

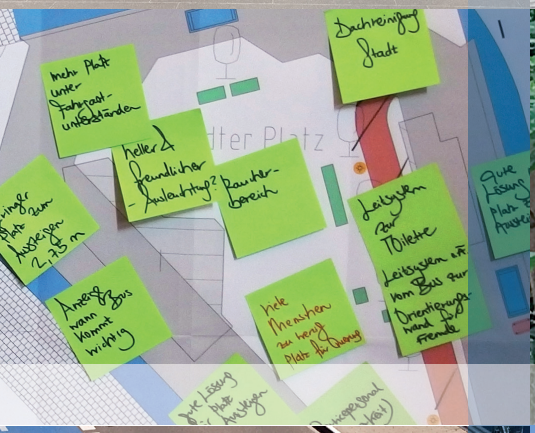



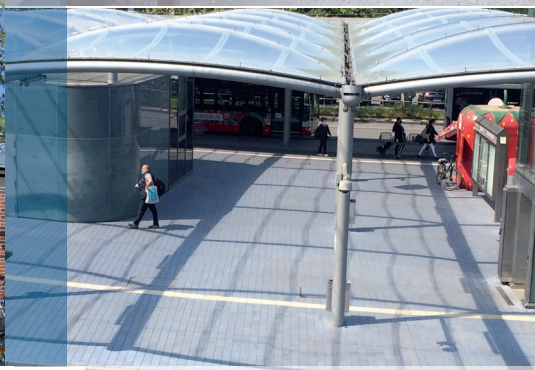

GUIDELINES

SENIOR-FRIENDLY TRANSFER HUBS

Hamburg

Legal notice

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GreenSAM Green Silver Age Mobility

Interreg Baltic Sea Region

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EUROPEAN UNION

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Content

Foreword

Shaping the mobility transition towards climate-friendly mobility is a key challenge for contemporary urban development. That is why Hamburg, like many other European cities, is investing in the expansion of public transport and an improved infrastructure for pedestrians and cyclists. In addition to this, new mobility services such as ride-sharing offer attractive opportunities to be flexibly mobile without owning a car.

In doing so, it is important to involve all stakeholders and to make sustainable mobility attractive and accessible to all. This is especially true for the growing group of senior citizens. A good 18% of Hamburg's population is already aged 65 or older, and the trend is rising.

The Borough of Eimsbuettel is actively addressing this issue. We are currently developing our own climate protection concept, in which climate-friendly mobility plays an important role. Since 2019, we have been working as a lead partner in the EU project "GreenSAM – Green Silver Age Mobility" to make sustainable mobility options age-friendly. The underlying idea of the project is that a needs-based design of infrastructure and mobility offers can only succeed with the involvement of the user group in question.

Eight partners from the Baltic Sea region have therefore joined forces in the project to develop and test ways of involving older people in mobility issues and to pass on the results.

Kay Gätgens, District Mayor of Eimsbuettel

Our district has devoted itself to the topic of sustainable mobility transfer hubs in public spaces. Together with senior citizens, we have collected the most important requirements for these places in a comprehensive participation process and are now implementing some exemplary measures.

With this guide, the results are now being made available to all those involved in the planning and design of transfer hubs, so that the concerns of older people are given greater consideration. And this is not only important for this group. Because aspects such as accessibility, good orientation and service offers benefit everyone.

We would like to thank all those who have contributed to the success of the project and this guide! This includes above all the Senior Citizens' Advisory Board of the District, the Senior Citizens' Advisory Board of the State with the specialist group on safety and transport, all other senior citizens involved as well as experts, the associated organisations in the project, the European partners and, last but not least, all colleagues who have worked on the p

1 Introduction

Many local authorities are investing in environmentally friendly mobility solutions to reduce motorised private transport and enable sustainable forms of urban mobility. This includes local public transport, cycling and walking as well as car, bike and ride sharing and new mobility services such as "shuttle on demand". Intermodality, i.e. the flexible combination of different means of transport, is a key aspect of environmentally friendly mobility beyond having a (an own) car. And digitisation is an important driver of this development. At the same time, further demands are placed on the design of the physical transport infrastructure, especially where different modes of transport meet. Transfer hubs for bus and rail, pedestrians and cycling as well as new mobility offers are therefore important places when it comes to a sustainable transport infrastructure.

A crucial aspect here is, however, that environmentally friendly mobility offers are widely accepted and used. This requires needs-based planning of infrastructure and mobility offers in order to increase the acceptance and attractiveness of environmentally friendly mobility. Older people are an important target group here, as they represent a large and growing population group. By 2050, around a quarter of Europe's population will be aged 65 and over [see GreenSAM 2021: P. 4]. At the same time, there is a lack of knowledge about the specific needs and requirements of older people regarding environmentally friendly forms of mobility as well as possible barriers.

1.1 Goals and contents of these guidelines

These **guidelines for the design of age-friendly transfer hubs** are intended to help close this knowledge gap and enable needs-based planning (not only) for older people. It was developed in Hamburg with the intensive participation of senior citizens and **focuses on transfer hubs and the surrounding public spaces where people change between different means of transport,** e.g. from bicycle to public transport services or from a bus or train to other forms of mobility such as sharing services.

These guidelines are therefore aimed at planners in public administration, in planning and engineering offices as well as at operators of mobility services. It formulates **recommendations for age-friendly transfer hubs**. In doing so, the guidelines focus on the following topics:

- Orientation and service
- Welcoming atmosphere
- Pedestrians and bicycle traffic
- Sharing offers

Good practice examples complement the exemplary solutions. A **checklist** provides a quick overview of the aspects that should be considered when planning and converting transfer hubs – even for individual measures.

The contents of this document were developed under the leadership of the Eimsbüttel District

Office (Mobility Section) during a comprehensive participation process together with senior citizens and experts. To kick things off, on-site surveys covering the concerns of older people at transfer hubs took place in October 2019. Discussions in senior citizen groups as well as the participation of the project team in the "Seniorentag Eimsbüttel 2019" (Senior Citizens' Day Eimsbüttel) provided further insights into the mobility of older people as well as the requirements for transfer hubs. In a series of workshops, the topics were examined in depth with senior citizens and possible solutions were discussed and specified. During an online participation event in March/April 2020, these approaches were put up for discussion and comment. Furthermore, the exchange of information with multipliers in the field, among others the "Haltestellenumfeld-Koordination des HVV" (coordination of public transport stops of the Hamburg Public Transport Association) as well as the Senior Citizens' Advisory Board of the Borough of Eimsbuettel and of the City of Hamburg, was an important part of the development process. The results are therefore based on the broad experience and knowledge of users and experts.

1.2 Background

These guidelines were developed within the framework of the EU project **"GreenSAM – Green Silver Age Mobility"**. The issue of mobility for the 60+ generation concerns communities and regions all over Europe, especially against the backdrop of an ageing population. Within the framework of the project, participatory approaches were developed and tested to increase the acceptance and accessibility of environmentally friendly mobility offers for the 60+ generation. For this purpose, different **pilot projects** were implemented in six participating communities and regions. Furthermore, an **"Atlas" on age-friendly mobility** in the Baltic Sea Region and participatory approaches as well as a **"Toolbox" to ensure the successful participation** of senior citizens were developed, which can be found at www.green-sam.eu. The Borough of Eimsbuettel has acted as the lead partner. The guidelines are one of the key results of the project.

The project aims to

- encourage older people to use environmentally friendly mobility options,
- help public administrations and other stakeholders to collect structured knowledge about the needs of the 60+ generation, and
- promote the needs-based design of sustainable urban mobility.

A total of eight partners have joined forces in the project:

- Free and Hanseatic City of Hamburg, Borough of Eimsbuettel
- City of Aarhus, Denmark
- Municipality of Gdansk, Poland
- Tartu City Government, Estonia
- Valonia as part of the Regional Council of Southwest Finland
- City of Riga, Latvia
- Institute of Baltic Studies (IBS), Estonia
- Turku University of Applied Sciences (TUAS), Finland

Furthermore, the project partners exchange information with associated organisations in the participating countries as well as "follower

cities", i.e. cities that are accompanying the process passively.

The follower cities are:

- Gothenburg, Sweden
- Växjö, Sweden
- Oslo, Norway
- Tampere, Finland
- Vilnius, Lithuania
- Gdynia, Poland
- St. Petersburg, Russia

