FORWARD PINELLAS
Integrating Land Use & Transportation

The Knowledge Exchange Series

Micromobility in Pinellas County

July 2021

WHY MICROMOBILITY?

Micromobility has the potential to transform community transportation systems according to a report published by the National Association of City Transportation Officials (NACTO) titled, "Shared Micromobility in the U.S. 2018". The current rise of micromobility sales and share programs that has taken hold in many communities across the country demonstrates the emerging popularity of these devices. In the United States, micromobility share programs have steadily increased by 60%, annually, since 2017. Furthermore, a 2020 NACTO report found that in 2019, there were 136 million counted trips on e-bikes and e-scooters.

Micromobility devices provide numerous benefits including first mile, last mile solutions and options for mobility deserts in urban areas. However, micromobility device and share programs have several challenges as standard methods to address safety and develop regulatory approaches for integrating these systems into transportation systems have not been established. While expanding recreational and economic opportunities, micromobility use has provided governments with significant regulatory challenges. Matters of placement, parking and speeds are some of the common issues local governments are faced with in the effort to regulate micromobility use in a manner to ensure the protection of public safety. There is a growing need for place-based policies that meet community transportation needs and keep the public safe and the public right-of-way unconflicted.

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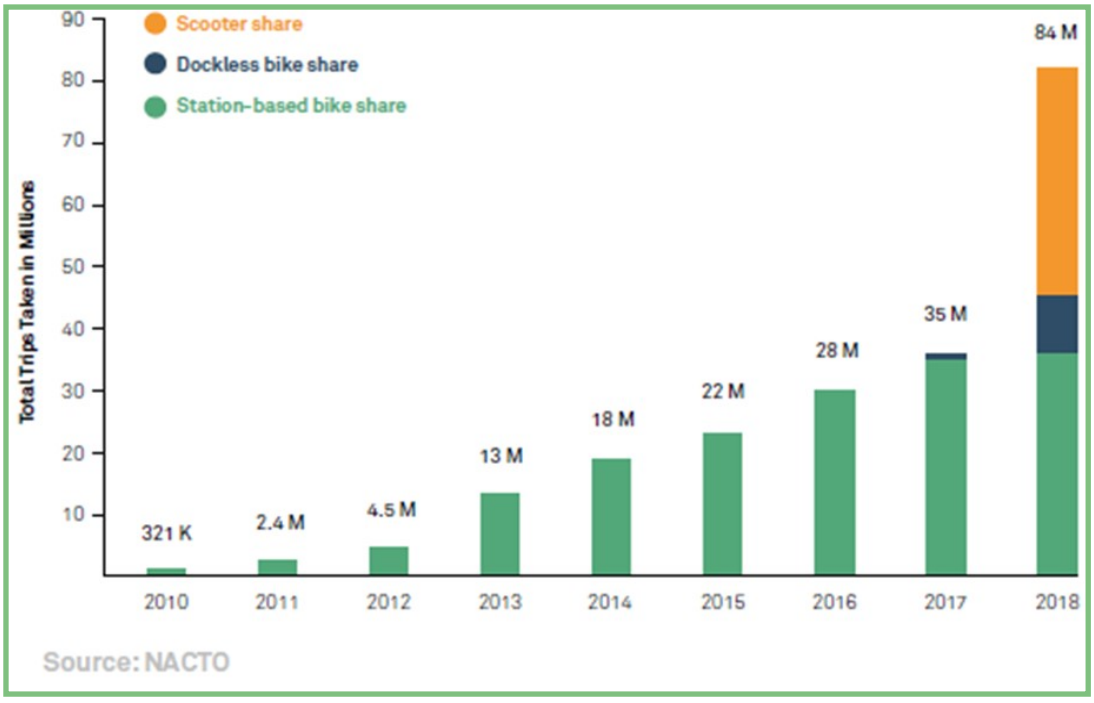
RAPID EXPANSION OF MICROMOBILITY IN THE UNITED

Throughout the nation, numerous shared micromobility service providers emerged in 2018 as popularity and public demand increased. One e-scooter provider, Bird, documented 10 million e-scooter rides within their first 12-months operating in Southern California. Another popular company, Lime, offering e-scooters, e-bikes and pedal-assist bikes services counted 34 million trips across their platform in their first year of operation. As demonstrated in the NACTO graph below, it was reported in 2018 there were 84 million trips taken using shared scooter and bike systems. Prior to 2018, there were only five American cities with e-scooter share programs and by 2018 that number had jumped to 70 cities. The availability of e-scooters in American cities in 2018 quickly transformed transportation options. For example, one e-scooter pilot study in Portland reported a 40% reduction in single-occupant automobile trips as a result of micromobility opportunities.

The rapid growth of micromobility in 2018 and 2019 resulted in an initial degree of chaos as many communities were not consulted prior to device deployments and those that were had little experience with regulating the devices or developing micromobility ordinances. Cities such as San Francisco and Milwaukee, grappled with regulatory issues, safety and unprecedented challenges, resulting in conflict and legal battles. Despite these initial implementation challenges, public perception of micromobility has been overwhelmingly positive. In fact, over 70 percent of 10 major U.S. Cities rank e-scooters as a positive transportation asset. Even cities such as San Francisco, amidst broad e-scooter controversy, are comprised of communities which ranked e-scooters 52% positively.



DEFINITIONS AND REGULATIONS

What is Micromobility?

Micromobility includes small, lightweight transportation devices, which operate at low speeds ranging from 15-20 miles per hour and are typically associated with single-occupancy and short trips. These devices are both personally owned and associated with shared service. Shared service is made available for private use by reservation through an online application, website, or software for point-to-point trips. This definition is flexible as future technological innovations evolve to include new devices which meet this criterion.

Florida Statutes:

316.2128 Micromobility Devices: The operator of a motorized scooter or micromobility device has all of the rights and duties applicable to the rider of a bicycle under s. 316.2065, except the duties imposed by s. 316.2065(2), (3)(b), and (3)(c), which by their nature do not apply. However, this section may not be construed to prevent a local government, through the exercise of its powers under s. 316.008, from adopting an ordinance governing the operation of micromobility devices and motorized scooters on streets, highways, sidewalks, and sidewalk areas under the local government's jurisdiction.

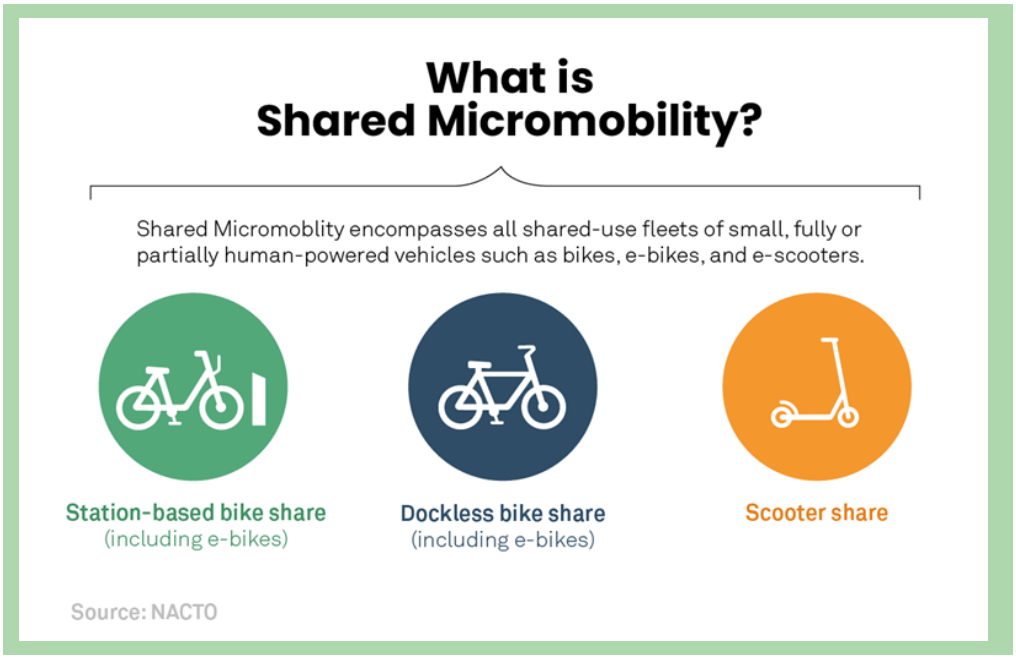
316.003 (38) Definitions Micromobility: Any motorized transportation device made available for private use by reservation through an online application, website, or software for point-to-point trips and which is not capable of traveling at a speed greater than 20 miles per hour on level ground.

Amongst literature, regulations and popular discourse, there is no universal definition for micromobility. A review literature provides several different perspectives on the term, micromobility, as well as its application as either a device, a share program or both. When considering a micromobility ordinance, program or conducting research, these different definitions are commonly applicable:

The Institute for Transportation and Development Policy (ITDP) definition defines micromobility as small, lightweight devices operating at low speeds that can be personally owned or shared and can be electric or manual. The ITDP definition supports the inclusion of future modes as new devices continue to evolve and become publicly available.

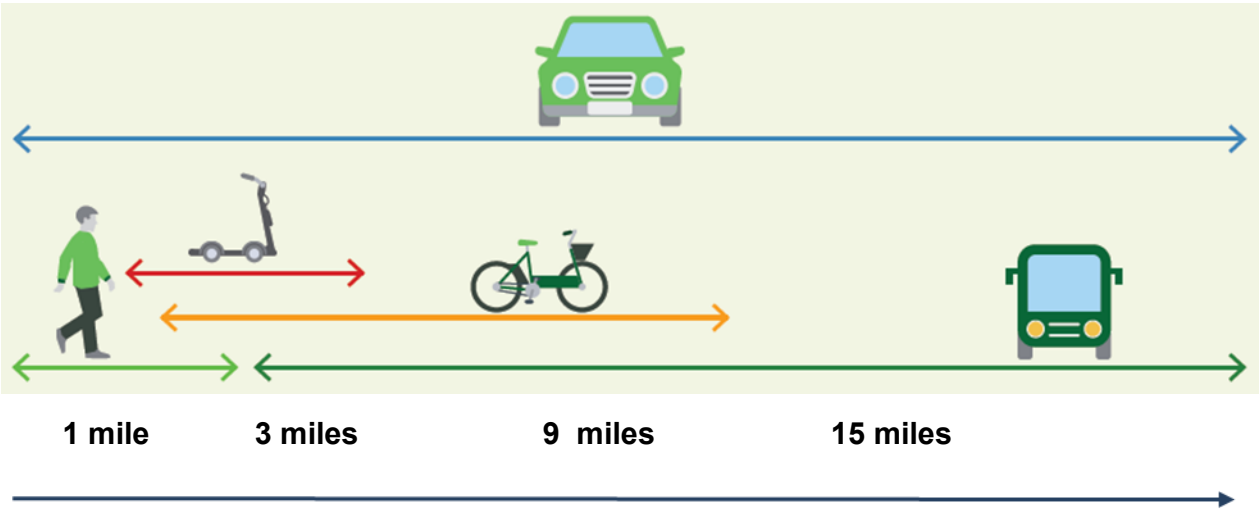
The Pedestrian and Bicycle Information Center (PBIC) provides a three-prong approach to defining micromobility. This definition frames micromobility as devices which are motorized or motor-assisted; travel at low speeds; and have a small size regarding weight, width and height. The PBIC definition explicitly excludes devices such as golf carts, motorcycles, and mopeds as they do not fit the criteria due to size and/or speed.

NACTO defines shared active transportation as the network of small vehicles that are placed in the public right-of-way, are for rent in short time increments and provide increased mobility in urban areas. Shared mobility service providers utilize all forms of micromobility devices to include bike-share systems, e-bikes and e-scooters. E-scooters and e-bikes are the most common shared service.



