Elżbieta Marciszewska
Prof. dr hab.
Szkoła Główna Handlowa w Warszawie, Katedra Transportu
emarci@sgh.waw.pl

Izabela Bergel
Dr
Szkoła Główna Handlowa w Warszawie, Katedra Transportu
iberge@sgh.waw.pl

Jaroslav Matuška
Dr hab.
Uniwersytet w Pardubicach
Jaroslav.Matuska@upce.cz

Věra Záhorová
Dr
Uniwersytet w Pardubicach
zahorova.vera@upce.cz

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Problems of Disabled Persons in Public Transport in Poland in Light of Research in V4 Countries

Abstract: In the article we describe the fundamental problems of disabled persons in public transport in the light of results of research conducted in Poland. This article has arisen in framework of grant nr 11420036 "Rights of Passenger with Reduced Mobility in V4 Countries" supported by International Visegrad Fund, 2014 – 2015. In the next article we shall describe the same problem in the Czech Republic.

Keywords: Disabled Persons; Passengers with Reduced Mobility (PRM); Public Transport

Introduction

As part of a research project funded in 2015 by universities from four countries, financed from the Visegrad Fund, surveys were conducted among people with disabilities. The research concerned many aspects of transporting the needs of people with disabilities, including knowledge of their rights in transport and the greatest problems encountered in meeting transport needs by passengers with limited mobility - in transport called in English Passengers with Reduced Mobility (PRM). The surveys were prepared according to the agreed uniform for all countries of the design.

The online surveys were assisted by associations of people with disabilities - in Poland, including the Polish Forum of Disabled People (PFON), in the Czech Republic Národní Rada Osob Se Zdravotním Postižením (National Council of Persons with Disabilities - NRZP). It should be noted, however, that despite the involvement of people and organizations that are interested in its results (like PFON), the participation of people with disabilities in surveys in Poland did not bring the expected quantitative effects because relatively few surveys were received.

Definitions and classifications of categories of people with disabilities

Let's start with sorting the classification and terminology associated with the subject of research. Czech legislation includes people with limited mobility (PRM) not only disabled people (wheelchair users, people moving on crutches, visually impaired and blind people, people with intellectual disabilities), but also elderly people (65+), pregnant women or wheelchair users, and taking care of children up to three years.

The Convention on the Rights of these people in Poland includes among those with disabilities those people who have long-term physical, mental, intellectual or sensory impairments, which may - in interaction with various barriers - impede their full and effective participation in social life, on the principle of equality with other people. PFON uses the nomenclature adopted and used universally (or postulated for use) in the environments of people with disabilities: those with disabilities / physical disability, with disabilities / visual impairment, with disability / auditory impairment, deaf-mute (no disabilities of this kind at all) Polish jurisprudence, despite the fact that it is necessary to introduce this term for years), with intellectual disability, experiencing mental health problems, people with overall developmental disorders, disability / disability caused by neurological disorders and injuries, disability / disability caused by chronic diseases, disability and requiring a high level of support.

The general international definition of WHO (used also in Poland) says that (…)*a disabled person is one who cannot independently, partially or completely ensure the possibility of a normal individual and social life as a result of congenital or acquired impairment of physical or mental disability.*

Within the EU and in the transport literature in connection with the transport of people with disabilities, a definition can be used in accordance with EU regulations, e.g. EU Regulation No. 181/2011 [9].

However, it should be noted that the definitions used in these regulations are quite non-standard because they differentiate disabled people and people with limited mobility. Some of the documents or regulations use their own, not quite correct, definitions of PRM. For example, in the Code [16], such people are *(...) traveling disabled and elderly people with partially limited mobility or limited intellectual ability due to age or other problems related to transport (...).*

Classification of persons belonging to the PRM group in the Czech Republic and Poland is presented in tab. 1. In order to compare whether possible reflections were also given the appropriate categories of people with disabilities in Germany [32].

Tab. 1. Categories of people with disabilities in Poland (PL), Czech Republic (CZ) and Germany (DE). Source: own study.

