

Disabled and Older Persons and Sustainable Urban Mobility

Ann Frye

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Ann Frye is an international specialist on the transport needs of disabled and older people with over 30 years experience in the field both in Government and as an independent consultant. She is a Visiting Professor at University College, London, a Fellow of the Chartered Institute of Logistics and Transport and of the Institution of Highways and Transportation in the UK and an honorary Transport Planning Professional. She co-chairs the US Transportation Research Board sub-committee on International Activities in Accessible Transportation. Ann has led Europe-wide projects to develop Standards for accessible buses and trains. Comments may be sent to the author by e-mail to ann@annfrye.co.uk.

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List of acronyms

AMTRAK	National Railroad Passenger Corporation, of the US
ASEAN	Association of Southeast Asian Nations
BRT	bus rapid transit
EU	European Union
GDP	gross domestic product
NGO	non-governmental organization
UK	United Kingdom of Great Britain and Northern Ireland
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
US	United States of America
USAID	United States Agency for International Development
WHO	World Health Organization

1. The Crisis of Sustainable Mobility in Urban Transport

The demographic trends common to both developed and developing countries are a cause of major concern in many countries. United Nations data on demographic trends¹ show that:

- Currently 11 per cent of the global population is more than 60 years old;
- By 2050, this figure is expected to be 22 per cent; rising from 700 million people in 2009 to 2 billion;
- The number of people over 80 is growing at 4 per cent per annum; the population as a whole is growing at 1 per cent per annum;
- The pace of population ageing is faster in developing than in developed countries;
- Currently 64 per cent of older people live in developing countries, by 2050 this figure will rise to 80 per cent;
- 3.5 million people will be over 100 years old by 2050: over half will live in Asia.

However, the rate of ageing varies considerably between countries. In 2009, 22 per cent of the Japanese population was aged 65 and above. In Afghanistan the comparable figure was only 2 per cent.² It is also clear that there is a strong correlation between age and disability. There is evidence that:³

- About 10 per cent of the world's population has a disability;
- About one third of older people have a disability and in some countries as many as two thirds of disabled people are also elderly;
- 80 per cent of the world's 500 million disabled people live in developing countries;
- Disability and poverty are closely linked.

Taking figures on ageing and disability together, in the future this will account for between 25 and 30 per cent of the world's population. Given that the majority of people now live in urban areas (already more than half, and by 2025 nearly 60 per cent) and that the fastest rate of urbanization is in developing countries, these trends on age and disability are particularly relevant to urban environments.⁴

World Bank data⁵ shows that recorded figures on disability vary greatly between developed and developing countries with a typical developing country figure being in the order of 5 per cent. For developed countries the figure is typically between 15 and 20 per cent. This gross underestimate of the scale of the problem in developing countries results from the way in which data is gathered and impacts on the level of political attention given to addressing the needs of disabled people. Figure 1 shows a range by countries in the UNESCAP region.

However, when questions are asked about functional impairment (which is more relevant to mobility) the figures change significantly. In Brazil this change of approach in the National Census led to a rise in the prevalence of disability from 0.9 per cent to 14.5 per cent.⁶ Looking at disability in a functional context means that the emphasis is on the barriers created by the environment and infrastructure (steps, lack of audible information, etc.) and what can

1. UNDESA, 2009.

2. <http://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS>, last accessed 28 March 2011.

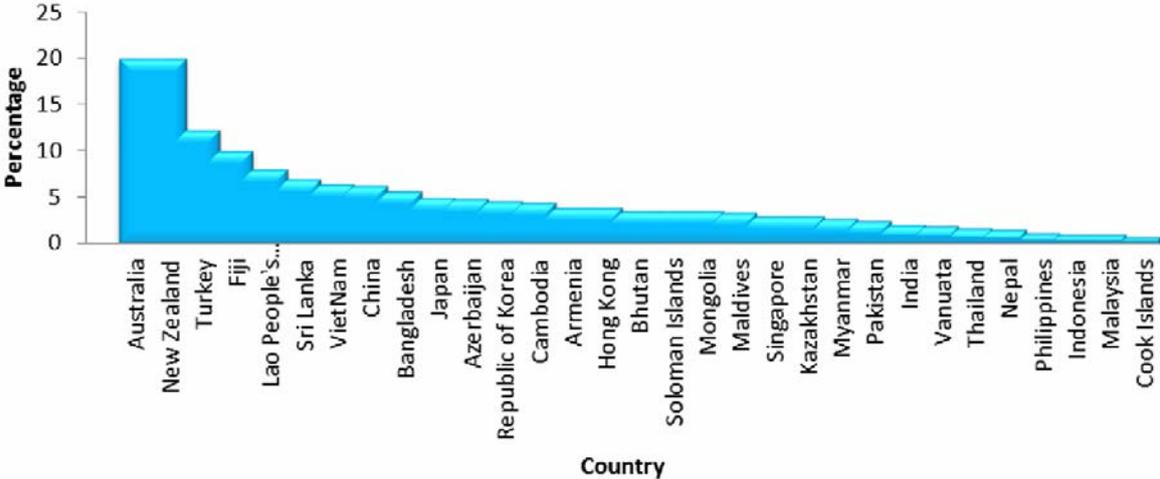
3. UN Enable, undated.

4. UNFPA, 2007.

5. As presented in Mont, 2007.

6. Mont, 2007.

Figure 1. Proportion of disabled people relative to total population, UNESCAP region



Source: UNESCAP, 2010.

be done to overcome them. This provides a much more effective basis both for focussing political attention on the issues and for prioritising what needs to be done to address them.

Disability is not just about people with physical impairments. It also extends to people with sight impairment (ranging from low vision to total blindness), hearing impairment (ranging from slight hearing loss to profound deafness) and to those with cognitive impairment (learning disability) and mental health problems.

Accessibility for disabled and older people does not only mean physical access to vehicles and systems. It includes information in forms that are useable by everyone, training of transport staff to understand the needs of disabled and older people, and design and layout of urban areas to enable people to move about safely and confidently.

The concept of the transport chain is important. Disabled and older people can only make a journey if all links in the chain that make up the journey from door to door are accessible.

2. Non-Motorized Transport

This chapter examines non-motorized forms of transport starting with walking; the only form of mobility available to disabled and older people in many developing countries. It also considers the pedestrian environment and the problems that can prevent access or put disabled and older people at risk, and reviews solutions being developed. The chapter also discusses the important topic of different patterns of wheelchair availability and use in different parts of the world. Non-motorized vehicles, including rickshaws, trishaws and pedicabs are also considered.

2.1. Trends and conditions

2.1.1. Walking

Every journey begins and ends on foot. But in US, people aged 65 and older make only about eight per cent of trips as pedestrians,⁷ while in sub-Saharan Africa, walking accounts for 50 per cent of all daily trips (for all ages).⁸

Disabled and older people are most likely to walk significant distances, despite their difficulty in doing so. Both lack of accessibility and cost exacerbate this problem. The recommended maximum walking distances are particularly limited for those who walk with an aid such as a stick. The figures in Table 1 are averages; there is considerable variation between the capabilities of individuals. Factors such as gradients and weather conditions will also affect the distances people can walk.

Table 1. Mobility limitations

Type of impairment	Recommended distance without a rest
Wheelchair user	150m
Mobility impaired person using stick	50m
Mobility impaired person without walking aid	100m

Source: Department for Transport, UK, 2002

Older pedestrians are at greater risk because of their frailty, with a higher chance of death or serious injury compared with younger adult pedestrians. They are more likely to sustain serious or fatal injuries and to take longer to recover. They are also more likely to have some functional impairment which adds to the possibility of error in dealing with traffic at road crossings.⁹

In many developing and transitional countries a combination of poor road surfaces and inexperienced drivers has also led to a significant increase in the numbers of younger pedestrians becoming disabled as a result of road accidents. In Cambodia, road accidents are the biggest single cause of disability in young people under 17 years of age.¹⁰

Badly maintained streets, lack of traffic management, lack of physical segregation between pedestrians and cyclists or motorized vehicles all contribute to increased risk and, for older people, fear of falling or being knocked over. Box 1 below illustrates this point.

7. Oxley et al, 2007.

8. World Bank, 2005.

9. Mitchell, 2005.

10. <http://www.handicapinternational.be/Cambodia>, last accessed 27 April 2011.

Box 1. Creating an 'age friendly' city, Toronto, Canada

An evaluation of the 'age friendliness' of the city of Toronto revealed some simple improvements that could make a significant difference to people's confidence.

These included keeping icy streets clear in the winter and extending crossing times at pedestrian crossings so that older people don't lose confidence that they will have long enough to cross safely.

Source: International Federation on Ageing, undated.

Figure 2. Good road layout for disabled pedestrians, Tanzania



Photo: Tom Rickert, Access Exchange International.

Facilities to increase the safety of disabled and older pedestrians are being introduced in many places. In Seoul, the Republic of Korea, the construction of mid-island refuges on wide roads is regarded as a priority to protect slower moving older pedestrians.¹¹ In Kolkata, India, an accessible pedestrian overpass has been installed.

Box 2 below describes initiatives in the City of Helsinki to improve accessibility of the city.

Box 2. The 'Helsinki for All' project, Finland

The 'Helsinki for All' project is a cooperative venture established by the Helsinki City Board in 2002. Representatives of city offices, associations of disabled and older people, government and other organizations are participating.

The project has solved many problems that were identified at the start including:

- A new type of kerb which works both for wheelchair users and visually impaired people;
- Guidance and warning surfaces for visually impaired people that are robust enough to withstand the Finnish winter climate.

Source: <http://www.hel.fi/helsinkikaikille/>. See also City of Helsinki Accessibility Plan, undated.

11. Lee et al, 2005.

Japan was the first country (in 1967) to introduce warning and guidance surfaces to help blind people navigate city streets independently. Tactile surfaces and audible signals at road crossings are now common in developed countries to provide guidance and warning to blind and partially sighted people. In some countries in Europe there is also extensive use of wayfinding techniques using tactile and audible guidance to help people with low vision navigate around cities.

However there is concern in many developed countries that the lack of international standards either for tactile surfaces or for audible warning signals can make it both difficult and potentially dangerous for blind people who travel abroad. A report from the World Blind Union draws attention to the lack of standardization and calls for the implementation and enforcement of ‘*universal design standards for infrastructure, including adequate width and demarcation of walking surfaces, and building design*’.¹² Many developed countries are also now introducing more sophisticated wayfinding systems using radio signals and other technology (see Box 3).

Box 3. The Wayfinder guidance system for blind people

Birmingham (UK) has introduced the Wayfinder, to improve access to transport and public services around the city centre. The system enables users to access audio information to help them navigate. Units have been installed in the main areas where people need information including railway stations and bus stops.

