

Sustainable Mobility Planning Prerequisites and Perspectives - Gdynia Maritime University Case Study

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ABSTRACT: Sustainable mobility is one of the key elements determining the correct operationalization of the idea of sustainable development. This concept also appears more and more often in modern cities, whose authorities strive to improve the quality of life of their inhabitants, among others by creating SUMP -Sustainable Urban Mobility Plan. This is followed by all kinds of facilities that generate big traffic in cities. One of the institutions willing to meet the challenges of the ever-growing number of trips in its vicinity is Gdynia Maritime University (GMU), which is one of the largest employers in this seaport city, and thus – is one of the biggest traffic generators. The objective of this paper is to investigate the prerequisites and perspectives of creating and implementing mobility plan for GMU in order to make transport more sustainable in its vicinity. For this purpose, pilot research survey has been carried out among employees and students regarding their behaviour and transport preferences in reaching this destination. The research hypothesis stating that the transport habits of the GMU commuters are not compatible with the concept of sustainable mobility was confirmed. The implementation of a sustainable mobility plan in this institution will help to change the standards of traveling in the area of the University and will contribute to better quality of life in the city. It is recommended to enhance the cooperation with the Gdynia City Hall in order to create a synergy effect and bring an added value to sustainable development of this congested seaport urban space.

1 INTRODUCTION

One of the key elements determining the correct operationalization of the idea of sustainable development is sustainable mobility. This term is understood primarily as the development of transport that does not pose a threat to the surrounding ecosystem and human health, but at the same time is able to meet their transport expectations, while observing the applicable rules related to the use of renewable and non-renewable energy sources [1]. The concept of sustainable mobility also appears more and more often in modern cities, whose authorities strive to improve the quality of life of their inhabitants [2]–[4][5]–[7] There, this idea is translated primarily as an

international definition of rational travel, i.e. choosing as often as possible other means of transport than the car, especially over short distances, which dominate in moving around the city [8]–[10]. It is also important that all means of transport complement each other in order to create one coherent and efficient transport system [11].

People awareness all over the world about the sustainable development still increases [12]–[14]. Many countries are still struggling with increasing air pollution and noise standards escalating in city centers. For this purpose, Sustainable Urban Mobility Plans (SUMP) are created. This is a long-term strategy to ensure good accessibility to destinations and

services, including actions to help implement it [15]–[20]. According to the document prepared for the European Commission, including the "Guidelines for developing and implementing a sustainable urban mobility plan", a properly developed SUMP should be characterized by:

- a long-term vision and a clear implementation plan,
- participatory approach,
- balanced and integrated development of all means of transport,
- vertical and horizontal integration,
- assessment of current and future effectiveness,
- regular monitoring, review and reporting,
- taking into account the external costs of all modes of transport.

Whereas the goals to be achieved with the support of the Sustainable Urban Mobility Plan are as follows:

- provide all citizens with transport options that allow access to destinations and services,
- improve security,
- contribute to reducing air and noise pollution, reducing greenhouse gas emissions and energy consumption,
- improve the efficiency and cost-effectiveness of transporting people and goods,
- positively affect the attractiveness and quality of the urban environment for the benefit of residents, the economy and the community as a whole [21].

Polish cities also try to regulate transport issues in accordance with international and national laws, but on their own. Gdynia was one of the first large cities in Poland to create a Sustainable Urban Mobility Plan, which was adopted by the Gdynia City Council in 2016 [22]–[25]. Currently, work is underway to create such a document for the entire Gdańsk-Gdynia-Sopot Metropolitan Area, which assumes improvement of the effectiveness and efficiency of the mobility system and ensuring its integration with urban and territorial development, while involving the inhabitants [26]–[28].

Another, however, no less important issue is the creation of mobility plans for large traffic generators, which are inevitably modeled on Sustainable Urban Mobility Plans. The implementation of mobility plans allows to mitigate the negative effects of transport, and is also one of the most important tools for mobility management. Such a document can be created for any area or facility creating a lot of traffic in the city, and its idea is to present the intended goals, projects and proposed activities that may contribute to the introduction of the concept of sustainable development in the area or facility [29]–[32]. For this purpose, it is obligatory to develop an appropriate methodology adapted to the needs of a given institution. It is also necessary to conduct a detailed analysis of the receivers in terms of their awareness and needs, so as to select the actions implemented in the mobility plan appropriately for them, provide appropriate information, and also to competently draw conclusions later in the implementation of the mobility plan, constantly reacting to the feelings of the receivers related to the currently entered tasks. It is also very important to skilfully assess the results of pilot activities, as well as those implemented in the field of education and

promotion of sustainable development on the premises of the facility [16], [33]–[38].