Categories of people with disabilities	CZ	PL	DE
people with physical disabilities	✓	✓	✓
people with visual disabilities	✓	✓	✓
people with auditory disabilities	✓	✓	✓
deaf-blind people / people with deafblindness	×	×	×
people with intellectual disabilities	✓	✓	✓
people experiencing mental health problems	×	✓	✓
people with overall developmental disorders	×	✓	×
people with disabilities caused by neurological disorders and injuries	×	✓	✓
people with disabilities caused by chronic diseases	×	✓	×
people with coupled disabilities and requiring a high level of support	×	✓	×
seniors (65+)	✓	×	✓
pregnant women	✓	×	✓
assistance of children up to 3 years / pushchair	✓	×	✓
people with more luggage	×	×	✓
people of short stature	×	×	✓
people with a walker and/or other help	×	×	✓
osoby ze zmniejszonymi zdolnościami chwytnymi	×	×	✓
osoby doświadczające problemów z koncentracją i orientacją	×	×	✓

The comparison of data in Table 1 shows clearly that the basic categories of PRM (people with physical, visual, auditory or mental disabilities) have legal bases in Polish, Czech and German legislation. However, for example, deaf people are not affected by this type of legislation in any country. In Poland, the PRM category does not include the category of seniors and pregnant women, although in the practice of transport services they are taken into account. In some European countries (Germany, the Scandinavian countries), the category of PRM includes also small travelers (up to 150 cm), with larger luggage, using various aids (balcony, walker), people with reduced grip abilities (fingers), people with allergies, etc. Such PRM categories do not exist in Polish or Czech legislation.

People with disabilities (ON) form one of the PRM groups. In the Czech Republic, the percentage share of ON over the age of 15 is about 10% of the population (2007: 9.87%, 2013: 10.2%). Balcerzak-Paradowska [3] states that in Poland in 1996 there were 5.43 million disabled people, which is 14.3% of the total population; in 2010, it was 10.7% in Poland. According to the findings of the National Census of 2011, there were 4.7 million in Poland, i.e. 12.2% of people with disabilities in the entire Polish population. In Germany or Turkey, the share of the ON category is comparable - it is 12% and 13% respectively; while in Great Britain it is 17.5%, in the US 19.3%, in Australia 18%. [1] As a result of the aging population

and the increase in life expectancy, not only the number of seniors will increase, but also people with visual deficits. According to Wolfram and Pfeiffer [34], e.g. in Germany between 1993 and 2009, the number of people with visual impairment increased by 12.3%, the largest increase was recorded among people over 75.

A significant percentage of all passengers with limited mobility is in the category of people - in Polish legislation - not included in the ON, so "without disability", i.e. seniors, pregnant women, mothers with children and prams. This results in the necessity of a comprehensive solution to the problem of accessibility of public transport for all persons from the PRM group. This should be borne in mind in any spatial changes / adaptations regarding urban transport, as well as any space related to it (e.g. urban).

The division of barriers into architectural, information, communication or psychosocial [30] proved to be insufficient for barriers in public transport, therefore [20] divides barriers into 6 basic subsystems, which must be available, if the entire public transport system is to be available: infrastructure , vehicles, information systems, personnel, services and transport technology. The last category of barriers concerns transport and organizational aspects of accessibility of public transport and related problems, e.g. transfers or synchronization of connections. The authors of the article, like [23], point to the necessity of eliminating not only architectural barriers, but also a systemic view of the entire transport chain, including information and communication systems for PRM, especially for travelers with visual and auditory disabilities.

According to the Report of the European Parliament and Council Commission on the application of Regulation No. 1371/2007 on the rights and obligations of travelers using rail transport [28], the main problem in travel by train is that the PRM considers unadapted stations, or the infrastructure subsystem. However, the results of a survey conducted among PRMs in Poland and the Czech Republic indicate other categories of barriers that have a significant impact on the use of public transport as a whole.

Research conducted among PRMs on the availability of public transport (travel) is extremely rare. In the Czech Republic, a nationwide study on public transport in the first place and its availability for wheelchair users was carried out in 2011 [21]. The results of the study on a smaller scale, focusing on PRM people in air, rail and bus transport, are provided [31]. In Poland, these problems have been dealt with for many years by the lecturers of the Warsaw School of Economics [4], [5], [6], [7], [8], [9], [15], [18] Poznan University of Technology [17] , University of Szczecin [35] or the Railway Institute in Warsaw, where the issues of adaptation of space for people with visual disabilities in transport are dealt with, for example [24], [25]. In view of the diversity of definitions and classifications used in the literature of so far few studies of the availability of public transport research, it is necessary to define the adopted rules in the presented study, which is the subject of the next chapter.

