

# Pilot Actions Evaluation Report

## Budapest Airport

### Implementation of BindiMaps Indoor navigation software at Budapest Airport

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

September 2022

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People with visual impairments may feel disabled if they do not have adequate access to supports and services and face barriers such as discrimination or inaccessible buildings or transportation. It has been 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 that accessibility is extremely low in many countries in the Danube Region. Furthermore, significant differences in the level of accessibility between countries and also 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 surface indicators (TWSI), tactile orientation maps, large print and Braille signage, audio signage, screen reader friendly websites and applications makes it extremely difficult and, in some cases, impossible to use conventional transportation systems (airplanes, buses, trains, public transportation). In these cases, they rely on the assistance of a sighted person (their personal assistant, member of a 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.

The DANOVA project 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 skills to enable full access to all transport information, facilities, and services. Within DANOVA project several steps were undertaken in order to improve accessibility:

- International investigation and collection of best practices
- Local assessment of infrastructure accessibility and web page accessibility for each transportation partner within DANOVA project. Assessment was performed according to prescribed Assessment methodology which was produced by University of Maribor in co-operation with technical partners like Croatian Blind Union (CBU) and Austrian Federation of the Blind and Partially Sighted (BSVO),
- International Call for ideas in which total of 22 ideas for improvement of accessibility of infrastructure for blind and partly sighted people have been submitted. Three best ideas were selected and chosen by the Call for ideas Jury,
- Implementation of pilot actions,
- Transnational Training programme for employees of infrastructure providers and stakeholders at the Budapest meeting.

According to the Local assessment done by each transportation partner, implementation measures or fields of intervention for pilot actions were identified and prioritised in three categories: high, medium, low.

The first step of WP T3 was achieved – Action Plans of sites where the testing will be implemented were prepared by each Pilot Partner. The international investigation and its summary in the Capitalization Strategy (WPT1), Local assessment report (WP T1) as well as and inputs collected during the development of the concept of a totally accessible facility (WPT2) were used in the Pilot Plans.

Core phase of the WP T3 is the testing phase, where the Action Plan is put into practice, PPs perform testing & consecutive feedback. Implementation aims to show the feasibility, effectiveness & replicability of solutions, operative procedures, and technological innovations. PPs already identified several fields of intervention; new topics could be added on the basis of results obtained from investigations and development of a totally accessible transport facility.

Deliverable D.T3.2.1 is the Appraisal Report on testing.

The testing pilot action is completed by an evaluation report to give feedback on action's performance and to show how the blind and partially-sighted passengers benefited from these initiatives. The evaluation report is crucial for the analysis of transferability and adaptability of the solutions. This document contains a Pilot action process evaluation(P1) and a Pilot action evaluation grid (P2). One report is to be done per each testing site.

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## 1. PROCESS EVALUATION

This chapter provides the evaluation of the pilot action planning and implementation process. Costs, problems and barriers encountered during the project life, and successes achieved with the pilot action at Budapest Airport.

### 1.1 BRIEF DESCRIPTION OF PILOT ACTION SITE

#### Location

Budapest International Airport “Ferenc Liszt” (BUD) is the main airport of Hungary and serving 95% of passenger flights to and from Hungary, in addition to a fast-growing turnover of air cargo. The airport is located 16 kilometre far southeast of the centre of Budapest, bordering Pest County.

Passenger traffic at Budapest Airport grew by 60% in 2015-2019. 2019 was a record year in the history of the airport: 49 airlines carried 16.2 million passengers to 153 airports in 49 countries. However passenger traffic has been hit by the Covid-19. In 2021, BUD processed a total of 4,6m passengers and 183 ktons of air cargo, an increase from 2020 of 20% and 36%, respectively.

Budapest Airport is continuously expanding its routes, currently serving 108 cities and 119 airports with 30 airlines. In June 2022, Liszt Ferenc International Airport's passenger traffic exceeded 1.2 million again, which is already 82% of the 2019 figures, meaning that month by month the airport is approaching the pre-pandemic passenger numbers. BUD expects a rapid recovery of the passenger segment latest until 2025.

Therefore, it is essential that BUD provides accessible services to all PRM passengers, mainly to

#### BUD infrastructure

The total land area of the airport is 1.515 ha and the airport operates two main runways respectively runway 1 (13R-31L) 3,010m and runway 2 (13L-31R) 3,707 m. Budapest Airport has two terminal buildings. Terminal 1 has been temporarily closed to passenger traffic since May 2012. Terminal 2 (2A and 2B) covers more than 49 000 m<sup>2</sup>. Budapest airport has 74 check-in counters, 17 passenger boarding bridges, 56 gates, 18 self-check-in counters (bagomat) and 28 tagomat, 18 security control lines, 8 luggage belts.

The airport is a facility operating day and night, with its own Police and fire-fighter units, its own heating centres, drinking water wells and snow clearance fleet. Accessibility to the airport is ensured by road transport, which includes public transport, taxis, car sharing, minibuses and shuttles. Between 2019-2021 Budapest Airport has invested more than 200 million EUR in infrastructure, capacity expansion, digital developments and other background improvements. Thanks to the investments and developments, traveling through the airport has become faster, more convenient and predictable, with the same, high level of security.

Among other developments, at the end of 2019, Budapest Airport handed over the air cargo handling facility called the BUD Cargo City. In terms of terminal capacity, a 220-meter-long pier, called Pier B was opened in 2018 and a new terminal hall, called Pier 1, was opened in 2020. In September 2020, the construction of the external baggage sorting hall and the related baggage system were completed. In 2021, Budapest Airport put into operation a new Main Gate serving its staff and partners.

The investments implemented at Ferenc Liszt International Airport have produced a noticeable improvement in the image of the airport, are continuously making themselves felt in the results of the quarterly ASQ (airport service quality) survey and in the awards handed out in recent months as well.

### **Accessibility for blind and partly sighted**

Currently Budapest Airport has not developed adequate infrastructure and equipment for the accessibility of blind and partly sighted. AMS Assistance Kft. provides assistance to persons with reduced mobility (PRMs) at Budapest Airport under the supervision of Mr. István Szabó Chief Passenger Services Officer and Pál Hegedűs, head of Terminal Services. Therefore, we made an assessment on PRM services to have a clear picture on the actual service and to identify the main shortcomings and the challenges which Budapest Airport needs to face and to overcome.

