



Agnieszka KASZUBA • Adam PRZYBYŁOWSKI • Michał KUZIA

SUSTAINABLE MOBILITY CHALLENGES – CASE STUDY OF THE OFFSHORE CENTER IN GDANSK TRANSPORT ACCESSIBILITY

Agnieszka **Kaszuba** (ORCID: 0000-0001-9661-1196) – *Gdynia Maritime University, Department of Transport*

Adam **Przybyłowski** (ORCID: 0000-0001-8789-4649) – *Gdynia Maritime University, Department of Transport*

Michał **Kuzia** (ORCID: 0000-0002-0521-4193) – *Gdynia Maritime University, Department of Logistics and Transport Systems*

Correspondence address:

O. S. Tarasiuka Street 2, 16-001 Kleosin, Poland

e-mail: l.uscinowicz@pb.edu.pl

ABSTRACT: Urban mobility planning is one of the key elements in building a sustainable future. Strategic management of urban transport traffic not only reduces congestion and minimises the negative impact on the environment but also positively affects the improvement of residents' quality of life. Furthermore, following the Corporate Sustainability Reporting Directive approved by the European Union in 2023, companies are obliged to submit annual reports on their environmental impact. One of its elements is the calculation of the organization's carbon footprint, which includes emissions caused by means of transport, including emissions from commuting to work. This case study investigates the impact of transport accessibility on employee preferences and behaviour in the context of changing the premises location, using the example of the Maritime Institute of Gdynia Maritime University (GMU), located at the newly opened Offshore Center in Gdansk seaport. The research hypothesis states that the relocation to new premises with limited transport accessibility may, as a consequence, influence the choice of commuting transportation methods among employees, potentially leading to a shift towards less sustainable means of transport. The results of the research survey prove that there is a complex interconnection between transport accessibility, commuting behaviours, and sustainable mobility initiatives. This pilot study aims to contribute to urban mobility planning by exploring how to transport accessibility influences employee behaviour and by proposing strategies to improve commuting conditions and promote more sustainable solutions.

KEYWORDS: sustainable mobility planning, transport accessibility, carbon footprint, company relocation

Introduction

The mobility of company employees has a significant impact on environmental and economic issues in the city. With increasing globalisation and the complexity of the economy, employee mobility is becoming an increasingly important factor in the effective conduct of company operations. At the same time, the high intensity of car traffic by commuters is the main source of greenhouse gas emissions, which leads to air pollution and deterioration of the quality of life for residents. Additionally, road congestion generates economic losses by extending travel time and also negatively affects the transport of goods, which directly increases the costs of running a business (Kaszuba et al., 2023). According to data from the European Environment Agency, approximately one-quarter of total carbon dioxide emissions in the EU in 2019 came from the transport sector, of which 71.7% were from road transport. To achieve climate neutrality by 2050, in line with the European Green Deal, countries must reduce greenhouse gas emissions by 90% by 2050, compared to 1990 levels (European Commission, 2019). However, for several decades, there has been a noticeable increase in the number of trips and the use of passenger cars (Lindström Olsson, 2013). Motorised passenger transport (measured in passenger kilometres) increased by almost 21% between 2000 and 2019. The passenger car remains the dominant means of transport and has increased its share since 2000 (European Environment Agency, 2022; Trane Technologies, 2023). Moreover, when it comes to commuting, several factors influence the choice of mode, including the comfort and the availability of parking space for car drivers, availability and frequency of public transport, distance to work, and the quality of infrastructure for active modes such as walking and cycling (Tyrinopoulos & Antoniou, 2013; Cervero & Griesenbeck, 1988). Socioeconomic factors, such as income levels and car ownership, also play a significant role, as do environmental concerns and individual preferences. Additionally, workplace policies and incentives, like subsidised public transport passes or facilities for cyclists, can encourage the use of more sustainable commuting options (Padma et al., 2024; Wang & Liu, 2015).

Urban mobility management has a high priority in EU strategic documents because it affects the modal split in the city – the percentage share of various forms of travel such as by car, public transport, bicycle, on foot, or using other forms like scooters. Actions taken to reduce emissions concern not only cities but also enterprises – employees' travel choices to their workplaces significantly influence the transport and environmental situation in a given city/region. Eurostat data show that commuting times vary significantly among European countries. In 2019, the average travel time to work in the EU was as follows: 4.2% of employees arrived in 0 minutes (remote work), 61.1% travelled 1-29 minutes, 26.6% travelled 30-59 min, and 8.2% travelled over 60 min. The Polish average is similar to the EU average (Eurostat, 2022).

This case study of the GMU's Maritime Institute, whose employees recently moved to the newly opened Offshore Center – an innovative Center of integrated marine environment research laboratories for the offshore industry – highlights how the location of the workplace can influence the behaviour and transport preferences of its employees. Transport accessibility plays a pivotal role in shaping mobility behaviours and influencing the environmental and economic sustainability of urban areas (Ross, 2000; Litman, 2008). Accessible transportation systems facilitate the efficient movement of people and goods, thereby fostering economic activities while minimising negative environmental impacts (Rubulotta et al., 2013). In the context of company operations, transport accessibility directly impacts employee mobility, affecting their commuting experiences and transport preferences (Hidayati et al., 2021; Curtis & Scheurer, 2017). Insufficient transport accessibility, as experienced by the Maritime Institute during its relocation, poses challenges for both employees and employers (Johnson et al., 2017). Employees may encounter longer travel times, increased costs, and difficulties accessing their workplace, particularly those reliant on public transport (Inturri et al., 2021; Stępnik et al., 2019). Such challenges can lead to heightened stress and dissatisfaction, ultimately impacting motivation and performance. For employers, transportation issues can disrupt operational efficiency, further exacerbating difficulties during relocation. Moreover, transport problems associated with job changes can contribute to increased greenhouse gas emissions and air pollution, posing additional sustainability challenges (Biosca et al., 2013).

