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Micromobility management – selected issues

The environment of every institution and enterprise – external and internal – affects effectiveness on a continuous basis. The changing economy, and thus the environment, must be the impetus for adjustments to an organization's strategy and action plans. Having many definitions, effectiveness is a key element of an organization operating in both the public and private spheres. Measures of effectiveness affect the image, financial performance, and stable development of an organization.
The aim of this article is to show the link between an organization's environment and effectiveness. The first chapter deals with the general characteristics of the environment and shows the impact on an organization through component factors that can also be a source of risk. The second and third chapters describe environments: external and internal. An attempt is made to confront the definitions and features that raise or lower an organization's ability to achieve goals, and thus its effectiveness. The next, fourth chapter is the search for answers to what elements of the environment support an organization. It turns out that the environment can have a positive impact on the effectiveness of an organization while maintaining effective leadership and process implementation of previously established goals and through its constant monitoring. This monitoring is to be the basis for introducing potential changes and corrections.
The conclusion reports that effectiveness is a measure of management and determines whether the organization is

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properly prepared, properly operating and properly managed under the influence of impulses from the environment. If they are not detected and reacted to appropriately, effectiveness may be inhibited.

Keywords: organizational environment, effectiveness, effectiveness in management

Introduction

Management is a set of actions (including planning and decision-making, organizing, leading, i.e., directing people, and controlling) aimed at the resources of an organization (human, financial, material, and informational) and performed to achieve the organization's goals efficiently and effectively (Griffin, 2005: 6). Micromobility management can be related to the coordination of actions and services that enable safe and efficient use of micromobility transportation means, such as electric scooters, bicycles, mopeds, microcars, skateboards, roller skates, segways, and other similar devices.

The article aims to present the essence of micromobility management and to verify the research hypothesis that micromobility and its further development require many coordinated actions, such as route planning, provision of adequate infrastructure, fleet management of micro-vehicles, safety monitoring, cooperation of micromobility participants, and constant data exchange. The research methods used in the work included the analysis of the subject literature encompassing literature positions, reports, and information from stakeholders. The method of description, analysis, and deduction was also applied. The whole was crowned with a summary.

Mobility and micromobility

Mobility is a term broadly understood and used in various fields. It comes from the Latin word *mobilis*, which means the ability to move freely and, therefore, to relocate. Mobility is a feature of the modern world and thus of today's humans. The intense development of mobility can be linked, among other things, to the invention of the telegraph and the construction of railways. According to Z. Jazukiewicz, mobility was multiplied by colonialism, which primarily required geographical movement over large distances and resulted in the diffusion of cultures. These processes created a massive demand for mobile or mobility-assisting technical means, i.e., mobile technologies. In the Middle Ages, the vast majority of people in Europe never left the borders of their town or county for their entire lives. Mobility was a characteristic only of power, administration, and the Church, to a lesser extent of spontaneous trade. The establishment of private fleets and trading companies in the West occurred very late. The world was static until the beginning of the 19th century (see: Jazukiewicz, 2011).

The cited perspective on the historical development of mobility can be confirmed by many different examples (e.g., the invention of the wheel). However, the tremendous significance of mobility development should be attributed to the first industrial revolution, the invention and use of a drive unit in transport. Not insignificant for mobility is also the subsequent revolutions dated with the use of electricity, the exploitation of automation, information technology, and artificial intelligence.

Physical mobility, or relocation, is the domain of transportation, the English cross-carry. The essence of mobility is the necessity of moving people and cargo by various means of transport. Thus, it can be associated with methods and means of transport and states that mobility pertains to the transportation of people and cargo in time and space, traversing distance, and all actions needed to achieve its objectives.

E. Załoga and E. Dudek call the potential for movement "potential mobility," while actual movement is called "real mobility." According to the authors, in transport terminology, mobility means, on the one hand, the ability or freedom of movement and, on the other, the actual displacement. The more goals we can achieve in our time, the higher the potential mobility. The more goals that are actually achieved, the higher the real mobility. Potential mobility can be expressed by the number of activities within reach, while real mobility by the number of goals achieved (Załoga, Dudek, 2009: 103).

