The Electric Assist:

LEVERAGING E-BIKES AND E-SCOOTERS FOR MORE LIVABLE CITIES

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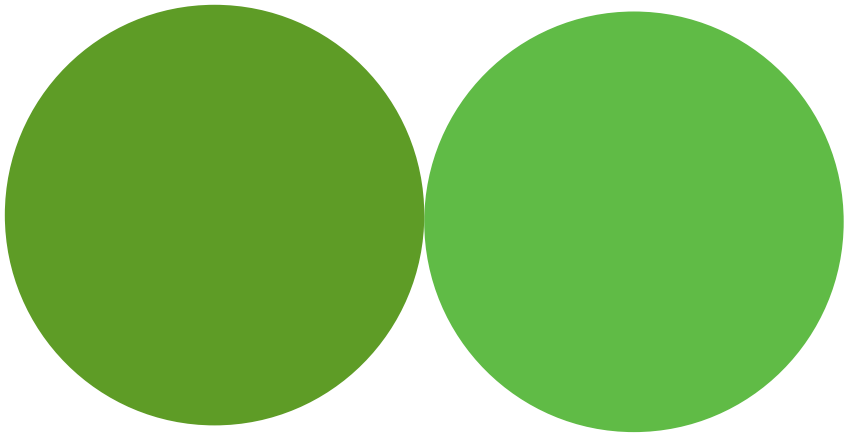

THE ELECTRIC ASSIST: LEVERAGING E-BIKES AND E-SCOOTERS FOR MORE LIVABLE CITIES

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EXECUTIVE SUMMARY

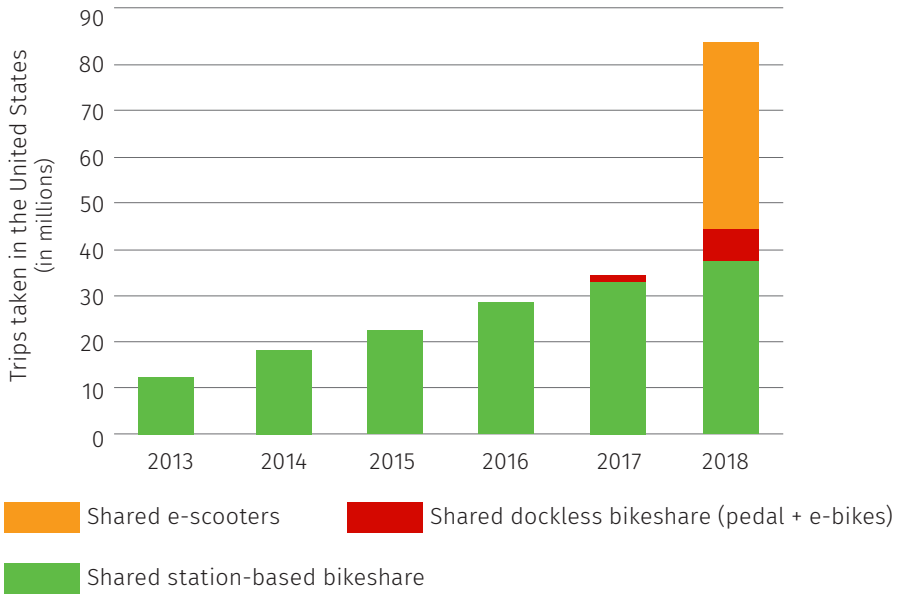
WHAT IS ELECTRIC MICROMOBILITY?

Micromobility, though not yet universally defined, has been used to refer to a number of different modes. In this report, we use the term “electric micromobility” to refer to electric-powered modes of transport that are low-speed (comparable to a bicycle), small, lightweight, and typically used for short distance trips. These include primarily electric bicycles and standing e-scooters, but also other small electric devices, and can be shared or personally owned.

Credit: BikePortland, Flickr CC

Why Does Electric Micromobility Matter?

