Technical Sciences, 2022, 25, 17–33

UNIWERSYTET WARMIŃSKO-MAZURSKI W OLSZTYNIE

Yearbook peer-reviewed scientific journal
ISSN 1505-4675
e-ISSN 2083-4527
TECHNICAL SCIENCES
Homepage: https://czasopisma.uwm.edu.pl/index.php/ts/

DOI: https://doi.org/10.31648/ts.7581

EVALUATION OF THE PUBLIC TRANSPORT SYSTEM IN TERMS OF ITS ADAPTATION TO SERVE PEOPLE WITH DISABILITIES IN NORTHERN WIELKOPOLSKA (POLISH CASE STUDY)

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Received 18 March 2022 accepted 12 April 2022, available online 25 May 2022.

K e y w o r d s: transport, public transport for disabled people, infrastructure, means of transport.

A b s t r a c t

The problem of disability affects more and more people every year. One of the obstacles to their proper functioning are everyday problems connected with mobility. The aim of this article is to find out the opinion of disabled people living in Northern Wielkopolska on the quality of infrastructure, its adaptation and accessibility for the disabled as well as to present improvements which would enable disabled people to use public transport services safely, freely and comfortably. On the basis of the survey, it may be concluded that the basic problem of road infrastructure from the point of view of people with disabilities is the low quality of access to stops, roads, pavements and high kerbs, poor adaptation of public space or very wide transport and lack of reconstruction of some places and road fragments. Added to this is the average quality of adaptation of public transport for people with disabilities.

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Introduction

According to Polish law, a disabled person is defined as a person who, as a result of a long-term or permanent inability to fulfil social roles, causing, in particular, inability to work, is temporarily or permanently unable to fulfil social roles (The Act of 27 August 1997 on vocational and social rehabilitation and employment of disabled persons. Journal of Laws 1997, no. 1997 No 123, item 776). Ensuring the accessibility of the public transport system for people with disabilities means, among other things, having adapted rolling stock on railways, long-distance railways, in city buses and buses. In addition, the road and communication infrastructure on which people with disabilities move should be adapted to their needs. For example, adapting urban public transport for people with disabilities means primarily replacing rolling stock with low-floor vehicles and providing correct audio and visual information for passengers both inside and outside the vehicle (Raczyńska-Buława 2017a, 2017b).

It has always been considered that people with disabilities have mobility difficulties that limit their daily life (Lucas 2004, Dodson et al. 2004). These limitations are considered as accessibility barriers to the use of transport systems services (Evans, White 1998). Many authors address the accessibility of adaptations of buildings, public transport or public infrastructure for people with disabilities (Mace et al. 1991, Donnelly 2003, Czarnecki, Siemiński 2004, Wysocki 2009), as well as the movement of people with disabilities and mobility in public spaces (Travers 1992, Heiser 1995, *Improving transport…* 1999, Campion et al. 2003, Taylor, Józefowicz 2012a, 2012b, 2012c, 2012d).

People with disabilities constitute 15% of the population and there are more than one billion of them in the world (*Disability Inclusion*. 2022). In Poland, people with disabilities officially constitute more than 3 million people, while their number in reality may vary from 4 to almost 7 million (Jendrzejewski 2019). The number of studies referring to people with disabilities in geographical terms is increasing every year (Cormode 1997). This is happening systematically, which is related to demographic changes and the increasing number of people with disabilities (Skalska 2004, 2010, Zajadacz 2015). A large number of studies link people with dysfunctions to the geographical environment (Ostrowska 1994, Gaines 2004, Józefowicz 2014). A very good example is research on accessible tourism for people with disabilities, in which mobility is an integral part of travel (Kaganek 2009, *Krajoznawstwo i turystyka osób niepełnosprawnych*. 2005, Buhalis et al. 2006). Facilitated access to transport services influences the quality of life and, in the case of people with disabilities, additionally contributes to their self-esteem and social participation (Zadrożny 2009, Furmanek 2014).

