Cycling Past 50: A Closer Look into the World of Older Cyclists

Carol Kachadoorian
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CYCLING PAST 50: A CLOSER LOOK INTO THE WORLD OF OLDER CYCLISTS

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Cycling Past 50: A Closer Look into the World of Older Cyclists

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**Abstract**  
This document reports on 2,300 responses to a nationwide survey of older adults who cycle. The survey, open from February through September 2020, includes questions about a rider’s cycling history, current cycling habits, and falls. It includes a visual preference survey of various cycling facilities and an online journaling option for two rides subsequent to completing the survey (results of the online journals will be available in the summer 2021). Responses reflect the impact of COVID-19 on older adults’ cycling habits, the impact of aging on ability and agility, the impact of the built environment, types of bicycles, and opportunities to cycle with others. Responses were analyzed by gender and age. Questions such as cycling frequency and falls were compared to a modified version of Geller’s four types of cyclists. Key take-aways include: Many older adults will need to adapt to their changing cycling abilities with a different bicycle, a different expectation about their cycling experience, and local programs to encourage sustained cycling. A fair number of respondents learned to cycle as an adult which suggests that local programs can also encourage older adults to learn to ride and how to select a bicycle. Lower cycling rates may result from not having a bikeable or proper-fitting bicycle, or the money to fix or purchase a bike. Questions posed for further consideration include: Can education and outreach help reduce near misses? Can planning and engineering help reduce near misses, especially in areas where more older adults cycle? How can falls due to poor infrastructure or maintenance or the actions of others be reduced?

**Key Words**  
Bicycling, older adults, surveys

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Cycling is a powerful and fulfilling experience

“I used to ride a bike when I was teenager now that I am old and alone, I wish to ride again.”

“I used to cycle regularly (2 or 3 times a week) but my ‘riding buddy’ moved away & my motivation left with her!”

“Five years ago, we moved to a large city from a small city where I regularly cycled to work and to do errands. Daily cycling does not feel safe in my current city though I live close enough to work to cycle easily. Just got a new old bike so am cautiously sticking a toe back into cycling but will probably only be on our city’s protected bikeways or around my neighborhood. Also, wind is an ever-present barrier to cycling in OK, if not for the sheer force of it, for the allergens it stirs up.”
I. CHARACTERISTICS OF SURVEY RESPONDENTS

OVERVIEW

At least two responses from each U.S. state except Mississippi (plus some from Canada), as shown in the map below.

Results in this Databook are for just under 2,300 separate responses. This number does not include duplicate responses. Further, results by question or comparison of questions include those responding. For example, percentages showing how frequently respondents cycle are based on those who answered the question, not all who responded to the survey.

Figure 1. Map of Survey Responses

GENDER, AGE, INCOME, AND ETHNICITY

Figure 2 shows responses by gender, including those who did not provide a gender. The largest group responding were men, with just over 60%. Figure 3 shows the response rate by age group drops off at the 71–75 age group, however, 16.3% of responses are from those 71+.
As shown in Figures 4 and 5, respondents were primarily white and of higher household income. This is a recognized weakness of the survey. AARP’s involvement in promoting the survey in 2020 increased the number of other ethnicities. However, there is a strong need to expand the future surveys to specifically target underrepresented populations of all ethnicities and household income, so survey results reflect national demographics.
Figure 4. Percent Responses by Household Income

Figure 5. Percent Respondents by Ethnicity
LEARNED TO CYCLE

While the largest percent of respondents for each age group learned to cycle as a child, learning to ride as an adult, including after age 50 was not uncommon, as shown in Figure 6.

Figure 6. When Did You Learn to Cycle? by Age Group

**Take-away.** Non-cycling adults can and do learn to ride. Some communities offer programs to encourage older adults to learn to ride, including options for a good-fitting bicycle. These programs can be developed by a local health or recreation department, the local area agency on aging, or by a local bicycle shop. For example, Cambridge, MA is developing a multi-part program for older adult to learn or re-learn to cycle, and to enhance their cycling agility. While the pandemic has shifted the original program plan, staff held a webinar series in the fall 2020, posting the recordings on their YouTube channel. They followed-up the webinar series with monthly virtual meetups and will launch a virtual exercise and strength training program in March 2021 to help prepare older adults for spring riding. The program promotional flyers in Appendix B provides more information.
II. CYCLING HABITS & PREFERENCES

CYCLING FREQUENCY

Respondents answered the question about whether they cycled regularly using their own definition of the term ‘regularly’ – a type of self-assessment – with a follow-up question to provide frequency details. Those who responded that they do not cycle regularly answered a subsequent question on circumstances prompting them to ride.

Regardless of gender or age, most respondents cycle regularly, as shown in Figure 7, with higher rates of regular cycling for men than women.1

![Figure 7. Do You Cycle Regularly? Total by Gender](image)

The rate of regular cycling habits is consistent by age group, however, declines for women between 76 to 85. See Figures 8, 9 and 10. The low number of responses from women and men 85+ affects the rate of regular cycling for this gender and age group.

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1 It is important to note that this group is mostly comprised of older adults who remain active as they age, which provides an understanding of how aging influences their cycling behavior and safety more than what may encourage people as they age to take up cycling.
When regular cyclists were asked about the frequency, many cycle three to five times a week, which may be comparable to younger, regular cyclists. Overall, the frequency of weekly cycling increases with age. See Figure 11.
There are few differences in cycling rates between women and men by age group, as shown in Figures 12 and 13. Weather was not a strong indicator of cycling frequency for most age groups, except for 71-75.
Figure 13. Frequency of Cycling for Men Who Cycle Regularly

Circumstances prompting non-regular cyclists to ride varied, as shown in Figure 14. Some common reasons include:

- Good weather
- Having a bikeable bike
- The desire for exercise or a different type of exercise
- When there is time or when motivated
- Where errands are bikeable
- Where there are safe places, such as trails and separated facilities

**Take-away.** Based on the number of reasons related to not having a bikeable bike, it appears that bicycle shops can be a valuable resource. Bike shops have experienced a renaissance due to COVID-19, as more people return to cycling. Shops could consider doing more outreach to let older cyclists know of their COVID-19 safety protocols, allowing them to offer in-neighborhood pop-up shops to repair bikes and sell new or used bikes.
Figure 14. Sampling of Reasons to Cycle, Non-Regular Cyclists, N=149

TYPE OF CYCLIST

This question is based on the four types of cyclists developed by Roger Geller from Portland, OR. The typology, based on a study of 3,000 cyclists in Portland, has been used to support designing and building cycling facilities that are 'low stress', i.e., offer increased safety and comfort for cyclists. The four types, which include non-cyclists, and typical percent of people self-identifying in each are defined below and shown in Figure 15:

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2 [https://www.portlandoregon.gov/transportation/article/264746](https://www.portlandoregon.gov/transportation/article/264746)
Strong and Fearless: People willing to bicycle with limited or no bicycle-specific infrastructure.

Interested but Concerned: People willing to bicycle if high-quality bicycle infrastructure is in place.

Enthused and Confident: People willing to bicycle if some bicycle-specific infrastructure is in place.

No Way, No How: People unwilling to bicycle even if high-quality bicycle infrastructure is in place.

Figure 15. Typical Distribution Among Four Types of Cyclists

Towards the end of the 50% Cycling Survey, respondents were asked to select the type of cyclists with which they associated. Because the 50+ Cycling Survey is for those who cycle, the survey question replaced the No way, No how type with A mix -- depends on circumstances type. The results differ from the typical Geller percentage distribution in two significant ways. First, twenty percent (20%) of respondents identified as Enthused and confident (Geller) cum Casual and somewhat confident (50+ Cycling Survey); and fifty-five percent (55%) of respondents identified as Enthused and confident (Geller) cum Experienced and confident (50+ Cycling Survey). The new type, A mix – depends on the circumstances, was selected by 22% of respondents, suggesting that this type may be needed, as it resonates as accurate for many cyclists. See Figure 16.

3 https://altago.com/understanding-the-four-types-of-cyclists/

4 Type names differed from the Geller type names. Also, a handful of respondents said they do not cycle, primarily due to health or balance issues, or concerns for safety while cycling.

5 The difference in names may have affected which type respondents chose.
As noted in the introduction to this section, Geller’s typology is used to support developing low stress bicycle networks. The analysis for determining Level of Traffic Stress (LTS) identifies various conditions that create comfort or discomfort for cyclists. Geller’s typology which typically results in a 57% share of Interested but concerned cyclists, becomes the type to design for. The distribution of 50+ Cycling Survey respondents varies significantly from the typical distribution of Geller’s typology; the 55% Experienced and confident should not suggest that older adults can tolerate higher stress networks. Instead, low stress networks are needed for older adults, as much as they are needed for all other cyclists.

There are noticeable differences in type of cyclists by gender, as shown in Figure 17. Women were more evenly distributed among the four types, with the lowest identification with Interested but Concerned, while nearly 70% of men identified as Experienced and Confident and very few as Interested but Concerned.

