

Improving the Accessibility of Rail Transport for People with Disabilities

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Summary

The subject of the article concerns the issue of transport accessibility, due to the special needs of disabled persons and persons with reduced mobility. The disability related to the state of health is presented numerically for Poland, including the dysfunctions occurring and also in relation to the population of Europe and the world. The presented values indicate a significant size of problems that cannot be ignored or downplayed in the context of the policy of equal treatment of all citizens. On the basis of European and Polish legal regulations, the issues of rail transport accessibility in relation to meeting the requirements specified in the technical specifications for interoperability are discussed. The conditions specified in the PRM TSI for the “Infrastructure” and “Rolling Stock” subsystems are presented in detail, including the obligation to create registers: railway infrastructure and rolling stock and requirements for the development of strategic documents, such as national implementation plans and access strategies to passenger infrastructure and access strategies to passenger rolling stock. Following the National Implementation Plan of the PRM TSI, a diagnosis of the condition and assessment of the accessibility of Polish railways for people with disabilities was discussed, as well as the functioning principles and actions taken by infrastructure managers and railway operators to eliminate existing barriers.

The article also indicates the internal project carried out in the Railway Track and Operation Department of the Railway Research Institute, concerning the development of a method facilitating the preparation of a strategy guaranteeing full access to passenger infrastructure in accordance with the requirements of the TSI PRM. The proposed method uses the questionnaire of the facility, which covers all aspects related to the accessibility of the railway station for people with disabilities. This project is an offer for rail infrastructure managers who are required to have a strategy for each passenger station and are part of the state policy implemented to improve the accessibility of public space.

Keywords: railway transport, availability, technical specifications for interoperability, Passengers with Reduced Mobility subsystem

1. Introduction

In the Central Statistical Office (GUS) report “Stan zdrowia ludności Polski za rok 2014” [23] (Health Condition of the Population of Poland for the Year 2014), disability was defined as one of the most important aspects of health. It is obvious that in the life of every human being there appear periods of smaller or larger of his or her physical disabilities or limitations. The problem of disability is not associated only with age and nor does it affect only the elderly. It can also occur among young people and even small children due to birth defects, chronic diseases, injuries or

accidents. Regardless of the reasons, disability is a serious social problem.

There are more than one billion disabled people in the world, which constitute 15% of the entire world population [11]. The incidence of disability is higher for developing countries. Nearly one fifth of the estimated population of people with disabilities (i.e. from 110 to 190 million) experience significant impairments (World Bank, 2016). The statistics of people with disabilities aged 15 and over for the European Union² in 2012 according to EHIS (European Health Interview Survey)³, indicate more than 73 million people, while the percentage of the disabled ranges

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² 27 countries, without Croatia.

³ The examination aimed at monitoring the health condition of the population of the European Union. In Poland the last such examination was conducted in 2014.

from 12.0% in Malta to 24.8% per Hungary [1]. In Poland, according to the report [23] more than 3.8 million inhabitants of our country, which is statistically every tenth Pole, had the legal disability certificate or equivalent at the end of 2014.

There are three main types of dysfunctions: physical, mental-psychic as well as other and more undefined. In addition to the listed ones there are still related mental and physical ailments determining the degree of disability (light, moderate and significant). Another division characterizing people with disabilities takes into account the type of their illnesses. Considering this systematics, the most numerous group in Poland are people whose disability is caused by damage to the musculoskeletal system (3989.5 thousand people), as well as cardiovascular diseases (3280.3 thousand people). Next, persons with disabilities include blind and visually impaired persons (2403.7 thousand) and persons with hearing impairment (1127,000, including over 470,000 deaf) [8].

However, in comparison with legal disability, twice as many people (nearly 7.7 million) declared that due to health problems they had a limited ability to perform various activities, while the study included serious and less serious restrictions (the so-called biological disability). The quoted figures indicate that the problem of disability affects up to 20% of the population.

2. Privileges of disabled people

The aim of the state and legislation is to enable disabled people to fulfill social, family and professional roles and to counteract their social marginalization. In recent years, there has been a special legislative activity for people with disabilities. Many standards, amendments and legal regulations have been introduced to improve the lives and social functioning of people with disabilities.

The *Konstytucja Rzeczypospolitej Polskiej* [7] (Constitution of the Republic of Poland) contains provisions that require public authorities to take special care of certain social groups, including people with disabilities. Article 69 states „Public authorities, in accordance with the Act, provide assistance to persons with disabilities in order to secure their existence, adaptation to work and social communication”, although it does not specify either the tasks of public authorities or the rights of persons with disabilities, but it is of great importance for respecting and implementing the principle of equality and counteracting their discrimination.

One of the documents regulating the rights of people with disabilities is the *Karta Praw Osób Niepełnosprawnych* (Charter of Rights for Persons with Disabilities), approved approved by the Parliament (*Sejm*) [26]. It protects these people against dis-

crimination and aims to give them the right to independent and active life. It contains the rights of people with disabilities, including:

- access to goods and services enabling full participation in social life,
- access to treatment and medical care, rehabilitation and medical education,
- living in an environment free of functional barriers,
- free movement and use of means of transport,
- full participation in public, social, cultural, artistic, and sports life as well as recreation and tourism, according to their interests and needs.