Furthermore, according to the main goal of mobility plan, which is to promote sustainable commuting pattern, implementing mobility plans impact on company carbon footprint, and then to the carbon footprint of the whole city. On 5 January 2023, new European Union directive entered into force – the Corporate Sustainability Reporting Directive (CSRD). The first companies (the largest) will have to apply the new rules for the first time in the 2024 financial year. However, the key issue of this directive is the need to count the emissions not only from vehicles belonging to the company's fleet, but also from employees' commuting from home [39]. This can significantly influence the validity of mobility plans and prioritise their implementation in the future.

World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) provided Greenhouse Gas Protocol which establishes comprehensive global standardised frameworks to measure and manage greenhouse gas (GHG) emissions from private and public sector operations. With regard to the protocol companies should collect data on:

- Number of employees
- Average distance travelled by an average employee per day
- Average breakdown of transport modes used by employees
- Average number working days per year [40].

One of such facilities generating large flows of traffic is the Gdynia Maritime University. The number of employees commuting to work - lecturers, administrative employees or other workers employed at Gdynia Maritime University makes it one of the largest employers in the city. In addition, students commuting to classes and moving between campuses, the location in the city center and the organization of many events on campus contribute to increasing traffic both around the campus on Morska Street and John Paul II Avenue [41].

That's why Gdynia Maritime University collaborates with local and regional public authorities responsible for transport planning and infrastructure development. This collaboration ensures that the educational programs offered by the university align with the needs of the transport sector in Gdynia. It also facilitates knowledge exchange and cooperation in areas such as transport policy, infrastructure planning, and sustainable mobility.

The objective of this paper is to investigate the prerequisites and perspectives of creating and implementing mobility plan for GMU in order to make transport more sustainable in its vicinity. For this purpose, pilot research survey has been carried out among employees and students regarding their transport preferences and behavior in reaching this destination. The research hypothesis stating that the transport habits of the GMU commuters, i.e. employees and students, are not compatible with the idea of sustainable mobility was confirmed.

2 MOBILITY PLAN FOR GDYNIA MARITIME UNIVERSITY AS A LARGE TRAFFIC GENERATOR

2.1 *Rules of creation and implementing mobility plans for generators of large traffic flows*

Universities are one of the facilities in the city that generate a large number of travels around their campuses or student dormitories. For such places it is really important to create a space for the smooth movement of a plurality of people. It is for this purpose that mobility plans are created, which are implemented with the intention of changing the communication behaviour of stakeholders, so as to limit, above all, individual trips by car, which are one of the main sources of noise or air pollution in the city. Of course, these journeys are made not only by cars, but also by public transport, by means of personal transport such as bicycles or scooters, through shared transport and by foot, which are perceived as more sustainable modes of transport.

The creation of such a mobility plan is usually carried out in the form of stages, in which it is necessary to implement successive phases of project implementation, which in turn will lead to the achievement of a number of benefits for both addressees and traffic generators. Each mobility plan should be aimed at improving the transport accessibility of the area and meeting the transport needs of its addressees. However, it should be remembered that at the same time, criteria related to environmental protection, economic efficiency and social equality must be met.

Properly implemented mobility plans bring benefits to both their addressees and the traffic generators themselves.

The advantages that they can offer to addressees include, above all:

- improving the transport accessibility of travel destinations,
- proposing alternative forms of transport for a passenger car,
- improvement of existing transport services,
- improving transport and personal safety,
- shortening the time and reducing travel costs,
- creating opportunities for daily physical activity using active forms of mobility.

On the other hand, the benefits for traffic generators resulting from the implementation of mobility plans can be considered as:

- improving the transport accessibility of the facility,
- reduction of costs and problems related to parking on the premises,
- improving relations with the inhabitants of neighboring areas,
- more efficient use of company vehicles,
- creating a pro-ecological and innovative image of the facility.

According to the Interreg Central Europe Movecit Programme – Guidelines for developing a mobility plan there are at least six stages of the implementation process:

1. Mobility Concept – first step is to clearly articulate the mobility concept, which outlines the overarching goals and principles of the mobility

plan. This concept should address the specific needs and challenges of the community or organization for which the plan is being developed. For example, the mobility concept might aim to reduce traffic congestion, improve public transportation options, promote sustainable modes of transportation, or enhance accessibility for all individuals. Main goals of this stage are to secure support in the development and implementation of the mobility plan, anchoring sustainable mobility in the object's Mission Statement and in its self-image, embedding sustainable mobility in political strategies and documents, develop a common vision, a long-term goal for transport and mobility development.

