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**Problems of Disabled Persons in Public Transport in the Czech Republic in the Light of Results of Research Conducted in Poland.**

**Abstract:** In the article we describe the fundamental problems of disabled persons in public transport in the light of results of research conducted in the Czech Republic. 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. This article correspond to the previous text in Przegląd Komunikacyjny nr \*\*describing fundamental problems of PRM in Poland.

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

**Introduction**

In this study, we refer to studies concerning the Czech Republic and Poland, pointing to differences and similarities in the assessment of the situation of people with disabilities in public transport in both these countries.

From the statistical analysis of research results in the Czech Republic (the problems referred to), it appears that the most serious barriers to travel Czech respondents, people with disabilities, consider:

- infrastructure,
- information/orientation/communication systems,
- technological and organizational aspects of transport (lack of connection synchronization, uncertainty of connection, etc.),
- public transport vehicles.

As you can see, this is a slightly different hierarchy of importance of problems and barriers than in Poland.

An overview of all categories of existing barriers and the responses assigned to them indicates that the infrastructure subsystem seems to be the most problematic in the Czech Republic.

23.5% of all respondents to our questionnaire (264 people) indicated it as the most serious difficulty in public transport. This problem category contains answers regarding e.g. access roads to railway stations, bus stations, public transport stops, a condition of platforms and stops. In this category, there were problems regarding entry and exit to/from the vehicle, i.e. the ratio of the height of the platform edge to the floor height of the vehicle.

**Tab. 1.** The biggest problems encountered in public transport by persons with disabilities.

Problem category - barrier	[%]	The most important for
1. Vehicles - floor height, way of opening the door	14,8	people with physical disabilities, 65+
2. Infrastructure including entering/leaving the vehicle	23,5	people with physical disabilities
3. Transport technology - transfers, uncertain connections	17,8	people on crutches, assistance with a baby stroller
4. Expertise and attitude of the staff (drivers, conductors etc.)	7,6	people with physical disabilities
5. Information, orientation, communication - getting information in an accessible form	18,2	blind and deaf people
6. Places reserved in vehicles (including places for prams)	7,2	people with mental disability, assistance with a stroller
7. Bus transport - regular, excursion, long distance, interurban	8,7	blind people, assistance with a stroller

Source: Own study based on the research of Project V4

In addition to problems such as differences in height (stairs, edges) or poor access to the platform and/or the bus stop, very often encountered by PRM the problem is:

- no stop islands in the urban commune,
- no benches at stops,
- distance between the platform and the railway vehicle (train, metro),
- no alternative path to reach the stairs or lift - movable stairs can often be used by people with crutches only with huge problems.

The problems described above and similar types are important not only for wheelchair users, but also for travel ers on crutches or using other compensatory aids, and to a lesser extent for seniors and wheelchair users. Differences between specific PRM groups and their needs are also documented, among others, the fact that, for example, wheelchair users indicate the availability of infrastructure as the biggest problem almost twice as often as people with visual disabilities.

The condition of the infrastructure is extremely important from the point of view of specific groups of PRM people, for persons assisting with crutches or using other assistance in relocation (39.4%) and for persons traveling in wheelchairs (30.4%). On the contrary, in the case of deaf and hard-of-hearing people or pregnant women, the condition of the infrastructure does not present them with fundamental problems.

The research shows that the problem of the level of infrastructure availability in the Czech Republic does not change. One of the reasons may be high financial requirements related to the technical adaptation of facilities, the number of which is large in the communication system (number of city and suburban stops, number of railway platforms, bus and railway stations, etc.). The results of the study also confirm the fact that the availability of

infrastructure is not a problem only for a small group of wheelchair users, but also for a much larger group of seniors, people with a slight mobility disability, mothers with prams or travellers with larger luggage. All these travellers also benefit from facilities originally intended only for people in wheelchairs.

