Complaints Analysis as an Opportunity to Counteract Social Transport Exclusion in Shared Mobility Systems

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Abstract: Modern cities are associated with efficient transportation, including modern transportation solutions that reflect the trend towards sustainable development. These solutions, for example, are shared mobility services, which have gained popularity in recent years. The systems present in the markets, as well as each transport service, aimed at meeting the transport needs of the society, are also associated with the occurrence of many problems. Many of the problems can turn into transport barriers and have a real impact on the quality of transport services and the life of society in the city. To check whether transport problems occurring in shared mobility may translate into transport exclusion, the author’s own research was proposed. The aim of the study was to analyze the public negative opinions of the shared mobility services and to determine the existence of their connection with the main areas of the phenomenon of transport exclusion. The Desk Research method was used for the study, due to which 1500 opinions and complaints regarding 60 bike-, car-, and scooter-sharing applications operating in six European countries were analyzed. As a result of the research, it was shown that in all types of shared mobility, there are barriers that users complain about. These barriers are connected to the main transport social exclusion aspects indicated in the Church’s method framework. The leading areas of grievance are the system infrastructure and operational aspects. The mobile applications used to run the systems turned out to be the least problematic. Based on the results obtained, recommendations for the elimination of transportation social barriers were developed. The work supports municipalities and operators who wish to reduce the problems associated with shared mobility systems in cities.

Keywords: smart cities; smart cities problems; smart cities challenges; transport exclusion; transport social exclusion; transport problems; transport challenges; shared mobility; complaint management

1. Introduction

Urbanization is a phenomenon that has grown more and more in recent years. Statistics show that currently, 55% of the world’s population lives in urban areas, and it is predicted that by 2050 it will be 68% [1]. The growing number of urban residents is both a great benefit for the development of urban centers, but also an organizational challenge from the point of view of many aspects of their functioning. One of the leading economic areas that constitutes one of the basic needs of society is transport. However, for transport services to fulfill their basic task and, above all, to be available, profitable ones must be in harmony with the overall urban activities. It is said that transport development determines the development of the economy. [2]. One of the phenomena that support modern transport is digitization. Thanks to it, it is possible to achieve a higher level of automation of transport services; implementation of technologies based on digital solutions such as the Internet of Things, cloud computing, artificial intelligence, or big data analytics; changing business models with a focus on digital platforms; increasing innovation, including better access to open innovations, greater visibility of companies on the market,
development of a data-driven approach, development of digital synergies, and mutual data exchange within common systems, e.g., Mobility as a Service (MaaS) systems [3–6].

Digitization is also the basis for modern transport services offered in smart cities, i.e., cities that have used information and communication technologies to increase the interactivity and efficiency of urban infrastructure and its components, as well as to raise awareness among citizens. However, to be considered “intelligent”, a city has to invest in social capital and all communication infrastructure [7]. What is more, it is also required to actively promote sustainable economic development and high quality of life, including wise management of natural resources, through civic participation [8].

Since digitization is conducive to the development of new forms of mobility, more and more services offered to society are appearing on the market. One example is shared mobility systems, i.e., short-term automatic vehicle rentals where vehicles such as scooters, bikes, mopeds, or cars can be rented by society via a dedicated smartphone application. The lack of costs related to the maintenance of vehicles, universality, and convenience are the main advantages that have contributed to the significant development of systems in the world [9]. Therefore, the shared mobility market is described as one of the fastest-growing business trends in the modern economy [10].

According to the statistics available for 2021, the value of the world shared mobility market reached $85.8 billion, and it is expected that by 2026 it will reach USD 185.1 billion [10]. Intensive development of systems translates into many benefits for society; however, as with any transport service, it is also associated with various challenges. A review of the world literature shows that scientists recognize many problems with the shared mobility services offered in urban transport systems. These problems concern, for example, the issue of proper fleet management and its appropriate location and relocation, the use of business models, optimization, modeling of services, as well as activities promoting sustainable mobility [11–14]. Among the barriers mentioned above, little attention is paid to social problems, the existence of which is emphasized by the operators of shared mobility services. Knowing that the difficulties in access to transport contribute to the emergence of socio-economic difficulties, social differences, and the reluctance to use a given means of transport [15], this article is devoted to the relationship between the phenomenon of transportation social exclusion and the shared mobility market.

