

NORTH AMERICAN BIKESHARE & SCOOTERSHARE ASSOCIATION

Shared Micromobility

State of the Industry Report



NABSA is pleased to present our third annual **Shared Micromobility State of the Industry Report**. In 2021, the industry continued to respond to the COVID-19 pandemic with shared micromobility filling critical gaps in essential mobility. The industry continued to rebound and demonstrate tremendous resilience, with the number of systems growing past pre-pandemic levels. This report tracks that progress and the trends that are emerging in the industry.

To inform this report, we have collected data across a wide variety of topics, including ridership metrics, user profiles, employment, equity, and community benefits. Our data sources include surveys sent to shared micromobility operators and public agencies across North America, supplemented by research reports on shared micromobility, census data, and other data that is tracked by NABSA. This 2021 State of the Industry report shows a snapshot in time, providing a comparison for tracking trends with previous years and marking successes and challenges as the industry continues to evolve. See page 19 for detailed notes on methodology.



Shared Micromobility in North America

In 2021, an estimated 298 cities* had at least one bikeshare or e-scooter system* and 97 had both. This is 30% higher than in 2020 and 2% higher than in 2019 and includes:

- 273 cities in the United States
- 19 cities in Canada
- 6 cities in Mexico

There are 191 e-scooter systems and 204 bikeshare systems, with a mix of docked, dockless, and hybrid* systems, with some cities having multiple systems of different types; 50% of cities with bikeshare systems have fleets that include e-bikes.

> At least 298 cities in **North America** have a shared scooter or **bikeshare** system

North American Cities with Shared Micromobility Systems, Shown by Population Size

> **Circle is proportional** to population Bikeshare





e-scooters



*Definitions for these terms are included on the Methodology page.

COVID-19 Pandemic Resilience

Shared micromobility continued to show remarkable resilience and rebound from the impacts of the pandemic in 2021. The number of systems and vehicles was above 2019 levels, and while total trip numbers were below 2019 numbers, monthly ridership started to surpass 2019 levels towards the middle of 2021.



Trends During COVID-19

In 2021, the shared micromobility industry continued to play its part in keeping North America moving.

Of operators* responding to NABSA's survey:



50% continued to provide programs for essential workers such as discounted or free rides

Of agencies* responding to NABSA's survey:

Over 60[%] continued or implemented "slow streets" or repurposed street space for active transportation



waived user fees



Since the start of the pandemic, there have been changes in the way that people use shared micromobility:

- Over 75[%] of agencies and operators reported changes to the times of day that trips were made
- Almost 70% reported an increase in weekend trip-making
- Over 40% saw increased trips to destinations near essential services
- Approximately 44% reported increased trip-making in "equity zones"*





*Definitions for these terms are included on the Methodology page.



Industry Impact

Transportation Options

User surveys show that shared micromobility is used in place of a wide variety of modes, and that 4% of trips are new trips that would not have been taken otherwise. **37**[%] of shared micromobility trips replace a car trip



Recent research using push notifications at the end of a shared micromobility trip suggests that auto mode replacement is even higher and that the distance of auto trips being replaced is higher than other modes, resulting in greater VMT offset.*

Physical Activity & Exercise

North Americans gained almost

of additional physical activity

through shared micromobility, by creating new trips and replacing motorized trips:

5.7 million hours on pedal bikes

- 2.1 million hours on e-bikes
- 7.7 million hours on e-scooters

Reduced Greenhouse Gas Emissions



Riding shared micromobility produces considerably fewer greenhouse gas emissions.

By replacing auto trips, shared micromobility trips reduced GHG emissions by:

100% on pedal bikes 97% on e-bikes 98% on e-scooters

> In 2021, shared micromobility trips offset approximately **54 million pounds of CO₂ emissions** by replacing auto trips.

These reduction factors do not take into account operations, externalities, or lifecycle costs for shared micromobility or for driving, as data for these calculations was unavailable.

* See Methodology page for study information.