Micromobility Share Programs include electric micromobility devices, such as e-bikes and e-scooters; however, a micromobility share program also includes bike-share service devices, both dockless and station-based. Generally, when people refer to the term "micromobility", the commonly associated concept is that of a shared micromobility program. From a regulatory perspective, micromobility share programs are commonly the focus of codes, ordinances and laws. A mass amount of public comment is generated from micromobility share programs in communities. Many communities have found success with creating pilot programs coupled with regulations and ongoing monitoring as effective strategies to maximize the benefits of micromobility in communities and address the many public concerns. Furthermore, when designed with connectivity within a transportation network, a micromobility share program provides for first mile and last mile solutions, as demonstrated below.

Micromobility Share Programs Provide First Mile / Last Mile Solutions:



Source: NACTO

MICROMOBILITY CLASSIFICATION

Micromobility classification is bound by parameters of weight, motor type, power supply and speed. Micromobility also includes bike-share systems; however, the electric devices are categorized below. **Overall, defining a micromobility device versus a vehicle is an important aspect of understanding the legal aspects. There are important distinctions in operation and use for an e-scooter versus a moped, or a golfcart versus an e-bike.**

Table 1 Micromobility Classifications:

	Electric Standing or Sitting Scooters	Electric Bicycles Class 1 (pedal assist)	Electric Bicycles Class 2 (throttle assist)	Electric Bicycles Class 3 (pedal assist at higher speed)	Other Small Electric Devices (electric skateboards)
Weight	Typically < 50 pounds	Typically < 100 pounds with multiple passenger versions near 200 pounds.	Typically < 100 pounds	Typically < 100 pounds with multiple passenger versions near 200 pounds.	Typically < 50 pounds
Motor	Typically electric motor with less than 750 watts.	Typically electric motor with less than 750 watts.	Typically electric motor with less than 750 watts.	Typically electric motor with less than 750 watts.	Typically electric motor with less than 750 watts.
Power Supply	Motor propels scooter with minimal assistance by rider. Most cease to assist when e-scooter reaches 20 miles per hour.	Motor provides assistance only when rider is pedaling and ceases to assist when e-bike reaches 20 miles per hour.	Motor exclusively propels bike and ceases to assist when e-bike reaches 20 miles per hour.	Motor provides assistance only when rider is pedaling and ceases to assist when e-bike reaches 28 miles per hour.	
Speed	20 miles per hour or less; some cities apply additional restrictions.	20 miles per hour or less.	20 miles per hour or less.	28 miles per hour or less.	Most are 20 miles per hour or less with some models up to 30 miles per hour.
					

DELINEATION BETWEEN MICROMOBILITY DEVICES AND SMALL VEHICLES

What is not included as a micromobility but is small, lightweight and possibly operating at a low speed? Small motor vehicles! In some areas, public concern and confusion reside in delineating what constitutes a micromobility device versus a small vehicle, such as a golf cart.

Motor Vehicles: Automobiles, motorcycles, trucks, trailers, semitrailers, truck tractors and semitrailer combination, or any other vehicles operated on the roads of this state, used to transport persons or property, and propelled by power other than muscular power. ***This term does not include scooters, micromobility devices, bicycles, or swamp buggies.***

Golf carts and other vehicles smaller than automobiles: Golf carts, mopeds and motorcycles are closely related transportation devices but are outside of the micromobility classification. These devices exceed the weight, motor, power supply or speed parameters and are considered motor vehicles per Florida Statute 320.01.

Florida Statute 320.01: Motor vehicles include but are not limited to motorcycles, mopeds and golf carts which are smaller and lighter than automobiles but are not considered micromobility devices.

Table 2: Small Motor Vehicles Which Are Not Micromobility Devices

Low-Speed Vehicles (Golf Carts)	Motorcycle	Moped
Low-speed vehicle means any four-wheeled vehicle whose top speed is greater than 20 miles per hour but not greater than 25 miles per hour, including, but not limited to, neighborhood electric vehicles. Golf cart means a motor vehicle that is designed and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of 20 miles per hour.	A motorcycle is any motor vehicle having a seat or saddle for the use of the rider and designed to travel on not more than three wheels in contact with the ground.	A moped is a vehicle with pedals to permit propulsion by human power, having a seat or saddle for the use of the rider and designed to travel on not more than three wheels, with a motor rated not in excess of 2 brake horsepower and not capable of propelling the vehicle at a speed greater than 30 miles per hour on level ground, and with a power-drive system that functions directly or automatically without clutching or shifting gears by the operator after the drive system is engaged.

Not a Micromobility Device

How to define Electric Personal Assistive Mobility Devices?

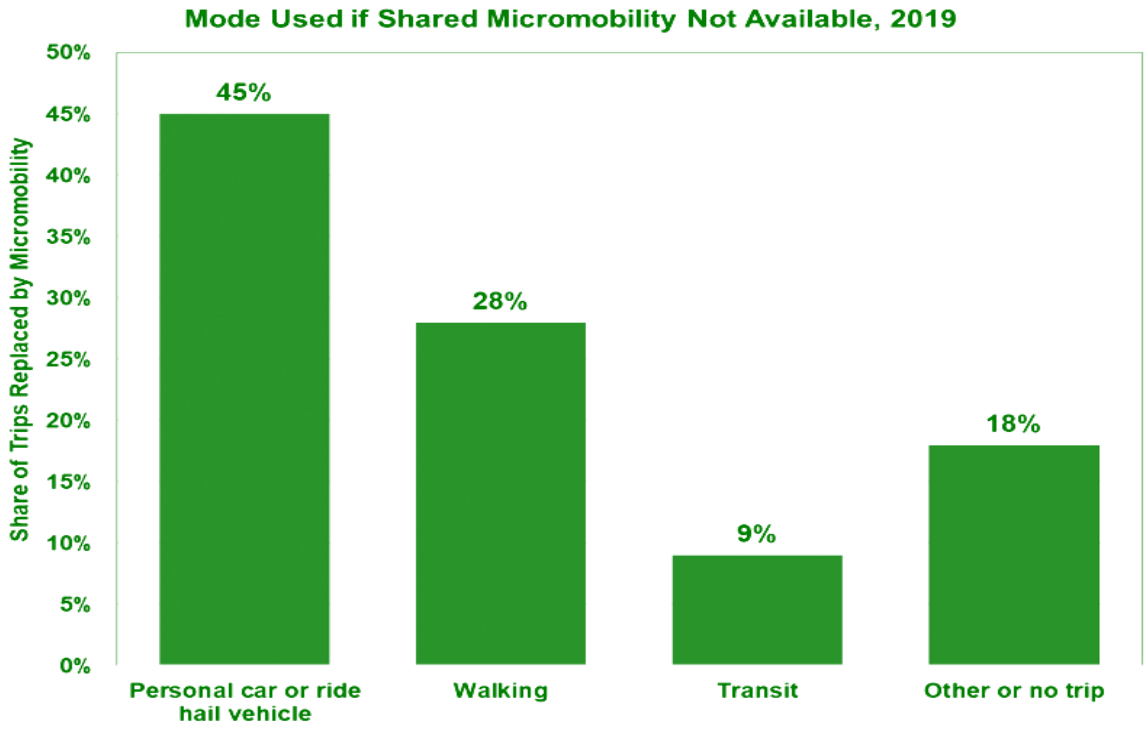
Florida Statute 316.003 (22) Definitions: Any self-balancing, two-nontandem-wheeled device, designed to transport only one person, with an electric propulsion system with average power of 750 watts (1 horsepower), the maximum speed of which, on a paved level surface when powered solely by such a propulsion system while being ridden by an operator who weighs 170 pounds, is less than 20 miles per hour.

MICROMOBILITY BENEFITS

The success or failure of micromobility implementation in communities is largely dependent on regulations which ensure safe operation, equitable access and infrastructure to support the transportation mode. Pilot programs such as in Portland in 2018, spurred micromobility regulations designed to reduce traffic congestion, prevent fatalities and serious injuries, expand access for underserved communities and reduce air pollution. These benefits and many others can be provided by micromobility programs. Specifically, e-scooter and e-bike benefits include the following:

Increased Access: E-scooters and e-bikes provide an option for commuters to travel short distances from transit stops, homes, or parked vehicles into work. Although these devices were initially used for recreational trips, as public operation comfort level has increased, so has the utility. Data supports this widespread utility as multiple communities have demonstrated that e-scooters and e-bikes fill gaps in transportation networks associated with shorter trips for commuting, recreation and entertainment.

The incorporation of dockless e-scooters and e-bikes, also known as "floating transport", boosts transit use as dockless devices can be picked-up or parked at variable transit stops. Technological improvements in using GPS and cellular connectivity to track dockless e-scooters and e-bikes provides users with the ability to track down local devices and companies the ability to track micromobility. The popularity of dockless systems has led to car decline in many communities. For example, a dockless sharing company providing micromobility devices in cities in China reported that micromobility has almost doubled accessibility to jobs, education and health care by filling transportation gaps.



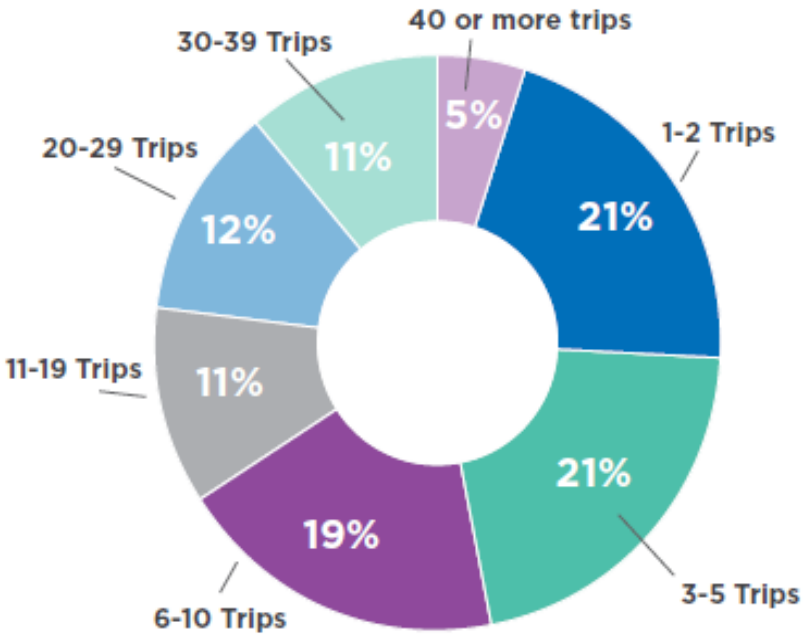
Source: Department of Energy, 2020

Connection to Transit: Transit deserts make it difficult for people to access jobs, healthcare and education opportunities. An integrated transportation network which strategically aligns transit routes with micromobility device locations is a successful strategy for increasing access. The National League of Cities 2019 report, "Micromobility in Cities" found micromobility devices encourage transit use by providing multi-modal opportunities within a pedestrian shed or walk shed. A study conducted between November 2011 and January 2012, in Minneapolis-Saint Paul, reported that after including bike share systems into the transportation network, approximately 15% of people increased rail ridership and 38% of people increased walking. In San Francisco, a 2018 public survey documented that approximately 39% of the e-scooter trips were conducted for connections to public transit.

Communities are clearly recognizing the opportunity for micromobility share programs to provide increased mode options and accessibility. In Austin, TX in 2021, the city's regional transit authority, Capital Metro, transitioned to conducting the predominant planning and oversight role for the Austin bikeshare provider, Metro Bike. As described in a City Lab article, the Metro Bike system was incorporated into the larger bus line service by adding bike share docks to bus stops and stations. Transit authorities have a unique benefit to contribute to a community micromobility share programs, which stems from their expertise managing fleets and large-scale community mobility. Although not all communities have transit authorities managing micromobility programs, some areas such as Kansas City provides funding allocation to sponsor a city-based bikeshare service. Another innovative concept is the inclusion of mobility hubs to collectively center several transportation modes in one area to allow for intermodal travel options. Mobility hubs are further discussed in the "Practical Applications" section.

