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TRANSPORT BEHAVIOUR AND PREFERENCES OF CYCLISTS IN GDYNIA

Abstract:

The aim of the article is to present preferences and transport behaviour of cyclists in Gdynia. Conducting research in this regard allows the local authorities to develop bicycle transport in a way that is adjusted to the expectations of users, while raising the chances of increasing the participation of bicycles in the daily travels of Gdynia inhabitants in general. The results presented in the article clearly indicate that the development of bicycle transport is beneficial not only for cyclists, but also for the society. The research shows how important it is for the life comfort of residents of cities to convince them to give up cars in favour of bicycles to the greatest extent possible. The discussion on this topic is upgraded also by the present situation presented in the article, where in general, a low participation of this means of transport which is consistent with the policy of sustainable mobility development of Gdynia inhabitants is observable.

Keywords: transport behaviour, transport preferences, cyclists

Introduction

A bicycle as a means of transport has a great share in the urban traffic across many cities worldwide. Denmark and Netherlands are amongst those countries in Europe which can pride themselves on a particularly large share of urban travel completed by bike. The share of this means of transport in the capital cities in this countries reached 30% and 22%, respectively (EPOMM: Home, 2017). The Danish research has shown that each kilometre of urban journeys completed by bike gives 23 eurocents of profit back to society. On the contrary, the same distance completed by car generates an external cost of 16 eurocents (Cathcart-Keays, 2016). The research carried out in Copenhagen suggests that people who travel by bike are found to live

longer, have more stamina and have less absence from work due to illness. All those factors contribute to a drop in the cost of healthcare by 1.1 USD per each kilometre of travel completed by bike (Available from: www.copenhagenize.com). Further research conducted on the basis of an analysis of costs and benefits has shown that 1 kilometre of travel by bike generates a cost of 0.6 Danish Crown, whilst the same distance travelled by car generates a cost of 3.74 Danish Crown (Cycling Embassy of Denmark, 2012, p. 16). The above mentioned research was inclusive of internal costs incurred by the person travelling as well as of external costs incurred by the society. All of the research mentioned, despite the varied methodology, points to the fact that an increase in the share of bicycles in urban travel may bring a significant benefit. The introduction of a sustainable development strategy in the cities forces both the central and local governments to take actions that would encourage inhabitants to use this particular mode of transport. Local governments are entrusted with the responsibility to shape the transport policy within their cities and to develop the cycling infrastructure. This development should strive to meet the requirements of bicycle usage as much as possible. Therefore it is vital to conduct market research that will allow such requirements and needs to be determined.

1. Public transport and bicycle transport according to the level of utilization by the inhabitants of Gdynia

A representative study of the preferences and transport behaviour of the inhabitants of Gdynia is conducted at regular intervals (2–3 years) on the basis of an interview conducted with the respondents between 16 and 75 years of age who constitute a representative sample of 1% of the total number of inhabitants. The findings of this study show that the share of public transport and bicycle transport in urban trips of the city's inhabitants is decreasing. Figure 1 illustrates the downward trend of the popularity of this type of travel that has been seen for years. The current level of 42% of urban trips completed via bus, trolleybus, rail or bicycle allows a conclusion that the attempts to convince the inhabitants of Gdynia to travel according to the sustainable development strategy have been unsuccessful.

