Safe and Independent Mobility for Blind and Partially Sighted Persons

Best Practices from Europe

The voice of blind and partially sighted people in Europe

August 2019

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1. INTRODUCTION

In 2019, the European Blind Union (EBU) invited its member organisations to submit examples of best practices on the accessibility of mobility for visually impaired persons. This activity followed a similar competition from 2018, which yielded a brochure on best practices in accessibility of employment (Download Brochure here).

This present brochure documents best practices towards independent and safe mobility from across Europe. It is structured in three clusters, which reflect important and interlocking areas of accessible mobility: legislation and standards, built environment and infrastructure and lastly digital solutions. A short discussion section complements these chapters in order to contextualise some pertinent issues on the safety and independency of mobility for visually impaired persons.

It is important to note that this brochure presents best practices from a variety of countries. It lies within the nature of this publication that negative examples are excluded, which may give a skewed impression of fully accessible mobility. In fact, the opposite is the case and much more remains to be done. This brochure provides some ideas on how.

2. LEGISLATION, STANDARDS & STRATEGY

Laws, rules, and standards are important prerequisites for making independent and safe mobility become a reality. Best practice examples are helpful, but real change usually only comes about when laws are adopted to make those provisions obligatory. The best practice from **Belarus** gives a recent example on how this can be achieved.

Unfortunately, the enforcement of those rules is often an issue. Most countries have difficulties making sure legislation and standards are fully obeyed. Reasons may include insufficient training resulting in poor expertise of public authorities and professionals, overall respect of legislation in public tenders, prioritising design over accessibility and usability, lack of or insufficient allocation of resources, and many more. The best practice from **Slovenia** shows how to balance these issues.

Nevertheless, legislation is one of the strongest tools for improving independent and safe mobility for visually impaired persons. Therefore, continuous support of decision makers is essential in achieving the long run goal of achieving fully independent mobility, which will also be more and more important for our aging population in Europe.

Fact Sheet 1: Creating Legal Responsibilities

Name:	Creating Legal Responsibilities
Country:	Belarus
Key Words:	Laws; Technical Standards
Approach:	In 2016, Belarus ratified the UN Convention on the Rights of Persons with Disabilities. This set the starting point for a three-year action plan of the Belarusian Disabled Persons' Organisations to constructively support its implementation and to create legal responsibilities for the accessibility of the built environment and transport infrastructure. Dedicated laws on the rights of persons with disabilities and on accessible living environments were adopted, defining a common terminology and a legal base to make accessibility an obligation. Additionally, the expertise of the Belarusian EBU Member was used to develop three technical codes on road pavements, building design, and rail passenger infrastructure, which outline standardised provisions on guiding strips and tactile elements. These technical codes draw on existing European experiences and turn legal responsibilities into concrete action for authorities and builders.
Contact Details:	Belarusian Association of the Visually Handicapped, Oleg CHEPEL (CEO) E-mail: cp@beltiz.by
More Information:	Read the full Belarus contribution

Fact Sheet 2: Strategic Accessibility Planning

Name:	Strategic Accessibility Planning
Country:	Slovenia
Key Words:	Urban Planning; Built Environment
Approach:	Strategic Accessibility Planning (SAP) is a concept that delivers an agreed-upon plan by the city municipality, accessibility experts, and organisations of persons with disabilities on accessibility priorities in a local context. Its purpose is to enable everyone to access public spaces and buildings. SAP follows a set structure including safe routes, public transportation, key buildings and open spaces. SAP facilitates communication and exchange of information between citizens and their municipalities, improves cooperation with local services, and mediates between access needs of different persons with disabilities. It also targets investments where they are needed most and clearly allocates resources. To assist and monitor the implementation Accessibility Councils are established in each municipality, consisting of local representatives of disabled persons' organisations and other accessibility experts. SAP is anchored in national legislation and is guided by a handbook for the responsible Ministry.
Contact Details:	The DOSTOP Accessibility Institute, Dr. Andreja ZAPUŠEK ČERNE (Landscape Architect and Universal Design Consultant) E-mail: andreja@adkrajine.si
More Information:	Read the full Slovenia contribution

3. BUILT ENVIRONMENT & INFRASTRUCTURE

Many of the laws and standards in place regulate the built environment, which includes for instance streets, public transportation stations, traffic lights and zebra crossings or lifts. Tactile adaptations of the built environment include specific pavement structures, which alert pedestrians to directions and dangerous areas. Additionally, there can be acoustic adaptations, for instance to indicate green traffic lights. Importantly, the concept of shared spaces does not guarantee safe and independent mobility. Therefore, spaces for pedestrians, cyclists and cars in the built environment need to be clearly separated.

