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Transnational Concept

of completely accessible transportation facilities for blind and partially sighted passengers in the Danube Region

Innovative transportation services for blind and partially sighted passengers in Danube region
DANOVA

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1. INTRODUCTION

1.1. PURPOSE AND APPLICATION OF THE DOCUMENT

DANOVA aims to improve the accessibility of public transportation facilities for blind and partially sighted passengers and enable full access to all transport information, facilities and services. The DANOVA Transnational Concept offers practical guidance for implementation to public transport providers.

Two aspects are essential for sensible planning and proper decisions during the implementation process:

- A basic understanding of what measures are needed to enable independent mobility for blind and partially sighted people, which are most important and what time and cost effort their implementation is associated with
- A clear overview of applicable measures and their relevance

The DANOVA Transnational Concept contains both, background information on accessibility measures for blind and partially sighted persons in relation to public transportation facilities indicating their relevance and estimated effort for implementation in general as well as a checklist with measures applicable to different types of facilities arranged according to priorities. To give a concrete idea of what specific measures could look like, selected good practice examples are presented.

The DANOVA Transnational Concept is supposed to offer specific guidance at the development of individual strategy plans for improvement of accessibility at a particular site. The following procedure is recommended for the use of the DANOVA Transnational Concept in practice:

1. Read section 1.3 carefully in order to learn about the challenges visually impaired (VI) people are confronted with depending on the range of their residual sight and which measures support them in using environments and services without assistance.
2. Find general information on each measure in section 2. to get an impression of what the result of your action should be in detail.
3. Move on to section 3. to get an overview of the measures you should take and make up your individual plan for implementation.

To find out about the current status of your transportation facility regarding accessibility for visually impaired passengers, we strongly recommend as a first step in the process of improvement to apply the DANOVA Assessment Methodology [https://www.interreg-danube.eu/approved-projects/danova/outputs]. It also provides useful guidance for implementation offering details which would make the DANOVA Transnational Concept too complex for its purpose.

1.2. DEVELOPMENT AND SOURCES

The recommendations presented in the DANOVA Transnational Concept are derived from results of activities within the DANOVA project where various measures and ideas to make transportation facilities fully accessible for blind and partially sighted passengers have been collected. To determine their relevance and roughly estimate the time and cost effort for their implementation, a survey was conducted among DANOVA partners. For details on the methodology see section 5.1. Feedback was received from members of the Transnational Working Group which included representatives of

transport facilities, associations representing blind and partly sighted people, local public authorities, experts from technical and innovation companies and scientists from universities and academic sector.

Detailed results of the survey can be found in the Annex. For the recommendations in the DANOVA Transnational Concept they were basically essential in terms of

- indication of recommended measures' relevance and estimated time and cost effort in section 2.,
- selection of good practice examples presented in section 2 and
- classification of recommended measures according to their relevance in section 3.

At developing the DANOVA Transnational Concept, results from the assessment of training needs were as well as results of the training activities were taken into consideration.

All these aspects should be implemented in transportation facilities' internal procedures and policies in order to better design innovative and successfully targeted services, to create a successful communication plan and code of conduct and to prescribe competences and skills employees needs to have in dealing with blind and partly sighted passengers.

1.3. VISION IMPAIRMENT AND ACCESSIBILITY

1.3.1. Definitions

According to the European Blind Union (EBU), "the definitions of blindness and partial sight, as well as the registration criteria vary from one European country to another.

The term 'visually impaired' is used to indicate blind plus partially sighted people together. Partially sighted and low vision are used as equal indication of limited sight.

A common misconception is that blind persons cannot see anything at all. This is of course true for some, while many have some perception of light and shadow, see everything in a vague blur, have tunnel vision, or lack central vision."

The extent to which a person can use his or her residual vision, e.g. for orientation, depends on various factors such as lighting and other environmental conditions, but also on the person's own physical and mental state during the day (fatigue, etc.). It is quite different from person to person, but also for one and the same person in the course of life and even one day. The boundaries are fluid. However, in relation to accessibility measures a clear distinction has to be made in order to consider all relevant requirements equally (see also EBU statement on the need to use the right definitions and terminology in standardisation work).

1.3.2. Requirements of blind and partially sighted persons

Depending on their residual vision and the degree to which they can efficiently use it, visually impaired people have different requirements regarding the design of environments, products and also services in order to be able to act and move independently:

- Partially sighted people primarily use their (residual) vision. They need impressions and information which are clearly visible.
- Blind people primarily use hearing and touch. They rely on audible and tactile impressions and information.

In order to achieve accessibility equally for partially sighted and blind people, it is therefore essential to apply the so-called “principle of multiple senses”. This means, that the design enables perception by two or more complementary senses (e.g. vision and touch, vision and hearing).

Another principle that should definitely be applied to achieve accessibility for visually impaired people is to strive for some uniformity. This is a big challenge, especially when it comes to solutions implemented in different countries with different legislation and standards and different habits and abilities. However, it should at least be kept in mind when taking decisions, that being provided with familiar circumstances, solutions and technologies is a big benefit in relation to usability and accessibility.

1.3.3. Conclusion regarding ranking of measures

The DANOVA Transnational Concept contains a lot of recommendations for measures and solutions to improve the accessibility of transportation facilities for passengers with visual impairment. It also offers a ranking regarding the relevance of these measures.

Apart from these details, it is of fundamental importance to always keep in mind that accessibility for the entire group of people with visual impairments always presupposes that impressions and information are both clearly visible and audibly or tactilely available. To ensure complete accessibility for blind and partially sighted passengers, measures such as guidance systems and signage with good visual contrast, visual marking of potential hazards or good lighting are just as indispensable as e.g. tactile guidance systems and signage, structural protection against potential hazards or high quality audio outputs.

When selecting particular products and provisions, existing solutions and systems should be preferred whenever possible, as long as a new one does not offer any additional advantages.

2. AREAS OF ACTION

In the context of the DANOVA project, accessibility of transportation facilities is understood to include three main aspects:

- Access to travel related information
- Access to services
- Physical access to all publicly accessible parts of the building

These three aspects are covered in detail in the DANOVA Assessment Methodology, which provides guidance to assess the current status of a transportation facility's accessibility for blind and partially sighted passengers based on the provisions, requirements and recommendations that international and national regulations and standards contain.

Taking these aspects and the details given in the DANOVA Assessment Methodology into account in principle ensures accessibility along the entire mobility chain and thus unhindered travel for visually impaired passengers.

When conducting the audit described in the DANOVA Assessment Methodology, a crucial principle when implementing accessibility measures is applied: active involvement of experts representing the target group of visually impaired persons. This principle remains essential during the process of implementing measures according to the DANOVA Transnational Concept.

2.1. INCLUSION STRATEGIES

2.1.1. Basic considerations regarding inclusion strategies

A cornerstone of a company's active commitment to accessibility is that appropriate rules are defined to which management is guided and to which all employees must adhere.

Inclusion strategies include

- accessibility policies,
- customer service standards,
- disability awareness training and
- participatory platforms for strategic advisory by visually impaired persons' advocacy groups.

Awareness and understanding regarding the requirements of blind and partially sighted passengers of management and all staff members are the key to high quality inclusion strategies as well as optimal implementation in practice. Involvement of representatives of blind and partially sighted persons and experts in the field of visual impairment in the development of policies, standards and staff trainings is crucial in order to meet the actual requirements of the target group.

Within DANOVA, training programmes for management as well as for staff were developed and implemented. Experiences and recommendations are summarized in DANOVA

- D.T3.4.2: Transnational Training Programme and evaluation report and
- D.T3.4.3: Local Training Programme and evaluation report

2.1.2. Examples regarding inclusion strategies

In order to ensure the ongoing involvement of blind and partially sighted persons and their experts, it is advisable to establish a body in which a regular exchange can take place in connection with the development of standards and the implementation of accessibility measures. Ideally, this platform should be set up and managed by the transport company or the responsible authority, and the consulting experts should also be remunerated for their services. Within the DANOVA project, existing examples were found in Austria coordinated by Vienna International Airport and in Slovenia provided by the Municipality of Maribor.

2.1.3. Relevance and implementation effort of measures regarding inclusion strategies

Inclusion strategies are basically highly relevant. Depending on their impact on safety, they are considered either as "must haves" (accessibility policies and awareness training of staff due to their impact on e.g. evacuation) or "should haves". It is assumed, that implementation of these measures requires medium resources by the company, is embedded in few key processes and is implemented in medium time period.

2.2. PROVISION OF SERVICES AND SUPPORT

2.2.1. Basic considerations regarding provision of services and support

Considering visually impaired passengers' requirements in all standard procedures should be the basis of all efforts regarding accessibility for this target group. Apart from this, there are various provisions that should be taken into account in order to specifically address their requirements and in doing so support them in acting independently.

Provision of services and support includes

- support and information via telephone,
- remote support guidance,
- equipment for navigation,
- provision of information for orientation via labels, beacons, stickers etc.,
- provision of text information for orientation/navigation,
- tactile maps,
- accessible counters/info points,
- assistance service,
- facilities for service animals and
- evacuation concept/measures.

2.2.2. Examples regarding provision of services and support

"Be my Eyes" is a commonly used smartphone app, where sighted volunteers lend their eyes to solve tasks such as checking expiry dates, determining colours, reading instructions or navigating in new surroundings. The visually impaired person requests assistance on the app. Through the live video call, he or she can communicate directly with the volunteer and solve a problem. The volunteer will help guide a visually impaired person which direction to point the camera, what to focus on or when to turn on the torch. It is also available in a version, where trained staff provides the support or guidance. This version is a good example of an approved system which can be implemented to provide support in relation to a transportation facility. There is another app called "Guide Me", which works similarly and is focused on public transportation services.

2.2.3. Relevance and implementation effort of measures regarding provision of services and support

Most of the measures in this group are supposed to be nice to have, but not absolutely necessary, for they do provide notable support, but neither safety nor independency are essentially dependent on them. Just three categories are considered to be "must haves": Accessible counters/info points, facilities for service animals and – last, but not least – measures in relation to evacuation. Most measures are assumed to cause medium cost and time efforts. There are two categories rated as "nice to haves", where implementation is assumed to require significant resources by the company, be embedded in several key process and be implemented in longer time period: Remote support guidance and equipment for navigation.

2.3. ACCESSIBILITY OF DIGITAL PROVISIONS

2.3.1. Basic considerations regarding digital provisions

Web accessibility is a major aspect of accessibility for visually impaired persons in general and also specifically in relation to transportation services. Websites and smartphone apps have become a commonly used source for all kinds of information and services, which support a smooth travel experience for all passengers.

