cycling with two people onboard, making teamwork essential. One hundred and six (106) people provided interesting information about why they are, who they ride with, and their trip purpose. Figure 37 shows the response rate by gender. While over half of responses were from men, many said they are tandem cyclists to cycle with their life partner (i.e., they are the captain, and their life partner is the stoker).[6] This means that there may be more women who are tandem cyclists than responded to the survey.

Women, N=29   Men, N=61   Other, N=16
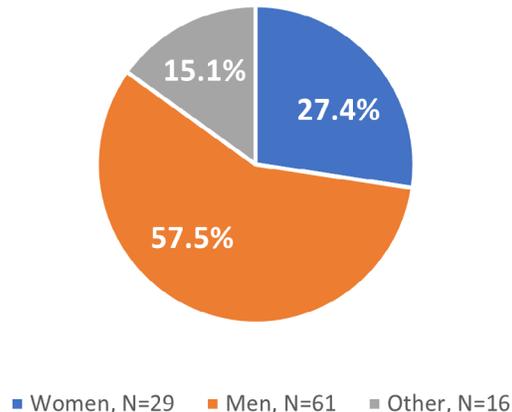
Figure 37. Tandem Response Rate by Gender

While there are different types of tandems—non-recumbent, recumbent, folding, e-bikes— Figure 38 shows that the most popular, by gender.

Men reported cycling with their life partner, children or grandchildren, and those who cannot cycle on their own more often than women. See Figure 39.

Women, N=29   Men, N=61   Other, N=16
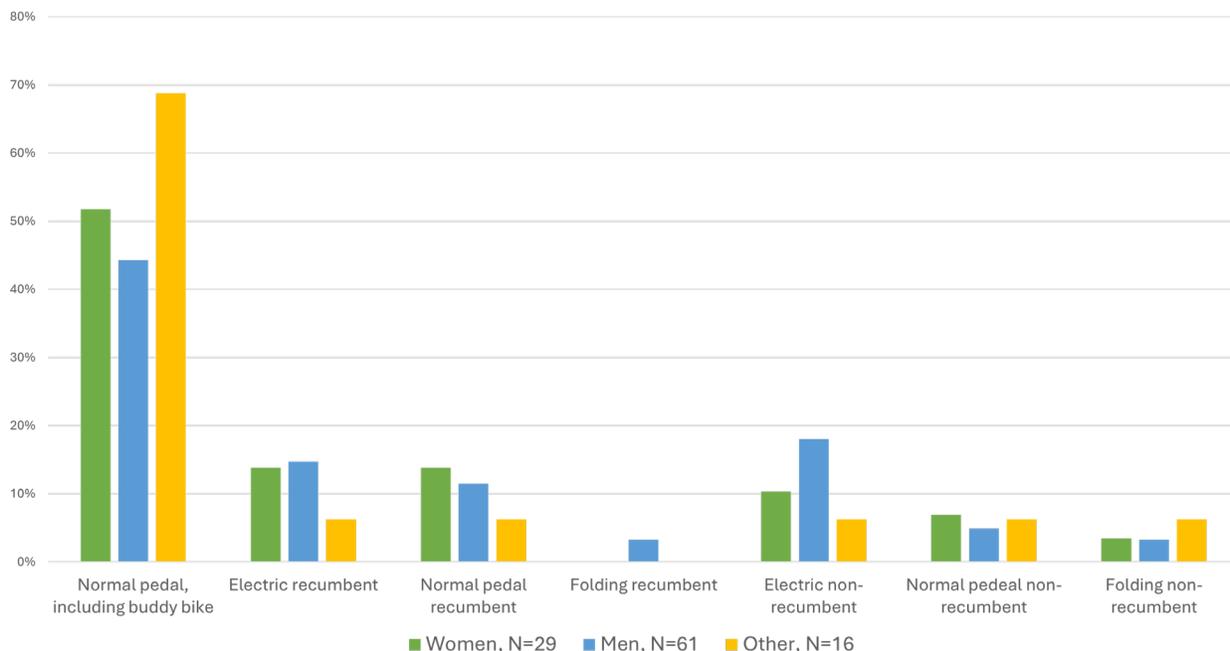
Figure 38. Type of Tandem Ridden by Gender

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6   Tandem Terminology - https://www.bicycle-and-bikes.com/bicycle-buying-guide/tandem-bicycles/ tandem-bicycles-terminology/
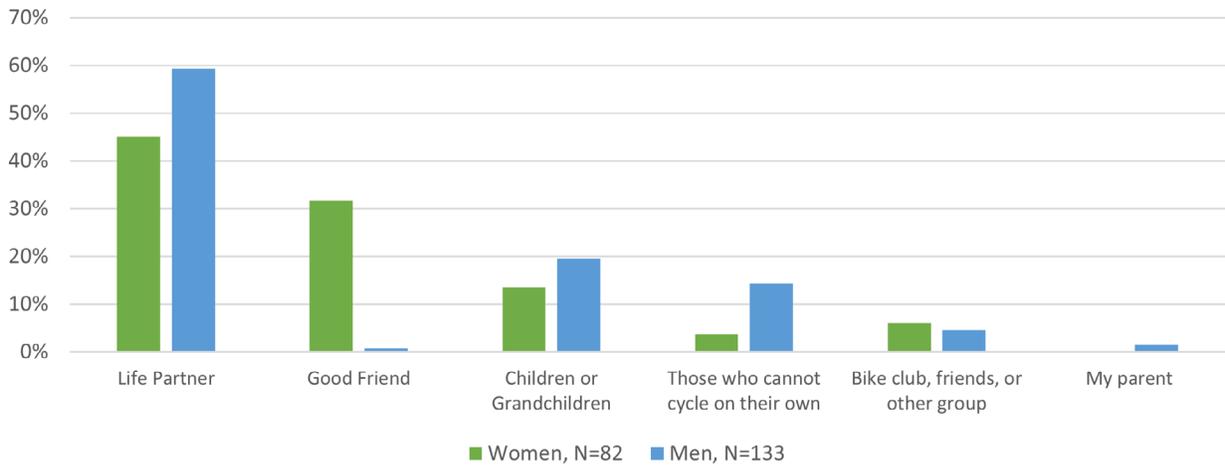
Figure 39. Tandem Cycling Partners by Gender

Tandem cycling is most often done for recreation and touring. Running errands and commuting to work cannot be done easily; however, one 66-year-old woman takes her granddaughter to school by tandem. As noted in the above section, when answering the question about the type of bike people have, a 66-year-old man said he uses his tandem when giving rides to other people. See Figure 40.
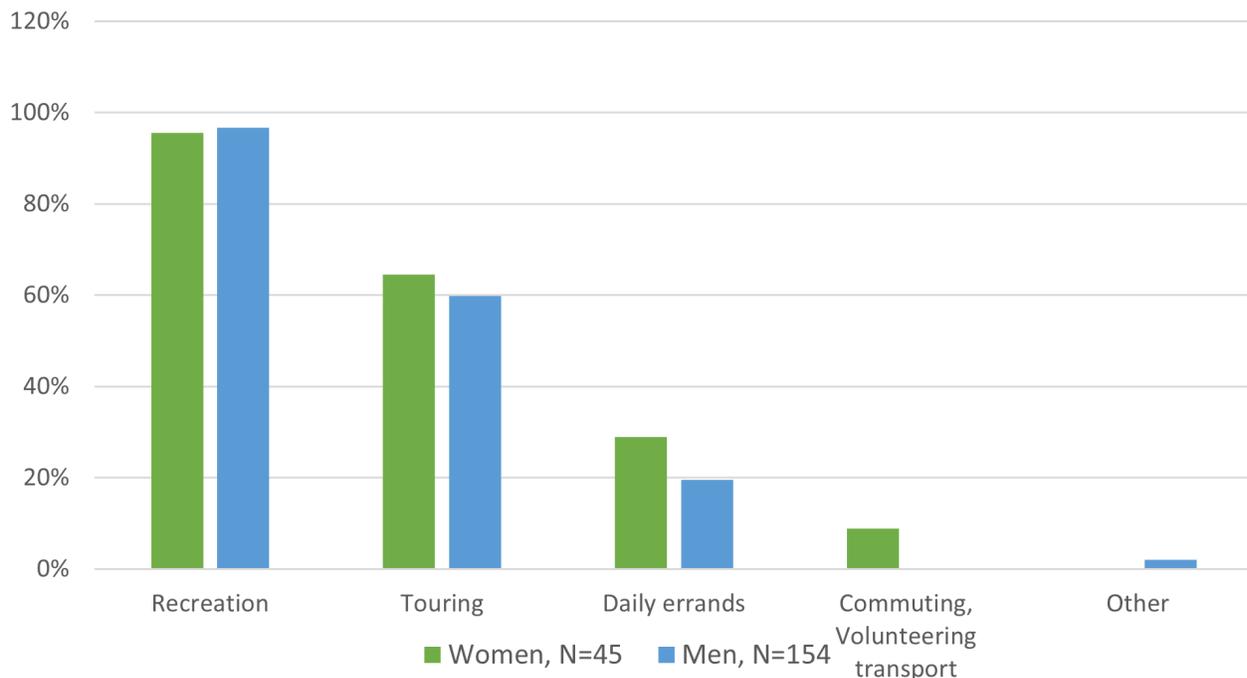
Figure 40. For what purpose do you ride a tandem?

Perhaps the most interesting answers came from the question, *What prompted you to begin riding a tandem?* Common responses included cycling with one's life partner or, in one case, an old girlfriend, and the resulting ease of conversation while on the bicycle, as well as the compatibility of speed band endurance. Responses also included health- and ability-related reasons, such as someone with no or low vision being a stoker, being the

captain for someone with no or low vision or recovering from an injury. Notable quotes from tandem cyclists are in Table 3. Note the one that likens tandem cycling to a relationship.

Table 3.   Notable Reasons for Tandem Cycling

I enjoyed my previous experiences working with the blind and wanted to do so while enjoying cycling. (Man, 66 to 70)

It keeps my husband and me together on long rides. He rides 2-3 mph faster than I do on singles. (Woman, 61 to 65)

We found a cute cruiser tandem for town rides. (Woman, 56 to 60)

To stay with and communicate with my wife during a ride, (Man, 56 to 60)

They are fast and fun with the right person, now to have a close shared experience with my life partner/best friend. (Man, 61 to 65)

I cycle with my 91-year-old mother. (Man, 50 to 55)

Joined a team that takes blind people for rides. (Man, 66 to 70)

5.1.2   E-bikes

The popularity of e-bikes continues to grow for people of all ages, increasing from 17.5% in the Year 4 survey to 32% in Year 5. The ownership rate for women is three points higher than for men. Fewer than one-third purchased the e-bike in the past year: 29.1% for women and 28.5% for men. See Figure 41.

The rate of e-bike ownership based on household income changed from the Year 4 to Year 5 survey. Specifically, ownership rates among all income groups leveled out, as shown in Figure 42. This may be due to both a wider range of the cost to purchase an e-bike and the value older adults see in having one.
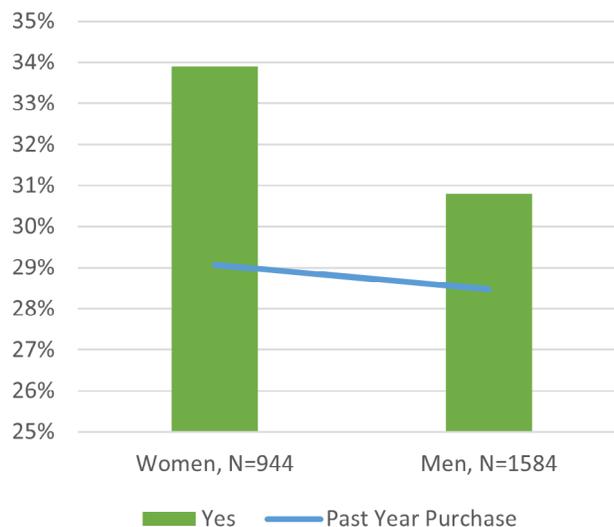
Figure 41. E-bike Ownship Rates and Past Year Purchase
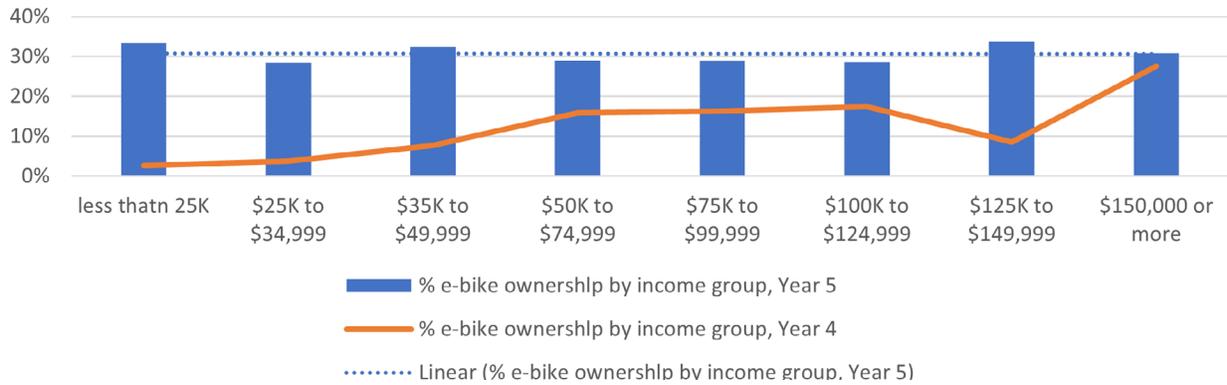
Figure 42. E-Bike Ownership Rates by Income Group A Comparison of Year 5 and Year 4

Reasons for owning an e-bike are related to three general areas: as a medical aid or to remain active while aging; for transport; and for the cycling experience. Figure 43 shows responses. The top two choices, *To make it easier to ride up hills* and *To Cycle farther than on a normal pedal bike* are in the value they offer to the cycling experience. About 13% of those using the Other option to answer this question cited medical reasons or the desire to remain active as they age as the reason for purchasing one. Also important were safety considerations, especially the ability to cycle through intersections. One person framed it this way: "Electric assist allows for far greater agency in negotiating intersections because you approach parity with cars—when you can accelerate fast enough, you can stay within drivers' vision. This is HUGE."
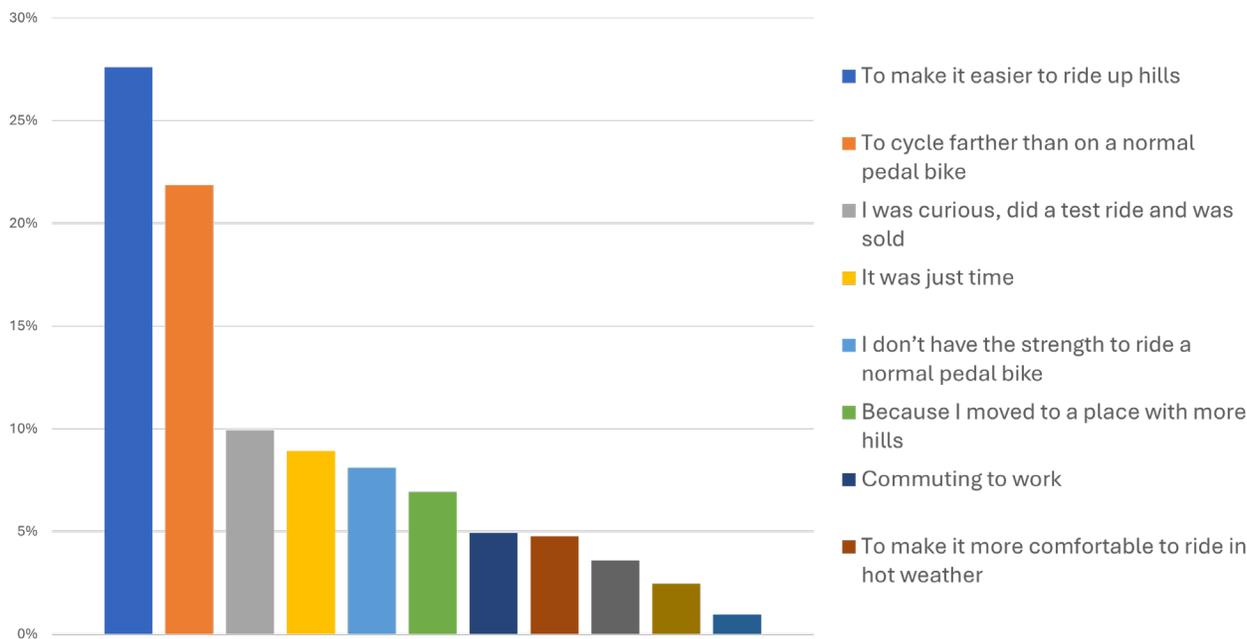
Figure 43. Reasons for Owning an E-Bike

Reasons for not owning an e-bike are consistent with surveys in past years, relating to their cost, the person's physical condition, opportunity for social cycling, and household lifestyle. Just under 24% of those who do not own an e-bike do not expect to purchase one.

5.1.3 Adult Trikes

A small percentage of survey respondents own an adult trike—3.4%—which is about on par with the Year 4 survey. Of those responding *Yes* or *No* to owning an adult trike, 3.1% of those were women and 3.6% were men. See Figure 44. However, through age 70, more women than men own an adult trike, with a higher rate of past-year purchase. These trends reverse at age 71. See Figure 45.
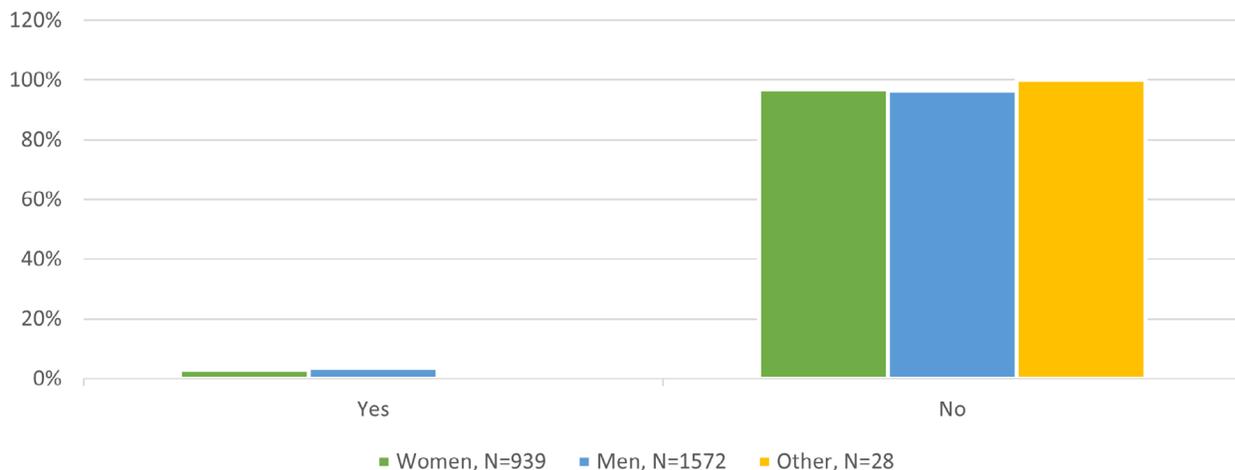
Figure 44. Adult Trike Ownership Rates by Gender
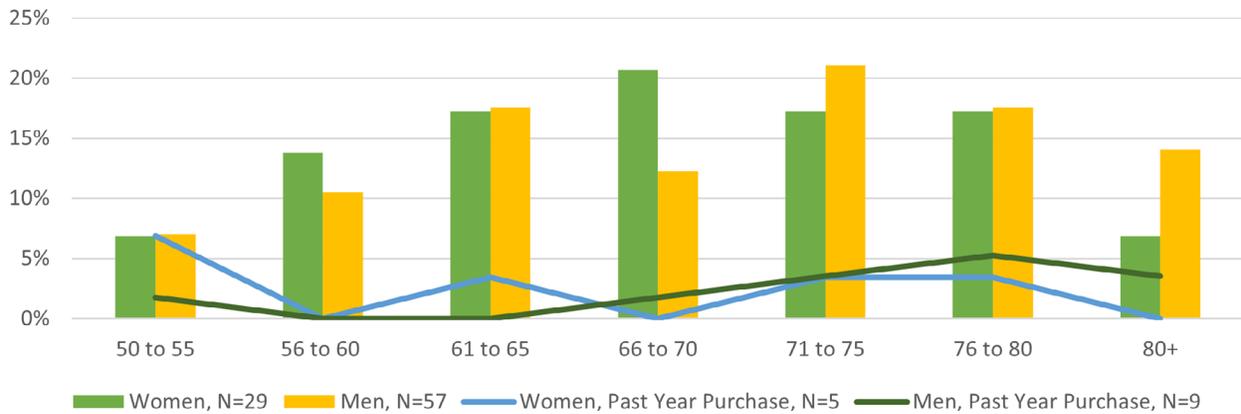
Figure 45. Adult Trike Ownership by Gender and Age Group, Past Year Purchase

Four basic configurations for adult trikes are based on two sitting positions and how the trike is powered. Figure 46 below shows that those responding tend to own normal pedal recumbent trikes.

The reasons for purchasing a trike range from mitigating medical issues, wanting more stability, getting on and off more easily, riding with someone else, carrying groceries and other items, and when they can afford it. See Figure 47.

While many of these reasons affect a future purchase, barriers to a future adult trike purchase include their affordability and not having a place to store a trike due to its size. While trikes may be gaining in their image as a "sexy" bike, given the many configurations offered, there is less perceived status to owning a trike among many older cyclists. The greatest reasons for purchasing a trike are due to something making riding a 2-wheel bike impossible or unsafe. Like e-bike purchases, some people responded they would get one with their partner so they could cycle together. The top response for a future purchase was due to a physical limitation or medical condition at 43.8% of responses, however, 52.2% of responses were *I do not anticipate a time or reason for getting one.* These two responses are also the top reasons given for either purchasing or not purchasing an e-bike, however, the percentage of those saying they do not expect to get an e-bike is smaller.
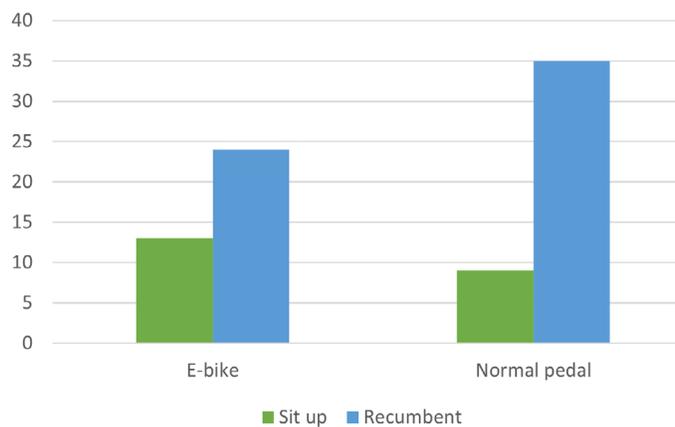
Figure 46. Configuration and Power Source for Adult Trikes
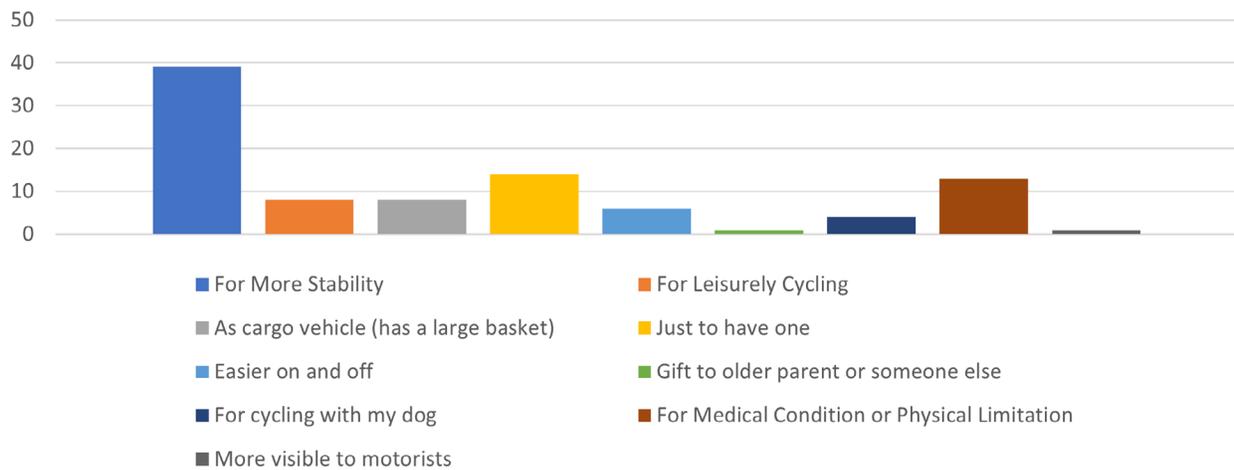
Figure 47. Reasons for Owning an Adult Trike

Some interesting responses about an adult trike include a reference to their size— "if there were places to ride something that big"—and a desire for a safer bike network—"If a car-free infrastructure was available, I would consider a recumbent trike." This person summed it up as follows: "Triketechnology needs major improvement. Lanes and regulations need improvement for rider and pedestrian safety. Current design limits portability and sacrifices rider comfort."

6. WHAT ARE THEIR CYCLING-ENVIRONMENT EXPERIENCES?

This section reports on several survey question series about cycling environments in which older adults feel comfortable: *What factors affect where you ride*; *Do you feel comfortable cycling at night*; and *Do you feel comfortable cycling alone*?