### **Information, orientation, communication**

The second most important group of barriers generates problems related to obtaining information, orientation and communication. 18.2% of PRM considered it to be the biggest problem, which is almost one in five people with disabilities. The relatively high share of responses of respondents assigned to this category indicates the high importance of the problem and the necessity of affordable and environmentally aware information for the comprehensive accessibility of public transport. Orientation and communication is essential for people with visual and hearing impairments. The blind people themselves recognize that the use of public transport services most often hampers the lack of a vehicle's sound signaling system, guidance lines or homing paths, maps, tactile plans and information, information on disembarking from the left / right (on the railway platform), platform number information to which the train arrives or where it is in the case of a change, or the lack of sounding of information panels at stops. Visually impaired travelers lack information primarily in enlarged and contrasted writing. People with auditory disabilities (hard of hearing or completely deaf) most often pointed to problems in random situations in transport, which are reported only through voice messages, e.g. through loudspeakers or orally by the conductor or bus driver. Information provided in this way is worthless to them.

Another problem is the lack or failure of information (visual) panels in buses (public and interurban transport) because people with disabilities need information about the course of the route in order to prepare for getting off in advance.

The responses of PRM have confirmed, among others the rightness of separating an independent category of "information" barrier in public transport in the Czech Republic. The problem of orientation, communication and obtaining information is essential for people with visual (89%) and hearing impairments (59%). Most of the other PRMs indicate the above problems in the range 5.5 - 7.5%. The problem of appropriate information for PRM should not be downplayed, because the EP and Council regulations [3], [4] assume, among others, the right of people with limited mobility to information in an accessible form.

In connection with the above, a conclusion is drawn about a clear link between informative or general communication systems with vehicles and infrastructure (stops, waiting rooms for travellers, etc.). A frequent problem for people with sight, movement or seniors disabilities is to provide information inadequately in advance. The above groups of people need significantly more time for passage from, for example, the station hall to the platform, than other travellers - without disability [2].

### **Transport technology**

The problems grouped here concern first of all transfers (conditions necessary for their implementation), reliability and linking of guaranteed connections, etc. The research has shown that communication and technological problems are assessed almost identically, as those from the information and communication groups. The main problem for 17.8% of PRM in the Czech Republic is above all:

- transfers with a short time for their implementation,
- delays in the implementation of timetables and the resulting uncertainty of transport connections (not only train - bus, but also train - train, bus - bus),
- uncertainty in the implementation of the ordered service tailored to the needs of PRM.

The last of these problems is crucial because the system of guaranteed (ordered) calls was created in the Czech Republic primarily to guarantee (mainly to wheelchair users) that the previously ordered, tailored connection will be made within the required time and route.

Another problem, according to PRM, is in the Czech Republic to plan (search) transport with guaranteed connections dedicated to PRM, long intervals between connections made by low-floor vehicles or their uneven daytime offerings..

From the point of view of individual categories of PRM, technology and transport aspects are essential not only for seniors (27%), but also for people traveling with children in prams and carers of small children (25.8%). The opinion of people traveling in wheelchairs is interesting: despite considerable criticism of the ordering process or communication of guaranteed connections, only less than 9% of travellers from this group considered this category as their biggest problem. This shows relatively satisfactory - the level of communication, the introduction of guaranteed customized connections or their satisfactory offer (number).

The review of the problems under discussion proves that, despite all the improvements in recent years, one should concentrate in the ordering process on early information to travellers about possible changes or inability to provide a guaranteed service. When planning a timetable, one should ensure that guaranteed connections available for PRM are available and that it is even more necessary to ensure sufficient time for exchanges between such connections. [2] Also in case of delays, roadworks, round trips etc., should traffic dispatchers or dispatchers, take into account interchanges also for people with limited mobility: mothers with prams, seniors, travellers with crutches, etc. Significant help for users could be supplementing the calling search in the timetable ([www.idos.cz](http://www.idos.cz)) with the search function only guaranteed available for PRM (so-called barrier-free) calls. In 2016, in the Czech Republic, this opportunity is offered by 9 out of 13 provincial cities and 45% of smaller cities and municipalities with public transport.