Research methodology

The survey among PRM persons took place in the countries of the Visegrad Group at the turn of 2014-2015 [26]. The questionnaires prepared in 4 language versions included in addition to the so-called 16 questions: 15 closed and one open question. The availability of public transport in Poland and the Czech Republic was assessed for the year in which the open question was answered and partly from the responses closed on this topic. The questions in the survey can be broadly divided into four categories, taking into account the methodology used to assess them, depending on the method of response:

a) the answer is selected from several categories, only one can be selected,
b) you can only answer yes-no,
c) the answer is in the form of a number,
d) the respondent gives a free answer.

Answers of types a) and b) were developed using typical methods of descriptive statistics and then using collective tables. The breakdown tables served as the basis for independence tests (X2 test or Fischer exact test) and alternative distribution tests.

Type c responses were developed using Kruskal-Wallis or Mann-Whitney tests, because the hypothesis of normalization of data was not confirmed. Type (c) responses were firstly qualitative, followed by simple descriptive statistics methods.

When developing answers to open-ended questions, "What do you consider to be the biggest problem when using public transport?", A set of all the answers was put - ie the problems indicated by the respondents. Ambiguous, unclear, too general answers or for other reasons impossible to use (such as "barriers", "small barrier cellar", etc.) have been removed from here. The remaining answers were divided into 8 categories depending on barriers which are problems when using public transport:

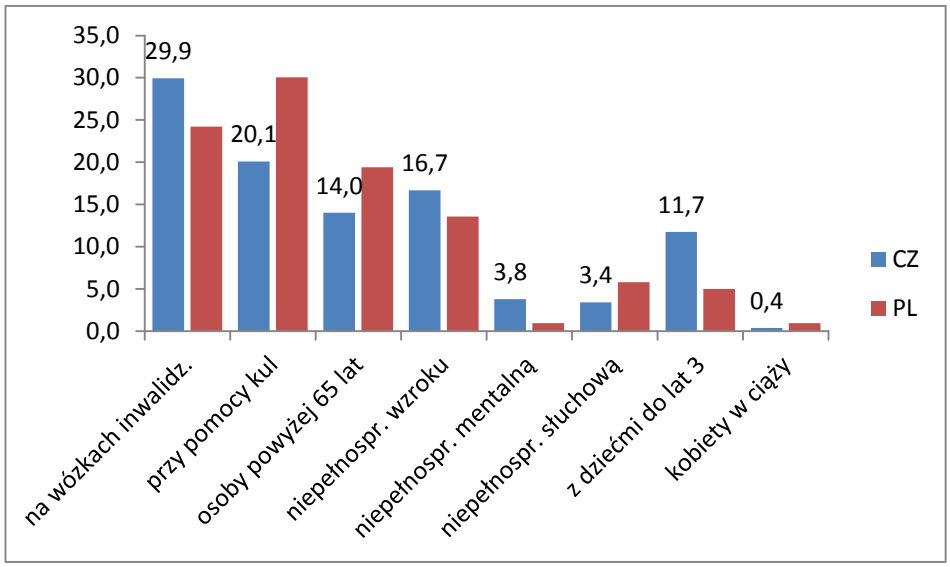
1. Vehicles - trains, buses,
2. Infrastructure - access roads, platforms, stops, terminals,
3. Transport / transfer technology - transfer conditions, connection synchronization, convenience of connection, etc.,
4. Information, orientation, communication - getting information, orientation and communication problems,
5. Bus transport - problems related to regular public transport,
6. Staff - experience / professionalism and service attitude to PRM people,
7. Places for PRM on wheelchairs - their number, location, etc.,
8. Other - problems not falling into any of the above categories, e.g. the availability of toilets, the method of stopping vehicles at the edge of the platform (distance between the vehicle and the edge of the platform) or traveling with luggage.

Individual problems were assigned to the above categories. If a specific problem affected more than one area, it was assigned to all relevant categories. For example, the answer: "insufficient number of designated places" was assigned to category 7, but "insufficient number of designated places in inter-city buses" was in categories 5 and 7. After analyzing the representation of individual problems in specified categories, with the help of the STATISTICA program, some problems were detected dependence and statistical significance of differences between the biggest problems in using public transport in the Czech Republic and Poland. The frequency of individual categories of problems (see data in Tables 2 and 3) was related to the total number of respondents (264 in the Czech Republic, 103 people in Poland), and not only to the number of respondents who answered the question. Experience shows that PRM people are very active and critical, as long as they are defending their rights, which is why the authors assume that respondents who have not received answers have no problem using public transport. Apart from basic information on the perception of the situation in each country of residence by PRM, some statistical tests were also performed. Their goal was to assess to what extent the quantitative differences with the answers of the same type to a given question in the survey between respondents representing Poland and the Czech Republic are large enough to be considered statistically significant.