Duration: 1/2019 – 09/2021
Budget: €1.94 million
ERDF: €1.53 million

Further information and resources:
www.greensam.eu
Twitter: @GreenSAM_BSR
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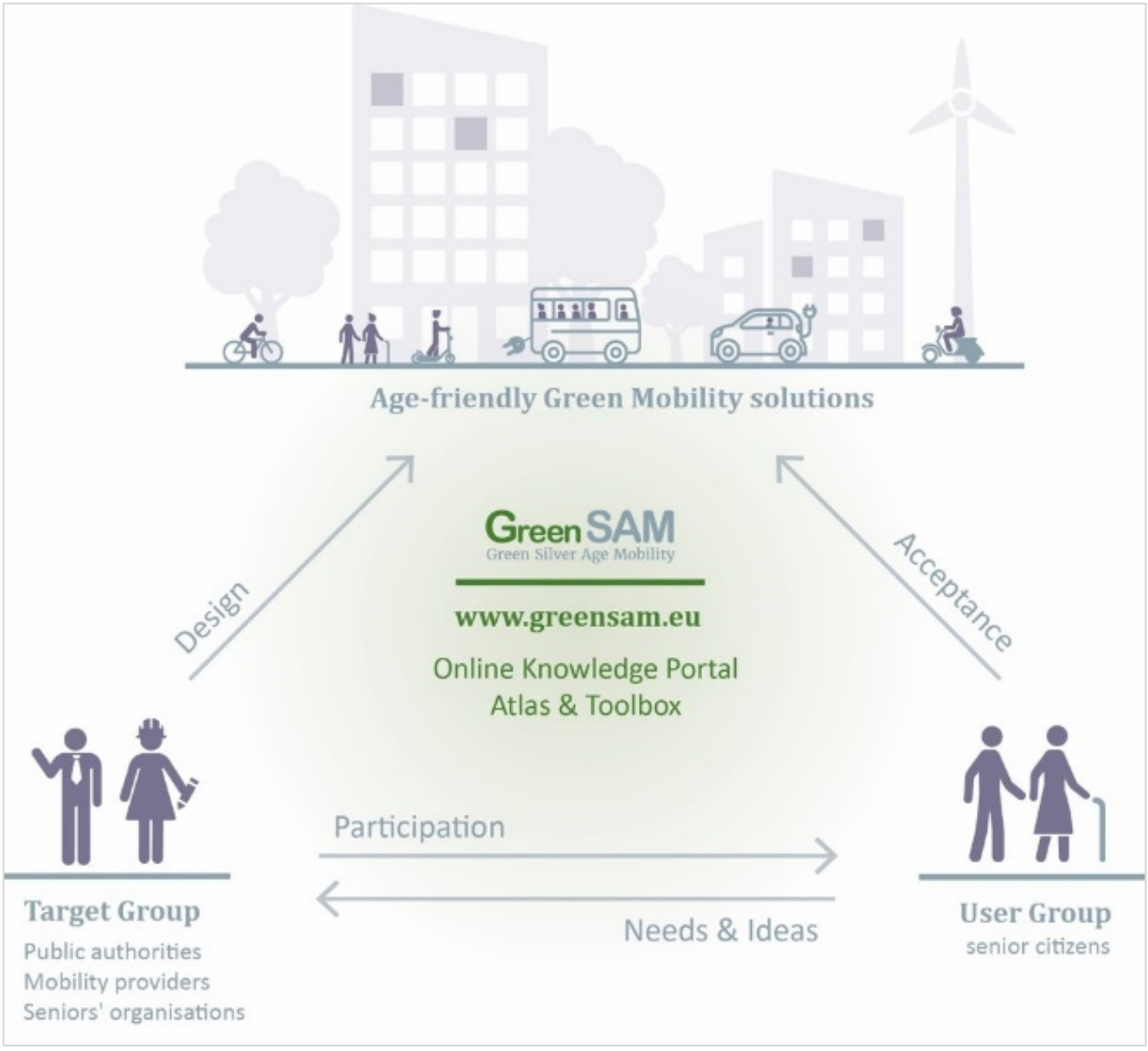
www.hamburg.de/eimsbuettel/greensam



Overview of the GreenSAM project

2. Requirements for age-friendly transfer hubs

With an increasing share of older people in the population, the needs of senior citizens with regard to the design of the transport infrastructure and public spaces are increasingly being focussed on. And the focus here is primarily on the accessibility and attractiveness of sustainable mobility offers for senior citizens. But what does "age-friendly" mean in this context? What requirements do senior citizens have for transfer hubs and what general concerns do they have?

2.1 Age-friendly mobility and infrastructure

When it comes to senior citizens, the group is very heterogeneous. Lifestyles, income and cultural backgrounds are becoming increasingly differentiated in this group as well as in the rest of the population. In addition to this, the group covers a wide age range, from the retirement phase to old age. This is accompanied by different physical and mental requirements for the mobility of older people. Nevertheless, some general key points can be noted that have an impact on the mobility behaviour of this group and the question of an infrastructure suitable for senior citizens. Physical fitness and endurance usually decline, and physical impairments can also occur with increasing age, ranging from limitations of the musculoskeletal system and vision and/or hearing to reduced responsiveness and decreasing flexibility. Even if these limitations are only partial, any product or spatial adaptation that facilitates safe orientation and movement in the environment is helpful [cf. Beucker/Zurnatzis 2011: p. 7].

GOOD PRACTICE

Oslo: Universal Design

The City of Oslo adopted an integrated plan for "Universal Design" in 2009 and derived "Common Principles of Universal Design" from it in 2014. By 2025, transport, communication, infrastructure, information technologies as well as buildings and land that are the responsibility of the public sector should be designed according to this principle.
[cf. https://zeroproject.org/policy/pol183057nor-factsheet/],

Many aspects arising from this are being taken into account with the barrier-free development activities that are already being applied in many cities. In this context, tactile guidance elements are now being used in many cities as a palpable and visual separating element between different types of transport. Sufficient walkway widths are also important for accessibility. However, the requirements for age-friendly public spaces go beyond this. For example, with impaired vision, high-contrast design and good lighting of rooms and signs becomes more important. Slower reactions and speeds necessitate short and safe pathways as well as barrier-

free options between these pathways, which also provide opportunities to rest in between. Furthermore, many older people find it difficult to orientate themselves in confined spaces with many different stimuli. Here, sufficient space is definitely required. Cleanliness and subjective safety are also important aspects.

On this basis, an **age-friendly infrastructure can be defined as barrier-free, safe and supportive, where users can find their way around easily**.

2.2 Requirements for age-friendly transfer hubs

In the course of the GreenSAM project, the requirements of the 60+ generation for transfer hubs and the surrounding public spaces were specified together with senior citizens in Hamburg.

Many senior citizens' requirements for transfer hubs can be summarised within two core aspects: Sufficient **space** and enough **time** to move and orientate. Therefore, a transfer hub should be as spacious as possible and provide **enough space away from busy pathways**. A **clear layout** of the place as well as **good light conditions** and **lighting** are also important.

For better orientation, simple, consistent **signposting** to the various transport services is desired, also at road works and building sites. **Information and service offers** are equally important. Ideally, there should be a **central information office** and **service staff** on site. Services (e.g. ticket machines) should be designed in such a way that the user does not have to bend down to operate them. Furthermore, there should be **public toilets** that are easily accessible.

A **welcoming atmosphere** at a transfer hub is another important point. The focus here is not on hanging around, but on the ability to be able to wait and transfer (the bus or train, for example) in pleasant, safe surroundings. Sufficient, **weather-protected seating** near departure areas, which are not impaired by smoking passengers, are very important for this, as is **cleanliness** and an **appealing design**, e.g. through well-kept greenery or display cabinets. The areas in question should also be **well lit** and **visible from outside** to increase the feeling of safety.

Workshop results: The ideal transfer hub (top) and ideas for walking & cycling (below)

Barrier-free footpaths and plenty of **space for walking and cycling** are further essential aspects. A **clear separation of traffic** is preferred in order to avoid conflict situations. It should also be possible to cross bicycle lanes and roads **safely**, with sufficient time for senior citizens to do this. **Elevators** should

ensure barrier-free access at the public transport stop at all times. Furthermore, there should be sufficient and safe **bicycle parking facilities**, also for pedelecs or tricycles for seniors. Bicycle parking and also the question of where e-scooters can be parked is also of great importance, as carelessly parked bicycles and scooters often represent barriers on walkways. Bike + Ride and Park + Ride facilities, which are easy to find and use in the vicinity of the public transport stops, are also important, especially in suburbs that do not have such a dense network of commuter and underground trains as the inner city.

With all of these aspects, **maintenance, cleaning and care** play an important role. These issues should already be taken into account during the planning stage, in order to ensure the **attractiveness and accessibility** of the transfer hubs over the long-term.

2.3 General requirements for sustainable mobility

During the participation process, aspects of age-friendly mobility services were also addressed that cannot be implemented or only to a limited extent, through the design of transfer hubs. However, they are important for a holistic mobility design and provide insight into how sustainable mobility offers for the 60+ generation can be improved to make mobility without owning a car more attractive for this age group.

One recurring theme is the desire for more **consideration**, whether on the bus or on walkways and bicycle lanes. In buses, it is problematic if older people do not have a seat before the bus has started moving. There is a need to raise the awareness of other passengers as well as bus drivers. This is already being worked on within the scope of driver training. Riding a bicycle or e-scooter on walkways is also a major problem. Although this can be responded to with measures in public spaces, further approaches are required, such as the campaigns "Sicher mobil im Alter" ("Staying mobile and safe in old age") of the German Road Safety Council (DVR) in cooperation with the Federal Ministry of Transport and Digital Infrastructure (BMVI) or "Hamburg gibt 8" ("Hamburg pays attention"), for better cooperation and care in traffic [cf. Behörde für Inneres und Sport 2019a].

Mobility costs are also important. **Favourable fares for senior citizens,** or even **free use of public transport,** make such forms of transport particularly attractive for older people. Fares should have a simple structure and be easy to understand. The desire for **overground transport systems**, such as city rail systems, was also mentioned several times, as there are no "level" differences to overcome as with the underground, and orientation and the feeling of safety are usually better.

Sharing systems were generally known by the people interviewed, but they are used relatively rarely. The main barrier here is not so much the design of public areas, but rather the digital access. This can be remedied, for example, by mentoring programmes and/or access without a smartphone. **Simple usability** as well as a **senior-citizen-friendly design** of the services themselves is also helpful.

3. Guidelines and solutions for age-friendly transfer hubs

The aspects of orientation and service, welcoming atmosphere and the organisation of low-conflict pedestrian and bicycle traffic have turned out to be particularly relevant for senior-citizen-friendly transfer hubs. In the following chapter, these requirements and possible solutions as well as tips for sharing offers are presented.

3.1 Orientation and service – key aspects:	
Clear, consistent guidance systems and signs	
Interactive information services, staff on site that can be contacted	
Centrally located, clean public toilets with clear signs	
3.2 Welcoming atmosphere – key aspects:	
Good lighting during the day and night	
Weather-protected, well-placed seating	
Protection of non-smokers	
Well-kept appearance and appealing design	
3.3 Pedestrian and bicycle traffic – key aspects:	
Accessibility, safe crossing possibilities	
Separation of pedestrian and bicycle traffic where possible	
A sufficient amount of secure parking facilities for bicycles	
3.4 Notes on sharing offers and shuttle services – key aspects:	
Easy to find, information on site	
Shortest possible distances, easy, barrier-free accessibility	
Easy to book, training on the digital booking process	

3.1 Orientation and service

Simple and comprehensible signs as well as supplementary services are important aspects when designing a transfer hub that is suitable for senior citizens. If it's difficult to find your way around a station, this can lead to uncertainty, especially among older people. Unnecessarily long distances have to be covered when searching for the right place. To enable better orientation, it is imperative to provide information about all public transport lines at a transfer hub, especially the place and time of departure. Signs and directions to key facilities at the transfer hub should also be considered. Mobility offers should also be clearly illustrated on a map of the surrounding area.

