



Planning Minnesota's
Transportation Future

SHARED USE MOBILITY TREND ANALYSIS

CONTENTS

- Shared Use Mobility Trend Analysis.....1
- Contents.....2
- Summary3
- Ridesharing Services.....3
 - Local Context4
 - Current and Future Trends5
- CarSharing Services7
 - Local Context7
 - Current and Future Trends8
- Bicycle and Scooter Sharing9
 - Local Context 11
 - Current and Future Trends 12
- The future of Shared Use Mobility 14
- Related Trends 16
- Revision History..... 16

SUMMARY

Technology is changing the way people get from one point to another. People are now using smartphones to hail rides, compare transportation options and rent cars, bikes and scooters. In the example of carsharing, after someone uses a vehicle, carshare allows it to be available for other users. Planning professionals and academics describe this shift from personally owning modes of transportation to transportation when needed as shared use mobility. Instead of personally owning a vehicle or bike, a digital platform allows you to lease or contract a ride for a period of time. After the contract is up, the vehicle is available to others. Shared use mobility can broadly be defined as transportation services and resources that are shared among users, either concurrently or one after another. This includes public transit, micromobility (bikeshare and scooter share), automobile-based services (carshare and rideshare) and commute modes such as car or vanpooling.

Sharing vehicles or rides is not a new concept. Many people have rented a car on a trip, caught a taxi or ridden in an airport shuttle. For example, a vehicle rental usually required a trip to a rental center, typically located in airports, central business districts or an auto dealership. Taxi rides, with exception to airports and central business districts, need to be called in advance. Now, in many areas, it is possible to access a variety of transportation modes through a smartphone app. The proliferation of mobility services available through smartphone apps makes transportation more broadly accessible, removes barriers such as long wait times and makes information and cost more transparent for users. This technological change is driving down the cost of transportation trips for some people and increasing the overall demand for trips on our transportation networks. As shared mobility services grow and new shared mobility business models proliferate, these services have the potential to reshape people's transportation behavior and place new demands on transportation infrastructure.

In Minnesota, shared mobility services are rapidly expanding and changing but many Minnesota communities still do not have access to these services. Initially concentrated in the seven-county metro area, rideshare, bikeshare and scooters are expanding across the state. In recent years, bikeshare services began operating in places like Rochester, Hastings and Saint Cloud. To better understand the future of shared use mobility in Minnesota, it is important to grasp shared mobility as a concept, its national and global growth and future market trends.

RIDESHARING SERVICES

Rideshare services like Lyft and Uber have changed how people navigate cities. Ridesharing first emerged in San Francisco in 2009 and is a service that connects people making trips with drivers in a shared vehicle arrangement. Using a smartphone app, riders are paired with drivers who use personal, non-commercial vehicles to transport riders to a destination. Drivers' compensation comes from ride fare, which is made up of a base price, cost per mile, cost per minute and market demand.¹ Most drivers are part-time, but there are a few full-time drivers.² These transportation network companies (TNC) are, in many ways, simply an app with a back-end (or "cloud-based") dispatch service instead of a traditional taxicab dispatch.

¹ "How and When Driver Pay Is Calculated," Lyft Help, accessed June 3, 2021, <https://help.lyft.com/hc/en-us/articles/115013080008-How-and-when-driver-pay-is-calculated#calculations>.

² Kathleen Elkins, "A Day in the Life of an Uber, Lyft and Juno Driver Who Makes about \$6,000 a Month in NYC," CNBC, January 31, 2019, <https://www.cnbc.com/2019/01/30/a-day-in-the-life-of-a-full-time-uber-lyft-and-juno-driver-in-nyc.html>.

Uber and Lyft both have international reach. Uber currently operates in over 60 countries while Lyft operates in Canada and the United States. Both services currently operate in portions of the Minnesota market. The ubiquity of TNCs gives riders flexibility. They can rely less on their own vehicles and transit, making car-free living easier for some. Moreover, Lyft and Uber offer several different vehicle and trip types to cater to the users' party size and needs. Preferences are noted when the trip is first booked. Uber Pool and Lyft Line offer users the option to carpool with others. Users at two different origins and two different destinations can share a ride for a reduced fare.

TNCs also offer some services catered to the unique needs of individuals with impaired mobility. Uber Assist functions just as the basic Uber request does, except the driver is trained to assist with mobility devices and entry and exit to and from the vehicle. This includes anyone with a folding wheelchair, walker, collapsible scooter or crutches.³ Uber Assist is available in 40 cities around the world. Currently, this does not include any cities in Minnesota. Uber has also piloted wheelchair accessible vehicles in Chicago, New York, Philadelphia and Washington D.C.⁴ These accommodate users who need a ramp or lift for a motorized or un-foldable wheelchair. Companies like HopSkipDrive and Zūm are positioning themselves as "Uber for kids," offering safe rides to and from school but are not yet operating in Minnesota.^{5 6}

LOCAL CONTEXT

Uber and Lyft began services in the seven-county metro area in 2013 and have seen considerable growth and popularity. In the years following their launch in the seven-county metro area, ride hailing wait times averaged only five minutes.⁷ However, there was, and may continue to be, concerns about whether drivers discriminate against rides hailing from low-income, predominately non-white neighborhoods.⁸

Lyft and Uber operate services across many Minnesota communities. As of January 2020, Lyft provides service for Duluth, Mankato, Minneapolis, Rochester, Saint Cloud, Saint Paul and across many other communities. This does not mean that wait times are consistent throughout the state. Larger cities, often with more drivers, have shorter wait times than smaller cities and rural areas with fewer drivers. Some communities in Greater Minnesota do not have access to Lyft service yet, including Moorhead.⁹ In August 2019, Moorhead officials reached out to Lyft to fix the service gap.¹⁰ As of November 2021, Moorhead still does not have Lyft service. Uber only provides service in

³ Steven John, "How to Use Uber Assist or WAV, for Riders Who May Need Additional Help to Enter and Exit a Vehicle," Business Insider, accessed May 14, 2020, <https://www.businessinsider.com/what-is-uber-assist>.