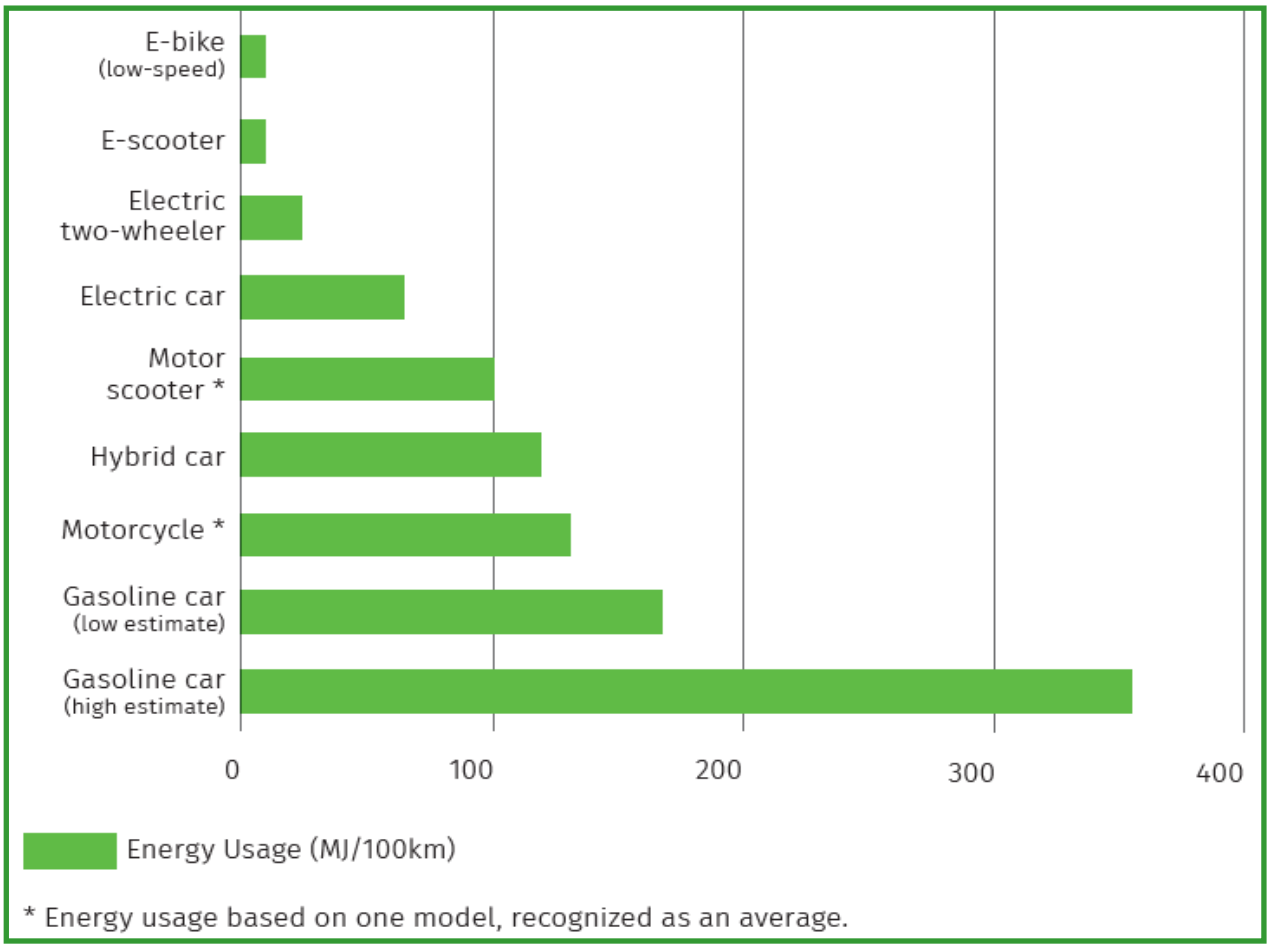
As communities, both urban and rural, transform through the next decade it is logical to project a continual increase in small-scale mobility options such as micromobility and small electric vehicles will continue. Communities working towards increasing safety on roadways can benefit from the combination of transit and micromobility. Vehicle fatalities may be reduced through increasing public transit as it is the safest travel mode, aside from walking and biking. The goal for communities is to develop a network utilizing transit and small-scale mobility options which provide for the most efficient, affordable, safe and fast method to travel.

Micromobility share programs are highly popular and have the potential to bridge gaps in transportation networks and increase access. This graph shows the number of trips taken by individuals in Washington D.C. using their "Capital Bikeshare" in its first year of operation.



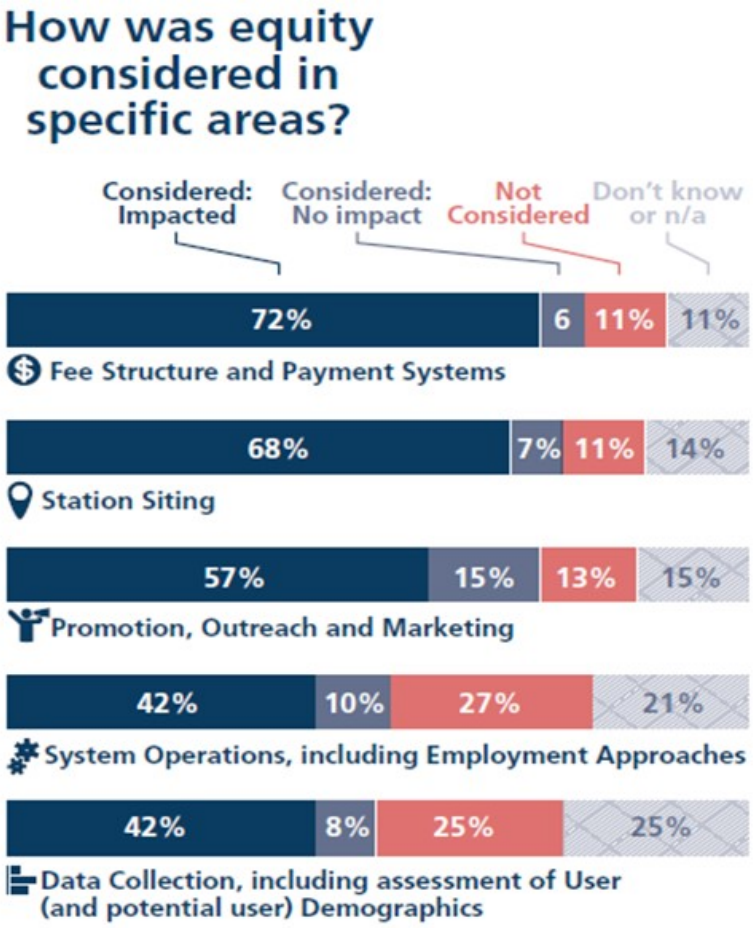
Environmental: Use of micromobility for short, single-passenger trips is not only an added option to access destinations, it helps make strides for environmental improvements by lowering vehicle emissions. With transportation resulting in 1/5 of all emissions in the U.S., utilizing micromobility and active transportation on a widespread basis could have a positive cumulative impact. The math adds up! In one example, a 2018 e-scooter study in Portland found a 1-year pilot program prevented 122 metric tons of carbon dioxide from entering the atmosphere, which is the equivalent of removing over 300,000 vehicle miles. As demonstrated by the graph below, in addition to emission reductions, micromobility provides for lowered energy consumption. **Overall, micromobility programs assist with developing sustainable urban transportation networks through its potential to provide equitable access, reduced resource consumption and increased health benefits.**

Environmental concerns are not limited to carbon dioxide emissions as global warming impacts associated with e-scooters include matters of waste, materials, manufacturing and automobile-dependency. An increase in environmental impacts can be associated with e-scooters when the materials are toxic, the lifespan is short, and automobiles are required to collect them daily. To obtain maximum environmental benefits, communities can create regulations which require long-lasting devices which are free of toxic materials, and by creating systems that do not require them to be collected by automobiles daily.



Source: Institute for Transportation & Development Policy

Resource Efficiency: Resource efficiency is the process by which individuals, families and communities assimilate to minimize the use of financial resources while obtaining maximum results. In several areas of the country, transportation costs result in excess of 30% of household incomes. In Pinellas County, households spend an average of 24% of their budget on transportation costs. This household average is not equitable as recent research at Forward Pinellas for the Equity Assessment, has demonstrated that lower income families spend proportionally higher costs on transportation necessities. Whereby, the lower a household family income, the higher percentage of household income is required for basic transportation needs. This cost burden to low income households could be offset, in part, through increasing transportation modes. Micromobility programs in combination with transit and active transportation networks can vastly reduce the need for vehicle purchase, insurance, gas and maintenance costs for personal automobile ownership. For example, Portland, Oregon's 2019 e-scooter pilot had 34 percent of participants indicating in a survey that they would have used a personal car, ride-hailing service or taxi had scooters been unavailable. Furthermore, this study demonstrated that 71 percent of Portlanders used e-scooters for commuting to a destination. Provided there is a dependable network of micromobility options for the public, communities may be able to use e-scooters and e-bikes as a mode to help people travel to their destinations and reduce costly transportation burdens.



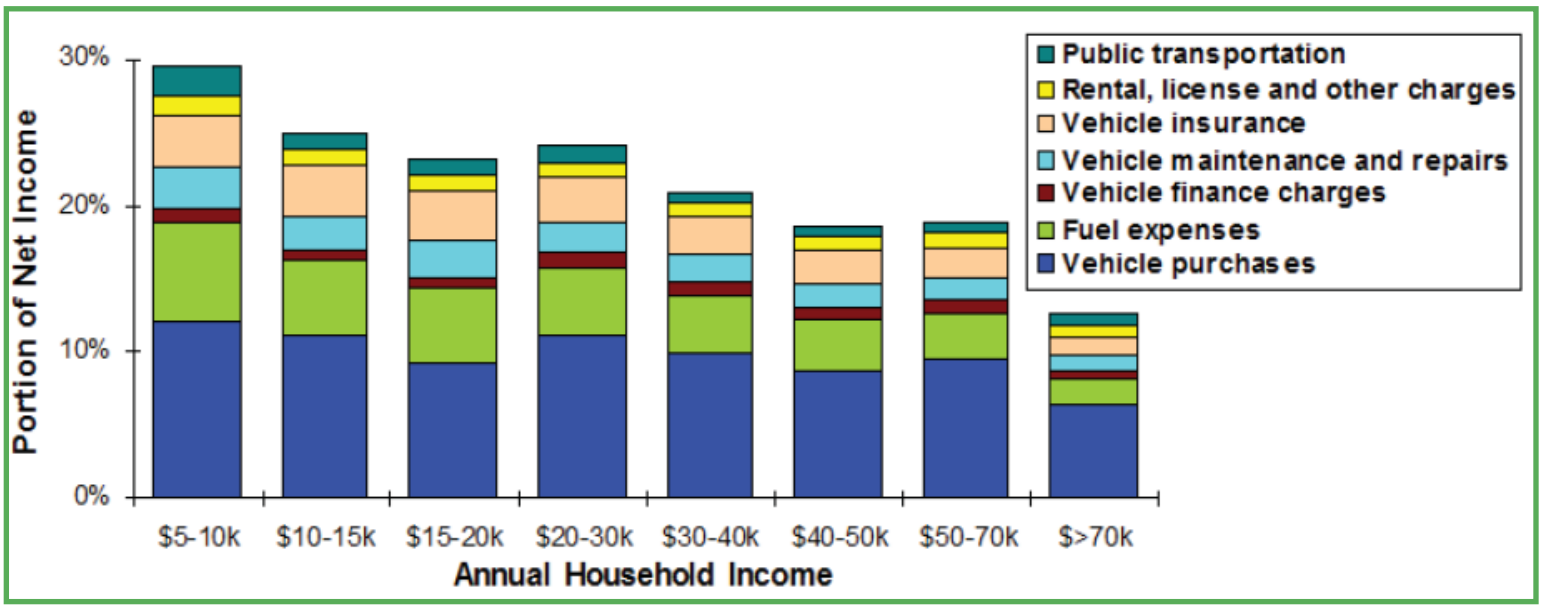
EQUITY CONSIDERATIONS

Equity: A principal responsibility for communities is to provide impartial access for all people within a transportation network to basic needs and services. **A 2015 Harvard study found transportation was "the single strongest factor in the odds of escaping poverty. The longer an average commute in a given country, the worse the chances of low-income families there moving up the ladder."**

Micromobility has the potential to increase access as adding additional transportation modes, such as e-scooters, has the potential to provide new transportation resources for disadvantaged communities. Equity can be incorporated into micromobility programs in many facets, as demonstrated by the graph above from TREC's 2017 report, "Breaking Barriers to Bike Share: Insights on Equity".