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**Figure 16. 50+ Cyclist Survey Type of Cyclist Responses**

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**Figure 17. Type of Cyclist by Gender**

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6 [https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity](https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity)
Not surprisingly, those who said they cycle regularly were more likely to consider themselves as Experienced and confident riders, while those who do not cycle regularly were more likely to consider themselves as Casual and Somewhat Confident, as shown in Figure 18. Regardless of whether they cycle regularly, cyclists chose the Mix – Depends on the situation type second most often.

![Figure 18. Type of Cyclist Compared to if Cycle Regularly](image)

**CHANGES IN CYCLING**

Changes in the frequency and length of cycling from year-to-year occurs because of many factors. The rate of change in 2020 reflects the usual factors, however, the most significant factor was COVID-19. Respondents both cycled more often or reduced the amount of cycling because of COVID-19.

**Cycling more.** Cycling for exercise during COVID-19 restrictions was the most common response for those whose cycling increased in the past year, as shown in Figure 20. It is difficult to speculate if the cycling increases will continue, so focusing on the other reasons for increased cycling may be more useful. Importantly, having someone to cycle with and good places to cycle rated second in affecting increased cycling, as well as shifting to cycling from a different sport. Responses by age group (see Figure 21) shown that maintaining exercise during the pandemic was a strong motivator for most age
groups. In addition, those between 50 and 60 seemed to use the COVID-19 time to train for a long-distance ride. Acquiring an eBike was less of a factor, but this could be due to the relatively low rate of eBike ownership among respondents.

Figure 20. Cycling More in Past Year, Women, Men, Total N=1521

Figure 21. Why More Cycling in Past Year, Age Group, N=1533
Cycling less. Those cycling less did so for fewer days and/or for shorter distances. As shown in Figure 22, the most frequently noted reason for cycling less was safety concerns. When considered alongside responses to other questions such as near misses and falls, safety concerns may be related to actions of others as well as a lower level of confidence in their own cycling agility. Changes in home or work responsibilities and health issues were also cited as reasons for cycling less. COVID-19-related reasons for less cycling was not as strong a reason for this group, however some reasons are based on changes to daily schedules due to the pandemic. See Figure 23 for a breakout of specific COVID-19-related reasons for cycling less provided by 70 respondents.

Figure 22. Why Cycling Less in Past Year, N=554
Figure 23. Specific COVID-19 Reasons for Cycling Less, N=70

FACTORS AFFECTING CYCLING

Figure 24 shows responses to the question about factors affecting where older adults ride, such as a mix of good infrastructure, end of- and during-trip facilities, and destinations. Group rides were more important for men than women. There do not appear to be age-based differences in factors, however, as shown in Figure 25.
Figure 24. What Affects Where You Ride? Women, Men, Total N=13,413
Figure 25. What Affects Where You Ride? Age Group, N=10,959 (multiple answers allowed)

Figure 26. Older Cyclists Value Things such as Benches, Pleasant Vistas, and Someone to Ride with
AGE AND CYCLING HABITS

The amount of cycling typically changes at different times in a person’s life. While a portion of respondents intend to continue cycling as long as possible, some anticipate a time when they would stop cycling. Top reasons for discontinuing cycling, regardless of gender or age group, are a physical condition or a move to a place with no safe places to ride. Many older cyclists responded that they could not envision a time or circumstances that they would stop riding – in fact, this response was the third highest for all ages, especially among men. See Figures 27. The ranking of these reasons were similar by age group, as shown in Figure 28.

Figure 27. Reasons Would Stop Cycling, Women, Men, N=3857 (multiple answers allowed)
Take-away. Older adults' desire to continue riding means that planners and designers need to include this demographic in network planning, design, and maintenance. Planning for older adult communities should also be designed to support cycling both within and with connections to the adjacent bicycle network. The worldwide COVID-19 pandemic has increased cycling rates in many countries and cities, which may continue as the pandemic fades. Some U.S. cities are taking the advice of Paris's mayor who in a piece published by The Economist speaks to trusting Parisians for telling their government what they want: *We trusted Parisians by opening new cycle lanes, and with their bikes they are bringing this transformation to life.*

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EBIKES AND TRIKES

eBikes

eBikes have grown in popularity for people of all ages. AARP encourages older adults to remain physically active, including cycling. A 2018 AARP article by Jay Walljasper begins with this assessment: By providing a boost to get up hills or give older bones and weary muscles a bit of a break, electric-assist bicycles make cycling a practical option for getting around.8

The 50+ Cycling Survey showed an eBike ownership rate of 8.2%, with the greatest ownership rate among those 76 and older. See Figure 30. Slightly more men than women own an eBike. See Figure 31.

![Figure 30. Do You Own an eBike? by Age Group](image)


![Figure 31. Do You Own an eBike? by Gender](image)
Regardless of gender or age group, survey respondents reported “to make it easier to ride up hills” as the most popular reason for purchasing an eBike. The next two most common reasons were to satisfy their curiosity about eBikes, to make it more comfortable to ride in hot weather, and to ride farther. See Figure 32.

![Figure 32. What Motivated You to Buy an eBike? Women, Men, Total, N=406 (multiple answers)](image)

Figure 33 shows reasons for owning an eBike by age group. Hill-riding was especially important for the 61-65 age group, as was a desire to cycle farther and to ride with stronger fellow cyclists for those over 70.
The majority of those who do not own an eBike either do not anticipate purchasing one or will do so when they experience a physical limitation to riding a regular pedal bicycle. See Figure 34. While questions that ask what someone will do in the future are hypothetical, answers to this question convey the strength of conviction to remaining an able cyclist. The sense is that purchasing an eBike denotes an unwelcome change in physical ability.
Figure 34. Expected Reason for Future eBike Purchase, Women, Men, N=2620 (multiple answers)

Figure 35 shows how answers differ somewhat by age group, with the reason, “When I have a physical limitation” as the most common response for all but those 76 and older. This age group was also uninterested in getting an eBike just to have one. Instead, ease of riding and ability to ride with others were highly rated reasons.
**Take-away.** Ebikes will continue to grow in popularity, especially as more models are introduced in the market. It is likely that some older cyclists will resist purchasing one until they feel it is necessary, such as the desire to keep cycling. When advising older adults on what bicycle to purchase, it is more useful to discuss the full range of options, such as number of wheels, sitting position, and propelling choices, rather than to immediately recommend an eBike. For example, the analysis of Falls in this Databook includes respondent-provided information on balance issues, which is important to consider when selecting a bicycle.
Trikes

Far fewer respondents own a trike – just 2.7%. More men than women own them. The majority are recumbent trikes; few are e-assist. Reasons for purchasing a trike range from wanting more stability and ease of getting on and off the bike. Figure 36 shows anticipated reasons for a future trike purchase, including when respondents have a physical limitation or health issue. Some will get one when they can afford it.

Figure 36. Anticipated Reason to Purchase a Trike N=2692 (multiple answers)

Affordability affects an older cyclist’s ability to purchase both an eBike (10.7%) or trike (2%). While this Databook does not cross-reference these affordability answers with household income, affordability does affect the type of bicycle people own. A bicycle that does not fit the rider or a rider’s type of cycling may reduce the amount of riding if a proper fitting bicycle is not affordable.

Figure 37. Standard Adult Trike with Basket (left); Recumbent Trike with Two Front Wheels (right)
An older cyclist’s desired cycling experience can change as they age. For example, 12 responses conveyed the sentiment, “I’m not in a hurry and having this bike helps me be more leisurely.” Conversely, some cyclists may ride with others to help maintain their cycling fitness. One group of 70+ cyclists asked how they compared with others taking the survey. As shown in the text box below, the answer is keeping them cycling and talking.

I have looked at your website and participated in your survey. I am a 70-year-old male and a fairly active cyclist (~4500 miles/year). I ride with a group of men all about the same age and we constantly debate a question that I hope you can help us with: Among 70-year-old men and older, who own a road bike and primarily do road cycling, what would be the average mileage for 1-year and the average speed?

Based on data provided from respondents in early 2020 (speed and type of two-wheel normal pedal bike information in NOT part of the survey), these cyclists concluded,

In general, I think it appears that at our age and riding > 40 miles/week (2080 miles/year) puts us in the top 10% of cyclist distance regardless of “purpose of activity i.e., social, exercise, or competitive.”

You should know the 4 of us argue about this frequently which is excellent fodder/discussion for our longer rides and a source of great amusement.

VISUAL PREFERENCE SURVEY

This portion of the 50+ Cycling Survey asked respondents to identify which bicycling facilities and conditions they would feel comfortable using. Photos of a variety of facilities and conditions were divided into two groups: Along the Roadway and Across the Roadway. Respondents clicked on photos of facilities they would use based on the conditions shown. See Figure 38.