Crucially, adaptations need to take into considerations the accessibility needs of blind persons as well as those of partially sighted or deafblind persons. City planners also need to consider the needs of other persons with disabilities. Among many other solutions, this requires the incorporation of vibration and sound, high contrast values for floor tiles, or a mixture of lowered and normal curb. These adaptations need to be tied into a coherent whole, for which the best practice from the **Czech Republic** offers a good approach.

Adaptations across Europe differ by country or even by city. Given the absence of harmonised standards and considering different cultural approaches to changing the built environment, a common system across the continent is unlikely. Nonetheless, it would be desirable, as predictability and usability for visually impaired pedestrians are key elements. There needs to be a common structure, for instance a harmonised “language” of guiding strips or warning signals. This predictability makes it possible to navigate unknown locations at ease. The best practice from **the Netherlands** shows how this can be done in a national context.

In addition to predictability, solutions also need to be adjusted to the local context. Adaptations of the built environment in an old town with narrow cobblestone sidewalks present different challenges and require different solutions as those in a newly-built suburb. In terms of the infrastructure, existing services play into the design of an accessible solution. This dynamic can be seen in the best practice from **Iceland**.

Fact Sheet 3: Tactile and Acoustic Mobility System

Name:	Tactile and Acoustic Mobility System
Country:	Czech Republic
Key Words:	Remote Control; Beacons; Acoustic Information; Tactile Features
Approach:	Tactile and acoustic adaptations combined with staff training form an organic and well-thought system for accessibility in the Czech Republic. Tactile features include surface indicators such as signal strips that alert visually impaired persons to important features, for instance the entry point for incoming buses. Surface indicators further include warning strips that inform about dangerous areas. Tactile features also include Braille and relief print marking on handrails or controlling elements of any machine used for personal mobility. Acoustic features are activated by a specific remote control, called Transmitter for the Blind. The remote has six buttons, each of which has a predefined standard use. These range from activating simple sound beacons that give an acoustic orientation of a destination to more complex ones like external loudspeakers of incoming vehicles or acoustic time tables. Acoustic features also include those used for the general public, like current stop announcement. Such messages intentionally include information for visually impaired persons, such as the side of door opening or announcing the immediate next stop, which even fully sighted passengers benefit from.
Contact Details:	Czech Blind United (SONS), Centre for Barrier-Free Environment, Jan URBÁNEK E-mail: urbanek@sons.cz
More Information:	Read the full Czech contribution

Fact Sheet 4: Nation-Wide Train Station Adaptation

Name:	Nation-Wide Train Station Adaptation
Country:	The Netherlands
Key Words:	Transport; Train Station; Accessibility
Approach:	In collaboration between the Dutch EBU Member, the national rail operator (NS) and the respective infrastructure manager, all train stations in the Netherlands have been made accessible for visually impaired persons. The same accessibility provisions have been coherently implemented in all stations of the NS network, which means they are thus predictable for the passenger. These features include route descriptions that can be downloaded in both print and audio version in advance, tactile guidance and signage, adequate contrast values and harmonised location of ticketing machines. Once the accessibility provisions had been implemented, training was organised for both the passengers as well as the staff to learn how to use the features in practice. Throughout the entire procedure, volunteers tested the proposed solutions, giving feedback on materials and measurements. Initial user evaluations show that passengers with visual impairments are independently mobile in all Dutch railway stations, even if they visit a station for the first time.
Contact Details:	Eye Association Netherlands, Ingeborg VAN DER PIJL (Transport Accessibility Officer) E-mail: ingeborg.vanderpijl@oogvereniging.nl
More Information:	Read the full Netherlands contribution

Fact Sheet 5: Personal Mobility Service

Name:	Personal Mobility Service
Country:	Iceland
Key Words:	Taxi; Transport Service
Approach:	The Personal Mobility Service of the Icelandic EBU Member is a flexible taxi service for visual impaired persons. In the absence of convenient public transport, this service is crucial to participate fully in social life. An agreement is set up between the local municipality, the EBU Member and a taxi company to establish the service. Only registered persons with a visual impairment are eligible for the service and can order a taxi for the price of a regular bus ticket at any time of the day. Taxi drivers are specifically trained on access needs. At the end of each month, the EBU Member calculates the account for each user. The service is cost-effective for all parties involved and thus is highly satisfactory. The difference to the actual taxi costs is covered by the municipality. The service is also cheaper than the other existing solution, a government-managed transport services for all persons with disabilities. 80% of visually impaired persons in Iceland evaluate this service positively, as it is easy to use, affordable and provides a high-quality service.
Contact Details:	Icelandic Association of the Visually Impaired, Kristinn Halldór EINARSSON (CEO) E-mail: khe@blind.is
More Information:	Read the full Iceland contribution