Economic Benefits of Shared Micromobility

NABSA compiled the results of user surveys conducted in cities with shared micromobility to understand why people ride, and what users see as the main benefits. This is supported by research showing the economic benefits of shared micromobility and NABSA's estimate of the number of people employed in the industry.



representing an

additional \$62 million

in restaurant spending across the 298 cities operating shared micromobility in 2021.

micromobility employs Contractors 13%



This represents about 1 job for every 26 vehicles 13% Part-time Full-time 13% 74%

Who Uses Shared Micromobility



The chart shows the average number of percentage points by which shared micromobility users over- or underrepresent local demographics. For example, if women represent 50% of the population of a particular city, but they represent only 40% of that city's shared micromobility users, then women are under-represented by 10 percentage points.

The following trends are noted:

- Income: the highest income earners were highly over-represented in 2021; the lowest earners were also slightly over-represented; low-to-middle incomes were the most underrepresented in 2021.
- Age: the 25-44 year age bracket continued to be over-represented; the 18-24 year age bracket was also slightly over-represented; older adults were under-represented.
- Race: People of Color were much closer to representative in 2021 than previous years; however White populations were still over-represented.
- **Gender:** female participation continued to be under-represented.

There was better representation of very low income users and People of Color compared to 2020.

*Since data was unavailable, people under 18 years old were omitted from the analysis, as were nonbinary and other genders not counted in the Census.

Transportation Equity

Shared micromobility systems offer a range of equity programs. There was a significant increase in the percentage of bikeshare and e-scooter systems in North America that have equity programs including:

	Dis	count Pre	ograms	92 %	
Alternative I	Payment C	ptions	85 %	2021 saw a	
Education and Outreach Pr	ograms	79 %		significant increase in	
Geographic Distribution Policies	75%			the number of shared micromobility systems	
Equitable Hiring	75%			providing equity	
Adaptive Vehicles 21 %				programs.	

Agencies and operators reported increased participation in NABSA's Workforce Diversity Toolkit initiatives:

- % stated that diversity is part of every hiring conversation.
- % reported that their staff have completed cultural competency or diversity training.
- reported that women and people of color are represented at all levels of their organization.
- reported that staff is representative of the populations being served.

Shared micromobility providers continued to offer heavily discounted access for low-income and other qualified individuals (average annual cost)



Non-discounted Cost Discounted Cost

\$**142**

Agencies and operators continued their support for racial justice and better representation of minority populations by...

- Making organizational change through more representative leadership and positions focused on diversity, equity, and inclusion (DEI).
- Increased focus or update of DEI plans, policies, and performance metrics.



 Continued energy in building partnerships with community based organizations that are representative of the community.



Comparison of Trip Trends

North Americans took an estimated 128 million trips on shared micromobility vehicles in 2021. This is approximately 53% more trips than the total taken during 2020, and approximately 18% lower than in 2019. E-scooters accounted for almost half of all trips, up from just over a third in 2020. Pedal bike trips were slightly higher than 2020 and e-bike trips were almost double the 2020 level.

128 Million Trips Across North America in 2021





The rebound in trips from the COVID-19 pandemic resulted in higher utilization compared to 2020, though still lower than 2019. The average shared micromobility vehicle was used for approximately 2.0 trips per vehicle per service day. The average trip length increased from 1.3 to 1.4 miles in 2021, but average trip duration was shorter than last year, reducing from 17 to 15 minutes. These numbers are based on aggregate data, individual cities will have variations based on local conditions.



Comparison of Vehicle Trends

North Americans had access to an estimated 232 thousand shared micromobility vehicles in 2021. This was approximately 37% higher than the number of vehicles available in 2020 and 20% higher than in 2019. The number of e-scooters increased significantly during 2021 and is now 57% of the shared micromobility fleet. The number of bikes increased only slightly compared to 2020.

232 Thousand Vehicles

Deployed Across North America on an average day in 2021



Country-by-Country Shared Micromobility Vehicle Breakdown



E-Bike Trends

The use and popularity of e-bikes is increasing in the shared micromobility industry.





E-bikes were ridden approximately **36%** more than regular pedal bikes.

System Statistics by City Size

Shared micromobility systems have different operating characteristics in cities of different sizes. The number of systems, average vehicle counts, system densities, utilization, and the median number of operators for small-, medium-, and large-sized cities are shown below.



