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Changing Transport Behaviour for Sustainable Urban Mobility

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Abstract:

Purpose: *The paper aims to analyze residents' current transport habits and their willingness to change mobility behaviour within the Warsaw West functional area (Mazovian Voivodship, Poland). The study supports the preparation of a Sustainable Urban Mobility Plan (SUMP) by identifying behavioural patterns, challenges, and expectations related to sustainable transport.*

Design/Methodology/Approach: *An online survey conducted in 2021 among 177 residents from seven municipalities and three counties collected data on travel modes, frequency, and preferences. Descriptive statistics and comparative analysis were used to assess current mobility behaviours and respondents' readiness to adopt sustainable alternatives. The study focuses on citizens' perceptions of road safety, public transport accessibility, and infrastructure for vulnerable road users.*

Findings: *The results show that 83% of respondents are willing to change their mobility habits, provided that improvements in public transport, multimodal integration, and active travel infrastructure are made. Only 17% expressed no intention to modify their travel behaviours. Car dependency remains dominant—used by over half of residents for local trips—while walking and cycling are popular only within municipal boundaries. Improved public transport connections and safe cycling routes are key motivators for change. The findings provide a diagnostic basis for long-term implementation of the SUMP in the Warsaw West area.*

Practical recommendations: *Local governments should prioritize integrated public transport systems, safe pedestrian and cycling infrastructure, and community engagement to promote behavioural change. Implementing SUMP principles will reduce congestion, pollution, and accident risks, contributing to improved quality of life and road safety.*

Originality value: *This study provides one of the first empirical analyses of residents' readiness to shift toward sustainable transport modes in the Warsaw West functional area. It highlights behavioural aspects often overlooked in technical mobility planning, offering practical insights for SUMP implementation in medium-sized urban regions.*

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1. Introduction

Mobility brings many benefits but causes a lot of economoc costs and emotional burdens for society too. Future road transport should be safer, cleaner, and healthier. European Union urges all cities and towns to have a Sustainable Urban Mobility Plans (SUMP) by 2030, with the goal of zero death on road and safer walking and cycling infrastructure as well as clean and affordable public transport.

The concept of Sustainable Urban Mobility Plan, as a more integrative planning process connected with complexity of urban mobility, was recognised and introduced by European Commission (EC) in 2013 as an Urban Mobility Package: A concept for sustainable urban mobility plans (European Commission, 2013).

The SUMP (Sustainable Urban Mobility Plan) aims to address the mobility needs of all users in urban areas and their hinterlands, improving integration across various transport modes. It focuses on social equity, health, environmental quality, and efficiency, optimizing the use of urban space and infrastructure while enhancing the quality of life. The plan also supports the EU's long-term strategy to eliminate road deaths by 2050, reduce pollution, and improve the transport network, with the EU Urban Mobility Observatory as a key resource for urban mobility data.

This is a platform to exchange of information, knowledge and experience in the field of urban and regional development, health, energy and environmental sciences with goals, plans and implemented initiatives of SUMP are included. New Guidelines for Sustainable Urban Mobility Planning published by European Platform on Sustainability Urban Mobility in 2019 were second edition of guidelines providing with more information, knowledge and experience of many stakeholders and planning experts in field of sustainable mobility across the Union (European Commission, 2019).

According to the SUMP' concept crucial is planning for sustainable mobility in the entire "functional city" with cooperation across institutional boundaries and great involvement of citizens and civil stakeholders.

First, at the beginning you must assess current and future performances, and then define a long-term vision and a clear implementation plan. At the end of planning processes of SUMP, you must develop all transport modes in an integrated manner, then after implementation arrange monitoring and evaluation with assurance of quality (European Commission, 2021).

European Union' Mobility Strategy adopted in 2020 is focused on fundamental transport transformation for green, smart an affordable mobility outlined in the European Commission' Act of Sustainable and Smart Mobility Strategy – putting European transport on track (European Commission, 2020). This strategy together with the Action Plan of 82 initiatives will transform transport means for users to put them first and provide them with more affordable, accessible, healthier, and cleaner alternatives (European Commission, 2021b) .

The package of European Green Deal will result in 90% cut in emissions by 2050 (all passenger cars, buses, and new trucks will be emission-free, rail freight traffic will double). At the heart of the Urban Mobility Strategy is Vision Zero 2050 with the specific goal of the Road Safety Program 2030 (by 50% reduction of all road deaths and serious injuries in EU). Initiatives of sustainable urban mobility will, i.e. concentrate on doubling the number of safe bicycle lanes to 5 000 km by improving public transport and promoting active modes of transport like walking and cycling.

