

2020 COVID Participation Study

PeopleForBikes Coalition

February 2021



peopleforbikes

Executive Summary

As of late 2020, 30.1% of American adults rode a bicycle at least once within the past two years. During the COVID-19 pandemic, 4% of American adults rode a bike for the first time in over one year, or for the first time ever. An additional 6% participated in a different type of bicycling during the pandemic, such as trying indoor riding or riding their bike for transportation. The table below estimates the percentage of American adults who rode before the pandemic (“existing riders”) as well as those who started a particular type of riding after March 2020 (“newcomers”). These new riders are broken out into two categories: “new recruits” had not ridden any type of bike for one or more years (or ever) before the pandemic, while “cross participants” are those who rode bicycles for a different reason/purpose during the pandemic.

	Recreation	Commuting	Transportation	Indoor
Existing Riders	20.2%	7.6%	9.8%	14.1%
New Riders	6.0%	1.7%	3.5%	5.7%
<i>Cross Participants</i>	2.5%	0.9%	2.1%	3.3%
<i>New Recruits</i>	3.5%	0.8%	1.4%	2.3%

When social distancing measures and stay-at-home orders were enacted, many Americans looked for new ways to exercise, get out of the house and safely socialize with friends and family. Those who started biking during the pandemic were more likely than existing riders to engage with bicycling because it offers stress relief and a way to relax. Additionally, while many existing riders are motivated to ride their bike to experience solitude, new riders tend to value the social aspect of bicycling and riding with others.

In the coming year, new riders expect to continue riding. An overwhelming majority (78%) of new recruits intend to continue bicycling once the effects of the pandemic wane. To support their new bicycling habit, half of new riders reported buying a bicycle recently, and one-third plan to purchase a bicycle within the next year. In order to ensure their continued riding, new riders reported that improved bike lanes, paths and other infrastructure would further encourage them to continue riding. Additionally, an invitation to ride from a friend or family member as well as access to information about local routes are both methods new riders said would keep them on their bicycles.

Americans turned to bicycling during the pandemic as a way to get outside, have fun and stay healthy. Many new riders became enthusiastic about riding, and plan to keep riding in the future. Providing these riders with infrastructure improvements and increased access to bicycle trails, as well as fostering a welcoming bicycling community with group rides and events, will ensure new riders continue to get out on two wheels.

Table of Contents

Executive Summary.....	ii
Table of Contents.....	iii
Background	1
Data & Methods.....	2
Data cleaning and organization	2
Segmentation Analysis.....	3
Description of Reporting Tables	3
Results.....	4
Participation Overview	5
Pre-COVID Bicycling Activity	6
Recent Bicycling Activity	7
New Rider Overview	8
New Recreation Riders.....	8
New Bicycle Commuters and Transportation Riders	9
New Indoor Riders	10
Future Bicycling Activity.....	11
Motivations	12
New riders.....	12
Existing riders.....	13
Purchase Overview	15
Recent Bicycle Purchases.....	16
Upcoming Bicycle Purchases.....	17
Parts and Accessories.....	18
Demographic Overview	19
Appendix 1 – Questionnaire	20
Appendix 2 – HB Analysis Detail	42

Background

The COVID-19 pandemic brought unexpected challenges to the health, livelihood and well-being of communities across the world last year. Working, shopping and getting around fundamentally changed amidst global efforts to control the spread of the virus.

Adapting to a “new normal,” people turned to the outdoors for exercise, mental relaxation and to help escape the stress caused by the new patterns of daily life. By May 2020, bicycling was one of the most popular forms of recreation and exercise in cities around the world.

In response to this increased interest in bicycling, PeopleForBikes launched a study of participation at the end of 2020 to better understand how personal riding habits changed during the COVID-19 pandemic. The results presented here mirrored the headlines published throughout the pandemic — Americans were riding bikes at unprecedented levels, increased sales of bicycles left store shelves and bike shops critically low of inventory and cities were closing streets to make way for this surge in bicycling.

Our research creates the framework by which we can build on this momentum for bicycling and position our partners to activate opportunities in 2021.

Data & Methods

This report presents the results of a general population survey of American adults, fielded by PeopleForBikes through InnovateMR from Nov-Dec, 2020. Respondents who had participated in bicycling (indoors or outdoors) within the past 2 years were admitted into the survey. Those not admitted were used to calibrate the population of non-riders, allowing this study to reliably estimate the percentage of American adults who have ridden a bicycle at least once within the past 2 years.

Data cleaning and organization

To overcome biases common to online surveys, all survey responses are weighted to reflect the true population of American adults. As such, those respondents who were identified as bicycle riders are representative of the population of riders in America based on age, gender, Census geographic region, household income, and race/ethnicity as defined by 2019 Census estimates shown below.

Gender		Age		Race/Ethnicity	
Male	48.7%	18 to 24 years	11.8%	White	60.0%
Female	51.3%	25 to 44 years	34.3%	Hispanic, Latino	18.4%
		45 to 64 years	32.7%	Black or African American	12.4%
Census Region		65 years +	21.2%	Asian	5.6%
Northeast	17.1%	Household Income		American Indian and Alaska Native	0.7%
Midwest	20.8%	Under \$100k	65.9%	Native Hawaiian and Other Pacific Islander	0.2%
West	23.9%	\$100 to \$199	23.8%	Two or more races	2.5%
South	38.0%	\$200 and more	10.3%	Other	0.3%

Even though the data are weighted to reflect Census distributions, the reported percentages in the tables are subject to sampling variability. Because the margin of error is determined by the reported percentage and the size of the sample on which it is based, the margin of error will be different for each table in the report. For that reason, “N=” is included at the bottom of each table to denote the sample size on which the table is based and as a general indication of statistical reliability.

