

Case analyses of practices aimed at managing the safety of senior road users

Sub task 5.2 Urban infrastructure

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***Case analyses of practices aimed at managing
the safety of senior road users***

Work package 5.2 Report

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Executive Summary

The CONSOL sub-task 5.2 objective is to analyse examples of practices aiming at managing the safe mobility of older road users in an urban environment. More specifically, this task reviewed good practices regarding accessible infrastructure and public transport from the perspective of older road users, identified safety issues relevant to older road users in an urban context. This report presents the approach followed and the methodology adopted. A tentative definition of a good practice has been agreed by the project: the practice has to be designed for older people (or people with reduced mobility), designed in cooperation with end users (older people), evaluated and sustained (duration of the initiative).

The good practice case studies collected cover the urban context and the public transport area and are clustered in different themes:

- Practices targeting older people
 - Personal transport schemes
 - User Training
 - Information provision & travel planning
 - Pricing and incentive measures
 - Policy for older drivers
 - Health issues
- Practices targeting stakeholders, authorities, designers
 - Planners, transport operators staff training
 - Urban environment design
 - Integrated accessibility planning

More than 40 good practices have been collected in 14 countries, including the USA. Despite of having elaborated a formal framework for the selection of good practices examples, it has been quite difficult to make a selection without subjectivity. It has also to be reported that the documentation available about practices is quite sparse and difficult to get.

From all the cases collected it can be observed that few initiatives really target older people in the considered context. Older people are most frequently included in the “people with disability” category in Europe. Initiatives dedicated to older people are more frequent in the health, well-being and social (generation sharing) areas and this seems to show that European society still perceives ageing as mainly a medical issue. The other important issue highlighted by this report is that older road users are mostly considered as a homogeneous group. It is very rare that initiatives, designed to improve older people mobility and safety, specify the characteristics of the older people who participate. Gender differences are not considered for the set up of the action planned but it usually comes to the result that participants are mainly older women, particularly if the action is concerned with public transport.

In terms of recommendation for EU policy or other research program, CONSOL is making the following recommendations:

- Design focused actions according to the typology of older people identified by Haustein (2012): Captive car users, Affluent mobiles, Self-determined mobiles, Captive public transport users
- Develop in a more holistic and explicit way the inclusion of older pedestrian needs in the design of urban infrastructures
 - Promote an EU older pedestrian environment friendly handbook: the limit of the person with reduced mobility approach could be that designers focus mainly on the problems of wheelchair users or blind people, but underestimate the question of older people
- Develop awareness program on the potential benefits from the use of new on board technologies



CONSOL TASK 5.2



WP5.2 – Practices aimed at managing the safety of senior road users

- Develop the knowledge on the trigger of modal shift for older travellers by supporting national initiatives

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1 Introduction

The urban infrastructure should accommodate the needs of all users, and particularly the older. It should be safe, accessible, attractive and easy to use, providing continuous direct routes and convenient connections between destinations. By being user-friendly for older road users, an urban infrastructure will also be easy for every citizens.

The urban context appears to be a critical area for older road users; in the context of a modal shift, the use of personal transport (PT) should become increasingly important for older people for whom multi-sharing urban mobility spaces are very challenging.

In work package 5, the CONSOL project planned to analyse examples of practices aiming at managing the safe mobility of older road users in an urban environment. More specifically, sub-task 5.2 aims:

- To review good practices regarding accessible infrastructure and PT from the perspective of older road users,
- To identify safety issues relevant to older road users in an urban context,
- To issue recommendations for senior-friendly cities in Europe.

1.1 Tentative definition of good practices

One difficulty for this task is the definition of good practice. This concept can be highly subjective and variable because what is good for one older person could be bad for another. When trying to collect information on good practice at the European level, the difficulty could also come from the fact that each EU member country is at a slightly different level of development and may not yet experience the challenge of an aging society.

However, in an attempt to achieve the CONSOL task 5.2 objectives, some criteria are proposed as a tentative definition of good practice:

- Designed for older people, or people with reduced mobility
- Designed in cooperation with end users (older people)
- Evaluated
- Sustainable (duration of the initiative)

1.2 Clustering the case studies

The various good practice case studies should cover the urban context and the public transport area; different themes can be proposed to provide a data collection structure:

- Practices targeting older people
 - Personal transport schemes: door to door, flexible route, accompanying person are examples, even though the “design for all” approach should be promoted.
 - User Training: could concern the use of information systems, ticketing, or the use of a public transport network
 - Information provision & travel planning
 - Pricing and incentive measures
 - Policy for older drivers (refreshing courses, retraining sessions, etc.)
 - Health issues
- Practices targeting stakeholders, authorities, designers
 - Planners, transport operators staff training
 - Urban environment design: improvements to infrastructure and pedestrian environment (streets, curbs, pedestrian crossings, pedestrian areas)

- Integrated accessibility planning

1.3 Identification of safety issues relevant to older road users in urban contexts

The “Risk situation analysis framework” (Wretstrand & Marin-Lamellet 2011), developed as part of the ACCESS2ALL project, was intended to provide an overview of potential risks faced by persons with disabilities and older road users when using public transport and urban infrastructures.

The work within the ACCESS2ALL project has identified some key areas to be addressed, which are highly relevant to the CONSOL project. The main situations that appear to present high risk levels for older people in urban contexts are:

Streets

Public transport buildings: railways stations, underground, transport hubs

2 Methodological approach

2.1 Collection of case studies

It has been proposed to collect examples of good practice in the countries represented by CONSOL partners, but also to use examples provided by other EU members, if they are documented in an accessible language.

2.1.1 Template for data collection

The following table has been proposed for the collection of good practice examples

Themes	Good practice title	Short description	Designed for older people	Designed in cooperation with end users	Evaluated	Sustainable	Ref
Personal transport schemes							
User Training							
Information provision & travel planning							
Pricing and incentive measures							
Policies for older drivers							
Health issues							
Integrated accessibility planning							
Planner and transport operator staff training							
Urban environment design							

2.1.2 Evaluation of the practices collected

After gathering good practice examples, a selection of the most representative practices is made according to the following criteria:

- Applicability: local, global level, duration in time
- Evaluation: evaluation completed, number and characteristics of participants, cost benefit analysis
- Population: Only older people? We suggest extending the approach to good practices designed for people with reduced mobility or targeting a universal design approach.

2.2 Framework for safety related issues

In the proposed framework, the level of risk is considered as the result of the interaction between two parameters:

- The likelihood of situations: This parameter represents the probability of occurrence of one event; for example, the fact that an older traveller could fall while walking is more likely than a person falling from his/her wheelchair on a ramp
- The severity of injuries: An injury is a complex phenomenon because it includes the injury by itself as well as the disability that may result. In this context, older people can be considered as vulnerable users, because they could more frequently experience at-risk situations, but also because the same accident could lead to a higher severity.

The proposed framework is based on the ISO 14971 standard “Medical devices - Application of risk management to medical devices”, it will first attempt to identify hazardous situations and contexts, which could lead to accidents for older pedestrians.

3 Analysis of results

3.1 Case studies collected as good practices

40 good practices have been collected by web search, literature search on databases and by knowledge imparted by CONSOL partners.

The main documents were obtained from the following sources:

- Previous EU projects: PT-Access, EuroAccess, Access2All, Mediate, AENEAS, Niches
- TRB data base
- Fiedler M. (2007). Older people and public transport. Challenges and chances for an aging society
- (Fiedler, Schuster, & Link, 2010)
- Lis et al. (2008). Evidence-based guidelines on health promotion for older people. Austrian red cross, Vienna
- Levin et al (2012). VTI report 749A
- TRL report

These 40 good practices were collected from 14 countries:

- Austria
- Bulgaria
- Czech Republic
- Denmark
- France
- Finland
- Germany
- Ireland
- Luxembourg
- Spain
- Sweden
- Switzerland
- UK
- USA

Research into good practices has focused mainly on European countries, but it was also decided to take into account some relevant cases from outside Europe; two practices were selected for their relevance and available documentation.

Details of the 40 good practices are presented in annex 6.1; the breakdown of the cases collected according to the clustering chosen is as follows:

- Practices targeting older people
 - Personal transport schemes:
 - Flexibus- North Ireland
 - „Dorf Mobil Klaus“, Upper Austria, Austria
 - ITN America
 - Birmingham Shopmobility, UK
 - “Compagnons du Voyage“, France
 - User Training:
 - Passenger training- Munich
 - Training of Older Passengers, EVAG, Essen
 - “Mobil bleiben – sicher ankommen” (Stay mobile – arrive safe) Bonn, Germany
 - “Engel opjepass – Oldies op Jöck” Angels watch out – Oldies on their way, Cologne, Germany
 - “mobil sein – mobil bleiben” (be mobile – stay mobile), Bern, Switzerland
 - “Sichere Mobilität” 60+
 - “Sicherheit für Senioren”, KfV Austria
 - “Zu Fuß im höheren Alter”, Austria
 - “Mobil sein – dabei sein”, Salzburg Austria
 - Public transport Information provision & travel planning:
 - Internet information in the Rhine-Main Area, Germany
 - London underground direct enquiries
 - Audio announcements at public Bus & Trams stops Sofia, Bulgaria
 - Czech republic - The national train services
 - Pricing and incentive measures
 - Czech Republic Free ACCESS CARD for public transport – Prague, Brno etc.
 - England older person's bus pass
 - BOB Ticket in Bremen, Germany
 - Policies for older drivers (refresher courses, retraining sessions, etc.):
 - Älter – Aber Sicher! Wissenswertes für Senioren am Steuer, Switzerland
 - „mobil sein – mobil bleiben“, Austria
 - Bilforer 65+ (Driver 65+), Norway
 - Health issues:
 - Promotion of walking as a health trigger, Donostia San Sebastián
 - Guided Cycle Trips – Encouraging Older People to Continue Cycling in Odense
 - Czech Republic – project: ceskojede, and national Cycling strategy
 - “Bewegte Apotheke” Vienna, Austria
 - Programme for the promotion of Healthy ageing, Spain
 - “Gemeinsam Gehen”, Styria, Austria
 - Park(T)raum, Vienna, Austria
- Practices targeting stakeholders, authorities, designers
 - Planner and transport operator staff training
 - Training for railway staff -Luxembourg
 - Salzburg Austria

- Urban environment design:
 - Urban mobility in local partnership scheme in München
 - Generationen-aktiv-Park, Vienna, Austria
 - Czech Republic barrier free
 - Easy access Stockholm
 - SuRaKu Project, Helsinki
 - FHWA Older Driver Highway Design Handbook
- Integrated accessibility planning
 - Project KOLLA – Public Transport for All Göteborg Sweden
 - Nürnberg- Germany

According to the criteria proposed in the method part, a selection of “most relevant” practices for the purpose of the CONSOL project has been made for a detailed presentation in the following pages of this report. This does not mean that examples that have not been detailed are not interesting.