## **Vehicles**

The availability of vehicles is the biggest challenge for 14.8% of PRM in the Czech Republic, to the greatest extent for people with disabilities of motor organs, wheelchairs, crutches, as well as for seniors. The survey also showed that a large group of travelers, who enter into high-floor vehicles is in considerable trouble, are people traveling with prams. In the case of vehicles, the biggest problem is the large difference in height between the floor level of the vehicle and the edge of the platform, which may mean that several steps have to be overcome when entering. The next identified problem concerns the opening of sliding and wing doors with the help of a button or a handle, which requires considerable force. Small and demanding buttons or handles are found in some older types of rail buses in the Czech Republic. Vehicles purchased in recent years (from around 2013) already meet the requirements of the PRM TSI [28] regarding the maximum force necessary to use the door control buttons. Problems when opening the door can have people with disabilities upper limbs. Blinds, in turn, find the buttons with difficulty.

Another, relatively frequently indicated problem is the insufficient number of connections made using low-floor vehicles, especially those running to smaller municipalities. The results of this part of the study indicate an interesting fact: the level of vehicle availability is indicated at a further place, up to the changes and information. Apparently, this was influenced by the long-term renovation of the transport park in the case of public transport (MHD) and railways - in regional, suburban and long-distance transport of the Czech Republic (purchase of low-floor vehicles for public transport, low-floor traction units and modernization of vehicles intended for rail transport) long-distance). Even a few

years ago, problems regarding the availability of low-floor vehicles were high in addition to infrastructure issues.

### **Staff, reserved places, bus transport**

These three problem categories have a similar meaning according to PRM opinion - their percentage share in questionnaires varies from about 7% (places reserved in vehicles) to about 9% (problems related to bus transport); the ratio of transport company personnel and its professionalism found a place in the middle, with a percentage share of 7.6%. There are a lot of reasons for a relatively positive assessment of the staff of conductors and railway station employees. Particularly here is the overall attitude to PRM, which has improved significantly in the last few years, especially among employees of ČD (Czech Railways). Trains and ticket offices underwent trainings organized by instructors from the National Council of Disabled People. Probably this assessment does not reflect the knowledge of e.g. sign language, but rather a general knowledge of the principles of providing help and communication with people with hearing, sight or wheelchair disabilities. Nevertheless, among the indicated problems, there is still, for example, a reluctance to help with entering the vehicle, ignorance of operating a mobile lifting platform or unwillingness to intervene in case of unlawfully seized seats reserved for PRM. At the same time, the surveys were praised for their kindness and willingness to help the employees of ČD. Railway operator RegioJet ordered for its conductor's training in the Association of Blind and Visually Impaired Organizations only in 2015. Stewards of the LEO Express operator are trained at the time of taking up the job, and then they are upgraded each year.

The problem with marked, reserved places - apart from their incorrect marking - concerns especially their insufficient number in public transport vehicles or intercity buses, and not only for people in wheelchairs, but also lack of space for prams. The situation is changing very slowly in this matter, because it is a construction problem related to the design and use of the interior of the vehicle, or even its total capacity. Some of the newly designed vehicles for the needs of public transport have 2 or more places reserved for wheelchair users and prams.

The correctness of distinguishing a separate category of barriers related to bus transport confirms a wide spectrum of indicated problems encountered in regular and irregular transport, cross-sectionally by all PRM groups. It is indicated here the inability to enter (due to the height of the floor), the lack of accessibility of the interior of the bus intended for long-distance transport for a person in a wheelchair, lack of information on the current location of the bus connection, but also not marking vehicles (where from - where they are going) or refusal to take on board people in a wheelchair without a guardian.

### **Other problems**

In this category, there were problems, which due to their specificity could not be classified into the previously discussed categories. They hit here (according to the order of occurrence): the behaviour of travellers, stopping vehicles at the edge of the platform, earlier ordering transport, adjusting toilets for people in wheelchairs, but also e.g. travel with luggage or problems with the operation of ticket machines.