6.1 WHAT FACTORS AFFECT WHERE YOU RIDE?

The question, *What factors affect where you ride*, listed 17 answer options and allowed people to select as many as apply. The 17 answer options were grouped into four categories with the percentage of answers also shown in Table 4 below. Figure 48 shows small differences between women and men between each category, with the largest difference for *Social Relations.*

Table 4. Distribution of Responses Among Four Categories of Answer Options, N=13,203

Cycling Environment	Health & Safety	Social Relations	Personal-Lifestyle
• Other cyclists are present • Easy & safe bike parking • Pleasant vistas, parks • Easy connections to destinations	• Benches for breaks • Shade to cool off • Bathrooms, water fountains • Few or no cars • Roads are in good condition, no debris • Low volume, speed, neighborhood streets • Protected bike lanes • Overall feeling of being safe	• Places to stop, eat, shop, visit • Group rides	• Ride primarily during the day • Avoiding rush hours • Avoiding night cycling
23.6%	**55.1%**	**9.4%**	**11.9%**

Figure 48. Factors Affecting Where Older Cyclists Ride by Gender

It may be that factors affecting where someone cycles change as they age. Figure 49 shows answers for women and men aged 50 to 64. This provides a "base age group" against which the two subsequent age ranges are compared.
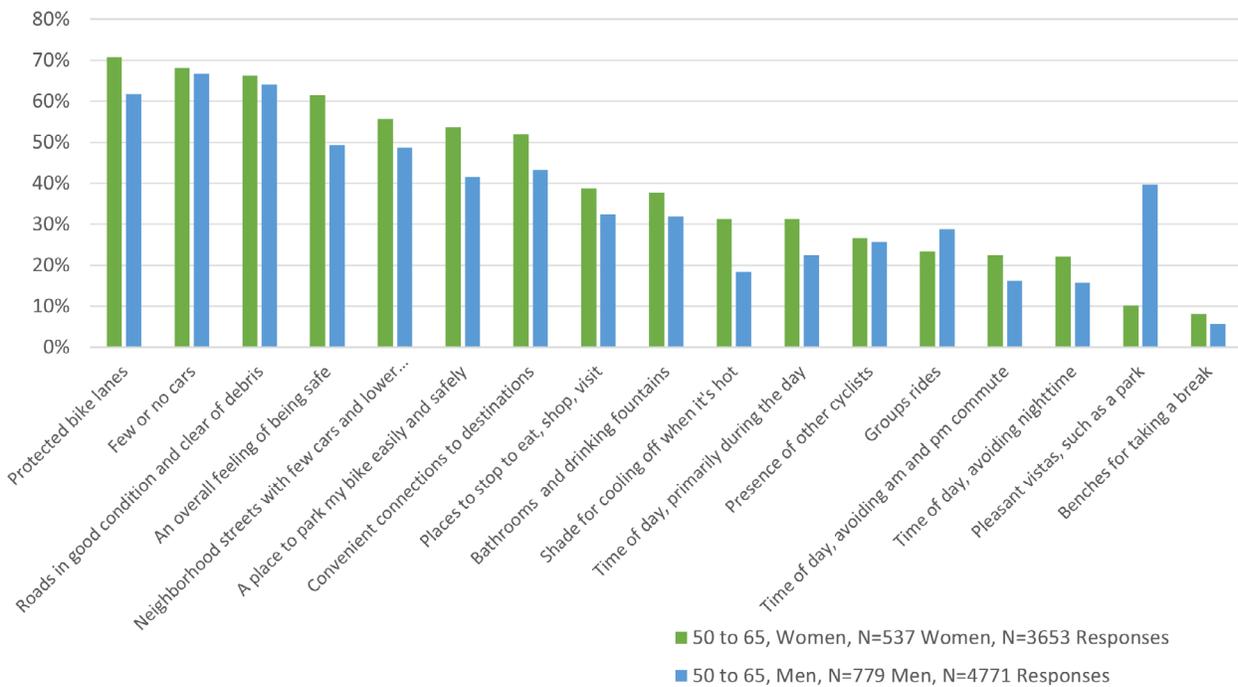
Figure 49. Factors Affecting Cycling: Baseline Age Group, 50 to 65, Women and Men

Changes in factors affecting where people cycle as they age between the base age group of 50 to 65 and the two older age groups (66 to 75 and 76 and older) are shown in Figures 50 and 51. These changes are generally characterized by less influence from the first 10 factors and more influence from the last seven factors:

- Presence of other cyclists

- Group rides

- Time of day, primarily cycling during the day and avoiding morning and evening rush hours

- Pleasant vistas, such as parks

- Benches for taking a break

It may be that the typically safety-related factors such as protected bike lanes, few motor vehicles, and roads in good condition, are of less importance as the older age groups cycle in locations away from roadways such as trails.

	Protected bike lanes	Few or no cars	Roads in good condition and clear of debris	An overall feeling of being safe	Neighborhood streets with few cars and lower speeds	A place to park my bike easily and safely	Convenient connections to destinations	Places to stop to eat, shop, visit	Bathrooms and drinking fountains	Shade for cooling off when it's hot	Time of day, primarily during the day	Presence of other cyclists	Groups rides	Time of day, avoiding am and pm commute	Time of day, avoiding nighttime	Pleasant vistas, such as a park	Benches for taking a break
■ Difference for women 66 to 75	-12.8%	2.5%	0.1%	2.6%	1.8%	0.4%	-8.3%	-2.4%	10.8%	6.9%	15.4%	4.3%	10.9%	10.7%	17.2%	39.2%	5.7%
■ Difference for men 66 to 75	-2.8%	-2.0%	2.6%	4.5%	-1.1%	0.0%	-5.9%	4.5%	10.3%	5.7%	14.9%	-0.4%	-1.6%	8.3%	12.9%	4.2%	5.3%

■ Difference for women 66 to 75 ■ Difference for men 66 to 75

Figure 50. Comparison of Factors for those 66 to 75 with Base Age Group

	Protected bike lanes	Few or no cars	Roads in good condition and clear of debris	An overall feeling of being safe	Neighborhood streets with few cars and lower speeds	A place to park my bike easily and safely	Convenient connections to destinations	Places to stop to eat, shop, visit	Bathrooms and drinking fountains	Shade for cooling off when it's hot	Time of day, primarily during the day	Presence of other cyclists	Groups rides	Time of day, avoiding am and pm commute	Time of day, avoiding nighttime	Pleasant vistas, such as a park	Benches for taking a break
Difference for women 76 and older	-10.2%	-18.2%	-2.7%	-9.9%	-11.7%	-3.6%	-9.5%	0.7%	1.6%	-10.1%	14.2%	8.2%	12.9%	0.2%	14.2%	27.6%	2.4%
Difference for men 76 and older	-5.2%	-10.0%	-0.3%	-6.0%	0.7%	-3.0%	-12.5%	0.5%	10.9%	3.6%	8.9%	-0.4%	3.0%	5.8%	18.3%	4.3%	5.3%

■ Difference for women 76 and older   ■ Difference for men 76 and older

Figure 51. Comparison of Factors for those 76 and older with Base Age Group

6.2   QUESTIONS ABOUT CYCLING ALONE OR AT NIGHT

These two questions were combined for the Year 5 survey to clarify and simplify the survey. In addition, the three larger age groups used in the *Factors Affecting Where I Cycle* analysis above are used here. A matrix format offered the same answer options for cycling alone and cycling at night:

- *Yes, depending on where I am cycling*

- *Yes, if there are safe and comfortable cycling facilities*

- *Yes, but only during daylight hours (not included in the cycling at night figure)*

- *Yes, if I am familiar with the route*

- *Yes, if the weather conditions don't limit visibility or surface conditions*

- *Yes, depending on how far I plan to cycle and how I feel*

- *No, never*

Figures 52 and 53 show the results. Overall, fewer older adults cycle at night with generally lower cycling rates for women in all age groups. Figure 52 shows that the cycling alone rate generally declines with age, however, there does not appear to be a large difference between women and men.
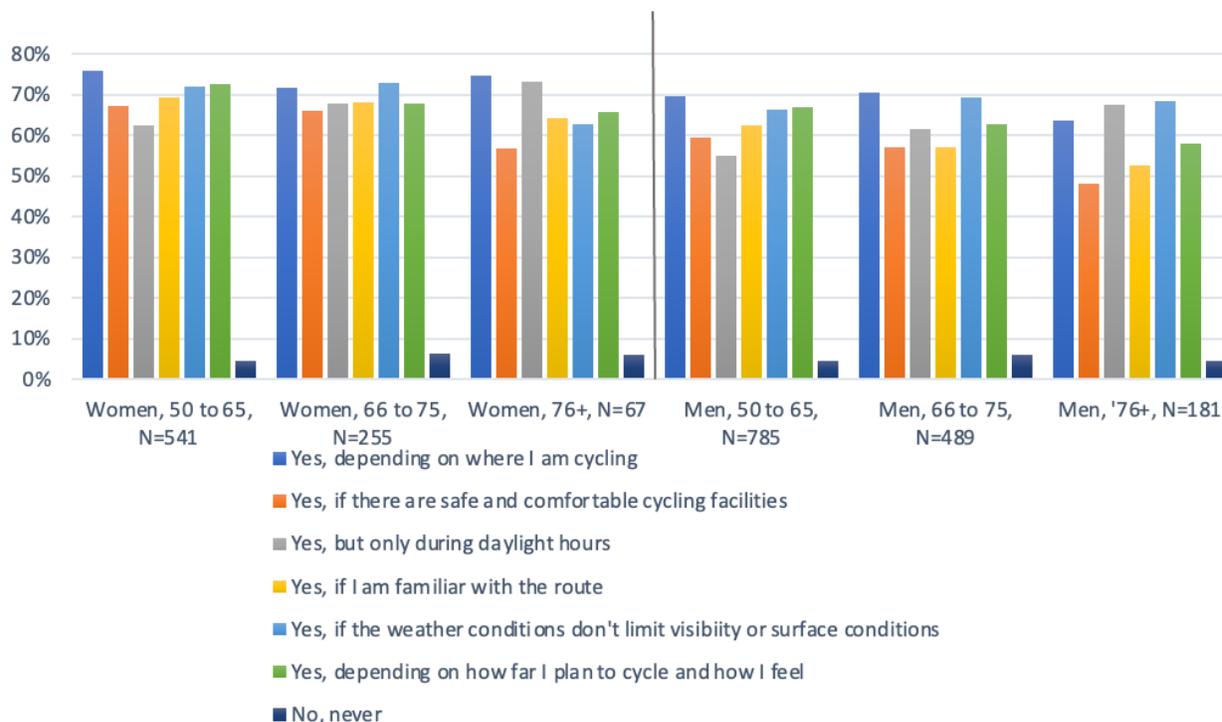
Figure 52. Comfort with Cycling Alone by Gender and Age

Figure 53 shows a higher rate of nighttime cycling for men, but an overall decline in nighttime cycling rates for both women and men as they age. There is a higher percentage for all age groups indicating they never cycle at night than those who do not cycle alone.

Legend:
- Yes, depending on where I am cycling
- Yes, if there are safe and comfortable cycling facilities
- Yes, if I am familiar with the route
- Yes, if the weather conditions don't limit visibiity or surface conditions
- Yes, depending on how far I plan to cycle and how I feel
- No, never
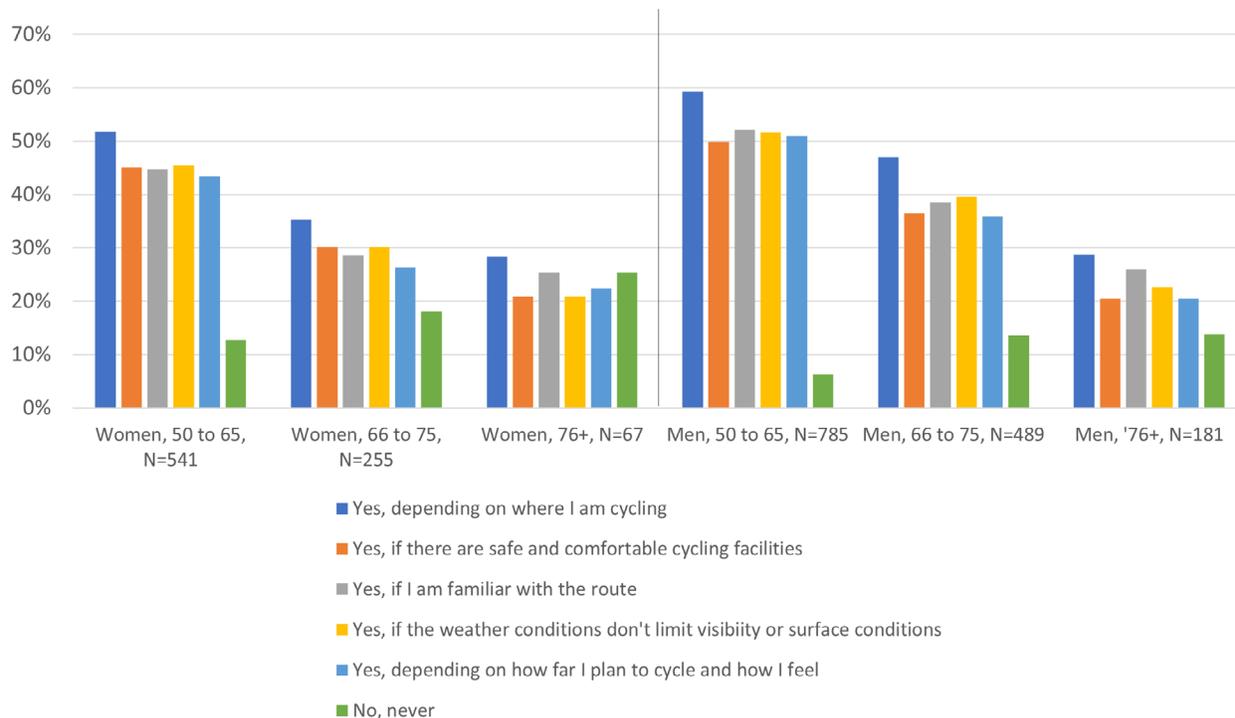
Figure 53. Comfort with Cycling at Night by Gender and Age

While the Year 5 question about nighttime cycling did not allow for comments, those from the Year 4 survey are worth including here, as follows:

> Some noted the mental health benefits they received from cycling at night, similar to responses in other questions, such as during COVID-19 restrictions (see Section 8, The Ebbs and Flows of Cycling Over the Lifecycle). This response from a man aged 60 years old sums it up: "I cycle at night four or five times a week. I have good lights and use streets where there is not much traffic. Riding at night helps me clear my head from the day." Interestingly, a 78-year-old man who indicated his nighttime cycling depends on the circumstances, notes: "Try not to drive much at night either."[7]
>
> Responses from answer options and the write-in responses for the *Depends on Circumstances* answer option were grouped into the four categories shown in Table 5, including details and average response rate for each category. The table includes a speculative summary of why these factors affect whether someone decides to cycle at night.

---

7 See the Section 8, The Ebbs and Flows of Cycling Over the Lifecycle, for more information on cycling cessation. A short article, Ageing and mobility: a look at how ageing impacts driving and cycling is on the dblTilde CORE, Inc. website at this link.

Table 5.   Nighttime cycling Depends on Circumstances factors by category

Place & Distance Average 40.2%	Conditions Average 35.1%	My input Average 23.2%	Time of Day Choice Average 1.4%
• Where I am cycling • How well I know the route • Distance I plan to ride • Safety of surrounding areas	• Street or trail lighting is present • Separated (protected) bike lanes or trails are present • Low motor vehicle traffic volumes • On neighborhood streets • Cycling surface is in good conditions	• Who I cycle with • What I wear to be visible • Weather I will cycle in (temperature, precipitation, wind)	• Ride lasts longer • Meetings last longer • Choice to cycle at night to events • Participate in nighttime events • Fun of cycling at night
Speculative summary for each category			
Most prefer separated cycling infrastructure, some only cycle at night on trails. While the practice of not lighting trails at night is slowly shifting towards lighting trails, one respondent praised her local trail for supporting its use at night: "The Indianapolis Cultural Trail is well-lighted at night" (66-year-old woman). At the other end of the spectrum, a 73-year-old man "Prefer[s] full moon on traffic free trails, no electric lights."	Older adults recognize the risks of cycling with motorists who can be impatient, not see people cycling, or be under the influence. Nighttime cycling on roadways means fewer motor vehicles and can also reduce potential conflicts due to fewer people out walking and cycling.	The nighttime and early morning bring cooler temperatures when days are hot, making the ride more enjoyable. Some write-in responses detailed the type of lights and clothing cyclists use to remain visible. One 64-year-old man noted, "I prefer not to ride at night and especially at the end of long rides when I am tired and make poor decisions. Also, everything looks different at night."	The nighttime cycling experience can be peaceful and fun. Those who tour or cycle for daily transportation expect to cycle at night when the day's touring ride or a meeting runs long.

Source: Reproduced from Table 9 in the Year 4 Annual Report

7. VISUAL PREFERENCE SURVEY

The Year 5 Visual Preference Survey was enhanced with several different photos, some of which offered a link to Google Streetview so people could see the broader context. Basic context information was also added, in response to feedback from the Year 4 survey.

Given the number of variables and possible analyses that can be completed on the visual preference survey data, we are limiting the analysis included here. First, Table 6 lists the photos from low to high safety and comfort scores. Figure 54 graphs the accompanying safety and comfort scores for each image, from low to high.

Table 6.   Cycling Condition Caption, Colors Indicate Safety & Comfort Score from Low to High

1	Major urban collector with no designated bike facility	7	Shared road where people walking, cycling, scootering, driving, etc., can travel freely without designated pathways	13	Neighborhood street with sidewalks on both sides and parking on one side
2	Intersection with Through Bicycle Lane	8	Intersection of two protected 2-way bicycle facilities along major arterials	14	Shared pathway in the road of a collector road in a low-density neighborhood
3	Single-lane roundabout with crosswalks and sidewalks for cyclists and pedestrians.	9	Cycling pathway along a two-lane state route with wide shoulder and edge and center-line rumble strips	15	Two-way multiuse trail along a major arterial with a narrow grassy buffer
4	Rural road with no shoulder, low traffic volumes, and widely spaced out housing and other development	10	Residential neighborhood street with parking and shared lane marking for bicyclists	16	Separated two-way bicycling facility along a one-way neighborhood collector street in an urban mixed used area
5	Two-lane neighborhood commercial street with shared lane marking	11	Edge-lane road with bicycle priority	17	Two-way multi-use trail in parkland and a forested area
6	Suburban collector road with center median, a bike lane without buffer, and a sidewalk	12	One-way buffered bicycle lane on an urban collector road with a center left turn lane		

Each photo offered four or five options for using the facility presented. These options ranged from using the facility as shown to finding another route. Options in between included using the sidewalk if present, only using the facility if cycling with others or during daylight hours, walking the bicycle through the location, and, *I'm not sure*. Figure 55 shows the distribution of these choices for each location. Choices for which option to use for traveling through the location affect the overall safety and comfort score, however, in all but one case, over half of the selected option was to use the facility as shown.

	Major Urban Arterial Lacking Bicycle Facility	Intersection with Through Bicycle Lane	Single Lane Roundabout	Rural Road with No Shoulder, Low Traffic	Two-lane neighborhood commerical street with shared lane marking	Suburban collector with center median, bike lane, no buffer	Shared road in downtown area	Intersection of two protected 2-way bicycle facilities along major arterials*	Cycling pathway along a two-lane state route with wide shoulder	Residential neighborhood street with parking and shared lane marking	Edge Lane Road	One-way buffered bicycle lane on urban colllector	Neighborhood Street	Shared Pathway on Collector Road*	Two-way multi-use trail along major arterial	Separated two-way bicycle facility along major urban arterial*	Two-way multi-use trail in parkland
Safety and Comfort Score	2.8	3.2	3.2	3.4	3.4	3.5	3.6	3.6	3.6	3.7	3.8	4.1	4.2	4.2	4.4	4.5	4.6

Figure 54. Visual Preference Survey Images Safety and Comfort Scores

	Major Urban Arterial Lacking Bicycle Facility, 2.8	Intersection with Through Bicycle Lane, 3.2	Single Lane Roundabout, 3.2	Rural Road with No Shoulder, Low Traffic, 3.4	Two-lane neighborhood commerical street with shared lane marking, 3.4	Suburban collector with center median, bike lane, no buffer, 3.5	Shared road in downtown area, 3.6	Intersection of two protected 2-way bicycle failities along major arterials, 3.6	Cycling pathway along a two-lane state route with wide shoulder, 3.6	Residential neighborhood street with parking and shared lane marking, 3.7	Edge Lane Road, 3.8	One-way buffeered bicycle lane on urban colllector, 4.1	Neighborhood Street, 4.2	Shared Pathway on Collector Road, 4.2	Two-way multi-use trail along major arterial, 4.4	Separated two-way bicycle facility along major urban arterial, 4.5	Two-way multi-use trail in parkland, 4.6
Use facility as shown	61.7%	78.0%	52.7%	0.0%	57.6%	83.9%	54.3%	86.1%	73.5%	81.8%	88.9%	96.3%	50.3%	89.8%	88.6%	96.0%	83.4%
Option 1	15.4%	4.3%	4.6%	0.0%	10.1%	1.1%	36.2%	1.6%	3.2%	14.1%	5.8%	1.8%	44.4%	8.3%	6.3%	0.6%	1.2%
Option 2	1.1%	8.4%	31.3%	89.9%	22.8%	11.5%	1.9%	10.2%	16.4%	2.9%	0.0%	0.5%	2.7%	0.6%	0.9%	2.0%	14.7%
Option 3 or I'm not sure	5.0%	4.7%	8.7%	4.1%	7.1%	0.0%	2.5%	0.0%	1.6%	0.0%	0.0%	1.0%	0.0%	0.0%	3.7%	0.6%	0.0%
Find another route or I'm not sure	16.8%	4.6%	2.6%	6.0%	2.5%	3.5%	5.1%	2.1%	5.2%	1.2%	5.3%	0.4%	2.6%	1.2%	0.5%	0.8%	0.7%

■ Use facility as shown ■ Option 1 ■ Option 2 ■ Option 3 or I'm not sure ■ Find another route or I'm not sure

Figure 55. Distribution of Choice for Using Location Shown in Photo and Choices for traveling through the location shown in photos through cycling context, low to high for safety & comfort score

7.1   VISUAL PREFERENCE IMAGES AND DETAILED RESPONSES

This section consists of each Visual Preference photo, overall safety and comfort score, and distribution of choices for traveling through each location. The images are presented from low to high safety and comfort scores.

Photo and label

Answer options

Major urban arterial with no designated bike facility. Runs along residential nieghborhood and mix-use area. Heavily used for commuting with posted speed limit 35 MPH.

2.8

Percent of respondents

61.7%

15.4%

1.1%

5.0%

16.8%

■ I would cycle in the street
■ I would cycle on the sidewalk
■ I would walk my bike on the sidewalk
■ I am not sure
■ I would find another route
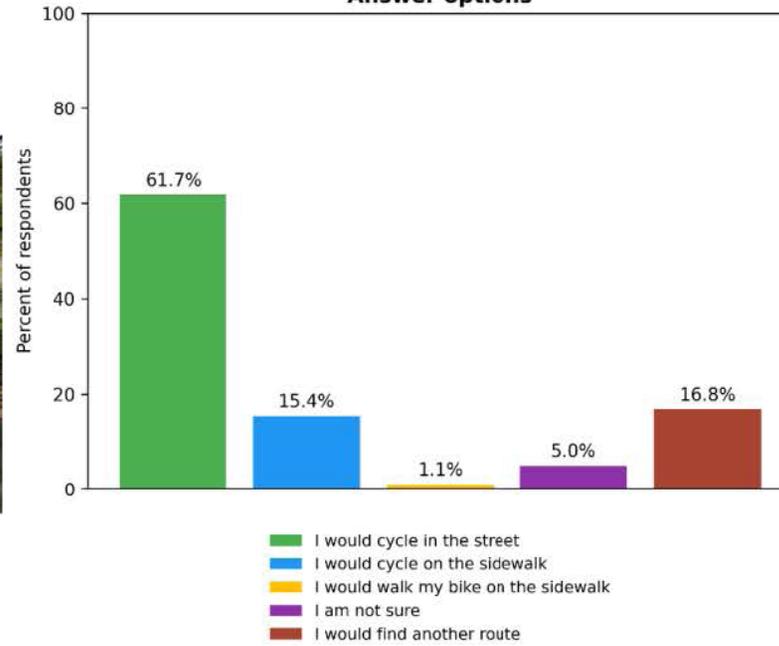
Photo and label

An intersection with a bike through lane between the right turn lane and the through lane. Mixed use suburban neighborhood along block grid pattern. Four to six travel lanes with center median. Primarily unprotected bike lanes. Posted speed limit 45 MPH.

Answer options
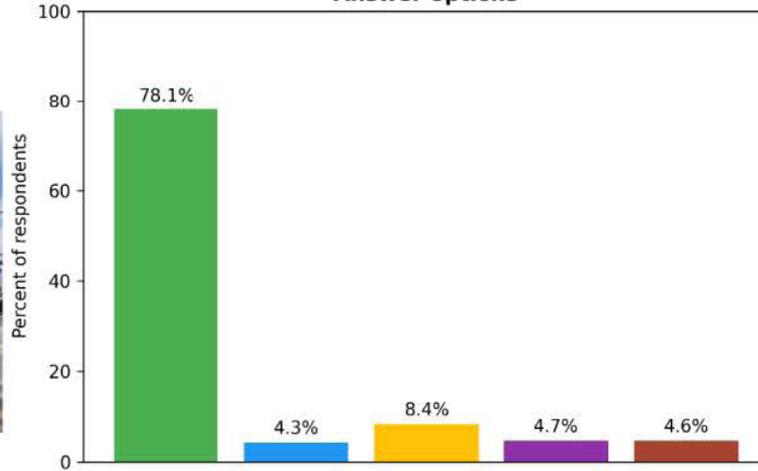
- I would use the bike lane to travel through the intersection
- I would use the through motor vehicle lane to travel through the intersection
- I would hop onto the sidewalk and use the crosswalk to travel through the intersection
- I am not sure
- I would find another route

Avg Safety Score

3.2

Photo and label

Single lane roundabout with crosswalks and sidewalks. Rural, low density area with neighborhood. Posted speed limit 50 MPH.

Avg Safety Score

Answer options

52.7%
4.6%
31.3%
8.7%
2.6%

Percent of respondents
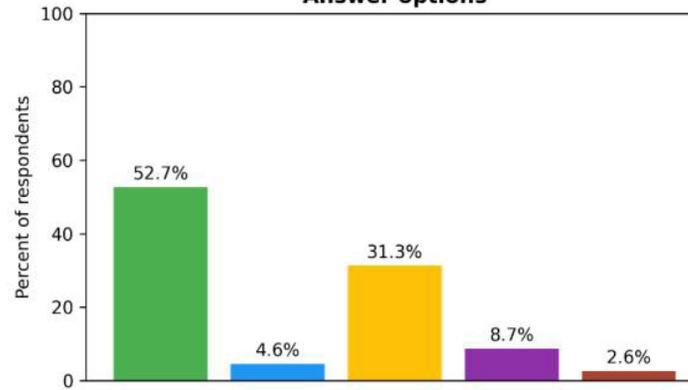
- I would use the vehicle travel lane to travel through the intersection, whether I'm cycling solo or with others
- I would use the vehicle travel lane to travel through the intersection, only when cycling with others
- I would use the crosswalks and sidewalks to travel through the intersection
- I am not sure
- I would find another route to use

3.2

Photo and label

Rural road with no shoulder, low traffic, and spaced out housing. Low density residential with posted speed limit 50 MPH.

Percent of respondents

■ I would use the road whether I am cycling solo or with others

■ I would use the road only when cycling with others

■ I would use the road during daylight only, regardless of whether I'm cycling solo or with others

■ I am not sure

■ I would find another route

3.4

Photo and label

Two-lane neighborhood commerical street with shared lane marking. Urban residential neighborhood leading to major shopping and transit corridor. Posted speed limit 25 MPH.

Answer options
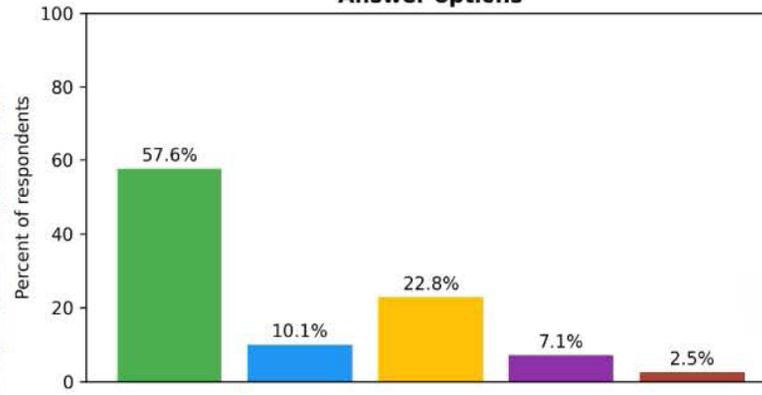
- I would cycle along the shared lane markings
- I would cycle in the roadway, not paying close attention to the shared lane markings
- I would cycle between the outside white line and the curb
- I would hop onto the sidewalk and walk or cycle, especially if there is a lot of motor vehicle traffic
- I would find another route to use

Avg Safety Score

3.4

Photo and label

Suburban collector road with center median, a bike lane without buffer, and a sidewalk. Suburban collector used for moderate to high amount of commuting through the day. Posted speed limit 45 MPH.