Accessibility of digital provision includes

- general digital provisions and
- specific provisions for visually impaired persons.

All digital provisions for passengers should be accessible and comply with the Web Content Accessibility Guidelines (WCAG) 2.1 level AA. This makes extra solutions for visually impaired passengers largely obsolete, which is in line with the Universal Design approach.

However, especially in relation to navigation and guidance there are in fact support services tailored to the requirements of visually impaired passengers, which are implemented as a digital provision. This type of measures is covered in section 2.2.1.

2.3.2. Examples regarding digital provisions

"Budapest Go" is a smartphone app with various functions and services in relation to public transport in Budapest (real-time route planning, ticket shop, information on traffic changes of the lines). It is fully accessible for visually impaired passengers.

2.3.3. Relevance and implementation effort of measures regarding digital provisions

The accessibility of general digital provisions is considered to be a "must have", which is in line with the purpose of European legislation (Web Accessibility Directive and European Accessibility Act). Its implementation is considered to cause medium effort in relation to costs and time.

2.4. ACCESSIBILITY OF THE BUILT ENVIRONMENT

2.4.1. Basic considerations regarding accessibility of the built environment

Measures which directly affect the built environment are certainly a core part regarding accessibility of transportation facilities. They are also what the DANOVA Assessment Methodology deals with in most detail. Basically, the aim of all measures introduced in this section is to enable safe and independent movement in all areas of a transportation terminal's travel chain. This is mainly achieved by facilitation of orientation, avoiding unnecessary obstacles and safeguarding and marking of unavoidable obstacles.

Accessibility of the built environment includes

- arrival/departure at the facility,
- visual orientation,
- tactile orientation,
- acoustic orientation,
- accessibility of horizontal areas,
- safeguarding at hazardous areas,
- accessibility of doors,
- accessibility of vertical circulation and
- access to sanitary areas.

Interior and exterior areas have to be considered equally. Which measures are relevant and applicable depends on the type and size of the terminal and the specific situation.

The measures to ensure accessibility of the built environment for blind and partially sighted people can be grouped as follows:

1. Avoiding obstacles
   To avoid obstacles right from the start, special attention should be paid to clear and simple room structures, intuitively comprehensible positioning of room and operating elements and avoiding unnecessary hazards. Colour and material selection, lighting conditions and room acoustics play an important role in this context. As a result, orientation systems, additional information and safeguarding/marking of hazards can be kept sparse and remain comprehensible.
2. Orientation systems
   Orientation systems need to be clearly structured, intuitively graspable and continuous. They need to be perceivable visually and haptically.
   - The basis for good visual orientation is provided by sufficiently contrasted design, conscious choice of materials (non-reflective and glare-free) and sufficient glare-free lighting of spatial structures and elements. Visual orientation systems as such are usually provided independent of considerations regarding accessibility in publicly accessible areas, since they help all sighted people to find their way in an unfamiliar environment. To comply with the requirements of visually impaired people, it is particularly relevant to position information media in a way that they can be easily located and approached, to ensure good lighting at information media and design signage to be easily visible and understandable (contrast, size and clarity).
   - The basis for good tactile orientation is provided by existing (or deliberately created) spatial structures and elements that offer a continuous, obstacle-free orientation line that can be felt with the white cane, feet and/or hands - e.g. walls, lawn edges, handrails, fixed

furniture, clearly distinguishable floor materials, etc. Where spatial structures and elements cannot provide sufficient orientation (e.g. no or incomplete/uncertain given orientation line), tactile walking surface indicators (TWSI) are applied.
Note: Tactile orientation lines are not self-explanatory – no matter if they are created by spatial structures or by TWSI. They do not contain information about where the paths they indicate lead to. Tactile labels and maps support by providing additional information about the location and directions to important destinations nearby. In order to make them as easy to find as possible, there are specific positions where they should preferably be placed (handrails, next to doors, on the door frame of elevators, at information desks connected by TWSI).

3. Safeguarding and marking of hazards
   Apart from their avoidance, structural safeguarding hazardous areas offers the most reliable protection against accidents and injuries because it does not require any interpretation. This refers to measures that make it impossible (or very unlikely) to enter the hazardous area at all - e.g. parapets in the case of major level differences in the terrain, space closed off with walls in the low area below stairs etc.
   Certain hazards cannot be avoided and/or structural protection is not compatible with their function - e.g. stairs, platforms, doors, transparent doors and walls, etc. These cases require visible and tactile marking in order to warn (partially) sighted as well as blind persons of the potential hazard and allow them to react adequately (evade, walk more carefully etc.). Visually, people's attention is drawn to the hazardous area by application of a contrasted marking (e.g. stripe at the edge of a step). For tactile warning, a specific type of TWSI is applied: attention patterns. They are applied e.g. in front of the top step of a staircase, in front of the edge of the sidewalk when crossing a roadway or in front of the swing area of a door that opens in the opposite direction to the direction of travel.
   Note: Tactile attention patterns are not used if
   - the hazard itself contains elements that can be used to recognize it in time (e.g. closed sliding door, bottom step of a staircase, front wall of an information counter) or
   - the sole indication of a hazard is not sufficient to avoid the danger (e.g. obstacle at head or chest height).

4. Operating elements, information and signals
   The built environment contains various elements, where some kind of information is provided, which is necessary to access and use them. "Information" in this sense could be anything – from a simple difference in a surface on the wall that highlights a button and therefore informs about the fact that it is there, to a signal that is well known or intuitively interpretable and therefore offers information quickly, to actual text information. Particularly at operating elements, this also contains information that is need for their operation – e.g. clear feedback, whether or not a button has been pressed and activated. For all these kinds of information it is extremely important, that they are made perceptible for all by application of the principle of multiple senses. In many cases this means, that information which is usually just offered for people to see, needs to be made available via audio output and/or tactile lettering depending on the area of application.

2.4.2. Examples regarding accessibility of the built environment

Dubrovnik Airport has set up TWSI at the check in area so that passengers can access check in counters or self-check in devices by himself and after check in, PRM service take them to the gate and

PRM area (if needed). Note: A too complex system of TWSI can easily be confusing and might even be counterproductive in terms of independent navigation. Therefore, it is important to be careful when selecting areas to be equipped with TWSI and consider sufficient provision of support to supplement the TWSI system.

2.4.3. Relevance and implementation effort of measures regarding accessibility of the built environment

The majority of measures for accessibility of the built environment was considered as “must have” in the survey among experts and this estimation is supported by the fact, that all of the measures are included in existing international and European standards and guidelines and therefore considered approved state of the art. The implementation of measures in the categories “acoustic orientation”, “safeguarding at hazardous areas” and “accessibility of doors” is considered to take high efforts. All other measures are considered to be implemented with medium cost and time effort. However, in relation to the built environment it is particularly difficult to make an overall statement regarding effort for implementation, because it depends so much on the individual type and size of the facility as well as on what is already there as a basis.

2.5. ACCESSIBILITY OF EQUIPMENT IN THE BUILT ENVIRONMENT

2.5.1. Basic considerations regarding accessibility of equipment in the built environment

The built environment contains various elements, which are neither purely digital provisions nor part of the building as such and may not be neglected in terms of accessibility.

Accessibility of equipment in the built environment includes

- self-service terminals,
- displays and
- acoustic signals and information on demand via remote control.

Regarding acoustic signals and information on demand via remote control it is important to keep in mind, that this must not be the only way to make information available, because it would exclude people who do not have a remote control.

For equipment in the built environment, the same design principles as already explained in the sections above apply.

2.5.2. Example regarding accessibility of equipment in the built environment

At Vienna International Airport, all ATMs in public areas are equipped with a software that allows blind and partially sighted people to operate them autonomously (audio output and optimized visual display). Money transactions are a very sensitive matter. Therefore it is especially important to enable unassisted use - even if assistance may be needed to find the self-service terminal.

2.5.3. Relevance and implementation effort of measures regarding accessibility of equipment in the built environment

The measures listed in this group are all considered as “should have” and to take medium effort for implementation. For individual situations, we however recommend to question, whether or not a particular measure is essential for safety and make the decision about its priority accordingly.

2.6. ACCESSIBILITY OF VEHICLES

2.6.1. Basic considerations regarding accessibility of vehicles

The accessibility of vehicles concerns mostly the on-board experience during the journey, which is not subject of the DANOVA project. However, the journey itself is an essential part of the mobility chain and in practice, public transportation providers are likely to participate in processes regarding selection, design and equipment of the vehicles. Therefore, this aspect is mentioned for decision makers to keep it in mind and consider it in the strategy developed according to the DANOVA Transnational Concept.

Accessibility of vehicles includes

- announcement of vehicles in the station,
- equipment for information during travelling in a vehicle and
- equipment inside vehicles.

As with all types of signals and information, which must be made available to all according to the principle of multiple senses, it is important that no additional device is necessary in the first place to access/perceive them. Solutions using technologies such as a remote control or a smartphone app to receive signals or information on demand can however have an additional benefit and increase comfort.

For the design of vehicles (controls, furniture etc.) the measures introduced in 2.4 and 2.5 are applicable in principle.

2.6.2. Examples regarding accessibility of vehicles

Voice announcements are integral part of the public transportation in Zagreb. Trams and buses have external and internal speakers. External speakers tell the number of the vehicle and its direction. Internal speakers tell the status of the door (opening/closing), indicate the current and the next stop. These two announcements must not overlap to be usable.

2.6.3. Relevance and implementation effort of measures regarding accessibility of vehicles

The estimation of relevance in the survey varies from “must have”, to “should have” to “nice to have”. Since the DANOVA project does in general not explicitly deal with the vehicles, the measures mentioned in this category are not reliably extensive. It is nevertheless kept in the document to work as a reminder for decision makers, that this area also needs to be considered in principle. Therefore, the categories are listed as “should have” in the checklist. In fact, the relevance of measures can be considered analogously to related measures at the site.

3. RECOMMENDATIONS FOR MEASURES

3.1. TYPES AND SIZES OF PUBLIC TRANSPORTATION FACILITIES

The DANOVA Transnational Concept is supposed to be applicable to various types of transportation facilities: airports, seaports, train stations of different sizes, metro stations, bus terminals, bus stops and tram stops. The various types of facilities differ in many respects, which have a major influence on the type and scope of the measures required:

- size
- areas (outdoors, indoors)
- relevance of other facilities nearby
- organization of management
- provisions and services offered
- involvement of staff
- etc.

It is impossible to deal with each and every potential type of terminal or even individual situations. Therefore, the checklist is deliberately designed to enable transportation providers to adapt it or rather find their own path through it according to their individual needs.

