UNDERSTANDING AIRPORT SYSTEMS EMPLOYEES MOBILITY NEEDS AND BEHAVIOURS

Analysis of needs and behaviors related to the mobility of airport employees in the Mazovia (Warsaw/Modlin Airport) FUA

Version 1
05 2018

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Introduction

A survey among the employees of Warsaw/Modlin Airport was conducted by the Mazovian Office for Regional Planning in Warsaw with the support of the airport management. The data was collected using PAPI and CAWI methods, i.e. the results were based on both paper and online surveys. 247 employees of the Warsaw/Modlin Airport participated in the survey.

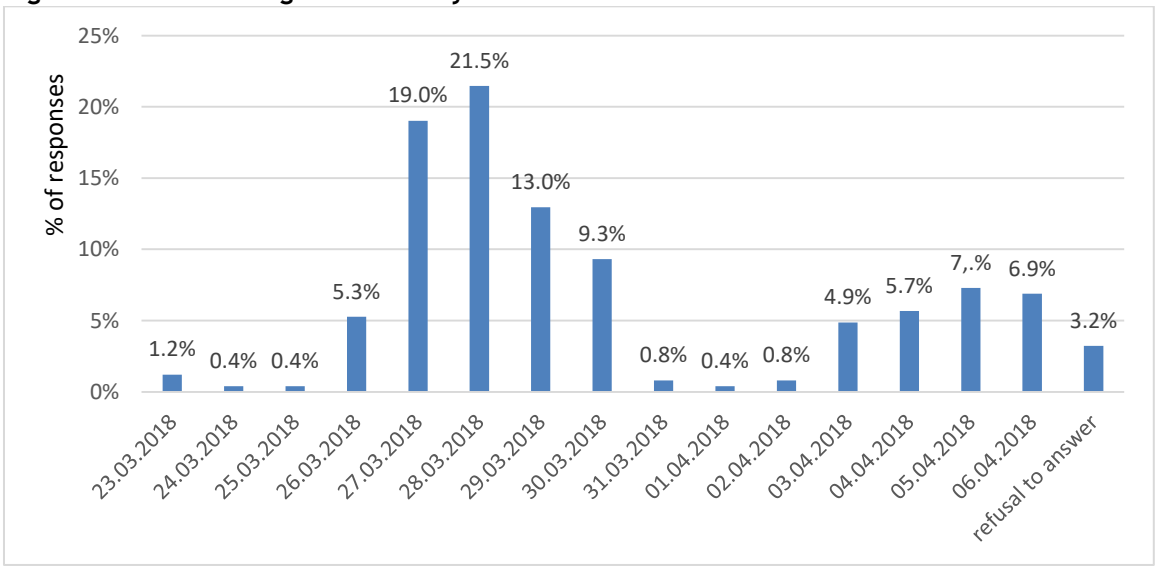
The report from the survey conducted among the airport staff consists of the following parts:

- Information about the data collection;
- A summary of responses;
- Conclusions from the study;
- A presentation of the results relevant to the objective of the study, including correlations, particularly those between:
  - answers to general questions (gender, age, education, earnings, work system), and the usually chosen means of transport in commuting to/from work;
  - the time of commuting to work and the distance travelled, and the usual means of transport in commuting to/from work;
  - the assessment of individual means of transport and the usual mode of transport in commuting to/from work;
  - the assessment of individual means of transport and the place of residence;
  - the awareness of the problem of CO_2 emissions and the tendency to resign from the car, and answers to general questions (gender, age, education, earnings, work schedule) and default means of transport when commuting;
  - the factors that would lead to giving up commuting by car, and time needed to travel to work, distance travelled, stopping on the way to/from work and the place of residence.

Information on the data collection

The survey was conducted from 23.03 to 6.04.2018. 247 respondents, employees of the Warsaw/Modlin Airport, participated in the survey.

Figure 1. Date of filling in the survey

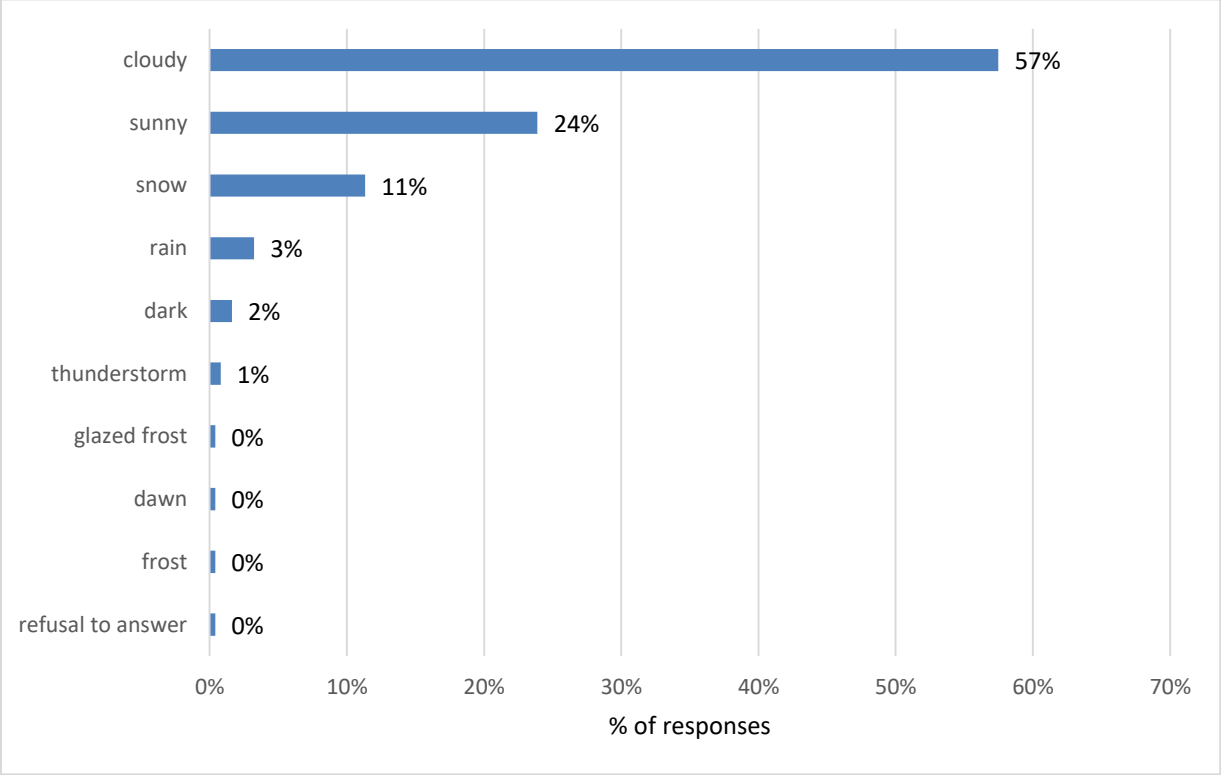


Source: own research based on (results of) survey

According to 57.4% of respondents participating in the survey, the weather was cloudy at the time of answering. On other days it was sunny (23.89%), or it was snowing (11.34%). It should be noted that the answer "cloudy" was chosen mainly on the following days:

- March: 23-31.03.2018,
- April: 01-06.04.2018,

Figure 2. What was the weather like when you left for work?

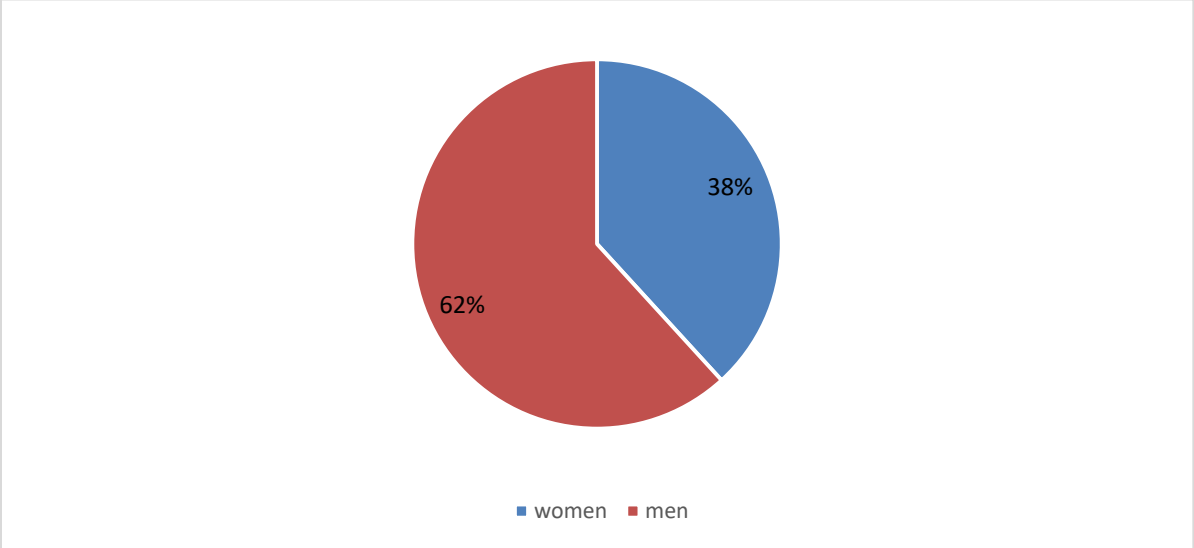


Source: own research based on (results of) survey

A summary of the results of the survey

Among the respondents there was a larger number of men than women – their share in the research sample amounted to as much as 61.54%. Women constituted 38.06% of respondents (due to 0.4% of participants not answering this question).

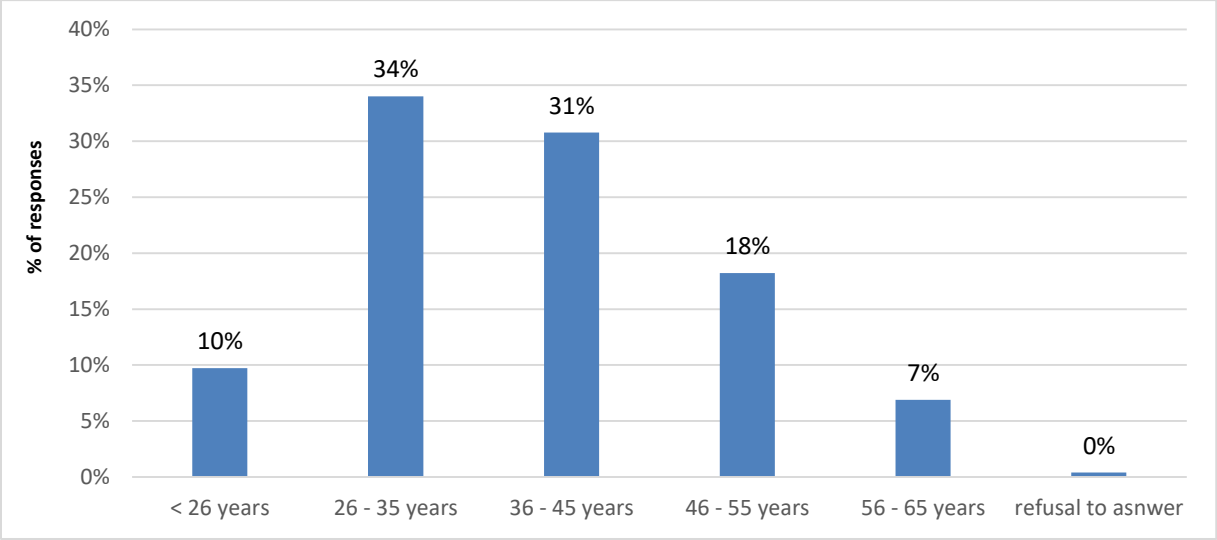
Figure 3. Respondents' gender



Source: own research based on (results of) survey

The research sample was considerably diversified in terms of the age of the respondents. The majority of respondents were in the age groups of 26–35 and 36–46 years (respectively 34.01% and 30.77%). A relatively high share also consisted of people aged 46–55 (18.22%). The share of no other age group exceeded the 10% threshold.

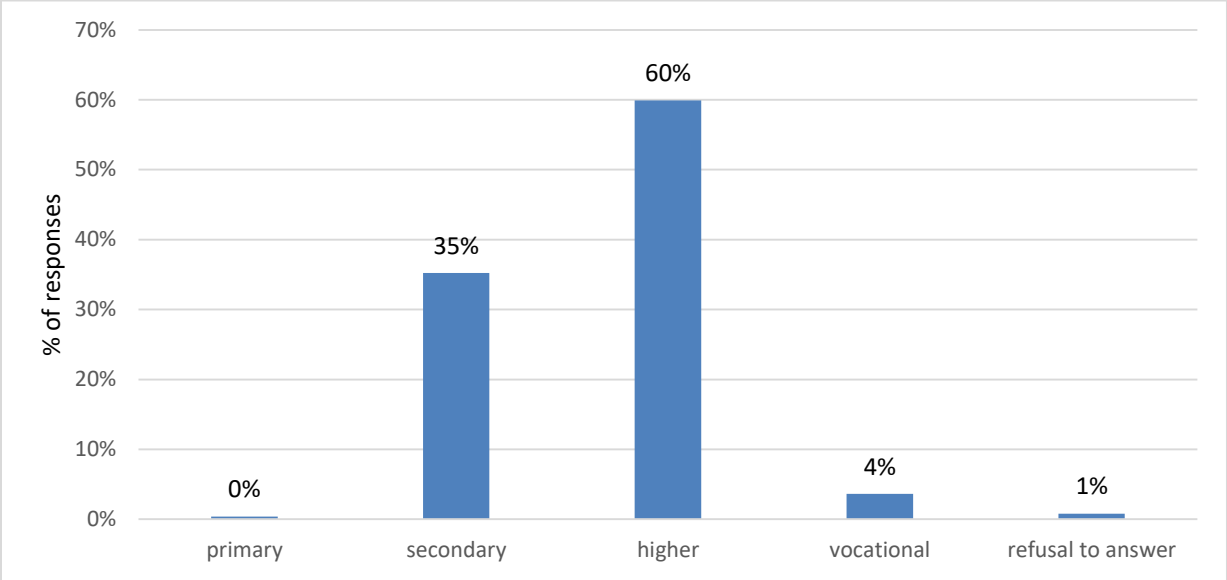
Figure 4. Respondents' age



Source: own research based on (results of) survey

Regarding the level of education of the respondents taking part in the survey, the largest number of people had higher education (almost 60% of all respondents). The second most numerous category were people with secondary education (over 35%). The remaining variants of the response were chosen by a significantly lower number of participants.

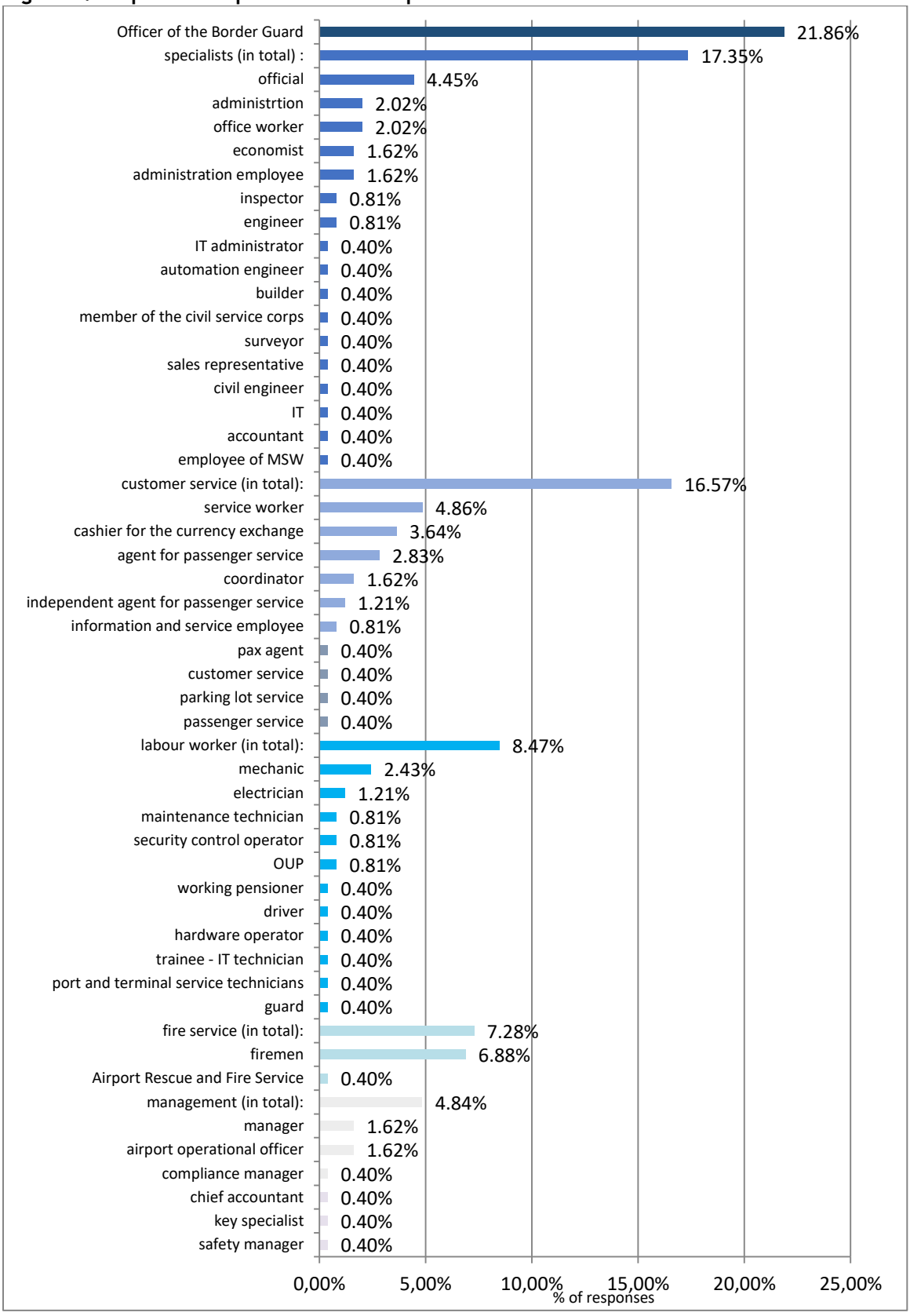
Figure 5. Respondents' level of education



Source: own research based on (results of) survey

In the case of the question concerning current professional occupation, many respondents refused to answer this question (almost 14). Nevertheless, the most frequently indicated position was that of a border guard officer which was chosen by 22% of survey participants. The next most numerous category were specialist positions, indicated by 17% of respondents, and customer service (16% of responses). Slightly less frequently chosen by respondents were the occupations of a physical worker (8%) and fireman (7%), while the lowest number of respondents represented managerial positions (5%).