This report shows the results of the Visual Preference Survey from high to low preference. The Visual Preference Survey was optional, with about 75% of respondents completing it. This portion of the survey provides direct cyclist information for specific conditions, similarly to portions of the Online Journal that some respondents completed.9

9 An analysis of the Online Journals will be available in early Spring 2021.
Some facilities that are generally considered desirable for all types of cyclists were not selected as ‘would feel comfortable using.’ Image bias may have affected respondents’ reactions to the photos. For example, as shown in Figure 39, only 69% of respondents said they would feel comfortable using a sidepath next to a major arterial. The 50MPH speed limit sign may have affected this rate, as it could convey undesirable conditions such as a high noise level and stress from traveling close to fast-moving vehicles. Conversely, only 44% of respondents would use a road in a rural setting with no visible traffic and a posted speed limit of 30MPH.
Similarly, photos of roundabouts shown in Figure 40 received different reactions, perhaps because of the different context or perspective of each. The image of the left is an aerial of the entire roundabout, while the image on the right provides a user-level view of one piece of the roundabout. Respondents may have interpreted these two Across the Roadway examples as different facilities, even though they both were roundabouts with a bus and vehicle in each image.
The visual preference survey will be revised for the 2021 survey, including different photos and a way to determine why respondents would or would not use the facility. One respondent asked that the survey include cycling conditions more familiar to him, such as the neighborhood street shown in the photograph to the right that he provided.

See Appendix C for the full Visual Preference Survey results.
III. SAFETY: NEAR MISSES AND FALLS

The survey includes questions about Near Misses and Falls. The questions are intended to show any changes in cycling agility and balance as people age, as well as how adequately facilities can accommodate more users and those of different modes. The analysis shows respondents by gender, by age by gender, and with whom the near misses occurred. The table below provides a hyperlinked sub-table of contents for the analysis of these two questions.

<table>
<thead>
<tr>
<th>Near Misses</th>
<th>Falls</th>
<th>Fall Comparisons with Other Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near Misses by Mode, Gender, and Age Group</td>
<td>Typical Falling Incidents</td>
<td>Fall Rates and Type of Cyclist</td>
</tr>
<tr>
<td>Are Fewer Near Misses Possible?</td>
<td>Unpacking Fall Descriptions</td>
<td>Fall Rates and Frequency of Cycling</td>
</tr>
<tr>
<td>Can Education and Outreach Help?</td>
<td>Results and Typical Combination of Factors</td>
<td>Fall Rates for Cyclists with eBikes</td>
</tr>
<tr>
<td>Can Planning and Engineering Help?</td>
<td>Noticeable Differences between Genders</td>
<td>Are Fewer Falls Possible?</td>
</tr>
<tr>
<td></td>
<td>Noticeable Differences by Age</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sampling of Fall Descriptions</td>
<td></td>
</tr>
</tbody>
</table>

NEAR MISSES

Just over 62% of those responding to the survey reported at least one near miss with another cyclist, scooter, walker, jogger, or motorist. This section parses response data based on gender, age group, and mode. Speculative narrative attempts to understand the responses provided and identify potential mitigations.10

The top two modes were motorists at 50% and other cyclists at 21%. See Figure 42. The survey did not ask for details on the near miss.11 Near misses with scooters were the lowest reported, perhaps due to an increasing understanding between cyclists and scooterists about each other, i.e. they are cross-over modes traveling at comparable speed.

10 NOTE: Some of the falls reported cite a near miss as causing the fall. Because of the connection between the two, these two questions for the 2021 survey will be combined.

11 Because some of this information was provided in descriptions of falls, these two questions will be consolidated for the 2021 survey.
Both genders and all age groups reported near misses in rates similar to the overall survey response rates. In other words, a particular age group or gender was not more or less likely to report a near miss. See Figures 43 and 44 to compare response rates.
However, there are differences among age groups with respect to the near miss mode, as shown in Figure 45. The rate of near misses with motorists decreases with age, while the rate of near misses with other cyclists increases noticeably beginning with the 76-80 age group. Near miss rates with joggers and scooters was relatively level for all age groups. The low rate of near misses with scooters may be a result of the presence of fewer scooters and may increase in subsequent surveys as scooter use increases.
Safety: Near Misses and Falls

Near Misses by Mode, Gender, and Age Group

Individual charts of near misses by mode, age and gender shown below, Figures 46 through 50.

Figure 46. Near Misses with Other Cyclists, Gender, Age Group

Figure 47. Near Misses with Scooters, Gender, Age Group
Question to Consider: Are Fewer Near Misses Possible?

Determining why near misses occur can help identify mitigations. This section speculates about potential ways to reduce near misses through education and outreach, and with planning and design strategies. It is presented here to invite others to provide their experience on effective strategies.
Some initial observations from the 50+ Cycling Survey are:

- While most near misses do not appear to make many older adults reluctant to cycle, the frequency of those with motorists may.

- The general increase in cycling, with more eBikes and eScooters sharing space designed for cyclists can create stress and uncertainty for older cyclists. See the text box labeled Figure 51 for information on a conversation on this topic convened by the Safe Routes Partnership.

**Question to Consider: Can Education and Outreach Help?**

Providing information about multi-modal transportation systems and how people can travel successfully within them may reduce some near misses. This strategy requires people to adopt strong habits of situational awareness, i.e., be aware of others traveling where they are, and a desire or willingness of people to change their behavior. It relies on effective communication and opportunities for discussion, along with established safety campaigns. For example, hosting community conversations among people with varying primary travel modes is one tactic. Others include ad campaigns showing people of all ages and abilities walking, bicycling, scootering, etc.; and education and skill-building programs such as the one Cambridge, MA is developing (see Appendix B).
In the winter 2020, the Safe Routes Partnership brought together diverse stakeholders to better understand the potential opportunities and challenges facing older adults due to the advent of shared eScooters. The group explored how scooters affect walking, cycling, physical activity, and other public health goals, including safe, convenient mobility for people of all ages, and began to identify potential policy needs and implications. The effort is related to larger policy agendas through collaborations such as with the American Heart Association and Robert Wood Johnson Foundations’ Voices for Health Kids initiative.

The group’s work was paused due to the pandemic, but a final set of findings and recommendations will be issued in 2021. The discussion included several items with respect to the impact of eScooters on older adults and their mobility needs:

- It is not clear to what extent older adults want to ride eScooters, but in some cities, there is organized opposition to them with participation by older adults.
- There are a variety of devices entering the eScooter market, including those with seats and larger devices that provide more stability, which may be attractive to some older adults.
- While cycling or walking, older adults may experience a ‘startle effect’ when someone on an eScooter passes them, causing some instability for older adults.
- Among people with disabilities, the sidewalk clutter increased by eScooter use presents barriers to access curb ramps and present tripping hazards for people with vision impairment.
- Increased education and outreach would benefit eScooters users and those who travel with them within cycling facilities.

**Figure 51. How Do eScooters Affect Older Adults?**

**Question to Consider: Can Planning and Engineering Help?**

Just over half the near misses were with motorists. While the survey did not ask for details of the near miss, based on comments in open-ended question, we can conclude that the near miss occurred while cyclists were riding in the roadway in either an unbuffered bike lane or in the regular travel lane, through in an intersection, or entering the roadway.

The second and third most frequently occurring near misses were with other cyclists and walkers. One effective solution is to create separate space for cyclists and walkers or joggers, like portions of the Burke Gillman Trail in Seattle, WA, or guidance to walkers provided on the lead-up to the Big Dam Bridge in Little Rock, AR. See Figure 52.
Figure 52. Examples of Separate Pathways for Cyclists and Pedestrians
Source: https://place.la/project/burke-gilman/ (left image)

FALLS

The survey asked respondents if they had fallen or nearly fallen in the past year. Those that had, were asked to describe the circumstances about the fall. The questions are intended to show changes in cycling agility and balance as people age, as well as built environment conditions that may contribute to falls.

As Figure 53 shows, just under 29% of respondents reported a fall. These 641 falls are comprised of 193 women and 448 men. When looking at all survey respondents by gender, the fall rate for men was 32.4%, compared to the rate for women of 23.0%. This nearly 10% difference may be explained by women having better risk-adverse attitudes and behavior, especially with respect to route and facility choice.

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12 Some falls occurred when mountain biking, which respondents noted in the description of the fall. The 2021 survey will be clearer about its focus on road and trail (Shared Use Path) riding, rather than mountain biking.

When looking at fall rates for women and men compared to all survey respondents, rates peak at age group 56 to 60, with overall higher rates for men. See Figure 54. However, a different pattern emerges when looking at those who fell by gender within each age group. Fall rates are greater for women than men in age groups 50 to 65. This trend reverses at age 66, with greater fall rates for men. See Figure 55.
Typical Falling Incidents

Totals of riders above include those riding on paved and unpaved surfaces, including mountain biking. Because the 50+ Cycling Survey in 2020 was not intended to include mountain biking, the description of falls included here does not include mountain biking.\textsuperscript{14} As a result, 433 people are included in this analysis. This represents those who provided both their gender and age group, and who provided a description of a non-mountain-biking fall.\textsuperscript{15}

Unpacking Fall Descriptions

Each fall description by gender and age was reviewed to identify common factors – 27 factors in all – further organized into six groups, as shown in Table 1. The groups are intended to help identify potential ways to reduce falls, such as through infrastructure design or maintenance changes, education, and outreach, etc. The results were sorted in various ways, including by totals, age, and age and gender. See the Appendix D for charts of falls by gender, age, and factor.