3.1.1 Cases selected for the Personal transport schemes

Flexibus and „Dorf Mobil Klaus“ are interesting examples but designed for rural area; as the focus of the CONSOL task 5.2 is more on urban issues, these cases have not been selected for a detailed review. Birmingham Shopmobility is an interesting practice consisting in providing mobility aids (electric scooters, wheelchair, rollators) to visitors of a big shopping mall; however, according to the information collected, it seems that this service has been significantly reduced due to funding problems. So even if the idea is quite interesting, this example has not been selected for detailed presentation. The two cases selected are then: ITN America and “Les Compagnons du Voyage“, France.

3.1.1.1 ITN America, USA

ITN America has evolved from the Independent Transportation Network, a non-profit transportation service for seniors and people with visual impairments. Developed through research funded by the Federal Transit Administration, AARP, and the Transportation Research Board, the ITN is a model for consumer-oriented, community-based senior transit. The ITN incorporates the efficiency of mass transit through shared rides and advance planning.

The Independent Transportation Network (ITN) is a dignified way to address the issue of transportation for older people. Members of ITN America pay dues to a non-profit organisation committed to their independence and mobility. They call in to schedule a ride and are provided with a transportation alternative that keeps them in control. Volunteer drivers provide rides for older users a few hours during the month. Volunteers receive training, and ITN arranges driving assignments and routes around volunteer schedules.

ITN characteristics and services:

- Affordable fares that are typically lower than a comparable taxi ride
- Available 7 days a week, 24 hours a day for any purpose
- Volunteer drivers provide older people with door-through-door service and help with packages
- No money is exchanged in the vehicle, and tips are not accepted
- Riders pre-fund a personal transportation account and a monthly statement details all payments and charges
- Uses automobiles, rather than vans or buses
- Rides may be booked at any time, with discounts for advance notice
- Older Riders may travel alone or with others, with discounts for shared rides

3.1.1.2 Les Compagnons du Voyage – Paris, France

Les Compagnons du Voyage is an association created by the SNCF (Société Nationale des Chemins de fer Français) and RATP (Régie Autonome des Transports Parisiens). Les Compagnons du Voyage is a service in Paris that provides older people with personal accompanying for journeys on public transport. It consists of personal escorts who assist individuals, as well as whole communities and companies, on trips. Although located in Paris, the service is offered on trips to surrounding districts and even abroad. It is available every weekday, 24 hours a day. The main target groups are older people, those with disabilities and children. This door-to-door accompanying service provides older people with access to medical services, banks, post offices and other day-to-day destinations (public parks, senior centres, and cultural activities). The service can be booked by telephone, fax, post and email. This service is not free of charge (20€/hour for older people), but half of the cost can be deducted from annual income tax. Persons who are accompanying older people are also required to show them how to travel safely, to guide them in the city, to explain the basics of public transport and networks and to give them self-confidence in order to regain autonomy in travelling. Les Compagnons du Voyage employs about 100 persons for the accompanying service. Since its inception in 1993, more than 1 million accompanying have been undertaken.

In the beginning, only younger people were targeted, but today, older people are becoming increasingly interested in the service. 5% of the customers are individuals (mostly older people), 35% are so called “local authorities” and 60% are specialised institutions (e.g. of n deaf, blind, etc.).

3.1.2 Cases selected for user training

A lot of examples have been collected for this category and most of them come from Germany or German-speaking countries. Some cases seem to be more awareness support than genuine training programs and are not detailed here.

3.1.2.1 Passenger training for older people- Salzburg, Austria

In order to encourage older people to use buses, to give them recommendations on how to prevent accidents and to familiarise them with new or less well-known functionalities, the Salzburg bus operator StadtBus and ZGB have developed a training scheme for Passengers. The concept targets older people in Salzburg (60 to 100 years old) who represent approximately 33% of the city’s bus users. They often face problems when using public transport: 64% of all accidents in public transport occur with persons over the age of 65. During the passenger training sessions, people learn in small groups how to board the bus, how to stand safely inside the vehicle or how to get a seat. Afterwards, a trip is organised, where the newly acquired knowledge can be put into practice. The training sessions also address people who recently had an accident and are at risk of seeing their mobility significantly reduced. The participants of the training are invited in small groups (max. 6 persons) to the bus depot, where a bus is made available for the training session. 3 coaches and 1 driver run the training. The trainees have the opportunity to practice on the bus.

Evaluation reports showed that these training courses attract more women than men. The courses can be booked individually or for whole groups. Since the beginning of this training programme, more than 150 people have been trained. About 75% of people who returned the evaluation form say that they intend to use public transport more frequently in the future. 86% of participants stated that they feel safer when using public transport after having completed the training. The training helps to reduce fears and to teach safe behaviour. Along with the training there is a safety-brochure, which contains all the topics of the training and defines safe behaviour on public transport. The success of this training lies in the equal cooperation between the NGO Centre for Generations & Accessibility and the StadtBus Salzburg.

3.1.2.2 Passenger training- Munich, Germany

The objectives of passenger training were to enable older people to use public transport in a safe and comfortable way and to respond to the needs and requirements of older passengers in public transport. The main target group was older people between the ages of 60 and 90 who want to be safer in their use of public transport and need certain information about safety and security. Such people could be partly disabled (in wheelchairs or requiring a mobility stick), but they were required to be mobile in order to participate in the practical training sessions.

The project was initiated by MVG (Munich Public Transport Cooperation) and Green City e.V. (an environmental organisation from Munich). MVG was responsible for providing the buses, infrastructure and the more technical aspects of the training. Green City took care of the educational component, the organisation of the training and general preparations in collaboration with older people service centres. Ten training sessions were held during October and November 2010 with a total of 77 participants. The average age of participants was 78, with the oldest person being 94. The participants were 83% women and 17% men. They mentioned that the courses were very helpful. The most important things they learned included improving their skills in getting on and off the vehicles and feeling more confident in using public transport.

3.1.3 Cases selected for Information provision & travel planning:

Two main categories of practices are identified for this topic: pre-trip information available on websites or mobile platforms and on trip information. The traveller information on barrier-free travelling from Germany has been selected because it appears to be more extensive than the two other examples found. Concerning trip information, a case from a new EU member country has been selected, but many equivalent examples exist in other European cities.

3.1.3.1 Traveller information on barrier-free travelling - Frankfurt Rhein/Main and Berlin, Germany

Within BAIM an information system has been developed that supplies people with reduced mobility with detailed information on the accessibility of public transportation facilities, including vehicles, buildings, available technical facilities, and assistive features. Furthermore the BAIM information system searches for barrier-free transportation chains from any given starting point to any destination – according to the user's personal requirements profile. BAIM has developed a concept and methodology that shall be applicable to all regions of Germany (and similar regions throughout Europe). The implementation and practical testing are conducted in two selected regions in Germany: the federal capital Berlin and the surrounding federal state Brandenburg and the Rhein-Main-Verkehrsverbund with several cities (Frankfurt, Offenbach, Wiesbaden, Darmstadt, etc.) and an extended rural surrounding.

The BAIM project was followed by the BAIMS plus project. BAIM plus is a research & development project co-funded by the German Ministry of Economics and Technology. The project consortium consists of two public transport associations: Rhein-Main-Verkehrsverbund GmbH (coordinator) and Verkehrsverbund Berlin-Brandenburg GmbH; their traffic and information technology provider: IVU Traffic Technologies AG; the information system provider HaCon Ingenieurgesellschaft mbH; the service provider of voice-operated dialog systems SemanticEdge GmbH; the rehabilitation centre Evangelische Stiftung Volmarstein with its "Technology and Disability Research Institute".

The challenge in BAIM plus is to inform all user target groups appropriately about the present opportunities of barrier-free travel and to present this information through integrated and continuous barrier-free information paths. The overall objective of the project BAIM plus is the provision of appropriate services (real-time information, tour escort services, barrier-free routing around stations and stops, a brand new reachability search function and a voice-operated dialogue system) with target group-oriented information concerning suitable traveling opportunities or potential barriers, before and

during the journey. Target groups of the preceding project BAIM and the succeeding project BAIM plus are people with reduced mobility (e.g. due to disabilities, luggage or other circumstances), “Best Ager” (55 to 64 years) and “Seniors” (65 years and older).

Key conditions for the implementation of the activity are the provision of an up-to-date and high quality database, the integration of real-time data, user contribution to data collection and data maintenance, and permanent database updates.

The effective provision of information services is highly dependent upon the requirements of public transport providers as well as user needs. Therefore, user demand and operator demand were analysed in order to gain a good understanding of the needs and requirements. The developed information systems were evaluated within a field test. An important challenge is the handling of real-time data. The development and continuous administration of real-time data is a crucial factor since there is only little information concerning user requirements on services with real-time data so far.

3.1.3.2 Audio announcements at public transport stops, Sofia, Bulgaria

Waiting time for public transport such as urban buses is a major issue for older users. As they can find it difficult to stand or feel rapidly insecure, they may be interested in having real-time waiting time information provided by visual and audio messages. This is also the case for people who are blind or partially sighted.