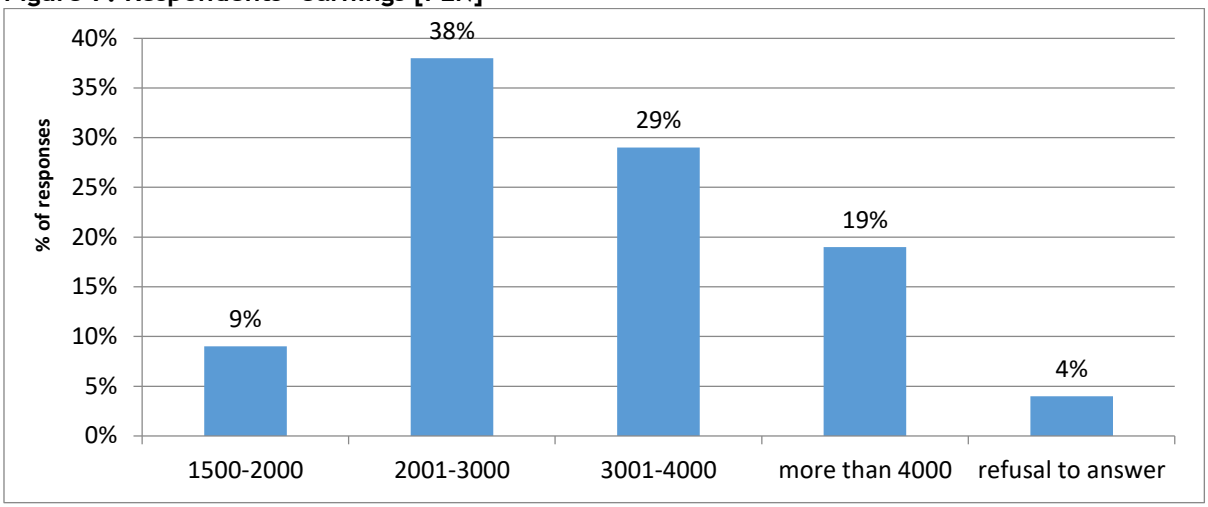
Figure 6. Respondents' professional occupation



Source: own research based on (results of) survey

The highest percentage of respondents in this study consisted of people whose net salary was in the range of PLN 2,001--3,000 (38.46%). A smaller number of respondents (29.15%) earned from PLN 3,001 to PLN 4,000, and the earnings of a little over 19% of respondents exceeded PLN 4,000. Less than 9% of respondents stated that their earnings do not exceed PLN 2,000, and the remaining 4.45% refused to answer this question.

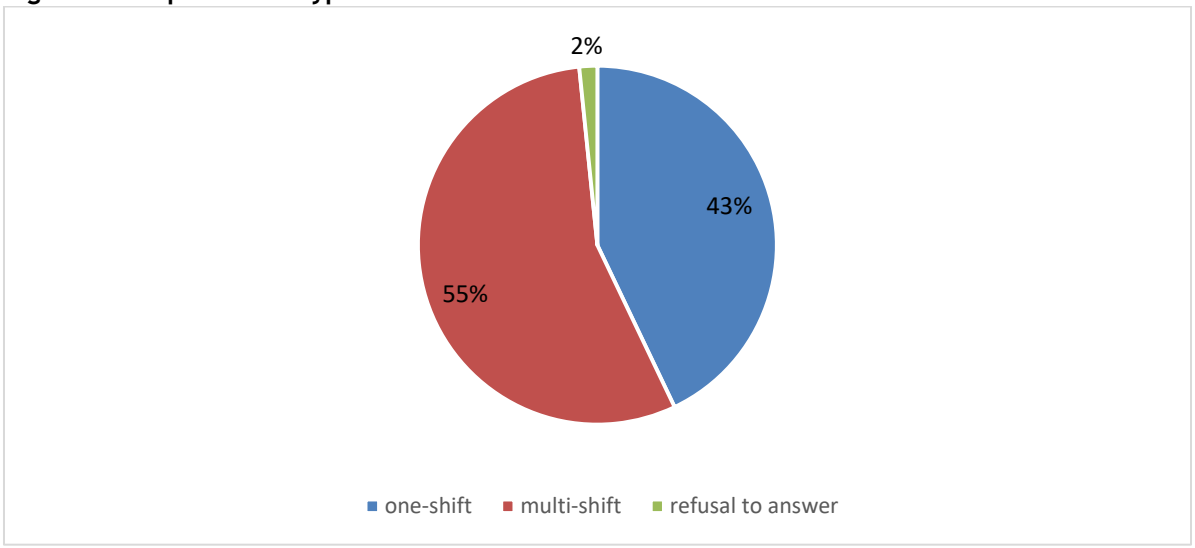
Figure 7. Respondents' earnings [PLN]



Source: own research based on (results of) survey

Concerning the work schedules of respondents, just over half (55.47%) of participants of the survey stated that they work in a multi-shift (rotating) system. The one-shift system, in turn, was the choice of almost 43% of respondents. 1.62% refused to answer this question.

Figure 8. Respondents' type of work schedule

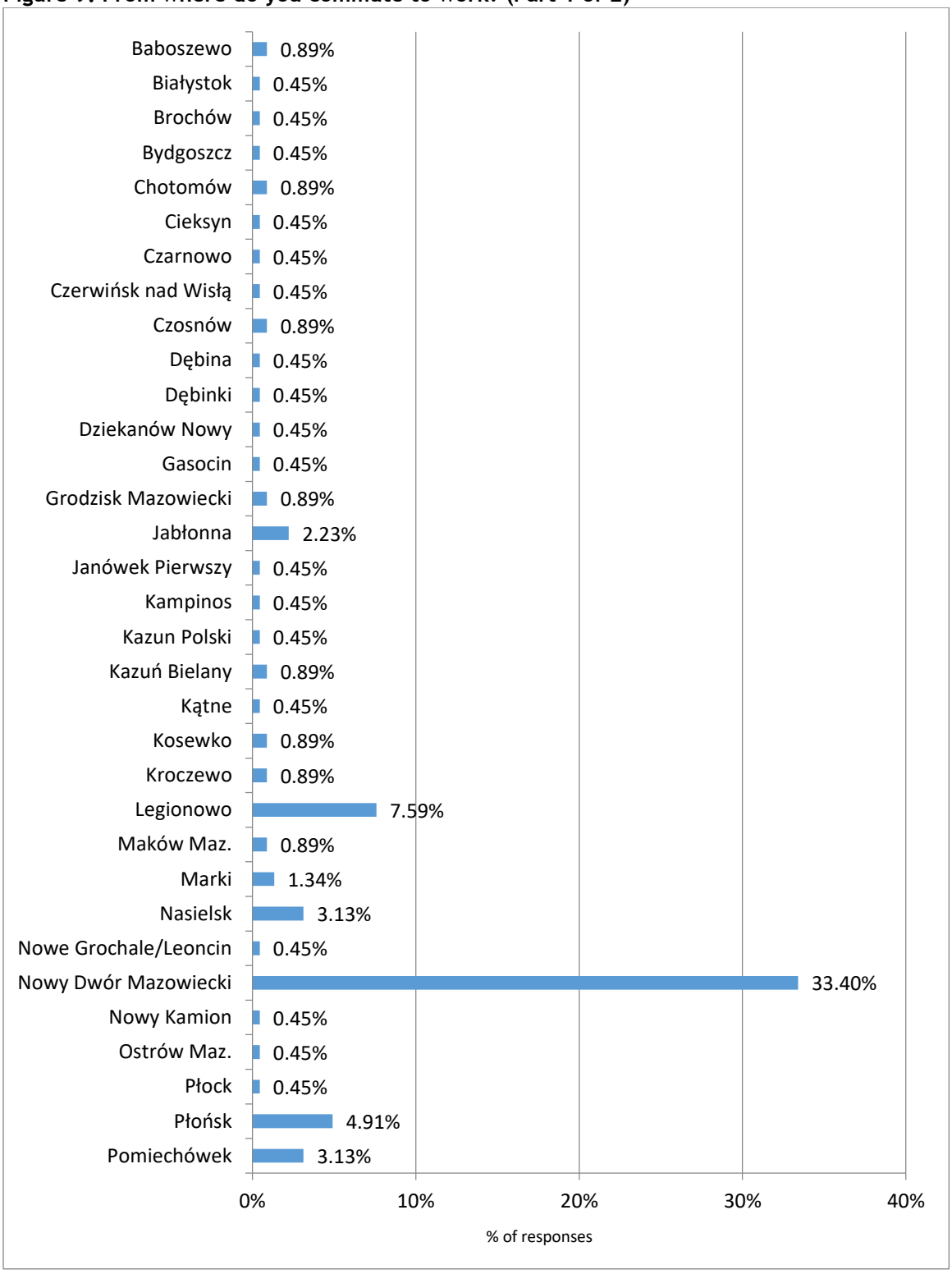


Source: own research based on (results of) survey

The departure points of the respondents' journey to work were very diverse. Due to the proximity of the city to the airport, the largest share of employees commuted from Nowy Dwór Mazowiecki (1/3 of respondents). A considerable number of respondents came from Warsaw (16%), but given the division of the city into districts, the percentage of employees from individual districts was not high (up to 3.13%). Among the towns that constitute important starting locations of commuting employees, Legionowo (7.59%) and Płońsk (4.91%) should be mentioned. The remaining cities are

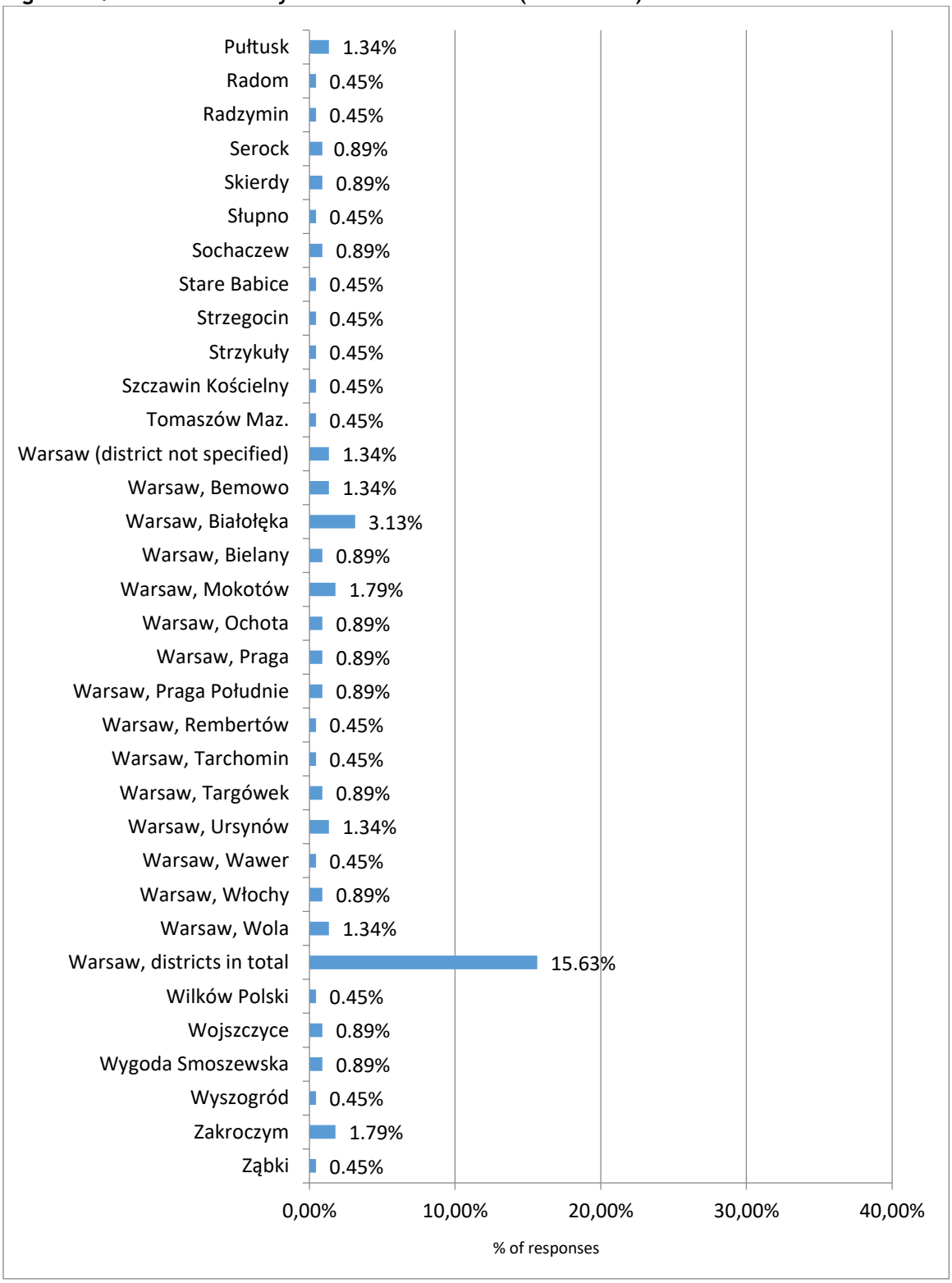
characterized by lower shares of responses in the research sample, however, their total share was very high- over 38% , resulting from a considerable fragmentation of commuting sources.

Figure 9. From where do you commute to work? (Part 1 of 2)



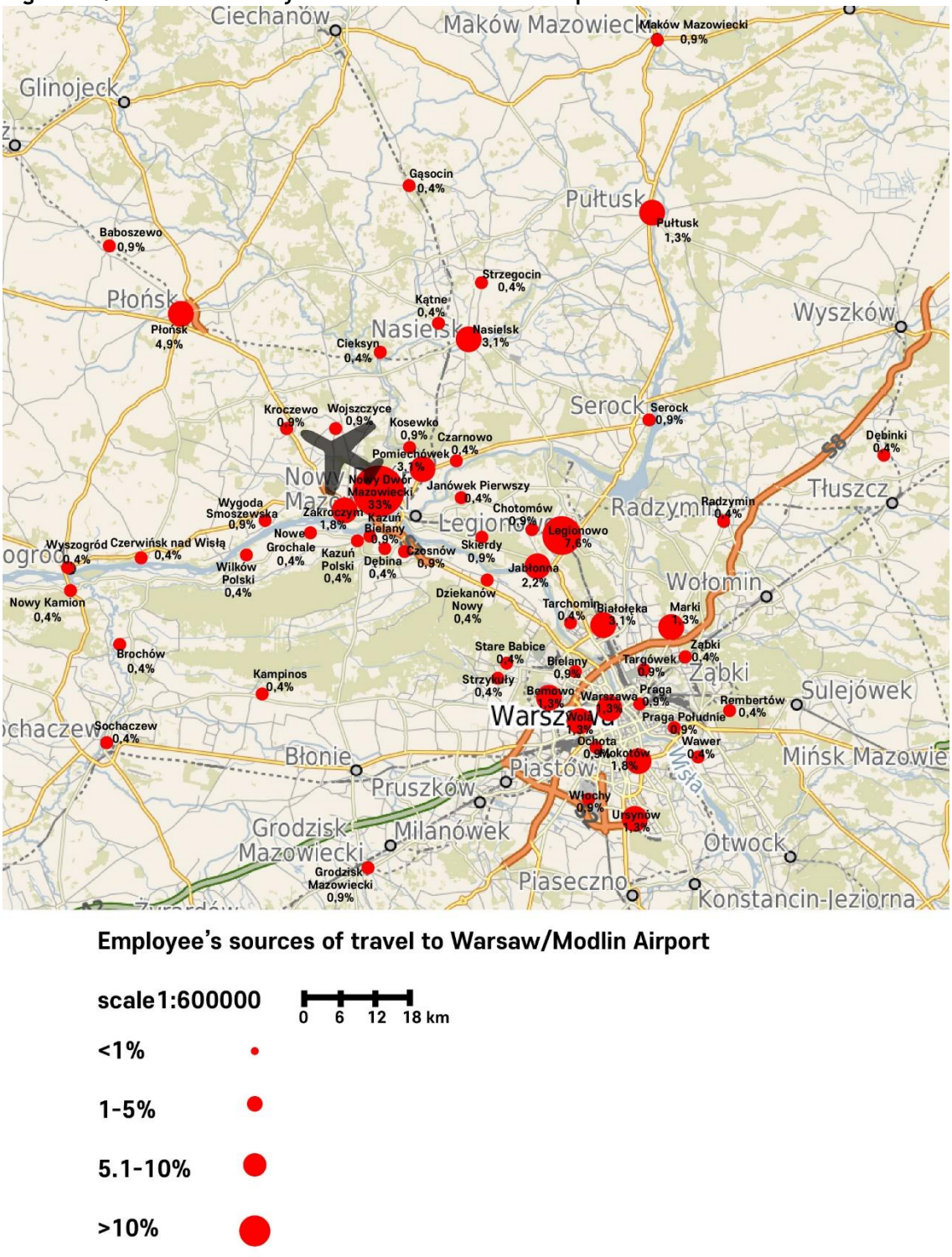
Source: own research based on (results of) survey