EU' strategy on future transport calls all medium and large cities to prepare a Sustainable Urban Mobility Plan by 2030 with the final goal of number Zero road deaths, with safer infrastructure for pedestrians and cyclists. Not only EU call for improvements on vulnarable road users because of high risk of fatalities among that group. Another initiative, but on the worldwide level was launched by Word Health Organisation this year.

US Global Road Safety Week was organized around the world with the slogan: Street for Live promoting speed of cars of 30 km/h in cities, in all areas with high density of vulnerable road users, in centre of big cities and everywhere where there is mixed traffic of motorised and non-motorised traffic between 17- 23 of May 2021 (World Health Organization, 2021a). Lowering speed in cities is a central key point of the new Decade of Action Plan for the European Union 2021-2030 to make roads safer for all road users, mostly for vulnarable ones (World Health Organization, 2021b).

A lot of cities introduced SUMP in their mobility policies and many more are transforming their cities for achieving Zero deaths on roads by modifying infrastructure not to allow speeding cars for better safety of pedestrians and cyclists. Except for infrastructural issues, changing citizen's mobility behaviours by promoting active lifestyle, building awareness among road users for more greener, cleaner and connected (triple zero) transport is a key point of new strategic plan of SUMP.

Transport safety as an essential component of sustainable urban mobility plans should be firmly integrated with cities mobility planning processes according to the EU' Sustainable and Smart Mobility Strategy. In accordance with the above-mentioned recommendations and guidelines of SUMP' concept there was signed an agreement between 7 municipalities in Mazovian Voivodship to develop SUMP for functional area of Warsaw West.

The neighborhood municipalities were located close to each other in the Mazovian Voivodship. The Warsaw West functional area consisted of Lomianki, a lider of agreement, Stare Babice, Izabelin, Czosnów, Nowy Dwor Mazowiecki, Jablonna, Zakroczym. The 7 municipalities were in 3 counties (nowodworski, legionowski, zachodnio-warszawski) of Mazovian voivodship. The Sustainable Urban Mobility Plan for functional area "Warsaw West" is an example of cooperation across instutions beyond administrative boundaries, reaching larger area than only one municipality.

By developing a long-term vision and clear implemntataion plan not limited for one municipality administrative boundaries you will improve urban accessibility of all 7 connected municipalities, bring more benefits to more communities and municipalities. For all municipalities only one document of SUMP for the Warsaw West functional will be preapred.

Usally mobility plans are preapared together with the cooperation of experts on transport-urban-, road design planning, institutional environmental protections bodies together with great involvement of citizens and other stakeholders (civil society engagement). The map of 3 counties in Mazovian Voivodship where survey on SUMP among 7 municipalities were carried out in 2020 presents Figure 1.

Figure 1. *Map of Mazovian Voivodship with marked 3 counties creating the Warsaw West functional area*

In this article is presented road safety in all 7 munipalities compared to road safety in Mazovian Voivodship to whole Poland as a country, with special emphasis on safety of vulnerable road usres, cyclist and pedetraians. Then the results of the survey among residents of municipalities are shown. Identyfiing problems require responding to diverse demands for mobility and transport services for citizens, businesses and industry and is a big challenge for SUMP' team.

A key factor for successful SUMP is engagement of public interest, and their acceptance develops awareness of changing transport mobility performance. It's important to built communication with society to have their support while introducing new solutions and investments (Eltis – European Commission, 2021). The article presents the results of the online questionnaire with some recommendations for the City Hall in Lomianki for future SUMP.

Although the presented data is from 2021, it constitutes an important diagnostic contribution to the development process of the Sustainable Urban Mobility Plan (SUMP) for the Warsaw West functional area. Its analysis helps to understand the residents' needs at that time and serves as a reference point for future actions and the evaluation of the implemented strategy's effectiveness.

2. Road Safety in Poland and Sump Area of the Warsaw West Area

To the main areas of interventons while developing an integrated plan for very good access to public transport with decreasing share of passenger cars in travel and climate neutrality in transport (by reduction of emissions, noise, greenhouse) is improving road traffic. This is measured by reducing the number of accidents, within fatalities). The SUMP adopted horizontal objectives that are directly in line with the principles of national and European transport policy.

The objectives related to road safety reflect implementation of the Vision Zero strategy (no fatalities in traffic accidents). The objectives for climate neutrality in the field of mobility are due to the goal of the European Green Deal strategy which is reduction by 90% in emissions by 2050 from the entire transport sector. According to the assumptions of the National Road Safety Program, the number of fatalities in road accidents in accordance with Vision Zero should drop to zero by 2050.