The study aimed to analyze the public negative opinions of shared mobility services and to determine the existence of their connection with the main areas of the phenomenon of transport exclusion.

All the indicated problems may cause negative opinions among service users and aggravate existing shared mobility barriers. Taking this topic of research from the perspective of intelligent cities is very important because the human factor is one of the foundations of the concept of an intelligent city [16]. What is more, it is indicated that in smart cities all attempts should be made to abandon access restrictions in the transport of people [16–22]. Based on these assumptions, the article presents the results of the author’s own research on the perception of shared mobility systems in Europe.

The article is divided into six chapters. The first part presents the introduction and basic challenges facing the shared mobility industry; the second chapter is devoted to the elaboration on social exclusion in the transport area. The methodology and research approach used in this article are further presented in the third chapter. The fourth part presents the results of the obtained research. The fifth chapter presents a discussion of the results obtained and their relationship with the research conducted by other authors, as well as this author’s own recommendations. The last part contains a summary.

2. Social Exclusion in the Transport Area

Social exclusion is a term that was first used by Lenoir in France in 1974 [23]. At that time, it was considered a problem in society related to poor access to resources that caused personal and physical harm [23,24]. In 1997, the British government established the Social Exclusion Unit, which in 2003 published a report entitled “Making the Connections: Final
Report on Transport and Social Exclusion” to explain how poor accessibility can contribute to social exclusion and how improvements to the transport system can increase social inclusion [25]. As the report explains, the effects of transport-related social exclusion are wide: social individuals can be affected personally, financially, and physically.

Ensuring the appropriate quality of transport is one of the basic tasks required of cities. The quality of transport depends, among other things, on its availability and the limitation of all transport exclusions [19,20]. When reviewing the literature, one can notice the perception of social exclusion in transport from the point of view of various factors. For example, Mackett and Threave distinguish two main areas related to exclusion, including factors that directly relate to society and factors related to travel [22]. The social aspects include income, disabilities, age, gender, and ethnicity [22]. In turn, aspects related to travel are referred to as transport barriers. They comprise transport costs, transport availability, psychological barriers, physical barriers, facilities, and information [22]. On the other hand, Lucas points to factors that lie in the structure of the local area, including the failure of local services, and factors that lie in the national and/or global economy, such as labor force restructuring, market, cultural influences, migration, and legal frameworks [26]. Kamruzzaman et al. emphasize the link between social exclusion and the dimension of mobility [27]. Kaufmann, on the other hand, indicates that another important factor related to social exclusion is the mobility capital (motility) of the individual [28]. The author classifies citizens according to their accessibility to mobility, distinguishing access, aptitude, and appropriation aspects [28]. Moreover, Kaufmann also points out that sometimes the available transport infrastructure is not compatible with the use of public transport, stressing the lack of policies that would support solving problems in this situation [29]. In turn, in another article, Villeneuve and Kaufmann emphasize the existence of exclusion also among non-motorized persons, pointing to the need to include them in various types of actions and communication campaigns [30]. Furthermore, many scientists stated that lack of access to transport results in poor access to goods and services and consequently leads to social exclusion [31–36].

Other authors who propose a detailed structure for considering social exclusion concerning transport are Church et al. [37]. This structure is called the Church’s framework. According to its assumptions, this phenomenon is associated with seven main areas, which include economic, physical, geographic, spatial, fear-based, time-based, and facility-access aspects. Church’s framework on transport social exclusion is a diagram that can be used to define social barriers for any transport service, thanks to the analysis of the indicated exclusions [37]. The purpose of its application is to develop a set of specific exclusions for a given transport service to reduce transport problems and create sustainable and socially responsible transport systems [37].