3.1.1 Guidance systems

A system of signs should provide users with a simple overview of the important areas, such as entrances, exits and departure areas, from the moment they reach the transfer hub until they leave. Furthermore, consistent and continuous signs should ensure that passengers do not lose their way when going to the bus or train. They should also highlight where service offers are available on site.

Directions

These signs are usually above head height on the ceiling of the public transport stop. They should be placed at a sufficient height so that neither objects nor other passengers can obscure the panels. Furthermore, a location should be chosen that gives everyone enough space to read the information without standing in the congested area of the transfer hub, where people are passing through.

To provide a basic overview, large display boards that provide information about departure areas and, if possible, departure times are suitable. Furthermore, such boards can also provide information on other service offers as well as exits, public toilets or sharing stations. Digital display boards that continuously update the departure times and points of the individual lines and also provide information about deviations from the regular service are preferable here. Ideally, both digital and analogue display boards should be available at the transfer hubs, so that good orientation is guaranteed even if the digital displays fail. The information should cover as many areas as possible, i.e. all public transport services that run from a station should be listed.
Any other direction signs are also usually placed above head height. It is important to have a consistent system of signs throughout the public transport stop to help with orientation. Important places in the surrounding area and mobility services should also be displayed on signs.

An additional element for providing directions can be markings on walls. Such elements can help to ensure directions are provided consistently. They have the advantage that they are more intuitive to follow than display boards. People with severe visual impairments can also move closer so that they can read the sign.

Directions on the floor can also help with orientation, as they can also be followed intuitively. However, this is more suitable for use in indoor areas that are less susceptible to soiling. Overall, such guidance systems on floors and walls are not a substitute for

Easy-to-read signs and directions to mobility and service options as well as destinations in the surrounding area

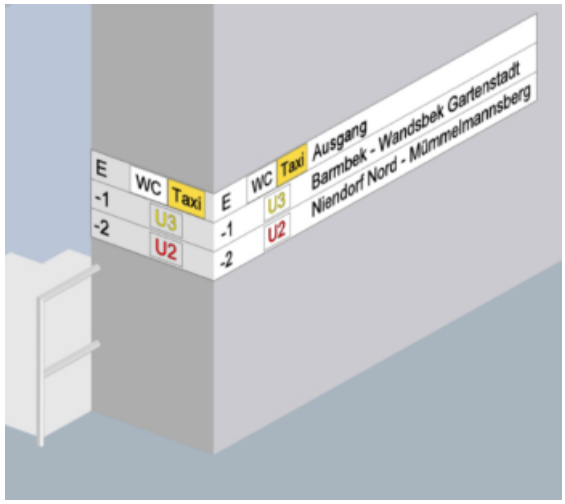
overview boards or other signs mounted above head height, as they can be obscured by other passengers. However, they can be a useful addition to an orientation/guidance system.

For severely visually impaired and blind people, information with direction and location details in Braille and embossed letters on staircases or other elements can be useful [cf. HVV 2019: p. 7].

In addition to the signs at the transfer hubs, the directions and signs leading towards the transfer hubs should also be considered. This should also make the stations and entrances recognisable if they are not immediately obvious.

Guidance systems at building sites/roadworks

Building sites at a transfer hub and in the extended access area change the familiar image of the stop and can make orientation more difficult. People with reduced mobility may experience problems if the signs provided through a building site and the accessibility of adjacent areas is not clearly apparent. Unnecessary or incorrectly taken routes due to missing or inconsistent signs can make older people, in particular, feel insecure and push them to their physical limits.



Schematische Darstellung: Zusätzliche Beschilderung an den Wänden eines Umsteigepunktes

Road works and building sites in the direct vicinity of a transfer hub should, therefore, be announced well in advance. A clear and continuous guidance system through the construction site area is to be used for both bicycle and pedestrian traffic. In spatial terms, it must be clear at an early stage which locations can be reached through the building site or in which direction the guidance system routes people. Pedestrian and bicycle traffic should be prioritised over motorised traffic. Once a construction site has been set up, it should be checked that the di-

rection signs are correctly placed, clearly visible and logical. Furthermore, care must be taken to ensure that the diversion around the site is barrier-free and also traversable by passengers with reduced mobility. In the event of changes within the construction site that affect the route guidance, the guidance system must be adapted accordingly.

For many older people, personal contact with local staff is important in such special situations in order to help them find their way, as is the case in Hamburg with rail replacement services, for example.

3.1.2 Information systems

Closely linked to the guidance systems are information systems that provide an overview of the transfer hub and the immediate surroundings, but also of the lines, fares and services in use there. Such information systems should be centrally located and easily accessible, but they should also be accessible in a decentralised manner at all arrival and departure points. Formulated in a simple language with additional visual support as well as a clock are characteristics of a good information system. The information offered should be supplemented by reliable loudspeaker announcements, especially during special situations such as operational disruptions.

GOOD PRACTICE

Station surroundings plan with easy-to-understand pictograms as well as information on mobility offers and barrier-free access in Altenbeken /North Rhine-Westphalia (Nahverkehrsverbund Paderborn / Höxte (nph – Local transport association of Paderborn / Höxter)

Surrounding area plans and overview maps

A variety of mobility services can usually be found at transfer hubs. In order to obtain a quick overview of where to find which services, plans covering the transfer hub and immediate surroundings should be placed in central locations. This can provide support (not only) to senior citizens, enabling them to take direct routes inside and outside the public transport stop. All mobility offers and the corresponding locations (including sharing stations) should be noted on such plans.

Transport network and city maps offer the possibility to find out about connections and destinations in the nearer and wider surroundings and, for example, check the routes of bus lines. The presentation should be simple and schematic, and a large, high-contrast font should be chosen.

Station area maps and overview maps should be placed in a central location, such as in the ticket machine area. Furthermore, the map should be large enough to avoid crowding in front of it. They should be placed away from walkways so that users have sufficient space to view the map at their leisure. Such overview maps can also be made available as part of digital information services. This means that changes (e.g. when setting up additional sharing services at transfer hubs) can be incorporated with less effort than with printed versions.

Interactive information services

Interactive information services generally provide all of the necessary information for passengers and are useful in both centralised and decentralised arrangements. Interactive ticket vending machines are one example of this kind of information service. They have a large display and – similar to the corresponding apps on one's own smartphone – provide various items of information, including the best connection to the chosen destination, possible transfers on the route, the respective departure and arrival times, fares, other offers in the vicinity and also how accessible the means of transport are. From an age-friendly perspective, it is important that these services are easy to use and reliable. An important additional feature here is the provision of acoustic information, which explains the visual information (e.g. at the push of a button) and which follows the principle of two senses. In this way, people with impaired vision can also obtain comprehensive information.

Self-service terminals with an interactive user interface in the Hamburg metropolitan region

GOOD PRACTICE

Talking timetable

An orientation aid directly on the platform could, for example, be "talking" timetables, such as those used in Austria. The departure times of the next connections are shown on a display. By pressing a button, further information on each of the individual connections is shown on the display and also explained acoustically. In this example, the location chosen is directly at the departure area. Other central locations at the transfer hub are also conceivable. To ensure that passengers know where to find such a device at each stop, the location should be similar at each stop. Colour highlighting or labelling with pictograms also makes it easier for users to find a "talking" timetable.

Talking timetable (Neukirchen, Austria)

Information columns

Many senior citizens would like to have a central contact point and contact person on site. Nationwide introduction in this regard is not, however, realistic. At larger transfer hubs, however, the possibility of realising such a contact point at a central location should be reviewed, as this can contribute significantly to the usability and attractiveness of transfer hubs, and not only for older people. What's more, on-site staff also help to improve the sense of security.

Hamburger Hochbahn emergency call and information column

Alternatively or additionally, information columns, such as those used on all platforms of the underground and commuter railways in Hamburg, are a good way to implement information facilities at stops, if it's not possible to have service personnel present on site. By pressing a button, an audio connection is established via which passengers can speak directly to a service person and therefore receive information on connections, fares, etc. When the SOS button is pressed, a camera connection is also made in the operation con-

trol centres. An idea formulated here by senior citizens was to enable visual contact with the service staff via a screen, even for service questions, which would also support the principle of two senses.

Even though the personal component that many older people want is only partially present in this solution, it has an advantage over interactive ticket vending machines or the like, as the user can ask questions if something is unclear. The information columns should be located both centrally, in the area of the transfer hub (e.g. in the area of the ticket machines), and decentrally (e.g. directly at the departure points). In addition, the ability to recognise and find them quickly are also important, especially with a decentralised arrangement.

An important supplement here would be reliable loudspeaker announcements in the event of operational disruptions and in other special situations, such as road works and diversions. Speech intelligibility through distortion-free reproduction and clearly understandable statements are important, of course

3.1.3 Public toilets

Senior citizens may need to use a toilet more often and may take longer to travel a specific distance. Public toilets should, therefore, be available at transfer hubs.

A central location should be chosen in order to avoid long distances. Furthermore, in out-of-the-way locations, the likelihood increases that barrier-free access between the transfer hubs and the toilet is no longer given, which means the route has to be structurally redesigned and adapted. Therefore, if possible, a WC should be located on a direct route between the arrival and departure areas or on the way to the exit of the station.
In addition to the central location, appropriate signs to the toilet should be provided throughout. The toilet must be signposted and easy to find from all entrances and exits as well as all arrival and departure areas.
This can also be supported by pictograms on walls or on the floor. Further information on this can be found in a sign and information concept for public WC signs by the Hamburg Ministry of Environment, Climate, Energy and Agriculture [cf. Behörde für Umwelt, Klima, Energie und Agrarwirtschaft 2017].