The intermediate goal is a 75% reduction in the number of fatalities among cyclists and pedestrians by 2040 compared to numbers in 2030 (in 2030, the target assumes a decline of 50% (compared to 2021 values). Attached road safety analysis indicated high risk of fatalities on roads per 1 million inhabitants in Poland. Fatality rate in Poland is one of the highest among the Eurppean Unions' countries and is dropping very slowly during past years.

This risk rate in Poland was 59 fatalities per million inhabitants in 2021 (while average for UE at 45). Analyzing road safety in Poland liked other countries in the

European Union did not meet the objectives of the National Road Safety Programme, based on the Vision Zero approach, adopted for years 2013-2020.

According to the nstrategy there should not be more than 2 000 fatalities and not more than 6 900 seriously injured on Polish roads in 2020. In fact, in 2020 there were 2 491 fatalities and seriously injured 8 805. Improving beeter quality of life through safer roads for all, but especially for vulnerable road usres in urban areas according to SUMP require infrastructure investments and trasforminf meaning of transportataion. Swiching for walking and cycling is vital.

In Poland pedestrians and cyclists are at more danger of life loss comapre to other EU countries. Pedestrians accounted for 17% of all casualties in road accidents in Poland in 2021. In 4 675 road accidents involving pedestrians 527 (24%) died and 4 304 (16%) were injured (including seriously 1 672, accounted for 20%). The risk of death in a road accident increases with age. Like other EU countries, the largest group among casualties of road accidents in Poland are seniors, elderly people aged over 60 (accounted fof 30%).

The average risk for road users aged over 70 years is up to 7 times higher than for children aged from 2 to 3 years old. Cyclists are small but increasing group of road users in Poland. They accounted for 2% of the total population of road users; however, their number is increasing every year.

In 2021 cyclists were involved in 3 518 road accidents resulted 185 fatalities and 3 192 injuried (3 179 injured cyclists within 1 107 seriously; 13 injured passengers of bicycle within 1 seriously).

More cyclists are active road usres in urban and rural areas today, where the infrastructure is constantly developed. Bicycle- paths and routes meet the requirements of the safety system approach and the cyclists' attitudes change gradually for more responsible and safe performances.

According to the studies cyclists in Poland mostly didn't use any additional protective equipment (e.g. helmets, reflective clothings or special gloves) that could save them from certain injuries or at least minimize their severities in case of an accident.

But additional equipments which increases their visibility and safety on roads, is used more often than before. Three counties in Mazovian Voivodships of Warsaw West functional area of SUMP were analysed for road safety reasons (Tables 1 and 2).

Data on area information, number of fatalities, accidents and casualties were compared and rated for three counties (warszawsko-zachodnie, legionowskie, nowodworskie) versus voivodship and whole country.

Table 1. *Area information with number of fatalities per 100 accidents for three counties in Mazovian Voivodships, compared to whole voivodship and Poland*

	Three counties			Mazovian voivodship	Poland
	2019	**2020**	**2021**	**2021**	**2021**
Area information					
Area (km²)	1 620	1 620	1 620	35 559	312 705
Length of county and municipal roads in urban and rural areas (km)	1 785	1 811	1 835	28 805	266 668
Number of inhabitants	316 576	319 291	340 138	5 512 794	37 907 704
Whole number of registered vehicles	327 128	345 431	364 912	5 424 468	34 030 267
Number of registered passengers' cars	243 228	257 279	272 458	4 092 435	25 869 804
Number of fatalities per 100 000 population	10,1	7,5	8,5	6,8	5,9
Area, rating comparison					
Number of fatalities per 100 accidents	19,8	19	21,8	12,2	9,8
Car ownership rate (number of passenger cars per 1 000 inhabitants	768	806	801	742	682

Source: *Polish Road Safety Observatory, 2022.*

Accidents and casualties according to data on Polish Road Safety Observatory due to comparison of 3 counties (warszawsko-zachodnie, legionowskie, nowodworskie) compared to data of Mazovian voivodship and whole Poland.