Bicycle transport in Gdynia remarkably shows a growing trend in the share of urban travel of the city inhabitants contrary to other means of transport preferred in the sustainable development strategy. Nonetheless, this share is still small and amounts to only 1.8% of the total number of trips (fig. 2). Nevertheless, it must be mentioned that this level signifies a twofold increase in comparison to 2013, and an over fourfold increase in comparison to the years 2008–2010. In those years the share of buses, trolleybuses, and rapid urban rail in the trips completed by the inhabitants of Gdynia decreased by 20%, 30%, and 35%, respectively. In Gdynia, 36% of households do not have a bike, 22% of households have one bike, 26% of households have two bikes and 16% of households have 3 or more bikes (Hebel, Wyszomirski, 2015, p. 19).
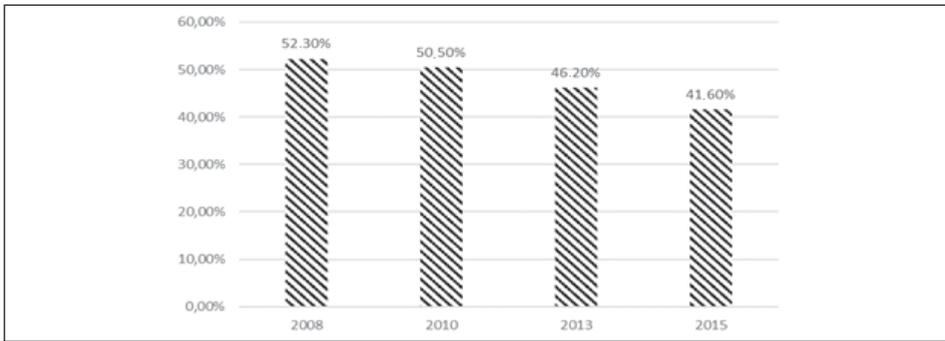
Figure 1. Share of urban public transport and cycling in urban travels of Gdynia residents 2008–2015 (pedestrians excluded)
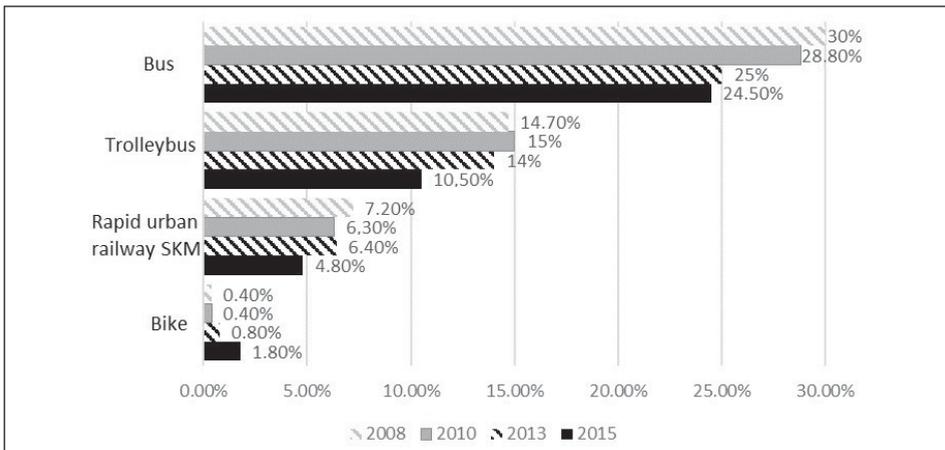Source: own study based on (ZKM, 2015)

Figure 2. Modes of urban travel by public transport and cycling by Gdynia residents in 2008–2015
Source: own study based on (ZKM, 2015)

A representation of the scale of bicycle transport in Gdynia in comparison to other Polish cities is hindered due to the lack of a uniform methodology of study in various cities. There is also no nationwide comprehensive study of bicycle transport with the exception of research concerning state and voivodeship roads conducted by the General Directorate for National Roads and Motorways (Generalna Dyrekcja Dróg Krajowych i Autostrad).

2. Transport behaviour and preferences of cyclists in Gdynia

416 respondents took part in the research into bicycle transport in Gdynia conducted in 2016. 37% of the respondents were female and the rest were male. The study was conducted on the basis of an individual interview in 38 research points located along the city and sylvan bike routes. 44 cyclist travelling on sylvan routes and 372 cyclists travelling on city routes were interviewed. The histogram in figure 3 illustrates the age of respondents. Respondents who at the time of the interview were below 10 years of age were considered as outside of the histogram. This happened due to a legal requirement that children of 10 years and younger cannot travel on bikes without adult supervision, and hence, they cannot be considered as able to decide independently to choose a bike as means of transport. The said histogram in figure 3 is characterised by a distinctive slope on its right side. This means that younger people are more eager to use bicycles. Nearly half of the respondents were between 21 and 35 years of age.
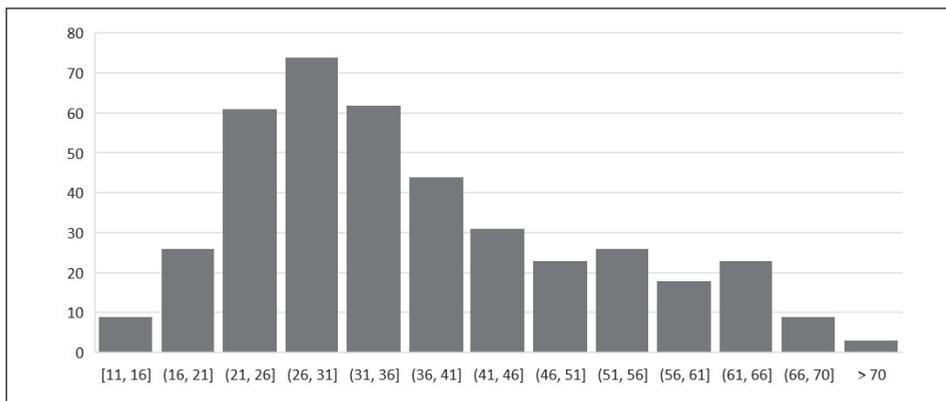

Figure 3. Age of studied cyclists
Source: (own study based on ZDiZ Gdynia data, October–November 2016)

Another feature used for segmentation of cyclists in Gdynia was the frequency with which they chose a bike to travel a given route about which they were interviewed. The largest group of respondents (39%) were people who use bicycle transport on a regular basis. These respondents used a bike at least 4 times a week (fig. 4). Respondents choosing to travel by bike only once a week were among the group with the fewest number of respondents.