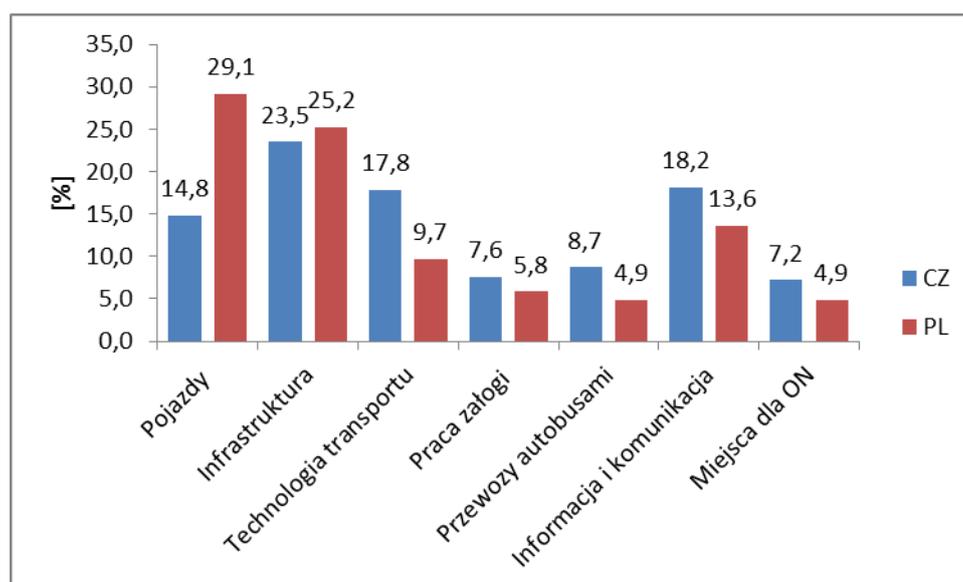
The problems mentioned above result from human behaviour (attitudes of other travellers, ordering trips), as well as from operational and technological activities (stopping vehicles at the edge of the platform, adaptation of WC to the needs of wheelchair users, ticket service). For people in wheelchairs, using walkers and other compensatory aids, but also for mothers with prams, the problem arises when, for example, the bus stops too far from the edge of the platform and there is a big gap. In Czech legislation, unlike Germany or other countries (France, Great Britain, USA), the free space between the vehicle floor and the

platform is not defined. For example, in Germany the optimal break may be up to 5 cm distance, with the assumed difference in height between the floor and the edge of the platform 5 cm. In the presence of a guardian, a difference of 10 cm is allowed with the height difference between the vehicle floor and the platform maximum 5 cm (VDV, 2012) [5]. When two or more vehicles stop at the same time, the problem affects travellers with visual impairment, for them the identification of a vehicle can be quite a challenge. Automatic ticket machines, but also self-service information stands with touch screens (without any palpable elements under the fingers) are absolutely inadequate for blind people and unhelpful.

### Comparison of research results in Poland and the Czech Republic

In this part - on the basis of the presented research results in Poland (presented in the Communication Review No. \*\*\*\*) and the Czech Republic - a comparison of the problems indicated in the respondents' statements on the biggest problems encountered in public transport in their countries is presented. This comparison was supplemented by the preferences resulting from the PRM response to the question whether they would use public transport more often if the availability of selected environmental categories improved (infrastructure, vehicles, professionalism of the personnel, etc.).

A list of the most important problems encountered by PRM in public transport in the Czech Republic and Poland, together with the comparison of individual categories, it is shown in Chart No. 1.