Effective mobility planning is essential in addressing these issues. It involves identifying optimal access routes, considering employee preferences, and investing in sustainable transport infrastructure (Kuzia & Przybyłowski, 2017; Gallo & Marinelli, 2020). By promoting sustainable transport

methods and enhancing transport accessibility, cities can reduce car traffic, lower CO₂ emissions, attract investment, and improve economic efficiency (Kuzia, 2016; Wołek, 2019). Investments in infrastructure for sustainable mobility, such as expanding roads for cyclists or improving public transport availability, contribute to increasing the city's attractiveness to investors and tourists (Vickerman, 1974). Additionally, effective employee mobility enhances the city's economic efficiency by reducing travel costs and increasing productivity related to easier access to jobs and services (Ziemska-Osuch & Osuch, 2024). Therefore, promoting sustainable mobility among company employees is integral to achieving both ecological and economic goals within urban areas (Kinigadner & Büttner, 2021).

Furthermore, the GMU may be required in the future to report on sustainable development, including emissions from employees commuting to work. To accelerate actions aimed at achieving climate neutrality in 2050, the EU adopted Directive (EU) 2022/2464 of the European Parliament and of the Council on 14 December 2022 in January 2023 (Directive, 2022). The provisions introduced by the Corporate Sustainability Reporting Directive (CSRD) will apply to 50,000 enterprises in the EU. Initially (from January 1, 2024), the directive will cover large companies – regardless of whether they are listed on the stock exchange or not. Currently, 150 companies in Poland are covered by the CSRD, and soon, new reporting obligations will apply to a group of over 3,500 Polish enterprises – in 2026, this obligation will be extended to include large enterprises (with 250 employees and an annual turnover exceeding EUR 50 million or an annual balance sheet total exceeding EUR 43 million). In 2027, this obligation will be additionally extended to small and medium-sized enterprises listed on the stock exchange and other financial institutions.

Companies use specialised tools to report on sustainability, including carbon footprint. The most widespread standard in the world for calculating carbon footprints is the Greenhouse Gas Protocol (GHG Protocol). In 2016, at least 92% of Fortune 500 companies that responded to the Carbon Disclosure Project were using the GHG Protocol either directly or indirectly through a GHG Protocol-based program. The GHG Protocol analyses a company's emissions in detail and provides the world's most widely used greenhouse gas accounting standards for companies. The protocol divides emissions into three ranges. Scope 3 is responsible for "other indirect emissions (covering 15 categories)" resulting from employees commuting to work or taking business trips (World Resources Institute & World Business Council for Sustainable Development, 2013; United Nations, 2015).

Research methods

From the 7th to the 21st of December, a research survey was conducted among employees of the GMU's Maritime Institute. To collect data, a survey questionnaire made available via the Google Forms platform was used. Ninety representatives of the Maritime Institute took part in the study, representing roughly 75 % of all Maritime Institute employees. The questionnaire consisted of 23 questions, including specific questions, single-choice questions, multiple-choice questions and open questions. The questions were designed to obtain information about the respondents' current transport habits and their beliefs related to them, as well as to explore various aspects regarding planned trips after a possible change of workplace. The open-ended question allowed respondents to describe the inconveniences they face during their daily commute to work.

This research is notable for its comprehensive examination of the impact of workplace relocation on commuting behaviours and the resulting environmental and economic implications. The study integrates multiple dimensions, including transport accessibility, employee preferences, and infrastructural challenges. The relocation of the Maritime Institute to the Offshore Center serves as a unique case study, providing real-world insights into how significant changes in workplace location influence commuting patterns. Furthermore, the inclusion of diverse data sources, such as employee surveys, transport accessibility analysis, and environmental impact assessments, offers a holistic view of the issue. This multifaceted approach not only enhances the depth of understanding but also provides a replicable model for other organisations undergoing similar transitions.

The research hypothesis posits that the relocation of the GMU's Maritime Institute to a new headquarters in the Offshore Center in Gdańsk seaport, with limited transport accessibility, may, in a consequence, affect the choice of means of transport for commuting to work among employees, potentially leading to shift towards less sustainable means of transport.

Through the use of various research methods and through the development of the questionnaire by the Mobility Team, appointed by the Rector of the Gdynia Maritime University, the data obtained allow for an in-depth analysis of employees' preferences and behaviours in the context of changing the location of the workplace and transport accessibility.

Results of the research

Recently, the Maritime Institute of the Maritime University of Gdynia has made significant changes in the location of its headquarters. The previous three locations, situated on Długa Street (Gdańsk Śródmieście), Trzy Lipy Street (Gdańsk Piecki-Migowo) and Grunwaldzka Avenue (Gdańsk Oliwa), have been replaced by one Offshore Center headquarters on Roberta de Plelo Street (Gdańsk Przeróbka). Additionally, one of the former headquarters on Trzy Lipy Street has been preserved. As shown in Figure 1 and Table 1, the now-unused offices on Długa Street and Grunwaldzka Avenue were located at strategic points in the city, meaning that employees did not report any serious problems related to commuting to work. A similar situation exists with the remaining headquarters on Trzy Lipy Street, which, although located in a district far from the main roads or train stations, is well-connected by buses and trams, minimising access difficulties. However, the new location of the Offshore Center at Martwa Wisła presents a completely different situation. The distance from the workplace to the nearest bus stop is over a kilometre, and the condition of the road leading to the Offshore Center leaves much to be desired, which may significantly impede access for employees.

