

# Introduction to Battery-Powered Micro-Mobility



## What is Battery-Powered Micro-Mobility?

On February 4th, 2021 Transport Canada repealed its definition of Battery-Powered Micro-Mobility (BPMM), leaving it up to each province and territory to define the different types of BPMM devices permitted and put in place rules governing users[1].

While precise definitions vary, the general consensus is BPMM references small, low-speed, lightweight vehicles, powered by a battery, usually traveling at speeds below 32 kilometers (km) per hour. They can either be fully motorized or motor-assisted, where the device still requires some human propulsion by either pedalling or kicking.

The batteries in these devices are typically charged using common residential 120V AC outlets. Depending on the device and the battery's capacity, a BPMM device may take from 2.5 to 12 hours to fully charge. On a full charge, the range of BPMM devices can be anywhere from 20 km to 200 km, with the average range being 30-80 km. Factors influencing range include battery size, ambient temperature, terrain, weight of the rider, cargo and weight of the devices.

The main types of BPMM include cargo e-bikes, electric kick-style scooters, and large quadracycles[2]. Other forms of battery-powered devices such as e-skateboards and hover-boards have not yet been included in provincial micro-mobility programs.

Motorized wheelchairs and personal mobility devices used by people with mobility issues/disabilities have their own standardized definition and, while they are related to BPMM, they are not considered "micro-mobility" and thus not included in this fact sheet[3].

## A Closer Look at the Players

**Electric bikes:** Electric bikes (e-bikes) are a battery-assisted one-, two- or three-wheeled cycle that has both an electric motor and pedals or hand cranks capable of propelling the e-bike forward while the motor is engaged[4]. Average cost is \$999 on the low end to over \$10,000 for higher end models.



**Cargo e-bikes:** Cargo e-bikes are very similar to regular e-bikes but have a platform or box designed to carry passengers or goods such as packages and boxes for deliveries[5]. Average Cost is \$1,800-\$8,000.

**Electric scooters:** An electric scooters (e-scooter) is a transportation device that has two wheels (one at the front and one at the back), a platform to stand on, a handlebar for steering, and an electric motor which alone propels the device forward[6]. Average Cost is \$200-\$7,000.



# BPMM Rental Services

Across the world, e-bike and e-scooter rental services have been growing rapidly, with many countries integrating these services into their city's transportation scheme. In particular, e-scooter rental services have become popular. Since these services are relatively new, feedback from users is encouraged and well-received by cities as well as rental services, helping them to analyze which aspects of these services work, and which still need to be improved upon.

## Benefits

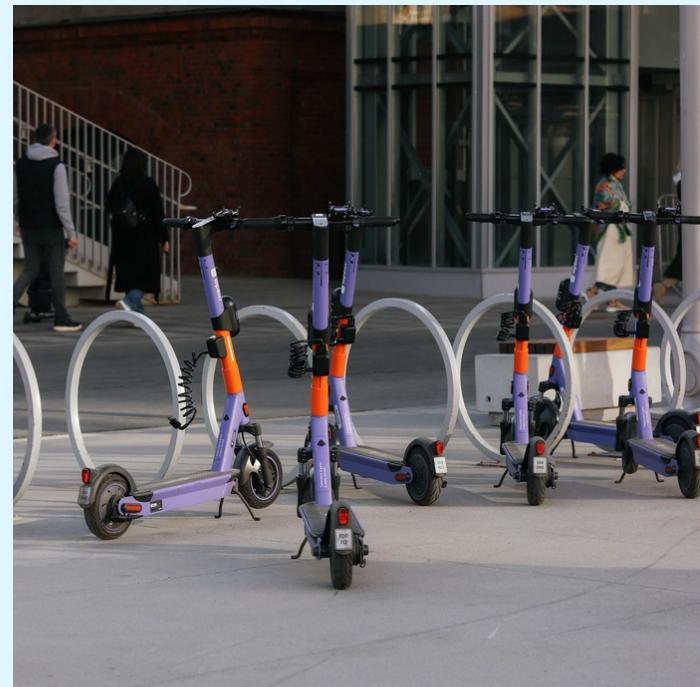
Companies that have launched rental services in Canada have stated the majority of feedback received by these new programs is positive[7]. Frequent users of e-bikes and e-scooters claim that the rental services are helpful in rush hour when traffic is heavy and public transport is slow. For those who choose to walk their commute, rental services have been convenient when in a hurry, due to their easy access and accessibility in some cities. Many who have used e-scooters have done so because they find it new and exciting, using it more for recreation than for transportation. Additionally, these rental services are a convenient, cheaper, option to ride-hailing services[8].