In Poland, in December 2020, there were 2.4 million people receiving pension benefits and/or insured with contributors to the Social Insurance Institution who

had a disability certificate or a certificate of inability to work. Men predominated in the study population, accounting for 52.6%. Taking age into account, men aged 64 were the most frequent in the analysed group (54.4 thousand). About 52.7 thousand men were aged 63. The largest number of women with a disability certificate were aged 71 (31.7 thousand). More than 30 thousand women were aged 59 (30.7 thousand) or 70 (30.5 thousand). The median age of men with a certificate was 62 years and the median age of women was 63 years (*Osoby niepełnosprawne w 2020 r.* 2021).

Most women and men with certificates of disability or inability to work declared their place of residence in the Śląskie Voivodeship (148.4 thousand and 123.8 thousand respectively). Half of the surveyed group indicated the following voivodeships: Dolnośląskie, Małopolskie, Mazowieckie, Śląskie and Wielkopolskie. The least number of people in the analysed group indicated the Opolskie Voivodeship (21.0 thousand women and 25.2 thousand men). The highest rate of people with disability or incapacity certificate per 10 thousand inhabitants occurred in Lubuskie (890). This indicator exceeded 700 persons in the following voivodships: Wielkopolskie (723), Świętokrzyskie (721), Podkarpackie (712), Kujawsko-Pomorskie (708) and Warmińsko-Mazurskie (706). On the other hand, the lowest number of people with disability certificate per 10,000 inhabitants was recorded in the Mazowieckie Voivodeship (468). Moreover, the value of this indicator was lower than 500 people in the Opolskie Voivodeship (473) (*Osoby niepełnosprawne w 2020 r.* 2021).

Based on PENTOR data, it can be concluded that most municipalities in Poland do little for people with disabilities. The real drama takes place in rural areas. Here, support often ends with the granting of social assistance benefits (Stanisławski 2007). In recent years, many projects have been developed to make life easier for these individuals. For example, in the district of Piła, a project is being implemented with funds from the State Fund for Rehabilitation of Disabled Persons under the Programme for Equalisation of Differences between Regions III. As part of this project, lifts for people with disabilities are being installed in secondary schools. Moreover, under this project, a bus for transporting this community was purchased and bathrooms were renovated and adapted to the needs of those people, participants of Occupational Therapy Workshops in Morzew (*Projekty realizowane przez powiat pilski w ramach Programu wyrównywania różnic między regionami III*. 2022).

Piła Municipality offers deaf, hard of hearing and deaf-blind people the possibility to use (*Informacja dla osób niepełnosprawnych*. 2022):

– free assistance of a sign language interpreter or an interpreter-guide, with the right to freely choose the form of communication that is convenient for them;

– assistance of an accompanying person, who can be over 16 years of age, chosen by a disabled person, helping him or her to arrange matters;

– communication aids, i.e. e-mail, SMS text messages, sending faxes;

– provision by a public administration body of documents necessary to settle a matter in a form accessible to such persons upon their request.

We can also encounter assistance for people with disabilities in the Złotów district. Within the project: *Comprehensive support programme for dependent and disabled persons in Złotów* the disabled can count (*Kompleksowy program wsparcia osób niesamodzielnych i niepełnosprawnych w Złotowie*. 2018) on, among others:

– care services provided at the place of residence;

– specialist care services provided at the place of residence: nursing, rehabilitation, psychological;

– assistance services provided at the place of residence for disabled persons;

– specialised training.

In another of the municipalities in question, Krajenka municipality, the project Personal assistant for a disabled person is also implemented. The main objective of the programme is to support people with disabilities in performing daily activities, functioning in social life and supporting them in undertaking any activities therefore, using the services of an assistant will enable to lead more active and independent lives (*Asystent osobisty osoby niepełnosprawnej w gminie Krajenka*. 2021).

There is also an Occupational Activity Centre in Piła. The main mission of the institution is the social rehabilitation and professional activation of people with significant and moderate degrees of disability, with particular emphasis on people with mental disabilities and mental illnesses. These goals are realised, among others, through: running a business, various professional trainings for disabled employees, vocational counselling, support of a social worker in solving problems of everyday life, a comprehensively equipped rehabilitation room, organisation of integration events (picnics, carnival games, excursions) (Zakład Aktywności Zawodowej. Piła. 2022).