Figure 10. From where do you commute to work? (Part 2 of 2)



Source: own research based on (results of) survey

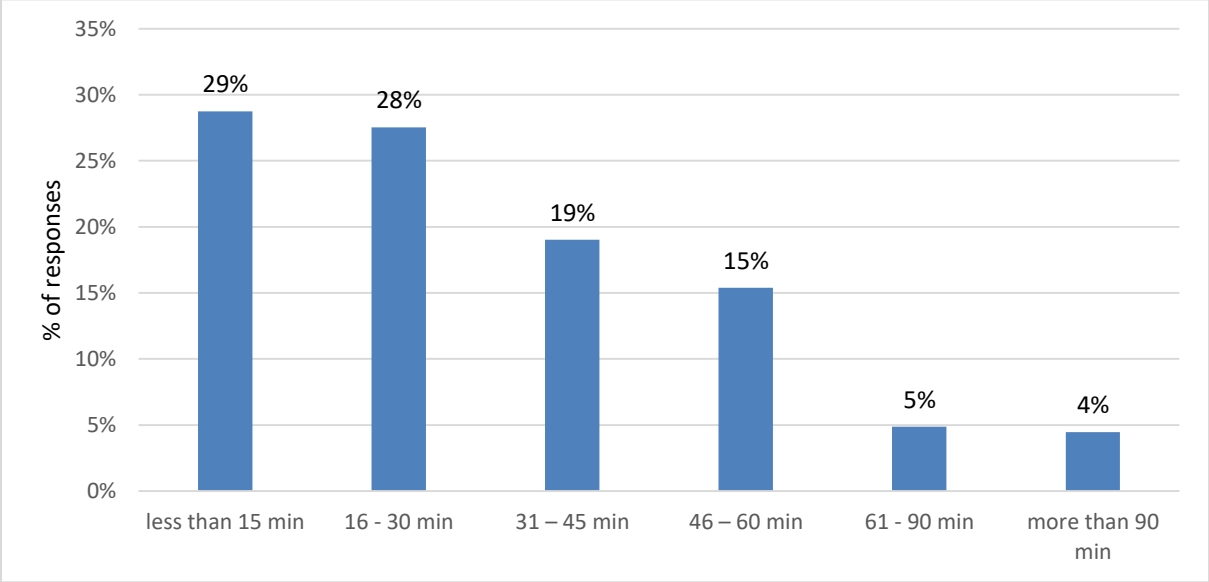
Figure 11. From where do you commute to work? - map



Source: own research based on (results of) survey and www.openstreetmap.org *(a detailed map is included in annex 2 to this report)*

Most of the respondents (over 56%) commute to work for up to 30 minutes, with nearly 29% commuters travelling up to 15 minutes. Commuting for 31-45 minutes was indicated by slightly more than 19% of respondents, while 46-60 minutes by 15.3% of respondents. A longer travel time was indicated by slightly more than 9% of respondents, including 4.45% commuters travelling for over 90 minutes (there were individuals from, for example, Radom, Białystok and Bydgoszcz, i.e. 150-250 km from the airport).

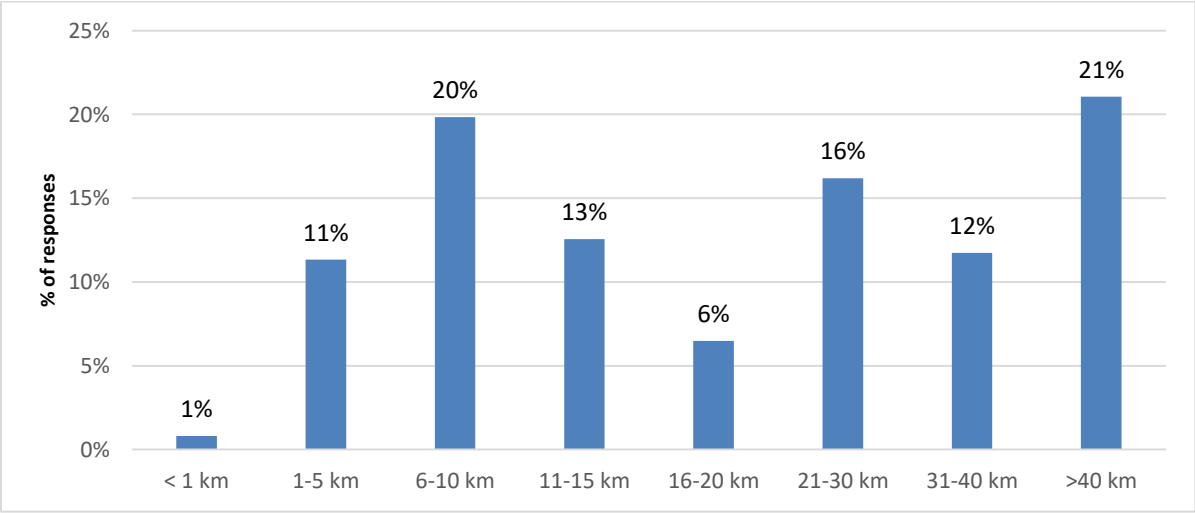
Figure 12. How long do you commute to work?



Source: own research based on (results of) survey

The responses regarding the distance travelled on the way to work were very diversified. It is worth noting that the highest share (over 21%) of respondents commuted to work from places at a distance of more than 40 km from the airport. The second most numerous category (in terms of share of responses) were workers travelling only 6-10 km, a result of the large share of employees living in Nowy Dwór Mazowiecki.

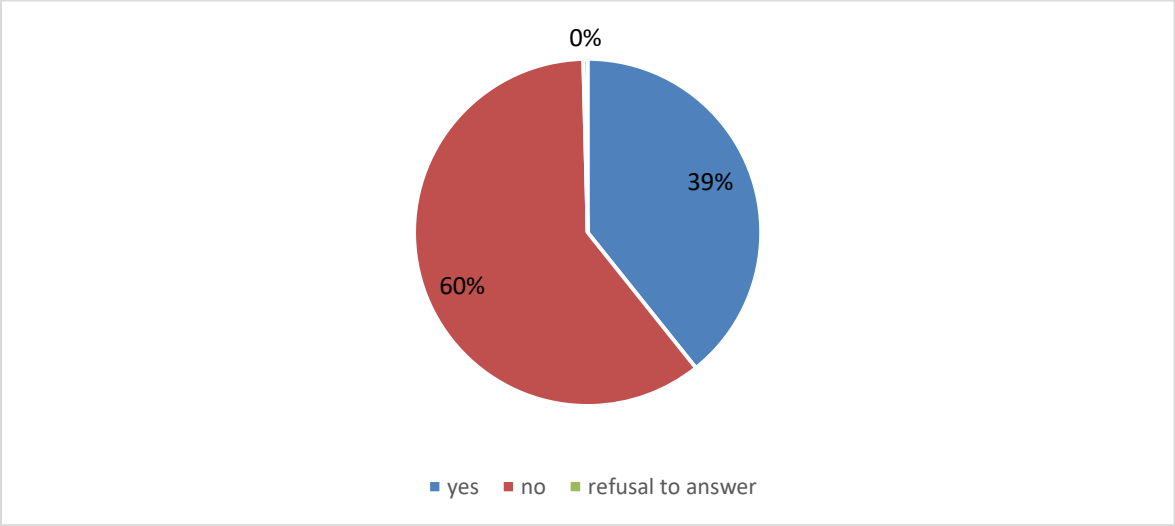
Figure 13. What distance do you travel to work from your place of residence?



Source: own research based on (results of) survey

Nearly 40% of respondents stop on their way to/from work (i.e. for shopping, in order to take children to school, etc.). Given that, over 60% of respondents commute straight to/from work, without stopping on their way.

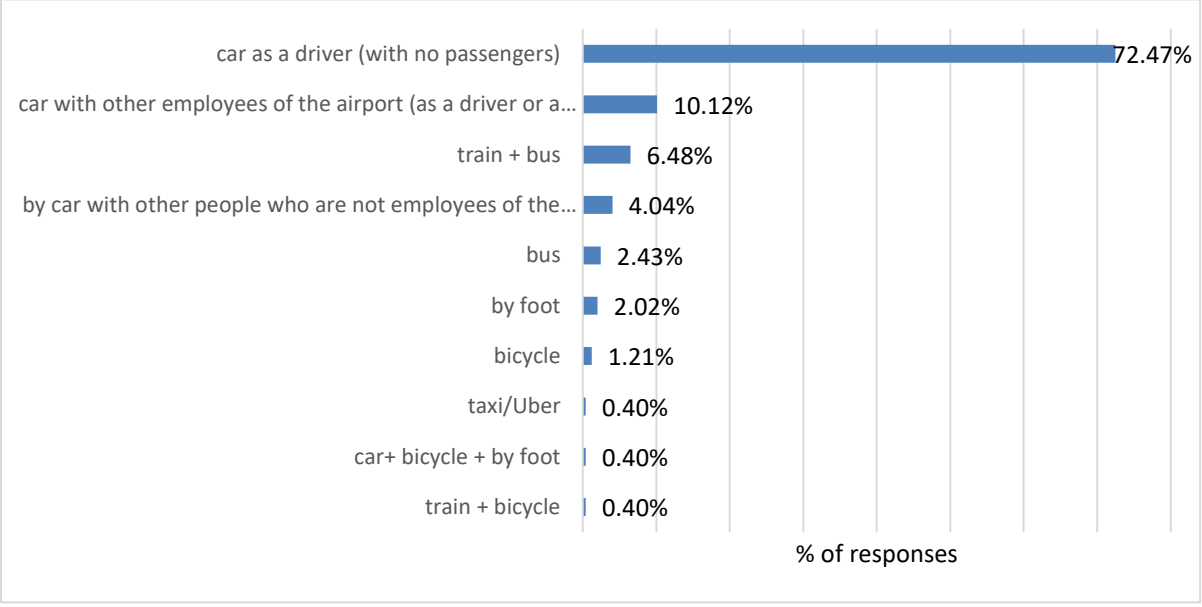
Figure 14. Do you stop on your way to/from work (i.e. for shopping, in order to take children to school)?



Source: own research based on (results of) survey

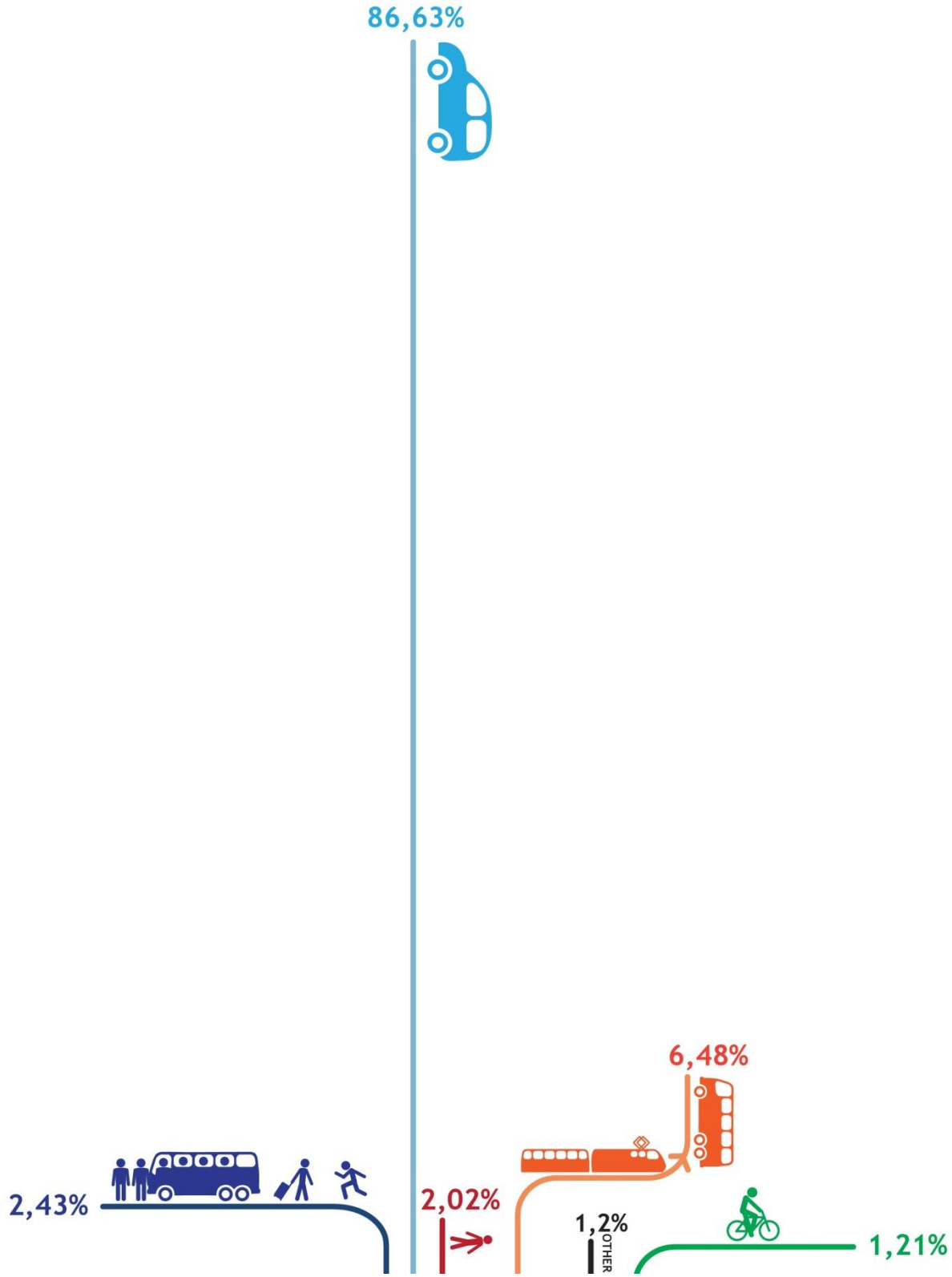
Among the means of transport chosen by the surveyed employees, cars are predominant. As many as 72% of respondents drive to work by car (as a driver), 10.12% by car as a passenger (with other airport employees), and 3.68% by car as a passenger with people who are not airport employees. Among alternative means of transport, the highest share of responses concerns the combination of bus and train, indicated by 6.48% of respondents. Other options were characterized by a relatively low share of responses, including 2.02% commuting by foot and 1.21% by bicycle.

Figure 15. What means of transport do you usually use when commuting?



Source: own research based on (results of) survey

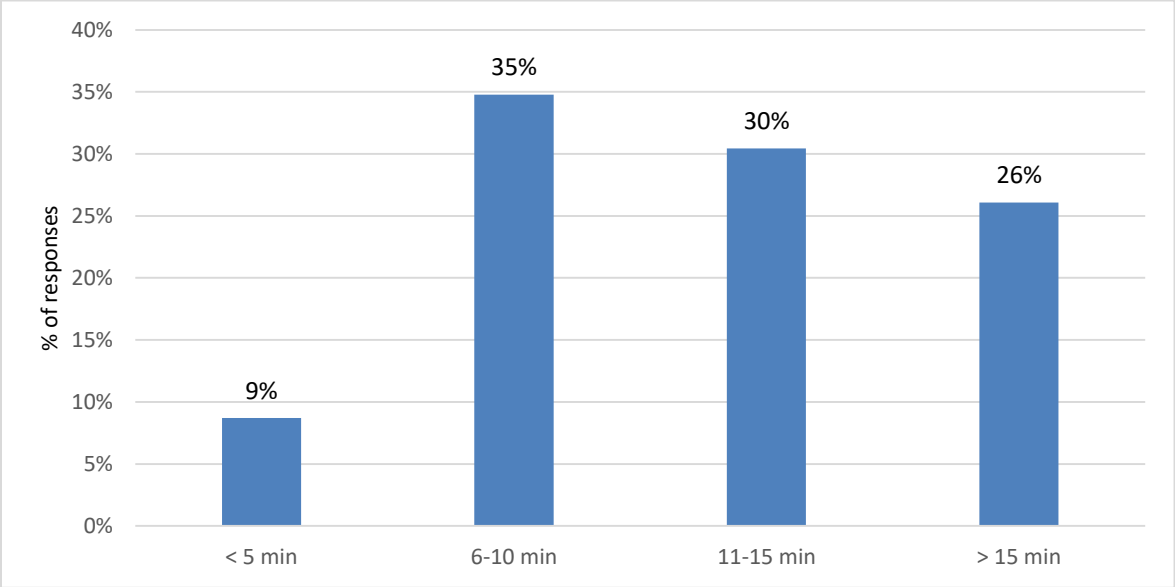
Figure 16. What means of transport do you usually use when commuting?



Source: own research based on (results of) survey

Among people who confirmed commuting to work by train and/or bus, the largest percentage usually waits at the bus stop for up to 10 minutes (43.48%). The waiting period from 11 to 15 minutes was indicated by 30.43% of the respondents. Over 26% of participants of the survey stated that they usually wait at the bus stop for over a quarter of an hour.