Through its output, the DANOVA project provides a certain basis for efficient planning of reasonable measures for the implementation of accessibility. During the preparation of the various DANOVA deliverables, preliminary work was carried out, especially with regard to the balance between the interests of visually impaired passengers and economic feasibility for transportation providers. For optimal results in practice, we nevertheless recommend entering into direct dialog and discussing the implementation plan drawn up on the basis of the DANOVA Transnational Concept with local experts and representatives from advocacy organisations of visually impaired people and adapting it as necessary.

3.2. CHECKLIST OF MEASURES TO BE CONSIDERED

3.2.1. Determination of areas to be considered

The aim of this checklist is to get an overview of all relevant areas to be considered to improve accessibility for visually impaired passengers at the particular transportation facility you deal with. The primary goal is to implement measures consistently and reliably throughout the entire facility, so that the improvement you achieve as a result is given along the entire mobility chain. So, if you have to decide on individual steps in succession, please implement one measure after the other in the entire facility, if possible, instead of implementing all measures in only one area.

Start by defining the scope of your project in order to set the frame for selecting measures.

From the following list, select all areas in relation to the facility you deal with, that you are able to influence:

- ☐ Policies of the company
- ☐ Customer service standards of the company
- ☐ Staff trainings within the company

From the following list, select all services that are provided to passengers in relation to the transportation facility you deal with:

- ☐ Website with information and functions relevant for travelling (e.g., timetables, ticket shop, map of the site)
- ☐ Smartphone app with information and functions relevant for travelling (e.g., real time timetables, ticket shop, navigation on site)

From the following list, select all areas that are present in the transportation facility you deal with:

- ☐ Approach and departure to and from the site
- ☐ Entrance to the site
- ☐ Circulation on the site
- ☐ Security screening and customs
- ☐ Sanitary facilities
- ☐ Shopping and catering facilities
- ☐ Waiting areas
- ☐ Departure point(s)
- ☐ Arrival point(s)
- ☐ Evacuation routes
- ☐ Exit from the site

Before you start to apply measures from 3.2.2., 3.2.3. and 3.2.4. to the areas included in the scope of your project, please make sure you are aware of the relevant details. We recommend adding some notes to each area you selected in the lists above, to help you to get a more detailed overview on what you have to consider when implementing a particular measure throughout the whole facility.

Examples:

- At "staff trainings within the company", add a rough estimation of which staff members have contact with passengers in the context of the facility you deal with and how many they are approximately, so you get an impression on the extent of disability awareness trainings you plan to conduct.
- Add the concrete types of information and functions that are available via Website or Smartphone app in relation to the facility you deal with, so you can more easily make decisions on what should be improved first and what effort you have to expect.
- Add the number of stairs along the relevant paths to each area on the site, so you will get an overall impression of the number of visual and tactile markings you have to expect to implement.

3.2.2. Must have

Must have measures are essential in terms of safe as well as independent mobility at the facility.

3.2.2.1. Inclusion strategies which transportation facilities must have

- ☐ Accessibility policies – Ensure, that accessibility policies explicitly include visually impaired passengers.
- ☐ Awareness training – Establish trainings to teach all staff members who have contact with passengers how to appropriately respond to visually impaired passengers' requirements.

3.2.2.2. Provision of services and support which transportation facilities must have

- ☐ Accessible counters/info points – Make sure, that counters and info points can be located easily (contrasted design, TWSI etc.) and information is made available according to the principle of multiple senses.
- ☐ Facilities for service animals – Provide facilities (relief area, space to sit and rest etc.) for guide dogs.
- ☐ Evacuation concept/measures – Make sure that the evacuation concept contains explicit strategies and instructions for safe evacuation of visually impaired passengers.

3.2.2.3. Accessibility of digital provisions which transportation facilities must have

- ☐ General digital provisions – Ensure accessibility of information, services and functions provided on websites and smartphone apps in connection with the facility according to WCAG 2.1 level AA.

3.2.2.4. Accessibility of the built environment which transportation facilities must have

- ☐ Arrival/departure at the facility – Make sure, that the facility can be located, approached, identified and entered by partially sighted as well as blind people safe and without help. Consider also routes from and to car parks, taxi stops and public transport stops.
- ☐ Visual orientation – Provide good lighting, contrasted design of structures and furniture and visual guidance systems with sufficient additional information.
- ☐ Tactile orientation – Provide structure and furniture elements that can be used for tactile orientation, tactile walking surface indicators (TWSI) and sufficient additional tactile information.
- ☐ Acoustic orientation – Pay attention to reducing noise exposure and provide acoustic information (audio output, announcements) and signals for orientation.
- ☐ Accessibility of horizontal areas – Ensure good visual, tactile and acoustic orientation in all horizontal spaces and avoid obstacles.
- ☐ Safeguarding at hazardous areas – Make sure to equip all hazardous areas (road crossings, steps and stairs, transparent surfaces and glass doors, obstacles in head- and chest height etc.) with sufficient markings and/or safeguards.
- ☐ Accessibility of doors – Make sure, that doors can be located, used and identified using contrasted design, providing TWSIs, applying low operating force, avoiding thresholds and offering visual and tactile information.
- ☐ Accessibility of vertical circulation – Equip stairs, ramps, lifts, travellators and escalators so that they can be used safe and without help by blind and partially sighted people by e.g. providing contrasted handrails with tactile information at stairs and ramps and choosing pushbuttons instead of touchscreen or sensor controls at lifts.
- ☐ Access to sanitary areas – Make sure, that toilets can be located and identified easily and that the interior of all toilets is designed according to the general principles of accessibility for blind and partially sighted people.

3.2.2.5. Accessibility of equipment in the built environment which transportation facilities must have

n/a

3.2.2.6. Accessibility of vehicles which transportation facilities must have

n/a

Note: All categories of measures regarding the vehicles are listed in “should have”, because they are generally not dealt with in the DANOVA project and therefore only have informative character in this checklist. They should however be kept in mind and are essential when it comes to selection, design and equipment of vehicles.

3.2.3. Should have

Must have measures are essential in terms of independent mobility at the facility, but are not crucial in terms of safety.

3.2.3.1. Inclusion strategies which transportation facilities should have

- ☐ Customer service standards – Make sure that accessibility standards for visually impaired passengers are part of the general service standards and are implemented and monitored.
- ☐ Participatory platforms for strategic advisory by visually impaired persons’ advocacy groups – Establish routines to get in touch and consult with representatives and experts of advocacy organisations of visually impaired people on a regular basis.

3.2.3.2. Provision of services and support which transportation facilities should have

- ☐ Support and information via telephone – Provide a telephone service to make information reliably available for passengers who cannot access information on the internet.

3.2.3.3. Accessibility of digital provisions which transportation facilities should have

- ☐ Specific provisions for VI persons – Critically question whether solutions you offer exclusively for visually impaired people (e.g. an app) can either be covered by accessibility of the general digital services or whether the additional service would have an added value for all passengers and should thus be made available as a supplement to the general digital services. For services, which are definitely only useful for visually impaired passengers, move to 3.2.4.2.

3.2.3.4. Accessibility of the built environment which transportation facilities should have

n/a

Note: All categories of measures regarding the built environment are listed here, because they were already defined as essential in principle through the DANOVA Assessment Methodology.

3.2.3.5. Accessibility of equipment in the built environment which transportation facilities should have

- ☐ Self-service terminals – Ensure accessibility of self-service terminals such as ATMs and ticketing machines (audio output, contrasted screen design etc.)
- ☐ Accessibility of displays – Make sure, that displays providing information relevant for orientation in the facility or for travelling (signposts, timetables, special announcements etc.) can be located easily and approached closely, are easy to read and understand (content, font type and size, illumination, contrast etc.) and that for blind persons an alternative to get the information is offered.
- ☐ Acoustic signals and information on demand via remote control – Find out about systems to demand acoustic signals (e.g. at traffic lights) and information (e.g. acoustic announcement of information displayed at the platforms) remotely with a device, that are already applied around the area of the facility you deal with and tie in with this by making signals and information available via the same system.

3.2.3.6. Accessibility of vehicles which transportation facilities should have

- ☐ Announcement of vehicles in the station – Provide acoustic announcement of vehicles (line, direction, time to wait, obstructions etc.) at the platform and make sure that they can be heard and understood easily (quality and alignment of loudspeakers).
- ☐ Equipment for information during travelling in a vehicle – Make sure, that acoustic announcement of stations to be approached next etc. are provided in the vehicle and can be heard and understood easily.
- ☐ Equipment inside vehicles – Ensure that the interior of the vehicle is well lit, furniture is contrasted and the controls (buttons to open doors, alarm buttons etc.) and information (signposts to toilets, seat numbers etc.) can be located and used easily (good visual contrast, intuitive positioning, audible feedback, tactile lettering etc.).

3.2.4. Nice to have

Nice to have measures offer additional support and increase comfort in terms of safety and/or independency at the facility, but are not crucial in that aspect.

3.2.4.1. Inclusion strategies which are nice to have at transportation facilities

n/a

3.2.4.2. Provision of services and support which are nice to have at transportation facilities

- ☐ Remote support guidance – Find out about AIRA services such as the smartphone app "BeMyEyes" that are commonly used by visually impaired persons around the area of the facility you deal with and tie in with them by offering specific information and train your staff to provide support via the system.
- ☐ Equipment for navigation – Provide data about the site you deal with so commonly used assistive technologies for navigation within the site can refer to them or provide a specific service tailored to the site to support visually impaired passengers in navigating using their smartphone or another device.
- ☐ Provision of information for orientation via labels, beacons, stickers etc. – Find out about systems that are commonly used by visually impaired persons to get information on site using a smartphone or other device (e.g. QR codes, NFC chips) and provide information for orientation about your site by tying in with this system.
- ☐ Provision of text information for orientation/navigation – Provide detailed directions or orientation and navigation at the site you deal with and make them available in an accessible digital format (accessible PDF document, website content, smartphone app etc.)
- ☐ Tactile maps – Enable visually impaired people to get an overview on the site or parts of it by offering tactile maps either stationary at specific points at the site or as "handout" available at info desks. Make sure that the maps are also perceivable and readable by sight.
- ☐ Assistance service – Establish a system of staff to escort and directly assist visually impaired persons to navigate and move within the site.