K. Nosal and W. Starowicz define mobility as a set of activities related to the movement of people, as well as all actions necessary to achieve this goal (Nosal, Starowicz, 2010: 26). On the other hand, A. Ciastoń-Ciulkin, employing the concept of mobility culture in cities, believes that it is a way of moving urban population that allows for the free traversing of space, that is, in no way restricted, resulting from the choice of the most beneficial means of transport, travel time, or route from the traveller's perspective. According to the author, car culture is included in such a mobility culture (Ciastoń-Ciulkin, 2016: 5). The mobility culture and car culture, singled out by the author, not only apply to urban areas but also to longer journeys, in which cars are also used.

J. Szołtysek considers mobility in several categories, namely as a physical ability to traverse space within a city, the sum of displacements realized by means of transport, a system of transport processes carried out in the city, and problems associated with transport congestion. J. Szołtysek also points to mobility as a form of mobility manifested in transportation arising from social needs such as work, rest, culture, recreation, etc. (see more: Szołtysek, 2011: 6–17).

Mobility is commonly associated with means of transport, including cars, trains, aeroplanes, bicycles, or public transport, and with typical business models, e.g., car manufacturers, airlines, and taxi companies providing individual modes of transport or related services. However, expectations towards mobility are changing – towards a comprehensive solution for the entire journey from its starting point to the destination, tailored to individual needs and preferences. Therefore, mobility encompasses

the combination of many elements – various means of transport at different stages of the journey or on different days organized into a system with accompanying services and digital solutions helping to plan the journey, find the way, a parking spot, make payments, etc. This is accompanied by the rapid development of technologies that provide new opportunities and create innovative business models (Nessel, 2019).

While the essence of mobility is the need to move people and goods by various means of transport over varying distances, micromobility narrows this ability to short distances and small means with a total mass not exceeding 500 kg. Micromobility in transport has been present for a long time, although in the era of intense development of motorization and the ubiquitous cult of the car, it was overlooked. Etymologically, micromobility derives from the word mobility.

A multi-aspect review of micromobility definitions can be found in the concise publication by the authors (Janczewski, Janczewska, 2022: 7–16), who accept that micromobility is a concept that assumes the use of small, lightweight, and zero-emission vehicles and slow transport devices to cover short distances – most often the first or last leg of a planned journey. Thanks to their small dimensions and low weight, micromobility transport means to make it easier to move around narrow and crowded sections of cities, and their electric drive eliminates noise and reduces the so-called carbon footprint. They include, among others, bicycles, scooters, skateboards, mobility aids, personal transport devices, scooters and mopeds, as well as small light cars (i.e., microcars, quadricycles). They allow filling the gap between conventional transport nodes, such as a bus or tram stop, a railway station, or a car park and the destination points of the journey, e.g., workplace or school, home, shopping centre, etc. This is particularly important where there is a lack of sufficient fill in the traditional communication layout (*ibid*.: 16)

Micromobility is primarily manifested in the use of electric bicycles, electric scooters and scooters. An increasingly important segment is also that of three- and four-wheeled electric devices weighing between 100 and 500 kg, fitting between cars and bicycles and designed to transport two to three people or small loads. Depending on the type of vehicle and local regulations, their maximum speed may range from 25 to 90 km/h. This segment also includes small autonomous robots servicing the last mile and delivering parcels, meals, and other products (*Niezwykły robot na ulicach Warszawy. „Sam dzwoni do klienta”*, 2023; *Roboty dostarczą przesyłki kurierskie na Starówce*, 2022).

Thanks to innovations and new transportation options, the micromobility sector is dynamically developing worldwide. The prospects for micromobility development are promising, and the growing number of companies and investments in this sector suggests that this trend will continue. The most important factors stimulating the development of micromobility are popularity, technology, investments, ecology, integration, and usage cost.

Micromobility devices offer a variety of features, such as GPS tracking, mobile app integration, and also swappable energy packs. As technology progresses, micro-

mobility solutions become more reliable, efficient, and widespread, making them a viable alternative for short commutes to classic cars. As the demand for these devices is steadily increasing, further innovations and advances in the industry should be expected (*How can we encourage micromobility use in the urban transport landscape?*, 2023).

The micromobility sector is attracting increasing investments, which is accelerating the growth of this market. Investors see great potential in it and are investing in the development of new technologies, infrastructure, and services, leading to further progress in the sector.

Micromobility is continuously being integrated with existing public transport systems. This encourages its users to move in a manner that is accessible and convenient for them. This integration facilitates transfers, allowing users to move around the city more quickly and cheaply.