Addressing transportation equity is paramount in any transportation network and more complicated than adding e-scooters to low-income areas. To ensure fair access, communities can require that micromobility providers incorporate cash options for all devices and ensure devices are in areas that are underserved and have experienced transportation discrimination. Additionally, communities can develop equity analyses to determine what portions of the population would rely more on e-scooters due to factors such as areas with higher percentages of households without personally owned vehicles.

A disproportionate amount of annual household income is required for low-income households to fund transportation expenses. Micromobility programs have the ability to narrow this gap by providing lower expense modes.



Source: VTPI

A study conducted by the Transportation Research and Education Center (TREC) in 2017, titled "Breaking Barriers to Bike Share: Insights on Equity," found that out of 56 e-bike systems, less than one in four had written policies around equity. However, larger share systems had a higher probability of incorporating equity into system aspects such as station siting; fee structure and payment systems; and promotion and marketing. The study also found that bike share systems which included a policy on equity were more likely to consider equity in a wider-range of implementation processes within communities. An equity policy which guides micromobility share programs within communities is essential to ensure equitable opportunities. Additionally, communities can work towards removing barriers to lower-income populations.

TREC found that discounted memberships, free transfers with public transit, short-term memberships, and free or low-cost gear were positive incentives to assist low-income communities utilize bike share.

The ability for micromobility to narrow the equity gap in communities is highly possible provided specific equity policies are established which outline goals and objectives to engage low-income, minority and physically disabled communities.

The ability for micromobility to narrow the equity gap in communities is highly possible provided specific equity policies are established which outline goals and objectives to engage low-income, minority and physically disabled communities. A poll in Portland found 74% of people of color viewed e-scooters positively. The same poll found 66% of people with incomes below 30K viewed e-scooters positively. The 2018 pilot in Portland also found that women favored e-scooters over e-bikes. Data also indicated that older adults, women, and people who do not consider themselves physically fit are more comfortable riding an e-bike compared to a traditional pedal bicycle.

Overall, this data suggests that e-scooters could be adopted by wide-ranging populations, and potentially those who are underserved. It is therefore paramount that communities capitalize on vendor relationships to ensure e-scooter and e-bike rental services are distributed within disadvantaged regions; and that communities develop specific equity policies in concert with micromobility programs.

Equity Considerations for Transportation Programs:

Increase Access to Mobility	Reduce Air Pollution	Enhance Economic Opportunity
1. Affordability 2. Accessibility 3. Efficiency 4. Reliability 5. Safety	6. Air quality and health impacts 7. Greenhouse gas emissions 8. Total vehicle travel (less is better)	9. Connectivity to employment, education, services and recreation 10. Fair labor practices 11. Transport-related employment opportunities 12. Inclusive local business & economic activity

Source: Creger, Espino and Sanchez 2018

Equity Zones and Cash Options:

Cities such as, Baltimore, Washington D.C. and St. Louis, have developed equity zones for deployment of e-scooters.

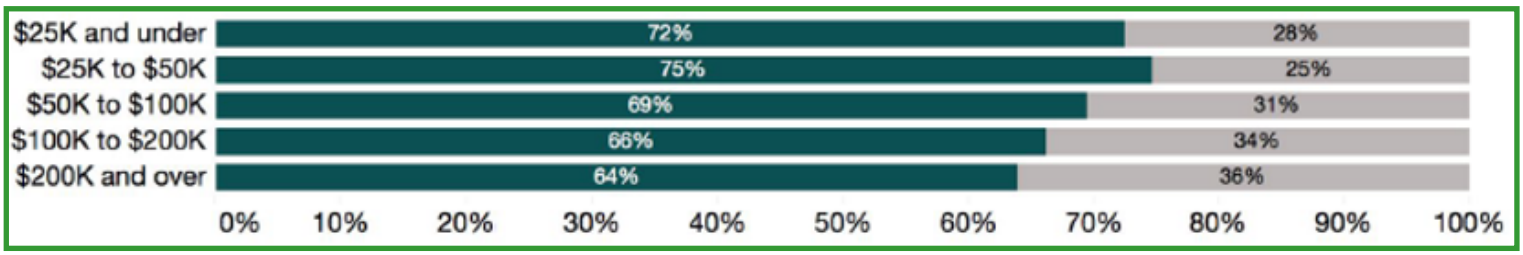
- In Baltimore, Maryland, a total of 20 zones around the city are designated as "Equity Zones" and are located in neighborhoods demonstrated to have been underserved by the Baltimore City transportation system. These areas are located in lower household income areas and areas with historically limited transit access. In addition to establishing equity zones for dockless micromobility vehicles, the City required every micromobility company to provide discounts for low-income users, text-to-text plans and cash payment options. The City also stressed the importance for micromobility companies to redefine and revisit equity zones through reporting and monitoring.

- In Washington D.C., a 2020 regulation requires equity zones; whereby, micromobility companies are required to deploy at least 400 vehicles within equity areas for use during morning commute timeframes.

- In St. Louis, Missouri, a total of 20% of all e-scooters are required by the City to be in certain low-income neighborhoods. Also, the City requires companies provide a non-smart phone option and offer a cash payment option.

Technology as Driver for Equity: As technological advances provide a wide-range of seated and wheelchair adaptable micromobility devices, communities can incorporate new designs into micromobility systems. For example, seated e-scooter versions and two-seat cargo bikes can be incorporated into shared micromobility providers fleet, and wheelchair adaptors can be included for gear to be purchased at a discounted rate. In 2017 in Portland, a $30K adaptive bike sharing pilot was launched to increase bike share for people with physical disabilities. The program utilized foot-powered trikes, hand-powered trikes and side-by-side tandems. The Portland illustration provides a real-world tangible step to increasing micromobility for a wider range of people.

Public Perception of E-Scooters by Income:



Source: Populus, 2018

Health and Quality of Life:

E-scooters have the added benefit of inspiring people to choose active transportation options like biking and walking instead of driving. There is also a simple and logical aspect of micromobility which increases quality of life: people can use e-scooters or e-bikes to commute to work or entertainment and arrive in a presentable condition. Physically, it is less arduous to choose an e-scooter or e-bike over a long walk or a bike ride. A Portland pilot demonstrated that 74% of the e-scooters users reported never using a bike share system and 42% of the e-scooter users reported never bicycling. Lack of physical exercise in Americans contributes to the high rate of health problems. Micromobility has the can increase active transportation by encouraging users try new transportation modes.

The CDC has recognized that the quality of transportation infrastructure is an indicator for SDOH and can impact quality of life. The Center for Disease Control (CDC) utilizes Social Determinants of Health (SDOH) to quantify health conditions and outcomes in communities. SDOH are the conditions in which people live that affect a multitude of outcomes such as health, livelihood, risk and income. This includes where people work, live, access entertainment, etc. An individual's ability to access dependable transportation networks greatly impacts their daily lives through access to, work, school and home.

Health and Quality of Life Continued: Micromobility programs diversity and expand transportation options, thereby, improving quality of life for people. Quality of life benefits are also attributed to the experience gained from utilizing a micromobility mode versus single-occupancy vehicles. In Pinellas County, almost 80% of people drive vehicles alone to work. Utilizing an e-bike or e-scooter in conjunction with transit and/or walking not only expands a walkshed but decreases stress and increases health. For example, a study conducted by D.C.'s Capital Bikeshare found that 30% of users indicated they reduced stress and lost weight using the bikeshare system.

Lastly, when individuals travel using micromobility options in lieu of personal vehicles there is a derived social and cultural benefit. Specifically, people visually see other people which fosters human connections. Outside of a personal vehicle, while moving slower a community of people have the opportunity to humanize other travelers. With aggressive driving in Pinellas County acting as one of the leading causes of crashes, humanizing other travelers and simply making eye contact or providing a "hello" may cumulatively result in an increase of courtesy as well as decrease of aggression.

Economic Benefits:

Economic benefits from personal micromobility ownership as well as micromobility share programs within communities are based on factors such as, increase visibility for commercial developments and store fronts; tourism; increased access to restaurants and grocery stores; revenue from micromobility programs; and economic benefits from increased recreation and entertainment within urban areas. For communities considering implementing a micromobility program, the return-on-investment, can be quantitatively measured through proceeds generated from rental fees which in the case of many communities supports the staffing to manage the program. As an economic driver, micromobility share programs have been demonstrated to increase retail and restaurant sales by recent studies. For example, a 6-month study conducted in 2019 in Atlanta, Austin, San Francisco and Washington, D.C. found e-scooters increased sales to 370 food and beverage companies resulting in an increase in approximately $13.8 million of additional sales. Real estate benefits have recently been attributed to close proximity to mobility hubs. Realizing these and other economic benefits requires multi-faceted community partnerships with governments, businesses and the public to support infrastructure to allow accessibility and increase connectivity of micromobility devices, as well as strategically placed docking stations and charging areas. Overall, communities looking to pro-actively increase financial resources can utilize micromobility share programs to offset program development costs as well as increase business sales.

MICROMOBILITY CHALLENGES AND OPPORTUNITIES

Overarching concerns of safety, infrastructure, public right-of-way, limits to ridership, and theft concerns, dominate micromobility related discourse. Mitigating these impacts is essential for ensuring fair, safe, and efficient micromobility implementations in communities. The following provides micromobility challenges and associated opportunities:

Safety: Designing a micromobility program requires prioritizing safety. Serious injuries have been reported in news articles since the initiation of the micromobility revolution. There are both real and perceived safety risks associated with micromobility programs. For example, a recent Portland study found 90% of e-scooter users observed were not wearing a helmet. Furthermore, safety issues are commonly reported as central to community concerns. On a national scale, safety concerns have resulted in conflict, complaints and lawsuits. The literature on safety pertaining to micromobility devices and share programs suggests in several communities that an increase in crashes involving micromobility devices correlates with an increase in micromobility popularity. The increase in crashes, however, is not nearly as steep as the increase in popularity. For example, in Minneapolis-St. Paul, bike share increased 65% but crashes increased only 1% during the same timeframe, Recent research on e-scooters and safety has demonstrated a varying degree of injury types and severity. For example, a Los Angeles, California, e-scooter safety study conducted over the course of 1-year between 2017 and 2018 found that a total of 249 people sought medical treatment. The associated injuries required minor treatment with less than 1% of cases being referred intensive care. Overall, the study reported the crashes involved relatively high rates of intoxication, limited helmet use and ridership under the age of 18 years old. A commonly reported concern regarding e-scooters and e-bikes includes crashes involving pedestrians from micromobility riders. Conversely, research conducted by the International Transport Forum demonstrated that among several global studies only 4% of micromobility crashes involved pedestrians.