The assessment was performed on 15th of June 2021, in line with the provided methodology. During the one-day visit, it soon became clear that it is difficult for blind and partially sighted people to navigate around and gather information independently at the terminal. Although PRM service is available, the possibility should be granted for every blind and partially sighted to take care for themselves. Without appropriate aids (tools) and preventive measures, the physical integrity of the blind and partially sighted at certain points in the airport may be endangered. With some basic upgrades the terminal can be much more accessible for blind and partially sighted. Although there are many paths around and in the terminal tactile paving can be still an option. Choosing only the main paths to certain locations can make sense.

As stated above a few times it is not enough to navigate around in the terminal, collecting information is crucial also for blind and partially sighted people. Similar to orientation, in this aspect the airport has its own issues, although the problem is not so acute like as the navigation, because braille writings can be found all over the terminal mainly on machines like the ATMs, lifts etc.

Based on Assessment report results, the need to improve accessibility of BUD facilities to blind and partially-sighted passengers has been acknowledged claiming that self-orientation and information gathering for blind passengers is basically impossible. Hands-on solutions based on audio guidance can grant huge freedom without mayor investment and reconstruction. Hence, Budapest Airport has hashed out the decision that it will implement an audio-based, hands-on indoor navigation software and mobile application in order to facilitate the mobility of visually impaired passengers at the airport primarily on the landside (Arrival and Departure). In addition, Budapest Airport intends to make a website accessibility audit according to experience from DANOVA project during 2022. The audit report will provide an in-depth understanding of the deficiencies and shortcomings of its current website in terms of accessibility, so that it can use the recommendations by the implementation of the new website. The accessibility audit must be carried out in accordance with the standard EN301549 and in line with the WCAG recommendations (levels A and AA). These measures and their timeline was summarised in Budapest Airport pilot action plan.

## 1.2 DETAILED DESCRIPTION OF ACTIONS TAKEN

Assessment of BUD infrastructure accessibility to blind and partly sighted passengers has been performed in 15 June 2021 according to prescribed methodology. Recommendations and measures for improvement are prioritised in three main categories, high, medium and low priority. Within DANOVA the assessment is organized within modules making assessment process as well as outcomes easier to understand. There are two distinct parts of the assessment – the off-site and on-site assessment. The former is composed of eight modules related to access to information and rules of conduct, while the latter deals with built environment and is composed of eleven modules. Assessment process was divided in three main steps:

- a) Review of national environment (regulations),
- b) Off site assessment which included eight modules: review of existing site accessibility policies, disability training programme, customer service standards and pre-post travel access to information
- c) On site assessment which includes eleven modules: approach and departure to and from the site, entrance to the site, inside circulation, security screening and custom, sanitary facilities, waiting areas, departure and arrival pints, evacuation routes and exit from the site

Each of these modules is built using DANOVA building blocks: parking (car, taxi), public transport, wayfinding (signage and displays), horizontal and vertical circulation, counters, machines, sanitary facilities and evacuation routes.

Accessibility of each area has been assessed in scale from 1 (Hazardous, inaccessible, and unsatisfactory) to 5 (Accepted as a Best Practice). According to performed assessment, improvement areas and type of interventions were identified which were divided in three categories: High, Medium and Low priority type of interventions.

There were total of 2 high, 4 medium and 6 Low priority type of interventions identified for BUD out of which 7 of them has been implemented

Priority of intervention	Total recommendations	Implemented by BUD	Implemented within DANOVA
High	2	1	0
Medium	4	4	2
Low	6	2	0

Table 1. Comparison of number of recommendations implemented according to priority of intervention

### 1.2.1. Type and reason for pilot action intervention

According to the assessment performed, Budapest Airport has identified following pilot action interventions to be implemented within DANOVA project:

- implementation of BindiMaps indoor navigation software and mobile application that will provide voice and speech-based navigation for blind and partially sighted passengers in the terminal's landside passenger areas (medium priority measure number 4)
- perform webpage accessibility check (medium priority measure number 4).

Interventions to be implemented within pilot action were chosen according to their priority (high and medium), according to estimated budget of BUD within project DANOVA and according to prioritization of measures done by BUD management. In process of determining which interventions are most critical for BUD to implement, representatives of MVGYOSZ has been asked for evaluation as well as interested stakeholders.

### 1.2.2 Implementation process

These interventions can be seen in the following budget lines:

Pilot action intervention name	Estimated budget of implementation	Start date of procurement	Date of contract	Date of service performed
<i>External expertise</i> Website accessibility check for <a href="http://www.bud.hu">www.bud.hu</a> website	4.250 EUR	Jan 2022	March 2022	July 2022
<i>External expertise</i> BindiMaps indoor navigation software	67.250 EUR	Febr 2022	Sept 2022	Oct 2022
<b>TOTAL</b>	<b>71.500 EUR</b>			

*Table 2. Pilot action procurement and implementation timeline*

Largest procurement and more complex one for implementation was “Implementation of BindiMaps indoor navigation software and mobile application”. In preparation of specification documentation for that procurement, support was given by BUD IT. Installation of beacon equipment was finalized in October 2022.

### 1.2.3. State before and after the implementation

Evaluation of pilot action intervention has showed significant improvement in accessibility of BUD infrastructure as follows:

- 0 out of 2 high priority measures were implemented,
- 2 out of 4 medium priority measures were implemented.

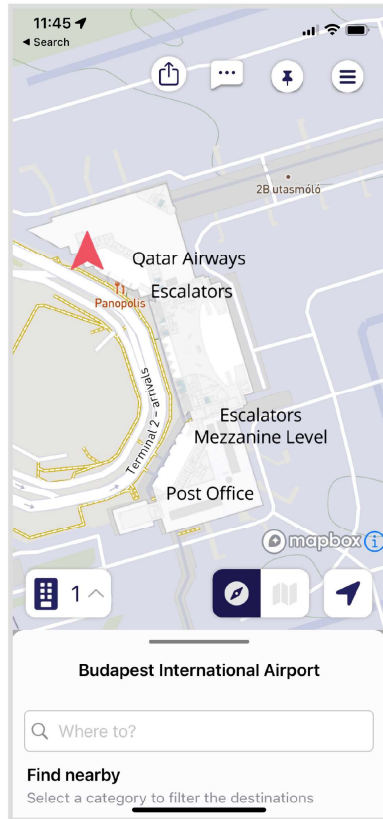
Most significant measure implemented relates to the development and implementation of BindiMaps indoor navigation software which needed installation of beacons at Budapest Airport landside areas.