2. Mobility Team – implementing a mobility plan requires careful coordination and collaboration from the mobility team. Each step of the implementation process is crucial to ensure the successful execution of the plan. Mobility team focuses on defining the key objectives and performance metrics that will guide the implementation of the mobility plan. This step sets the foundation for measuring the effectiveness and success of the plan. By focusing on establishing clear objectives and performance metrics, the mobility team can effectively track progress, make data-driven decisions, and demonstrate the impact of the implemented mobility plan. This step lays the groundwork for the subsequent actions and initiatives required to bring the mobility plan to fruition.
3. Analysis of the existing situation – in the process of creating a mobility plan, analysing the existing situation is a crucial step that provides a comprehensive understanding of the current state of transportation and mobility. Describing steps such as: data collection (mobility survey – questionnaire, site audits and inspections), traffic analysis, public transportation evaluation, infrastructure assessment, accessibility analysis, environmental impact assessment, stakeholders' engagement and SWOT Analysis of the object the process of analysing the existing situation in the creation of a mobility plan can be outlined.
4. Planning measures – this step involves developing specific strategies and actions to address the identified mobility challenges and achieve the desired goals. When implementing a mobility plan, planning measures is a crucial step that involves developing specific strategies and actions to address mobility challenges and achieve desired outcomes. Based on the analysis findings and established objectives, there is a need to identify targeted measures that will help address the identified mobility challenges and achieve the desired outcomes. These measures should be tailored to the specific needs and characteristics of the target area or community.
5. Implementation of measures – in the process of creating a mobility plan, implementation of measures involves executing the planned strategies and actions to bring about desired changes in transportation and mobility. This also include specific goals, financial sources, targets, responsibilities and measures itself along with the timeline of the process.

6. Evaluation and Monitoring – this step plays a crucial role in the implementation of a mobility plan as they allow the mobility team to assess the progress, effectiveness, and impact of the plan. Activities such as consultations with the project's addressees should be carried out at every stage of creating the mobility plan, so that they are aware of the implementation of the plan, the goals set and the scope of the project - so that their involvement in the project is as high as possible. In the further part, this will make it easier to draw conclusions or assess the effects of the plan's implementation. In addition, to assess the functioning of the created mobility plan, a number of indicators can be used to assess the degree of success of the implemented project, and measures to determine the effects of the implementation of specific instruments within the project [42], [43].

2.2 Gdynia Maritime University characteristics and planned investments

Gdynia Maritime University plays an important role in the functioning of the City of Gdynia. As a specialized university in maritime studies and engineering, Gdynia Maritime University provides high-quality education and research opportunities in various maritime-related disciplines. The university produces skilled professionals, including mechanics, marine engineers, and navigators, who contribute to the development of the local maritime industry and workforce. The research conducted at the University also fosters innovation and technological advancements in the maritime sector. Gdynia Maritime University also contributes to the economic development of Gdynia by attracting students and staff from different parts of Poland and abroad. This leads to increased demand for local goods and services, such as accommodation, dining, transportation, and entertainment. It also creates opportunities for businesses to cater to the needs of the university community, supporting local entrepreneurship and employment. Moreover, Gdynia Maritime University organizes various cultural and social events, conferences, and seminars, which contribute to the city's cultural life. These events bring together scholars, professionals, and students, fostering intellectual exchange and community engagement.

Therefore, considering the fact of being one of the largest employers in the city and accepting a number of clients, as well as organizing classes for many students, the Gdynia Maritime University is also perceived as one of the largest traffic generators in the city. Students, lecturers, and staff members commuting to and from the University can contribute to increased traffic during peak hours. This influx of vehicles, especially if concentrated in specific time slots, can lead to congestion on roads surrounding the university campus and, consequently, to increased traffic and noise throughout the city. The locations of the buildings comprising the Maritime University of Gdynia are presented in Figure 1 and, as can be seen there, they are located in the central district of Gdynia - Śródmieście (Navigation Faculty and Swimming Pool), the neighbouring Kamienna Góra (student house), and also in Grabówek (main building of

GMU, Sports Centre of GMU and student houses at Beniowskiego Street). Soon, the Gdynia Maritime University may also become the owner of the building at Piłsudskiego avenue, which is also located in Śródmieście. That is why it is so important to create the awareness of rational travel among students and city dwellers i.e., through encouraging the use of alternative transportation modes, such as bicycles, walking, carpooling, and public transportation, through infrastructure improvements and awareness campaigns can reduce the reliance on private vehicles and mitigate traffic congestion.