3.2.4.3. Accessibility of digital provisions which are nice to have at transportation facilities

n/a

3.2.4.4. Accessibility of the built environment which are nice to have at transportation facilities

n/a

3.2.4.5. Accessibility of equipment in the built environment which are nice to have at transportation facilities

n/a

3.2.4.6. Accessibility of vehicles which are nice to have at transportation facilities

n/a

4. REFERENCES

DANOVA output and deliverables: https://www.interreg-danube.eu/approved-projects/danova/outputs

European Blind Union (EBU) – Facts and Figures: https://www.euroblind.org/about-blindness-and-partial-sight/facts-and-figures

5. ANNEX – ASSESSMENT OF RELEVANCE, COST AND TIME EFFORT ESTIMATION

5.1. METHODOLOGY

The measures evaluated in the survey were taken from the following DANOVA documents:

- D.T1.1.2 Catalogue of existing solutions and best practices
- D.T1.2.1 Assessment methodology including assessment grid for data collection
- International call for ideas

Partners were asked to rate the relevance of each measure with grades assigned with the following meaning:

- 1 – Must have (essential in terms of safety as well as independency)
- 2 – Should have (essential in terms of independency)
- 3 – Nice to have (additional support in terms of safety and/or independency)
- 4 – No need (no added value in terms of safety or independency)
- 5 – Useless (counterproductive in relation to safety or independency)
- n/a – Not applicable (no measure or solution to be provided by a transportation facility)

Regarding time and cost effort, partners were asked to rate which of the following levels they would assign each measure to:

- 1 – High (implementation requires significant resources by the company, is embedded in several key process, is implemented in longer time period)
- 2 – Medium (implementation requires medium resources by the company, is embedded in few key processes, is implemented in medium time period)
- 3 – Low (implementation requires low resources by the company, is not embedded in key process, is implemented in shorter time period)

Only measures which had been rated with a relevance of 1, 2 or 3 by the majority were supposed to be considered for the recommendations in the DANOVA Transnational Concept. Since this did not significantly apply to any of the measures, the next step was to group similar types of measures into categories in order to reduce complexity and be able to provide clear recommendations. An average rating for each category was derived from the rating of the individual measures assigned and checked again for accuracy.

5.2. COLLECTION OF MEASURES AND IDEAS

As explained in 4.2, the measures and ideas considered for the survey were all taken from results of former activities of the DANOVA project. The list, that was provided in the survey among DANOVA partners, was organized by type of measure. For transparency and clarity, the source was mentioned in each case using an abbreviation in brackets after the project's title as follows:

- BP (D.T1.1.2 Catalogue of existing solutions and best practices)
- AM (D.T1.2.1 Assessment methodology including assessment grid for data collection)
- CFI (International call for ideas)

In the survey, each measure/idea was mentioned with a title and short description. Details could be found in the respective source if required. For the purpose of this summary of results, only titles and sources are mentioned.

For all DANOVA outputs and deliverables please use following link: https://www.interreg-danube.eu/approved-projects/danova/outputs

5.2.1. Inclusion strategies

a) Accessibility policies (AM)
b) Disability awareness training (AM)
c) Awareness raising for staff regarding interaction with persons with disabilities (BP)
d) Training of PRM assistance agents of Vienna Airport (BP)
e) Customer service standards (AM)
f) Municipality of Maribor, Council for disabled persons (BP)
g) Universal Design and Accessibility Design Guide (BP)
h) Working Group "Passengers with reduced mobility at Vienna Airport" (BP)
i) Continuous consultation regarding TWSI details (BP)
j) Cooperation with stakeholders (BP)
k) ÖBB experts' network (BP)
l) Panel for mobility and infrastructure (BP)
m) Accessibility advice centre for blind and partially sighted people (BP)

5.2.2. Provision of services and support

a) Telephone services (AM)
b) INFOstation Panel (BP)
c) Personalized assistive technologies (AM)
d) Support at ticket machines (BP)
e) Video call service (BP)
f) Guide ME (CFI)
g) Be my Eyes (BP)
h) Live Navigation via earbud (CFI)
i) Assistance app with score system for volunteers (CFI)
j) iGuideU (CFI)
k) EVA (CFI)
l) GUIDE-Walk (CfI)
m) Guide stick Ariadne (BP and CFI)
n) Lazarillo (BP)
o) MyWayPro – orientation and navigation app for blind and partially sighted users (BP)
p) Multifunctional app for navigation (CFI)
q) Indoor navigation app (CFI)
r) Navigation app (CFI)
s) WAY4WARD (CFI)
t) NaviLens – Navigation and Labelling App (BP)
u) Smart sticker (CFI)
v) Information for orientation via NFC (CFI)
w) QR Codes at public transport stations (CFI)
x) Audio Guide map (BP)
y) Detailed directions for subway stations and their surroundings (BP)
z) Accessible directions (CFI)
aa) DANOVApp (CFI)

bb) Tactile orientation plan (BP)
cc) Tactile map for orientation and mobility of the area of the city of Maribor (BP)
dd) Counters (AM)
ee) Provision of mobility and family service at information desk (BP)
ff) Accessible information point at the concourse (BP)
gg) Calling point (BP)
hh) Assistance for passengers with disabilities (BP)
ii) Waiting zone (BP)
jj) ÖBB Customer centre – Mobility service central (BP)
kk) Relief areas for guide-dogs and service animals (BP)
ll) Facilities for guide-dogs and service animals (BP)
mm) Guide dog resting spot (BP)
nn) Evacuation (AM)

5.2.3. Accessibility of digital provisions

a) Pre- and post-travel access to information (AM)
b) Moovit – Urban Mobility App (BP)
c) Transport-related information BudapestGo App (BP)
d) Newsletter for blind and partially sighted persons (BP)

5.2.4. Accessibility of the built environment

a) Carparking (AM)
b) Drop-off areas (AM)
c) Public transport stops (AM)
d) Visual guidance (AM)
e) Passenger terminal signage (BP)
f) Optimized visual guidance system (BP)
g) Tactile guidance (AM)
h) Check in area TWSI (BP)
i) TWSI for indoor use (BP)
j) Provision of temporary TWSI during alteration works (BP)
k) Acoustic guidance (AM)
l) Horizontal circulation (AM)
m) Consistent marking of vertical glazed surfaces and doors (BP)
n) Furniture to ensure clear height below escalators and stairs (BP)
o) Doors (AM)
p) Accessible signage on doors and keys (BP)
q) Stairs (AM)
r) Ramps (AM)
s) Travellators and escalators (AM)
t) Lifts (AM)
u) Voice announcement in elevators (BP)
v) Toilets (AM)

5.2.5. Accessibility of equipment in the built environment

a) Machines (AM)

b) Simplified mode at ticket machines (BP)
c) ATMs with audio output and optimized visual display (BP)
d) Displays (AM)
e) Information screens with optimized visual display and placement (BP)
f) Monitors to display announcements at the gates (BP)
g) Tactile digital board (CFI)
h) Accessible signage – tactile and compatible with smartphones (BP)
i) INFOZIJA (CFI)
j) Acoustic announcement of visual information (timetables) displayed at tram and bus stations (BP)
k) Audio guidance (BP)
l) Transport-related information (BP)
m) aBeacon (BP)
n) Acoustic solutions in the Czech Republic (BP)

5.2.6. Accessibility of vehicles

a) Exterior announcements at public transport vehicles (BP)
b) Airport flight announcements (BP)
c) INTROS – public transport radar (BP)
d) BlindBus (CFI)
e) Door opening button with tactile indication and signal for location (BP)
f) Electric ramps (CFI)
g) Voice announcement in public transport vehicles (BP)
h) Own „seat“ for assistance dogs (BP)
i) High contrast design of trains (BP)
j) Tactile marking inside trains, tactile indication of first class at entrance (BP)
k) Acoustic sign for occupied seats (CFI)

5.2.7. Other

a) Translation configurator for 3D models and printing in Braille (BP)

5.3. RESULTS FOR INDIVIDUAL MEASURES AND IDEAS

For accuracy and readability of the ranking of results regarding relevance, the following calculation method was applied: The number of votes for grades 1, 2 and 3 was multiplied by a certain factor according to the importance expressed by the related grade. Votes for 1 (“must have”) were multiplied by 2, votes for 2 (“should have”) were multiplied by 1,5 and votes for 3 (“nice to have”) were multiplied by 1. The sum gave the total result for each measure.

To account for weighting by a majority vote, two points were added to the result if the majority voted for "must have" and one point was subtracted if the majority voted "nice to have."

Example: 5/13 “must have”, 4/13 “should have” and 4/13 “nice to have” – ranking: 5*2+4*1.5+4*1+2 =22

The higher the total result of a measure is, the more relevant it is according to the experts involved.

For more clarity of the final results, the scores were reduced again to three levels representing the average grade.

Regarding relevance, where 13 persons responded, the following key applies:

- > 19,5 – must have
- 13,1 to 19,5 – should have
- ≤ 13,0 – nice to have

Regarding relevance, where 12 persons responded, the following key applies:

- > 18,0 – must have
- 12,1 to 18,0 – should have
- ≤ 12,0 – nice to have

Regarding relevance, where 11 persons responded, the following key applies:

- > 16,5 – must have
- 11,1 to 16,5 – should have
- ≤ 11,0 – nice to have

Regarding effort for implementation, the grade with the most votes was adopted as result. Where two grades received an equal number of votes, the grade chosen was the one closer to the one for which the remaining votes were cast.

Example: 3 votes for "medium", 3 votes for "high", 1 vote for "low" - overall result "medium".

Measures rated as "1" require more effort to implement than those rated as "2" or "3", according to the experts involved.