Facilities / Cleanliness

Another important aspect is the cleanliness and maintenance of the toilet facility. A small user fee of 50 cents to a maximum of €1 was considered acceptable by the senior citizens involved, if the toilets are clean and well-maintained.

A barrier-free WC is optimal in relation to senior-citizen-friendliness, as it meets various needs. If this is not feasible, there should at least be sufficient space for freedom of movement and for parking or carrying walking aids or rollators. In addition, toilets should have facilities that make it easy to sit down and get up. Depending on the location and environment, however, it should also be considered that spacious public toilets can also be misused, for example as sleeping places. The best possible solution for the respective location must therefore be weighed up.

Many cities also have a toilet finder that provides people with an overview of public toilets, so they can plan their routes accordingly. In Hamburg, the Stadtreinigung (public cleaning service) offers such a toilet finder, however, it only shows the toilets that are operated by the Stadtreinigung [cf. Stadtreinigung Hamburg 2017]. However, such an offer does not replace service and information offers on site.

GOOD PRACTICE

Campaign "Nice toilet"

If a public toilet is not possible in the transfer hub area, the "nice toilet" concept offers an alternative. The concept is to make toilets, such as those in pubs and other facilities like libraries or community-centres, available free of charge. Participating businesses receive subsidies for the maintenance of the premises and for conversion work to make them "handicapped-accessible". Participation in the campaign is indicated by a logo in the entrance area. 260 cities are already involved around the country.

The city of Bremen, for example, offers an overview map online with a search function via Google Maps, in which the address and opening hours of approximately 100 participating businesses and centres are stored. Information is also provided to show whether the toilet is accessible for people with disabilities. According to Bremen's public cleaning services, the need for public toilet facilities can be partly compensated for with such a campaign, which also improves quality while lowering costs [cf. Bremer Stadtreinigung 2017].

3.2 Welcoming atmosphere

A welcoming atmosphere is particularly important when it comes to public transport stops. If people feel uncomfortable and unsafe at a transfer hub, this can result in them avoiding the stop in question, especially older people, and it may also mean they will stop using public transport altogether. An appealing design, weather-protected waiting and seating facilities as well as cleanliness and a well-maintained condition are therefore key requirements. Maintenance and cleaning must, therefore, always be considered during planning and conversion. In addition to this, security issues should be included at an early stage and principles of crime-prevention through urban planning should be observed. This includes, among other things, the creation of clear areas, unobstructed lines of sight and good lighting. Vitalisation and social control in the respective area through a kiosk and/or shops can also create a welcoming atmosphere and feeling of safety.

3.2.1 Lighting

The lighting of a public transport stop is a key aspect when it comes to well-being and safety. If walkways or subways are poorly lit, this increases the feeling of insecurity and also makes orientation more difficult. Potential tripping hazards are also more difficult to recognise. Lighting at a transfer hub must therefore be ensured at all times of the day and night.

Design of buildings and covered areas/canopies

Diffuse and uniform daylight in particular is perceived as pleasant and should be taken into account in the lighting concept of a transfer hub. This can be implemented above all through the extensive use of glass elements in roofs and walls. The use of bright colours also promotes brightness in covered or enclosed areas. The cleaning possibilities must also be kept in mind with such elements. Buildings and roofs can quickly become dirty, especially in inner-city areas. The more difficult it is to access the relevant components, the more expensive the cleaning will be.

GOOD PRACTICE

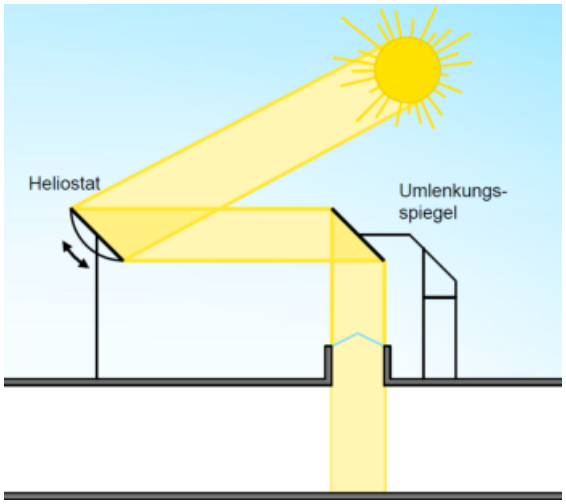
Glazed roofs in stations in Hamburg

Numerous newer transfer hubs of the underground and commuter railways in Hamburg now have glazed roof structures, which give the stops a bright and friendly effect and ensure even lighting during the day. These include the Wandsbek Markt and Poppenbüttel bus stations as well as the Elbbrücken station, which is a new junction for the commuter and underground lines.

Transfer hubs with glass roofs in Hamburg

Daylight deflection

Another option is daylight deflection, which transports daylight over longer distances to where it is needed. Daylight deflection systems are used where daylight is not available directly. However, the technology is quite complex and is therefore only suitable for large transfer hubs with several levels. This can be implemented, for example, with light shafts and heliostats (mirror systems) that enable the light to be diverted into several areas. A deflecting mirror can direct light into a building using windows, shafts or skylights, without any loss.



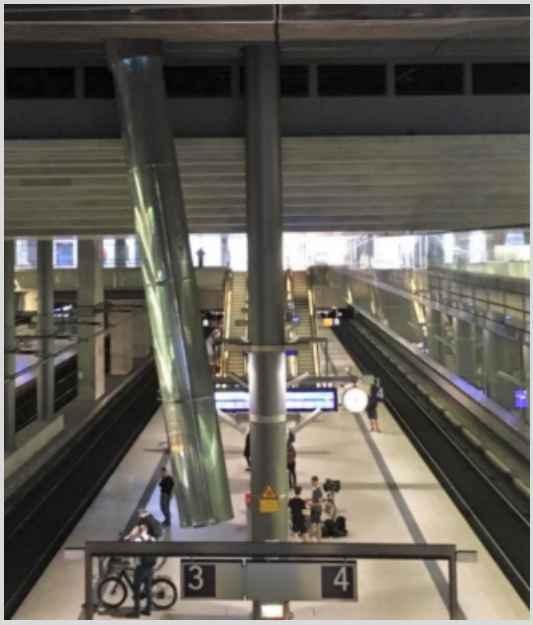
Daylight deflection by means of heliostats

With light ducts, daylight is captured in a light deflector using light-focusing lenses, and it is then transported into a building via the reflective walls.

GOOD PRACTICE

Daylight deflection at Potsdamer Platz

At the Potsdamer Platz railway station, large light shafts combined with heliostats are used to provide the station with daylight. This was implemented using three glass cylinders at Potsdamer Platz together with highly reflective, transparent foil-coated tubes. To provide sufficient illumination, artificial lighting is also used, which creates luminous columns at night [cf. Baunetz Wissen, n.d.].



Light tubes at Potsdamer Platz station, Berlin

Illumination of information offers

The illumination of information offers is another important aspect for senior-citizen-friendliness. Notices, boards and displays that serve to provide information and orientation must be illuminated in such a way that they are easily recognisable, even for people with impaired vision. However, they should

not be overlit or too glaring either. Furthermore, care must be taken to ensure no light reflections have a dazzling effect on these information devices.

Lighting at night

From the point of view of older people, good lighting in the evening and at night is a key requirement for transfer hubs. It is important to ensure there is no abrupt change in brightness between the station and the surroundings, as this causes problems for many people, especially those with poor eyesight. This can be achieved by gradually reducing the lighting beyond the direct transfer hub, for example, by decreasing the intensity of or the distance between the light elements in order to adapt the lighting step-by-step to the light conditions of the surrounding area.

GOOD PRACTICE

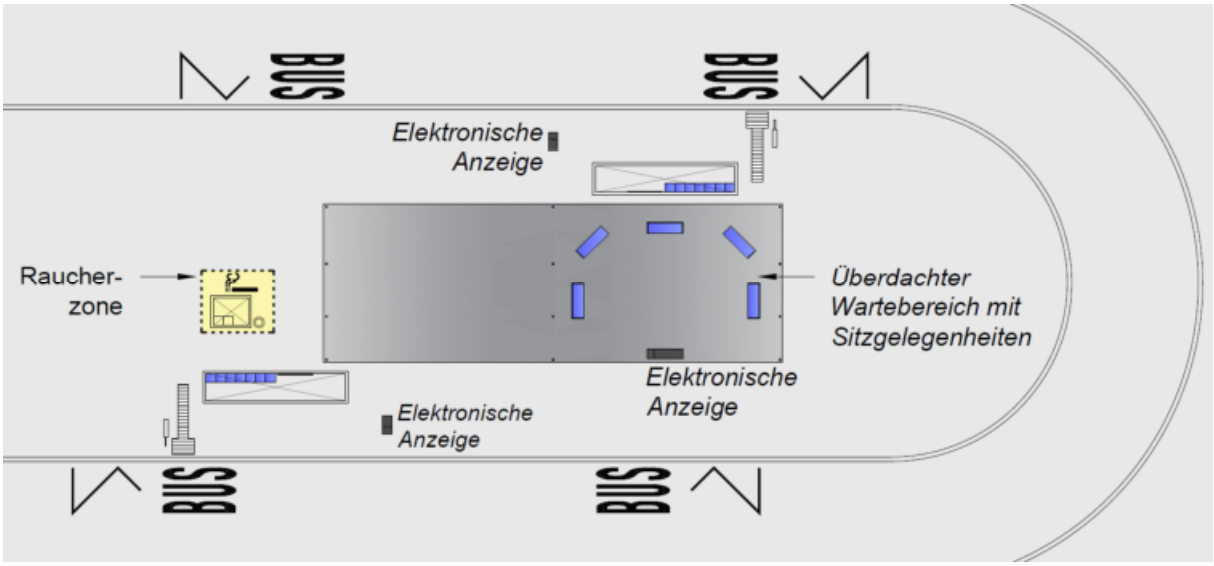
Sustainable lighting: The EU project "LUCIA – Lighting the Baltic Sea Region"

The EU project LUCIA is testing solutions for sustainable urban lighting. This includes the use of insect-friendly LED lighting, as already used in Hamburg. Connected light sensors can control the lighting in line with what is actually needed. In Jürmala (Latvia), for example, the lighting for the central pedestrian street is being renewed and new motion sensors are being used. The district of Hamburg-Altona, a leading partner in the project, has implemented a lighting concept for a pedestrian subway (cf. www.lucia-project.eu).