The Washington Post published an article in 2020 describing a Class Action lawsuit whereby two popular e-scooter companies, Bird and Lime, allegedly "knew riders were injuring pedestrians by failing to stop collisions" this lawsuit alleged the companies encouraged riders to commit "assaults." As of June 2021, the lawsuit is not settled; however, the case identifies the widespread public safety concern regarding e-scooters. In 2018 during the initial deployment of e-scooters and e-bikes, micromobility companies operated negligently by not requiring safety gear, safe operations, or organized parking systems. Many devices were abandoned within streets, sidewalks and right of ways resulting in a public nuisance. Over the last few years, communities have developed strategies, ordinances and public-private partnerships to increase safe implementation of micromobility devices and share programs

Communities around the world are working to develop regulatory approaches to improve safety for micromobility devices and share programs. Additionally, communities are working to develop standardized reporting structures to increase data collection and the understanding of potential safety risks.

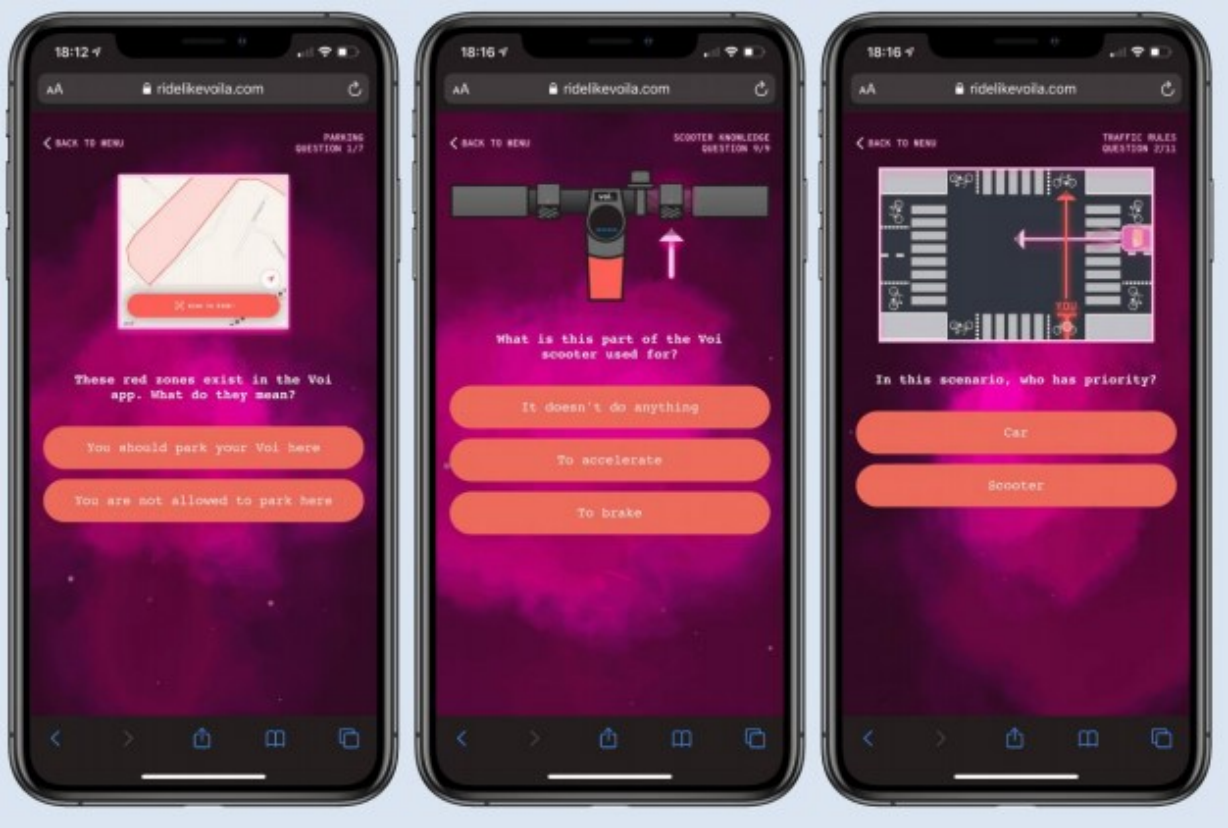
How to ensure safety?

The following safety related measures are helpful to consider for communities considering micromobility programs:

- Designate space for micromobility users within a transportation network. Examples include physically separated and protected lanes on busy roadways and light separation on slower roadways.
- Speed limit requirements for all modes of transportation, including micromobility devices.
- Approximately 80% of crashes include motor vehicles. As such, it is intuitive that increasing safe motor vehicle operations within roadway corridors reduces crash risks.
- Communities can partner with vendors to develop public workshops and training opportunities to teach the public how to safely use micromobility devices.
- Vendor requirements for online safety training prior to use of shared micromobility device.
- Communities can ensure increased safety through creating regulations which require vendors provide free gear such as helmets, lights and reflective vests.
- Creating ordinances, code or other regulatory framework which specifically permits the geographic areas and portions of the public right-of-way where micromobility devices can and cannot operate is a prudent process to develop a safe transportation network.
- Community specific regulations which require helmet use as part of a micromobility share program can increase public compliance.
- Partnerships with local law enforcement to assist with micromobility user compliance of local laws and regulations can provide for safe parking and safe ridership. This includes governments focusing on tackling intoxicated driving for all vehicles.
- Collecting crash data is imperative as there has been limited research on micromobility related crashes. Albeit crash and Injury data is difficult to obtain as there are no universally adopted standardized reporting mechanisms for micromobility, police records and health data provide for sources of vital information. As demonstrated by the City of Tampa case study in this report, data derived from hospital records can be used, with scrutiny, to provide generalized information about injuries from micromobility devices. Furthermore, communities can rely on vendor requirements to construct a framework for reporting crashes related to micromobility devices.
- Community maintenance programs for sidewalks and roadways can reduce hazards such as pot holes and damaged sidewalks to reduce crashes.
- Micromobility vendor partnerships with government entities can reduce speeding on micromobility devices through renting devices based on a fixed-amount for trips versus charging by-the-minute for rentals.

Safety Continued:

Encouraging outreach, education and wide-spread public messaging increases safety for all roadway users is essential for safe roadway operations. As an example, below are screen shots of an online traffic school called "RideLikeVoila" developed by micromobility provider, Voi.



Source: Attefors, 2019

Infrastructure:

Public concerns regarding safety are partly due to the perceived nuisance created when micromobility devices are abandoned within the public right-of-way or people operate them in unsafe areas. Rethinking design of public right-of-way may be a necessity in communities across the globe. Developing infrastructure to accommodate micromobility devices is one solution to addressing competing roadway use. Complete streets concept designs are ideal infrastructure as these designs provide multimodal and equitable roadways which accommodate all types of users. One of the many benefits of complete street concept retrofits is providing more livable, walkable and bikeable spaces which are safer for people.

Communities can prepare for increased micromobility on roadways by creating new and wider bike lanes and trails to accommodate this rapidly rising transportation mode. As sidewalks are not always appropriate space for micromobility devices and bike lanes may be populated with use by cyclists, another concept is the development of a "third lane" as described by the research institute, Gensler, in the report, "Micromobility, Third Lanes, and Tomorrow's Streetscapes". Specifically, a third lane would function as a "rolling lane for people and goods that move faster than pedestrians, but slower than cars, combined with slow speed zones where different modes can safely share streets."

Right of Way Concerns:

Conflict over e-bikes and e-scooters has ensued as e-scooters have caused dangerous conditions after being deposited in roadways, blocking sidewalks and other inopportune areas. Micromobility device abandonment is a common issue amongst communities who have implemented dockless micromobility programs. For example, the City of San Francisco received multiple public complaints and as a result issued cease and desist orders against the major scooter-sharing companies due to health and safety concerns from scooter abandonment. In Tampa, e-scooters' abandonment during the pilot program was one of the chief complaints.

How to manage right-of-way concerns?

- Potentially hazardous device abandonment can be mitigated through user education and technological improvements. Education programs operated by vendors and communities can ensure that the public operate micromobility devices with appropriate safety measures. Furthermore, the use of public opinion polling in conjunction with the development of micromobility regulations can increase public support and decrease conflict of the shared right-of-way.
- Many communities have developed systems to ensure micromobility devices are not left within the right-of-way by developing parking areas within the geographic share program designation. This concept utilizes designated places, commonly referred to as "corrals" within a shared micromobility program geographic area. These corrals are designated for exclusive e-scooter, e-bike and/or pedal assist bikes. In respect to floating micromobility device programs, communities have often uniformly painted these areas and utilized appropriate signage for memorable recognition of these areas.
- Infrastructure widely varies from city to city and innovative techniques can be used when physical solutions are not available. For example, the City of Tampa utilizes a "scooter bounty" program whereby individuals who return scooters abandoned outside of authorized parking areas are provided with payment. The concept allows for people to receive monetary reward for helping keep the right-of-way unconflicted.
- Leveraging emerging technology, communities can require micromobility vendors utilize tracking devices and parking requirements as part of the device rental process. E-scooters can be designed to incorporate a virtual fence which disallows use outside of a set geographic range by automatically turning a device off once it reaches a geographic limit. Additionally, vendors can be required to continually tracking devices with use of mobile apps (e.g. City Mapper App) to ensure they are not deposited in hazardous areas by incorporating tracking technology which provides geo-locations for all fleet devices.
- To manage the risk of devices on sidewalks, communities can collaborate with vendors on a fee structure for abandoned vehicles.

Micromobility space can be found within the complete streets concepts by designing roadways which accommodate multifaceted transportation options.

Ridership Limitations:

Limitations to wide-spread ridership are based on physical limitations; lack of commercial applicability; inability for transporting children; and weather dependent conditions. Perhaps the most concerning disadvantage to micromobility are the few available options for people with physical limitations and disabilities. Micromobility models which provide 3 or 4 wheels may be better suited to accommodate a wider range of riders; however, these devices are not yet widely available in the market. Cities such as Tampa and Portland are investigating seated scooters and three-wheeled scooters. Wider availability for diverse micromobility devices will likely result as more communities create the demand for such devices and technology advances. Other barriers to micromobility use included needing to transport children and age restrictions. In many geographic areas, there are limited options for commercial travel, outside of tourism. Weather can limit use as both a real and perceived risk for riders. Lastly, micromobility share programs which require a credit card and driver's license results in limited use by disadvantaged communities.

Ideas to manage ridership limitations:

- Design program to be inclusive by requiring vendors to incorporate equity zones.
- Consider utilizing seated, three-wheeled, cargo and ADA compliant versions of bikes, e-bikes and e-scooters.
- Provide cash and discounted programs.
- Collaborate closely with local transit authorities to combine micromobility parking corrals at transit stops and major stations.
- Despite limitations, focus on safety as a priority and utilize appropriate age user restrictions, designated parking areas and "no ride zones" on crowded sidewalks.

Vandalism and Theft:

Vandalism and theft are persistent issues. Retrieving, charging, and balancing the fleet each night can be a costly and labor-intensive exercise for vendors. Some providers have utilized the approach to flood a geographic area with rental devices instead of managing a smaller fleet. Communities have not yet developed a system universally applied to address theft and vandalism. Some communities have created punitive measures such as fees for lost and abandoned devices. Other communities, have focused on mandatory education materials and public messaging to improve public behavior. Overall, the 2019 NACTO report, "Shared Micromobility" provides a guide for micromobility share programs and suggested the following recommendations which provide flexibility and safeguards when managing a program.

Overall, to combat vandalism and theft, communities should ensure the micromobility provider has dedicated staff and support for the program. In contracting, reserve the right to suspend, revoke, and modify permits based on noncompliance with managing fleet devices or if the service violates local laws. Further, partnership with enforcement and community organizations to educate the public is a feasible solution to minimize theft.