Avg Safety Score

Answer options
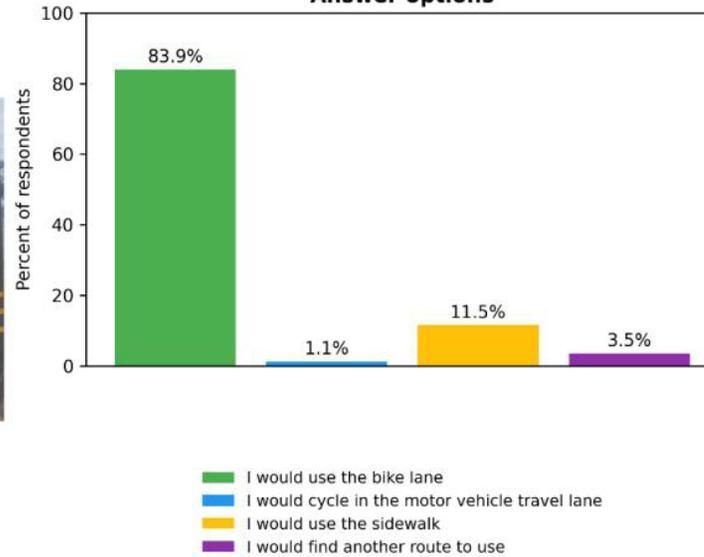
- I would use the bike lane
- I would cycle in the motor vehicle travel lane
- I would use the sidewalk
- I would find another route to use

3.5

Photo and label

Shared road where people are walking, cycling, scootering, driving, etc. Downtown area with shops, restaurants, and apartment buildings. Local tourism destination. No posted speed limit.

Avg Safety Score

Answer options

54.3%
36.2%
1.9%
2.5%
5.1%

Percent of respondents
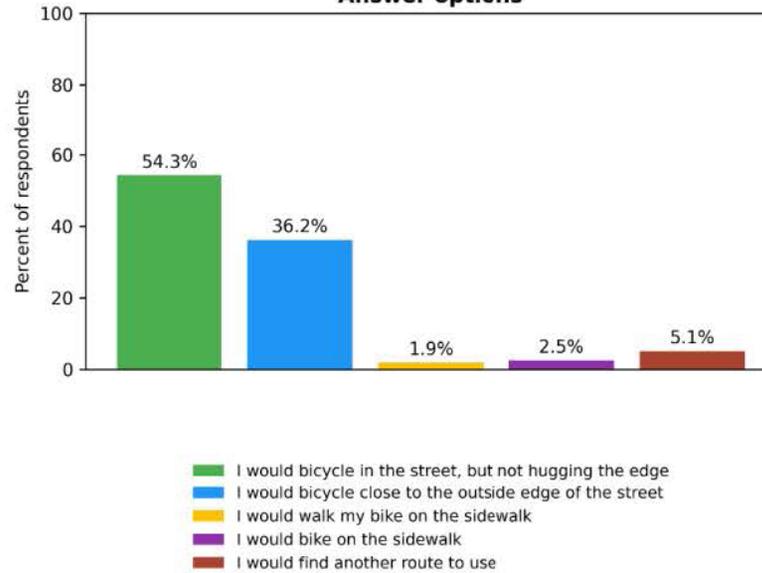
- I would bicycle in the street, but not hugging the edge
- I would bicycle close to the outside edge of the street
- I would walk my bike on the sidewalk
- I would bike on the sidewalk
- I would find another route to use

3.6

Photo and label

Answer options

Avg Safety Score

3.6

- ■ I would use the bike lanes and signals to travel through the intersection
- ■ I would use crosswalks and sidewalks to travel through the intersection, even though it means crossing twice
- ■ I am not sure, as it seems complicated
- ■ I would find another route to use

Intersection of two protected 2-way bicycle facilities along major arterials in urban area. Busy area with multiple destinations such as medical centers, golf courses, and large religious institutions. Posted speed limit of 35 MPH.

Photo and label

Cycling pathway along a two-lane state route with wide shoulder, with edge and center line rumble strips. Rural, low density area with wide shoulder for cycling. Posted speed limit 50 MPH.

Answer options

Avg Safety Score

3.5
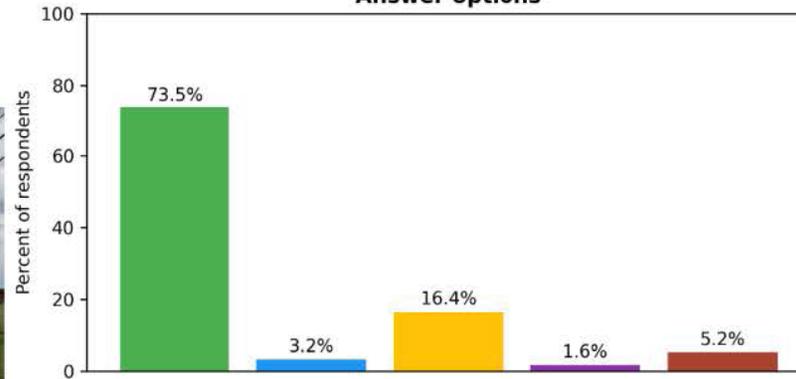
- I would use the shoulder, cycling solo or with others
- I would use the shoulder only when cycling with others
- I would use the shoulder, but ride far to the right
- I am not sure
- I would use another route to avoid noise and high motor vehicle travel speeds

Photo and label

Answer options

Percent of respondents

81.8%

14.1%

2.9%

1.2%

3.7

■ I would cycle in the street, following the shared lane marking
■ I would cycle in the street, not paying close attention to the shared lane marking
■ I would use the sidewalk
■ I would use another route to use

Residential neighborhood street with parking and shared lane marking for bicyclists. Urban residential leading to major shopping and transit corridor. Posted speed limit 20 MPH.

Photo and label

Avg
Safety
Score

3.8

An edge lane road with bicycle priority. Low density suburban/rural area. Roadway used by people cycling and driving. Post speed 35 MPH.
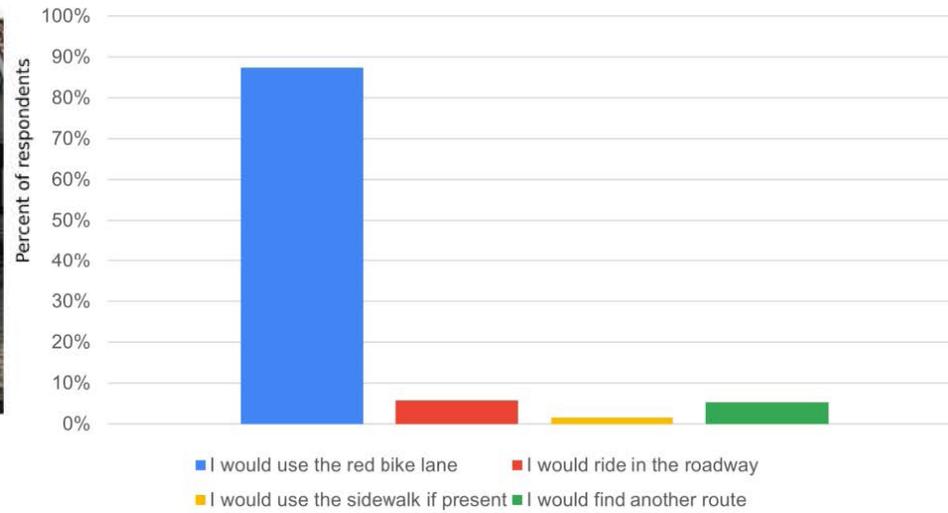
Photo and label

Answer options

One-way buffered bicycle lane on an urban collector road. In town mixed use neighborhood. Posted speed limit 25 MPH.
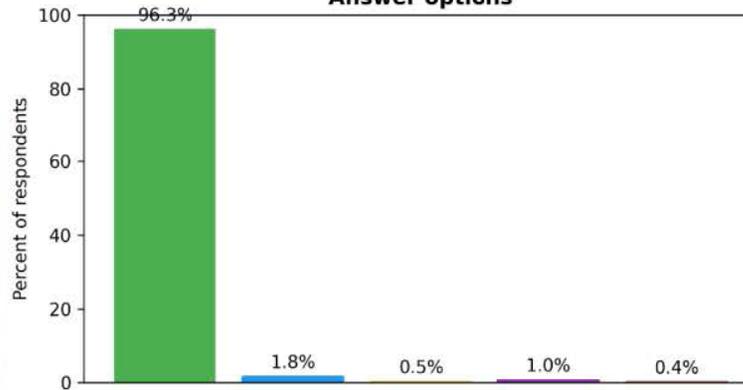
Avg Safety Score

4.1

Photo and label

Answer options

Percent of respondents

50.3%

44.4%

2.7%   2.6%

4.2

- ■ I would cycle in the street, far away from the parked cars
- ■ I would cycle anywhere in the street
- ■ I would cycle on the sidewalk
- ■ I would find another route

Neighborhood street with sidewalks on both sides and parking on one side. Residential neighborhood mostly frequented by residents and maintains a posted speed limit of 20 MPH. Volumes of pedestrians and traffic higher on weekends.

Photo and label

Answer options

Avg
Safety
Score
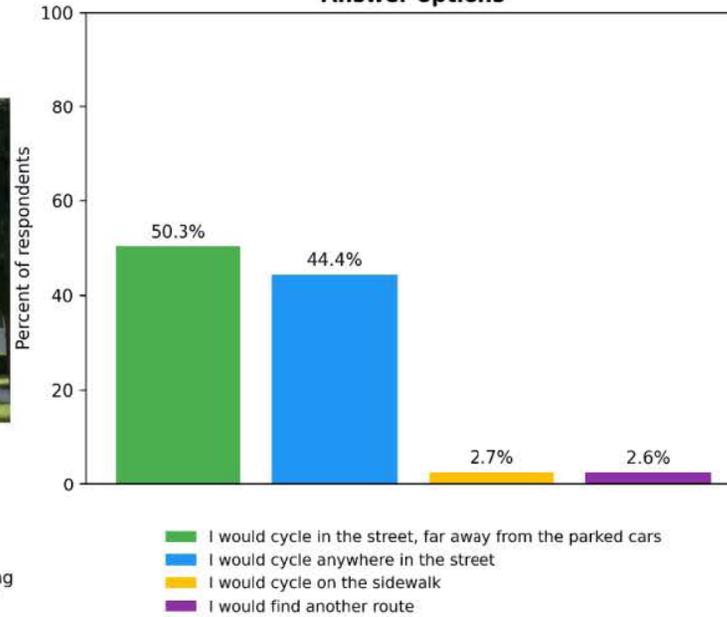
Shared pathway in the road of a collector road. Load density neighborhood with bus route and large private schools on both sides. Posted speed limit 25 MPH.

Percent of respondents

89.8%

8.3%

0.6%

1.2%

4.2

- I would cycle in the pathway, taking care to yield to pedestrians
- I would cycle in the street to avoid conflicts with pedestrians
- I would walk my bicycle in the pathway when there are pedestrians
- I would find another route to use

Photo and label

Answer options

Two-way multi-use trail along a major arterial with a narrow grassy buffer. Rural area with low density residential development. Posted speed limit 50 MPH.

4.4

Percent of respondents

88.6%
6.3%
0.9%
3.7%
0.5%
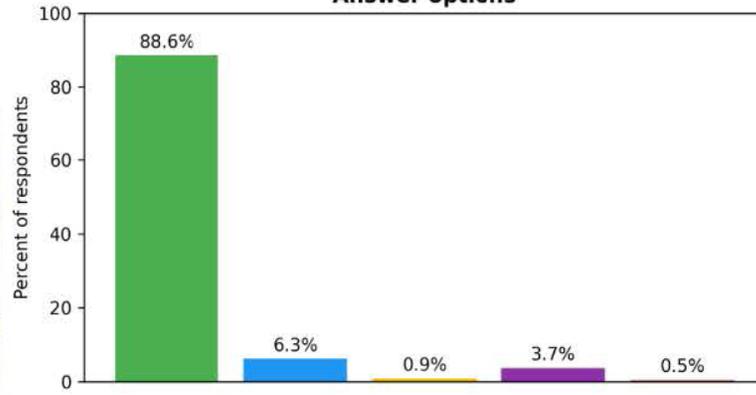
- I would use the trail
- I would only use the bicycle lane farthest from the roadway
- I am not sure
- I would use another route to avoid cycling along this noisy road with high motor vehicle speeds
- I would use another route for other reasons

Photo and label

Separated two-way bicycling facility along a major arterial in an urban mixed-use area. Bicycle facility is part of larger trail system. Posted speed limit 30 MPH.
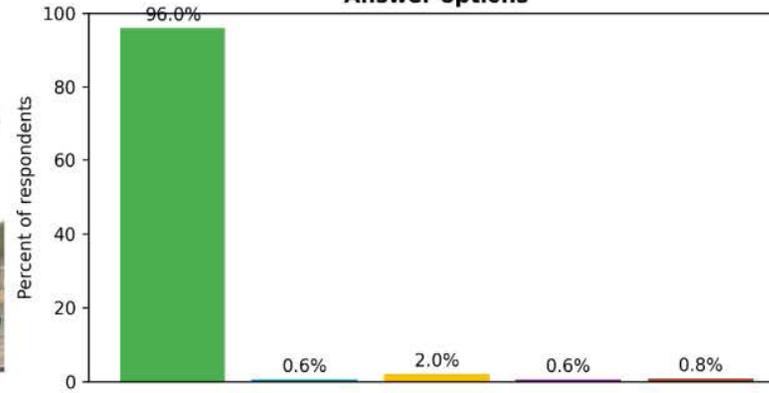
Avg Safety Score

4.5

Photo and label

Two-way multi-use trail in parkland and forested area. Rural with low-density residential development. Posted speed limit 50 MPH.

Avg Safety Score

4.6
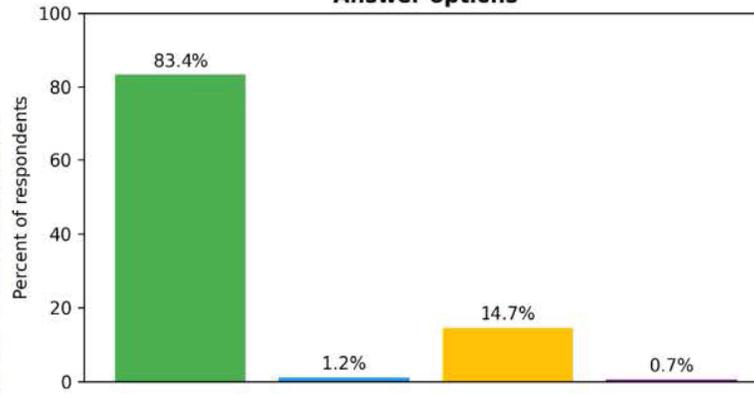
- I would use the trail whether cycling solo or with others
- I would use the trail only when cycling with others
- I would limit use to daylight hours, regardless of whether cycling solo or with others
- I would use another route

8. THE EBBS AND FLOWS OF CYCLING OVER A LIFE COURSE

The survey included questions that allowed respondents to share cycling over their life course: when they started cycling; if they stopped cycling for at least a year at some point in their life and the reason for restarting; if the amount of cycling they did (frequency and distance) changed during the past year; and if they could envision cessation and why. Figure 56 diagrams these time points. By looking at responses to these questions, we gain an understanding of how age and life-circumstance influence older adults' cycling habits. Some differences emerged between regular and non-regular cyclists, among the four types of cyclists, by gender, and by age group.
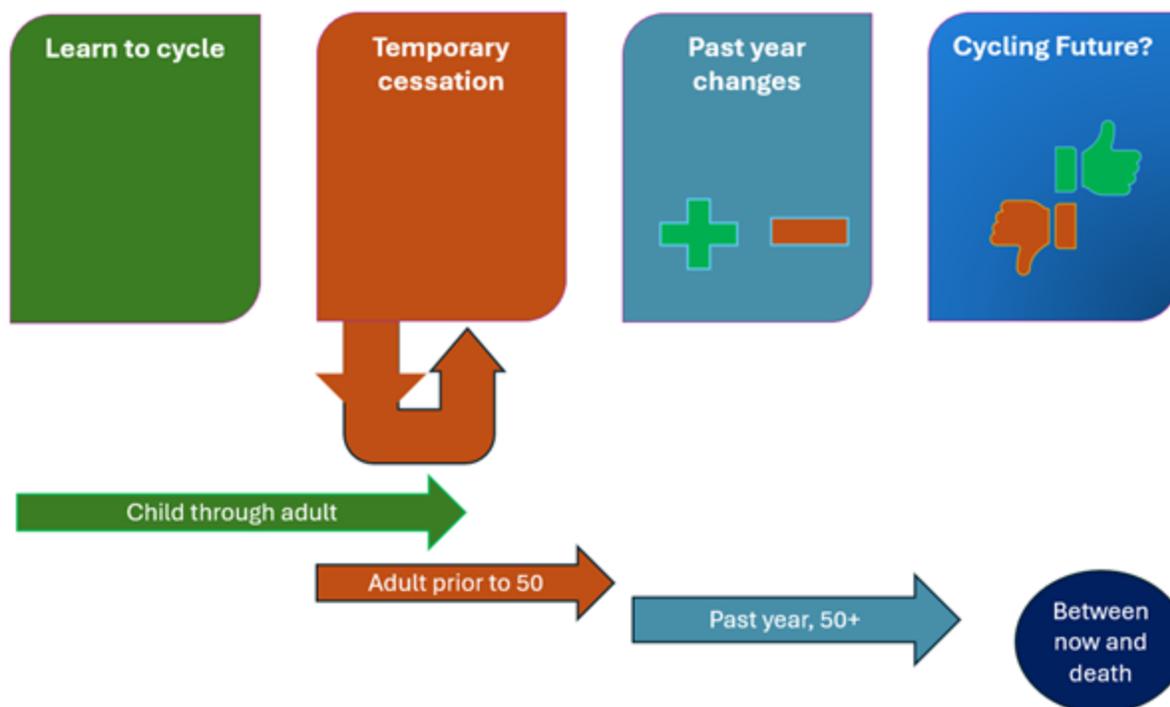
Figure 56. Cycling Life Course Diagram

8.1 LEARNING TO CYCLE

When a person gets their first bicycle and learns to ride, they often remember that feeling of independence and accomplishment; the memory of this feeling can last for a long time. Most respondents, 84.7%, learned to cycle as a young child, with a slightly higher percentage for women. While the rate of those learning to cycle declines with age, about up to 3% learn at age 50 or older. See Figure 57.

	As a child	As a teenager	Between 20 and 29	Between 30 and 39	Between 40 and 49	Between 50 and 55	Between 56 and 60	Between 61 and 65	Between 66 and 70	71 and older
Women, N=828	85.4%	5.6%	2.7%	1.6%	2.4%	1.2%	0.6%	0.4%	0.2%	0.0%
Men, N=1364	84.3%	6.8%	2.6%	1.8%	1.5%	1.0%	0.8%	0.5%	0.7%	0.0%

2.4% of Women learned at age 50 or older

3.0% of Men learned at age 50 or older
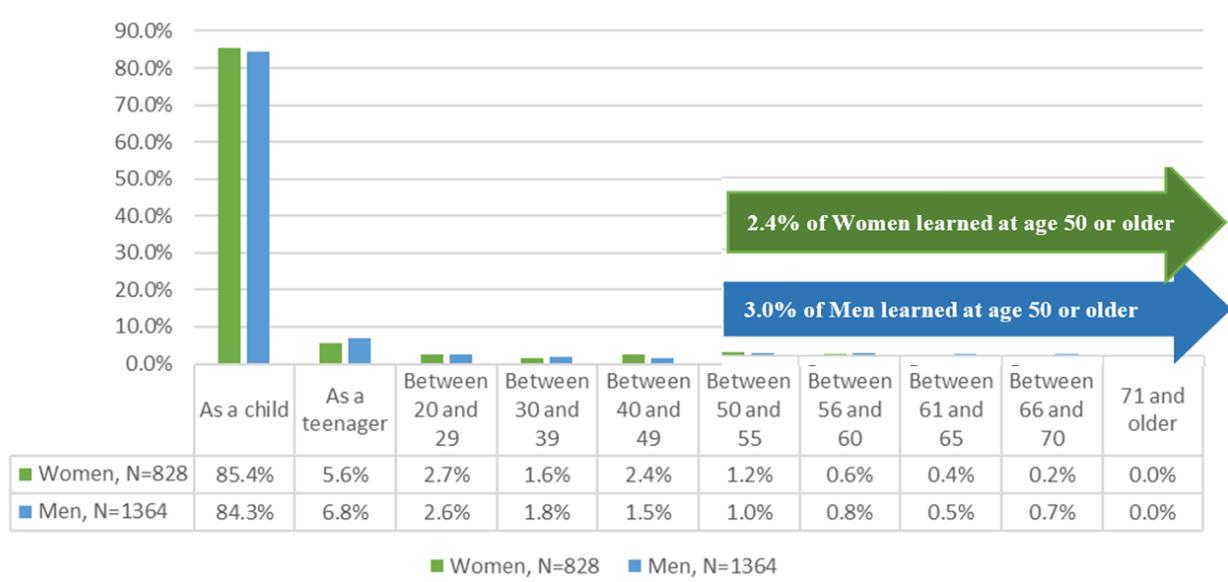
Figure 57. When Learned to Cycle by Gender and When Learned Age Group

8.2   TEMPORARY CESSATION

Studies of physical activity for people over the course of their life reveal changes in the level and type of movement. Based on this, the survey asked respondents if they had stopped cycling for at least a year during the past (longer than a year before taking the survey). Not surprisingly, over two-thirds of those answering this question said they did, with more women than men. See Figure 58.

Reasons for stopping ranged from a change in job to caretaking responsibilities. Figure 59 shows the 15 reasons offered as answer options on offer or provided by respondents, from most often to least often cited.

Figure 60 shows differences between women and men, shown with trend lines, highlighting differences in family roles, career paths, and other characteristics.

Temporary cessations in cycling are often not due to a single factor. Disincentives for continuing to cycle can combine to result in not cycling. For example, safety concerns or the lack of cycling infrastructure can dissuade someone, especially if they had a crash or unnerving near miss. They may gradually get away from cycling and switch to another form of exercise. In addition, single factors such as caretaker responsibilities or not having someone to cycle with can also result in cycling cessation; both of which are more likely for women than men. Often teenagers who may have cycled as a means of independent transport switch to driving once they get their license, more often true for boys than girls, however.

■ Women, N=1000 ■ Men, N=1694
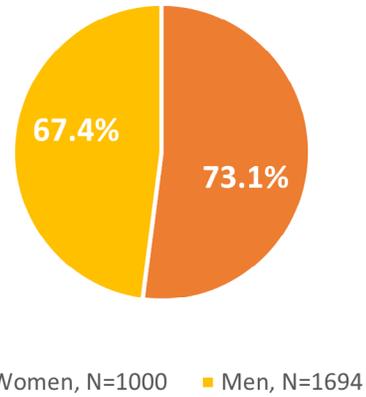
Figure 58. Percent Answering "yes" to One-Year or More Temporary Cessation by Gender
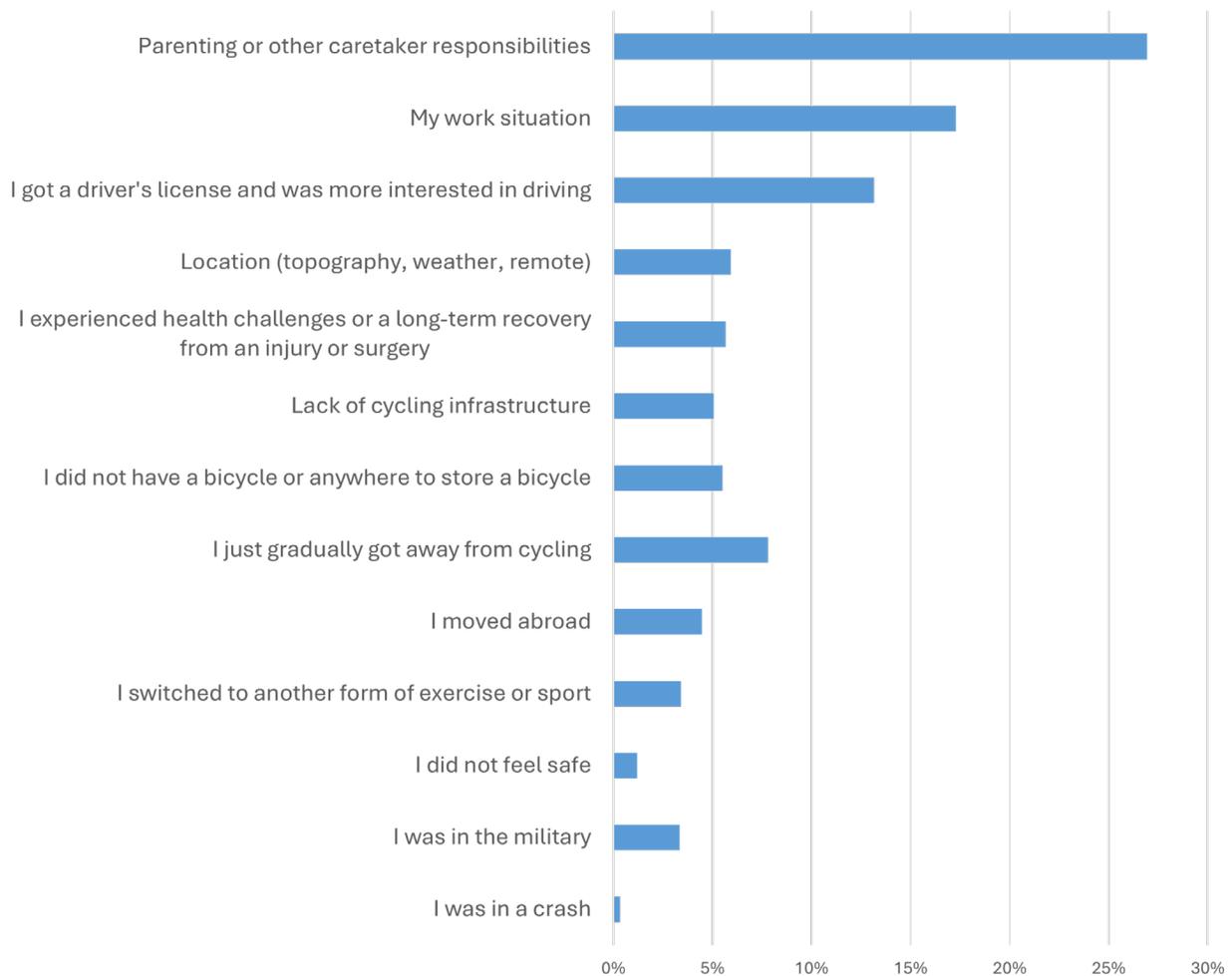
Figure 59. Reasons for Temporary Cessation
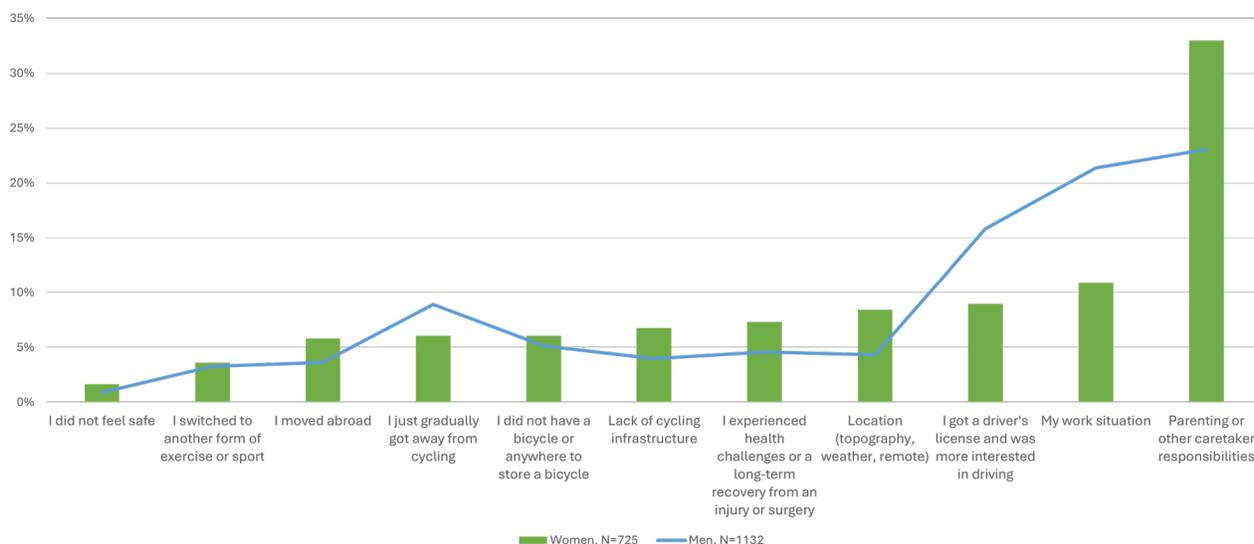
Figure 60. **Differences in Reasons for Temporary Cessation between Women and Men**