Aim and scope of the study

The aim of this study is to find out the opinion of people with disabilities living in northern Wielkopolska on the quality of infrastructure, its adaptation and accessibility for this community, as well as to present improvements which would enable these people to use public transport services safely, freely and comfortably. The results obtained may serve as a basis for determining directions for improving road infrastructure for people with disabilities when a similar situation occurs in the future. The survey was conducted using a questionnaire among people with disabilities in March 2021.

Research methodology

The study was conducted in the form of a questionnaire. Initially, a pilot study was conducted, based on which the questionnaire was revised. Then the questionnaire was made available on the Internet, on forums for people with disabilities and in paper form during meetings in rehabilitation and care centres for people with disabilities. The questionnaire consisted of 20 closed-ended questions asking about, among other things, gender, age, degree of disability, time of onset of disability and type of disability. The most important questions in the questionnaire concerned the use by people with disabilities of public transport (train, intercity communication, city communication) and minibuses. Respondents were also asked if they have any mobility problems and if they use wheelchair lifts or parking places for handicapped, with a following question about the location of those spaces. They were also given the opportunity to express their opinion about difficulties in public transport infrastructure as they could rate public transport and the availability and condition of parking spaces. At the end of the survey, each respondent had the opportunity to suggest improvements to public transport and infrastructure for people with disabilities. If the survey was not fully completed, it was not taken into account. The results of the surveys were presented in the form of graphs, correlations were made and appropriate conclusions were drawn.

Due to the pandemic, the survey was conducted electronically on publicly available websites and in paper form in places of rehabilitation and care for people with disabilities. The questions concerned only women and men with disabilities, people who know a person with a disability and/or have close contact with them. The questions in the survey were single or multiple choice and included open-ended questions where the respondent could provide their own thoughts and suggestions on transport for people with disabilities.

Object of research

The subject of the research were disabled people living in Northern Wielkopolska according to sex, age, degree, type of disability and its duration. The research was conducted on a group of 120 respondents, however, only 105 correctly filled in questionnaires were used for further analyses.

Among respondents 60 people (57.14%) were disabled, 29 people (27.62%) declared they were a parent of a disabled person and 5.71% were caretakers of a disabled person. 9.52% of respondents were close people - friends, relatives, neighbours or managers of institutions dealing with rehabilitation of disabled people. Among respondents 52% are men and 48% are women.

Table 1

Socio-demographic characteristics of survey respondents

Category	*n*	%
Role of the interviewee		
Disabled person	60	57.14
Parent of a disabled person	29	27.62
Carer of the disabled person	6	5.71
Other (friend, relative, neighbour)	10	9.52
Sex		
Female	55	52.38
Male	50	47.62
Age		
Up to 15 years	21	20.00
16 to 25 years	22	20.95
26-40 years	29	27.62
41-65 years	30	28.57
Over 65	3	2.86

Table 2

Disability characteristics among respondents

Category	*n*	%
Degree of disability		
Substantial	63	60.00
Moderate	29	27.62
Mild	13	12.38
Time when disability arose		
Since birth	51	48.57
As a result of an accident	20	19.05
As a result of an illness	34	32.38
Type of disability		
Intellectual disability	20	15.63
Hearing disability	12	9.38
Speech disability	8	6.25
A person with a physical disability who uses a wheelchair	32	25.00
Disabled person with physical disability who is not in a wheelchair	43	33.59
Other	13	10.16

The biggest group were respondents aged 41-65 (29%) and 26-40 (28%). The fewest answers, only 3%, were given by people over 65 years old. Those aged up to 15 years gave 18% of responses and those aged 16-25 years gave 21% (Tab. 1).

60% of respondents have a severe disability, 28% a moderate disability and 12% a mild disability. Almost 49% of respondents have been disabled since birth, 32% as a result of illness and 19% as a result of an accident.

In response to a further question, 34% of respondents said they were non-disabled people who use a wheelchair, while 25% of respondents were disabled people who use a wheelchair. People with intellectual disabilities made up 16%, 9% were hearing impaired and 6% were speech impaired. In addition to those mentioned above, 10% of respondents were disabled due to: asthma, epilepsy, visual impairment, spinal cord injury, stroke and autism (Tab. 2).