The presented practice was implemented in partnership between the Sofia Urban Mobility Centre and the Sofia Regional Department of the Union of Blind People in Bulgaria. Electronic boards giving real-time visual information about vehicle movements had already been fitted at city centre stops. This project added audio announcement modules to make the real-time information available to blind and partially sighted people. After the first implementation phase, the volume level of the announcements was increased to address the requests of the users. The same kinds of announcements are in the process of being deployed inside vehicles.

3.1.4 Cases selected for Pricing and incentive measures

Ticketing and pricing are important issues for the promotion of public transport use by older citizens. While most EU member states proposed reduced fares for older users, the practice in the UK was considered by the CONSOL project as very interesting. An innovative post-payment ticketing system developed in Germany is also described.

3.1.4.1 England older person's bus pass, UK

The Transport Act 2000 gave all those who had reached pensionable age (then 65 for men and 60 for women, now 61 for women, increasing gradually to 65 by 2020) and those with disabilities, the benefit of half-fare bus travel within their local area. From 1 April 2008, free bus travel has been extended England-wide. One third of bus trips in England are now made free because of 22 concessionary travel passes (CTPs). This currently costs the British taxpayer over €1.15 billion per year. About 19.0 million people are eligible for a CTP due to age or disability (or both), which is about 31% of the population of Great Britain. The highest rate is in London, which has had the Freedom Pass offering free travel to older people since 1984 (free travel both on buses and the London Underground at all times).

According to the British National Travel Survey, most people have used the bus more since obtaining their passes. There is an inverse relationship between age and an increase in bus use, with the younger group aged 55-64 increasing their bus use most and the oldest increasing it least. Several studies have found evidence of respondents saying that holding a CTP had improved their quality of life in general: better access to health facilities, more exercise by increased walking and better mental health by more social interaction. Due to the cost of the scheme and the economic crisis, this right is discussed at the state level, with some proposals to modulate it according to the income level of older people.

3.1.4.2 BOB Ticket in Bremen, Germany

Within the VIVALDI-Project, the city of Bremen and the public transport operators in the area designed the BOB-ticket. This is a special chip card focussing on non-frequent passengers. Based on smartcard-technology, this ticket allows the customer to access to public transport without the need for prepaid tickets or cash. The customer registers once at one of the participating public transport operators for a BOB-ticket. When entering a bus or a tram, he/she registers the stop of destination and number of passengers for his journey. The information is stored on the registered smartcard and also transferred to a main database for the monthly bill. Customers making single trips are charged as if they were using “one of ten” prepaid tickets; multiple journeys per day are billed for the cheaper one day ticket only.

BOB-ticket started in Bremen at the municipal BSAG and VWG and BremerhavenBus (two other public transport operators of the region). The other 31 operators of the North-West-region will follow as soon as terminals and software are installed in their vehicles.

The BOB-ticket was introduced to the public in May 2005. By the end of 2005, after 6 months, 13,000 people had registered for the BOB-Ticket. By the end of 2010 there were about 68,000 BOB-ticket holders registered in the BSAG (Bremen municipal transport operator) and 77,000 in all, including the entire public transport region around Bremen. No data are available regarding the age of the users, but it seems that this kind of practice can be relevant for older people who are in the process of reducing their use of their cars for urban trips. These people are not familiar with the pricing scheme and ticketing system and want to avoid handling money in public. However, it should be noted that, due to its strong technological characteristics, older people who are comfortable with technology could more easily adopt this practice than those who are not. Nonetheless, using the terminal inside the vehicle can also be difficult for older users with mobility impairments.

This practice is a good way to attract older car drivers and to promote the use of public transport.

3.1.5 Cases selected for Policy for older drivers (refresher courses, self-awareness)

Very few structured and evaluated refresher courses were identified in Europe, and the most interesting practice selected has been the course proposed in Norway. Regarding self-awareness/assessment tools, based on a recent report from Lang & al (2013), which identified several examples in Europe, a practice used in Switzerland is described as a representative example.

3.1.5.1 Bilforer 65+ (Driver 65+) refresher course, Norway

This program for older drivers was introduced in the Norwegian Road and Road Traffic Plan 1998–2007, and was implemented in the 2006 National Plan of Action for Traffic Safety on the Road. These courses are open for all Norwegians from 60 years and are run by the Norwegian Public Roads Administration in collaboration with authorised driving schools. A course invitation is sent to all drivers 65+ holding a licence and is repeated for those reaching 70. The courses are based on voluntary participation and contain both theory and practice. Drivers have to pay a fee of about 60 Euros to participate in the course.

The Public Roads Administration in Norway has listed topics that the participants usually want to address during the course:

- Right of way
- Roundabouts
- Road markings
- Traffic signs
- Traffic light crossings
- Highways
- Light usage
- Overtaking

- Parking regulations

The “Driver 65+” refresher course was evaluated in 2011 on the basis of a sample of 2100 drivers aged 70 years or over who had reported an accident to their insurance company during a two-year period. About 24% of the sample had completed the course prior to the accident. Drivers who had taken the refresher course before turning 75 years of age were found to be at a 35 per cent lower risk of being involved in multiple vehicle crashes compared to older drivers who had not taken the course (Ulleberg, Bjørnskau, & Fostervold, 2011). This was statistically significant both before and after adjusting for various confounding variables (age, number of miles driven annually, etc.). On the other hand, drivers who had taken the refresher course when they were 75 years of age or older were at the same risk as drivers who had not. The same tendency, although weaker and non-significant, was found for single-vehicle accidents. It is then possible that the refresher course has a beneficial effect on safe mobility only if the driver completes the course before turning 75.

3.1.5.2 Älter – Aber Sicher! Wissenswertes für Senioren am Steuer, Switzerland

The brochure *Älter – Aber Sicher! Wissenswertes für Senioren am Steuer* [Older – but safe! Useful facts for seniors on the road] was published by the Touring Club of Switzerland in 1996. Its aim is to support older drivers' mobility by providing information on age-related changes in driving ability and recommendations for the maintenance of safe mobility. It comprises detailed information on age-related changes in performance and medical conditions, and on legal processes in relation to driving licences and fitness-to-drive assessments. Ten questions allow the reader to self-assess driving performance in difficult situations (intersections, dense traffic and reversing), incidents of failing to see other road users, experience of fatigue and vision problems when driving, slowing of reactions in critical situations, and negative feedback from the driver's friends and family, or from other road users. The question set does not require scoring; respondents are recommended to see a doctor if they experience any of the listed problems, and to undergo a detailed assessment of their fitness to drive. As for most self-assessment tools, no scientific evaluation is available.

3.1.6 Cases selected for Health issues

A lot of programs and initiatives focusing on the issue of health in older people have been launched in EU countries; many of them are very medical-centric (use of medicines) or focused on very old people (social deprivation) and do not fall precisely within the scope of the CONSOL project. As an active life style, which means being mobile, has been shown to be very positive for the health of older people, the two practices selected here will concern walking and cycling.

3.1.6.1 Promotion of walking as a health trigger, Donostia/San Sebastián, Spain

Having a walk is still possible for many people at advanced ages, while other kinds of personal exercise become difficult or impossible. An active lifestyle is important for health; in the UK for example, only 20% of older citizens reach the recommended level of activity. Walking has sociological and psychological benefits as well; it is stimulating, reduces stress and helps to stimulate attentional resources.

During 2009 and 2010, the Municipality of Donostia - San Sebastián developed up to 20 walking tours with the aim of promoting walking among older people, not only for leisure and social activity, but also as a means of transport inside the city, to promote the idea that walking for older people is a source of health, to develop the use of unknown pedestrian routes for the general public and older people. The target group was people over 60, with no major mobility disabilities and ready and able to make an excursion of nearly two hours.

Almost 1,000 people took part in the activity; most of them were between 60 and 70 years old. 80% of the participants were female. More than 90% of the participants already walked almost every day and used public transport even if they had a car. In this light, it is a positive result that they felt confirmed in

their motivation to walk more and reduce car use, maintaining their health and capabilities. In a longer perspective, it would be interesting to increase the involvement of seniors who currently do not walk enough (even if they are able to) e.g. some sort of partnering / buddying scheme.

3.1.6.2 Guided Cycle Trips – Encouraging Older People to Continue Cycling in Odense, Denmark

With more than 550 km and hundreds of speed bumps, Odense provides a unique infrastructure for walking and cycling for all ages. In 2008, cycling covered 25% of all trips in the municipality and in central areas it exceeded 50%. In June 2009 a traffic and mobility plan for the City of Odense was enacted. The plan contains different suggestions as to how the future transport situation should look and work by 2020.

Regarding the mobility of older people in Odense, two policies were adopted in 2007: a policy for the life of senior citizens and a health policy. In practice these policies mean that – amongst other things – the City of Odense will: give priority to cycle and footpath connections and routes as well as the quality of the surroundings and green areas, ensure that public areas, squares and streets are accessible to senior citizens, ensure that cycle and footpaths are safe and well-lit 24 hours a day; increase the number of citizens who are physically active, ensure that the opportunities for physical activity are easily accessible for everyone, regardless of age and physical capability.

Research shows that older cyclists are at particularly high risk of being injured in an accident. Most accidents do not involve other road users, but happen because the cyclist loses balance and falls over. Often older citizens stop cycling due to fear of falling or being involved in an accident. Therefore, the objective was to raise awareness on safety issues for older cyclists and to teach them to cycle safely, to maintain their bike, and to show them the possibilities offered by new equipment.

The cycle captains were defined as people who are at least 55 years old. Further, they should be experienced cyclists and fit to be responsible for others on the cycle trips. 24 cycle trips with approx. 250 participants were carried out in 2009. In addition, three cycle courses were organised in 2010 with approx. 50 participants. Both activities were evaluated by questionnaires (123 questionnaires from the cycle trips and 23 questionnaires from the cycle courses) and 66% of participants answered that they felt safer on a bike after taking part in the course.

3.1.7 Cases selected for Planners, transport operators staff training

For this topic, only dedicated transport operator staff training was identified. Two examples are presented, one pertaining to railways and the other to urban buses. This kind of training has been extensively used in Europe (at least in historical EU member states).