The new location at Roberta de Plelo Street is significantly less accessible compared to the previous locations. Employees will now face a much greater distance to public transport stops and will only have city bus stops at their disposal. With longer distances to public transport, employees may be more inclined to use personal vehicles, leading to an increased carbon footprint for the Institute's operations. The substantial differences in accessibility highlight the urgent need for improved transportation infrastructure and connectivity to the new headquarters at Roberta de Plelo Street. This improvement could help mitigate the negative impact on employees' commutes and reduce the environmental footprint.

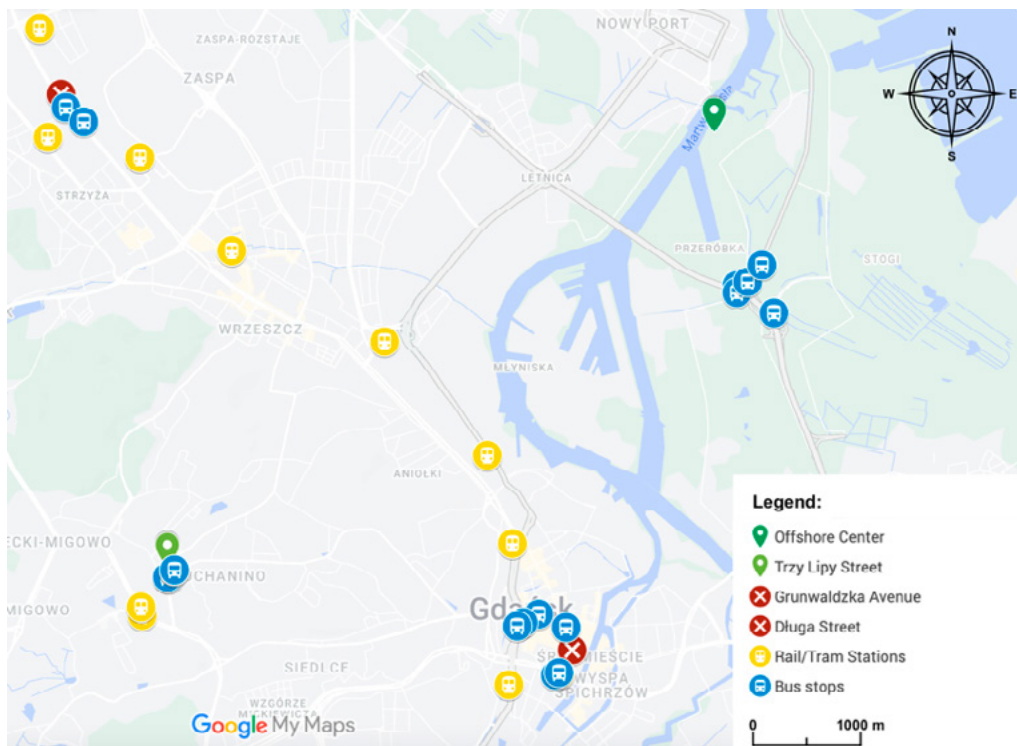


Figure 1. Map of current and deactivated locations of the Maritime Institute in the city of Gdynia, including its nearest train stations or bus stops

Source: authors' work based on Google MyMaps.

Table 1. Distance of a given location from the nearest public transport stops

Location of the Maritime Institute	Distance to bus stop [m]	Distance to rail/tram station [m]
Długi Targ (deactivated)	300	850
Grunwaldzka Avenue (deactivated)	200	700
Trzy Lipy Street	150	750
Roberta de Plelo Street	1600	4200

Ninety employees of the Maritime Institute took part in the study, representing about 75 % of all Maritime Institute employees. Table 2 presents the change in their current and targeted distances to work. The relocation of the Maritime Institute to Roberta de Plelo Street has significantly impacted employees' commuting distances. The data indicates that 83 out of 90 employees will face increased commute times, with 30 experiencing over a 100 % increase. The new location's poor connectivity, including its distance from public transport stops and bad road conditions, exacerbates these challenges.

Table 2. Change in the distance traveled by employees after changing their workplace

Change in distance to work	Number of indications
Reduced by 1–40%	6
Stays the same (0%)	1
Increased from 1–20%	20
Increased from 21–60%	22
Increased from 61–100%	11
Increased above 100%	30

The figure below depicts the various modes of transportation used by employees to commute to work, comparing the data before and the mode preferable after changing locations. Since the survey was conducted before the employees moved, some were unable to declare how they would commute to work. The results for car usage remain more or less consistent with the change in the company's location. In percentage terms, walking, cycling and tram usage suffered the most in this comparison, which, according to the map in Figure 1, suggests significant difficulty in reaching the Offshore Center.

To determine whether the relocation of the Maritime Institute to a new location had a statistically significant effect on employee behaviour and their choice of transportation to/from work, McNemar's test of significance of differences in dependent samples was conducted. This test assesses whether the location change influenced the choice of transport for a significant number of surveyed employees or whether the differences are coincidental. The null hypothesis of the test posits that the change in the MI location has no significant effect on the choice of transportation, while the alternative hypothesis suggests that such a relationship exists. The test statistic used is the χ^2 statistic with a chi-square distribution with 1 degree of freedom. The test was performed for employees who declared driving a car (either as a driver or a passenger), using public transport (bus, tram, train, MI company bus) and engaging in active forms of travel (walking, cycling). The results of the McNemar test indicate a significant effect of MI location change on the willingness to travel by car and engage in active forms of travel. For car usage, the test statistic was $\chi^2=18.375$, with a significance level of $p=0.000$, allowing us to reject the null hypothesis of the test and show a significant difference. In this case, the employee's indecision is most visible. For active forms of travel: $\chi^2 = 26.035$ and $p=0.000$, indicating a significant impact of the Institute's location change. A significant group of employees declared that they would abandon active forms of commuting to the new building. In the case of public transport, the test statistic was $\chi^2 = 1.333$, with a significance level of $p=0.248$. There is no basis to reject the null hypothesis, indicating that the location change does not significantly impact the willingness to travel by public transport. Approximately the same number of people intend to continue commuting by

public transport to the new building, though the possibility of organising transport by the workplace plays a significant role here.