Detailed types of transport social exclusion according to the Church’s framework are presented in Table 1.
Table 1. Transport social exclusion types.

| Exclusion               | Description                                                                                                                                 |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Economic exclusion      | Limitations are directly related to travel costs and the ratio of public services to private services. Furthermore, the costs of business trips and travel determine the possibility of using other means of transportation than the employee’s vehicle. |
| Physical exclusion      | Barriers related to the physical and mental difficulties of society. They include barriers related to movement dysfunction and mental and educational barriers related to learning difficulties and difficulties in communicating in each language. |
| Geographic exclusion    | Barriers related to the unavailability of a given transport service in a selected area and spatial isolation of some communities or districts. These barriers affect the disruption of the labor market and the fair competition and free market in each area. |
| Spatial exclusion       | Barriers resulting from the implemented local transport policies or the lack of them, related to parking decisions, speed limits, traffic restrictions in specific places, etc. |
| Fear-based exclusion    | Fear of using specific means of transport, incompletely understood principles of operation of services, fear of the spread of infections and diseases in means of transport, mental fears, e.g., related to the lack of parking space, etc. In addition, concerns about the lack of proper vehicle equipment or its condition. |
| Time-based exclusion    | Issues related to the travel time and all aspects affected by it, e.g., difficulties with the division of duties, childcare, etc., to be able to carry out a given trip longer. In addition, timetables or barriers with the possibility of accurately planning the time of arrival of a given means of transport. |
| Facility-access exclusion | Barriers are related to the limited access to full use of vehicles through their inadequate equipment, etc. |

Source: author’s own collaboration.

Referring to other items of the literature, it should be emphasized that in terms of exclusion in transport, various types of transport were analyzed, from public transport to individual vehicles and non-motorized persons. For example, Schönfelder and Axhausen indicate the existence of social exclusion regarding mobility, considering individual and public transport systems [38]. Barry points out that the car is usually a subject of social exclusion; therefore, to achieve harmony, it is necessary to implement generally available transport solutions, such as public transport [39].

It is particularly important to emphasize that there is a research gap in the literature on the analysis of shared mobility systems in terms of social exclusion in transport. This is also emphasized by Cass et al. who regret the fact that most of the literature on social exclusion ignores the mobility dimension of this phenomenon, especially recalling the existence of many problems linking mobility and social exclusion [40]. Studying the links between social exclusion and mobility is especially important because Kenyon et al. emphasize that social exclusion often results in many negative consequences for society, including, for example, the deterioration of their quality of life [32]. Moreover, Schwannen points out that negative effects can also translate into social life (including social ties and activities) and cultural life (including public debate, arts, and media) [36].

Noting that social exclusion may result in negative opinions, it was decided to analyze the opinions regarding the use of shared mobility services, focusing on the complaints.

3. Methods

Due to the recognition of a niche in research related to transport social exclusion in the field of shared mobility services, proprietary research was proposed based on an analysis of the negative opinions issued by customers of shared mobility systems available in Europe. The study focused on the analysis of complaints because, as the researchers point out, a correct analysis of negative opinions and their appropriate management is a factor
driving quality improvement [41]. In addition, complaints are emphasized to be treated as an indicator of the organization’s performance evaluation, signaling problems or failures in internal processes that require a quick fix to avoid the migration of profitable customers [42,43]. A complaint analysis is also a guide when a company wants to determine its customers’ emotionalism through their traits and behaviors [43–45]. In addition, the link between complaints and social exclusion is underlined [46].

The research method is the Desk Research (Secondary Research) analysis based on the analysis of existing sources [47]. Desk Research is one of the non-reactive research methods [48]. It allows for research of real and readily available data [49]. The method is economical; it makes it possible to conduct research on large research samples depending on the researcher’s availability of the data [50]. It also allows the analysis of actual results without the researcher’s interference in the obtained results [50]. It is also worth mentioning that when using the Desk Research analysis, special attention should be paid to the reliability of the data [49,50]. Therefore, it is important to use data published by verified organizations, governments, organizations, or websites with a good social reputation [50]. For this article, a study using the Desk Research method was conducted based on the Google Play database. Google Play is a Google-developed digital distribution platform [51]. It serves as the official app store for certified devices running on the Android operating system and its derivatives as well as Chrome OS, allowing users to browse and download applications developed with the Android software development kit (SDK) and published through Google [51]. In the database, for each application, it is possible to leave an application evaluation along with a detailed justification of the opinion of users. Due to its volume—2.87 million applications—the database enables research on large research samples [51].

It is also worth mentioning that the Desk Research method was used since operators of shared mobility services are very reluctant to share data, therefore reaching a large research sample of their customers using classical research methods, e.g., questionnaires, would be difficult. In addition, it should be mentioned that Google publishes opinions only of “real” people confirmed in the system, which was an advantage for the use of the method.