⁴ "Drive with WAV," Uber, accessed May 14, 2020, <https://www.uber.com/us/en/drive/services/uberwav/>.

⁵ "School Transportation," HopSkipDrive, accessed September 2, 2020, <https://www.hopskipdrive.com/>.

⁶ Zūm, "Our Story," <https://www.ridezum.com/> (accessed September 2, 2020).

⁷ Erin Golden, "Mpls. Officials Say First Year for Uber, Lyft was a Success," Star Tribune, August 11, 2015, <http://www.startribune.com/mpls-officials-say-first-year-for-uber-lyft-was-a-success/321473401/>.

⁸ Beatrice Dupuy, "New Data: Uber, Lyft More Likely to Bypass North Minneapolis," Star Tribune, August 6, 2015, <http://www.startribune.com/new-data-shows-uber-lyft-more-likely-to-bypass-north-minneapolis/320845871/>.

⁹ "We've got your easy ride across town, Greater Minnesota," Lyft, accessed January 24, 2020, <https://www.lyft.com/rider/cities/greater-minnesota-mn>.

¹⁰ Nick Broadway, "Moorhead Rideshare Mystery: Lyft Never Asked to be in the City," Inforum, August 12, 2019, <https://www.inforum.com/news/4607851-Moorhead-rideshare-mystery-Lyft-never-asked-to-be-in-the-city>.

Duluth, Mankato, the seven-county metro area, Rochester, Saint Cloud, Moorhead (Fargo-Moorhead), East Grand Forks and Crookston.

CURRENT AND FUTURE TRENDS

Ridesharing has proliferated since the first cars started testing the service a decade ago. A significant concern currently and moving forward is how TNCs affect traffic congestion and pollution. In Minnesota, there has been no explicit study of how TNCs contribute to traffic congestion or pollution. However, the City of Minneapolis has suggested creating TNC pick-up and drop-off zones to manage congestion after events. Minneapolis-Saint Paul International Airport utilizes designated areas to manage TNC passenger pick-up.¹¹ Studies in San Francisco and New York have found that TNCs contribute to more traffic congestion, particularly in central business districts, arterial roadways and during peak travel.¹² TNCs often operate without passengers when drivers have to drive around, waiting for the next trip to come through the app. This time without an active passengers is called “deadheading” and some studies have estimated that this makes up 35% to 45% of total mileage driven by TNC vehicles.¹³ A majority of users use Uber and Lyft mainly for late-night or social reasons (e.g., using a ridesharing service to pick you up after a night of drinking).¹⁴ Before the existence of ridesharing technology, those same late-night trips may have been made via transit, taxi, personal vehicles or not at all.

The use of electric vehicles (EVs) in ride sharing services can help mitigate carbon emissions. A study completed by the National Center for Sustainable Transportation at the University of California Davis¹⁵ explored the benefits of integrating EVs into TNC vehicle fleets. EVs when compared to relatively fuel-efficient gasoline vehicles (i.e., 35 MPG) could result in a daily emissions savings average of 38.7 kg of CO₂. This saving assumes there was not change in the demand for ride-hailing services. Because vehicles used for TNC services have a much greater average daily mileage than privately-owned vehicles, electrifying TNC fleets could bring great emissions reductions. However, charging infrastructure would need to be upgraded and expanded to achieve these benefits.

The future of Uber, Lyft and other TNCs and their place in the transportation market is unclear. In 2020 Lyft lost nearly \$2 billion and Uber lost nearly \$7 billion. Venture capitalists bankrolled their rapid growth in the 2010s with the goal to rapidly expand and control the rideshare market. TNC business models are still evolving even after a decade of operations. Recently, legal battles over the classification of drivers as private contractors are increasingly putting TNCs under pressure and have the possibility to reshape the relationship between drivers and TNC operators.¹⁶ In the long run, these companies hope that automated vehicle technology could reduce overhead costs and allow them to operate without paying drivers. In the short term, Uber has sold their

¹¹ Miguel Otárola, “Downtown Minneapolis to Designate Pickup Zones for Uber, Lyft at Bar Close,” Star Tribune, November 23, 2018, <http://www.startribune.com/downtown-minneapolis-to-designate-pickup-zones-for-uber-lyft-at-bar-close/501152462/>.

¹² Gregory D Erhardt et al., “Do Transportation Network Companies Decrease or Increase Congestion?,” Science Advances (American Association for the Advancement of Science, May 1, 2019), <https://advances.sciencemag.org/content/5/5/eaau2670>.

¹³ Nair, Gopindra et al., “A Model of Deadheading Trips and Pick-Up Locations for Ride-Hailing Service Vehicles,” The University of Texas at Austin, 2019, <https://www.cae.utexas.edu/prof/bhat/ABSTRACTS/RidehailingEmptyTrips.pdf>.

¹⁴ Regina R. Clewlow and Gouri Shankar Mishra, “Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States,” Research Report UCD-ITS-RR-17-07 (Davis, California, 2017).

¹⁵ Jenn, A, “Emissions Benefits of Electric Vehicles in Uber and Lyft Services,” The University of California Davis, 2019, <https://escholarship.org/content/qt15s1h1kn/qt15s1h1kn.pdf>.

¹⁶ Sarah Jaffe, “The battle for the future of “gig” work,” Vox, May 18, 2021, <https://www.vox.com/the-highlight/22425152/future-of-gig-work-uber-lyft-driving-prop-22>.

autonomous vehicle division to focus on generating profits, but they have kept licensing agreements in place for the eventual implementation of automated vehicles in their fleet.¹⁷

These battles could also impact the economics of rides and the markets TNCs operate in. With these companies losing money, the TNC operators are essentially subsidizing individual rides, meaning that each ride currently costs below market value which artificially raises demand. If prices rise to allow these companies to operate at a profit, demand for the services could fall. Prices have started to rise in some markets as recovery from the COVID-19 pandemic continues, demand for their services return and ride hailing companies have trouble enticing drivers back to their platforms.¹⁸

