🏆 reviewed paper

Mobility Inequality in a Small Town in Central Poland. The Case Study of Zgierz

Bartłomiej Olczak

(MSc E. Bartłomiej Olczak, Lodz University of Technology, Staffa 1/38 95-100 Zgierz, bartlomiej.olczak.1@dokt.p.lodz.pl)

1 ABSTRACT

Over the past decades, the number of cars has been increasing around the world rapidly. In effect, the demand for road space and space for parking has also been growing. At the same time, especially in town centres, space is limited, which leads to many urban conflicts.

Our cities are automobile-dependent, which means that transportation and land use patterns favour car users and at the same time create less accessible circumstances for other means of transport, particularly for pedestrians and cyclists. It excludes vulnerable and marginalised groups and harms the majority of inhabitants.

There is a need for a different distribution of the forms of mobility, in particular in terms of sustainable development and climate change mitigation.

It finds confirmation in many European agreements. The European Union has been dealing with sustainable development and mobility for several years. The results of it are the Green and White Papers. The newest documents like the European Green Deal and the New Leipzig Charter focus on sustainable transformation, which leads to climate neutrality. The main aim is to make cities inclusive, safe, resilient, and sustainable. It also concerns the topic of urban mobility.

In Poland, transport problems began to increase in the second half of the 20th century. The transition to a market economy led to the decapitalization of transport networks. As a result, differences between regions increased and the accessibility of many areas in the national and European systems deteriorated. The problem concerns especially small towns, where the resignation from public transport is common. and leads to exclusion.

Zgierz is a town located in central Poland, in the vicinity of Lodz, the third-largest city in the country. Due to the collapse of the textile and chemical industries, Zgierz faced the need to transform its economic profile, which it has not dealt with yet. Moreover, the negative impact of transportation compounds the effect of the degradation. The problem is the most visible in the centre area due to the radial layout of streets and the lack of ring roads.

This study examines the negative impact of transport and mobility inequality in a small town in Poland. Using the case study method it identifies diverse aspects in which users of different means of transport are not treated equally. It analyses traffic congestion, demand for space, barriers in public spaces, road safety and air pollution. It also compares the results of analyses with European guidelines and offers some key recommendations.

Keywords: sustainable development, mobility inequality, urban mobility, climate change, small town

2 INTRODUCTION

The need for inclusive, safe, resilient, and sustainable cities is emphasised in the 2030 Agenda for Sustainable Development. Overcoming mobility inequalities is connected to at least 4 of 17 set goals – good health and well-being (SDG 3), gender equality (SDG 5), reduced inequalities (SDG 10) and sustainable cities and communities (SDG 11). It also finds confirmation in many other documents, such as the New Urban Agenda, the Paris Agreement, the European Commission's Green Deal and the New Leipzig Charter. In order to achieve the set goals, the need for a better understanding of mobility inequality is one of the critical elements.

In Poland, transport problems began to increase in the second half of the 20th century. The transition to a market economy led to the decapitalization of transport networks. As a result, differences between regions increased and the accessibility to many areas in the national and European systems deteriorated. Also, due to the technical condition of regional roads and tracks, the accessibility to public services worsened. The problem particularly concerns small towns, where the resignation from public transport is common and leads to exclusion (Koncepcja Przestrzennego Zagospodarowania Kraju, 2012).

ISBN 978-3-9504945-0-1. Editors: M. SCHRENK, V. V: POPOVICH, P. ZEILE, P. ELISEI, C.BEYER, J. RYSER, G. STÖGLEHNER

Despite the collapse in the early 1990s and the lack of investment, the mobility and transport of goods increased. As a result, the environment and road infrastructure suffered and the number of accidents increased. The more environmentally-friendly railway has also lost its position. It is no longer a competition for road transport. Moreover, the independent development of individual forms of transport led to the lack of connections between them (Koncepcja Przestrzennego Zagospodarowania Kraju, 2012).

Year	2000	2005	2010	2015
The average daily annual traffic of motor vehicles	7009	8244	9888	11178

Table 1: The average daily annual traffic of motor vehicles on national and voivodeship roads. Source: own table based on Generalny Pomiar Ruchu.

Based on the data collected by the General Directorate for National Roads and Motorways, during the General Traffic Measurement carried out every five years, it is possible to observe the traffic intensity on national and voivodeship roads. In 2015, the average daily annual traffic of motor vehicles was 11,178 vehicles/day, 13% higher than in 2010. The most significant increase in traffic was among trucks with trailers (18%), passenger cars (17%) and motorcycles (15%). In 2010-2015, there was an increase in traffic on national roads in all voivodeships. However, the highest was recorded in the Lodzkie Voivodship, by 26%. These changes were caused not only by the actual increase in traffic but also due to the construction of new road sections such as the A1, A2 motorways or the S8 expressway (Generalny Pomiar Ruchu, 2016).

3 METHODOLOGY

Case study research helps to understand reality, which is nuanced and based in a concrete context. Some processes, especially connected to human behaviour, cannot be described as predictive theories and universals (Flyvbjerg, 2006). The most considerable value of this method is giving special attention to what has actually happened in a given setting and how. This method has a practical value for practitioners, providing data and understanding complex urban processes and relations (Duminy, 2015).