Characteristics of respondents - research participants in Poland and the Czech Republic

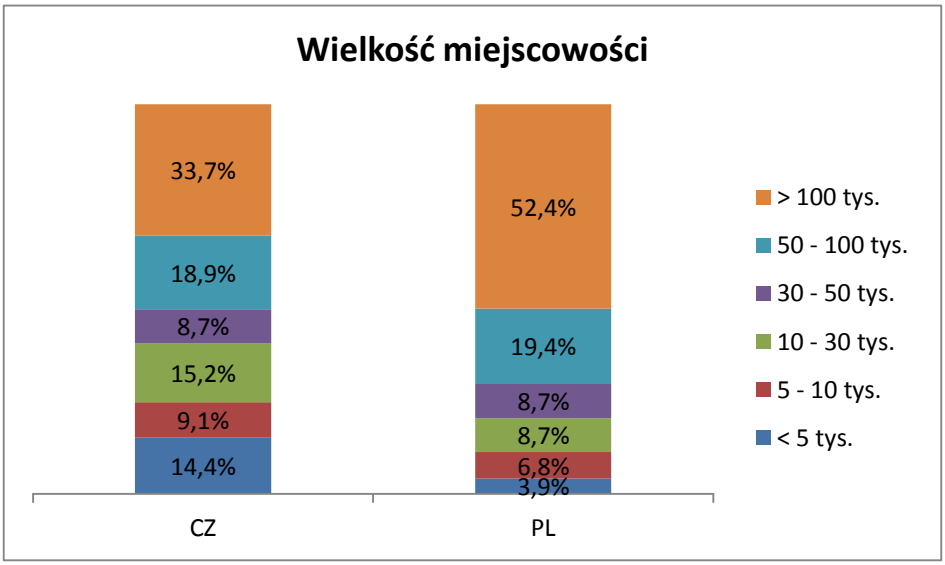
This article presents and interprets the results obtained primarily from respondents' statements about their biggest problem, which prevents or hinders the use of public transport. In the Czech Republic, 182 PRM responded to this question (69% of all respondents). Many of these people pointed to a greater number of problems, which is why it gave a total of 294 responses. In Poland, this question was answered by 81 people from PRM (79% of all respondents) who gave a total of 151 responses.

The structure of respondents participating in the PRM survey in both countries is shown in Chart 1. In the Czech Republic the largest share is people in wheelchairs (almost 30%), then people with slight impairment of the musculoskeletal system (about 20%) and people with eye disabilities (less than 17%), while in Poland there are slightly handicapped persons in the first place (over 30%), then people in wheelchairs (over 24%) and seniors (over 19%). The smallest percentages in the representation in Poland were people with mental disabilities and pregnant women, while in the Czech Republic they were pregnant women and people experiencing problems with hearing.



1. Structure of people with disabilities participating in the study

The structure of respondents according to the size of place of residence is shown in Chart 2