The last section of the report on falls compares fall rates to three other questions: Type of Cyclist, Frequency of Cycling, eBike Ownership.

\textsuperscript{14} Many who described a fall while mountain biking stated that it came with mountain biking, i.e., they expect to fall. One cyclist said, “Regarding mountain biking: I mountain bike and sometimes falls happen. I still love it. I don’t fall much anymore.”

\textsuperscript{15} A couple of notes. First, only 3 respondents indicated ‘other’ as gender, so they were not included in these calculations. Second, responses were a mix of a few words to several sentences, hence some descriptions only have one factor noted, while others have 2 or 3.
### Table 1. Grouping of Factors Drawn from Fall Descriptions

<table>
<thead>
<tr>
<th>Group</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weather</strong></td>
<td>• Rain</td>
</tr>
<tr>
<td><em>On-going weather conditions while riding, rather than residual impacts of weather</em></td>
<td>• Wind</td>
</tr>
<tr>
<td><strong>Surface condition &amp; Construction</strong></td>
<td>• Ice, mud, wet surface</td>
</tr>
<tr>
<td><em>Residual impacts of weather and other existing conditions which could suggest maintenance needs; construction logistics that impacted riding.</em></td>
<td>• Gravel or sand on surface or pathway</td>
</tr>
<tr>
<td></td>
<td>• Slippery bridge surface</td>
</tr>
<tr>
<td></td>
<td>• Potholes</td>
</tr>
<tr>
<td></td>
<td>• Cracks in pavement, between surfaces, transitions</td>
</tr>
<tr>
<td></td>
<td>• Uneven surface</td>
</tr>
<tr>
<td></td>
<td>• Obstacles, debris, etc., on pavement or pathway</td>
</tr>
<tr>
<td></td>
<td>• Construction-related</td>
</tr>
<tr>
<td><strong>Operator error</strong></td>
<td>• Stopped unexpectedly</td>
</tr>
<tr>
<td><em>Actions by cyclists that contributed to the fall</em></td>
<td>• Going too fast</td>
</tr>
<tr>
<td></td>
<td>• Sharp turn</td>
</tr>
<tr>
<td></td>
<td>• Trouble with hills – up or down</td>
</tr>
<tr>
<td></td>
<td>• Inattention, poor bike handling, poor decision while riding</td>
</tr>
<tr>
<td></td>
<td>• I don’t know or remember</td>
</tr>
<tr>
<td><strong>Actions of others</strong></td>
<td>• Action of pedestrian/s, including kids and dogs</td>
</tr>
<tr>
<td><em>Actions by other traveling on the same pathway, driveway, intersection, etc., that contributed to the fall.</em></td>
<td>• Action of another cyclist</td>
</tr>
<tr>
<td></td>
<td>• Action of motorists</td>
</tr>
<tr>
<td></td>
<td>• Dooring</td>
</tr>
<tr>
<td><strong>Bike issues</strong></td>
<td>• Factor X (unusual circumstance that did not fit into another group)</td>
</tr>
<tr>
<td><em>Poorly fitting bicycles or a mechanical issue caused or contributing to falls. In many cases, cyclists could not unclip to avoid a crash due to another precipitating factor.</em></td>
<td>• Could not unclip</td>
</tr>
<tr>
<td></td>
<td>• Mechanical issue such as chain, flat, other</td>
</tr>
<tr>
<td></td>
<td>• Poor bike fit; learning new bike</td>
</tr>
<tr>
<td><strong>Issues related to skill or age</strong></td>
<td>• Balance issue; fall at slow speed, getting on or off bike</td>
</tr>
<tr>
<td><em>This group of factors are most directly related to age.</em></td>
<td>• Health issue; physical strength</td>
</tr>
<tr>
<td></td>
<td>• Effects of aging</td>
</tr>
</tbody>
</table>
Results and Typical Combination of Factors

Of the 27 factors, the following four were noted at least 10% of the time as contributing to the fall:

- Actions of motorists – 12%
- Slippery surface conditions due to ice, mud, or water – 11%
- Cyclist couldn’t unclip – 11%
- Cyclist inattention, including poor decisions – 10%

Responses often included a sequence of factors, such as those shown below. The first one shows how the actions of a motorist or another cyclist results in a fall when the older cyclist is a bit inattentive, needs to stop unexpectedly, and unable to unclip.

<table>
<thead>
<tr>
<th>Action of motorist or another cyclist</th>
<th>Inattention</th>
<th>Stopped unexpectedly</th>
<th>Unable to unclip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slippery Road conditions</td>
<td>Sharp turn</td>
<td>Stopped unexpectedly</td>
<td></td>
</tr>
<tr>
<td>Actions of motorists</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Noticeable Difference between Genders

There are several noticeable differences between women and men with respect to factors attributable to falls. Some studies show that aging does not necessarily affect the postural balance of women between 65 and 74,\(^{16}\) and that women are more likely than men to retain postural balance as they age.\(^{17}\) However, survey responses indicate a difference, as shown in Table 2. Women had higher rates of falls due to stopping unexpectedly, inattention or poor decisions, the actions of other riders, and various balance issues. Only falls for men due to the actions of motorists were higher. This is surprising, given a recent study showing motorists to be more likely to encroach on cycling space for women than men.\(^{18}\)

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\(^{17}\) [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5955023/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5955023/)

Table 2. Differences in Fall Factors between Women and Men

<table>
<thead>
<tr>
<th>Factor</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stopped unexpectedly</td>
<td>8.2%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Inattention, poor decision</td>
<td>13.5%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Actions of other riders</td>
<td>9.4%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Actions of motorists</td>
<td>10.5%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Balance issues (various)</td>
<td>9.9%</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

Noticeable Differences by Age

Table 3 shows a noticeable age-related difference for the ‘unable to unclip’ factor. Those under 70 reported higher rates, which may mean that cyclists stop using pedal clips as they age.

Table 3. Unable to Unclip Factor by Age Group

<table>
<thead>
<tr>
<th>Factor</th>
<th>Highest Age Group/s</th>
<th>Lowest Age Group/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to unclip</td>
<td>56 - 60</td>
<td>66 - 70</td>
</tr>
<tr>
<td></td>
<td>76 through 85+</td>
<td>Begins to decline at 71-75</td>
</tr>
</tbody>
</table>

Sampling of Fall Descriptions

Falling was a source of embarrassment for many riders. These riders included a brief description of what happened, then concluded by say, ‘embarassed,’ ‘felt stupid,’ and ‘totally my fault,’ etc. In addition, several noted they had ‘no idea’ of what happened or simply could not remember. Table 4 provides a sampling of description organized by the factor group. Where it makes sense a potential take-away is provided.

Table 4. Sample Fall Descriptions by Factor Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Take-away</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather</td>
<td>Wind drove me into an anti-traffic pole.</td>
<td>Bike-handling skills, especially for biking in the wind (or deciding to bike in spite of the wind) may help.</td>
</tr>
</tbody>
</table>
### Table 4. Sample Fall Descriptions by Factor Group, Continued

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Take-away</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surface condition &amp; Construction</strong></td>
<td>Brand new storm grate installed on my daily commuting route which would catch tires and flip the bike over. City had construction company replace it with the bicycle friendly one.</td>
<td>Each condition described is somewhat out a cyclist’s control, regardless of age. Periodic bike audits to identify needed updates and careful attention to construction logistics could help eliminate these.</td>
</tr>
<tr>
<td></td>
<td>Difficult stop sign on an upslope with poor intersection visibility.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor signage. Missed a bicycle route turn, breeched a blind hill, and found myself riding down a concrete staircase.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slipperiness of painted signage on the road surface with leaves on the ground after a rain.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encountered a curb where the bike lane narrowed at a bridge.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Could not avoid pothole due to car traffic on surface street without dedicated bike lane.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poorly placed trail closure barricade with no advanced warning.</td>
<td></td>
</tr>
<tr>
<td><strong>Actions of others</strong></td>
<td>Another cyclist suddenly stopped in front of me and I nearly fell before I could get my foot unclipped from the pedal.</td>
<td>Each condition described is fairly common. Education and outreach may help alleviate.</td>
</tr>
<tr>
<td></td>
<td>The biggest problem I have is when cars go by me without yielding to the side of the road as they pass by.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A woman drove through the mass of cyclists at the Baltimore Bike Party. Missed my front wheel by an inch.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unsafe conditions due to the overcrowding on multipurpose trails. Cars and cyclists that cut you off or get too close causing one to swerve or brake abruptly.</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>Description</td>
<td>Take-away</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Bike issues               | *Bike does not fit right.*  
  *Using e-bike and was not properly mounted when it started forward.*  
  *Note: Some comments were about rental bikes.*                                                                                                                                  | Important to stress the value of good-fitting bicycles. Bicycle type and fit may change as people age.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Operator error            | *My jacket got caught on the seat while I was getting off.*  
  *I forgot to unclip, and I was carrying a big load on my bike. Basically, I came to a stop and fell over.*                                                                                           | Odd-ball things happen (consider them due to Factor X)  
  Several riders noted they forgot to unclip. As people age and continue to cycle, they may consider using clipless pedals.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Issues related to skill, age, health, or age | *Agility problems, difficulty dismounting even at low speed.*  
  *Diagnosed with Parkinson’s for 6 years; when I started to stop at a stop sign tremors became very bad on both sides of my body. Once I got going again, I was fine.*  
  *I am blind in one eye, so I cannot always see my path ahead with clarity. I was making a sharp turn on an up-slope and my tire went off the path causing me to fall into some bushes, suffering minor scrapes.*  
  *Because of neuropathy my balance is off. I can only bike 10 yards before falling. So I moved to a trike.*  
  *Sometimes I clip my shoes onto pedals. Sometimes I forget to unclip when stopping.*  
  *Mobility issues -- old age catching up.*  
  *One typically falls getting on or off a bike or starting/ stopping. That’s when to be extra careful. Tip, if you’re a man over 60, buy a step through bike. What we used to call a girl’s bike. Much easier to get on and off.* | As people age and their cycling strength, agility, balance, etc., change, it important to consider and support different bikes that work. Some riders who responded are doing that. Others may benefit from changing the type of bike they use.                                                                                                                                                                                                                                                                                                                                 |