It is too early to tell how the competition between operators and their legal battles will impact the market in the long term. Recently, the companies diversified their services with Uber Eats, Uber Freight and Lyft scooters and bikeshare. Lyft is now the operator of the Nice Ride bikeshare in Minneapolis. Moreover, venture capitalists continue to double down on investments to generate growth. To minimize losses, both companies have also increased their share of ride profit, leading to some driver protests.¹⁹ The price per ride is also likely to increase further since it has been heavily subsidized by drivers, not accounting for gasoline and vehicle depreciation. If the number of drivers willing to work for slim profit margins declines, Lyft and Uber will be pressured to increase the cost of rides.²⁰ In 2020, Uber unloaded their unprofitable scooter and bike share business, Jump, in a \$170 million investment deal with Lime. This move was compelled in part due to the COVID-19 pandemic reducing rideshare demand.²¹

Public transit and rideshare services are also exploring opportunities to partner. For example, in Minnesota, Metro Transit's Guaranteed Ride Home program promises reimbursement for regular transit users who use rideshares in cases of emergencies or during limited transit hours.²² The region is also exploring opportunities to subsidize rideshare trips for Metro Mobility users, certified transit riders who are unable to use regular buses due to a disability or health condition.²³ In Los Angeles, Lyft riders can take shared rides to and from select LA Metro rail stations during weekday peak periods for a flat fare of \$3.00. After taking three trips, riders receive \$10.00 of credit on their transit access pass. LA Metro found that the pilot program generated 2,000 new transit access pass accounts and showed 38% of participants were encouraged to ride transit more.²⁴ Some have raised concerns that rideshare services are depressing public transit ridership. A 2018 study by the University of Kentucky found

¹⁷ Heather Somerville, "Uber Sells Self-Driving-Car Unit to Autonomous -Driving Startup," The Wall Street Journal, December 7, 2020, <https://www.wsj.com/articles/uber-sells-self-driving-car-unit-to-autonomous-driving-startup-11607380167>

¹⁸ Laur Forman, "At Uber and Lyft, Ride-Price Inflation Is Here to Stay," The Wall Street Journal, October 4, 2021, <https://www.wsj.com/articles/at-uber-and-lyft-ride-price-inflation-is-here-to-stay-11633345381>

¹⁹ Sam Dean, "Uber Fares are Cheap, Thanks to Venture Capital. But is That Free Ride Ending?" Los Angeles Times, May 11, 2019, <https://www.latimes.com/business/technology/la-fi-tn-uber-ipo-lyft-fare-increase-20190511-story.html>.

²⁰ Megan McArdle, "Uber and Lyft are Losing Money. At Some Point, We'll Pay for It," Washington Post, March 5, 2019, https://www.washingtonpost.com/opinions/uber-and-lyft-are-losing-money-at-some-point-well-pay-for-it/2019/03/05/add607c-3f95-11e9-a0d3-1210e58a94cf_story.html.

²¹ Romain Dillet, "Uber Leads \$170M Lime Investment, Offloads Jump to Lime," Tech Crunch, May 7, 2020, <https://techcrunch.com/2020/05/07/uber-leads-170-million-lime-investment-offloads-jump-to-lime/?guccounter=1&renderMode=ie11>.

²² "Guaranteed Ride Home," Metro Transit, accessed January 24, 2020, <https://www.metrotransit.org/guaranteed-ride-home>.

²³ "Metro Mobility," Metropolitan Council, accessed March 10, 2020, <https://metro council.org/transportation/services/Metro-Mobility-Home.aspx>.

²⁴ LA Metro, "Can Public Transit and TNCs Get along? Expanding the Reach of Transit with Lyft," The Source, March 13, 2020, <https://thesource.metro.net/2020/03/09/can-public-transit-and-tncs-get-along-expanding-the-reach-of-transit-with-lyft/>.

that TNCs decrease rail ridership by 1.3% and bus ridership by 1.7% annually in the 22 largest metro areas (based on 2010 population).²⁵

CARSHARING SERVICES

Carsharing is the marketing term for short-term car rental services using mobile technology. Mobile technology allows the customer and company to avoid the hassle of repetitive contract negotiations and inconvenient car pick-up and drop-offs that are common in traditional vehicle rentals.²⁶

There are four models for carsharing: round-trip, one-way or point-to-point, peer-to-peer and niche carsharing services. The most common in Minnesota is round-trip carsharing such as Zipcar and HOURCAR. Cars are parked and stored at designated locations, reserved by members for a set amount of time and returned to the initial location at the end of their reservation.²⁷

The second most common model is one-way or point-to-point. The user is not obligated to return the vehicle to the same location from where they started, as long as it is dropped off in the defined home boundary area.²⁸ Car2Go was an example of this model but the service stopped operating in the North American market in early 2020.²⁹ HOURCAR launched a point-to-point service in 2021 with electric vehicles called Evie.

In peer-to-peer carsharing, a car owner makes their personal vehicle available for rent. Using a web-based marketplace platform provided by a carshare company, an owner can advertise their car to prospective renters. A renter can reserve, unlock and return a vehicle without interacting with the owner. Getaround and Turo are examples of peer-to-peer carshare with the latter currently operating in Minneapolis.

Niche carsharing services include renting out private cars left in airport parking lots as well as closed network carshare systems that serve specific communities, like housing complexes or universities.³⁰

LOCAL CONTEXT

Carsharing began operating in Minnesota in May 2005 in the Uptown and Loring Park areas of Minneapolis with HOURCAR. HOURCAR is a local non-profit specializing in round-trip carsharing, and as of March 2020 has 53 hubs and 2,300 members in the seven-county metro area and Rochester. The vehicles are primarily located around commercial corridors, colleges, universities and transit stations with cars rented hourly. HOURCAR is also the University of Minnesota's official carsharing service, offering both hourly and annual rates for students.³¹ The

²⁵ Michael Graehler, Jr. et al., "Understanding the Recent Transit Ridership Decline in Major US Cities: Service Cuts or Emerging Modes?" (paper presented at the 98th Annual Meeting of the Transportation Research Board, Washington D.C., 2018).

²⁶ David Levinson et al., "The Transportation Futures Project: Planning for Technology Change," (Minnesota Department of Transportation Research Services & Library, 2016).