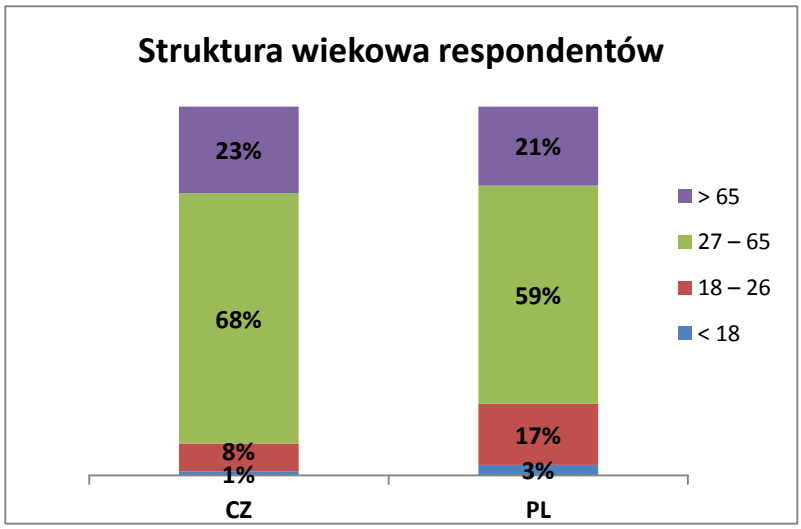


2. Respondents according to the size of the place of residence

In both countries, the highest share of respondents (PRM) is recorded in cities over 100,000 residents. The percentage share of respondents from cities in the range of 50-100 thousand, and further 30-50 thousand, in both countries is almost identical (about 19% in the first case, and further 9%). In the Czech Republic, there is a clearly larger share of respondents from smaller towns (about three times more than in Poland). These conditions

may affect some of the assessed accessibility indicators, as it is assumed that in large cities solutions aimed at increasing accessibility are more frequent than in smaller towns. In the same way, the use of public transport is undoubtedly more frequent among people living in big cities than people who live in small communes (without public transport), and larger cities commute to.

The structure of respondents by age is shown in Chart 3:



3. The structure of respondents by age category

As shown in Chart 3, in both countries the largest number of participants in the survey is at working age (in the Czech Republic about 68%, in Poland by 59% respectively), followed by seniors. This representation of respondents is also important in the final assessment, because it should be assumed that people of working age are more active than, for example, students or students. Seniors usually have more time to travel and other activities compared to people under 26.

A significant group of respondents were people with mobility disorders - wheelchair users and respondents with a lighter form of mobility limitation, using crutches or other compensatory aids. The proportion of wheelchair users who travel alone and with their carer is fairly equal in Poland and the Czech Republic - in Poland 52: 48 (independently: with carer), in the Czech Republic 51: 49 for the benefit of travelers in a wheelchair without a guardian. A small difference is in the relation of manual and electric wheelchair users. In Poland, 72: 28, and in the Czech Republic 80: 20 - for hand wheelchairs [21]

Summary of research results carried out in Poland

This discussion of the results obtained from the surveys concerns the key question 16: What is the biggest problem for you when traveling by public transport? Based on the answers to the above question, a dozen or so categories have been distinguished, for which answers have been qualified, as shown in Table 2. The first column introduces the problem category (barriers) and collects examples of such problems. The second column indicates the representation [%] of the problem of a given category in relation to the number of all respondents. The last column indicates which group of PRMs the given category is of primary importance, i.e. which PRM groups most often indicated a given problem.

Tab. 2. The biggest problems in public transport of people with disabilities in Poland

Problem categories - barriers	**[%]**	**Essential for:**
1. Vehicles	29,1	passenger on crutches
2. Transport infrastructure - platforms and boarding of vehicles, routes to stops / stations, waiting rooms for passengers, etc.	25,26	passenger in a wheelchair
3. Transport technology - transfers, a short time to change, poor offer of connections available with trains / buses	9,7	passenger in a wheelchair, 65+
4. Work and help of the crew - drivers, behavior of conductors on trains, etc.	5,8	passenger in a wheelchair
5. Transport by bus / coach	4,9	*
6. Information, orientation and communication as well as the possibility of orientation, including obtaining information in an accessible form for the hearing impaired and deaf, visually impaired and blind people	13,6	Blind passenger, deaf
7. Places for people with disabilities in vehicles - marked with a symbol for people with disabilities in vehicles, insufficient number, etc.	4,9	passenger on crutches

* just as important for people on wheelchairs, on crutches, 65+, blind and mentally disabled
Source: Own study

Due to the greatest difficulties in mobility, it is worth first distinguishing the responses of disabled people using wheelchairs, which constituted the fourth part of the answers obtained (25/103 from questionnaires, ie 24%). Of these respondents, the majority (76%) used handcarts, and only 24% of people with electric prams. For the group of people with disabilities in question, both adapted vehicles and transport routes are necessary in transport, allowing to reach the chosen means of transport. Therefore, it was noted that in the category of the biggest problems with the use of public transport by wheelchair users, many respondents indicated an insufficient number of means of transport adapted to the needs of this group of passengers. Sometimes they have to give up traveling by train or bus, unable to get to public transport. In the responses, attention was also drawn to the lack of help from the driver, quoting the drivers' claims that the wheelchair passenger must have a guardian to use public transport, whereas such a requirement in the regulations for transport by public means of transport is not. Therefore, it can be stated in the light of the answers received that the above group of passengers does not treat public transport as an affordable and friendly way of moving, which is why - as emphasized in the surveys - respondents often give up traveling or use individual means of transport or taxis.In the light of the results of the conducted study, the following problems were identified as the causes of the biggest problems occurring in using public transport by disabled people in wheelchairs:

- maladjustment of vehicles,
- maladjustment of transport infrastructure,
- missing information and communication systems with disabled passengers.