Table 4. Sample Fall Descriptions by Factor Group, Continued
Fall Comparison with Other Questions

Responses to other questions may help understand the likelihood that an older cyclist may fall, such as those that characterize a rider’s overall cycling profile, including the Type of Cyclist, Frequency of Riding, and those riding eBikes. This section compares answers to these three questions with fall rates.

Fall Rates and Type of Cyclist

Overall, fall rates peaked for both women and men who considered themselves Experienced and Confident. See Figures 56 and 57 for Fall and No fall rates by gender and type of cyclist.

Some differences emerge when parsing responses by age group and gender. Noticeable differences are in Table 5, based on Figures 58 and 59.
### Table 5. Noticeable Differences in Fall Rates and Type of Cyclist

<table>
<thead>
<tr>
<th>Age Group</th>
<th>A mix of all</th>
<th>Experienced and confident</th>
<th>Casual and somewhat confident</th>
<th>Interested but concerned</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55</td>
<td>Lowest fall rate for men</td>
<td>Highest fall rate for women</td>
<td>No women reporting a fall</td>
<td>No men or women reporting a fall</td>
</tr>
<tr>
<td>56-60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61-65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66-70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71-75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76-80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 58. Women Fall Rates, Age Group and Type of Cyclist

Figure 59. Men Fall Rates, Age Group and Type of Cyclist

### Fall Rates and Frequency of Cycling

Overall cycling rates for older adults responding to the survey are strong, with many cycling at least 3 times a week. See Figure 60. It may be that cycling more frequently reduces the likelihood of falls due to increased skill and experience. Conversely, it may be that cycling more frequently increased the likelihood of falls due to increased exposure.
Figure 60. Cyclists Who Cycling 3 or More Times a Week, Age Group

Figure 61 shows fall rates for those cycling at least 3 times a week. The fall rate is relatively comparable between 56 and 70. It is highest for the 50-55 age group cycling at least 6 times a week, which may be due to commute to work risks. It is lowest for the 76-89 age group cycling 3-5 times a week. The fall rate increases for those above 80, however, because the N for these age groups is low the fall rate may be different with more responses from these older cyclists.

Figure 61. Fall Rates for Those Cycling 3 or More Times per Week, Age Group
Fall Rates for Cyclists with eBikes

Fall rates for those owning an eBike is higher than the rate for all respondents, regardless of bicycle type. Figure 62 shows the difference in fall rates for eBike owners and regular pedal bike owners.

![Pie chart showing fall rates for eBike owners and non-owners.](image1)

**Figure 62. Comparison of Fall Rates and eBike Ownership, N=2251**

Fall rates are different between women and men eBike owners, as shown in Figure 63.

![Pie chart showing fall rates for women and men eBike owners.](image2)

**Figure 63. Comparison of Fall Rates for eBike Owners, Women N=194, Men N=448**
Fall rates for all eBike owners, regardless of gender are higher than fall rates for all cyclists, regardless of gender. For several age groups, the rate is double or more. Fall rates for the youngest and oldest age groups are comparable. Falls may be due to different factors. For example, because ‘younger’ riders may be commuting to work and be more confident in their cycling skills, they may be more aggressive (i.e., take more risks). Older cyclists may have age-related balance and health issues that result in falls, especially when riding an eBike that is both heavier and faster than a normal pedal bike.

![Figure 64. Comparison of Fall Rates, eBike Owners to All Cyclists, Age Group](image)

**Are Fewer Falls Possible?**

**Question to Consider: How can falls due to poor infrastructure or maintenance or the actions of others be reduced?**

Some communities establish ‘Senior Zones’ along streets with a high percentage of older adults and popular walking destinations. Bicycle facilities in areas with many older adults who cycle can be considered similarly (without the specific designation by signs) by doing a better job of designing, building, and maintaining these facilities. See the [below discussion](#).

How do cyclists as they age recognize changes in their agility, ability, stamina, etc.?

Those who continue to ride as they age can be surprised when a fall happens or they cannot ride as far and fast as they used to. Their suspicion that age is a factor should prompt consideration of ways to continue cycling as an enjoyable activity, while remaining safe. See the [below discussion](#).
Question to Consider: What basic design or maintenance standards can reduce some of these falls, benefitting all cyclists?

Older cyclists can be more sensitive to poor cycling surfaces, affecting their balance. Rough surfaces can also be harder on older bodies, generating physical discomfort.

**Gravel.** Some survey respondents slipped on gravel, sand, or stones on the pavement. Basic regular maintenance will eliminate this risk. In addition, requiring paved driveway aprons reduces the number of stones that migrate onto shoulders, sidewalks, or bikeways from unpaved driveways.

![Driveway Gravel Impacts Surface Quality for Cyclists](image)

Figure 65. Driveway Gravel Impacts Surface Quality for Cyclists

**Poor cycling surfaces.** Cyclists have a lower tolerance threshold for potholes, cracks, and debris than motorists. Separate triggers should be established and adhered to for maintenance and repair, noted through regularly surveying popular cycling routes.
Narrowing pathways. While narrow pathways can be an engineering strategy to force cyclists to slow down, they can also contribute to falls and crashes. For example, a cyclist can get caught in another’s handlebars when passing each other or may fall when an unexpected pathway narrowing occurs. Narrowing that occurs adjacent to motor vehicle lanes an also create a crash risk. See Figure 66.

Figure 66. Bike Lane Widens and Narrows, with On-Again/Off-Again Buffer

Question to Consider: Do cyclists recognize and adapt to changes in their cycling profile?

The goal for many older cyclists to continue to cycle may require thoughtful adaptations. Some cyclists may be slow to recognize and respond to changes in their cycling ability and agility. This can result in continuing to ride a bicycle that does not ‘fit’ them or cycling in places that do not provide important safety and comfort features such as lighting, easy to read signs, wide pathways, and formalized roadway crossings.

While state and national safe driving programs for older drivers are not needed, some level of conversation and tactics are. Bicycle shops can be important partners in this with some type of assessment tool or structured conversation with customers. For example, the analysis shows that those using eBikes have a higher crash rate than regular pedal bikes. Fall descriptions also show that a change in bicycle type may be needed for improved stability and balance. National and local bicycle organizations can help with this conversation, too, by providing resources for older cyclists, such as an updated version of the one from Vinnova, Better Bicycles: An analysis of the needs and requirements of older cyclists.

Another resource is a self-assessment of physical activity intensity offered by the Centers for Disease Control. This webpage also includes links to tools to measure target and maximum heart rates and the perceived exertion rate (Borg Rating of the Perceived Exertion scale).

19 There are many older driver safety programs nationally, such as this one by NHTSA, as well as programs in state safety plans.
EXCERPT FROM AARP ARTICLE

September 15, 2020, AARP Livable Communities eNewsletter

HOW LOCAL LEADERS CAN SUPPORT SAFE BICYCLING

Creating safe streets and sidewalks for all users involves effective community engagement, smart policies and, often, infrastructure changes. Some ways elected officials and other local leaders can advance safe cycling:

- **Convene** community meetings with people who travel by different modes — walking, cycling, driving — to identify needs and concerns, but also to help them learn from one another about their experiences using the street network. The free AARP Roadmap to Livability: Community Listening Session Tool Kit includes step-by-step instructions and worksheets for hosting such discussions and the dbiTilde Collaborative offers a suggested meeting agenda.

- **Conduct** a cycling survey of area residents — including why they bike, what amenities they seek, and what type of infrastructure they favor — and then compare its finding with the community’s current bicycle network.

- **Demonstrate** and/or test cycling infrastructure — such as protected bike lanes — by hosting a pop-up demonstration to show the community what can be done to enhance cycling safety, and then assess the reaction and support for such changes. (The Pop-Up Placemaking Tool Kit, a free publication by AARP and the firm Team Better Block, features information and “recipes” for pop-up bike lanes and other demonstration projects.)