²⁷ Shared-Use Mobility Center, "Shared-Use Mobility Reference Guide," (Chicago, IL and Los Angeles, CA, 2015).

²⁸ Ibid.

²⁹ Andrew Hawkins, "Share Now, formerly Car2Go, is leaving North America," The Verge, December 18, 2019, <https://www.theverge.com/2019/12/18/21028517/sharenow-car2go-leaving-north-america-bmw-daimler-cities-date>.

³⁰ Shared-Use Mobility Center, "Shared-Use Mobility Reference Guide," (Chicago, IL and Los Angeles, CA, 2015).

³¹ "Car-Sharing," Parking & Transportation Services (University of Minnesota, Accessed October 22, 2021), <https://pts.umn.edu/park/specialty-parking/car-sharing>.

company is currently working with Xcel Energy to convert their entire fleet to electric vehicles and is shifting to a one-way model called Evie by the end of 2022³²

Zipcar, the nation's largest carshare provider, operates in the seven-county metro area, Mankato and Winona. The traditional car rental provider, Avis, bought Zipcar in 2013. Like HOURCAR, users must begin and end their trip at the same location.

In mid-2021 HOURCAR launched a one-way carsharing service for Minneapolis and Saint Paul. This type of service was previously unavailable after Car2Go announced in early 2017 that it was ceasing operations in the seven-county metro area after four years in the region. In 2020, Car2Go stopped service in North America completely.

The peer-to-peer company Turo operates in several Minnesota cities. Turo allows users to rent their personal vehicle directly to strangers.³³ The company offers daily, weekly and monthly rates. Concerns related to how the company's insurance policy covers personal liability may limit expansion in Minnesota.

CURRENT AND FUTURE TRENDS

Carsharing is not designed to replace traditional rental cars, which primarily serve tourists and business travelers. Rather, it is a supplemental service geared for local residents. This may change as services continue to evolve. Carsharing is also unlikely to be a cost-effective replacement for daily commute trips. However, if teleworking, walking, biking or taking transit to work are available, carsharing may be an option to replace owning a car or second car for non-commute trips. Carsharing can also be linked to areas with high parking demand or paid parking. Carsharing is less promising in areas with plentiful free parking where there is no cost for storing a vehicle.³⁴ In areas with scarce parking, owning a personal vehicle is challenging and potentially costly. In these instances, carsharing eliminates the stress of parking.

Automakers' future in carsharing is also uncertain. Flexdrive and FreshCar connect users to dealerships and automakers that offer monthly subscriptions on a wide range of cars. The subscription includes maintenance, roadside assistance and insurance.³⁵ Automakers such as Nissan, Toyota and Audi are participating in the program. Meanwhile, Daimler's Car2Go and Chevrolet's Maven carsharing services both closed U.S. operations, raising the question of whether there will be more investment in carshare from large, established car brands.³⁶

Equity concerns also exist within the carsharing space. Carsharing is most accessible to those living in walkable areas and with the financial flexibility to spend money on hourly rentals. Even for long-term, subscription-based or peer-to-peer services like Turo, users continue to be disproportionately white, middle-to-high-income and under 35 years of age.³⁷

³² Martin Moylan, "Twin Cities-Based HourCar Expanding, Planning All-Electric Fleet," Minnesota Public Radio News, April 2, 2018, <https://www.mprnews.org/story/2018/04/02/hourcar-expanding-planning-all-electric-fleet>.

³³ "How Turo Works," Turo, accessed January 28, 2020, <https://turo.com/us/en-us/car-rental>.

³⁴ David Levinson et al., "The Transportation Futures Project: Planning for Technology Change," (Minnesota Department of Transportation Research Services & Library, 2016).

³⁵ "How it Works," Flexdrive, accessed March 10, 2020, <https://www.flexdrive.com/>.

³⁶ Laura Sky Brown, "GM's Car-Sharing Service, Maven, Shuts Down after Four Years," Car and Driver, April 22, 2020, <https://www.caranddriver.com/news/a32235218/gm-maven-car-sharing-closes/>.

³⁷ Susan Shaheen et al., "Peer-To-Peer (P2P) Carsharing: Understanding Early Markets, Social Dynamics, and Behavioral Impacts," (Berkeley, California, 2018).

WaiveCar is a subsidized electric carsharing program that is slowly expanding in the Los Angeles area. The company operates with a different business model that attempts to address some equity concerns. Advertisements on the cars serve as “driving billboards” and help cover the costs of the program.³⁸ This program represents only one example of mobility companies innovating to address equity issues by making shared mobility cheaper. Compared to today’s privately-owned cars, shared mobility vehicles could see cheaper per mile fixed and operating costs.³⁹ This includes reduced expenses in insurance, gas and general maintenance which could provide better access to transportation for low-income populations.

In 2022, Saint Paul launched one-way, round trip, station-to-station electric car share centering on mobility hubs in a partnership with HOURCAR, Xcel Energy and the Twin Cities Shared Mobility Collaborative.⁴⁰ Mobility hubs provide a focal point that bring together public transit and shared mobility transportation services and integrates them with multimodal supportive facilities and urban place-making strategies. This service will be a hybrid carsharing model and will focus on electric vehicle charging infrastructure at transit and high use zones. This will create a network of stations from which drivers can check out or return electric vehicles.

BICYCLE AND SCOOTER SHARING

Bicycle and scooter sharing services are general considered micromobility share services. Micromobility refers to a range of small, lightweight vehicles operating at lower speeds and driven by the person renting the vehicle.

Bike sharing is a system that allows users to rent shared bicycles, usually for a short period of time. Bikeshare systems have been around for decades with varying degrees of success and increasing levels of sophistication. In the 2010s, systems gained popularity thanks to a combination of real-time data, balancing bicycle availability, mobile apps, expanded payment options and growing deployment of e-bikes.⁴¹ Dockless systems appeared in 2017. Dockless systems provide flexibility for users to drop-off and pick-up a bicycle anywhere within a predefined service area. Spin, LimeBike and JUMP are examples of dockless services that operate in several cities across North America. In 2018, electric scooter rentals began to appear, adding more mobility options to U.S. cities. Increasingly, bikeshare companies including Lime and Spin are making scooters their primary vehicle. Some of these companies are even pulling dockless bikes out of service. Electric scooters have now become the preferred vehicle for most, if not all, service providers and signaled a clear shift in micromobility.⁴²

³⁸ “Drive More, Pay Less: WaiveWork Provides Affordable Cars for People with Driving Centered Careers,” Waive, accessed January 29, 2020, <https://www.waivecar.com/work-info.html>.