The above rights indicate, therefore, creating appropriate conditions facilitating disabled people the independent use of public transport and the elimination of existing barriers in terms of transport accessibility. Better access to transport services increases these people's mobility and is an important factor in reducing their discrimination. A greater chance of movement affects the increase of their professional and social activity.

Accessible transport is particularly important for people with disabilities, but it also brings benefits to other groups of passengers, e.g. travellers with small children or with bulky luggage. It should be remembered that in accordance with the Act of Law on Vocational and Social Rehabilitation and Employment of People with Disabilities [27], the definition of a disabled person „indicates persons whose physical, mental or psychological condition permanently or periodically impedes, limits or prevents the performance of social roles, in particular limits the ability to perform work”. However, in the Commission Decision 2008/164 / EC [2], the term of a person with reduced mobility was quoted as:

- moving on wheelchairs or persons with reduced movement abilities (having difficulty walking due to injuries or broken limbs),
- travelling with small children,
- with heavy or bulky luggage,
- the elderly,
- pregnant women,
- blind and partially sighted,
- deaf and hard of hearing,
- having difficulties communicating with the environment (who have problems communicating or understanding written or spoken language – including people from abroad who do not speak the local language),
- mentally or intellectually disabled,
- of short height (including children).

Still another term for a “disabled person” or “person with reduced mobility” can be found in Regulation

No. 1371/2007 [12]. According to this document, these people include any person whose mobility when using transport is reduced due to any physical disability (sensory or locomotory, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or as a result of age, and whose situation needs appropriate attention and adaptation to his or her particular needs of the service made available to all passengers. In many countries, the group of disabled people with limited mobility also includes obese people.

3. Ensuring accessibility to transport

In the field of transport, the main objective of the European Union's policy is to create a single European railway area, by improving the interconnection and interoperability of national rail networks, as well as access to them. This objective is implemented with the help of the Technical Specifications for Interoperability (TSI) defined and announced by the European Commission. Among them is the PRM TSI on the aspect of accessibility of the EU rail system for disabled persons and persons with reduced mobility.

The first technical specifications for interoperability relating to the "People with reduced mobility" aspect of the trans-European conventional rail system and the trans-European high-speed rail system were laid down in the Commission Decision of 21 December 2007 (2008/164 / EC) [2]. The purpose of this document was (Point 9) "to harmonise the provisions to be made for persons with reduced mobility travelling as passengers on the conventional and high-speed railway system. Train, stations and relevant parts of the infrastructure that comply with the measures described within the TSI will permit interoperability and offer a similar level of access to persons with reduced mobility across the trans-European network. The TSI does not prevent Member States from introducing additional measures for improving access, as long as it does not impede interoperability or place undue cost on Railway Undertakings. Improved accessibility to rolling stock and stations for disabled and persons with reduced mobility could potentially increase the number of passengers that are currently forced to use other modes of transport". In addition to increasing the accessibility of rail transport for people with reduced mobility, the purpose of the TSI was also to improve the accessibility of public infrastructure, with particular emphasis on problems arising at the platform-to-train interface and evacuation needs in the event of a security threatening situation. This document covers the subsystems of infrastructure and passenger rolling stock and:

- specifies the scope of application (part of the network or rolling stock, subsystem or part of it);

- lays down essential requirements for each subsystem concerned and its interfaces vis-à-vis other subsystems;
- establishes the functional and technical specifications to be met by the subsystem and its interfaces with other subsystems. In addition, for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the subsystems, as well as the implementation of the TSI;
- determines the interoperability constituents and interfaces which are to be covered by European specifications, including European standards, which are necessary to achieve interoperability within the trans-European conventional rail system;
- states, in each case under consideration, the procedures for the assessment of conformity or suitability for use. This includes in particular the modules defined in Decision 93/465/EEC or, where appropriate, the specific procedures to be used to assess either the conformity or the suitability for use of interoperability constituents and 'EC' verification of subsystems;
- indicates the strategy for implementing the TSI. In particular, it is necessary to specify the stages to be completed in order to make a gradual transition from the existing situation to the final situation in which compliance with the TSI shall be the norm.

Among the requirements for the „Infrastructure“ subsystem, there is a disposition of a written strategy by the infrastructure manager or manager of the station, aimed at guaranteeing access to the passenger infrastructure to all persons with reduced mobility throughout the station's operation. Similarly for the "Rolling Stock" subsystem, the provisions of the TSI PRM impose on railway undertakings the obligation to use a written strategy to ensure access for persons with reduced mobility to passenger rolling stock throughout its working time, in accordance with the technical requirements of the TSI. Such strategies should be in accordance with the procedure of each railway undertaking wishing to use the facilities and equipment available at stations and platforms or, as appropriate, with the infrastructure manager's and station manager's procedure. Implementation of the strategy, including traffic rules for specific situations, takes place by providing relevant information to the staff, procedures and training. In addition, the provisions of Decision 2008/164 / EC provide for the establishment of a register of infrastructure and register of rolling stock with the provision of the required scope of information.

The Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Un-

ion's rail system for persons with disabilities and persons with reduced mobility [5] has been in force since 2015. This document applies to the subsystems "Infrastructure", "Operation and Traffic Management", "Telematics Applications" and "Rolling stock".

This regulation repeated the requirements for both infrastructure managers and station managers as well as railway undertakings regarding the availability of access strategies to passenger infrastructure and passenger rolling stock for disabled persons and persons with reduced mobility. The scope of information included in the traffic rules of the access strategy is presented in Table 1.

Compared to Decision 2008/164/EC [2], the revised TSI PRM also includes the requirements for the provision of accessibility information for disabled persons and persons with reduced mobility, which should be placed and updated in the infrastructure register (RINF) and register vehicles (ERATV) (Table 2).

Functional and technical specifications concerning the "Infrastructure" and "Rolling Stock" subsystems have also changed. It is difficult to assess the changes introduced by Regulation 1300/2014 in the context of ensuring greater accessibility in comparison to the provisions of Decision 2008/164/EC. In favour of the

Table 1

Operating rules included in access strategies	
Strategy for access to passenger infrastructure	Access strategy for passenger rolling stock
<ul style="list-style-type: none"> • Station Accessibility; • Unstaffed Stations – Ticketing for Visually Impaired Passengers; • Ticketing Control – Turnstiles; • Lighting of platforms; • Visual and Spoken Information – Achieving Consistency; • On-demand Spoken Passenger Information System; • Platform – Wheelchair Boarding Aid Operational Zone; • Safety of Manual and Powered Wheelchair Boarding Aids; • Assistance to board and alight the train; • Supervised Level Track Crossing. 	<ul style="list-style-type: none"> • Access and Reservation of Priority Seats; • Carriage of Assistance Dogs; • Access and Reservation of Wheelchair Spaces; • Access and Reservation of Universal Sleeping Compartments; • Train crew – exterior doors activation; • Call for aid device in wheelchair space, universal toilets or wheelchair accessible sleeping accommodation; • Audible safety instructions in case of emergency • Visual and audible information – Control of advertisements; • Automatic Information Systems – Manual Correction of incorrect or misleading information; • Rules for announcement of the final destination and the next stop; • Rules on train composition to make wheelchair boarding aid devices usable according to the arrangement of the platforms; • Safety of Manual and Powered Wheelchair Boarding Aids; • Assistance to board and alight the train; • Emergency method to deploy moveable steps; • Operating combinations of rolling stock compliant and non-compliant with this TSI; • Forming trains from individual vehicles compliant with this TSI.

Source: [5]

Table 2

Common specifications related to people with disabilities and persons with reduced mobility	
Infrastructure register	Rolling Stock register
<ul style="list-style-type: none"> • IM's code; • Identification of platform; • TEN Classification of platform; • Usable length of platform; • Height of platform; • Existence of platform assistance for starting train; • Range of use of the platform boarding aid. 	<ul style="list-style-type: none"> • Number of fixed seats *; • Number of toilets *; • Number of sleeping places *; • Number of priority seats; • Number of wheelchair spaces; • Number of PRM accessible toilets; • Number of wheelchair accessible sleeping places; • Platform heights for which the vehicle is designed; • Description of any integrated boarding aids (if provided); • Description of any portable boarding aids if considered in the design of the vehicle for meeting the PRM TSI requiremen.

* Open points for traction vehicles (this group also applies to electric traction unit) and hauled passenger vehicles, i.e. the data is optional in the permit for the type of railway vehicle; source: [3, 4].

different use in the Polish version of the wording in both documents – from the direction of aspiration (i.e. certain recommendations – “should”), to the obligation to provide (i.e. the requirement – “must”).

In the context of the comparison of parameters, it can be concluded that some of the entries have been relaxed (liberalized), by deleting some properties and their values, or simply being changed. Examples of existing differences are included in Table 3.

The key novelty introduced by Commission Regulation 1300/2014 [5] is the need for each EU Member State to develop a national implementation plan for the PRM TSI to eliminate identified barriers related

to the accessibility of rail transport. Such documents were notified to the Commission by January 1, 2017. National implementation plans must contain a strategy, including the principle of prioritization defining the criteria and priorities for rolling stock stations and units to be renewed or upgraded. This strategy is due to be developed in cooperation with infrastructure managers, station managers, railway undertakings⁴ and, if necessary, with other local authorities (including local transport authorities). Consultations are to be carried out with associations representing users, including people with disabilities and persons with reduced mobility.