4. DIGITAL SOLUTIONS

Digital Solutions involve a wide variety of technologies and serve for localization, navigation, control and information announcement. Some solutions require specific applications or devices, whereas others are available for everyone. Because of their reliance on technology, including sometimes a stable internet connection, they might be of limited use in rural areas or for users unfamiliar with technology. At the same time, their adoption proceeds much faster than adaptations to the physical environment. The possibilities of future technologies – self-driving cars, artificial intelligence and hyper accurate positioning for instance – are potentially limitless, which indicates their promise for independent and safe mobility.

It is crucial to consult with visually impaired experts to identify specific needs in advance, such as very accurate precision and detailed map data, specific points of interest, or the ability to distinguish multiple bus stops with the same name. Virtually any display or device can be made accessible for visually impaired users. Notably, however, the adaptations differ for partially sighted persons (high contrast values, large and legible font, etc.) and for blind persons (synthetic speech output, availability over internet, etc.). Moreover, when an accessible device or app serves the general public, it is essential not to forget about its accessibility features when performing any updates. The **Spanish** best practice gives an example in this area.

Digital Solutions need to be well thought-out, predictable and usable. Wherever possible, digital solutions and physical infrastructure should mutually complement each other, for instance buses and stops in public transport. Specialised mobile applications or specialised assistive equipment in the form of a remote control can activate acoustic features, for instance the announcement of incoming vehicles. In turn, they can notify others of the presence and intentions of visually impaired persons, for example to board the vehicle or to call for assistance. These aspects are present in the best practice from **Israel**.

Digital solutions may be used for both indoor and outdoor navigation, announcing the location of acoustic traffic lights or elevators among other aspects. In any way, navigation should – in contrast to most mainstream applications – prioritise the safest route for visually impaired users. This approach is present in the **German** best practice.

Fact Sheet 6: Mobile Application Development

Name:	Mobile Application Development
Country:	Spain
Key Words:	App; Cooperation; Tags
Approach:	The Spanish EBU Member collaborates with mainstream navigation app providers. Experts from the organisation regularly audit one of the largest applications for integrated, multi-modal public transport (Moovit) and implement necessary changes to increase accessibility for all user groups, including deafblind users. Additionally, the organisation cooperates with developers of an innovative smartphone app that scans new bidimensional bar code tags (NaviLens). These codes can be scanned from up to 12 metres of distance and have been installed for instance in the Barcelona metro system, where they are used for localisation and vocalised navigation. In both projects, the Spanish EBU Member maintains long-lasting links with mainstream app operators to ensure accessibility for visually impaired users. This inclusive approach can also benefit other persons with access needs. Moreover, by formalising the relations, the likelihood of accessibility issues after updates is reduced significantly.
Contact Details:	National Organisation of the Blind of Spain, Directorate for Personal Autonomy, Accessibility, Technology and Innovation, Guillermo HERMIDA SIMIL (Executive Director) E-mail: ghs@once.es
More Information:	Read the full Spain contribution

Fact Sheet 7: Bus Station Guidance

Name:	Bus Station Guidance
Country:	Israel
Key Words:	Bus Station; Vehicle Management; Bracelet
Approach:	Together with a private company, the Centre for the Blind in Israel pilots a flexible and modular system at bus stations on two bus lines. Visually impaired persons receive an electronic bracelet or use their private smartphones as radio frequency transmitter. The stations receive solar-powered GPS units, Bluetooth receivers, and an audio module, which are integrated into one joint hardware system at each station. Upon arrival at the bus station and upon individual authentication, persons with access needs are directed to specific locations and receive 360 degree orientation. Users receive voice information about waiting times and voice identification of an incoming bus. Upon request, they can communicate individually with service providers and the bus drivers. Through the bracelet or smartphone, they can also indicate their wish to get off at the next station or call for help.
Contact Details:	The Centre for the Blind in Israel, Zohar SHABATH (Resource Development and Spokesperson) E-mail: zohar@ibcu.org.il
More Information:	Read the full Israel contribution