5.3.1. Inclusion strategies

a) Accessibility policies (AM) – 25,0 (must have); 3 (low)
b) Disability awareness training (AM) – 24,5 (must have); 3 (low)
c) Awareness raising for staff regarding interaction with persons with disabilities (BP) – 23,5 (must have); 2 (medium)
d) Training of PRM assistance agents of Vienna Airport (BP) – 17,0 (should have); 2 (medium)
e) Customer service standards (AM) – 23,0 (must have); 3 (low)
f) Municipality of Maribor, Council for disabled persons (BP) – 14,0 (should have); 2 (medium)
g) Universal Design and Accessibility Design Guide (BP) – 18,0 (should have); 2 (medium)
h) Working Group “Passengers with reduced mobility at Vienna Airport” (BP) – 14,5 (should have); 3 (low)
i) Continuous consultation regarding TWSI details (BP) – 13,5 (should have); 2 (medium)
j) Cooperation with stakeholders (BP) – 19,5 (should have); 2 (medium)
k) ÖBB experts’ network (BP) – 16,0 (should have); 2 (medium)
l) Panel for mobility and infrastructure (BP) – 15,0 (should have); 2 (medium)
m) Accessibility advice centre for blind and partially sighted people (BP) – 12,0 (nice to have); 2 (medium)

Table A.1: Inclusion strategies – Experts' votes regarding relevance and estimated effort for implementation of measures

Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
1a) Accessibility policies	10	2			1		3	2	2	
1b) Disability awareness training	9	3			1		4	3		
1c) Awareness raising for staff	8	3	1		1		3	3	1	
1d) Training of PRM agents	5	2	2	2	1	1	2	2	2	1
1e) Customer service standards	7	4	1	1			4	3		
1f) Council for disabled persons	3	2	6			2	2	3		2
1g) Universal Design Guide	4	4	4			1	1	5		1
1h) PRM working group	4	1	6		1	1	3	2	1	1
1i) Consultation regarding TWSI	4	1	5	3			2	3	1	1
1j) Cooperation with stakeholders	5	3	3	2			3	4		
1k) OBB experts' network	3	4	4	1		1	3	4		
1l) Panel for mobility	3	4	3	1		2	2	5		
1m) Accessibility centre for b/ps	1	4	5			3	1	3	1	2

In total, the measures regarding inclusion strategies have been ranked as follows (sorted from lowest to highest relevance):

- 1m) Accessibility centre for b/ps (12 points)
- 1i) Consultation regarding TWSI (13,5 points)
- 1f) Council for disabled persons (14 points)
- 1h) PRM working group (14,5 points)
- 1l) Panel for mobility (15 points)
- 1k) OBB experts' network (16 points)
- 1d) Training of PRM agents (17 points)
- 1g) Universal Design Guide (18 points)
- 1j) Cooperation with stakeholders (19,5 points)
- 1e) Customer service standards (23 points)
- 1c) Awareness raising for staff (23,5 points)
- 1b) Disability awareness training (24,5 points)
- 1a) Accessibility policies (25 points)

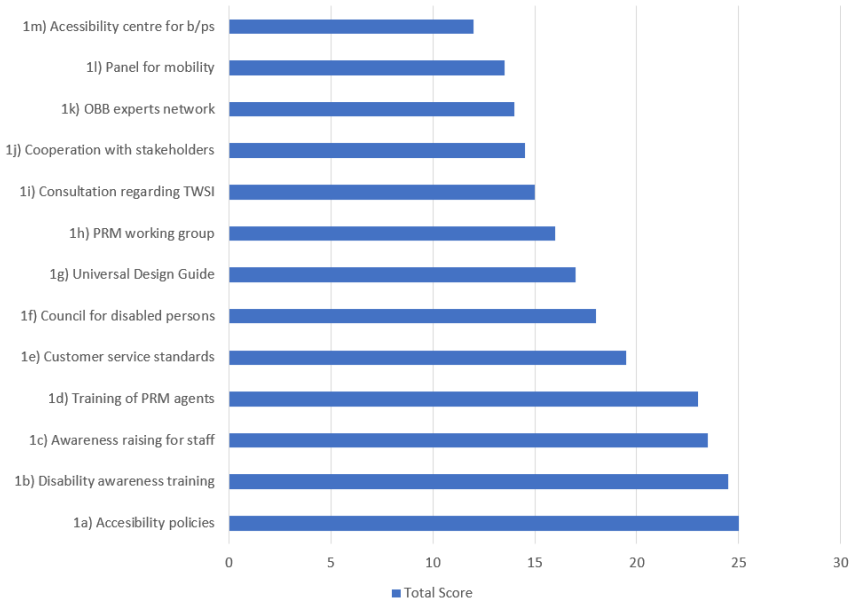


Figure A.1: Measures regarding inclusion strategies sorted by relevance

5.3.2. Provision of services and support

a) Telephone services (AM) – 19,5 (should have); 2 (medium)
b) Info station Panel (BP) – 18,0 (should have); 2 (medium)
c) Personalized assistive technologies (AM) – 13,5 (should have); 2 (medium)
d) Support at ticket machines (BP) – 13,5 (should have); 2 (medium)
e) Video call service (BP) – 11,0 (nice to have); 1 (high)
f) Guide ME (CFI) – 11,0 (nice to have); 1 (high)
g) Be my Eyes (BP) – 11,0 (nice to have); 3 (low)
h) Live Navigation via earbud (CFI) – 9,0 (nice to have); 1 (high)
i) Assistance app with score system for volunteers (CFI) – 8,5 (nice to have); 3 (low)
j) iGuideU (CFI) – 9,5 (nice to have); 1 (high)
k) EVA (CfI) – 7,0 (nice to have); 1 (high)
l) GUIDE-Walk (CFI) – 9,0 (nice to have); 3 (low)
m) Guide stick Ariadne (BP and CFI) – 5,0 (nice to have); 1 (high)
n) Lazarillo (BP) – 8,0 (nice to have); 2 (medium)
o) MyWayPro – orientation and navigation app for blind and partially sighted users (BP) – 9,5 (nice to have); 2 (medium)
p) Multifunctional app for navigation (CFI) – 11,5 (nice to have); 1 (high)
q) Indoor navigation app (CFI) – 11,0 (nice to have); 1 (high)
r) Navigation app (CFI) – 8,0 (nice to have); 1 (high)
s) WAY4WARD (CFI) – 8,5 (nice to have); 1 (high)
t) NaviLens – Navigation and Labelling App (BP) – 12,5 (nice to have); 3 (low)
u) Smart sticker (CFI) – 9,0 (nice to have); 2 (medium)
v) Information for orientation via NFC (CFI) – 9,5 (nice to have); 1 (high)
w) QR Codes at public transport stations (CFI) – 10,0 (nice to have); 2 (medium)
x) Audio Guide map (BP) – 12,0 (nice to have); 2 (medium)
y) Detailed directions for subway stations and their surroundings (BP) – 12,0 (nice to have); 1 (high)

z) Accessible directions (CFI) – 11,5 (nice to have); 2 (medium)
aa) DANOVApp (CFI) – 10,0 (nice to have); 2 (medium)
bb) Tactile orientation plan (BP) – 14,5 (should have); 2 (medium)
cc) Tactile map for orientation and mobility of the area of the city of Maribor (BP) – 12,0 (nice to have); 2 (medium)
dd) Counters (AM) – 21,5 (must have); 2 (medium)
ee) Provision of mobility and family service at information desk (BP) – 22,5 (must have); 2 (medium)
ff) Accessible information point at the concourse (BP) – 20,0 (must have); 2 (medium)
gg) Calling point (BP) – 18,5 (should have); 2 (medium)
hh) Assistance for passengers with disabilities (BP) – 11,0 (nice to have); 2 (medium)
ii) Waiting zone (BP) – 7,0 (nice to have); 3 (low)
jj) ÖBB Customer centre – Mobility service central (BP) – 16,5 (should have); 2 (medium)
kk) Relief areas for guide-dogs and service animals (BP) – 20,5 (must have); 2 (medium)
ll) Facilities for guide-dogs and service animals (BP) – 20,5 (must have); 2 (medium)
mm) Guide dog resting spot (BP) – 20,5 (must have); 2 (medium)
nn) Evacuation (AM) – 22,0 (must have); 2 (medium)

Table A.2: Provision of services and support – Experts' votes regarding relevance and estimated effort for implementation of measures

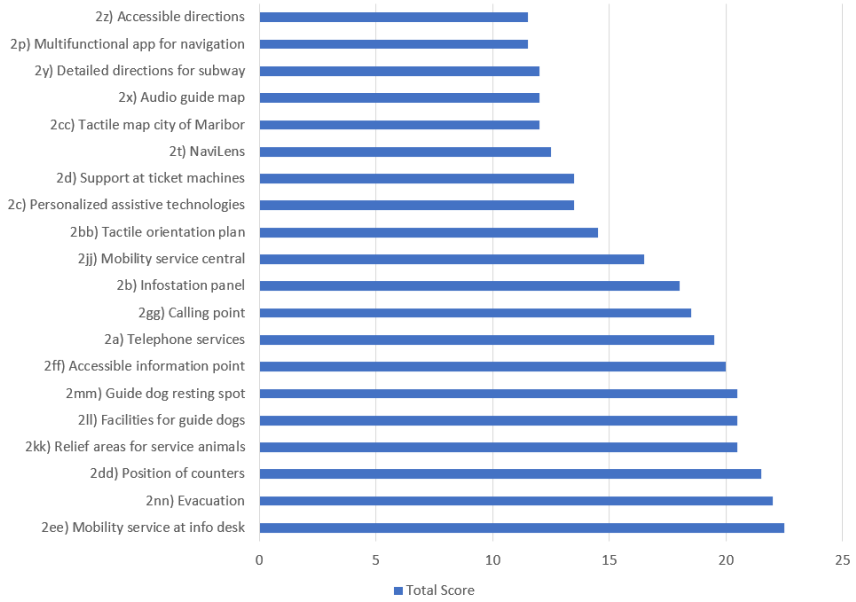
Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
2a) Telephone services	5	5	2	1			1	6		
2b) Info station panel	3	6	3		1		2	4	1	
2c) Personalized assistive technologies	3	1	7	1		1	2	3	1	1
2d) Support at ticket machines	3	3	4	1	1		1	4	2	
2e) Video call service	2		8		1	2	2		3	2
2f) Guide Me	1	2	7		2	1	2		4	1
2g) Be my eyes	2	2	5	1	1	2	3	1	2	1
2h) Live navigation via earbud		2	7	2	1	1	2		4	1
2i) Assistance app		1	8		1	2	3	1	2	1
2j) iGuideU		1	9		1	1	2	1	4	
2k) EVA		2	5	2		3	1	1	4	1
2l) GUIDE-Walk		4	3	1	1	4	3	1	1	2
2m) Guide stick Ariadne			6	3		3	2		3	2
2n) Lazarillo	1	2	4	2		4	2	2	1	2
2o) MyWayPro	1	1	7		1	3	2	2	1	2
2p) Multifunctional app for navigation	1	3	6	1	1		2	2	3	
2q) Indoor navigation app	1	2	7	1	1		1	2	4	
2r) Navigation app			9	1	1	1	1	1	4	1
2s) WAY4WARD		1	8	1	1	1	1	2	4	
2t) NaviLens		5	6		2		3	2	2	
2u) Smart sticker		2	7		2	1	1	3	2	1
2v) Information via NFC chip		3	6	1	1	1	1	2	4	
2w) QR codes at public transport stations		2	8	1	1		1	5	1	
2x) Audio guide map		4	7		1	1	3	3	1	
2y) Detailed directions for subway	1	2	8	1		1		2	4	1
2z) Accessible directions	2	1	7	1		1	1	3	2	1
2aa) DanovApp		4	5	2	1	1	1	4	2	
2bb) Tactile orientation plan	3	3	5	1	1		2	5		
2cc) Tactile map city of Maribor	2	2	6		1	2		4	1	2