To use the system, blind people carry a small fob, which sends a constant radio signal that is picked up by the speaker unit. The unit delivers a pre-recorded audio message giving brief details of the immediate surroundings. Fobs are available free of charge for anyone who is registered blind.

Source: Worsfold and Chandler, 2010.

There is little benefit in tackling the accessibility of public transport vehicles until improvements are made to the pedestrian environment to enable disabled and older people to reach the bus stops. In 2008 a study in Penang, Malaysia, audited the pedestrian environment and identified options for improvement (see Box 4).

Box 4. Access audits of George Town, Penang, Malaysia

The access audits identified many deficiencies in the pedestrian infrastructure in central George Town. The accessible sections did not connect to create a network, many sections were constructed to unsatisfactory standards, sections which were otherwise accessible were blocked by objects ranging from signposts to flower pots; motorists were parking on footways and motorcyclists riding on accessible footways.

The project identified footways and road crossings as first priority for improvement to connect existing accessible sections to create a network of footways.

Source: UNDP, undated; Mitchell and Wee, 2010.

In Amman, Jordan, a plan for pedestrian walkways with trees and benches has been introduced under the slogan ‘A liveable city is an organized city, with a soul.’¹³

Lack of confidence is a key issue for many disabled pedestrians and in particular for those with a learning disability or vision loss. There are many schemes in cities in the developed world which provide travel training. In New York City, US, travel training has been provided by the City’s Department of Education since the 1970s. The programme

12. World Blind Union, 2010.

13. Access Exchange International, 2010a.

focuses on helping students with learning disabilities find their way safely through the pedestrian environment. One student with a learning disability who has completed the scheme commented:¹⁴

'I would walk fast and not look when I crossed the streets. I now slow down and am more aware of what is going on. I stop and look both ways before I cross the street.'

In many European cities the concept of 'shared space' is becoming popular. In these areas the traditional demarcation between motorists and pedestrians has been removed. The idea is that shared space areas lead to greater traffic safety because motorists are more alert and slow down. It is also argued that pedestrians can move freely in the entire street space instead of being confined to footways.

However, for older people and those who have reduced vision, the shared space concept, which relies on eye contact between the pedestrian and driver or cyclist, presents both real and perceived dangers. Although there is little evidence to date of accidents, many older and disabled people are reported to be changing their travel patterns because they cannot use such areas with confidence. It is difficult to separate the reality of risk from the perceived risk but the end result – to reduce mobility – is the same.

Surveys carried out in the UK and the Netherlands confirm the major concerns shared by many vulnerable pedestrians.¹⁵

2.1.2. Wheelchairs

Availability of wheelchairs is an indicator of basic levels of mobility; there is a high correlation between the level of wheelchair supply and GDP per capita. In developed countries, annual sales of wheelchairs average approximately 30 units per 10,000 population – for the rest of the world the figure is approximately 2–3 wheelchairs per 10,000 population.¹⁶ This means that even the most basic outdoor mobility is beyond the reach of many in developing countries (see Box 5).

Box 5. The gap between wheelchair need and supply

- In Tanzania, population 41 million, there are estimated to be 2000 wheelchair users and 30,000 people who need a wheelchair.
- Estimates suggest that over 100,000 people in El Salvador need a wheelchair but do not have one.
- The United Nations Statistical Office estimates that there are 20 million people in the world who need a wheelchair and don't have one.

Source: McKee 2010.

It is vital that wheelchairs are appropriate to local conditions. In many developing countries donated wheelchairs from developed countries, designed for different terrains and without maintenance or spare parts, give limited benefit. There are a number of schemes both for local manufacture and supply of purpose built wheelchairs to suit local infrastructure as well as clinical needs, often administered via major international agencies such as USAID. These include Motivation (UK) and Whirlwind Wheelchair International (US), each supplying 12,000 to 15,000 wheelchairs a year.

14. New York City Department of Education, 2009.

15. Guide Dogs, UK, 2006.

16. McKee, 2010.

Figure 5. A non-motorized transport solution for a paraplegic person



Photo: Motivation.

Figure 3. Donated wheelchair that is broken, Papua New Guinea

Figure 4. A pile of discarded inappropriate donated wheelchairs for which there are no spares in Tanzania



Photo: Motivation.

2.1.3. Cycling

Cycling is not an option for many disabled people but there are major implications for frail older and visually impaired people from the growing number of bicycles in cities. They can represent both a real and a perceived threat to safety unless they are regulated and, where possible, segregated from pedestrians.

In countries with a strong tradition of cycling (for example China) many older people do continue cycling safely into old age and this can be an important part of local independent mobility. In the Netherlands, 25 per cent of all trips made by septuagenarians are by bicycle.¹⁷ In Germany 50–55 per cent of all trips for adults aged over 65 are either on foot or by bicycle.¹⁸

However, the same factors that can affect older motorists and pedestrians are a safety factor here. Dutch studies indicate that older cyclists are more often involved in crashes than other cyclists.¹⁹

2.1.4. Rickshaws, trishaws and pedicabs

In many developing countries non-motorized forms of transport – including rickshaws, trishaws and pedicabs – are the cheapest, most reliable, most widely available and consumer friendly form of transport and provide a valuable means of local mobility for those unable to walk long distances because they provide a door-to-door service. In Kolkata, India, for example, rickshaws are a key means of transport for women and for older and disabled people.²⁰ Hand propelled tricycles can also provide valuable local mobility, often in areas with little alternative provision such as Dhaka, Bangladesh.

There is little evidence of steps to improve the accessibility of such vehicles. However, driver assistance can help to overcome basic access problems.

2.2. Impacts and challenges

The poor state of footways (or lack of them) and the dangers of traffic are major barriers to mobility. Access improvements need to start at the fundamental level of enabling people to walk (or wheel) within their local communities.

Wheelchair users are commonly seen in most cities in developed countries but are often still dependent on the help of others to overcome obstacles in the pedestrian environment. There is a universal lack of standards for basic accessible infrastructure such as minimum footway widths or ramp gradients even though there is clear research based guidance. Any gradient steeper than 2.5 per cent is impossible for many manual wheelchair users.²¹

Unless disabled and older people are able to use the streets of their cities with confidence, they will be limited in their ability to live independently. There is evidence of a close link between a loss of local outdoor mobility among older people and a significant decline of mental and physical health and wellbeing.²²

The loss of mobility among older people can be triggered by any number of factors:

- Hearing loss can reduce confidence in identifying the direction of sounds – such as approaching traffic;
- The perception that street crossings do not allow enough time to get across;
- Uneven or badly maintained footways which can cause slips and trips;
- Cyclists or younger pedestrians pushing or moving up too close behind.

17. Geller, undated.

18. Bailey, 2004.

19. Goldenbeld 1992.

20. Whitelegg and Williams, 1998.

21. Department for Transport, UK, 2002.

22. Metz, 2005.

The costs to society and to the individual are enormous. This point is further illustrated in Chapter 7.

The further development of wayfinding and other guidance and warning systems is helpful but there remains a need for greater standardization so that the same surface or signal has the same meaning in every city. It is also important that systems are installed on a consistent basis. Too many cities have kerb cuts only on one side of the street!

The availability of appropriate and affordable wheelchairs and other mobility aids must be a priority. Without the ability to move outside the home, the prospects for more extensive mobility and for a return to economic independence are non-existent.

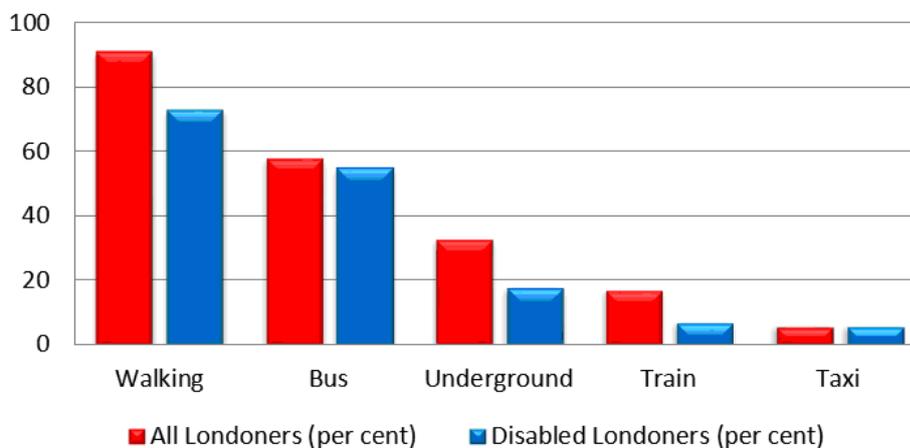
It is equally important to capitalize on the widespread availability of rickshaws and similar vehicles in many cities to make them more accessible to disabled and older persons.

3. Public Transport

This chapter examines trends in making public transport accessible, discusses the role that public transport can play in facilitating independent mobility of disabled and older people, and focuses on examples of both good and bad practice.

Data on modal share of trips made by older and disabled people is scarce. Figures from the US²³ (where private cars predominate) suggest that those aged over 65 make only about 1.5 per cent of trips by public transport. In European cities, however, with better developed public transport systems and a culture of public transport use, levels are generally higher. Figure 6 compares public transport use by disabled Londoners and all Londoners.²⁴

Figure 6. Travel patterns of disabled persons in London, UK (the percentages of Londoners using a given mode of transport at least once a week)



Source: *Transport for London, 2007*.

3.1. Trends and conditions

3.1.1. Buses

The bus is the most common form of urban public transport in most parts of the world. The trend towards low floor buses in developed countries has transformed the accessibility of public transport. The pace of change has been rapid in many European cities. In the UK, the proportion of the national bus fleet that was low floor and accessible rose from 53 per cent in 2004/2005 to 89 per cent in 2009/2010.²⁵ The accessible vehicles arrived faster in cities where public transport use was highest.

Additional accessibility features – such as colour contrast to help people with low vision and grab handles for those unsteady on their feet – are not widely available in either developing or developed countries even though they are cheap and easy to install. More costly facilities such as audible and visual ‘next stop’ information for those who are blind or deaf are available only in the major cities of some developed countries.

23. US National Travel Survey, 2009.

24. *Transport for London, 2007*.