Micromobility is becoming increasingly popular worldwide as it offers a fast, affordable, and convenient solution for short-distance transport. The rise in popularity of micromobility is also due to a growing interest in sustainable modes of transport and the need to avoid sometimes congested public transport or personal car travel. Micromobility is also spreading on campuses, large offices and exhibition halls, as well as in resorts and tourist towns.

The development of new technologies in the micromobility sector allows for faster and more convenient mobility and tailoring services to individual user needs. The advancement of batteries, electric engines, and other technologies enables increasingly comfortable travelling with micromobility means of transport. Micromobility vehicles provide a convenient and sustainable alternative for short-distance travel, and they do not emit toxic exhaust gases and assist in reducing traffic congestion. With the growing interest in ecology, more and more people should switch from cars to micromobility transport, which is likely to contribute to the further growth of this market.

Managing micromobility

Micromobility management can have various approaches, including route planning, infrastructure creation, fleet deployment of microvesicles and traffic control, and safety monitoring. The critical aspects of micromobility management include route planning and providing appropriate infrastructure, managing a fleet of microvesicles and traffic control, safety monitoring, micromobility participants' collaboration, and access to data. Practical examples of micromobility management features can be found, among others, in the best practices and guidelines for cities published in the materials of the North American Cities and Transit Agencies Association NACTO (see: NACTO Guidelines for Regulating Shared Micromobility, 2019), as well as in a study by the Budapest University of Technology and Economics, in which urban

mobility experts discuss planning, regulation, and practical implementation of micromobility services (see: Aba, Esztergár-Kiss, 2023).

Route planning and infrastructure creation

Route planning primarily involves ensuring the availability of suitable routes and connections that encourage individuals to use micromobility transportation options. This is facilitated by appropriate infrastructure such as paths or dedicated bicycle lanes on roads, parking facilities, stands, hubs, shelters, service and battery charging points, traffic lights, rental systems and other solutions that ease the use of micromobility. Integrating micromobility transportation options with urban public transport is essential to encourage users who want to travel easily and conveniently. This integration makes transfers more accessible and allows users to move around the city quickly and affordably.

Micromobility infrastructure is very important as it ensures the safety and comfort of micromobility transportation users and encourages their use. Thanks to it, cities have become more micromobility-friendly, which translates into benefits for the entire society – less air pollution, less congestion on the streets, and improvement in the residents' health and physical condition.

Micromobility infrastructure primarily stems from pedestrian, bicycle and motor vehicle infrastructure, onto which the specific features of micromobility are overlaid. Due to their popularity, most attention is given to electric scooters, focusing less on other micromobility transport methods. Efficient and safe movement using an electric scooter depends primarily on infrastructure. This is one of the most critical challenges for individual and shared micromobility. The design features of scooters, especially their small wheels, limit their use on uneven surfaces, particularly those made of cobblestones or concrete. In many countries and cities, as written by D. Glavić, A. Trpković, S. Jevremović and M. Milenković, electric scooter users are directed towards bicycle infrastructure. Such examples can be found in most American and European cities. In London, electric scooters are mainly widespread in business zones, parks and campuses. Voi in Sweden is introducing the so-called 20 Zones for electric scooters. In Texas, it is permissible to ride electric scooters on sidewalks. The same is true in Italy and Croatia – if there is no bike path, in Estonia, Lithuania, Portugal and Slovakia – you can ride on sidewalks at a speed similar to a pedestrian's; in Finland, those under 12 years old may ride on the sidewalk with a maximum speed of 15 km/h and in France – if there is no bike path, the speed should not exceed 6 km/h. However, riding on sidewalks in California is prohibited. In Serbia, where the use and movement of electric scooters have not yet been regulated, users utilise roads, sidewalks and bike paths. The reality, as is usually the case, is different from what legislators expect, as electric scooters are seen on sidewalks, streets, and roads despite prohibitions and warnings, posing a risk to traffic safety (more in: Glavić,

Trpković, Jevremović, Milenković, 2021; Michalak, 2023; *Majówka na e-hulajnodze w UE. „Rozkład jazdy" w różnych krajach*, 2023). Another problem, besides appropriate routes for electric scooters, is disorder in their parking and lack of charging infrastructure for batteries. So far, most operators prefer to travel to any point in the city by electric scooter and leave it on the sidewalk within a specified zone after use. This results in the reservations of other infrastructure users, especially pedestrians and cyclists, about the risk arising from indiscriminately parked equipment. One possibility here could be the designation of zones or parking areas for electric scooters or special mobility hubs (Domaszewicz, 2021; *Czym są Huby Mobilności?*, 2023). There is increasing talk of docking electric scooters in the same way as city bikes.