As a general rule, results based on a sample with fewer than 30 respondents should be viewed with caution because the margin of error can be sufficiently large that there are no real differences between the percentages in most categories in the table. This is most likely to occur with the monthly estimates where the sample sizes for some purchases are small. For tables with N=100, the margin of error can be +/-9.8%. For tables with N=500, the margin of error can be +/-4.4%. For tables with N=2,000, the margin of error can be +/-2.2%.

Segmentation Analysis

Latent class analysis was used to segment new riders and existing riders in the Motivations section (beginning on page 21) based on their responses collected in a MaxDiff experiment. The details of the MaxDiff experiment can be found within the questionnaire on page 31.

Description of Reporting Tables

The results, beginning on page 4, are an estimation of the population of existing riders – those who rode before the COVID-19 pandemic, and new riders – those who, during the COVID-19 pandemic, started riding or resumed riding after a lapse. Definitions for each type of rider are included below.

The following ‘types’ of bicycle riding are discussed in the following results, and are used to define riders by their activities.

- *Recreational* – rode a bicycle for recreation (outdoors)
- *Indoors* – rode a bicycle indoor (at home or away from home)
- *Commuting* – rode a bicycle to work or school
- *Transportation* – rode a bicycle for transportation (to access essential services, groceries, etc.)

Riders were grouped into the following categories based on their riding during the COVID-19 pandemic.

- *Existing Rider* – riders whose riding habits did not change during the COVID-19 pandemic
- *New Cross-Participant* – riders who participated in a new type of cycling during the COVID-19 pandemic. Cross-participants began, or resumed after a 1+ year lapse, a different type of riding during the COVID-19 pandemic. For example, an individual who was an active indoor rider but shifted to recreational riding during the pandemic would be considered a cross-participant.
- *New Recruit* – riders who had not ridden a bicycle of any type for any reason in 2019 or before the COVID-19 pandemic began affecting the US in early 2020. This group includes both totally new riders as well as those who rode at some point in the past.

Results

Q: Which of the following activities have you done within the past 2 years?

The following question was asked only of those who had ridden a bicycle within the past 2 years.

Q: Have you participated in any of the following activities for the first time in a year (or more) as a result of the COVID-19 pandemic?

Participation Overview

The following section describes the types of riding that American bicyclists have done, as well as where they have ridden, both before and during the COVID-19 pandemic.

Q: What type of riding have you done within the past 2 years?

Q: Where have you ridden within the past 2 years?

Pre-COVID Bicycling Activity

Respondents who reported that they rode before March 2020 were asked the following questions about their riding activity before COVID-19 began affecting the United States.

Q: Before March 2020, in a typical year how frequently were you participating in the following types of riding?

Q: Before March 2020, in a typical year how frequently were you riding in the following types of places?

Q: Before March 2020, when riding in the following types of places how long did you typically ride?

Recent Bicycling Activity

Many riders changed when and where they were riding bikes during the COVID-19 pandemic. The following questions were asked of those who reported riding during March 2020 and more recently.

Q: Since March 2020, how frequently have you been participating in the following types of riding?

Q: Since March 2020, how frequently have you been riding in the following types of places?

Q: Since March 2020, how long would you typically ride when riding in the following types of places?

[New Rider Overview](#)

The following section describes riders who began riding for recreation, commuting / transportation, or indoors during the COVID-19 pandemic. Each sub-section describes two types of riders: cross participants and new recruits. Cross participants are those who were riding a different type of bike before picking up a given activity. For instance, this could be a rider who rode for commuting purposes before the pandemic and then transitioned to riding indoors on a trainer after March 2020. Along with cross participants, new recruits are presented in each table; these riders had not ridden a bicycle for at least 1 year (or ever) before riding during the COVID-19 pandemic.

[New Recreation Riders](#)

Riders who began bicycling for recreation were asked the following questions about why they hadn't done so beforehand, and what motivated them to start riding for this reason during the pandemic.

Q: Why had you not ridden a bicycle for recreation before the COVID-19 pandemic?

Q: Before the COVID-19 pandemic, how long had it been since you rode a bike for recreation?

Q: What changed that caused you to start riding a bicycle for recreation?

New Bicycle Commuters and Transportation Riders

Riders who began using bikes for transportation or commuting by bike were asked the following questions about why they hadn't done so beforehand, and what motivated them to start riding for this reason during the pandemic.

Q: Why had you not ridden a bicycle for commuting or transportation before the COVID-19 pandemic?

Q: Before the COVID-19 pandemic, how long had it been since you rode a bike for transportation or commuting?

Q: What changed that caused you to start riding a bicycle for transportation or commuting?

New Indoor Riders

Riders who began bicycling indoors, either on trainers, rollers, or a stationary bike, were asked the following questions about why they hadn't done so beforehand, and what motivated them to start riding for this reason during the pandemic.

Q: Why had you not ridden a stationary bicycle, trainer, or rollers before the COVID-19 pandemic?

Q: Before the COVID-19 pandemic, how long had it been since you rode a bike for recreation?

Q: What changed that caused you to start riding indoors?

Future Bicycling Activity

While many Americans chose to ride a bicycle during the pandemic, the conditions under which these new riders were participating in cycling were unique. Many streets in city centers limited traffic to favor pedestrians and bicycles, and many Americans had increased leisure time when in-person commitments were no longer viable. The following questions were asked of all riders to gauge expectations for future participation after the effects of COVID wane.

The following table presents results irrespective of the bicycling activities in which respondents participate. For instance, frequency of commuting to work or school by bicycle was asked of all riders, not just those who have commuted by bike in the past.

Q: Considering your riding *next year*, how frequently do you plan to participate in the following types of riding?