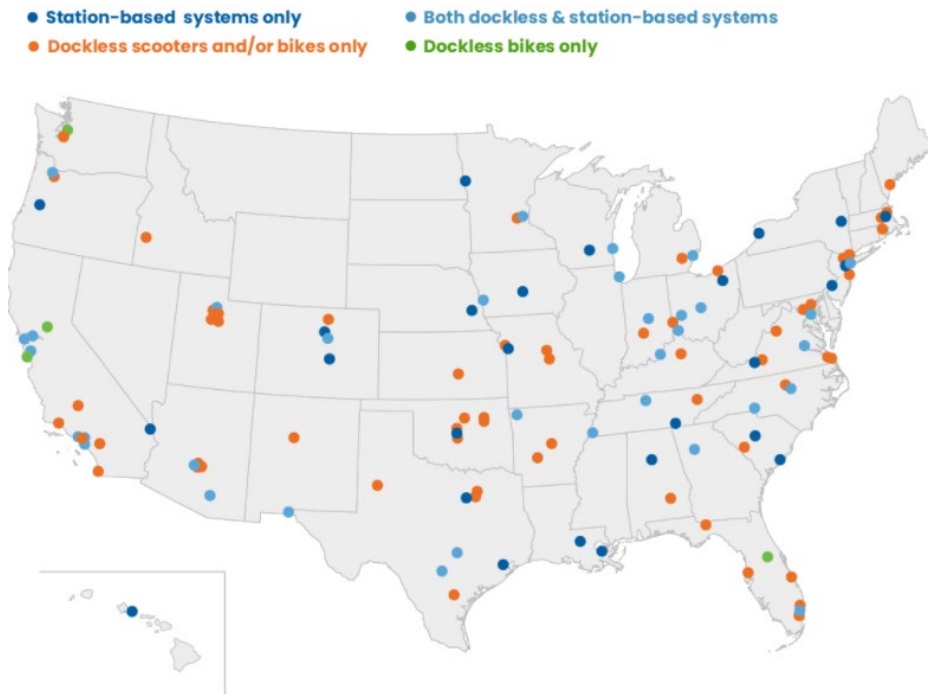
³⁹ Jerry Albright et al., “Marketplace of Change: Automobile Insurance in the Era of Autonomous Vehicles,” (KPMG, LLC, 2019).

⁴⁰ Leslie Gray, “Mobility Hubs Come to Life in the Twin Cities,” Shared-Use Mobility Center, October 9, 2019, <https://sharedusemobilitycenter.org/mobility-hubs-in-twin-cities/>.

⁴¹ Aarian Marshall, “Americans Are Falling in Love with Bike Share,” Wired, May 3, 2018. <https://www.wired.com/story/americans-falling-in-love-bike-share/>.

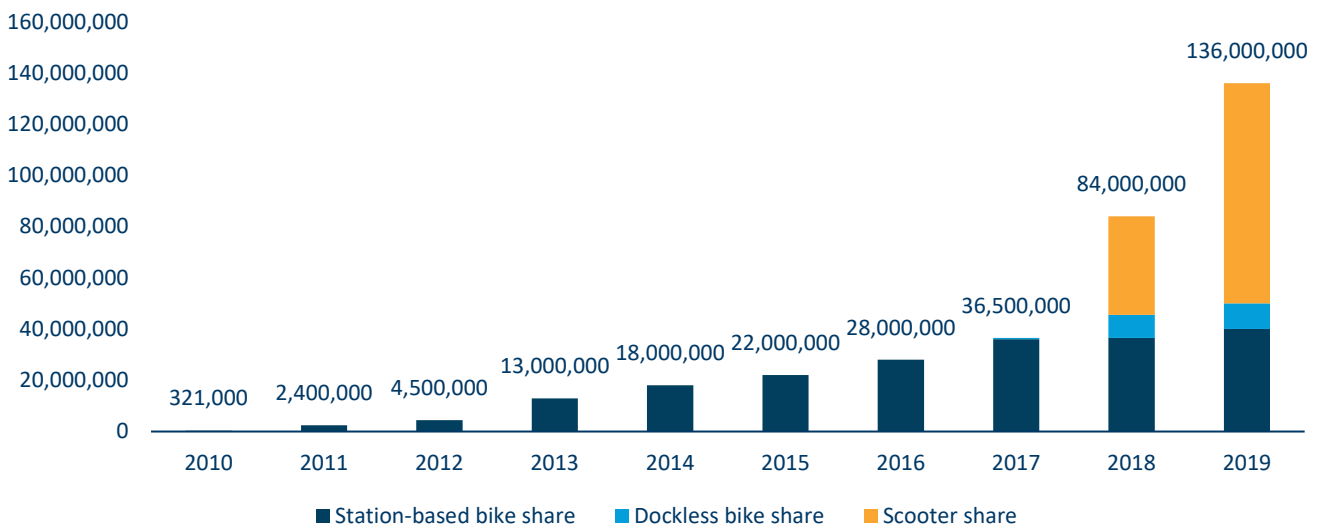
⁴² National Association of City Transportation Officials, “Shared Micromobility...”

Figure 1: Shared Micromobility Across the United States, 2019⁴³



Since 2010, the number of shared micromobility systems has grown (see Figure 2). As of 2019, the dock-based system was the most common type of bikes here. They allow users to pick-up and drop-off bicycles at specific locations. The bikes are nearly all identical and are checked out using an on-site payment system. After paying the fee, the rider can unlock the bike from the docking station and ride off.

Figure 2: United States Growth in Micromobility from 2010 to 2019⁴⁴



⁴³ NACTO, "Shared Micromobility in the U.S.: 2019," Accessed October 22, 2021, <https://nacto.org/shared-micromobility-2019/>.