Managing a micromobility fleet

Managing a micromobility fleet involves adjusting supply to demand, i.e. ensuring the proper transport means, controlling their quantity, location and relocation, as well as their technical condition, collecting and delivering them to the destination points, and service and repair. Noteworthy are the sources of fleet financing, selecting the appropriate transport means, and retiring them from service. The latter does not necessarily have to end the machine's life cycle.

Traffic control and management primarily involve planning and controlling road traffic, including traffic lights, road signs, and other systems that allow users of small transport means to move safely. It is also crucial to monitor the safety of users and take actions to minimise accidents and thus increase safety.

Adjusting demand to supply is one of the most significant challenges for micromobility operators. It means maintaining a certain number of vehicles where they are actually needed. Upon opening the operator's application, it would be ideal if a user could always find a nearby vehicle. This is challenging because users leave vehicles in places with low demand after completing their journey. This makes them out of reach for potential users and limits their utilisation. The fleet becomes imbalanced, with too few vehicles in high-demand areas and too many in low-demand ones. To meet demand, the simplest thing to do is to add more vehicles, which could lead to capital loss and reduce operator profitability in the long run.

Another approach is to collect vehicles and transport them from low-demand areas to where they are currently needed. This requires continuous information on the location of unused vehicles and the engagement of additional resources to move micromobility transport means. This increases distribution costs, and vehicles transporting the means cause more traffic in the city, which contradicts the idea of micromobility.

Manual relocation of transport means is one of many ways to balance demand and supply. Once the fleet is launched, the operator can quickly identify areas of high and low demand for micromobility transport means in the city and use various

techniques and financial incentives to convince users to leave vehicles in appropriate zones. This system works well for many micromobility operators, and the fleet supply balances itself out (see: Cataneo, 2023).

In the longer term, autonomous micromobility transport means that they can return to their parking place independently or, in an optimistic vision, locate the customer by themselves are also being considered. So far, these technologies are undergoing research and implementation like other autonomous vehicle technologies.

Monitoring micromobility safety

Micromobility safety is crucial for sustainable urban development and improving the quality of life of its residents. Micromobility safety is a crucial task requiring attention and action from users, manufacturers, legislators, and decision-makers responsible for planning and managing urban infrastructure. Therefore, it is necessary to carry out continuous activities to minimise the risk of accidents and improve the safety of micromobility users, including other road users. The most important activities for improving micromobility safety include educating its users, improving infrastructure, legislating and effectively enforcing it, perfecting technical requirements for equipment and infrastructure, caring for the lighting of routes and vehicles, and conducting a broad understanding of monitoring these actions.

Micromobility users should be educated about the safety rules to observe when using electric scooters, bicycles or other micromobility devices. Users must be informed about speed guidelines, road traffic rules, caution and protective helmets. Road infrastructure and cycle paths can minimise the risk of accidents and improve the safety of all their users. Without bicycle lanes, lanes should be designated for cyclists and people using electric scooters or similar vehicles. Owners of electric scooters, bicycles or other micromobility vehicles should ensure their vehicles are in the proper technical condition. Before renting a scooter or bicycle, it should be thoroughly checked for damage and ensure functional brakes and lighting. Lighting is crucial when using micromobility devices in the evening or at night. Vehicles should be equipped with appropriate lights to allow for visibility and minimise the risk of accidents. Monitoring the fleet is very important. Companies renting electric scooters, bicycles or other micromobility vehicles should monitor their fleets and the dangerous behaviours of their users and remove vehicles from the operation that are damaged or poorly parked. Cities should have widespread traffic monitoring cameras, mainly focusing on paths, pavements and routes for bicycles and pedestrians. All these activities require cooperation between operators and entities such as city councils, government institutions, vehicle manufacturers, private companies, NGOs, training companies and insurance companies.