Vehicles

Discussion of the most important problems starts with the category of vehicles.

Respondents emphasized that although it is already better with the availability of low-floor vehicles, there are still many high-floor vehicles in use. Hence the frequently occurring response in this category (unadapted vehicles) was the difficulty of getting on or off the bus or train, the necessity of overcoming high stairs at the entrance to the vehicle, etc. Attention was also paid to the non-adaptation in vehicles of seats intended for PRM and narrow passages inside vehicles, hindering or preventing the movement of a person with reduced mobility inside the vehicle. In this category - vehicles - the highest number was classified as 29.1% of responses. It can be concluded on the basis that in the opinion of the surveyed passengers with disabilities, the non-adaptation of vehicles is the most important cause of their problems when traveling by public transport.

Transport infrastructure

In the light of the research results, the second category in terms of the number of indications in the responses (25%) is the maladjustment of transport infrastructure. Architectural barriers such as stairs and numerous level differences as well as lack of slipways or elevators to overcome the differences in altitude occurring in pedestrian routes, lack of adaptation of railway station buildings, including particularly unadjusted passageways (entrances) to platforms, were pointed out here. It was also pointed out that there were no sidewalks, but also uneven pavements, and even more frequent use of paved traffic routes on the pavement, where the wheelchair or walker used by a disabled person trembles and makes a lot of noise. Thus, in the assessment of people with disabilities, non-adaptation of transport infrastructure is a very important cause of their problems in using public transport services.

Information and communication

The third separate category of cases that cause problems for people with disabilities in using public transport means is a lack of information and communication with individual groups of people with reduced mobility. The survey indicated lack of reliable information, insufficient availability of websites with full information on the carriers' offer, lack of voice messages in public transport, eg in Wrocław, poor quality of voice messages on trains or lack of staff familiar with sign language. It also stressed the difficulties in communication between hearing and deaf passengers as well as the blind and blind. In improving and adapting the information system and communicating with passengers with disabilities, one can see a solution to many problems of this group of passengers in the future.

Transfer - transport technology

Another category clearly distinguished in the respondents' answers (9.7% of responses in questionnaires) of problems important for PRM related to the implementation of their transport needs, applies to transfers. It concerns both changes resulting from the change of consecutively chosen different means of transport, e.g. bus - train, as well as necessary changes as a result of the change of means of transport of the same branch, e.g. bus - bus. The respondents draw attention to the uncertainty of punctual access to the place of change, the low frequency of courses, especially means of transport marked as adapted to the needs of PRM, which increases the total time of travel with changeovers and the lack of security in travels and uncertainty of getting to the destination on time. Inconveniences in complex journeys (requiring changeovers) concern the general passenger, but they are particularly

onerous for passengers with disabilities, for whom the operation of getting on / off the means of transport is due to various restrictions on movement and - as indicated earlier - insufficient vehicle adaptation to the needs of PRM, often the most difficult part of the journey.

Work and help of the crew

It is worth paying attention to 5.8% of responses of respondents regarding assistance and work of crews in means of transport. Unfortunately, the kindness of the staff (and reading the intentions of such a record of the answer, more precisely the lack of it) has been indicated here as the most important problem in moving with people with disabilities. The reluctance to help in getting on and off the bus or train was emphasized, it was pointed out that there are often no employees trained to operate the platform or ramp. Unfortunately, it happens that even when there is adequate staff, it does not respond to the passenger's request for help and the PRM traveler must ask for help of efficient passengers. Sometimes such a person also encounters a refusal of co-passengers and it happens that a bus or train will leave before the passenger gets any help. It was also emphasized that drivers are not always patient and attentive enough, eg by stopping the vehicle too far from the platform's curb, which makes it impossible to enter the bus on a trolley. Clearly - in the light of this research - insufficient sensitivity was demonstrated both for crews (drivers, conductors) and co-passengers, for the needs of traveling people with disabilities.

