

Capitalisation Strategy

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

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1. INTRODUCTION

Visual impairment is a broad term that refers to any degree of vision loss affecting a person's ability to perform the usual activities of daily living and that cannot be corrected to normal vision, even if the person wears glasses or contact lenses. It is not a disease per se, but a consequence of disease, injury or other trauma affecting the structures and functions of the visual system. The term "visual impairment" includes blindness and the term "visually impaired" is used to refer to both blind and partially sighted persons. When a person experiences limitations and impairments in interacting with the environment and/or performing tasks due to an impairment, we speak of a disability.

People with visual impairments may feel disabled if they do not have adequate access to assistive devices and services and face barriers such as discrimination or inaccessible buildings or transport. It is estimated that 96% of the transport system in the EU is still not fully accessible to blind and partially sighted people (European Blind Union) and accessibility is extremely low in many countries in the Danube Region. Furthermore, significant differences in the level of accessibility between countries and between cities/regions within a country have been identified. As a result, over 30 million blind and partially sighted people cannot travel independently.

For blind and partially sighted passengers, the lack of accessibility features such as tactile walking surface indicators (TWSI), tactile orientation maps, large print and Braille signage, audio signage, screen reader-friendly websites and applications makes the use of conventional transport systems (airplanes, buses, trains, public transport) extremely difficult and in some cases impossible. In these cases, they rely on the assistance of a sighted person (their personal assistant, facility's staff, or a random passer-by), which ensures their ability to travel, but still imposes some limitations compared to the travel experiences of sighted people.

Although there are laws, regulations and procedures at both EU and country levels, enforcement of these rules is often a problem and most countries in the Danube Region have difficulties in fully implementing the standards. The reasons are very often a lack of expertise of authorities in ensuring accessibility, general compliance with legislation in public tenders, insufficient allocation of resources, etc.

DANOVA aims to improve the accessibility of airports, seaports, train stations and bus terminals for blind and partially sighted people by developing a range of new services and capabilities that allow full access to all transport information, facilities, and services, where visually impaired people are no longer considered as "discriminated passengers to be helped", but as citizens who can travel independently and use all services offered like other passengers without disabilities. The DANOVA Capitalisation Strategy summarises the results and experiences of the project to make them easily transferable and useful for stakeholders. It is designed as a practical document to help policy makers, service providers, management of transport facilities and services, and companies working with passengers to better understand the results, experiences, and solutions of the DANOVA project. It provides insights into existing innovative solutions that have been implemented worldwide, a description of the accessibility assessment guidelines and results, a characterisation of the transnational concept of fully accessible transport, a summary of the DANOVA pilot implementation and a recapitulation of the DANOVA training courses. This document is a one-stop shop of DANOVA results for stakeholders interested in this topic.

2. EXISTING SOLUTIONS AND BEST PRACTICES

Accessibility of the environment and information for visually impaired people is of paramount importance for their inclusion in society. Adequate accessibility is often provided by various solutions available in transport terminals and elsewhere. Many of these solutions and measures have a high potential for transfer to other facilities dealing with similar problems.

To facilitate this transfer of usable solutions and to provide a basic insight into the variety of measures that improve access to places and services for visually impaired people, a catalogue of existing solutions and good practises has been developed.

A common methodology was developed to identify assistive technologies, environments and infrastructures, approaches, strategies and standards in the field of accessibility for blind and partially sighted people. All partners of the DANOVA project contributed with best practises and examples of innovative and/or useful solutions, which were published in a collection of cases in the DANOVA Catalogue. Within the Catalogue, the cases are divided into different categories, all of which are explained in the vocabulary to facilitate the use of the document. For each case, information on inclusion of visually impaired persons, long term sustainability of the case and contact information are also provided.



https://www.interreg-danube.eu/uploads/media/approved_project_output/0001/53/72bb411306a7538de820a28829aea8e7f40a7d7c.pdf

Figure 1: DANOVA Catalogue of existing solutions and best practices

The Catalogue contains 61 cases, all of which are applicable to transport facilities. In the following subsections an overview of the cases in various categories can be found.

2.1. ACCESSIBILITY POLICIES, CUSTOMER SERVICE STANDARDS AND PROCEDURES

Policies, standards, and codes of conduct can create barriers for visually impaired passengers, but they can also help to remove them. An organisation's accessibility policies should create a shared understanding of why accessibility is important and how it fits into the organisation's framework or vision and core values. Service standards and procedures set clear expectations and lead to a better travel experience for visually impaired passengers when they are tailored to the needs of passengers with disabilities.

The best examples of an accessibility policy are the establishment and operation of a permanent working group or council to deal with all aspects of accessibility. Such a policy exists at Vienna Airport and in the Municipality of Maribor, where a working group/council has been established. A good example of a service standard is a Universal Design and accessibility guide as used by the Budapest Transport Centre (BKK). It defines the functional, technical and aesthetic requirements in a uniform way, to create an integrated image for a uniform and transparent passenger information service and to make it accessible to all types of passengers. The guide must be taken into account in the design of customer centres, pedestrian underpasses, tram and bus stops.

2.2. DISABILITY AWARENESS STAFF TRAINING

It is important that transport facility staff are aware of the needs of passengers with reduced mobility (including visually impaired persons) and are able to respond appropriately to their needs. One of the most effective ways to achieve this is to implement an appropriate training programme. The Austrian Federal Railways (ÖBB) regularly provide training for train attendants, sales staff, service staff and customer service staff on how to deal with people with disabilities (correct behaviour, wording, support, legal background, etc.). The trainings are conducted by external trainers who have special knowledge and understanding of the different needs of passengers with disabilities.



Figure 2: The Austrian Federal Railways disability awareness training at Vienna a railway station

2.3. GUIDANCE AND SIGNAGE (ACOUSTIC, TACTILE, VISUAL, BRAILLE)

In general, transport facilities should be designed, built and managed to facilitate orientation. Orientation involves finding your way, avoiding obstacles that could pose a hazard, and knowing when you have reached your destination. Appropriate visual, auditory and tactile information should be provided to facilitate orientation and wayfinding. Visual orientation aids, signage and tactile information, such as a change of material or tactile walking surface indicators (TWSIs), should be provided at key decision points to facilitate orientation and wayfinding.

Acoustic: examples include remote controller for visually impaired passengers that activates audio-and voice-based traffic lights, real-time travel information displays and subway escalators as in case of Budapest Transport Centre (BKK). Also in Linz (AT) the acoustic announcement of line number and direction of a tram or bus can be activated at a stop with a radio transmitter that passengers who want to use this service carry with them. In Innsbruck (AT), passenger information displayed on screens at tram and bus stops can be read aloud at the push of a button. Other cases include voice announcements in public transport vehicles, announcements in elevators, audio guide maps, airport flight announcements and detailed audio directions at stations.



Figure 3: Acoustic announcement of timetables at a bus station in Innsbruck, Tyrol

Tactile: Cases include use of indoor and outdoor tactile walking surface indicators (TWSIs). At Vienna Airport, temporary tactile walking surface indicators were used during reconstruction work to redirect blind passengers. A case is described in which an orientation map was created in relief with lines and shapes that can be perceived and recognised both by touch and by lettering in Braille.



Figure 4: Example of tactile orientation plans (hospital in Zadar, Croatia)

Visual: Accessible visual guidance and signage means the use of appropriate colours and contrasts, large and legible fonts, appropriate placement of visual elements (pictograms) and adequate lighting. Included cases show accessible signage with appropriate font type and size, yellow letters on a black surface and an overall design based on the International Civil Aviation Organisation (ICAO) recommendations for passenger terminal signage. The placement of information displays is also important, as shown in the case of optimised visual display and the placement of information screens at eye level with optimised visual characteristics.

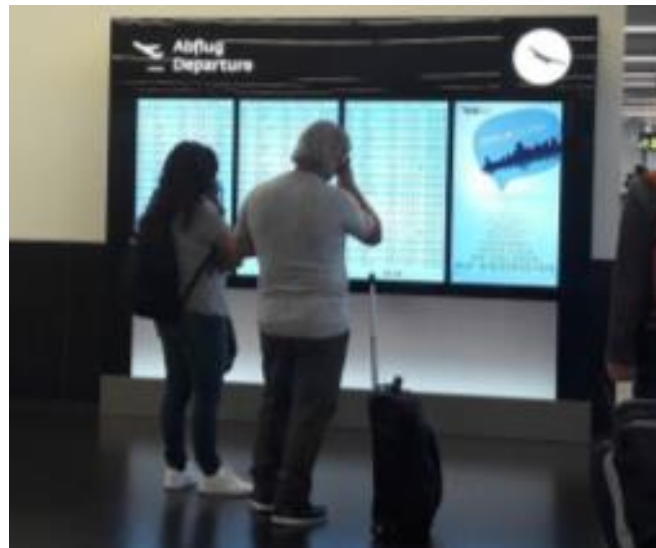


Figure 5: Accessible information displays at Vienna International Airport

Braille: examples include Braille inscriptions on doors and lift control panels. The most interesting case is the translation configurator, which automatically translates content into Braille and creates the

corresponding 3D models for 3D printing in aluminium or other materials. This enables the printing of Braille add-on signs (handrails or similar) that can be used at all transport terminals.



Figure 6: Ad-on for handrails with raised lettering and inscription in Braille printed with 3D printer

2.4. DEPARTURE/ARRIVAL POINTS, WAITING AREAS

These types of cases depict solutions for platforms, gates, queuing as well as to solutions related to waiting areas in airports, ports, and rail/bus stations. One such example is a calling point located in the concourse of an airport terminal and equipped with accessible intercom to allow persons with disabilities to receive support at any time.



Figure 7: Accessible calling point for passenger with reduced mobility at Budapest airport

2.5. MOBILE APPLICATIONS AND VISUAL INTERPRETATION SERVICES

There are many mobile applications supporting passengers with visual impairments while a visual application service is one in which remote agents guide passengers via video using the passengers' smartphones or smart glasses. There are several such services, e.g. Be My Eyes, AIRA, and there are also country-specific services that provide this type of assistance to visually impaired passengers in their own language.

The cases described in the DANOVA Catalogue include several navigation apps, e.g. Lazarillo, MyWay and also INTROS, an app that assists visually impaired passengers with an acoustic signal indicating the arrival of the vehicle on the chosen route, indicating the position of the vehicle door, opening it and signalling to the driver that a person may need special attention.

The catalogue contains a very interesting example of the navigation and labelling app NaviLens, which was specially developed for visually impaired users. Colourful tags are readable from afar through the app helping passengers find their way around provide real-time passenger information in different languages.

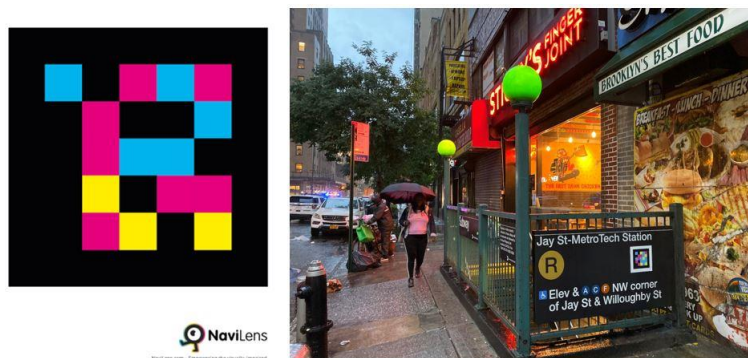


Figure 8: Examples of NaviLens tag (www.navilens.com)

2.6. VENDING MACHINES

Vending machines are too often not accessible for visually impaired persons. Touch screens and the lack of physical buttons can make vending machines difficult to use for partially sighted persons and impossible for blind persons. Vending machines such as the Austrian Federal Railways ticket vending machine, which switches to a mode with a different layout with increased contrast and font size where each screen contains only one question and the text meets the standards for "easy reading" (certified), are a good example of how to deal with this problem.