2dd) Position of counters	7	3	1	1	1			5	2	
2ee) Mobility service at info desk	8	3		1	1		2	3	2	
2ff) Accessible information point	6	2	3	1	1		1	4	2	
2gg) Calling point	5	3	2	2	1		2	4	1	
2hh) Assistance for passengers	4		1	3	1	3	2	1	2	2
2ii) Waiting zone			8	4	1		3	1	2	1
2jj) Mobility service central	2	5	5	1			1	5	1	
2kk) Relief areas for service animals	5	3	4	1			2	4	1	
2ll) Facilities for guide dogs	5	3	4	1			2	3	2	
2mm) Guide dog resting spot	5	3	4	1			2	4	1	
2nn) Evacuation	10			2	1		2	4	1	

In total, the measures regarding provision of services and support have been ranked as follows (sorted from lowest to highest relevance):

- 2m) Guide stick Ariadne (5 points)
- 2k) EVA (7 points)
- 2ii) Waiting zone (7 points)
- 2n)Lazarillo (8 points)
- 2r) Navigation app (8 points)
- 2i) Assistance app (8,5 points)
- 2s) WAY4WARD (8,5 points)
- 2h) Live navigation via earbud (9 points)
- 2l) GUIDE-Walk (9 points)
- 2u) Smart sticker (9 points)
- 2j) iGuideU (9,5 points)
- 2o)MyWayPro (9,5 points)
- 2v) Information via NFC chip (9,5 points)
- 2w) QR codes at public transport stations (10 points)
- 2aa) DanovApp (10 points)
- 2e) Video call service (11 points)
- 2f) Guide Me (11 points)
- 2g) Be my eyes (11 points)
- 2q) Indoor navigation app (11 points)
- 2hh) Assistance for passengers (11 points)
- 2p) Multifunctional app for navigation (11,5 points)
- 2z) Accessible directions (11,5 points)
- 2x) Audio guide map (12 points)
- 2y) Detailed directions for subway (12 points)
- 2cc) Tactile map city of Maribor (12 points)
- 2t) NaviLens (12,5 points)

- 2c) Personalized assistive technologies (13,5 points)
- 2d) Support at ticket machines (13,5 points)
- 2bb) Tactile orientation plan (14,5 points)
- 2jj) Mobility service central (16,5 points)
- 2b) Info station panel (18 points)
- 2gg) Calling point (18,5 points)
- 2a) Telephone services (19,5 points)
- 2ff) Accessible information point (20 points)
- 2kk) Relief areas for service animals (20,5 points)
- 2ll) Facilities for guide dogs (20,5 points)
- 2mm) Guide dog resting spot (20,5 points)
- 2dd) Position of counters (21,5 points)
- 2nn) Evacuation (22 points)
- 2ee) Mobility service at info desk (22,5 points)



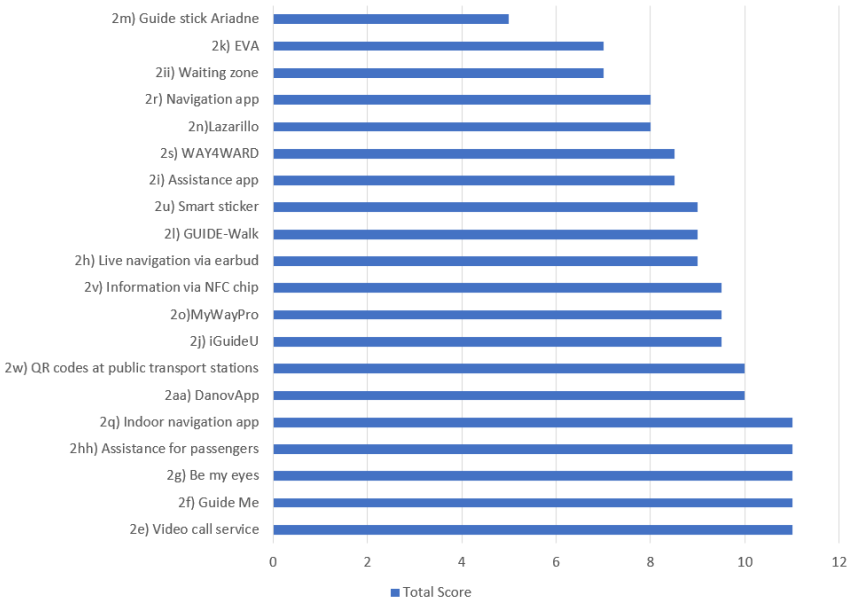


Figure A.2: Measures regarding provision of services and support sorted by relevance

5.3.3. Accessibility of digital provisions

a) Pre- and post-travel access to information (AM) – 23,0 (must have); 2 (medium)
b) Moovit – Urban Mobility App (BP) – 11,0 (nice to have); 2 (medium)
c) Transport-related information BudapestGo App (BP) – 17,5 (should have); 2 (medium)
d) Newsletter for blind and partially sighted persons (BP) – 6,0 (nice to have); 2 (medium)

Table A.3: Accessibility of digital provisions – Experts' votes regarding relevance and estimated effort for implementation of measures

Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
3a) Pre/post travel access to information	7	4	1		1		1	5	1	
3b) Moovit app	2		8		1	2	1	3	1	2
3c) BudapestGo app	4	3	3	1	1	1	1	3	2	1
3d) Newsletter for b/ps			7	1		3	2	1	2	2

In total, the measures regarding accessibility of digital provisions have been ranked as follows (sorted from lowest to highest relevance):

- 3d) Newsletter for b/ps (6 points)
- 3b) Moovit app (11 points)
- 3c) BudapestGo app (17,5 points)
- 3a) Pre/post travel access to information (23 points)

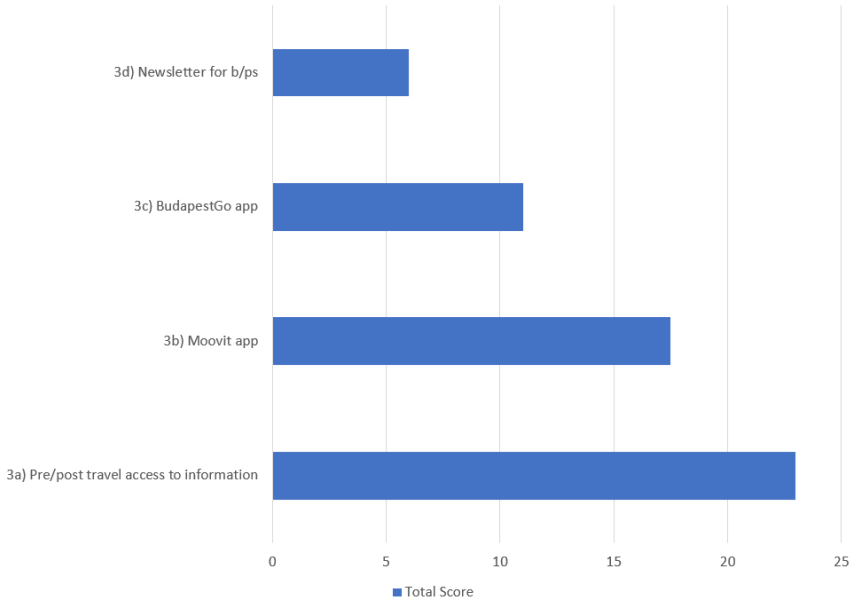


Figure A.3: Measures regarding accessibility of digital provisions sorted by relevance

5.3.4. Accessibility of the built environment

a) Carparking (AM) – 21,0 must have); 2 (medium)
b) Drop-off areas (AM) – 21,0 (must have); 2 (medium)
c) Public transport stops (AM) – 20,0 (must have); 2 (medium)
d) Visual guidance (AM) – 20,0 (must have); 2 (medium)
e) Passenger terminal signage (BP) – 20,5 (must have); 2 (medium)
f) Optimized visual guidance system (BP) – 21,0 (must have); 2 (medium)

g) Tactile guidance (AM) – 20,0 (must have); 2 (medium)
h) Check in area TWSI (BP) – 21,0 (must have); 2 (medium)
i) TWSI for indoor use (BP) – 23,5 (must have); 2 (medium)
j) Provision of temporary TWSI during alteration works (BP) – 21,0 (must have); 2 (medium)
k) Acoustic guidance (AM) – 15,5 (should have); 1 (high)
l) Horizontal circulation (AM) –20,5 (must have); 2 (medium)
m) Consistent marking of vertical glazed surfaces and doors (BP) – 21,0 (must have); 1 (high)
n) Furniture to ensure clear height below escalators and stairs (BP) – 12,0 (nice to have); 1 (high)
o) Doors (AM) – 18,5 (should have); 2 (medium)
p) Accessible signage on doors and keys (BP) – 20,5 (must have); 1 (high)
q) Stairs (AM) – 17,0 (should have); 2 (medium)
r) Ramps (AM) – 21,0 (must have); 2 (medium)
s) Travellators and escalators (AM) – 18,0 (should have); 2 (medium)
t) Lifts (AM) – 18,5 (should have); 2 (medium)
u) Voice announcement in elevators (BP) – 18,0 (should have); 3 (low)
v) Toilets (AM) – 21,5 (must have); 2 (medium)

Table A.4: Accessibility of the built environment – Experts' votes regarding relevance and estimated effort for implementation of measures

Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
4a) Carparking	7	2	2	2			1	5	1	
4b) Drop off areas	8	2		2	1		1	4	2	
4c) Public transport stops signage/TWSI	7	2	1	2	1			6	1	
4d) Visual guidance/accessible signage	7	2	1	1	2		1	6		
4e) Passenger terminal signage	8	1	1	2	1		3	4		
4f) Optimized visual guidance system	8		3	2			1	5	1	
4g) Tactile guidance	8		2	2	1			5	2	
4h) Check in area TWSI	6	4	1		1	1		5	2	
4i) TWSI for indoor use	8	3	1		1			6	1	
4j) Temporary TWSI during works	7	2	2	1	1		2	5		
4k) Acoustic guidance	2	5	4	1		1	1	1	4	1
4l) Horizontal circulation	7	3		1	2		1	4	2	
4m) Marking of vertical surfaces/doors	7	2	2		1	1	1	1	4	1
4n) Cordoning off below stairs area	3	4		6			1	2	4	
4o) Doors	4	7		1	1		1	4	2	
4p) Accessible signage on doors and keys	6	3	2	1	1		1	1	5	
4q) Stairs	6	2		3	1	1	1	3	2	1