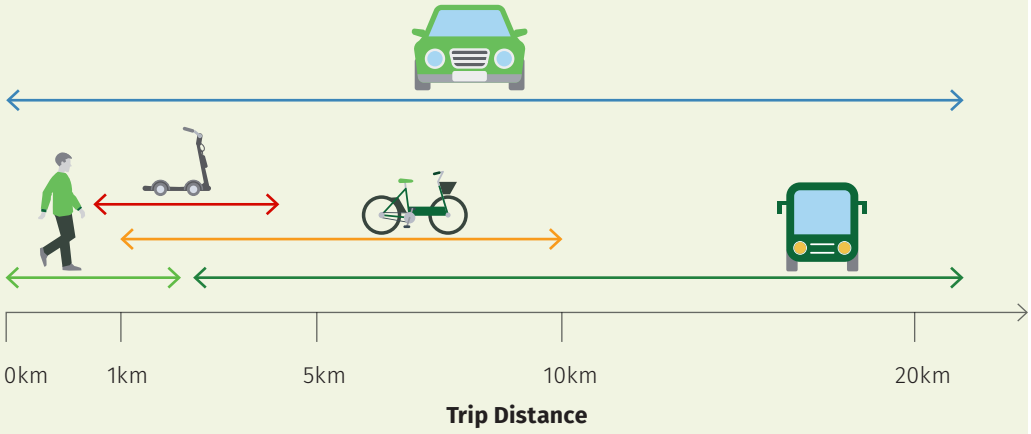
Electric micromobility has enormous potential to improve sustainable urban transportation systems. Recent technological advancements and the rapid growth and adoption of shared mobility services have enabled small electric modes to scale. As a result, e-bikes and e-scooters could serve as a point of entry to the broader sustainable transportation network, enabling more people to rely on walking, cycling, and public transit for more trips—and perhaps consider not owning a car at all.



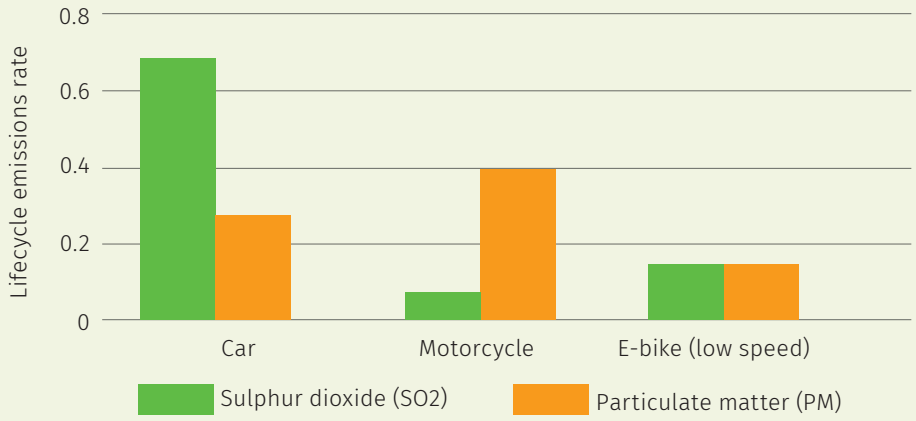
Source: Adapted from NACTO's "Shared Micromobility in the US: 2018" report

Most urban trips are less than five kilometers, a distance easily traveled using electric micromobility. As the share of short and mid-distance trips completed using e-bikes and e-scooters instead of cars grows, we can expect to see:

MORE TRIPS MADE BY BICYCLE, WALKING, AND TRANSIT, and a combination of these with electric micromobility

