Executive summary

Fot.: Krzysztof Winciorek/archiwum Referatu Mobilności Aktywnej UM w Gdańsku

It is Thursday, 7:45 a.m., i.e. one of commonly experienced period of rush hours in the city. A resident of the city, taking advantage of a sunny day, decides to resign from taking his car. Instead, he draws a mobile phone from his pocket and looks for the nearest public bicycle in his area. It appears, that such a vehicle is securely parked 200 meters away. During a two minute walk to the near bicycle parking stand, the resident logs into a teleinformation system of the service using a dedicated mobile app. Then he mounts a bicycle and starts riding. The rented bike has an electrically assisted propulsion system, thus the ride appears to be more pleasant than he could predict, the sun is shining and our cyclist simply enjoys the ride, passing by a number of cars stuck in a traffic jam. Instead of frustration, he experiences an inflow of endorphins, instead of being late he reaches his destination ahead of time... This kind or similar expectations appear most frequently in the context of a vision of an efficiently functioning urban bicycle sharing system. The analysis of experience gained from the currently operating systems accumulated until now or in the past (both at home and abroad, including publicly or privately operated systems), reveals that the above presented scenario is materialised only if certain conditions described in the following paper are met, it will also require proper understanding of functions of a public urban bicycle in the range of transport options available in the city.

Public urban bicycle is not a solution by itself, it is a part of a MaaS offer

Maas i.e. „mobility as a service" is a term, which characterises the change of transport habits of urban dwellers. It means gradual resignation from moving around with one's own means of transport (most often a car) and renting other transport devices

or services. Thanks to such an arrangement the user may select the most effective or the most convenient solution available at hand, allowing him to reach a given destination. Traditionally, the MaaS offer includes:

- rent a vehicle services, including cars (e.g. Trafficar), traditional bicycles (e.g. Veturilo in Warsaw), electrically assisted bikes (e.g. Bycyklen in Copenhagen), electrical kickscooters (e.g. Bird) or e-scooters (e.g. Blinkee);
- public transport services (e.g. bus or rail transport services);
- private personal transport services (such as Uber or myTaxi).

This catalogue is, however, not closed and in future we may expect the appearance of other forms of provision of „transport services" (the concept of Maas will be discussed in more detail in chapter 6). From the user's point of view, each of the proposed solutions, even if potentially offered by various service providers, will not be considered individually, but will create a combined bunch of offers. That is why the practice, which will result in the most effective implementation of a bike sharing system is an appropriate combination of it with a range of other (also private) options of moving around in the city. In spite of the fact, that for certain routes the solutions may seem to compete with one another, it is possible to observe a clear interrelationship between the degree of development of the Maas portfolio and the level of usage of each particular service considered in separation. This situation appears to be also a source of important challenges. The attractiveness of the public urban bicycle will strongly depend on the quality of other services offered. For instance: public urban bicycles facilitate the assess to public transport options, serving as feeder to transport nodes or as a means of covering the „last mile" (discussed in chapter 8) from a transport node to the final destination. Low attractiveness of public transport (such as thin network of connections, frequent delays or overcrowding) resulting in declining popularity of it, will be directly translated into the number of clients of a bikesharing system. The decline in popularity of public urban bikes will not result, in this case, from the poor assessment of the valour of this service, but from the elimination of the initial trip destination/ reason for making the trip.