1. The most important problems of PRM in public transport in the Czech Republic and Poland.

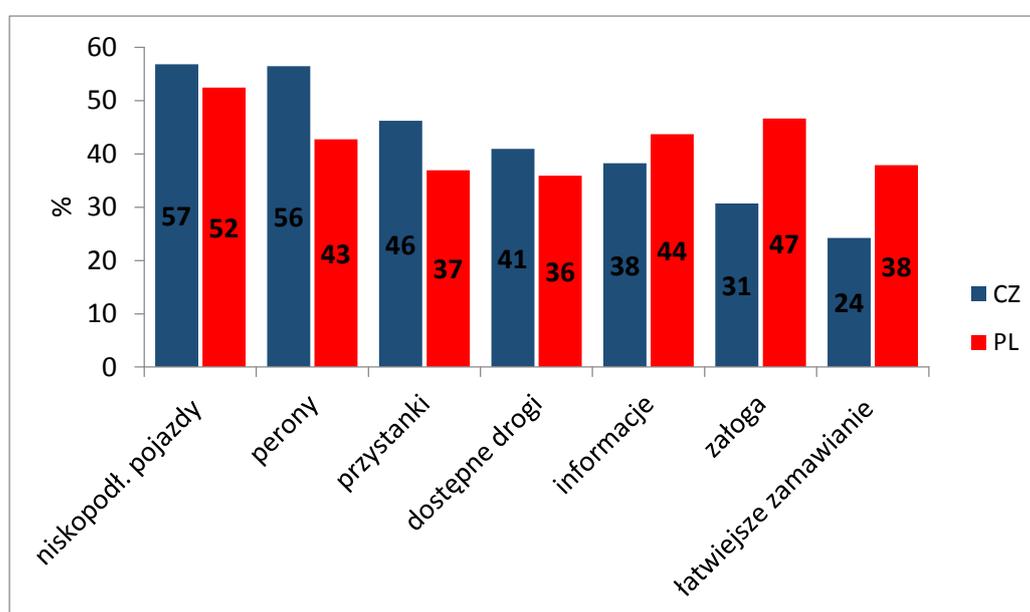
From the comparison of data presented in Chart No. 1, you can say:

- a comparable level - from the point of view of the most important public transport problems in PRM, occurring in Poland and the Czech Republic - concerns infrastructure areas as well as the work and assistance of the crew;
- in Poland, we are dealing with a better situation for PRM in the following categories: "Transport technology" (changeovers), "Information and communication" and "Transport by bus / coach";
- in the Czech Republic, the level of accessibility (barrierlessness) of vehicles is better assessed;

- PRM persons in both countries agree that the level of accessibility of bus transport, professionalism of staff and the space designated for them (reserved) do not constitute a very significant problem in their implementation of mobility by public transport.

### Ranking of preferences regarding the improvement of accessibility

To complement the above comparison, it is worth discussing PRM preferences in the field of improving the accessibility of public transport. Respondents answered the question whether they would use public transport more often if the level of specific parameters improved. The choice could be made from parameters relating to infrastructure, vehicles, transport organization, staff behaviour and information. The respondents answered "yes - no". While the possibility of speaking about the biggest problem (any answer) was not used by all respondents, but probably only by those who considered the problem as significant, in this case all respondents answered. The results of the answers are shown in Graph No. 2. The proportions of the responses of positive respondents from both countries are visible.



2. Preferences by categories affecting the availability of public transport in the Czech Republic and Poland

Table 2 presents the ranking of individual parameters affecting the availability of public transport according to their validity. In Poland and the Czech Republic, the PRM preferences have similar, very high importance, availability of low-floor vehicles, which was indicated by more than half of the respondents. The difference in the relative frequency is not statistically significant. However, you can see the differences that are statistically significant. It should, therefore, be expected that they show the current trend, which should also be visible in the repeated study.

**Tab. 2.** Ranking of preferences as to improving the accessibility of public transport

No.	Czech Republic	%	Poland	%
1	Low-floor vehicles	57	Low-floor vehicles	52
2	Platforms	56	Personnel	47
3	Stops	46	Information	44
4	Availability of the route to reach the means of transport	41	Platforms	43
5	Information	38	Easier ordering of services	38
6	Personnel	31	Stops	37
7	Easier ordering of services	24	Availability of the route to reach the means of transport	36

While in the Czech Republic in subsequent items, all categories related to the state of transport infrastructure appear, in Poland, the behaviour of the personnel appears second, and the third (better) information. The review of preferences also shows that the process of ordering a ride for wheelchair users (e.g. a wagon with a boarding platform or a compartment for wheelchair users) is a more serious problem in Poland than in the Czech Republic. This is also confirmed by statistical differences when testing the PRM response to the question about experience with ordering a trip such as: "ordering a ride discourages me from traveling", "I have terrible experiences with ordering a ride" and "ordering a ride causes me trouble".