Figure 5 illustrates that the highest number of people chose a bike for leisure purposes. They constituted nearly a third of the total number of respondents. 26% said that they used a bike to get to the workplace and 22% on their way home. It was only 3% of the respondents that chose a bike to get to the place of education. The suggestion that such a small number of students use bikes to get to school is confirmed by a study of the preferences and transport behaviour of high school students in Gdynia and Sopot. According to its findings as little as 0.27% of all school commuting was completed by bike (Konarski, Wyszomirski, 2015, p. 25).
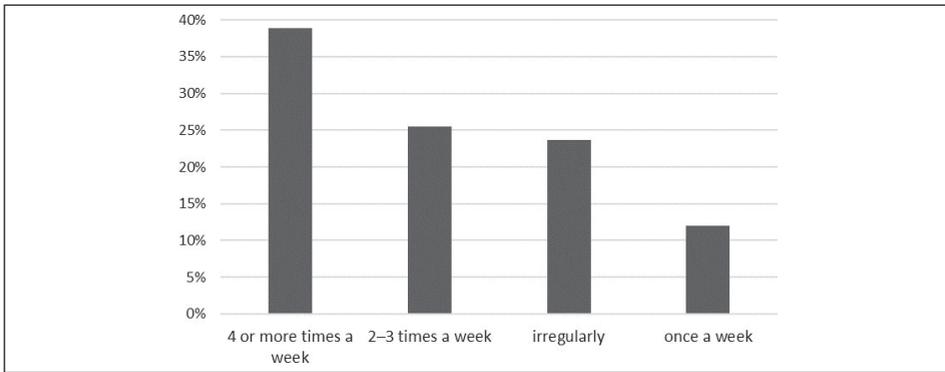
Figure 4. Frequency of travelling by bike
Source: (own study based on ZDiZ Gdynia data, October–November 2016)
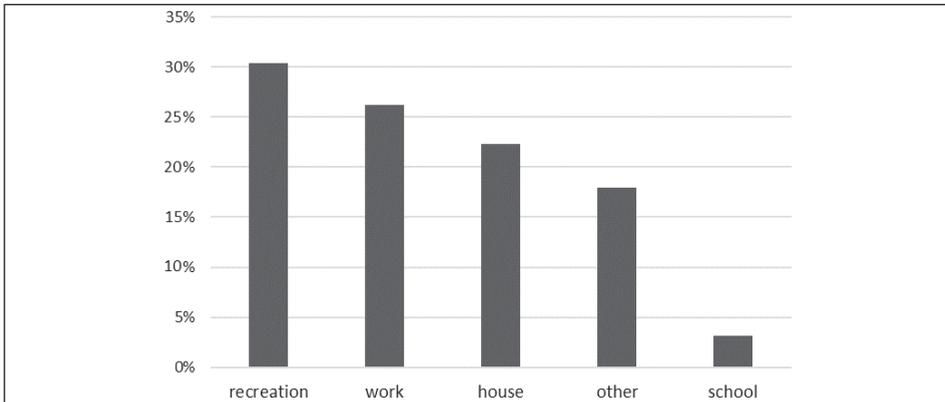

Figure 5. Destination of studied persons
Source: (own study based on ZDiZ Gdynia data, October–November 2016)

A change in the purpose of travel finds its reflection in the change of the transport behaviour of cyclists in Gdynia. Those who choose a bike to travel to the workplace or school cycle much more often that those who use bikes for leisure purposes. Nearly 60% of people choosing to cycle to work/school declared that they travelled by bike at least 4 times a week. It was only 24% of the respondents using bike for recreational purposes that matched that frequency. The largest number of respondents using bike for leisure do so intermittently (fig. 6).