According to finalised works and equipment installed following quantities were implemented:

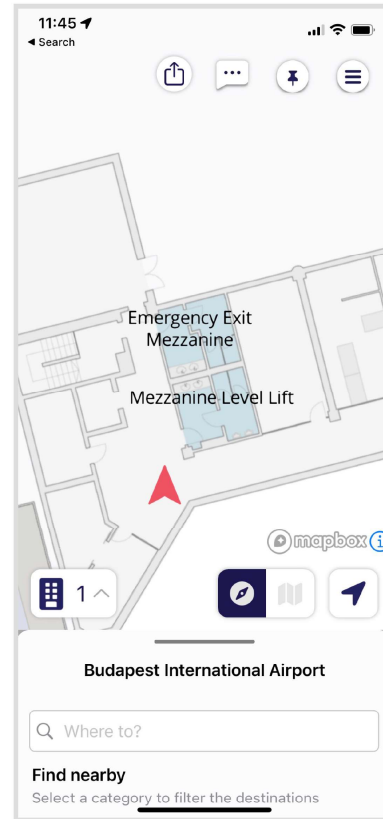
Type of equipment	Prior to implementation (pieces or m2)	After the implementation (pieces or m2)
number of beacons installed	0	174
covered area (m2)	0	7070,84

*Table 3. Pilot action improvements*

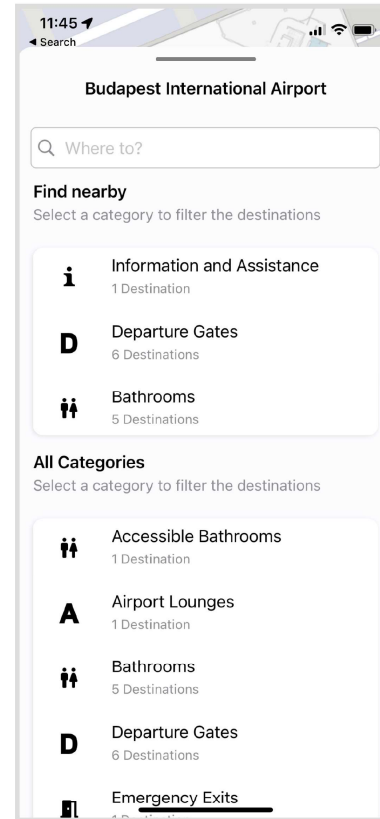




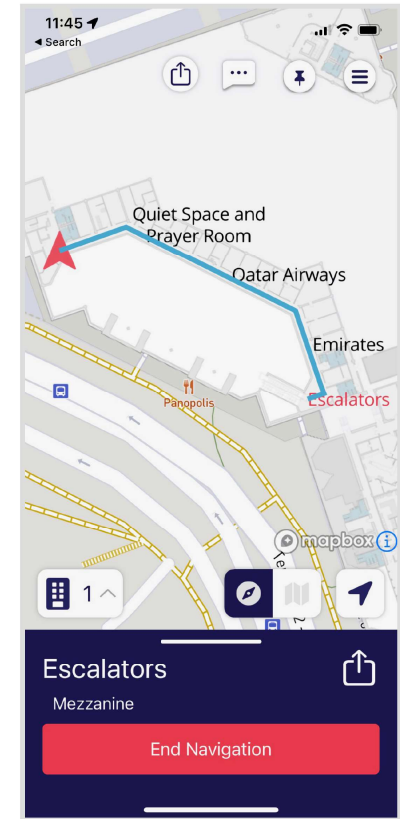
1. High view of Mezzanine level showing my location