⁴⁴ Ibid.

LOCAL CONTEXT

Bikeshare began in Minnesota in 1996 with the Yellow Bike Project in Minneapolis and Saint Paul.⁴⁵ This program used coin-operated locks to give users access to yellow-painted bicycles. This program was eventually canceled when bikes were either kept for too long, disappeared or damaged.

Bikeshare returned to Minnesota in 2010 through Nice Ride, a non-profit. In June of that year, Nice Ride launched in Minneapolis with 700 bikes at 65 docks and has since expanded to 3,000 bikes and 400 stations in Minneapolis.⁴⁶ Initially, Nice Ride provided service in Saint Paul, but in 2019, the City discontinued their contract with Nice Ride citing disagreements with the process.⁴⁷ In 2014, Nice Ride began a pilot system in Bemidji to evaluate the possibilities of bikeshare in smaller cities but this program is no longer operational. However, other small cities around the state are experimenting with bikeshare programs separate from NiceRide, including Hastings, Rochester, Willmar, Austin, Duluth and Saint Cloud.

In July 2018, Motivate, a national private bikeshare firm, took over Nice Ride operations.⁴⁸ On the same day, Lyft acquired Motivate's technology platform and corporate functions and left Motivate to continue managing the system-level operations and customer service.⁴⁹ Nice Ride experimented with dockless bikes, but chose to retire them after the 2019 season due to unreliable cellular tracking, stolen bikes and confusion with parking.⁵⁰ In 2020, Nice Ride deployed e-bikes.⁵¹

Electric scooters came to the seven-county metro area in July 2018. Initially introduced in west coast cities in September 2017, these motorized, stand-up scooters can reach speeds of up to 15 mph. Bird and Lime began operations by deploying 200 scooters into downtown Minneapolis and Saint Paul's Frogtown in July 2018 without making an announcement.⁵² In response, the City of Saint Paul asked the electric scooter rental service Bird to remove their scooters until a deployment framework and permitting process could be completed.⁵³

Lack of oversight has led to discarded scooters obstructing roads, sidewalks and businesses. Minneapolis approved a comprehensive ordinance regulating scooters in July 2018. The regulatory framework requires a valid contract between the scooter sharing service and the city and reiterates the city's ability to impound scooters parked illegally in the city-maintained right of way.⁵⁴

⁴⁵ Susan Shaheen, Stacey Guzman, and Hua Zhang, "Bikesharing across the Globe" (MIT Press, 2012), p. 118.

⁴⁶ "How it Works," Nice Ride, accessed September 2, 2020, <https://www.niceridemn.com/how-it-works>.

⁴⁷ Tad Vezner, "Saint Paul pulls away from 'dockless' bike share proposal over concerns with process," Pioneer Press, January 17, 2018, <https://www.twincities.com/2018/01/17/citing-problems-with-process-st-paul-pulls-away-from-dockless-bike-share-proposal/>.

⁴⁸ "New Era for Nice Ride Minnesota: Motivate, North America's Bike Share Leader, to Begin Operations and Usher in Upgrades, Lower Pricing," Motivate, July 2, 2018, <https://www.motivateco.com/new-era-for-nice-ride-minnesota-motivate-north-americas-bike-share-leader-to-begin-operations-and-usher-in-upgrades-lower-pricing/>.

⁴⁹ "Bike Share Leader Motivate Announces Transformative Agreement with Lyft to Advance the Future of Urban Transportation," Motivate, July 2, 2018, <https://www.motivateco.com/bike-share-leader-motivate-announces-transformative-agreement-with-lyft-to-advance-the-future-of-urban-transportation/>.

⁵⁰ Emma Dill, "Nice Ride Considers Retiring Dockless Bikes, Adding E-Bikes," Minnesota Daily, October 6, 2019, <https://www.mndaily.com/article/2019/10/n-nice-ride-considers-retiring-dockless-bikes-adding-e-bikes>.

⁵¹ "2020 Season Launch," Nice Ride, accessed September 3, 2020, <https://www.niceridemn.com/blog/2020-launch>.

⁵² Frederick Melo, "As Saint Paul Battles Bird, Lime Rolls 100 More E-Scooters into Minneapolis," Twin Cities Pioneer Press, July 23, 2018, <https://www.twincities.com/2018/07/23/have-you-heard-the-word-bird-limebike-rolls-100-e-scooters-into-minneapolis/>.

⁵³ *Ibid.*

⁵⁴ "Amending Title 18 of the Minneapolis Code of Ordinances Relating to Traffic Code," City of Minneapolis, July 10, 2018, <http://www.ci.minneapolis.mn.us/news/WCMSP-212410>.

Minneapolis and Saint Paul City Councils continue to deliberate on various issues around electric scooters and dockless bikeshare and are currently seeking solicitations for a common vendor to provide these services.⁵⁵ In 2019, Minneapolis limited contracts to four electric scooter operators—JUMP, Lime, Lyft and Spin (owned by Ford Motor Company). Saint Paul allowed Lime, Bird and Spin. These companies made a commitment to ensure equitable access near transit lines and in low-income areas and to ensure dockless scooters and bicycles do not clutter sidewalks and roadways.⁵⁶ In 2020 Minneapolis and Saint Paul both reduced the number of scooter vendors in each city to two providers and implemented a per-mile fee structure to more accurately tie the fee structure to use. In addition, Minneapolis added a lock-to requirement, meaning scooters had to be lockable to bike racks, and included a minimum level of service requirement in certain low-income neighborhoods. The City of Rochester approved a contract with Lime to continue the pilot scooter program in 2020 and 2021.