The following 5 tables present further breakouts of the results presented above in **Error! Reference source not found. Error! Reference source not found.** Results are specific to individuals which participate in each type of riding, with the final table aggregating responses for only relevant types of riding.

Q: Considering your riding *next year*, how frequently have you plan to ride in the following types of places?

Q: What would prevent you from riding as much in 2021 as you have ridden this year, or in previous years?

Q: Which of the following might encourage you to continue riding more in 2021 and beyond?

Q: Within the past 6 months, have you invited anybody to go on a bicycle ride with you?

If 'yes' above **Q: Did you invite someone who you would consider to be a less avid, or beginner, bicycle rider?**

Motivations

Respondents were asked about their motivations for riding a bicycle, irrespective of the type of riding they typically do. The two sub-sections which follow on the next two pages detail the results of a Best-Worst experiment; in this experiment, respondents were asked about the most motivating and least motivating characteristics of a bicycle ride. These results were analyzed for new riders and existing riders separately. The full latent class analysis results can be found in Appendix 2.

Q: Considering all types of bicycle riding you do, which of the following motivations reflect why you ride? Select up to 3 answers.

New riders

New riders, including cross-participants and new recruits, were segmented into the following groups based on their motivations to ride a bicycle.

	Social Fun Outside	Serious Exercise	Mental and Physical Health	Solitude, Relaxation and Mental Health	Freedom and Thrill
Top 1	Exercise/health	Exercise/health	Exercise/health	Stress relief / mental health	Sense of freedom
Top 2	Being outside	Stress relief / mental health	Stress relief / mental health	Being outside	The thrill of the ride
Top 3	Socializing with friends/family	Relaxation	Active lifestyle	Relaxation	Socializing with friends/family
Least Motivating	Spending time alone	The thrill of the ride	Protecting the environment	Socializing with friends/family	Spending time alone
Total	N=148	N=163	N=203	N=157	N=243

Existing riders

Existing riders were segmented into the following groups based on their motivations to ride a bicycle.

	Lone Outdoor Enthusiast	Being Active Outside	Mental and Physical Health	Socializing Outside	Freedom and Thrill
Top 1	Stress relief / mental health	Exercise/ health	Exercise/ health	Socializing with friends/family	The thrill of the ride
Top 2	Being outside	Being outside	Stress relief / mental health	Exercise/health	Protecting the environment
Top 3	Spending time alone	Active lifestyle	Active lifestyle	Being outside	Sense of freedom
Least Motivating	Socializing with friends/ family	Socializing with friends/ family	Protecting the environment	Spending time alone	Spending time alone
Total	N=148	N=163	N=203	N=157	N=243

Q: What role do each of these activities play in your life?

Q: How satisfied are you with the amount of time you spend doing the following activities?

Purchase Overview

Identifying purchasing patterns highlights a rider's intent to continue spending time on their bike, and helps identify potential markets for upgrading equipment. The following two questions were used as screeners to ask respondents relevant questions about recent purchases and intended purchases.

Q: Which of the following items have you purchased within the past 2 years?

Q: Which, if any, of the following items do you plan to purchase within the next year?

Recent Bicycle Purchases

The following questions were asked of those who reported buying a bike within the past 2 years (December 2018 to November 2020).

Q: What type of bicycle have you purchased within the past 2 years?

Q: Considering your most recent bicycle purchase, how did you purchase this bicycle?

Q: From what kind of retailer did you purchase this bicycle?

Q: Was this a new or used bicycle?

Q: About how much did you spend on your most recent bicycle purchase?

Upcoming Bicycle Purchases

The following questions were asked of those who intend to purchase a bicycle within the next year.

Q: What type of bicycle do you plan to purchase?

Q: Considering your intended bicycle purchase, how do you plan to purchase this bicycle?

Q: From what kind of store will you purchase this bicycle?

Q: Do you plan to purchase a new or used bicycle?

Q: About how much are you planning to spend on your upcoming bicycle purchase?

Q: Why haven't you made this purchase yet?

Parts and Accessories

Q: Have you purchased any of the following bicycle-related items within the past year?

Asked of those who selected "Parts" in Error! Reference source not found. **Q: What type of bicycle parts did you purchase?**

Asked of those who selected "Accessories" in Error! Reference source not found. **Q: What type of bicycle accessories did you purchase?**

Q: In total, about how much did you spend on all of your bicycle-related purchases within the past year?

Demographic Overview

A brief overview of respondent demographic information is presented below.

Appendix 1 – Questionnaire

Basic Information

Q1. What is your age?

[Textbox answer]

[Remove respondents younger than 18]

Q2. In which state do you live?

US states, plus 'U.S. territory' and 'Outside the U.S.'

[Remove respondents outside of the US]

Demographics

Q3. Which of the following best describes how you identify?

- ☐ Male
- ☐ Female

Q4. Which of the following best describes your race / ethnicity? Please select all that apply.

- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Black/African-American
- ☐ White
- ☐ Hispanic/Latino
- ☐ American Indian / Alaska Native
- ☐ Other. Please describe: _____

Q5. Which of the following best describes your total annual household income before taxes?

- ☐ Less than \$20,000
- ☐ \$20,000 to less than \$40,000
- ☐ \$40,000 to less than \$60,000
- ☐ \$60,000 to less than \$100,000
- ☐ \$100,000 to less than \$150,000
- ☐ \$150,000 to less than \$200,000
- ☐ \$200,000 to less than \$250,000
- ☐ \$250,000 or more
- ☐ Prefer not to answer

Participation Screeners

Q6. Which of the following activities have you done within the past two years?