Energy-efficient lighting for a pedestrian subway in Hamburg-Altona

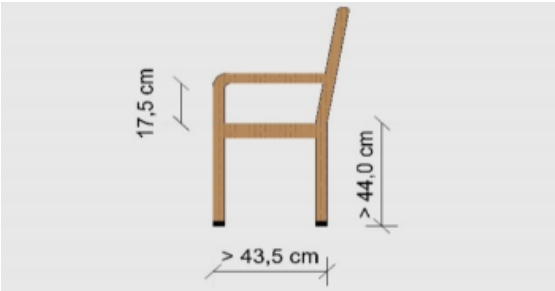
3.2.2 Seating and waiting areas

Sufficient, weather-protected seating that is in good order is essential for age-friendly transfer hubs. Both the location and the design of the seating must be taken into account. The location of the seating must be chosen in such a way so as to provide a good view of the departure areas. On the one hand, this can be done by providing seating in the direct departure area. This gives people who are waiting a direct overview of the buses and trains that are arriving. In addition, seating can also be arranged away from the direct departure areas. The prerequisites for these locations are, on the one hand, that digital information with updated departure times is clearly visible from there and, on the other hand, that these seating areas are located close to the main pathways at the transfer hub. This way, people who are waiting can reach the departure point on time for the bus and train departures.



Schematic diagram showing the relationships between waiting areas and areas where information offers are available

When designing the seating area, care must be taken to ensure there are enough seats or benches, which are also high enough and thus suitable for senior citizens. Particular attention should be paid to this aspect at locations where facilities are available for the elderly in the direct vicinity. Higher seats make it easier for senior citizens to sit down and get up again. This should be supported with armrests on the individual seats or benches. The recommended dimensions for seating can be taken from the following system layout.



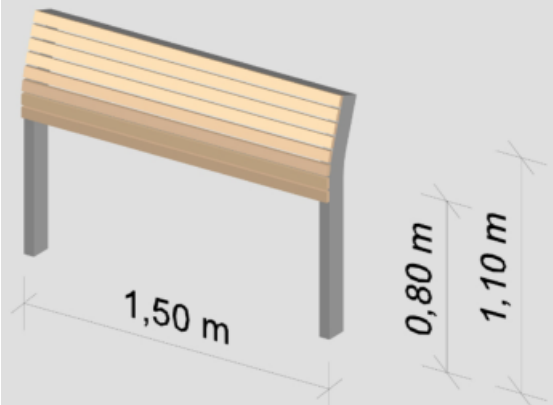
Dimensions of a senior-citizen-friendly seating arrangement

With regard to the materials to be used for seating, building materials that feel cold, such as wire mesh and concrete, are not recommended. The material and the shape of the seat shell are also relevant to achieving the desired level of comfort. Concave-shaped seats made of wood or plastic are usually regarded as comfortable. At the same time, the seating should be robust enough and not show any signs of damage [cf. Beucker/Zurnatzis 2011].

When designing waiting areas, care should also be taken to ensure space is provided for people in wheelchairs. In places where there is sufficient space and/or where senior citizen facilities are located nearby, consideration should also be given to installing special benches for such older people. These not only have a raised seat height and armrests at each seat, some also have integrated room for a rollator.

Senior citizens' bench with rollator parking space

A weather-protected area for the seating is just as important. These should be protected against wind and rain in particular. A sufficiently large canopy should also be provided, especially at larger public transport stops and in places where many senior citizens board or change. Care should be taken to ensure the canopies are designed to provide protection even in heavy rain and wind, for example by providing an appropriate roof pitch or additional side protection.



System layout: Leaning benches

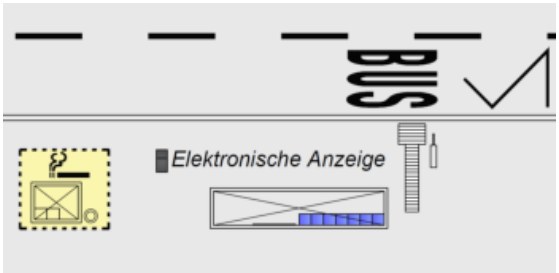
When creating seating areas, there is always a risk of misuse, which can affect the feeling of safety. A ban on alcohol and smoking, social control and sufficient lighting can help to reduce this risk.

If space is limited, i.e. directly at the departure area, standing room with a leaning bench is also suitable in addition to normal benches. Such options provide relief for the legs and back, without having to sit down or stand up, which some older people find difficult. In addition to this, the risk of soiling is significantly lower than it is for seats. However, they should not replace regular seating areas, but instead complement them.

3.2.3 Protection of non-smokers

A common problem is that waiting passengers often smoke directly at the point of departure, and in bad weather this also often happens in covered waiting areas. Apart from the health risk this poses to others, many passengers feel disturbed by this and therefore wait away from the direct departure point or outside of the passenger shelter. Short distances to the boarding area or seating are therefore not used even if they are needed. Discarded cigarettes on the ground also create an unwelcoming atmosphere.

In order to protect non-smokers, transfer hubs and, above all, waiting areas should be smoke-free. If a complete smoking ban cannot be implemented in these places, e.g. at larger bus stops, specific smoking areas can provide a remedy to this problem. As is already the case on platforms for regional and long-distance services, areas can be designated as smoking zones and equipped with ashtrays. To ensure these zones are used, they may not be too far away from the departure areas. In addition, compliance with the smoking ban should be monitored in the other areas of the transfer hub.



System outline: Location of separately marked smoking areas outside the shelters

3.2.4 Attractive design

Other essential aspects are cleanliness and a tidy, attractive appearance. This relates primarily to ongoing maintenance, cleaning intervals and local social conditions/aspects. Nevertheless, the planning and design of transfer hubs can also make a contribution here. This includes, for example, an appealing architectural design. When wall surfaces are designed in a colourful and artistic way, they have a friendlier appearance and often prove less susceptible to unwanted graffiti than dull surfaces do. Cluttered corners that are difficult to clean should be avoided. Having enough rubbish bins (including contactless ones) can contribute towards cleanliness, as can smoking bans. Kiosks, shops and services can strengthen the attractiveness of the area as well as social control and a sense of security.

Making transfer hubs more green can also help to improve the overall attractiveness of the area, if maintenance thereof is ensured. In view of the increasing number of heat waves, greener transfer hubs are also becoming more important from a climate-related perspective. In addition, care should be taken to ensure that there are shaded waiting areas, as heat can cause serious health problems, especially for older people. Drinking water dispensers can also help to ensure that (not only) older people can stay safe in public spaces (and also want to) when it is very hot.

GOOD PRACTICE

Green public transport stops

In recent years, options for making passenger shelters greener have been tested in various cities. This contributes towards making public transport stops more attractive while also helping to make cities more insect friendly. Increased greenery can also help to cool down urban spaces during hot spells, which are particularly stressful for older people. In Utrecht (Netherlands) and Bonn, various options for green passenger shelter roofs were tested. In Vienna, too, public transport shelters, among other things, are being made more green. At the back of existing public transport stops, planters have been installed with fast-growing climbing plants, in order to form a kind of canopy. [cf. https://www.wienerlinien.at/web/wiener-linien/begrünung].

Green public transport stop in Vienna

3.3 Bicycle and pedestrian traffic

A key issue when designing transfer hubs is the spatial conflict between cyclist and pedestrians. On the one hand, the different types of traffic and their special features must be taken into consideration, on the other hand, the intersection of traffic types and the identification thereof must also be planned.

An age-friendly walkway layout is characterised above all by short distances and accessibility. For cyclists, clear routes and safe parking facilities should be considered. The provision of convenient bike to train changeover possibilities should also be considered.

Often, the crossing of pedestrian and bicycle traffic cannot be avoided at transfer hubs. Special attention must therefore be paid to these points of conflict with regard to the decreasing ability of senior citizens to react and move. Ways of designing these points are explained below.

3.3.1 Accessibility

Many different paths are taken at transfer hubs. Changing from one mode of transport to another often also involves different height levels, which need to be overcome. Accessibility is a key aspect here that should be considered in the overall design of the transfer hub.

Routes / Elevators

In order to make the routes within and access to transfer hubs suitable for senior citizens, attention must be paid to the accessibility of all points that need to be reached. In terms of design, this can be achieved by making the central areas of the transfer hubs accessible at ground level and by planning the shortest possible routes – also for those who rely on elevators. In particular, it must be possible to bypass long flights of stairs with elevators that function at all times. If elevators are not available, it must be possible to obtain information before and during the journey, so that the best-possible route can be planned accordingly. Information systems such as the HVV elevator map (cf.www.hvv.de/aufzugsplan) should therefore know the operating status of an elevator. If there is a malfunction or elevators are being renewed and are not available for this reason, passengers should be offered an alternative, barrier-free route, e.g. by bus. If elevators are out of service for a longer period of time, passengers should also be informed about alternative travel options on site by means of notices or similar (see chapter 4.1.).

The distances between the elevators and the arrival and departure areas should also be as short as possible. Consistent signs help with accessing the elevators directly (see also chapter 3.1.1). Direct walking routes should be kept free of physical barriers such as parked bicycles, seating or outdoor areas of catering establishments. It is important here to have clear zones separating walking routes and waiting/seating areas [cf. HVV 2019: p. 7]. In addition to this, sufficient parking facilities for bicycles must be provided at transfer hubs in order to reduce unauthorised bicycle parking (see chapter 3.3.4). Another major problem is the growing number of dockless e-scooters, which are frequently left at transfer hubs and which result in over-utilisation of these already heavily congested areas. Here it is recommended to agree on fixed parking stations at very busy locations together with the providers

[cf. Agora Verkehrswende/DST/DStGB 2019: p. 20].