This study adopts a case study method approach to investigate and better understand processes connected to transport patterns leading to mobility inequalities in a small town in central Poland against the backdrop of international documents mentioned above. The first part of the research describes specific conditions in Zgierz, such as spatial structure and road layout. After that, considerations on the consequences of the current situation and the associated nuisances contributing to mobility inequality were discussed. Direct factors such as congestion, land consumption, spatial barriers, safety and air pollution were considered. Based on the available materials related to the conditions in the town, such as reports, databases and thematic maps, and observations and field inventory results, an assessment was made of the impact of transport on mobility inequality in Zgierz. The final part of this study includes conclusions of the findings and some key recommendations.

4 CASE STUDY

4.1 About Zgierz

Zgierz is a town located in central Poland, in the neighbourhood of Lodz, the third-largest city in the country. Due to the collapse of the textile and chemical industries, Zgierz faced the need to transform its economic profile, which it has not dealt with yet. As a result, many post-industrial areas located in the centre are currently unused and contribute to decreased attractiveness. Besides, the negative impact of transportation compounds the effect of the degradation. The problem is mostly visible in the centre area due to the radial layout of streets and the lack of ring roads. The cars' domination in urban space contributes to the aggravation of negative phenomena and prevents the proper functioning of the centre of Zgierz, leading to its collapse.

4.1.1 The road system

The road system in Zgierz is the result of historical connections with neighbouring cities. They form a radial network, the meeting point of which is the town centre (Figure 1). The lack of ring roads and the radial layout makes it necessary to drive through the centre each time, regardless of the destination. It leads to the accumulation of negative impact of transport in the historical part of the town and puts pressure on the environment.

One of the main problems of the transport system in Zgierz is that main national roads run through the town and cross each other in the centre. At the same time, they are one of the most congested roads in Poland. The possibilities of transformation are limited due to external factors, such as road parameters regulations, as well as internal ones, such as the historic urban layout and the current investment. Furthermore, rebuilding these roads would not significantly improve their functioning or eliminate their negative impact (Studium, 2015).

The construction of the bypass system is seen as a solution to a conflict situation. The already completed A1 motorway and the planned S-14 expressway could successfully transfer transit traffic currently running along national roads through the town centre. This situation would allow to adjust the rank and class to the current parameters and adapt to the streets' character in the town centre (Studium, 2015).

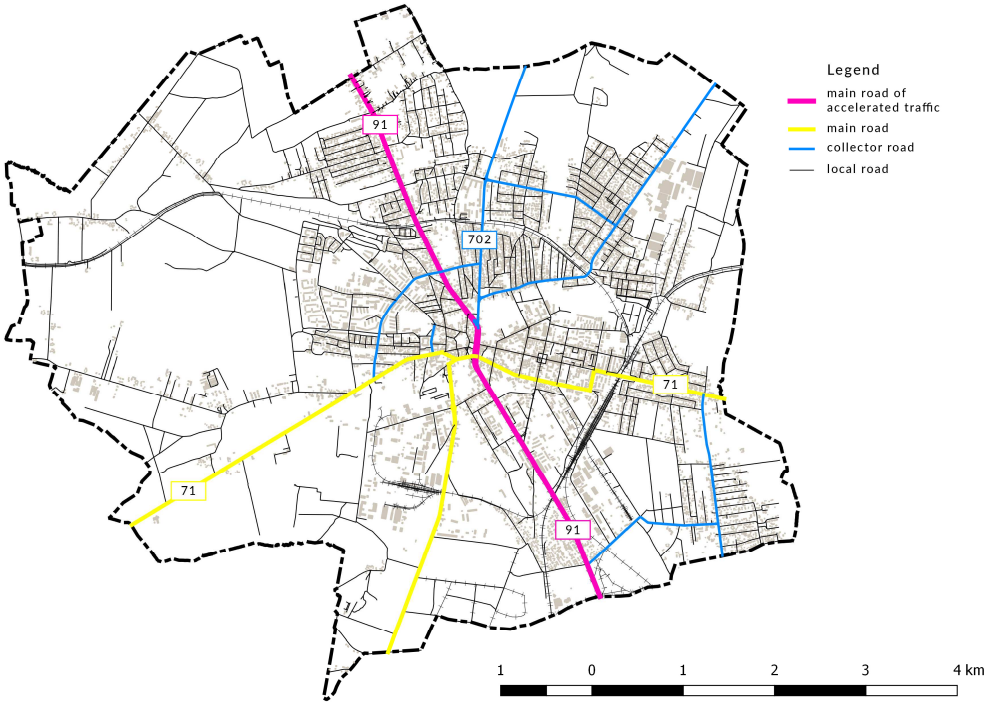

Fig. 1: Road classes in Zgierz. Source: (Olczak, 2019) based on (Studium, 2015) and (Geoportal Województwa Łódzkiego).

In Zgierz, the General Traffic Measurement is the only current source of information about the number of vehicles on the road. Due to the fact that both national roads as well as the only voivodeship road run and intersect in the very centre of town, this gives a certain picture of the traffic intensity.