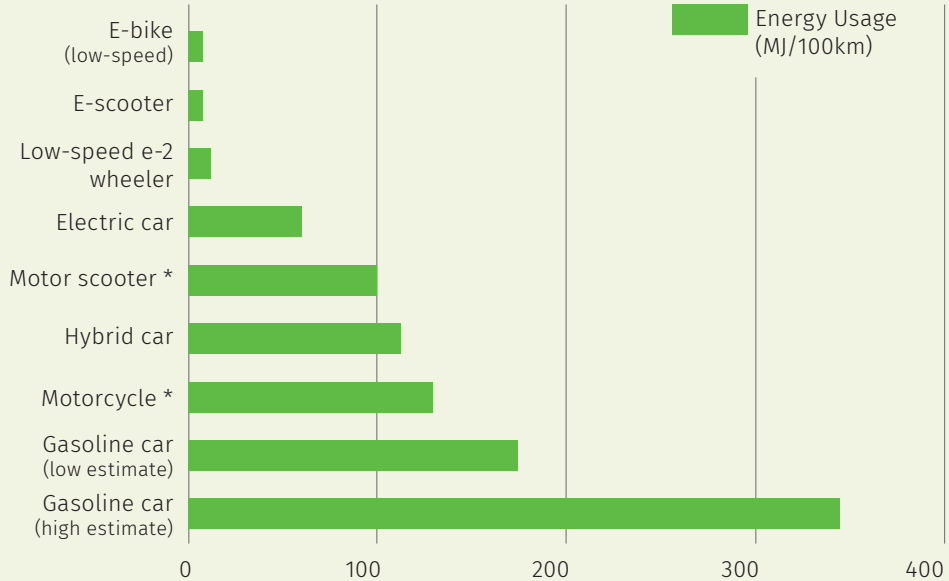


IMPROVED AIR QUALITY from a reduction in harmful pollutants



Source: Cherry et al., 2009

MORE EFFICIENT USE OF ENERGY



*Energy usage based on one model, recognized as an average.

Source: ITDP data

HOW CAN E-BIKES AND E-SCOOTERS LINK TO SUSTAINABLE TRANSPORT GOALS?

Successful urban transportation systems increase access to destinations, activities, goods, and services, and do so in a form that is safe and equitable (both to access and in terms of benefits distribution), minimizes environmental harm, uses resources efficiently, and mitigates negative health impacts. Using this framework, we can evaluate the role of e-bikes and e-scooters in moving cities toward more sustainable transportation networks and identify potential negative impacts that will need to be addressed.

Sustainable Transport Goal	Potential Positive Impacts +	Potential Negative Impacts -
Access	+ Offer travel times competitive with vehicles for short trips + Provide connections to transit and economic and social opportunities + Increase use by more types of users and for more kinds of trips than pedal bicycles	- Demand for public parking and charging infrastructure
Environment	+ Reduce single-occupancy vehicle trips + Improve air quality + Reduce harmful emissions from passenger and local freight transport	- Increase net emissions and materials use (shared devices with short life spans) - Displace transit, cycling, and walking trips
Equity + Affordability	+ Shared systems offer alternative to purchasing outright + Connect underserved areas to transit + Provide travel alternatives that enable car-free or car-light living	- Availability limited to higher-income neighborhoods (shared systems) - Present barriers to use by those without a smartphone and/or credit card - Too expensive for low-income groups, especially without fare integration with transit (shared systems)
Efficiency	+ Free up street space for more efficient uses + Increase energy efficiency in transport + Decrease need for public investment in road maintenance	- Oversupply and indiscriminately parked devices clutter sidewalks (shared dockless systems) - Increase energy use due to inefficient charging and redistribution of shared devices
Safety	+ Contribute to “safety in numbers” effect where the presence of pedestrians and cyclists leads to safer streets for all + Increase demand for safe cycling and pedestrian infrastructure	- Increase crashes and injuries - Prompt harassment or social stigmatization
Health	+ (E-bikes) Increase physical activity levels for those who would not consider pedal cycling + Reduce noise pollution when replacing car and motorcycle trips	- (E-scooters) Reduce physical activity levels if replacing walking or pedal cycling trips

WHAT SHOULD CITIES DO TO LEVERAGE THE BENEFITS OF E-BIKES AND E-SCOOTERS?

Only a handful of published studies look at the impact of electric micromobility on sustainability goals. Few best practices of outcome-oriented planning in regards to electric micromobility have emerged given how recently e-bikes and e-scooters have grown in popularity in many cities. Recognizing this knowledge gap, we reviewed existing policies on e-bikes and e-scooters and developed the following recommendations for cities to minimize potential harm and maximize benefits.