The research included the following systems: bike-sharing, scooter-sharing, and car-sharing, with twenty applications for each category. The research used unfavorable opinions expressed by users of individual applications, which may be related to the occurrence of transport barriers related to social exclusion transport. It should be noted that the opinions issued by users usually concern the entire functioning of the systems and not only individual applications. What is more, opinions are also expressed by users who have a given application installed on their devices, which is why the research source was considered reliable.

The research results are presented in the next chapter.

4. Results

The analyses were performed on 60 applications related to offering short-term rental of bicycles, scooters, and cars, operating in six European countries, i.e., Austria, France, Germany, Italy, Poland, and Spain. A thousand opinions were analyzed. Detailed information on the applications analyzed is presented in Table 2.

| Country   | Number of Applications | Type of System     |
|-----------|------------------------|--------------------|
| Austria   | 8                      |                    |
| France    | 10                     |                    |
| Germany   | 12                     | Bike-sharing       |
| Italy     | 11                     | Car-sharing        |
| Poland    | 9                      | Scooter-sharing    |
| Spain     | 10                     |                    |
During the analysis, 1500 unfavorable opinions were filtered out and identified. Opinions have been sorted into the main areas of grievance. The indicated areas are valid for each type of shared mobility service, regardless of the mode of transport used. Four areas such as system operation and infrastructure; system policies, regulations, and management; local transport policies; mobile application to use the system were identified. Detailed characteristics of each area are presented in Table 3.

**Table 3.** Areas of complaints about shared mobility systems.

| Areas of Complaints                                  | Characteristic                                                                                                                                 |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| System operation and infrastructure                  | All issues regarding the infrastructure offered in the systems necessary for their proper functioning; from the issue of parking spaces or docking stands, to own charging stations for electric vehicles and a fleet of vehicles, the technical and visual condition of the offered fleet of vehicles in the systems, and issues related to how the rentals are operated in the areas of transport systems. |
| System policies, regulations, and management         | All issues regarding the policies of system operation, price lists and economic issues, insurance, and service regulations, as well as user liability aspects. |
| Local transport policies                             | Any issues related to locally applied transport policies regarding the operation of shared mobility services in the designated area. |
| Mobile application to use the system                  | All issues related to the functioning of the mobile application used to rent a vehicle in the sharing system. |

Afterward, based on the identified areas, detailed analyses of the respondents’ responses were made. Each of the complaints was analyzed and assigned to an appropriate area. A total of 1500 responses, i.e., 500 for each of the analyzed systems, that is, bike-sharing, car-sharing, and scooter-sharing, were analyzed. Detailed complaints related to the functioning of individual systems are presented in Tables 4–6. Moreover, based on the analyzed responses, the percentage distribution of complaints was determined, and broken down into their areas for each of the analyzed systems. The percentage distribution for bike-sharing, car-sharing, and scooter-sharing, respectively, is presented in Figures 1–3.

**Table 4.** Areas of complaints about bike-sharing systems.

| Complaints Area                          | Characteristics of the Barriers                                                                 | Number of Responses |
|------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------|
| System operation and infrastructure      | 1. Too few bikes available in fleets (mostly in rush hour)                                     | 45                  |
|                                          | 2. Too far from the docking stations                                                           | 41                  |
|                                          | 3. Non-return areas                                                                            | 25                  |
|                                          | 4. Too little choice of type of bikes                                                           | 32                  |
|                                          | 5. No additional bicycle equipment (baskets or helmets)                                        | 51                  |
|                                          | 6. A too small number of places with a possible return of the bike in the form of a dockless   | 59                  |
|                                          | 7. Inadequate rotation of bikes between rental stations                                        | 25                  |
|                                          | 8. Bad technical condition of the bike fleets                                                  | 23                  |
|                                          | 9. Bad visual condition of the bicycle fleets                                                   | 19                  |
| System policies, regulations, and management issues | 10. Incorrect business type of the system, e.g., no dockless function                           | 50                  |
|                                          | 11. Too high prices                                                                            | 10                  |
|                                          | 12. Too many users who use systems only for the first 15 min that are free                     | 74                  |
| Local transport policies                 | 13. Too low docks near public buildings or spaces, e.g., near hospitals                         | 32                  |
| Mobile application to use the system      | 14. Application errors, logging out, unnecessary notifications                                  | 14                  |

Based on the proposed area, the percentage distribution of complaints related to bike-sharing systems was determined and presented in Figure 1.
Figure 1. Percentage distribution of complaints areas in bike-sharing systems.