Measuring point	Road number	Number of vehicles			
		2000	2005	2010	2015
1	91	19213	18684	19980	18114
2	91	24725	26185	25551	27641
3	71	-	11229	11430	11093
4	71	3176	3998	5617	7977
5	702	-	-	17447	16751

Table 2: Average daily annual traffic at measuring points on national and voivodeship roads running through Zgierz in 2000-2015. Source: own table based on Generalny Pomiar Ruchu.

The above data (Table 2) shows that the national road No. 91 has been the most heavily burdened by traffic for many years. Additionally, the traffic on this route has been constantly increasing. Moreover, on the route from Aleksandrów Łódzki (national road No. 71), the number of vehicles has increased by 42% in 2010-2015. In other cases, the traffic was reduced by a few percent. Far more vehicles travel north-south on national road No. 91 than east-west on national road No. 71.

The dominant means of transport on all the routes studied were passenger cars (Table 3), which accounted for over 80% of all vehicles. A significant group on the route to Aleksandrów Łódzki (measuring point 4) were lorries with trailers, their share at the level of over 17%. A comparable value was also recorded on the national road No. 91 at the measuring point 1 – over¬ 10%. In the remaining cases, both lorries with and

ISBN 978-3-9504945-0-1. Editors: M. SCHRENK, V. V: POPOVICH, P. ZEILE, P. ELISEI, C.BEYER, J. RYSER, G. STÖGLEHNER

without trailers accounted for a few percent of the share (about 1-6%). Light trucks (delivery vans) constituted a significant group of a few percent share (about 5-10%). Among the other means of transport, a small share, less than a percentage, was recorded.

Measuring point (Road number)		1 (91)		2 (91)		3 (71)		4 (71)		5 (702)	
Motorcycles		64	0,35%	128	0,46%	48	0,43%	21	0,26%	117	0,70%
Passenger cars		14540	80,27%	23203	83,94%	8945	80,64%	5496	68,90%	14272	85,20%
Light trucks		1268	7,00%	1712	6,19%	1024	9,23%	652	8,17%	938	5,60%
Lorries	Without trailer	291	1,61%	911	3,30%	442	3,98%	376	4,71%	268	1,60%
	With trailer	1859	10,26%	1561	5,65%	500	4,51%	1387	17,39%	1039	6,20%
Buses		86	0,47%	124	0,45%	131	1,18%	41	0,51%	117	0,70%
Tractors		6	0,03%	2	0,01%	3	0,03%	4	0,05%	0	0,00%

Table 3: Average daily annual traffic at measuring points on national and voivodeship roads running through Zgierz in 2015. Source: own table based on Generalny Pomiar Ruchu.

4.1.2 Urban structure

The town centre of Zgierz consists of two-parts – historical with buildings from the beginning of the 19th century and historic urban layout and a modern one with blocks of flats. The axis of the entire downtown layout is Długa Street, along which a large part of public institutions and various services are located (Studium, p. 97).

An essential element of the urban structure of Zgierz is also the 650th Anniversary Housing Estate located to the west from the town centre. It is inhabited by nearly 40% of all inhabitants of the town and is a competitive area for the town centre.

A huge problem of the town centre is the lack of a coherent spatial structure and gaps in development. The value of the areas in the centre and the sense of identity are too low to counteract the deconcentration and the progressive urban sprawl effectively. The urbanisation process is incredibly intensive in the northern, northeastern and eastern parts of the town (Studium, 2015, p. 93). There is also no intention to intensify the use of the centre. One of the reasons may be the growing demand for space dedicated to cars and habits of both decision-making groups and the residents, which oppose any attempts to limit the availability of cars (Wesołowski, 2008, p. 40).

The designation of new non-urbanised areas for development planned in the Studium may contribute to further progress of the suburbanisation process. Consequently, it leads to deterioration in the accessibility of services and transport, and thus the dependence on cars of the inhabitants of peripheral areas.

5 INEQUALITIES

5.1 Automobile dependency

This term refers to transport and land-use patterns that are privileging car users and at the same time creating less accessible circumstances for other means of transport, especially pedestrians and cyclists (Victoria Transport Policy Institute, 2016). Shopping centres are a great example of this problem but it also applies to municipal offices.

In Zgierz, most offices and institutions (66,7%) are located in the town centre (Figure 2). Therefore they are available to motorists, pedestrians, cyclists and public transport users. However, some objects of this type (33,3%) are located further from the centre. Their surroundings do not indicate that it is an essential public facility. In their vicinity, extensive single-family housing, industrial facilities, and even open areas are located. Reaching these offices by public transport is significantly tricky because they are located further from main roads and only low-frequency buses stop in the area. However, parking spaces are provided for each of them. Moreover, these offices are at great distances from each other.