Operating Characteristics

The way that shared micromobility operates continues to evolve. This page shows a 2021 snapshot of system ownership, the range of sizes of operators, and a summary and breakdown of operating costs and revenues.



The number of public and nonprofit systems represented 42% of systems and was a decrease from 2020. Private systems, including those operated under an agency permit represented 58% of systems, an increase compared to 2020.

% of Operators with... 6% 10% **57**% 27% 2-5 1 system 6-10 100% 0% systems systems 2021 saw an increase in the footprint of some smaller and medium sized operators. The majority More of operators (84%) still have fewer than 5 systems. than 10 systems

Operators identified their Top 3 program costs as...



Rebalancing and recharging



Vehicle maintenance and repair



Overhead costs (e.g. insurance, fees, etc.)

There was a significant increase in the number of cities requiring the General Bikeshare Feed Specification (GBFS) for use in navigation and trip planning apps in 2021. Does your agency require GBFS feeds from operators?













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Shared Micromobility as Transportation

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Shared Micromobility in Policy

Shared micromobility plays a key role in delivering climate, equity, health, transportation, and other public benefits. Shared micromobility can be included in a variety of regulations and policies at local, regional, state/ provincial, and federal levels. Some examples of this are shown below.

E-Bike Codification

In Canada, **11/13 provinces** codify e-bikes for use in the right of way.

In the U.S., **50/50 states** codify e-bikes for use in the right of way.

E-Scooter Codification

In Canada, **3/13 provinces** codify e-scooters for use in the right of way (all pilot programs).

In the U.S., **34/50 states** codify e-scooters for use in the right of way.



Agencies responding to NABSA's survey said that:

Approximately $50^{\%}$ of agencies had to change their regulations to accommodate e-bikes.

Approximately $80^{\%}$ of agencies had to adjust their regulations to allow for e-scooters.

Agencies **very often** refer to shared micromobility in their **transportation policies; often** refer to it in **climate policies; and sometimes** refer to it in **equity or public health policies.**

Shared Micromobility as Public Transportation

Shared micromobility is part of the public transportation ecosystem. As a flexible transportation option with comparatively low overhead and operations costs, shared micromobility can complement higher-volume fixed-route transit services by offering mobility services for many trips at a lower pertraveler cost. Below is a summary of shared micromobility's effectiveness as a public transportation option and how it complements other public transportation modes.



Transit Agency Roles

Transit agencies are playing an active role in shared micromobility. Agencies responding to NABSA's survey showed the following involvement from local transit agencies:

	Involved in station/hub planning	54%
Support grant writing/funding applications 29%		
Serve on advisory boards 21%		
Provide direct funding support 19%		

Transit Integration

Some of the ways that transit agencies are integrating with shared micromobility include:



Shared Micromobility Advancing Policy Objectives

Colorado

The state legislature created a clean air grant program with electric bikeshare an eligible project type.

New rules have been created

Environmental Quality Act (CEOA)

review process for proven programs

to streamline the California

Hamilton, ON

City Council committed public funding towards operating the city's bikeshare program.

Toronto, ON

Shared micromobility is a key part of the City's Climate Action Plan goal of 75% of trips <5km being made by walking, cycling, or transit.



United States

Bikeshare and shared scooters are eligible projects for Congestion Mitigation Air Quality (CMAQ) funding.

San Jose, CA

hop

California

Shared micromobility is a key element of the City's Emerging Mobility Action Plan focused on providing more equitable access to transportation.

Mexico

Mexico's new General Law on Mobility and Road Safety establishes a "Safe Systems" approach that will improve safety for all road users including shared micromobility.

Integrating Shared Micromobility with Transit

TransLink Tomorrow Shared Mobility Pilot (Vancouver, BC)

TransLink (the regional transportation authority for Vancouver) started with a small-scale MaaS pilot. A Shared Mobility Compass Card allowed users from 13 local employers to access public transit, carshare, and bikeshare services for work-related purposes. Early results indicated a mode shift toward more sustainable modes of transportation.