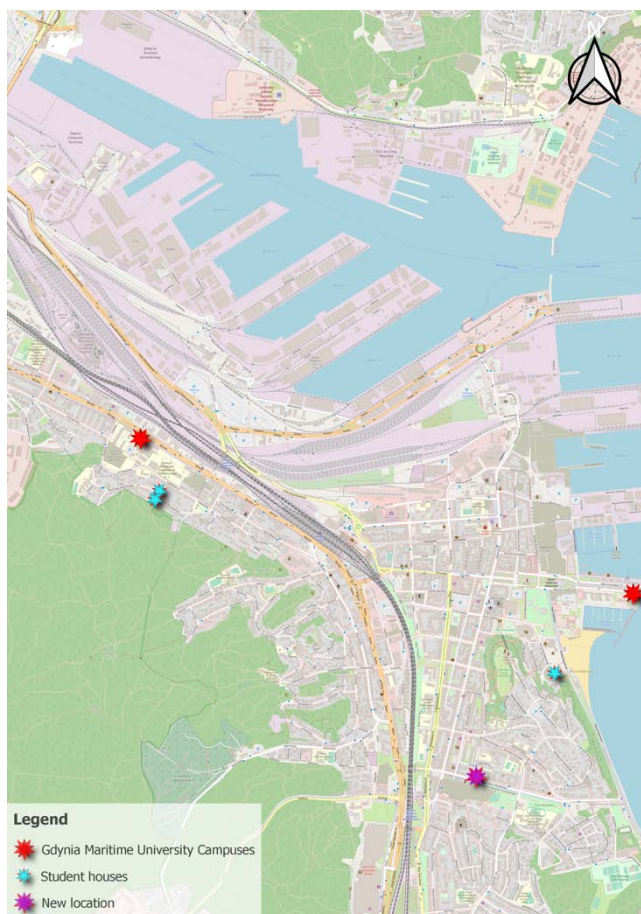


Figure 1. Location of GMU buildings on the map of Gdynia

Gdynia Maritime University also has a high demand for parking spaces. Insufficient parking facilities can lead to students and staff searching for parking spaces in the surrounding neighbourhoods, potentially causing congestion and inconvenience for local residents. Especially now, when the construction of the new Gdynia Maritime University Sports Centre is entering the final phase of construction (the planned completion date is the second quarter of 2024), the traffic around the campus at Morska Street may increase even more (Fig. 2). The possibility of organizing sports events in a modern sports hall or conferences in the office part of the new building will certainly contribute to choosing the Gdynia Maritime University as a destination for many people. A partial improvement to the expected increase in traffic may be the commissioning of an underground car park with 49 spaces, also built as part of this investment. However, using the Sports Centre to promote active mobility can bring much greater potential. Sanitary facilities, locker rooms or a fitness area can contribute

to increasing the share of trips by sustainable means of transport to the University campus.



Figure 2. Visualization of the GMU Sports Centre building

Overall, Gdynia Maritime University has a positive impact on the functioning of the City of Gdynia by driving education, research, economic development and infrastructure improvements. The university's close collaboration with industry and its specialized programs cater to the specific needs of the maritime sector, reinforcing Gdynia's position as a key maritime centre in Poland.

3 RESULTS AND DISCUSSION

One of the most important stages of the implementation of the Mobility Plan for traffic generators is the analysis of the existing state. In this case, a pilot research survey was carried out among 136 of students and 18 employees of the Gdynia Maritime University in order to find out what their behaviour and transport preferences are. It was also analysed what instruments should be implemented to balance mobility within both campuses of the University. The formulated research hypothesis states that the way of traveling of the surveyed people is not in line with the sustainable mobility paradigm.

Figure 3 presents the data collected from the participants of the study related to their most frequently chosen means of transport, taking into account the gender of the respondents. Sustainable means of transport such as walking, bicycle, bus, trolleybus or train are chosen more often by women – 68 % than by men – 54 % of respondents. Among women, the most dominant way of traveling to the University is bus/trolleybus (28%) or walking (24%), while among men the car (29%) and bus/trolleybus (22%) definitely prevail. Among the representatives of both sexes, there was only one person each who declared that they most often use a bicycle to get to the University. On the other hand, multimodal transport, i.e. a combination of several different means of transport, was indicated by 19% of women and 17% of men participating in the study. The presented results regarding more frequent sustainable travel by women are also confirmed by other studies conducted by world researchers. Women are more

likely to choose sustainable means of transport and are more aware of the ecological aspects of rational travel [44]–[48].