Results

Further questions concerned the frequency with which disabled people use public transport and special minibuses. 61% of respondents said they rarely use public transport by PKP. 19% answered that they often use PKP services and 20% never used this type of transport (see Fig. 1). When giving reasons for not using PKP transport services, respondents gave the following arguments:

- not very comfortable conditions;
- not adjusted to the needs of disabled people and their carers;
- no ramps;
- having own car for travelling;
- lack of help from railway workers when getting on the train;
- lack of lifts;
- difficulties in moving between platforms.

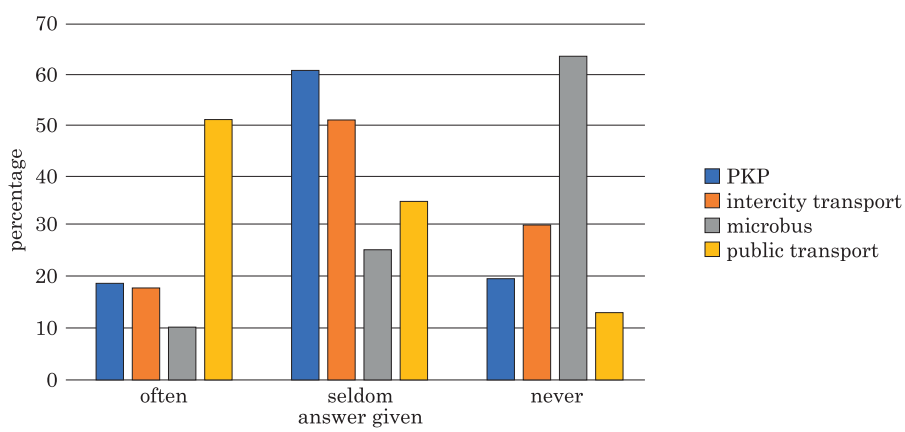

Fig. 1. Frequency of use of road transport and special minibuses by respondents

When asked about intercity transport, 51% of respondents said they rarely use it, 18% said they often use it and 31% said they never use it (see Fig. 1). When asked in an open question about the reasons for not using intercity transport services, respondents indicated that:

– lack of intercity transport in some smaller towns;
– inadequate communication;
– communication does not have low-floor entrances from the vehicle;
– having own car which is more comfortable.

More than half of the respondents answering the next question (64%) indicate that they have never used a special minibus for disabled people, while 10% use it often and 26% rarely (Fig. 1). In an open question about the reason for not using minibuses, respondents gave the following answers:

– low number of available minibuses in the area;
– high cost of renting a minibus for one person;
– having their own car adjusted to a person's disability;
– high cost of transport;
– existence of minibuses only for people from occupational therapy workshops.

52% of respondents said they use public transport often, 35% rarely and 13% never (Fig. 1). As reasons for not using public transport respondents stated that:

– they have their own car;
– there is no public transport in the area they live in;
– they have difficulties in getting to the bus stop.

When asked about the problems they have when travelling by public transport, 50% of the respondents said they rarely have problems, 38% said they often do and 12% said they never do (see Fig. 2). It should be noted that not many people use public transport, which is confirmed by the results of the above questionnaire.

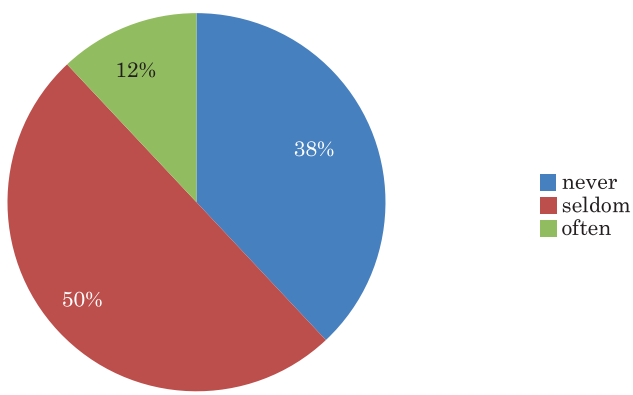

Fig. 2. Percentage of respondents' answers about problems connected with travelling by public transport

In an open question, respondents were given the chance to say what problems they think exist with public transport. In response to this question, respondents mentioned:

– lack of ramps or places for wheelchairs (not all transport is accessibe, especially in small towns);

– falling down to get to a lift (it takes them a long time and hinders the movement of other transport users);

– lack of accessibility (great inadequacy of public transport);

– failure to adapt bus stops to the needs of disabled people;

– lack of driver assistance for people who have problems boarding the bus;

– lack of low-floor vehicles to facilitate wheelchair access.