- ☐ Ridden a bicycle (indoors or outdoors, including spin classes)
- ☐ Kayaking for any reason (fishing, touring, whitewater, etc.)
- ☐ Read a book (electronic, print, or audiobook)
- ☐ Running on a road or paved trail
- ☐ Trail running
- ☐ Hiking or mountaineering
- ☐ Consumed a beverage with caffeine
- ☐ Used any kind of public transportation (e.g., train, bus, etc.)
- ☐ Visited a museum of any type
- ☐ Played team sports
- ☐ Visited the gym, fitness club, etc.
- ☐ Gone to the movies, theatre, or concerts
- ☐ None of the above

***Note, only those respondents who select 'bicycle riding' in Q3 will be admitted into the survey
It is not necessary for a respondent to have made a bicycle purchase.**

Q7. Which of the following activities have you done for the first time in a year or more as a result of the COVID-19 pandemic?

- ☐ Ridden a bicycle (indoors or outdoors, including spin classes)
- ☐ Kayaking for any reason (fishing, touring, whitewater, etc.)
- ☐ Read a book (electronic, print, or audiobook)
- ☐ Running on a road or paved trail
- ☐ Trail running
- ☐ Hiking or mountaineering
- ☐ Consumed a beverage with caffeine
- ☐ Used any kind of public transportation (e.g., train, bus, etc.)
- ☐ Visited a museum of any type
- ☐ Played team sports
- ☐ Visited the gym, fitness club, etc.
- ☐ Gone to the movies, theatre, or concerts
- ☐ None of the above

The second screener question will be compared against the first, and responses with discontinuity (e.g. not selecting 'bicycling' in Q3 but selecting it in Q4) will be terminated for quality.

Purchase Screeners

Q8. Which of the following items have you purchased within the past 2 years?

- ☐ Bicycle
- ☐ Stationary bicycle
- ☐ Sit-on-top kayak
- ☐ Sit-inside kayak
- ☐ Running shoes
- ☐ Hiking boots
- ☐ Streaming device (AppleTV, Roku, etc.)
- ☐ Home office furniture (desk, office chair, etc.)
- ☐ Camping equipment (tent, cooking equipment, etc.)
- ☐ None of the above

Q9. Which, if any, of the following items do you plan to purchase within the next year?

- ☐ Bicycle
- ☐ Stationary bicycle
- ☐ Sit-on-top kayak
- ☐ Sit-inside kayak
- ☐ Running shoes
- ☐ Hiking boots
- ☐ Streaming device (AppleTV, Roku, etc.)
- ☐ Home office furniture (desk, office chair, etc.)
- ☐ Camping equipment (tent, cooking equipment, etc.)
- ☐ None of the above

Section 1: Participation

Section 1.1: Participation Overview

Q10. What type of riding have you done within the past 2 years?

Please select every time period when you've done each type of riding.

	Not within the past 2 years	Last year	This year, before the COVID-19 pandemic	Since the COVID-19 pandemic
Bicycle riding for recreation	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commuting to work or school by bicycle	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding a bicycle for transportation (to access essential services, groceries, etc.)	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indoor bicycle riding (at home or away from home)	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q11. Where have you ridden within the past 2 years?

- ☐ Paved roads where motor vehicles are allowed
- ☐ Paved paths/trails where motor vehicles are allowed
- ☐ Paved paths/trails where motor vehicles are not allowed
- ☐ Unpaved roads where motor vehicles are allowed
- ☐ Unpaved paths/trails where motor vehicles are allowed
- ☐ Unpaved paths/trails where motor vehicles are not allowed
- ☐ Mountain bike trails (singletrack)
- ☐ Lift served mountain bike park
- ☐ Bike park/pump track (not including lift served)
- ☐ Inside at home
- ☐ Inside at a gym or studio
- ☐ Other – please describe: _____
- ☐ None of the above – I have not ridden in the past year **Terminate for inconsistency**

TEXT:

This survey will first ask you about your riding before the COVID-19 pandemic. The next page will ask about your riding since the onset of COVID.

Before March 2020 (Typical Year)

[Hide from 'new riders' who only began since COVID]

Q12. **Before March 2020**, in a typical year how frequently were you participating in the following types of riding?

	Very infrequently	Less than once a week	About once a week	A couple of times a week	Nearly every day
Pipe answers from Q10. Rec, commute, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Hide from 'new riders' who only began since COVID]

Q13. **Before March 2020**, in a typical year how frequently were you riding in the following types of places?

	Very infrequently	Less than once a week	About once a week	A couple of times a week	Nearly every day
Pipe answers from Q11. Paved, unpaved, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Hide from 'new riders' who only began since COVID]

Q14. **Before March 2020**, when you have ridden in the following types of places, how long did you typically ride for?

	Less than one hour	1 to 2 hours	3 to 5 hours	More than 5 hours
Pipe answers from Q11. Paved, unpaved, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Since March 2020 (During COVID)

Q15. ***Since March 2020***, how frequently have you participated in the following types of riding?

	Very infrequently	Less than once a week	About once a week	A couple of times a week	Nearly every day
Pipe relevant answers from Q10 . Rec, commute, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16. ***Since March 2020***, how frequently have you riding in the following types of places?

	Very infrequently	Less than once a week	About once a week	A couple of times a week	Nearly every day
Pipe relevant answers from Q11. Paved, unpaved, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q17. ***Since March 2020***, when you have ridden in the following types of places, about how long did you typically ride for?

	Less than one hour	1 to 2 hours	3 to 5 hours	More than 5 hours
Pipe relevant answers from Q11. Paved, unpaved, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 1.1.1: New Riders

Recreation Rider

This page is shown only to those who indicated riding for recreation during the COVID-19 pandemic, and not beforehand (e.g. selected only "Since the COVID-19 pandemic" in Q10.).

Recreational Riding

Q18. Why had you not ridden a bicycle for recreation before the COVID-19 pandemic?