Table 2. *Number of accidents, fatalities and injuries in three counties, whole Mazovian voivodships and Poland from 2019 to 2021*

Number	**Three counties**			**Mazovian voivodship**			**Poland**		
	2019	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**
Accidents	162	126	133	3 802	2 960	3086	30 288	23 540	22 816
Fatalities	32	24	29	469	420	375	2 909	2 491	2 245
Injuries	177	125	146	4 391	3 295	3561	35 477	26 463	26 415

Source: *Polish Road Safety Observatory, 2022.*

The comparison of fatality rate (measured by the number of fatalities per 100 000 inhabitans) of 6.8 in Mazovian voivodship indicated higher value than 5.9 for the

whole Poland in 2021. The fatality rate measured by the number of fatalities per 100 accidents in Mazovian voivodships of 12.2 in 2021 was lower than in 3 counties of 21.8. This value was higher than average for whole voivodships (12.2) and for the whole Poland (rate of 9.8). Car ownership rate (number of passenger cars per 1 000 inhabitants) in Mazovian voivodship of 742 was the highest in Poland in 2021.

Road safety and public health benefit from encouraging active modes of transport (walking, cycling) and travelling by public transport is preferred for sustainable, green, emission free urban road mobility. Today, mobility requires infrastructural solutions, effective public and shared transport multimodial nodes supported by smart digital solutions.

Mobility planning helps to create a complementarity that suits people's individual mobility needs. Bringing the number of residents using cars down is possible when there is less competition between different forms of transportataion for public space. Presented data on pedestrians' and cyclists' safety showed high risk of death on Polish roads. As sustainable mobility prefers walking and cyckling as a healthy way of mobility, developing safe road infrastructure will result less risk for that groups of vulnarable road users.

3. Survey for Sump in Warsaw West Functional Area

The residents' survey on SUMP in Warsaw West functionalarea was prepared by the City Hall in Lominaki according to resolution of the City Council Lomianki [9]. Due to study car plays dominant role in meeting transport needs what must be changed for more public transport use and cycling and walking. Changing mobility behaviors of negative passenger car' dependance according to the sustainable development is important challenge.

But growing urbanisation into more distant places into municipalities means more dependance on a passenger car. Answer could be automatization of public transport but in far futher future. Climate change due to the increased number of passenger's cars emitted air pollution, noise of high road traffic intensity required different integrated transport modes and changing transport behaviours.

During SUMP settings inhabitants expressed opinions in questionnaire on used modes of transportation while travellingKnowing the frequency of used transport modest and commuting habits indicate the strength and weaknesses transportation system.

Methodology of the study was online questionnaire on Sustainability Urban Mobility Plan among residents of Warsaw West functional area. To know better mobility needs, while preparing strategy of SUMP local authorities invited citizens to support it by expressing their opinions on mobility habits and expectations.

Answer to questionnaire should have been used while developing SUMP document in the next phase. For in-depth analysis of citizens' travel issues and their needs of transport modes was used on-line questionnaire. Situation due to the COVID-19 resulted the survey was carried out via Internet using on-line questionnaires. Respondents, participated 177 were known by name, email address and municipality they live.

Except of road users declared opinion (attitudes) additionally data on their performances (physical acting) are usually collected to create comprehensive picture of the citizen's mobility habits. This time only questionnaire was prepared, promoted and carried out by the local authorities of selected municipalities in Mazovian voivodship.

Online survey was carried out in 7 municipalities (Lomianki, Stare Babice, Izabelin, Czosnów, Nowy Dwor Mazowiecki, Jablonna, Zakroczym) from 3 counties (nowodworski, legionowski, zachodnio-warszawski).

Inhabitants could not only send on-line questionnaire but some of them take part in on-line consultation workshops. Workshops on sustainable urban mobility due to the epidemic threat were held in Internet.

The online survey was prepared by the City Hall in Lomianki and was held between 18th of February and 8th of March 2021.

There were 177 respondents taking part in online survey. Questionnaire consisted of five questions. One set of questinons were related specific means of transportation, current citizens' commuting habits and problems they faced travelling in their own municipality and between neighbourhood of municipalities in the Warsaw West area.

Other questions to know expectations for better urban mobility in the future were pro or contra statements to choose, with rating questions of transportation system of Warsaw West (very good, good, satisfactory, less than satisfactory, poor) as well as close question about inhabitants changing travel preferences. Respondents had to answer too what was the aim of travelling (work, health care, education, cultural, shopping, others).

Inhabitants mostly came from, big cites: Nowy Dwor Mazowiecki, Jablonna, Czosnów, Stare Babice, Lomianki, Izabelin. 76% of respondents were employed, 7% of them work and study at the same time, 5% of them were studying at secondary level (rest: 1% study at the university; 4% were retired; 2% unemployed).