Table 3

Comparison of the requirements of selected parameters [2, 5]

Parametr	Commission Decision No 2008/164/EC of 21 December 2007 [2]	Commission Regulation (EU) No 1300/2014 of 18 November 2014 [5]
Obstacle-free route		
Route identification	If there are handrails or walls within reach along the obstacle-free route to the platform, they shall have brief information (for example platform-number or direction-information) in Braille and in prismatic-letters or numbers at the rear of the handrail, or on the wall at a height between 850 mm and 1 000 mm. Numbers and arrows are the only permissible tactile pictograms.	If there are handrails or walls within reach along the obstacle-free route to the platform, they shall have brief information (for example platform-number or direction-information) in Braille or in prismatic-letters or numbers on the handrail, or on the wall at a height between 145 cm and 165 cm.
Doors and entrances	Doors and entrances shall have a minimum clear opening width of 800 mm, free headroom of 2 100 mm.	Doors shall have a minimum clear useable width of 90 cm and shall be operable by persons with disabilities and persons with reduced mobility
Furniture and free-standing devices	Cantilevered items fitted below a height of 2 100 mm, which protrude by more than 150 mm, shall be indicated by an obstacle, at a maximum height of 300 mm, that can be detected by a blind person using a stick. There shall be no hanging elements below a height of 2 100 mm.	Within the station confines, furniture and free-standing devices (including cantilevered and suspended items) shall be positioned where they do not obstruct blind or visually impaired people, or they shall be detectable by a person using a long cane.
Platform		
Platform width and edge of platform	It is permitted for the width of the platform to be variable on the whole length of the platform. The minimum width of the platform without obstacles shall be the greater of either: – the width of the danger area plus the width of two opposing freeways of 800 mm (1 600 mm) or, For a single side platform 2 500 mm, or for an island platform 3 300 mm (this dimension may taper to 2 500 mm at the platform ends).	The minimum width of the platform without obstacles shall be the width of the danger area plus the width of two opposing freeways of 80 cm (160 cm). This dimension may taper to 90 cm at the platform ends.
End of platform	The end of the platform shall have both visual and tactile markings.	The end of the platform shall either be fitted with a barrier that prevents public access or shall have a visual marking and tactile walking surface indicators with an attention pattern indicating a hazard.

⁴ It means any public or private undertaking which provides services for the transport of goods and/or passengers by rail. Undertakings whose only business is to provide services for the transport of passengers by metro, tram and/or light rail are excluded [13].

On the occasion of the subject matter, it is not possible to disregard Regulation (EC) No. 1371/2007 on rail passengers' rights and obligations [12]. In Chapter V of this document provisions are foreseen concerning disabled persons and persons with reduced mobility, which regulate: the right of such persons to transport, information and availability⁵, conditions and assistance at railway stations and on the train, as well as compensation in respect of mobility equipment or other specific equipment of persons with limited mobility. In contrast, Annex II: "Minimum information to be provided by railway undertakings and/or by ticket vendors", obliges these entities to provide information on pre-travel information, including information on accessibility, access conditions and adaptation of the train to the needs of disabled persons and persons with reduced mobility. In turn, in Annex III, the definition of the scope of assistance provided to disabled persons and persons with reduced mobility was included as one of the information areas in the "Minimum service quality standards".

4. The level of railway accessibility and action towards its improvement

Regulations on the Community level, laws serving the cohesion and the uniformity of the European railway network, including also the needs of disabled persons associated with the access to transport services, are obliging the Polish side to implement decisions in the domestic legislation. Apart from issued acts and regulations, transposing the European law also takes place in other documents, having a form of standards, guidelines or textbooks of best practices. It is possible here to mention the example: recommendations of the President of the Office of Rail Transport of 2013: "*Obsługa osób o ograniczonej możliwości poruszania się na rynku pasażerskich usług kolejowych*" [9] (Providing services for persons with disabilities or reduced mobility on the market for rail passenger services), "*Warunki dostępności przewozów kolejowych dla osób z niepełnosprawnością i osób o ograniczonej sprawności ruchowej w umowach o świadczenie usług publicznych*" [28] (The access conditions of rail services for persons with disabilities or reduced mobility in public service contracts), "*Ekspertyza w zakresie dostępności kolejowych obiektów obsługi podróżnych z niepełnosprawnościami oraz ograniczoną możliwością poruszania*" [6] (Expert

opinion on access conditions of facilities providing assistance for persons with disabilities or reduced mobility) or the handbook of the Ministry of the Infrastructure and the Construction considering the concept of universal design "*Standardy dostępności budynków dla osób z niepełnosprawnościami*" [24] (Accessibility standards for persons with disabilities), and instruction of the company PKP PLK S.A. – Ipi-1. "*Wytyczne architektoniczne dla kolejowych obiektów obsługi podróżnych*" [31] (Architectural guidelines for railway facilities providing services for passengers).

A gradual change in rail passenger transport has been observed recently. The improvement relates to the state of the train infrastructure, including the parameters of increasing the speed on railway lines, modernization of stations, stops and the increase in the quality of the travel through the exchange and the purchase of new rolling stock. This action is supposed to raise the competitiveness of the rail transport and responds to growing expectations of the market. Apart from that they result from assumptions of the sustainable development transport policy, establishing the dominance of railways in these market segments, which generate the biggest economic and social benefits. Infrastructure and rolling stock projects carried out in a comprehensive way consider the demand of the improved transport accessibility related to needs of persons with disabilities.

