Electric scooters: impact on mobility in the city

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Abstract. This article examines the impact of electric scooters on mobility in the city in terms of changing the time spent on transfer from home to work. To determine how much the time spent on transfer from home to work will change when changing the previously used vehicle (car, bus or metro) to an electric scooter, a comparative analysis of data was carried out in three designated groups. The results obtained make it possible to assess the level of influence of changing a previously used vehicle (car, bus or metro) to an electric scooter when transferring from home to work. The results of the study may be relevant for further research in the field of urban mobility, including through the introduction of such types of vehicles as electric scooters.

1 Introduction

Urban mobility is experiencing global changes in the twenty-first century, one of the factors of such changes is the emergence of such types of vehicles as electric scooters. The advantages of electric scooters are zero impact on the ecology of cities, independence from traffic jams, no transport taxes, an expanded network of parking lots where you can rent an electric scooter, which allows you to refuse to buy your own electric scooter. Studying how electric scooters can influence urban mobility in modern metropolises can have a positive impact on the decision of users to change their type of vehicle and start using an electric scooter on various trips, for example to work, to the store, etc. At the same time, the more people begin to use electric scooters in everyday life for their mobility in the city, the less burden will be placed on the environment from the operation of urban transport, and traffic jams on city roads will also be reduced. In this study, the subject of analysis is to determine how much the time spent on transfer from home to work will change when changing the previously used vehicle (car, bus or subway) to an electric scooter, which is an important aspect of analyzing the impact of electric scooters on urban mobility in general.

2 Materials and Methods

To obtain data on the impact of electric scooters on mobility in the city in terms of changes in the time spent on transfer from home to work, a corresponding questionnaire survey of 60 urban electric scooter drivers was conducted.

The survey was conducted in three different groups of urban electric scooter drivers:

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• the first group of city electric scooter drivers – who previously used the car for transfer from home to work;

• the second group of city electric scooter drivers – who previously used the bus for transfer from home to work;

• the third group of city electric scooter drivers – who previously used the metro for transfer from home to work.

The breakdown of urban electric scooter drivers by type of transport previously used was carried out to take into account the difference in changes in the time spent on transfer from home to work.

All surveyed urban electric scooter drivers were given questionnaires that included the question: how much has the time spent on transfer from home to work changed?

• first option – increased;

• second option – reduced.

For the purpose of collecting and processing data from a survey of urban electric scooter drivers, various methods used in works [1-24] were considered.

3 Results and Discussion

3.1 Results of the analysis of changes in the time spent on transfer from home to work when changing the previously used vehicle (passenger car, bus or metro) to an electric scooter

3.1.1 Measuring the change in time spent on transfer from home to work when changing the previously used vehicle (passenger car) to an electric scooter

The results of measuring the change in time spent on transfer from home to work when changing a previously used vehicle (passenger car) to an electric scooter are presented in Figure 1. The result is the average value for all measurements taken by vehicle type.
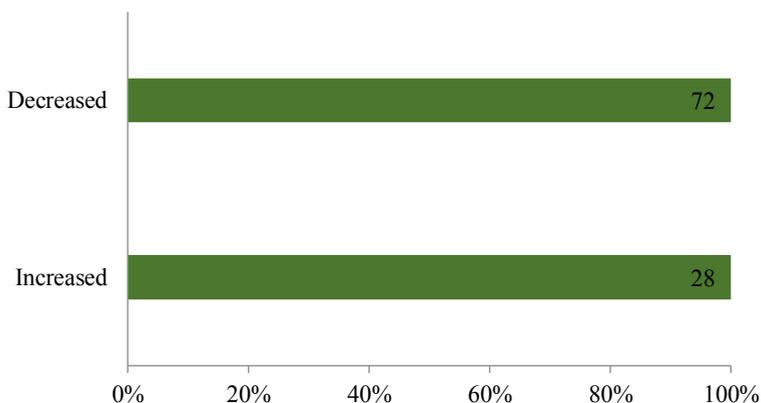

Fig. 1. Results of measuring changes in the time spent on transfer from home to work when changing the previously used vehicle (passenger car) to an electric scooter.

3.1.2 Measuring the change in time spent on transfer from home to work when changing the previously used vehicle (bus) to an electric scooter

The results of measuring the change in time spent on transfer from home to work when changing the previously used vehicle (bus) to an electric scooter are presented in Figure 2. The result is the average value for all measurements taken by vehicle type.
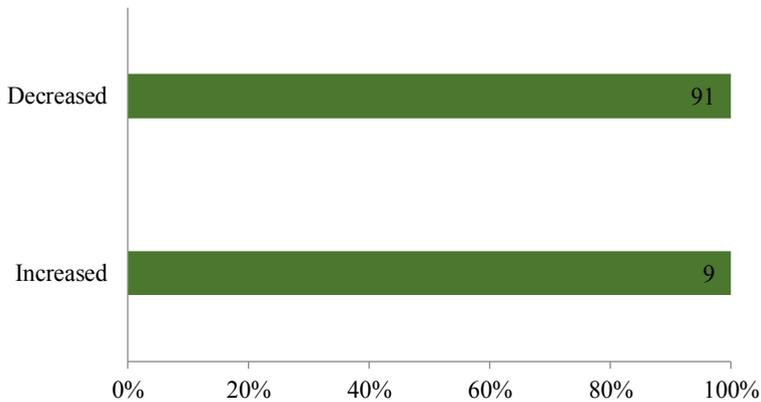

Fig. 2. Results of measuring changes in the time spent on transfer from home to work when changing the previously used vehicle (bus) to an electric scooter.