Another question asked about the use of public transport concessions by people with disabilities. More than half of the respondents (68%) answered that they use public transport. Those who do not use public transport represent 20% of respondents and the answer "I do not use public transport" was given by 12% of respondents (Fig. 3).

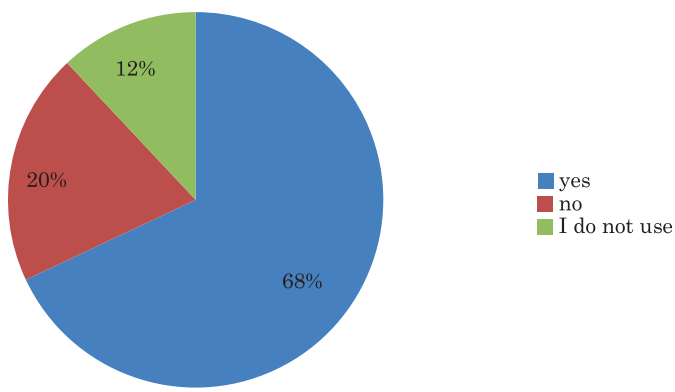

Fig. 3. Use of public transport by disabled people

The next question asked respondents if they use disabled parking spaces. The data shown in Figure 4 shows that over half of respondents (55%) use disabled parking spaces. 22% do not use them and 23% do not have a parking card and are not entitled to use such spaces.

In response to a further question about the location of parking spaces, 52% of respondents said they were adequately located, 34% had no opinion and 14% thought they were poorly adapted (see Fig. 5).

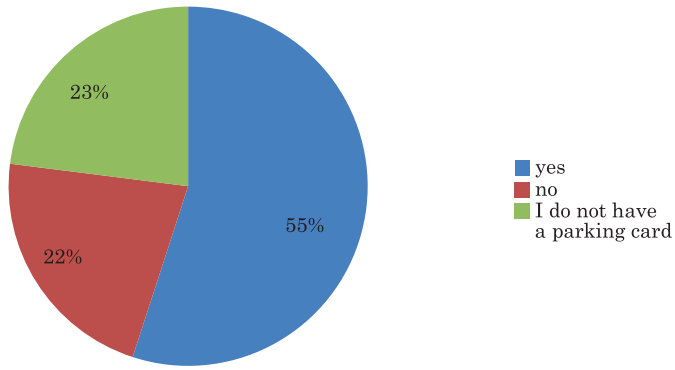

Fig. 4. Use of disabled parking spaces by respondents

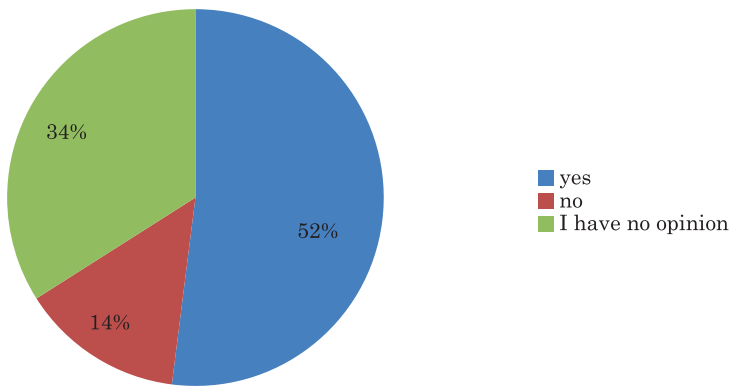

Fig. 5. Opinion on the location of parking spaces

The next open question was: What, in your opinion, are the reasons for poor location of parking spaces for disabled people? When answering this question, respondents most often indicated that:

– there are often not enough parking spaces near pharmacies and clinics;

– it would be good to increase their number;

– parking spaces are occupied by non-disabled people who do not have a parking card;

– parking spaces are not visible and have outdated signage (they are badly marked);

– parking spaces should be as close to shops as possible and should not have high kerbs.