Cyclists choose their routes depending on the aim of travel. 30% of the respondents travelling to work said they chose the shortest possible route. On the contrary, 82% of those choosing a bike for leisure declared that the route length was not the major factor in deciding about the choice of the route.
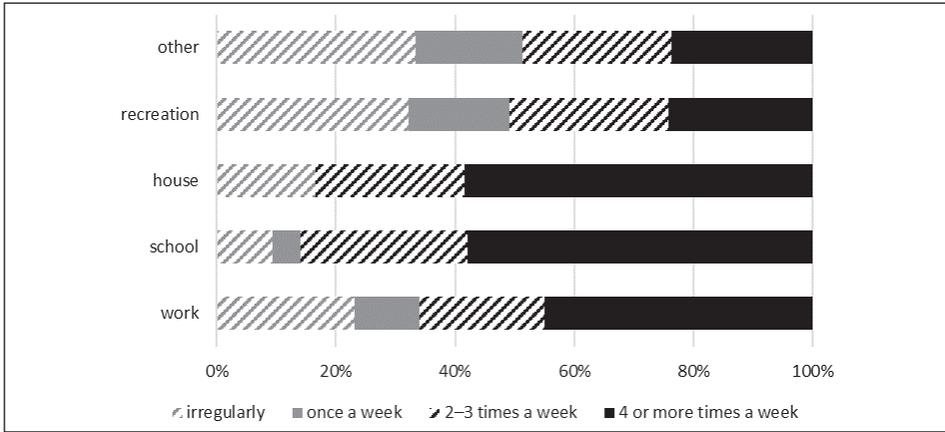
Figure 6. Influence of destination on bike travel frequency
Source: (own study based on ZDiZ Gdynia data, October–November 2016)

The respondents evaluated four factors having influence on choosing the shortest route on a scale of 1–4 (where 1 means the most discouraging and 4 the least discouraging). Figure 7 illustrates their choices. The following factors were among those having the most negative influence on the route choice by the cyclist:
– necessity to travel through crossroads with traffic lights;
– necessity to travel uphill;
– unsuitable surface on the route;
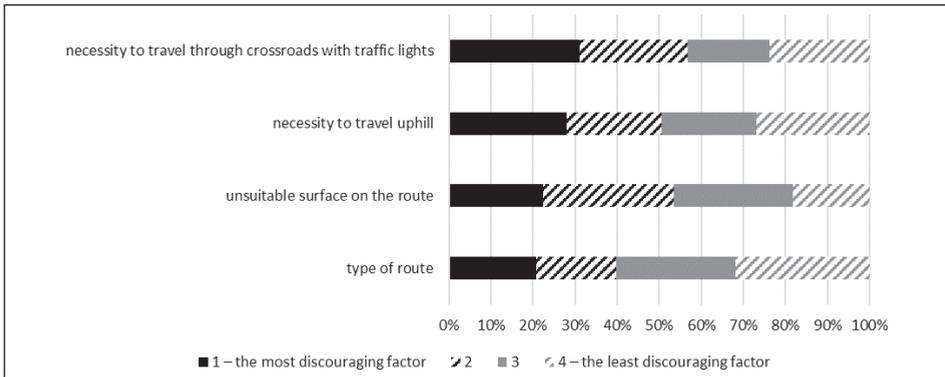– type of route.

Figure 7. Factors discouraging from travelling by bike by the shortest route
Source: (own study based on ZDiZ Gdynia data, October–November 2016)

Each route type chosen by the cyclist was further evaluated on a scale from 1 to 4 (where 1 means the most discouraging and 4 the least discouraging) during the study. Cycling paths were chosen as the most attractive route form (fig. 8) – they were chosen by 87% of respondents, 97% of which gave them a mark of 1 or 2. Pavements are the least attractive route form according to cyclists. 42% of the total

number of lowest marks were given to pavements. Marks 3 or 4 chosen by the respondents accounted for 78% of the total number of given marks. The Road Traffic Act of 20 June 1997 (Journal of Laws, No. 98, item 602) defines a cycling path as "a path or a part of a road designated for bicycle traffic, sign posted by appropriate signs and separated from roads for car traffic or distinctly isolated from the roadway either structurally or by the means of safety features". The cycling infrastructure in Gdynia consists of 39 sections totalling 56 kilometres of mostly cycle paths. Nonetheless, the authors of the sustainable development plan emphasise that this network is characterised by a lack of flow which hinders travel between the city centre and the outskirts (The plan of sustainable city mobility for Gdynia). The following issues are also named as hurdles in the development of the bicycle transport in Gdynia: freedom of car travel; spatial obstructions; large differences in altitude between various areas of the city; development of residential areas located west of the city – a considerable distance from the centre; ownership issues hindering the process of allocation of space for cycle paths (Bue, Makowski, Reiter, 2013, p. 21).