4r) Ramps	7	2	2	2			1	4	2	
4s) Travellators and escalators	5	4		1	1	2	2	1	2	2
4t) Lifts	6	3		2		2	1	2	2	2
4u) Voice announcements in elevators	5	4			2	2		3	2	2
4v) Toilets	7	3	1	1	1		1	4	2	

In total, the measures regarding accessibility of the built environment have been ranked as follows (sorted from lowest to highest relevance):

- 4n) Cordoning off below stairs area (12 points)
- 4k) Acoustic guidance (15,5 points)
- 4q) Stairs (17 points)
- 4s) Travellators and escalators (18 points)
- 4u) Voice announcements in elevators (18 points)
- 4o) Doors (18,5 points)
- 4t) Lifts (18,5 points)
- 4c) Public transport stops signage/TWSI (20 points)
- 4d) Visual guidance/accessible signage (20 points)
- 4g) Tactile guidance (20 points)
- 4e) Passenger terminal signage (20,5 points)
- 4l) Horizontal circulation (20,5 points)
- 4p) Accessible signage on doors and keys (20,5 points)
- 4a) Carparking (21 points)
- 4b) Drop off areas (21 points)
- 4f) Optimized visual guidance system (21 points)
- 4h) Check in area TWSI (21 points)
- 4j) Temporary TWSI during works (21 points)
- 4m) Marking of vertical surfaces/doors (21 points)
- 4r) Ramps (21 points)
- 4v) Toilets (21,5 points)
- 4i) TWSI for indoor use (23,5 points)

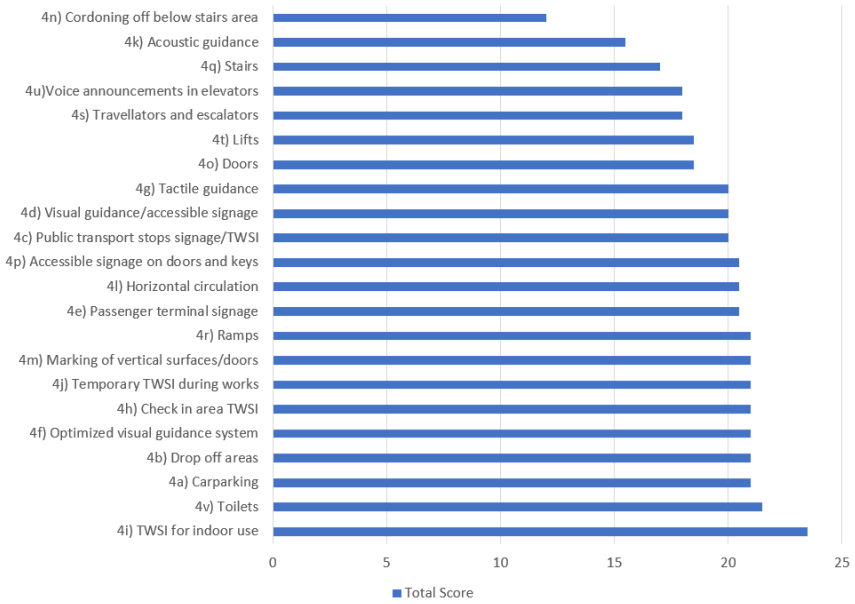


Figure A.4: Measures regarding accessibility of the built environment sorted by relevance

5.3.5. Accessibility of equipment in the built environment

a) Machines (AM) – 16,5 (should have); 2 (medium)
b) Simplified mode at ticket machines (BP) – 20,0 (must have); 2 (medium)
c) ATMs with audio output and optimized visual display (BP) – 17,0 (should have); 2 (medium)
d) Displays (AM) – 20,0 (must have); 2 (medium)
e) Information screens with optimized visual display and placement (BP) – 21,0 (must have); 2 (medium)
f) Monitors to display announcements at the gates (BP) – 18,5 (should have); 2 (medium)
g) Tactile digital board (CFI) – 13,0 (should have); 2 (medium)
h) Accessible signage – tactile and compatible with smartphones (BP) – 16,5 (should have); 2 (medium)
i) INFOZIJA (CFI) – 11,5 (nice to have); 2 (medium)
j) Acoustic announcement of visual information (timetables) displayed at tram and bus stations (BP) – 16,0 (should have); 2 (medium)
k) Audio guidance (BP) – 18,0 (should have); 2 (medium)
l) Transport-related information (BP) – 15,0 (should have); 1 (high)
m) aBeacon (BP) – 14,5 (should have); 2 (medium)
n) Acoustic solutions in the Czech Republic (BP) – 11,5 (nice to have); 1 (high)

Table A.5: Accessibility of equipment in the built environment – Experts' votes regarding relevance and estimated effort for implementation of measures

Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
5a) Machines	3	5	3		1	1	1	4	1	1
5b) Simplified mode at ticket machines	5	4	2		1	1		6		1
5c) ATM w/audio and optimized display	6		3	2		2	2	2	1	2
5d) Displays	6	2	3	1	1			6	1	
5e) Optimized info screens	7	2	2	1	1			7		
5f) Monitor at gates	5	3	2	3				7		
5g) Tactile digital board	2	4	3	2		1	3	3	1	
5h) Accessible signage	4	3	4	2			2	5		
5i) Infozija	2	1	7	2		1		6	1	
5j) Acoustic announcement tram/bus	3	4	4		2		1	4	2	
5k) Audio guidance	5	2	3	1	2		1	3	3	
5l) Transport related information	4	2	5		2		1	1	5	
5m) aBeacon	1	5	5	1	1			4	3	
5n) Acoustic solutions	2	3	4	1	1	2	1	1	5	

In total, the measures regarding accessibility equipment in the built environment have been ranked as follows (sorted from lowest to highest relevance):

- 5i) Infozija (11,5 points)
- 5n) Acoustic solutions (11,5 points)
- 5g) Tactile digital board (13 points)
- 5m) aBeacon (14,5 points)
- 5l) Transport related information (15 points)
- 5j) Acoustic announcement tram/bus (16 points)
- 5a) Machines (16,5 points)
- 5h) Accessible signage (16,5 points)
- 5c) ATM w/audio and optimized display (17 points)
- 5k) Audio guidance (18 points)
- 5f) Monitor at gates (18,5 points)
- 5b) Simplified mode at ticket machines (20 points)
- 5d) Displays (20 points)
- 5e) Optimized info screens (21 points)

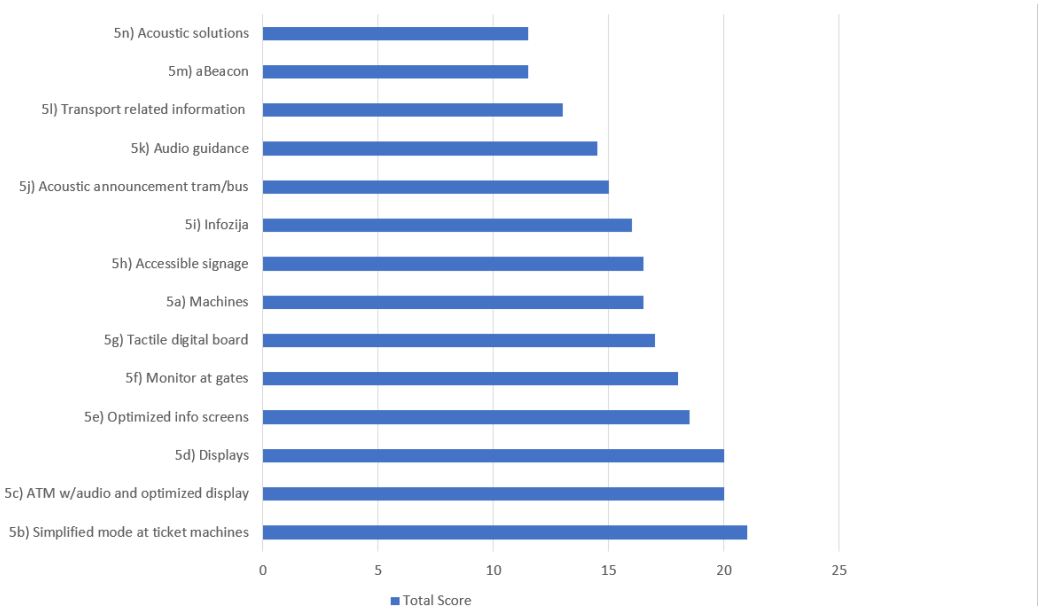


Figure A.5: Measures regarding accessibility of equipment in the built environment sorted by relevance

5.3.6. Accessibility of vehicles

a) Exterior announcements at public transport vehicles (BP) – 13,5 (should have); 2 (medium)
b) Airport flight announcements (BP) – 21,0 (must have); 2 (medium)
c) INTROS – public transport radar (BP) – 12,0 (nice to have); 2 (medium)
d) BlindBus (CFI) – 10,5 (nice to have); 1 (high)
e) Door opening button with tactile indication and signal for location (BP) – 19,0 (should have); 2 (medium)
f) Electric ramps (CFI) – 7,0 (nice to have); 1 (high)
g) Voice announcement in public transport vehicles (BP) – 18,5 (should have); 2 (medium)
h) Own „seat“ for assistance dogs (BP) – 12 (nice to have); 2 (medium)

i) High contrast design of trains (BP) – 19,5 (should have); 2 (medium)
j) Tactile marking inside trains, tactile indication of first class at entrance (BP) – 16,0 (should have); 2 (medium)
k) Acoustic sign for occupied seats (CFI) – 12,0 (nice to have); 2 (medium)

Table A.6: Accessibility of vehicles – Experts' votes regarding relevance and estimated effort for implementation of measures

Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
6a) Exterior announcements public transport	4	1	5	1	1			5	1	1
6b) Airport flight announcement	8	2		1	2		2	3	2	
6c) INTROS	2	2	6	1	1	1	1	3	2	1
6d) BlindBus	2	1	6		2	2	1	2	3	1
6e) Door opening button	5	4	1	1	1	1	2	4		1
6f) Electric ramps	1		6	2	3	1	1		5	1
6g) Voice announcement in public transport	6	3		2	1	1	1	4	1	1
6h) Seat for assistance dogs	3	2	4	1	1	2	2	3		2
6i) High contrast trains	5	3	3		1	1		4	2	1
6j) Tactile markings inside trains	4	4	2	1		2	1	3	1	2
6k) Acoustic sign for occupied seats	1	4	5	3			2	3	2	