- ☐ I didn't have time to ride
- ☐ I didn't have a bike, or didn't have access to a bike
- ☐ I wasn't interested in bicycles
- ☐ I was concerned about safety on the path or road
- ☐ I preferred other outdoor recreation activities
- ☐ I preferred different leisure activities other than outdoor recreation
- ☐ I had too many family or work obligations
- ☐ I didn't know how to ride
- ☐ Other. Please describe: _____

Q19. Before the COVID-19 pandemic earlier this year, how long had it been since you rode a bike for recreation?

- ☐ 1 to 2 years
- ☐ 3 to 5 years
- ☐ 6 to 10 years
- ☐ More than 10 years
- ☐ I had never ridden a bicycle for recreation

Q20. What changed that caused you to start riding a bicycle for recreation?

- | | |
|---|---|
| <input type="checkbox"/> I have more time | <input type="checkbox"/> I was looking for an activity was safe and allowed for social distancing |
| <input type="checkbox"/> I wanted to exercise, be healthy | <input type="checkbox"/> I wanted to be outside in nature |
| <input type="checkbox"/> I wanted to lose weight | <input type="checkbox"/> I wanted a social activity |
| <input type="checkbox"/> I got a bike | <input type="checkbox"/> Gyms closed |
| <input type="checkbox"/> I had nothing else to do | <input type="checkbox"/> Streets were less busy |
| <input type="checkbox"/> I learned how to ride | <input type="checkbox"/> Other. Please describe: _____ |
| <input type="checkbox"/> I wanted to get out of the house | |
| <input type="checkbox"/> I was looking for a way to deal with stress, tend to mental health | |

Transportation Riding

This page is shown only to those who indicated riding for transportation during the COVID-19 pandemic, and not beforehand (e.g. selected only "Since the COVID-19 pandemic" in Q10.).

Q21. Why had you not ridden a bicycle for transportation before the COVID-19 pandemic?

- ☐ I preferred to travel by car/other transportation
- ☐ Traveling by bicycle was too slow/I didn't have time
- ☐ I had to travel too far
- ☐ I didn't have access to a bike
- ☐ I had not considered bicycling
- ☐ I thought riding a bicycle was unsafe
- ☐ I did not know how to ride
- ☐ Other. Please describe: _____

Q22. Before the COVID-19 pandemic earlier this year, how long had it been since you rode a bike for transportation?

- ☐ 1 to 2 years
- ☐ 3 to 5 years
- ☐ 6 to 10 years
- ☐ More than 10 years
- ☐ I had never ridden a bicycle for recreation

Q23. What changed that caused you to start riding a bicycle for transportation?

- ☐ I wanted to get in shape, be healthy
- ☐ I wanted a way to exercise
- ☐ Traveling by bicycle was safer than other forms transportation
- ☐ I got access to a bike (purchase, borrow, etc.)
- ☐ I have more time
- ☐ I learned how to ride
- ☐ I lost access to other forms of transportation
- ☐ I wanted to spend time outside
- ☐ Traveling by bicycle became a way to save money
- ☐ Streets were less busy
- ☐ Other. Please describe: _____

Indoor Riding

This page is shown only to those who indicated riding indoors during the COVID-19 pandemic, and not beforehand (e.g. selected only "Since the COVID-19 pandemic" in Q10.).

Q24. Why had you not ridden a stationary bicycle, trainer, or rollers before the COVID-19 pandemic?

- ☐ I didn't have equipment
- ☐ I didn't have time
- ☐ I preferred going to the gym/spin class
- ☐ I wasn't concerned with my health
- ☐ I was able to bike/exercise outdoors
- ☐ I was not interested in riding a stationary bike
- ☐ I preferred other outdoor recreation activities
- ☐ I preferred other leisure activities (not outdoor recreation)
- ☐ Other. Please describe: _____

Q25. Before the COVID-19 pandemic earlier this year, how long had it been since you rode a stationary bicycle, indoor trainer, or rollers?

- ☐ 1 to 2 years
- ☐ 3 to 5 years
- ☐ 6 to 10 years
- ☐ More than 10 years
- ☐ I had never ridden a bicycle for recreation

Q26. What changed that caused you to start riding a stationary bicycle, indoor trainer, or rollers?

- ☐ I wanted to become healthy / get in shape
- ☐ The pandemic forced me to stay indoors
- ☐ I wanted a way to exercise safely
- ☐ Gyms closed
- ☐ I was concerned about social distancing
- ☐ Maintain the healthy lifestyle I had before COVID-19
- ☐ Began working from home and indoor riding was an efficient way to exercise
- ☐ Other. Please describe: _____

Section 1.2: Future Participation

Q27. Considering your riding **next year**, how frequently do you plan participate in the following types of riding?

	Very infrequently, or not at all	Less than once a week	About once a week	A couple of times a week	Nearly every day
All answer options from Q10. Rec, commute, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q28. Considering your riding **next year**, how frequently do you plan to ride in the following types of places?

	Very infrequently, or not at all	Less than once a week	About once a week	A couple of times a week	Nearly every day
All answer options from Q11. Paved, unpaved, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q29. What would prevent you from riding as much in 2021 as you have ridden this year, or in previous years?

- ☐ Concerns about safety on the path or road
- ☐ Increased traffic as workers begin commuting to work again
- ☐ Spending time doing other outdoor recreation activities
- ☐ Spending time participating in other leisure activities (other than outdoor recreation)
- ☐ Family or work obligations
- ☐ Returning to the gym/spin class
- ☐ Other. Please describe: _____

Q30. Which of the following might encourage you to continue riding in 2021 and beyond?