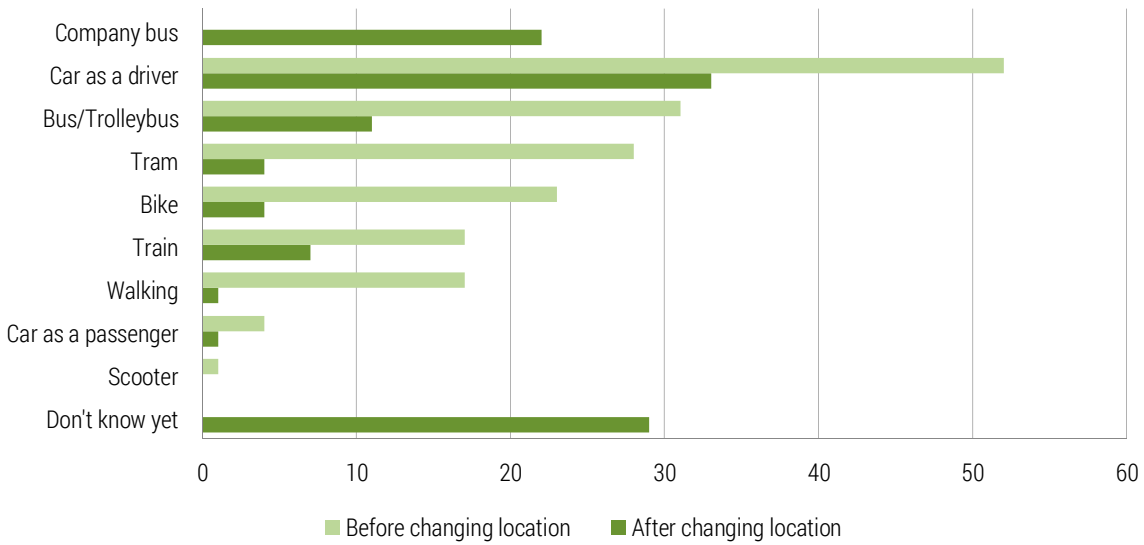


Figure 2. The most common ways to travel to work before and after the change of the Institute location

The graph provided elucidates the primary motivations for employees who commute to work by car. Notably, the leading factors are saving travel time and comfort, both mentioned by over 30 respondents, highlighting a clear preference for efficiency and convenience in daily commuting. This tendency underscores the critical role of time management and personal comfort in transportation choices, which urban mobility planners must address to promote sustainable alternatives. Further factors, such as the need to carry out non-work-related trips and insufficient public transport options, are also significant, with around 25 respondents each suggesting multifunctional trip purposes and inadequate public transport drive car usage. The relatively lower yet still notable factors, such as parking availability and the lack of other transport options, indicate additional infrastructural challenges. Limited parking and the absence of alternative transport options can compel employees to rely on personal vehicles, thus presenting obstacles to sustainable commuting practices.

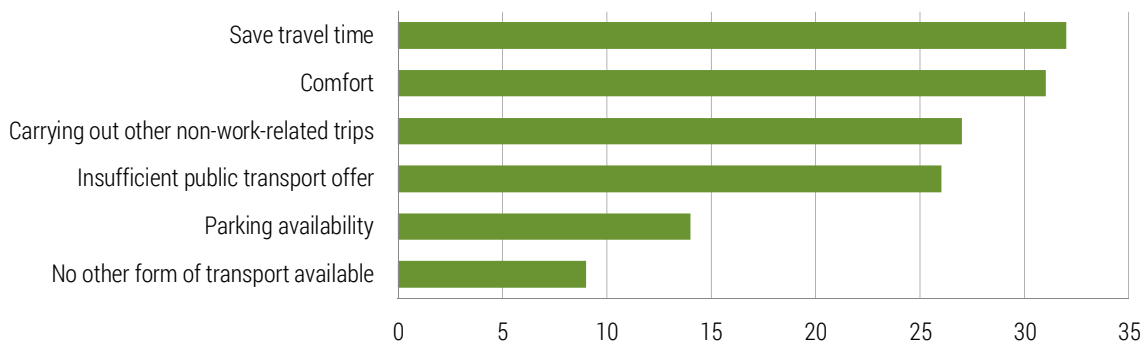


Figure 3. Motivations for travelling to work by car

When it comes to motivations for commuting to work by public transport (Figure 4), cost savings are the most significant factor. This suggests that affordability is a major advantage of public transport, which urban planners and policymakers can leverage to promote more sustainable commuting habits. Another prominent reason – not owning a car – highlights a segment of the population that depends on the availability and reliability of public transport services. Additionally, the factor of a “good public transport offer” points to the importance of maintaining and enhancing public transport systems to effectively meet commuters’ needs. The lack of parking spaces for cars or the absence of alternative transport options reflects infrastructural and accessibility issues that deter the use

of personal vehicles and alternative modes of transport. All respondents were also asked to indicate the three inconveniences they most often encounter when travelling by public transport. The most common were a travel time that was too long (63 people), too many transfers (47 people), and too low frequency of vehicles (40 people).