In total, the measures regarding accessibility of vehicles have been ranked as follows (sorted from lowest to highest relevance):

- 6f) Electric ramps (7 points)
- 6d) BlindBus (10,5 points)
- 6c) INTROS (12 points)
- 6h) Seat for assistance dogs (12 points)
- 6k) Acoustic sign for occupied seats (12 points)
- 6a) Exterior announcements public transport (13,5 points)
- 6j) Tactile markings inside trains (16 points)
- 6g) Voice announcement in public transport (18,5 points)
- 6e) Door opening button (19 points)
- 6i) High contrast trains (19,5 points)
- 6b) Airport flight announcement (21 points)

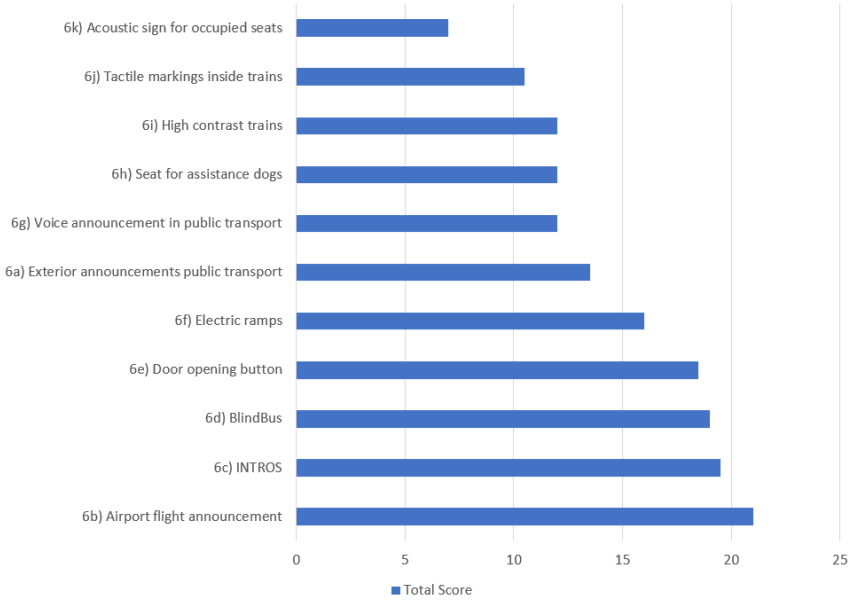


Figure A.6: Measures regarding accessibility of vehicles sorted by relevance

5.3.7. Other

a) Translation configurator for 3D models and printing in Braille (BP) – 11,5 (nice to have); 2 (medium)

Table A.7: *Accessibility of vehicles – Experts' votes regarding relevance and estimated effort for implementation of measures*

Measure	Must have	Should have	Nice to have	No need	Useless	n/a	Low	Medium	High	n/a
7a) Configurator for 3D printing	2	1	7	1	1	1	1	4	2	

5.4. GROUPING OF MEASURES

5.4.1. Inclusion strategies

The measures, solutions and ideas listed in "inclusion strategies" are compiled in the following categories:

- Accessibility policies (contains a))
- Awareness training (contains b) to d))
- Customer service standards (contains e) to g))
- Participatory platforms for strategic advisory by visually impaired persons' advocacy groups (contains h) to m))

5.4.2. Provision of services and support

The measures, solutions and ideas listed in "provision of service and support" are compiled in the following categories:

- Support and information via telephone (contains a), b) and d))
- Remote support guidance (contains c) and e) to i))
- Equipment for navigation (contains j) to s))
- Provision of information for orientation via labels, beacons, stickers etc. (contains t) to w))
- Provision of text information for orientation/navigation (contains x) to aa))
- Tactile maps (contains bb) and cc) and 5 i))
- Accessible counters/info points (contains dd) to gg))
- Assistance service (contains hh) to jj))
- Facilities for service animals (contains kk) to mm))
- Evacuation concept/measures (contains nn))

5.4.3. Accessibility of digital provisions

The measures, solutions and ideas listed in "accessibility of digital provisions" are compiled in the following categories:

- General digital provisions (contains a))
- Specific provisions for VI persons (contains c))

5.4.4. Accessibility of the built environment

The measures, solutions and ideas listed in "accessibility of the built environment" are compiled in the following categories:

- Arrival/departure at the facility (contains a) to c))
- Visual orientation (contains d) to f))
- Tactile orientation (contains g) to j))
- Acoustic orientation (contains k))
- Accessibility of horizontal areas (contains l))
- Safeguarding at hazardous areas (contains m) and n))
- Accessibility of doors (contains o) and p))
- Accessibility of vertical circulation (contains q) to u))
- Access to sanitary areas (contains v))

5.4.5. Accessibility of equipment in the built environment

The measures, solutions and ideas listed in “accessibility of equipment in the built environment” are compiled in the following categories:

- Self-service terminals (contains a) to c))
- Displays (contains d) to j), except i))
- Acoustic signals and information on demand via remote control (contains k) to n) and 6. a))

5.4.6. Accessibility of vehicles

The measures, solutions and ideas listed in “accessibility of vehicles” are compiled in the following categories:

- Announcement of vehicles in the station (contains b))
- Equipment for information during travelling in a vehicle (contains c) to g) – except e) and f))
- Equipment inside vehicles (contains h) to k))

5.4.7. Other

“Other” contains just one particular best practice example: Configurator for 3D printing.

5.5. SUMMARY: RESULTS FOR CATEGORIES OF MEASURES

The grades for each category were defined according to the grades of the majority of measures it contains. Table A.8 shows an overview of the results.

Table A.8: Overview on rating of relevance and implementation effort of measures sorted by categories

Key: R = Relevance; IE = Implementation effort

		R 1	R 2	R 3	IE 1	IE 2	IE 3
Inclusion strategies	Accessibility policies	X			X	X	X
	Awareness training	X			X	X	
	Customer service standards	X	X		X	X	
	Participatory platforms for strategic advisory by visually impaired persons' advocacy groups	X	X		X	X	
Provision of services and support	Support and information via telephone	X	X		X	X	
	Remote support guidance	X	X	X	X		
	Equipment for navigation	X	X	X	X		
	Provision of information for orientation via labels, beacons, stickers etc.	X	X	X	X	X	
	Provision of text information for orientation/navigation	X	X	X	X	X	
	Tactile maps	X	X	X	X	X	
	Accessible counters/info points	X			X	X	
	Assistance service	X	X	X	X	X	
	Facilities for service animals	X			X	X	
	Evacuation concept/measures	X			X	X	
Accessibility of digital provisions	General digital provisions	X			X	X	
	Specific provisions for VI persons	X	X		X	X	
Accessibility of the built environment	Arrival/departure at the facility	X			X	X	
	Visual orientation	X			X	X	
	Tactile orientation	X			X	X	
	Acoustic orientation	X	X		X		
	Accessibility of horizontal areas	X			X	X	
	Safeguarding at hazardous areas	X			X		
	Accessibility of doors	X			X		
	Accessibility of vertical circulation	X	X		X	X	
	Access to sanitary areas	X			X	X	
Accessibility of equipment in the built environment	Self-service terminals	X	X		X	X	
	Displays	X	X		X	X	
	Acoustic signals and information on demand via remote control	X	X		X	X	

Accessibility of vehicles	Announcement of vehicles in the station	X			X	X	
	Equipment for information during travelling in a vehicle	X	X	X	X	X	
	Equipment inside vehicles	X	X		X	X	
Other	Configurator for 3D printing	X	X	X	X	X	

5.5.1. Inclusion strategies

- Accessibility policies (contains a)) – relevance 1, implementation effort 3
- Awareness training (contains b) to d)) – relevance 1, implementation effort 2
- Customer service standards (contains e) to g)) – relevance 2, implementation effort 2
- Participatory platforms for strategic advisory by visually impaired persons' advocacy groups (contains h) to m)) – relevance 2, implementation effort 2

5.5.2. Provision of services and support

- Support and information via telephone (contains a), b) and d)) – relevance 2, implementation effort 2
- Remote support guidance (contains c) and e) to i)) – relevance 3, implementation effort 1
- Equipment for navigation (contains j) to s)) – relevance 3, implementation effort 1
- Provision of information for orientation via labels, beacons, stickers etc. (contains t) to w)) – relevance 3, implementation effort 2
- Provision of text information for orientation/navigation (contains x) to aa)) – relevance 3, implementation effort 2
- Tactile maps (contains bb) and cc) and 5 i)) – relevance 3, implementation effort 2
- Accessible counters/info points (contains dd) to gg)) – relevance 1, implementation effort 2
- Assistance service (contains hh) to jj)) – relevance 3, implementation effort 2
- Facilities for service animals (contains kk) to mm)) – relevance 1, implementation effort 2
- Evacuation concept/measures (contains nn)) – relevance 1, implementation effort 2

5.5.3. Accessibility of digital provisions

- General digital provisions (contains a)) – relevance 1, implementation effort 2
- Specific provisions for VI persons (contains c)) – relevance 2, implementation effort 2

5.5.4. Accessibility of the built environment

- Arrival/departure at the facility (contains a) to c)) – relevance 1, implementation effort 2
- Visual orientation (contains d) to f)) – relevance 1, implementation effort 2
- Tactile orientation (contains g) to j)) – relevance 1, implementation effort 2
- Acoustic orientation (contains k)) – relevance 2, implementation effort 1
- Accessibility of horizontal areas (contains l)) – relevance 1, implementation effort 2
- Safeguarding at hazardous areas (contains m) and n)) – relevance 1, implementation effort 1
- Accessibility of doors (contains o) and p)) – relevance 1, implementation effort 1
- Accessibility of vertical circulation (contains q) to u)) – relevance 2, implementation effort 2
- Access to sanitary areas (contains v)) – relevance 1, implementation effort 2

5.5.5. Accessibility of equipment in the built environment

- Self-service terminals (contains a) to c)) – relevance 2, implementation effort 2
- Displays (contains d) to j), except i)) – relevance 2, implementation effort 2
- Acoustic signals and information on demand via remote control (contains k) to n) and 6 a)) – relevance 2, implementation effort 2

5.5.6. Accessibility of vehicles

- Announcement of vehicles in the station (contains b)) – relevance 1, implementation effort 2
- Equipment for information during travelling in a vehicle (contains c) to g) – except e) and f)) – relevance 3, implementation effort 2
- Equipment inside vehicles (contains h) to k)) – relevance 2, implementation effort 2

5.5.7. Other

- Configurator for 3D printing – relevance 3, implementation effort 2