3.1.7.1 Training for railway staff –Luxembourg

This practice concerns accessibility training for the staff of the Luxembourg Railway Company (CFL). The training comprises a one-day session including theoretical information and practical exercises to give staff experience of the real-life situations faced by people with reduced mobility and people with cognitive and sensory disabilities. The training, which started in 2005, is now an on-going scheme. The national disability movement initiated it since there had been a large number of complaints from disabled travellers. The initiative started with an awareness phase: working with the railway company on why the training was needed. Then the consolidation phase consisted of building up relations with a key contact within the railway company. The on-going implementation phase is now officially integrated into routine staff training and takes place three or four times a year. Five disability associations run the training (focusing on mobility, cognitive, hearing and visual impairments). Instructors include people with disabilities. The training also benefits older people and foreign visitors as it includes exercises, teaching staff to communicate without speaking, which can be helpful in many situations. Since the training was put in place there have been fewer complaints and greater satisfaction levels among disabled travellers. The evaluation forms used during the training indicate

high levels of satisfaction. Trainees feel that they have gained a much better understanding of disability issues.

The cost of each training session is about €750 and the total annual operating cost is between €3,000 and €3,750. The rail company pays for the training, which involves three of their own instructors and between six and eight people representing the different user groups. Each course consists of one day for the training session plus one to three days to prepare it.

3.1.7.2 Training of bus drivers in Salzburg, Austria

In addition to passenger training, bus drivers must be made aware of the needs of older people. This is why a special training scheme has been integrated into driver training. Bus drivers need to be made aware of the needs of older people and should practice driving skills such as driving safely and stopping close enough to the curb to make (low-floor) buses easily accessible.

Training emphasises the following issues:

- **Style of driving:** older people generally have difficulty keeping their balance and have less handgrip strength, making it harder to hold on in a moving vehicle. Quick acceleration from a bus stop and abrupt braking can make older passengers anxious. Non-aggressive, courteous driving can help prevent accidents.
- **Vehicle condition:** older people are particularly aware of dirt in the vehicles, and rubbish left lying on the floor can cause them to trip and fall.
- **Punctuality:** Even people who have retired are unhappy at wasting time waiting. Older passengers also have appointments for which they must be punctual.
- **Seats:** To an older person, a seat means a feeling of security. If no free seats are available when they get on the bus, they are likely to feel anxious. Older passengers generally prefer to sit facing the direction of travel because otherwise they can become dizzy.
- **Getting on and off the vehicle:** When boarding or leaving a bus, older passengers are at the greatest risk of falling. However, if drivers are considerate, accidents can be prevented.
- **Friendliness and courtesy:** Older people value personal contact and enjoy exchanging a few words with the driver. They appreciate friendliness and are particularly sensitive to rudeness and lack of respect.
- **Respect and consideration:**

In addition to passenger training, there were about sixty new drivers trained with the new training scheme and the movie about the needs of older passengers was shown to the whole driving staff (approx. 250.) at the beginning of 2011.

3.1.8 Cases selected for urban environment design

Designing an inclusive urban environment is very complex and constitutes a long-term process. The practices identified illustrate the various approaches adopted: practical guidelines and design recommendations, collaborative design of solutions with the end users. One practice, coming from the US, has been selected because it was the only example found which focused on older road users.

3.1.8.1 SuRaKu Project, Helsinki, Finland

Practical guidelines were established in 2004 through cooperation involving the cities of Helsinki, Espoo, Joensuu, Tampere, Turku and Vantaa. Working instructions were completed under the leadership of the Helsinki for All Project with the support of the Ministry of Social Affairs and Health.

The guidelines form the basis for the City of Helsinki Accessibility Plan. They are also freely available for use by other municipalities, corporations and planners. The guidelines consist of two parts: accessibility criteria by which the accessibility of outdoor locations can be assessed and regulated, secondly guidelines based on model designs covering key accessibility-related area types and

solutions for outdoor public spaces. The guidelines contain criteria for evaluating the accessibility of outdoor locations and instruction cards for applying them. The instruction cards and accessibility criteria created in the SuRaKu project have achieved a central position as national guidelines for construction of outdoor locations, and they have been implemented in several Finnish municipalities.

SuRaKu Instruction Cards are the following:

- 1 Pedestrian crossings and pavements
- 2 Pedestrian streets and squares
- 3 Differences in elevation
- 4 Public courtyards
- 5 Park paths and resting places
- 6 Public playgrounds
- 7 Public bus stop areas
- 8 Temporary traffic arrangements

SuRaKu Accessibility Criteria contain:

- 1 Kerbstones at pedestrian crossings
- 2 Outdoor staircases
- 3 Ramps
- 4 Guidance paving flags
- 5 Demarcation strips
- 6 Loading islands
- 7 Gutters and gullies
- 8 Walking surfaces
- 9 Pedestrian crossing markings
- 10 Handrails
- 11 Railings
- 12 Pedestrian push-button posts
- 13 Pedestrian crossing signs
- 14 Seating
- 15 Bollards in pedestrian zones
- 16 Pedestrian refuge islands
- 17 Tactile maps and information signboards
- 18 Warning areas

These guidelines take into account the needs of people with disabilities and with restricted mobility; older road users are identified in the general target groups but there are no specific recommendations dedicated to these users.



The SuRaKu design guidelines have been used for the design of an accessible Bus Terminal with Lighting and Colour Contrasts in Espoo

3.1.8.2 FHWA Highway Design Handbook for Older Drivers and Pedestrians, USA

The *Highway Design Handbook for Older Drivers and Pedestrians* published by the FHWA in 2001 is an updated edition of the first guide published in 1998. The range of applications covered by the latest version of the Handbook has expanded in order to take into account issues related to older pedestrians.

The main body of the Handbook is organised according to five broad site types with associated design elements. The top priority is *at-grade intersections*, reflecting older road users' most serious crash problem area. Next, older driver difficulties with merging/weaving and lane changing operations focus attention on *interchanges (grade separation)*. *Roadway curvature and passing zones* plus *highway construction/work zones* are also included. Finally, *highway-rail grade crossings* are identified as sites where conflicts are rare, and thus unexpected; and where problems of detection (with passive controls) are exaggerated due to sensory losses with advancing age.

The most relevant part of this document for the purpose of this CONSOL report is related to the design of intersections from a pedestrian perspective. The analysis by Council and Zegeer (1992) included an examination of vehicle-pedestrian crashes and the collision types in which older pedestrians were over-involved. The results showed older pedestrians to be overrepresented in both right- and left-turn crashes. The young-elderly (ages 65-74) were most likely to be struck by a vehicle turning right, whereas the old-elderly (age 75 and older) were more likely to be struck by a left-turning vehicle. Crash types that predominantly involve older pedestrians at intersections are as follows (Blomberg and Edwards, 1990):

- Vehicle turn/merge--The vehicle turns left or right and strikes the pedestrian.
- Intersection dash--A pedestrian appears suddenly in the street in front of an oncoming vehicle at an intersection.
- Multiple threats--One or more vehicles stop in the through lane, usually at a crosswalk at an unsigned intersection. The pedestrian steps in front of the stopped vehicle(s) and into the path of a through vehicle in the adjacent lane.
- Bus stop related--The pedestrian steps out from in front of a stopped bus and is struck by a vehicle moving in the same direction as the bus.
- Pedestrian trapped--At a signed intersection, a pedestrian is hit when a traffic signal turns red (for the pedestrian) and cross-traffic vehicles start moving.
- Nighttime--A pedestrian is struck at night when crossing at an intersection.

Recommendations for all design elements covered in the Handbook are presented initially, followed by a more lengthy section presenting the Rationale and Supporting Evidence for each recommendation. Since the development of this document, several actions have been implemented: street names plates have been increased in size to facilitate reading, protected left turn traffic signs have been adopted, island protection place for pedestrian have been implemented.

Not all the design recommendations presented in this document are suitable in the European context, but the process of providing road designers and traffic operators with a comprehensive document to design road infrastructure inclusive for older road users is by itself a practice that the CONSOL project wished to highlight.

3.1.8.3 Urban mobility in local partnership scheme in Munich, Germany

A Neighbourhood mobility concept ("Stadtviertelkonzept Nahmobilität") was implemented in a selected Munich city centre area in 2003. Transport professionals from various organisations (different city departments, transport operators, consultancies) and citizens from the area worked together to identify

problems, assess them and develop solutions. The aim was to find effective, simple and reasonable measures to improve conditions for walking, cycling and other forms of non-motorised transport as well as for the locally relevant bus network. A key element of the approach was extensive citizen participation, which involved not only local interest groups but also “ordinary” citizens. The scheme included tours with different focus groups (older people, children) and considered different transport modes. In a following step, the identified problems were discussed in citizen juries with citizens and transport professionals and possible solutions were developed during two workshops. Most proposals focused on walking and cycling. It was then the task of the city council and of the transport operator to remove the identified obstacles. The focus was on small measures, more on an organisational than a technical level. It included dislocation of bus shelters and new benches or improved lighting. The possibility of alighting between two bus stops was also discussed, but introduced only in areas located farther from the city centre. Of the 230 proposals, 23% have already been implemented, 31% planned, 9% are still open, and 37% cannot be implemented. The scheme clearly shows how transport professionals and citizens can cooperate in order to improve sustainable transport at the local level. It highlights the fact that an integrated approach considering all modes is necessary.

While the concept was very successful, it was also a highly complex undertaking with considerable costs. This was also due to the nature of the pilot project, testing a wide range of participation tools. Professionals that had been involved in the process, however, saw a sized-down process as feasible on a wider scale. In Munich the experiences from the pilot project are to be into account for further projects.

By nature, this kind of scheme is very complex to evaluate and at the time of the production of this report, no evaluation data are available. Even though being evaluated was one of the criteria used to select the good practices presented in this document, this case study has been reported because it was considered by CONSOL as a positive practice that needs to be promoted.