Reasons for a return to cycling are shown in Figure 61. The most often cited reason is *physical exercise*. A group of second popular reasons include *for transportation, moved to where cycling was easier, just missed it,* and *for health reasons.* Environmental concerns were also important for all who responded, often leading to a decision to get a bicycle and use it for transportation. While not shown here, often two reasons were selected, indicating a relationship between them, such as moving to a place where cycling was easier and getting a bicycle; or missing cycling and connecting with friends. Similar to moving to a place where cycling was easier, new or improved cycling infrastructure promoted a return to cycling.
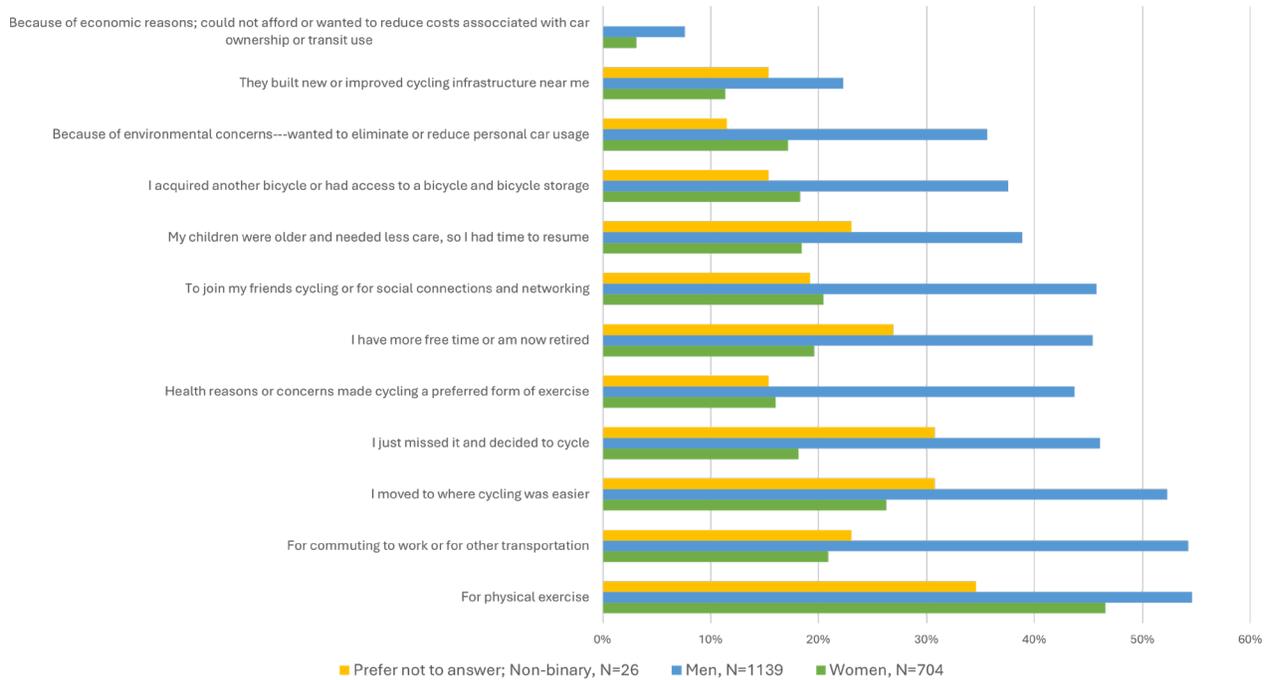
Figure 61. Reasons for Return to Cycling by Gender

8.3 PAST-YEAR CHANGES IN CYCLING

The third timepoint in the life course survey questions relates to changes in cycling in the past year. Figure 62 shows the percentage of *Yes* answers by gender within each age group. The accompanying chart shows the number responding *Yes* or *No* by gender and age group.
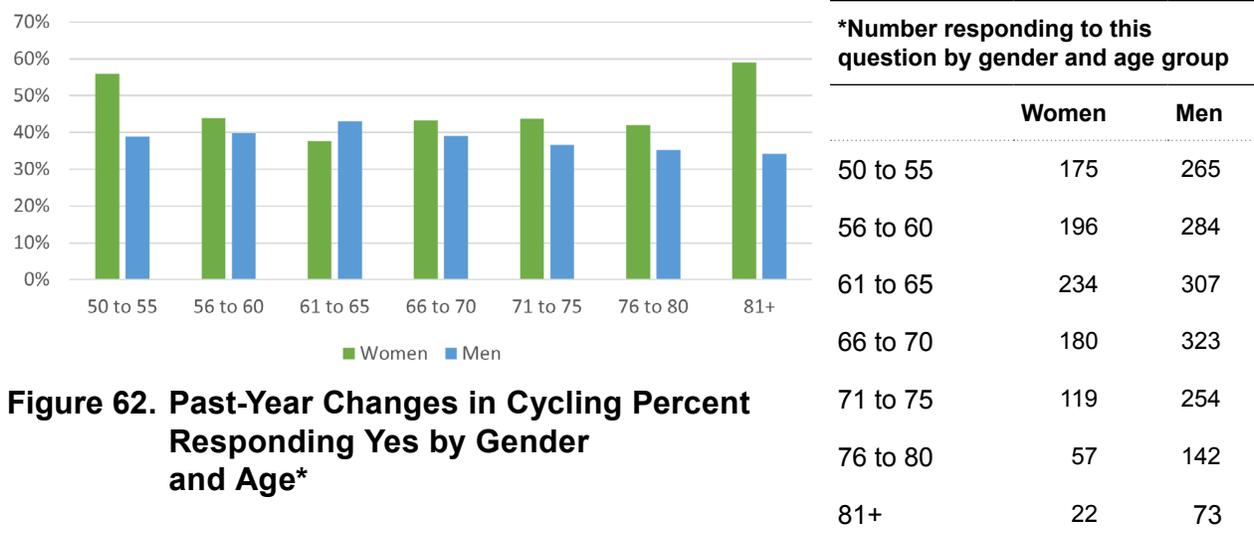
Figure 62. Past-Year Changes in Cycling Percent Responding Yes by Gender and Age*

*Number responding to this question by gender and age group		
	Women	**Men**
50 to 55	175	265
56 to 60	196	284
61 to 65	234	307
66 to 70	180	323
71 to 75	119	254
76 to 80	57	142
81+	22	73

For those answering *Yes,* we distinguish changes in frequency and distance over the year before people responded to the survey, grouping responses by gender and age. We also analyzed the reasons for the changes.

Over 93% of those responding indicated the frequency of cycling had changed in the past year. Just over 40% cycled less often, with over 50% cycling more often. Figure 63 shows differences between women and men.
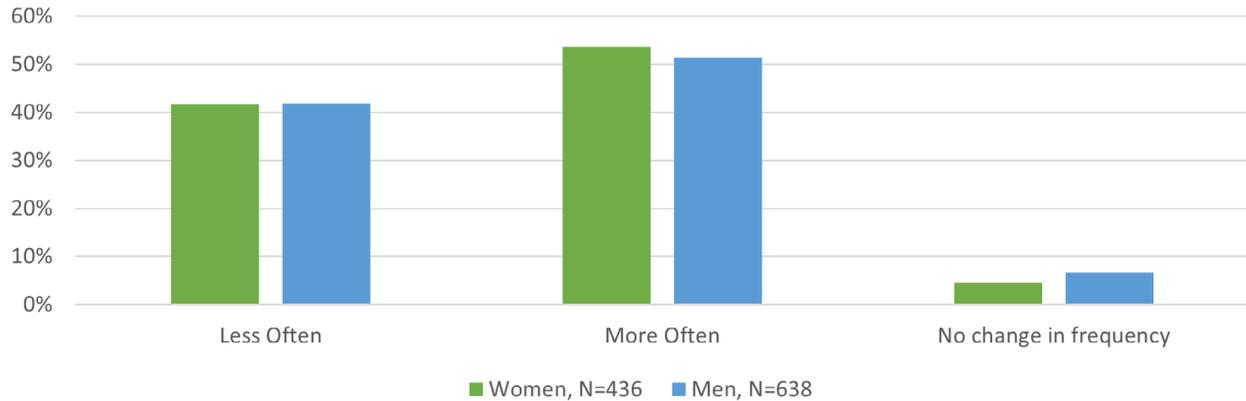
Figure 63. Past-Year Changes in Cycling Frequency by Gender

There are age-based changes in cycling frequency for women and men, shown in Figures 64 and 65 below. Simply put, women and men in older age groups cycled less frequently, while more frequently in younger age groups.
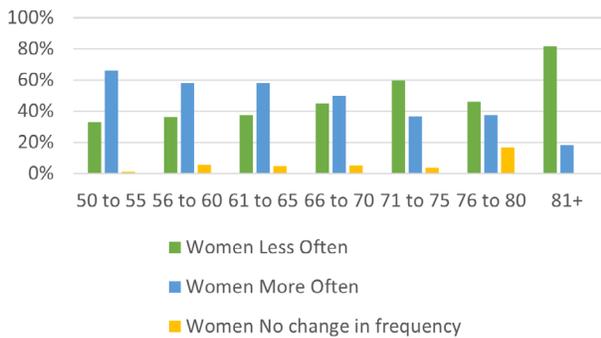
Figure 64. Past-Year Changes in Cycling Frequency for Women by Age
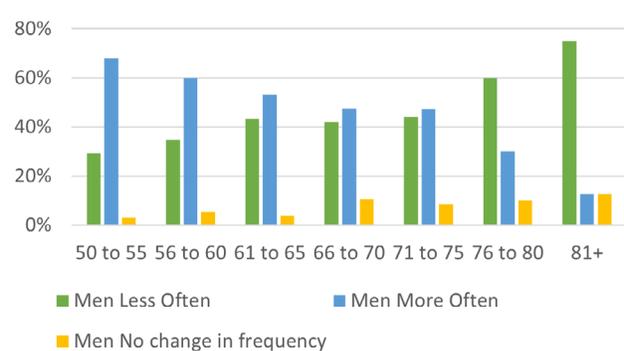
Figure 65. Past-Year Changes in Cycling Frequency for Men by Age

Figure 66 shows the overall differences between women and men in distances cycled. While a few more women are cycling longer distances and more men cycled shorter distances, women and men are about the same for no change in distance cycled.
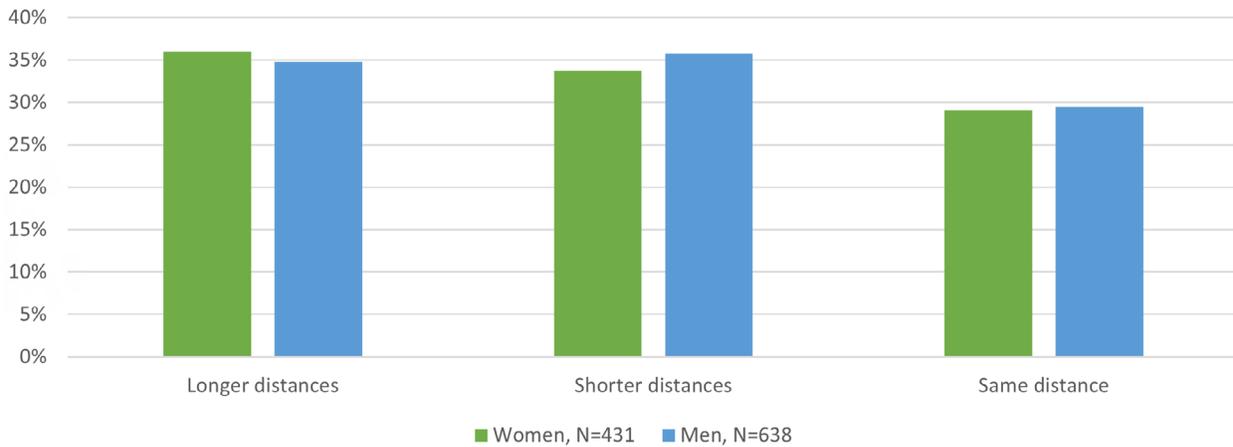
Figure 66. Past-Year Changes in Cycling Distances by Gender

There are age-based changes in cycling distances for women and men, shown in Figures 67 and 68 below. Women and men in older age groups reduced the distance they cycled. Interestingly, the trendline for those cycling the same distance increases for women as they age but decreases for men (see the yellow dashed line).
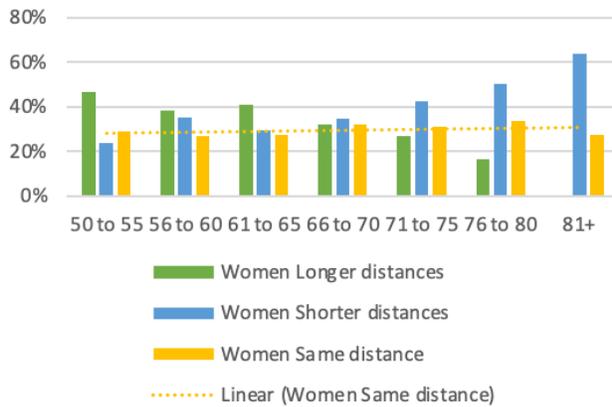
Figure 67. Past-Year Changes in Cycling Distances for Women by Age
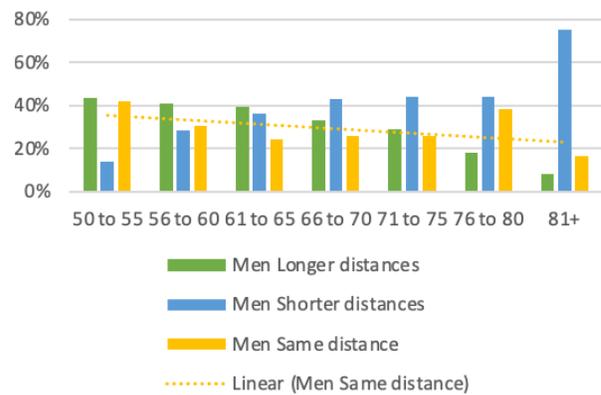
Figure 68. Past-Year Changes in Cycling Distances for Men by Age

There are nine combinations of cycling changes, including no change in frequency or distance. Both the frequency and distance cycled depend on a person's age and circumstances.

8.3.1 Reasons for past-year decreases in cycling

Those indicating a decrease in frequency or distance provided reasons for this change. The answers offered, plus the written-in "Other" reasons resulted in 18 reasons shown in Figure 69. Reasons relating to how one feels were often selected, especially: *I have a physical condition that makes it difficult to cycle, I don't have the energy,* and *A different sport works better for me.* Those who cited the fact of getting older are included in the *I don't have the energy* response, typically using the *Other* option. Examples include:

- "Age just sucks"

- "As I am now 80, motivation is a bigger factor."

- "Getting older"

- "Got Old"

- "I decided that my goal of 30+ miles per ride made little sense at age 76, so I am doing many shorter rides this year."

- "I find that I've aged and I need more recovery time between rides and I'm not just able to physically do some of the things I used to do."

A number of people have switched to exercises that increase bone density. Cycling is not considered an exercise that benefits increased bone density; other physical activities such as weightlifting do.[8] Despite the popularity of Pickle Ball, only one person said they are playing more Pickle Ball and cycling less.

Other reasons for decreases in cycling include replacing longer rides with shorter local trips for errands. This switch can result in more total trips. Several people said that weather conditions affect the amount of cycling they do, so this answer is included as a standalone in Figure 69.

Age and gender appear to play a role in cycling decreases. Figure 70, which shows differences between women and men, suggests that women are more affected by safety concerns when cycling, including construction along their cycling routes, and the loss of a cycling partner. More men responded that home and work responsibilities affected their cycling more than women, as well as a loss of energy or feeling the effects of aging.

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8   https://www.osmifw.com/sports-medicine/bone-density-and-weight-bearing-exercise/
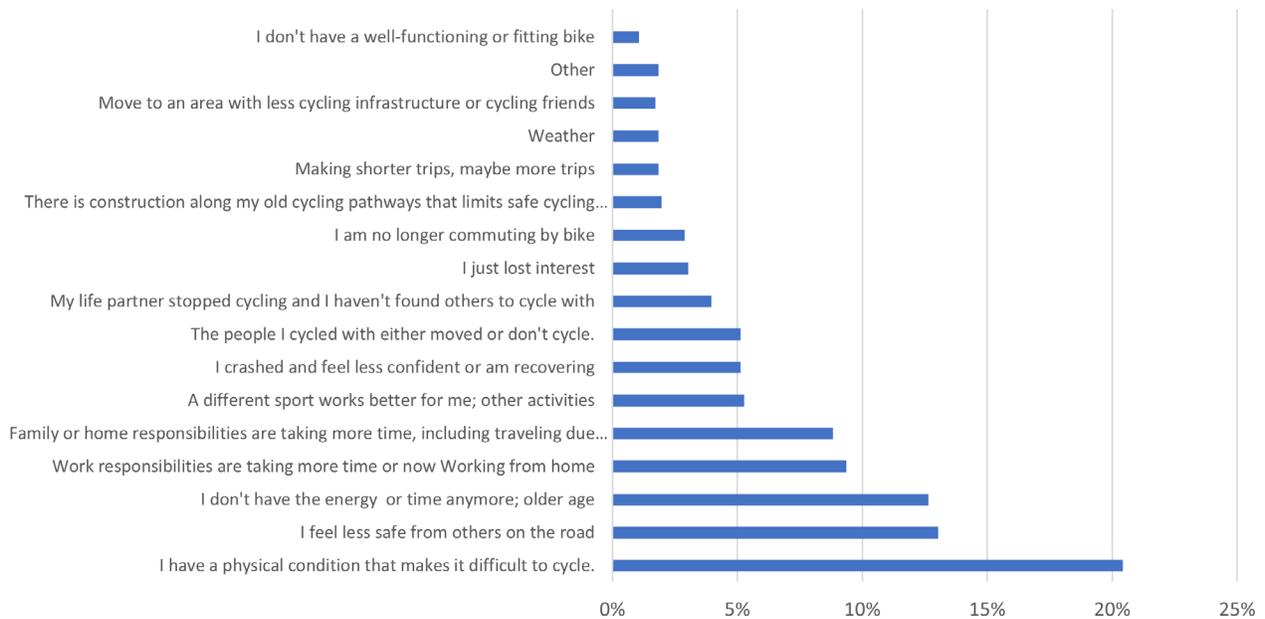
Figure 69. Reasons for Less Cycling in Past Year, Women and Men Combined N=753

Figures 71 and 72 show reasons for past year cycling decreases for women and men by age. Because the figures can be a bit difficult to read and interpret, we have created separate Figures for four reasons in Figures 73 through 76. Noticeable differences are in Table 7.

■ Men, N=454   ■ Women, N=305
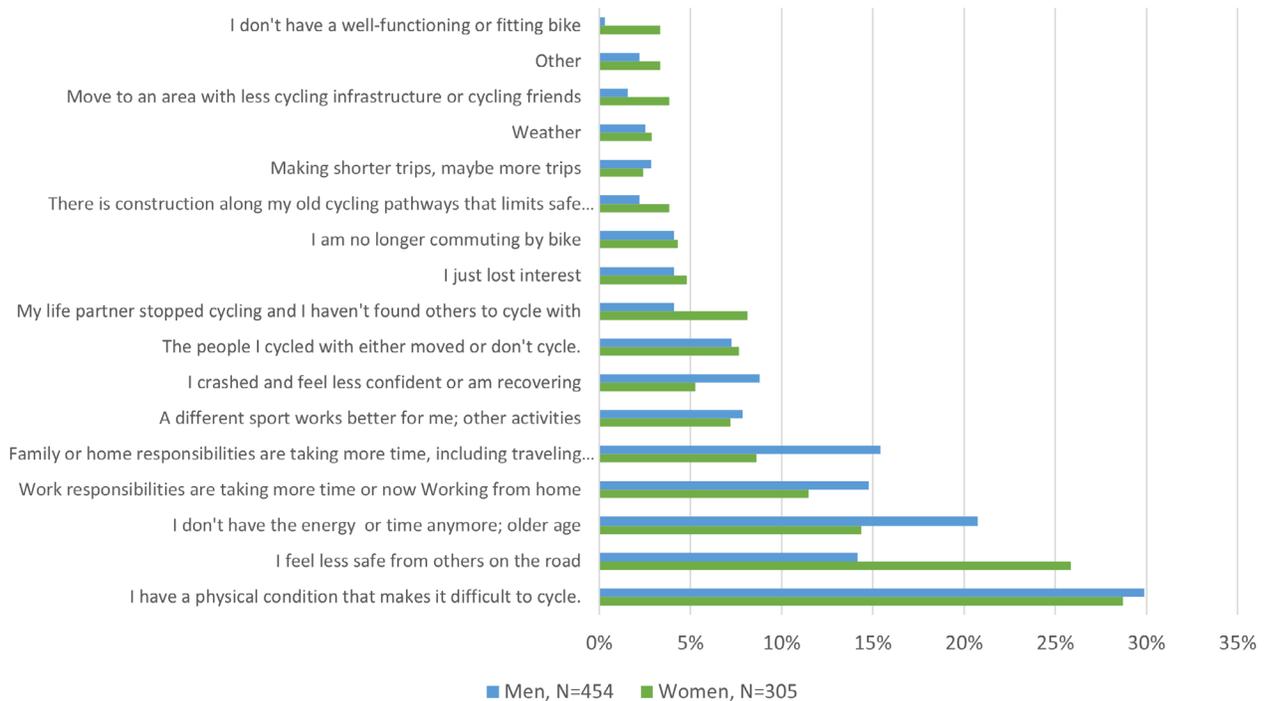
Figure 70. Reasons for Less Cycling in Past Year, Women and Men