2. Zoomed in view of my location

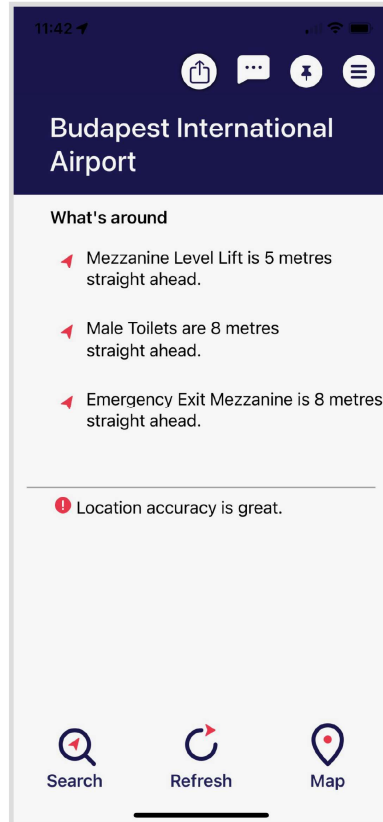


3. Search screen view

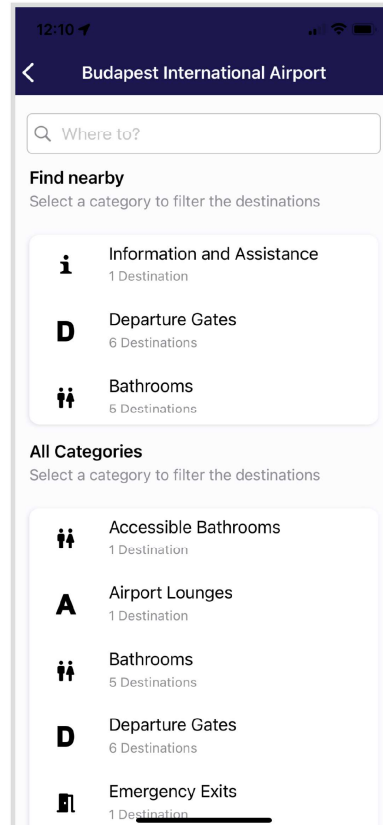


3. Route to the Escalators

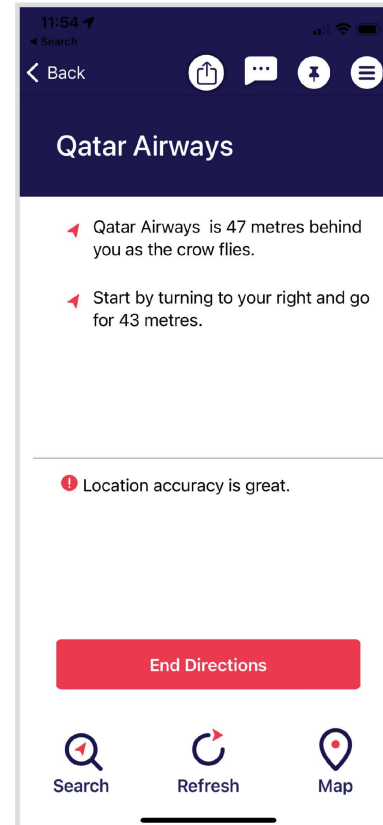
Picture 1. Map view screen shots



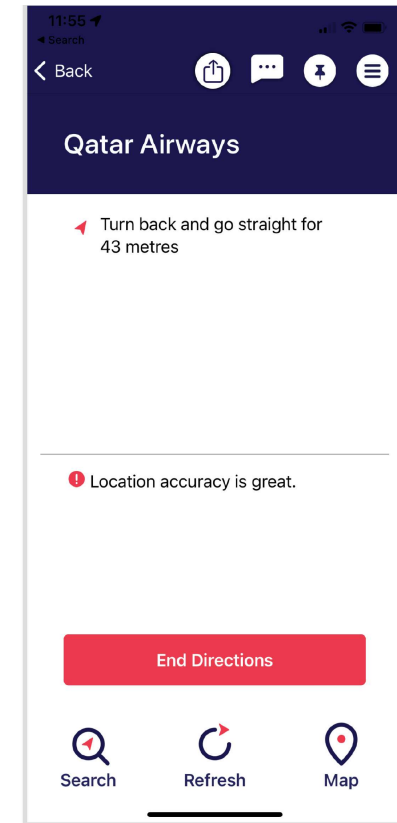
1. What's Around view orients vision impaired users