An example of actions taken for micromobility safety could be the company Bolt, which has published an official commitment to ensure the safety of scooters and

electric bicycle rides (*Bolt Scooter Safety Pledge*, 2023). The main issues raised in Bolt's commitment to electric scooter safety include: cooperating with cities to create safe conditions for micromobility and supporting cities in creating micromobility infrastructure, combating drunk driving of scooters, including further expanding the cognitive reaction test, which prevents driving under the influence of alcohol. Other commitments by Bolt include conducting educational campaigns to inform customers about the dangers of driving after consuming alcohol, effective user education and promoting a beginner mode, a special option in the application that limits the scooter's speed to 15 km/h – respecting space by counteracting the danger resulting from improperly parked scooters by popularising an appropriate parking system and supporting all solutions in terms of improving safety levels.

Bolt's commitment to the safety of scooters and electric bicycles covers issues essential to building a safe micromobility service. As a result of these actions, in the first half of 2022 in Poland, the company recorded 31% fewer accidents than in the same period in 2020, with a threefold increase in scooter rides (*Bezpieczna mikromobilność w Bolt*, 2023).

Cooperation of micromobility stakeholders and access to data

Micromobility stakeholders can be divided into five groups: users, service providers, transport equipment manufacturers, government and local authorities, collaborating individuals, and independent experts.

Micromobility users are individuals and legal entities using various micromobility transport means for short distances. They include city dwellers, tourists, business owners, officials, and private individuals. City dwellers utilise micromobility to move around the city and commute to work, school, shopping and entertainment. Tourists use micromobility to explore the city and its surroundings, for example, by renting bicycles or scooters. Business owners use micromobility for business purposes, such as delivering goods and services. Officials use it for easier and faster travel around the city. Private individuals predominantly use micromobility for recreational and sports purposes. Users may own their means of transport or use those offered in a sharing system.

Users can be categorised in various ways. In the given division, we distinguish entrepreneurs using micromobility transport means as work tools (delivering food, goods, and parcels), micromobility service providers – operating fleets, and individual people owning single vehicles. Micromobility service operators provide transport means they own (in interaction with the operator), whereas, in the case of individuals, transport means directly interacting with the manufacturer. Without exception, all users require clear and easy-to-follow legal regulations, efficient service, and safe infrastructure. By choosing sustainable micromobility transport means over cars, users can majorly contribute to sustainable development.

Service providers are those who supply their transport means for shared use. These vehicles can be provided in a docked, dockless, or hybrid system. Service providers require stable legislation and access to public spaces. Their standardised solutions can help lower service costs. Providers can support city mobility, shorten travel time compared to walking, or provide missing public transport links. In observing micromobility development, a vital issue is replenishing energy storage and disposal after their energy reserve is depleted.

An example might be the Swedish company Voi, which, thanks to broad cooperation with stakeholders, successfully developed an electric scooter rental service in Western England over two years (see: *Most successful e-scooter scheme in the UK reaches 10 million journeys milestone*, 2023). Another telling example is a joint initiative of operators Dott, Lime, Superpedestrian, TIER and Voi, who proposed actions aimed at integrating micromobility vehicles with urban transport to European city authorities, thus reducing air pollution and building alternatives to individual car use in cities (*Micro-mobility operators unite to advise European cities on integration*, 2023).

Manufacturers may be affiliated with specific micro-mobility service providers, or they may be independent entities. Processes such as product development, design and production are strongly linked to legislation and market standards. Considering these aspects, manufacturers' expectations can be reduced to having harmonised regulations, the same norms in different regions, and growing market opportunities. By introducing new solutions, manufacturers stimulate the development of micro-mobility. However, considering the sustainable development of micro-mobility, one of the significant tasks is the durability and safety of micro-mobility transport means and their power sources.

National and local authorities decide on national, regional, and city legal regulations. These institutions have various levels of authority and make independent, often different, decisions from others. There are regions and cities where specific legal regulations regarding micro-mobility means of transport still need to be implemented. In such cases, general road traffic law provisions apply, determining the use of infrastructure and public space and general regulations regarding the provision of transport services. Authorities are responsible for sustainable development goals and legislation. Local governments are responsible for organising public transport. Specifically, transport development planning and organising and managing public transport are tasks for the organiser, who in Poland, depending on the length of the communication line, is the commune head, town mayor, city president, district governor, provincial governor, or the minister responsible for transport. These bodies can directly control the actions of service providers.