3.1.9 Cases selected for integrated accessibility planning

Mobility is a global task, which includes not only the vehicle but also the infrastructure and the operating process. The design of an efficient transport service needs to be thought of as a whole issue and this seems to be particularly true when dealing with people with reduced mobility or older people. This needs a lot of discussion between the different players, along with efficient cooperation. The two following practices are good illustration of this process.

3.1.9.1 Public Transport for All - Project KOLLA – Göteborg, Sweden

In the city of Gothenburg, the three bodies responsible for how the urban public transport system should work for people with limited mobility have drawn up a plan. These bodies are:

- Färdtjänsten (the authority responsible for responsive transport demand)
- Trafikkontoret (the traffic and road authority)
- Västtrafik (the Public Transport Authority in Gothenburg).

A detailed working plan has been implemented progressively and was finalised in 2010, before being adopted as the regular system. The project strives to improve the urban environment by encouraging more use of public transport and bicycles, and fewer cars. It seeks to increase the use of regular public transport and flex-lines and decreases the use of STS-buses and taxis. The number of flex-lines in Göteborg has expanded and stops have been adapted to travellers’ needs; other measures implemented have been travel training and trip accompaniment.

Key achievements include:

- One bus line and one tramline have been made fully accessible (vehicle and stops)
- The creation of a map of accessible journeys

- The introduction of personal assistance at major interchanges
- Since December 2005, training of public transport company staff on the needs of disabled people
- Extension of Flex-line to all users in specified areas
- The disabled transportation system has been taken over by the public transport authority

According to evaluations, the project has succeeded in that many STS passengers have switched to buses and trams. From 2008 to 2009, the number of STS trips decreased by 32,000, i.e. a reduction of 5.2 per cent. At the same time, journeys with flex-lines increased from 132,000 to 137,000. The project also resulted in the introduction of free public transport for passengers over the age of 65, between the hours of 08.30 and 15.00 and 18.00 and 06.00 and all day on Saturdays and Sundays, which has changed the travel habits of older people. However, there are still groups (particularly the “older” old people) that still need individual transport solutions such as STS (special transport services).

3.1.9.2 Barrier-free mobility, Nürnberg, Germany

Nürnberg was the first city in Germany to commit to making its public transport accessible in 1972. From this date several improvements to the public transport network and urban environment have been made: trams and buses are low floor (with kneeling and ramps for the buses) with adapted platforms, metro stations are accessible and the safety of the 2 automated lines has been addressed with extensive discussions with representatives of older and disabled passengers. Since 1980, an Accessibility commissioner has been appointed to liaise with representative organisations of older and disabled passengers. A study in 1986 (supported by the Federal Transport Ministry) compared the costs of barrier-free public transport system to providing a separate door-to-door transport service for disabled people. The cost estimates for the two were quite close but a political decision was made to pursue the barrier-free route. The same study had also surveyed all the different disability groups within the city in order to obtain a clear understanding of their needs. The success of the commitment to accessibility is the continuing close relationship between VAG and disability organisations, and the large and growing number of disabled and older people using public transport in the city.

3.1.10 Element of discussion regarding good practice collection

The first point that seems important to note from the cases collected is that few initiatives really target older people in the considered context. Older people are most frequently included in the “people with disability” category in Europe, but it is interesting to note that this is not exactly the same in North America and Australia: older people are identified as a distinct population.

This could be a problem because increasing numbers of older people do not want to be considered as persons with a disability and could be less reluctant to be involved in initiatives like training courses. Another example of this potential drawback is web-based pre-trip information systems. Most of these provide their information regarding accessibility or barrier-free trips if the user declares himself as a disabled person. Most of older people will not understand that and then will not use the service correctly.

Initiatives dedicated to older people are more frequent in the health, well-being and social (generation sharing) areas and this seems to show that European society still perceives ageing as mainly a medical issue.

Much promotion of walking and cycling has been found in various countries and this could have a negative effect on safety if the environment is not inclusive for older people (higher fatality risk for

older pedestrians and cyclists). The CONSOL safety result showed that older pedestrians and cyclists are at higher risk of being injured than middle-aged people and the promotion of walking and cycling for them should be performed only in parallel to the promotion of the design of a safe environment for older people.

The information collected also indicates that for most of the training programs or initiatives to develop walking and cycling, most of the older participants are women.

It is surprising to note that many initiatives identified regarding training of older travellers were found in German speaking countries (Germany, Austria, Switzerland); this could be because the main source of information available on this topic was the results of the AENAS project which includes a lot of German-speaking participants.

3.2 Safety issues for older people in urban environments

The pedestrian environment should accommodate the needs of all users, being safe, accessible, attractive and easy to use, providing continuous direct routes and convenient connections between destinations. Pedestrian facilities should therefore be free of any hazards and barriers. All these features represent the main principles for the design of pedestrian areas and fit the accessibility requests addressing the needs of older road users. Being user-friendly for them, a pedestrian environment will also be easy for other citizens.

From the background presented in CONSOL deliverable 3.1 and 3.2, the main sources of accidents for older pedestrians in an urban environment are falls and collisions. Falls are mainly situations where the older pedestrian interacts only with the environment, while collision situations involve interactions with other road users or vehicles.

The first step in the approach is to identify situations in which older pedestrians could face a risk of sustaining injuries in an urban environment. Two contexts will be covered in this document: streets and public transport areas.

3.2.1 Street context

In a European perspective, it is almost impossible to describe all existing types of streets. Hence, we proposed to focus on three main categories: regular streets, streets with mixed traffic and streets with shared spaces.

- Regular streets: streets that could be one way or two ways, with pavements and parking on one side or on both sides of the street. Pedestrian crossings are marked and either with or without traffic signals.
- Streets with mixed traffic: streets where traffic is composed by different vehicles including public transport vehicles such as buses or tramways. Dedicated lanes for public transport vehicles are present as well as bicycle lanes.
- Streets with shared space: concept emerging from The Netherlands and Switzerland. Vehicles, bicycles and pedestrians share the same space, without any separation. The speed limit is very low, e.g. 20km/h in France.

3.2.1.1 Risks of falls in the street context

The risk of falling in the street context is not very different in the three sub-contexts selected for this study (regular, with mixed traffic and shared space) and is clearly linked to the characteristics of the pavement. Uneven pavement is the major factor causing falls on streets, followed by slippery pavement (with external contributors such as rain or ice). These kinds of falls could occur frequently,

but the level of the severity of the injury can be significant for more frail older road users.

Falls due to the non-detection of downward stairs on the sidewalk (entrance to underground stations, car parks, etc.), or to difficulties seeing the steps, could be considered as not an issue for older people, even though the level of severity of the injury can be serious. Exceptions are older people with visual impairments.

Finally, falls from the sidewalk could also occur with a level of severity of the injury that can be significant for more frail older road users.

3.2.1.2 Risk of collision in the street context

A distinction between collisions that occur when older pedestrians are walking and when they are crossing the street must be made. When they are walking, they face risks of colliding with obstacles that are on the sidewalk, like stanchions, bins, bicycles, etc. In streets with mixed traffic, it could be possible that bicycle lanes on the sidewalk have no physical barrier between the two parts, as in the example shown in figure 4. In this case, older pedestrians could collide with and be hurt by cyclists; the resulting injuries could be severe if the bicycle is going fast.



Figure1: An example of the situation where pedestrians and cyclists/roller-skaters have to cohabitate

New shared spaces represent a genuine difficulty and a source of risk, particularly for older pedestrians. The problem for them is how and to what extent they understand that they are walking in a new area with different rules.

The situations and risk levels when crossing the street are important to emphasise. Several reasons can lead to a road accident at a pedestrian crossing. The pedestrian may make an error while estimating the speed of an approaching vehicle or the distance, or simply fail to detect the vehicle. Alternatively, the vehicle's driver may not detect the pedestrian or misinterpret his/her intentions. Another issue at this level is the duration of the traffic signals for the pedestrian, which is often too short for older pedestrians. In a Swedish study, older pedestrians were asked to cross a street at fast, very fast and normal speeds. The results indicated that 90% of the subjects crossed the street at a speed of less than 1.2 m/sec, some of them crossing at a speed lower than 0.7 m/sec. In terms of reference, it is worth noting that some official traffic engineering recommendations are to take a speed of 1.2 m/sec as the basis for a minimum crossing time.

The complexity of street design (e.g. the number of lanes) does not have a linear effect on risk level, as it has been shown for example that older pedestrians can also have accidents while crossing small streets. The reasons could be that they tend to cross outside the pedestrian crossing area. However, it is clear that complex junctions can present a higher risk for pedestrians, particularly for the elderly. Hybrid cars and electric vehicles also introduce an important potential source of danger for them because of their low noise level.

Streets with mixed traffic containing cars, bicycles and public transport vehicles represent a real danger and their designers need to be aware of these difficulties. Unfortunately, such complex

crossings are increasingly frequent in cities, as in the example shown in figure 5.



Figure 2: The Saint Marcel Boulevard in Paris; from the left to the right: two bus lanes with bicycles allowed, a pavement and then two lanes for motor vehicles

For collisions, the expected severity is assessed as critical to catastrophic, and due to the organic fragility of older people, causing fatal crashes especially when heavy vehicles are involved.

3.2.2 Public transport context

The risk encountered by older travellers when boarding, alighting or riding a public transport vehicle was examined in the ACCESS2ALL project¹. For the purpose of the CONSOL project, it seems sensible to consider two sub-categories either underground (metro) or railway stations and intermodal hubs, i.e. areas where at least two modes are connected together (e.g. buses and tramways).

3.2.2.1 Risk of falls on the public transport context

In this report, the public transport context refers to stations (underground or railways) and intermodal hubs. For stations, irregular flooring should not be an issue but in fact, indoor or outdoor stations often present such characteristics, being a significant hazard item for people walking in these areas. These kinds of falls could have a frequent occurrence but the severity of the injury is estimated to range from negligible to minor.

One of the main risks faced by older pedestrians is to fall in stairs, due to functional disabilities or to a negative effect of crowds.

Escalators also present a degree of risk for the older population. Finally, the risk of falling from a platform must be considered as a catastrophic risk (fatal injury) but is not really an issue for older people.