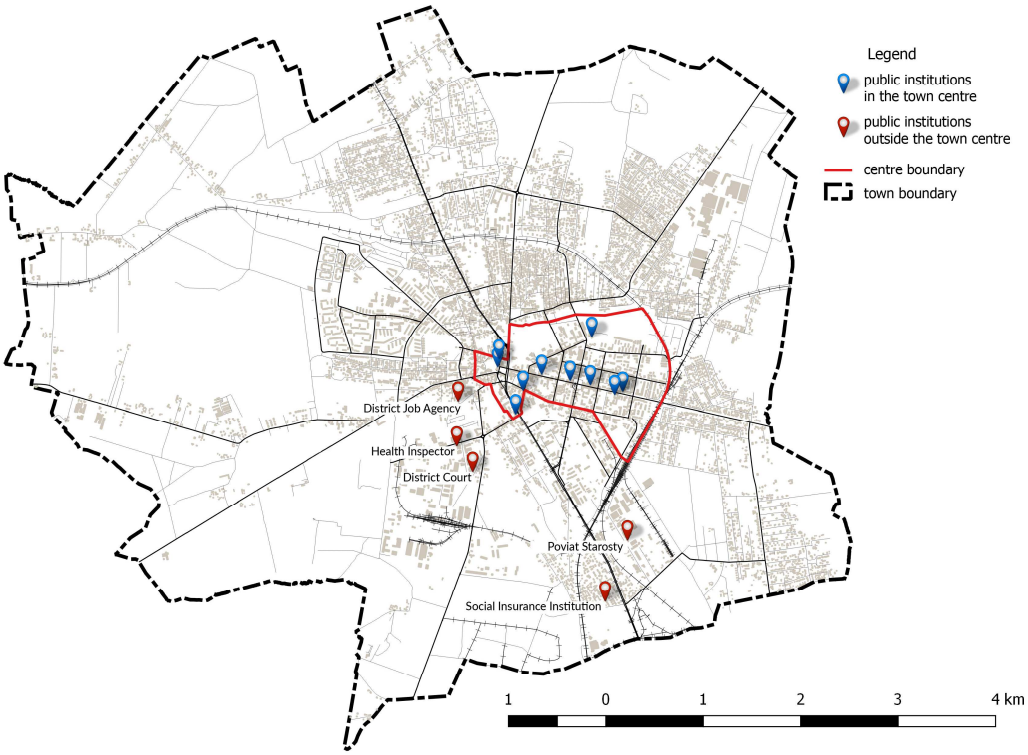

Fig. 2: Location of public institutions in Zgierz. Source: (Olczak, 2019).

5.2 Demand for space

The demand for road space and space for parking is growing. At the same time, space is limited, especially in town centres. Dedicating this much space to cars is a very ineffective way of land use because cars are only actively used for a minimal time and, in most cases, only by one person. Due to limited parking space, car users leave their vehicles on pavements, lawns or crosswalks. Space dedicated to pedestrians or cyclists, which is very limited right now, is even more reduced. Inequality in space distribution is a big problem in towns. Especially in town centres, it is crucial to allocate space in favour of efficient transportation.

5.2.1 Parking space

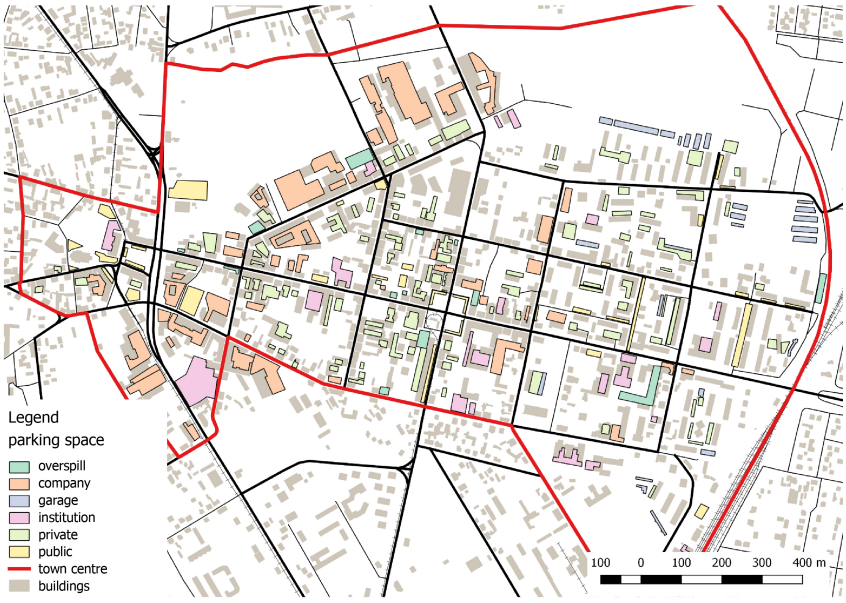

Fig. 3: Parking space in the centre of Zgierz. Source: (Olczak, 2019).

The biggest problem with parking in Zgierz is the area it occupies and the way it is organised. In addition, drivers appropriate space to park illegally in places not intended for this, such as lawns or pavements. In many locations where cars are parked, there should be buildings or greenery.

ISBN 978-3-9504945-0-1. Editors: M. SCHRENK, V. V: POPOVICH, P. ZEILE, P. ELISEI, C.BEYER, J. RYSER, G. STÖGLEHNER

The pavements are also occupied by cars, making it difficult for pedestrians. Often this is the case with wide streets with little traffic, where parking space could be located within the street. However, the lack of designated places leads to cars parked in the space dedicated to pedestrians.

Additionally, the lack of a parking policy contributes to the escalation of the problem in the centre of Zgierz. Parking in the entire town is free, which only encourages the use of cars. Moreover, the lack of reaction to illegal parking on pavements or undeveloped plots gives drivers a sense of quiet consent.