- **Develop** or update an existing bicycle plan to minimize conflict points between pedestrians, cyclists, and drivers. There are many ways to identify locations with conflicts, and there are great resources for learning how to fix them, such as these from the National Association of City Transportation Officials: Urban Bikeway Design Guide, Don’t Give Up the Intersection and the Urban Bikeway Design Guide for All Ages and Abilities.

- **Use** resources from the League of American Bicyclists, such as its Quick Start Guide to help people bicycle safely or seek bicycle-friendly certification for your community or business.

- **Work** with local businesses to establish bike-friendly amenities — such as convenient bike parking — or new services connected to key locations, on-site parking, etc.

20 Available at https://bit.ly/Over50CyclingArticle
• **Establish** an effective maintenance program to ensure that cycling surfaces are smooth and free of debris, pavement striping is refreshed regularly, and that signage and protective features are present where needed. See the Federal Highway Administration’s [Bikeway Selection Guide](#) for ways to incorporate maintenance into facilities planning and operations.

• **Support** or create bicycling groups and community activities. Sponsor events to support more biking — such as Cyclovia-style “Open Streets” events. Partner with groups (e.g., health, aging and recreation agencies; local bicycle shops; residential communities and facilities for older adults) to identify new opportunities to expand cycling.

• **Engage** with organizations that pave the way for more inclusive participation, such as those for older people with physical limitations ([Cycling Without Age](#)); young riders (the national [Youth Bike Summit](#) and [Safe Routes to School](#) programs); and women (such as [Girls on Bikes](#) and [Black Girls Do Bike](#)).

**HOW INDIVIDUALS CAN SUPPORT SAFE CYCLING**

• **Research** the community’s bicycle network to see what exists — and then get out and use the existing network of trails, paths, and separated bike lanes. Check online or pick up a bike map at a local bike shop if you’re unsure of where to begin. Using the existing network is one way to illustrate demand for more and better infrastructure. Pay attention to what is missing — and what future transportation links or amenities may be needed.

• **Connect** with the community’s bicycle and pedestrian advocacy organizations. Those may be formal advisory commissions or committees, or member-driven bicycling or walking organizations. These groups are critical to advocating for more and better cycling infrastructure. If there’s a vacancy on a commission, consider applying.

• **Contact** elected officials, the department of transportation or streets, and other people and programs in a position to advance needed change. As a cyclist, you bring valued insight into how the built environment does — or doesn’t — provide a protected, safe, and healthy riding experience. Share that insight with local leaders.
Tips for Cycling at 50+

**Whether you ride a bike for sport, recreation or as a means of getting around, bicycling is an age-friendly activity that people of all ages can enjoy. Some tips:**

- Dust off the bicycle that’s been sitting in storage unused. (Before riding, have the bicycle checked and serviced by a bike shop.)

- If a bicycle is needed, buy a new or re-used one. Make sure it fits properly and has features that promote cycling with ease, whether it’s a three-wheeler, e-bike or a traditional two-wheel pedal bike.

- Research local cycling groups and join one. Having others to ride with is a great motivator for starting and continuing riding.

- Invite a friend to ride and explore new places together.

- Make a plan to bicycle regularly, perhaps replacing one car trip with a bike trip.

Not a Bike Rider?

Take lessons! It’s rarely too late to learn to ride a bike. Local recreation departments, senior centers and bicycle shops often offer classes. Self-service videos (such as "How to Teach an Adult to Ride a Bike") are available online. Many communities offer classes by League of American Cyclists-certified instructors who can ensure that new riders can take to the road safely and with confidence.

Cycling Stories

About 400 people who responded to the 50+ Cycling Survey completed journal entries for two of their rides. The journals captured real-time experiences such as the weather, how the cyclist felt, the trip’s purpose, and information about the trip’s length. Most trips were for recreation — either alone or with others in informal or formal groups — with about the same number of rides for 6 to 10 miles, 11 to 15 miles, 16 to 20 miles, and 26 to 36 miles. The journals also captured information on the safety and comfort of various cycling facilities used. Not surprisingly, cyclists felt the safest and most comfortable in locations with where bicycling paths are separate from motor vehicle traffic.

Bicycling at 80+

More than two-dozen people age 80 or older completed the survey. All but two had learned to ride as a child or teenager. Among those who said their cycling habits changed in the past year, they’re cycling shorter distances — due to a cycling partner moving away, a health condition or a loss of energy. Those cycling more than in the past report cycling longer distances, often for exercise during the COVID-19 restrictions.
APPENDIX A - CYCLING SURVEY

50+ Cycling Survey - Summer 2020

1. PRE-SURVEY QUESTION: Is this the first time you are taking the survey?
   - Yes
   - No

2. Please indicate your age.
   - 50 to 55
   - 56-60
   - 61-65
   - 66-70
   - 71-75
   - 76-80
   - 81-85
   - 85+

3. Is this the same age range for you as last year?
   - Yes
   - No, it’s one age range older

4. Please indicate your gender
   - Male
   - Female
   - Other

5. Please indicate your primary ethnicity
   - Asian
   - Native Hawaiian or Other Pacific Islander
   - Black/African American
   - White
   - Hispanic/Latino
   - American Indian/Alaska Native
   - Other - Write in
   - Prefer not to answer

6. Please indicate your annual household income
   - Less than $25,000
   - $25,001 to $34,999
   - $35,000 to $49,999
   - $50,000 to $74,999
   - $75,000 to $99,999
   - $100,000 to $124,999
   - $125,000 to $149,999
   - $150,000 or more

7. Do you cycle regularly now?
   - Yes
   - No

8. How often do you cycle now?
   - 6+ times a week
   - 3-5 times a week
   - 1-2 times a week
   - 1-2 times a month
   - Weather dependent

9. Since you don’t cycle regularly, what prompts you to cycle?
   - When I’m on vacation
   - When I visit my children or grandchildren
   - Good weather
   - When someone pushes me
   - Other - Write in (Required)

10. Copy of When did you first start biking?
    - As a child
    - As a teenager
    - 20-29
    - 30-39
    - 40-49
    - 50-59
    - 60-69
    - 70+

11. Is there a time in your life when you stopped cycling for at least a year?
    - Yes
    - No
Appendix A - Cycling Survey

12. What was the reason you stopped cycling?
Select up to 3.

- Parenting or other caregiver responsibilities
- My work situation or schedule changed
- I was in the military
- I moved abroad
- I got a driver's license and was more interested in cars
- Experienced health challenges or a long-term recovery from an injury or surgery
- Location (topography, weather, remote)
- Lack of cycling infrastructure
- I did not feel safe biking
- Social pressure or stigma
- I did not have anyone to cycle with
- I switched to another form of exercise or sport
- I did not have a bicycle or anywhere to store a bicycle
- I just gradually got away from cycling for no specific reason

13. Why did you start cycling again?
Select up to 3.

- I moved where cycling was easier
- New or improved cycling infrastructure near me
- My children were old enough for me to resume cycling
- More free time or retirement
- Health reasons or concerns made cycling a preferred form of exercise
- For physical exercise during COVID-19 restrictions
- To join my friends cycling or for social connections and networking
- As a form of transit/bike commuting
- Environmental concerns — wanted to eliminate or reduce personal car usage
- Economic — could not afford or wanted to reduce costs associated with car ownership or transit usage
- I acquired another bicycle or had access to a bicycle and bicycle storage
- I moved here and just decided to cycle
- N/A — I do not currently cycle

14. In the past year, have you changed the amount of cycling you do?

- Yes
- No

15. How has the frequency of your rides changed?

- I cycling more often
- I cycling less often
- No change

16. How has the distance of your rides changed?

- I cycling shorter distances
- I cycling longer distances
- No change

17. Why has your amount of cycling declined in distance or duration in the past year?
Select up to 3.

- The people I cycled with either moved or don’t cycle
- I霞th and feel less confident cycling
- I feel unsafe out there on the road
- I don’t have the energy anymore
- I have a physical condition that makes it difficult to cycle
- Family responsibilities are taking more time
- Work responsibilities are taking more time
- Change in job or home parries it
- A different spot works better for me
- Other - Write In (Required)

18. Why has your amount of cycling increased in distance or duration in the past year?
Select up to 3.

- I have new people to ride with regularly
- A new cycling facility opened that I can use
- I moved to a place where there is good network of on-road facilities and trails
- I moved to a place where there are more cycling accessible destinations
- I moved to a place where the weather is more moderate
- For physical exercise during COVID-19 restrictions
- I stopped running and increased the amount I cycled
- I training for a long-distance ride
- Other - Write In (Optional)

19. Under what circumstances would you stop riding altogether? Click all that apply.

- A physical condition that made riding difficult
- An overall loss of energy
- A move to a place with few or no safe places to ride
- A move to a place where the weather was not conducive to riding
- I cannot envision a time or circumstances that would cause me to stop riding
- Other - Write In (Optional)
20. Indicate any near misses you have had while cycling in the past year with...
   Click all that apply:
   - Other cyclists
   - Scooters
   - Walkers
   - Joggers
   - Motorists
   - Road users other than your near misses