Policies	Goal(s)	Recommendation
Classification	N/A	· Classify e-bikes and scooters as non-motor vehicles · Clearly define maximum speeds for low- and moderate-speed devices
Infrastructure	Safety	· Define the infrastructure that electric modes are permitted to use · Design safe, inclusive on-street infrastructure · Enforce safe use of cycling infrastructure
Adoption and Use	Access Equity and affordability Efficiency	· Increase exposure and access to small electric modes · Encourage trip replacement by making car travel less convenient · Design and implement parking and charging spaces
Crash Reduction	Safety	· Design safe, inclusive on-street infrastructure · Offer public safe-riding courses
Strategic Planning	Environment Health	· Integrate small electric modes into citywide strategies and plans · Collect data for analysis and enforcement

ASSESSING CAPACITY NEEDS FOR SUCCESSFUL MANAGEMENT

Some cities are better equipped than others to implement supportive infrastructure, like cycle lanes and parking, and monitor the provision of shared e-bike and e-scooter services by the private sector. Cities that are less equipped should build capacity to better position themselves to manage e-bike and e-scooter use and to operate a sustainable transport network more broadly. Building capacity and partnerships between public and private stakeholders will be critical for these modes to achieve scale and related benefits, and to ensure they are well-integrated into urban transportation networks.