5.2.2 Roads

Roads in the town centre also occupy a significant area. According to the law, the maximum width for roads class Z, L and D can be broadened to 3.50 m if it results from the traffic forecast. The regulation also allows reducing by 0.25 m the values given in the table for traffic calming. However, in Poland, it is common that roads have the maximum permissible width of lanes, and often even wider ones, regardless of their class or traffic intensity.

Road class	GP and G	Z	L	D
Minimal width of lane	3,50 m	3,00 m	2,75 m	2,50 m

Table 4: Minimal width of lane. Source: own table based on Rozporządzenie.

In addition, the space dedicated to cars is not fully used. In many places, despite the broad streets, parking takes place entirely or partially on sidewalks, additionally appropriating the space intended for pedestrians.

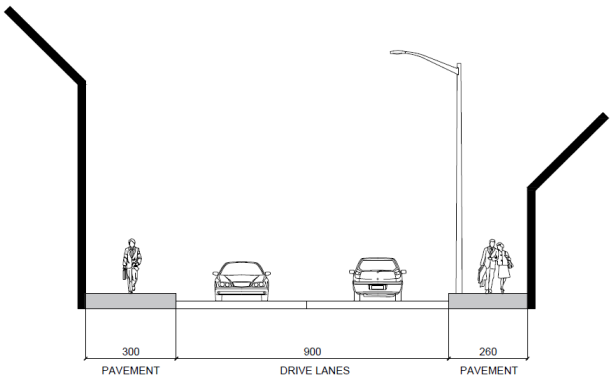

Fig. 4: Street section – Długa street in Zgierz. Source: (Olczak, 2019).

Długa Street (Figure 4), which is the representative space of the town, is 9 m wide, thus significantly exceeding the norms specified in the regulation. There are two lanes within the road and nothing else. However, the width would allow for the separation of parking spaces, greenery or bicycle lanes. The pavements on Długa Street are relatively wide, but there is often infrastructure such as lamps or road signs, which reduce the space on some fragments. Additionally, the pavement space is often occupied by parked cars.

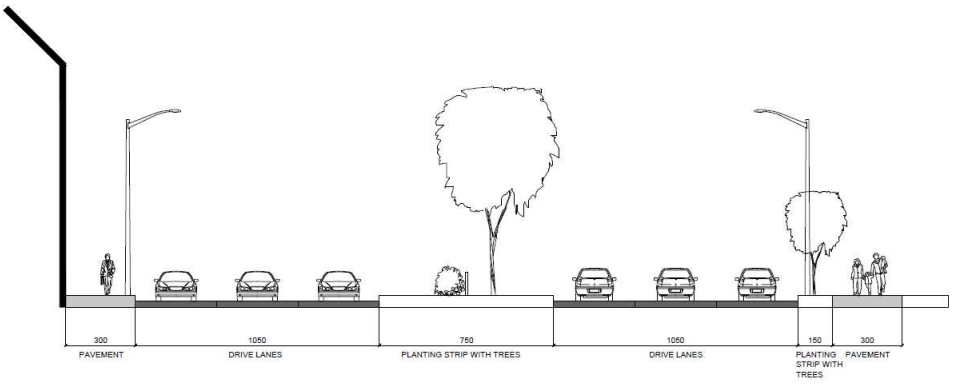

Fig. 5: Street section – the national road no. 91 in Zgierz. Source: (Olczak, 2019).

It is also worth paying attention to the national road no 91 (Figure 5), which runs through the town centre, cutting it into two parts. At the town entrances, both from the south (towards Łódź) and the north (towards Gdańsk), it has a single carriageway with two lanes. In the vicinity of the centre, it widens to 4 lanes, 2 in

each direction. The section running directly through the centre has a 2x2 section – 2 roadways with two lanes each. In addition, there are also left-turn lanes and a green belt, which separates both roadways. The road covers a large area and is a spatial barrier that separates the town's structure. It cuts the centre into two separate entities, leaving them unconnected. In addition, due to its width and traffic congestion, this road is an obstacle for pedestrian traffic. To get to the other side of the road, pedestrians have to cover about 30 m. Also, other roads in the centre are barriers to pedestrian traffic. Although their parameters are much smaller – 1x2 (one road with two lanes), they are still very broad (8-9 m wide) and the traffic congestion is very high.

5.3 Road safety

In 2016, 3,026 people died on Polish roads, which accounted for almost 12% of all victims in the European Union. Poland is therefore one of the leading countries, with the highest number of deaths. In addition, the following countries on the list have over a thousand deaths less. (CARE database). In 2015, 915 pedestrians died on Polish roads. Although within ten years (2006-2015) this number has been reduced by half, Poland is still in the infamous first place among the European Union countries, overtaking other countries by nearly 300 victims. Also, with regard to cyclists, Poland ranked high, with the number of victims of 300 in 2015, overtaken only by Denmark (European Road Safety Observatory, 2017).