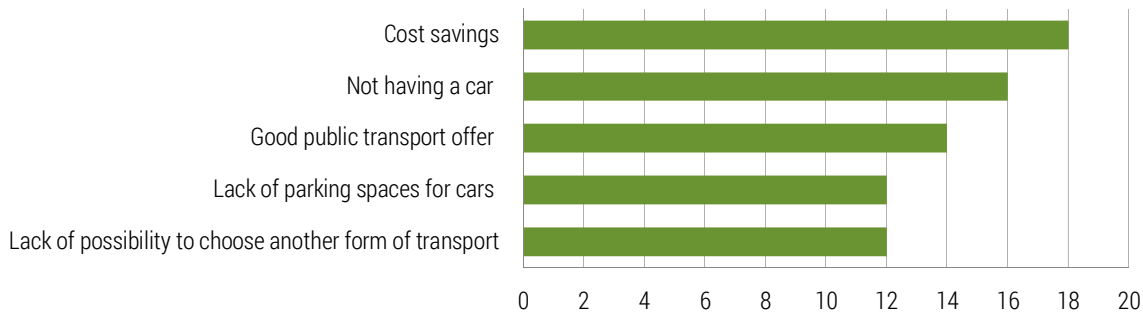


Figure 4. Motivations for travelling to work by public transport

The analysis of the data depicting motivations for commuting by bike at the GMU’s Maritime Institute reveals several key insights. First of all, it proves that health benefits are a major incentive for choosing cycling as a mode of commuting. Promoting the health advantages of cycling can further encourage this mode of transport among employees. Secondly, the low travel costs underscore the economic benefits of cycling, making it an attractive option for cost-conscious employees. Ease of commuting and avoiding traffic congestion are also important motivations, suggesting that cycling can be a more time-efficient way of commuting in congested urban areas. Implementing measures to reduce car traffic and improve cycling conditions can also support this motivation. Moreover, environmental concerns motivate about 18 respondents to bike to work, indicating a significant level of environmental awareness among employees and aligning with global trends towards sustainability. Promoting the environmental benefits of cycling and integrating eco-friendly initiatives can further encourage this mode of transport. The study participants identified the greatest inconveniences as follows: too much physical effort (long distance, uneven terrain) – 50 people, poor road infrastructure (lack of bicycle paths or their poor condition) – 42 participants, and careless car drivers – 40 respondents.

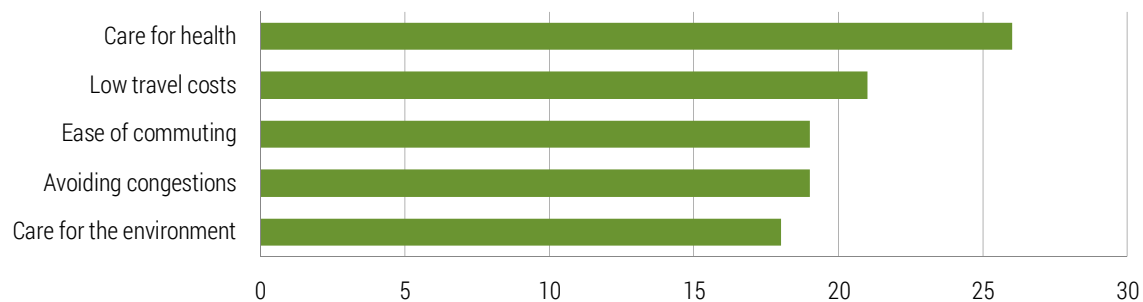


Figure 5. Motivations for travelling to work by bike

The study also included employees who commute on foot. The motivations for walking are similar to those for biking, with the most common being health care, low travel costs, ease of commuting, avoiding congestion, and environmental care.

Due to the fact that the new headquarters of the Maritime Institute is located in an area with limited accessibility, employees reported some concerns related to commuting after the workplace relocation (Table 3). Sixteen of them claimed that the infrastructure may be in poor condition, including the lack of sidewalks and lighting on de Plelo Street. In the vicinity of the new headquarters, another important problem is air pollution resulting from coal heaps being stored nearby. Additionally, comments regarding an increased distance and significantly extended travel time were mentioned by 12 respondents. As reported by respondents, the above problems cannot be solved by using

sustainable means of transport, as public transport availability to the new location is very low. They also indicated a lack of satisfactory cycling infrastructure in the surrounding area.

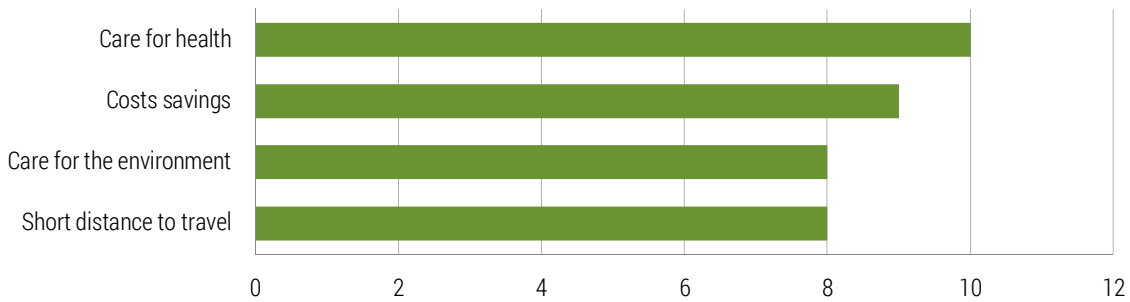


Figure 6. Motivations for travelling to work by foot

Table 3. Inconveniences when commuting to the Institute indicated by respondents

Type of inconvenience	Number of indications
Congestion in the city	19
Poor condition of road infrastructure at de Plelo Street	16
Low availability of public transport for the Offshore Center	14
Long travel time	13
Higher cost of traveling by car to the Offshore Center	6
Air pollution on de Plelo Street	3
Lack of bicycle infrastructure	3

Discussion/Limitation and future research

The relocation of the Maritime Institute of the GMU to a consolidated Offshore Center headquarters has prompted an examination of transport accessibility and its impact on commuting behaviours among employees. The findings reveal a complex interplay of factors influencing transportation choices, including geographic location, infrastructure, individual preferences, and employer interventions. Before the relocation, the Institute's dispersed locations were strategically situated, with easy access to main roads and public transportation hubs. As a result, employees reported minimal commuting challenges. However, the new Offshore Center at Martwa Wisła presents a stark contrast, characterised by a considerable distance from the nearest bus stop and inadequate road conditions, posing significant obstacles to accessibility.