MovePGH Pilot (Pittsburgh, PA)

Pittsburgh's Mobility Collective launched a single digital platform for users to plan and book shared micromobility, transit, carshare, and carpool trips. The program also supports mobility hubs*. The city also launched a Universal Basic Mobility pilot program, providing 100 low-income residents free access to all participating transportation options in MovePGH for six months.

Mexico City

Ecobici is fully integrated into the TCDMX integrated mobility card which is used for access to Metro, trains, buses, and bikeshare.

How NABSA Supports the Industry

The North American Bikeshare & Scootershare Association (NABSA) collaborates across sectors to grow shared micromobility and its benefits to communities, creating a more equitable and sustainable transportation ecosystem. NABSA is a nonprofit organization dedicated to providing resources, education, and advocacy for the shared micromobility industry, and to creating spaces for the industry's public, private, and nonprofit sectors to convene and empower each other. In 2021, NABSA had 72 members from 6 countries.



NABSA Highlights for 2021



Methodology

Survey Tools

Primary data for this report was collected through two surveys: an Operator Survey and an Agency Survey. The Surveys were distributed to all known shared micromobility operators and agencies and included questions about the attributes of shared micromobility systems operating within those agency jurisdictions and operator markets.

Page 1 – Shared Micromobility in North America

Population data sources for the map include:

- The US American Community Survey 5-Year Estimates, 2016-2020
- The 2021 Canadian Census
- Mexico's Population and Housing Census 2020

System data was derived from an internal database of all known shared micromobility systems in North America that is maintained and updated by NABSA.

The word "cities" is used to denote local jurisdictions or municipalities throughout this report. On occasion, the word cities is used as a catch-all that may include metro regions or counties in which shared micromobility systems operate; when this happens, the geography will be specified in the text and/or the methodology section.

A "system" is defined as at least 3 stations or 20 dockless devices that are not on a closed campus. In addition, systems are automated with a back-end management software.

A "hybrid system" is defined as a system that uses branded stations or hubs and that also allows some degree of free-floating use of devices outside of branded stations.

Page 2 - COVID-19 Pandemic Resilience

Trip-making comparisons were made using monthly ridership data for 2019, 2020, and 2021 for the following shared micromobility systems: Austin Dockless Pilot, Bay Wheels (San Francisco Bay Area), Bixi (Montreal), Blue Bikes (Boston Metro Area), Capital Bikeshare (Washington D.C. Metro Area), CitiBike (Jersey City and New York City), CoGo (Columbus, OH), Divvy (Chicago), EcoBici (Mexico City), Indego (Philadelphia), Metro Bike Share (Los Angeles), Nice Ride (Minneapolis), Norfolk E-Scooter Pilot (Norfolk, VA), Seattle Dockless Bikeshare Pilot, SFMTA Dockless Mobility Program (San Francisco). Data sources included the U.S. Department of Transportation's Bureau of Statistics and publicly available ridership data.

Monthly transit ridership data was obtained from the Federal Transit Agency's National Transit Database.

Page 3 - Trends During COVID-19

The response of operators and agencies to the COVID-19 pandemic were based on data collected from the Agency and Operator Surveys.

The word operator refers to a company or organization responsible for day-to-day operations of one or more shared micromobility systems. The word agency refers to a public agency responsible for oversight of one or more shared micromobility systems in their jurisdiction.

Equity zones are areas including higher proportions of low income and other communities that have been historically underserved by transportation. Shared micromobility can play a key role in improving transportation access for these communities.

Page 5 – Industry Impact

Mode Replacement

Mode replacement statistics (for all modes) were calculated as averages of published survey data collected in 19 systems or cities between 2018 and 2021: Alexandria, Arlington, Aspen, Bird (national data), Bloomington, Calgary, Chicago, Denver, Hoboken, Milwaukee, Norfolk, Los Angeles, Oakland, Portland, San Antonio, San Francisco, Seattle, Tucson, and Vancouver, BC. "Other" modes include other shared micromobility, personal e-scooters, and non-identified "other" options. The automobile trip replacement percentage was calculated using the above dataset plus data collected in Atlanta, Kelowna, and Santa Monica, who report only the auto replacement statistic.

The push notification study suggesting higher auto mode replacement and VMT offset is based on the research in *How Should Vehicle Miles Traveled Displaced by E-Scooter Trips be Calculated?* (Meroux et al. 2022).