Almost 87% of road incidents in Zgierz are the fault of the vehicle driver. In addition, they are responsible for 69% of the deaths, 78% of the seriously injured and 85% of the lightly injured. Apart from vehicle collisions, collisions with pedestrians are the most common type of event - 480 events. Many accidents also occur at pedestrian crossings. Moreover, failure to prioritise pedestrians is the most common cause of fatal accidents and severe and slight injuries (SEWiK).

In Zgierz, pedestrians are the largest group of fatalities and are more likely to be severely injured in accidents. The most significant number of deaths among pedestrians was recorded in the over 50 age group, and especially in the over 70 group. In turn, fatalities among vehicle drivers are much younger – under 40 years of age (SEWiK).

The most dangerous roads are located in the town centre. Although the most significant number of incidents (Figure 6) takes place on Łódzka Street (61% more incidents than on Długa Street), the most significant number of victims was recorded on Długa Street (46% more injured than on Łódzka Street). The representative Zgierz street leads in terms of the number of injured, lightly and severely, and fatalities. In addition, the number of casualties significantly exceeds the figures recorded in other streets - 36% more lightly injured and 78% more seriously injured than on the second-ranked streets (SEWiK).

If we look at pedestrian safety (Figure 7), the most significant number of pedestrian incidents also occur in the town centre. Pedestrians were about 50% of all victims (Długa Street - 56.4% and 1 Maja Street - 46.2%) (SEWiK).

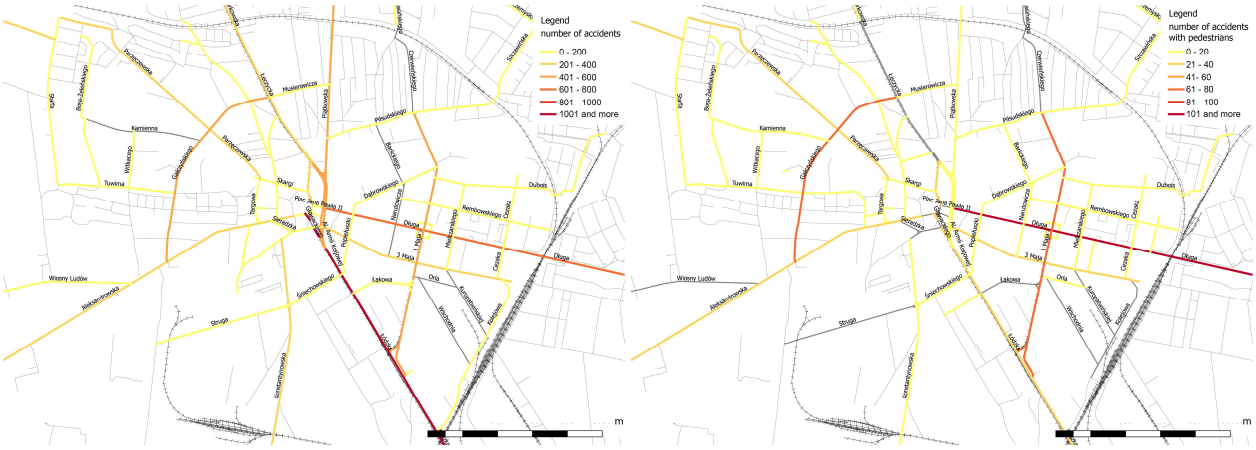

Fig. 6-7: The number of car accidents in total (left) and with pedestrians' involvement (right) in Zgierz in 2007-2017. Source: (Olczak, 2019) based on (SEWiK).

5.4 Air quality

The monitoring results clearly show the growing impact of road transport on the deteriorating air condition. When looking at the reports from the only measuring station in Zgierz (Figure 10) and comparing the PM10

ISBN 978-3-9504945-0-1. Editors: M. SCHRENK, V. V: POPOVICH, P. ZEILE, P. ELISEI, C.BEYER, J. RYSER, G. STÖGLEHNER

and PM 2,5 measurement results with Polish (solid line) and European standards (dashed line) (Figure 8-9), significant discrepancies can be noticed. If national limit values are used, bad or very bad air condition is recorded only a few times a year. On this basis, it can be concluded that air pollution in Zgierz is not severe. However, according to European standards, the situation in the town is much worse again. Transgressions are recorded for a significant part of the year. This means that residents breathe poor or very poor quality air most of the time, which can pose a severe health risk, especially to children, the elderly, and pregnant women.

It should also be emphasised that the measuring station is located in the eastern part of the town centre, surrounded by blocks of flats, at a considerable distance from the roads with the highest traffic. This may translate into incomplete accounting for pollutants of transport origin. Therefore, it should be assumed that the actual air pollution near roads may be significantly higher.