The study sample, comprising ninety employees, exhibited diverse commuting patterns. While car usage predominated, a notable portion utilised various modes of public transportation, cycling, or walking. A considerable proportion of respondents opted for cycling, citing health benefits, cost savings, and environmental concerns. However, they also highlighted challenges such as physical exertion and inadequate cycling infrastructure, underscoring the need for improvements in road networks and safety measures. Similarly, employees who commuted on foot emphasised health, cost savings, and environmental consciousness as motivating factors. Nonetheless, the decision to walk was also influenced by proximity to the workplace and the absence of viable alternatives.

The relocation to a less accessible location elicited apprehensions among employees, particularly regarding increased travel distance and time. Concerns about infrastructure deficiencies and environmental hazards further compounded these challenges. Notably, the absence of sustainable transport options exacerbated the situation, as public transportation availability was limited, and cycling infrastructure was lacking.

Thus, the study underscores the intricate relationship between transport accessibility, commuting behaviours, and sustainable mobility initiatives. Addressing the identified barriers necessitates collaborative efforts involving employers, policymakers, and urban planners to create a more inclusive and environmentally friendly transportation ecosystem. By prioritising employee needs and investing in infrastructure enhancements, organisations can foster a culture of sustainable mobility, thereby contributing to a greener and more equitable urban environment.

Despite the valuable insights gleaned from this study, several limitations warrant acknowledgement. Firstly, the research was conducted within the specific context of the Maritime Institute of the GMU, which may limit the generalizability of findings to other institutions and organisations. The study focused on a single city, Gdańsk, and specifically on the Maritime Institute's new Offshore Center. This geographic limitation may affect the applicability of the findings to other urban areas with different public transportation systems and infrastructural conditions. Furthermore, the survey was conducted before the change of workplace, so it focused only on employees' assumptions regarding their preferred modes of transport after the relocation. Moreover, the relatively modest sample size may not fully capture the diversity of commuting behaviours and preferences within the workforce. Additionally, the absence of qualitative data collection methods, such as interviews, may have overlooked nuanced insights into the underlying motivations and experiences of employees regarding commuting to the new location. Self-reported data from employees can be subject to biases, such as desirability bias or recall bias, which may affect the accuracy of the reported commuting behaviours and preferences. Finally, the study does not provide a comparative analysis with other organisations that have undergone similar relocations. Such comparisons could offer additional insights into common challenges and effective mitigation strategies. Recognising these limitations underscores the need for future research endeavours to employ more robust methodologies and larger sample sizes to obtain a comprehensive understanding of transport accessibility challenges and sustainable mobility practices in organisational contexts.

In addition to the current findings, it is imperative to emphasise the importance of conducting follow-up assessments after the transition to the new location. Monitoring commuting behaviours and transportation challenges over time will provide valuable insights into the long-term impacts of the relocation and the effectiveness of any implemented interventions. By periodically reassessing employee preferences, concerns, and mode choices, organisations can adapt their strategies accordingly to address evolving transportation needs. Moreover, repeated testing enables the identification of emerging trends and allows for the refinement of sustainable mobility initiatives to ensure their continued relevance and efficacy. Therefore, scheduling future evaluations post-relocation is essential for maintaining a proactive approach towards enhancing transport accessibility and promoting sustainable commuting practices among employees. In fact, further research is already planned by the Mobility Team under the auspices of GMU authorities.

Conclusions

In conclusion, the relocation of the Maritime Institute to the Offshore Center headquarters has highlighted the intricate relationship between transport accessibility and sustainable mobility behaviour. The pilot study conducted among employees provided significant insights into their commuting patterns and the challenges they face with the new location. The research hypothesis has been confirmed: the relocation to new premises with limited transport accessibility may, as a consequence, influence employees' choice of commuting transportation methods, potentially leading to a shift towards less sustainable means of transport. However, the results may be actually misleading that the study was conducted before the change of the workplace location. While previous locations were strategically positioned to facilitate easy access for employees, the move to a peripheral location presents a stark contrast, characterised by considerable distances from public transportation stops and infrastructural deficiencies.

Survey participants predominantly relied on cars for commuting, confirming the results presented in the literature review in the introduction of this paper. They cited reasons such as time-saving, comfort, and the flexibility to undertake other errands. However, motivations for using public transport and bicycles centred around cost savings, environmental concerns, and health considera-

tions, which were also identified as main factors in the literature review. Despite the inclination towards sustainable modes of transportation, challenges such as long travel times, inadequate infrastructure, and safety concerns deterred employees from embracing alternatives to car commuting. The study shed light on employees' apprehensions regarding the new location, including infrastructure shortcomings, increased commuting distances, and limited public transport options. Notably, the lack of cycling infrastructure and air pollution concerns emerged as significant deterrents to sustainable commuting practices, leading to an almost complete abandonment of active forms of transportation. Addressing these challenges requires a multifaceted approach. Employees expressed a desire for improved infrastructure, enhanced public transport options, and subsidies for monthly tickets. Additionally, the proposal for a company bus service garnered substantial support, indicating a willingness to embrace collective commuting solutions.