Table 7.   Noticeable Differences in Past-Year Cycling Changes by Gender and Age

I have a physical condition that makes it difficult to cycle	I feel less safe from others on the road	I don't have the energy or time anymore, older age	A different sport works better for me
The 50 to 55 age group for women is higher, but higher rates for men 66 and older.	The 50 to 55 age group for women is higher, but higher rates for men 66 and older.	Except for age group 50 to 55 and 61 to 65, women have a higher response rate.	The 50 to 55 age group for women is higher, but higher rates for men 66 and older.
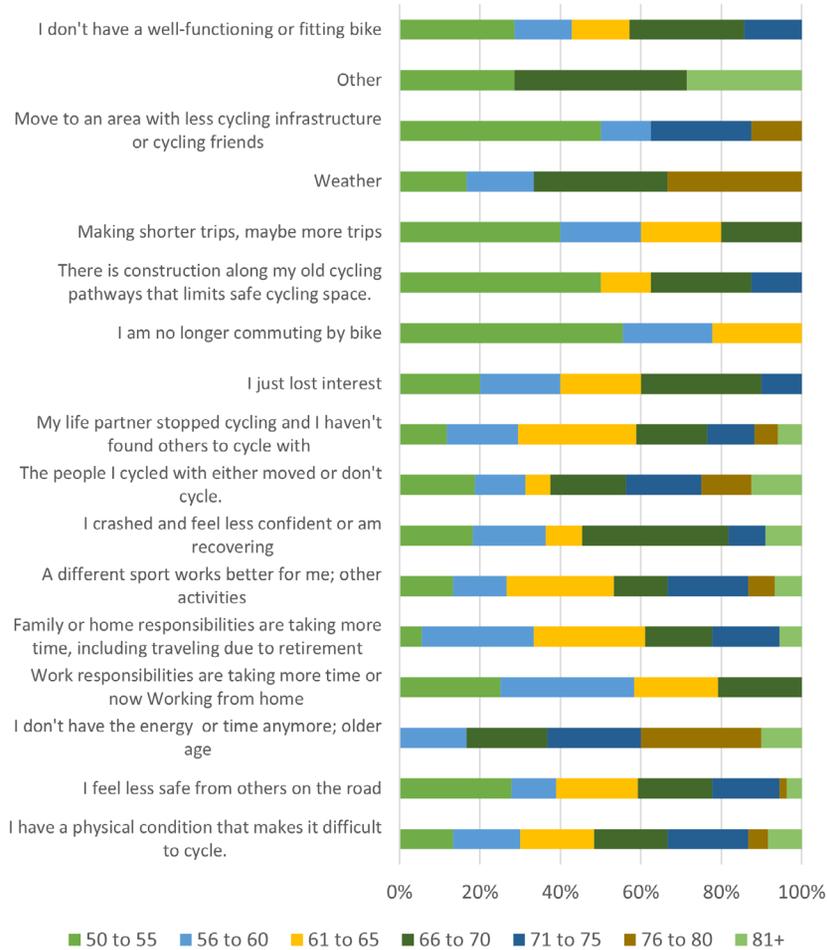
Figure 71. Reasons for Past-Year Cycling Decreases for Women
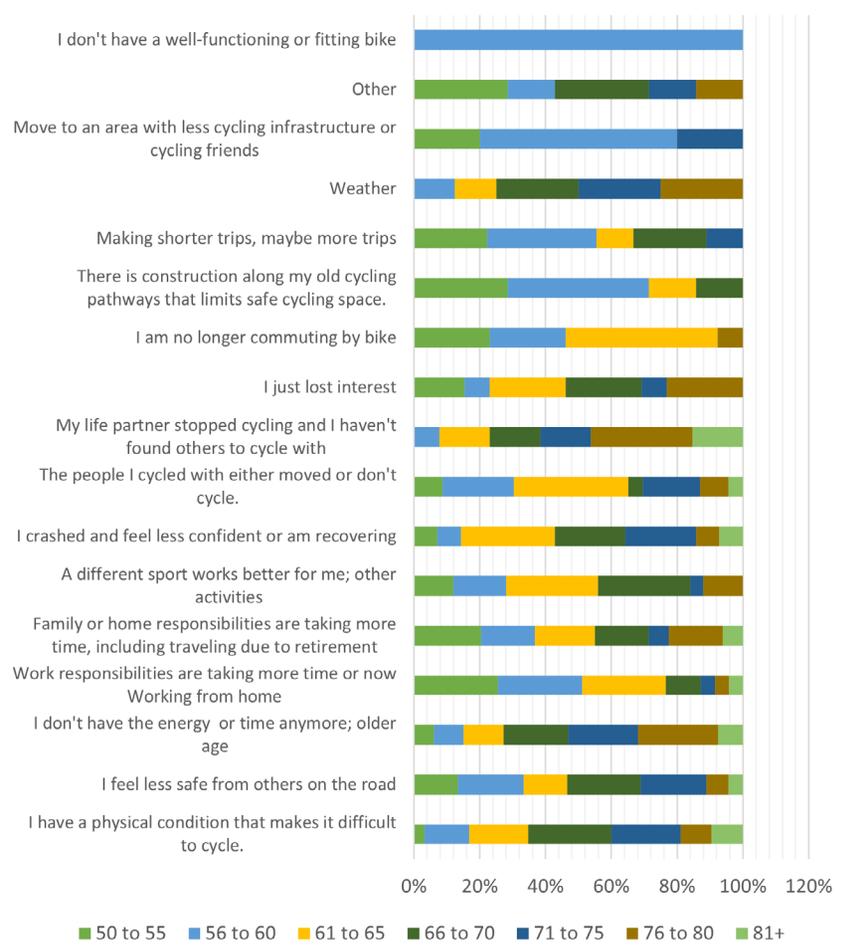
Figure 72. Reasons for Past-Year Cycling Decreases for Men
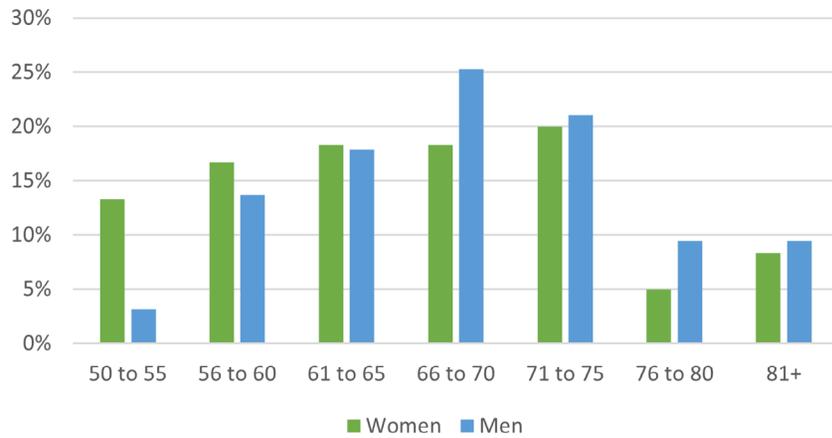
Figure 73. I Have a Physical Condition That Makes It Difficult to Cycle
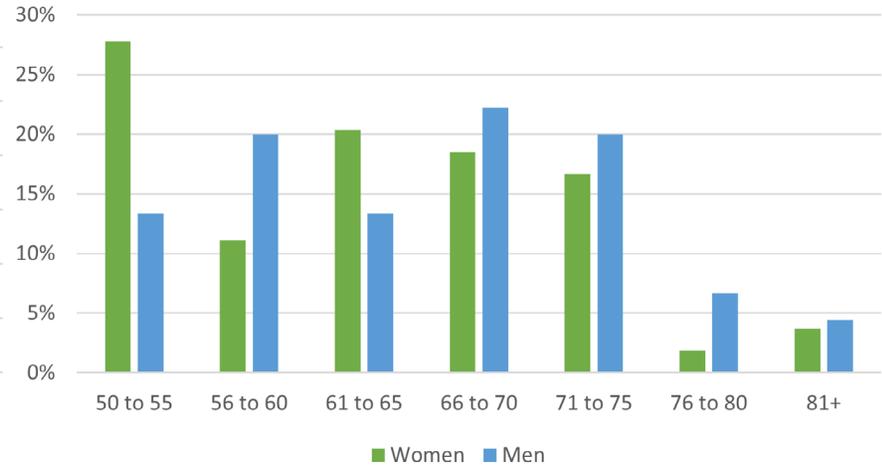
Figure 74. I Feel Less Safe from Others on the Road
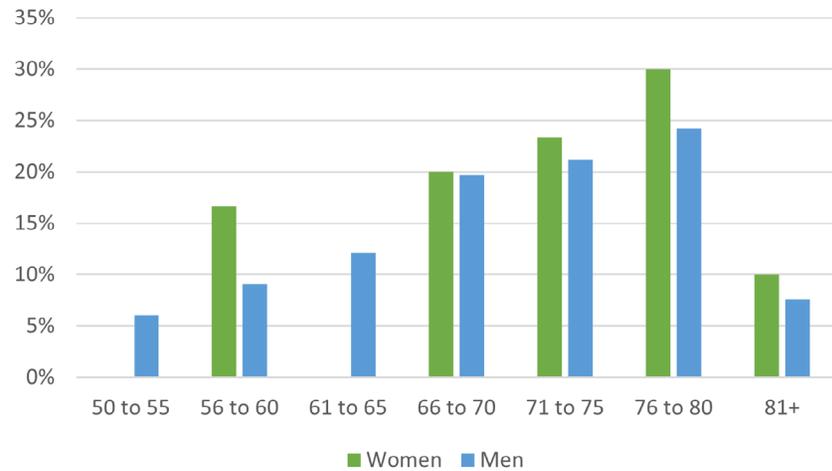
Figure 75. I Don't Have the Energy or Time Anymore
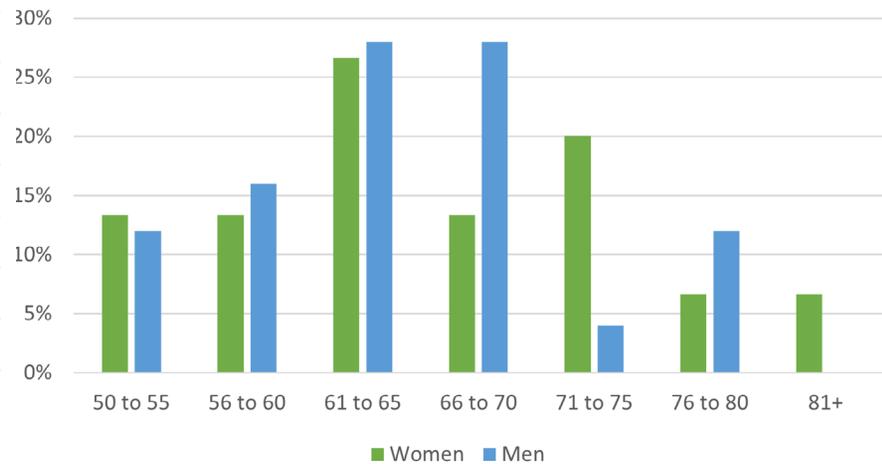
Figure 76. A Different Sport Works Better for Me

8.3.2   Reasons for increases in past-year cycling

Those indicating an increase in frequency or distance provided reasons for this change. Figure 77 shows the reasons in ascending order of response frequency. Physical fitness reasons were most often cited. The next tier responses include an e-bike purchase, finding people to cycle with regularly, and a lifestyle decision to cycle more. Several people said they are making more, shorter trips for errands as a way to reduce car trips.
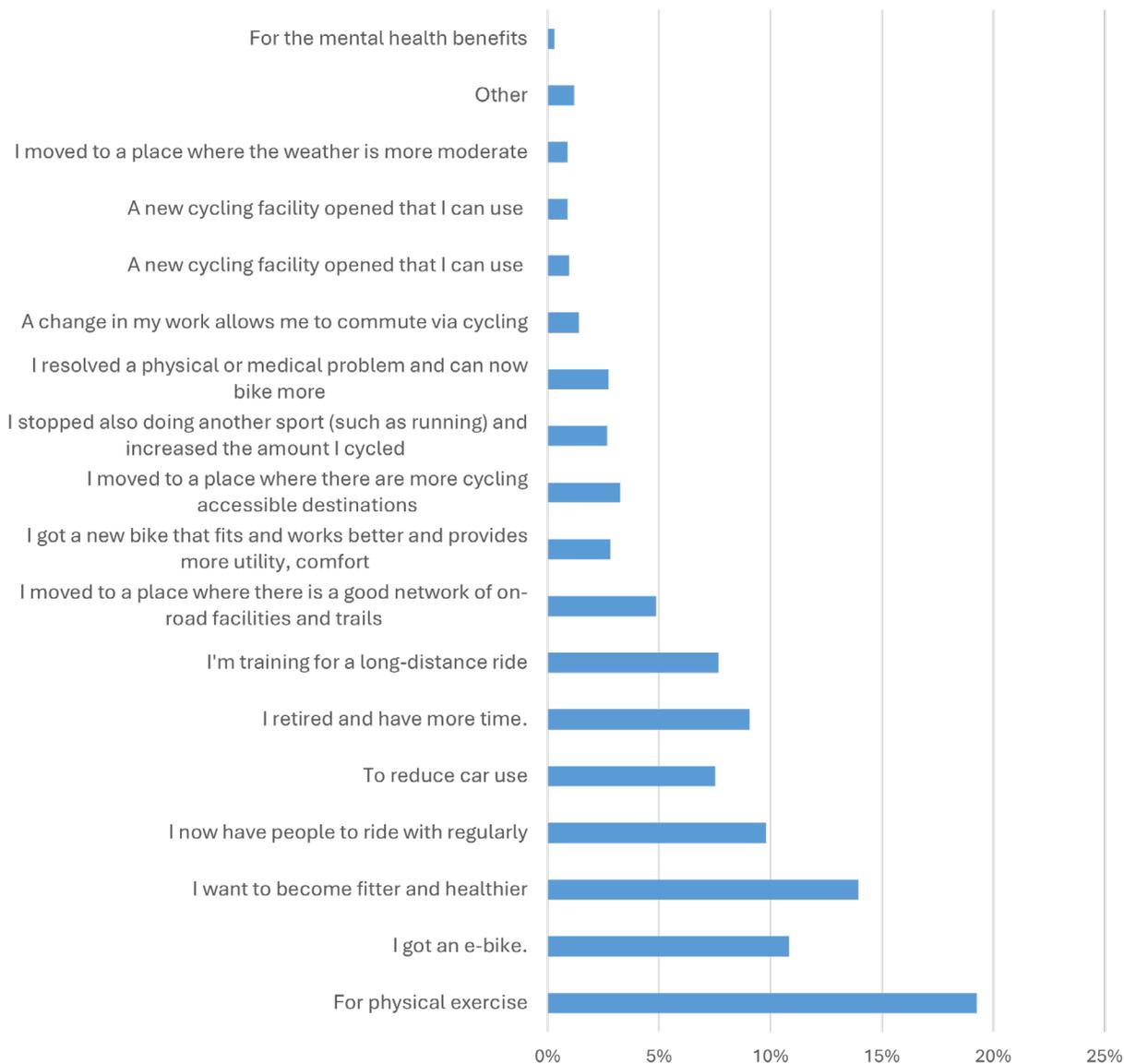
Figure 77. Reasons for Past-Year Cycling Increases N=1378

Figure 78 shows these responses for women and men based on the number of each that answered this question.
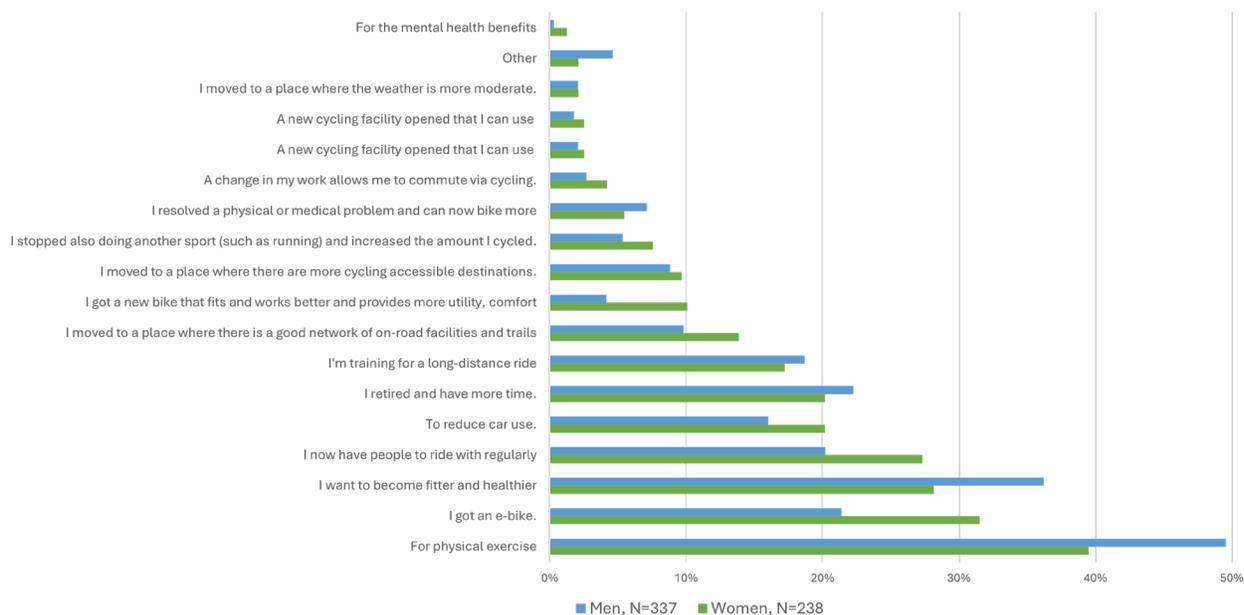
Figure 78. Reasons for Past-Year Cycling Increases for Women and Men

Figures 79 and 80 compare these responses by age for women and men. Because these figures are detailed, examples of four reasons follow in Figures 81 through 84: *To be fitter and healthier*; *To reduce car use; I'm retired and have more time; I now have people to ride with*.

We note the following for each of these reasons:

- Wanting to be healthier and fitter seems to be a stronger motivator for men than women in the younger and older age groups, with more women than men between 66 and 70, then again 76 and 80.

- Reducing car use is a stronger motivator for women until age 65. Without further information, it is hard to know how other factors in the lives of people as they age affect mobility. For example, life changes such as losing a spouse who preferred to drive or moving to a place with more accessible destinations or a good bicycle network may have an impact.

- The most noticeable difference based on age groups is for the *I'm retired and have more time* reason: older cyclists between 61 and 75 are more likely to have retired during this time and can increase their cycling. People in the age groups before and after these are either still working or retired long enough ago that they have already sorted out how to use their non-working time.

- Gaining cycling partners appears to be a strong reason for women in all age groups to increase their cycling. This may be due to the social benefits of cycling with friends as well as the safety benefits of cycling with at least one other person.
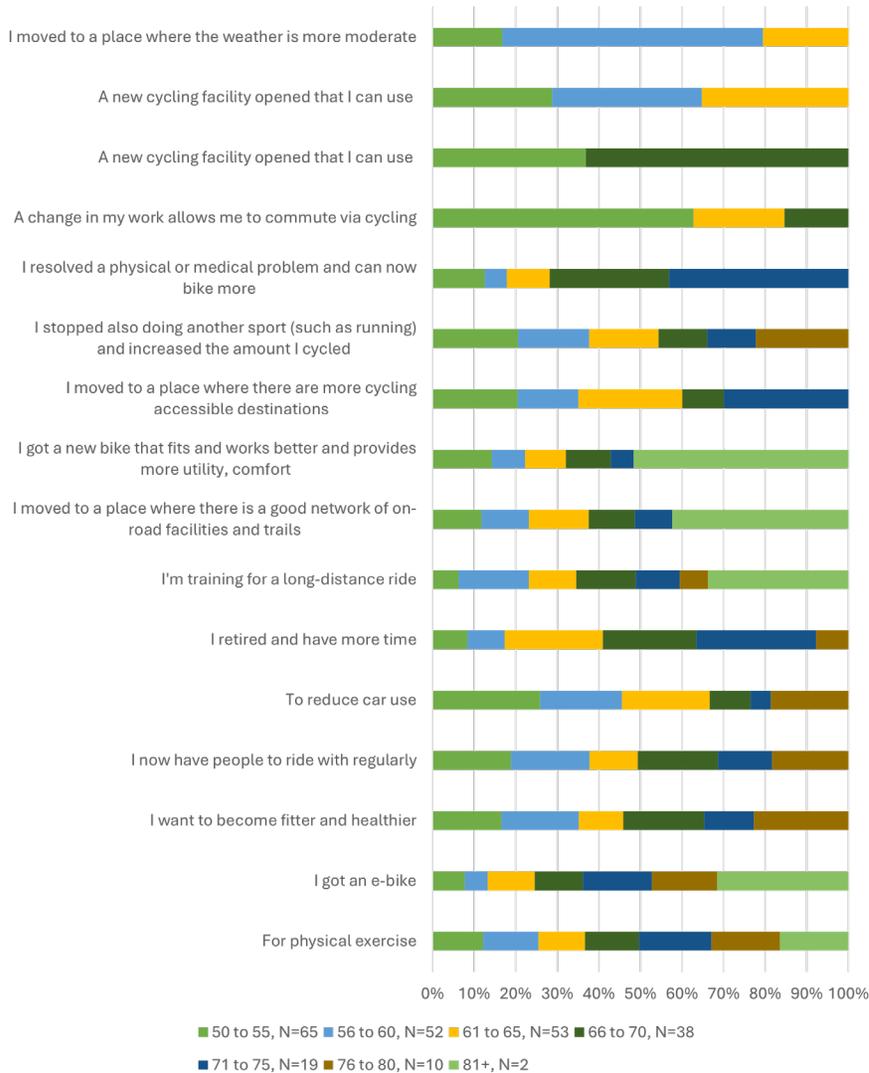
Figure 79. Reasons for Past-Year Increases for Women by Age
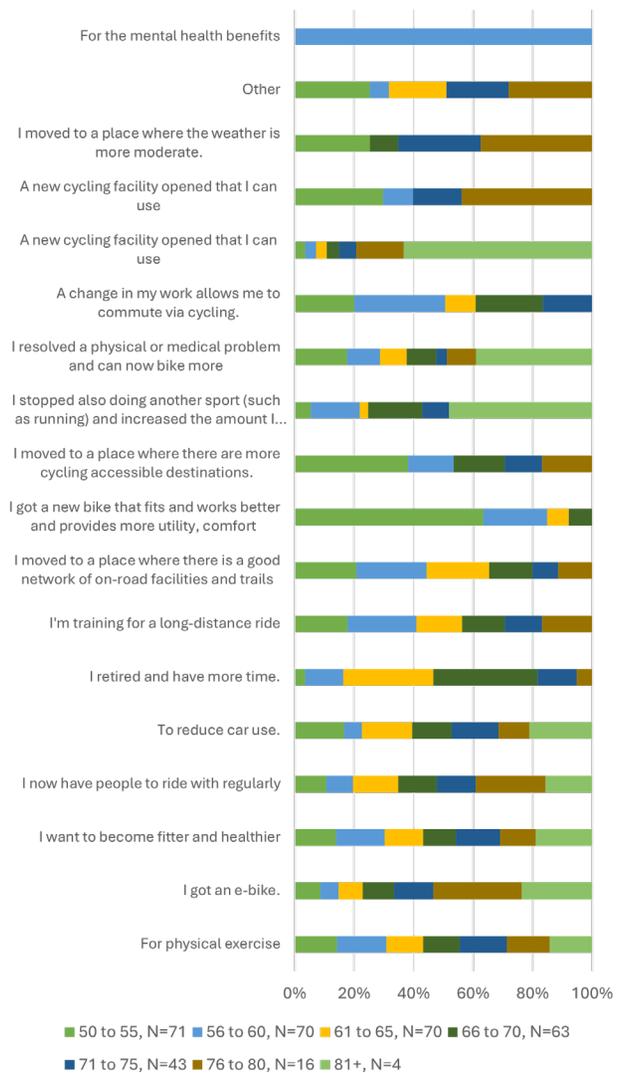
Figure 80. Reasons for Past-Year Cycling Increases for Men by Age
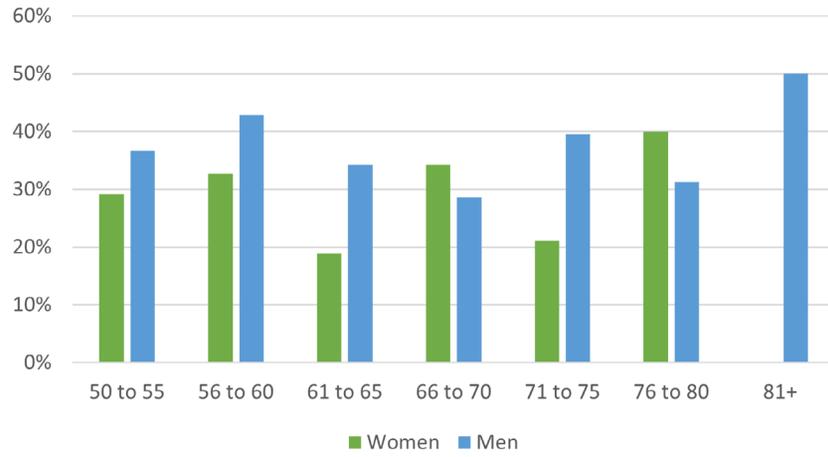
Figure 81. To be Fitter and Healthier
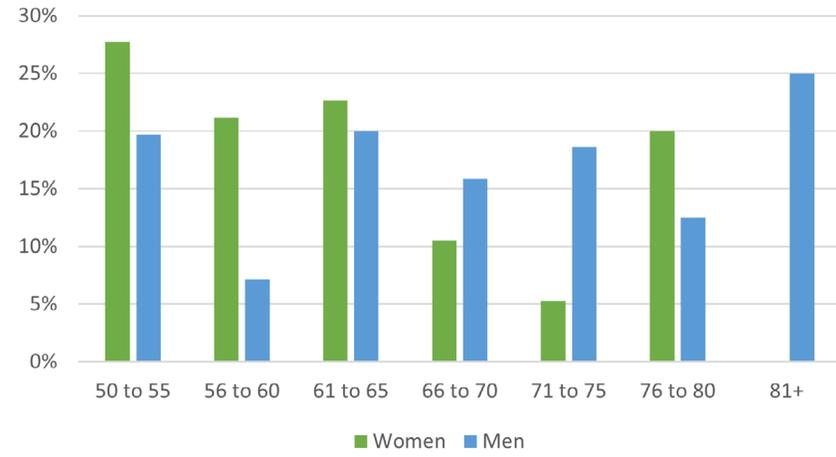
Figure 82. To Reduce Car Use
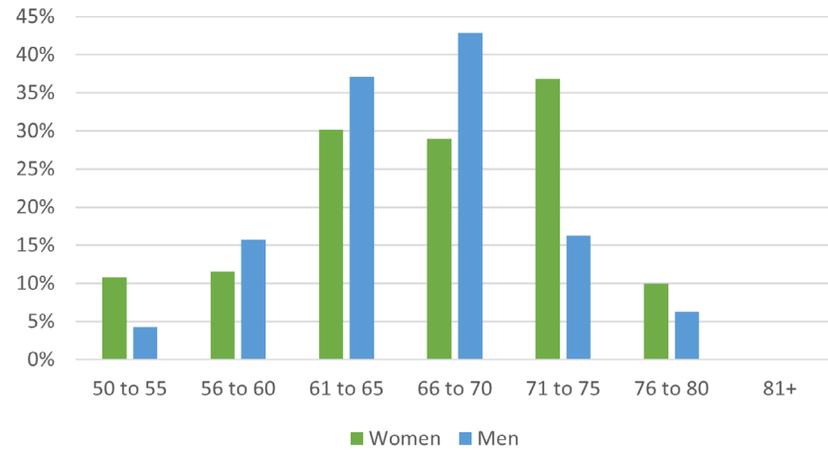
Figure 83. I'm Retired and Have More Time
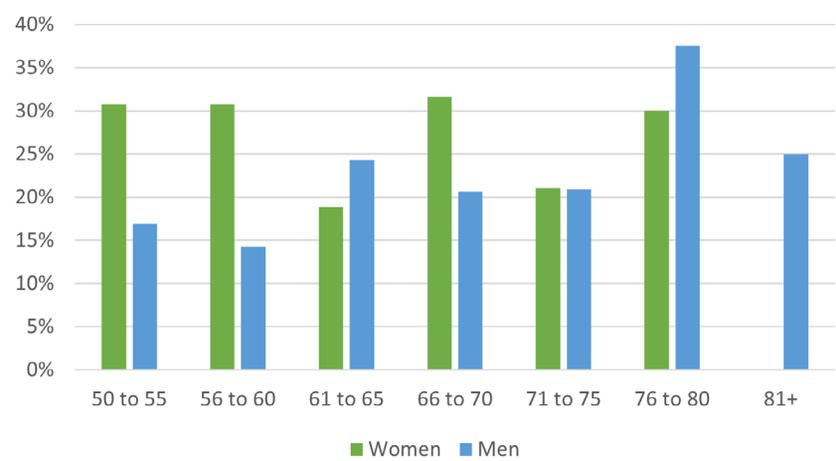
Figure 84. I Now Have People to Ride With

A comparison of past-year cycling changes between Regular and Non-regular cyclists shown in Figure 85, indicates that Non-Regular cyclists tended to maintain or reduce the frequency and distance they cycle, while Regular Cyclists tended to cycle more often and for longer distances.

	Cycling more often			Cycling less often			Cycling same frequency		
	Shorter Distances	Longer Distances	No distance change	Shorter Distances	Longer Distances	No distance change	Shorter Distances	Longer Distances	No distance change
Regular Cyclists, N=902	4.2%	35.3%	16.3%	25.1%	2.0%	11.1%	3.1%	1.6%	1.4%
Non-Regular Cyclists, N=174	6.9%	18.4%	11.5%	39.7%	0.6%	18.4%	1.7%	0.0%	2.9%
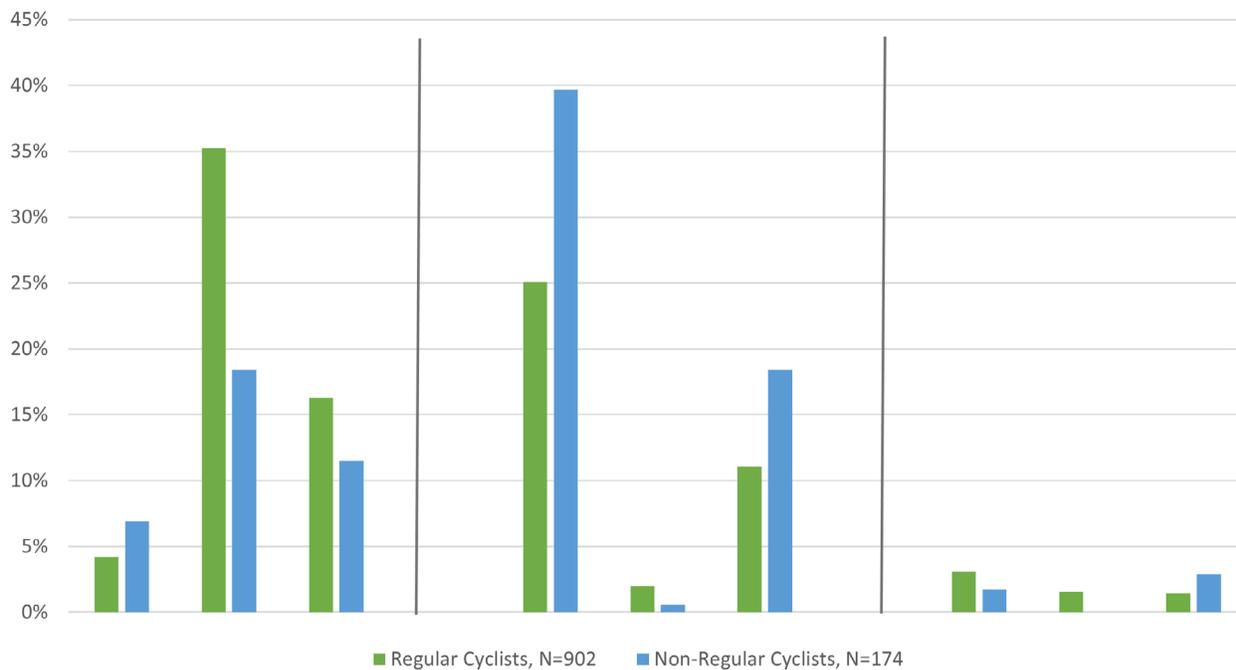
Figure 85. Comparison of Past-Year Cycling Changes between Regular and Non-Regular Cyclists

A cursory review of reasons causing cycling decreases shows common reasons for both regular and non-regular cyclists. See Table 8.