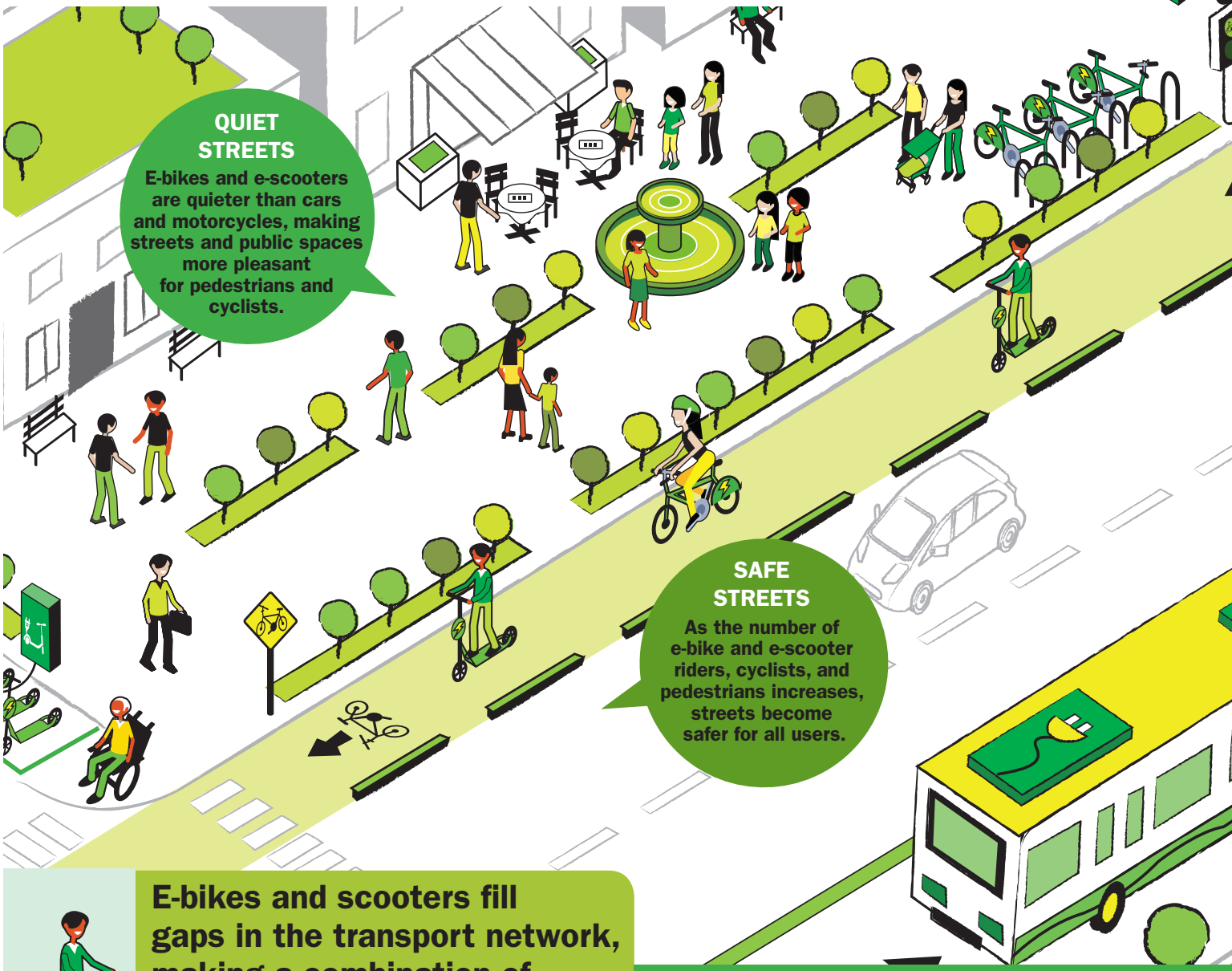
CONCLUSIONS

Additional research and analysis across the board—and especially in low-income contexts outside North America and Europe—is needed to better understand the right role for both personal and shared electric micromobility in urban transport. In the meantime, regardless of location, cities can take the following steps to expand access to and oversight of electric micromobility in the near term: **Legalize** use; **standardize** speed maximums for electric modes when using cycling infrastructure; **design** safe cycling infrastructure that accommodates both electric and non-electric devices; **manage** and regulate shared electric micromobility systems; and monitor use and ridership trends.

ELECTRIC MICROMOBILITY HAS THE POTENTIAL TO BECOME A CRITICAL COMPONENT IN THE SHIFT AWAY FROM PRIVATE VEHICLES AND TOWARD TRANSPORTATION SYSTEMS THAT PRIORITIZE PEOPLE. TO ACHIEVE THIS PIVOT, CITIES WILL NEED TO TAKE AN ACTIVE ROLE TO MAXIMIZE BENEFITS AND LIMIT NEGATIVE OUTCOMES.

E-BIKES AND E-SCOOTERS: DRIVERS OF CLIMATE ACTION

Electric bikes and scooters are more than a convenient first-last mile solution in cities. They also reduce emissions while catalyzing a broader shift toward sustainable transport.



E-bikes and scooters fill gaps in the transport network, making a combination of cycling, walking, and public transit the easy choice over cars for more trips:

In Portland, Oregon, **6% of e-scooter users reported getting rid of a car** due to the availability of micromobility options.

What cities can do:

LEGALIZE

Make low-speed e-bikes and scooters legal in cities. Regulate them as bicycles, not motor vehicles, so license and insurance are not required to ride.

STANDARDIZE

Clearly define and enforce speed maximums for e-bikes and e-scooters to distinguish where they can safely share cycle lanes with pedal bicycles.

Choosing an e-bike or scooter instead of a car translates to measurable emissions reductions:

A 5% increase in trips made by bicycle and electric micromobility instead of cars globally would reduce CO_2 emissions by 7% —the equivalent of taking more than **134 million cars off the road** by 2030.

CONVENIENT ALTERNATIVES

E-bikes are competitive with cars on travel time, especially for trips up to 10km.

EQUITABLE ACCESS

E-bikes and e-scooters are attractive to—and increasingly used by—women, older adults, and other groups who have not felt comfortable on traditional bicycles.

DESIGN

Ensure cycle lanes are protected and form a complete network, safely accommodating low-speed e-bike and e-scooter riders in addition to pedal cyclists.

MANAGE

Enforce rules for bikeshare and scootershare operators to ensure that sidewalks are clear, and shared bicycles and scooters are well-maintained.

MONITOR

Collect and analyze data on trip length, frequency of use, and destinations to better quantify personal e-mobility use, and scale and improve shared systems.

CITIES CAN BE PROACTIVE IN MAXIMIZING THE BENEFITS OF ELECTRIC MICROMOBILITY BY ENACTING MEASURES TO LEGALIZE, STANDARDIZE, DESIGN FOR, MANAGE, AND MONITOR THESE MODES. DOING SO CAN HELP ENSURE THAT E-BIKES AND E-SCOOTERS PUSH FORWARD GOALS LIKE THOSE RELATED TO CLIMATE.

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