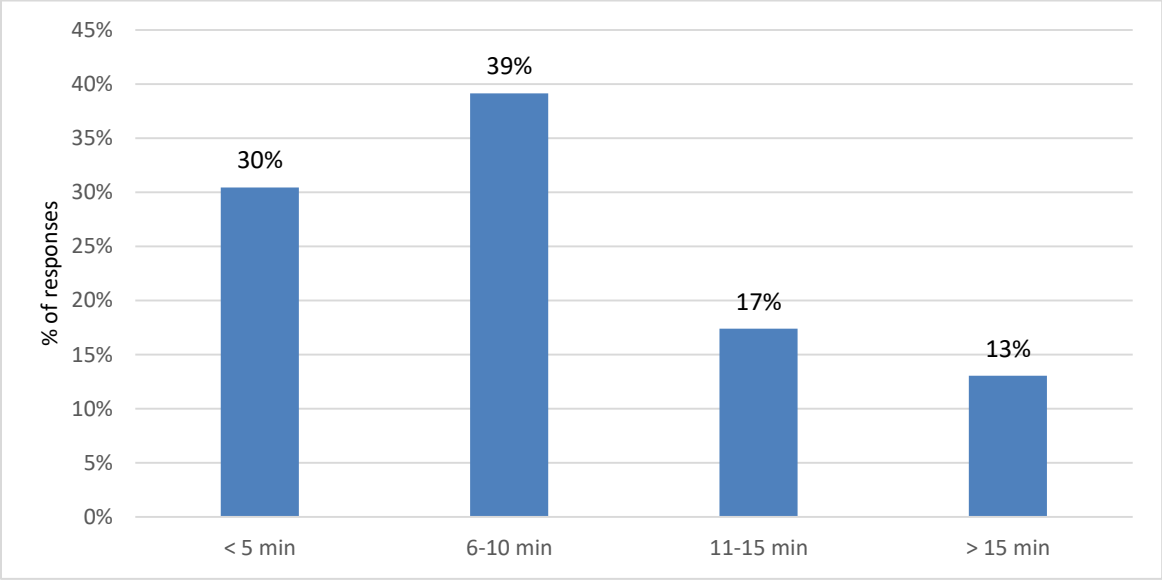
Figure 17. How long do you usually wait at the bus stop/stops (in total)?



Source: own research based on (results of) survey

In response to the next question, linked to the previous one, the majority of respondents (almost 70%) who travel by public transport need 10 minutes to reach the bus stop. This time is slightly longer (11–15 minutes) for 17% of respondents, and 13.04% need more than a quarter of an hour.

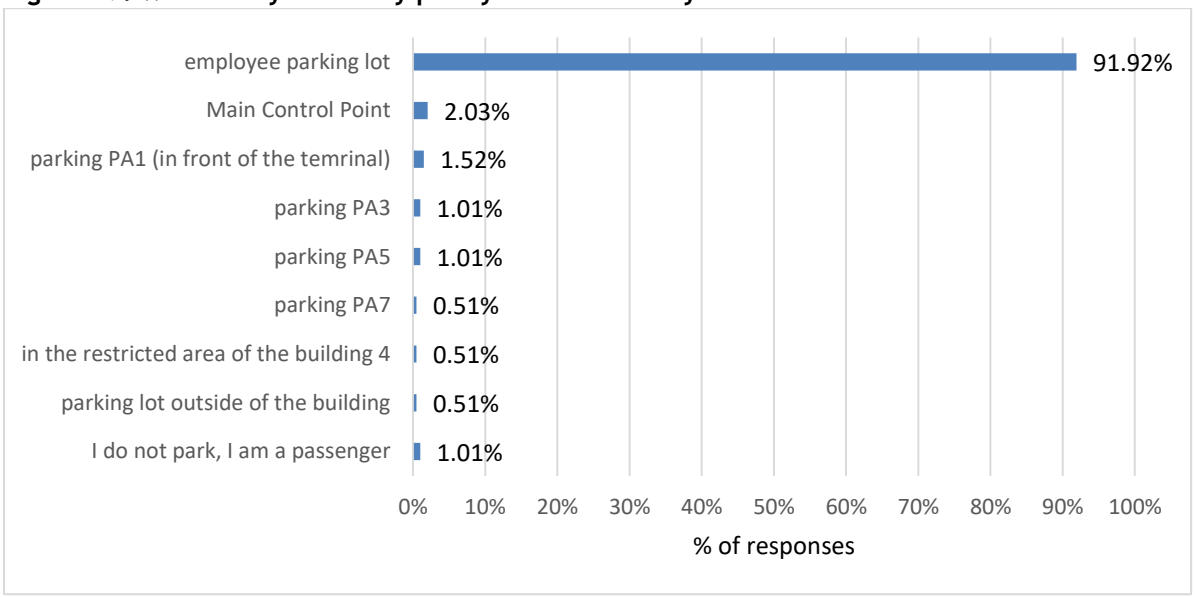
Figure 18. How much time does it take you to get from your house to the bus stop?



Source: own research based on (results of) survey

Participants of the survey who commute to work by car were asked to indicate the place where they usually leave their vehicle – apart from proposed answers, respondents could provide their own answer. 92% of commuters by car chose the employees' parking lot. The remaining answers were chosen much less frequently.

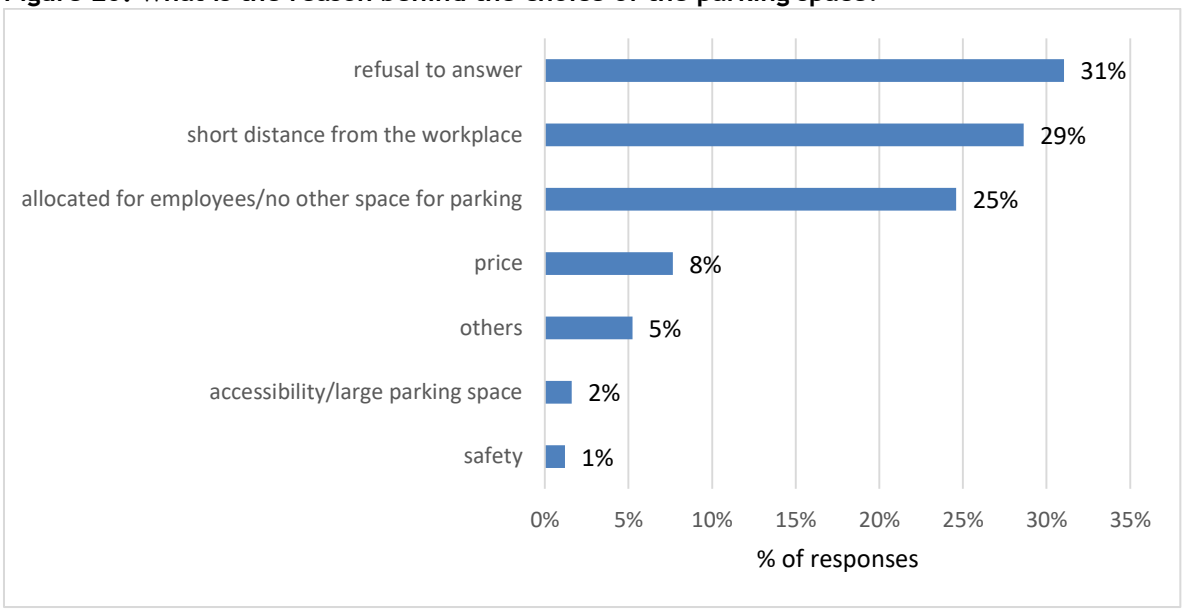
Figure 19. Where do you usually park your car/motorcycle?



Source: own research based on (results of) survey

Among the reasons determining the choice of parking lot, the short distance from the workplace was indicated the most often (28.63%). An almost equally popular reason was allocation to this space/lack of other possible space for parking (24.60%). A relatively important factor was also the price (7.66%).

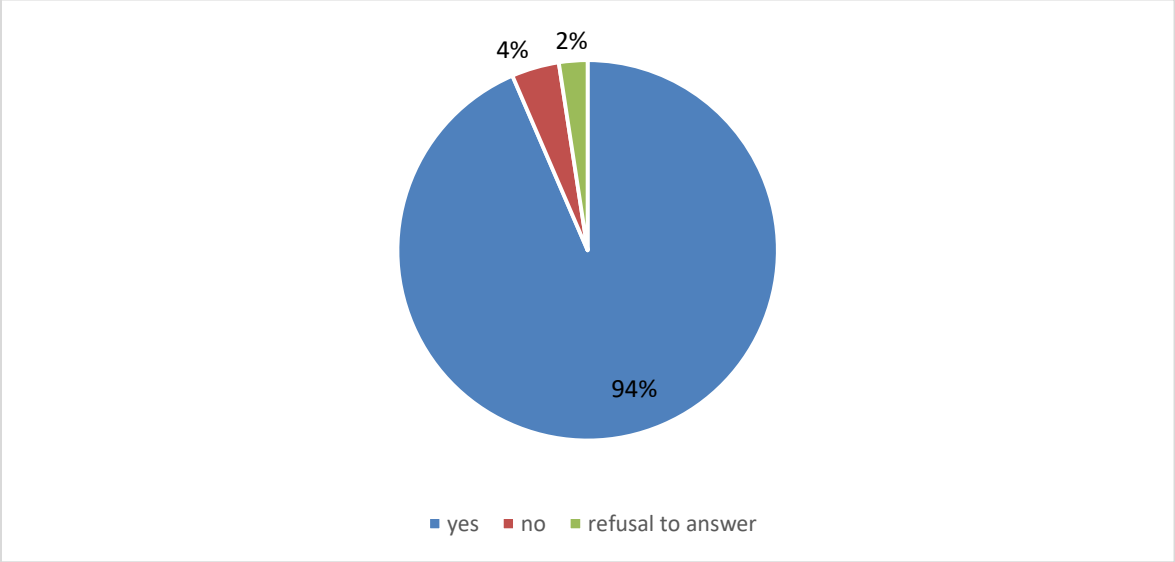
Figure 20. What is the reason behind the choice of the parking space?



Source: own research based on (results of) survey

On the day of the study, as many as 94% of respondents came to work using the same means of transport as usual.

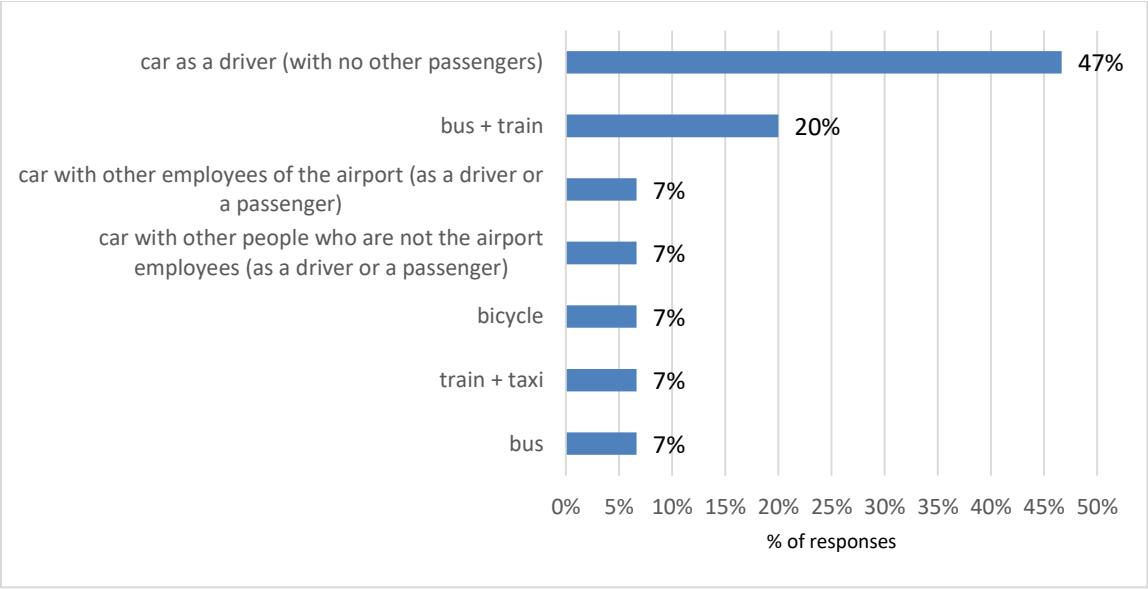
Figure 21. Did you use the same means of transport as usual to get to work today?



Source: own research based on (results of) survey

Among those who used a different than usual means of transport on the day of the survey, car transport was the most frequently chosen answer (46.67% for car travel, as a driver without passengers). Train and bus was the second most frequent one (20%). It should be kept in mind that car transport also applies to people who travel as a passenger (with other airport employees or with other people).

Figure 22. Means of transport used by airport employees to commute to work — responses of respondents who arrived at work with the use of different than usual means of transport on the day of the survey

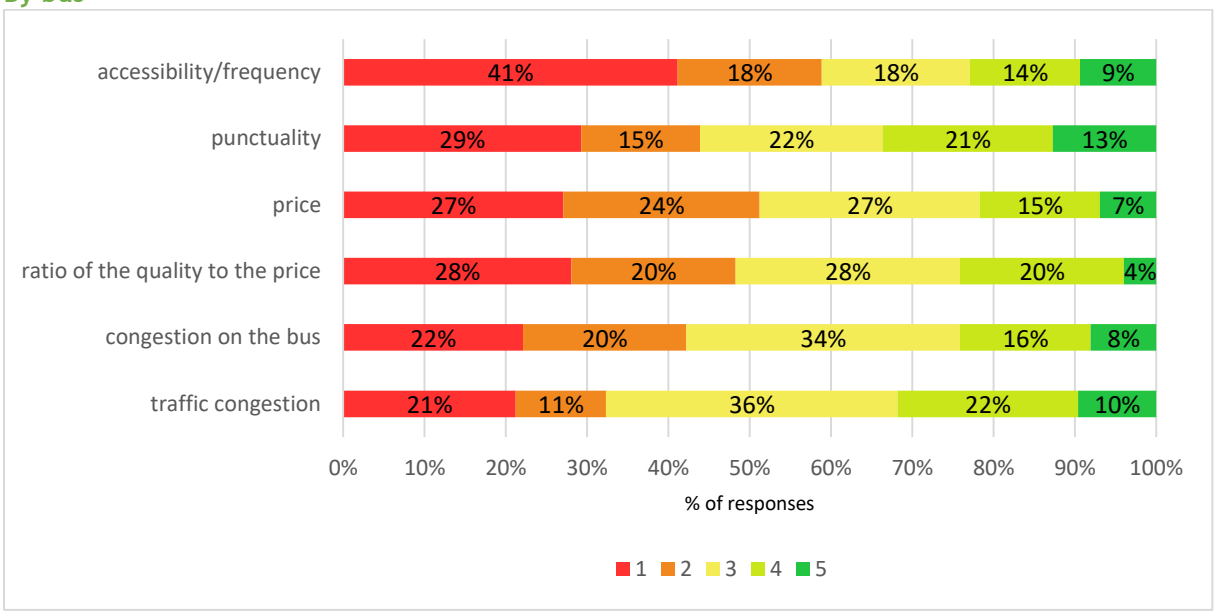


Source: own research based on (results of) survey

Respondents were asked to assess the accessibility of the airport from their place of residence by various means of transport, taking into account several aspects. The first of the assessed means of transport was the bus which received the largest share of negative ratings (1 and 2) for its availability/frequency and price. The same conclusions can be drawn from the analysis of assessments of the accessibility of a combined train-and-bus journey. A different distribution of negative answers concerned the taxi, in the case of which the most negative ratings related to the price and the relation of quality to price. In the case of the car, traffic congestion received the most negative answers.

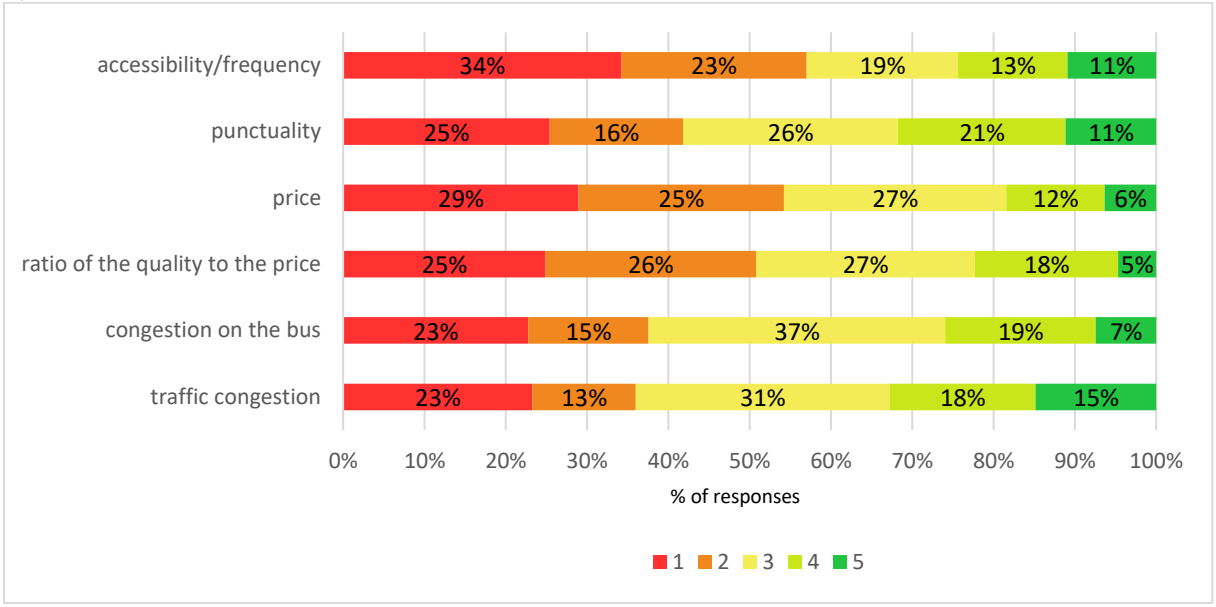
Figure 23. Please rate on a scale of 1 to 5 (where 1 means "very bad" and 5 "very good"), the following aspects of airport accessibility from your place of residence:

By bus



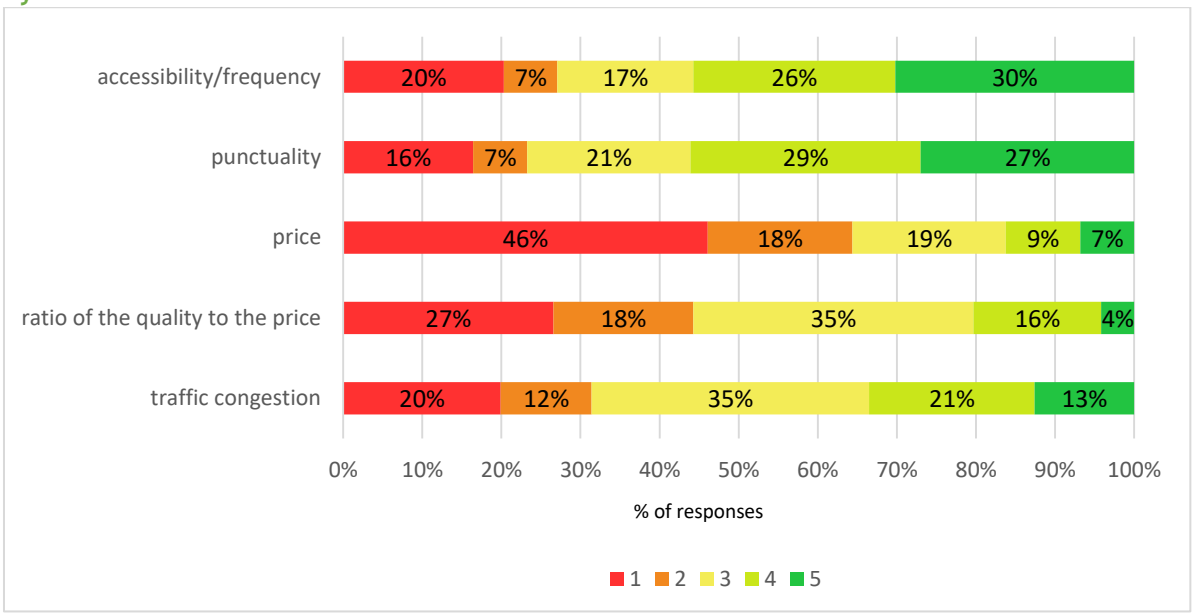
Source: own research based on (results of) survey

By train+bus



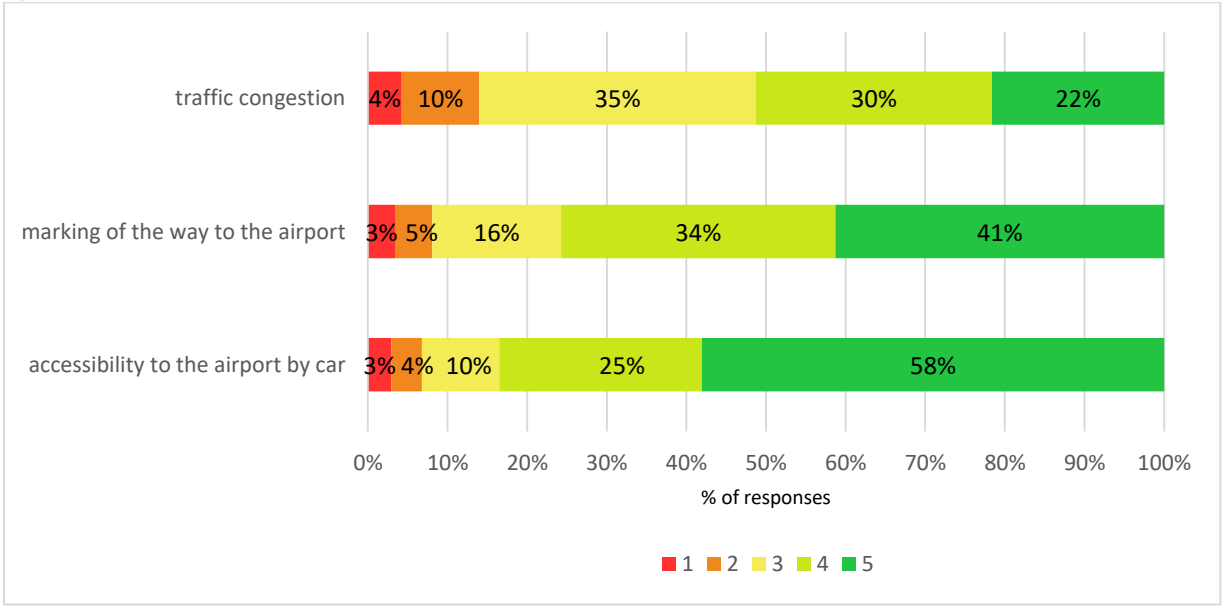
Source: own research based on (results of) survey

By taxi



Source: own research based on (results of) survey

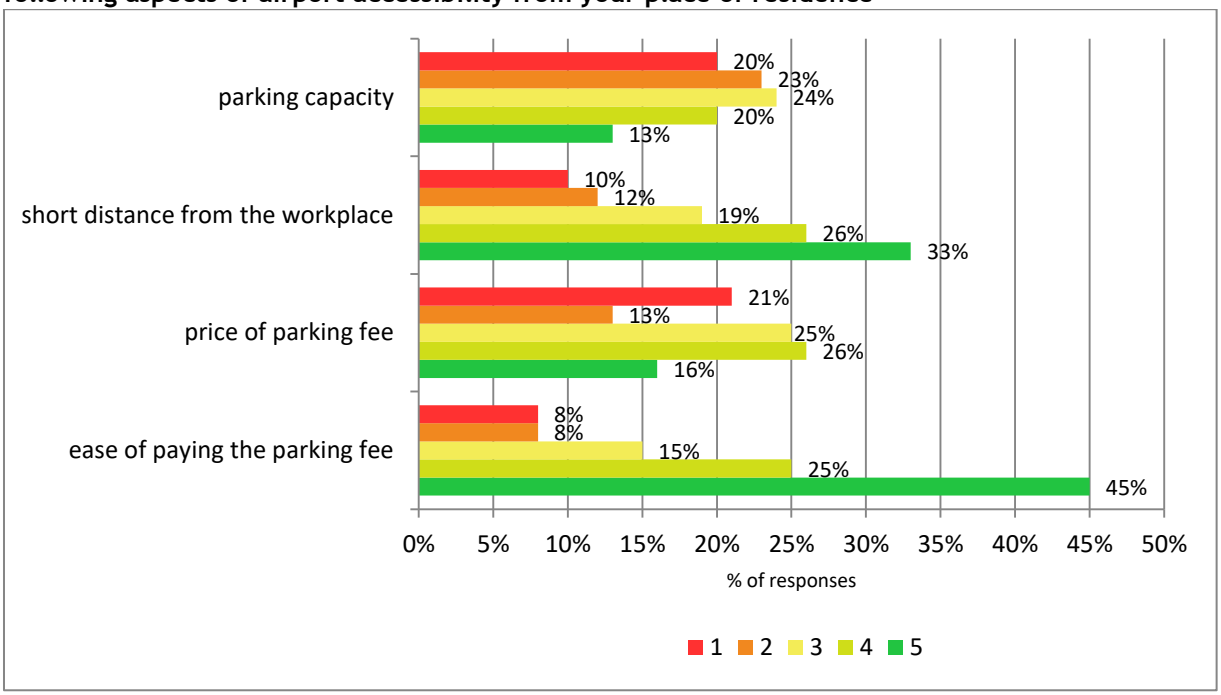
By car



Source: own research based on (results of) survey

Another question concerned the assessment of the accessibility of the airport in terms of the conditions of parking vehicles at the airport. The highest rates were assigned to aspects such as the ease of paying the parking fee (the sum of 4 and 5 marks was nearly 70%) and the short distance to the workplace (nearly 60% for the sum of 4 and 5 marks). Respondents gave the lowest marks to the capacity of the parking lot (the sum of grades 1 and 2 constituting nearly 40%) and the price of the parking fee (1/3 of the answers were 1 and 2).

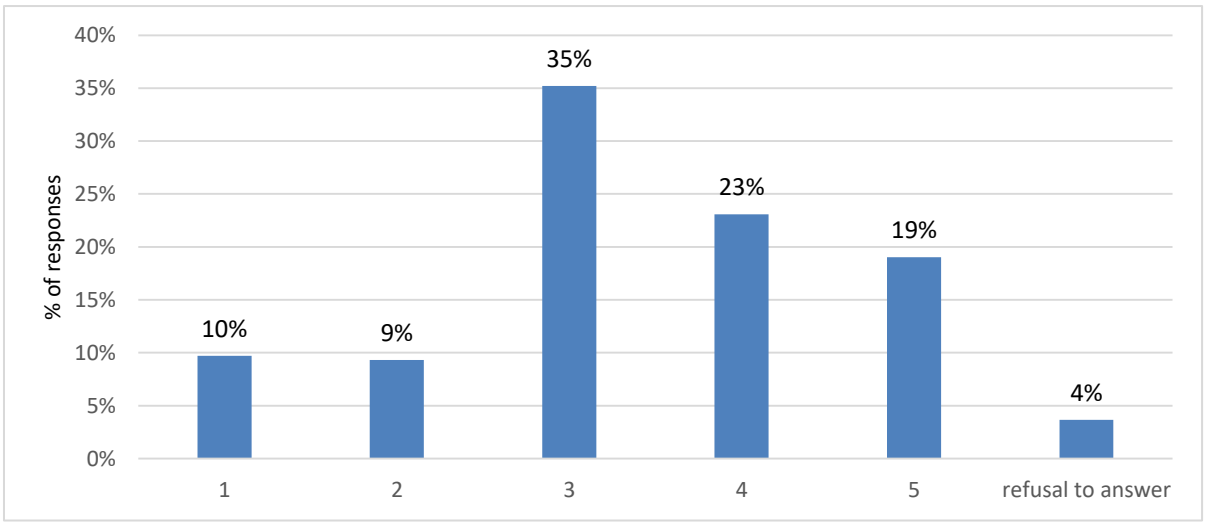
Figure 24. Please rate on a scale of 1 to 5 (where 1 means "very bad" and 5 "very good"), the following aspects of airport accessibility from your place of residence



Source: own research based on (results of) survey

The problem of greenhouse gas (CO_2) emissions generated by the airport, including the emission from commuting to the airport is considered important by a significant part of employees. Ratings 4 and 5 ("important" and "very important"), were chosen by over 42% of respondents. Over 1/3 of those surveyed evaluated it as moderately important, therefore assessments suggesting that the aspect is unimportant and completely unimportant accounted for slightly over 19%.

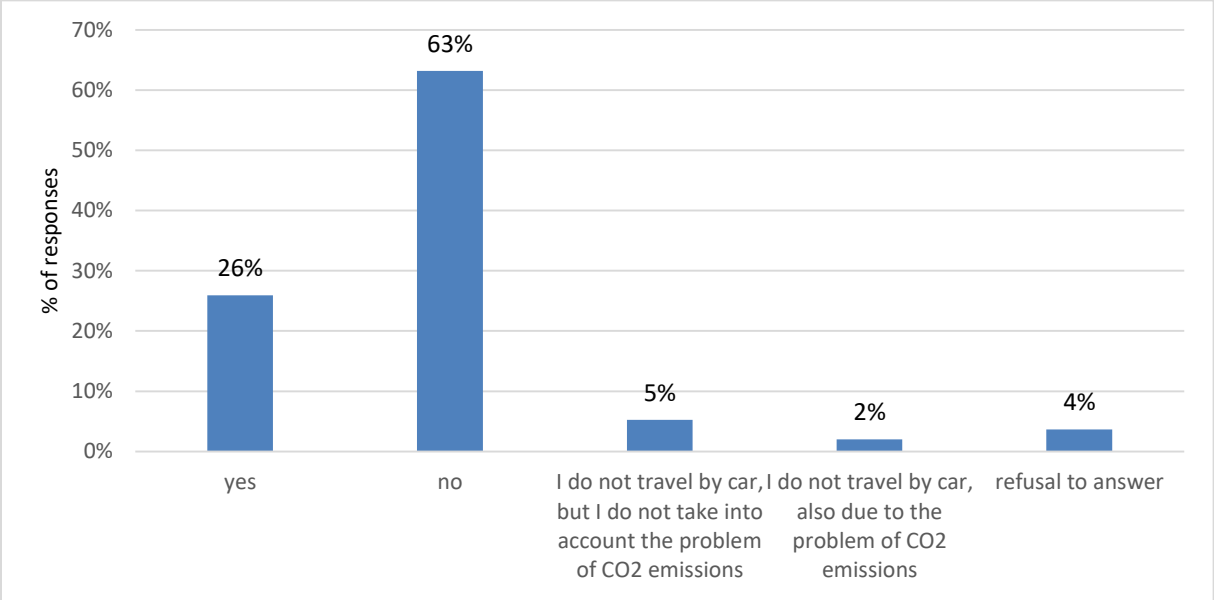
Figure 25. According to you, how important is the problem of greenhouse gas emissions, that is carbon dioxide (CO_2) generated by the airport, including by commuting to/from the airport (according to the scale 1-5, 1- "completely unimportant", and 5- "very important")?



Source: own research based on (results of) survey

The relatively high assessments of the significance of CO_2 emissions are, unfortunately, not reflected in a willingness to resign from driving to the airport (in relation to the awareness of the problem of greenhouse gas emissions). Only slightly over ¼ of respondents were open to such a possibility, and only 2.02% answered that they do not commute to work by car because of greenhouse gases. As many as 63.16% of respondents said they were not willing to stop commuting by car. The remaining respondents (5.26%) do not drive to the airport (but not because of greenhouse gas emissions), and the rest (3.64%) refused to answer this question.

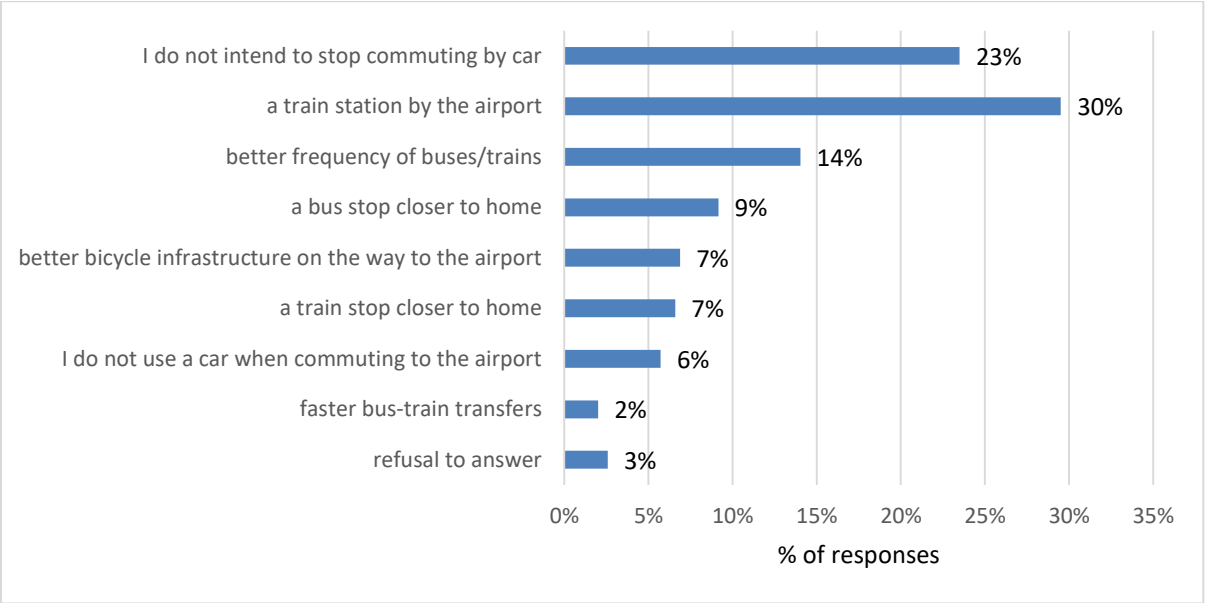
Figure 26. If you were familiar with the issue of CO_2 emissions, would you be willing to resign from commuting to the airport by car?



Source: own research based on (results of) survey

A complementary question concerned the aspects that would influence respondents to stop commuting by car. The surveyed could choose one or two answers, therefore the sum of responses is larger than the number of respondents. Even though 23% of respondents said that none of the proposed answers would convince them to stop commuting by car, a significant part of the respondents confirmed such a possibility. The respondents liked the idea of a train stop at the airport, which for almost 30% of respondents would be an argument for giving up the car. Aspects such as the increase in bus and train frequency and the location of a bus stop closer to home turned out to be relatively important (chosen, respectively, by 14% and 9.17%). It is also worth mentioning that improving the bicycle infrastructure and locating a train stop closer to their place of residence was also indicated by a relatively significant number of respondents (respectively 6.88% and 6.59%).