Ramps

Individual steps to accommodate different height levels (and even larger height differences) can also be overcome using inclined walkways or, in the case of larger height differences, ramps. In Hamburg, the following rules apply to this, which can also be used elsewhere as a guide for the barrier-free design of public spaces: If the slope of walkways is between 3 and 6%, level areas should be provided at intervals of no more than 10 m [see Behörde für Wirtschaft, Verkehr, und Innovation 2017: p. 105]. The slope of a ramp must not exceed 6%, the minimum width is 1.20 m. After a maximum of 6 m, intermediate landings are to be built; in addition, a handrail should to be provided on both sides [cf. Road and Transport Research Association (FGSV) 2011: p. 45]. Furthermore, ramps are to be arranged within the direct pathway so that people with limited mobility can also rely on short walking distances.

Steps

Care must also be taken to ensure that staircases can be used safely by people with impaired vision and slight physical disabilities. This concerns, among other things, the design of the steps, which should be constructed with risers in any case. Step treads should not extend beyond the risers to reduce the risk of tripping. The front edges of the steps should be formed with a clear visual contrast to the surrounding surface. The first and last steps, in particular, must be clearly marked. A landing should be provided after a maximum of 15–18 steps. If there are more than three flights of stairs, extended intermediate levels with an area for resting should be provided. In public spaces, the upper edges of steps in particular should be marked in a way that draws attention [cf. Road and Transport Research Association 2011: p. 45f].

Handrails

Another aspect of accessibility is the presence and unrestricted usability of handrails. At staircases, ramps and bridges as well as crossovers, these should be available as standard and/or they should be including in the planning. They should not be interrupted in areas they are needed and they should not be too short, either. Access to the handrail must also be taken into consideration. Parked bicycles, for example, can restrict accessibility here. To ensure accessibility, the handrail should be designed in such a way that it cannot be reached with parked bicycles or it should appear unsuitable for locking bicycles. This can be done, for example, with a version that is attached completely to the wall instead of a railing with individual rungs.

Significant reduction in bicycle parking due to modified railings in Hamburg-Bergedorf

The parking of bicycles may also be prohibited if this would constitute an obstruction or danger to others. Prohibition signs or pictograms can support this.

Material / Surface of the substrate

When designing the surface, make sure that it is even and has a good level of grip. Frequent changes of material, especially between small and large pavements, can affect senior citizens' ability to move around. On the one hand, moving a rollator or using other walking aids on coarser, uneven material and paving with large joint widths can cause problems, and on the other hand, the risk of tripping increases. Steps must be clearly recognisable as such and marked with high contrast.

3.3.2 Separation of cycling and pedestrian traffic

The structural separation between the walkway and bicycle lane is a key aspect of senior-citizen-friendliness. In this way, unclear, stressful and accident-prone situations can be avoided. This separation can be realised in different ways.

Cycling traffic guidance at the road level

The guidance of cycling traffic at the road level in the form of protective lanes, bike lanes or protected bike lanes, as well as joint signalling with motor vehicle traffic (or separate cycling traffic signalling) create a clear separation between cycling and pedestrian traffic. This can help to minimise conflicts between these modes of transport. It also provides sufficient room for pedestrian traffic in adjacent areas with little space. This means that at bus stops, the direct entry and exit area is only available to pedestrian traffic.
In the area of bus stops, cycle lanes and protective lanes should be continued if possible to avoid confusion among road users [see Behörde für Wirtschaft, Verkehr und Innovation 2017: p. 64].

Cycle traffic guidance in the adjacent areas

If the guidance or routing of cycling traffic runs through the adjacent areas at transfer hubs, the possibility of using the "Berlin solution" in the intersection area should be examined, which provides for the routing of cycling traffic in a straight line at the road level. Conflicts with waiting pedestrians can therefore be avoided. In addition to this, the "Berlin solution" can be used if the bicycle lane runs in the adjacent area, but there is not enough space for a walkway, bicycle lane and waiting area in the bus stop area. Cycle traffic is then diverted to a cycle lane in front of the bus stop and, if necessary, re-routed after the bus stop. If this routing is not possible or sensible, bicycle traffic can be routed on the secondary areas behind the bus stop. In case of doubt, both options should be examined and weighed up, taking into account the concerns of pedestrians and cyclists.

Bicycle traffic is routed behind a bus stop at the Mundsburg Bridge in Hamburg

GOOD PRACTICE

"Berlin solution" at a bus lay-by

The illustrated plan for the Doormannsweg project in Hamburg shows how the bicycle lane can be routed to road level next to a bus stop. The bicycle traffic is routed through an extra-wide bus lay-by using a dedicated bicycle lane next to the bus stop area.

When guiding bicycle and pedestrian traffic in the adjacent areas, the paths should be visually separated from each other using different colours. Users are thus helped to orientate themselves and to recognise which paths and areas are used by other modes of transport. In this way, conflicts between pedestrian and bicycle traffic can be reduced. The installation of tactile guide elements between the walkway and bicycle lane, which is now common in Hamburg and other cities, emphasises this separation. People whose eyesight is limited or who move around with the help of a white cane are also supported with their orientation with such aids. Furthermore, the white guide elements increase the contrast to the adjacent surfaces and therefore make the separation of a cycle path and walkway more visible, even when the light is poor or the conditions are wet. In addition to the visibility of the white colour, the knobs on the guide elements also draw attention haptically for both pedestrians and cyclists when crossing.

Clearly marked, separate routing of bicycle lanes and walkways in Hamburg-Dammtor

Another possibility of separating pedestrian and bicycle traffic is the "Copenhagen solution", which provides separation of pedestrian, bicycle and motor vehicle traffic using different heights. To date, this design has been used primarily in Denmark and the Netherlands. Signalling is carried out together with motor vehicle traffic, and must therefore be coordinated according to the

needs of the junction. On a case-by-case basis, it should be checked whether bicycle traffic should be given a green signal several seconds before motor vehicle traffic moving in the same direction.

Both the walkway and the bicycle lane should be sufficiently wide. The walkway should not be narrower than the bicycle lane, unless the lane can be used in both directions.

Pictograms for additional support

To provide further clarification and support the colour design of the lanes and walkways, bicycle or footpath pictograms can also be used that support the orientation of all traffic participants. Pictograms should be high-contrast and in a size that is clearly visible. They should be provided at regular intervals.

Pictograms to highlight the routing for pedestrians and cyclists in Kiel

4.3.3 Crossings

The main mode of transport within at transfer hub is walking. As transfer hubs often cover a larger area and bus routes, for example, are tied to the given road layout, it is usually almost impossible to avoid crossings between pedestrian traffic and bicycle lanes. In addition to this, roads often have to be crossed to reach a bus stop or a sharing station. It is therefore important for an age-friendly transfer hub that all intersection lanes have suitable crossing points so that detours for pedestrians can be avoided.

Easing conflict zones

Crossing points for walkways and bicycle lanes should be designed in a clearly recognisable way so that pedestrians and cyclists are made aware of the situation at an early stage. Older people, whose reactions and speed of movement may be limited, must be able to cross such an area safely. At road crossings, it is important to provide clearly recognisable, sufficiently dimensioned areas for waiting pedestrians and, if necessary, turning bicycle traffic.

Pedestrian crossover in Göttingen

With regard to the senior citizens involved, priority rules such as pedestrian crossings (zebra crossings) across roads and bicycle traffic at busy points can be helpful. Alternatively, crossing a lane or road can be facilitated by narrowing the area in question or using pedestrian crossing islands.

Marking of the main crossing zone in Hamburg-Eidelstedt (above) and a sign showing "Respect" on the walking trail along the river Alster in Hamburg

Another possibility is to highlight the conflict point using markings and, if necessary, signs that, however, only indicate that increased attention and general consideration is required in this area. However, such solutions should only be used where a separation of cyclists and pedestrians is not possible and where support should be provided at best with communication in order to minimise conflicts.

GOOD PRACTICE

Fairness Zone at the Donaukanal

Vienna's Donaukanal is a popular meeting point for various road/walkway users with the obvious potential for conflict. With the help of a "Fairness Event" on site, tests were carried out to see whether a "Fairness Zone" marked in blue at central locations could bring about mutual consideration and fair cooperation among the users. A survey of the users showed that conflict situations in the location could not be completely resolved, but they could be defused and more respectful interaction could be achieved. [cf. https://stadtpsychologie.at/fairness-zone-donaukanal/].

Marking of the "Fairness Zone" in Vienna

Road/lane crossings

Safety when crossing lanes/roads at transfer hubs can be increased with the help of traffic light systems. In doing so,
care must be taken to ensure that the green light phase lasts long enough for people with limited mobility. The "crossing" time must be calculated in such a way that the entire road/lane can be crossed safely. A crossing speed of at most 1.0 m/s should be taken into consideration for signalling, to ensure users with limited mobility have sufficient time.

Tactile guide elements and acoustic orientation signals should be used to ensure the crossing area can be found. An acoustic crossing signal should be provided when the light turns green. If the crossing signals cannot be heard clearly at, for example, busy intersections, the start of the crossing period can also be indicated by additional tactile, vibrating signal transmitters. The kerb should

be lowered to a maximum height of 3 cm at the pedestrian crossing point, above all for rollator and wheelchair users [cf. reports of the Federal Highway Research Institute 2012]. Due to the complex requirements for planning traffic light systems at junctions, their design and possible design must be checked individually in each case.

GOOD PRACTICE

"Green Man Plus"

In Singapore, the concept of a longer green phase to make it easier to cross roads has been introduced in some places. This is made possible by a device on the traffic lights that enables a longer green phase of up to twelve seconds by using an electronic card. Such a card is available to people aged 60 and over as well as people with disabilities [see Stuttgarter Nachrichten 2019].