25. Department for Transport, UK, 2010.

In many countries, both developed and developing, the focus is on gradual replacement of life-expired vehicles with more accessible designs. The City of Montevideo, Uruguay, announced plans in 2010 to replace its fleet of around 1,500 buses with low-floor vehicles fitted with ramps, phased in over a period of several years.²⁶ In Singapore, the bus operator SBS Transit has been purchasing low floor wheelchair accessible buses since 2006. They are introduced route by route starting with routes with a high concentration of disabled people, for example running past rehabilitation centres. Over half the fleet is already accessible and the plan is for the entire fleet to be wheelchair accessible by 2023.²⁷

In less developed countries, simple low-cost features such as raised boarding platforms or ramps provide a solution. In Projimo, Mexico, a wayside platform built by local people provides access to high-floor buses.²⁸

In some cities with a legacy of old inaccessible vehicles, measures are being taken to help specific disability groups. In Sofia, Bulgaria, the local authority has worked with the National Association of Blind People to install audible real-time information points at public transport stops (see Figure 7). Although the vehicles remain inaccessible to anyone with a physical disability, this innovation has started the move towards accessibility.²⁹ In Moscow, Russia, 600 bus stops have been modified with features to help visually impaired people.³⁰

Figure 7. Audible and visual real time information at public transport stops in Sofia, Bulgaria



Photo: Sofia Urban Mobility Centre.

Box 6 below illustrates the problems facing disabled public transport users in Bulawayo, Zimbabwe.

-
26. Access Exchange International, 2010a.
 27. <http://www.sbstransit.com.sg/>, last accessed 27 April 2011.
 28. Venter et al, 2002.
 29. Mediate, 2010.
 30. Access Exchange International, 2011.

Box 6. Comments from a survey of people with spinal cord injuries, Bulawayo, Zimbabwe

- There is a lack of accessible buses and many bus drivers do not want to carry people using wheelchairs.
- One lady said that the minibuses would not stop for her because the driver claimed it would take too long for her to get on and that they needed extra space for the wheelchair.
- Another person who was able to get onto the vehicle was made to pay for two tickets – one for herself and one for the wheelchair – even though it can fold.

Source: Øderud, 2010.

However, there are many areas of the world where no physical provision is made to enable wheelchair users or other disabled people to board the vehicle. In these cases driver attitude is a critical factor. People who could be helped onto a non-accessible bus are often not allowed to travel.

Another common problem is that responsibility for running buses and responsibility for maintaining the pedestrian environment lie in different organizations, and co-ordination does not always happen. In Moscow, Russia, while the Transit Authority will have replaced the fleet of old inaccessible buses with low floor accessible vehicles by 2015, the bus stops (for which the City is responsible) remain inaccessible to wheelchair users.³¹

In many cities, crowded public transport, particularly during peak times, also presents safety issues for older people. In Jamaica, ‘pushing and shoving’ is reported to be a problem for older people at bus stops and while boarding buses.³²

3.1.2. Bus rapid transit (BRT)

BRT is a popular solution for many less developed regions and is supported by the World Bank and other international funding organizations. There are schemes in Latin America, Africa, China and India. However, accessibility is not universally included in BRT schemes. In Lagos, Nigeria, even basic requirements for accessibility such as access ramps and handrails have been omitted. As a result, the system is unusable by many who could have benefited from a more inclusive design.³³

In Jakarta, Indonesia, the Transjakarta busway features long flights of stairs at stations with no alternative means of access.³⁴ By contrast, in the BRT in New Delhi, India, co-operation between disabled people and the planners has led to a much more accessible system (see Box 7).

Box 7. Achieving accessibility in Delhi’s BRT system, India

Samarthyam, the National Centre for Accessible Environments in India, collaborated with BRT service providers to promote inclusive mobility. Vehicle accessibility was tested by users at early prototype stages and modifications were made in response to user suggestions. The involvement of users extended to the pedestrian environment around the BRT.

Early results show that the BRT is providing a lifeline to many disabled people. The lessons learnt from the development phase will be rolled out to the rest of the system as it is built.

Source: Agarwal et al, 2010.

31. WHO, 2007a.

32. WHO, 2007b.

33. Odeleye, 2010.

34. The Jakarta Post, 2010.

Access to vehicles has been included from the design stage of the express bus system in Curitiba, Brazil (see Figure 8),³⁵ 81 stops have raised platforms with ramps or lifts for wheelchair users. Passengers board at floor level via bridge plates that lower automatically as buses reach the stop. Curitiba has a high percentage of accessible feeder services linking with the BRT. As a result, some 21,000 trips are made daily by disabled people, of which 1,000 are by wheelchair users.³⁶

The privately owned and operated TransMilenio BRT system in Bogotá, Colombia, demonstrates the importance of accessibility in the street environment as well as in the vehicles and infrastructure.³⁷ Where access to the BRT stop is across a road via a footbridge, ramps are provided as well as stairs. Feeder buses to the BRT are also accessible.

Figure 8. BRT system in Curitiba, Brazil

Figure 9. Accessible BRT in Cape Town, South Africa



Photo: Juan Carlos Pineda Gómez (Curitiba); City of Cape Town (Cape Town).

Guidelines commissioned by the World Bank and produced by Access Exchange International provide advice on accessibility and best practice for those developing BRT systems.³⁸

3.1.3. Mainline rail

For urban rail to be accessible, both the rolling stock and the station must meet the needs of disabled and older people. In many parts of the world rail systems are old and inaccessible. Overcrowding further reduces accessibility. In many developed countries, laws have been introduced over the past 15–20 years requiring new systems to be accessible and including features such as space for wheelchair users and reserved seats. Audible and visual announcements on board and at stations are also important in enabling people with sensory impairment and learning disabilities to travel with confidence.

35. Access Exchange International, 2010a.

36. Access Exchange International, 2011.

37. Menckhoff, undated.

38. Rickert, 2010.

In the UK, the Disability Discrimination Act 1995 introduced requirements for trains to be accessible. Because of the high cost of scrapping old rolling stock prematurely, train operators have until 2020 to replace all existing stock with trains that meet accessibility standards.

Despite legislation, accessibility is only being implemented slowly in many areas. In the US, only 20 per cent of AMTRAK's stations are compliant with US accessibility standards.³⁹ However, railway authorities in India are reported to be aiming to improve access to 1,500 railway stations (out of a total of 6,583⁴⁰) by the end of 2010, including access features for parking, signage, ticketing and waiting areas.⁴¹

Rail links between airports and city centres are increasingly common and are opening new opportunities for disabled and older tourists. Examples include the S-Bahn service from Hamburg airport (Germany) to the city centre, and the city airport rail link in Bangkok (Thailand).

3.1.4. Light rail and tramway

Light rail and tramway systems are often modern and most are built with some accessibility. Level boarding is common and can be achieved more simply and at lower cost than on mainline rail because of lower speeds. Cities such as Sydney (Australia), Vancouver (Canada) and Bangkok (Thailand) and many European cities have modern accessible light rail or tramway systems.

Lower operating speeds also make it easier for wheelchair users to travel without the need for special seating areas or wheelchair securement. Most systems have audio and visual information systems.

Older tram systems, such as in Hong Kong, have limited options for improving access. Here help is offered in terms of service rather than physical access. People with visual or hearing impairment board via the front exit where they are close to the driver in case they need assistance. Elsewhere, old inaccessible trams are being replaced. In Warsaw, Poland, an order has been placed for 186 accessible trams. The demand has been stimulated by the Euro 2012 Soccer tournament to be held in Poland. Orders have also been placed by some Hungarian cities, Turkish cities may follow.⁴²

Laws and technical standards for accessibility exist in many developed countries. In less developed countries where international aid has contributed to the cost, accessibility is sometimes (but not always) a condition of funding. This issue is further developed in Chapter 11.

3.1.5. Underground rail and metro

Systems built in the last twenty years are generally accessible, either as a requirement under national law or as a condition of funding support. Examples include the Metro Rail development in Kuala Lumpur, Malaysia, and the integrated Metro Rail/BRT project in New Delhi, India. The New Delhi Metro system is regarded as best practice in accessibility and similar models are being adopted in other cities in India. The system includes accessible approaches to the stations by ramps and lifts, accessible ticket counters and wide entry carriages with designated spaces for wheelchair users.

39. New York Times, 2010.

40. Indian Railways, 2011.

41. Access Exchange International, 2010b.

42. The Warsaw Voice, 2010.

Laws provide a strong impetus for accessibility where it might not otherwise have been a priority. In Dubai, the new metro system was one of the first to comply with the United Arab Emirates Federal Law which requires cities to be '*friendly to people with special needs*'. The Dubai Metro's facilities include tactile guide paths at the stations. All ticket booths are designed to be accessible to wheelchair users.⁴³

Even in areas with a good record of accessible public transport, metro and other underground systems can still provide challenges to accessibility. In Montreal, Canada, recent improvements in the Metro system – including tactile platform edging – help visually impaired people, but do not help wheelchair users. Only 6 stations out of 68 have lifts.⁴⁴

Old underground systems, deep beneath the surface, present huge engineering and financial challenges to accessibility. In London, UK, rolling stock is improved as new trains are introduced or old ones refurbished; these include audible and visual next stop information, colour contrast on floor edging and handholds. However, only 60 out of a total of 260 stations are currently wheelchair accessible and it will be many years before some of the central deep level stations can be made accessible because of budget constraints.

3.1.6. Taxis

Taxis are a key component of public transport for many disabled and older people because they provide an on demand door-to-door service. For older people, they can be significantly cheaper for local journeys than maintaining and running a car.

Accessible taxis are available in a few countries, mostly in small numbers and based on van conversions. The UK is currently the only country in which most major cities require all licensed taxis to be wheelchair accessible and to include features to help other disabled and older people, such as a swivel seat, extra handholds, and induction loops. All London's 19,000 licensed taxis are accessible. This means that a wheelchair user can travel with the same confidence and spontaneity as others. A 2008 survey by wheelchair users⁴⁵ indicates no problems in locating wheelchair accessible taxis in Sydney (Australia) and Dubai (United Arab Emirates) but a complete absence of accessible vehicles in Tokyo (Japan). In Paris (France) and Madrid (Spain) they must be booked in advance. In Singapore a number of taxi firms offer services to disabled people. One uses lift-equipped vans, others are standard saloon cars which require a wheelchair user to transfer into a vehicle seat.⁴⁶

In many cities few taxis can accommodate a passenger travelling in their wheelchair. Efforts to design an accessible taxi suited to the needs of both disabled and non-disabled passengers are continuing in Japan and a number of other countries. The New York City Taxi and Limousine Commission reports that although some American cities have wheelchair-accessible taxis, they represent a small percentage of their fleets.⁴⁷ It is virtually impossible to hail one, and rare to find one waiting at the airport.

In Hong Kong some taxis are now equipped with an audio device to tell visually impaired passengers the taxi number, and the trip fare in English, Cantonese and Putonghua.⁴⁸

43. <http://dubaimetro.eu/>, last accessed 27 April 2011.

44. <http://www.montrealgazette.com/>.

45. Disability Holidays Guide, undated.

46. <http://www.dpa.org.sg/>, last accessed 27 April 2011.

47. <http://www.nytimes.com/>.