Respondents answered the questions in the survey were mostly between 26-45 years old (59%) and between 45-60 years old (21.5%). Seniors more than 60 years old were less represented (7%). Young people aged less than 18 years old were low

represented (4%) and respondents between 18-25 years old participated in survey in 8%.

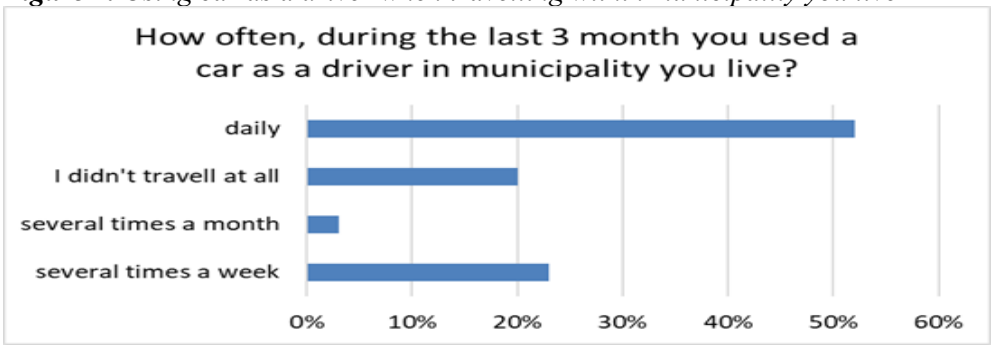
Most respondents were well educated with master's degree (75%), with secondary/ technical education 21%, less than 3% had elementary education. 95% of respondents had a car in households.

First set of questions from questionnaire related to traveling with specific means of transportation (public transport, rail, car as a passenger, car as a driver, regional bus (bus), moped / scooter, taxi, bike, walking on foot) in own municipality and between neighbourhood of 7 municipalities in the Warsaw West area. The region is diverse and the accessibility of inhabitants to the means of transport differs.

All questions from survey referred to travel as a single journey to last 3 months and its frequency (every day, several times a week, once a week, several times a month, once a month and less, I do not use at all / not applicable). Questions of means of transportation required one answer per each transport modes with specification of frequency.

First set of questions specified area of travelling: within own municipality (one). Using car as a driver was popular by 52% of respondents when travelling within municipality you live Figure 2. Only 1 % answers indicated frequency of commuting this way as: once a week/once a month or even less. The results showed priority of car dependency while travelling in area you live.

Figure 2. *Using car as a driver when travelling within municipality you live*

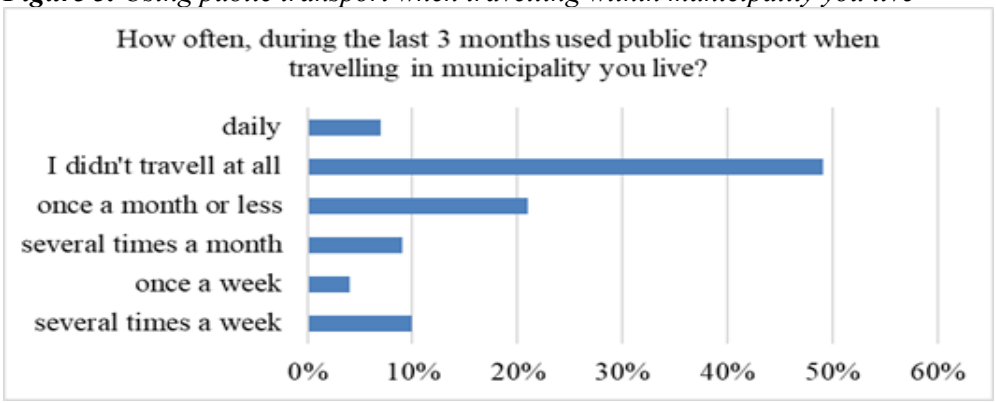


Source: *City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

21% of respondents travelled in the same municipality several times a week as a passenger in a car. Another 21% did not use this type of travel at all and only 7% did it every day. The same percentage of 22% travelled as passenger in a car several times a week or a month. It showed travelling as a passenger is not popular while commuting within the same municipality.