3.3.4 Safe parking facilities

Cycling is an excellent way to reach transfer hubs and to continue a longer journey by another means of transport, such as bus or train. This is especially true for older people, for whom longer journeys by bicycle are a challenge. Safe and easy-to-use parking facilities are therefore particularly important for age-friendly transfer hubs. An adequate amount of bike parking is also essential when it comes to ensuring accessibility. Since an increase in the number of bicycles is to be expected in relation to the mobility paradigm shift, planning is needed with a view to the future, which should look into providing more than enough parking facilities instead of not enough. The extent to which car parking spaces can be converted for this purpose should be examined. What's more, care must be taken to ensure that secure parking facilities are also provided for those types of bicycles that have special requirements. With regard to older people, this primarily concerns pedelecs and tricycles for seniors. A distinction can be made here between open parking spaces and lockable, rented parking spaces, whereby both should be available if possible.

Open parking facilities

A sufficient number of parking facilities should be provided with sufficient size and in close proximity to a station. The parking facilities should be arranged at a certain distance from adjacent pathways, in order to increase safety and reduce disturbance for all road users. Parking spaces should be separated using tactile guide elements to enable blind and visually impaired people to "feel their way" and avoid any obstacles on the path. If demand is high, bicycle parking garages can also be useful.

Older people usually need sufficient space to be able to move without conflict at their own pace and in a way that is in line with their physical abilities. This is also necessary for reaching, manoeuvring or parking in bicycle parking facilities. Furthermore, age-friendly two- and three-wheelers usually have larger dimensions than normal bicycles. So not only the parking space itself should be dimensioned sufficiently, but also the direct access, such as the walkway to the parking space.

Lockable parking facilities

The use of pedelecs and tricycles is associated with high purchase costs. Secure parking facilities, e.g. shared locking systems, are therefore essential to make bicycles more attractive as a means of transport to the next public transport stop or sharing station.

As age-friendly bicycles are usually heavier, and as physical strength decreases with age, it is important to provide older people with parking facilities that are at ground level wherever possible.

GOOD PRACTICE

B+R rental parking spaces in Hamburg

The B+R parking spaces, which can be rented for a charge, can be accessed via a PIN or a user card. Shared locking systems usually have double-deck parking slots. Older people can use the lower level comfortably. Gas pressure springs are provided to help people lift a bicycle onto the attachment rail of the upper level of the double-deck parking slot. This makes it easier to position the bike and it also enables older people to use the upper level if required.

B + R parking space in Hamburg-Altona

3.4 Notes on sharing systems and shuttle services

In recent years, bike-sharing, car- and ride-sharing, and platform-based shuttle services have significantly expanded the individual possibilities of remaining mobile without owning a car.

During the course of the participation process for the GreenSAM project, it became apparent that senior citizens are often aware of these offers, but hardly make use of them. The biggest barrier here is digital access via smartphone apps. What's more, contact persons who provide support when booking or renting are very important to the users. In this regard, telephone offers, service points, training programmes and targeted information opportunities would appear to be particularly promising. What's more, the age-friendly planning and design of sharing stations and transfer hubs remains important, as the removal of mental and digital barriers is of little use if barriers still remain in public areas.

GOOD PRACTICE

Mentoring programmes for public transport and bike sharing in Turku / Finland

Within the scope of the GreenSAM project, the use of mentoring programmes for senior citizens has been successfully tested in Turku in order to give them better access to public transport (including digital offers) as well as bike sharing systems and to reduce inhibitions when it comes to using these offers. On the one hand, "peer mentoring" was tested, i.e. older people were trained as mentors to then support others. On the other, a "youth mentoring approach" was developed, in which students in the field of physiotherapy help older people to use public transport as well as rental bikes.

Mentor in Turku / Finland

3.4.1 General requirements

The location of a sharing station at a transfer hub is basically dependent on the location and the road layout. In order to facilitate the use of sharing services for older people, such services should be as barrier-free as possible and directly accessible, as long as the local conditions allow this.

Sharing offers should also be easy to find. Information about these should therefore be integrated into the control and information systems. Integration into the directions system can be achieved through information on central display boards, consistent signs throughout and also markings on the ground. The locations should also be marked on overview maps. Interactive information systems (see chapter 3.1.2) can facilitate access to rental and use on site. If there is a service point at a transfer hub, support in using sharing systems should also be offered there.

As explained in chapter 3.2.2, weather-protected seating or leaning areas in the direct vicinity of the sharing station can also help to support the age-friendly nature of the services. These can not only be used while waiting or resting, but also to calmly rent a bicycle or vehicle while protected from the wind and rain.

Pictogram to highlight sharing offers in Hamburg

3.4.2 Bike sharing and e-scooters

Bicycles with a step-through frame that are not too heavy are easier for senior citizens to handle. In order to be able to offer an age-friendly bicycle rental system, it is therefore important that such criteria are taken into account in the offer. Other options are pedelecs, such as those used in the GreenSAM partner city Tartu (see good practice example), and/or senior-citizen tricycles. It is also important that the bicycles can be rented and reconnected without much effort or bending over. In addition, as with other sharing systems, the rental process should be as uncomplicated as possible. Interactive information offers on site (similar to the information columns in public transport), if necessary with acoustic information and/or the possibility of personal communication, can also help to make the offer more attractive for the 60+ generation..

GOOD PRACTICE

Bike sharing in Tartu / Estonia

In Tartu, Estonia's second largest city, a comprehensive bike sharing system was introduced in 2019. The system is free of charge for older people. Bikes rentals are possible using a senior citizens card, which can also be used for public transport. During the course of the GreenSAM project, an "information and encouragement package" for senior citizens was developed, which included short videos and information tailored specifically to the target group. This information was widely advertised at events and received a great deal of interest from older people.

Bike-sharing-system in Tartu / Estonia

For dockless bike sharing services, fixed locations should be defined at busy transfer hubs in coordination with the providers, in order to keep pathways free of parked rental bikes and to be able to include the service in signs and directions. The same applies to e-scooters, which can be a barrier if parked carelessly. Here, too, fixed parking areas can reduce the problem, especially at transfer hubs.

GOOD PRACTICE

Fixed parking points for e-scooters at Frankfurt am Main main station

At Frankfurt's main station, Deutsche Bahn (DB) has designated a parking zone for e-scooters in a central location so that it's possible to switch to public transport quickly [cf. Agora Verkehrswende 2019: p. 26].

3.4.3 Car sharing / Car rental

Car sharing services should be offered as close as possible to train and bus stations in order to allow for quick transfers. For increased visibility and better directions to the car sharing vehicles, signs and/or pictograms at the transfer hubs would be helpful. Recognisable markings make it even easier to find the stations. They are also important to keep the parking spaces free for car sharing.

Car sharing stations should be located away from the
main roads so that users can familiarise themselves with a car at their leisure and start the journey on a road with less traffic. Enough space to get in and out – also for passengers with a rollator or wheelchair – is helpful in any case. However, it would only make sense to provide special barrier-free parking spaces if vehicles converted for disabled access are permanently available there. And with free-floating services, it cannot be ensured that barrier-free parking spaces are always available in the required number, as the parking spaces are used flexibly and may already be occupied.

To ensure the time required to familiarise oneself with a vehicle is not a cost factor, it makes sense to take this into account when setting the rates and not to charge for it.

3.4.4 Shuttle services

Shuttle services make it possible to get from one's own front door to the nearest high-speed railway stop or to other important destinations (and back again). They represent an important way to stay mobile without having to own a car, especially for senior citizens who live in the suburbs and/or for whom the distances on foot or by bike have become too far. Shuttle services can also be an attractive alternative to owning a car when it's dark (especially in winter). For many older people, taxis are used for this purpose. They must therefore always be included when planning and designing transfer hubs. Barrier-free accessibility, which is as direct as possible, should be ensured. However, this offer is comparatively cost-intensive and for many older people only an option for special occasions.

Shuttle services provided by transport associations, commercial shuttle-on-demand providers and/or community buses organised by volunteers, which serve as shuttles to public transport stops or other important destinations, are therefore important supplemental services to public transport. They enable people to remain mobile without having to own a car. Privately organised drop-offs and pick-ups can also fulfil this function. Such shuttle services should be taken into account when designing transfer hubs. So far, however, with the exception of taxis, they are not generally visible in urban areas and therefore not easy to find.

Because of this, a review should be carried out at these key places of sustainable mobility, in order to determine whether stopping zones for such offers with a drop-off/pick-up function can be marked accordingly and integrated into the direction and information systems. They should of course also be easily accessible/barrier-free. This makes it easier to make use of such services, and it can also help to raise awareness of them. Weather-protected waiting facilities as well as interactive information options can also help to make the offers more attractive to the 60+ generation.

GOOD PRACTICE

ioki Hamburg

In Hamburg this service is already running in the districts of Osdorf, Lurup and Billbrook under the name "ioki Hamburg". This is a public transport service provided by HVV, which has no fixed timetable or route, and it's available around the clock. The barrier-free, partially emission-free e-vehicles can accommodate up to six people. The vehicles are barrier-free and can be used comfortably with a rollator or wheelchair. The service can be booked via an app. Pre-bookings are possible. If access via smartphone is a problem for older people, the HVV senior citizens' advisory service can help by telephone and in person. Training courses explaining how to use ioki via smartphone were provided together with the Adult Education Centre (VHS).

4. Checklist for the planning and conversion of transfer hubs

This checklist allows the criteria for developing age-friendly designs, which are covered in these guidelines, to be taken into account at an early stage during the planning process. It can be utilised several times during the planning process:

- when determining the basis or analysing existing transfer hubs and/or
- when examining plans for the conversion or new construction of stations.

It should be viewed as a planning aid and supplement to communication activities with relevant public agencies (see p. 53ff). With regard to larger measures, direct participation of senior citizens should also be envisaged within the scope of citizen participation processes, in order to ensure suitable location-specific solutions can be found. Guidance and tools for the participation of older people can be found at www.green-sam.eu/toolbox.