St. Petersburg, Florida

Micromobility in Pinellas County: City of St. Petersburg

The City of St. Petersburg has taken a pro-active approach to the rapid trend of micromobility programs and device popularity. Specifically, the City has been working since 2012 on developing a regulatory framework to address matters pertaining to micromobility programs for bike share, e-scooters, and e-bikes. Through a data-driven process, the City of St. Petersburg has developed a robust micromobility share program and two associated ordinances. As Cheryl Stacks explained, "the first wave of micromobility share programs in the City of St. Petersburg was in the form of bike share; however, that quickly transitioned to e-scooters and e-bikes."

The first implementation involved a pilot program for bike share which was initiated in 2017. The City of St. Petersburg first initiating a soft launch in Phase 1 of only 10 Bike Share hub locations and 100 bikes. The final phase of the bike share pilot included 450 bike racks and 300 bikes across the core of Downtown St. Petersburg. The bike share program has been highly successful. The program has been administered through the partnership of the City of St. Petersburg, Coast Bike Share and HOPR. Since the pilot project in 2017, a total of 116,000 trips have been taken as of May 2021, with an average of 3,000 bike rentals per month.

The second implementation involved a "Scooter Share Pilot Program" which was initiated in 2019. The following narrative on the pilot program provides a concept for practical applications in designing a pilot program and initiation a micromobility program. First, the City of St. Petersburg issued a Request for Proposal (RFP) in December 2019, providing an opportunity for micromobility operators to submit a proposal to obtain a license for the Scooter Share Pilot Program. The RFP scope of services for the pilot program included requirements for safety, education, and operations.

CASE STUDIES

St. Petersburg, continued: The RFP also included an emphasis on the operator's agreement with an 18-month term and minimum of 12-months of operations, as well as compliance with the parking system utilizing 100% of parking within the designated areas. The operator agreements included an option to renew the agreement for a maximum of two (2) three-year periods. Second, a committee comprised of staff and stakeholders evaluated the applications on the basis of experience; willingness to meet safety needs; ability to meet St. Petersburg designated parking strategy; strong operations plan; strong staffing plan; willingness to share data; strong communication; outreach and education; as well as strong recommendation. Third, subsequent to the committee recommendations, the City of St. Petersburg entered into negotiations with the operators and ultimately constructed an operating agreement with two operators.

The following facets were found to be essential to the pilot program. The City of St. Petersburg Scooter Share Pilot Program utilized Equity Zones which were established by the City of St. Petersburg staff to provide equitable access for all communities. The City of St. Petersburg provided maps of the Equity Zones to the operators and as part of their agreements offered incentives for adding scooters to the Equity Zones. The City of St. Petersburg included the development of authorized parking areas, also known as "corrals," as a required portion of the program. The Scooter Share Pilot Program required 100% of scooters rented to be parked in the designated corrals. Additionally, the City of St. Petersburg included the ability to assess fines to the operators for each scooter found to be a "Nuisance Scooter" due to improper parking. According to the City of St. Petersburg, the entire pilot program was administered cost-neutral with the exception of costs to initially establish parking areas; however, the City assessed a one-time fee of $40,000 to each operator to cover the majority of these costs.

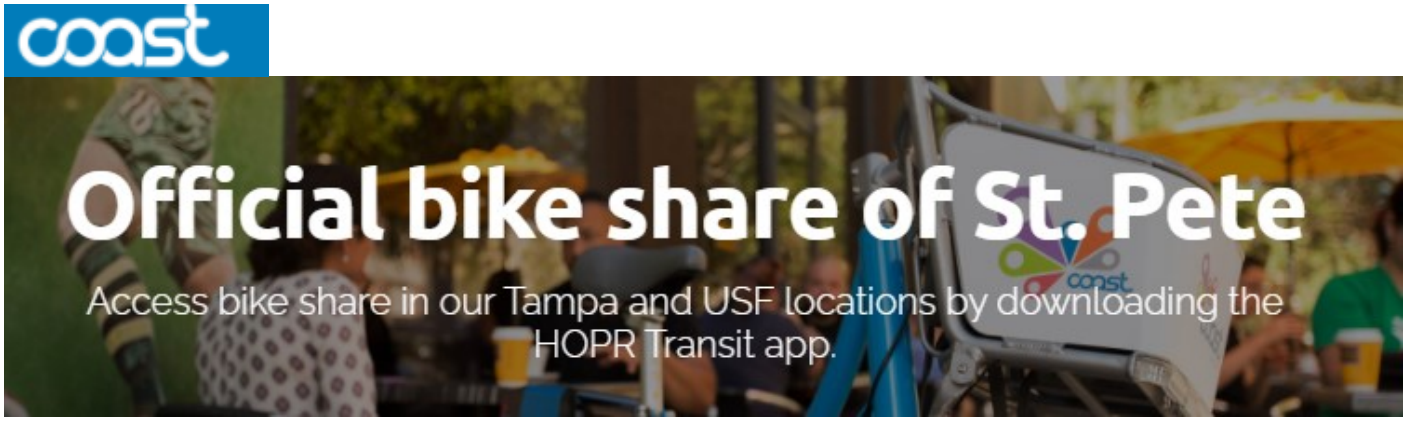
The third micromobility implementation has been to incorporate e-bikes into the existing bike share program. As recently as March of 2021, e-bikes have been incorporated into the Coast bike share program. The e-scooters provide expanded routes and access to transit and other locations directly adjacent to the downtown core. The first fleet of e-bikes was comprised of 50 e-bikes which have a maximum speed of 20 miles per hour and a range of 40 miles per charge. Currently, the fleet has been expanded to xxx e-bikes. Data has demonstrated approximately xxx e-bikes have been rented over the course of the past year. The City of St. Petersburg continues to analyze the micromobility data and obtain feedback back from the public regarding the bike share, e-scooter, and e-bike programs.

The City of St. Petersburg example ordinance, request for proposals and vendor contract is provided in Attachment A to this report. Coast Bike Share of St. Pete online platform also provides examples of fee structure and educational material for the public. Ordinances can also be found here

The City of St. Petersburg having been first to navigate the micromobility ordinances and programs has offered the following "important considerations" as a result of their approximate 10 -year experience with micromobility:

Important Considerations:

- Parking Areas: This was a substantially important process for the program in the City of St. Pete. Designating parking corrals has helped to manage the fleet and ensure safety.
- Equity Zones: Equity Zones are essential to a micromobility share program and should be established prior to the initiation of negotiations with potential micromobility operators to ensure equitable access for all communities for this mode of travel.
- Availability of Data: Operator agreements should include highly structured and well articulated expectations for data collection and data sharing. Specifically, operators should provide monthly ridership; individual and total mileage; as well as noncompliant parking data. This data is essential to understand user trends, demands and potential future growth options for a micromobility share program.
- Ordinance Benefits: The City of St. Petersburg has created ordinances as well as City code through the development of the micromobility programs. The benefit to an ordinance over code, is that it is more flexible and can accommodate changes based on data derived during or after a pilot program. Code, however, is beneficial due to its enforceability but is more complicated to alter and can add increased time and resources to the program process.
- Public Messaging: The City of St. Petersburg has been diligent in engaging the public through the course of their micromobility program developments. Public feedback has been a driving force in designing the programs. Similar to cities such as Austin, Texas, utilizing a robust education and outreach campaign regarding micromobility use and safety has resulted in positive results. The City of St. Petersburg also recommends organizing in-person workshops to teach the public safe use of the micromobility devices.
- Transit Connection: One of the many benefits of micromobility is the first mile and last-mile connection to transit. Partnerships with transit authorities to design micromobility parking areas near bus stops, as well as geographic distribution of micromobility options, is essential to encourage functionality amongst transit and micromobility users.
- Important perspective of "what and how": Consider "what" a community wants to regulate and then decide "how" to regulate. Make a list of what regulations are wanted and then decide the appropriate vehicle for those regulations.



CASE STUDIES

Micromobility in Florida: City of Tampa

The City of Tampa initiated an e-scooter share program pilot in May 2019, to provide a cost-effective and reliable mobility option in downtown Tampa. The e-scooter program has effectively energized and revitalized Tampa by bringing people downtown and increasing business opportunities. In analyzing the e-scooter ridership, the City has found e-scooters are not just popular with tourists, as the data demonstrates an increase in use during timeframes when local residents are travelling downtown for the evening for dining, entertainment, and recreation.

The City initiated the pilot in the downtown core and the surrounding residential neighborhoods in a 10 square mile geographic areas in the city. For example, the City placed e-scooter corrals around the University of Tampa and a nearby Walmart to allow for effective and cost-efficient travel for students. Moving forward, the City of Tampa is coordinating with Community partners to expand micromobility options throughout the entire City of Tampa.

The University of South Florida recently analyzed the e-scooter program and provided a report titled, "Performance Evaluation of E-scooter Sharing in the City of Tampa". As demonstrated in this report, the City of Tampa has been successful at designing a popular and easy-to-use e-scooter program. As explained by Tampa's Micromobility Engineer, Calvin Thornton, "a problem-solving approach is key to a successful e-scooter program. It is essential to design a program which is flexible. Furthermore, it helps to have "problem-solvers" staffed and flexible E-Scooter Operating Manual to guide the program as issues arise." The City of Tampa has used the following innovative approaches in their e-scooter pilot.

Innovative Ideas and Lessons Learned

1. The City of Tampa quickly learned that people were confused on where to park devices. As such, the City will in recent release RFP implemented the following:

    a. Development of a "lock to technology", which allows individuals to lock devices to a structure located in the landscape and furniture zone, within the downtown core, Ybor City and the SoHo District.

    b. Requirement of micromobility vendors to place a charging stations and micromobility racks in the downtown core, Ybor City and SoHo District.

    c. Implementation of a "micromobility bounty program"; whereby, people who retrieve micromobility vehicles which are parked in the wrong locations receive payment for returning them to the designated parking areas. As Calvin Thornton explained, "the micromobility bounty program encourages the system to self-regulate."

2. Tampa's arching goal was to develop an "all abilities all-inclusive program" and encourage wide-spread ridership. One of the strategies to achieve this goal was to require vendors to supply an array of micromobility vehicle options for the public. In consideration of the cost for these vehicles and docking stations, the City reduced the vendor right-of-way fee from $20,000 to $5,000 for single rider vehicle (SRV) and $2,500 for multiple rider vehicle (MRV). The City has required the vendors provide the following devices for the public:

    a. Single Rider Vehicles (SRV)
        i. Stand-up e-scooters
        ii. Sit-down e-scooters
        iii. E-bicycles.

    b. Multiple Rider Vehicles (MRV)
        i. Cargo bicycles and or bicycles for 2-people, which can be used by families.

    c. Adaptive Vehicles (AV)
        i. Hand-cycle and other ADA cycle options.

3. In consideration of equity, the City of Tampa divided up the geographic areas into 15 distinct districts which had a requirement for a set number of devices in each of these districts. Furthermore, the City identified Opportunity Zones for disadvantaged communities' locations and require 50% of the vendor fleet required in each district and 20% of SRVs and 10% MRVs in Opportunity Zones. Data from the e-scooter program has demonstrated high ridership in these zones.

CASE STUDIES

City of Tampa, Continued.:

4.. The e-scooter rental price in the first year was $1 per day for an e-scooter and the program provided a revenue of over $600,000 in the first year for approximately 1,000,000 trips or $.060 per trip. To encourage affordable ridership opportunities and to allow the scooter operator to developed ridership, the City reduced the fee to $0.30 per trip for SRV and $0.15 per trip for MRV. The City of Tampa program is based on wide-spread and equitable use. Essential, the City goal is to developed ridership by deploying micromobility vehicles throughout all neighborhoods with the goal of equitable application of the micromobility program.