2. Search screen

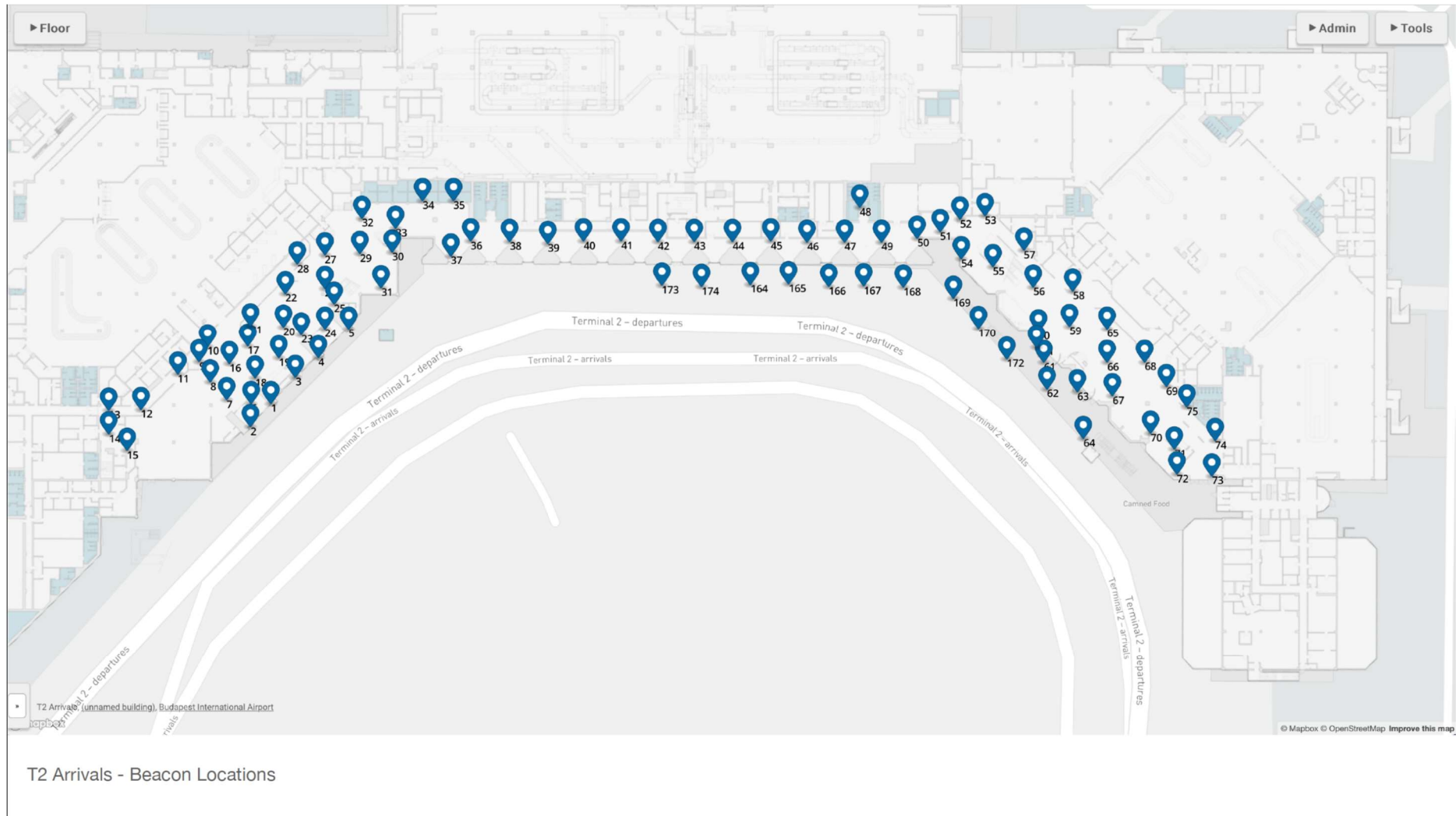


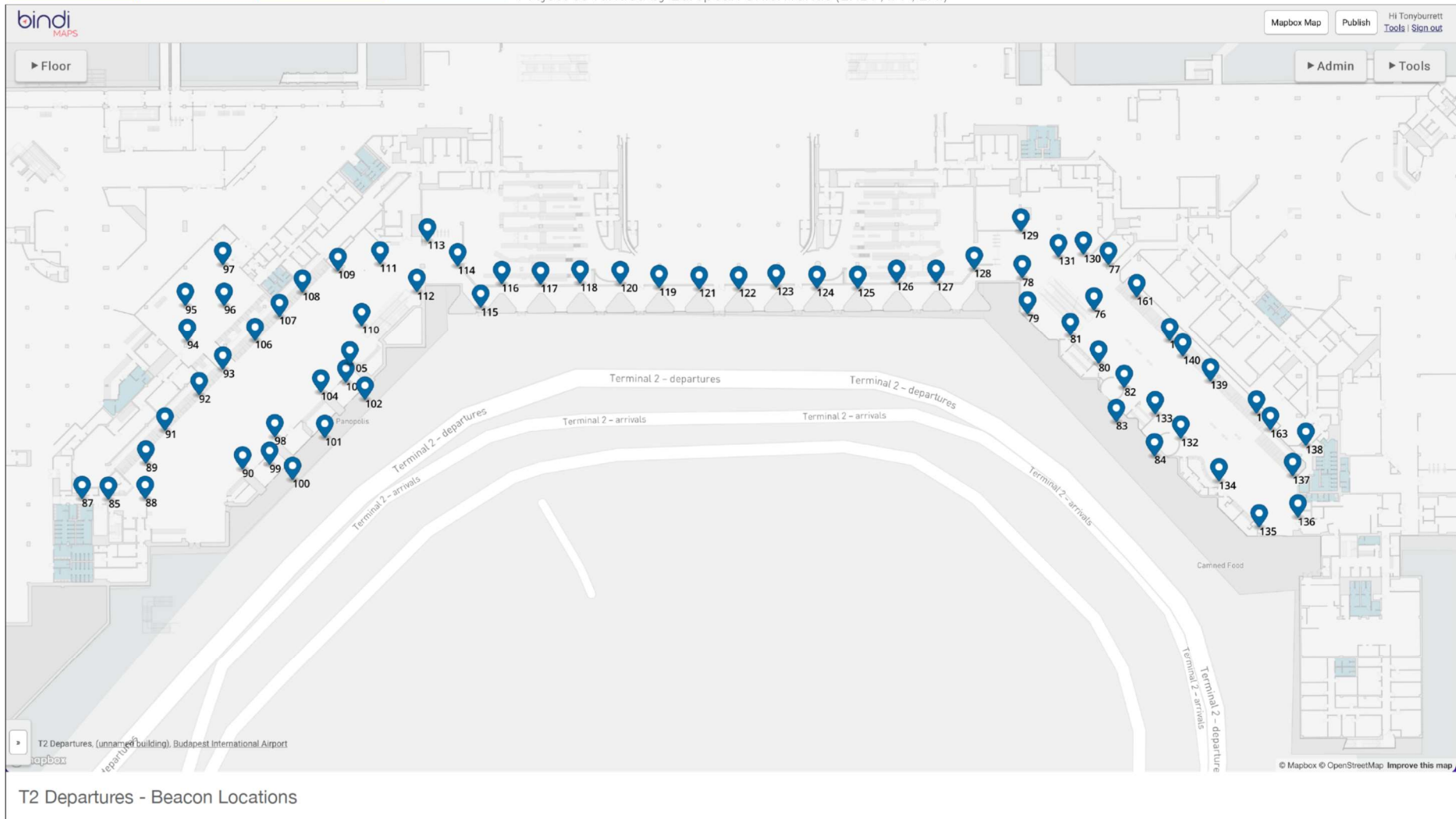
3. Overview audio directions to Qatar Airlines

