Micromobility user needs, charging and batteries

Introduction

This paper is an output from Special Interest Session 42 at the ITS European Congress in Lisbon in May 2023. The session was organised by **John Paddington**, Senior Manager at ERTICO, and was moderated by **Lidia Buenavida Peña**, Manager at ERTICO.

The panellists at the session were:

- **Lisa Spellman,** Director VRU Safety Consortium at SAE Industries Technologies Consortia
- **Pedro Gomes,** Project Manager & Coordinator - Clean Vehicles & Air Quality Working Group at POLIS
- **Samuel Pierce,** Project Manager at Cycling Industries Europe.

This session considered three areas:

- Fire Safety / Smoke Explosion Risk
- Batteries and charging
- What's cool that is happening around the world / Gender / Gig Workers

The following is a summary of the discussion amongst the panellists along with some key recommendations.

Discussion

The face of transportation continues to evolve. Cars, SUVs, trucks, and busses must share the same roads with a growing number of options that are generally classified as "micromobility". This category includes bicycles, especially e-bikes; scooters, which now include push, electric and seated varieties; and light electric vehicles (LEVs) which range from a three-wheeled cross between a bike and a LEV to modified golf carts. Forms of transit are not just things that roll; other road users include pedestrians, pets, road workers and emergency personnel.

For ease of discussion and writing, often the abbreviation VRU (Vulnerable Road Users) is used to describe these diverse categories of shared road users. However, the word "vulnerable" is based on the users' perceived risk of injury from other vehicles, but can lead to negative connotations - would "Valuable Road Users" be a better term to reflect the value of all shared road users?

Standards and common sense are important when it comes to fire safety. Fires can have serious implications, but batteries only make the news when they go wrong, not when they don't explode. If a battery catches fire, it releases toxic smoke, which can be incapacitating in a short period of time. Fire safety teams might also not be fully capacitated on how to deal with fires from lithium batteries.

POLIS is pushing this issue to the agenda and exchanging with its member cities and regions, as well as experts on the topic, on how to handle these issues. A key question for micromobility users is a lack of suitable alternatives to charge their batteries apart from inside their home, in a corridor / stairwell or in the parking

garage. There is an unanswered question whether people should charge overnight due to the risk of smoke inhalation.

Lack of properly designed infrastructure for safe riding, parking, and charging is a particular challenge for gig workers who, by nature of their employment, lack such workplace options and may be forced to charge at home, which also may lack safe and proper parking and charging facilities. Theft is also a growing issue: micromobility users of all types need a safe place for parking and charging; security is important. There's a real risk of theft, if charging outside. The other problem is that e-bikes can be heavy (around 8 kg), making it difficult to bring them inside.

There is a grey market for batteries and motors through imports, which makes it harder to tell whether batteries are safe. Batteries potentially have a lifespan of 8 to 10 years, leading to a significant second-hand market. However, they first need to be designed to be reused or recycled.

There is a clear need for better standards, guidance and regulation. The EU has issued a mandate to make cell architecture modifiable / replaceable, but the technology is currently not available; it will thus take a few years before this policy is implementable. There are some start-ups with architecture for cell replacement but these are not yet scalable. The battery industry supports the development of standards for these new approaches, but these could also introduce new risks from unproven technology. It is worth noting that for other transport modes, the battery remains within the vehicle. There needs to be a balance between circularity and safety considerations. This means working with the industry. Carrots and sticks are important in these conversations.

The search for improved parking and charging guidance is coming from a wide range of entities, including municipalities and homeowner associations. These new solutions need input from emergency workers, architects and landlords. Policy incentives need to be linked to funding and adapted to the local context – cities and regions are the responsible entities for policy and regulations related to micromobility. One good example of this is the EU-funded SOLUTIONSplus project, which is undertaking exchange sessions between several demonstration cities, including partners from Europe, South America, Africa and Asia. There is no one-size-fits-all approach. Learning is two way – Europe learning from the rest of the world and the rest of the world learning from Europe.