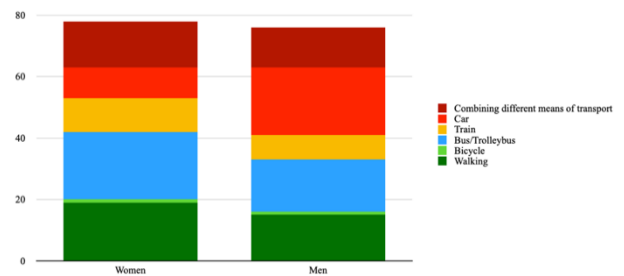


Figure 3. Modal split of respondents depending of their gender

In relation to the above, the respondents were also asked if they had a driving license and what means of personal transport they had (Figure 4). Depending on the answers to these questions, it was possible to conclude whether the respondents consciously choose sustainable means of transport or whether they simply have no other option to travel.

The means of personal transport that the participants of the study have at their disposal are mainly cars and bicycles. Over three-quarters (76%) of respondents have a car in their household, while 41.5% of them have it exclusively. However, in order to identify car owners by gender, it is mainly men who own them in their household. Over 80% of men participating in the survey declared that they had a car, while 52% of them had it at their own disposal. Among women, the results are as follows: 70% of women participating in the survey have a car in their household, but only 30% of them have it exclusively. Although, as many as 90% of the women and 92% of the men participating in the survey declared that they were licensed to drive a car. These are certainly a few of the reasons why women are more likely to choose sustainable means of transport. When it comes to bicycles, 71% of the survey participants declared having them, but as many as 60% of them have their own private bicycle. Therefore, this study confirmed that Poland is in the group of countries where inhabitants most often have their own bicycles (69% according to IPSOS research) [49]. This can be a very good starting point to encourage students and employees of the Gdynia Maritime University to use this type of transport more often, while meeting other important aspects for the users. Owners of motorcycles - 17.5% and scooter owners - 15% of respondents have a slight share in this ranking.

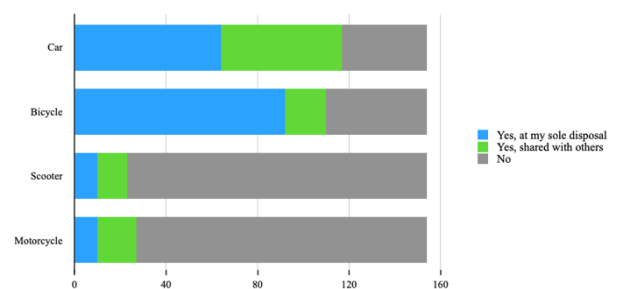


Figure 4. Possession of respondents' personal means of transport

Another important aspect raised in the research is the place of residence of the respondents. Figure 5 presents a map taking into account the area declared by the respondents as their place of residence. During the development of the Mobility Plan for the Gdynia Maritime University, thanks to this data it will be possible to identify the areas from which the traffic towards the University is the highest, so with the support of the city and the public transport authorities like Zarząd Komunikacji Miejskiej w Gdyni and the Szybka Kolej Miejska w Trójmieście, also adjusting the appropriate public transport offers to both campuses of the University. Most of the survey participants (20%) are residents of student houses. A significant number of respondents indicated the northern districts of Gdynia (15%) and the western districts of Gdynia (10%) as their place of residence. Many people (9%) also live in the vicinity of the campus at ul. Morska, i.e. in the area covering the districts of Leszczyńki, Grabówek and Działki Leśne. The remaining areas constitute an insignificant share in the ranking and are represented by a small number of people, while 18% of the survey participants declared that they live outside the borders of the Tri-City - mainly in neighbouring counties.