Figure 9: Ticket machine with simplified mode for visually impaired passengers at Austrian Federal Railways

ATMs with audio output and optimised visual display are another best practise example, while in Norway's Quickomat, a ticket automation solution providing full access to visually impaired people includes a talking interface to end users.

2.7. FACILITIES FOR GUIDE-DOGS AND SERVICE ANIMALS

For more than 100 years, people with disabilities have relied on animals to help them live and travel independently. Although these animals help passengers in different ways, they also have needs of their own. Large transport terminals, especially airports, are required to set up areas for service animals where passengers with disabilities can allow their animals to relieve themselves. Cases include guidelines for relief areas for service animals and rest areas for guide dogs at an airport, and a case where designated seats with spaces for guide dogs are provided on long-distance trains.



Figure 10: Foldable seat on a train provides room for the assistance dog it Railjet train in Austria

2.8. MISCELLANEOUS

The DANOVA catalogue contains further best practise examples on the topic:

- cooperation with stakeholders, e.g. Panel for Mobility and Infrastructure (advice to transport infrastructure managers by a non-governmental organisation) or Advisory Centre for Accessibility for Blind and Visually Impaired People (advice on accessible design/build and accessibility on the internet with a focus on the needs of blind and visually impaired people);
- provision of services for passengers with reduced mobility, such as sighted assistants for blind persons, Mobility Service Central for passengers with disabilities offering pre-trip advice and assistance during the journey, or providing contributions to the newsletter for blind and visually impaired persons;
- infrastructural solutions such as uniform marking of vertical glass surfaces and doors to solutions for closing off the low spaces under stairs and escalators.

3. ASSESSMENT OF THE ACCESSIBILITY TO BLIND AND PARTIALLY SIGHTED PASSENGERS

3.1. DANOVA ASSESSMENT METHODOLOGY

In the context of DANOVA, the focus is on unhindered access to transport terminals (airports, ports, train/tram, and bus stations), which includes physical access, access to pre-travel and post-travel information, and access to services supporting blind and partially sighted persons. DANOVA Assessment methodology provides a common methodological approach to assessing the level of accessibility for visually impaired passengers in all before-mentioned areas. But it does not include accessibility assessment for passengers with other types of disabilities (e.g., wheelchair users).



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Figure 11: DANOVA Assessment methodology

The DANOVA Assessment methodology allows for evaluations of accessibility for different transport terminals, from airports and ports to train and bus stations, from large terminals to smaller ones. The methodology addresses the physical accessibility of each transport terminal and verifies the policies and standards of each assessed site as well as reviewing compliance with national regulations. The assessment consists of three main segments:

1. review of national environment (regulations),
2. off-site assessment (access to information and rules of conduct),
3. on-site assessment (built environment assessment).

Within DANOVA, assessment is organized in modules so that both, the assessment process and the results, are easier to understand. As mentioned earlier, there are two different parts of the assessment - the off-site and the on-site assessment. The first part consists of eight modules related to access to information and codes of conduct, while the second part deals with the built environment and consists of eleven modules.

- Off-site assessment modules - Access to information and rules of conduct
 1. Accessibility policies
 2. Customer service standards
 3. Disability Awareness Training
 4. Website
 5. Smart-phone app
 6. Telephone services
 7. Personalized assistive technologies

- DANOVA Modules On-site assessment – Built environment
 - 8. Approach and departure to and from the site
 - 9. Entrance to the site
 - 10. Inside circulation
 - 11. Security screening and customs
 - 12. Sanitary facilities
 - 13. Shopping and catering facilities
 - 14. Waiting areas
 - 15. Departure point(s)
 - 16. Arrival point(s)
 - 17. Evacuation routes
 - 18. Exit from the site

Each of these modules is built using DANOVA building blocks:

- Parking – car
- Parking – taxi
- Bus stops
- Tram stops
- Train stops
- Signs
- Displays
- Paths, corridors
- Travellers / Passenger conveyors
- Doors
- Stairs
- Ramps
- Lifts
- Escalators
- Counters
- Machines
- Toilets
- Service animal relief
- Evacuation route

DANOVA modules are custom-built according to specifics of each terminal. The relationship between DANOVA building blocks and DANOVA modules is shown in the figure below.

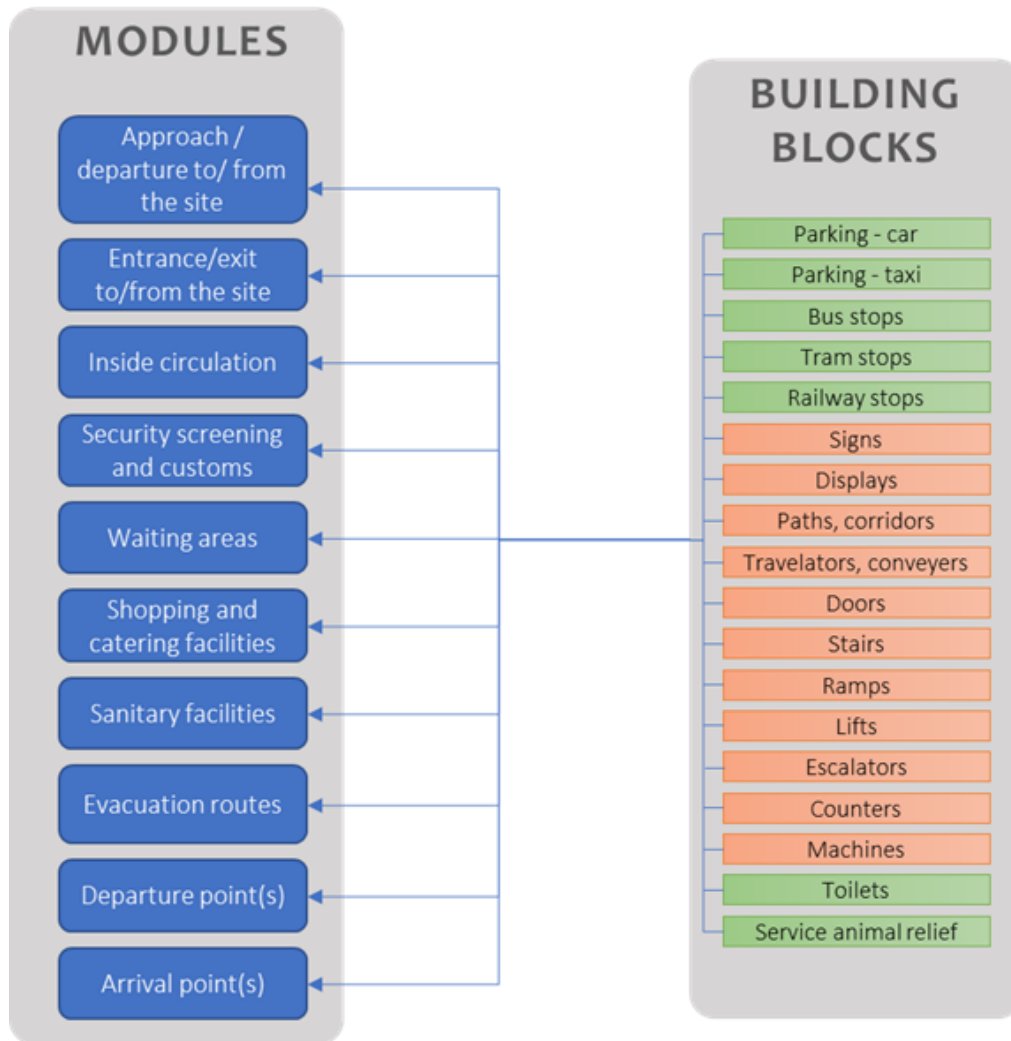


Figure 12: Relationship between DANOVA modules and building blocks

3.1.1. Assessment process

Assessing the accessibility of a transport terminal is a multistep process (see Figure 13) that requires a dedicated audit team, as this is not a task for a single person. The process starts with in-depth understanding of the DANOVA Assessment methodology by whoever is organizing the assessment process.

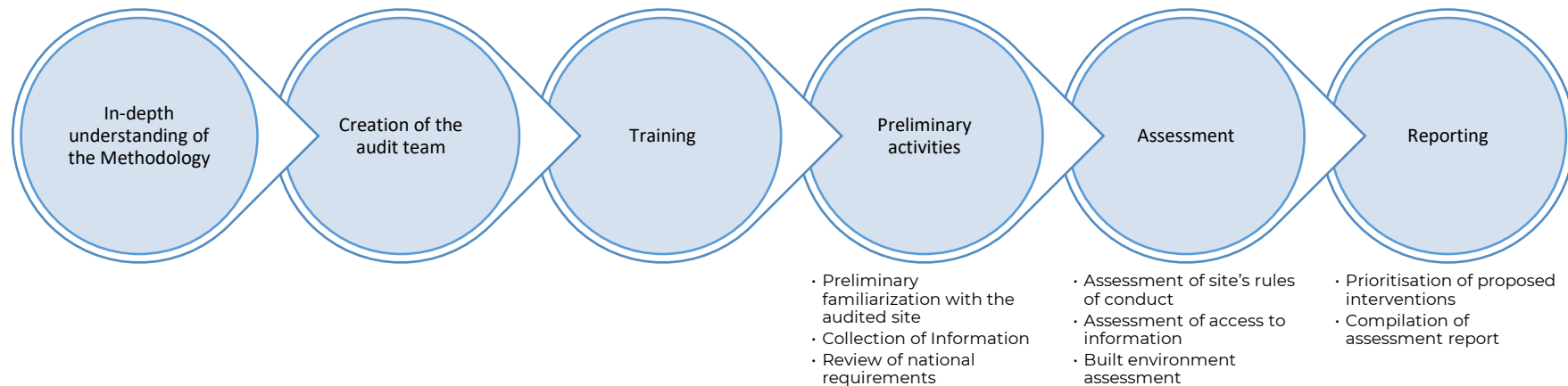


Figure 13: DANOVA assessment process

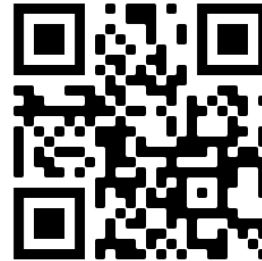
According to the methodology, the minimum number of people on the audit team is two; ideally, the team should consist of at least four people:

1. **representative of the transport terminal** (provides background knowledge of the building, operational procedures, specific legislation etc., and grants access to restricted areas accessible to passengers);
2. **expert in the field of accessibility for visually impaired persons** (should act as a team leader to coordinate the work of the audit team);
3. **representative(s) of blind and partially sighted persons**. It is ideal to have two representatives – one blind person and one partially sighted person.

Before the assessment begins, members of the audit team need to be trained on the use of the DANOVA Assessment methodology. The two recordings of DANOVA trainings are publicly available at



<https://youtu.be/tsfHHoInteg>



<https://youtu.be/oFuYjrraM7I>

Figure 14: Recordings of DANOVA online trainings

The next step in the process is the familiarization of the team with the transportation terminal being assessed. Initial site visits need to take place to allow audit team members to gain a basic understanding of the site being audited. The process continues with the collection of information on national regulations and standards, rules of conduct (policies, standards, information about staff training), and information sources (webpage, apps, information/telephone services). Once all data are collected, a review of national requirements takes place. In this phase, the team members should be familiarized with the national regulations and standards. If this is not the case, it will be impossible to assess the site's compliance in later phases. At this stage, the actual assessment begins with an evaluation of the site's code of conduct covering three different aspects - accessibility policies, customer service standards, and disability awareness trainings. To obtain this information, interviews with terminal managers need to be conducted.