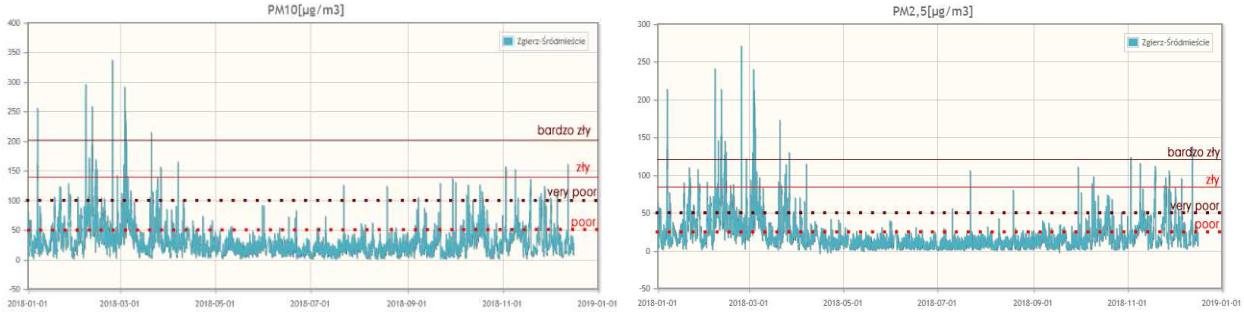

Fig. 8-9: PM10 (left) and PM2,5 (right) measurement results at the Zgierz station in 2018. Source: Wojewódzki Inspektorat Ochrony Środowiska.

6 DISCUSSION

6.1 Automobile dependency

The location of offices in Zgierz is in contradiction with the idea of the compact city. The dispersion of public administration facilities beyond central areas limits individual transport mobility options. For a person who does not have a car and has several official matters to deal with in one day, the route between the facilities can be challenging and time-consuming. It creates mobility inequalities and can lead to social exclusion for vulnerable and marginalised groups such as the elderly or disabled people.

6.2 Demand for space

Roads located in the centre of Zgierz are designed in the cars' favour. In effect, it limits transport options for citizens without cars. It is worth paying attention to how unevenly distributed space is to the needs of different traffic users. Pedestrians, cyclists and even public transport users are put in a worse position. Walking between parked cars is a barrier and obstruction to pedestrians, especially for vulnerable groups such as the elderly, disabled people or people with small children. It is also worth noting that vehicles parked on the pavements reduce the visibility of both pedestrians and drivers, which may also increase dangerous situations on the road.

Furthermore, roads, especially those with heavy traffic, are also barriers in spatial and social terms. They are hindering the development of outdoor activities, neighbourly contacts and freedom of movement. Spatial barriers can also have a significant impact on transport decisions made by residents.

The national road No. 91 – Łódzka Street brings the most negative spatial consequences for the central area. It reaches the largest size, occupying a large area, separating the town structure and creating a spatial barrier, mainly for pedestrians.

6.3 Road safety

Road transport is the most dangerous of all of the modes. Even though everyday people are dying or being injured in car accidents, we seem not to see the problem and treat it as a natural consequence of using cars. As a result, car users are more privileged than pedestrians, who are primarily casualties. This situation is also generating costs for the whole society.

It should be emphasised that, contrary to popular belief, the victims of accidents are not usually drunk or invisible pedestrians and cyclists. On the contrary, often children or the elderly are among the victims. Most of the incidents occur mainly during the day on newly built or modernised roads. In the case of pedestrians on sidewalks and crossings, they should theoretically feel safe.

The level of safety on the streets of Zgierz, as in the rest of Poland, is too low. In particular, the unprotected road users, i.e., pedestrians and cyclists, who cannot feel safe even in their designated areas (sidewalks, pedestrian crossings or bicycle lanes), are at risk. Also, the spatial distribution of both the number of incidents and victims indicates that the town centre is the least secure space. On the other hand, road safety also has a massive impact on the choice of means of transport.

It is also worth paying attention to the massive number of events on Długa Street, the town's representative street. It ranks second in terms of the number of accidents in the town but it is also the most dangerous for pedestrians. On the one hand, it plays a vital role in the centre by concentrating the activity of residents. At the same time, there is heavy traffic on it, leading to conflict situations. Undoubtedly, the intensity of traffic on Długa Street and the high risk of an accident translate into unfavourable conditions for other than cars modes of transport.

6.4 Air quality

Based on air quality measurements from the only one station in Zgierz, it can be concluded that the level of pollution in Zgierz poses a severe threat to the health of its inhabitants. Numerous transgressions of the acceptable standards, both European and World Health Organization, and much less restrictive Polish, indicate the need to improve air quality. In particular, more than 40,000 premature deaths occur annually in Poland due to air pollution (European Environment Agency, 2017). Even though cars are responsible for a significant part of the emissions in the urban area, all citizens have to deal with its adverse effects. In this case, individual transport is privileged because we often do not think about external costs connected to it, for example, polluting the air.

6.5 Recommendations

A proven method of achieving equal mobility is using the push-pull method, on the one hand, introducing restrictions primarily for the use of cars, on the other hand, incentives in the form of, e.g., efficient public transport. However, the implementation of the idea of sustainable mobility should be carried out in a balanced way. Choosing a car as a means of transport is supposed to be an option, not a necessity.

Promoting the idea of sustainable mobility should therefore take place through appropriate shaping of transport behaviour. For this purpose, soft transport should be given preference by providing the shortest route for cycling and walking. This means shaping the infrastructure that prioritises users traveling in this way. The advantageous route should also be provided to public transport. However, individual transport should receive the least priority. Such thinking about shaping transport in the city is a manifestation of the push-pull method.

Actions to change the transport behaviour of residents should also be followed by architectural and urban solutions aimed at restoring the original functions of the street, i.e., public space lost as a result of uncontrolled expansion of the car. High-quality and well-functioning public space can also be a form of compensation for limitations in the use of individual transport.