21. In the past year, have you fallen or nearly fallen while cycling?
   - Yes
   - No

22. Thinking about the most recent incidence, briefly describe what caused you to fall or nearly fall.

23. Are you comfortable biking at night, assuming you have a front and back light on your bike?
   - Yes, generally
   - No, never
   - Sometimes

24. If you answered sometimes what factors does this depend upon?
   Select all that apply:
   - Location
   - Lighting (on street, path or trail)
   - Presence of bike lanes or shoulder to bike on
   - Biking with others
   - Weather
   - Familiarity of route

25. Are you comfortable biking alone?
   - Always
   - Sometimes, depending on the circumstances
   - Never

26. If you answered sometimes what circumstances does this depend upon?
   Select all that apply:
   - Location
   - Lighting (on street, path or trail)
   - Presence of bike lanes or shoulder to bike on
   - Time of day
   - Weather
   - Familiarity of route
   - Distance traveled

27. What factors effect where you ride?
   Select all that apply:
   - The presence of other cyclists
   - Places to stop to eat, shop, visit
   - A place to park my bike easily and safely
   - Pleasant vistas, such as a park
   - Benches for taking a break
   - Shade for cooling off when its hot
   - Bathrooms and drinking fountain
   - Few or no cars
   - Roads in good condition and clear of debris
   - Groups rides
   - Neighborhood streets with few cars and lower speeds
   - Protected bike lanes
   - An overall feeling of being safe

28. For which trip purposes do you ride and what is the average trip length?

29. Do you own an eBike?
   An eBike, or electric bike, is a generic term used for a bicycle that uses a battery to provide assistance when pedaling.
   - Yes
   - No
30. What motivated you to purchase an eBike?
Click all that apply:
- I don't have the strength to ride a regular bike where I'd like to bike
- I want to cycle farther than I do now
- I recently moved to a place where there are hills and the eBike will help
- I was curious and when I did a test ride, I was sold!
- I was just tired, I can't be anymore specific than that
- To make it easier to ride with someone who cycles faster than me
- To make it easier to ride up hills
- To make more comfortable to ride in hot weather (I don't sweat as much)
- For commuting to work
- So I could continue to ride during recovery from a medical condition
- Other - Write in (Required)

31. What would you consider purchasing an eBike?
Click all that apply:
- I don't envision ever getting one
- When I have some type of physical limitations on the type of cycling I do now
- When I just decide to get one
- When I can afford it
- To make it easier to ride with someone who cycles faster than me on a regular pedal bike
- To ride with someone who rides an eBike
- To align with environmental goals
- Other - Write in (Required)

32. Do you own a 3-wheel bike for adults?
- Yes
- No

33. What type is your 3-wheel bike for adults, i.e., what is your sitting position when you ride? Regular sitting position (bike on the left) or a recumbent position (bike on the right):
- Regular sitting position
- Recumbent position
- Other - Write in (Required)

34. Is your 3-wheel bike e-assist?
- Yes
- No

35. What motivated you to purchase a 3-wheel bike for adults?
Click all that apply:
- I wanted immediate assistance when I ride
- I'm not a hurry and having the bike helps me be more leisurely
- I like the large bag/basket when I go shopping
- I just decided to get one to add to my bike collection
- It's easier to get on and off than my two-wheeled bike
- Purchased one for my much older parent
- More convenient for cycling with my dog
- Other - Write in (Required)

36. What would you consider purchasing a 3-wheel bike for adults?
Click all that apply:
- When I have some type of physical limitations on the type of cycling I do now
- When I just decide to get one
- To align with environmental goals
- When I can afford it
- If I developed a health issue or had an injury requiring it
- When my partner gets one, I'll get one too as we can ride together
- I don't anticipate a time or reason for getting one
- Other - Write in (Required)

37. Now that you've provided a lot of information about your cycling habits, which types of cyclists are you?
- Casual and Somewhat Confident
- Experianced and Confident
- A mix of all -- depends on the situation
38. You've just completed Part 1 of the survey.

Will you complete Part 2 of the survey?
For this part, you will review photos of various cycling facilities and conditions, selecting the conditions under which you would feel comfortable cycling.

☐ Yes
☐ No thanks

39. Where would you feel comfortable riding?

Click on those photos where you would feel comfortable riding, given the conditions you see.
Remember: A green check mark will appear in the upper left hand corner of the photo when you click on it.
40. Which conditions for traveling through an intersection or crossing the roadway would you feel comfortable using?

Click on those photos where you would feel comfortable riding, given the conditions you see.
Remember: A green check mark will appear in the upper left hand corner of the photo when you click on it.
41. Would you agree to complete this survey again in about a year?
   - [ ] Yes
   - [ ] No

42. Please provide your email address

43. Would you agree to journal at least two biking trips during the next month?
The online journal form is designed with pre-populated answers and open-ended questions. It should take about 10 minutes to complete and is accessible on your home computer, a tablet, or smart phone.
   - [ ] Yes
   - [ ] No
Healthy Aging and Bicycling in Cambridge Virtual Series

Do you enjoy cycling and are looking for ways to be active while respecting social distancing?

Do you want to try bicycling again, but are feeling rusty?
Are you interested in learning about cycling considerations for older adults from the comfort of your home?

Cambridge’s Community Development Department, in partnership with the Council on Aging, is launching a Healthy Aging and Bicycling in Cambridge program this October. Five 1-hour workshops followed by a 15-minute question and answer session will be held virtually over Zoom. Participants and instructors will be able to see and engage with each other. For more information, visit cambridgema.gov/bikeworkshops.

Classes on Tuesdays (Oct. 13, 20, 27 and Nov. 3, 10) from 9:30 AM to 10:45 AM

Click Here to Register or call the Cambridge Council on Aging at 617-349-6220

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycling Basics for Older Adults</td>
<td>October 13</td>
<td>9:30 am - 10:45 am</td>
</tr>
<tr>
<td>Getting Back on the Bike</td>
<td>October 20</td>
<td>9:30 am - 10:45 am</td>
</tr>
<tr>
<td>Urban Cycling Basics</td>
<td>October 27</td>
<td>9:30 am - 10:45 am</td>
</tr>
<tr>
<td>Design for All Ages: Bike Lanes in Cambridge</td>
<td>November 3</td>
<td>9:30 am - 10:45 am</td>
</tr>
<tr>
<td>Adaptive Cycling</td>
<td>November 10</td>
<td>9:30 am - 10:45 am</td>
</tr>
</tbody>
</table>
Healthy Aging and Bicycling in Cambridge Virtual Series

**Getting Back on the Bike**
**October 20, 9:30am - 10:45am**
As we get older, what are the considerations to think about when bicycling to maximize safety and prevent injury? We will cover strategies to adapt your riding style to accommodate physical changes.

**Cycling Basics for Older Adults**
**October 13, 9:30am-10:45am**
Riding a bicycle is a great low-impact way to stay active and improve mobility as well as an excellent transportation option. This workshop will discuss getting started (or back on the road) as an older adult!

**Urban Cycling Basics**
**October 27, 9:30am - 10:45am**
Bicycling in a city can be intimidating for anyone! This workshop will cover what you need to know in order to get moving around the city.

**Adaptive Cycling**
**November 10, 9:30am - 10:45am**
Interested in learning about adaptive cycling options? We will present different types of adaptive bicycles as well as adaptive cycling programs and other ways to engage with cycling as an older adult.

**Design for All Ages: Bike Lanes in Cambridge**
**November 3, 9:30am - 10:45am**
Find out about the types of bicycle infrastructure in Cambridge and how the design process takes older adults into consideration along with how you could be part of the design process and dialogue!

[Click Here to Register]
APPENDIX C - VISUAL SURVEY

This portion of the 50+ Cycling Survey asked respondents to identify which bicycling facilities and conditions they would use. Photos of a variety of facilities and conditions were divided into two groups: along the roadway and across the roadway. Respondents clicked on photos if they would use the conditions shown. This report shows the results of the Visual Preference Survey from high to low preference. The Visual Preference Survey is optional, with about 75% of respondents complete it.

NOTE: The standard practice for rounding up or down decimals was used for the percentages shown here.