Fact Sheet 8: Door-to-Door Navigation

Name:	m4guide (Door-to-Door Navigation)
Country:	Germany
Key Words:	Door-to-Door Navigation; App
Approach:	Based on a publicly funded research project by a consortium including the German EBU member, the app provides door-to-door navigation with a specific focus on the mobility needs of visually impaired persons. The integration of multiple sensors (radio frequency; Bluetooth, WiFi, GPS) improves the accuracy of positioning to approximately 1m. Navigation is tailored to the needs of visually impaired users, so that clearer directions as well as information on crossings, staircases or traffic lights are given. The algorithm does not provide the fastest but rather the safest route. The app combines indoor and outdoor navigation with multi-modal public transport usage. For better outdoor navigation, extended open street map data was collected and coded. Regarding public transport usage, the app draws on vehicle management data to communicate incoming vehicles and upcoming stops as well as the built environment at the station. The indoor pilot draws on spatial building plans and sensor input to provide navigation in public administration buildings. The data infrastructure was integrated into the mainstream public transportation app for the Greater Berlin area and expanded to other mobility access needs.
Contact Details:	German Federation of the Blind and Partially Sighted, International Office E-mail: international@dbsv.org
More Information:	Read the full Germany contribution

5. INDEPENDENT AND SAFE MOBILITY

While these best practice examples illustrate possible and workable solutions for independent and safe mobility, some systemic comments are required. All of these are grounded in the conviction that the three areas of legislation, built environment and digital solutions are no islands of their own. Instead, they need to be combined in order to maximise the accessibility of mobility across Europe.

First, innovative projects do not replace legislation. Binding laws are always the preferred solution to achieve an accessible environment for persons with disabilities. They need to be well implemented and thoroughly enforced, for example with fines. Administrators, planners, public transport staff and other personnel members have to receive training to be aware of access needs and accessibility provisions. Only then can consistent and long-lasting change occur.

Second, in the interconnected Europe of today, easily transferable solutions from one national context to another are preferable. This also means that accessibility provisions should be usable also for visitors and tourists and not rely on specific devices or services that are only available to local residents. In some cases, the development of European Standards could be beneficial, for instance regarding the use of remote controls in the Czech best practice.

Third, smartphones and mobile apps can offer great benefits, but they are limited in one fundamental way: Not every visually impaired person can or wants to rely on smartphone-based mobility services. Operating a smartphone is difficult if you have to hold a white cane and a shopping bag at the same time. Further, there is a significant risk of exclusion of older persons or those who cannot afford a smartphone. Moreover, pedestrians should not be overburdened with multiple additional gadgets in order to power their digital solutions, especially, when these only work in restricted locations.

Fourth, accessibility solutions should be designed according to the “Design for All” principle, which means it benefits the biggest possible number of persons with disabilities as well as persons without disabilities. While accessibility is necessary for some, it is useful for all. Moreover, designing products and services in an accessible way from the start is cheaper and easier than retrofitting.

Last, and along the same line, mainstream solutions for accessibility are preferable to separate, non-inclusive solutions for visually impaired users

only. For instance, the Icelandic best practice is suitable for the specific geographic context and the situation of limited public transport infrastructure. In general, however, mainstream public transport should be adapted towards full accessibility, so that it can be used by persons with disabilities and persons without disabilities alike. Additionally, reduced rates for persons with disabilities or their assistance is a recommended practice to increase mobility easily.

6. CONCLUSION

All countries in which EBU members are active have ratified the United Nations Convention on the Rights of Persons with Disabilities. Equal access to mobility is safeguarded in this international treaty. It is also an important precondition to enjoying other rights, as independent and safe mobility is necessary to reach a workplace, leisure activities or health service. This brochure draws together different best practices from Europe to inspire future innovative work on this crucial question.

ABOUT THIS BROCHURE

This publication was prepared on behalf of the European Blind Union by Marie DENNINGHAUS (EDF – European Disability Forum), Jan URBANEK (SONS – Czech Blind United) and Benedikt VAN DEN BOOM (DBSV – German Federation of the Blind and Partially Sighted).

Disclaimer: please note that the 'full contributions' available as downloadable files in this document were received from our members and may not conform to the same accessibility standards as the rest of this publication.

For inquiries about the brochure, please contact:

Jan URBANEK
Czech Blind United
E-mail: urbanek@sons.cz

For inquiries about the European Blind Union and the project "Best Practices on Accessibility", please contact:

Romain FERRETTI
European Blind Union
E-mail: ebuprojects@euroblind.org

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