3.2.2.2 Risk of collision in the public transport context

As presented in the last example of the previous category, there is an increasing number of public transport vehicles sharing the streets with other road vehicles (cars, trucks, motorbikes, etc.) and pedestrians. Dedicated lanes for buses are often adopted as a solution to increase the commercial speed of the service; however, it is sometimes difficult for older pedestrians to understand exactly how such crossings are intended to work.

¹ Wretstrand, A., Svensson, H., Marin-Lamellet, C., Bermond, F., Thomas, T., Beurrier, G. (2010). Travel safely: safety consideration for travelers with disabilities in public transport. ACCESS2ALL Deliverable 2.1, 74p

4 Managing the safety of senior road users in an urban context

Previous CONSOL deliverables gave support to the fact that the older population is very heterogeneous. In deliverable 1.1, Hausteine et al (2013)² reviewed different segmentations of older people in subgroups. These segmentations are based on several socio-demographic variables, mobility-related attitudes or mobility behaviour. Based on her own research using a phone survey and regression statistical analysis, Hausteine (2012)³ identified four subgroups:

- Captive car users: have rather good access to cars; they have low walking activity and have a negative feeling about public transport, walking and cycling. They are older than the affluent mobile and self-determined mobile subgroups, they have more disabilities and live more often alone. People in this subgroup are more likely men living in peripheral areas.
- Affluent mobiles: people in this subgroup have the highest car equipment level, a high-income level and the largest social network. They have a bad perception of public transport but are very keen to use soft modes like walking and cycling. These older people have a high feeling of mobility necessities; they often live with their partners and are less likely to have functional limitations. They finally also have better access to information and communication technologies, like mobile phone and internet.
- Self-determined mobiles: in this subgroup, older people have good access to both cars and public transport and are very positive regarding walking and cycling. They more often live in areas where most of the facilities are easily reachable, often together with their partners, they are less likely to have functional limitations and have good access to communication technology.
- Captive public transport users: these older people find it easy to use public transport in their everyday life; they have the lowest car ownership level and also the lowest income level. They are not keen to cycle at all and use walking in the context of the use of public transport mainly. They are older than the affluent mobiles and self-determined mobiles subgroups; they have more disabilities and live more often alone. Most of the persons in this subgroup are women and they more likely live in central areas; they have very limited internet access and only 54% of them have a mobile phone.

One element of discussion about these subgroups is the gender distribution among them. This is particularly true for two subgroups: the captive car users who are in majority men and the public transport captive users who are mainly women. It can be argued that with the increasing number of women in the baby boomer generation having their driving license and their higher car ownership, these women could be less dependent upon public transport. However, Siren and Hausteine (2013)⁴ showed that this generation of women still has, compared to men, lower annual mileage, a lower car usage rate, greater public transport usage habits and less expectations of continuing to drive a car after the age of 80. It seems most likely sensible to consider that the difference between men and women will remain valid in the upcoming years.

In the context of this CONSOL report, this segmentation can be used to define the different safety issues related to the safety of older road users in an urban context, based on the situation identified in

² Hausteine, S., Siren, A., Framke, E., Bell, D., Pokriefke, E., Alauzet, A., Marin-Lamellet, C., Armoogum, J. and O'neill, D. (2012). Demographic Change and Transport. CONSOL - Concerns and Solutions for Road Safety in the Ageing Society, WP1-Deliverable, 92 p.

³ Hausteine, S. (2012). Mobility Behavior of the Elderly: an attitude-based segmentation approach for a heterogeneous target group. *Transportation*, 1079–1103doi: 10.1007/s11116-011-9380-7

⁴ Siren, A., Hausteine, S. Baby boomers' mobility patterns and preferences : What are the implications for future transport ? *Transport policy*, 29, pp136-144.

the previous section of the document. The analysis shows that two subgroups are more concerned with safety issues: the captive car users and the captive public transport users. Captive car users are supposed to be more exposed to car accidents and due to the fact that they are older and not optimally fit, the consequences of these accidents can be major; they are also more prone to be involved in accidents as pedestrians (both for falls and collisions) due to their low functional capacities but also to their low practice of walking in an urban context, which can prevent them from adopting a safe behaviour. Captive public transport users present the opposite profile and are more concerned by accidents occurring in this context.

Affluent mobiles and self-determined mobiles share the same patterns in most of situations, even though affluent mobiles could be at greater risk of being involved in a car accident because of their high mileage.

The different subgroups of older people were also used to match the categories of good practices identified in this report. The first step was to make the matching “from a theoretical point of view”, trying to define what practices could be the best suited to each subgroup. Of course, for this analysis, only the practice categories focusing on older people are used.

Personal schemes seem to be more suitable for captive car users and to a less extent for captive public transport users. This could be a door-to-door service using cars or escort services using regular public transport. These services are not particularly well suited to the two other categories.

Public transport user training courses should also target captive car users in order to prevent them from becoming too dependent on cars; of course this is relevant only if an efficient public transport offer exists. The affluent mobiles are also concerned by this kind of action, because they have a poor vision of public transport facilities and could then more easily make the modal shift. The other two subgroups are less concerned, because they are regular users of PT; for them, training programs could be useful for maintaining their level of PT use, but could not lead to an increase in modal shift.

	Captive car users	Affluent mobiles	Self-determined mobiles	Captive public transport users
Personal schemes	+++	0	0	++
PT user training	+++	++	+	+
Public transport Information provision & travel planning	+	+++	+++	++
Pricing and incentive measures	+	++	+	+
Policies for older drivers (refresher courses, retraining sessions, etc.)	+++	+	+	+++
Health issues	+++	+	+	+

0 not concerned; + little relevance; ++ mild relevance; +++ high relevance

Public transport information provision is of high relevance for the affluent mobiles and the self-determined mobiles because of their positive relation with technology. These older people are more

used to making web searches for trips and to having a smartphone. However, the targeted effect should be different between these two subgroups. While for the self-determined mobiles, public transport information provision could improve their use of public transport by helping them to plan efficient trips, for the affluent mobiles, the idea will be more to improve their perception of public transport efficiency, as pre-trip information can demonstrate to them that they could save time by using public transport. Public transport information provision could have a small interest for captive car users and could be moderately useful for the captive public transport users, who know their regular trips and options and rarely make unknown trips.

Pricing and incentive measures to use public transport seem to be of low interest for most of the subgroups, with the exception of the affluent mobiles people who can be interested in ticketing innovation.

Older driver courses or awareness campaigns are of prime interest for the captive car users subgroup. This could be the place for them to identify some of their functional deficits, to develop adequate adaptive driving behaviour and to be sensitised to other transport options. In the case of public transport captive users, the interest could be to prevent women from stopping driving too early.

Finally, measures aimed to improve the health of older people seem to be better suited to captive car users who are reluctant to walk and use cycling; as they have the lowest functional abilities of the subgroups identified, these kind of initiatives could be of great interest for them.

Matching with practices identified by CONSOL

One of the main difficulties in the evaluation of practices collected was to find detailed information concerning the characteristics of the older people involved. The following analysis is based on the small amount of information collected.

Captive car users were concerned only by practices for older driver training/awareness, like the driving refresher courses in Denmark or the awareness flyer from Switzerland and the personal scheme like ITN America concept which is particularly well-suited to captive car users, as this service uses cars and is mostly operated in suburban areas.

Affluent mobiles individuals appeared to be involved only in pricing practices, like the chip card focusing on non-frequent passengers for buses developed in Germany. This practice fits well with the technology-friendly profile of affluent mobiles people and also clearly targets people who are not used to taking the bus.

Self-determined mobiles individuals were involved in several identified practices: PT user training, information provision via Internet, health promotion initiatives via walking and cycling. These practices are also well-suited to their characteristics: public transport regular users, very positive regarding walking and cycling- and technology-friendly.

Finally, the captive public transport users were involved in several identified practices: Personal schemes with the escort service using public transport operated in France, PT user training in Germany, Information provision with real-time waiting times and health promotion initiatives via walking.

5 Conclusion-Recommendations

This report aimed to analyse examples of practices aiming at managing the safe mobility of older road users in an urban environment. From all the cases collected it can be observed that few initiatives really target older people in the considered context. Older people are most frequently included in the “people with disability” category in Europe. Initiatives dedicated to older people are more frequent in the health, well-being and social (generation sharing) areas and this seems to show that European society still perceives ageing as mainly a medical issue.

The other important issue highlighted by this report is that older road users are mostly considered as a homogeneous group. It is very rare that initiatives, designed to improve older people mobility and safety, specify the characteristics of the older people who participate. Gender differences are not considered for the set up of the action planned and, as a consequence, participants are mainly older women, particularly if the action is concerned with public transport.

Some areas of interest for older road users have not been identified as covered by the good practices identified. For instance, no awareness program about the potential benefits that older drivers can get from on board technologies has been identified. However, some driving assistance systems can help older drivers to compensate for ageing effect on the driving task management; for instance, more and more cars could be equipped with parking assisting devices, facilitating the parking maneuver which is often difficult for older drivers. Training programs could be a good opportunity for older people to discover the possibility of these different technological aids in a non-commercial context or to practice a system they recently bought (a parking assisting system or a cruise control).

Another non-covered issue is a global scheme for older drivers who need to stop driving for functional reasons. It seems quite surprising that even in countries using aged related screening of older drivers, no global framework exists for the mobility of older people.

Finally, it can be said that most of the initiatives are lacking of scientific framework in their design and evaluation; as a consequence, it is very difficult to capitalize the knowledge produced by each initiative.

CONSOL recommendations for further actions to improve the safety of the mobility of older road users in urban context

CONSOL strongly recommends designing focused actions according to the typology of older people identified.