Another EU-funded project, eCharge4Drivers, is demonstrating creative solutions, which include:

- Business to Business approaches trialled in Berlin with battery-swapping solutions, which is convenient for gig workers who don't have to wait for batteries to charge;
- Business to Consumer approaches trialled in Barcelona with swappable batteries and battery charging as a service for L3e e-motorbike users. A four-wheeler L6e and L7e nanocar with two units of the e-motorcycle battery pack is being tested.

Cycling Industries Europe is working with NAPCORE (National Access Point Coordination Organisation for Europe) to create a standard for bike parking data. It is important to provide details of where safe parking exists. Riders need to be confident that they can drop off their bike and find it there when they return.

Brussels is making big progress with relatively small changes: there has been a 3-9% increase in bicycle usage with a 10% reduction in driving. Previously, employees could obtain a company car through their employer

through a leasing scheme, now this also includes micromobility, which is meaningful as a cargo bike can cost €5-8,000 to purchase, similar to the cost of a secondhand car.

Micromobility can be transformative for girls and women in terms of safety and access, so it is important to focus on their needs by providing funding and training. Once a critical mass of women and girls users is reached, others are inspired. The SOLUTIONSplus project is providing training for women in Kigali, Africa to become e-motorcycle drivers. This has two key benefits: it empowers women by giving them a source of income and makes other women feel more confident in using the service, as the driver is another woman. 35 women started training and 24 got driving licences at the end of the course. This is also interesting from a financial point of view, as women entrepreneurs tend to have better pay back. E-bikes, e-motos, and e-cargo bikes also help business, as they are cheaper than larger vehicles, allowing better asset utilisation and less funding tied up in the business.

In many places across the globe, accessing school may require a long walk of two hours (and often more). Using a bike makes it safer and more convenient, however there have been challenges to providing access. For example, a charity donated e-bikes to a low-income community in Africa, but there is no dedicated infrastructure, while the city of Denver in the United States consistently has bike incentives sell out within 30 minutes.

It is important to have data on how micromobility is used. Trips, origin / destinations and travel patterns data are all important. This is key to inform shared, free floating systems and relevant parking restrictions. There are often counts on main roads but very limited data on side roads. Manual counts are often not representative – Copenhagen found 60% variation in micromobility usage between two different manual count days. Great traffic models need good data.

Users need information on parking locations and availability. Accessibility is also important, such as knowing whether there are lifts and which coaches allow bikes. Ticketing is also important as you need an extra ticket to carry a bicycle in some cities. A new concept called "Green waves" is a good solution for prioritising users. Data can be obtained from a wide variety of sources, including mobile phones and smart locks or lights.

POLIS will be kicking off an initiative on safety linked to micromobility, particularly to consider the issues of conflict with pedestrians. Too often micromobility is treated as a toy. E-scooters / e-bikes can be challenging for pedestrians, due to their ability to rapidly change speed and direction. Users of micromobility need to treat their vehicles capabilities with more respect.

Geofencing is important to avoid badly parked vehicles, along with enforcement. There may also be a need to restrict the number of shared vehicles and the number of operators. Restrictions around school zones are also worth considering. The Netherlands requires users to dismount in pedestrian areas. Best to start implementing restrictions early, as it becomes much more challenging when sharing schemes are established with large numbers of vehicles and users. Planning is important to avoid street clutter. Often cities have a challenge when they did not anticipate micromobility. There has been some talk of registration schemes for micromobility but this doesn't work and becomes too costly to administer.

An important comparison about restricting micromobility use: driver and cars are free to do what they like – e.g., we don't limit car speeds or geofence their usage. Issues around pavement parking are an issue with cars.

Recommendations

The panel had the following four recommendations:

1. National governments should consider the fire risk of batteries and provide guidance on how these batteries should be charged.
2. Cities and Regions should consider the needs of micromobility charging as well as larger vehicle charging, especially for gig workers – parking and charging of all electric vehicles need to be easily accessible, safe and secure.
3. Incorporate micromobility data into public transport and MaaS apps to show where vehicles can be parked and charged.
4. The transition to e-mobility is an opportunity for gender mainstreaming and the empowerment of women and girls in transport.

This report of the session was contributed by John Paddington, Senior Manager at ERTICO.