Electrical vehicles (first of all the e-bicycles) mean an important change in transport habits and new opportunities of efficient moving around

One of the basic barriers in the process of mass „shifting" from cars to bicycles is the phenomenon of lower riding comfort. It results from the perception of bicycles as vehicles which need a physical effort to ride, as well as from the extension of riding time (average speeds achieved in an urban environment on a two wheeled vehicle are usually lower than on motorised vehicles). As a result, for people who avoid physical effort (or its consequences such as tiredness or increased sweating) or for those, who consider time as the basic criterion of choosing a transport option, a traditional two-wheeled vehicle propelled with muscle power is not an attractive alternative. The technological development of personal travel devices (so-called PTDs, the characteristics of which has been given in chapter 5) led, however,

to the appearance of products, which, on one hand, efficiently dispel the above mentioned objections, on the other hand allow to retain the benefits from moving around apart from the traditional motorised traffic. An electrically assisted bicycle, (pedelec) appears to be the leader of such devices, because of regulations described in chapter 3. Thanks to the electrical assistance it is possible to attain with them the speed of 25 km/h, what under conditions of dense traffic appears to be a sufficient speed of efficient moving around. Besides that, the fact, that pedelecs are allowed to move in pedestrian traffic or in cycling and pedestrian traffic zones they allow to choose the most favourable routes (e.g. by passing the queues or avoiding traffic jams). E-bicycle, from the point of view of practical usage in urban conditions should not be confused with the "electrically enriched" traditional bike. It should be considered as a "missing transport link" combining the advantages of walking (bypassing queues and traffic jams, travel time dependent only on the traveller's will) with a riding comfort comparable to driving a motorised vehicle (absence of tiredness or excessive sweating, efficient travel speed).

„Bikesharing" to nie tylko słuszna społecznie wizja, ale również rosnący rynek globalny

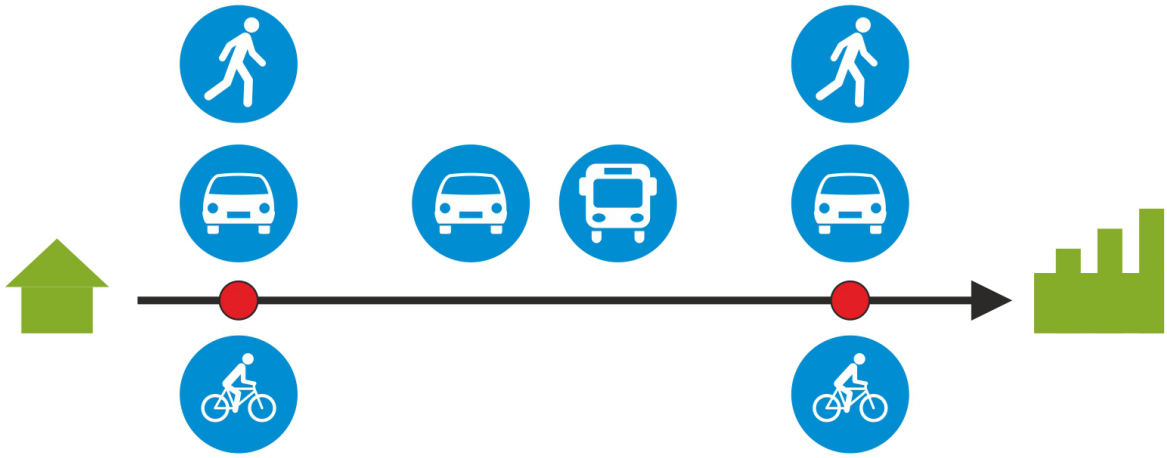
Extensive market data, subject to analysis within the framework of this paper, indicate without doubt that provision of public bike sharing services are an increasing sector of global economy, attracting an ever growing interest of global concerns. It is confirmed first of all by activities in the capital market, like the acquisition of the Jump Bikes company (a private company renting pedelecs in the US) carried out by Uber Inc. in April 2018 (for the amount of about USD 200 million), acquisition of Motivate (a leading operator of urban systems in the US) by the Lyft group (value of the transaction USD 250 million) or, in the two-wheeled segment, a record breaking amount collected from investors by the Ofo (a Chinese operator and bike renting company), which accumulated in total USD 2.2 billion.