One could say that while the Czechs see the possibility of improving the accessibility of public transport primarily through technical solutions, in the case of Poles, the categories of interpersonal nature are more important. It is worth considering how much this difference results from the state of public transport in both countries, and how much - from the mentality of both nations.

## Conclusions

In the conclusions, we refer to the results of research on Poland, presented in the previous issue of the Communications Review.

The results of the survey conducted in the PRM, in both countries confirmed the crucial importance of the level of accessibility of transport infrastructure, with the obtained data show that PRM in Poland are more satisfied with this issue than their counterparts in the Czech Republic. A different situation was recorded when vehicles are mentioned: while in the Czech Republic their availability is assessed higher than infrastructure, in Poland it is exactly the opposite, PRMs are from the availability of adapted vehicles less satisfied than from infrastructure.

The result of the assessment of the operational and technological area (changeovers, call signage, etc.) and information and communication was interesting. In both cases, in the Czech Republic, we register about twice as much the state of accessibility (greater importance of this problem) than in Poland. The obtained results indicate PRM problems related to transfers, waiting times and communication connections. These problems have not been solved at all, or are at the end of the issues to be solved, while the guarantee / certainty of the connection and interchange conditions are essential not only for travelers with disabilities, but also for other categories of PRM (seniors, people running prams). The improvement in this area requires minimal investment and can be introduced in a short time horizon (during the time of the given timetable, i.e. during the year) - it is about changes in the organization of public transport in the form of planning or work of dispatchers. The effect of these changes will also positively affect other travelers "without disabilities".

Relatively less problematic in the eyes of Polish PRM are categories such as personnel, bus transport and marking of seats reserved for PRM in vehicles. In the Czech

Republic the level of the above categories was assessed about two times lower, nevertheless, these are not areas presenting the basic problem for PRM in using public transport.

Persons on wheelchairs or with the impairment of upper limbs or seniors in solving the problem of opening doors in older vehicles could be helped by the use of a remotely controlled TYFLOSET® system (APEX) for a blind person [6]. Only blind people use it in the Czech Republic, Germany and Slovakia, but wheelchair travelers can use it in the same way. Negotiations have already begun in the Czech Republic on how to use this set, for example in public transport by wheelchair users.

In addition, research shows that the accessibility of public transport does not affect only people with disabilities, but far more numerous groups of travelers - e.g. mothers with children in wheelchairs, for whom entering the platform or the floor of the vehicle constitute a major obstacle to the accessibility of public transport. From statements about PRM preferences, as far as improving the accessibility of public transport is clear, for people with mobility disabilities in Poland and the Czech Republic the most important is to eliminate obstacles on the access routes to the means of communication and at the entrance to the vehicle. At the same time, it turned out that all the aspects discussed (infrastructure, vehicles, information, crew expertise, transport technology - ordering transport) have a clear impact on the willingness of these people to use public transport.

In the case of people with visual or hearing impairment, the most important is the way of obtaining information and communication. The behavior of personnel is also of particular importance, especially for persons with impaired vision. In the case of people with hearing impairment, the situation is slightly different, as far as the attitude to the staff is concerned - in Poland it is attributed to it by a larger proportion of respondents than in the Czech Republic. At the same time, it can be said that in Poland all of the aspects discussed have an impact on the willingness to travel by public transport for the majority of respondents than in the Czech Republic. Compared to the group of people with disabilities in the motor system, the impact of all these factors, with the exception of information and staff behavior, is smaller.

Other PRM groups have already mentioned a clear difference - the Czechs see a chance to improve the availability of public transport primarily in technical solutions, among categories of interpersonal importance play a more important role among Poles. The most important factor for the use of public transport by people with disabilities is the availability of low-floor vehicles in both countries.

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