In parallel, an assessment of access to information takes place. There are four elements to be considered – website, dedicated smartphone app (if available), telephone services and possibility of personalized assistive technology use. The audit team also checks whether the site offers information (and reservation of special services for people with disabilities, if applicable) via the phone and whether personal assistive technologies are available or can be used at the transport terminal.

The assessment of the built environment is the central part of the audit. All areas of the transport terminal accessible to passengers are inspected, including restricted areas of airports and ports (passenger areas behind security checkpoints).

Once all three main segments have been evaluated, the evaluation report is prepared. Based on the findings, audit teams draw up recommendations on how to improve the accessibility of the terminal. Recommendations are given in the form of a proposal for interventions ranked from most to least urgent. The audit team compiles a report containing a brief presentation of the transportation terminal, recommendations in the form of prioritization of interventions, and an evaluation grid (all tables used for the evaluation). The central part of the report is the prioritization of the interventions to be used by the transportation terminal manager for the creation of an action plan for improving the accessibility of the terminal.

3.1.2. Assessment criteria

The DANOVA Assessment methodology uses a five-point scale evaluation based on hazardousness, accessibility, and satisfaction criteria. Criteria of hazardousness are used for the built environment within on-site assessment where bodily harm can occur. It is not used for evaluation of the off-site assessment, including access to information and rules of conduct.

DANOVA five-point scale:

1. Hazardous, inaccessible, and unsatisfactory

The evaluated element is dangerous and poses a hazard to blind and/or partially sighted persons, and the element is inaccessible and is rated unsatisfactory by blind and/or partially sighted persons, it receives the lowest score (1) and is given the highest priority for intervention. All three conditions must be met to assign the lowest rank 1.

2. Inaccessible and unsatisfactory

The rated element is inaccessible and assessed as unsatisfactory by blind and/or partially sighted persons but does not pose a hazard to passengers with visual impairments. The element is rated with rank 2.

3. Unsatisfactory but acceptable

The element is rated unsatisfactory by blind and/or partially sighted persons but does not pose a hazard to passengers with visual impairments, nor is the element inaccessible. The element is evaluated with rank 3.

4. Accessible and acceptable






The element is rated as acceptable and accessible to blind and partially sighted persons; the element is rated with rank 4.

5. Accepted as a Best Practice

The element is rated as acceptable and accessible to blind and partially sighted persons and shows a suitable way of implementing standards. It is important that the element works for the intended user(s) - if the solution is very innovative but does not work for visually impaired people (e.g. due to its complexity), it cannot be given the highest rating.

The rating of the individual elements forms the basis for recommendations in the form of proposed measures. All elements rated 1 have the highest priority, followed by those rated 2. The fully accessible transport terminal (airport, port, train/tram and bus station) cannot have any elements rated 1 or 2, all ranks must be 3 or higher. The rating system used in assessment grid is shown in the table below.

Table 1: DANOVA rating scale

Evaluation rank	Evaluation Criteria	Symbol	Priority for intervention
1	Hazardous, Inaccessible and Unsatisfactory		Highest
2	Inaccessible and Unsatisfactory		Highest
3	Unsatisfactory but acceptable		Medium
4	Accessible and Acceptable		Low
5	Accepted as a Best Practice		None

3.1.3. Prioritization of interventions

As already mentioned, the prioritization of interventions is the main part of the assessment report. Based on the assessment grid, interventions are proposed for all elements:

1. ranked with 1 (Hazardous, Inaccessible and Unsatisfactory),
2. ranked with 2 (Inaccessible and Unsatisfactory),
3. ranked with 3 (Unsatisfactory but acceptable).

Interventions proposed for elements ranked with 1 (posing a danger to passengers) are given the highest priority, interventions proposed for elements ranked with 2 are given medium priority, and interventions proposed for elements ranked with 3 are given low priority. If the assessment does not include items rated 1, 2, and 3, the transportation terminal is rated as fully accessible to persons who are blind and partially sighted

The main outcome of the assessment is a list of proposed interventions grouped by priority. The interventions are ranked from most to least urgent which should make it easier to prepare an action plan for improvement of the assessed site. The list of interventions proposed within the audit is aimed at site managers to improve the assessed terminal.

3.2. DANOVA ASSESSMENT METHODOLOGY IN PRACTICE

The assessment of the accessibility to blind and partially sighted passengers was performed at ten transportation terminals consisting of six airports, two seaports, and two public transport systems:

- Airports
 - o Dubrovnik (HR)
 - o Zilina (SK)
 - o Sarajevo (BA)
 - o Podgorica-Tivat (ME)
 - o Budapest (HU)
 - o Chisinau (MD)
- Ports
 - o Dubrovnik (HR)
 - o Kotor (ME)
- Public (bus) transport:
 - o Budapest (HU)
 - o Maribor (SI)

3.2.1. Assessment outcomes

The main outcomes of the assessment of accessibility for blind and partially sighted passengers were recommendations for improvements. These recommendations were given as a list of interventions for each assessed site. For all assessed sites, 193 interventions were proposed. The great majority of interventions refer to the built environment.

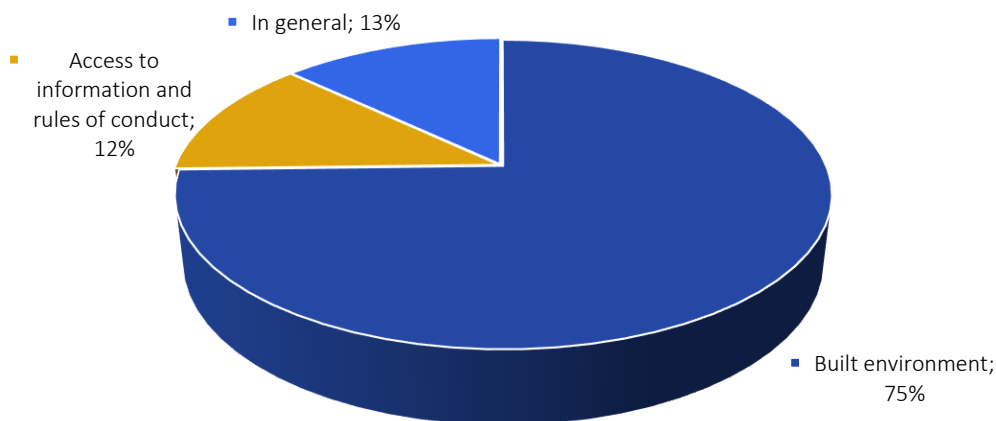


Figure 15: Proposed interventions by type

Out of 193 proposed interventions, 48 are of highest priority, 68 are of medium priority, and 77 are of low priority, as shown in the figure below.

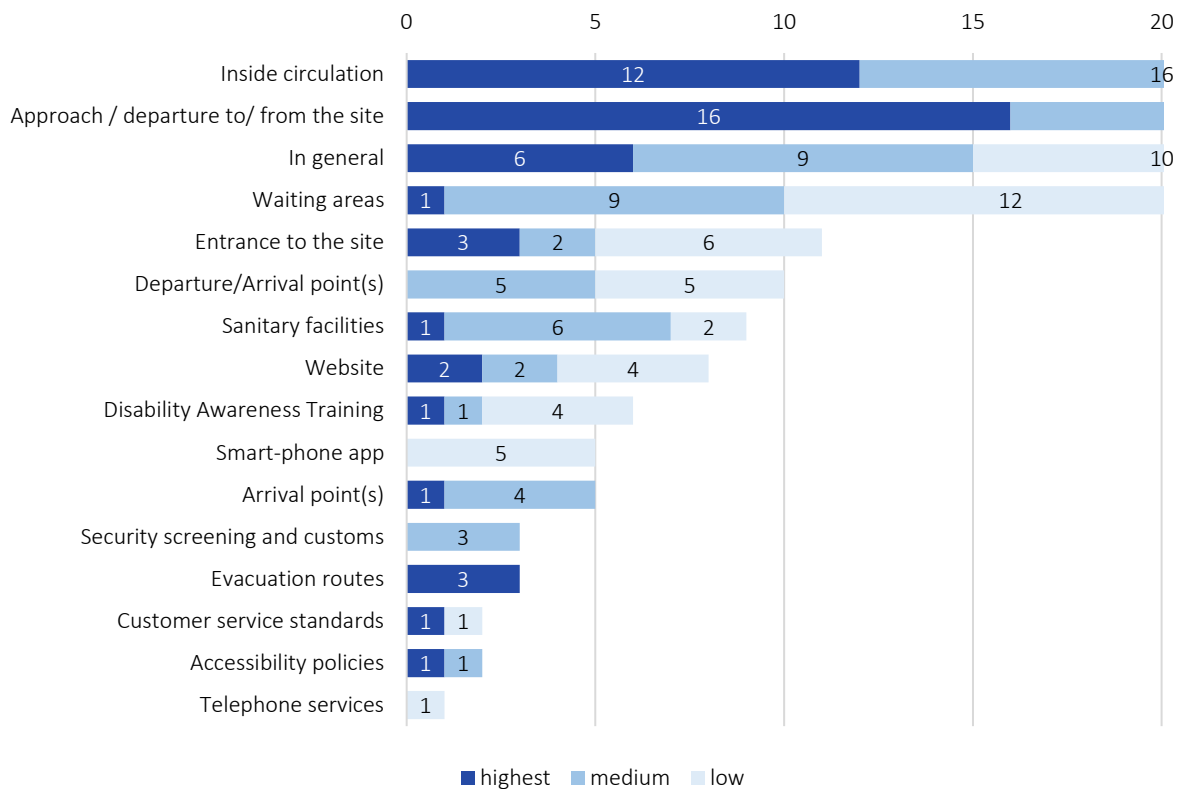
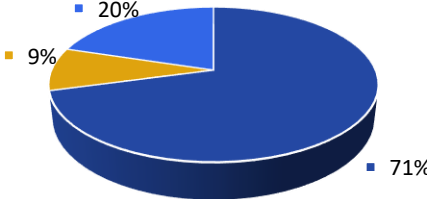
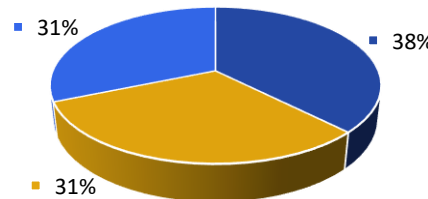
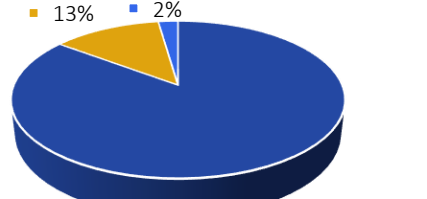


Figure 16: Prioritization of interventions per DANOVA module

For airports and seaports, proposals on interventions are somewhat similar and can be summarized in several points – installation of TWSIs, tactile orientation plans, website accessibility, under stairs areas, and contrasts. But for bus stations, the assortment of proposals is much broader, ranging from TWSIs, evacuation routes, lifts, timetable displays, signs and displays, guidance throughout terminals, accessibility policies, staff training, websites, and many more.