Physical Activity

Reported physical activity statistics were calculated from shared micromobility trips replacing taxi, rideshare, auto driver or auto passenger, transit, and new trips and applying the average trip duration calculated from responses to the Operator and Agency Surveys.

Research citations for the benefits of light physical activity include: Association of Light Physical Activity Measured by Accelerometry and Incidence of Coronary Heart Disease and Cardiovascular Disease in Older Women (LaCroix et al 2019), and Dose-Response Associations Between Accelerometry Measured Physical Activity and Sedentary Time and All Cause Mortality: Systematic Review and Harmonised Meta-Analysis (Ekelund et al 2019).

E-bike riders use about 76 percent of the energy expenditure of pedalbike riders. Riding an e-bike provides moderate metabolic activity on flat segments (metabolic equivalent of task [MET] of 3) and vigorous activity on uphills (MET of 6). This is based on the research in *Comparing Physical Activity of Pedal-Assist Electric Bikes with Walking and Conventional Bicycles* (Langford et al 2017).

E-scooters provide light physical activity (MET of 2.5). This is based on the research in *Evaluating the Physical Activity Impacts of Riding Electric Kick Scooters* (poster session presented at the 2019 Conference on Health and Active Transportation, Washington D.C; Wen et al 2019).

Reduced Greenhouse Gas Emissions

Reduction in total Greenhouse Gas (GHG) emissions was calculated based on taxi, rideshare, and auto driver/passenger trip replacement; an estimate of total trips taken on shared micromobility modes; and average trip distance calculated from responses to the Operator and Agency Surveys. Reduction factors do not take into account externalities, operations, or lifecycle costs for shared micromobility or for driving.

GHG emission factors for e-bikes and e-scooters were calculated based on energy factors from the following sources: *Electric Two-Wheelers in China: Analysis of Environmental, Safety, and Mobility Impacts* (Cherry 2007) and The Environmental Impacts of Shared Dockless Electric *Scooters* (Hollingsworth et al 2019); and average US Grid emission factors were obtained from the *US EPA eGrid2018 Database* (EPA, 2020). The automobile emission factor was taken from the *US EPA Memorandum on GHG Emissions from a Typical Passenger Vehicle* (EPA, 2018).

Page 6 – Economic Benefits of Shared Micromobility

Why People Ride & Community Benefits

These use cases were derived from published survey data of shared micromobility users. Not all response options are presented. This report lists the four most frequent answers for each of the two categories.

Increased Spending

These statistics were reported directly from the following research: Kim, K. and McCarthy, D. (2022). Wheels to Meals: Measuring the Impact of Micromobility on Restaurant Demand. Working Paper, available <u>here</u>.

Health Benefits

These statistics were reported directly from the following research: Clockston, R. and Rojas-Rueda, D. (2021). Health Impacts of Bike-Sharing Systems in the U.S. Available at https://doi.org/10.1016/j.envres.2021.11709

Shared Micromobility Job Estimates

Employment statistics were calculated from responses to the Agency and Operator Surveys. However, the sample was limited in size and coverage. Industry employment was estimated from the aggregate number of vehicles and applying average employment rates observed in the sample.

Page 7 - Who Uses Shared Micromobility

These statistics were calculated based on a comparison of the demographics of shared micromobility users (as reported by a selection of cities conducting their own user surveys) and the equivalent demographic data for those cities from the 2020 American Community Survey (ACS). User survey data from 2019 to 2021 collected in the following cities was used in this analysis: Alexandria, Atlanta, Baltimore, Chicago, Dayton, Denver, Ithaca, Jersey City, Los Angeles, Miami, Minneapolis, New York City, Oakland, Philadelphia, Portland, Salt Lake City, San Antonio, San Diego, San Francisco, San Jose, Santa Monica, Seattle, Tucson, Washington D.C. Not all cities reported in all categories. Over-/under-representation for each demographic is an average of the over-/under-representation for each city. People under 18 years old were omitted from the analysis, as were nonbinary and other genders not counted in the Census since data was unavailable.