According to the National Implementation Plan of TSI PRM [8], numerous architectural barriers in infrastructure were removed, lifts were installed as well as tunnels were built with ramps, and non-slip tiles were fitted on platform edges. PKP PLK Company as a railway infrastructure manager provides on its website [36] the latest information concerning the stations and stops facilities equipped with devices and conveniences, as well as the scope of the assistance provided for disabled persons. However, regulations how to act on a particular station or stop are displayed on stations and stops noticeboards (Figure 1), with among others elements of the train and service infrastructure available to passengers, information about adapting the facility for disabled persons, or showing the nearest fully accessible station where it is possible to gain the assistance of the station staff, as well as the phone contact to the entity providing assistance (Figure 2).

Data regarding the adjustment of railway stations managed by PKP S.A. is also available on the company's website [37].

⁵ Until December 3, 2019, it is excluded from the application of Art. 21 Item 1 to ensure the availability of rolling stock and infrastructure in accordance with the requirements of the TSI PRM [15].



Fig. 1. Example of regulations displayed at the station [Photo. I. Wróbel]

- the 5.2% of points provide the access to the platform with the lift or the vertical boarding aid,
- the 56.6% of points provide the access to the platform on the rail level with the assistance of a carer or accompanying person,
- the 14.3% of points enable reaching the platform with the help of the station employee, and 2.4% of stations or stops grant the help of the station security officer.

The rolling stock is strongly diversified, in terms of the type and functional-operational characteristics resulting from it as well as the technical condition, where its age plays a major role. It is of primary importance for operators to use a given type of rolling stock due to its intended use dedicated for operation in a given transport sector (qualified transport, inter-regional, local and urban) as well as technical and operational parameters of railway lines on which this rolling stock operates. A trend of positive changes has been observed in this area for several years improving the transport services quality and comfort of travelling. It is a rolling stock standard now to place pictograms for priority seats (Figure 3) for pregnant women, passengers with small children, the disabled or wheelchair spaces. Some types of rolling stock provide places for people with bulky luggage or bicycle.



Fig. 2. Example of information concerning the assistance for passengers [Photo. I. Wróbel]

In reference to the data in the National Implementation Plan of TSI PRM [8], the level of adapting railway stations for disabled persons and persons with reduced reaches 17.2%, however, the participation of stations and stops in operation which are equipped with conveniences is as follows:

- the 29.6% of points are granted access to the platform with the ramp/drive,
- the 2.4% of points provide access for to the platform with the staircase boarding aid,



Fig. 3. Examples of markings of priority seats in passenger trains; source: a, b – [5], c – [6], d – [32]

According to the national implementation plan of TSI PRM, the share of the rolling stock in operation

adapted for the transport of persons on wheelchairs⁶ amounts to the 27.6%, however, with reference to individual kinds it makes:

- 4.9% in case of 1st and 2nd class passenger carriages,
- 56.5 % in case of electric traction units,
- 95.5% in case of diesel engine vehicles.

The above values with reference to the passenger train infrastructure and transit means of transporting, determine the scale of arising problems in the aspect to providing the rail transport availability for disabled persons and persons with reduced mobility. They also show the necessity to continue the implementation of investment projects in order to eliminate existing transport barriers as well as initiate further efforts to improve transport accessibility.

According to PKP Intercity SA – an operator with 51.13% share in the market according to transport performance in 2017 [22], the implementation of the rolling stock strategy for 2016-2020 (the anticipated budget is over 7 billion PLN) stipulates the purchase of 185 wagons, 19 electric multiple units and 2 push-pull trains as well as upgrade of 700 wagons and 14 electric multiple units. This rolling stock will be adapted to the needs of people with disabilities – those in wheelchairs or the blind or visually impaired, equipped with wi-fi, comfortable seats, air-conditioning and facilities for families or cyclists [35].

We should also mention the station investment program for 2016–2023, implemented under the “*Strategia na rzecz odpowiedzialnego rozwoju do roku 2020 (z perspektywą do 2030 r.)*” (Strategy for responsible development until 2020 with the prospect up to 2030) [33], thanks to which 188 facilities will be modernized throughout the country. This programme will result in standardized, high quality, adapted to the needs of passengers and energy-efficient railway stations, which will allow improving the level of service for the disabled, including connections with other modes of transport and the development of local social functions.

Meeting the EU [12] and domestic (e.g. [14]) requirements concerning the rights of passengers with disabilities, railway passenger operators enable the unpaid assistance in organising and undergoing the ride on trains, including:

- application (by phone or on-line) of intention of travelling for persons requiring assistance as a default to 48 hours before the departure date (some operators, e.g. Łódź Agglomeration Railways require a shorter notifications up to 24 hours),

- providing assistance while boarding and alighting a train and taking a seat on the train,
- sale of tickets onboard of trains, without incurring extra charges.