Table 2: Proposed interventions per terminal type

AIRPORTS	SEAPORTS	PUBLIC TRANSPORT SYSTEMS – BUS
 <p> ■ Built environment ■ Access to information and rules of conduct ■ In general </p>	 <p> ■ Built environment ■ Access to information and rules of conduct ■ In general </p>	 <p> ■ Built environment ■ Access to information and rules of conduct ■ In general </p>
<p>Highest priority interventions</p> <ul style="list-style-type: none"> - the installation of TWSIs, outside and inside terminals, - the placing of tactile orientation plan, - contrast marking of stairs, - cordoning-off of under-stair area, - general recommendations – (glass) wall contrast and revolving doors. 	<p>Highest priority interventions</p> <ul style="list-style-type: none"> - the installation of TWSIs outside terminal in both seaports (including TWSIs to public bus stops), - website accessibility to visually impaired persons. 	<p>Highest priority interventions</p> <ul style="list-style-type: none"> - evacuation routes (installation of evacuation alarm and signalling, evacuation plan), - the installation of TWSIs, outside and inside terminals, - installation of a large freestanding timetable display, - an intercom system at the information desk, - positioning of contrasting strips on stairs, - improvement of sanitary facilities (emergency alarm), - ensuring alternatives for touch-screen operated machines, - proper entrance illumination, - adoption of accessibility policy and customer service standards, - regular implementation of disability awareness training with an emphasis on visual impairments, - improving website accessibility for visually impaired persons.

Based on interventions proposed for six audited airports, it might be safe to state that aviation legislation and international industry standards play a role in the accessibility of airports to persons with mobility impairments. This cannot be stated for seaports and urban public transport systems because there is not enough data – only two seaports and segments of two bus systems were analysed. It must be pointed out that the results described in this report reflect the situation in analysed terminals only and cannot be understood as representative of the whole Danube area

3.2.2. Experiences from assessed sites

The assessment process of all audited sites was carried out by audit teams specifically set up to implement the DANOVA methodology. Six audit teams have performed ten assessments. The set-up process and selection of audit team members started in the spring of 2021. Teams were composed of representatives of terminals, experts on visual impairments and accessibility, technical experts on web accessibility, representatives of blind and partially sighted persons, partners and other external members if needed. Audit teams were of different sizes, comprised of 5 to 8 members. In April of 2021, two online trainings for audit team members were carried out where the DANOVA Assessment methodology was explained. Part of the training was the “Questions & Answers” session, where all doubts and uncertainties were clarified. Additional information was provided in the DANOVA booklet “About accessibility for the visually impaired”.

For organizational reasons, teams used different approaches. Some teams met online several times to discuss the approach and test plan for the site being assessed, while other teams opted for a combination of online and in-person meetings. Regardless, all teams began their assessment with an initial familiarization with the site and preparation of assessment tables. Then interviews with managers and other staff took place, followed by on-site visits. The on-site part of the audit was typically completed in one or two days.



Figure 17: Audit teams performing the assessment

Following recommendations were made:

- audit team ought to be composed of experts in different fields,
- team members have to be familiar with the methodology and be properly trained on its application,
- the team needs to meet several times to discuss the approach to assessment,
- tasks must be delegated to team members, and the division of tasks has to be clear,
- familiarization with the audited site is crucial,
- assessment grid tables must be prepared before an on-site visit (this requires detailed knowledge of the site).

It can be summarized that for a successful assessment the team needs to be:

- competent in the application of the DANOVA Assessment methodology,
- familiar with the audited site,

and be composed of representatives of blind and partially sighted persons in order to achieve relevant results.

For detailed information on the experiences and results of the accessibility assessment for blind and visually impaired passengers carried out as part of the DANOVA project, see the DANOVA Transnational assessment report.



https://www.interreg-danube.eu/uploads/media/approved_project_output/0001/53/a674cdebd60bc5384c38f4589ac278dbad82d9f0.pdf

Figure 18: DANOVA Transnational assessment report

4. TRANSNATIONAL CONCEPT OF COMPLETELY ACCESSIBLE TRANSPORTATION FACILITIES TO BLIND AND PARTIALLY SIGHTED PASSENGERS IN THE DANUBE REGION

Through an active involvement of stakeholders, the partnership has developed a common transnational concept of completely accessible transportation facilities to blind and partially sighted passengers. The concept applies to airports, ports, public bus, tram and train stations. The aim of the concept is to create a scenario of a transportation facility where blind and partially sighted passengers have full access to all information and services, just like passengers without disabilities. The recommendations of the DANOVA Transnational Concept are derived from the results of the activities carried out in the framework of the project as well as from the Transnational Working Group, composed of representatives from transport operators, associations representing blind and partly sighted people, local public authorities, experts from technical and innovative companies, and researchers from academia and universities.

DANOVA's Transnational Concept provides practical guidance for public transport providers on the issue of accessibility for visually impaired passengers. Applying the concept of fully accessible transport facilities, two aspects in particular must be taken into account:

- A basic understanding of what measures are needed to enable independent mobility for blind and partially sighted people, which measures are most important, and the time and costs involved in their implementation
- A clear overview of the applicable measures and their relevance.

The Transnational Concept of DANOVA contains both, background information on accessibility measures for blind and partially sighted persons in relation to public transport, showing their relevance and the estimated effort for implementation in general, and a prioritized checklist of measures for different types of transport.

4.1. UNDERSTANDING REQUIREMENTS OF BLIND AND PARTIALLY SIGHTED PERSONS

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

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

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

It is important 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 full 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, for example, tactile guidance systems and signage, structural protection against potential hazards or high-quality audio output.

Another principle that should be applied in any case to achieve accessibility for visually impaired people is to strive for a certain uniformity. This is a major challenge, especially when it comes to solutions implemented in different countries with different laws and standards and different customs. However, decision-making should at least take into account that familiar circumstances, solutions and technologies are a great advantage in terms of usability and accessibility.

4.2. ELEMENTS TO BE CONSIDERED

In the context of the DANOVA project, accessibility of transport 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 (see chapter 3.1 *DANOVA Assessment methodology*). Consideration of these aspects and the details listed in the DANOVA Assessment methodology in principle ensures accessibility along the entire mobility chain and thus an unimpeded journey for visually impaired passengers. Building on the DANOVA Assessment methodology, the DANOVA Transnational Concept goes beyond the three aspects and defines the following elements:

- Inclusion strategies
- Provision of services and support
- Accessibility of digital provisions
- Accessibility of the built environment
- Accessibility of equipment in the built environment
- Accessibility of vehicles

4.2.1. Inclusion strategies

A cornerstone of a company's active commitment to accessibility is that appropriate rules are established to guide management 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 among management and all staff are the key to quality inclusion strategies and optimal implementation in practice. The involvement of representatives of blind and partially sighted people and experts in the field of visual impairment in the development of policies, standards and staff training is crucial to meet the real needs of the target group.

To ensure the continuous involvement of blind and partially sighted people and 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 operator or the competent authority, and the consulting experts should also be remunerated for their services.

Inclusion strategies are fundamentally important. Depending on their impact on safety, they are considered either "must" (accessibility measures and staff sensitization due to their impact on e.g. evacuation) or "should". It is assumed that the implementation of these measures requires medium resources in the company, is embedded in a few key processes and is implemented in a medium timeframe.

4.2.2. 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. 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.

Most of the measures in this group are nice to have but not essential, because while they provide remarkable support, neither safety nor independence are essentially dependent on them. Only three categories are considered "must haves": accessible counters/info points, facilities for service animals and - last, but not least - measures related to evacuation. Most of the measures are assumed to be of medium cost and time.

4.2.3. Accessibility of digital provisions

Web accessibility is an important aspect of accessibility for visually impaired people in general and specifically in relation to transport services. Websites and smartphone apps have become a frequently used source for all kinds of information and services that enable 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 largely eliminates the need for additional solutions for visually impaired passengers, which is in line with the Universal Design approach.

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

4.2.4. Accessibility of the built environment

Measures that directly affect the built environment are certainly a key component in terms of accessibility of transport facilities. They are also the ones that the DANOVA Assessment methodology deals with in most detail. Basically, all interventions in the built environment aim at enabling safe and independent movement in all parts of the travel chain of a transport terminal. This is mainly achieved by facilitating orientation, avoiding unnecessary obstacles, and securing and marking unavoidable obstacles.

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

1. Avoiding obstacles

To avoid obstacles from the outset, special attention should be paid to clear and simple room structures, intuitively comprehensible positioning of room and operating elements and the avoidance of unnecessary hazards. The choice of colours and materials, lighting conditions and room acoustics play an important role in this context. In this way, orientation systems, additional information and the safeguarding/marketing of hazards can be kept sparse and remain comprehensible.

2. Orientation systems

Orientation systems must be clearly structured, intuitively comprehensible and consistent. They must be visually and haptically perceptible.

- The basis for good visual orientation is a sufficiently high-contrast design, a 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 independently of accessibility considerations in publicly accessible areas, as they help all sighted people to find their way in an unfamiliar environment. In order to meet the needs of visually impaired people, it is particularly important to place information media so that they are easy to find and approached, to provide good lighting for information media and to design signage so that it is 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, solid furniture, clearly distinguishable floor materials, etc. If spatial structures and elements do not provide sufficient orientation (e.g. no or an incomplete/uncertain orientation line), tactile walking surface indicators (TWSIs) are used.

3. Safeguarding and marking of hazards

Apart from their avoidance, the structural safeguarding of hazardous areas offers the most reliable protection against accidents and injuries, as it does not require interpretation. This refers to measures that make it impossible (or very unlikely) to enter the hazardous area at all - e.g. parapets at the edges, cordoning off the area below stairs, etc. Where hazards cannot be avoided and/or structural protection is incompatible with their function - e.g. stairs, platforms, doors, transparent doors and walls, etc. - visible and tactile marking is required to draw the

attention of passers-by to them. Visually, people's attention is drawn by high contrast marking (e.g. a strip on the edge of a step) and the use of specific TWSI for tactile guidance.

4. Operating elements, information and signals

The built environment contains various elements that provide the information necessary for access and use. "Information" in this sense can be anything from a simple difference in a surface on the wall that highlights a button to indicate that it is there, to a signal that is known or intuitively interpretable and therefore provides information quickly, to actual textual information. For controls in particular, this also includes information that is necessary for their operation - e.g. clear feedback on whether a button has been pressed and activated or not. For all these types of information, it is extremely important that they are perceptible to all by applying the principle of multiple senses. In many cases, this means that information that is usually only offered to the eye must also be made available via audio output and/or tactile labelling, depending on the area of application.

Most measures for the accessibility of the built environment were rated as "must" in the expert survey. This assessment is supported by the fact that all measures are included in existing international and European standards and guidelines and are therefore considered the recognised state of the art. The implementation of measures in the categories "acoustic orientation", "safeguarding of hazardous areas" and "accessibility of doors" is considered to be very costly. All other measures are considered to be implementable at medium cost and time. However, in relation to the built environment, it is particularly difficult to discuss the effort required for implementation, as this depends so much on the individual type and size of the facility as well as on the existing features.

4.2.5. Accessibility of equipment in the built environment

The built environment contains various elements that are neither purely digital nor part of the building as such but cannot 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.

With regard to acoustic signals and information on demand via remote control, it is important to remember that this must not be the only way of providing information, as this would exclude people who do not have a remote control. For devices in the built environment, the same design principles explained in the above sections apply.

The measures listed in this group are all considered "shoulds" and can be implemented with moderate effort. However, we recommend questioning in individual cases whether a particular measure is essential for safety or not and deciding on its priority accordingly.

4.2.6. Accessibility of vehicles

Vehicle accessibility mainly concerns the experience on board during the journey, which is not the subject of the DANOVA project. However, the journey itself is an essential part of the mobility chain and in practice, public transport providers are likely to be involved in the processes of vehicle selection, design and equipment. Therefore, this aspect is mentioned so that decision makers 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 accessible to all according to the principle of multiple senses, it is important that no additional device is required to reach/perceive them at all. However, solutions that use technologies such as a remote control or a smartphone app to receive signals or information on demand can have an added benefit and increase convenience.