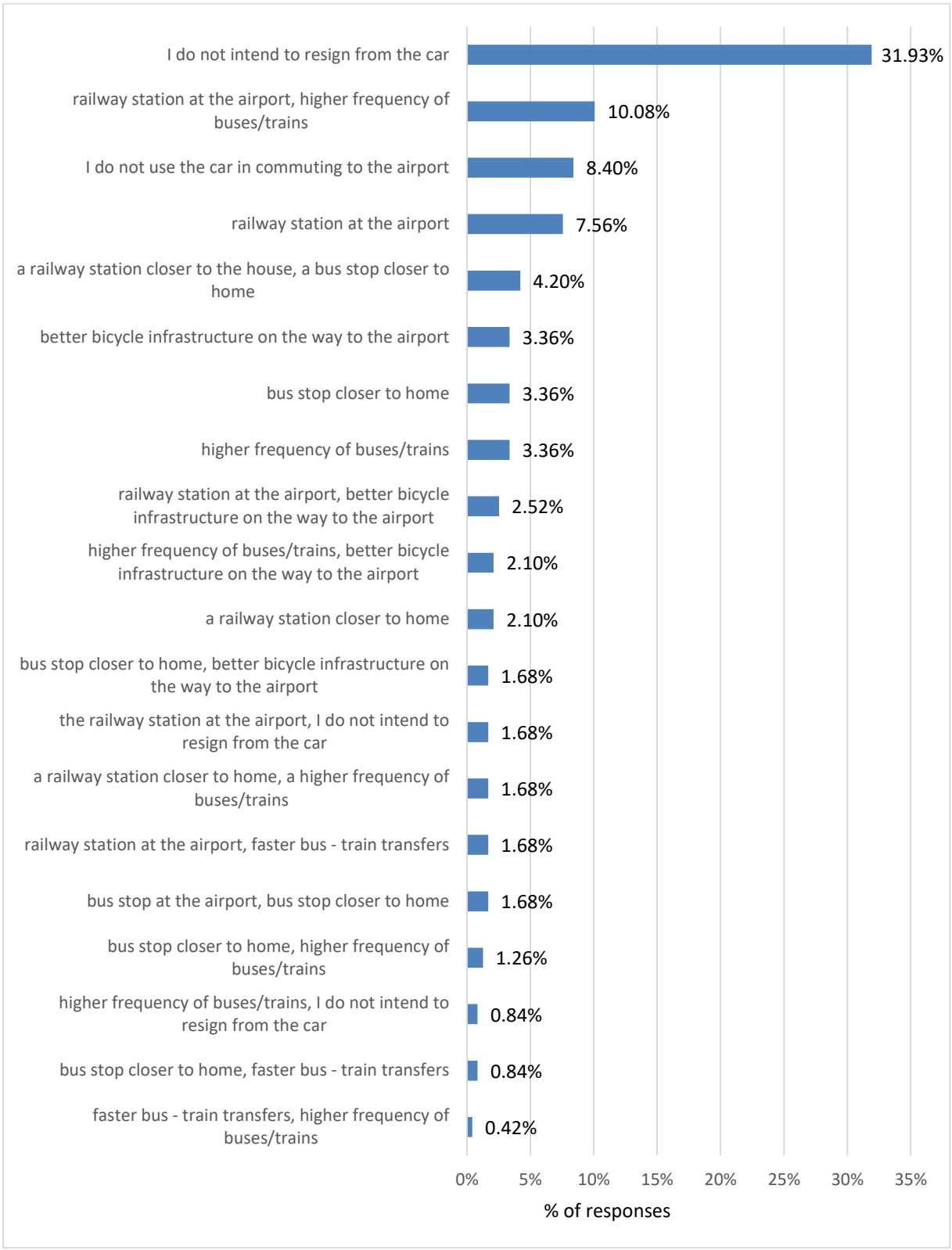
Figure 27. What would convince you to resign from a car when commuting to the airport (you can choose up to two answers - % refers to the sum of responses)



Source: own research based on (results of) survey

Complementary to the above analysis, the second chart below presents the respondents' answers, taking into account sets of answers. The reason behind this is the fact that one person could choose two answers, therefore it may be assumed that only the fulfilment of both conditions would convince them to stop commuting by car. As can be seen in the answers, respondents who were interested in a railway stop at the airport most often indicated that the frequency of trains/buses should also be increased (10%). A similar dependence occurred in the case of expecting a railway stop at the airport and locating a railway stop closer to home (9%). A relatively significant correlation also occurs in the case of providing railway and bus stops closer to home, which was jointly indicated by a total of 4% of respondents.

Figure 28. What would convince you to resign from a car when commuting to the airport (you can choose up to two answers - % refers to the sum of responses)



Source: own research based on (results of) survey

Conclusions from the survey

The surveyed airport employees commute from a large and diverse number of places. Due to the proximity of the city to the airport, the largest share of employees come from Nowy Dwór Mazowiecki (1/3 of respondents). Some of the employees living in this city commute to the workplace by foot or by bus (as the only means of transport). Moreover, employees residing in this city account for the majority of bicycle commuters (67% of all airport employees who declared traveling by bicycle). The farther from Nowy Dwór Mazowiecki, the lower the share of alternative means of transport, and the higher the share of people traveling by car. Among the towns that constitute significant departure points for commuting employees are Legionowo (7.59% of surveyed employees) and Płońsk (4.91% of participants of the survey). All the participants from these locations, despite the relatively short distance from the airport, commuted by car (alone or with somebody else).

A high percentage (16%) of employees indicated Warsaw as their place of residence. Moreover, the employees from individual districts of Warsaw are responsible for the relatively high share of respondents commuting to work by bus and train (depending on the district, this means of transport was used by up to 67% of employees). This fact may stem from the better availability of these means of transport in Warsaw and the possibility of avoiding traffic jams in the city, resulting in a shorter travel time.

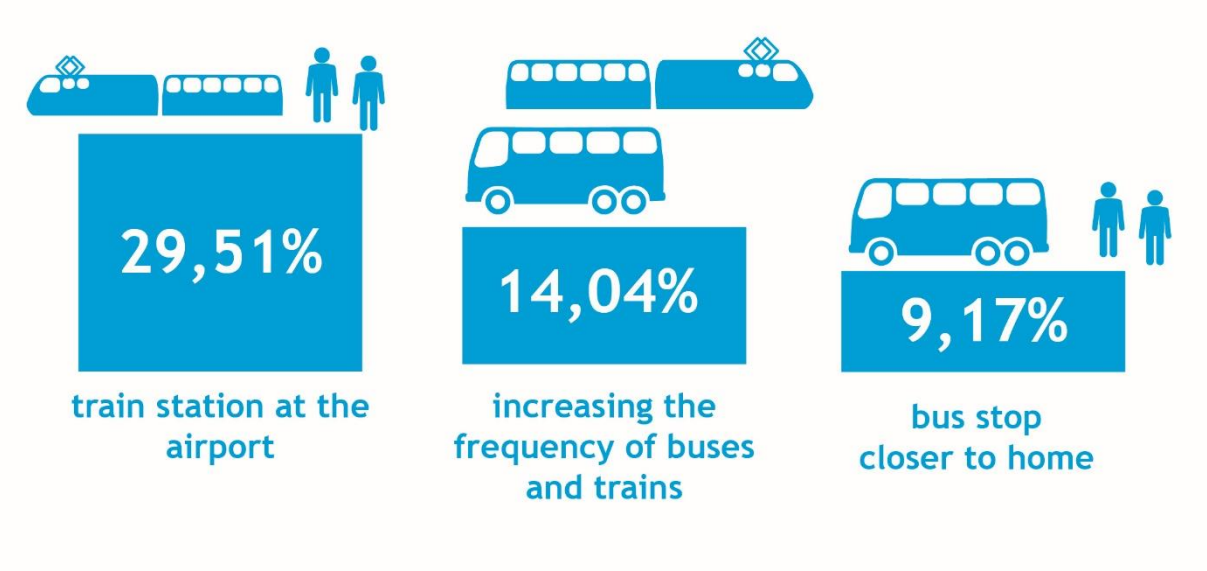
Identifying other major sources of airport employees' daily commutes poses difficulties due to the fact that a significant share of employees commute from a large number of smaller towns spread over a large area. This fact significantly impedes the possibility of developing recommendations regarding the reduction of the car's share as the main means of transport used by airport employees. Currently, as many as 86.63% of surveyed employees travel to/from work by car (as a driver or passenger).

In the context of the correlation between mode of transport and the time needed to travel to work, traveling by car as a driver without passengers was indicated the most often in the case of journeys not exceeding 90 minutes. The number of indications of train + bus journeys increased along with the journey time. Train + bus was also the most frequently chosen means of transport for travels longer than 90 minutes. A certain portion of respondents (not exceeding 13% of all participants) commuted by car with other airport employees, traveling for less than 60 minutes. Commuting by foot took up to 30 minutes.

It should be noted, however, that a significant number of employees considered to be important the problem of greenhouse gas (CO_2) emissions generated by the airport, including emissions generated through commuting to the airport. Over 42% of respondents regarded this problem as an "important" or "very important" issue. In addition, over ¼ of respondents confirmed that they would be willing to stop commuting to the airport by car in order to limit the scale of CO_2 emissions, assuming certain conditions were met. Even though 23.50% of respondents stated that none of the proposed solutions would convince them to stop commuting by car, a significant part of survey participants indicated such a possibility. The respondents were interested in the idea of a train station at the airport, which for nearly 30% of respondents would be a stimulus to give up commuting by car (it should be noted that the availability and frequency of trains and buses was the main problem identified by the respondents in the assessment of current train travel conditions which require a bus/train change). Other relatively important factors which could inspire a switch from the car to public transport were an increase in the frequency of buses and trains (indicated by slightly above 14% of surveyed) and the location of a bus stop closer to home (9.17%). Moreover, improving the

bicycle infrastructure and locating a train stop closer to home was also indicated by a relatively large number of respondents (6.88% and 6.59% respectively).

Figure28. The main possibilities of reducing the use of the car as a means of transport to the airport (% of responses to the question: What would convince you to resign from a car when commuting to the airport)



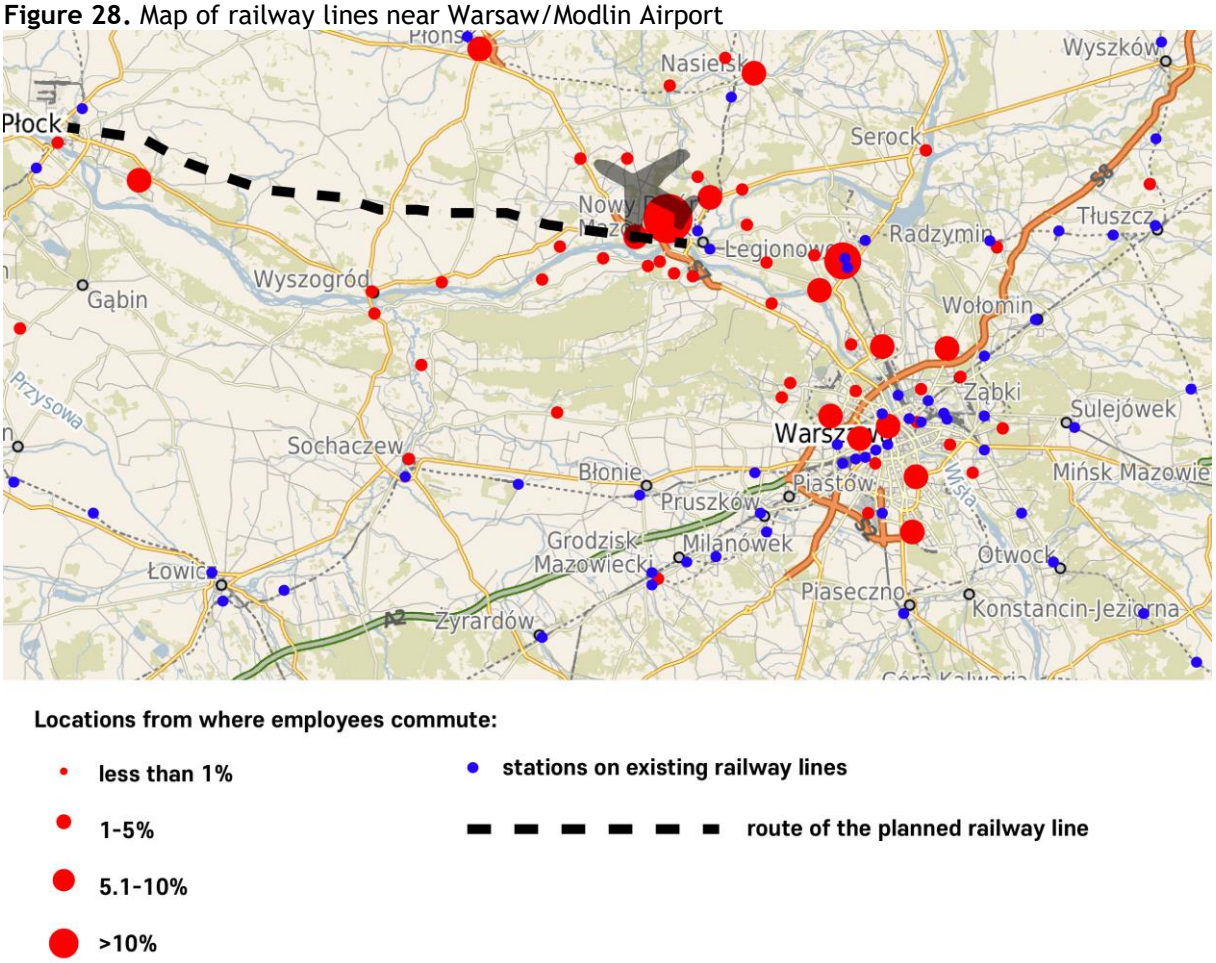
Source: own research based on (results of) survey

The main possibilities of reducing the use of the car as the dominant mean of transport should be seen in the increased availability of rail and bus transport. These measures, frequently indicated by respondents of the survey, were most often selected by the residents of Nowy Dwór Mazowiecki, Legionowo, Płońsk and some districts of Warsaw. There is also visible an unexploited potential for bicycle transport which could be tapped in case of a quantitative and qualitative improvement of the bicycle infrastructure, primarily for commuting from Nowy Dwór Mazowiecki.

The most important factors that could influence some respondents to resign from commuting by car (a railway stop, a railway stop closer to home) were usually indicated by the residents of Warsaw and Legionowo. It is worth recalling that these are the main directions of travel for the employees of the airport. What is more, a high share of responses concerning the need for faster transfers between the bus and the train was given by employees from Płońsk, who also constitute a (numerically) significant group of respondents. At this point it should also be mentioned that there are plans for a Płock–Modlin railway line, which may have a significant impact on the shift from car to train for workers coming from the area around the planned line (including towns such as Słupno, Wyszogród, Czerwińsk nad Wisłą, Wygoda Smoszewska).

The high interest in rail transport among the residents of Warsaw, Legionowo and Płońsk stems from the relatively high number of employees in this area, as well as the fact that the railway line runs through those cities. Therefore, it can be assumed that if the accessibility of this type of transport for other locations (which so far did not have access to railway infrastructure) increased, some of the employees would start commuting by train.

Figure 28. Map of railway lines near Warsaw/Modlin Airport



Source: – www.mapa.plk-sa.pl, www.openstreetmap.org, the Spatial Development Plan of the Mazovian Voivodship

The need to improve the bicycle infrastructure on the way to the airport was reported primarily by employees living in the neighbourhood of the airport, i.e. in Nowy Dwór Mazowiecki, Pomiechówek, Zakroczym, Kazuń Polski and Nasielsk. However, the potential of this mean of transport is considerably more significant and is not limited to these towns. The share of respondents commuting from a distance of no more than 10 km is as high as 32% of all respondents of the survey.

Attention should be also drawn to the fact that the need to increase the frequency of buses/trains was relatively often indicated by the residents of Nowy Dwór Mazowiecki (nearly 41% of responses came from residents of this city).

Annex 1: comparison of results — correlations

In the context of the relations between the respondents' usual mode of transport in commuting to and from work and general questions of the survey, there are no clear connections between the gender of the respondents and chosen means of transport. The highest percentage of people of all ages chose a car, although people aged 46–55 are slightly more likely to use public transport. As far as respondents' education is concerned, 100% of people with primary education chose the car as a means of communication, while it was less often indicated by people with a vocational education (67%). There was no significant impact of earnings and type of work schedule on the choice of the mode of transport.

Table 1. Relations between the usually chosen means of transport in commuting to/from work and general questions of the survey

	Gender		Age					Education				Earnings (PLN)				System of work	
	women	men	< 26	26 - 35	36 - 45	46 - 55	56 - 65	primary	secondary	higher	vocational	1500 - 2000	2001 - 3000	3001 - 4000	more than 4000	one-shift	multi-shift
bus	3%	2%	-	2%	-	7%	6%	-	3%	2%	-	9%	1%	4%	-	3%	2%
by foot	2%	2%	-	2%	1%	2%	6%	-	-	3%	-	5%	-	4%	2%	4%	1%
train + bicycle	-	1%	-	-	1%	-	-	-	1%	-	-	-	-	-	-	-	1%
train +bus	9%	5%	4%	7%	8%	7%	-	-	1%	9%	11%	5%	4%	7%	11%	7%	6%
bicycle	1%	1%	-	1%	-	2%	6%	-	1%	1%	-	5%	-	1%	2%	1%	1%
car as a driver (with no other passengers)	73%	72%	79%	75%	70%	64%	82%	100%	70%	74%	67%	68%	77%	67%	72%	71%	74%
car with other people who are not the airport employees (as a driver or a passenger)	3%	4%	4%	4%	7%	2%	-	-	4%	4%	-	5%	4%	4%	4%	7%	2%
car with other employees of the airport (as a driver or a passenger)	9%	11%	13%	7%	13%	13%	-	-	16%	6%	22%	5%	13%	11%	9%	7%	13%
car + bicycle + by foot	-	1%	-	1%	-	-	-	-	1%	-	-	-	1%	-	-	1%	-
taxi/Uber	-	1%	-	-	-	2%	-	-	1%	-	-	-	-	1%	-	1%	-

Source: own research based on (results of) survey

In the context of time needed to travel to work, for distances not exceeding 90 minutes, traveling by car as a driver without passengers was indicated most often. With increasing travel time, the number of responses related to train + bus increased. Train + bus was also the most frequently chosen means of transport for travels longer than 90 minutes. A certain share of respondents (not exceeding 13% of participants) commuted by car with other airport employees, traveling for less than 60 minutes. Commuting by foot took up to 30 minutes.

For journeys not exceeding 1 km, 100% of respondents decided to reach the destination by foot. In the case of distances greater than 1 km, a car (as a driver without passengers) was the most frequently chosen means of transport (71% to 84% of indications). Commuting by car with other airport employees (as a driver or passenger) was indicated by a certain percentage of respondents for nearly each selected distance range (from 7% (1–5 km) to 24% (16–20 km)). In the case of a distance of 4–6 km, 10% of respondents travelled by bus.