- ☐ Group rides from a local shop
- ☐ An invitation from a friend or family member to ride
- ☐ Access to rental or loaner equipment
- ☐ Improved bike lanes, paths, and other infrastructure
- ☐ Access to information about local rides
- ☐ Information and insights from local bicycling experts
- ☐ A special beginner event for beginner riders
- ☐ Stories about riding in local online media (blogs, social media, websites)
- ☐ Stories about riding in local print media
- ☐ Other. Please describe: _____

Q31. Within the past 6 months, have you invited anybody to go on a bicycle ride with you?

- ☐ Yes
- ☐ No

[If yes]

Q32. Did you invite someone who you would consider to be a less avid or beginner bicycle rider?

- ☐ Yes
- ☐ No

Section 2: Motivations

Q33. Considering all types of bicycle riding you do, which of the following motivations reflect why you ride? Select up to 3 answers.

- | | |
|---|--|
| <input type="checkbox"/> Sense of achievement | <input type="checkbox"/> Stress relief / mental health |
| <input type="checkbox"/> Active lifestyle | <input type="checkbox"/> Relaxation |
| <input type="checkbox"/> Spending time alone | <input type="checkbox"/> Sense of freedom |
| <input type="checkbox"/> Protecting the environment | <input type="checkbox"/> Socializing with friends/family |
| <input type="checkbox"/> Just for fun | <input type="checkbox"/> The thrill of the ride |
| <input type="checkbox"/> Exercise/health | <input type="checkbox"/> Other. Please describe: _____ |
| <input type="checkbox"/> Being outside | |

Q34. Please consider how the following motivations reflect why you ride a bicycle. Considering only these motivations, which is the **Most Motivating** and which is the **Least Motivating**?

MaxDiff Experiment for segmentation. ^Same answer options as above, with the exception of 'Other. Please describe'. Respondents will see 7 experiments with 6 answer options provided in each card, which allows for each motivation to be seen an average of 3.5 times. An example of one card is shown below.

Please consider how the following motivations reflect why you ride a bicycle. Considering only these motivations, which is the **Most Motivating** and which is the **Least Motivating**?

(1 of 7)

Least Motivating		Most Motivating
<input type="radio"/>	Just for fun	<input type="radio"/>
<input type="radio"/>	Sense of freedom	<input type="radio"/>
<input type="radio"/>	The thrill of the ride	<input type="radio"/>
<input type="radio"/>	Socializing with friends/family	<input type="radio"/>
<input type="radio"/>	Protecting the environment	<input type="radio"/>
<input type="radio"/>	Being outside	<input type="radio"/>

Click the 'Next' button to continue...

Q35. What role do each of these activities play in your life? Answer options shown below include all possible answers. They will be shown/hidden based on their selection in previous questions.

	1: This activity is not at all important to me	2: This activity is somewhat unimportant to me	3: I'm indifferent about this activity	4: This activity is somewhat important to me	5: This activity is very important to me – It's central to my life
Bicycle riding for recreation (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commuting to work or school by bicycle (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Riding a bicycle for transportation (to access essential services, groceries, etc.) (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indoor bicycle riding (at home or away from home) (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kayaking (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Running on a road or paved trail (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trail running (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hiking or mountaineering (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using public transportation (e.g., train, bus, etc.) (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visiting a museum (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing team sports (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Going to the gym, fitness club, etc. (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Going to the movies, theatre, or concerts (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q36. How satisfied are you with the amount of time you spend doing the following activities?
 Answer options shown below include all possible answers. They will be shown/hidden based on their selection in previous questions.

	1: I wish I spent less time doing this	2: I'm happy with how much time I spend doing this	3: I wish I could spend more time doing this
Bicycle riding for recreation (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commuting to work or school by bicycle (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Riding a bicycle for transportation (to access essential services, groceries, etc.) (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indoor bicycle riding (at home or away from home) (Q10.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kayaking (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Running on a road or paved trail (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trail running (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hiking or mountaineering (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using public transportation (e.g., train, bus, etc.) (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visiting a museum (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing team sports (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Going to the gym, fitness club, etc. (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Going to the movies, theatre, or concerts (Q7.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Asked if (4) or (5) is selected for any type of bicycling in the question above.

Q37. What is the main barrier that has prevented you from riding a bicycle more often?

[Essay answer]

Section 3. Purchases

3.1 Recent Purchases

3.1.1 Recent Parts, Accessories, H/F/G, and Apparel Purchases

Q38. Have you purchased any of the following items within the past year? [Multiple selection]

- ☐ Bicycle parts (components, pedals, saddles or pads, etc.)
- ☐ Bicycle tires
- ☐ Bicycle tubes
- ☐ Bicycle accessories (electronics, fenders, lights, locks, pumps, racks, trailers, etc.)
- ☐ Bicycle helmet
- ☐ Bicycle footwear (shoes, bike sandals, etc.)
- ☐ Bicycle gloves
- ☐ Bicycling apparel (jerseys, bibs, shorts, socks, etc.)
- ☐ None of the above

[If 'bicycle parts' is selected in Q38.]

Q39. What type of bicycle parts did you purchase?

- ☐ Components
- ☐ Forks & suspension
- ☐ Pedals
- ☐ Saddle or seat-pad
- ☐ Wheel parts
- ☐ Wheels
- ☐ Other. Please describe: _____
- ☐ None of the above

[If 'bicycle accessories' is selected in Q38.]

Q40. What type of bicycle accessories did you purchase?

- ☐ Lights
- ☐ Pump
- ☐ Electronics (e.g. cycling computers, power meters, etc.)
- ☐ Fenders
- ☐ Locks
- ☐ On-bike packs
- ☐ On-bike racks
- ☐ Repair/maintenance tools
- ☐ Trailers
- ☐ Trainer/rollers
- ☐ Water bottle cages
- ☐ Other. Please describe: _____
- ☐ None of the above

[If 'none of the above' is *not* selected in Q38.]