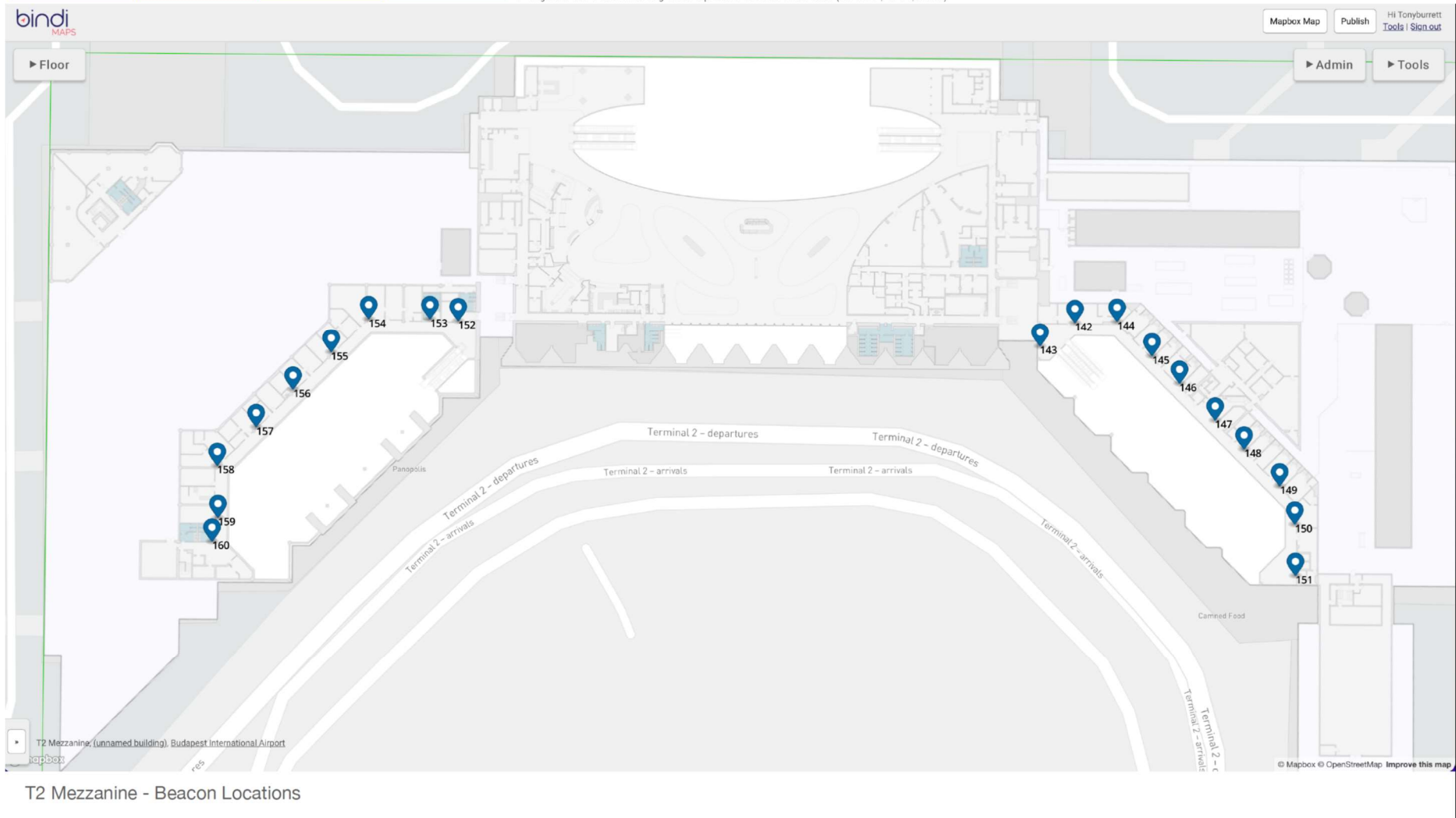


3. Updating Directions to Qatar Airlines

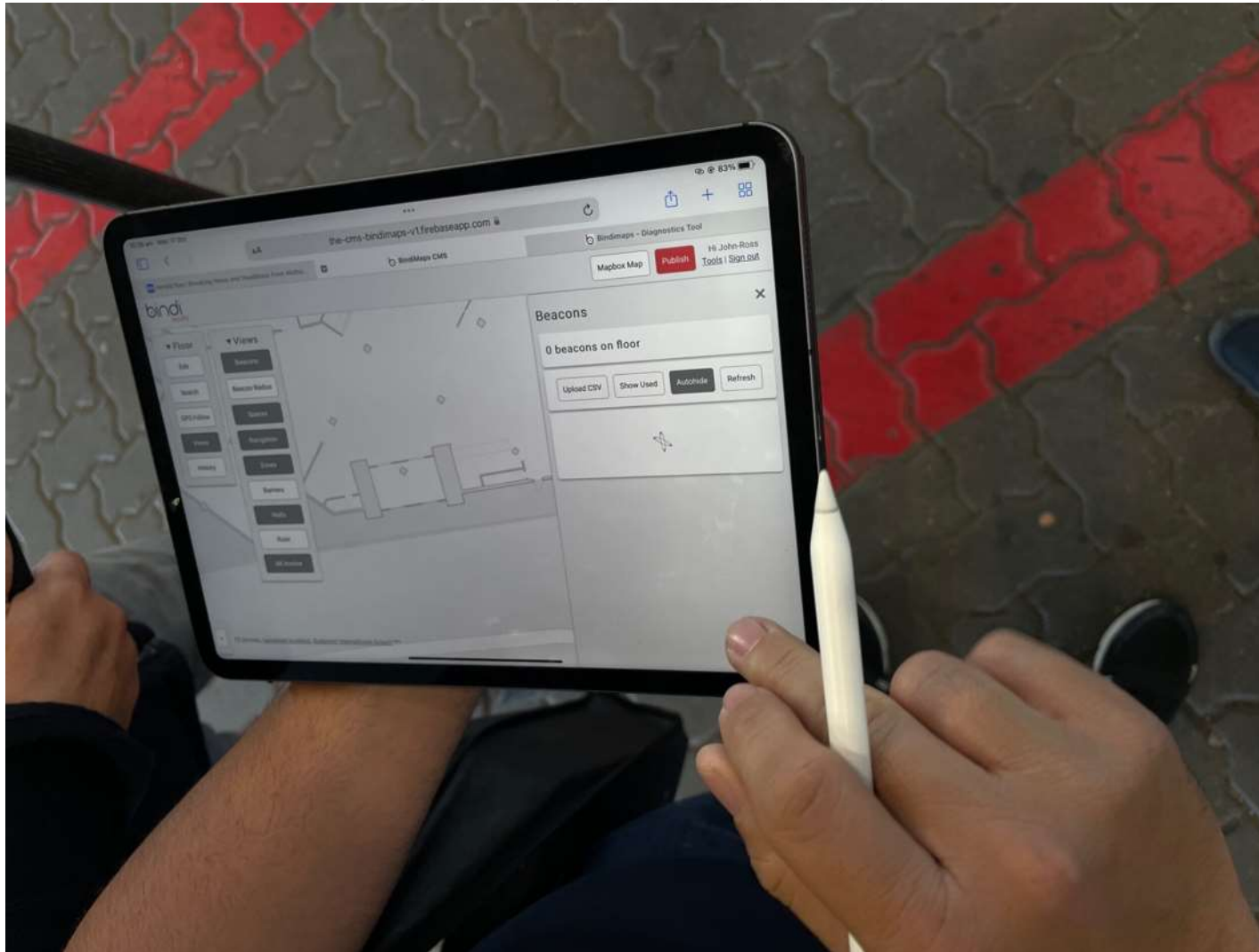
Picture 2. Audio screen shots







Picture 3-5. Budapest Airport Beacon Locations

















*Picture 6-12. Budapest Airport Beacons Installation*

### 1.3 COSTS

Pilot action costs reported in D.T.3.3.1. amounted to 47.118 EUR, please see attached table:

Category of funding	Expenditure Amount
<u>External expertise</u> Website accessibility for blind and partly sighted passengers check	4.030 EUR
<u>External expertise</u> Implementation of BindiMaps indoor navigation software – customization, development fee	67.110 EUR
<b>TOTAL</b>	<b>71.140 EUR</b>

*Table 4: Pilot action actual costs*

The total costs encountered during the pilot life cycle are equal to 71.140 EUR, which is slightly below originally budgeted amount for implementation of pilot action of 71.500 EUR.

The funding sources are:

- ERDF contribution 85% - 60.469 EUR
- Hungarian State contribution 10% - 7.114 EUR
- BUD contribution 5% - 3.557 EUR

Such costs are in line with the costs foreseen in the AF.

### 1.4 PROBLEMS FACED

During the implementation of pilot action BUD has faced several problems and challenges:

- Definition of technical description of pilot action in the procurement process. BUD 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 experts from MVGYOSZ was necessary in this respect.
- There was delay in the whole procurement process due to the DANOVA regulation, because it was necessary to show off at least 3 independent supplier offers. It was quite hard to find a 3rd offer, because we approached 10 companies but in the first stance only 2 companies were eager to give an offer. Only in the summer of 2022 we could achieve to have 3 offers.

The entire installation and configuration process went according to plan. No technical problems were encountered during the implementation phase. The BindiMaps team arrived on site fully prepared and the tools were immediately available in the admin interface thanks to the pre-configuration. Due to the fast and efficient work, the BindiMaps team was able to go live on the landside area of the airport a week after they arrived on site, with navigation on both android and IOS platforms. IT user tests were successfully run and conducted on the first attempt.