Interestingly, this case study reveals the critical role of transport accessibility in shaping sustainable mobility behaviour. As organisations navigate relocations and expansions, prioritising accessible locations and investing in supportive infrastructure emerge as imperative steps towards fostering sustainable commuting practices and mitigating environmental impacts. By aligning transportation policies with employee needs and environmental objectives, organisations can significantly contribute to promoting sustainable mobility and creating healthier, more livable urban environments. The insights gained from the relocation of the Maritime Institute to the Offshore Center headquarters can be invaluable for other organisations undergoing similar transitions. By examining the transportation accessibility challenges and the subsequent impact on employee commuting behaviours, this case study offers a blueprint that can be adapted and applied across various sectors. Whether in academic settings, corporate environments, or public institutions, understanding the critical role of accessible locations and investing in supportive infrastructure can guide future relocations and expansions. This approach ensures that the lessons learned from this study can contribute to broader efforts in promoting sustainable mobility and enhancing the overall quality of urban life.

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The contribution of the authors

Conceptualisation, A.K., A.P. and M.K.; literature review, A.K., A.P. and M.K.; methodology, A.K.; formal analysis, A.K.; writing, A.K., A.P. and M.K.; conclusions and discussion, A.K.

The authors have read and agreed to the published version of the manuscript.

References

- Biosca, O., Spiekermann, K., & Stępnik, M. (2013). Transport accessibility at regional scale. *Europa XXI*, 24, 5-17. <https://doi.org/10.7163/eu21.2013.24.1>
- Cervero, R., & Griesenbeck, B. (1988). Factors influencing commuting choices in suburban labor markets: a case analysis of Pleasanton, California. *Transportation Research Part A: General*, 22(3), 151-161. [https://doi.org/10.1016/0191-2607\(88\)90033-7](https://doi.org/10.1016/0191-2607(88)90033-7)
- Curtis, C., & Scheurer, J. (2017). Performance measures for public transport accessibility: Learning from international practice. *Journal of Transport and Land Use*, 10(1), 93-118. <https://www.jtlu.org/index.php/jtlu/article/view/683>
- Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, Pub. L. No. 32022L2464, 322 OJ L (2022). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022L2464>
- Elena, R., Matteo, I., Giuseppe, I., & Yodan, R. (2013). Accessibility and Centrality for Sustainable Mobility: Regional Planning Case Study. *Journal of Urban Planning and Development*, 139(2), 115-132. [https://doi.org/10.1061/\(ASCE\)UP.1943-5444.0000140](https://doi.org/10.1061/(ASCE)UP.1943-5444.0000140)
- European Commission. (2019). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, the European Green Deal, Pub. L. No. 52019DC0640. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN>