Table 2. Relations between the time and distance of commuting to/from work, and the usually chosen means of transport in commuting to/from work

	Time						Distance							
	< 15 min	16 - 30 min	31 - 45 min	46 - 60 min	61 - 90 min	> 90 min	< 1 km	1-5 km	6-10 km	11-15 km	16-20 km	21-30 km	31-40 km	>40 km
bus	3%	4%	-	3%	-	-	-	4%	10%	-	-	-	-	-
by foot	4%	3%	-	-	-	-	100%	11%	-	-	-	-	-	-
train + bicycle	-	1%	-	-	-	-	-	-	-	-	6%	-	-	-
train +bus	1%	-	4%	8%	33%	55%	-	-	4%	3%	-	5%	10%	15%
bicycle	1%	1%	2%	-	-	-	-	4%	4%	-	-	-	-	-
car as a driver (with no other passengers)	80%	69%	77%	74%	58%	36%	-	71%	69%	84%	69%	80%	66%	71%
by car with other people who are not employees of the airport (as a driver or a passenger)	-	-	-	3%	-	-	-	-	-	-	-	-	-	2%
car + bicycle + by foot	8%	12%	13%	13%	-	-	-	7%	8%	10%	13%	8%	24%	8%
taxi/Uber	1%	-	-	-	-	-	-	4%	-	-	-	-	-	-

Source: own research based on (results of) survey

As presented in the table below, the bus was assessed predominantly positively by respondents choosing this mode of transport — in each category the highest grades (5 and 4) dominated. Slightly lower ratings were given for a bus used with another mode of transport (train) — in this case the share of ratings 2 and 3 increased.

The bus was assessed considerably worse in the case of means of transport chosen by a marginal percentage of the total number of respondents of the survey. Attention shall be drawn to the lower assessment of the bus given by respondents commuting by car. Given this, it might be possible to identify a negative stereotype occurring in this situation.

Table 3. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - bus (part 1)

	accessibility/frequency					punctuality					price				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
bus	-	17%	17%	50%	17%	-	-	17%	17%	67%	-	17%	17%	17%	50%
by foot	75%	-	-	25%	-	75%	-	-	25%	-	75%	-	-	25%	-
train + bicycle	100%	-	-	-	-	-	-	100%	-	-	-	-	100%	-	-
train +bus	13%	19%	44%	19%	6%	6%	13%	44%	25%	13%	13%	31%	31%	25%	-
bicycle	33%	33%	-	-	33%	33%	33%	-	-	33%	33%	33%	-	-	33%
car as a driver (with no other passengers)	44%	18%	17%	12%	10%	29%	15%	19%	20%	11%	27%	24%	29%	13%	7%
car with other people who are not the airport employees (as a driver or a passenger)	56%	11%	11%	11%	22%	22%	11%	33%	11%	22%	20%	20%	40%	10%	10%
car with other employees of the airport (as a driver or a passenger)	44%	20%	16%	16%	4%	36%	12%	24%	24%	4%	36%	28%	20%	16%	-
car + bicycle + by foot	100%	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-
taxi/Uber	-	-	100%	-	-	-	100%	-	-	-	-	-	-	100%	-

Source: own research based on (results of) survey

Table 4. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - bus (part 2)

	ratio of the quality to the price					congestion on the bus					traffic congestion				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
bus	-	17%	17%	50%	17%	-	17%	17%	17%	50%	-	-	17%	67%	17%
by foot	75%	-	-	25%	-	75%	-	-	25%	-	75%	-	25%	-	-
train + bicycle	-	-	-	100%	-	-	-	100%	-	-	-	-	100%	-	-
train +bus	6%	31%	31%	31%	-	6%	13%	31%	31%	19%	8%	-	31%	38%	23%
bicycle	33%	67%	-	-	-	33%	67%	-	-	-	-	33%	67%	-	-
car as a driver (with no other passengers)	27%	18%	33%	18%	4%	22%	21%	35%	15%	7%	21%	14%	38%	19%	9%
car with other people who are not the airport employees (as a driver or a passenger)	40%	10%	30%	10%	10%	11%	33%	44%	11%	-	10%	10%	30%	30%	20%
car with other employees of the airport (as a driver or a passenger)	42%	25%	8%	21%	4%	36%	16%	32%	16%	-	36%	4%	32%	24%	4%
car + bicycle + by foot	100%	-	-	-	-	-	-	-	-	100%	-	-	-	100%	-
taxi/Uber	-	100%	-	-	-	-	-	100%	-	-	-	-	100%	-	-

Source: own research based on (results of) survey

The assessment of the bus + train option is similar to that of the bus in terms of the correlation with the respondents' selected means of transport-. The bus+train option was usually assessed neutrally or well (scores equal to 3, 4) in each category, with negative ratings given by a marginal share of respondents using means of transport unpopular among participants of the survey. In the case of commuters using the dominant means of transport (car as a driver, without passengers), the ratings were slightly lower than in the case of the bus assessment.

Table 5. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - train + bus (part 1)

	accessibility/frequency					punctuality					price				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
bus	-	-	-	-	100%	-	-	25%	25%	50%	25%	-	-	25%	50%
by foot	75%	-	-	-	25%	75%	-	-	-	25%	75%	-	-	-	25%
train + bicycle	-	-	100%	-	-	-	-	-	100%	-	-	-	-	100%	-
train +bus	27%	20%	33%	7%	13%	20%	7%	40%	27%	7%	13%	20%	33%	20%	13%
bicycle	33%	33%	-	33%	-	33%	33%	33%	-	-	33%	33%	33%	-	-
car as a driver (with no other passengers)	38%	23%	17%	14%	8%	27%	17%	26%	20%	10%	30%	27%	26%	12%	5%
car with other people who are not the airport employees (as a driver or a passenger)	10%	50%	10%	10%	20%	-	30%	30%	10%	30%	10%	50%	30%	-	10%
car with other employees of the airport (as a driver or a passenger)	29%	17%	29%	17%	8%	20%	12%	36%	28%	4%	28%	20%	40%	12%	-
car + bicycle + by foot	-	-	100%	-	-	100%	-	-	-	-	100%	-	-	-	-
taxi/Uber	-	-	100%	-	-	-	100%	-	-	-	-	-	100%	-	-

Source: own research based on (results of) survey

Table 6. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - train + bus (part 2)

	ratio of the quality to the price					congestion on the bus					traffic congestion				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
bus	-	50%	-	50%	-	-	25%	-	50%	25%	-	25%	-	25%	50%
by foot	75%	-	-	25%	-	75%	-	-	25%	-	75%	-	-	25%	-
train + bicycle	-	-	-	100%	-	-	-	100%	-	-	-	-	100%	-	-
train +bus	7%	33%	40%	13%	7%	7%	-	20%	53%	20%	15%	15%	31%	15%	23%
bicycle	33%	33%	-	33%	-	33%	33%	33%	-	-	33%	33%	33%	-	-
car as a driver (with no other passengers)	29%	22%	27%	17%	5%	23%	17%	38%	16%	5%	23%	15%	29%	19%	15%
car with other people who are not the airport employees (as a driver or a passenger)	-	50%	30%	10%	10%	10%	10%	60%	10%	10%	-	10%	60%	20%	10%
car with other employees of the airport (as a driver or a passenger)	20%	28%	32%	16%	4%	25%	17%	42%	8%	8%	28%	4%	40%	16%	12%
car + bicycle + by foot	100%	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-
taxi/Uber	-	100%	-	-	-	-	-	100%	-	-	-	-	100%	-	-

Source: own research based on (results of) survey

Taxi/Uber were rated rather negatively by people choosing those means of transport. In the case of other means of transport, attention shall be drawn to relatively high assessment, excluding the price which was characterized by a high share of negative ratings without the relation to chosen means of transport.

Table 7. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - taxi (part 1)

	accessibility/frequency					punctuality					price				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
bus	25%	-	-	-	75%	-	-	-	-	100%	50%	-	-	25%	25%
by foot	50%	-	-	25%	25%	50%	-	-	25%	25%	75%	-	-	-	25%
train + bicycle	-	-	-	-	100%	-	-	-	-	100%	100%	-	-	-	-
train +bus	-	10%	-	40%	50%	-	10%	20%	30%	40%	40%	10%	20%	20%	10%
bicycle	33%	-	33%	33%	-	33%	-	33%	33%	-	33%	33%	33%	-	-
car as a driver (with no other passengers)	21%	7%	18%	24%	30%	18%	6%	21%	28%	27%	46%	19%	21%	9%	6%
car with other people who are not the airport employees (as a driver or a passenger)	10%	-	30%	40%	20%	-	-	40%	40%	20%	50%	30%	-	-	20%
car with other employees of the airport (as a driver or a passenger)	18%	9%	23%	27%	23%	14%	14%	18%	36%	18%	41%	23%	23%	14%	-
car + bicycle + by foot	100%	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-
taxi/Uber	-	-	100%	-	-	-	100%	-	-	-	-	-	100%	-	-

Source: own research based on (results of) survey

Table 8. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - taxi (part 2)

	ratio of the quality to the price					congestion on the bus				
	1	2	3	4	5	1	2	3	4	5
bus	-	25%	25%	50%	-	25%	-	-	25%	50%
by foot	75%	-	-	25%	-	50%	-	-	50%	-
train + bicycle	-	-	-	100%	-	-	-	100%	-	-
train +bus	30%	20%	20%	20%	10%	10%	30%	30%	20%	10%
bicycle	33%	-	67%	-	-	33%	-	67%	-	-
car as a driver (with no other passengers)	24%	17%	38%	17%	4%	20%	10%	32%	24%	13%
car with other people who are not the airport employees (as a driver or a passenger)	20%	60%	10%	-	10%	-	10%	70%	10%	10%
car with other employees of the airport (as a driver or a passenger)	36%	9%	41%	9%	5%	18%	14%	45%	14%	9%
car + bicycle + by foot	100%	-	-	-	-	100%	-	-	-	-
taxi/Uber	-	-	100%	-	-	-	100%	-	-	-

Source: own research based on (results of) survey

The availability of the airport by car and other indicated aspects were assessed positively. An especially high share of neutral ratings (3) concerned, however, traffic congestion. Nevertheless, this aspect was assessed predominantly positively by respondents travelling by car as a driver.

Table 9. Relations between the usually chosen means of transport in commuting to/from work and the assessment of individual means of transport - car

	accessibility to the airport by car					markings on the way to the airport					traffic congestion				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
bus	-	-	-	25%	75%	-	25%	-	25%	50%	-	25%	25%	25%	25%
by foot	25%	-	-	25%	50%	-	-	-	25%	75%	-	-	50%	25%	25%
train + bicycle	-	-	-	-	100%	100%	-	-	-	-	-	-	100%	-	-
train +bus	10%	10%	40%	-	40%	-	10%	50%	20%	20%	20%	20%	40%	20%	-
bicycle	-	33%	33%	-	33%	-	33%	33%	33%	-	-	33%	67%	-	-
car as a driver (with no other passengers)	3%	3%	7%	25%	61%	4%	3%	15%	35%	42%	5%	9%	31%	32%	24%
car with other people who are not the airport employees (as a driver or a passenger)	-	-	20%	20%	60%	-	-	10%	40%	50%	-	-	60%	20%	20%
car with other employees of the airport (as a driver or a passenger)	-	-	12%	44%	44%	-	8%	12%	40%	40%	-	8%	48%	24%	20%
car + bicycle + by foot	-	-	-	-	100%	-	-	-	-	100%	-	-	-	100%	-
taxi/Uber	-	100%	-	-	-	-	-	100%	-	-	-	100%	-	-	-

Source: own research based on (results of) survey

The largest share of people commuting to work by bus + train indicated Warsaw as the source of their journeys. Depending on the district, up to 67% of employees from a given area chose this means of transport. It should be added that only the workers from Nowy Dwór Mazowiecki and Zakroczym chose to travel by bus or commute to work by foot or by bike. In the case of locations at a large distance from the airport, e.g. Radom, Białystok or Bydgoszcz, employees travelled by car.

Table 10. Relations between the place of residence and the default means of transport

	bus	by foot	train + bicycle	train + bus	bicycle	car as a driver (with no other passengers)	car with other people who are not the airport employees (as a driver or a passenger)	car with other employees of the airport (as a driver or a passenger)	car + bicycle + by foot	taxi/Uber
Baboszewo	-	-	-	-	-	50%	-	50%	-	-
Białystok	-	-	-	-	-	100%	-	-	-	-
Brochów	-	-	-	-	-	-	-	100%	-	-
Bydgoszcz	-	-	-	-	-	100%	-	-	-	-
Chotomów	-	-	-	50%	-	50%	-	-	-	-
Cieksyn	-	-	-	-	-	100%	-	-	-	-
Czarnowo	-	-	-	-	-	100%	-	-	-	-
Czerwińsk nad Wisłą	-	-	-	-	-	100%	-	-	-	-
Czosnów	-	-	-	-	-	100%	-	-	-	-

	bus	by foot	train + bicycle	train + bus	bicycle	car as a driver (with no other passengers)	car with other people who are not the airport employees (as a driver or a passenger)	car with other employees of the airport (as a driver or a passenger)	car + bicycle + by foot	taxi/Uber
Dębina	-	-	-	-	-	100%	-	-	-	-
Dębinki	-	-	-	100%	-	-	-	-	-	-
Dziekanów Nowy	-	-	-	-	-	100%	-	-	-	-
Gąsocin	-	-	-	-	-	100%	-	-	-	-
Grodzisk Mazowiecki	-	-	-	-	-	50%	-	50%	-	-
Jabłonna	-	-	-	-	-	60%	20%	20%	-	-
Janówek Pierwszy	-	-	-	-	-	-	-	100%	-	-
Kampinos	-	-	-	-	-	100%	-	-	-	-
Kazuń Polski	-	-	-	-	-	100%	-	-	-	-
Kazuń Bielany	-	-	-	-	-	100%	-	-	-	-
Kątne	-	-	-	-	-	100%	-	-	-	-
Kosewko	-	-	-	-	-	100%	-	-	-	-
Kroczewo	-	-	-	-	-	100%	-	-	-	-
Legionowo	-	-	-	6%	-	71%	6%	18%	-	-
Maków Mazowiecki	-	-	-	-	-	100%	-	-	-	-
Marki	-	-	-	-	-	100%	-	-	-	-
Nasielsk	-	-	-	-	-	71%	14%	14%	-	-
Nowe Grochale	-	-	-	-	-	100%	-	-	-	-
Nowy Dwór Mazowiecki	8%	5%	-	3%	3%	66%	4%	9%	1%	-
Nowy Kamion	-	-	-	-	-	100%	-	-	-	-
Ostrów Mazowiecka	-	-	-	-	-	100%	-	-	-	-
Płock	-	-	-	-	-	100%	-	-	-	-
Płońsk	-	-	-	-	-	64%	-	36%	-	-
Pomiechówek	-	-	-	14%	-	71%	-	14%	-	-
Pułtusk	-	-	-	-	-	100%	-	-	-	-
Radom	-	-	-	-	-	-	100%	-	-	-
Radzymin	-	-	-	-	-	100%	-	-	-	-
Serock	-	-	-	-	-	100%	-	-	-	-
Skierdy	-	-	-	-	-	100%	-	-	-	-
Słupno	-	-	-	-	-	-	-	100%	-	-
Sochaczew	-	-	-	-	-	100%	-	-	-	-
Stare Babice	-	-	-	-	-	100%	-	-	-	-
Strzegocin	-	-	-	-	-	100%	-	-	-	-
Strzykuły	-	-	-	-	-	100%	-	-	-	-

	bus	by foot	train + bicycle	train + bus	bicycle	car as a driver (with no other passengers)	car with other people who are not the airport employees (as a driver or a passenger)	car with other employees of the airport (as a driver or a passenger)	car + bicycle + by foot	taxi/Uber
Szczawin Kościelny	-	-	-	-	-	100%	-	-	-	-
Tarchomin	-	-	-	-	-	100%	-	-	-	-
Tomaszów Mazowiecki	-	-	-	-	-	100%	-	-	-	-
Warszawa	-	-	-	33%	-	67%	-	-	-	-
Warszawa - Bemowo	-	-	-	-	-	67%	-	33%	-	-
Warszawa - Białołęka	-	-	-	14%	-	71%	-	14%	-	-
Warszawa - Bielany	-	-	-	-	-	50%	-	50%	-	-
Warszawa - Mokotów	-	-	-	67%	-	33%	-	-	-	-
Warszawa - Ochota	-	-	-	50%	-	50%	-	-	-	-
Warszawa - Praga	-	-	-	-	-	100%	-	-	-	-
Warszawa - Praga Południe	-	-	-	50%	-	-	-	50%	-	-
Warszawa - Targówek	-	-	-	-	-	50%	50%	-	-	-
Warszawa - Ursynów	-	-	-	33%	-	67%	-	-	-	-
Warszawa - Wawer	-	-	-	-	-	100%	-	-	-	-
Warszawa - Włochy	-	-	-	50%	-	50%	-	-	-	-
Warszawa - Wola	-	-	-	33%	-	67%	-	-	-	-
Warszawa - Rembertów	-	-	-	-	-	100%	-	-	-	-
Warszawa - Mokotów	-	-	-	-	-	100%	-	-	-	-
Wilków Polski	-	-	-	-	-	100%	-	-	-	-
Wojszczyce	-	-	-	-	-	100%	-	-	-	-
Wygoda Smoszewska	-	-	-	-	-	100%	-	-	-	-
Wyszogród	-	-	-	-	-	100%	-	-	-	-
Zakroczym	-	-	-	-	25%	75%	-	-	-	-
Ząbki	-	-	-	-	-	100%	-	-	-	-

Source: own research based on (results of) survey

There are no specific correlations between the gender or age of respondents and the perception of the problem of CO_2 emissions. Larger differences occur in the case of education – 100% of surveyed respondents with primary education confirmed their awareness of this problem and the will to stop traveling by car. Nevertheless, it should be noted that people with this level of education constituted a low percentage of all respondents. In the case of other surveyed employees, the highest share of people aware of this problem was visible among respondents with higher education, but these differences were not considerable. Considering earnings and work systems, the differences in the structure of responses were not significant.