5. As the City of Tampa has demonstrated through strategic planning of e-scooter corrals in deployment zones and building a safe bicycle and pedestrian infrastructure, micromobility devices need to always be available and dependable to the general public as a viable alternative transportation mode. As a successful story, the City of Tampa has learned that if the network is safe, reliable, people will use it.

City of Tampa E-Scooter Snapshot:

Motorized Scooters (2400 E-Scooter Program) May 24, 2019 to April 30, 2021	
Total Count	1,795,935 Trips
Total Distance	2,171,299 Miles
Total Time on Scooters	31,451,640 Minutes
Average Distance per Trip	1.25 (miles)
Average Time on Scooters	17 minutes 30 seconds

Examples of Shared Micromobility Multiple Rider Vehicles

Shared Micromobility Multiple Rider Vehicles (Applied in Zones Based on maximum limit per zoning table)		
Vehicle Type	**Not to Exceed Total**	**Not to Exceed Per Operator**
E-Scooter with two seats	1000	1000
E-Cargo Bicycle or E-Bicycle with two seats	1000	1000
Total	**2000**	**2000**

PRACTICAL APPLICATIONS

1. Where to establish micromobility programs?

Micromobility devices and share programs offer new possibilities for short trips as first-mile, last-mile solutions and options for transportation deserts within urban areas. Transportation planning practices can utilize bike-share, e-bikes and e-scooters to provide expanded accessibility within a transport network. These modes provide options for people to reach essential needs and services. From a basic accessibility perspective, varying transportation options expand people's ability to travel to resources for food, education, public services, emergency services, and other basic needs. Transportation research has demonstrated people generally utilize walking for trips ranging from 0-2 miles; e-scooters for trips ranging from 0-3 miles; and e-bikes for trips 0 – 10 miles.

Density is key! It is important to identify the locations where infrastructure is available to ensure safe use. Cities such as St. Petersburg and Tampa have found success with creating geographic core areas within downtown areas to effectively pilot micromobility programs. Data provided from these pilot programs can then be used to strategically expand availability of e-bikes, e-scooters and shared bike services in adjacent transit hubs and neighborhoods.

Additionally, areas such as college campuses, large corporate campuses and military bases are ideal for offering micromobility options for increased access and short-trips. In fact, college campuses have extremely high levels of ridership as students report e-scooters are "fun" as demonstrated by data collected by Capital News Service out of Washington, D.C. in 2019.

With over half trips made in the United States being 5 miles or less, and 78% of those trips are made by personal vehicle, increased micromobility options can greatly improve traffic congestion, user access and equitability.

E-scooters and e-bikes can be incorporated as a vital part of transportation processes to reduce the need and dependency on single-trip personal automobiles. Communities considering a micromobility program can access the example ordinances, request for proposals and other documents located in the appendix of this report.

Spot Light Portland:

The City of Portland Oregon, although known for bike enthusiasts, responded to the national increase in e-scooter popularity by developing a pilot program and associated study. This 2018 study found over 700,000 e-scooter trips were taken during the 120-day pilot. Amongst other findings, people in Portland found e-scooters to be a feasible transportation option. During their pilot program, Portland found 71 percent of the trips were used for commuting to a destination while only 28 percent used them for recreation or exercise. The study provided a framework for the City to develop a second follow-up pilot and subsequently e-scooter regulations.

2. How do micromobility rental systems operate?

As travelers began to choose e-scooters and e-bikes as viable transportation options in 2018, micromobility companies responded by expanding service in cities throughout 2019 and 2020. One of the foremost reasons for the e-scooter and e-bike use and service increase is due to the availability of a simple to use transportation option. Technologically, the systems are simply operated, and the rental process is fast and efficient.

Rental Process: The micromobility company, Lime, provides an example of the widely adopted user-friendly e-scooter system. When renting an e-scooter through Lime, users download the Lime app which is used to locate, rent and pay for e-scooters. To locate an available scooter, the app provides a map with different icons for each of the Lime scooters and differentiates between the Micromobility options. Once users locate the nearest available e-scooter the app provides an individual QR code to unlock the scooter (*QR* is short for "Quick Response" which is a piece of transitory media that can be read quickly by a cell phone). Specifically, the user taps on a "ride" button on the app and the user can either scan the QR code on the e-scooter's handlebars or input the QR code manually into the app. The e-scooter will be available for use once activated in the app. Each minute of the e-scooter use is charged a predetermined fee to the user credit card saved to the app.

Cash Option: Many e-scooter companies have developed cash payment options. Bird users can purchase prepaid Visa, Mastercard, and American Express debit cards using cash from retailers selling the prepaid cards. Lime users can use cash by enrolling in Lime's discounted ride program, "Lime Access". Lime Access members receive a text message with a link to Lime's Cash Payment Order Form. They then use a "Pay Near Me" website to find cash payment locations nearby whereby the cashier scans the barcode and adds the user's cash funds to their account. Razor offers a cash payment option that allows riders to rent a scooter from a fixed warehouse for a fixed timeframe. Lastly, Spin provides a discounted ride program online.

3. What about personal transportation devices ?

A 2019 report by the Mineta Transportation Institute titled, "How are Where Should I This Thing? Rules of the Road for Personal Transportation Devices," detailing the dynamics of micromobility devices and personal ownership. As demonstrated in 2020, demand for personal ownership of micromobility devices is rising as more affordable devices are available and people seek new modes for recreation and commuting travel. Specifically, in 2020 there was a 62% increase in bike sales, to include e-bikes, resulting in over 4 billion dollars of bike sales from January—October, 2020. The Mineta Transportation Institute recommends regulating personal micromobility devices by class not by device, as devices continue to evolve. Furthermore, "rules of the road" development in cities and states that provide a regulatory framework for where and how these devices can be used is crucial. The aforementioned 2019 report suggests regulating these devices similar to a bicycle and allowing for safe operation on sidewalks with requirements for yielding to pedestrians. Example ordinance and operation language in this report is highly useful to communities establishing regulatory frameworks for personal micromobility use.

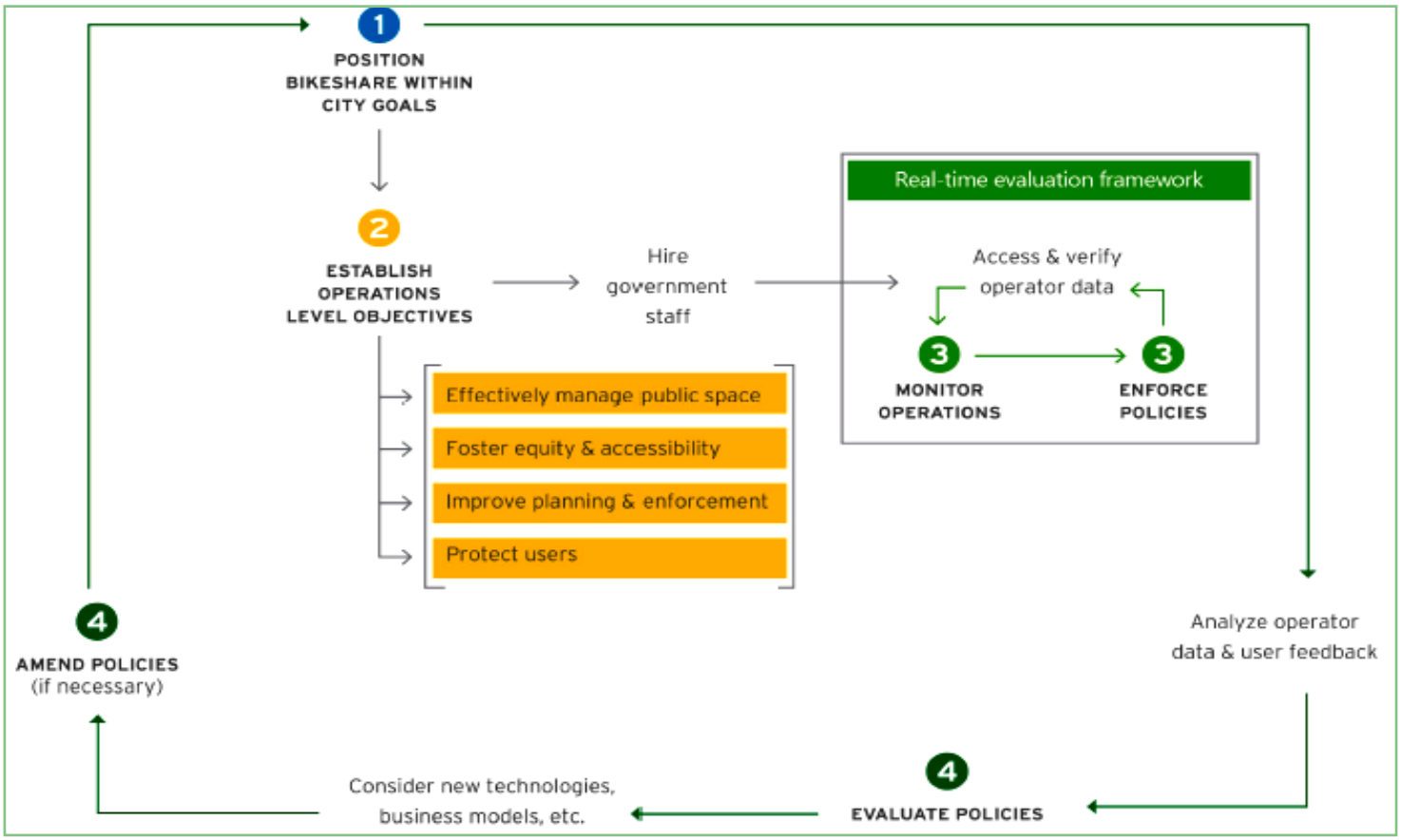
4. How to get started?

Engaging resources and time in a new city program is not without risk. Large cities In Florida, such as Miami, Fort Lauderdale and Tallahassee have collaborated with Lime, Bird, and Spin have developed micromobility pilot studies and processes to model for other communities.

Pilot Program Development: As a Florida specific example, Lime was provided approval in both Miami and Fort Lauderdale in late 2018 to initiate a pilot and deploy e-scooters. The pilot reported over 1 million trips were taken in these areas since they launched the program. In response to the e-scooters popularity, the City of Miami developed a pilot program in April 2019 which was extended in February 2020 to analyze the e-scooter program. Since 2018 there has been eight more e-scooter vendors which have deployed operations in South Florida.

Legalize and Standardize: In Fort Lauderdale, e-scooter companies Bolt, Lime and Bird were all given one-year permits to operate by the city. The City of Fort Lauderdale developed a policy and program for regulation titled, "Micromobility – Dockless Bikes and Scooter". This policy is an example for other cities as it focuses on safety and provides regulations outlining comprehensive micromobility topics to include but not limited to, device operation, public involvement, basic equipment requirements and equity considerations. The Fort Lauderdale policy has set requirements for permitting as well as vendor data sharing processes. **Vendor data collection and sharing requirements are pivotal to ensuring a successful micromobility share program.**

Monitor: Developing a pilot program and subsequently a data-driven regulatory framework are the first steps in a micromobility program. However, it is essential these programs operate with a high amount of flexibility and monitoring. Continual evaluation and problem-solving is required. The following flowchart provides an example monitoring process from ITDP:



5. How to measure success? Developing performance standards and success criteria in conjunction with a monitoring protocol is widely known as essential to any new pilot program. Regarding micromobility ordinances or share programs, monitoring the social, economic and environmental parameters before, during and after program adaptions provides essential insights. The following list provides a starting point for measurement criteria:

⇒ Have scooter, bicycle and/or pedestrian crashes, fatalities and injuries declined?

⇒ Is congestion getting worse?

⇒ Are fewer people driving to work alone?

⇒ Are people driving less?

⇒ Travel time to work (minutes); daily/annual vehicle milage per capita.

⇒ Is micromobility serving the community equitably?