Operators also undertake other actions aimed at eliminating the barriers and improving the offer. These include: equipping passenger service points and ticket offices with induction loops, video translation service, marking train interiors with information in the Braille alphabet, adapting websites to WCAG2.0⁷ standards, setting up standards and elaborating procedures to assist persons with disabilities as well as cyclical system of trainings and instructions for personnel who have a direct contact with travellers.

Providing a comprehensive service of the help for disabled persons to use the rail transport requires internal arrangements and agreements on the part of infrastructure managers and operators, an example of which is the Centre of Customer Support (CWK), i.e. a team initiated by PKP Intercity, PKP SA and PKP Polskie Linie Kolejowe, providing passengers with 24-hour assistance on every stage of the travel. Apart from providing help for disabled persons, CWK also intervenes in cases of critical disruptions in the traffic of trains, organising the substitute transport or meals. The appropriate cooperation of many entities influences the efficiency of the process of organisation of the help, completion of the entire travel (including help and assistance in the case of changing trains) and monitoring the course of the travel.

5. The Railway Research Institute’s offer to implement further activities to improve the transport accessibility

Ensuring the full accessibility to the rail transport for disabled persons and of persons with reduced mobility is a complex, multi-faceted and long-term process. The Railway Research Institute has been involved for over 30 years in activities aimed at improving transport accessibility, universal design, increasing freedom and facilitating the movement of travellers. During this period, cooperation was established within various working groups, a number of activities were undertaken and the direction of changes in transport was initiated to meet the needs of people with disabilities. As part of the implementation of projects for railway market entities and companies, many studies have been prepared regarding

⁶ Data concerns 10 passenger operators.

⁷ WCAG (Web Content Accessibility Guidelines) Guidelines concerning facilitation in the access to contents published in the Internet.

the elimination of barriers and the introduction of new solutions and improvements, in the scope of facilities and elements of railway infrastructure, rolling stock and service, information and organization of transport. The Railway Research Institute's experts are also actively involved in the creation of strategies, including in the National Implementation Plan of the PRM TSI [8], referred to repeatedly in this article. Detailed information on the activities of the Railway Track and Operation Department in the area of improving transport accessibility for disabled persons and persons with reduced mobility is presented in [10].

It should be expected that the implementation of the currently planned infrastructure and rolling-stock projects [8] will achieve the level of availability in 2023 in relation to:

- railway stations – 46.6%⁸,
- platforms – 51.6% (35.8% of platforms will be fitted with tactile markings and paths leading blind persons),
- rolling stock (averaged value for all kinds of rolling stock used for passenger transport) – 35.0%, including:
 - passenger carriages: 7.9%,
 - diesel engines: 95.7%,
 - electric traction units: 67.7%,
 - single electric engine cars: 100%.

In 2018, the government program “Accessibility Plus” [25] was implemented, aimed at increasing the quality of life and ensuring independence of life for all citizens, including the elderly and people with permanent or temporary limitations. It is aimed at the improvement of the accessibility of public space, products and services in the aspect of architecture, information and transport.

A thematic block of 20bn- zloty budget, associated with the accessibility of the public and private transport, will concern five actions:

- Action 5 – Accessible rail transport;
- Action 6 – The maintenance and the upgrade of 200 railway stations;
- Action 7 – Accessible public transport;
- Action 8 – Trainings for employees of the transport sector;
- Action 9 – Application “Can I get there?”

Action 5 and 6 are dedicated to railways and focused on the infrastructure and rolling stock (superstructure) improvement, in accordance with the TSI PRM requirements. Since 2018, the Program also assumes the development of a strategy for access to passenger infrastructure and rolling stock throughout its entire life, to all per-

sons with disabilities and persons with reduced mobility, along with traffic rules and implementation through appropriate procedures and personnel training.

In order to meet the binding for a decade legal requirements stipulated in TSI PRM [5] and policy carried out by the State, a research method was developed in the Railway Track and Operation Department of the Railway Institute, as part of the internal project implementation [29], using a questionnaire of the facility in which detailed parameters have been included affecting the accessibility and their assessment resulting from the provisions of the Community law. More information on the goals and final effects of the aforementioned internal project can be found in the information on research published in the journal “Prace Instytutu Kolejnictwa” [30].

The proposed questionnaire of the facility contains over 200 questions that enable detailed characteristics of the railway station and its particular elements, from the point of view of accessibility for disabled people and people with reduced mobility. The scope of information and data included in the sheet design has been divided into the following thematic blocks:

- 1) A. General information concerning a passenger station,
- 2) B. Use of a passenger station,
- 3) C. Characteristics of the condition of the facility,
- 4) D. Access to a passenger station,
- 5) E. Platforms,
- 6) F. Passenger information,
- 7) G. Obstacle-free route,
- 8) H. Unstaffed Stations,
- 9) I. Assistance for boarding and disembarking from trains,
- 10) J. Remaining information.

Such structured information about given operational points facilitates the development of strategies for passenger stations, and also allows the determination of traffic rules taking into account the existing local conditions. It is worth noting that an additional advantage of an ordered set of information will be the possibility to prepare a detailed database on rail passenger service facilities in Poland. The study on the implementation of the project also includes:

- proposal of the strategy structure for the passenger stations,
- definitions of disabled persons and persons with reduced mobility and glossary of important notions,
- sheet of passenger station characteristics,
- examples of descriptive parts of the passenger station strategy.