Table 8.   Comparison of Reasons for Cycling Decreases between Regular and Non-Regular Cyclists

	Regular Cyclists	Non-Regular Cyclists
Cycling decreases (either frequency or distance)	• Safety concerns • Limiting physical condition • Loss of energy • Loss of cycling partner • Switched to a different sport, such as for increased bone density	• Safety concerns • Limiting physical condition • Loss of energy • Loss of cycling partner
Cycling increases (either frequency or distance)	• Desire to be more physically fit • E-Bike purchase • Change in pattern of life, including retirement • Found someone to cycle with • Relocated to area with more cycling opportunities • Doing longer distances such as on tours	• Desire to be more physically fit • E-Bike purchase • Change in pattern of life, including retirement • Found someone to cycle with • Relocated to area with more cycling opportunities

8.4   ENVISIONING A TIME WITHOUT CYCLING

The fourth series of questions that helps understand the life course of respondents is their sense of whether they would continue to cycle. The question, *Under what circumstances would you stop riding altogether?*, was a time for people to reflect on the future. Many respondents' answers to other questions show they anticipate adapting to age-related changes in their ability or desire to cycle, such as switching to a step-through bike, not using clipless pedals, purchasing a trike or recumbent bike, or purchasing an e-bike. Yet over three-quarters of respondents expect to stop cycling at some point (78.8%), some reluctantly.

Answer options selected resulted in eight reasons, plus written-in *Other* reasons shown in Figure 86. *Other* reasons include a loss of interest in cycling perhaps due to taking up other activities and other changing circumstances where cycling does not work, such as job relocation. While only a handful of people used the *Other* option to say they would stop cycling when they are too old, this answer is included separately to show the impact of age on someone's sense of themselves. For one person, being over 80 was the delineator. Responses show a strong awareness of physical changes and challenges that come with age with 72% of women and 66% of men choosing this as a reason. However, when combined with all responses, the percentage drops to 40%, which still ranks highest.
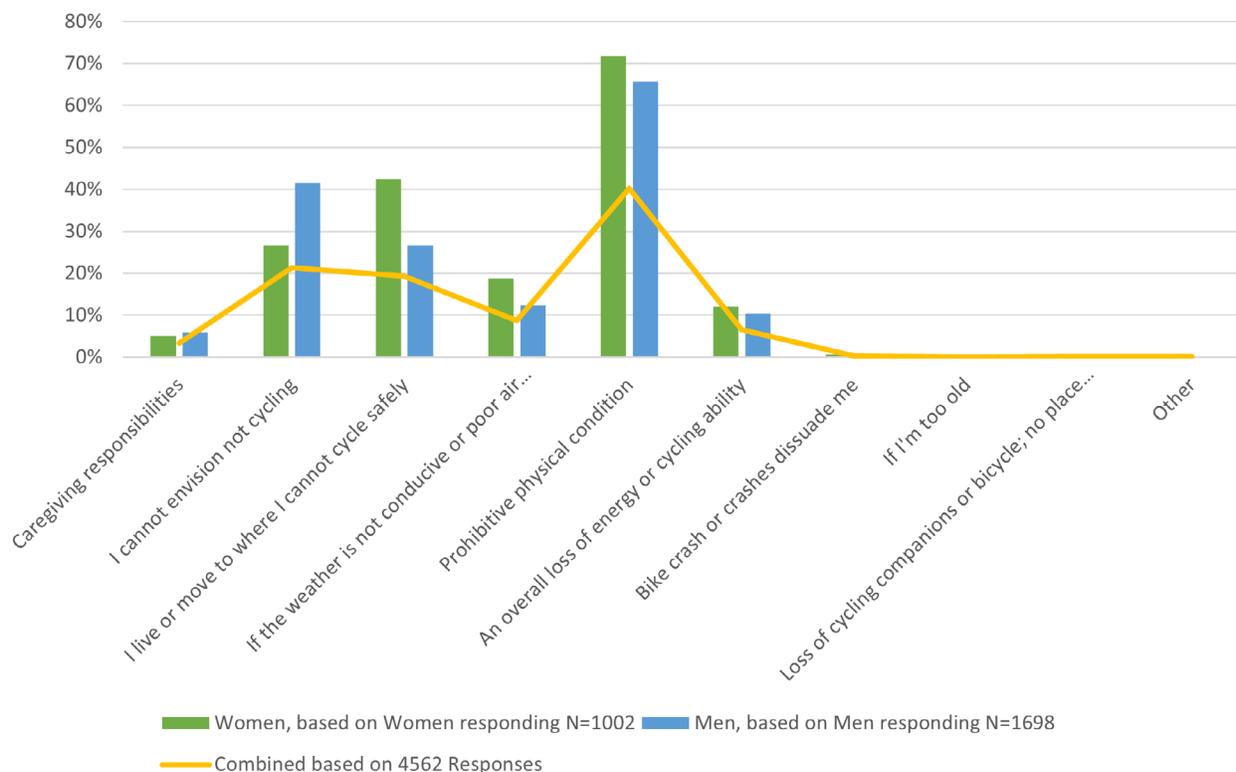
Figure 86. Reasons for Cycling Cessation by Gender and All Combined (Select up to 3)

Just over 21% of those responding could not envision a time when they would not cycle. Two used humor to convey this, saying: *"*When there is a zombie apocalypse" (Man, aged 50 to 55) and "When I float away" (Man, aged 71 to 75).

Safety concerns were also important and ranked second highest for women. Safety was reflected as both existing conditions on the road and motorist behavior. One who responded said she would stop cycling "If another car runs a red light again and AGAIN takes me out for another two years in a wheelchair" (Woman, aged 61 to 65).

It is important to call out the percentage that said caregiving responsibilities would cause them to stop cycling, 3.3%. We will discuss this topic more fully in the last section of this report.

Figure 87 breaks down responses by reasons for each age group. The percentage of those who cannot envision a time when they would not cycle is shown as a line. Many of those selecting this answer option also selected one or two other reasons, such as physical limitations or safety concerns. This suggests continuing to cycle is an aspiration, mixed with reality. One speculated that she would continue to cycle, but "I'm 71 and bike at least 6 days a week for all my transport. Hoping this will last forever, but....." (Woman, aged 71 to 75*).*
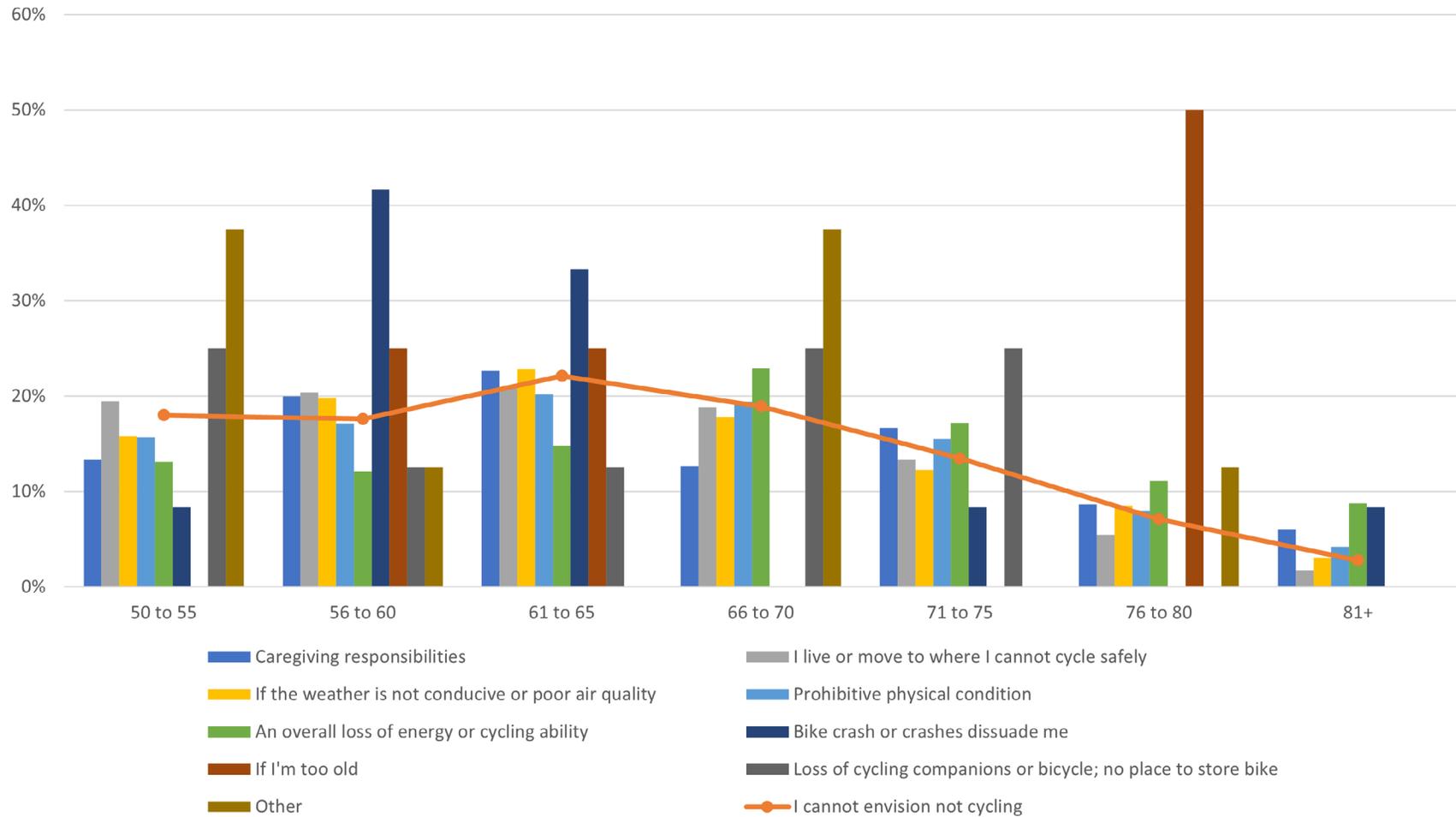
Figure 87. Reasons for Permanent Cycling Cessation by Age

9. NEAR MISSES AND FALLS

This chapter provides responses to questions about near misses and falls during the past year.

9.1 NEAR MISSES

Figure 88 shows the types of near misses older cyclists had in the past year. Of those that did, 71.1% were with a person driving a car and 48% were with another person on a bicycle. Of these, 26.7% were on a normal pedal bike and 21.3% on an e-bike. Shared pathways such as on-road bike lanes and multi-use trails see a variety of active travel such as walking and jogging where many of the near misses occurred. Note that nearly 20% of those responding did not have a near miss.
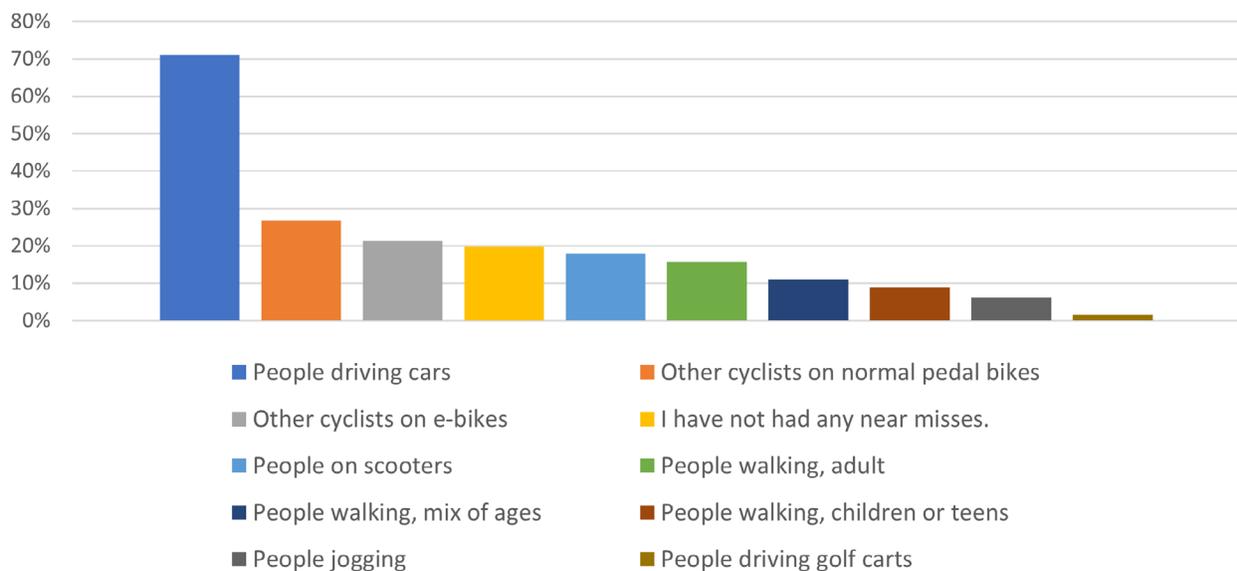
Figure 88. Past-Year Near Misses N=2674

Figure 89 compares near miss rates for regular and non-regular cyclists by gender, as well as combined. Overall, men have the higher rate of near misses, regardless of whether they are a regular or non-regular cyclist. The near miss rate for non-regular cyclists is lower than regular cyclists, perhaps because they are not out cycling as much and are more careful when they do cycle. Figure 90, repeated here from Section 3.2.2, shows that non-regular cyclists are more inclined to consider themselves to be more cautious when cycling, with higher selection rates for the three types other than *Experienced and Confident.*
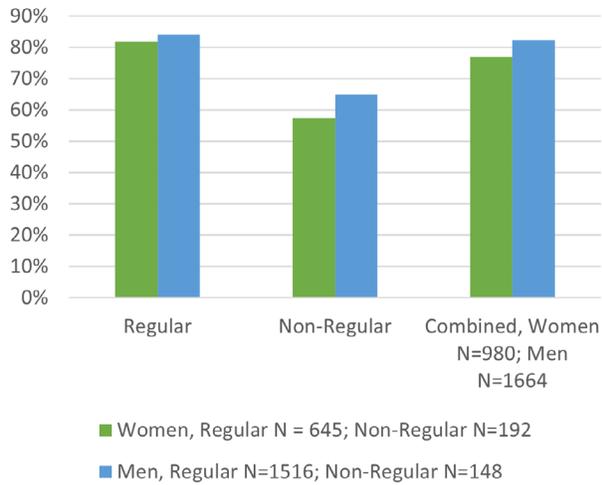
Figure 89. Past-Year Near Miss by Gender, Regular and Non-Regular Cyclist, Combined
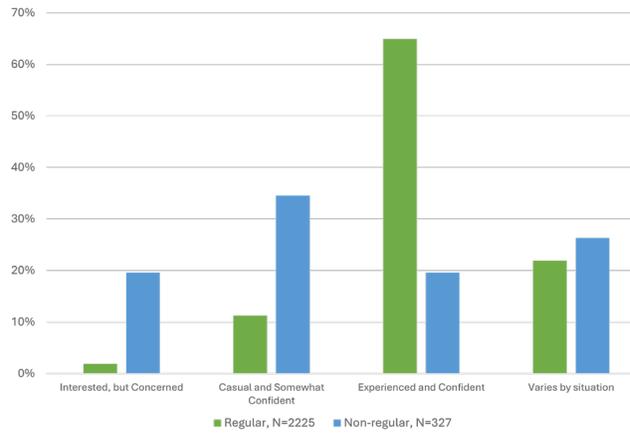
Figure 90. Type of Cyclist by Regular and Non-Regular

The higher near miss rate for men than women holds true for all for the oldest age groups, as shown in Figure 91 below. However, the rates are nearly the same for the youngest and oldest age group. As reported in the question on a past-year fall, about 20% of these near misses resulted in a fall, often caused by an avoidance maneuver.
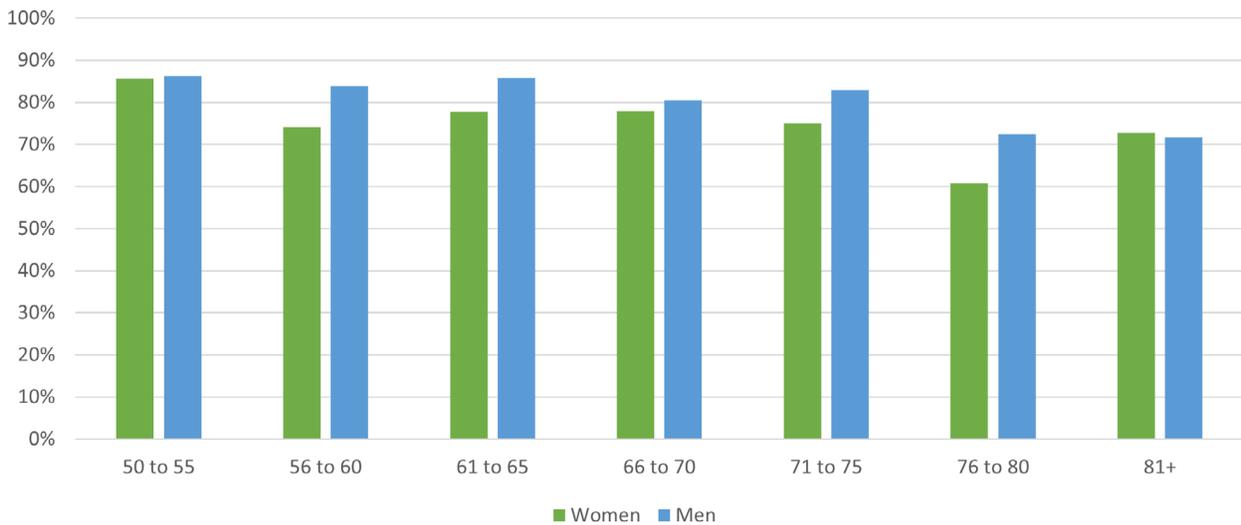
Figure 91. Near Miss Rates by Gender and Age

9.2 FALLS AND CRASHES

The survey asked respondents if they had fallen or nearly fallen in the past year. Just over 37% of those answering this question indicated they had a past-year fall. Figure 92 shows the primary factor contributing to the fall in these 903 cases.[9] The top three factors resulting in a fall are actions by the cyclist, surface conditions, and actions of others, especially people driving.
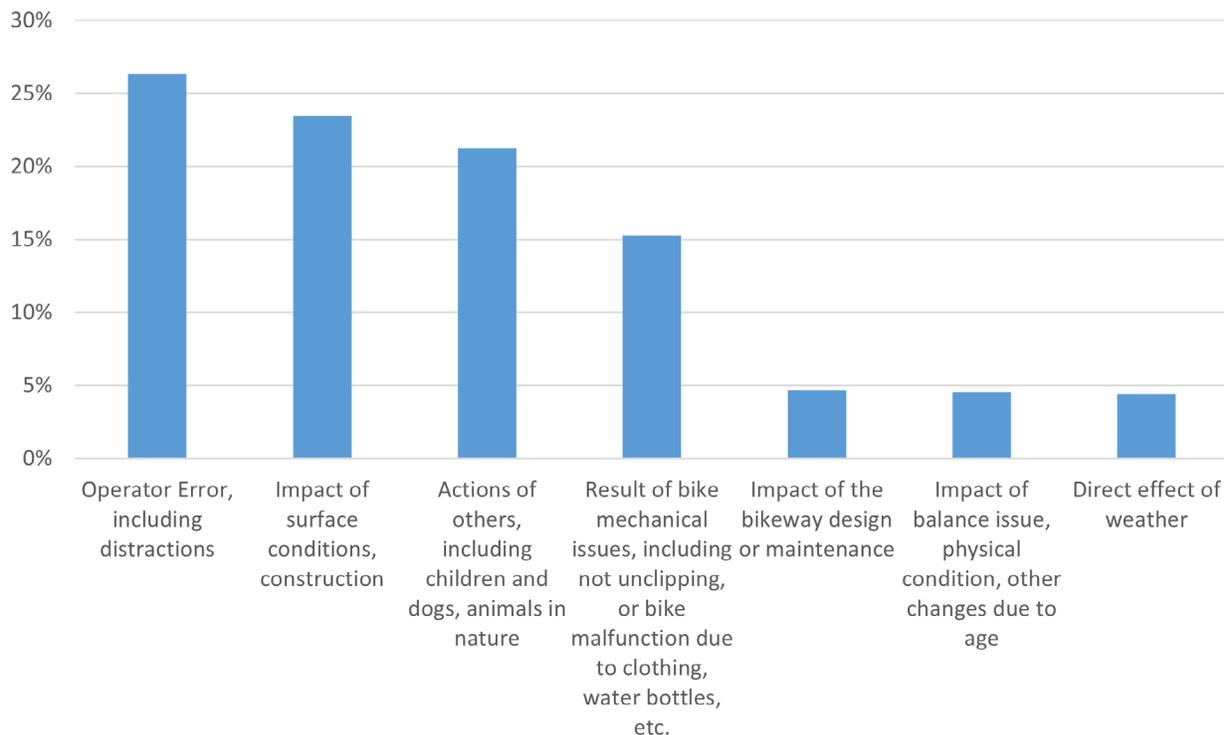
Figure 92. Primary Factor Contributing to Fall N=903

Those reporting a fall or crash described the circumstances. Descriptions include a full range of emotions from being very matter of fact, to humor, to anger or bewilderment, especially when the action of someone driving is the primary factor. The descriptions also varied from very brief, such as "Unseen pothole" (Man, aged 71 to 75) to a more detailed description of a series of events resulting in a fall: "I was in an area where curbside parking was illegal and I looked over my shoulder to a car/driver who was passing me after a near miss at an intersection. When I turned my gaze forward again, there was an illegally parked van in the bike lane and I maneuvered the bike but my shoulder plowed into the van, then I tumbled to the ground, on top of the bike, causing non-life-threatening injuries, bike was ok" (Man, aged 76 to 80).

Descriptions for each factor in Table 9 below also included common themes.

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9 The analysis of this question for the Year 3 and Year 4 report noted all circumstances contributing to each fall were included in the analysis. This year's report only uses the primary factor, which allows for a better focus on the impact of a specific factor on falls.

Table 9.   Primary Fall Factors with Common Themes or Words Used in Descriptions

Factor Description	Common themes or words
Operator Error: Fall is caused by something the cyclist did or did not do, including being distracted.	Embarrassing, not paying attention, distracted, going too fast, trying to be too clever, cycling too slowly. Two people likened their fall to something Tim Conway would do. For example, this clip from the Carol Burnett Show.
Surface condition: Fall caused by the surface condition, except for weather-related (snow, ice, wind).	Sand and gravel (especially on corners), trash and debris, unmarked speed bump or curb, potholes, cracks in pavement.
Actions of others: Falls caused by how another person's or animal's movement impacted the cyclist's path of travel.	Motorists not yielding, motorists driving too close and mirrors clipping, people on e-bikes being discourteous, off-leash dog; animals in the wild.
Bike Issues: Falls caused by mechanical failures with the bike, a poorly fitting bike, a new bike that the cyclist is not used to, an over-loaded bike, being unable to unclip, and 'Factor X' events such as clothing getting caught in a tire or gears.	Couldn't unclip in time; jacket got caught in my tire, foot got caught on panier, something broke; flat tire, bike overloaded, e-bike too heavy.
Bikeway Design or Maintenance: Cycling facilities that have design flaws such as narrow passageways, slippery bridges, uneven surfaces, poorly lit underpasses, etc. and are poorly maintained.	Placement of posts at trail entrance, 90-degree turn between two trails, narrow segments.
Physical Condition: Age-related changes such as difficulty lifting leg over a top tube, poor hearing or eyesight, recovery from a medical condition, or loss of balance.	Cannot mount a bike with a top tube; weaker due to a medical condition; off balance.
Weather: Specific weather conditions such as ice, snow, wind, or rain.	Icy patches, new snow fall, wet leaves, wind gust.

9.2.1   By age and gender

Figure 93 shows the primary factor contributing to the fall by age group. Overall, fall rates due to each primary factor do not increase with age, however, rates tend to increase for the middle age groups of 61 to 65 and 66 to 70, then begin to decrease. Additionally, the 81+ age group has a higher fall rate for the primary factor of Operator Error than other primary factors. This may be due to typical changes of age in hearing, vision, and decision-making acuity.
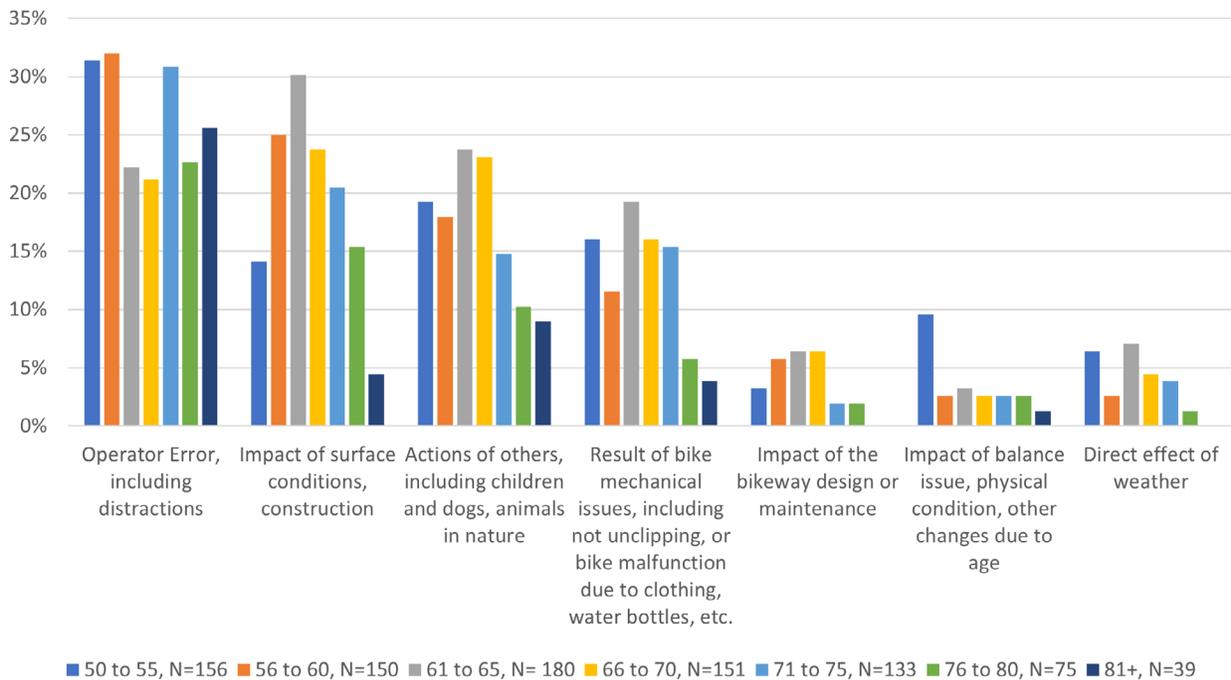
Figure 93. Primary Factor Causing Falls by Age

Adding gender to the analysis shows differences between women and men. Figure 94 shows the percentage by age group for women and men. The overall fall rate by gender on the far-right side of the chart shows women at 32.5%, which is 5% lower than the 37.6% rate for men. Fall rates for men are generally higher than for women in all age groups. The two exceptions are 66 to 70 and 81 and over where women's fall rates are about 1% higher than men's.