The next task question was: Please specify what are the most common obstacles you encounter in public transport infrastructure for people with disabilities? (e.g. unadapted kerbs, poorly adapted infrastructure, encountered stairs, lack of ramps etc.). Respondents found the most common obstacles to be:

– frequently encountered stairs;
– high kerbs;
– no wheelchair ramps;
– outdated, poorly adapted, dilapidated and uneven infrastructure;
– mentality of drivers and other public transport users;
– poor public transport infrastructure;
– the need to change, infrequent journeys and the resulting long journey times are often an obstacle not only for people with disabilities but also for other public transport users;
– lack of reliable information on how to adjust transport to the needs of people with disabilities.

The next question included a rating of the transport infrastructure by the respondents on a scale from 1 to 5 (Fig. 6). In this case 51% of the respondents rated it as 3, 31% as 4, 12% as 2 and only 4% as 5. From the answers given to this question it can be concluded that the transport infrastructure for people with disabilities needs improvement.

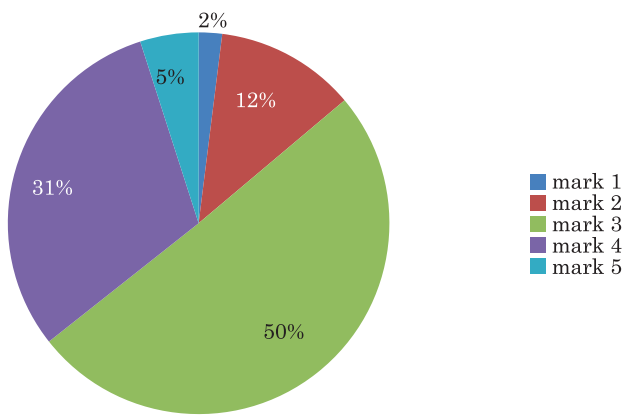

Fig. 6. Assessment of road transport infrastructure adapted to the needs of disabled people

In the next question respondents rated public transport for people with disabilities on a scale of very good, good average and bad. PKP received an average rating from 51% of respondents, 32% of respondents gave a good rating, 10% a very good rating and 7% a bad rating. Intercity transport was rated bad by 54% of respondents, 25% gave an average rating, 14% a good rating and 7% a very good rating. Intercity transport was best rated in terms of adaptation to the needs of people with disabilities, with 54% of respondents giving a rating of good, 30% giving a rating of very good, 13% giving a rating of medium and only 3% giving a rating of bad (Fig. 7). Public transport is the best rated mode of transport in terms of accessibility for people with disabilities, as it is the

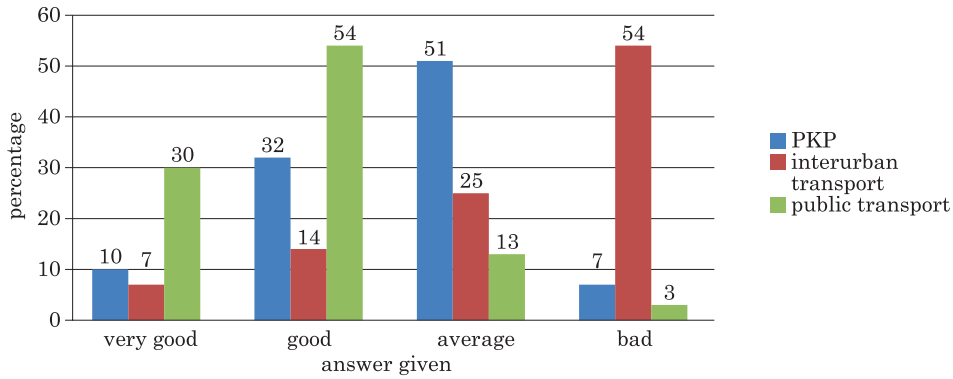

Fig. 7. Evaluation of public transport in terms of adaptation to the needs of disabled people

youngest mode of transport adapted to the needs of them. The worst rated is intercity transport, where the rolling stock is not adapted to transport disabled people, especially those in wheelchairs.