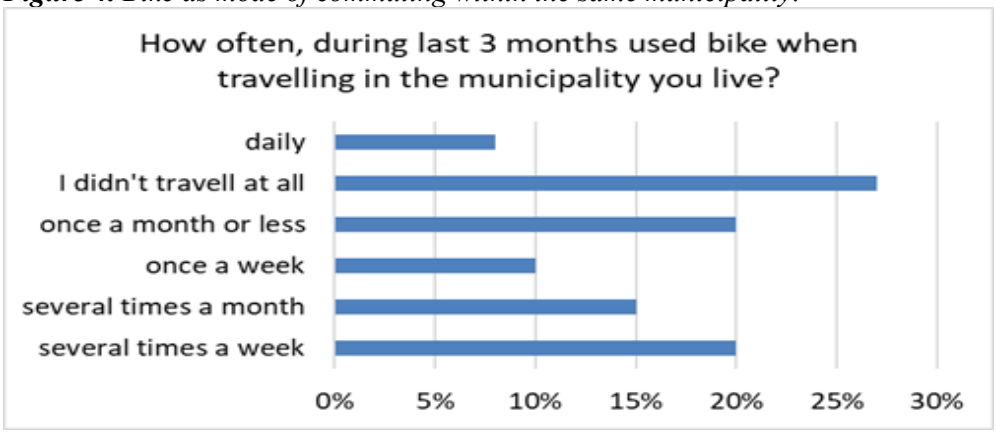
Almost 50% of respondents did not use public transport when travelling within municipality you live and less than 10% did it daily (Figure 3), which could mean the service provided is not good and reliable enough.

Figure 3. *Using public transport when travelling within municipality you live*



Source: *City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

Figure 4. *Bike as mode of commuting within the same municipality.*

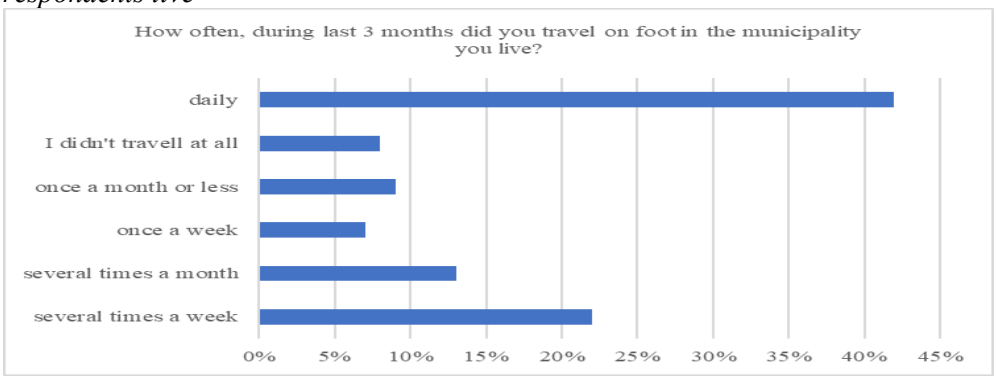


Source: *City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

As shown on Figure 4 overwhelming number of respondents 73% did cycling irregularly with different frequency while commuting in the same municipality you live. Bike as a transportation mode is used several times a week by 20% respondents, another 20% cycled once a month, 10% of them used it once a week and daily by 8%.

The results on Figure 5 showed that citizens liked to travel on foot irregularly, only 7% did not travel at all but more than 40% walking (traveling on foot, as a modes of transportation) daily in the area they live. Using Taxi, rail, regional buses, mopeds, or scooters were not popular not only when travelling in own municipalities but also when travelling from one to another municipality.

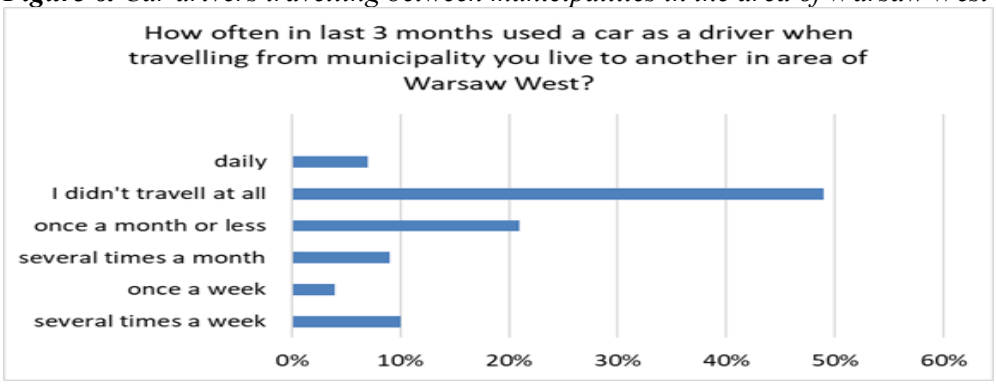
Figure 5. *Travelling on foot during last 3 months in the municipality where respondents live*



Source: *City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

Taxi was only used while travelling in own municipality once a month or less by 23% respondents, rail was used daily by only 4%, regional buses not used by 73% and scooter nor mopeds not used by 84%. Second set used the same questions as in first one but referred to travelling between 7 municipalities (from one to another).