Marked places for people with disabilities in vehicles

It can be assumed, however, that in the light of the results of the conducted study, the issue of places marked for people with disabilities, ie places reserved only for them, was relatively good. Only a small percentage of respondents (4.9%) indicated too few seats for people with disabilities and the resulting insufficient availability of seats in urban transport, moreover, the seizure of marked places by unauthorized so-called. healthy persons and lack of marking of extra-urban bus seats marked for PRM. It seems that the problems indicated in this category - in the responses of our survey respondents - can be easily solved by appropriate actions of urban and interurban carriers.

Transport by bus / coach

From the answers received, a separate category of specific problems in the implementation of mobility by persons with disabilities was also identified as an indication of the organization of bus and coach transport. The respondents indicated the lack of communication of bus lines as a problem, the lack of full information about the offer of bus carriers (various carriers, the total lack of information about the offer of many of them) and too long distance to bus stops.

Other problems indicated in the respondents' answers

Similarly, in the light of the study, the problem of the availability of toilets adapted to the needs of people with disabilities has fallen. Respondents pointed out this issue only in a few cases (3.9%), paying more attention to the fact that toilets are dirty, often closed, and also - that they are at stations and pens paid. As in the case of placemarks, this problem does not require large expenditures to eliminate it in the travel of people with disabilities using public transport.

It is also worth emphasizing that the problem of booking a transport and the required time advance in the report of a disabled person did not turn out to be important in the light of the responses of our respondents - it was indicated only in a few responses. Similarly, the issue of difficulties in implementing journeys related to transport technology was not emphasized in the respondents' replies. The indicated troubles of the respondents are the mismatch of the height of platforms to the stairs of the vehicles, the problem of getting into

the natural or too fast departure of the bus, before the disabled passenger has time to take a seat, and the need to get to the door before getting off the bus while driving to get off at the bus stop . There was also a shorter stop time for PRM.

When developing the results of the questionnaire regarding the question: "What is the biggest problem for you when traveling using public transport?", The respondents provided a lot of meaningful remarks included in the last, collective category: "other problems". Generally, the reported problems concerned issues such as: communication of means of various modes of transport, congestion in means of transport, their punctuality, speed and frequency and sanitary condition. In addition to accessibility and technical-technological problems, respondents' attention was also focused on the behavior of co-passengers, a sense of insecurity or assertiveness on the part of the personnel operating the means of transport.

Another group of problems related to architectural and transport barriers (which were also heavily displayed in detailed questions), primarily in the case of people in wheelchairs. It pointed to unevenness in pavement surfaces, street crossings, lack of lifts at transport points, inadequate toilets, no wheelchair spaces, narrow corridors, difficulties with changing.The largest group of respondents emphasized the nuisance related to the crowded means of communication, which often prevented them even using public transport.
In the statements, the problem of attitudes towards people with disabilities of other travelers, sometimes even their unethical, arrogant behavior, lack of kindness and willingness to help was also mentioned.The next important issue is the lack of dedicated places for travelers with disabilities, including the accompanying equipment.In the ranking of reported problems, the issue of communication between various transport means takes place, both at the level of urban transport (e.g. communication of several bus lines), as well as urban-extra-urban transport (e.g. suburban lines - long-distance) in an intra-branch and inter-branch system (e.g. train - bus).

As the next important issue, there were problems with accessibility and flow of information. They pointed to clogged information channels, through which the travel of people with disabilities is reported, which often resulted in the lack of reserved auxiliary equipment and space, which often led to the need to reorganize travel plans and use more expensive options, such as a taxi.Another issue raised by respondents is the price of tickets, especially on short or very short sections, which travelers with disabilities are not able to overcome on foot.Respondents also pointed to the low competitiveness of the railway communication offer. The answers indicate the lack of recognition in the offers of various operators operating on the railway transport market.

Summing up, it can be stated that the most troublesome phenomena for travelers with disabilities are: crowds, low availability of services, lack of certainty of transport needs, low quality of infrastructure and social factors, such as ratio of co-travelers and personnel to PRM people.In the responses in the "Other" category, the problems raised in the statements qualified for the previously identified and discussed categories were often repeated. This proves that these problems are very important and that people with disabilities are sensitive to their presence in everyday life and pressure (expectations) to improve the issues raised.

The next issue of the Communication Review will present the results of research on the problems referred to in the Czech Republic. I will also include general conclusions resulting from the conducted research and comparative analyzes in the scope of the most significant problems occurring in public transport systems of both countries from the point of view of PRM.

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