The rating of relevance in the survey varies from "must have" to "should have" to "nice to have". As the DANOVA project is generally not explicitly concerned with vehicles, the measures mentioned in this category are not reliably extensive. Nevertheless, it is retained in the document to remind decision-makers that this area also needs to be considered in principle. Therefore, the categories are listed as "should have" in the checklist. Indeed, the relevance of the measures can be considered analogous to related measures at the site.

4.3. CHECKLISTS

The DANOVA Transnational Concept is intended to be applicable to different types of transport facilities: airports, seaports, railway stations of different sizes, metro stations, bus stations, bus stops and tram stops. Transport facilities differ in many ways, which has a major impact on the type and scope of measures required:

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

It is impossible to go into all types of terminals or even individual situations. Therefore, part of the DANOVA Transnational Concept are customisable checklists that can be used in assessing the terminal's compliance with the concept of full accessibility. The checklists are intentionally designed so that transport companies can adapt them to their individual needs or find their own way through them.

The “DANOVA Transnational Concept of completely accessible transportation facilities for blind and partially sighted passengers in the Danube Region” including checklists is freely available and can be accessed on the DANOVA website.



<https://www.interreg-danube.eu/approved-projects/danova/outputs>

Figure 19: DANOVA Library

Through its results, the DANOVA project provides a certain basis for the efficient planning of meaningful measures for the implementation of accessibility. Preliminary work has been done in the elaboration of the various DANOVA results, especially with regard to the balance between the interests of visually impaired passengers and economic feasibility for transport providers. Nevertheless, in order to achieve optimal results in practice, we recommend entering into direct dialogue and discussing the implementation plan drawn up on the basis of the DANOVA Transnational Concept with local experts and representatives of visually impaired people and adapting it if necessary.

5. PILOT IMPLEMENTATIONS OF INNOVATIVE SERVICES FOR BLIND AND PARTIALLY SIGHTED PASSENGERS

The main component of the DANOVA project was to test innovative and soft measures to improve access for blind and visually impaired passengers as well as for passengers without visual impairments.

In addition to the tests, the transferability potential of each tested solution was also assessed to stimulate implementation in other facilities in the Danube Region. The lessons learned from the tests (how to best and most sustainably implement the tested solutions) and the recommendations for transferring the solutions to other facilities/organisations in the Danube regions are detailed in the evaluation reports of each site, while the general lessons learned are summarised in the transnational evaluation report. All reports are available in DANOVA Library.



<https://www.interreg-danube.eu/approved-projects/danova/outputs>

Figure 20: DANOVA Library

In following sections brief overview of implemented pilot actions, results and contact information is provided.

5.1. AIRPORTS

5.1.1. Dubrovnik airport

Dubrovnik Airport is the main gateway of Dubrovnik region, more than 65% of tourists arrive by air. Therefore, it is essential that the airport is accessible to all passengers. Prior to pilot action implementation, accessibility was not adequate in terms of infrastructure and equipment. Pilot action at Dubrovnik airport consisted of TWSIs and accessible signage installation and website update to ensure accessibility.

Dubrovnik Airport has installed:

- 387 outdoor and indoor metres of TWSIs,
- 55 tactile warning plates,
- 6 orientation maps,
- signage in Braille at sanitary facilities.

The website was reviewed for accessibility and based on the results, improvements were made to the website to improve accessibility for blind and partially sighted passengers. The website is now fully accessible for passengers with visual impairments.



Figure 21: TWSIs and tactile map at Dubrovnik airport

The total value of the pilot measures implemented amounts to 47,118.00 euros, of which the ERDF contribution is 40,050.00 euros.

PROBLEMS FACED

- Definition of technical description of pilot action in public procurement process. Without adequate knowledge determination on which type of the TWSIs should be placed indoor, which ones outdoor is challenging. Consultation with external experts solved this problem.
- As TWSIs implemented are made from stainless steel (indoor and outdoor) with anti-slip surface with small holes, there are problems with cleaning. Specialized cleaning equipment is needed, together with specialized cleaning products stainless steel (especially outdoor).

RECOMMENDATIONS

- Consultation on micro location (placement) of TWSIs with involved stakeholders, especially service providers, within the airport terminal building prior to installation are a must.
- Maintenance of TWSIs should be considered already in planning phase
- Involvement of representatives of blind and partly sighted passengers is necessary.

PILOT ACTION CONTACT

Zračna luka Dubrovnik
Hrvoje Spremić
hrvoje.spremic@airport-dubrovnik.hr

5.1.2. Budapest airport

Budapest International Airport “Ferenc Liszt” (BUD) is the main airport of Hungary and serving 95% of passenger flights to and from Hungary. Prior to DANOVA, Budapest Airport did not have adequate infrastructure and equipment for the accessibility of blind and partly sighted, except for PRM service.

To improve accessibility, Budapest Airport decided to implement an audio-based, hands-on indoor navigation software and mobile application in order to facilitate access to information and mobility of visually impaired passengers at the airport primarily on the landside. Budapest Airport has launched BindiMaps - indoor navigation software and a mobile application that provides voice and speech-based navigation for blind and partially sighted passengers in the landside passenger areas of the terminal. The new beacon technology and infrastructure used in the landside area of the terminal enable a positioning accuracy of 2-4 cm. The introduction of BindiMaps indoor navigation software has significantly improved accessibility for blind and visually impaired passengers at Budapest Airport.

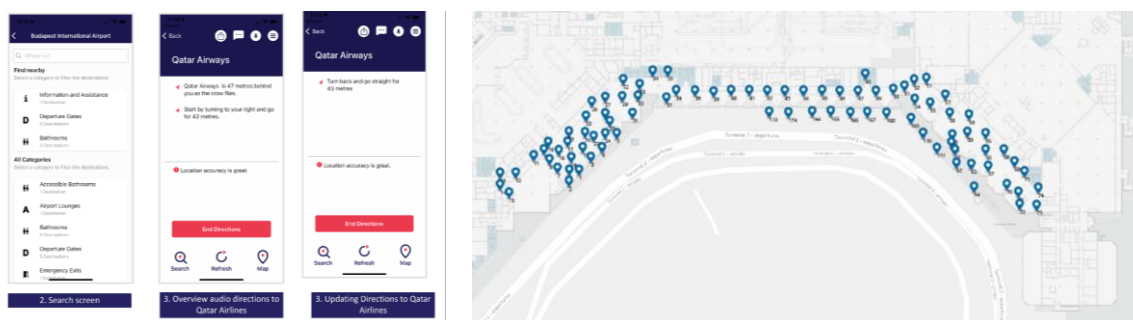


Figure 22: BindiMaps navigation and location of beacons in Arrival Hall of Budapest airport

In addition, Budapest Airport conducted an accessibility audit of its website. Existing website is not fully accessible to visually impaired passengers and updates are needed. As new website is already under development, the recommendations on accessibility audit will be considered. The new, fully accessible, website will be operational in 2023.

The total value of the pilot action carried out is 71,140.00 euros, of which 60,469.00 euros is the ERDF contribution.

PROBLEMS FACED

- Definition of technical specifications for indoor navigation system in the procurement process. Budapest airport had no adequate knowledge to determine what kind of PRM related and IT related functions an indoor navigation software should fulfil. Therefore, help of the external experts was necessary.

RECOMMENDATIONS

- Consultations on the use of BindiMaps software with involved stakeholders, especially service providers within the airport community, to installation are a highly recommended.
- Involvement of representatives of blind and partly sighted passengers is necessary.

PILOT ACTION CONTACT

Budapest Airport Zrt
Andras Balint
andras.balint@bud.hu

5.1.3. Podgorica airport

Podgorica Airport is an international airport serving the capital of Montenegro and the surrounding area. Against the background of the underdeveloped road and railroad infrastructure, air transport comes as the first choice of travelling public when visiting Montenegro. Prior to DANOVA, Podgorica Airport was not accessible to blind and partially sighted passengers in terms of available infrastructure and facilities.

As the main action, Podgorica Airport installed:

- TWSIs with a total length of 213 m (45 m outdoor and 178 m indoor),
- 57 m of tactile warning panels (23 m outdoor and 34 m indoor) and a
- tactile orientation plan with Braille legend.

The pilot action plan also included marking accessible toilets and counters with Braille labels, marking toilet walls with contrasting tape, replacing gate numbers with large-format number markers, equipping all counters with local microphones and installing a video wall in the central hall of the passenger terminal at Podgorica Airport. Additionally, the airport's website was updated to make it accessible to blind and partially sighted passengers.



Figure 23: Video wall, TWSIs and tactile map at Podgorica airport

Total value of pilot action implemented is 50.365,01 EUR.

PROBLEMS FACED

- Procurement procedure for TWSIs needed to be relaunched as one of the two tenders received was substantially non-compliant and the other exceeded the allocated budget. The key issue with procurement of TWSIs is reflected in the absence of available suppliers or low interest in responding to the invitation to bidders.

RECOMMENDATIONS

- Consultation on micro location (placement) of TWSIs with involved stakeholders, especially service providers, within the airport terminal building prior to installation are a must.
- Involvement of representatives of blind and partly sighted passengers is necessary.

PILOT ACTION CONTACT

Airports of Montenegro
Nina Planinić
nina.planinic@apm.co.me

5.1.4. Sarajevo airport

Sarajevo International Airport is the main air entrance to Bosnia and Herzegovina, receiving most of the country's international flights. In recent years, passenger traffic through Sarajevo Airport has increased significantly and continues to grow. To increase capacity, the main terminal is under reconstruction, planned annual capacity of Terminal B after the completion of works will be approximately 2,000,000 passengers on 18,862 m². Not renovated parts of the existing terminal are not fully accessible to blind and partially sighted passengers, with renovation this will be improved.

Within DANOVA pilot action Sarajevo International Airport has undertaken several significant activities to support and facilitate the safe and independent mobility of blind and partially sighted passengers. The scope of activities included both tactile and visual information improvements:

- a total of 136 metres of TWSI were installed indoors and outdoors,
- 500 metres of contrasting guide lines,
- 75 tactile warning panels,
- 30 metres of contrasting warning tape on glass doors
- contrasting pictograms with Braille signage at all sanitary facilities.

In addition, Sarajevo Airport has improved its official website by ensuring sufficient colour contrast, flexible font size adjustment and introducing a built-in screen reader for blind and partially sighted users.



Figure 24: Sarajevo Airport – pilot action

The total value of the pilot measures implemented amounts to 66,018.58 EUR.

PROBLEMS FACED

- The public tender process was fraught with challenges, firstly because of the specialised equipment to be procured and secondly because there was no competition in the region willing to bid.
- The appointed contractor did not adhere to the contract scope and delivery dates. The contractor's use of defective, unsuitable, and inferior materials was also an issue that needed to be addressed.
- Maintenance of the installed stainless steel TWSIs (inside and outside) was also a problem. Special chemicals and cleaning agents that are not harmful to these stainless-steel products have to be used. In addition, special equipment that does not damage

the TWSIs or separate them from the floor material to which they are attached has to be purchased for the maintenance of the TWSIs. The latter is especially important when clearing snow from the TWSI paths in winter.

RECOMMENDATIONS

- Involvement of representatives of blind and partly sighted passengers is necessary.
- Close cooperation with all stakeholders, including service providers within the airport terminal building prior to installation are a must.