Rating the accessibility of public infrastructure and parking spaces for people with disabilities in the listed facilities they use most often is the answer to the next question. In this case, respondents could give answers ranging from very good, good and average to bad. In this case, public infrastructure was rated as follows (Fig. 8):

– banks: 4.76% of the respondents gave a rating of very good, 16.19% gave a rating of good, 56.19% gave a rating of medium and as many as 22.86% gave a rating of bad, which in the aforementioned ranking of accessibility of public infrastructure and parking spaces for people with disabilities was the worst;

– pharmacies: 3.81% of respondents rated accessibility to pharmacies very good, 29.52% gave a good rating, more than half of respondents (56.19%) gave a medium rating and 10.48% gave a bad rating;

– supermarkets: 25.71% of respondents gave a very good rating, 47.62% of respondents gave a good rating, 18.10% gave a medium rating and 8.57% gave a bad rating;

– hospitals: 51.43% of respondents gave a medium rating, 20.95% gave a good rating, only 8.57% gave a very good rating and 19.05% gave a bad rating;

– shopping centres: 57.14% of respondents gave a good rating, 28.57% gave a very good rating, 9.52% gave a medium rating and only 4.76% gave a bad rating;

– post offices: 32.38% of respondents gave a good rating, 44.76% gave a medium rating, 10.48% gave a bad rating and 12.38% gave a very good rating;

– petrol stations: 53,33% of respondents found them well adapted, 17,14% found them very well adapted, 20% found them average and 9,52% bad.

The analysis of the question “How would you rate the accessibility of public infrastructure and parking spaces for people with disabilities in the following

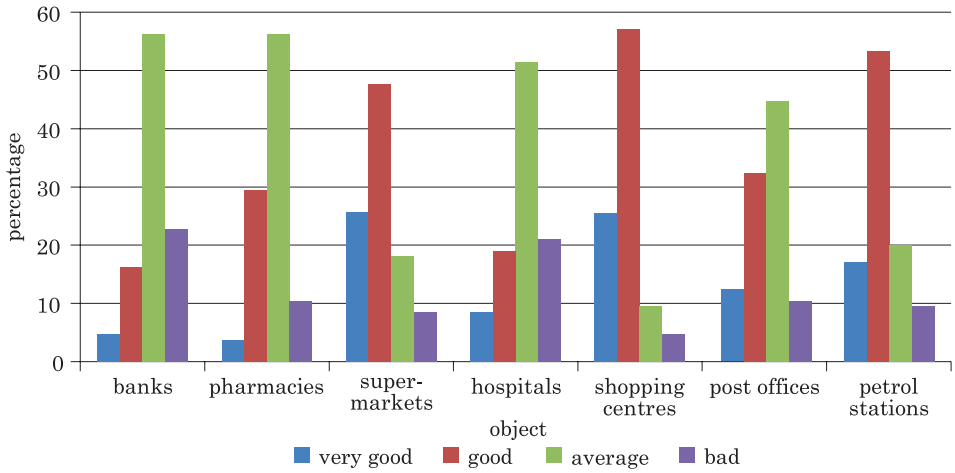

Fig. 8. Assessment of public infrastructure and parking spaces for people with disabilities

facilities?" shows that the adaptation of accessibility of public infrastructure and parking spaces for people with disabilities in the listed facilities is at an average level. An average rating indicates that the public infrastructure still needs additional improvements to meet accessibility conditions for people with disabilities. An average rating is certainly not a convenient indicator of the quality of facilities for this community.

The final question of the survey was: what improvements in public transport and infrastructure should be made for people with disabilities? This question was answered by over 50% of interviewers, who indicated the following proposals for improving transport for disabled people:

– introducing low-floor communication in all means of transport;

– putting extra seats next to people with disabilities in the means of transport for their carers;

– adjusting bus stops and railway stations to the needs of people on wheelchairs and those with mobility problems;

– increasing the number of parking spaces around shops and offices;

– adapting curbs and pavements;

– the introduction of an assistant to whom a disabled person can turn for assistance, for example in public transport vehicles or at railway stations;

– better signposting of parking spaces for people with disabilities and placing them closer to buildings;

– introducing on-demand stops on public transport if a disabled person is not assisted by a carer or assistant;

– every driver on public transport should assist people with disabilities;

– raising public awareness about people with disabilities.