Table 5. Areas of complaints about car-sharing systems.

| Complaints Area                                      | Characteristics of the Barriers                                                                 | Number of Responses |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------|
| System operation and infrastructure                  | 1. Too few cars available in fleets (mostly in rush hour)                                       | 30                  |
|                                                      | 2. Too far to the nearest available car                                                         | 39                  |
|                                                      | 3. Non-return areas                                                                               | 39                  |
|                                                      | 4. Too little choice of type of cars                                                              | 25                  |
|                                                      | 5. No additional car equipment, e.g., children’s seat                                             | 6                   |
|                                                      | 6. Lack of dedicated vehicles, e.g., for elder people, people with disabilities, tourists with large luggage, etc. | 15                  |
|                                                      | 7. Inadequate rotation of cars                                                                    | 26                  |
|                                                      | 8. Bad technical condition of cars                                                                | 12                  |
|                                                      | 9. Not fully fueled or charged cars                                                               | 9                   |
|                                                      | 10. Bad visual condition of cars                                                                  | 9                   |
|                                                      | 11. Not enough parking spaces which belong to the operator                                        | 22                  |
|                                                      | 12. Insufficient number of electric vehicle charging stations                                     | 21                  |
|                                                      | 13. Incorrectly marked vehicles: too small or too much branding                                  | 38                  |
| System policies, regulations, and management issues  | 14. Incorrect business type of the system, e.g., no free-floating type                            | 3                   |
|                                                      | 15. Too high prices                                                                               | 24                  |
|                                                      | 16. Imposed tariffs: kilometer, minute, or kilometer-minute, often without the possibility of changing  | 35                  |
|                                                      | 17. Too much responsibility of the user for damage to the vehicle                                 | 41                  |
|                                                      | 18. Too complicated rental procedure in terms of the necessary formalities                       | 8                   |
|                                                      | 19. Forbidden transport of animals                                                                | 3                   |
|                                                      | 20. Lack of integration with users, e.g., not taking their opinions into account                  | 35                  |
| Local transport policies                              | 21. Too low parking spaces in public areas                                                       | 19                  |
|                                                      | 22. Urban areas excluded from parking and returning vehicle                                     | 18                  |
| Mobile application to use the system                 | 23. Application errors, logging out, unnecessary notifications                                   | 6                   |
|                                                      | 24. GPS problems                                                                                | 17                  |
Figure 2. Percentage distribution of complaints areas in car-sharing systems.

Table 6. Areas of complaints about scooter-sharing systems.

| Complaints Area                        | Characteristics of the Barriers                                      | Number of Responses |
|----------------------------------------|---------------------------------------------------------------------|--------------------|
| System operation and infrastructure    | 1. Non-return areas                                                 | 82                 |
|                                        | 2. Mostly only one type of scooter in the system’s fleet            | 79                 |
|                                        | 3. No additional equipment (baskets or helmets)                     | 42                 |
|                                        | 4. Bad technical condition of the scooters in fleets                | 80                 |
|                                        | 5. Bad visual condition of the scooter’s fleets                     | 62                 |
| System policies, regulations, and      | 6. Too high prices                                                  | 23                 |
| management issues                      | 7. High user responsibility                                         | 57                 |
| Local transport policies               | 8. Lack of public order related to scooters, e.g., scattered on the sidewalks | 46                 |
| Mobile application to use the system   | 9. Application errors, logging out, unnecessary notifications       | 29                 |

Figure 3. Percentage distribution of complaints areas in scooter-sharing systems.
5. Discussion

The conducted Desk Research studies indicate that in each of the analyzed systems, i.e., bike-sharing, car-sharing, and scooter-sharing, there are various types of complaints pointing to existing transport barriers that correspond to particular areas of the Church’s framework. Interestingly, regardless of the systems, the distribution of complaints, despite the differences in exact numerical values, assumed the same arrangement as a percentage. The results indicate that for all types of analyzed systems, the largest areas of complaints were the aspects related to the infrastructure of the system and its maintenance. Aspects related to system policies, regulations, and management issues came second, followed by local transport policies and mobile applications to use the system aspects are last.