Captive car users: these older people should be targeted by **public transport training at an early stage of their ageing process**, in order to prevent them from being dependent on their cars; this means that the training programmes should be adapted to them, as they have low practice and expertise related to mobility by public transport services. Considering their low technology equipment level, they should be **targeted for pre-trip information provision using conventional paper medium**. Initiatives regarding **pricing**, such as England’s older person’s bus pass, are also very important for these subgroups of older people; because they have low income and live in suburban or rural areas. Finally, they should also be targeted by health issue initiatives and particularly the **promotion of walking**. Due to their functional level, the promotion of cycling is not recommended for them.

Affluent mobiles: **public transport training** and **pre-trip information provision via web platforms** should more closely target these older people, in order to improve their modal shift capacities. They can be **interested by all the other categories** of practice identified, as they get older.

Self-determined mobiles: these individuals can be **interested by all the topics** identified, with the exception of personal schemes.

Captive public transport users: this group is well identified in practice about **public transport training** and **health issues**, but it seems that for the future, they should be also **be targeted by older driver training/refresher courses**. Currently, this group consists mainly of women who don't have a driving license. While it is considered that in the next generation of baby boomers, women will have a higher driving license rate but will be more prone to stop driving early, it is of great interest to develop actions that will encourage these women to stay active drivers, or to drive again if they have stopped.

In terms of recommendation for EU policy or other research program, CONSOL is making the following recommendations:

- Develop in a more holistic and explicit way the inclusion of older pedestrian needs in the design of urban infrastructures
 - Promote an EU older pedestrian environment friendly handbook: the limit of the person with reduced mobility approach could be that designers focus mainly on the problems of wheelchair users or blind people, but underestimate the question of older people
- Develop awareness program on the potential benefits from the use of new on board technologies
- Develop the knowledge on the trigger of modal shift for older travellers by supporting national initiatives



6 Annexes

6.1 Practices collected

Note: in the following tables, n.a. means that the information has not been find or was not available in a language that can be red.

Themes	Good practice title	Short description	Designed for older people	Designed in cooperation with the end users	Evaluated	Sustained	Ref
Personal transport schemes	Flexibus- North Ireland	To the end of 2005 Flexibus had 21 scheduled regular public timetabled services open to any member of the public and accepting Free Travel Passes. They included daily commuter trips, weekly shopping, health and pension services, twice monthly shopping services and monthly health services trips. Flexibus also provided 18 scheduled Dial-a-ride services which operate on a pre-booking basis.	Yes, for older people living in rural area but the service was also designed for people with disabilities	yes	yes	yes	Euroaccess del3.1, See transed and TRB (mc Kenna et al 2013)
	„Dorf Mobil Klaus“, Upper Austria, Austria	As flexible as a taxi, but affordable for everyone. The journey costs €1.50, a highly subsidised price. Each passenger should actually be paying around five euros to the <i>Dorfmobil</i> association, but donations and contributions are made, and the federal province of Upper Austria also subsidises the municipal project. The project got off the ground thanks to the Institute for Transportation at "Universität für Bodenkultur Wien", with funding from the EU.	For all inhabitants	n.a.	yes	yes	http://alpsknowhow.cipra.org/main_topics/mobility_management/mobility_management_chapter8.html
	ITN America	ITN America is the first and only national nonprofit solution for senior transportation. ITNAmerica works with organizations and individuals to help develop dignified and sustainable transportation in communities across the USA. The ITN service is consumer oriented; it provides service with the arm-through-arm, door-through-door standard. Like using one's own automobile, the ITN service is available 24/7 and gives customers the flexibility to schedule their rides in advance or as needed, as well as the option to ride alone or with others, as they please, to destinations of their choice. Membership based - people 60 years and older (age eligibility varies by affiliate), and visually impaired adults are eligible to join. Riders pre-fund a personal transportation account, and a monthly statement details all	yes	yes	yes	yes	Freund TRB 2013 See more at: http://itnamerica.org

		than vans or buses, rides may be booked at any time, with discounts for advance notice, riders may travel alone or with others, with discounts for shared rides					
	“Compagnons du Voyage”, France	The “Compagnons du Voyage” is a service in Paris that offers older people personal accompanying for journeys on public transport. It is an association created by the SNCF (Société nationale des chemins de fer français) and RATP (Régie autonome des transports Parisiens). This service is not free of charge (20€/hour for older people), but half of the cost can be deducted from annual taxes income.	Targets older people, those with disabilities and children	n.a.	yes	yes	Aeneas del3.4/4.1, MEDIANE
	Birmingham Shopmobility, UK	Birmingham Shopmobility is a service to help anyone with a mobility difficulty, be it temporary or more permanent, and who wishes to visit the lively and attractive city centre of Birmingham, for any of a number of different reasons; to conduct business, enjoy its many visitor and cultural attractions, or to shop in the wide variety of retail outlets, shops, leisure and business services. Birmingham Shopmobility can do this by providing a hire loan of an electric powered scooter, an electric wheelchair or a manual wheelchair, to ease your walking difficulty.	Yes but not only, designed for passengers with limited mobility	yes	yes	Yes, but limited	Older people and public transport. Challenges and chances for an aging society. Fiedler M, 2007
Users Training	Passenger training- Munich	The objective of the passenger training is to enable elderly people to use public transport in a safe and comfortable way. It is also targeted to create an offer for the needs and requirements of older passengers in public transport	yes	yes	yes	yes	Aeneas del3.4/4.1
	Training of Older Passengers, EVAG, Essen	With a team experienced in mobility management / education for dedicated user groups already formed, EVAG set up a passenger training for older people. Since 2006, the demand for training sessions grew continuously; currently it is one workshop per month. A typical workshop takes three hours (10-13h). EVAG picks up the participants (approx. 15-20 persons) at a meeting point (centric & good accessibility) with a standard bus and brings them to the venue, a hotel in the city centre. The event starts with a presentation,	A similar program has been design previously for people with disabilities	yes	yes	yes	Aeneas del3.4/4.1

Users Training		including historic pictures on Public Transport in Essen, safety and security issues and hints / tips how to prevent dangerous or difficult situations. The relevant features of vehicles are presented as well. Further topics are tariffs, tickets and trip planning. People are encouraged to ask questions and discuss. Later on, the group transfers to the bus depot with a standard bus.					
	“Mobil bleiben – sicher ankommen” (Stay mobile – arrive safe) Bonn, Germany	Training for former car drivers, now dependent on public transport (and others). Seniors are trained in planning a trip, how to get to the station, how to act in busses and other PT.	Yes	n.a.	n.a.	yes	http://www.verkehrssicherheit.nrw.de/download/Ma_nahmenkatalog_Senioren1.pdf
	“Engel opjepass – Oldies op Jöck” Angels watch out – Oldies on their way, Cologne, Germany	Information movie for older road users by the public transport provider in Cologne, Germany.	Yes	n.a.	n.a.	Yes	http://www.kvb-koeln.de/german/news/senioren.html
	“mobil sein – mobil bleiben” (be mobile – stay mobile), Bern, Switzerland	Information events, trainings for seniors in public transport	Yes	n.a.	n.a.	Yes	http://mobilsein-mobilbleiben.ch/web/d/e/category/rubriken/partner
	“Sichere Mobilität” 60+	Information folder for seniors all mode types , provided by the KfV Austria	n.a.	yes	n.a.	yes	http://www.kfv.at/verkehr-mobilitaet/verkehrsteilnehmer/senioren/
	“Sicherheit für Senioren”, KfV Austria	Information folder for senior pedestrians provided by the KfV Austria	n.a.	yes	N.a.	yes	http://www.kfv.at/verkehr-mobilitaet/verkehrsteilnehmer/senioren/
	“Zu Fuß im höheren Alter”, Austria	Information folder for senior pedestrians	no	yes	n.a.	yes	http://www.bmvit.gv.at/verkehr/ohnemotor/publikationen/alter.html
	“Mobil sein – dabei sein”, Salzburg Austria	Training for seniors in using public transport	Yes	n.a.	Yes	Yes	http://www.bmvit.gv.at/innovation/aktuell/downloadsaktuell/schinag1.pdf

Information provision & travel planning	Internet information in the Rhine-Main Area, Germany	The End-to-end accessibility service allows getting to the destination with profiles for passengers with limited mobility, the passengers can receive offers tailored to his/her needs as well as providing important information on disabled access journey sections. In the different profile available, one is senior citizens. It allow to give very detailed information: walking distance, possibility to take steps (number , size), to use mechanic stairs, ramps ... As this special service is still being developed, it is currently only available in German.	Yes but not only, designed for passengers with limited mobility	n.a	Not yet	yes	Older people and public transport. Challenges and chances for an aging society. Fiedler M, 2007
	London underground direct enquiries	Web site providing information for specific users, including older people	Yes but not only, designed for disabled	yes	No	yes	Euroaccess del3.1
	Audio announcements at public transport stops Sofia, Bulgaria	Electronic boards giving real-time visual information about vehicle movements had already been installed at city centre stops. This project has added audio announcement modules to make the real-time information available to blind and partially sighted people	no	yes	yes	Not fully deployed	Mediate del 3.3
	Czech republic - The national train services	Website providing information for specific users, including older people.	It is designed for disabled and older passenger.	n.a	n.a	n.a	http://www.cd.cz/vnitr-ostatni-cestovani/s-cd-bez-prekazek/sluzby-pro-zrakove-postizene/-3690/
Pricing – incentive measures	Czech Republic Free ACCESS CARD for public transport – Prague, Brno etc.	Public transport for persons over 70 years of age is free (purchase a card for 30 to 50 CZK (€2)). The card can be ordered by telephone.	yes	yes	n.a	n.a	http://www.dpp.cz/en/barrier-free-travel/
	England older person's bus pass	People who reach the state pension retirement age (depending on their date of birth) are entitled to a free off-peak, all day at weekends and on bank holidays, bus pass on local buses anywhere in England.	yes	n.a	yes	yes	Mackett, TRB 2013
	BOB Ticket in Bremen, Germany	It is a special chip card focussing on no frequent passengers. Based on smartcard-technology for electronic ticketing, this ticket allows the customer easy access to public transport without the hazzle of	no	na	na	yes	Older people and public transport. Challenges and chances for an aging society. Fiedler