CURRENT AND FUTURE TRENDS

Integrating and streamlining the connections between various transportation modes is at the forefront of shared mobility trends. Bikeshare and electric scooters can function as an extension of public transit, where transit riders transfer to a bike or scooter that will take them close to their destination. According to surveys, bikeshare reduces vehicle trips and increases transit ridership, especially in medium-density cities where the first and last mile distances between transit stops are greater—such as Minneapolis and Saint Paul. In Minneapolis, for instance, a survey found that 14.7% of respondents said bike sharing increased their usage of light rail, while only 2.9% said bike sharing decreased it. For buses, the survey found mixed results. Fourteen-and-a-half percent of respondents said that bikeshare led them to use buses more while 16.7% used buses less.⁵⁷ In another survey from 2018, the City of Minneapolis found that 26.1% of electric scooter users used their personal vehicle ‘less often’ because of scooters (see Table 1). The survey also found that 33.5% of people reported using taxi or ride-hailing services ‘less often’. A 2016 Transit Cooperative Research Program report found that people who use shared mobility services change their travel behavior; 35% of responders indicated driving to work less, 32% indicated using a car less for errands and 43% indicated using public transit more often.⁵⁸

⁵⁵ Tim Harlow, “Minneapolis, St. Paul seek common provider for shared bike, scooter services,” Star Tribune, September 18, 2021, <https://www.startribune.com/minneapolis-st-paul-seek-common-provider-for-shared-bike-and-scooter-services/600098608/>

⁵⁶ “Amending Title 18 of the Minneapolis Code of Ordinances Relating to Traffic Code,” City of Minneapolis, July 10, 2018, <http://www.ci.minneapolis.mn.us/news/WCMSP-212410>.

⁵⁷ Martin, E.W., and S.A. Shaheen, “Evaluating Public Transit Modal Shift Dynamics in Response to Bikesharing: A Tale of Two Cities,” Journal of Transport Geography, 2014.

⁵⁸ Feigon, Sharon and Colin Murphy, “Shared Mobility and the Transformation of Public Transit,” TCRP Research Report 188, 2016, <https://www.trb.org/Main/Blurbs/174653.aspx>.

Table 1: 2018 Minneapolis Motorized Foot Scooter Pilot Survey Summary⁵⁹

Response	Carshare (Hourcar, Zipcar)	Personal or Shared Bicycle (Nice Ride)	Personal Vehicle	Public Transit	Taxi or Ride-Hailing (Lyft and Uber)	Walking
Much more often	0.5%	0.9%	1.8%	2.1%	1.1%	2.1%
More often	0.7%	3.9%	2.1%	6.6%	2.0%	6.2%
About the same	15.1%	28.5%	39.2%	46.7%	30.8%	38.8%
Less often	6.3%	20.0%	26.1%	18.0%	33.5%	41.3%
Much less often	3.8%	10.0%	7.7%	5.6%	15.0%	8.4%
I did not use this before, and do not use it now	71.0%	34.9%	21.2%	19.1%	15.7%	1.4%
N/A	2.6%	1.8%	1.8%	2.0%	1.8%	1.7%

To encourage integration of these services and promote their use, the City of Minneapolis created mobility hubs in the Fall 2019. These hubs conveniently locate shared scooters and Nice Ride bicycles near transit giving people reliable transportation options.⁶⁰

Electric and pedal-assist bikes appear to be the next iteration for shared use mobility. E-bikes make biking longer distances, carrying cargo or navigating terrain easier for individuals with differing abilities. A barrier for mass adoption of e-bikes is cost. In 2018, the Bicycle Product Suppliers Association listed the average wholesale cost for an e-bike at \$2,600 compared to a conventional bicycle that costs \$753 from a specialty retailer.⁶¹ To manage the cost, incentives such as government subsidies, public private partnerships or employer-sponsored programs could increase affordability for low-income populations. Once e-bikes are introduced to a bikeshare system, they consistently outperform regular pedal bikes, often being used twice as frequently as conventional bikes. In New York City, an e-bike is used 15 times a day during summer months compared to five times a day for a conventional bike.⁶²

⁵⁹ “Motorized Foot Scooters” City of Minneapolis, accessed March 10, 2020, <http://www.minneapolismn.gov/publicworks/trans/WCMSP-212816>.

⁶⁰ “Mobility Hubs,” City of Minneapolis, accessed March 10, 2020, <http://www.minneapolismn.gov/publicworks/trans/mobilityhubs>.

⁶¹ Michael McQueen, John MacArthur, and Christopher Cherry, “How E-Bike Incentive Programs Are Used to Expand the Market,” 2019.

⁶² National Association of City Transportation Officials, “Shared Micromobility in the U.S.: 2018.”

Electric scooters are also evolving. Some scooter models have seats that provide more utility and range. Higher speed options are emerging as well. Vespa-style scooters provide greater range and utility and are entering the market in Washington D.C. and New York from companies like Revel.⁶³

Like the rideshare sector, there is currently tremendous volatility and many challenges in the micromobility space. Some challenges for electric scooters include short fleet vehicle lifespan, high operational costs, low barriers to entry and strong competition for riders among existing providers. The industry is struggling to become profitable and interest in new funding from investors has cooled since both Uber and Lyft went public.⁶⁴ Consolidation has begun with Bird purchasing Scoot and Uber investing in Lime while closing their Jump-branded scooter and bike service.⁶⁵

Many providers began exiting less profitable markets in late 2019 and early 2020, leaving some cities without any micromobility service. Lyft, Uber, Lime and Bird did multiple rounds of scooter-related layoffs as well.^{66 67 68} The service providers continue to innovate, seeking to increase vehicle lifespans by developing closer design partnerships with scooter manufacturers. Reducing costs is also key to these services' longevity and many companies are searching for operational savings in strategies like field swappable batteries, deploying charging stations and remotely controlled scooters for lower-impact deployments.

The COVID-19 pandemic exacerbated challenges already facing micromobility providers. Sharing scooters with strangers during a pandemic was not popular and effectively paused the industry. Scooter providers often suspended operations but began redeploying large numbers of their vehicles in early 2021.⁶⁹

THE FUTURE OF SHARED USE MOBILITY

Car, bike, ride and scooter sharing will likely continue to grow as people discover the benefits and flexibility of such services. As of 2019, only 36% of Americans had ever used a ridesharing service according to a Pew Research poll, indicating that these platforms have a lot of room for growth.⁷⁰ Many users are also young, with Uber reporting in 2018 that 65% of its user base is 34 years old or younger.⁷¹ These platforms offer an opportunity to reshape urban mobility, especially as the services become more widely adopted and more users gain access to the services. Many claims have been made that these services will result in people choosing to share vehicles

⁶³ Sean O’Kane, “Electric Moped Startup Revel Expands into Washington, DC,” The Verge, August 13, 2019, <https://www.theverge.com/2019/8/13/20804463/revel-washington-dc-scooters-moped-sharing>.