48. Chan, 2010.

Even in cities with accessible vehicles, disabled people complain that drivers will not stop or will claim a bad back or damaged ramp as a reason not to accommodate them. A report from Tunisia recounts the story of one man of restricted growth:⁴⁹

'My work requires me to commute, but my height is an obstacle to using public transportation. I am forced to use taxis, but they often ignore me. The taxi drivers think I am a child.'

3.1.7. River/waterway transport

In some cities, waterborne transport is an integral part of daily mobility. There are few accessibility standards. The International Maritime Organization has published guidelines on the design and operation of passenger ships to meet the needs of disabled and older people.⁵⁰ The European Commission has introduced passenger rights legislation to protect the interests of disabled people travelling by water as well as for air, rail, bus and coach.

Access is particularly challenging in areas where there is significant tidal movement, such as Hong Kong. However, there are examples of simple low-cost modifications to improve accessibility. The Hong Kong Transport Department also sets minimum access standards as a condition of tender for new ferries.

In Norway, the Rogaland region (around Stavanger) is dependent on sea transport and accessibility of new boats is a condition of the tender requirements set by the local authority. As well as wheelchair access the boats have tactile signs, colour contrast and induction loops.⁵¹

3.1.8. Emergency service vehicles

The only issue relevant to the needs of disabled and older people is the design of ambulances. Although they are intended to accommodate a stretcher, they are often less accessible to a disabled or older person travelling as the patient or accompanying person and for whom steep steps and a lack of handholds can be a problem. However, staff assistance will always be available.

3.2. Impacts and challenges

There remain many cities around the world with no accessible transport and few if any alternative sources of mobility. Reports from Iran, Armenia and Georgia⁵² indicate that there is no provision for disabled people on public transport. In Iran there is some privately operated special transport but some 50 per cent of disabled people are unemployed while in Armenia the figure is 92 per cent. These figures underline the close link between immobility and poverty.

Research among disabled people living in poverty in Yemen⁵³ emphasized that poverty among disabled people is exacerbated by:

- Lack of access to jobs and the labour market;
- Reduced opportunity to attend school or vocational training;
- Reduced access to health care;
- Limited ability to participate in communal life.

49. <http://www.magharebia.com/>.

50. IMO, 1996.

51. Mediate, 2010.

52. ArmeniaNow, 2010.

53. Grut and Ingstad, 2006.

A disabled person in Armenia commented:⁵⁴

'... the disabled remain isolated. Lack of special transport confines them to a single neighbourhood, special school, small church, local polyclinic, and small shop'.

Even in cities with well developed accessible transport networks, transport problems can be a key barrier to employment. Data from London, UK, indicate that 23 percent of disabled people seeking employment have had to turn down a job offer, and a further 23 per cent a job interview, because of inaccessible transport.⁵⁵

A range of problems remain in many cities. The most common is lack of co-ordination between vehicle operators and those maintaining pedestrian and transport infrastructure. Unless access improvements are made in parallel to the vehicle and the pedestrian environment, much of the benefit will be lost. This issue affects conventional bus and BRT systems as well as metro and tram systems. At the root of this problem is the fact that those responsible for operating public transport are seldom the same as those responsible for the street environment. Equally important is to ensure access of feeder services which connect with major transport systems like BRT.

On mainline rail, the cycle for rolling stock renewal is long and the cost of refurbishment is high so inaccessible trains may continue for many years in some areas. This will prolong uncertainty for many disabled travellers who cannot be sure which services will be provided with accessible rolling stock.

Incompatibility of access standards between different systems can mean that disabled people are unable to complete a journey. The European Union (EU) has had legislation in place since 2008 to bring new heavy rail rolling stock across Europe under common standards,⁵⁶ but there is still a long way to go.

In developed countries, lack of ticket compatibility between different modes also makes travel complicated. Smart ticketing and the use of smart phone 'apps' should bring major benefits to disabled travellers provided that their needs are designed into the software.

Lack of driver training is a major barrier to the use of public transport in general and buses and taxis in particular.

Information both before and during the journey is also vital to enable people to understand how to use the system. In some cities where accessible buses have been introduced, disabled people are still reluctant to travel because they are unsure how the system works. There are some good examples, such as Stuttgart (Germany) and Vienna (Austria)⁵⁷ where transport operators organize visits to depots and stations for disabled people to experience public transport in a non-pressured environment (see Figure 10).

54. Narayan et al, 2000.

55. Transport for London, 2007.

56. Official Journal of the European Union, 2008.

57. Mediate, 2010.

Figure 10. Familiarisation sessions for disabled people on the Metro system in Nürnberg, Germany



Photo: VAG VerkehrsAktiengesellschaft Nürnberg.

4. Informal Motorized Transport

This chapter considers services which provide informal transport in many cities, particularly in developing countries. These range from small schemes run on a very limited basis to extensive networks supported with Government funding. Some have very narrow criteria restricting who can use them and for what purpose while others offer greater flexibility. The chapter also looks at the very different roles played by such services in delivering accessibility and draws on a number of examples around the world.

4.1. Trends and conditions

4.1.1. Door-to-door services

Privately run special services such as shared-taxis, minibuses and pick-up trucks are a major form of public transport in many cities. They provide between 20–50 per cent of public transport in Manila (the Philippines), Jakarta (Indonesia), Kuala Lumpur (Malaysia) and Bangkok (Thailand).⁵⁸ These figures are for paratransit in general. No separate figures are available for disabled and older people's journeys. However, given the greater flexibility and greater penetration into residential areas it is likely to be a major mode of choice for disabled and older people even when the vehicles are not totally accessible.

Door-to-door services, often run by NGOs, were the starting point for accessibility in many cities in Europe and in the US. Often they still exist as a complement to, rather than a substitute for, accessible public transport. However, in transitional areas, such as parts of Eastern and Central Europe, door-to-door transport is still often the only viable option for disabled and older people and is either run by the local authority or by an NGO. In other cities the door-to-door service started when there were no alternatives for most disabled people to use but has continued to grow and flourish even when accessible transport has been introduced (see Box 8 below).

Box 8. The Hong Kong Rehabus, China

The Rehabus Service began in 1977, using two donated 7-seater vans. In 1978, the non-profit making Hong Kong Society for Rehabilitation agreed to take over the service with full financial support from the government.

The service has now expanded to a mixed fleet of 92 vehicles – mostly 12-seater light buses, each with a lift and four wheelchair places and a low retractable step. The annual ridership has increased from 8,000 passenger trips in 1977 to 660,000 trips in 2009. As well as a door-to-door service, Rehabus runs a scheduled route service for trips to work, school, and training, and also connects to major accessible mass transit and rail lines.

Source: Access Exchange International, 2007.

Many European countries started with door-to-door services and are now moving to accessible mainstream transport (because although entry costs are lower, operating costs are higher). In these areas efforts are being made to persuade people to make the transition to public transport through flexible intermediate services which brings them close to their destination but are not door-to-door. In Göteborg, Sweden, the Flex Lines help disabled and older people to develop confidence and expand their travel horizons (see Figure 11).⁵⁹

58. WBCSD, 2007.

59. Mediate, 2010.

Figure 11. Flex line service in Göteborg, Sweden



Photo: Peter Svenson.

An approach to reducing dependence on costly door-to-door services in parts of Western Europe is to use travel mentors or assistants to help people to build up the skills and confidence to use accessible mainstream transport. Schemes in London (UK)⁶⁰ and Paris (France)⁶¹ provide an assistant to travel with a disabled person using public transport to help them find the route, understand how to buy a ticket and find the right bus or train. The idea is that once they have built up the confidence and knowledge they will be able to travel independently (see Box 9).

Box 9. The London Travel Mentor scheme, UK

The London Travel Mentor scheme is a free service which helps individuals to plan accessible routes and journeys and provides a mentor to travel with them until they have the confidence to make the journey independently.

There is a limit of 10 accompanied journeys, but most people need far fewer. The service is available to people with any kind of physical, sensory or cognitive impairment. Around 7,000 assisted trips are provided every year.

Source: Transport for London: Travel Mentoring Service (unpublished document)

In the US, disabled people have a legal right to ‘paratransit’ in addition to a requirement that all public transport be made accessible. Many disabled people are reluctant to give up the convenience of a door-to-door service even when they are physically capable of using public transport. This is an issue of growing concern to operators who have to bear the substantial cost of paratransit services in addition to making all their mainstream services accessible.

60. <http://www.tfl.gov.uk/tfl/gettingaround/dialaride/travelassistance.asp>, last accessed 27 April 2011.

61. <http://www.compagnons.com>, last accessed 27 April 2011.

In an historic city like Lisbon, Portugal, with the added difficulty of many steep hills, door-to-door remains the only practicable solution for many people.⁶² The drivers of the door-to-door service regularly have to collect the disabled person from inside their home because they cannot otherwise manage the steps in and out of their apartment.

Door-to-door systems are also used in some developing countries. São Paulo, Brazil, has an extensive accessible door-to-door network. This provides free transport for those who cannot use public transport within the greater São Paulo area. The service is primarily for travel to and from hospitals and clinics but can also be used for work, leisure and cultural destinations.⁶³

In some cases the criteria for use may be relatively relaxed as in the São Paulo example. In others the journey purpose may be quite specific and limited. The city-run service in Cape Town transports about 200 people a day. The service is restricted to journeys to and from work and is specifically designed to overcome the economic disadvantage facing disabled people unable to use mainstream public transport.⁶⁴

In Moscow, Russia, the ‘Vozrozhdenie’ paratransit service, provides both medical and social service trips.⁶⁵ The system uses more than 100 accessible vehicles and has increased significantly in size over recent years. In addition to the door-to-door service, a more recent innovation in Moscow has been the introduction of two specialized service routes for passengers with disabilities, using small lift-equipped buses operated by the city’s surface transport agency. Each route serves locations regarded as being of special interest to those using it.

Vehicle standards for accessibility are generally less well defined for the smaller vehicles that deliver door-to-door services than they are for larger public transport buses. Although there are some purpose-built accessible minibuses now on the market in developed countries, in many places adapted vans are the primary vehicle type in use. These have high floors and are therefore generally fitted with lifts rather than ramps.

In some developing countries less formalized systems exist, not dedicated to disabled and older people, but nonetheless able to provide a form of local mobility for many.

4.1.2. *Tuk-tuks* and auto rickshaws

Tuk-tuks and auto rickshaws are used by many older and disabled people. Even those using a manual wheelchair are able to access them provided that the chair folds and can be stowed in the vehicle. The low floor design of some vehicles, for example the auto rickshaws in New Delhi, India, makes access a relatively straightforward process. In Luanda, Angola, an auto rickshaw service provides employment for amputees as well as a transport service for disabled people visiting local rehabilitation centres.⁶⁶

Helpful measures to improve access to these vehicles and services include: providing seats and shelter at waiting areas; signage and information to help people, including those with low vision to locate boarding places; and training to ensure that drivers are aware of the needs of disabled people.