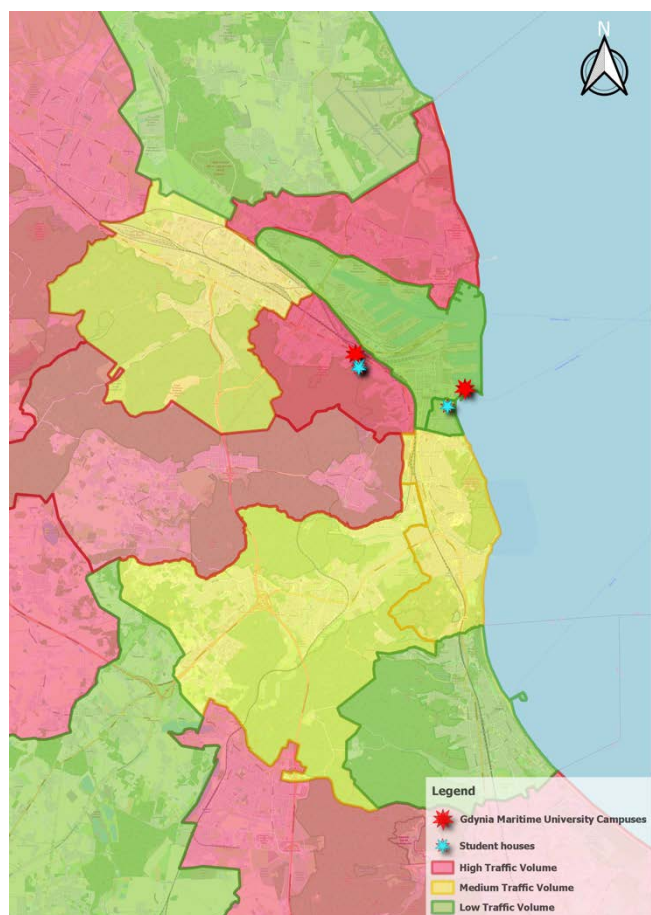


Figure 5. Traffic intensity to GMU from individual groups of Gdynia districts and neighbouring counties

In order to find out the motivation for choosing specific means of transport by the study participants, they were asked to refer to specific statements. On this basis, it can also be deduced whether the reasons for choosing a given way of traveling depend on the respondents (e.g. concern for the environment) or whether they have no influence on them (lack of parking spaces). Subsequently, Figures 6, 7, 8 and 9

present the respondents' motivations related to walking, cycling, public transport or a private car commuting to the University.

As the main reason for walking to the University, the participants of the study indicated the short travel distance, which does not require the use of another means of transport, savings on travel costs and also care for health. The obtained results confirm the results of studies conducted among people declaring walking as their way of traveling also in other regions of the world [50]–[52]. Subsequently, the lack of parking spaces and concern for health were also indicated. The postulates with which the respondents completely disagree are the lack of having a car and the lack of the possibility to use a car or other means of transport. It should be noted, however, that the majority of people who declare walking to the University are students living in student houses in the vicinity of the campus.

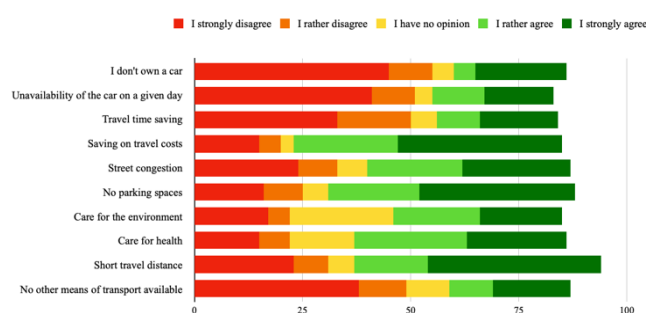


Figure 6. Motivations for choosing walking trips by respondents

Although the bicycle is the least frequently chosen everyday means of transport among the survey participants, over 40 people declared that they use it occasionally when commuting to the University. In the case of this vehicle, the most frequently indicated motivations in its choice were low travel costs, health care, ease of commuting - independence from congestion, as well as care for the environment - these are factors mainly dependent on the respondents. According to the IPSOS research mentioned before, Polish people also perceive cycling more than a sport than a way to travel. Over 61 % people in Poland declared that they ride a bicycle for exercise and this was the highest ratio obtained in the study [49]. Therefore, cycling may not be as popular among study participants at GMU.

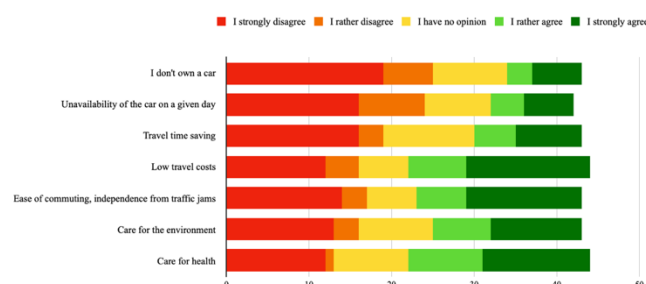


Figure 7. Motivations for choosing cycling trips by respondents

Public transport is the most frequently chosen means of transport among the survey participants. The fact that respondents have student discounts is

the main reason for choosing this sustainable mode of transport. Savings on travel costs and the lack of parking spaces in the vicinity of the University campuses were also often mentioned. The last two indicated factors, combined with a negative attitude to statements about the inability to use a car, may indicate that if the number of parking spaces within the campus were greater, they would choose a car as a means of transport to the University. An equally important aspect when choosing this way of traveling is the place of residence of the study participants. People who run districts far away from the GMU are not willing to choose this means of transport. This is also confirmed by other transport studies of other European cities [53], [54].