Figure 6. *Car drivers travelling between municipalities in the area of Warsaw West*



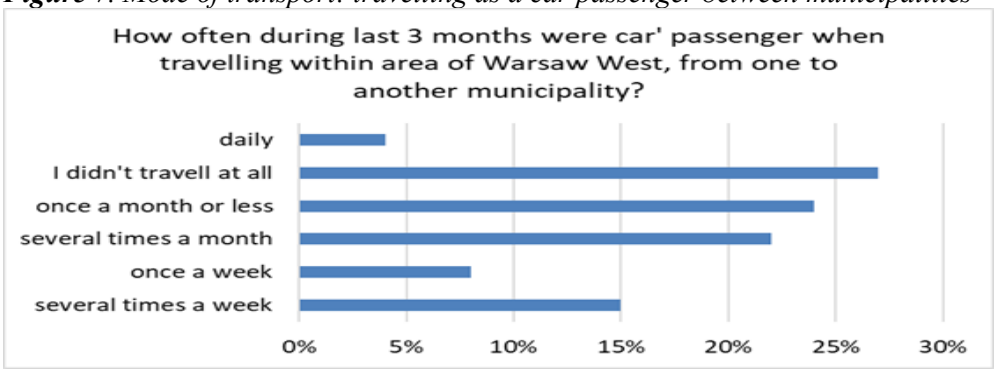
Source: *City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

Answers related travelling with a car as a driver outside own municipality between 7 municipalities indicated almost 50% of drivers did not travel this way. There is a high dependency on travelling a passenger car as a driver both in own and outside municipality you live. But using others peoples passengers cars and travelling car as a passenger between municipalities happened more often than in own community (Figures 6 and 7).

Questioned inhabitants of 7 municipalities mostly in 65% not used public transport when travelling between municipalities. Only 3% of respondents travelled this way daily and 11% of them several times a month. This indicated low level of public bus service between municipalities which is compensated by travelling a car as a

passenger. This mode of transportation was extremely popular; indicated irregularly travellers (73%) as a passenger in somebody' car with different frequency.

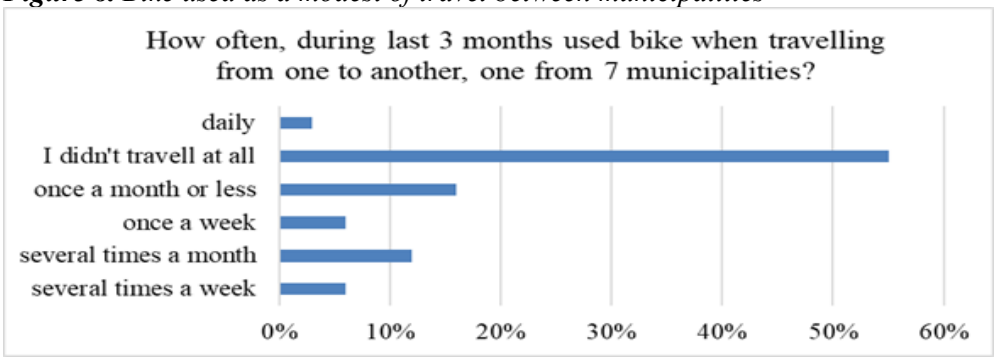
***Figure 7**. Mode of transport: travelling as a car passenger between municipalities*



***Source:** City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

When travelling between municipalities in Warsaw West 78% of respondents did not use railway at all (only 6% did it regularly/ daily). No travelling with local/regional buses declared 81% of questioned. Using Taxi is not popular either (81%), one a month or less did only 15%.

***Figure 8.** Bike used as a modest of travel between municipalities*



***Source:** City Hall in Lomianki prepared by Polish Road Safety Observatory, 2021.*

Bike cycling was not popular when travelling between municiplaties (more than 50% did not cycled at all) (Figure 8) neither scooter nor mopeds (97% did not travel scooter or mopeds at all). This could indicate unsafe and low infrastructure for vulnerable road users as pedestrians, cyclists, motorcycles, and scooter riders resulted low mobility of those groups while travelling between munipalities.

Biking in own municipality shows irregularly, 73% cyclists used to cycle around places they live. No travelling by foot was declared by 65% of respondents (daily only 4.5% travelled by foot). Other set of questions referred to some statements describing overall 14 transport situation which required respondents' agreements or

disagreements: pro or contra statements (agreement/disagreement; strong, rather, no opinion).

