

## TEACHING MATERIAL GUIDANCE

### 1) Title of the material

*Dias, G.; Arsenio, E.; Ribeiro, P. The Role of Shared E-Scooter Systems in Urban Sustainability and Resilience during the Covid-19 Mobility Restrictions. Sustainability 2021, 13, 7084. <https://doi.org/10.3390/su13137084>*

<https://www.mdpi.com/2071-1050/13/13/7084>

### 2) Which section of the SUMP it is relevant to?

This paper is aimed at providing a first insight on shared e-scooter systems as one of the options for shaping urban mobility. Therefore, the article can be linked to the third, fourth and fifth sections of the SUMP circle related respectively to the determination of planning framework, analysis of the mobility situation (in particular the analysis of problems and opportunities for all modes of transport - **subsection 3.2.**), scenario building and joint evaluation (development of scenarios of possible futures - **subsection 4.1.**) and vision and strategy development (arguments for stakeholders – **subsection 5.1.**).

### 3) Which Mobility Manager knowledge this material is the most relevant to?

It is related to Transport and mobility planning (section 1 of the Mobility Manager competencies) especially 1d (d. development of mobility solutions meeting community challenges).

### 4) Problem approached and content overview

Problem approach – general understanding of the range of effects that can be achieved in urban mobility through the proper implementation of shared e-scooter systems. Shared e-scooter systems were first introduced in 2017 and have since spread around the world as a sustainable mode of transport. The success of this mode use is also due to new urban mobility strategies and plans, such as the European Sustainable and Smart Mobility Strategy, which is based on non-polluting transport modes. To show the range of effects that can be achieved in urban mobility through the proper implementation of shared e-scooter systems, a systematic literature review and a case study were conducted. It was found that this shared system can help cities with environmental issues such as reducing air pollution, reducing inequalities in access to transport, promoting money-saving and improving mobility resilience. During the Covid-19 pandemic, shared e-scooters became a great asset in many cities around the world, as they promote social distance and help cities not to rely solely on private cars to replace public transport trips, especially for short-distance journeys. The Braga case study found that after the pandemic, the city continues to rely on shared e-scooters as a mobility option, also promoting special fares for people who want to start using the service.

This article aims to discuss how shared e-scooters are being used in cities and how they can help urban mobility to achieve sustainable development goals across three pillars -



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environmental, social and economic, as well as urban and transport resilience, mainly after the Covid-19 pandemic. From this perspective, this article also discusses how shared e-scooter systems have been used to help mitigate the spread of Covid-19 in different cities around the world, thus achieving more resilient urban mobility. Special attention was given to a case study in the city of Braga, located in the north of Portugal, to show how shared e-scooter systems were used before and after the pandemic. The changes that occurred in this city are linked and compared to other experiences around the world to highlight the range of possibilities for planning in urban mobility to build more resilient cities in the post-Covid-19 era. Finally, ways to enhance the positive effects of shared e-scooters as a first- and last-mile mode of transport are discussed to avoid possible risks and to help cities reduce public transport congestion while enabling social distance, sustainability, and mobility flexibility.

### 5) Who could be interested in this material?

The article is aimed at students and those looking for inspiration in implementations of shared mobility services in cities when such measures are applied in SUMP.

### 6) What is worth mentioning as an innovative factor for the reader?

Shared e-scooter systems debuted in the summer of 2017 in the United States of America and have since spread around the world, with the first appearance in Europe in 2018, in Paris, and Portugal in October 2018. This mode of transport has met with rapid user acceptance around the world, with usage rates reported to be higher than shared bikes when they were implemented. As a hope to alleviate traffic congestion, reduce air pollution, increase community relations and contribute to more resilient urban mobility, shared e-scooters have been adopted in cities, sometimes without any planning or policies governing their use, which has brought some problems for residents, such as pedestrian accidents and interference with people's right of way on pavements. However, the benefits of properly introducing this mode of transport can offset the negative effects. As an electric-powered micro-vehicle, e-scooters do not cause air pollution from the trips they make. On the other hand, the production process of e-scooters and the vehicle trips needed to replace e-scooters in cities and to recharge the batteries, as well as the short lifetime of the e-scooters themselves, may reduce the positive environmental impact. However, recent research and improvements in e-scooter logistics and lifecycle show that with minor changes in these aspects, urban shared e-scooter systems are a great asset in promoting sustainable urban mobility.

In addition to the positive environmental effects caused by shared e-scooters in cities, this can still contribute to reducing social inequalities in transport, mainly when comparing the share of men and women in urban travel. Shared e-scooters have proven that their use can induce more women to use different modes of transport. In addition, this mode of transport can help make transport more accessible in remote areas of different cities and is taken into account.



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Money can also be saved when riding shared e-scooters. Respondents say that they use this mode of transport because of the savings they can make and also because this mode of transport can be considered a cheaper way of commuting when comparing car-sharing and owning a car.

Unfortunately, with the spread of Covid-19, many cities around the world have stopped offering this service to their residents. However, good practices could be observed in other cities that reinforced the role of shared e-scooters as a means of transport to promote sustainable urban mobility. Examples from different cities (Rome, Rotterdam, Milan, Braga and the USA) show that this micro-mobility option can be used to avoid trips by public transport and also to stop the problem of modal shift from public transport to private cars in a pandemic world where social distance and avoidance of public transport is the rule. In addition, cities can promote the sharing of e-scooters in combination with walking to increase the trip length by implementing parking spaces for e-scooters within walking distance of people's residences. To confirm the global trend of investing in micromobility options in cities, namely to stop the proliferation of private cars to avoid public transport, the city of Braga was used as a case study example. This city already had a system of shared e-scooters established before the pandemic, although due to government-approved traffic restrictions, the service was temporarily suspended. After a few months, three different companies began to offer the service and some incentives, such as price reductions, were offered to encourage people to use it. This allowed more than 500 shared e-scooters to appear on the streets of Braga, along with dedicated parking spaces and supervision by the municipal authorities to ensure that the e-scooters are properly parked to minimise disruption to people on the pavements and disruption to transit. The return of e-scooters to Braga has restored an opportunity for the city to promote a more sustainable and connected mode of transport that could help the city be more resilient to future disruptions, as it was during the Covid-19 pandemic when people were afraid to use 'traditional' public transport to get around. Overall, the lessons learned from the case study show that the implementation of e-scooter sharing systems in cities can be seen as a great asset to help reduce the burden of mass car use in cities, promote more efficient use of public space and contribute to a resilient mobility system, namely by making it more redundant and inclusive.

### 7) Limitations

The problem was analysed at a high level of generality, but specific solutions were also presented that could support integration processes within micro-mobility modes. Nevertheless, the presented conclusions may serve as an inspiration for Polish cities regarding problems that may occur during the implementation of shared mobility services.