From the point of view of bike-sharing systems, the most problematic issue was the free travel for the first 15 min. This type of solution is used to encourage users to travel with shared mobility. It also fits perfectly into the mainstream of the 15 min city [52]. However, it often happens that users use the system only for these free rides, thus blocking the bikes of people who want to travel by bike-sharing for longer routes. It is worth emphasizing that the costs of a 15 min journey are borne by the city authorities where the system operates. It is, therefore, an additional cost for the city. Currently, it is said that bike-sharing systems are already a bit outdated concerning other forms of mobility, and in addition, cities have to add to them because they bring losses [53]. Maybe this aspect should be properly considered by the city, because scooter-sharing systems do not offer free 15 min of travel and are still actively used.

Another problematic aspect of bike-sharing is the small number of areas where the bike can be returned freely. This solution is known as ‘dockless’. It is a separate form of using the systems as it does not require the vehicle to be returned directly to the docking station. Dockless systems have been a controversial issue among scientists for years. On the one hand, they are said to be the perfect form for society. For example, Jiang et al. emphasize that the dockless form can create healthy, resilient urban mobility [54]. In turn, according to the authors of Chen et al. dockless systems improve users’ experiences at the end of their bike trips [55]. What is more, dockless systems translate into greater transport availability [56]. These systems, since they are left without docking stations in public spaces, require increased attention to their organization as well as appropriate relocation, as they are more likely to be damaged and devastated [57]; therefore, it is a more problematic form of mobility for operators or municipal authorities. However, due to the increase in accessibility, it seems to be an interesting form of mobility for the public, directly reducing transport exclusion.

For system users, the issue of additional accessories is also important. They indicate that it would be good if the systems were equipped with, for example, the possibility of renting a helmet. Such an option would not only improve the availability of the service but could also realistically translate into safety aspects.

Interestingly, the price of services is the aspect most rarely indicated by users. Therefore, the claim that alternative forms of mobility are expensive is not correct here.

From the point of view of car-sharing systems, the respondents indicated many more problematic aspects concerning bike-sharing or scooter-sharing. The most problematic aspect was the issue of too much responsibility for users. Little is said about it, but the rules for using car-sharing systems are very diverse. It happens that the user’s liability may be very high and entails high penalties for violations of the regulations, including, for example, destroying the car, transferring it to another person, using it inconsistently with the guidelines, etc. Often, users find out about violations after the fact, when they are forced to pay high penalties. Therefore, the accountability aspect of sharing systems should be much more emphasized. When properly prepared for the use of the systems, users would use them more often and, above all, in a more thoughtful way, because it could not only translate into the elimination of the transport barrier but also improve road safety.
The second place in terms of complaints was ex aequo the insufficient number of vehicles related to the too long distance to the available car, and areas where the vehicle cannot be returned. In the case of the first issue, the problem of the insufficient fleet has been discussed for years by many scientists around the world. Unfortunately, it is associated with huge costs for operators as well as a policy toward individual vehicles, because increasing the number of cars from the car-sharing would significantly reduce the public space. A solution to this kind of problem is therefore not easy to achieve. In the case of zones without the possibility of returning the vehicle, a good solution may be the monitoring by operators of the current demand and rotation of the zones. However, if this is not possible, you can use the option of picking up the vehicle directly from the customer’s home, the so-called “door-to-door”. The same form can also be used when booking a vehicle, which would certainly improve the availability of cars.

An interesting aspect indicated by users was also the marking of vehicles. This issue is also often overlooked, and there is no mention of it in the literature. Appropriate marking of vehicles affects their attractiveness and recognition in the field because it sometimes happens that the vehicle is very difficult to find, for example, in large parking lots or in situations where several of the same vehicles from a given rental company are available in the same place. However, it is worth remembering that branding should be properly selected for the type of car. It should be much more subtle in the case of premium vehicles.