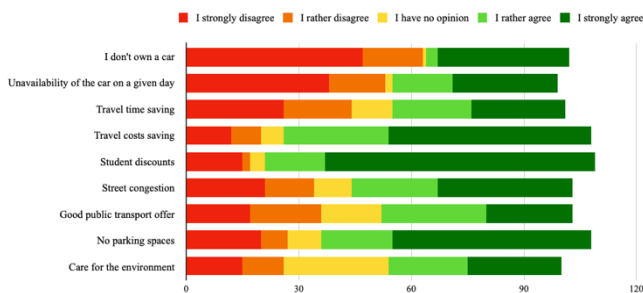


Figure 8. Motivations for choosing public transport by respondents

When it comes to car users, their main motivations when choosing the least ecological means of urban transport are traveling comfort, saving travel time, as well as making other trips on that day that are not related to work or study, these arguments are also substantiated in Chinese and British studies conducted for medium-sized cities [55]–[57]. However, most trips made by car towards the University are made from remote districts and counties, which are characterized by quite poor access to public transport. These are mainly northern districts of Gdynia (Babie Doły, Oksywie, Obłuże, Pogórze), western districts (Chwarzno-Wiczlino, Witomino), as well as Kościerzyna, Kartuzy and Wejherowo counties.

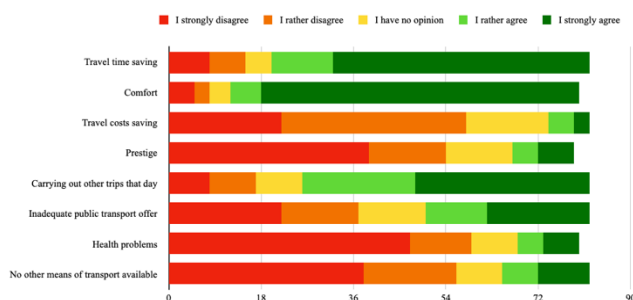


Figure 9. Motivations for choosing car by respondents

In order to increase the share of sustainable means of transport when commuting to the University by its students and employees, they were also asked to indicate factors that would change the way of traveling to the University by bicycle or public transport. Bearing in mind that not all participants of the study can be convinced to change their transport habits, the obtained results allow us to look with optimism at the possible choice of sustainable means of transport for travel. Figure 10 shows the factors that

would have to be improved in order for some of the study participants to start commuting to the University by bicycle, while Figure 11 shows the factors requiring improvement in the public transport offer.

Analysing the respondents' answers, it can be seen that infrastructural factors are the most important for them, such as the improvement of the existing bicycle infrastructure in the city, but also a safe, and preferably monitored, place to store a bicycle at the University. Equally important for study participants are basic hygiene facilities such as a shower/locker. From the point of view of the Gdynia Maritime University, these demands can be met on the occasion of the aforementioned construction of the Sports Centre.

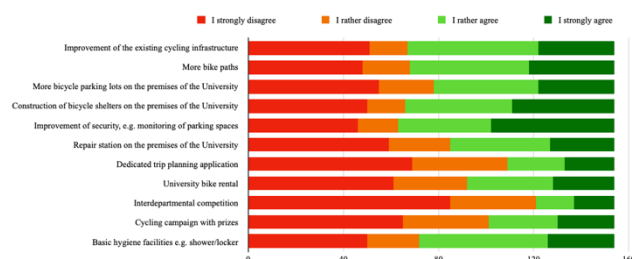


Figure 10. Factors that would encourage respondents to choose a bicycle as a means of transport when commuting to University

When it comes to transport postulates related to public transport, which the participants of the study would be most interested in when using this type of travelling, these are: punctuality, regularity, frequency of connections and a lower cost of a monthly ticket. However, recent changes introduced by the Zarząd Komunikacji Miejskiej w Gdyni (increase in ticket prices, withdrawal of bus lines) do not meet the expectations of users of public transport, which may mean that when creating a mobility plan for the Gdynia Maritime University, cooperation with public transport authorities may be one of the greatest challenges.