## 1.5 GOOD POINTS / SUCCESS OF THE IMPLEMENTATION PROCESS

Implementation of the BindiMaps indoor navigation software has largely improved accessibility for blind and partly sighted passengers at Budapest Airport. This, in combination with training of BUD employees, has significantly risen level of service that BUD provides to blind and partly sighted passengers.

In implementation phase participation of stakeholders was also important. On first two stakeholder events held in Sept 2021 and February 2022, pilot action intervention was discussed with stakeholders, and their ideas were taken into the consideration, especially in prioritising identified measures that will be implemented after the project DANOVA is finalised.

Furthermore, in discussion with stakeholders and MVGYOSZ, web page was identified as the crucial point of pre-travel information and its accessibility was considered of most importance for blind and partly sighted passengers. Therefore, BUD has performed a webpage accessibility check with the IT Foundation for the Visually Impaired.

## 1.6. TRANSFERABILITY POTENTIAL AND ADAPTABILITY

During stakeholders' meetings and Transnational working Group meetings it was concluded that pilot action implemented in BUD can be used as a good practice for other airports in the region as well

Experience of the BUD and other DANOVA partners can be used in similar or other environments, following crucial points are to be considered in implementation of such practices according to BUD experience:

- Performing assessment of the current status of accessibility for blind and partly sighted.
- Prioritization of interventions to be implemented.
- Consultation on the use of BindiMaps software with involved stakeholders, especially service providers within the airport community,
- Expected costs and timeline for implementation of pilot action plans.
- Problems occurred during the installation and after the installation.
- Benefits for blind and partly sighted passengers after the pilot action implementation.

## 1.7 OVERALL CONCLUSION ON THE EVALUATION OF THE PILOT ACTION PROCESS

BUD pilot action has made BUD infrastructure more accessible to blind and partly sighted passengers. Prior to pilot action intervention there was no solution for self-orientation with the help of an indoor navigation software. After the pilot action implementation there are total of 7070 square metres were covered by the BindiMaps software and with beacon infrastructure.

Also, as web page is considered to be starting point of each travel, BUD has performed web page accessibility check and has taken into account the recommendations by designing a new webpage, since a separate session and online presentation was held internally at BUD.

Expected impact of BUD pilot actions and DANOVA project can be summarised as follows:

Project and Policy instrument	Goal	Impact	Indicator
Danova – Danube Transnational Programme	Increase competences for business and social innovation - Developing innovative social services able to better meet social needs and to provide services in general interest	DANUBE region and other interested parties	Transnational concept for accessibility for blind and partly sighted that is to be developed based on Capitalisation strategy, collection of best practices, call for ideas' selection and stakeholder engagement
	Improvement in accessibility for blind and partly sighted passengers of BUD	All BUD passengers	Bindimaps indoor navigation software for landside terminal areas (departure and arrival)  Recommendations on website accessibility
	Improvement in level of service to blind and partly sighted passengers in the BUD-BKK Corridor	BUD and BKK employees and blind and partly sighted passengers	At least 6 employees of BUD and BKK together will attend local training session

*Table 5. Expected impact of BUD pilot actions and DANOVA project*

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### NOTE:

**FILL IN ONLY THE TABLES THAT WERE INCLUDED IN THE PILOT ACTION AND DELETE THE REST!**



## 1. OFF-SITE ASSESSMENT

### 1.1. Awareness training

Disability awareness training			Evaluation	Comments
Did the pilot action include any improvements on this matter?	Yes/No  If no please leave empty this table	We organise a local training for BUD and BKK staff which is plagued with managing PRM passengers.	N/A	
Is disability awareness training of staff members performed?	Yes/No	Our PRM service supplier, AMS provides awareness training for its own staff.	4	
Is every staff member trained?	Yes/No	At our PRM service provider the employees are well-trained.	4	
Which aspects are covered in training?	briefly describe, circle those that are included in the training <ul style="list-style-type: none"> <li>• Legislation - employment and customer service</li> <li>• Challenging stereotypes and assumptions</li> <li>• <u>Relating to people with disabilities - language and etiquette (how to adequately communicate, support and guide a person with disability)</u></li> <li>• <u>Working with people with disabilities - practical skills and use of equipment</u></li> <li>• Inclusive working - removing barriers in practices, policies and procedures</li> <li>• Universal design - removing barriers in the physical environment; and</li> <li>• Inclusive information - removing barriers in communication and information provision</li> </ul>		4	

Are specialized staff trainings performed (e.g., support for blind and visually impaired persons, for people with hearing disabilities, support for persons with reduced mobility etc.)?	<u>Yes</u> /No - if yes, specify which trainings (for which group) are implemented.  Our PRM service supplier, AMS provides training in relation to different profiles of PRM passengers	4	
Is visual impairment awareness training implemented?	<u>Yes</u> /No - if yes, specify who was the training provided by – was it by representatives of blind/partially sighted community, experts?	2	

## 1.2. Pre- and post-travel access to information

Website		Evaluation	Comments
Did the pilot action include any improvements on this matter?	<u>Yes</u> /No  BUD has commissioned a supplier on doing accessibility check on its current websites ( <a href="http://www.bud.hu">www.bud.hu</a> ). Recommendations and challenges has been identified and will be taken into account during the design of the new website.	N/A	
Does the pilot site have its own website (stand-alone website)?	<u>Yes</u> /No <a href="http://www.bud.hu">www.bud.hu</a>	4	
Is website of the audited site compliant with W3C levels A/AA or AAA?  (for stand-alone websites expert assessment is mandatory, for webpages within corporate websites, online tools can be used <a href="https://www.experte.com/accessibility">https://www.experte.com/accessibility</a> to check accessibility of main webpage)	<u>Yes</u> /No/ <u>partially</u>  According to the audit results, the BUD website fails to meet 21 criteria at level A, and 13 criteria at level AA. Altogether, it constitutes 68 percent of the success criteria.	3	<input checked="" type="checkbox"/>  Compliance checked by the expert (if YES, tick the box, leave empty if checked with online tool)






Does the website provide information on the building (including accessible paths and facilities, etc.) in suitable format (text)?	Yes/No/n.a.  For instance detailed directions to support orientation in and around the building, access statement.	2	
Are there any online services accessible (e.g., live chat online)?	Yes/No/n.a.	2	
Are there any services offered at the pilot site for blind and partially sighted persons) that can be booked online (e.g., personal assistance?). Is the application for booking them fully accessible	Yes/No/n.a.	4	
If forms need to be filled in, they can be filled electronically through an accessible software.	Yes/No/n.a.	4	