⇒ User demographics (by income, age, gender, ability, etc.).

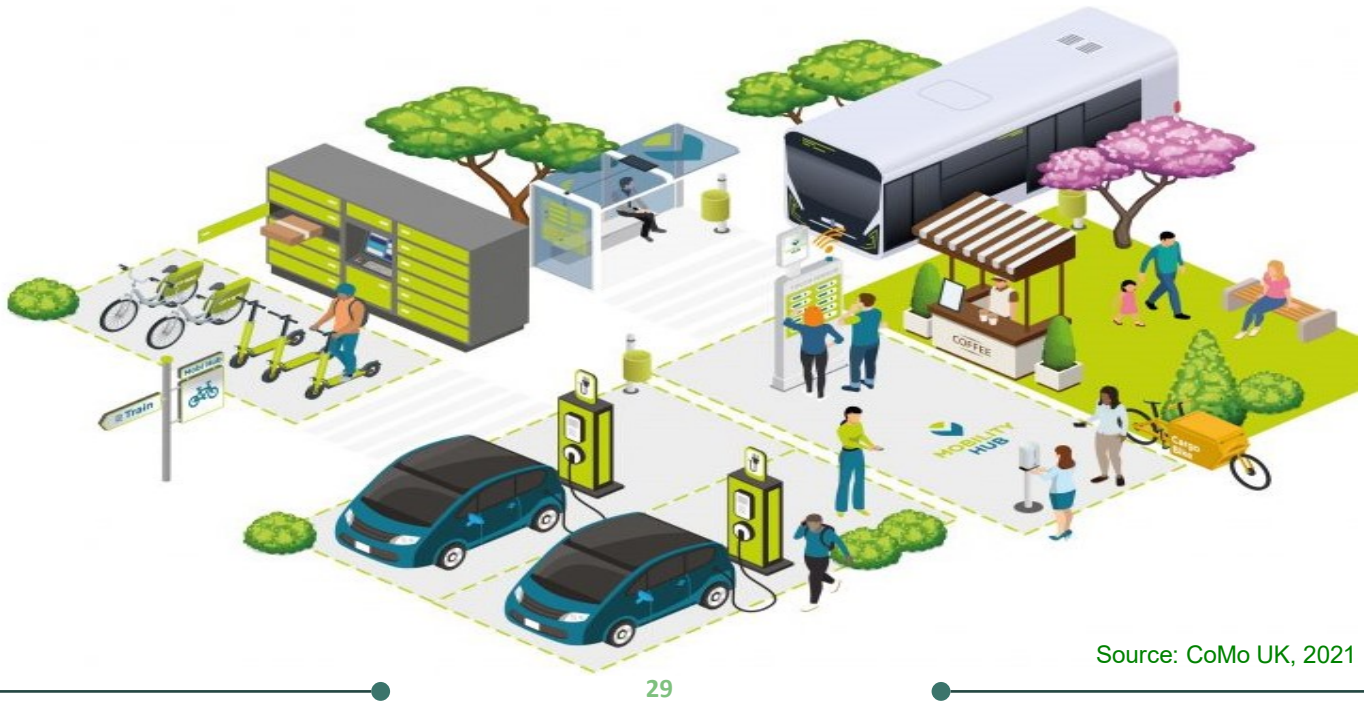
⇒ Average distance to the nearest micromobility device/service area.

⇒ Percentage of the population/geography served by micromobility.

⇒ Status on achieving energy efficiency and carbon dioxide (CO2) footprint goals?

6. What are the best practices?

Mobility Hubs: A greener, more sustainable, and equitable future may be actualized through land use transformations such as mobility hubs. These provide centralized areas within transportation corridors where intermodal connections, charging stations, micromobility device corrals, bikeshare providers and small-scale businesses collectively operate. Strategic location of mobility hubs is essential within a larger interconnected network.



Source: CoMo UK, 2021

Best Practices Continued.

Micromobility Demand:

Forward Pinellas has conducted trail user count data collection and analysis since 2017. The data demonstrates active transportation in Pinellas County has experienced exponential growth in popularity. Albeit, the trail user count data cannot differentiate between a traditional bike and an e-bike, antidotally the public has repeatedly reported an increase in e-bike and e-scooter use on the Pinellas Trail. National economic reports concur with this trend as e-bike sales in 2020 skyrocketed resulting in 145% growth according to the NPD Group, Inc. Determining the amount, type and location of micromobility devices within a given region will be subject to parameters of space, roadway compatibility, social and economic conditions. However, it is evident from local and national data there is suitable public demand.

Law, Ordinances and Regulations:

Jurisdiction between Federal, State, County and Municipalities can be rather complex. A legal opinion for governments enacting new ordinances and regulations from their respective legal counsel is a prudent protocol. A site-specific analysis is required as delineation between authorities can be complex. In regards to communities considering developing ordinances, codes or local regulations pertinent to micromobility, local examples from the City of St. Petersburg provide for examples which effectively manage safety, accessibility, vendor contracts, and other facets of a micromobility program. This information and other examples will be accessible on the Forward Pinellas Micromobility web site.

As a best practice, delineating the pertinent micromobility topics and defining the applicability to either a vendor contract vs. a public legal procedure is an important initial process to clearly differentiae responsibilities and authorities. For example, a vendor contract may be suitable for detailing pilot program durations, terms of agreement and vendor operations. Whereas, local code may be applicable for defining regulations for all micromobility users, age restrictions or geographic operation prohibitions.

The State of Florida has adopted a, "Municipal Home Rule Powers Act", as identified in the Florida Statute below. While there are numerous benefits to delegation of authority, one suggestion for Pinellas County governments and decision makers is to scrupulously consider the social, geographic and economic dynamics within the region. Specifically, the unique connectedness of the network due land use development, transportation and urbanization.

Florida Statutes:

Section 316.008 (7)(a): Florida Uniform Traffic Control Law allows municipalities to enact ordinances to permit, control or regulate the operation of vehicles, golf carts, mopeds, motorized scooters and electric personal assistive mobility devices on sidewalks or sidewalk areas when such use is permissible under federal law as long as such vehicles are restricted to a maximum speed of 15 miles per hour.

166.021 (1) Powers: As provided in s. 2(b), Art. VIII of the State Constitution, municipalities shall have the governmental, corporate, and proprietary powers to enable them to conduct municipal government, perform municipal functions, and render municipal services, and may exercise any power for municipal purposes, except when expressly prohibited by law.

7. What is the future of micromobility in Pinellas County?

Regional Consistency is Key

- Collaboration amongst the 24 municipalities, County authorities, regional agencies and state agencies provides for consistency and predictability. Similar rules, regulations and programs throughout the region encourages public compliance and positive public messaging. For example, St. Petersburg chose to partner with Coast due to the City of Tampa use of this vendor.
- Collectively, our most important and yet most challenging perspective is education. Micromobility devices and programs are not limited to just a law enforcement issue. Working together, we can provide a viable and easy way for people to follow the law and comply wit roadway rules without confusion.
- Micromobility in the forms of e-bike personal ownership to large-scale e-scooter programs, is a growing transportation dynamic. Proactive approaches to providing a regulatory framework coupled with shared public messaging can help us move forward to provide safe, connected and reliable transportation.
- Across the County, we can collaborate to increase opportunities to develop Complete Streets designs. Complete Streets are designed, operated and maintained for all users, regardless of age or ability, based on the context of the roadway and its surrounding area. Development of region-wide Complete Streets projects provides for a safe corridor for all travelers and is a viable strategy to work towards Safe Streets Pinellas goals to drastically reduce traffic related fatalities.
- Additional funding opportunities to develop roadway corridors which provide multi-modal access can be found through the Forward Pinellas Transportation Alternatives Program.
- Join us in sharing data regarding economic, social and environmental benefits from micromobility programs to include:
    - ⇒ Micromobility pilot programs revenue;
    - ⇒ User quantification data (i.e. number of trips, timing of trips and trip purposes);
    - ⇒ User qualification data (i.e. user experience, feedback and public opinion);
- Please share your perspectives, data and reports. Forward Pinellas will continue to gather and store micromobility information, data and relevant documents for local application.
- Finally, collaborate with us to develop new and innovative approaches to develop mobility hubs, County-wide micromobility programs and other connected transportation services.

Micromobility can increase Pinellas County's integrated, safe, connected and reliable active transportation network

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RESOURCES CITED

- Better Bike Share Partnership. (2020). E-Scooters, Equity and Accessibility.
- Chen, Zhiwei. (2019). Exploring the Equity Performance of Bike-Sharing Systems with Disaggregated Data: A Story of Southern Tampa.
- Cox, Stephanie. (2020). E-Scooters, Equity, and Accessibility. Better Bike Share.
- David Zipper. (2021) Why Don't Transit Agencies do Bikeshare? City Lab.
- Deloitte. (2019). Small is Beautiful: Making Micromobility Work for Citizens, Cities and Service Providers.
- Environmental Protection Agency. (2018). Fast Facts on Transportation Greenhouse Gas Emissions.
- Institute for Transportation & Development Policy. (2020). Will E-Bike Make Cycle Highways Happen?
- Institute for Transportation & Development Policy. (2019). The Electric Assist: Leveraging E -Bikes and E-Scooters for More Livable Cities.
- Johnston, Caitlin (2020). Bike vs. Scooters: Does Tampa Bay Have Room for Both?
- Joseph Hollingsworth, et al. (2019). "Are e-scooters polluters? The environmental impacts of shared dockless electric scooters" Environ. Res. Lett.
- International Transport Forum. (2019). Safe Micromobility.
- Kittleson & Associates. (2020). What Baltimore Can Teach Us About E-scooters and Equity During COVID.
- Luz Lazo. (2019). There Could Be Up to 10,000 E-Scooters on D.C Streets Come January. The Washington Post.
- McKinsey & Company. (2019). Micromobility Rapidly Attracts Cash and Customers.
- Mineta Transportation Institute Publications. (2019). How and Where Should I Ride This Thing? Rules of the Road for Personal Transportation Devices.
- National League of Cities. (2019). Micromobility in Cities: A History and Policy Overview.
- National Association of City Transportation Officials. (2018). Shared Active Transportation Guidelines.

Resources Cited Continued:

- National Association of City Transportation Officials. (2019). 84 million trips in 2018.
- National Association of City Transportation Officials. (2019). Guidelines for Regulating Shared Micromobility.
- National League of Cities. (2019). Micromobility in Cities Report.
- Pedestrian Bicycle Information Center. (2019). Micromobility in Midsized Cities.
- Populus. (2018). The Micro-Mobility Revolution: The Introduction and Adoption of Electric Scooters in the United States.
- Portland Bureau of Transportation. (2018). 2018 E-Scooter Findings Report.
- Portland State University. (2017). Evaluation of E-Bike Use.
- Portland Bureau of Transportation. (2018). 2018 E-scooter Pilot User Survey Results.
- Portland State University. (2019). E-Bike Incentives.
- Transportation Research Center for Livable Communities. (2015). Exploring Equity Bike Share.
- TREC. (2019). Bike Share Report.
- Toby Sun. (2019). Riding into 2019 with new financing to serve more users around the globe.
- U.S. Department of Transportation Federal Highway Administration. (2016). Shared Mobility: Current Practices and Guiding Principles.
- Victoria Transport Policy Institute. (2020). Evaluating Transportation Equity: Guidance for Incorporating Distributional Impacts in Transportation Planning.
- Will Yakowicz. (2018). 14 months, 120 cities, $2 billion: There's never been a company like bird. Is the world ready?

This is a "living document" updates will be conducted as technology and research on micro-mobility advances.

This project has been developed in compliance with Title VI of the Civil Rights Act of 1964 and other federal and state nondiscrimination authorities. This project will not deny the benefits of; exclude from participation in or subject to discrimination anyone on the basis of race, color, national origin, age, sex, disability, or family status.