## Drawbacks

The primary apprehension with BPMM rental services is surrounding safety. There are concerns regarding ignorance on how to use the devices, sharing spaces with pedestrians, and interactions with other vehicles. Not knowing how to use the device can be harmful for both the vehicle and the user, increasing the risk of injury and damage. In addition to safety concerns, other critiques of rental services include use being dependent on the weather and if the rider has a load to carry, since many rentals do not have places for riders to store items. Furthermore, most of these rental services require a smartphone and the downloading of an application to be able to pay and use the devices. Limited payment methods also are known to negatively impact the user interface[8].

## Opportunities

Further integrating BPMM rental services could reduce traffic and transportation congestion, as well as the strain on public transportation networks [8].



Using electric modes of transportation including BPMM also have a huge potential to decrease greenhouse gas emissions (GHG). In 2021, Canada's transportation sector was the second largest source of GHS emissions, accounting for 22% of the nation's total emissions[10].

Diversifying our daily modes of transportation and moving away from traditional fossil fuel-powered vehicle is an essential step towards achieving net zero and addressing the global climate crisis. BPMM devices in particular are financially more accessible than other electric vehicles, providing an opportunity for more citizens to incorporate greener choices into their lives.

## Mitigating Safety Concerns

Whether personal devices or the use of rental BPMM, it is important cities and rental services address safety concerns in order to support/protect users and increase usage. According to the National Electronic Injury Surveillance System in the United States, there were 133,872 injuries involving e-bikes/scooters between 2000 and 2017 in America, with injury rates higher between 2013-2017 correlating with increased use of these devices[11]. In order to reduce the rate of injury and increase safety, it is important riders wear appropriate protective gear including helmets and if

possible, elbow and knee pads. Furthermore, education on the proper use of equipment, never riding under the influence of drugs or alcohol, and making sure that there is no damage to the device before using can all help ensure the safety of the rider and those in the immediate vicinity.

Much like non-electric micro-mobility, BPMM devices are prohibited from being ridden on sidewalks where it can be dangerous for pedestrians[9]. However, non-users have expressed ongoing concerns over BPMM users riding on sidewalks in-spite of regulations[8]. One reason this may be the case is due to lack of knowledge on the part of new users. That is why we encouraged all potential BPMM riders to check provincial/territorial regulations and stay up-to-date with rules before riding.

In addition, creating more lanes and paths dedicated to micro-mobility would allow riders to feel safe away from cars and protect pedestrians from potential collisions.

Another safety concern surrounding BPMM is the fire risk associated with lithium-ion batteries. This risk can

be significantly reduced if users buy high-quality, name-brand batteries, certified by a third party (e.g. Underwriters Laboratory of Canada), compatible with their devices. Other safety tips include not leaving batteries near flammable items, not storing or charging batteries in temperatures below freezing or above 49°C, and replacing batteries with visible damage[12].

## The final word

The popularity of BPMM devices continues to grow in Canada and abroad as users learn how practical and affordable they can be.

We encourage you to investigate the applicability of BPMM to your lifestyle. Do your research. Check with your city/provincial/territorial transportation department to ensure you can legally ride in your jurisdiction and thoroughly review all the attributes of any device you are considering. Try it out for fit, comfort and usability in a wide open space like an empty parking lot before riding on the road to get a feel for the controls. And above all, use BPMM wisely. Happy trails!

### References:

- [1] <https://tc.canada.ca/en/road-transportation/importing-vehicle/importing-non-regulated-vehicles>
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- [9] <https://ebikebc.com/en-us/blogs/articles/canadian-electric-bike-rules-and-regulations>
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- [12] <https://www.electrifybike.com/blogs/news/charging-and-caring-for-your-lithium-ion-ebike-battery>

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