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# **ACCESSIBILITY PROBLEMS OF SHARED ELECTRIC SCOOTERS IN TURKEY**

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**Electric scooters are seen as micromobility vehicles, which are used in many countries in the world and have started to be used in Turkey in the last few years. Providing its users with relatively easy use and not requiring physical effort compared to manual vehicles such as bicycles, it has facilitated its adaptation to modern city life. The electric scooter is an electric powered device that has a chassis on which the user stands, can be steered with the handlebar, moves with the motor inside the wheel, and is powered by a lithium-ion battery. Electric powered personal vehicles -such as electric bicycles, electric scooters, mono wheels, self balancing devices, and electric skateboards- are electrically operated personal vehicles used in the city for short-range journeys (Zagorskis & Burinskiene, 2019).**

**Electrically powered personal vehicles are used for their first and last journeys. The use of the term first and last mile in the literature is the final stage in the transportation chain where a good reaches the consumer. In recent years, the term has entered the mobility and public transport literature. Its usage here is the name given to the distance that the user using public transportation wants to reach by public transportation (Wasser & Parkes & Diels & Tovey**

**& Baxendale, 2020). Electric scooters provide connectivity to other transportation, so e-scooters increase accessibility to public transport. With the flexible use it provides, it allows access in situations where there is a traffic jam barrier (Gössling, 2020). Transportation systems are important for sustainable cities. The use of public transport for users should be encouraged, and therefore their first and last-mile experience should be created inclusively.**

**Electric scooters can be used by users with personal ownership or shared services. Electric scooter sharing services allow users to rent electric scooters for short distances or first and last mile journeys. Users reach the electric scooter from places left in random places or a station in the city by companies that provide electric scooter sharing services.**

**The increase in the use of this new actor participating in the transportation systems in relatively modernized cities has affected urban life. The worldwide spread of electric scooters has created new opportunities for urban mobility, while at the same time intensifying conflicts over public space (Tuncer, Brown, 2020). These conflicts, which increased in the public sphere, were handled by the lawmakers with regulations. In Turkey, the "Electric Scooter Regulation" was published on the 14th of April 2021 by the Ministry of Transport and Infrastructure, Environment and Urbanization, and the Interior Ministry of Turkey.**

**Electric scooters are defined by the regulation as: "An electric vehicle with reaching a maximum speed of 25 km/h, wheels, having brake mechanism, can be a footboard and handle, can include**

vertical steering mechanism and use by standing electric vehicle". Shared electric scooters are defined by the regulation as: "Services using an electronic system that allows users to rent e-scooters for short periods". In summary, it is stated how e-scooters can be used with the following regulation;

- *E-scooters can be used by users over the age of 15.*
- *E-scooters should be parked in such a way that they do not hinder pedestrians and traffic.*
- *No one other than the driver can ride.*
- *Loads cannot be carried, except for personal loads that can be carried on the back.*
- *Issues regarding the recognition of e-scooters by pedestrians and vehicles are stated (Official Gazette of the Republic of Turkey, 2021).*

In this regulation implemented in the context of Turkey, no detailed regulation on inclusiveness has been made. Our study is aimed to keep electric scooters on the agenda not only as a new technological transportation model but also to keep the micromobility experience on the agenda to meet the needs of all user groups. For example, work continues on vehicles that can carry multiple people and loads or better support the disabled (Hawkins, 2019). This can be addressed with an inclusive design approach, removing the barriers to research for all user groups on micro mobility.

Inclusive Design is a methodology that aims to produce design solutions without leaving anyone out, taking into account all the differences defined as "barriers" in people. This methodology; considers differences as an opportunity to design better, not as an

**obstacle and limiting factor for design. While inclusive design produces individual solutions to problems, these solutions can make an impact on much wider user groups. In other words, the approach brought by the inclusive design increases the experience not only for a single user group but also for large user groups.**

**For a more socially sustainable world, disability for users can be addressed with inclusive design. From a design perspective, disability is more than a personal trait. It is a mismatch between the user's needs and the design of a product, system, or service. From this perspective, it follows that anyone excluded by a design can experience disability. Designing inclusive products, services, spaces, and experiences should be seen as a natural requirement of user-centered design.**

**Inclusive design is also possible in the market as a business strategy. The fact that products, services, places, and experiences are accessible to everyone increases the number of customers. Designing products that embrace the needs and capabilities of users not only ensures increased customer satisfaction and enhanced corporate social responsibility but also leads to better market penetration. In recent years, inclusive design has gained more and more importance as an approach that aims to expand the boundaries of product use as much as possible (Clarkson & Mieczkowski & Hessey, 2013).**

**Shared electric scooters used in Turkey are not inclusive enough to meet the needs of all user groups. In the regulation, inclusiveness**

for electric scooters and electric scooter sharing services has not been fully addressed.

The restriction on the use of electric scooters in the regulation made in Turkey for those over the age of 15 shows that every user over the age of 15 can use an electric scooter. This situation raises a debate as to the necessity of being inclusive, predicting that every user group over the age of 15 has similar needs. It also does not indicate a difference in usage experience between personal scooters and shared scooters. For example, a user may choose to buy a scooter in the market that can customize according to size and remove the barriers to the driving experience. However, since the shared electric scooter user cannot make any adjustments or corrections to his dimensions, barriers arise for the driving experience. The barriers to the use of shared scooters used in Turkey can be exemplified as follows:

- **Not inclusive for visually and hearing impaired users. No experience has been created for this user group to be able to detect environmental and physical stimuli for using shared electric scooters.**

- ***Not inclusive for the user group with limb deficiency (finger, hand, arm, leg, foot, etc.). The electric scooter user-product relationship has not been created for this user group to use shared electric scooters.***

- ***Not inclusive for users of old users. An experienced process that this user group can experience without outside help has not been established.***

**- Handlebar heights cannot be adjusted. It is seen that people over the age of 15 have different heights. Adjusting the handlebar height may be necessary for safe riding, enabling customization.**

**- The hand grips have little contact with the hand. The grips used in shared electric scooters have a massive form. It is not sufficiently integrated with the human hand. It does not support the palm.**

**- The angle of the screen is not adjustable in models with a screen. The fact that the users are not the same height causes the screen and eye relationship to not be established correctly enough.**

**- Gas and brake levers are on one side. For right and left handed users, this is not comprehensive enough.**

**- Heavy to take to the pavement. For example, when going up and down the pavement with shared electric scooters, the underside of the chassis rubs against the pavement. Therefore, when going up and down the sidewalk with shared electric scooters, the user has to take the electric scooters off or off the sidewalk by hand.**

**- Loads that cannot be carried outside the back cannot be carried. Restricted to carry on the back by regulation. For example, for the user with a load, this creates an obstacle to the use of shared electric scooters.**

**- The width of the deck section is problematic. For example, if the user's feet shoe size is large, the user's feet hang out on the deck. This may impair driving safety.**

**In summary, it has been intuitively determined that there is not enough user interaction in electric scooters used in shared electric scooter services. The simplicity of the design of these electric scooters and their insufficient inclusiveness have reduced and standardized the experience of different user groups. This issue is not only related to users' satisfaction and well-being but can also endanger users' driving safety. Users can use electric scooters at a maximum speed of 25 km/h in vehicle traffic with the regulations made, and this increases the risk of accidents. The findings of this review reveal the need for more studies to investigate and implement the inclusiveness of electric scooters used in shared electric scooter services.**

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