⁸ Planned value to achieve in the year 2021.

The assumption of the described above internal project is an offer to undertake cooperation between the Railway Research Institute and railway infrastructure managers in order to help in the preparation of access strategy documents. It should be emphasized that railway infrastructure managers should have strategy documents in writing, developed separately for each passenger station.

6. Conclusions

Transport infrastructure is an element of public space, and the use of transport services results from the basic human life needs. Hence, the creation of both these factors affects the life activity and the mobility of the society.

Despite the legal sanctioning of improving transport accessibility for all citizens, including special regard to special social groups such as people with disabilities and big progress in adapting public facility and services to all citizens, there is still much to be done in terms of eliminating obstacles and barriers, regarding the accessibility of rail transport. Several tasks being implemented that take into account universal solutions, allow increasing the level of these people's independent functioning and participation in various spheres of life. Taking into consideration the growing share of the population struggling with temporary or permanent health dysfunctions, as well as the increasing number of notifications regarding travel assistance (Figure 4), all possible solutions to improve transport accessibility should be sought. Apart from continuing the implementation of projects related to the standardization of infrastructure and rolling stock, urgent action is required in the field of developing procedures and traffic regulations, taking into account local conditions and ensuring full accessibility of infrastructure and rolling stock, dedicated to travellers.

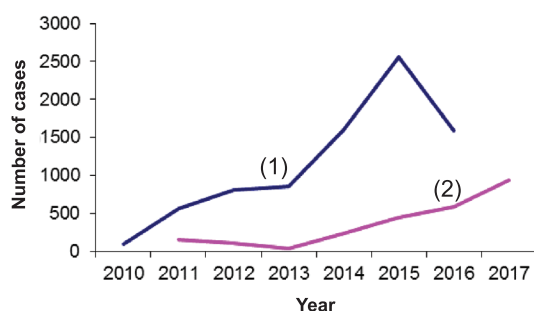


Fig. 4. Registered number of applications to provide assistance for disabled persons in rail transport: 1) Przewozy Regionalne, 2) together: Koleje Mazowieckie, PKP SKM w Trójmieście, Koleje Dolnośląskie (from 2012), Koleje Śląskie (from 2014), ŁKA (from 2014); own elaboration based on [19–24]

Literature

1. Antczak R., Grabowska I., Polańska Z.: *Podstawy i źródła danych statystyki osób niepełnosprawnych*, Wiadomości Statystyczne Rok LXIII 2 (681) 2018, 21–43 [access 28.09.2018].
2. Commission Decision of 21 December 2007 concerning the technical specification of interoperability relating to ‘persons with reduced mobility’ in the trans-European conventional and high-speed rail system (notified under document C(2007) 6633) (2008/164/EC, O.J. L 64, 7.3.2008).
3. Commission Implementing Decision of 26 November 2014 on the common specifications of the register of railway infrastructure and repealing Implementing Decision 2011/633/EU (notified under document C(2014) 8784) (2014/880/EU), O.J. L 356, 12.12.2014).
4. Commission Implementing Decision of 4 October 2011 on the European register of authorised types of railway vehicles (notified under document C(2011) 6974) (2011/665/EU), O.J. L 264, 8.10.2011.
5. Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union’s rail system for persons with disabilities and persons with reduced mobility, O.J. L 356, 2.12.2014.
6. Ekspertyza w zakresie dostępności kolejowych obiektów obsługi podróżnych z niepełnosprawnościami oraz ograniczoną możliwością poruszania; UTK, Warszawa 2017.
7. Konstytucja Rzeczypospolitej Polskiej (Dz.U. z 1997 r. Nr 78, poz. 483).
8. Krajowy Plan Wdrażania technicznych specyfikacji interoperacyjności, odnoszących się do dostępności systemu kolei unii dla osób niepełnosprawnych i osób o ograniczonej możliwości poruszania się (TSI PRM), Ministerstwo Infrastruktury i Budownictwa, Warszawa 2017, available website <https://ec.europa.eu/transport/sites/transport/files/rail-nip/nip-prm-tsi-poland.pdf> [access 23.08.2018].
9. Obsługa osób o ograniczonej możliwości poruszania się na rynku pasażerskich usług kolejowych; UTK, Warszawa 2013.
10. Poliński J., Ochociński K.: *Wkład Zakładu Dróg Kolejowych i Przewozów Instytutu Kolejnictwa w poprawę dostępności transportu kolejowego dla osób niepełnosprawnych*; Prace Instytutu Kolejnictwa, 2018, No 157.
11. Popiel M.: *Innowacje służące poprawie dostępności transportu miejskiego dla osób niepełnosprawnych – wybrane przykłady*, Prace Komisji Geografii Komunikacji PTG 2016, 19(3), 46–56.
12. Regulation (EC) No 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers’ rights and obligations, O.J. L 315, 3.12.2007.