Page 8 - Transportation Equity

The distribution and median number of equity programs were calculated from responses to the Agency and Operator Surveys. Equity program categories are adapted from *Evaluating Efforts to Improve the Equity of Bikeshare Systems* (McNeil, MacArthur, Dill, and Broach, 2019).

Annual costs were calculated as averages based on publicly available data for the full and discounted prices of annual, monthly, or weekly passes or subscription costs for shared micromobility systems in the following cities: Atlanta, Austin, Boston, Chicago, Cincinnati, Detroit, Fort Worth, Honolulu, Indianapolis, Los Angeles, Milwaukee, Minneapolis, New York City, Philadelphia, Portland, San Francisco, Seattle, Toledo, Vancouver, BC, various Bird systems, and Washington D.C.

All other statistics were calculated from responses to the Agency and Operator Surveys.

Page 10 - Comparison of Trip Trends

Trip data was obtained from responses to the Agency and Operator Surveys and supplemented by online data. Some data for smaller systems was unavailable and supplemented by online data.

Reported overall utilization rates were calculated from aggregate industrylevel data. Duration and distance statistics were calculated from tripweighted Operator Survey responses. It is noted that docked bikeshare and bikeshare not fitted with GPS uses only point-to-point data and may result in data showing shorter trip lengths. The comparison of e-bike imports and EV sales is based on data from BloombergNEF and the Light Electric Vehicle Association as reported in the article: Bloomberg (01/21/22): America's Best Selling Electric Vehicles Ride on Two Wheels.

Page 11 - Comparison of Vehicle Trends

Vehicle data was obtained from responses to the Agency and Operator Surveys and supplemented by online data. However, some vehicle data for smaller systems was unavailable. Missing data was estimated based on that system's number of trips and the calculated utilization rate and average number of service days for the technology type as estimated from the Agency Survey responses. Systems reported as hybrid systems were classified into either docked or dockless systems based on their technology type and operating characteristics.

The e-bike and pedal bike system statistics were calculated from NABSA's shared micromobility system database and utilization comparisons were calculated from system average utilization rates.

Page 12 - System Statistics by City Size

The number of systems was derived from NABSA's shared micromobility system database. All other statistics were calculated as averages of system data collected from the Agency and Operator Surveys; city population and size were drawn from the 2018 American Community Survey 5-Year Estimates and from the U.S. Census Bureau, respectively.

Page 13 - Operating Characteristics

Ownership model statistics and the reported number of systems per operator is based on an internal database of all known shared micromobility systems in North America that is maintained and updated by NABSA.

Reported agency data requirements were calculated from Agency Survey responses.

Bikeshare farebox recovery was calculated as an average of data from the Agency and Operator Surveys, and transit farebox recovery data was obtained from the Federal Transit Administration's National Transit Database for the same set of cities that responded to the farebox recovery Survey question.

Monthly user cost was calculated as an average of publicly available data on the cost of monthly passes for shared micromobility and transit systems in the following cities: Atlanta, Austin, Boston, Chicago, Cincinnati, Detroit, Fort Worth, Honolulu, Indianapolis, Los Angeles, Milwaukee, Minneapolis, New York City, Philadelphia, Portland, San Francisco, Seattle, Toledo, Vancouver, BC, and Washington D.C. These cities were chosen as a sample of different geographies and system types.

Page 15 - Shared Micromobility in Policy

E-bike and e-scooter codification maps are based on a review of provincial and state regulations governing vehicles and their use in the public right-of-way.

Page 16 – Shared Micromobility as Public Transportation

Usage and connection to transit statistics were calculated from responses to the Operator and Agency Surveys.

Transit agency role and integration statistics were calculated from responses to the Agency Survey.

Page 17 – Shared Micromobility Case Studies

Mobility hubs are locations that bring together multiple transportation options.

Page 18 - How NABSA Supports the Industry

These statistics were drawn from data recorded by NABSA.

Acknowledgments

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North American Bikeshare and Scootershare Association (NABSA) (2022): 3rd Annual Shared Micromobility State of the Industry Report. https://doi.org/10.7922/G2HD7TOP



NORTH AMERICAN BIKESHARE & SCOOTERSHARE ASSOCIATION

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