Recommendations and suggestions for improving mobility equality in Zgierz:

- Intensify the development of the centre of Zgierz and limit the urban sprawl.
- Make the location of new buildings dependent on the possibility of using public transport.
- Provide an attractive public space in the centre to restore social functions to streets and squares.
- Provide the appropriate width of the pavement, including convenient conditions for stopping and resting, especially important in the context of older people, children and people with reduced mobility.
- Ensure space continuity and reduce spatial barriers and hazardous locations.
- Eliminate parking on pavements, thus reclaiming space for pedestrians.

ISBN 978-3-9504945-0-1. Editors: M. SCHRENK, V. V: POPOVICH, P. ZEILE, P. ELISEI, C.BEYER, J. RYSER, G. STÖGLEHNER

- Introduce traffic calming in the centre area – c¬ombine policy solutions, such as a speed limit of 30 km/h or the introduction of equivalent intersections, with engineering solutions – r¬oad narrowing, speed bumps or chicanes.
- Develop the bicycle infrastructure.
- Integrate public transport systems.
- Adapt the accessibility of public transport to the needs of elderly and disabled people.
- Give priority to public transport in road traffic.
- Introduce parking fees as an instrument to ensure the rotation of parking spaces in the town centre.
- Maintain or reduce the number of parking spaces while eliminating illegal parking.

7 CONCLUSION

Transport not only influences climate change but also introduces inequalities between the different users of the city. The privileging of cars, which takes advantage of their appropriation of space, leads to restricting the freedom of movement of other users.

In particular, much more attention should be paid to a more equitable distribution of space in the centre, emphasising soft transport - pedestrian and bicycle. A significant part of the transport area could be successfully recovered and used for other purposes, such as infrastructure for walking and cycling. The lack of an appropriate setting in the form of small architecture or greenery and appropriate pedestrian and bicycle infrastructure translates into unfavourable conditions for other than cars modes of transport.

In this case, providing safe, affordable, accessible and sustainable transport systems for all has not been achieved yet. It would not be possible without changing the way of thinking about transport and introducing solutions for improving the situation of pedestrians, cyclists and public transport.

8 REFERENCES

CARE DATABASE. European Commission. Source: https://ec.europa.eu/transport/road_safety/specialist/statistics_en.

DUMINY James. Using the case study approach to inform planning practice and research in Africa. In: Silva E.A., Healey P., Harris N., Van den Broeck P. (Eds.) The Routledge Handbook of Planning Research Methods. Routledge, pp. 440-448, New York and London, 2015.

EUROPEAN ENVIRONMENT AGENCY. Air Quality Index. 2017. Source: https://www.eea.europa.eu/themes/air/air-quality-index.

EUROPEAN ROAD SAFETY OBSERVATORY. Annual Accident Report 2017. European Commission, 2017.

FLYVBJERG Bent. Five Misunderstandings About Case-Study Research. In: Qualitative Inquiry Vol. 12 Number 2, pp. 219-245, 2006.

GEOPORTAL WOJEWÓDZTWA ŁÓDZKIEGO. Source: http://geoportal.lodzkie.pl/imap/.

GENERALNY POMIAR RUCHU. Generalna Dyrekcja Dróg Krajowych i Autostrad. Generalny Pomiar Ruchu. Source: https://www.gov.pl/web/gddkia/generalny-pomiar-ruchu.

GENERALNY POMIAR RUCHU. Synteza wyników GPR 2015 na zamiejskiej sieci dróg krajowych. Generalna Dyrekcja Dróg Krajowych i Autostrad, Warszawa 2016.

KONCEPCJA PRZESTRZENNEGO ZAGOSPODAROWANIA KRAJU. 2012.

OLCZAK Bartłomiej. Transport a ożywianie centrów miast. Analiza na przykładzie Zgierza [Tansport and city centre regeneration. The case study of Zgierz]. Łódź 2019.

ROZPORZĄDZENIE. Rozporządzenie Ministra Transportu i Gospodarki Morskiej. z dnia 2 marca 1999 r. w sprawie warunków technicznych, jakim powinny odpowiadać drogi publiczne i ich usytuowania (Dz.U. 2016 poz. 124).

SEWiK. System Ewidencji Wypadków i Kolizji. Source: http://sewik.pl/search.

STUDIUM. Studium uwarunkowań i kierunków zagospodarowania przestrzennego miasta Zgierza. Zgierz 2015.

UNGA. United Nations General Assembly. Transforming our world: the 2030 Agenda for Sustainable Development. 2015

VICTORIA TRANSPORT POLICY INSTITUTE. TDM Encyclopedia. Automobile Dependency. 2016. Source: http://www.vtpi.org/tdm/tdm100.htm.

WESOŁOWSKI Jacek. Miasto w ruchu. Dobre praktyki w organizowaniu transportu miejskiego. Instytut Spraw Obywatelskich, Łódź 2008.

WOJEWÓDZKI INSPEKTORAT OCHRONY ŚRODOWISKA. Monitoring powietrza. Source: https://www.wios.lodz.pl/Zgierz-Srodmiescie,211,9.