Destinations in the vicinity of the public transport stop	**Available**		**Distance / Notes**
	Yes	**No**	
Retirement homes / Sheltered accommodation for senior citizens			
Senior citizen contact points / Advice centres			
Hospitals / Medical centres			
Town hall, library, neighbourhood centre, museum, cinema, sports facilities, swimming pool			
Shopping centre / shopping streets			
Other destinations (e.g. parks, cemeteries, local recreation areas)			
Assessment: Is a particularly high number of older people to be expected?			

4.1 Orientation and service 	**Available / Planned**		**Need for improvement / Notes**
	Yes	**No**	
4.1.1 Guidance systems			
Are **analogue** or **digital displays** planned or available in a central location?			
Do the centrally-located displays provide **information on all of the types of public transport**?			
Have **the centrally-located displays** been placed in such a way that they can be **studied at leisure**?			
Are **decentralised digital displays available or provided?**			
If digital displays fail, is **analogue information available as well?**			
Is information also **provided on the floor and/or walls**?			
Is the **recognisability of the information** ensured with high-contrast lettering that is large enough?			
Have important **destinations in the surrounding area been integrated into the guidance system**?			
Are **pathways** (e.g. to toilets) from the public transport stop to the destination **signposted without any gaps?**			
Have **all available transport services been integrated** into the guidance system (incl. sharing offers)?			
Are **directions provided in the vicinity** of the transfer hub?			

Is a **continuous guidance system** provided for all traffic types during at construction sites?			
4.1.2 Information systems			
Is a **service point with contact persons provided** on site?			
Are **interactive, easy-to-use service offerings** provided?			
Are **comprehensive information offers available at a central, easy-to-find location**?			
Are **decentralised information points** available at all arrival and departure areas?			
Is visual information supported with **acoustic** or **tactile information**?			
Are **additional information offers** and/or contact persons provided for special situations (e.g. building sites)?			
4.1.3 Public toilets			
Is there a **public toilet** in the vicinity of the transfer hub?			
Is the **toilet in a central location**?			
Is **accessibility ensured (barrier-free)?**			
Is the **toilet suitable for handicapped people**?			
Is regular **cleaning of the toilet** ensured?			
If no public toilet is available: Are **alternatives available nearby**?			

Comments on orientation and service:

4.2 Welcoming atmosphere 	**Available / Planned**		**Need for improvement / Notes**
	Yes	**No**	
4.2.1 Lighting			
Is **diffuse, even lighting** provided for the entire area **during the day** (among other things with glass elements, bright colours, if necessary with daylight deflection)?			
Is regular **maintenance and cleaning** of canopies/covered areas, etc. ensured?			
Are possible **glare effects – when the sun is low for example –** avoided through a suitable choice of location for information and waiting areas?			
Is the transfer hub well lit in all areas when it's dark?			
Are **information and guidance systems** well lit **during the day and night**?			
Can an **abrupt change in brightness,** with regard to the environment, be **avoided**?			
Are **smart, energy-efficient lighting concepts** being used?			
4.2.2 Seating and waiting areas			
Are **sufficient age-friendly seats** available?			
Are **special benches for senior citizens** provided at the respective location?			
Are leaning **benches** also provided at the location?			
Are the **waiting areas** arranged in such a way that the **departure information can be seen** and the **boarding areas reached quickly**?			

Is there adequate **weather-protected seating with a roof and side protection** against heavy rain and wind?			
Are the seating areas **protected** against vandalism (as far as possible) and rotting due to weather exposure?			
Is regular **maintenance / cleaning of the seating** area ensured?			
4.2.3 Protection of non-smokers			
Is a general **smoking ban envisaged over the entire area of the transfer hub**?			
Is the **smoking ban displayed throughout the area?**			
Are **smoking areas** provided?			
Are the smoking areas located in such a way that **waiting areas are disturbed as little as possible**, but **entry points and information are easily accessible** from there?			
Are **smoking areas equipped with ashtrays**?			
Is **regular emptying and cleaning** of the ashtrays guaranteed?			
4.2.4 Appealing appearance			
Are any **special designs planned** (special architecture and/or artistic designs of walls, light or similar)?			
Are there **areas or showcases for local advertising, art** or the like?			
Is **greenery** and/or **shading elements** provided?			
Are there **drinking water dispensers**?			
Are there **shops and/or a kiosk** on site?			

Are **rubbish bins provided in all areas of the transfer hub**?			
Is **regular emptying of all rubbish bins** ensured?			
Have **precautions** been taken to minimise **pigeon droppings**?			
Are **corners that are difficult to access or clean avoided**?			
Is the regular **maintenance of facilities and plants** ensured?			

Comments about the welcoming atmosphere:

4.3 Bicycle and pedestrian traffi 	**Available / Planned**		**Need for improvement / Notes**
	Yes	**No**	
4.3.1 Accessibility			
Are **all areas** at the transfer hub **accessible**?			
Are **elevators or ramps for the handicapped** provided, in order to overcome height differences without steps?			
Have **elevators been installed in such a way** that all areas can also be reached by people with reduced mobility **over short distances**?			
Are **ramps available and are they located directly along the pathways**?			

Have the **steps been designed in a barrier-free** manner according to the BSVH (association for the blind and visually impaired)?			
Have **clear zones and pathway guidance been provided at the transfer hub**?			
Have **measures been taken to prevent unauthorised bicycle parking**?			
Have measures been taken to ensure the **continuous usability of handrails** (e.g. railings attached completely to the wall)?			
Are **grippy, level surfaces planned for the walkways**?			
Will **tactile guide elements** be provided along the main walkways?			
Are areas for **pedestrian traffic sufficiently dimensioned** and **free of structural obstacles**?			
4.3.2 Separation of cycling and pedestrian traffic			
Are **cycle and pedestrian traffic lanes separated**?			
Will **measures be provided to ease hazardous situations**?			
Can the **bicycle lanes** in the area of the transfer hub be routed away from the walkways **at the road level**?			
If **bicycle lanes are routed via adjacent areas**: Are the areas **clearly separated** (e.g. using tactile guide elements)?			
Are **pictograms and/or arrows** provided in the area of **central walkways**?			

4.3.3 Crossings			
Are additional measures in place in potential **conflict areas** between pedestrians and bicycle traffic to ease the situation?			
Are **measures provided to ensure roads can be crossed safely**?			
Are traffic light systems **provided with sufficiently long green phases** so that **people with limited mobility** can cross without any stress?			
Are **pedestrian crossings** provided across roads that are less busy?			
Do **pedestrian crossings continue over bicycle facilities and lanes**?			
Are traffic-calming measures planned for **motorised traffic**?			
4.3.4 Safe parking facilities			
Are there enough **open parking spaces for bicycles** (also with regard to an increase in the number of cyclists)?			
Are **open parking facilities provided for different types of bicycles** (cargo bikes and tricycles as well)?			
Are **covered parking facilities / shared locking systems** provided for bicycles?			
Are **parking facilities for cargo bikes and tricycles** also provided in any shared locking systems?			

Comments on bicycle and pedestrian traffic:

4.4 Sharing and shuttle offers 	**Available / Planned**		**Need for improvement / Notes**
	Yes	**No**	
4.4.1 General notes			
Can **sharing offers be accessed barrier-free** and **as directly as possible**?			
Are the **routes to sharing stations** or other services (e.g. taxi, shuttle on demand) **sign-posted consistently**?			
Are **sharing stations** and other service offers **displayed on general plans**?			
Do on-site information systems also provide **information about sharing offers**?			
Are **weather-protected seats or leaning benches** available in the direct vicinity of sharing service offers?			
4.4.2 Bike sharing and e-scooters			
Are pedelecs and **age-friendly bicycles** that are not too high or too heavy available?			
Are **special bicycles** (senior citizen tricycles and/or cargo bikes) available?			
Can **bicycles be rented** in a manner that is not strenuous**and** without having to bend?			
Is an **uncomplicated procedure** in place for bike rentals, without the need for a smartphone app?			
Are **fixed parking spaces** provided for dockless rental bikes and/or e-scooters?			
4.4.3 Car sharing			
Can car sharing stations **be reached directly** from bus and train **stops**?			
If roads need to be crossed: Are **adequate crossing aids** provided?			

Is the **station** clearly signposted from all areas of the transfer hub?			
Is the station clearly visible through the use of **markings/columns**?			
Is the station **located away from main roads**?			
Do the parking areas **provide sufficient space for getting in and out** (e.g. also for passengers with a rollator or wheelchair)?			
Is **information about the offer** provided on site?			
4.4.4 Shuttle services			
Are fixed **stops for shuttle services and taxi ranks signposted**?			
Are **stop zones for other drop-off and pick-up services** (also private) provided?			
Can **the offers be accessed barrier-free and as directly as possible**?			
Is **information about the offer** provided on site?			

Comments on sharing offers:

Involved stakeholders	Institution / Company Contact person	Comments
Planning / conversion management		
Commissioned office(s), if applicable		

Public participation	Yes	No	Measures for reaching older people	Comments
Online participation				
Events (e.g. workshop, forums, etc.)				
Other formats (e.g. focus groups, site inspections)				
Evaluation				

Other public agencies to be involved			Institution Contact person	Comments
Administration / public sector	**Yes**	**No**		
Planning of roads / public space				
Maintenance of roads				
Urban greenery				
Lighting				
Police: Local PS				
Traffic directorate				
State authorities				
Coordination centres for the ensuring equality for people with disabilities				
Other				
Other				

Mobility service providers	**Yes**	**No**	**Institution** **Contact person**	**Comments**
Operator of the public transport stop				
Transport association				
Coordination offices (e.g. coordination of the public transport stops)				
DB, commuter railways, regional transport				
Taxi companies				
Other mobility service providers				
Other mobility service providers				
Park + Ride / Bike + Ride				
Public cleaning service				
Other				

Associations / Clubs / Other	**Yes**	**No**	**Institution** **Contact person**	**Comments**
Senior Citizens' Advisory Board				
State Advisory Council for Senior Citizens				
District Advisory Council				
Associations / Clubs – accessibility				
Associations / Clubs – bicycle traffic				
Associations / Clubs – pedestrian traffic				
Local businesses				
Other				
Other				

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