⁶⁴ Daniel Schellong et al., “The Promise and Pitfalls of E-Scooter Sharing,” Boston Consulting Group, May 16, 2019, <https://www.bcg.com/publications/2019/promise-pitfalls-e-scooter-sharing.aspx>.

⁶⁵ Megan Rose Dickey, “Bird Confirms Acquisition of Scoot,” Tech Crunch, June 12, 2019, <https://techcrunch.com/2019/06/12/bird-confirms-acquisition-of-scoot/>.

⁶⁶ Ingrid Lunden, “Lyft Lays Off Up to 50 in Bikes and Scooters as it Gears Up for Another Wave of Launches,” Tech Crunch, March 8, 2019, <https://techcrunch.com/2019/03/08/lyft-layoffs-bikes-scooters/>.

⁶⁷ Mallory Moench, “‘Quite a Shock’: Scoot Employees Laid Off by Bird in SF Scooter Shake-Up,” San Francisco Chronicle, December 6, 2019, <https://www.sfchronicle.com/business/article/Quite-a-shock-Ex-Scoot-employees-laid-off-by-14887826.php>.

⁶⁸ Matt McFarland, “Uber Pulls Its Jump Bikes from Two Cities,” CNN Business, September 13, 2019, <https://www.cnn.com/2019/09/12/tech/uber-jump-bikes/index.html>.

⁶⁹ Benjamin Schneider, “There’s Something About Scooters,” Slate, April 27, 2020, <https://slate.com/technology/2020/04/dockless-scooters-cities-safer-better.html>.

⁷⁰ Jingjing Jiang, “More Americans are using ride-hailing apps,” Pew Research Center, January 4, 2019, <https://www.pewresearch.org/fact-tank/2019/01/04/more-americans-are-using-ride-hailing-apps/>.

⁷¹ “Uber Revenue and Usage Statistics,” Buildfire, 2019, <https://buildfire.com/uber-statistics/>.

instead of owning them outright. This trend has not shown up in national statistics yet and the COVID-19 pandemic led to record auto sales in early 2021 which may delay the much-touted promise of these platforms.⁷²

Growth in scooter share is likely to disrupt an already fast-moving shared mobility market. Despite business model challenges, scooter share popularity is generating unparalleled momentum amongst shared modes. In 2018, scooter trips in New York City accounted for more trips than the well-established and successful docked bikeshare CitiBike—38.5 million trips by scooter (across all brands).⁷³ In September 2019, Lime announced its 100-millionth ride after only two years of operations.⁷⁴ Electric scooters are expanding the number of people using bike lanes and associated infrastructure. A 2018 study from the City of Portland surveyed 3,444 scooter users and found that 44% of them reported never using a personal bike, and one-quarter had never ridden public transit.⁷⁵ The expansion of bike lane users is changing attitudes and putting pressure on cities to rethink policies and roadway space to accommodate increasing non-drivers.

Mobility apps that combine multiple travel options into a single-user interface are another potential catalyst for continuing growth. Platforms such as Transit, Whim and Citymapper help users survey the vast range of public and private mobility options by calibrating a mixed-mobility trip which is travel-time sensitive and cost effective. For example, these apps could suggest a user ride a bus and then scooter to reach their destination. A seamless integration of modes makes it easier to use shared mobility regularly.

Figure 3: Mobility Hub Example



The increase in shared use mobility services is changing public spaces as well. Mobility hubs are becoming a design solution many cities are deploying to organize, integrate and better connect multiple transportation services. In 2019, the City of Minneapolis launched 12 mobility hubs to increase the convenience and coordination between bikeshare, electric scooters

and public transit. Mobility hub initiatives hope to alleviate urban congestion by integrating transportation alternatives and reducing single-occupancy commuter trips. As the City learns from their pilot, they plan to improve pedestrian and bicycle infrastructure around the hubs, consider curbside bump-outs for rideshare pickups and drop-offs and add traveler centers with staff to assist less tech-savvy transit users.

Curbside management is another issue that cities are having to design new solutions for as mobility services grow. Mobility services compete for limited public curbside space and as these services grow in popularity conflicts between transportation modes and users are increasing. This is compounded by the growth of other services such as e-

⁷² “Record April Sales Deplete May New-Vehicle Inventory,” Cox Automotive, May 14, 2021, <https://www.coxautoinc.com/market-insights/record-april-sales-deplete-may-new-vehicle-inventory/>.

⁷³ National Association of City Transportation Officials, “Shared Micromobility in the U.S.: 2018.”

⁷⁴ “Why Lime? 100 Million Reasons,” Lime, September 16, 2019, <https://www.li.me/second-street/lime-100-million-rides>.

⁷⁵ City of Portland, “2018 E-Scooter Pilot User Survey Results,” Portland Bureau of Transportation, accessed September 3, 2020, <https://www.portlandoregon.gov/transportation/article/700916>.

commerce delivery. Urban curbsides, including parking, bike lanes, transit stops and loading areas are not designed to handle the increased demand of curbside activity that mobility services have brought to urban neighborhoods. Curbside management seeks to inventory, optimize, allocate and manage curbside space to maximize mobility and access across a variety of user demands while reducing potential conflict between users accessing curb space.⁷⁶ Since 2017, cities have begun to develop strategies and publish plans to better manage and accommodate growing curbside demand.

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REVISION HISTORY

Date	Summary of revisions
June 2019	Original paper.
November 2021	Updated with new data.

⁷⁶ “What is Curbside Management,” ITE, 2017, <https://www.ite.org/technical-resources/topics/complete-streets/curbside-management-resources/#:~:text=Curbside%20Management%20seeks%20to%20inventory,wide%20variety%20of%20curb%20demands>.