In the case of scooter-sharing systems, the most problematic issue turned out to be the barrier of non-return areas. That issue is similar to the concept of dockless systems in bike-sharing and free-floating in car-sharing. The next problematic aspect was the condition of the scooter in fleets. Unfortunately, that problem is happening often. Rented scooters are frequently devasted or used incorrectly, for example, with two or three people on board, which has an impact on the technical condition of the vehicles [58]. To remedy this, it is important to increase the monitoring available in the systems of scooters. In addition, according to other authors, for example, Sanders et al. or Zhang et al. better technical conditions of vehicles would translate into increased interest among users [61], which would also eliminate the transport barrier.

It is also worth mentioning the low diversification of the vehicle fleet. Typically, rental companies use one scooter model that can be selected by users. For comparison, car-sharing systems usually use several types of cars tailored to the needs of users. Research shows that the use of a more diversified fleet translates into increased interest among users [61], which would also eliminate the transport barrier.

Based on the indicated opinions on transport barriers and exclusions, transition forms have been proposed that may improve the current state of service availability. Due to the very similar percentage distribution of individual areas of complaints in all three types of systems, a unified scheme for the entire shared mobility market has been proposed. A diagram based on the Church’s framework is shown in Figure 4.
6. Conclusions

To sum up, based on the research and the results obtained, it should be stated that the Desk Research analysis was successfully applied to the process of obtaining complaint data in shared mobility systems. The study indicated that there are social barriers in shared mobility systems despite the increasing popularity and significant development of the systems. The most numerous areas of problems faced by users are issues related to the infrastructure and functioning of systems. On the other hand, the least problematic aspects were related to the technical aspects of the functioning of mobile applications for operating systems. Interestingly, these results are true regardless of the types of vehicles that are available in the systems.

Among the analyzed services, car-sharing systems are the most inaccessible to users. In turn, the most affordable services are scooter-sharing systems.

The article proves that user complaints related to the functioning of shared mobility systems relate to the areas of transport social exclusion. The conducted research proved that the Church’s framework method can be used for the analysis of transport exclusions in shared mobility systems.

From the application point of view, the developed set of exclusions may support policymakers who often oversee the functioning of shared mobility services in cities. Above all, they should be a guideline for operators providing individual sharing services as an indication of what areas of their company’s activity should be improved.

On the basis of the results obtained, it should be stated that to eliminate individual transport exclusions, the greatest attention should be focused on creating appropriate policies and regulations. This issue should concern both local governments and service operators. Next, attention should be paid to the appropriate use of technology and the consideration of the implementation of new solutions, such as, for example, the connection to MaaS systems by shared mobility operators or the establishment of appropriate cooperation with stakeholders. These two issues are very often overlooked by operators due to the reluctance to share data or fear of competition. However, the results of the study
indicate that taking risks and investing in technology and collaboration may translate into limiting the aspects that customers complain about.

In summary, conducting appropriate analyses of complaints by enterprises will allow not only the determination of the processes that should be improved, but also may contribute to the elimination of the aspects of transport exclusion. Eliminating aspects of social exclusion in shared mobility services is particularly important, because in the systems, each user can feel like the owner of their vehicle. This lack of ownership has been cited as one of the causes of social exclusion in transport. Therefore, shared mobility services, along with collective transport, are an excellent solution to counteract the development of this phenomenon.

Like every article, this one also has its limitations. The main limitations are related to the use of the Desk Research method. Although it is a very convenient tool, it also has some drawbacks. Since comments on services are often entered under pseudonyms or nicknames, it is not possible to identify the gender of the people expressing opinions and take it into account in the analysis. It was also not possible to identify the origin of each of the respondents; therefore, the results of the analyses are compiled on a general level without a detailed breakdown by country. The opinions presented were expressed by the owners of individual shared mobility applications. When filtering comments, the focus was on those related to specific weaknesses in the functioning of the systems. However, it was impossible to get to know the opinions of people who do not use the systems. Therefore, in further research, it is planned to conduct a classic survey to be able to compare the opinions of users and non-users of shared mobility services.

What is more, in subsequent studies, the author also plans to conduct research on a larger research sample, including analyzing opinions available on other platforms with applications, to be able to compare opinions and indicate possible discrepancies in the prepared list of transport social exclusions.

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