PILOT ACTION CONTACT

Sarajevo International Airport
Nermin Zijadić
Nermin.zijadic@sarajevo-airport.ba

5.1.5. Zilina airport

Žilina Airport is located 10 km west of Žilina. The airport is used for air transport of Slovak and foreign airlines, flights of corporate and private aircraft, flight training and sport flying, ambulance flights, special aviation work and the activities of the Slovak Army Air Force. The layout of the terminal is suitable for visually impaired and blind passengers and the big advantage is complete barrier-free accessibility in every part.

Within DANOVA pilot implementation, Žilina Airport has installed

- 132 m of TWSIs (2 m outdoors and 130 m indoors),
- 1 tactile outdoor warning panel and 9 tactile indoor warning panels,
- 1 tactile relief orientation plan with Braille signage,
- 23 doors were equipped with Braille signs.

The entrances on the landside and on the apron were also equipped with the ZOM03S orientation beacons commonly used by visually impaired people in Czech and Slovak regions.



Figure 25: Outdoor TWSIs and ZOM03S orientation beacon at Zilina airport

The total costs for the implementation of the pilot measures amounted to 38,496.00 EUR.

PROBLEMS FACED

- Delay in delivery of indoor TWSIs.

RECOMMENDATIONS

- Involvement of representatives of blind and partly sighted passengers is recommended.
- Use of equipment commonly used by visually impaired people in the region (in case of Zilina ZOM03S orientation beacons) to be considered when designing measures.

PILOT ACTION CONTACT

Zilina Airport
Ronald Wilczek
opu@airport.sk

5.2. SEAPORTS

5.2.1. Port of Dubrovnik

Passenger terminal in Dubrovnik port – Gruž is situated on the ground floor of the main building. It is equipped and organized for port, police and custom department and has been used for touristic and ferry passengers. Terminal building consists of one ground floor.

Within the DANOVA pilot action, the Dubrovnik Port Authority has installed:

- high-contrast labels for visually impaired persons,
- Braille labels for blind persons,
- software to improve website accessibility for visually impaired passengers.



Figure 26: Accessible website and Braille signage in Port of Dubrovnik

The total value of the pilot measures implemented amounts to 25,876.97 EUR.

PROBLEMS FACED

- There was a lack of technical expertise or sufficient knowledge to determine the required design for Braille labels. External expert assistance was needed.
- Lack of technical expertise to assess the accessibility of the website and make changes to make it accessible. Support from external experts was required.

RECOMMENDATIONS

- External support from representatives of blind and partly sighted passengers is necessary.

PILOT ACTION CONTACT

Lučka uprava Dubrovnik
Kristina Laptalo
dpa.kristina@portdubrovnik.hr

5.2.2. Port of Kotor

The Bay of Kotor is located in Montenegro on the Adriatic coast and the Port of Kotor is situated on its south-eastern tip in the immediate vicinity of the Old Town of Kotor. The port of Kotor has the status of a permanent border crossing and a port for international maritime traffic, which is mainly visited by cruise ships. The most relevant part of infrastructure for the accessibility of blind and partially sighted persons are passenger terminal area and ship docking area in front of the terminal. Port of Kotor did not have sufficient infrastructure and equipment in place for the accessibility of blind and partly sighted prior to DANOVA project.

As the main action, the Port of Kotor installed:

- TWSIs with a total length of 410 m (360 m outdoor and 50 m indoor),
- 70 m of tactile warning panels (40 m outdoor and 30 m indoor).
- 2 tactile orientation maps with Braille legend
- Braille signage (indoors) in the sanitary facilities, at the police and customs reception, at the entrance and exit of the terminal building and in staff offices (15 in total).

The port has also conducted an accessibility audit of the website to make it accessible to partially sighted passengers.

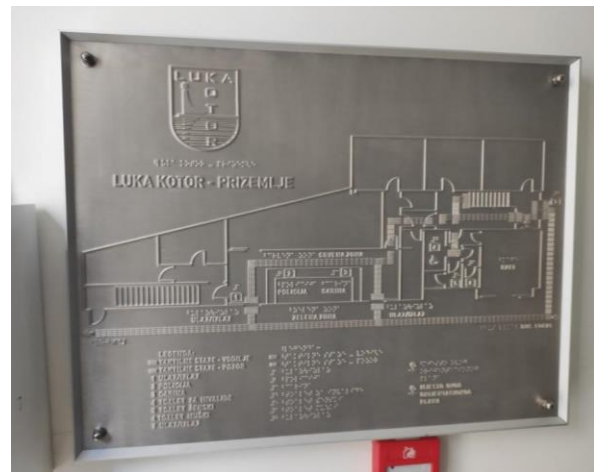
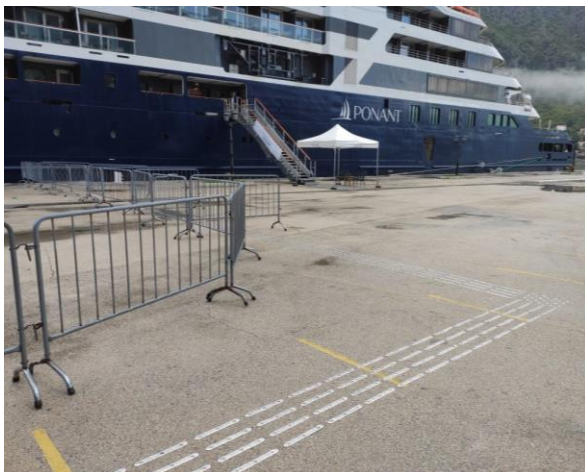


Figure 27: TWSIs and tactile map in Port of Kotor

The total value of the pilot action implemented is 43,640.00.

PROBLEMS FACED

- Lack of technical expertise to determine which type of TWS should be placed indoors and which outdoors. Support of external experts was needed.
- Since the TWSs used are made of stainless steel (for indoor and outdoor use) with a non-slip surface with small holes, cleaning is challenging for specialized equipment and cleaning agents are needed.

RECOMMENDATIONS

- External support from representatives of blind and partly sighted passengers is necessary.
- Maintenance of TWSs needs to be part of the procurement specification so life cycle costs can be properly assessed.

PILOT ACTION CONTACT

Port of Kotor
Maja Danilović
maja.danilovic@portofkotor.co.me

5.3. PUBLIC TRANSPORT

5.3.1. Maribor main bus station

Maribor is the second largest city in the Republic of Slovenia and the capital of the Podravje region. Maribor has app. 110.000 inhabitants and spreads across 147.5 km². Main bus station in Maribor is located in walking distance to city centre and adjacent to main railway station in Maribor. . The station offers city, inter-city and international bus transport services. It has 25 Indoor (roof protected platforms) and 16 outdoor platforms. Prior to DANOVA, the main bus station has had partially adequate infrastructure and equipment for the accessibility of blind and partially sighted.

The DANOVA pilot action consisted of the following interventions:

- installation of two free-standing 55-inch monitors to display the departure times of city, suburban and international buses,
- creation of a stylised map of the bus station
- existing timetables at the bus station were replaced with timetables in a larger format,
- online timetables of the city transport were converted into readable PDF formats,
- stairs at the main entrance of the station were marked with high-contrast markings,
- acoustic signals for traffic lights were installed at the surrounding intersections.

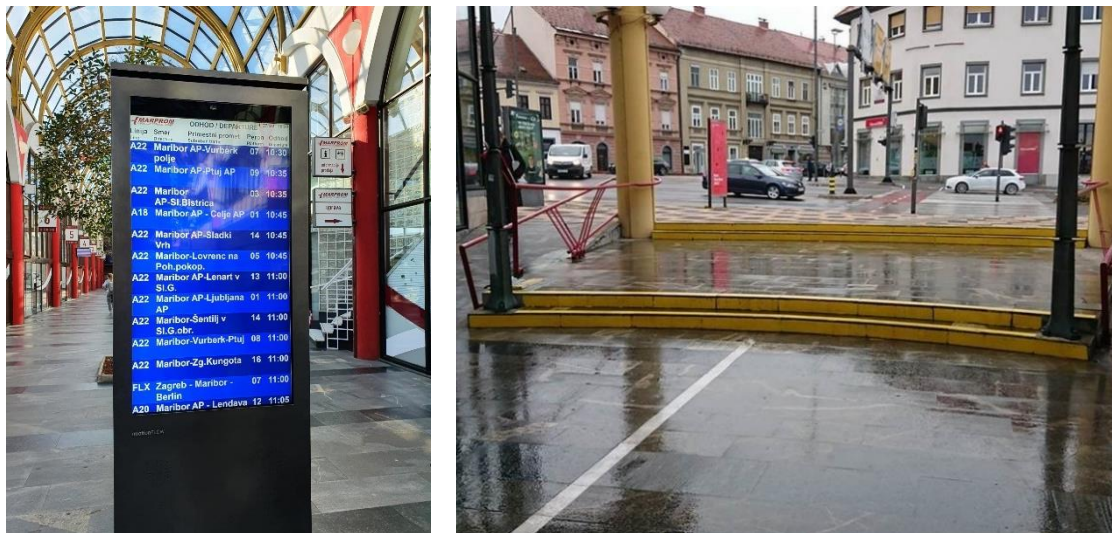


Figure 28: freestanding monitor and contrast marking of stairs at Maribor bus station

The total value of the pilot action is EUR 34,060.00 EUR.

PROBLEMS FACED

- definition of technical description of pilot action in public procurement process as there was no adequate knowledge to determine all necessary technical requirements for large freestanding indoor bus timetable display,
- Coordination of various stakeholders sharing the responsibility for management and maintenance of main bus station,
- Data displayed at the monitor is managed and provided by Slovenian ministry – correction of typographical errors is difficult to achieve.

RECOMMENDATIONS

- Mobilisation of external expert for technical specifications of equipment is strongly recommended.
- Take into consideration also the expected costs and timeline for preparation of data connected to the implementation of IT equipment.

PILOT ACTION CONTACT

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Tadej.kurent@maribor.si

6. TRAININGS TO IMPROVE SKILLS TO ADEQUATELY ASSIST VISUALLY IMPAIRED PASSENGERS

In addition to physical accessibility and accessibility of information, the competence of staff in transport terminals is an important factor in achieving accessibility. Their skills and attitudes play an important role - they can improve accessibility by providing appropriate support, or they can worsen it with inappropriate attitudes or lack of skills. To raise awareness, improve skills and support transport authorities and service providers to improve their organisational policies and procedures, the DANOVA project has provided local and transnational trainings.

The transnational trainings targeted managers of transport authorities and service providers, and focused on planning and managing practises and policies related to accessibility for blind and partially sighted passengers (how to integrate accessibility and inclusive design principles into everyday processes). The local trainings targeted staff working with passengers (e.g. ticket/information counters, check-in, bus drivers, security checkpoints, etc.) and focused on the skills needed to adequately support and communicate with blind and partially sighted passengers.

6.1. TRANSNATIONAL TRAINING

6.1.1. About the training

The transnational training was aimed at the management level of transport facilities, service providers as well as policy makers to raise their awareness. Understanding the needs of visually impaired passengers is of great importance for the management level, as they set the accessibility policies in the organisations, define the standards for customer service and are responsible for staff training, which should include disability training. The legal framework for accessibility for visually impaired passengers is another important issue that the management level needs to understand and consider. Therefore, the legal aspects were also considered and included in the training.

Based on the above considerations, the DANOVA transnational training curricula consists of:

MODULE 1: How do people with visual impairments see?