62. Euro Access, 2008.

63. Rickert et al, undated.

64. All Voices, 2010.

65. Access Exchange International, 2009.

66. Beresford, 2004.

In New Delhi, India, plans have been approved by Government to help blind users of auto rickshaws make sure that they are not cheated by drivers.⁶⁷ A metal plate with both Braille and embossed information will be attached to the vehicles so that blind people can check the registration number. Organizations of blind people in Delhi are now campaigning to fit audio meters to auto rickshaws to give added protection to blind people – about 10,000 of whom travel every day.

4.1.3. Small buses and jitneys

Small buses or jitneys in Africa and other developing regions generally offer better physical access (excluding wheelchair access) than large buses, because of their smaller size and ubiquitous presence. However, driver behaviour, as well as overcrowding, is a major barrier to their use by disabled people.⁶⁸

In some cases the informal services have denied access to disabled people⁶⁹ and steps have been taken by the city authority to improve the situation. In Dar es Salaam, Tanzania, the public transport sub-sector was dominated by 7 to 15 seater minibuses (*daladalas*) which could not accommodate a wheelchair. These vehicles were banned from operating in the central business district of the city and have now been replaced with more accessible vehicles.

In Nairobi, Kenya, public service vehicle owners have been given one year (from February 2011) to redesign their vehicles to allow disabled people to board more easily in accordance with the Disability Act of 2003, which requires such vehicles to be accessible.⁷⁰

4.1.4. Powered wheelchairs and scooters

In many developed countries, there is a dramatic rise in the numbers of powered wheelchairs, scooters and buggies used by older people and increasingly by obese people. These can provide valuable local outdoor mobility but if they are not controlled can also be a danger to frail pedestrians and those who have low vision as they often travel at speed on the footway as well as in the road.

There is also growing concern in some developed countries about the extent to which it is possible to accommodate these vehicles within accessible public transport in terms of size, weight and stability.

Some countries (like Japan and the UK) have schemes called ‘Shopmobility’ or ‘Townmobility’, which enable people to hire a powered wheelchair or scooter to take them around a shopping centre or pedestrianized zone. The users of these schemes are predominantly older people who cannot walk long distances.

4.2. Impacts and challenges

In many cities, in both developed and developing countries, door-to-door services are often the entry point to providing accessible public transport. However, costs per trip are generally much higher than those of public transport and in developed countries, door-to-door transport is now largely seen as a complement to fully accessible mainstream services rather than as an alternative to it.

67. Samarthyam, 2010.

68. Venter, undated.

69. Kikoyo, undated.

70. Daily Nation, 2011.

With the economic challenges facing many cities, there is a risk that high costs will mean the end of door-to-door services in most developed countries, and that will lead to a significant minority of disabled and older people whose mobility is reduced because they cannot transfer to mainstream transport.

For those who can make the change – but need support and encouragement to do so – travel training or mentoring schemes could be used more widely to help with that process.

In developing countries the informal transport sector provides invaluable services to many disabled and older people at low cost to the user. The proximity to the driver and other passengers also means that there is more likely to be help available to overcome inaccessible vehicle design. However, such vehicles often remain difficult to access and uncomfortable to ride in.

In developed countries, the growing challenge of obesity, as well as old age, means that large numbers of scooters and buggies are not only out and about on city streets, their users often want and expect to bring them onto public transport. This in turn raises issues about the risk to other vulnerable pedestrians from large and heavy vehicles (generally operated without a licence) and the space and weight requirements imposed on public transport. Recent research in the US suggests that current space requirements on vehicles for wheelchair users under US law are inadequate to meet the needs of a growing number of heavy powered wheelchairs and scooters.⁷¹

71. D'Souza et al, 2010.

5. Private Motorized Transport

This chapter looks at the role of the private car in meeting the mobility needs of disabled and older people. It considers licensing and re-licensing, safety, driving cessation for older people and the problems that can be associated with it, and at how easy it is for disabled and older people to hire cars when they travel. The chapter also looks at parking and the affordability of cars and driving.

5.1. Trends and conditions

Private cars are widely used by disabled and older people in many developed countries, but are far less significant in most developing countries. This reflects overall car ownership levels. Car ownership in Kenya is about 20 per thousand people⁷² compared with 776 per thousand in the US.⁷³ In the US people aged over 65 make around 92 per cent of all trips by private car.⁷⁴

Disabled people, even in developed countries, tend to travel less by private car than non-disabled people. Data from London, UK, shows that while 42 per cent of all Londoners drive a car or van at least once a week, the figure for disabled Londoners is 25 per cent.⁷⁵

5.1.1. Disabled drivers

5.1.1.1. Driver licensing

Developments in technology now allow even very severely disabled people to drive. Provided that sight and reaction times meet required standards, physical disability (including high levels of paralysis or loss of limbs) can be overcome. Adaptations range from simple attachments to the steering wheel to make it easier to turn through to voice control and infrared systems which compensate for a loss of strength and movement.

There is a lack of reliable data about numbers of disabled people holding driving licences, even in those countries with policies to promote their mobility. Most figures available are based on estimates. In the EU it is estimated that around 1 per cent of all drivers have a disability.⁷⁶ Data from London, UK, suggests that 37 per cent of disabled Londoners have a full driving licence compared with 53 per cent of all Londoners.⁷⁷

There are major variations between countries and regions in the laws and policies on licensing of disabled people to drive and on re-licensing those who become disabled. Some countries prohibit people with certain types of disability from driving. 26 countries, including Pakistan and China, do not allow deaf people to drive.⁷⁸ In India a disabled person is only entitled to drive the specific vehicle in which they passed the driving test.⁷⁹ Other countries permit anyone who can demonstrate their ability through a driving test to do so.

5.1.1.2. Assessment and advice

Some countries (including the US, Canada, many European countries and, most recently, the emirate of Dubai) provide assessment services to enable disabled people to get advice on

72. World Bank, 2005.

73. UNECE, 2005.

74. US National Travel Survey, 2009.

75. Transport for London, 2007.

76. Quavadis, 2003.

77. Transport for London, 2007.

78. World Federation of the Deaf, 2009.

79. India Car, undated.

whether they will be able to drive and to find the most suitable vehicle and adaptation. Assessment can include a full check both off and on-road of functional ability and cognitive awareness.

In South Africa, the Quad Para Association set up its own driver training service (initially as a pilot in 2002) to teach disabled people to drive a vehicle fitted with hand controls. The service has now extended and is available in both KwaZulu-Natal and Western Cape.⁸⁰

In Japan there is a significant market for adapted vehicles but the majority are to accommodate a wheelchair user as a passenger rather than a driver.⁸¹ As a result, there are very limited facilities for assessing the ability of a disabled person to drive (3 centres in total).

5.1.1.3. Affordability

There are schemes in some countries to reduce the cost of vehicle purchase or operation for disabled people. In the UK severely disabled people receive a tax free payment to offset the additional transport costs associated with disability. Through a Government-backed charity, Motability, this money can be used for a car on lease or hire purchase. Since the scheme started in 1978 over two million cars have been provided.⁸²

In Japan there is no government funding for mobility. In Singapore, the Land Transport Authority administers a scheme to help disabled people who need assistance to buy a car to earn a living. Disabled drivers there are exempt from paying an additional registration fee.⁸³

There are a number of similar concessions available to disabled drivers in many other countries. In some cases financial help is only available to those who are already in employment.

5.1.1.4. Access and parking

Many developed countries have parking schemes with reserved places for disabled people to enable them to access essential facilities in cities. In some cases such schemes also exempt disabled people from parking charges. However, there is little consistency. In Canada, parking concessions are the responsibility of the Provinces, who then delegate it to the municipalities. In the EU, there is a scheme of reciprocal recognition of a standard disabled person's parking badge but the concessions to which it entitles the disabled person will vary according to the national or local rules in the city they are visiting.⁸⁴

The location of parking places is also critical. If disabled and older people are to reach the city centre, there must be parking available within a reasonable distance (see mobility ranges in Chapter 2).

5.1.1.5. Car hire

There are significant differences in the availability of hire cars that are adapted to meet the needs of disabled people. They are widely available on demand in North America and becoming more common in Australia and some parts of Europe, particularly at airports and in major city centres. At Heathrow airport in London, UK, 4 out of the 6 hire car companies

80. QASA, undated.

81. JAMA, 2009.

82. <http://www.motability.co.uk/>, last accessed 27 April 2011.

83. Land Transport Authority, 2010.

84. International Transport Forum, 2009.

operating from the terminals offer adapted vehicles. In many other parts of the world such vehicles are not available. In Israel, portable car adaptations of the kind widely used by hire car companies are illegal.⁸⁵

5.1.2. Older drivers

5.1.2.1. Licensing

The number of older people who hold a driving licence is growing significantly in most developed countries and will continue to do so. A 2001 study projected increases between 2000 and 2030 in the percentage of drivers aged 65 and above ranging from 93 per cent in the Netherlands to 40 per cent in Sweden.⁸⁶ In the US, within 15 years more than one in five licensed drivers will be 65 or older.⁸⁷

The re-licensing and checking of fitness to drive among older people also varies widely between countries and regions:

- In the EU rules range from issuing lifelong licences without subsequent medical checks, to requiring medical examinations for renewal, to renewal every 5 years from the age of 45.⁸⁸
- In Japan, drivers aged 75 or older undergo examinations in cognitive function when renewing their driving licence;⁸⁹
- In Pakistan licenses are valid to age 70 and then renewable every three years.⁹⁰

In some countries restricted licences are issued to enable older drivers to retain independent mobility. Restrictions include only driving to certain destinations or at certain times of day.

5.1.2.2. Safety

The safety of older drivers is an issue of growing concern as their numbers increase. However, the reality of older driver safety appears to be rather different from the media stereotypes. A 2010 study⁹¹ reports that:

'Today's older drivers are no less safe than their middle age counterparts. The misconception that the elderly are dangerous when behind the wheel is a function of their overrepresentation in the casualty statistics – older motorists do not tend to have more accidents but their frailty means that they are more likely to be seriously hurt or killed when they do.'

'Until the age of 80, older drivers are only at greater risk of injury for every mile driven because frailty increases with age. It is only when drivers are over the age of 80 and / or travel less than about 2,000 miles a year that there is any type of increased risk due to driving ability.'

Figure 12 illustrates this trend and gives data on fatalities; drivers killed or seriously injured (KSI) and slight injuries, by age of driver.