Partners are individuals and legal entities supporting, promoting, and lobbying for micro-mobility in cities. Competing companies can also become partners, vying for the end-users of city transport. Individuals can own micro-mobility means of transport and use them as individual or shared means complementing travel chains. In the lat-

ter case, transport multimodality and cooperation between micro-mobility operators, public transport operators, and *car-sharing* services are crucial. These parties compete for end-users, but under certain circumstances, they should collaborate to improve customer service quality and deliver new added value to the transport service, e.g., by creating multimodal points, harmonising timetables, and standardising travel tickets. This is an integration process that should continue in the broadest possible scope.

Independent experts deal with various aspects of micro-mobility, such as technology, standardisation of means of transport, law, economics, ecology, safety, and many others. They can operate in various fields, on different markets, and in different time scopes. Independent experts can use specific research and analytical methods. They can be associated with various organisations or institutions, such as universities, research centres, consulting firms, non-governmental organisations, or the media. There is no universal classification of independent experts for micro-mobility, as this field is vast and complex.

Micro-mobility data exchange refers to sharing data associated with shared micro-mobility services, such as electric scooters and electric bicycles. This data can include information such as journey duration, start and end locations, vehicle status, and usage patterns of these modes of transport. Micro-mobility data exchange aims to promote cooperation between various micro-mobility providers, city authorities, and other interested parties, e.g., to improve the quality, efficiency, and effectiveness of shared micro-mobility services. By sharing data, stakeholders can gain insights into usage patterns, identify areas where services are most needed, and develop strategies to improve service quality. Some many platforms and protocols facilitate data exchange, for instance, the Mobility Data Specification (MDS) developed by the Open Mobility Foundation (OMF) (*MDS & Data Privacy at the OMF*, 2023) and the General Bikeshare Feed Specification (GBFS) (*GBFS: A Common Language for Shared Mobility*, 2023) developed by the North American Bikeshare Association (NABSA). These platforms provide a standardised way of sharing data with various mobility stakeholders, which helps ensure interoperability and ease of use.

Summary

Managing micro-mobility refers to regulating traffic and operating modes of transportation, planning routes, ensuring adequate infrastructure, monitoring safety, fostering participant collaboration, and maintaining a constant data exchange.

With the development of shared micromobility services, legislative bodies and local authorities have faced new challenges in managing and regulating these services while simultaneously ensuring their safety, accessibility, and integration with the existing transport system. This situation also applies to individual micromobility, as a significant portion of electric scooters and bicycles are individually owned, and their numbers are constantly increasing.

Effective micromobility management involves planning and building infrastructure and developing rules and regulations that balance the needs of various stakeholders, such as operators, local authorities, manufacturers, users, pedestrians and drivers. It is necessary to define operational areas, parking regulations, safety standards, pricing models, and data-sharing requirements.

Micromobility management aims to create a sustainable and efficient transportation system in the city, which promotes active mobility, shapes demand for alternative means of transport, reduces congestion, noise and the emissions of toxic transportation by-products, and improves the overall quality of life in urban areas. This requires collaboration between public bodies, private operators, community groups, and other interested parties to create a comprehensive and integrated approach to micromobility management. All these actions require coordination and significantly impact its popularity and further development.

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Streszczenie

Zarządzanie mikromobilnością – wybrane kwestie

Zarządzanie mikromobilnością można odnieść do koordynacji działań i usług, które umożliwiają bezpieczne i efektywne korzystanie ze środków transportu mikromobilności, takich jak: elektryczne hulajnogi, rowery, skutery, mikrosamochody, deskorolki, rolki, segwaye i inne tego typu urządzenia.

Celem artykułu jest przedstawienie istoty zarządzania mikromobilnością i zweryfikowanie hipotezy badawczej, że mikromobilność i jej dalszy rozwój wymaga wielu skoordynowanych działań, np. planowania tras, zapewnienia odpowiedniej infrastruktury, zarządzania flotą mikropojazdów, monitorowania bezpieczeństwa, współpracy uczestników mikromobilności i stałej wymiany danych. Metodami badawczymi wykorzystanymi w pracy były analiza literatury przedmiotu obejmującej pozycje literaturowe, raporty i informacje od interesariuszy. Zastosowano również metodę opisu, analizy i dedukcji. Całość zwieńczono podsumowaniem.

Słowa kluczowe: mobilność, mikromobilność, zarządzanie mikromobilnością