- European Environment Agency. (2022). *Transport and environment report 2022. Digitalisation in the mobility system: challenges and opportunities*. <https://www.eea.europa.eu/publications/transport-and-environment-report-2022/transport-and-environment-report/view>
- Eurostat. (2022). *Key figures on European transport*. <https://ec.europa.eu/eurostat/documents/15216629/15589759/KS-07-22-523-EN-N.pdf>
- Gallo, M., & Marinelli, M. (2020). Sustainable Mobility: A Review of Possible Actions and Policies. *Sustainability*, 12(18), 7499. <https://doi.org/10.3390/su12187499>
- Hidayati, I., Tan, W., & Yamu, C. (2021). Conceptualizing Mobility Inequality: Mobility and Accessibility for the Marginalized. *Journal of Planning Literature*, 36(4), 492-507. <https://doi.org/10.1177/08854122211012898>
- Inturri, G., Giuffrida, N., Le Pira, M., Fazio, M., & Ignaccolo, M. (2021). Linking Public Transport User Satisfaction with Service Accessibility for Sustainable Mobility Planning. *International Journal of Geo-Information*, 10(4), 235. <https://doi.org/10.3390/ijgi10040235>
- Johnson, D., Ercolani, M., & Mackie, P. (2017). Econometric analysis of the link between public transport accessibility and employment. *Transport Policy*, 60, 1-9. <https://doi.org/10.1016/j.TRANPOL.2017.08.001>
- Kaszuba, A., Przybyłowski, A., Kościuk, K., Lachowicz, A., & Kuzia, M. (2023). Sustainable Mobility Planning Prerequisites and Perspectives – Gdynia Maritime University Case Study. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation*, 17(4), 981-990. <https://doi.org/10.12716/1001.17.04.25>
- Kinigadner, J., & Büttner, B. (2021). How accessibility instruments contribute to a low carbon mobility transition: Lessons from planning practice in the Munich region. *Transport Policy*, 111, 157-167. <https://doi.org/10.1016/j.TRANPOL.2021.07.019>
- Kuzia, M. (2016). Mobility Plan as a Tool for Traffic Generators. The Process of Implementation. *Zeszyty Naukowe Uniwersytetu Szczecińskiego Problemy Transportu i Logistyki*, 36, 71-78. <https://doi.org/10.18276/ptl.2016.36-07> (in Polish).
- Kuzia, M., & Przybyłowski, A. (2017). Challenges for Urban Sustainable Mobility – Gdynia Maritime University Case Study. *Economic and Environmental Studies*, 17(44), 1071-1085. <https://doi.org/10.25167/ees.2017.44.27>
- Lindström Olsson, A.-L. (2013). *Factors that influence choice of travel mode in major urban areas. The attractiveness of Park & Ride*. <https://www.diva-portal.org/smash/get/diva2:7556/FULLTEXT01.pdf>
- Litman, T. (2008). *Evaluating Accessibility for Transportation Planning*. <https://www.vtpi.org/access.pdf>
- Padma, T., Chandra, B., & Prasad, C. (2024). Revealing Commute Choice Factors: SEM Analysis of Public Transport and Active Modes in Hyderabad, India. *Journal of Urban Planning and Development*, 150(3), 04024026. <https://doi.org/10.1061/jupddm.upeng-5022>
- Ross, W. (2000). Mobility and accessibility: the yin and yang of planning. *World Transport Policy and Practice*, 6(2), 13-19. <https://trid.trb.org/View/658966>
- Rubulotta, E., Ignaccolo, M., Inturri, G., & Rofè, Y. (2013). Accessibility and centrality for sustainable mobility: Regional planning case study. *Journal of Urban Planning and Development*, 139(2), 115-132. [https://doi.org/10.1061/\(ASCE\)UP.1943-5444.0000140](https://doi.org/10.1061/(ASCE)UP.1943-5444.0000140)
- Smith, J., Petrovic, P., Rose, M., de Souza, C., Muller, L., Nowak, B., & Martinez, J. (2021). Placeholder Text: A Study. *The Journal of Citation Styles*, 3.
- Stępnia, M., Pritchard, J. P., Geurs, K. T., & Goliszek, S. (2019). The impact of temporal resolution on public transport accessibility measurement: Review and case study in Poland. *Journal of Transport Geography*, 75, 8-24. <https://doi.org/10.1016/j.JTRANGE.2019.01.007>
- Trane Technologies. (2023). *Acceleration action for impact. 2023 ESG Report*. <https://www.tranetechnologies.com/content/dam/cs-corporate/pdf/sustainability/annual/2023-ESG-Report.pdf>
- Tyrinopoulos, Y., & Antoniou, C. (2013). Factors affecting modal choice in urban mobility. *European Transport Research Review*, 5, 27-39. <https://doi.org/10.1007/s12544-012-0088-3>
- United Nations (2015). *Paris Agreement*. https://unfccc.int/sites/default/files/english_paris_agreement.pdf
- Vickerman, R. W. (1974). Accessibility, Attraction, and Potential: A Review of Some Concepts and Their Use in Determining Mobility. *Environment and Planning A: Economy and Space*, 6(6), 675-691. <https://doi.org/10.1068/a060675>
- Wang, D., & Liu, Y. (2015). Factors Influencing Public Transport Use: A study of University Commuters' Travel and Mode Choice Behaviours. *Proceedings of the State of Australian Cities Conference 2015*, Gold Coast, Australia, 1-14. <https://espace.library.uq.edu.au/view/UQ:379895>
- Wołek, M. (2018). Sustainable mobility planning in Poland. *Transport Economics and Logistics*, 76, 13-22. <https://doi.org/10.26881/etil.2018.76.01>
- World Resources Institute & World Business Council for Sustainable Development. (2013). *Technical Guidance for Calculating Scope 3 Emissions*. https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf
- Ziemska-Osuch, M., & Osuch, D. (2024). Analysis of the Capacity of Intersections with Fixed-time Signalling Depending on the Duration of the Green Phase for Pedestrians. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation*, 18(2), 323-327. <https://doi.org/10.12716/1001.18.02.08>

Agnieszka KASZUBA • Adam PRZYBYŁOWSKI • Michał KUZIA

WYZWANIA ZRÓWNOWAŻONEJ MOBILNOŚCI – STUDIUM PRZYPADKU DOSTĘPNOŚCI TRANSPORTOWEJ CENTRUM OFFSHORE W GDAŃSKU

STRESZCZENIE: Planowanie mobilności w miastach jest jednym z kluczowych elementów budowania zrównoważonej przyszłości. Strategiczne zarządzanie miejskim ruchem komunikacyjnym nie tylko zmniejsza zatory i minimalizuje negatywny wpływ na środowisko, ale także pozytywnie wpływa na poprawę jakości życia mieszkańców. Ponadto, zgodnie z zatwierdzoną przez Unię Europejską w 2023 r. Dyrektywą w sprawie raportowania zrównoważonego rozwoju przedsiębiorstw, spółki są zobowiązane do składania rocznych raportów na temat swojego wpływu na środowisko. Jednym z jego elementów jest obliczenie śladu węglowego organizacji, który obejmuje emisję powodowaną przez środki transportu, w tym emisję z dojazdów do pracy. W niniejszym studium przypadku zbadano wpływ dostępności transportowej na preferencje i zachowania pracowników w kontekście zmiany lokalizacji siedziby na przykładzie Instytutu Morskiego Uniwersytetu Morskiego w Gdyni w nowo otwartym Centrum Offshore w porcie Gdańsk. Przyjęto hipotezę badawczą zakładającą, że przeprowadzka do nowej siedziby o ograniczonej dostępności komunikacyjnej może znacząco wpłynąć na wybór środków transportu do pracy wśród pracowników, przesuując niestety te preferencje i decyzje w stronę mniej zrównoważonych środków transportu. Uzyskane wyniki przeprowadzonego badania ankietowego dowodzą, że istnieją wieloaspektowe zależności pomiędzy dostępnością transportową, zachowaniami w zakresie dojazdów do pracy i inicjatywami w zakresie zrównoważonej mobilności. Celem tego badania pilotażowego jest wniesienie wkładu w planowanie mobilności w miastach poprzez zbadanie, w jaki sposób dostępność transportu wpływa na zachowania pracowników oraz zaproponowanie strategii poprawiających warunki dojazdów do pracy i promujących bardziej zrównoważone rozwiązania.

SŁOWA KLUCZOWE: planowanie zrównoważonej mobilności, dostępność transportowa, ślad węglowy, relokacja instytucji