		prepaid tickets, electronic or hard cash. The passenger uses public transport now and pays later and saves immediately due to a built in best price function. The scheme fits for older car users who are not familiar with ticketing systems. The customer registers once at one of the participating public transport operators for a BOB-ticket. When entering the bus or tram, the customer electronically books in the target and number of passengers for his journey. The information is stored on the registered smartcard and also transferred to a main data base for the monthly bill, his account is charged for at the end of the month.					M, 2007
Policy for older drivers	Bilforer 65+ (Driver 65+) refresher course, Norway	Introduced in the Norwegian Road and Road Traffic Plan 1998–2007, and implemented in the 2006 National Plan of Action for Traffic Safety on the Road. Open for all Norwegians from 60 years and run by the Norwegian Public Roads Administration in collaboration with authorised driving schools. Based on voluntary participation and contain both theory and practice; fees of about 60 Euros	yes	yes	yes	yes	Ulleberg, Bjørnskau, & Fostervold, 2011
	Älter – Aber Sicher! Wissenswertes für Senioren am Steuer, Switzerland	The brochure “Older – but safe! Useful facts for seniors on the road” was published by the Touring Club of Switzerland in 1996. Its aim is to support older drivers’ mobility by providing information on age-related changes in driving ability and recommendations for the maintenance of safe mobility.	yes	n.a	no	yes	http://www.tcs.ch/fr/cours/apercu/seniors.php
	„mobil sein – mobil bleiben“, Austria	Training for senior car drivers with costs. Provided by the ÖAMTC (driver association Austria)	no	yes	no	yes	http://www.oeamtc.at/?id=2500%2C%2C1388161%2C
Health issues	Donostia San Sebastián (Spain)	Promotion of walking as a key factor of autonomy and health.	yes	Yes	Yes	n.a	Aeneas del3.4/4.1
	Guided Cycle Trips – Encouraging Older People to Continue Cycling in	In 2009 the City of Odense and eight volunteer cycle captains planned and carried out 24 cycle trips with the aim to encourage and promote cycling among older people. The trips had different lengths,	Yes	Yes	yes	yes	Aeneas web site

Health issues	Odense	destinations and starting points in order to reach as many people as possible and to show the variety of cycling possibilities in Odense.					
	Czech Republic – project: ceskojede, and national Cycling strategy	Part of the National Cycling Strategy, offer a bicycle tour for seniors describing the difficulty route.	Yes but not only	n.a	n.a	n.a	http://www.ceskojede.cz/rubriky/cyklotypy-pro-rodiny-s-detmi/
	“Bewegte Apotheke” Vienna, Austria	“Moving pharmacy” a project funded by pharmacies , proving Nordic walking events	n.a.	yes	n.a.	yes	http://www.wig.or.at/Bewegte%20Apotheke.322.0.html
	Programme for the promotion of Healthy aging, Spain	To promote the active and healthy aging in terms (ends) of optimization of potentials and improvement of the quality of life. To stimulate, in all the areas, the continuity of the participation activates of the older persons in the bosom of his(her,your) communities. To promote a more realistic and exact image of the group of older persons, according to the important role that they play for families and communities.	yes	yes	n.a	n.a	Lis et al (2008). Evidence-based guidelines on health promotion for older people. Austrian red cross, Vienna.
	“Gemeinsam Gehen”, Styria, Austria	A project to increase mobility and activity of seniors in 5 communities in Styria, Austria	yes	yes	yes	yes	http://www.styriavitalis.at/cms/Aktuelle_Projekte/Gemeinsam_Gehen/9.9.0.0.html
Planners, transport operators staff training	Training for railway staff -Luxembourg	The training comprises a one-day session including theoretical information and practical exercises to give staff experience of the real-life situations faced by people with reduced mobility and people with cognitive and sensory disabilities. The training also benefits older people.	No, designed for travellers with disabilities	no	Yes, internal	yes	Mediate del 3.3
	Bus drivers, Salzburg Austria	Training sessions for bus drivers are provided in order to increase their awareness on the mobility issues of older people and teach them to drive safely	Yes, but also for travellers who have been injured in a public transport vehicle	?	yes	?	Older people and public transport. Challenges and chances for an aging society. Fiedler M, 2007

	Easy access in Stockholm project	Aims to deliver improved accessibility to the built outdoor environment (streets, pavements and public areas) and to public buildings by removing barriers.	Design for all approach	yes	yes	yes	Mediate del 3.3
Design urban environment	Urban mobility in local partnership scheme in München	In 2003, in one Munich city center area, transport professionals and citizen from the area have worked together in order to identify problems and find solutions. This included on site tours with different user groups (older and children), workshops. Measures included dislocation of bus shelters, new benches and better lighting; allow alighting between two bus stops was also discussed.	Design for all approach		no		Older people and public transport. Challenges and chances for an aging society. Fiedler M, 2007 Niches http://www.niches-transport.org
	Generationen-aktiv-Park, Vienna, Austria	Workout devices for seniors in public parks.	yes	Yes	Yes	yes	http://www.generationen-aktiv-park.at/
	Czech Republic barrier free	They are removing barriers in public buildings, entrances to train platforms and at many stations it is possible to book a service that helps people with limited mobility to board and stand out of the train.					
	Park(T)raum, Vienna, Austria	Not closely connected to mobility, intergenerational communication introduced by volunteering elderly migrants in Viennese public parks	Yes, focusing on communication between generations	yes	Yes	yes	http://www.ifau.at/fileadmin/Fotos_SYM08/vortraege_2008/Parkraum_Spiel-und_Freiraumsymposium_170908V3.pdf
	SuRaKu Project, Helsinki	Practical guidelines were established in 2004 through cooperation involving the cities of Helsinki, Espoo, Joensuu, Tampere, Turku and Vantaa. Working instructions were completed under the leadership of the Helsinki for All Project with the support of the Ministry of Social Affairs and Health. The guidelines form the basis for the City of Helsinki Accessibility Plan. The guidelines contain criteria for evaluating the accessibility of outdoor locations and instruction cards for applying them.	Yes but not only, designed for passengers with limited mobility	Yes	Yes	yes	MEDIATE, http://www.hel.fi/hki/HKR/en/Helsinki+for+All/Accessibility+Guidelines+%28SuRaKu%29

Design urban environment	FHWA Older Driver Highway Design Handbook	The main body of the Handbook is organized according to five broad site types, each containing one of more specific roadway features with associated design elements. The top priority is at-grade intersections, reflecting older drivers' most serious crash problem area. Next, older driver difficulties with merging/weaving and lane changing operations focus attention on inter-changes (grade separation). Finally, highway-rail grade crossings are identified as sites where conflicts are rare, and thus unexpected; and where problems of detection (with passive controls) are exaggerated due to sensory losses with advancing age.	yes	Na	Na	yes	http://www.fhwa.dot.gov/publications/research/safety/humanfac/01103/
Integrated accessibility planning	Project KOLLA – Public Transport for All Göteborg Sweden	Elements of the project include: modified public transport stops and accessible pedestrian routes to the stops, flexible transport services (Flex Lines) in all parts of the city, staff-training, free travel training for disabled people, personal assistance to make transfers, new IT-programmes, information and marketing. The authorities meet with the users' committees between four to six times a year.	Disabled and older people.	Disabled and older people.	yes	yes	Euroaccess del3.1 Mediate del 3.3
	Nürnberg- Germany	Nürnberg was the first city in Germany to commit to making its public transport accessible in 1972. From this date several improvements to the public transport network and urban environment have been done: trams and buses are low floor (with kneeling and ramps for the buses) with adapted platform, metro stations are accessible and the safety of the 2 automated lines has been addressed with extensive discussion with representative of older and disabled passengers. Since 1980, an Accessibility commissioner has been appointed to liaise with representative organisation of older and disabled passengers.	Designed for people with disabilities, with inclusion of older passengers	yes	yes	yes	Mediate del 3.3

6.2 Safety framework for older people in urban context

Older user	Street context Regular Streets	
	Falls	Collisions
main risk situation and sources	Sensitivity to the pavement; if irregular or slippery higher risk; un-signalised stairs and road works are high risk situations	Crossing is the main risky situation: bad detection of vehicles, higher risk if low noise vehicles and crossing outside crosswalk
probability level estimated for this particular risk	Probable	Probable
expected injury severity level	From minor to serious	From minor to critical
Street context Streets with mixed traffic		
main risk situation and sources	Sensitivity to the pavement; if irregular or slippery higher risk; un-signalised stairs and road works are high risk situations	Crossing is the main risky situation particularly with PT vehicles: bad detection of vehicles, higher risk if low noise vehicles and crossing outside crosswalk
probability level estimated for this particular risk	Probable	Probable
expected injury severity level	From minor to serious	From minor to critical
Street context Streets with shared space		
main risk situation and sources	Sensitivity to the pavement; if irregular or slippery higher risk; un-signalised stairs and road works are high risk situations	Motor vehicles, two wheels are the main risk source; position on the street; bad detection of vehicles, higher risk if low noise vehicles
probability level estimated for this particular risk	Probable	Probable
expected injury severity level	From minor to serious	From minor to critical
Public transport context Underground		
expected injury severity level	From minor to serious	From minor to critical

main risk situation and sources	Sensitivity to the pavement; if irregular or slippery higher risk; un-signalised stairs are high risk situations	
probability level estimated for this particular risk	From occasional to Probable	
expected injury severity level	From minor to serious	
Public transport context Railway station		
main risk situation and sources	Sensitivity to the pavement; if irregular or slippery higher risk; un-signalised stairs are high risk situations	
probability level estimated for this particular risk	From occasional to Probable	
expected injury severity level	From minor to serious	
Public transport context Intermodal hubs		
main risk situation and sources	Sensitivity to the pavement; if irregular or slippery higher risk; un-signalised stairs are high risk situations	Crossing is the main risky situation particularly with PT vehicles: bad detection of vehicles, higher risk if low noise vehicles and crossing outside crosswalk
probability level estimated for this particular risk	From occasional to Probable	Probable
expected injury severity level	From minor to serious	From minor to critical