Along the Roadway, Highest Percentage Selected to Lowest

<table>
<thead>
<tr>
<th>Multi-use trail bridge</th>
<th>Sidewalk bike lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>87%</td>
<td>85%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wide unpaved trail</th>
<th>2-way trail down center median</th>
</tr>
</thead>
<tbody>
<tr>
<td>85%</td>
<td>83%</td>
</tr>
</tbody>
</table>
### 2-way green lane sidepath vs. Wood-chipped path in forest

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-way green lane sidepath</td>
<td>82%</td>
</tr>
<tr>
<td>Wood-chipped path in forest</td>
<td>79%</td>
</tr>
</tbody>
</table>

### Shared lane marking vs. Buffered bike lane

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared lane marking</td>
<td>75%</td>
</tr>
<tr>
<td>Buffered bike lane</td>
<td>74%</td>
</tr>
</tbody>
</table>

### Leftside contraflow bike lane vs. Bike lane on commercial street

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leftside contraflow bike lane</td>
<td>73%</td>
</tr>
<tr>
<td>Bike lane on commercial street</td>
<td>72%</td>
</tr>
</tbody>
</table>
### 2-way sidepath next to arterial
- Wide shoulder along state road
- 69%
- 66%

### Wide shoulder into rural town
- Green bike lane between through and left turn lane on urban street
- 66%
- 63%

### 2-way separated bike lane on urban street
- Bike lane on road with 2 motor vehicle lanes, center left turn lane
- 63%
- 63%
Conclusions

In general, respondents prefer bicycling conditions away from roadways. Cycling along wide shoulders or where there are separated, and designated facilities received lower preferences. Conditions shown in the photos such as speed limit signs and multiple cycling options may have affected the respondent’s choice.
## Across the Roadway, Highest Percentage Selected to Lowest

<table>
<thead>
<tr>
<th>Protected urban intersection</th>
<th>Crosswalk on suburban arterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>78%</td>
<td>73%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trail crossing, signs and striping only</th>
<th>Crosswalk or cross-bike on in-town commercial street</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>67%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Left turn pocket, frontage to main road</th>
<th>Bikebox</th>
</tr>
</thead>
<tbody>
<tr>
<td>67%</td>
<td>66%</td>
</tr>
<tr>
<td>Scenario</td>
<td>Percentage</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>2-way trail intersection</td>
<td>66%</td>
</tr>
<tr>
<td>2-way cycle track</td>
<td>65%</td>
</tr>
<tr>
<td>Midblock trail crossing</td>
<td>64%</td>
</tr>
<tr>
<td>Midblock 2-stage crossing</td>
<td>63%</td>
</tr>
<tr>
<td>Midblock 1-stage Crossing</td>
<td>62%</td>
</tr>
<tr>
<td>Multi-leg intersection</td>
<td>61%</td>
</tr>
<tr>
<td>Merging ramp onto roadway</td>
<td>Green bike lane across freeway ramp</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>58%</td>
<td>55%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bike lane continuation through urban intersection</th>
<th>One lane roundabout</th>
</tr>
</thead>
<tbody>
<tr>
<td>52%</td>
<td>50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-stage unsignalized crossing on multi-lane road</th>
<th>Crossing with median refuge island</th>
</tr>
</thead>
<tbody>
<tr>
<td>49%</td>
<td>43%</td>
</tr>
</tbody>
</table>
Conclusions

In general, respondents prefer crossing conditions that are well-marked and with a lower potential for conflicts with motorists. Roundabouts, while shown to be safer for all modes, ranked low, as did trail crossings along multi-lane roads in less developed areas. None of the across the road features received as high a usage selection percentage as the top along the roadway features. This supports cyclists’ preference for trails away from the roadway with fewer roadway crossings which were stated in open ended questions in the survey.
APPENDIX D - DETAILED CHARTS OF FALLS

Detailed information by gender, age group, and factor are provided in this appendix. The first chart shows a grand total, as well as totals for women and men. The remaining charts provide these totals for each age group.
Age Group 71-75, Women, Men, Total

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Project 2112
March 2021
APPENDIX E – RESOURCES

The following resources are provided as a place to begin and will be expanded over time. Included here are resources cited in the Databook, as well as others. Please resources you find to be useful to dbltildecollab@gmail.com.

CYCLING AND OLDER ADULTS

Barriers and Motivators of Bicycling by Gender Among Older Adult Bicyclists in the Midwest


Better Bicycles: An analysis of the needs and requirements of older cyclists (December 2007)

https://www.vinnova.se/contentassets/99c0a936480b463cbd9f6a6fc9cb417e/vr-07-17.pdf

Cycling strategies of young and older cyclists (April 2016)


The 50+ Cycling Survey (September 2020)

https://www.aarp.org/livable-communities/getting-around/info-2020/50-plus-cycling-survey.html?cmp=EMC-DSM-NLC-LC-HOMFAM-20200915_LivableCommunities_899300_1359001-091520-F2-cycling-CTA_Button-CTRL-4857209&encparam=qVa53IE3h4Iuny63%2BFK1b2vLcngL01EKeSIRZ7A%3D

Geriatric Cyclists: Assessing Risks, Safety, and Benefits (January 23, 2018)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784561/

Smart Cycling Tips for Older Adults

https://www.bikeleague.org/ridesmart
Appendix E – Resources

CYCLING AND GENDER

Are millennial women the answer to ending the gender gap in bicycling?

https://jenniferdill.net/2017/03/31/are-millennial-women-the-answer-to-ending-the-gender-gap-in-bicycling/

Explaining Gender Differences in Bicycle Behavior (February 2009)

https://activelivingresearch.org/explaining-gender-differences-bicycle-behavior

CYCLING AND SAFETY

Bicycles, Gender, and Risk: Driver Behaviors When Passing Cyclists (July 15, 2019)


Characteristics of single-vehicle crashes in e-bikes in Switzerland (August 2018)


E-Bike Injuries: Experience from an Urban Emergency Department – A Retrospective Study from Switzerland (2014)

https://www.hindawi.com/journals/emi/2014/850236/

CYCLING TYPES AND BEHAVIOR


Designing for All Ages and Abilities


Four Types of Cyclists

https://www.portlandoregon.gov/transportation/article/264746
Low-Stress Bicycling and Network Connectivity (May 2012)
https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity

Understanding and Measuring Bicycle Behavior: A Focus on Travel Time and Route Choice (December 2008)

Understanding the “Four Types of Cyclists” (August 2017)
https://altago.com/understanding-the-four-types-of-cyclists/

E-BIKES AND TRIKES

Hot Wheels: Today’s Adult Tricycles are Low, Sleek, Speedy, and Finding a Larger Fan Base (October 2018)

The Unlikely way eBikes Could Transform How We Age (May 9, 2019)
https://www.fastcompany.com/90341686/the-unlikely-way-e-bikes-could-transform-how-we-age


PHYSICAL ACTIVITY AND WELLNESS

Measuring Physical Activity Intensity (September 2020)
https://www.cdc.gov/physicalactivity/basics/measuring/index.html

Reducing Isolation and Loneliness Through Membership in a Fitness Program for Older Adults: Implications for Health (November 2018)
https://www.researchgate.net/publication/328742003_Reducing_Isolation_and_Loneliness_Through_Membership_in_a_Fitness_Program_for_Older_Adults_Implications_for_Health
ABOUT THE AUTHOR

CAROL KACHADOORIAN

Carol has a breadth of knowledge and expertise in transportation planning and operations, which began in Alexandria, VA, where she served as a transit analyst before leading the City’s first Office of Transit Services. After several years working with a family design-build company and at a major university, Carol returned to the transportation industry with the Washington, DC region’s transit agency. There, she worked in operations and communications before focusing on pedestrian and bicyclists access to transit. Carol’s work with Toole Design from 2008 to 2020 focused on school- and community-based active transportation plans. She started dbITilde Collaborative in 2020, specializing in older adult mobility and wellness. She describes the motivation for this work this way: “At age 60, I began to consider what my professional and personal life would look like during the next 30+ years. Now in my late 60’s, I am working to improve mobility for people as they age.”
MINETA TRANSPORTATION INSTITUTE

Founded in 1991, the Mineta Transportation Institute (MTI), an organized research and training unit in partnership with the Lucas College and Graduate School of Business at San Jose State University (SJSU), increases mobility for all by improving the safety, efficiency, accessibility, and convenience of our nation’s transportation system. Through research, education, workforce development, and technology transfer, we help create a connected world. MTI leads the Mineta Consortium for Transportation Mobility (MCTM) funded by the U.S. Department of Transportation and the California State University Transportation Consortium (CSUTC) funded by the State of California through Senate Bill 1. MTI focuses on three primary responsibilities:

Research
MTI conducts multi-disciplinary research focused on surface transportation that contributes to effective decision making. Research areas include: active transportation; planning and policy; security and counterterrorism; sustainable transportation and land use; transit and passenger rail; transportation engineering; transportation finance; transportation technology; and workforce and labor. MTI research publications undergo expert peer review to ensure the quality of the research.

Education and Workforce Development
To ensure the efficient movement of people and products, we must prepare a new cohort of transportation professionals who are ready to lead a more diverse, inclusive, and equitable transportation industry. To help achieve this, MTI sponsors a suite of workforce development and education opportunities. The Institute supports educational programs offered by the Lucas Graduate School of Business—a Master of Science in Transportation Management, plus graduate certificates that include High-Speed and Intercity Rail Management and Transportation Security Management. These flexible programs offer live online classes so that working transportation professionals can pursue an advanced degree regardless of their location.

Information and Technology Transfer
MTI utilizes a diverse array of dissemination methods and media to ensure research reaches those responsible for managing change. These methods include publication, seminars, workshops, websites, social media, webinars, and other technology transfer mechanisms. Additionally, MTI promotes the availability of completed research to professional organizations and works to integrate the research findings into the graduate education program. MTI’s extensive collection of transportation-related publications is integrated into San Jose State University’s world-class Martin Luther King, Jr. Library.

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