The advantage that cycle paths have over other types of bicycle routes in the eyes of the respondents taking part in the study proves that using regular roadways does not present an attractive alternative for space specifically designated for bicycle travel. Therefore, it is vital that the cycle paths in Gdynia should be connected as soon as possible whereby bicycle travel through the main passageways would be possible without the need to turn to less attractive routes.
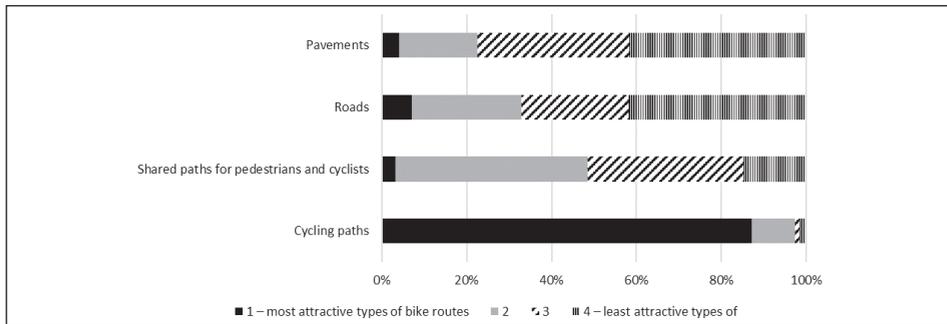

Figure 8. Assessment of specific types of bike routes
Source: (own study based on ZDiZ Gdynia data, October–November 2016)

Cyclists who took part in the study also evaluated the road surface friendliness on a scale of 1 to 5 (1 being the lowest mark and 5 the highest). The undeniable leader was Tarmac with 68% of all top marks given by the respondents. Nearly 90% of 5 and 4 grade marks were given to this type of surface. Cobblestones were the surface with the lowest marks from users. 68% of the total number of lowest marks were given to this type of surface. 86% of marks given to cobblestones were either 1 or 2.
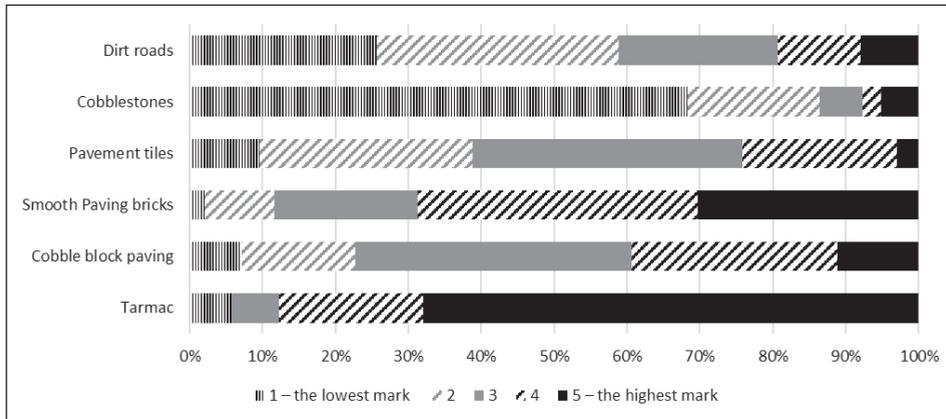
Figure 9. Assessment of specific bike route surfaces [N = 290]
Source: (own study based on ZDiZ Gdynia data, October–November 2016)

Tarmac is seen as the best surface for cycle paths not only in the eyes of cyclists but also engineers who deal with the issue of such infrastructure. Among many advantages of using this type of material they name easiness and swiftness of construction as well as relatively low costs in comparison to other available solutions. Moreover, tarmac cycle paths are very durable, smooth and provide little resistance (Bańkowski, 2016, p. 2).

Conclusions

The following conclusions can be drawn from the study into the bicycle transport in Gdynia:
– age constitutes one of the determinants in choosing the bicycle as a means of transport;
– the share of bicycle travel is small (1.8% in 2015), however, it shows a high growing trend;
– a bicycle is used by the inhabitants of Gdynia mostly for leisure, and to a lesser extent, as a means of transport to the workplace or school;
– the aim of travel bears an influence on the traffic behaviour of cyclists in Gdynia. Those travelling to work or school by bike use this means of transport more often than those who travel by bike for leisure. They are also more likely to choose the shortest available route;
– the following factors were named by the cyclists in Gdynia as the most detrimental to the route selection: necessity to travel through crossroads with traffic lights, necessity to travel uphill, unsuitable surface on the route, route type;
– cycle paths were named as the most appealing type of a route. Pavements were the least appealing cycling routes for riding;
– the respondents named tarmac as the best surface for cycling paths. Cobblestones were the least appealing to them.

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