The above mentioned phenomenon, from the point of view of the local government unit or any other public entity would probably mean new opportunities for the organisation of a range of urban transport services, including a public bike sharing system. It may, for instance, allow to gradually abandon the model of subsidising or providing subventions to the urban bikesharing operator, towards the so-called conceding model (discussed in chapter 2), or to create mixed solutions. It is important, however, to take these circumstances under consideration at the conceptual stage of creation of a local Maas system, to allow the participation and integration of solutions applied till now with the new (also private) ones, if the latter meet appropriately designed quantitative and qualitative criteria.

A public urban bike allows, for the first time in history, to individualise mass transportation

In this sense, the vehicles offered within the system will constitute one of the key mile stones on the road to sustainable urban transport. A typical way of daily commuting of urban dwellers (in particular during the rush hours) is made by the division into the following stages (according to the following infographics):

Daily commute in urban conditions without or with an available bikesharing system



1. stage of an individualised trip (so-called first mile) – extending from the residence of the traveller to one of transport nodes constituting the beginning of the main transport route. Under daily conditions this stage means a walking trip or a trip made with a private vehicle to the nearest public transport stop, or, in the case of a car journey, the travel to the main arterial road; 2. stage of a trip along the main transport artery – characterised with the highest mass of traffic and density of the number of travellers, leading from an initial node to the final transport node of the main artery. This segment may mean a trip along the freeway from periphery to the city centre or a ride made on a rapid rail transit line or a metropolitan (underground) railway line; 3. stage of an individualised trip (so-called last mile) – from one of the nodes which constitute the end of the main transport route to the place of work. Under daily conditions this stage means a walk or ride with an own vehicle from the public transport stop to the final destination, or, in the case of a car trip, the drive from the main artery to the final destination.

The public transport systems designed all over the world, in view of the logistics, technical and financial constraints, could only increase the throughput capacity only the second stage of the above mentioned stages, i.e. the stage of mass travel. The offer concerning individualised segments used to have either a fragmented or an inefficient character.

Bikesharing, as one of the principal means of the Maas, allows to close this communication gap for the first time in history. A public urban bicycle allows to individualise the public transport at those stages of travel, where the organisation of the service on a mass scale is not necessary or appears to be impossible to carry out or is financially unfeasible. Making this way the urban transport system more complete, better adapted to the needs of its potential customers and being (in combination) able to constitute an effective alternative for car travel. In spite of the fact, that the transport system organised this way will continue to be called a mass transportation system, it will assure individualisation wherever it is going to be needed by the residents.

An electric bike is a kind of a continuous innovation, whose potential will be only revealed in the future

In spite of the fact, that numerous publications contain arguments, which indicate possibly wide interest in two-wheeled vehicles with electrical assistance among social groups, which until now have not been actively using the bicycle as a transport mode, it is worth to note, that electrically propelled personal mobility devices are still a kind of transport innovation. As a result, those devices have not yet attained a meaningful level of saturation of the available market, and the main group of their current users are the innovators and forerunners (according to the analysis presented in chapter 5). That is why we may still expect a continuous increase in popularity of such solutions, however, the attainment of the level of general popularity in this respect (so-called reaching the common households) is a process which generally takes from 3 to 7 years. Thus only after such a period of operation of the system it will be possible to fully assess its potential and popularity. The process of creation of the target market may be accelerated if an appropriate, efficiently information or affirmation campaign is addressed and implemented to a given target group of recipients.

Bikesharing, like
nisation of the w
of this initiative c
depend on a nun
framework of the
and bad practice
understand those
urban cycling sys

the other forms of shared transport offers new opportunities for the orga-
ays of moving around in a sustainable city of the 21st century. The success
depends largely not on the properties of the bicycle fleet as such, but it will
nber of factors, creating a combined, final image of the service. Within the
e present paper, the most important organizational issues as well as good
es applied in the currently functioning systems, which would allow to better
e issues and to learn the regularities of development of the global market of
stems.

Capital Bikeshare system in Washington, D.C., source: capitalbikeshare.com