13. Regulation (EC) No 91/2003 of the European Parliament and of the Council of 16 December 2002 on rail transport statistics, O.J. L 14, 21.01.2003.
 14. Rozporządzenie Ministra Infrastruktury i Budownictwa z dnia 8 grudnia 2016 r. zmieniające rozporządzenie w sprawie planu zrównoważonego rozwoju publicznego transportu zbiorowego w zakresie sieci komunikacyjnej w międzywojewódzkich i międzynarodowych przewozach pasażerskich w transporcie kolejowym (Dz.U. 2016 poz.1996).
 15. Rozporządzenie Ministra Infrastruktury i Budownictwa z 20 listopada 2014 r. w sprawie zwolnienia ze stosowania niektórych przepisów rozporządzenia (WE) nr 1371/2007 Parlamentu Europejskiego i Rady dotyczącego praw i obowiązków pasażerów w ruchu kolejowym (Dz.U. z 2014 r., poz. 1680).
 16. Sprawozdania z realizacji norm jakości obsługi – Koleje Dolnośląskie, available website <http://www.kolejedolnoslaskie.4bip.pl/index.php?idg=6&i-d=94&x=2> [access 28.09.2018].
 17. Sprawozdania z realizacji norm jakości obsługi – PKP Szybka Kolej Miejska w Trójmieście: <http://www.skm.pkp.pl/dla-pasazera/aktualnosci-pkp-skm/> [access 28.09.2018].
 18. Sprawozdania z realizacji norm jakości obsługi – Przewozy Regionalne, available website <https://polregio.pl/media/> [access 28.09.2018].
 19. Sprawozdania z realizacji norm jakości usług – Koleje Mazowieckie: <https://www.mazowieckie.com.pl/pl/sprawozdanie-z-realizacji-norm-jakosci-uslug> [access 28.09.2018].
 20. Sprawozdania z realizacji norm jakości usług – Koleje Śląskie, available website <http://kolejeslaskie.com/bip-2/ogloszenia/> [access 28.09.2018].
 21. Sprawozdania z realizacji norm jakości usług – Łódzka Kolej Aglomeracyjna, available website <https://lka.lodzkie.pl/o-spolce/Dokumenty/> [access 28.09.2018].
 22. Sprawozdanie z funkcjonowania rynku transportu kolejowego w 2017 r.; Urząd Transportu Kolejowego, 2018.
 23. Stan zdrowia ludności Polski za rok 2014, GUS, Warszawa 2016 [dostęp dnia 28.09.2018].
 24. Standardy dostępności budynków dla osób z niepełnosprawnościami, Ministerstwo Infrastruktury i Budownictwa, Warszawa 2017.
 25. Uchwała Nr 102/2018 Rady Ministrów z dnia 17 lipca 2018 r. w sprawie ustanowienia Rządowego Programu Dostępność Plus (RM-111-89-18).
 26. Uchwała Sejmu Rzeczypospolitej Polskiej z dnia 1 sierpnia 1997 r. – Karta Praw Osób Niepełnosprawnych (M.P.50.475).
 27. Ustawa z dnia 27 sierpnia 1997 r. o rehabilitacji zawodowej i społecznej oraz zatrudnianiu osób niepełnosprawnych (Dz.U. 2011, Nr 127, poz. 721 z późn. zm.).
 28. Warunki dostępności przewozów kolejowych dla osób z niepełnosprawnością i osób o ograniczonej sprawności ruchowej w umowach o świadczenie usług publicznych; UTK.
 29. Wróbel I., Poliński J.: *Opracowanie metody niezbędnej do sporządzenia strategii gwarantującej pełną dostępność infrastruktury pasażerskiej zgodnie z wymaganiami TSI PRM*; Temat 8730/11, Zakład Dróg Kolejowych i Przewozów IK; lipiec 2018 r.
 30. Wróbel I.: *Strategie dostępności do infrastruktury pasażerskiej według TSI PRM*; Prace Instytutu Kolejnictwa, 2018, No 159.
 31. Wytyczne architektoniczne dla kolejowych obiektów obsługi podróżnych Ipi-1; Załącznik do uchwały nr 1283/2017 Zarządu PKP Polskie Linie Kolejowe SA z dnia 27 grudnia 2017 r.
- Internet sources
32. <https://dziennikzachodni.pl/pkp-intercity-wprowadzilo-przedzial-dla-matki-z-dzieckiem-oznaczenia/ga/916268/zd/2042940>.
 33. <https://www.gov.pl/web/infrastruktura/program-inwestycji-dworcowych-na-lata-2016-2023>.
 34. <http://www.ikolej.pl/httpikolejplsyyovrrhtml/>.
 35. <https://www.intercity.pl/pl/site/o-nas/dzial-prasowy/aktualnosci/pkp-intercity-kolej-duzych-inwestycji-7-mln-zlotych-inwestycji-w-komfort-naszych-pasazerow.html>
 36. <https://www.plk-sa.pl/niepelnospawni/>.
 37. <https://www.pkp.pl/pl/bez-barier/>.