85. Access Israel, undated.

86. OECD, 2001.

87. US National Transportation Safety Board, 2010.

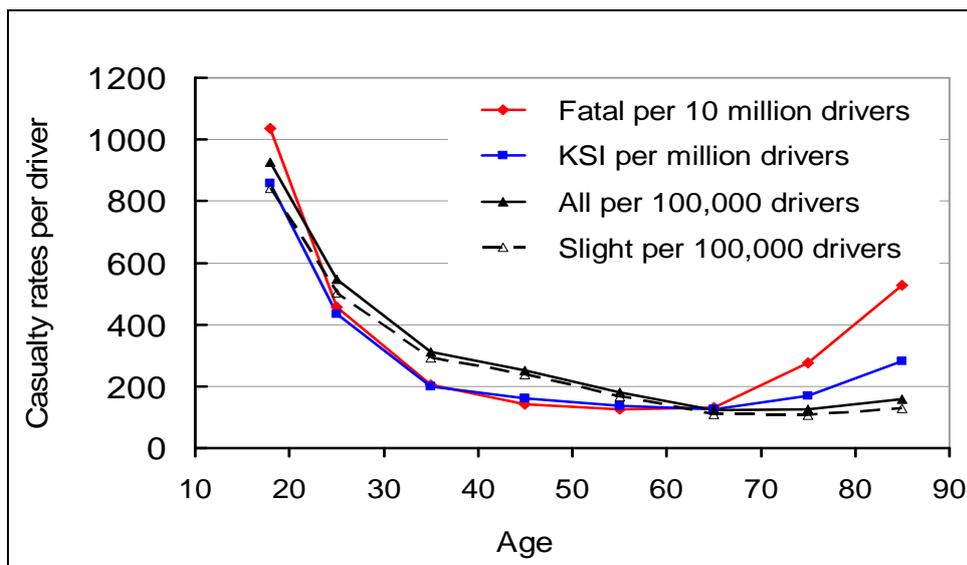
88. Mitchell, 2008.

89. Japan Today, 2010a.

90. http://www.pak.gov.pk/driving_license.aspx.

91. Box et al, 2010.

Figure 12. Car driver casualty rates, Great Britain (2008)



Source: Department for Transport, UK, 2009.

Drivers aged 85 years or more appear, from another study,⁹² to be more than four times as likely to have caused a crash as to have been innocently involved. The most frequent types of crash caused by older drivers involve right of way decisions.

Drivers over the age of 85 are also nine times more likely to die in a crash per mile driven compared with younger drivers. The higher crash fatality rate is thought to be a consequence of older adults' relative frailty.⁹³

In Japan growing concern about accident rates among the large population of older drivers has led to policy initiatives including a scheme in Tokyo which offers incentives to its 760,000 drivers aged 65 and above to encourage them to give up their licences. These include discounts in restaurants and shops.⁹⁴

Many older drivers are reluctant to give up driving because of the impact it will have on their independence, particularly those living in areas without accessible public transport. Nonetheless the majority self-regulate their driving habits by not driving after dark or on busy roads.

There is evidence from the US of older drivers continuing to drive long after they should have stopped. One 83 year old driver commented:⁹⁵

'I drive in the city every day, but even that is getting more uncomfortable because my eyesight isn't what it used to be since I have a cataract. I drive by instinct in dark areas since I can't see as well. When an area is not lit, I feel my way along; I almost creep.'

This is also a growing problem among people with dementia who are unable to make appropriate judgements while driving but are unaware of their own difficulties.

92. Department for Transport, UK, 2009

93. Wang and Carr 2004.

94. Japan Probe, 2008.

95. Kostyniuk and Shope, 1998.

5.1.2.3. Hire cars

It is often difficult, or impossible for older people to hire a car. In some areas there are restrictions (mostly imposed by insurers) that prevent anyone over 70 from hiring.

A further complication for both disabled and older people wanting to hire cars is that although there are some major hire car companies with an almost worldwide presence, a significant number are in practice franchise operations, essentially private companies trading under a corporate name. This means that there may not be any consistency in the policies they apply to disabled and older people.

5.2. Impacts and challenges

A car may provide the only mobility option in cities where public transport and the pedestrian environment are not accessible, but only for those disabled people who can afford to own and run one.

The safety of older drivers is a highly contentious issue in many developed countries, particularly those which are most heavily car dependent.

A further issue is driving cessation. One of the key reasons why many older people are reluctant to give up driving is that they have never used public transport because the private car was available and convenient. Making the transition to public transport in old age is a major challenge and one which local authorities and transport providers need to address in terms of the way that services are marketed. This is an issue of growing concern as the first of the baby-boomer generation, many of whom have been wholly car dependent throughout their adult lives, reach old age.

There is also a specific challenge related to the growing number of older people who develop dementia. They may be physically quite capable of driving but mentally unable to control the car safely. In some developed countries, specialized programmes have been developed to try to stop people diagnosed with dementia from driving.

Lack of consistency and reciprocity between parking badges issued to disabled motorists in different cities makes it more difficult for disabled people to travel by car to other areas. They may find that they are unable to park near enough to their destination.

The variability of policy and practice in the hire car industry is another potential barrier to disabled and older people. It would be very helpful if the major global players in the field, at least, had a corporate policy that was applied across all franchises so that disabled and older people know what they could expect.

This limitation on older people hiring cars is likely to have a detrimental impact on tourism among the growing market sector of older tourists from developed countries who have both the time and the disposable income to travel but for whom comfort and accessibility are a key requirement.

Changes in family settlement patterns have exacerbated problems of driving cessation. In previous generations (and still in some cultures, for example Latin America) family support is available to older people who can no longer function independently. However, in many parts of the developed world families have dispersed leaving the older generation without a family-based support network.

6. Commercial Goods Transport

This chapter looks at the impact of commercial goods transport as a significant cause of disability in many developing countries and considers initiatives to reduce risk. It also looks at the challenges that heavy vehicles present to disabled and older pedestrians in both developed and developing city environments.

6.1. Trends and conditions

Most freight transport in developing countries is by road and levels are set to continue to rise. The growth in heavy vehicle traffic, combined with inadequate road and pedestrian infrastructure in many developing countries mean that commercial goods transport is a significant cause of disability.

A UNESCAP report⁹⁶ indicates that more than 4.7 million people were injured in road crashes in the ten countries which make up the Association of Southeast Asian Nations (ASEAN) during 2003, with many victims severely disabled for the rest of their lives.

Disabling injuries are at their highest in developing countries where heavy commercial traffic shares road space with vulnerable road users including pedestrians, cyclists, rickshaw users and others.

The design of many larger vehicles also increases the risk of serious injury to pedestrians in general and older and disabled pedestrians in particular.⁹⁷

In India, trucks are involved in half of all crashes in cities. Victims are predominantly pedestrians and cyclists who are more likely to sustain serious chest and head injuries if hit by a truck than if hit by a car.⁹⁸ A report from Ethiopia also indicates that road traffic injuries are the most common cause of permanent musculoskeletal disability. Most of the road traffic accidents involve pedestrian injuries and are caused by commercial vehicles.⁹⁹

In cities like Johannesburg, South Africa, with high levels of disability caused by road accidents, there are efforts by the city authorities to promote safer driving and to persuade drivers to obey basic rules of the road in order to reduce the high levels of injury, death and permanent disability.¹⁰⁰ Policies such as this will not address the needs of people who are already disabled but should help to reduce the numbers of people becoming disabled as a result of road accidents.

In developed countries too there is a high correlation between volumes of commercial traffic and injuries and fatalities involving pedestrians and cyclists. These trends continue to grow as levels of road-based freight continue to rise. It is not just the volume of commercial traffic that is a problem. The areas in which they operate can also create risks for disabled and older pedestrians. In many developed countries where pedestrianized areas have been created, access for commercial vehicles is still permitted (between certain restricted hours) to allow supplies to reach shops in the area. This can create additional risks for vulnerable pedestrians who may be less alert to the presence of vehicles in such circumstances. Simple measure such as better signage or information for pedestrians can help to reduce this risk.

96. UNESCAP, undated.

97. Oxley et al, 2006.

98. Roberts, 2004.

99. Lambrisso and Biruk, 2006.

100. <http://www.joburg.org.za/>.

Areas in which vehicles and pedestrians have equal priority (for example Shared Space schemes) also expose blind and other disabled and older pedestrians to the risk of injury from the presence of commercial vehicles.

6.2. Impacts and challenges

Older and disabled people are very vulnerable as pedestrians and in most developing countries, where there is poor or non-existent definition between carriageway and footway, people are particularly at risk from large, heavy vehicles whose drivers may have poor visibility.

Solutions being developed include traffic calming and other speed reduction methods, physical segregation of heavy and light traffic and improvement in vehicle design to reduce the severity of injury in the event of impact.

Driver training is also an important factor. More effective monitoring and enforcement of driver behaviour and factors such as drivers working hours and conditions would also be helpful.

The trends to allow shared use of road space by vehicles and pedestrians in some developing countries potentially put older and disabled people at increased risk from commercial vehicle traffic. This issue is further developed in Chapter 2.

7. Land-Use and Transport Planning

This chapter examines how effective planning of land use and transport can shape and create environments within which disabled and older people can maximize their independence and confidence. It considers a range of initiatives that have been introduced around the world including ‘ageing in place’ and ‘liveable communities’.

7.1. Trends and conditions

Urban land-use and transport planning and the design of built and pedestrian environments are central to meeting the mobility needs of disabled and older people. Independent living depends on the ability to access the daily necessities of life including food, healthcare and, for many, education or employment.

Many developed countries have taken planning decisions in the past thirty years that have led to the growth of out of town facilities – including shops and hospitals – that can only be accessed by private car. In less developed countries an absence of coherent land-use planning has resulted in poor connections between residential and other facilities and many barriers – both physical and safety related – which prevent disabled and older people from moving about independently.

7.1.1. Planning for ageing populations

There is evidence that many older people living in urban areas feel isolated, both in absolute terms and in comparison with older people in rural communities as a result of their lack of access to facilities and services as well as to friends and family. A survey in India of older people found that almost 90 per cent of those living in cities felt isolated. The survey also documents a link between loneliness and isolation and a decline in physical and mental health.¹⁰¹ The greatest cause of isolation is a loss of confidence to go out of doors, even within their own neighbourhood. Similar patterns, although less extreme, can be found in cities in developed countries. A study from Cambridge, UK, found that 42 per cent of those aged 85 and older experienced loneliness.¹⁰²

A growing number of cities are now recognizing the need to enable people to ‘age in place’ rather than have to abandon their traditional neighbourhoods because they can no longer cope alone. Singapore is developing this concept to sustain its older population within their own communities. Singapore sees accessible transport in an accessible pedestrian environment as an integral part of the policy of ageing in place.¹⁰³ The Prime Minister has pledged that:

‘Older Singaporeans should be able to move around freely and conveniently, despite their disabilities.’