Q41. Please indicate which items, if any, were purchased during the COVID-19 pandemic.

[Pipe responses from previous 3 questions]

- ☐ None of these

Q42. In total, about how much did you spend on [pipe answers: bicycle parts, bicycle accessories, helmets, footwear, gloves, etc.] within the past year?

Please do not consider any spending on a bicycle.

- | | |
|--------------------------------------|--|
| <input type="radio"/> Under \$200 | <input type="radio"/> \$750 to \$999 |
| <input type="radio"/> \$200 to \$349 | <input type="radio"/> \$1,000 to \$1,999 |
| <input type="radio"/> \$350 to \$499 | <input type="radio"/> \$2,000 to \$4,999 |
| <input type="radio"/> \$500 to \$749 | <input type="radio"/> \$5,000 or more |

3.1.2. Recent Bicycle Purchases

[If 'bicycle' is selected in Q38.]

Q43. What type of bicycle have you purchased within the past 2 years? (Answer options will be accompanied by a picture).

- ☐ BMX bicycle
- ☐ Children's bicycle
- ☐ Electric bicycle
- ☐ Road bicycle
- ☐ Mountain bicycle

- ☐ Tandem bicycle
- ☐ Urban / commuter bicycle
- ☐ Cruiser / lifestyle / leisure bicycle
- ☐ Tandem bicycle
- ☐ Other. Please describe: _____

Q44. Did you purchase any of the following bikes after the COVID-19 pandemic began affecting the United States? *Please select which, if any, you purchased since March 2020.*

[Piped answers from the question above]

- ☐ None of these

[TEXT] For the following questions, please consider your most recent bicycle purchase.

Q45. Considering your most recent bicycle purchase, how did you purchase this bicycle?

- ☐ Purchased online and delivered to me
- ☐ Purchased online and picked up in-store
- ☐ Purchased in-person

Q46. From what kind of store did you purchase this bicycle?

- ☐ Local bicycle shop
- ☐ Sporting goods store (Dick's Sporting Goods, Academy, Big 5, etc.)
- ☐ Mass-merchant (Walmart, Target, etc.)
- ☐ Marketplace (Amazon, eBay, etc.)
- ☐ From an individual (friend, Craigslist, Facebook Marketplace, etc.)
- ☐ Other. Please describe: _____

Q47. Was this a new or a used bicycle?

- ☐ New
- ☐ Used

Q48. About how much did you spend on your most recent bicycle purchase?

- | | |
|--------------------------------------|--|
| <input type="radio"/> Under \$200 | <input type="radio"/> \$750 to \$999 |
| <input type="radio"/> \$200 to \$349 | <input type="radio"/> \$1,000 to \$1,999 |
| <input type="radio"/> \$350 to \$499 | <input type="radio"/> \$2,000 to \$4,999 |
| <input type="radio"/> \$500 to \$749 | <input type="radio"/> \$5,000 or more |

-- end of bicycle purchase subsection --

3.2 Intended Purchases

3.2.1 Bicycle Purchases

[TEXT] For the following questions, please consider the bicycle you intend to purchase next.

Q49. What type of bicycle do you plan to purchase?

- | | |
|---|--|
| <input type="checkbox"/> BMX bicycle | <input type="checkbox"/> Urban / commuter bicycle |
| <input type="checkbox"/> Children's bicycle | <input type="checkbox"/> Cruiser / lifestyle / leisure bicycle |
| <input type="checkbox"/> Electric bicycle | <input type="checkbox"/> Tandem bicycle |
| <input type="checkbox"/> Road bicycle | <input type="checkbox"/> Other. Please describe: |
| <input type="checkbox"/> Mountain bicycle | _____ |
| <input type="checkbox"/> Tandem bicycle | |

Q50. Considering your next bicycle purchase, how do you plan purchase this bicycle?

- ☐ Purchase online and delivered to me
- ☐ Purchase online and pick up in-store
- ☐ Purchase in-person

Q51. From what kind of store do you plan to purchase this bicycle?

- ☐ Local bicycle shop
- ☐ Sporting goods store (Dick's Sporting Goods, Academy, Big 5, etc.)
- ☐ Mass-merchant (Walmart, Target, etc.)
- ☐ Marketplace (Amazon, eBay, etc.)
- ☐ From an individual (friend, Craigslist, Facebook Marketplace, etc.)
- ☐ Other. Please describe: _____

Q52. Do you plan to purchase a new or a used bicycle?

- ☐ New
- ☐ Used

Q53. About how much are you **planning** to spend on your upcoming bicycle purchase?

- ☐ Under \$200
- ☐ \$200 to \$349
- ☐ \$350 to \$499
- ☐ \$500 to \$749
- ☐ \$750 to \$999
- ☐ \$1,000 to \$1,999
- ☐ \$2,000 to \$4,999
- ☐ \$5,000 or more

Q54. Why haven't you made this purchase yet?

- ☐ I cannot find my desired bike in stock
- ☐ I do not have time to ride yet
- ☐ I cannot afford this purchase yet
- ☐ Other. Please describe: _____

3.2.2 Accessories, Parts, and Aftermarket Purchases

Q55. Do you plan to purchase any of the following within the next year?

- ☐ Bicycle parts (components, pedals, saddles or pads, etc.)
- ☐ Bicycle tires
- ☐ Bicycle tubes
- ☐ Bicycle accessories (electronics, fenders, lights, locks, pumps, racks, trailers, etc.)
- ☐ Bicycle helmet
- ☐ Bicycle footwear (shoes, bike sandals, etc.)
- ☐ Bicycle gloves
- ☐ Bicycling apparel (jerseys, bibs, shorts, socks, etc.)
- ☐ None of the above

[If 'bicycle parts' is selected in Q55.]