3.1.3 Measuring the change in time spent on transfer from home to work when changing the previously used vehicle (metro) to an electric scooter

The results of measuring changes in the time spent on transfer from home to work when changing the previously used vehicle (metro) to an electric scooter are presented in Figure 3. The result is the average value for all measurements taken by vehicle type.
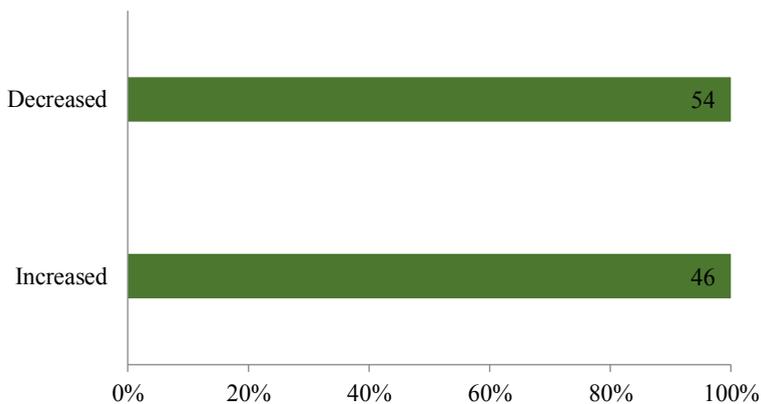

Fig. 3. Results of measuring changes in the time spent on transfer from home to work when changing the previously used vehicle (metro) to an electric scooter.

3.2 Discussion

The obtained results of the influence of changes in the time spent on transfer from home to work when changing the previously used vehicle (car, bus or metro) to an electric scooter in

three different groups allow us to conclude that there is such an influence on the transfer time (Table 1).

Table 1. Matrix of results.

Change of transfer time	Types of vehicles		
	A car	Bus	Metro
Increased	28	9	46
Decreased	72	91	54

The average indicator of the results of measuring the change in time spent on transfer from home to work when changing the previously used vehicle (car, bus or metro) to an electric scooter is shown in Figure 4.
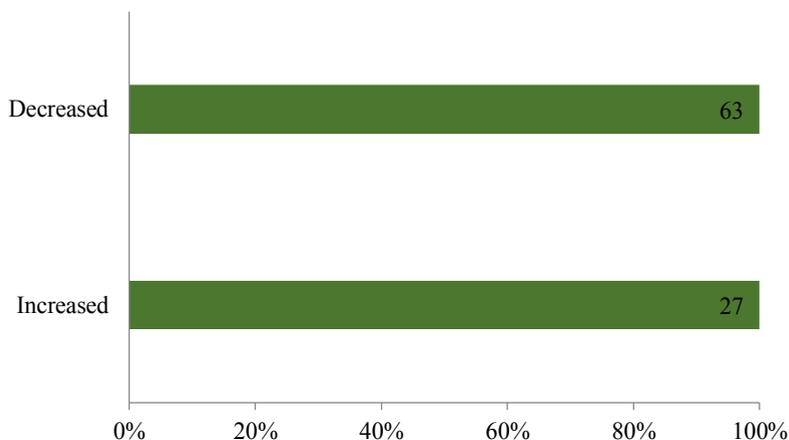

Fig. 4. The average indicator of the results of measuring the time spent on transfer from home to work when changing the previously used vehicle (car, bus or metro) to an electric scooter.

From the data obtained (Figure 4) it follows that the change in time spent on transfer from home to work when changing the previously used vehicle (car, bus or metro) to an electric scooter was: increased – 27 %, decreased – 63 %.

4 Conclusions

The study presents analysis data regarding the impact of electric scooters on mobility in the city in terms of changes in the time spent on transfer from home to work. To determine how much the time spent on transfer from home to work will change when changing the previously used vehicle (car, bus or metro) to an electric scooter, a comparative analysis of data was carried out in three designated groups. The results obtained make it possible to assess the level of influence of changing a previously used vehicle (car, bus or metro) to an electric scooter when transferring from home to work. From the data obtained it follows that the value of the change in the time spent on transfer from home to work when changing the previously used vehicle (car, bus or metro) to an electric scooter was: increased – 27 %, decreased – 63 %. The results of the study may be relevant for further research in the field of urban mobility, including through the introduction of such types of vehicles as electric scooters.

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