Figures 95 and 96 detail the primary factor causing a fall for women and men by age group. The solid line in each graph shows the overall percentage regardless of age. Women's falls peak for Operator Error, declining through the remaining factors. The fall rate for men peak at Surface Conditions, are the lowest at Impact of Bikeway Design, then rise slightly for Direct Effects of Weather. Following these two charts, Figure 97 offers a side-by-side comparison of the primary factors causing a fall by gender and age group.
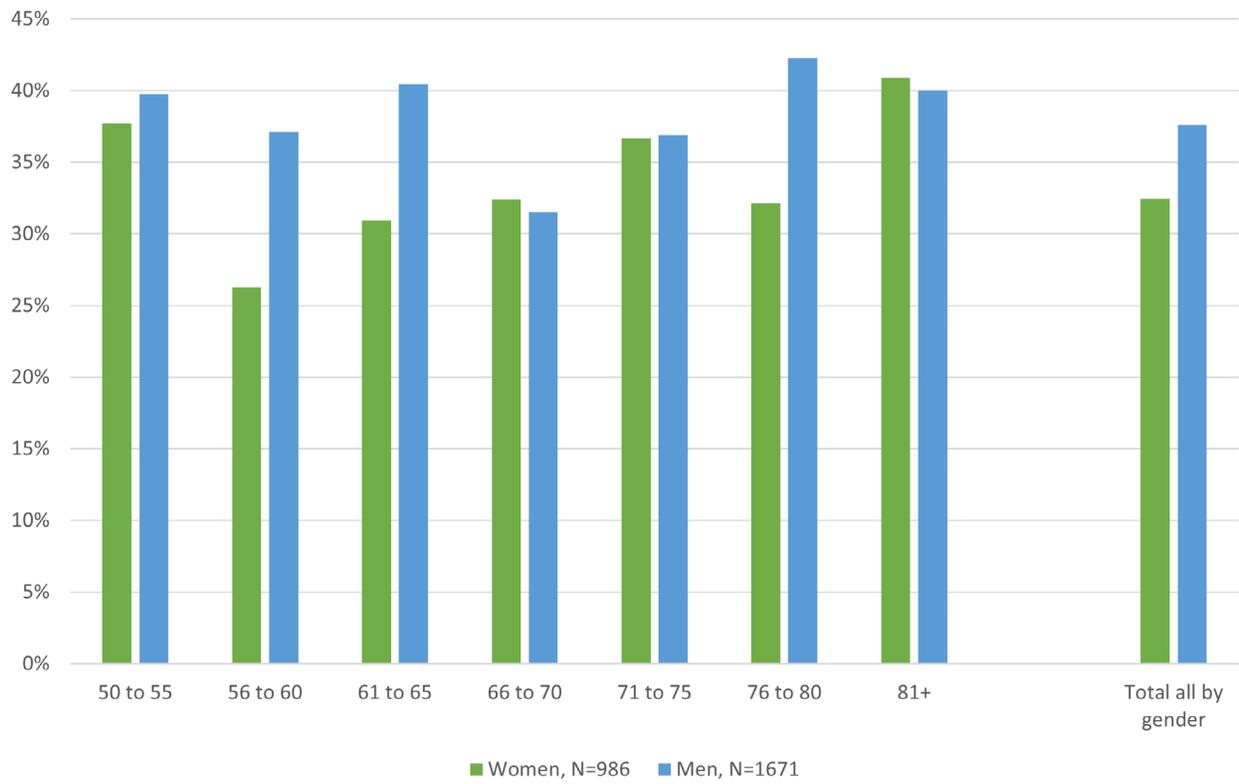
Figure 94. Past Year Falls by Gender and Age Group
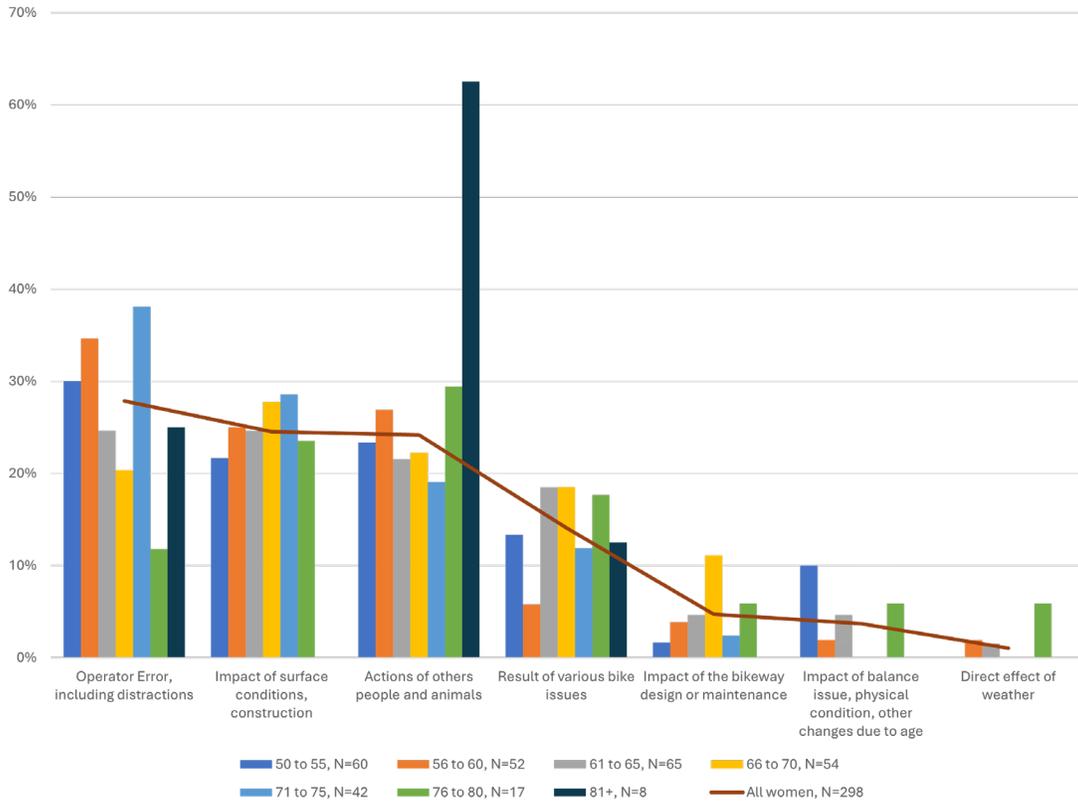
Figure 95. Primary Factor Causing Fall for Women by Age, All Women
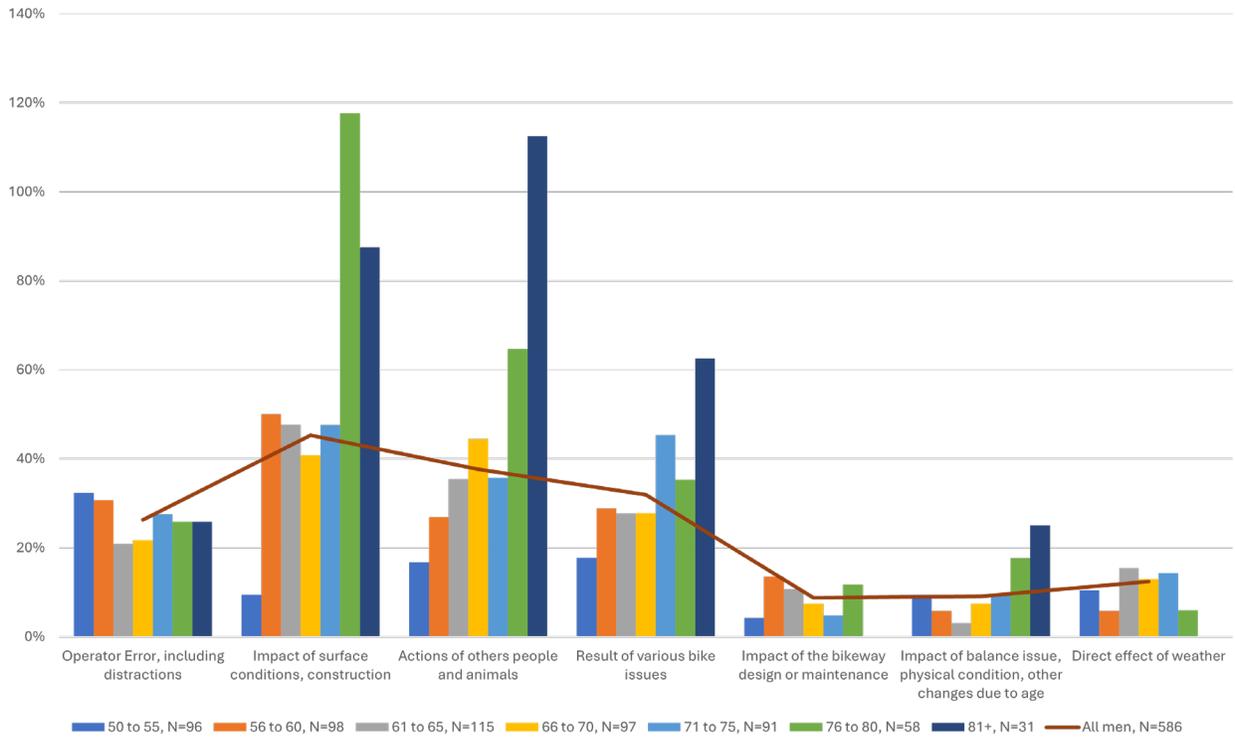
Figure 96. Primary Factor Causing Fall for Men by Age, All Men
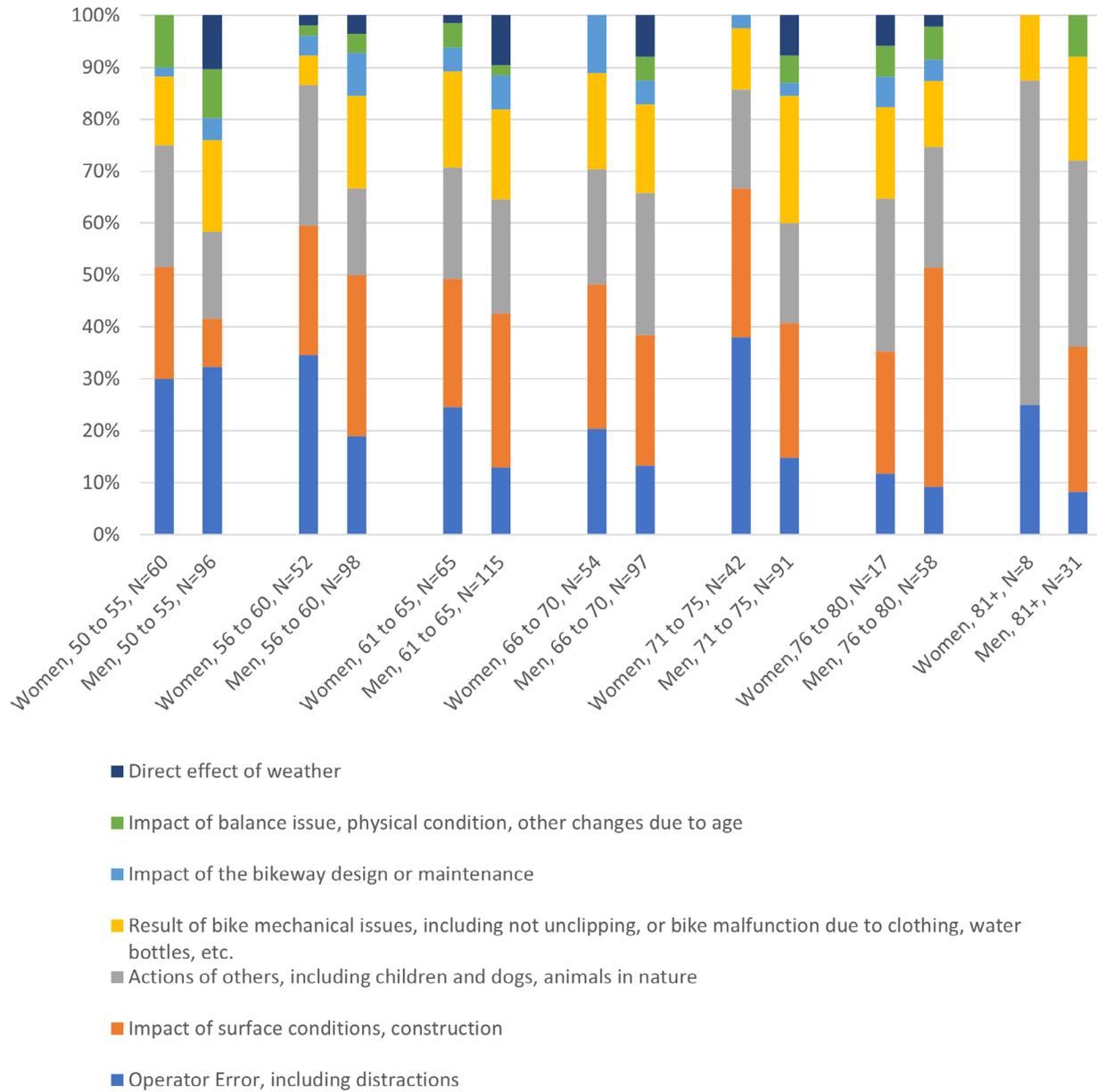
Figure 97. Side-by-Side Comparison of Primary Factor Causing Fall by Gender and Age

Another way to look at age-based differences is shown in Figure 98. This chart assumes the 50 to 55 age group as a base line and calculates differences by each successive age group and category, regardless of gender.
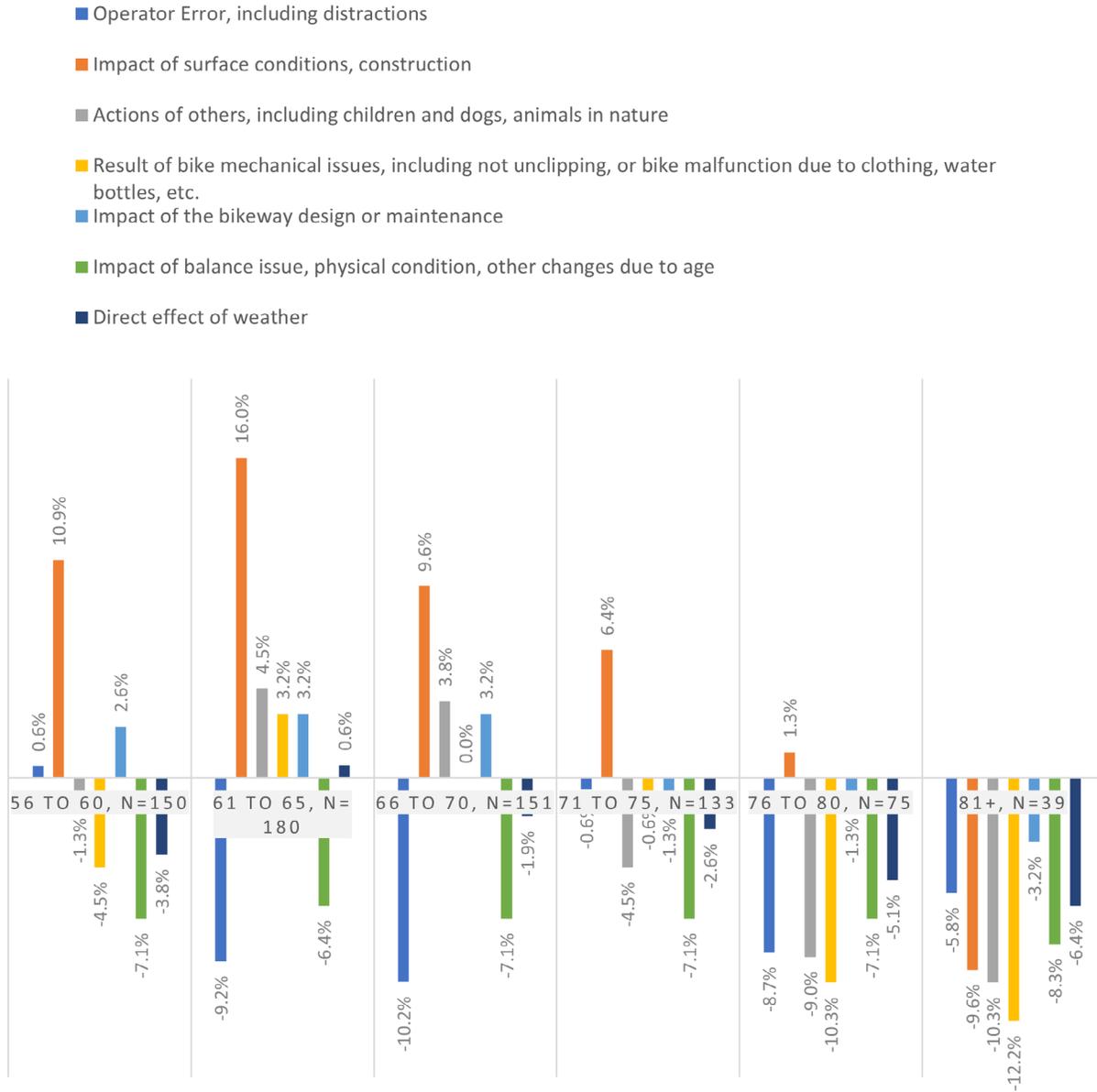
Figure 98. Changes in Primary Factor Causing Fall from 50 to 55 Base Age Group

9.2.2 Fall and Crash Experiences: A closer look

Regardless, the descriptions provide insights into the lived experience of older cyclists. Table 10 offers examples of these fall experiences. They are organized according to the primary factor causing the fall and include the cyclist's gender and age, and Residential Area-Type.

Table 10. Example Fall Descriptions by Primary Factor

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Operator Error	
Woman, Aged 50 to 55 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Overwhelming social stress.
Woman, Aged 50 to 55 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Very low speed navigating a walkway through a traffic island, hesitating while watching approaching traffic, and the "you go, no you go" dance.
Woman, Aged 50 to 55 ResAT: Suburban area, mostly residential.	I've had two falls in the past year - both while riding for recreation. In both situations, I made mistakes while riding that caused me to fall.
Man, Aged 50 to 55 ResAT: Rural area.	Occasionally I have nearly fallen if I have had to stop suddenly or swerve to avoid something or if I don't get my foot correctly on the pedal when starting up.
Woman, Aged 56 to 60 ResAT: In-town in a mostly residential area.	Lack of focus to look elsewhere caused me to leave the pavement into coarse, loose rock.
Man, Aged 56 to 60 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I was in a crowded parking lot and decided to jump up on a near-by sidewalk. But I did not navigate well and ran into a concrete post.
Man, Aged 56 to 60 ResAT: Suburban area, mostly residential.	I was stupid & overconfident and took a turn too fast, ran off the edge of the trail pavement. I stayed upright with no body/bike damage, but scared the crap out of myself.
Woman, Aged 61 to 65 ResAT: In-town in a mostly residential area.	My fault. I misjudged the distance between car mirrors of a parked car and of a car stopped at a red light. I nicked both mirrors and partially dropped my bicycle
Man, Aged 61 to 65 ResAT: In-town in a mostly residential area.	I drifted off a paved trail into loose soil without being aware of it.
Man, Aged 61 to 65 ResAT: Small town or village.	I didn't notice a patch of gravel because I was too focused on watching a bird. Wiped out, bent derailleur hanger
Man, Aged 66 to 70 ResAT: In-town in a mostly residential area.	Urban riding in a shopping center, came off a curb poorly and went down sideways. No injury.
Woman, Aged 71 to 75 ResAT: Rural area	Stupidity.
Man, Aged 71 to 75 ResAT: Small town or village.	Lost momentum going uphill.

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Man, Aged 71 to 75 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Lack of attention on the bike trail. Ran in a limb that was blown over the trail.
Man, Aged 76 to 80 ResAT: Suburban area, mostly residential.	My brain being scared.
Man, Aged 76 to 80 ResAT: Suburban area, mostly residential.	I was cycle-touring with a heavily loaded bike and was trying to navigate a tight space at an intersection with pedestrians and other cyclists and lost my balance while using clipless pedals.
Woman, Aged 81 and older ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I was thinking more about cappuccino than getting over a speed bump safely - loss of concentration while riding one-handed in a parking lot. D'oh!
Man, Aged 81 and older ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	While riding up a steep hill I touched the rear wheel of another cyclist, lost control, and fell into a wall---all very slowly.

Surface Condition

Woman, Aged 50 to 55 ResAT: Suburban area, mostly residential.	Road conditions. There was a huge crack in the pavement.
Woman, Aged 50 to 55 ResAT: In-town in a mostly residential area.	I was practicing sharp turns. I hit a bad patch of gravel.
Man, Aged 50 to 55 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Got front tire caught in a curved groove.
Man, Aged 56 to 60 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	The roadbed had a crevice that my tire entered and stuck causing me to go over the handlebars.
Woman, Aged 61 to 65 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	Bumpy roads with lots of potholes in asphalt.
Man, Aged 61 to 65 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	I braked for a pedestrian, and I was braking on slippery leaves; it was the slippery leaves that caused the fall. The pedestrian was not close to me; it was not an emergency brake, just slowing down on a slippery surface.

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Woman, Aged 66 to 70 ResAT: In-town in a mostly residential area.	Only fell once last February. I was riding on the Monterey Bay Coastal trail from the north part of Monterey City to Asilomar Beach and when I was making a U-turn the back tire started to slide out, which did not bother me much until a split second later when my front tire slid out and I went down on my side so quickly that I did not even have a chance to take my hands off the handle bars. It had rained a little the days before the fall and the wind had blown a lot of sand on the road which definitely contributed to the lack of friction as I was turning around. I had the wind knocked out of me and bruised my ribs but was still able to ride the 7 miles back to where I started.
Man, Aged 66 to 70 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Buildup of sand on the roadway where I was turning caused me to lose my front wheel.
Woman, Aged 71 to 75 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Near my gym on P St, a three-foot asphalt slab was installed. I didn't see it in time to avoid it and only avoided injury because I instinctively stood up and managed to roll over it. A painted demarcation or better streetlight positioning would have helped. Most cyclists, particularly novices, would have crashed into traffic.
Man, Aged 71 to 75 ResAT: In-town in a mostly residential area.	Hit a pothole on the road.
Woman, Aged 76 to 80 ResAT: In-town in a mostly residential area.	Cycling down a slope with debris.
Man, Aged 76 to 80 In-town with a mix of single and multi-family homes, offices, shops, etc.	Poor infrastructure - path had a sharp turn and the ground beside the pavement was lower on the inside turn and caught my tire.
Man, Aged 81 and older ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I hit a pothole and lost control of the bicycle at low speed.
Man, Aged 81 and older ResAT: Rural area.	I slipped on some wet leaves while cornering.

Action of Others

Woman, Aged 56 to 60 ResAT: In-town in a mostly residential area.	Side swiped by another cyclist.
Woman, Aged 56 to 60 ResAT: Suburban area, mostly residential.	SUV turned right suddenly into the bike lane. The traffic lights were timed so everyone was speeding to make the lights, and the SUV turned where there was a street but no traffic light. I braked to avoid being hit and I went over my handlebars and fractured my hand, which needed two surgeries to repair. The SUV stopped after I fell in the street but then drove off.
Woman, Aged 66 to 70 ResAT: In-town, mostly residential	A groundhog ran in front of me, while I was in a high gear going downhill at a high speed.
Woman, Aged 71 to 75 ResAT: Small town or village	Group riding; following behind someone on an e-bike who slowed down suddenly when going around onto a change if surface I caught an edge and went down. I use caution now when riding with e-bikes as they seem to be less predictable and have less saddle experience.

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Woman, Aged 81 and older ResAT: Suburban area, mostly residential.	Driver road range, he drove me into a parked car.
Man, Aged 50 to 55 ResAT: In-town, mostly residential	I saw a young boy collecting berries from the median on 34th Ave that I knew to be poisonous. His mother was with another child some yards behind and I swerved to alert him not to sample the berries because they were dangerous and an e-bike nearly killed the two of us by going between us at a very high speed. It was a chilling experience and one I hope never to have again. Definitely discouraged me from biking on this road, which I live on, because of the speeding e-bikes.
Man, Aged 61 to 65 ReAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Several near misses involving cyclists on Class 2 (fast) e-bikes going the wrong way in a bike lane or unexpectedly entering the bike lane going the wrong way. Also, one instance of being overtaken at speed by a motorbike on a bridge bike lane. (The Dumbarton).
Man, Aged 66 to 70 ResAT: Rural area	Vehicle so close to me I became fearful and I felt unbalanced.
Man, Aged 71 to 75 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	No bike path, car coming up behind me too fast, I tried to quickly exit onto sidewalk and my tire bumped up against the curb, I lost my balance and crashed, knocking myself unconscious and requiring stitches in my face.
Man, Aged 76 to 80 ResAT: In-town in a mostly residential area.	e-Bikes and scooters in bike lanes being unsafe / too fast.
Man, Aged 81 and older ResAT: Suburban area with a mix of residential, businesses, shops, etc.	A pedestrian jumped in front of me when I rang my bell. This happened in a dedicated bike lane.

Various Bike Issues

Woman, Aged 50 to 55 ResAT: In-town in a mostly residential area.	Front flip caused by under seat bag sticking in rear tire over a jump
Man, Aged 50 to 55 ResAT: Suburban area, mostly residential.	A cyclist in front of me rode over a stick on the tarmac, it flipped, and when I passed by it got stuck between my front wheel and the fork, locking it right away. I landed headfirst on the pavement, broke 6 t-vertebrae.
Woman, Aged 56 to 60 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	My husband put my seat on my bike. It was way too high. I didn't notice. When I took off on my bike and tried to sit on the seat, it was impossible. I lost I balance and tipped over. I got some bruises and abrasions. Thankfully nothing serious. I felt silly though!
Man, Aged 56 to 60 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Because I was carrying too heavy backpack.
Woman, Aged 61 to 65 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Chain derailed on a hill and I could not unclip from pedals quickly enough. I no longer clip in. I went into a blind curve and slid on wet silty sand. I rolled with the fall.