Smart-phone app			Evaluation	Comments
Did the pilot action include any improvements on this matter?	Yes/No  If no please leave empty this table	BindiMaps App was customised and developed for Budapest Airport needs.	N/A	
Does the pilot site have its own smart-phone app?	Yes/No	BindiMaps App	4	
Is the app of the pilot site compliant with W3C levels A/AA or AAA?	Yes/No/n.a.			<input type="checkbox"/> Compliance checked by the expert (if YES, tick the box, leave empty if checked with online tool)
Does the app provide information on the building (including accessible paths and facilities, etc.) in suitable format (text)?	Yes/No/n.a.  For instance detailed directions to support orientation in and around the building, access statement.		4	

Are there any online services accessible (e.g., live chat online)?	Yes/ <u>No</u> /n.a.	3	
Are there any services offered at the pilot site for blind and partially sighted persons) that can be booked via app (e.g., personal assistance?). Is the application for booking them fully accessible?	Yes/ <u>No</u> /n.a.	3	
If forms need to be filled in, can they be filled electronically through an accessible software?	Yes/ <u>No</u> /n.a.	3	

## 2. EVALUATION CRITERIA

- 1. Hazardous, inaccessible, and unsatisfactory**  
If the evaluated element is dangerous and poses a hazard to blind and/or partially sighted persons, and, if the rated element is inaccessible, and if it is rated unsatisfactory by blind and/or partially sighted persons, the element receives the lowest rank (1). Note that all three conditions must be met in order to assign the lowest rank 1.
- 2. Inaccessible and unsatisfactory**  
If 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 an exemplary way of implementing standards. It is very important that the expert or representative of the visually impaired rate the element as exemplary. It is very 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 rank. The solution is something that works and can/should be transferred and implemented elsewhere; the element is evaluated with rank 5.

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

### 3. IMPROVEMENT AFTER IMPLEMENTATION OF THE PILOT ACTION.

Please, based on the evaluation grid, describe

- Whether the problems you tackled with the Pilot Actions are dealt with appropriately?

The problems detected by the accessibility assessment were solved by implementing pilot actions in such a way as to ensure accessibility for blind and partially sighted people to the extent necessary so that they as air passengers could participate and use the service in question much more equally. By implementing 1/2 defined top priorities and 4/4 defined medium priorities, the accessibility standards necessary for easier and equal use of the Airport facility for blind and partially sighted people have been ensured. According to the assessment performed, Budapest Airport has identified following pilot action interventions to be implemented within DANOVA project:

- implementation of BindiMaps indoor navigation software and mobile application that will provide voice and speech-based navigation for blind and partially sighted passengers in the terminal's landside passenger areas (medium priority measure number 4)

- perform webpage accessibility check (medium priority measure number 4).

- What is the accessibility improvement (one evaluation rank higher equals 20% improvement)?

The accessibility improvement can be hardly measured by exact percentages, but we can say that Budapest International Airport has become the first in the world to allow blind and vision impaired travellers to navigate safely and independently on landside areas of its terminals, thanks to unique Australian-developed technology from BindiMaps.

- How that corresponded to the Pilot action plan – was it fulfilled as planned?

In the Pilot Action Plan we set out two main interventions to meet stakeholder requirements and the findings of the Assessment Report:

- based on the feedbacks of the stakeholders we proposed to introduce an easy-to-use, hands-on indoor navigation software and mobile application which satisfy blind passenger needs in their mobility at Budapest Airport. The BindiMaps indoor navigation app was chosen as part of a worldwide tender and was implemented on landside areas of Terminal 2A and 2B. In doing so, we deployed a Beacon technology to secure accurate positioning. The BindiMaps app will guide passengers with visual impairment using accessible audio, text or map to navigate independently the airport independently rather than relying solely on staff assistance and in-person services;

- in the Local Assessment report we emphasized the importance of providing usable information to blind and partially sighted people. The Budapest Airport is now planning to update and improve its website in a way that visually impaired persons can also use the website and will get all the necessary information they need for their travelling. The new website will be functioning next year in 2023, and it is quite essential to know already in the planning and design phase how can we make the website full accessible for blind and partially sighted people. Therefore in the DANOVA programme we conducted a website accessibility audit by a savvy consultant in order to see what aspects we should take into account and what kind of development actions should we initiate in our future website.

- What were the reasons behind the success / unsatisfactory result?

Budapest Airport is committed to improving its services for passengers and with this project we could achieve a better level of service for passengers with low vision and blindness. We believe that this kind of attitude and dedication of our employees and the DANOVA team has led us to the success of the project.

- What are the lessons learned?

After every project it is very important to draw conclusions on the management and realization of the project. Regarding this project we identified the following lessons learned:

- More time needs to be devoted to Procurement Phase (at least 6-8 months), so we need to schedule our activities in a way that more time should remain for pilot action implementation and testing;
- Collecting and validating stakeholders' opinion on the potential partner before contracting is crucial, if you want to select a suitable company. The involvement of Blind Unions into the pre-selection can help identify potential suppliers;
- Developing a brand new application from zilch takes significantly more effort, time and money than buying and configuring an already existing and well-proved app. With a tested technology, you can assure that the system will run without any bugs and issues after the customization period.

- Would you consider this Pilot action can be replicated in a similar transport node – yes/no, why?

Yes, we believe that this pilot action can be replicated easily at other airports, because the supplier company has a well-proved, teste technology in different environment like hospitals, office buildings, shopping malls, transport company buildings etc.

- What will you advise the management of other transport nodes which are going to implement similar Pilot action?

We can propose taking into account the following recommendation if such an indoor navigation app would be considered to be implemented:

- Discuss the installation schedule a few months before the actual start date. BindiMaps is a constantly growing company and they may already be booked for the next few weeks or months.
- Be prepared to provide a floor plan of the area to be covered quite early in the project.
- You don't need a big in house project or IT team to implement mobile navigation. BindiMaps takes care of the complete installation process and scheduling. Map design, beacon installation, route guidance and location testing is all done by their team. However, weekly follow-up project meetings between members are always recommended to keep on schedule.
- Bindimaps is a trustworthy and professional team of passionate people, don't be afraid the ask questions or get in touch with the team before making a decision.