- Introduction to the concept of blindness and low vision.
- Visual impairment - types and causes.
- Simulations of visual impairment - practical part with simulation glasses.
- Prejudices:
 - o Scientific theory of the emergence of stereotypes and prejudices
 - o Prejudices against blind and partially sighted people
 - o Personal experience and examples

MODULE 2: Daily functioning of visually impaired people

- How do people with visual impairments move?
- Problems and obstacles in everyday life with a focus on passenger traffic - experiences of a person with visual impairment.
- Assistive aids and technologies

MODULE 3: Legislative framework and accessibility standards in the EU related to the visually impaired

- Review of the EU legislative framework
- EU accessibility standards for blind and partially sighted people
- Examples of best practices
- Participant questions and discussion

The training programme includes both a theoretical and a practical part to combine theoretical knowledge with real life situations and personal experiences of visually impaired people. The trainings need to be conducted by professionals experienced in working with people with visual impairments or by experts trained in the field of orientation and mobility of people with visual impairments. At each training, visually impaired and/or blind people should share their experiences with the participants.

6.1.2. Budapest transnational training

The transnational training curricula was implemented in practice at the DANOVA transnational training that took place on 16th of September at the Budapest airport in Hungary. Representatives of the leading structures of the BKK Centre for Budapest Transport, Budapest Airport, Airports of Montenegro, Sarajevo International Airport, Žilina Airport, Dubrovnik Port Authority and Dubrovnik Airport, as well as research institutions and other stakeholders participated in the international training.

The training was led by experts from the *Croatian Blind Union*, who have extensive experience and expertise in the field of orientation and mobility of visually impaired people. In order to make it easier for the training participants to relate the theoretical knowledge to real situations, the visually impaired people presented their own experiences and examples during the training.



Figure 29: DANOVA transnational training in Budapest, Hungary

The training conducted in Budapest shows that such training is necessary, that prejudices need to be reduced, that it is important to provide information on how to communicate with blind people, that the latest elements of the legal framework are known and that it is important to fight prejudices. An important aspect of the training was the sharing of experiences and approaches to accessibility between participants from different backgrounds. This was an unplanned added value of the transnational training.

With an overall rating of 4.55 (out of 5.00), participants were very satisfied with the training and would recommend attending the training to their other colleagues.

6.2. LOCAL TRAININGS

People who encounter people with visual impairments in their daily tasks are important actors in supporting them and creating the necessary conditions for their full inclusion in society and the realisation of their own potential. However, lack of knowledge and information often leads to the formation of negative attitudes and prejudices about the abilities and needs of people with visual impairments. The training "Dealing and communicating with people with visual impairments" was aimed at employees who are in contact with passengers to improve their professional and personal knowledge and skills in the areas of communication, approach and dealing with people with visual impairments.

6.2.1. About the training

The training programme includes both a theoretical and a practical part to combine theoretical knowledge with real life situations and personal experiences of visually impaired people. The trainings need to be conducted by professionals experienced in working with people with visual impairments or by experts trained in the field of orientation and mobility of people with visual impairments. At each training, visually impaired and/or blind people should share their experiences with the participants.

All trainings followed the DANOVA local training curricula:

MODULE 1: How do people with visual impairments see?

- Introduction to the concept of blindness and low vision.
- Visual impairment - types and causes.
- Simulations of visual impairment - practical part with simulation glasses.

MODULE 2: Approach to the visually impaired

- How do people with visual impairments move?
- Respectful and supportive communication with people with visual impairments
- Visual guide technique: initial contact, guidance, rotation, narrow passage, stairs, doors, elevator, seating, entering the car, etc. as needed.
- Presentation of educational videos on proper approach and communication with people with visual impairments.
- Practical part - vision guide technique.

MODULE 3: Daily functioning of visually impaired people

- Problems and obstacles in everyday life with a focus on passenger traffic - experiences of a person with visual impairment.
- Assistive aids and technologies
- Discussion and questions of participants.

The practical part on the technique of guiding people with visual impairments was an indispensable part of the training. This part of the training was always led by an expert trained in the field of orientation and mobility of people with visual impairments. The participants had the opportunity to put themselves in the role of a sighted guide and experience what it is like to be in the "shoes" of a blind person. Practical tasks included instructions on how to make first contact, how to walk on a flat surface, how to use stairs, how to walk through a door, how to sit or how to guide with luggage. Different resources and tools were used to better implement the training: presentations, training brochures, simulation glasses, blindfolds, training videos, typhlo-technical aids, etc.

The trainings were conducted in nine DANOVA countries and the training activities carried out in each country are described in the following section. In addition, contacts with the training providers are given so that potential successors can use these contacts to organise training for their organisations.

6.2.2. Local training – Austria

The training took place on 22nd of September in Graz and was organized by *Austrian Federation of the Blind and Partially Sighted*, 7 participants attended the training. Feedback from participants shows a high level of satisfaction with the training, with a satisfaction rating of 4.83 (out of 5).

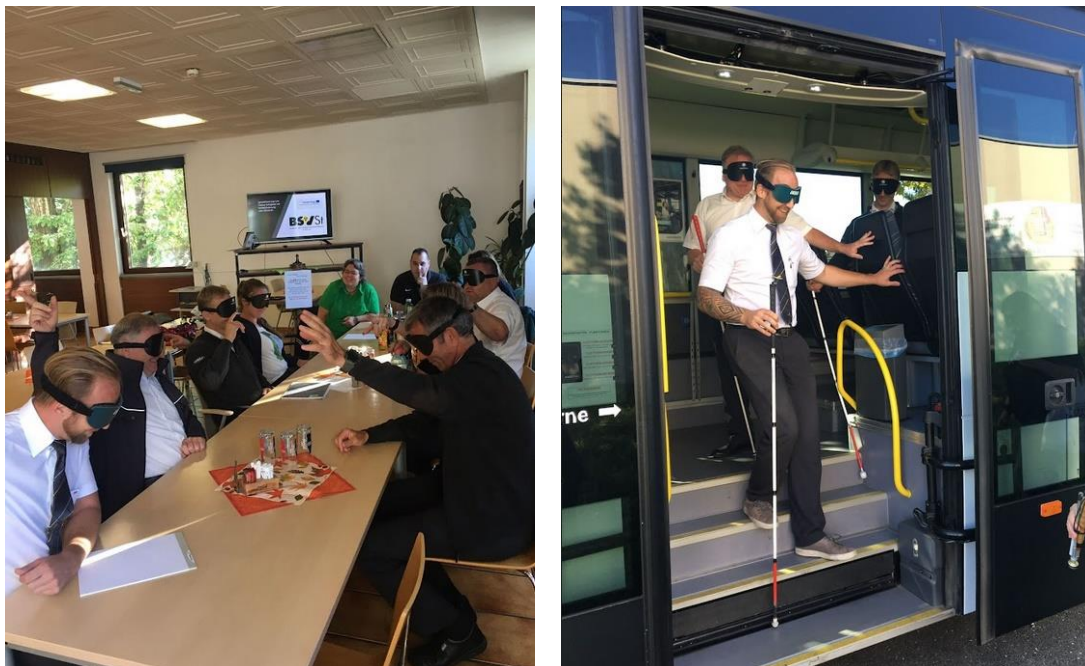


Figure 30: Local trainings in Graz, Austria

The training conducted in Graz shows that there is a need for such training, as the participants found the knowledge of what it means to be blind or visually impaired extremely valuable. Moreover, the participants will recommend their other colleagues to attend the training.

TRAINING PROVIDER:

BSVÖ – Blinden- und Sehbehindertenverband Österreich
www.blindenverband.at
international@blindenverband.at

6.2.3. Local training – Bosnia and Herzegovina

The local training took place on 4th of October 2022, experts and employees from Sarajevo International Airport and customs and border protection officers participated in the local training.

The training was conducted by experts from the *Croatian Blind Union* with extensive experience and expertise in the field of orientation and mobility of visually impaired people. To make it easier for the training participants to relate the theoretical knowledge to real-life situations, the visually impaired people presented their own experiences and examples during the training. The local training consisted of 3 modules that contained the theoretical part and practical assignments. 23 people attended the training, feedback from participants shows a high level of satisfaction with the training, with a satisfaction rating of 4.95 (out of 5).

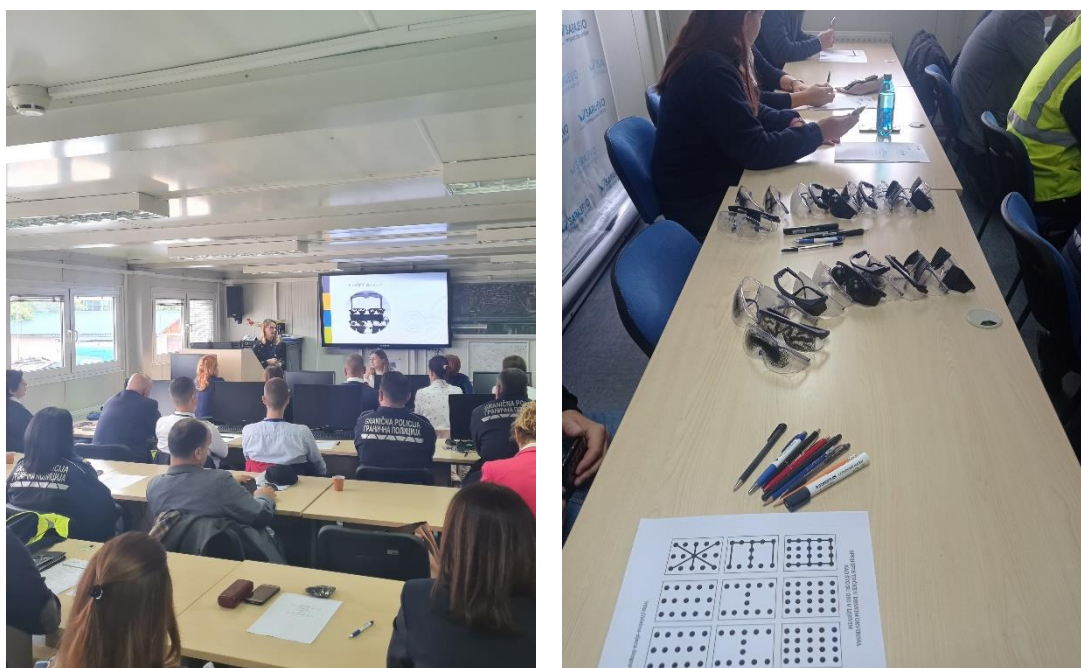


Figure 31: Local trainings in Sarajevo, Bosnia and Herzegovina

Participants emphasised that the training provides useful examples for everyday life and the work environment and shows participants how to approach people with disabilities. Participants also liked the competence of the lecturers, the combination of lectures/exercises/examples, the presentation of the topic and the exchange of information. Participants indicated that they would recommend the training to their colleagues.

TRAINING PROVIDER:

Hrvatski savez slijepih
<https://savez-slijepih.hr/>
hrvatski@savez-slijepih.hr

6.2.4. Local training – Bulgaria

A two-day training was held on 19th and 20th of December 2022, aimed at people working in transport facilities and attended by various staff working with blind and partially sighted people. The training followed the DANOVA training programme, 28 people attended. Feedback from participants was positive with a satisfaction rating of 4,62 (out of 5).



Figure 32: Local training in Varna, Bulgaria

The training was rated as excellent by 92% of the participants. Some participants felt that the training was too long and they had difficulty concentrating 100%. The general feedback we received indicated that the training was appropriate, informative and practical.

The participants agree that the training was useful and that they have acquired new knowledge that will help them to provide appropriate support to blind and partially sighted people.