Table 11. Relations between the assessment of the awareness on CO_2 emission and the tendency to resign from the car, and general answers of the survey

	Gender		Age					Education				Earnings				System of work	
	women	men	< 26	26 - 35	36 - 45	46 - 55	56 - 65	primary	secondary	higher	vocational	1500 - 2000	2001 - 3000	3001 - 4000	more than 4000	one-shift	multi-shift
no	62%	64%	63%	58%	66%	67%	65%	-	68%	60%	67%	55%	63%	61%	68%	62%	64%
I do not commute by car, but I do not take into consideration the issue of the CO_2 emission	7%	4%	8%	10%	3%	2%	-	-	3%	6%	11%	9%	3%	6%	4%	5%	5%
I do not commute by car, also considering the issue of the CO_2 emission	3%	1%	-	1%	4%	-	6%	-	1%	3%	-	5%	1%	3%	2%	4%	1%
yes	23%	27%	29%	27%	24%	24%	29%	100%	25%	27%	11%	27%	28%	25%	26%	27%	26%
refusal to answer	4%	3%	-	4%	4%	7%	-	-	2%	4%	11%	5%	4%	6%	-	2%	5%

Source: own research based on (results of) survey

Respondents not commuting by car travel by foot or by train + bus, also due to the awareness of the issue of CO_2 emissions. In turn, a large part of the people declaring a tendency to stop commuting by car due to CO_2 emissions travel to/from work by car. However, among those willing to give up the car there was a high number of respondents already choosing other means of transport, such as bus or train + bus, therefore a convergence between the declared attitudes and the actual choices can be observed.

Table 12. Relations between the assessment of the awareness on the CO_2 emission and the tendency to resign from the car, and general answers of the survey

	bus	by foot	train + bicycle	train +bus	bicycle	car as a driver (with no other passengers)	car with other people who are not the airport employees (as a driver or passenger)	car with other employees of the airport (as a driver or passenger)	car + bicycle + by foot	taxi/Uber
I am not willing to stop commuting by car, even considering the issue of CO_2 emissions	17%	20%	100%	-	67%	70%	50%	80%	-	100%
I do not commute by car, but I do not take into consideration the issue of CO_2 emissions	33%	20%	-	44%	-	2%	-	-	-	-
I do not commute by car, also considering the issue of CO_2 emissions	-	20%	-	19%	-	-	-	4%	-	-
I am willing to stop commuting by car, considering the issue of CO_2 emissions	50%	20%	-	25%	33%	25%	50%	16%	100%	-
refusal to answer	-	20%	-	13%	-	3%	-	-	-	-

Source: own research based on (results of) survey

Surveyed employees who do not intend to stop traveling by car usually commute to/from work for up to 60 minutes.

Respondents who declared the possibility of not commuting by car usually get to work in less than an hour, which stems from the short distance from the place of residence. In the case of the most frequently indicated factors which would motivate to give up the car (i.e. a railway stop at the airport, a higher frequency of trains/buses), the largest share of responses concerned a group of employees commuting up to 45 minutes.

Table 13. Relations between factors that would influence respondents to resign from the car in commuting, and the time needed to travel to work

	Time					
	< 15 min	16 - 30 min	31 - 45 min	46 - 60 min	61 - 90 min	> 90 min
better bicycle infrastructure on the way to the airport	8%	3%	-	-	-	-
I do not use the car in commuting to the airport	1%	6%	2%	-	25%	36%
I do not use the car in commuting to the airport, better bicycle infrastructure on the way to the airport	-	1%	-	-	-	-
I do not use the car in commuting to the airport, bus stop closer to home	-	-	-	3%	-	-
I do not use the car in commuting to the airport, a railway stop closer to home	-	-	-	3%	-	-
I do not use the car in commuting to the airport, the railway station at the airport	1%	-	-	-	-	9%
I do not use the car in commuting to the airport, a higher frequency of buses/trains	1%	-	-	3%	-	-
I do not intend to resign from the car	23%	32%	36%	42%	25%	18%
bus stop closer to home	4%	6%	2%	-	-	-
bus stop closer to home, better bicycle infrastructure on the way to the airport	4%	1%	-	-	-	-
bus stop closer to home, faster bus- train transfers	-	3%	-	-	-	-
bus stop closer to home, higher frequency of buses/trains	4%	-	-	-	-	-
a railway station closer to home	-	-	4%	5%	8%	-
a railway station closer to home, a bus stop closer to home	1%	6%	4%	5%	8%	-
a railway station closer to home, a higher frequency of buses/trains	-	-	4%	5%	-	-
railway station at the airport	7%	7%	11%	3%	8%	9%
railway station at the airport, better bicycle infrastructure on the way to the airport	4%	1%	2%	3%	-	-
railway station at the airport, I do not intend to resign from the car	3%	-	4%	-	-	-
railway station at the airport, a railway station closer to home	1%	3%	-	-	8%	-
railway station at the airport, bus stop closer to home	6%	13%	13%	5%	8%	-
railway station at the airport, faster bus- train transfers	-	4%	-	3%	-	-
railway station at the airport, higher frequency of buses/trains	11%	7%	6%	13%	8%	18%
higher frequency of buses/trains, better bicycle infrastructure on the way to the airport	-	-	2%	-	-	-
higher frequency of buses/trains	7%	-	6%	-	-	-
higher frequency of buses/trains, better bicycle infrastructure on the way to the airport	7%	-	-	-	-	-
higher frequency of buses/trains, I do not intend to resign from the car	1%	1%	-	-	-	-
refusal to answer	3%	3%	2%	8%	-	9%

Source: own research based on (results of) survey

Respondents willing to stop commuting to work by car, travelling a distance of up to 5 km, indicated the need to increase the frequency of buses/trains and to improve the bicycle infrastructure on the way to the airport. Along with the distance that respondents have to travel, the reluctance to resign from the car increases, as well as the interest in a train station at the airport and a train stop closer to home.

Table 14. Relations between factors that would influence respondents to resign from the car in commuting to work, and the travelled distance

	< 1 km	1-5 km	6-10 km	11-15 km	16-20 km	21-30 km	31-40 km	>40 km
better bicycle infrastructure on the way to the airport	-	14%	4%	3%	6%	-	-	-
I do not use the car in commuting to the airport	50%	7%	6%	-	-	3%	3%	10%
I do not use the car in commuting to the airport, better bicycle infrastructure on the way to the airport	-	4%	-	-	-	-	-	-
I do not use the car in commuting to the airport, bus stop closer to home	-	-	2%	-	-	-	-	-
I do not use the car in commuting to the airport, a railway stop closer to home	-	-	-	-	-	-	-	2%
I do not use the car in commuting to the airport, the railway station at the airport	-	4%	-	-	-	-	-	2%
I do not use the car in commuting to the airport, a higher frequency of buses/trains	-	4%	2%	-	-	-	-	-
I do not intend to resign from the car	-	21%	16%	42%	38%	30%	52%	31%
bus stop closer to home	-	7%	4%	3%	6%	3%	3%	-
bus stop closer to home, better bicycle infrastructure on the way to the airport	-	7%	2%	3%	-	-	-	-
bus stop closer to home, faster bus - train transfers	-	-	2%	-	-	-	-	2%
bus stop closer to home, higher frequency of buses/trains	-	4%	-	6%	-	-	-	-
a railway station closer to home	-	-	-	-	6%	3%	-	6%
a railway station closer to home, a bus stop closer to home	-	4%	2%	-	13%	8%	-	6%
a railway station closer to home, a higher frequency of buses/trains	-	-	-	-	-	-	3%	6%
railway station at the airport	-	-	8%	6%	6%	10%	10%	8%
railway station at the airport, better bicycle infrastructure on the way to the airport	-	4%	8%	-	-	-	3%	-
railway station at the airport, I do not intend to resign from the car	-	4%	2%	-	-	5%	-	-
railway station at the airport, a railway station closer to home	-	-	4%	-	-	3%	-	2%
railway station at the airport, bus stop closer to home	-	4%	4%	13%	19%	20%	3%	6%
railway station at the airport, faster bus - train transfers	-	-	2%	3%	-	3%	3%	-
railway station at the airport, higher frequency of buses/trains	-	-	16%	6%	6%	5%	7%	17%
faster bus - train transfers, higher frequency of buses/trains	-	-	-	-	-	3%	-	-
higher frequency of buses/trains	50%	7%	2%	3%	-	3%	7%	-
higher frequency of buses/trains, better bicycle infrastructure on the way to the airport	-	7%	6%	-	-	-	-	-
higher frequency of buses/trains, I do not intend to resign from the car	-	-	-	3%	-	3%	-	-
refusal to answer	-	-	6%	6%	-	3%	3%	4%

Source: own research based on (results of) survey

A larger share of the people willing to stop commuting by car if a railway station at the airport or closer to home consisted of respondents who did not stop on their way to/from work. In the case of people who stop along the way, relatively more pointed to bus stops closer to their place of residence, but these differences were not significant. It is worth noting, however, that the majority of people who do not want to stop driving to work, stop on their way to work.

Table 15. Relations between factors that would influence respondents to resign from the car in commuting, and stopping on their way to work

	Commuting without stops	Commuting with stops
I do not intend to resign from the car	26%	38%
railway station at the airport, higher frequency of buses/trains	7%	13%
railway station at the airport, a railway station closer to home	9%	8%
I do not use the car in commuting to the airport	5%	5%
railway station at the airport	9%	5%
a railway station closer to home, a bus stop closer to home	4%	4%
refusal to answer	3%	4%
bus stop closer to home, better bicycle infrastructure on the way to the airport	1%	3%
a railway station closer to home, a higher frequency of buses/trains	1%	3%
higher frequency of buses/trains, better bicycle infrastructure on the way to the airport	1%	3%
better bicycle infrastructure on the way to the airport	4%	2%
railway station closer to home	2%	2%
higher frequency of buses/trains	4%	2%
bus stop closer to home	5%	1%
bus stop closer to home, higher frequency of buses/trains	1%	1%
railway station at the airport, better bicycle infrastructure on the way to the airport	3%	1%
railway station at the airport, I do not intend to resign from the car	2%	1%
railway station at the airport, faster bus - train transfers	2%	1%
higher frequency of buses/trains, I do not intend to resign from the car	1%	1%
I do not use the car in commuting to the airport, better bicycle infrastructure on the way to the airport	1%	-
I do not use the car in commuting to the airport, bus stop closer to home	1%	-
I do not use the car in commuting to the airport, a railway station closer to home	1%	-
I do not use the car in commuting to the airport, the railway station at the airport	1%	-
I do not use the car in commuting to the airport, a higher frequency of buses/trains	1%	-
bus stop closer to home, faster bus - train transfers	1%	-
railway station at the airport, bus stop closer to home	3%	-
faster bus - train transfers, higher frequency of buses/trains	1%	-

Source: own research based on (results of) survey

The most important factors that could influence some respondents to stop commuting by car (a railway station, a railway stop closer to home) were usually indicated by the residents of Warsaw and Legionowo. It is worth recalling that these are the main directions of travel for the employees of the airport. What is more, a high share of responses concerning the need for faster transfers between the bus and the train was given by employees from Płońsk, who also constitute a (numerically) significant group of respondents.

Improvement of bicycle infrastructure on the way to the airport was chosen primarily by employees living in the vicinity of the airport, that is in Nowy Dwór Mazowiecki, Pomiechówek, Zakroczym, Kazuń Polski and Nasielsk.

It should also be noted that the need to increase the frequency of buses/trains was frequently indicated, mainly by the residents of Nowy Dwór Mazowiecki (constituting nearly 41% of respondents who indicated such a need).

Table 16. Relations between factors that would influence respondents to resign from the car in commuting, and the place of residence

	better bicycle infrastructure on the way to the airport	I do not use the car in commuting to the airport	I do not intend to resign from the car	bus stop closer to home	railway station closer to home	railway station on the airport	faster bus - train transfers	higher frequency of buses/trains
Baboszewo	-	-	2,44%	-	-	-	-	-
Białystok	-	-	1,22%	-	-	-	-	-
Brochów	-	-	-	3,13%	-	-	-	-
Bydgoszcz	-	5,00%	-	-	-	-	-	-
Chotomów	-	-	1,22%	-	-	-	-	-
Cieksyn	-	-	-	-	-	1,19%	-	-
Czarnowo	-	-	1,22%	-	-	-	-	-
Czerwińsk nad Wisłą	-	-	-	3,13%	2,38%	-	-	-
Czosnów	-	-	1,22%	3,13%	-	-	-	2,04%
Dębina	-	-	1,22%	-	-	-	-	-
Dębinki	4,17%	-	-	-	-	1,19%	-	-
Dziekanów Nowy	-	-	1,22%	-	-	-	-	-
Gąsocin	-	-	-	-	-	1,19%	-	2,04%
Grodzisk Mazowiecki	-	-	-	3,13%	2,38%	1,19%	-	2,04%
Jabłonna	-	-	2,44%	-	4,76%	3,57%	-	2,04%
Janówek Pierwszy	-	-	-	-	2,38%	1,19%	-	-
Kampinos	-	-	-	-	-	-	-	-
Kazuń Polski	4,17%	-	-	3,13%	-	-	-	-
Kazuń Bielany	-	-	-	3,13%	2,38%	1,19%	-	-
Kątne	-	-	1,22%	-	-	-	-	-
Kosewko	-	-	1,22%	-	-	-	-	-
Kroczewo	-	-	2,44%	-	-	-	-	-
Legionowo	-	5,00%	6,10%	3,13%	11,90%	11,90%	14,29%	2,04%
Maków Mazowiecki	-	-	1,22%	3,13%	2,38%	-	-	-

	better bicycle infrastructure on the way to the airport	I do not use the car in commuting to the airport	I do not intend to resign from the car	bus stop closer to home	railway station closer to home	railway station on the airport	faster bus - train transfers	higher frequency of buses/trains
Marki	-	-	-	-	4,76%	2,38%	-	2,04%
Mosewko	-	-	1,22%	-	-	-	-	-
Nasielsk	4,17%	-	3,66%	3,13%	2,38%	3,57%	-	2,04%
Nowe Grochale	-	-	1,22%	-	-	-	-	-
Nowy Dwór Mazowiecki	66,67%	45,00%	18,29%	40,63%	11,90%	29,76%	14,29%	40,82%
Nowy Kamion	-	-	-	-	2,38%	-	-	2,04%
Ostrów Mazowiecka	-	-	-	-	-	-	-	-
Płock	-	-	-	-	2,38%	1,19%	-	-
Płońsk	-	-	9,76%	3,13%	2,38%	1,19%	14,29%	4,08%
Pomiechówek	8,33%	-	2,44%	3,13%	2,38%	3,57%	28,57%	-
Pułtusk	-	-	2,44%	-	2,38%	-	-	-
Radom	-	-	-	-	-	1,19%	-	-
Radzymin	-	-	-	-	-	-	-	-
Serock	-	-	-	-	2,38%	-	-	4,08%
Skierdy	-	-	-	3,13%	4,76%	1,19%	-	-
Słupno	-	-	-	-	-	1,19%	14,29%	-
Sochaczew	-	-	2,44%	-	-	-	-	-
Stare Babice	-	-	-	-	-	1,19%	-	-
Strzegocin	-	-	1,22%	-	-	-	-	-
Strzykuły	-	-	1,22%	-	-	-	-	-
Szczawin Kościelny	-	-	-	3,13%	2,38%	-	-	-
Tarchomin	-	-	-	-	-	-	14,29%	2,04%
Tomaszów Mazowiecki	-	-	1,22%	-	-	-	-	-
Warsaw - unspecified district	-	5,00%	1,22%	-	-	1,19%	-	-
Warsaw- Bemowo	-	-	2,44%	-	-	1,19%	-	-

	better bicycle infrastructure on the way to the airport	I do not use the car in commuting to the airport	I do not intend to resign from the car	bus stop closer to home	railway station closer to home	railway station on the airport	faster bus - train transfers	higher frequency of buses/trains
Warsaw - Białołęka	-	1-	3,66%	-	4,76%	3,57%	-	-
Warsaw - Bielany	-	-	1,22%	3,13%	2,38%	-	-	-
Warsaw - Mokotów	-	1-	-	-	2,38%	1,19%	-	2,04%
Warsaw - Ochota	-	5,00%	1,22%	-	-	-	-	-
Warsaw - Praga	-	-	-	-	-	1,19%	-	2,04%
Warsaw - Praga Południe	-	-	1,22%	-	-	1,19%	-	2,04%
Warsaw - Targówek	-	-	-	-	-	2,38%	-	4,08%
Warsaw - Ursynów	-	-	1,22%	3,13%	2,38%	1,19%	-	-
Warsaw - Wawer	-	-	1,22%	-	-	-	-	-
Warsaw - Włochy	-	5,00%	-	-	-	1,19%	-	2,04%
Warsaw - Wola	-	-	2,44%	-	-	1,19%	-	2,04%
Warsaw - Rembertów	-	-	-	-	-	1,19%	-	2,04%
Warsaw- - Mokotów	-	-	-	-	-	1,19%	-	2,04%
Wilków Polski	-	-	-	-	2,38%	1,19%	-	-
Wojszczyce	-	-	1,22%	3,13%	-	-	-	2,04%
Wygoda Smoszewska	-	-	2,44%	-	-	-	-	2,04%
Wyszogród	-	-	1,22%	-	-	-	-	-
Zakroczym	4,17%	5,00%	1,22%	-	-	2,38%	-	2,04%
Ząbki	-	-	-	-	2,38%	-	-	2,04%
refusal to respond	8,33%	5,00%	8,54%	9,38%	14,29%	9,52%	-	6,12%

Source: own research based on (results of) survey

Annex 2: map

List of figures

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