Japan too, with the world’s most rapidly ageing population, is introducing initiatives in this field. The University of Tokyo is running trials in cities with high populations of older people to establish what factors are needed to enable people to live productive and independent lives. The trials include the development of restaurants, leisure and other facilities all within easy reach of residential accommodation.¹⁰⁴

101. Agewell Foundation, 2010.

102. University of Cambridge, undated.

103. Loong, 2009.

104. Japan Today, 2010b.

At a broader level, the US government departments responsible for transport, housing and environmental protection are developing joint approaches to addressing need through establishing ‘liveable communities’.

‘A liveable community is one that has affordable and appropriate housing, supportive community features and services, and adequate mobility options, which together facilitate personal independence and the engagement of residents in civic and social life.’¹⁰⁵

The definition of a liveable community given by the US National Council on Disability is one that:

- ensures accessible, affordable, reliable and safe transport; and
- adjusts the physical environment for inclusiveness and accessibility.¹⁰⁶

Similar approaches are being taken at city level in many countries in Europe. For example, the plans for the Belfast (UK) ‘Streets Ahead’ programme to pedestrianize and improve areas of the city centre have been subject to a specific assessment of the needs of disabled and older people in close collaboration with representative organizations.¹⁰⁷

In most developing countries there is often little pedestrian infrastructure and features such as storm drains and gullies can create major barriers even to local mobility. About 60 per cent of Indonesia’s paved roads have no useable footways.¹⁰⁸

Nonetheless there are examples of initiatives in less developed countries to create more ‘liveable’ communities. In the City of Bayamo, Cuba, urban transport has been improved by using horse-drawn carriages as a main source of public transport. It has also opened access routes to integrate isolated neighbourhoods that are inhabited by the most vulnerable populations.¹⁰⁹

7.1.2. Joined up planning

There are moves in some cities towards a coherent approach to identifying and removing obstacles on an area or city-wide basis. In Hong Kong, China,¹¹⁰ the Transport Department is working with the Highways Department to make improvements to the pedestrian environment. These include: tactile guide paths to link community facilities with bus termini, rail stations and ferry piers; audible pedestrian traffic lights; and ramps at bus platforms and taxi stands. Another key element of good land use and urban planning is recognition of the limited mobility ranges that many disabled and older people have (see Table 1 in Chapter 2).

The creation of pedestrianized areas and the exclusion of cars and parking facilities can create ‘no go’ areas for many people. Distances from bus stops or car parks to shops or hospitals are crucial factors in determining whether a particular journey is manageable.

The same principles apply to the location of transport infrastructure such as rail or bus stations. These are often on the edge of cities. This can often mean that older and disabled people are denied access to the city centre. Problems are exacerbated where such facilities are separated from the city by fast moving traffic routes.

105. <http://journal.aarpinternational.org/explore-by-topic/infographics/the-livable-community>, last accessed 27 April 2011.

106. Winter, 2010.

107. Department for Social Development and Department for Regional Development, Northern Ireland, 2009.

108. WBCSD, 2007.

109. UN-Habitat, 2008.

110. Chan, 2010.

Poor planning decisions can have a major impact on mobility. In India, footbridges constructed to provide a safe means of crossing the Delhi-Gurgaon Expressway (on which there have been many fatalities) have been fitted with barricades to stop bikers using them. The result is that wheelchair users can no longer access them and have to risk their lives crossing the highway.¹¹¹

7.1.3. Transport infrastructure

Distances and other access features are equally relevant within transport terminals such as railway or bus stations and there are many examples of design features creating barriers which should have been eliminated at the planning stage and which exclude large numbers of people.

In some cities, accessible public transport has been introduced but because of inadequate planning consideration and a failure to focus on the whole journey chain, poor access to it still prevents many of those who could use it from doing so. A study of disabled people using the new accessible metro system in Dubai (United Arab Emirates) indicates that 22 per cent face difficulty getting to and from the stop or station while 26 per cent said that they could not get a ticket or get onto the system because of narrow gates.¹¹² A press release from the Assam Tribune (North East India) highlights some common problems that lack of ‘joined up’ planning can produce (see Box 10).

Box 10. Elderly, disabled endure travel woes: an account of poor planning in Assam, India

Absence of disabled-friendly infrastructure was noticed in major transport hubs like Guwahati Railway Station and Inter State Bus Terminus.

In Guwahati Railway Station, any disabled person would have a harrowing experience to move from platform one to other platforms in the absence of a lift.

Although the busiest train station of Northeast India has seen major augmentation in recent times, no thought was given to the need for a lift or escalator. Today the aged, the infirm, and the disabled have to climb up and down a flight of stairs before they can move between platforms.

Source: Assam Tribune, 2010.

7.1.4. Auditing access improvements

There are examples where the problems of poor planning are being tackled, often with the support of international aid projects to audit obstacles to mobility and to devise affordable solutions to them.

In Shanghai, China, older and disabled people are being brought into the process of identifying problems and prioritizing improvements¹¹³ in support of the planning authorities (see Box 11).

Box 11. Access audits in Shanghai, China

In Shanghai, older and disabled people are engaged in auditing the city themselves and reporting problems to city authorities. This World Bank funded project set out to establish the issues that were of greatest concern to older people in the city, to prioritize problems and engage the public in

111. The Times of India, 2010.

112. Dubai Metro, 2010.

113. Mehndiratta, 2010.

delivering access improvements. Among the key issues identified were a lack of dropped kerbs and damaged pavements. These issues were addressed by the city authorities as a priority.

This audit process is now repeated on an annual basis by the city authorities. It has helped to increase awareness of city authorities and contractors about the needs of disabled and older people, focus attention on the need for quality in the construction and maintenance processes and bring access improvements into the mainstream of city planning.

Source: World Bank 2010.

In New Zealand the Government recently commissioned an audit of urban public transport accessibility.¹¹⁴ This detailed study of a wide range of aspects of accessibility and how they affect different individuals and groups within the population has enabled the Government to identify shortcomings and gaps in current planning policies and how they impact on the goal of making public transport accessible. The route by route analysis identified that on one bus route served by a mix of accessible low-floor vehicles and older vehicles there were 25 bus stops at which part of the pedestrian route to the stop was not accessible, making it impossible for wheelchair users and other severely disabled people to use the bus.

This kind of micro-level analysis as an input to the planning and design process is an excellent way to establish how well accessibility is working and to be able to prioritize improvements in the areas where they will make the greatest difference.

7.2. Impacts and challenges

Land-use and transport planning decisions are often the cause of problems for disabled and older people – and indeed anyone without access to a private car. They are also potentially the solution to those same problems. It is important to note that creating environments within which disabled and older people can live independently will also create communities that everyone finds pleasanter and more convenient.

Trends in many European cities towards more sustainable urban living, reducing dependence on the private car and re-creating neighbourhood facilities all help to facilitate independent living for disabled and older people in those neighbourhoods. In the US too, the policy of ‘liveability’ is moving planners and developers in the same direction by promoting the creation of safe pedestrian routes around urban neighbourhoods as well as routes linking with accessible public transport.

Such policies will not benefit disabled and older people by default, their particular needs must be central to policy planning and development and changes must be made in full consultation with them. Without this process, there is a risk that disabled and older people will be further isolated. For example, if restrictions on car use in city centres are applied without recognition of the needs of disabled drivers, many will not be able to access shops, offices and other facilities.

In developing countries, a lack of coherent land-use planning exacerbates the existing challenges of poor and inaccessible public transport, lack of pedestrian facilities and lack of shops and other facilities within easy reach. The spiral of poverty and dependence experienced by many disabled and older people in developing countries could be significantly reduced with a clearer focus on creating safe local areas within which people could meet their daily living needs.

114. O’Fallon, 2010.

Bad land-use planning decisions can leave a legacy of inaccessibility for many years. Once the hospital or shopping centre has been constructed, the chances to improve access to it are significantly reduced and may depend on costly initiatives such as door-to-door transport. The location of such facilities relative to the residential areas of the city and other factors such as topography (particularly relevant in areas with steep hills) must be taken into account at the earliest planning stage. It is also important to plan transport services to link with new developments before the road network is constructed. There are examples of new housing areas without public transport because feeder roads have been built too narrow to accommodate buses!

8. Social Sustainability in Urban Transport

Both political commitment and appropriate structures within Government are essential components of socially sustainable policies on accessibility. The starting point for both must be engagement with disabled and older people at national and city levels and real understanding of their needs and priorities. Without this engagement, at best expensive mistakes are made and at worst disabled and older people remain isolated and unable to participate in the economic or social life of their communities.

In Brazil there has been a major transformation in public policies dedicated to disabled people over the past 15 years (see Box 12).

Box 12. Brazil's approach to inclusive mobility

In 2003 Brazil created a Ministry of Cities with a specific remit to establish guidelines for a national policy on public transport and urban mobility. Accessibility is seen as part of a set of urban mobility policies to promote social inclusion. SeMob (the National Secretariat for Transport and Urban Mobility) has developed an 'Urban Sustained Mobility Concept'. This has been designed to stimulate and support city governments to develop actions to ensure that public transport is accessible and to promote accessibility in the urban environment.

Cities are invited to develop a city accessibility plan with the support of SeMob. This comprises three phases of work. First, the Ministry of Cities, together with its national partners, ensures that local staff have the necessary training in accessibility issues, and works on an analysis of local conditions and challenges. In the second phase, cities develop a mobility plan, comprising changes to local legislation necessary to ensure that future developments are barrier-free, as well as setting out actions to be taken in the mid and long terms. In the third phase, all the elements of the plan are implemented.

Source: Boareto, 2007.

There are several programmes at international and national governmental levels to encourage city authorities to focus services and facilities on sustaining the ageing population. The WHO Age Friendly Cities Programme is one such example. It encourages city leaders to think creatively about how to improve life for older people, and so to improve city life for everyone. In 2006 representatives from 33 cities in 22 countries met to examine eight areas in which action could be taken. These included outdoor spaces and transport. A Guide and checklist were produced to help cities assess their 'age friendliness'.¹¹⁵ Features cited that are particularly helpful to older people include more seats and toilets in the pedestrian environment and longer timings on road crossings to help slower moving pedestrians.

Box 13 below gives details of the measures introduced in Istanbul in response to older people's comments:

Box 13. Recognizing older people's needs, Istanbul, Turkey

Istanbul's involvement in the 'Age Friendly Cities' Programme has led to a range of measures to help older people. The findings of the initial focus-groups with older people were disseminated widely, and the city government hosted an international good-practices meeting to learn from other cities. The measures include:

- Free public transport;
- Improved access for disabled people to public buildings; and
- Improved health services.

115. WHO, 2007b.

A Council for Older People is also being set up.