TRAINING PROVIDER:

Union of the Blind of Bulgaria, Varna branch

www.ssb-bg.net

ssb.sofia@abv.bg

0035952732151

6.2.5. Local training – Croatia

Three local training sessions were conducted in Croatia:

- 27th of September 2022, in Dubrovnik (Croatia) aimed at employees of *Dubrovnik Airport* and *Dubrovnik Port Authority*,
- 7th of December 2022, in Zagreb for employees of *Franjo Tuđman Airport Zagreb*,
- 20th of December 2022, in Osijek for employees of *Osijek Airport*.

All training sessions were conducted by experts from the *Croatian Blind Union* with extensive experience and expertise in the field of orientation and mobility of visually impaired people. To make it easier for the participants of the training to connect the theoretical knowledge with real situations, the visually impaired people presented their own experiences and examples during the training. All together 52 persons took part in the trainings. The participants' satisfaction with the training was high with an average rating of 4,94 (out of 5.00).

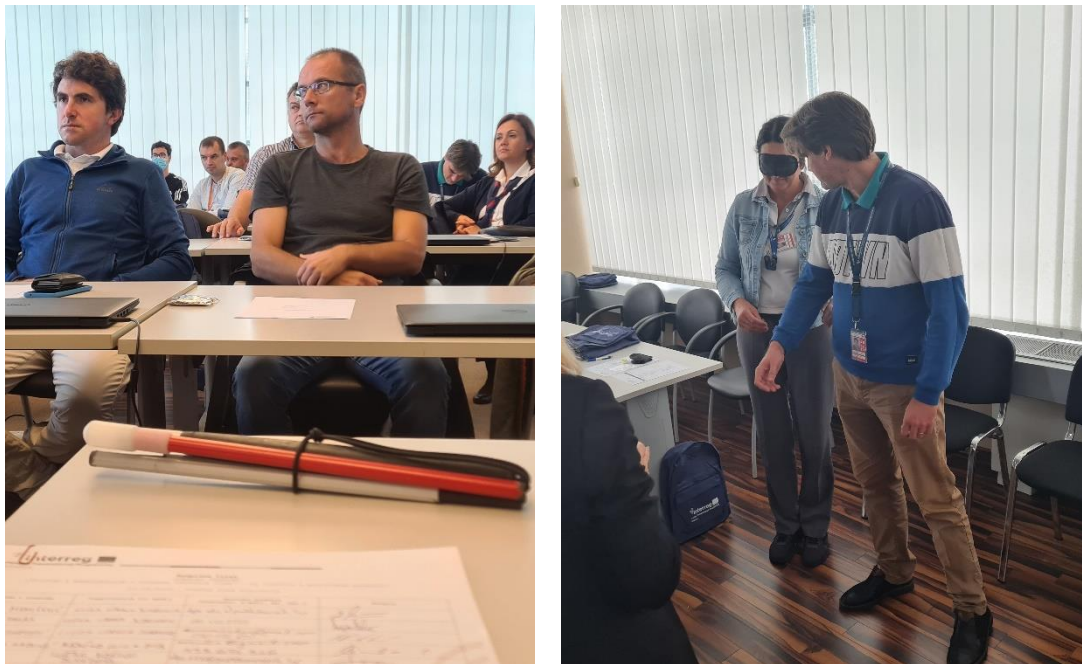


Figure 33: Local trainings in Dubrovnik, Croatia

The experiences from trainings conducted in Croatia show that the participants especially liked the method and practical parts of the training, the information about the real needs of visually impaired and blind people, the possibilities of approaching them and the topic of combating prejudices.

The participants rated the training as recommendable for their colleagues.

TRAINING PROVIDER:

Hrvatski savez slijepih
<https://savez-slijepih.hr/>
hrvatski@savez-slijepih.hr

6.2.6. Local training – Hungary

The training was organized jointly by the two Hungarian project partners, BKK and Budapest Airport, it took place on 16th of November 2022 at BKK's premises. The training was conducted by largest Hungarian stakeholder organization, namely the *Hungarian Federation of the Blind and Partially Sighted (MVGYOSZ)*, 17 participants attended the training.



Figure 34: Local trainings in Budapest, Hungary

All participants were satisfied with the training and would recommend it to their work colleagues. Everyone also agreed that this type of activity should take place more often and reach more people to raise awareness of the problems and obstacles that visually impaired people face when travelling.

TRAINING PROVIDER:

Magyar Vakok és Gyengénlátók Országos Szövetsége (MVGYOSZ)

<https://www.mvgyosz.hu/>

06(1) 384-8440 <https://www.mvgyosz.hu/kapcsolat/>

6.2.7. Local training – Moldova

Local training in Moldova took place on 20th of October 2022, organized by Technical University of Moldova, and implemented by *Moldavian Blind Association*. The training followed the DANOVA programme and consisted of theoretical and practical trainings. 35 persons attended, mainly employees of Airport Chisinau that provide services and support to passengers as well as airport security staff. The satisfaction with the training was high with an average rating of 4,90 (out of 5.00).



Figure 35: Local trainings in Chisinau, Moldova

The training conducted in the Republic of Moldova shows that the participants liked most the method and practical parts of the training, the information about the real needs of visually impaired and blind people, the ways to approach them and the topic of combating prejudice. The participants rated the training as recommendable for their colleagues.

TRAINING PROVIDER:

Asociația Nevăzătorilor Din Moldova
Strada Columna 101, Chișinău
+373 22 222 789

6.2.8. Local training – Montenegro

In Montenegro, five training sessions were held – one in Podgorica on 28th of September 2022, and second one in Kotor, taking place over several days between 25th of November and 2nd of December 2022.

Airports

The local training took place on 28th of September 2022 in Podgorica (Montenegro) with 19 participants. Experts and employees from Airports of Montenegro (Podgorica and Tivat) participated in the local training. The training was conducted by experts from the *Croatian Blind Union*. 19 participants attended the training, and their satisfaction was quite high with an average rating of 4,82 (out of 5.00).



Figure 36: Local trainings in Podgorica, Montenegro

Participants emphasised that the training was interesting, complemented participants' prior knowledge, but was also very important as it provided a large number of practical examples, a story from the point of view of a visually impaired person and an exchange of experiences. The participants stated that they would recommend the training to their colleagues. The participants' satisfaction

All participants found the training interesting and important to be able to adequately support passengers with visual impairments. Practical examples and real experiences of visually impaired people enriched the training. The participants would recommend the training to their colleagues.

TRAINING PROVIDER:

Hrvatski savez slijepih
<https://savez-slijepih.hr/>
hrvatski@savez-slijepih.hr

Port of Kotor

Port of Kotor implemented their trainings in several sessions over few days from 25th of November to 2nd of December 2022 following the DANOVA training programme. Additionally, the attendees were acquainted with correct terminology, phenomenon of disability in general and in terms of visual impairments, prejudices, and respectful and dignified communication. 15 persons working with passengers at Port of Kotor took part in the training, satisfaction with the training had an average rating of 4,80 (out of 5.00).



Figure 37: Local trainings in Kotor, Montenegro

Participants indicated that they were satisfied with the trainings as they gained new knowledge about supporting passengers with visual impairments that they did not know before. They felt the trainings were important to raise awareness and would recommend them to anyone.

TRAINING PROVIDER:

Savez Slijepih Crne Gore
www.ss-cg.org
savezslijepihcg@gmail.com

6.2.9. Local training – Slovakia

The local training in Slovakia was organised on 25th of November at Žilina airport and targeted airport staff who are in daily contact with passengers. The training followed the DANOVA training curriculum and consisted of theoretical and practical training. Seven participants took part in the training and, based on the questionnaires completed by all participants, the average rating was 5.00 out of 5.00. All participants agreed that the practical advice on how to approach and support blind and visually impaired passengers were the most useful.



Figure 38: Local training in Zilina, Slovakia

The participants appreciated the structure of the training very much. The theoretical part combined with the practical experience was highly appreciated as the participants were able to add something new and valuable to their knowledge. The practical part on how to approach, guide and assist blind and visually impaired people was very useful for all participants as they realised that helping blind and visually impaired passengers is not that difficult if you know how to do it properly.

TRAINING PROVIDER:

ÚNSS, Krajské stredisko Žilina

www.zilina.unss.sk

unss.zilina@unss.sk

6.2.10. Local training – Slovenia

Three training events were held in Slovenia. Two of them were held for the public transport provider *Marprom*, which operates intercity buses in Maribor. The participants were mainly employees with direct contact with passengers and some middle management staff. The trainings took place on 9th of November 2022, one in the morning and the other in the afternoon, each training lasted two hours, 29 participants attended the trainings.

The third training took place on 15th of November 2022 at the Faculty of Civil Engineering, Transportation Engineering and Architecture of the University of Maribor. The training was aimed at managerial employees of public transport providers with participants from companies and organisations providing public transport services in Slovenia (bus and railway companies) and companies related to public transport service providers (IT support companies, teaching and research staff of the faculty).

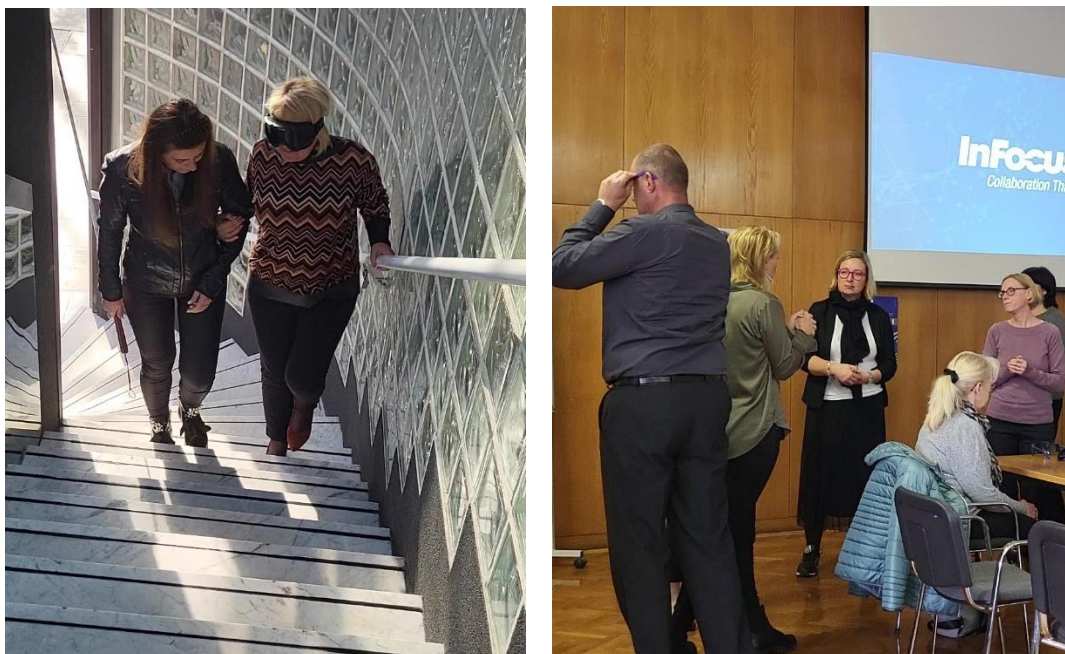


Figure 39: Local trainings in Maribor, Slovenia

The training was structured and delivered was positive. A little bit of everything - theory, personal experiences of visually impaired people, practical demonstrations, videos as well as practical exercises done by the participants themselves - proved to be a good combination, because people have different learning styles and preferences. Some prefer to listen, others want to experience things for themselves, some are more open and engage in discussions, while others are more reserved. All participants were satisfied with the training and would recommend the training not only to their work colleagues but also to their relatives and friends.

TRAINING PROVIDER:

Društvo študentov invalidov Slovenije
<http://www.dsis-drustvo.si/>
info@dsis-drustvo.si