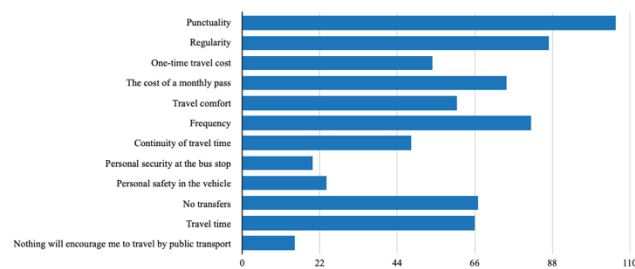


Figure 11. Transport postulates that would encourage respondents to travel by public transport

The last but no less important point was collecting opinions on the transport problems currently faced by the Gdynia Maritime University. 122 participants of the study took advantage of this opportunity. Respondents had a chance to comment on this topic in an open question, but for the purposes of this article, the answers have been collected and grouped in Table 1. This list includes both problems that could be solved at the level of the Gdynia Maritime University - such as the lack of parking spaces or insufficient

transport accessibility of the Faculty of Navigation, as well as the unsatisfactory offer of collective transport carriers or their delays, for which public transport authorities are responsible and indirectly the City of Gdynia. That is why it is so important to cooperate with municipal institutions in this regard as much as possible when creating a mobility plan for the Gdynia Maritime University.

Table 1. Gdynia Maritime University transport problems indicated by survey participants

Gdynia Maritime University transport problem	Number of respondents
Public transport delays	22
No parking spaces around the campuses for students	21
Congestion	19
Insufficient transport accessibility of the Navigation Department	19
Unsatisfactory public transport offer	18
Overload in means of public transport	11
Car parks prices at John Paul II Avenue	6
No bicycle routes in some parts of the city	3
No covered parking for bicycles	2
Public transport ticket prices	1

4 CONCLUSIONS

Implementing a mobility plan at the Gdynia Maritime University can bring numerous benefits to the university community, including environmental sustainability, improved health, reduced traffic congestion and improved safety. In addition, it can also contribute to the improvement of the functioning of the entire city of Gdynia, and consequently also to the service of the Port of Gdynia, because the Kwiatkowski Flyover, leading to the northern districts of Gdynia, inhabited by a large part of the study participants, is a road of significant importance from the point of view of land port services and operations [58]–[61].

The research hypothesis stating that that the transport habits of the GMU commuters are not compatible with the concept of sustainable mobility was confirmed. 61% of respondents declared that they use sustainable means of transport, such as public transport, cycling or walking. This way of traveling is chosen more often by women (68%) than by men (54%) participating in the survey. The result achieved is not sufficient to consider that GMU commuters are promoters of sustainable travel, but it is a very good starting point for the implementation of the Mobility Plan. However, the potential that can be used, especially taking into account the small share of bicycle transport in this list, shows that with the creation of a properly developed mobility plan for GMU, the share of sustainable means of transport in commuting to the University may increase. Especially considering that as many as 71% of respondents have a bicycle in their household.

Cooperation of the team creating the mobility plan for GMU with representatives of the city of Gdynia, e.g. in terms of infrastructure improvement and with other institutions - especially responsible for the organization of transport in the city - will allow for the complete or partial elimination of transport barriers indicated by students and employees of the

University, during their commuting to the facilities by sustainable means of transport, such as public transport and bicycles. In addition to solving transport problems related to selected locations of the Gdynia Maritime University indicated by respondents during the survey, the mobility plan may bring benefits such as reduction in CO₂ emissions and improve air quality around the campus and whole Gdynia city. This will be possible mainly through encouraging students and its employees to use more eco-friendly modes of transportation such as bicycles, public transport, or electric vehicles. As a result, it can lead to reduced traffic congestion on the roads leading to the campuses and also reduce in parking space needs at the University. Promoting public transport and carpooling can result in less congestion and shorter travel times for all users.

The implementation of the mobility plan for GMU may also have environmental and health benefits. Promoting active forms of transportation like walking or cycling can increase physical activity among the university community. Regular physical activity has positive effects on health, well-being, and concentration, which can translate into better academic performance. By implementing a mobility plan, the university can also become a leader in promoting environmental awareness within the academic community. This can influence the attitudes and behaviors of students and employees, not only regarding mobility but also in other areas of sustainable development.

Overall, Gdynia Maritime University has a significant impact not only on the shaping and functioning of the transport system in the seaport city of Gdynia. Through its maritime education, research, collaboration with industry and public authorities and research expertise, GMU contributes to the development of a sustainable, efficient, and competitive transport system, particularly in the maritime and logistics sectors.

ACKNOWLEDGEMENTS

This research was funded by Gdynia Maritime University – WN/2023/PZ/10 project.

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