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Man, Aged 61 to 65	I was stopped and when the light changed, I started to cross the intersection, when someone in a car started to turn to where I was headed, so I had to stop and it made me have to step off my heavy e-bike. I wanted a shorter and lighter e-bike after that.
Woman, Aged 66 to 70 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I nearly fell while riding in a paceline and I rubbed tires with the rider in front of me after he had to immediately brake when another rider's jacket flew out of his pocket onto the roadway in front of him.
Man, Aged 66 to 70 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I was riding an unfamiliar bike using toe cages and couldn't get my feet out fast enough.
Man, Aged 66 to 70 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Shorts caught on seat
Woman, Aged 71 to 75 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	My front light came off, hit the front wheel and caused the bike to swerve. I almost recovered, but not quite
Man, Aged 71 to 75 ResAT: In-town in a mostly residential area.	This is embarrassing, but I hadn't lubed my clipless pedals in quite a while, and one finally failed to release quickly enough to avoid tipping over. Against a chain link fence. In front of dozens of other cyclists. Perfect. :/
Woman, Aged 76 to 80 ResAT: Small town or village.	Slow motion fall while stopped, clothes got tangled in bike. Quick fall, slipped on wet leaves while turning.
Man, Aged 76 to 80 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Heavy e-bike pulled me over while I was dismounting.
Man, Aged 81 and older ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	My hub failed, I wasn't expecting it and couldn't unclip in time. I just fell over and was bruised but was unhurt.

Bikeway Design

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Woman, Aged 50 to 55 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Sharp turn on a narrow trail.
Man, Aged 50 to 55 ResAT: Rural area	I was riding in a group and none of the people in front of me called out the post which I then hit. The post was on a bike trail in an unexpected location (not where the trail crosses a road).
Man, Aged 56 to 60 ResAT: In-town in a mostly residential area.	Muddy trail and front tire slide out, tunnel on gap didn't turn on automatic lights when I entered and I rode off to the side into lose (*sic*) gravel.

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Woman, Aged 61 to 65 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	A 180-degree turn from 1 trail to another with 2 posts placed in an awkward position partially blocking the access to the connecting trail.
Man, Aged 61 to 65 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	Skidded on a bike path where a post had been knocked out leaving a pothole & gravelly surface.
Woman, Aged 66 to 70 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	Coming over a rise on a biking trail, there was center of path (no motor vehicles) pole lying in the path in the down position. There was also a narrow path adjustment and multiple signs as the path approached a crossroad. Both tires guided on the down pole and caused me to stop violently at 10-12 MPH.
Woman, Aged 66 to 70 ResAT: Small town or village	Misinformation on the roads.
Man, 71 to 75 ResAT: Suburban area, mostly residential.	Uneven multi-use pathway.
Man, Aged 76 to 80 ResAT: In-town in a mostly residential area.	I was on a multi-use trail and there was a blind corner. As I slowly proceeded, a car came around the corner, and I had to stop abruptly and fell.
Man, Aged 76 to 80 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I almost fell when my bicycle hit uneven pavement in the bicycle lane.

Physical Limitations

Woman, Aged 50 to 55 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	Hips less flexible and caught my foot flinging over on pannier. I am now far more careful.
Man, Aged 56 to 60 ResAT: In-town in a mostly residential area.	Bad knee caused weakness, problem has been solved.
Woman, Aged 61 to 65 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	I fall most often when I slow down to carefully navigate an obstacle. I think of myself like Tim Conway, I seem to fall in stages, very slowly and have been able to roll so as not to have any injuries except for a few scrapes and scratches.
Man, Aged 71 to 75 ResAT: Small town or village.	My inability to maintain balance with bike that had a bar when stopped. .... Solution: purchase a step through e bike! NO MORE FALLS!! Am LOVING the Trek Verve 4+!
Man, Aged 76 to 80 ResAT: In-town with a mix of single and multi-family homes, offices, shops, etc.	It's getting more difficult for me to kick my leg up & over the top tube to get on & off the bike, and one time I was trying to & my foot got stuck in the toe clips, and I went over.

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Man, Aged 76 to 89 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	Last year, I lost my balance coming to a stop. Two years ago, I had neck pain when cycling. My therapist recommended changing the shape of my handlebars That affected my balance. I have since changed back.
Man, Aged 81 and older ResAT: Suburban area with a mix of residential, businesses, shops, etc.	Late February, ice on the sidewalk near a stoplight. I slowed down so much that I lost my balance and fell. Fell - think like Tim Conway pretending to be a senior citizen I fell slowly in stages. No physical injuries but my pride was hurt.

Direct impact of Weather

Gender and age of cyclist Residential Area Type (ResAT)	Fall description by Primary Factor (all are quotes from survey responses)
Woman, Aged 61 to 65 ResAT: Rural area	Wind gust and hand position
Man, Aged 50 to 55 ResAT: Suburban area, mostly residential.	I was biking to work on my studded snow tires the morning after a 4" snowfall. It was a new route and I couldn't see the trail. I inadvertently rode off the trail onto a sloped section of grass. No injury.
Man, Aged 61 to 65 ResAT: Suburban area, mostly residential.	A pothole filled with water, invisible on a rainy day
Man, Aged 66 to 70 ResAT: Suburban area with a mix of residential, businesses, shops, etc.	Wind - I got blown over by wind.
Man, Aged 71 to 75 ResAT: Suburban area, mostly residential.	Slippery surface after rain on a paved trail with mud and puddles.

10. SUMMARY AND CONCLUSIONS: THINGS WE CAN LEARN THROUGH FURTHER STUDY & THINGS TO SHARE

The analysis provided in this report demonstrates a propensity for older adults to cycle as they age through the last decades of their lives. Some choose to cease cycling; others find ways to continue. Data provided from the Year 5 survey offers many opportunities for analysis and study, as well as things to act on and things to share. A description of these topics is provided here with the intent of inspiring subsequent study, action, and sharing.

10.1 IMPACT OF SOCIAL OR CULTURAL PRESSURE OR STEREOTYPES

All survey respondents currently cycle, but there may be some older adults who stopped cycling due to pressure from family and friends, or even themselves. The push to stop cycling typically comes from a concern about the older adult's ability to cycle safely (i.e., not to fall and injure themselves) and from a concern about falls and crashes with people driving, walking, and cycling in the same space. Even within the age span of 50 and older covered by the survey, there are hints of stereotypes about older adults who do not pay attention (i.e., lack of situational awareness). Here are some examples cited in the description of a fall:

- Another cyclist swerved into me while trying successfully to miss an *elderly man* walking his dog on a bike path with a leash extended longer than 6' (Non-binary, aged 50 to 55)

- Pedaling up hill on a paved trail past an *older gentleman* walking dogs and not paying attention to his surroundings. I had to swing wide to avoid hitting a dog, went off the edge of the trail, and lost control of the bike. (Man, 56 to 60)

- In my county, the bike path has gates on each side of the vehicle road when it intersects with the path requiring all cyclists/bikers to pedal in between the gates to continue onto bike path. *Older people* stopped directly after gate providing nowhere for me to go just after the gates. Almost tipped over injured myself trying to suddenly stop (Man 50 to 55)

Some older cyclists expressed significant concern and fear about continuing to cycle. One fall by a man aged 76 to 80 occurred because "My brain was being scare*d*." Others cycle less often or for shorter distances because they do not feel safe (See Figure 70).

The Year 5 survey included a couple of answer options for the follow-up question about a past pause in cycling of at least a year that suggest cultural reasons such as *getting a driver's license* and *social pressure*. But the survey did not include questions specific to social pressure as an older adult. This issue is related to driving cessation, which can be explored further, building on some initial work we completed in early 2023 that compares driving and cycling adaptations as people age: <u>Ageing and Mobility: A Look at How Ageing Impacts Driving and Cycling</u>.[10]

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10 See this article on the dblTilde CORE website: https://dbltildecore.org/wp-content/uploads/2023/05/Project-2157.3-Ageing-Mobility-4.13.pdf

10.2   IMPACT OF CAREGIVING ON CYCLING RATES

Caregiving responsibilities affected a number of people who completed the survey. Family caregiving when raising small children resulted in a pause in cycling. As children got older or moved out of the house, cycling resumed. A similar cycle was noted for older adults who had caregiving responsibilities for older parents or a life partner. Cycling rates decreased or paused because of these responsibilities, only to increase or resume when the person being cared for died, recovered from their illness, or the caregiver purchased an adaptive bicycle so they could cycle together.

Research on the need for carers and the effects of caregiving on family members has increased recently. Older age affecting the parents or spouses of well-known actors such as Bradley Cooper and Bruce Willis have helped bring into public view the issue. Bradley Cooper's documentary on PBS covers the broad range of topics and ages around caregiving, while Emma Hemming Willis' book shares the very personal and difficult decision about how to best care for a loved one.

This phenomenon is worthy of further research, as the benefits of cycling are lost when older adults reduce or stop cycling. Perhaps a series of focus groups for older adults whose cycling has been affected by caregiving needs could help identify specific ways to keep the caregiving partner cycling. For example, I attend a monthly caregiving support group; perhaps something such as a caregivers' cycling group could be formed. This would provide someone to ride with, create more social connections, and provide an outlet to discuss caregiving experiences. Other possibilities include a program to purchase an adaptive bicycle so that the couples can cycle together or to start a Cycling Without Age program to serve both the cyclist's loved one and other.

10.3   ENCOURAGEMENT AND RE-ENGAGEMENT

Some people give up on cycling as they age because they cannot determine how to continue or to get started, especially if they have not cycled for a long time. Safety concerns are a strong motivator to avoid cycling; the lack of support or encouragement is another. Family and friends who cycle can help, as can bike shops and local programs. CalBike published this blog post based on the 50+ Cycling Survey that captures various aspects of cycling for older adults. (Photo from the CalBike blog)

Consider starting by having a conversation with the person to understand why they are interested and what is of concern. There are various ways to satisfy a desire to cycle and mitigate a concern.

- Find the right bicycle. As the results from the survey show, there are many types of bikes. Considering which bicycle fits the person and their goals for cycling is the key. Trek University trains people working in their bicycle stores to have a conversation with a prospective buyer about the types of cycling they want to do, their experience, where they expect to ride, and so forth. Then, the salesperson 'connects the dots' and recommends a bicycle or two for the person to test ride.

- Find the right place to bike. Maybe start with a calm neighborhood street or parking lot, then try a trail.

- Find the right time to bike. If the desire is to avoid lots of traffic, whether it be people walking and jogging or others cycling, find a time of day with fewer people out. Designate a time of day or day of week to cycle.

- Find someone to ride with. Friends and family may be good cycling companions. This <u>list of questions</u> offered to encourage friends and family to cycle is a good resource.

There are also local programs to join. Some health departments or departments of aging have cycling programs that teach cycling, offer refresher courses, or simply offer group rides. For example, Howard County, Maryland's Department of Aging and Independence offers <u>Cycle 2 Health</u>. Cambridge, Massachusetts' Council on Aging offers classes to learn or re-learn cycling called <u>Pedal Power</u>.

10.4   IMPACT OF AGE OR INJURY, CHRONIC CONDITION, AND AVOIDING CESSATION

An injury or a chronic condition such as osteoporosis can affect someone's desire and ability to continue cycling. Several people responding to the survey offered their challenges and successes. Table 11 below offers six examples. For each person, we captured their fall description, age and gender; if they are a regular or non-regular cyclist; if they indicated that the fall affected past-year cycling decreases; and if they could envision a time when they would not cycle. It may be more likely that people in younger age groups will continue cycling after recovering from a serious fall, but responses show that some older cyclists also continue cycling.

Table 11. Falls Related to Other Features

Fall description	Gender and age	Regular or Non-regular Cyclist	Past-year change in cycling, especially decrease due to crash	Envision not cycling?
A woman failed to obey traffic laws. She did not yield to oncoming traffic and darted across the road and hit me (the cyclist) while riding in the bike lane. Bike was totaled. I broke 9 ribs, collapsed lung, concussion, AC joint separation etc.	Woman, Aged 50 to 55	Non-regular	Did not result in cycling decrease	Cannot envision not cycling
I cut close to a median and was going about 25 mph when I hit silt from the asphalt while making a left turn. Broken collar bone and cracked ribs. Tire blew out and broke my helmet.	Woman, Aged 50 to 55	Regular	Did not result in cycling decrease	Can envision not cycling for various reasons, including physical condition that makes riding difficult or impossible.
A cyclist in front of me rode over a stick on the tarmac, it flipped, and when I passed by it got stuck between my front wheel and the fork, locking it right away. I landed headfirst on the pavement, broke 6 t-vertebrae.	Man, Aged 50 to 55	Regular	Health reasons affected cycling decrease	A physical condition that made riding difficult or impossible.
It's taken some time to regain my strength and agility after being seriously injured by a car. Getting on and off the bike was somewhat difficult for a while	Woman, Aged 56 to 60	Regular	Did not affect cycling decrease	Can envision not cycling for various reasons, including physical condition that makes riding difficult or impossible.
Slow speed after a turn, looking back at a farm that a cycling friend was pointing at. Jackknifed the bike, fell immediately and broke my hip. Was back riding in 6 weeks.	Man, Aged 71 to 75	Regular	Did not result in cycling decrease	Cannot envision a time without cycling
While mountain biking in February, front wheel slipped out on a muddy side slope. The fall broke my arm and healed fine. I'm in physical therapy and making good recovery.	Man, Aged 71 to 75	Regular	Did not result in cycling decrease	Cannot envision a time without cycling
I was riding down a trail and there was a corner and the weeds had grown too tall, and I could not see a jump that was built into the trail and it launched me off of the trail and down the hill. I broke a rib was out for 6 weeks.	Man, Aged 76 to 80	Regular	Did not affect cycling decrease	Can envision not cycling for various reasons, including physical condition that makes riding difficult or impossible.

Simon Cook at Birmingham City University is doing work on crash recovery. His work uses narrative interviews to understand people's stories and practices after a crash. The older cyclists he interviewed offer an understanding of why they did, did not, or are trying to return to cycling after a crash resulting in an injury. These reflections include:

- The increased difficulty of physically rehabilitating when older and its impact on the desire, duration, and benefits of returning to cycling.

- The natural lifespan of cycling practices and the lack of value in returning to cycling (and/or investing in a new bike) after a collision in older age.

- The changing role of cycling in retirement means it can become more or less important in someone's life and affect their interest in returning to cycling after a collision.

- Awareness of what impact a collision in the future may mean for their cycling practices.

A report on Cook's post-collision study is available online at: https://www.open-access.bcu.ac.uk/12850/7/Post-collision%20cycling%20report.pdf

10.5   OSTEOPOROSIS AND CYCLING

Some who reported a past-year cycling decrease said it was because they switched to another sport, especially to increase bone density as part of mitigating osteoporosis. While cycling has overall benefits for fitness and mental health, [s]*tudies on the relationship between cycling and bone density have shown mixed results. Most research suggests that cycling may not provide significant benefits to bone health, as it is a non-weight-bearing activity (*Andersen, 2018*; *Olmedillas, 2012*). However, these studies have primarily focused on professional cyclists. Other studies have found that cycling may lead to modest improvements in bone density when combined with weight-bearing activities for people who do not exercise regularly (*Peterson, 2017*). But ultimately, this evidence is not conclusive.*[11]

Cycling can remain a part of an older adult's physical activity lifestyle by alternating a day of cycling with a day of weight-bearing activity. In doing so, older adults should do things that promote bone density in both the lower part of the body such as hiking and stair-climbing, and the upper part of the body such as planks, push-ups, weights, and resistance bands.[12]

10.6   DESIGN GUIDELINES AND MAINTENANCE STANDARDS

The near miss and fall descriptions provide examples of where design and maintenance guidelines and standards can be improved. Planners, engineers, and maintenance staff in many jurisdictions have experience designing and operating bikeways that reduce fall or crash risks. Examples of these should be shared more broadly with staff and policy makers in other jurisdictions to bring these business practices to more communities, especially in areas where older adults cycle. For example, the amount of cycling infrastructure serving older adult communities varies by jurisdictions and by developer goals. See a recent study of ten older adult communities in California for more information.[13]

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11 https://www.getwellen.com/well-guide/cycling-and-osteoporosis
12 IBID
13 https://scholarworks.sjsu.edu/mti_publications/452/

In addition, the federal Bipartisan Infrastructure Law (2021) made many positive changes to the Transportation Alternatives Program (TAP), including a new requirement that states define high-need communities and prioritize them in TAP project selection. Older adults are included in the criteria for defining high-need, increasing the potential to fund projects benefitting cycling infrastructure used by older adults. In September 2025, the Federal Highway Administration (FHWA) published a series of fact sheets on the TAP funding guidelines, but they do not specifically mention high-need.[14] Information on what travelers are considered high-need is found within the Safe Routes Partnership publication, *Defining and Prioritizing High-Need Communities in the Transportation Alternative Program.*[15] with respect to high-need, including a compilation of how states defined and prioritized high-need communities prior to the 2021 law. Updating this information and tracking how well TAP's high-need objectives are met is a worthwhile research effort.

Tables 12 and 13 provide examples of the types of problematic design and maintenance experienced by those responding to the survey.

Table 12. Fall Descriptions Indicating a Design Need

Fall description (all are quotes from survey responses)	Design
A 180-degree turn from one trail to another with 2 posts placed in an awkward position partially blocking the access to the connecting trail.	Reduce the number of sharp turns or replace them with a Z-gate that forces cyclists to slow or dismount. This is perhaps an option that is safer for older cyclists.
Example of fall caused by bollards: • Fell when unsuccessfully passing between 2 bollards narrowly spaced to prevent cars from accessing pedestrian/cycling path. My handlebar caught on one of the bollards.	Bollards (also known as posts) at trail entrances are used to keep motorists from driving onto the trail and to slow cyclists as they cross or enter a roadway. However, as the cycling survey shows, cyclists, including older cyclists do crash into bollards for a variety of reasons. The Farmington Valley Trails Council offers this information about the hazards of bollards and their preferred placement and design. This article from Walk Bike Cupertino lays out the pros and cons. There may be a better solution such as a speed hump sized to make people in a motor vehicle aware and that is comfortable for people to cycle on. While these are typically used for traffic calming, they may be adaptable for trail entrances. See the design guidance offered by NACTO.

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14 https://www.fhwa.dot.gov/infrastructure-investment-and-jobs-act/ta.cfm
15 https://saferoutespartnership.org/wp-content/uploads/2022/10/Defining-and-Prioritizing-High-Need-Communities-in-TAP-FINAL.pdf

Fall description (all are quotes from survey responses)	Design
Example of fall caused by poor bikeway maintenance and design: • I almost fell when my bicycle hit uneven pavement in the bicycle lane. • Turning an uneven 180-degree corner. • Uneven multi-use pathway • uneven Pavement in a transition leading to a bike dedicated Lane • Biking on a rough trail, but an uneven sandy spot, lost velocity, and just flopped over. • I stopped in a spot where the ground was uneven and just couldn't stabilize • Misjudged pavement/ground which was uneven. • Stopping on an uneven surface. • Uneven pavement on a bike path (pavement sloping down into grassy shoulder needs some maintenance • Uneven road • Uneven terrain on multi-use trail • Was standing on uneven surface with one foot clipped into pedal and lost balance • I almost fell when my bicycle hit uneven pavement in the bicycle lane. • Stopping on uneven trail. Ankle turned and lost balance. No significant physical injury, just my pride was wounded! • Turning an uneven 180-degree corner. • Uneven multi-use pathway Example of fall caused by potholes: • a pothole filled with water, invisible on a rainy day • A poor road with potholes and loose gravel. • Bad pothole in street • Bumpy road with lots of potholes in asphalt • ….I slipped sideways and fell. The road was small and rural and had potholes and a shaggy edge… • Flat tire. Hit a pothole and fell. • Gravel road with potholes. • Hit a pothole • Hit a pothole in the road • Hit a pothole • Hit a pothole • I hit a pothole and lost control of the bicycle at low speed. • I nearly fell when I swerved too quickly to make sure I was out of traffic, and I didn't see that there was a giant pothole near the curb. • Pothole • Pothole • Trying to avoid a pothole • unmarked pothole • Unseen pothole • Skidded on a bike path where a post had been knocked out leaving a pothole & gravelly surface.	The pavement for bicycle lanes on existing roads and on trails needs to be smooth with no uneven spots or large potholes. Nearly 20 reported falls point to a pothole as the cause.

Fall description (all are quotes from survey responses)	Design
I was on a multi-use trail and there was a blind corner. As I slowly proceeded, a car came around the corner, and I had to stop abruptly and fell.	Reduce the number of blind turns and likelihood of crashes by designing out blind turns, including mirrors, or installing vertical separation to establish two-way cycling lanes. Photo is example of limited sight lines and tight turns.
I was pedaling up a hill and had to take a near 180-degree turn onto a bike path with a short (confined) landing area/ space. Instead of stopping or slowing down, I attempted to retain the existing upward momentum and make the tight turn. I turned too sharply and tipped over in the direction that I had been turning.	
I was riding a path next to a parcel that was under construction. A fence had been constructed next to the path to protect the construction site. There was a short detour with a ramp that was difficult to see at night (even though I was well lit). While trying to navigate the narrow ramp I didn't notice that the fence was leaning into the path. My handlebar got caught, and that caused me to fall over.	Include a shy space in the bikeway design to the right of the bicycle pathway. NACTO offers this guidance on managing bikeways within a construction zone.
I fell on a short steep approach to a Rails to Trails trail. I wasn't paying attention to the steepness of the approach and didn't have enough momentum to climb it and didn't clip out in time to catch myself. (*Note: This fall description is from the Year 4 survey and is included here because of the importance of the issue.*)	Design switchbacks for trail connection or entrance pathways where space is available. Where steps are used for the entrance, include a channel for people to push their bikes up. Photo is example of solution.
Very low speed navigating a walkway through a traffic island, hesitating while watching approaching traffic, and the "you go, no you go" dance. Too much traffic, bikes and cars at a busy multiway stop, roads and bike trail. Bikes got bunched up and couldn't maneuver. (*Note: This fall description is from the Year 4 survey and is included here because of the importance of the issue.*)	Retrofit intersections with multi-modal traffic volumes to provide designed space with sufficient capacity for all modes, including time to proceed through the intersection.

Table 13. Fall Descriptions Indicating Maintenance Need

Fall description (all are quotes from survey responses)	Maintenance & Construction
Tire caught in road surface fault. Example of all description: • Front wheel got caught in a rut • I fell due to poor pavement conditions. A seam in the pavement caught my front wheel and caused me to fall.	For roads designated as a bicycling route or otherwise with established use by bicyclists, establish a threshold appropriate for bicycles (not motor vehicles). Review and repair pavement and surface conditions annually. Photo is an example of a road surface fault.
I was riding a path next to a parcel that was under construction. A fence had been constructed next to the path to protect the construction site. There was a short detour with a ramp that was difficult to see at night (even though I was well lit). While trying to navigate the narrow ramp I didn't notice that the fence was leaning into the path. My handlebar got caught, and that caused me to fall over.	Photo of temporary trail during roadway construction. Flexible bollards placed to provide a shy space from fence.

Fall description (all are quotes from survey responses)	Maintenance & Construction
Uneven pavement on roadways and trails. Example fall descriptions are: • I almost fell when my bicycle hit uneven pavement in the bicycle lane. • Turning an uneven 180-degree corner. • Uneven multi-use pathway • Uneven Pavement in a transition leading to a bike dedicated Lane • Biking on a rough trail, but an uneven sandy spot, lost velocity, and just flopped over. • I stopped in a spot where the ground was uneven and just couldn't stabilize • Misjudged pavement/ground which was uneven. • Stopping on an uneven surface. • Uneven pavement on a bike path (pavement sloping down into grassy shoulder needs some maintenance • Uneven road • Uneven terrain on multi-use trail • I was standing on uneven surface with one foot clipped into pedal and lost balance • I almost fell when my bicycle hit uneven pavement in the bicycle lane. • Stopping on uneven trail. Ankle turned and lost balance. No significant physical injury, just my pride was wounded! • Turning an uneven 180 degree corner. • Uneven multi-use pathway	The pavement for bicycle lanes on existing roads and on trails needs to be smooth with no uneven spots.

Fall description (all are quotes from survey responses)	Maintenance & Construction
Similar to poor surfaces, large potholes cause cyclists to fall. Nearly 20 reported falls point to a pothole as the cause: • A poor road with potholes and loose gravel. • A pothole filled with water, invisible on a rainy day • Bad pothole in street • Bumpy road with lots of potholes in asphalt • ….I slipped sideways and fell. The road was small and rural and had potholes and a shaggy edge… • Flat tire. Hit a pothole and fell. • Gravel road with potholes. • Hit a pothole • Hit a pothole in the road • Hit a pothole • Hit a pothole • I hit a pothole and lost control of the bicycle at low speed. • I nearly fell when I swerved too quickly to make sure I was out of traffic, and I didn't see that there was a giant pothole near the curb. • Pothole • Pothole • Trying to avoid a pothole • unmarked pothole • Unseen pothole • Skidded on a bike path where a post had been knocked out leaving a pothole & gravelly surface	Establish a standard for repairing potholes within cycling pathways such as dedicated bicycle lanes and trails, and along the expected travel line of shared lane markings. While reporting on conditions in the United Kingdom, this website has helpful information on the risks potholes have for people cycling. For example, it offers the following guide for determining a pothole that is too large for people cycling: *When a pothole can be considered dangerous will vary between local authorities. However, in general, a dangerous pothole is a minimum of 40mm deep (1 ½") and at least 300mm wide (12"). Potholes and uneven road surfaces can cause a cyclist serious head, neck, shoulder and upper-arm injuries if hit.* Avoiding pothole crashes involves both ensuring they are there when a bicycle facility is established as part of the construction requirements. In addition, maintenance guidelines should also be included in bicycle master plans, citing the threshold for a dangerous pothole size and timeframes for fixing it. The website recommends knowing how to report a pothole so that it can be fixed. This information should be easy for people to find and use.
I was on a multi-use trail and there was a blind corner. As I slowly proceeded, a car came around the corner, and I had to stop abruptly and fell.	Reduce the number of blind turns and likelihood of crashes by designing out blind turns, including mirrors, or installing vertical separation to establish two-way cycling lanes. Photo is example of limited sight lines and tight turns.

ABOUT THE AUTHOR

CAROL KACHADOORIAN

Carol started dblTilde CORE, Inc. in 2021, a nonprofit whose mission is to advance knowledge about and planning for sustainable mobility and wellness in communities through outreach, research, and education. dblTilde CORE's work draws on Carol's knowledge of and expertise in transportation planning and operations, working at both the city and regional levels, including school- and community-based active transportation plans and older adult mobility. She understands the importance of both big data and personal experience to determine feasible changes that make travel by all modes safe, accessible, and comfortable for all ages and abilities.

Carol's work focuses on the need to revise long-standing perceptions of older adults in words and images, and in the type of research she conducts. She developed a typology of older adults' physical activity, which she sees as part of a three-legged stool that includes Person-Environment Fit Theory and Life-Space Mobility Assessments. MTI published reports for Year 3 and Year 4 of her pioneering work the 50+ Cycling survey, Cycling past 50: A Closer Look into the World of Older Cyclists

Carol recently completed an article on older cyclists' use of public transit as part of their cycling trips. She also contributed to a project studying mobility challenges for AAPI older adults in Southern California, and one aimed at improving walking conditions for older adults in five Los Angeles neighborhoods.

Carol is a Research Associate with the Mineta Transportation Institute (MTI), and Executive Director of dblTilde CORE, Inc.

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