Q56. What type of bicycle parts do you plan to purchase in the next year?

- ☐ Components
- ☐ Forks & suspension
- ☐ Pedals
- ☐ Saddle or seat-pad
- ☐ Wheel parts
- ☐ Wheels
- ☐ Other. Please describe: _____
- ☐ None of the above

[If 'bicycle accessories' is selected in Q55.]

Q57. What type of bicycle accessories do you plan to purchase in the next year?

- ☐ Lights
- ☐ Pump
- ☐ Electronics (e.g. cycling computers, power meters, etc.)
- ☐ Fenders
- ☐ Locks
- ☐ On-bike packs
- ☐ On-bike racks
- ☐ Repair/maintenance tools
- ☐ Trailers
- ☐ Trainer/rollers
- ☐ Water bottle cages
- ☐ Other. Please describe: _____
- ☐ None of the above

Media Use and Social Network

Q58. What type of social media do you use?

- ☐ Facebook
- ☐ Instagram
- ☐ Snapchat
- ☐ Tik Tok
- ☐ LinkedIn
- ☐ Pinterest
- ☐ Reddit
- ☐ Twitter
- ☐ Other. Please describe: _____
- ☐ None of the above

Q59. Considering the social media platforms you use, which is your favorite?

[Pipe responses from previous question]

Q60. Which of the following sources of information do find influential when looking for places to ride? *Please select up to 3 answers.*

- ☐ Bike shops
- ☐ Ride tracker app (Strava, Ride Spot, Komoot, etc.)
- ☐ Online reviews
- ☐ Manufacturer websites
- ☐ Online forums / blogs
- ☐ Local riding clubs / organizations
- ☐ Non-profit organizations (i.e.)
- ☐ A friend / family member
- ☐ Other. Please describe: _____

Q61. Which of the following sources do you find influential when researching bicycle related product information? *Please select up to 3 answers.*

- ☐ Bike shops
- ☐ Online reviews
- ☐ Manufacturer websites
- ☐ Online forums / blogs
- ☐ Local riding clubs / organizations
- ☐ Non-profit organizations (i.e.)
- ☐ A friend / family member
- ☐ Other. Please describe: _____

Q62. How do you interact with the bicycle riding community?

- ☐ Post pictures of bicycle rides online
- ☐ Use ride tracker apps (e.g. Strava, MapMyRide, Ride Spot, etc.)
- ☐ Talk about bicycle riding with my friends
- ☐ Spend time talking with employees at my local bicycle shop
- ☐ Ride with a club or organization centered around cycling
- ☐ Other. Please describe: _____
- ☐ None of the above

Q63. Are you someone who your friends would approach with questions about where to ride or what bicycle related products to buy?

- ☐ Yes
- ☐ No

The following question is a quality check. We will compare their age to their birth year and remove those whose answer is off by more than 2 years.

Q64. What is your birth year?

[Open response]

Detailed Demographics

Q65. Which of the following best describes where you live?

Select one. [Randomize rows except other]

- ☐ Urban
- ☐ Suburban
- ☐ Rural
- ☐ Other

Q66. Do you have any children under the age of 18 who live with you?

- ☐ Yes
- ☐ No

Appendix 2 – HB Analysis Detail

The following two tables present the zero-centered interval scores for respondents based on the results of a Latent Class Analysis. Individual scores are highlighted based on their relative importance within each segment; the least motivating scores appear in red, while the most motivating scores appear in green. Yellow cells represent those motivations which exist between extremes.

	Social Fun Outside	Serious Exercise	Mental and Physical Health	Solitude, Relaxation and Mental Health	Freedom and Thrill
Sense of achievement	-35.72	-3.76	-5.96	-50.43	-5.04
Active lifestyle	23.56	12.03	27.82	-25.85	-27.98
Spending time alone	-45.06	-28.41	-9.48	18.66	-37.36
Protecting the environment	-35.04	0.92	-39.90	-49.07	-22.98
Exercise/health	54.94	61.88	60.10	29.44	-8.83
Being outside	36.57	-28.01	9.93	43.26	12.58
Stress relief / mental health	1.98	56.26	32.50	46.09	-21.85
Relaxation	0.52	23.28	-1.81	33.84	-24.62
Just for fun	19.34	-32.54	-8.85	29.93	-0.18
Sense of freedom	-20.82	-12.81	-8.94	13.37	62.64
Socializing with friends/family	29.04	-10.72	-36.24	-53.91	31.38
The thrill of the ride	-29.30	-38.12	-19.18	-35.34	42.25
Sample Size	N=148	N=163	N=203	N=157	N=243

	Lone Outdoor Enthusiast	Being Active Outside	Mental and Physical Health	Socializing Outside	Freedom and Thrill
Sense of achievement	-47.18	-28.93	1.05	-44.37	-10.57
Active lifestyle	-21.07	32.95	25.97	-1.29	-19.83
Spending time alone	27.95	-18.6	-19.65	-53.21	-60.76
Protecting the environment	-44.74	-25.01	-29.76	-40.84	35.08
Exercise/health	20.97	69.66	70.24	44.07	0.73
Being outside	35.75	35.7	-12.48	37.66	-39.36
Stress relief / mental health	42.24	-7.56	38.34	30.19	14.39
Relaxation	24.31	1.83	6.21	11.66	13.93
Just for fun	19.65	13.06	-19.95	28.02	5.48
Sense of freedom	23.53	-12.58	-8.44	-21.18	23.36
Socializing with friends/family	-57.76	-30.34	-26.03	46.79	-1.68
The thrill of the ride	-23.65	-30.18	-25.5	-37.52	39.24
Sample Size	N=343	N=364	N=482	N=253	N=420