Proposal for changes in public transport for people with disabilities

Based on the results of the survey, changes in the transport infrastructure were proposed. This process requires long-term measures to improve public transport for people with disabilities. The aim should be to enable every person to participate in transport, no matter how limited they are due to their health condition. The inclusion of all persons in public transport can be achieved through changes in the design of transport infrastructure and public spaces, taking into account the needs of all users. The systematic replacement of the outdated fleet of public transport vehicles with low-floor ones and retrofitting them with comfortable handrails would make travelling easier for disabled and elderly people. Another convenient change would be to equip public transport with external and internal passenger information systems and to modernise the road and bus stop infrastructure to meet the needs of disabled passengers.

Another change would be to promote environmentally friendly public transport in public spaces and to introduce a wider range of concessions in public transport for disabled people and their carers. It would also be a very good idea to improve passenger information and direct access to up-to-date data so that it contains all the information needed to use the chosen means of public transport freely, as well as to use an audiovisual passenger information system, equipping public transport with hands-free devices to make travelling easier for all passengers. Next, paying attention to safe use of public transport and adjusting the appearance of bus stops and their surface so that it is comfortable for each passenger waiting for transport. Eliminating architectural barriers that prevent people in wheelchairs and those with mobility problems from getting to the stop safely. Introducing the idea of developing sustainable transport in cities would allow meeting the basic needs of access to the transport system for all, with a positive impact on the environmental and economic spheres. A final change would be to create clear and understandable timetables, placing them in an appropriate place so that they are legible for people standing and those in wheelchairs.

The law, which should set appropriate standards in terms of transport infrastructure for the disabled, definitely needs to be improved. It would be possible to introduce such solutions as tactile information, a low floor or handrails in all means of public transport. Thanks to appropriate legislation, it would be possible to create concise standards for disabled people from this group, who would gain comparable access to transport infrastructure, which would eliminate their social exclusion.

Conclusions

On the basis of surveys conducted among 105 respondents living in northern Wielkopolska, an important element was to get answers to the question whether people with disabilities use public transport and what are the reasons for this, what are their needs, an assessment of the adaptation of the transport, as well as suggestions for modernization and improvements which, according to the respondents, should be introduced in public transport. After analyzing the survey results, one can get the impression that the public transport infrastructure is at an average level of adaptation for people with disabilities. It can be seen that public transport services need improvement in order to be adapted to the needs of these people as well. It would be necessary to introduce low-floor communication in every mode of transport, to properly adjust the infrastructure of sidewalks and curbs, paving slabs, stations and stops for the disabled community and to improve information about the network. In addition, it can be concluded that:

– the main infrastructure problem is the low quality of access to stops, roads, sidewalks and high curbs, mediocre adaptation of public spaces and very wide transport;
– inability to redevelop some areas and some roads;
– problem with accessibility of intercity infrastructure;
– mediocre quality of public transport adaptation for disabled people;
– necessity of modernization of some facilities by improving the technical condition of infrastructure surfaces;
– paying attention to accessibility of transport facilities and services for people with disabilities.

Minimizing barriers to accessing public transportation is considered by respondents to be a very important factor in making transportation accessible to every passenger. However, improvements to bus stops, infrastructure, and other proposed solutions cost millions of dollars. This suggestion suggests improvements that should be made to public transportation infrastructure for people with disabilities. Other transportation users, such as the elderly and pregnant women, who are vulnerable to exclusion, should also be considered. Safe and easy travel on public transport is a key aspect of the development of people with disabilities in society, regardless of social exclusion and disconnection from the community. Raising public awareness is also an important aspect of improving the quality of social life for these people, enabling mobility issues to be addressed through the sensitivity of passengers and drivers, even in unsuitable locations. Similar problems are also faced by residents of other municipalities in Poland and around the world.

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