The results showed that 74% of respondents rather and strongly agreed that new road infrastructure should be built and new ones should solve traffic jams problems. Passenger car' strongly and rather dependency declared 54% of drivers, even if it caused traffic jams. 40% of respondents agreed versus to 40% strongly and rather disagreed that without a passenger car, they would not be able to get to work.

To 48% respondents' public transport was available to their home or work, but in opinion of 64% respondents operating hours were rarely, 41% of all respondents declared it was not expensive, but 30% strongly or rather agreed it was expensive. Opinions about bike' infrastructure showed that 72% of respondents rather and strongly agreed that the network of bicycle paths was too poorly developed and 69% (strongly and rather) agreed that there were no safe paths for bicycles and there was a shortage of racks and shelters for bicycles 46%.

As for road safety is concerned 80% of all respondents indicated (strongly or rather) need of limiting noise related to traffic and accidents on roads. Rating of the transportation system in the Warsaw West functional area indicated that only 1% of respondents rated as a particularly very good, good (22%), satisfactory (19%) and less than satisfactory 50% and poor (7%).

The last set of questions in online survey for identifying needs and problems of mobility, environmental protection for better life in Warsaw West functional area was about ability to change own' travel preferences/ behaviours. The online survey conducted in early 2021 among residents of the Warsaw West functional area provided essential diagnostic insights into everyday mobility behaviours, transport preferences, and attitudes toward sustainable urban mobility.

With 177 participants from seven municipalities and three counties, the data collected allowed for an in-depth assessment of transport modes used within and between municipalities, frequency of travel, public transport accessibility, cycling and walking infrastructure, and residents' willingness to change their travel behaviours. Despite being based on data from 2021, the findings remain highly relevant. These results were gathered during the preparatory phase of the Sustainable Urban Mobility Plan (SUMP) and were intended as the foundation for strategic planning and long-term decision-making.

At that time, the COVID-19 pandemic necessitated online data collection and limited the possibility of broader field research. Nonetheless, the responses captured a representative snapshot of mobility patterns and residents' perceptions during a key period of policy formulation. It is important to emphasize that the core purpose of the survey was to serve as a baseline diagnostic tool—not to measure the current state of mobility, but rather to identify key areas for intervention and improvement.

Therefore, the analysis focuses on the residents' needs, challenges, and preferences expressed during the planning phase. While it is recognized that mobility patterns may have evolved since 2021 due to external factors such as post-pandemic recovery, infrastructure investments, or demographic shifts, no comparable and comprehensive follow-up data has yet been collected across all seven municipalities.

For this reason, the original dataset remains the most complete and cohesive source of information for understanding the initial conditions under which the SUMP was developed. Future evaluations of the SUMP implementation should incorporate updated data, enabling longitudinal comparisons and impact assessments. However, this article remains focused on the planning context, highlighting the foundational role of community engagement and early diagnostics in shaping sustainable mobility strategies.

4. Conclusions

Changing travel and transportation systems for the safety and health of residents require planning, investments, and financing, ultimately leading to changed urban mobility behaviours. Toward cleaner, safer, zero-emission transport, it is necessary to shift away from old, less sustainable transportation habits. Education and raising awareness among residents remain crucial phases in the implementation of SUMP.

Since 2021, several infrastructure projects in Warsaw have already been initiated: modernisation of Warszawa Zachodnia station with improved public transport access, new bicycle paths (e.g., along Solidarity Avenue and Leszno Street), and expansion of tram lines. These investments provide updated contexts for what residents in 2021 had declared as their needs.

According to the 2021 survey, 83% of respondents expressed readiness to change their transport behaviour if certain improvements were made: better public transport services with reliable inter-municipal connections and priority bus lanes; integrated multi-modal hubs; more bike paths; expanded city bike station infrastructure.

However, as of 2025, although some of these elements are being addressed, many remain only partially implemented. National statistics show a continuing decline in road deaths in Poland since 2019, with the fatality rate dropping by about 35%. This indicates progress in road safety policies which may reinforce residents' willingness to shift toward safer modes like walking and cycling.

For future SUMP updates, it is recommended to repeat the survey using consistent questions from 2021, supplement it with objective data (traffic counts, public transport ridership, accident records, air quality), and monitor whether declared intentions have translated into real behaviour change. Only in that way will the city halls be able to better respond to mobility needs, improve road safety, reduce emissions, and enhance quality of life.

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