One older resident commented that *'It was terrible to go from one place to another in Istanbul three years ago. But now, there are lots of alternatives and they are comfortable and safe.'*

Source: WHO, 2007b.

Similar initiatives have started in Canada and Ireland, and China's National Committee on Ageing is setting up a scheme to help the more than 400 million Chinese citizens who will be aged over 60 by 2050.

It is clear that broad policy initiatives can only succeed where there is detailed technical prescription to support them. Initiatives such as the 'liveability' agenda will not promote independent mobility unless detailed technical information such as the limited mobility distances described in Chapter 2 is taken into account.

Finland has adopted an interesting approach of legislation backed by government-funded research and development projects both to demonstrate the benefits of accessibility and to test the feasibility of different approaches to it. Topics have included a study of the economic significance of accessibility and effectiveness of measures promoting accessibility; and development of evaluation methods for accessibility and user-friendliness.¹¹⁶

Security and safety are key concerns to disabled and older people both in a real and perceived sense. They are more vulnerable as pedestrians and road users simply because of age or disability. There is also a strong element of fear for personal safety and security. A report of experience from Salzburg, Austria, of travel training programmes to encourage older people to keep travelling by bus notes:¹¹⁷

'Falls and accidents are a very serious threat to older people during public transport trips. One bad experience can make people stop using buses. The fear of falling again and other stressful situations leads especially older people to abandon using public transport.'

Too often, the success of initiatives such as new transport services or pedestrian infrastructure is only measured by talking to the people using the facilities. Unless efforts are made to talk to those who are **not** using them because they are too frightened, there will not be an accurate measure of how well the scheme has succeeded in meeting the needs of the whole population. This displacement factor is difficult to assess and needs more effort (and therefore more cost) to understand. More in-depth work, best done in association with organizations representing disabled and older people, is needed to find those who are not going out independently.

While it is unlikely that politicians would publicly speak out against measures to help disabled people, there is evidence of effective implementation of laws being delayed through political lobbying. Buenos Aires, Argentina, adopted accessibility laws based on national law, in 2003.¹¹⁸ In the transport field, however, lobbying on behalf of the transport industries has delayed implementation. The first accessible buses appeared in the city in 1998. After 10 years, fewer than 20 of the city's 199 bus lines had fleets that comply with accessibility rules.¹¹⁹ Similar issues are reported in Israel (see Box 14).

116. http://www.transport-research.info/web/programmes/programme_details.cfm?ID=4972, last accessed 27 April 2011.

117. <http://www.aeneas-project.eu/?page=salzburgmeasure2>, last accessed 27 April 2011.

118. Coriat and Chávez Penillas, undated.

119. Lai, 2010.

Box 14. Israel: A user perspective on accessibility

'Public transportation in Israel does not fulfil the needs of the majority of the disabled population. The Law of Equal Rights for People with Disabilities, 1998, and the Regulations of Equal Rights for People with Disabilities (regularizing the accessibility of public transportation services), 2003, have yet to solve the problem.

Despite progress made, and certain improvements in the accessibility of public transportation, a disabled person wishing to board an intercity bus will have no choice but to turn elsewhere. The situation at the Israel Railways is not very different, and many hardships await a disabled passenger.'

Source: Access Israel, undated.

Similar concerns are also reported from Kashmir, India¹²⁰ where there is no apparent co-ordination between Government Departments responsible for the needs of disabled people. The Disability Act requires annual reports to be prepared on the status of disability for discussions in the state legislature, together with setting up state committees of disabled people. Neither has happened. As the report notes:

'The inclusion of some representations from the disability sector could have greatly helped in locating the exact problems and the possible solutions as it is only the wearer who can explain where his shoe is pinching'.

This underlines strongly the key principle of engagement with disabled and older people so that problems are understood and improvements can be prioritized according to budgets. This approach is working in both developed and developing countries and is the most effective way to deliver change at a local and neighbourhood level. Examples of good practice in this area include Shanghai, China (described in Chapter 7).

In New York, US, the Council and the Mayor's Office have formed a partnership with the New York Academy of Medicine to consult with older people and service providers on useful measures to promote independent living. Among the simple initiatives recommended by older people were maintaining pavements so older people feel safe to walk along them. This includes keeping the pavements clear of ice and snow as well as litter and repairing broken paving stones. Using school buses off-peak to take older people to local supermarkets is another simple scheme underway.¹²¹

In Russia, disabled and older people are being called together by the Prime Minister to discuss the draft State 2011–2015 Accessible Environment programme. This is a package of measures to create conditions for unimpeded access for disabled people to various facilities and services, including transport.¹²²

These examples serve to underline that political commitment alone will not deliver social sustainability for disabled and older people. There must be engagement at a practical level with disabled and older people to understand their needs and a commitment to implement monitor and enforce the legislation that is in place.

120. Greater Kashmir News, 2010.

121. WHO, 2010.

122. Government of the Russian Federation, 2010.

9. Urban Transport and the Environment

There is strong synergy between many policies that promote the mobility of disabled and older people and those which many governments in the developed world are pursuing for environmental reasons. These include more frequent and more accessible public transport, lower traffic speeds, traffic-free areas and a return to neighbourhood living where people have access to their daily living needs without having to travel across the city.

Government-wide policies such as ‘liveable communities’ (described in Chapter 7) which extends across the US Government Departments responsible for housing, transport and environmental protection, are a positive approach towards creating sustainable urban environments from which disabled and older people can benefit.

However, some environmental developments are potentially hazardous for disabled and older people. Policies to reduce carbon emissions by encouraging hybrid and electric vehicles are a cause of great concern among organizations representing blind people who rely on the sound of an engine to establish the speed and proximity of a vehicle when they need to cross the road. There are proposals at European level to require quiet vehicles to incorporate some kind of artificial sound to combat this.

Similarly, policy initiatives to encourage cycling in many European cities potentially put disabled and older pedestrians at greater risk because bicycles are silent and often fast moving and certainly increase their levels of fear for their own safety.

It is important for those responsible for designing changes to the urban environment for environmental reasons to engage with disabled and older people at the earliest planning stages to ensure that unintended barriers (physical, fiscal or psychological) are not built in.

The concept of ‘universal design’ can play a key role in bringing environmental and accessibility goals together by making public transport more attractive and user friendly to the population as a whole. The low-floor bus is a good illustration of the concept. When low-floor buses were introduced in Europe, there was a significant increase in ridership from people travelling with children, shopping and luggage in addition to disabled people travelling for the first time. There is further evidence that those who were already using public transport did so more frequently.

UK data¹²³ shows a year on year increase in the number of bus journeys taken by disabled and older people between 2002 and 2004, especially in the densest urban areas. This increase is attributed to increased accessibility of urban bus services. Another illustration of this principle is the Barcelona Metro’s ticket machines in Spain, which have been designed by blind people and are therefore intuitive to use. The result is that everyone finds the machines quicker and easier to use.

At national government level an example of an environmentally sustainable approach to delivering accessibility comes from Norway¹²⁴ which has adopted the principles of ‘universal design’ as a goal to be pursued by all relevant government departments (see Box 15).

Box 15. Adopting ‘universal design’ policies, Norway

The Norwegian Government’s vision is to implement the principles of ‘universal design’ fully by 2025. They believe that ‘universal design’ helps to counteract discrimination against disabled people while improving surroundings for the entire population. The government is preparing a step-by-step drive to achieve ‘universal design’.

123. Jolly et al, 2006.

124. Norwegian Ministry of Children and Equality, 2009.

The plan includes measures that reach across the policy areas of 16 ministries, focussing on a range of issues including planning, buildings and transport.

One key element of the action plan will be at local government level and will include development projects at county and municipal levels. Cities and towns will have the opportunity to improve accessibility through maintenance and new construction projects.

The National Transport Plan 2010–2019 also includes important ‘universal design’ investments.

Source: Norwegian Ministry of Children and Equality (2009)

Perhaps the strongest policy message is that the economic and social imperative created by the growing numbers of older and disabled people across the world cannot be treated as a less important issue than environmental considerations. Both are vital to our future and must be given equal weight. They are by no means incompatible but care needs to be taken to ensure that disabled and older people are not disadvantaged by the overwhelming priority of environmental concerns.

10. The Economics of Sustainable Urban Transport

In many countries, national law or government subsidy or both have been put in place to drive the accessibility agenda. Experience from Europe suggests that once accessible vehicles have been introduced, it becomes apparent that everyone benefits from easier access and that passenger numbers increase.

10.1. Indicative costs and benefits

The World Bank¹²⁵ has drawn up an indicative priority list for making transport more accessible in developing countries and has rated different interventions by cost and benefit. These interventions (shown in Table 2 below) relate specifically to the urban environment where the demand for services is high and the marginal costs of improved design tend to be low.

Table 2. Interventions for more accessible transport system: indicative priority

Marginal cost	Marginal benefit	Typical intervention	Probable priority
None	Mostly broad	Visual contrast, colour coding, clear intuitive signs	Essential: there should be established design practice
Low	Broad	Basic sidewalk and crossing design, hazard markings, minimize steps and other hazards	Very high: should be established design practice
High	Broad	Raise pedestrian crossings, raise boarding platforms or low floor vehicles, general training of operational staff	High: should be considered practice for safe street environment, subject to resources
Low	Specific	User awareness, priority seating, additional training of operational staff, tactile surfaces, kerb insets	Very high: subject to policy for resource allocation
High	Specific	Elevators, illuminated and audible signals, wheelchair location, special transport services	High: subject to policy for resource allocation

Source: Roberts and Babinard, undated.

10.2. Tourism

Disabled and older people make up a sizeable and growing section of the tourism market, but their decisions on whether, and if so where, to travel are heavily based on the accessibility of facilities and services at the point of destination. Governments are becoming increasingly aware of this trend and are promoting the concept of more inclusive tourism.

A study that looked at the travel behaviour of German disabled tourists established that the current net turnover generated is 2.5 billion Euros, while some 65,000 jobs are sustained by it. The study estimated a potential additional economic impact from the buying power of this market sector of up to 4.8 billion Euros and a further 90,000 jobs. The study indicated that, among disabled tourists:¹²⁶

125. Roberts and Babinard, undated.

126. Neumann, 2008.

- 37 per cent have previously decided not to travel due to the lack of accessible facilities (or information).
- 48 per cent would travel more frequently if more accessible services were available.
- 60 per cent would be willing to pay higher travel expenses for improved accessible facilities.
- 7 per cent decided to travel abroad specifically because of the accessible facilities (or information) there.

Other regions heavily dependent on tourism are also becoming aware of the need to make services and facilities accessible to maximize the potential revenue from incoming tourists, particularly from countries like the US whose disabled citizens already have high standards of accessibility and expect to find them wherever they travel. A report to the Caribbean Tourism Organization from the Barbados Council for Disabled people¹²⁷ noted that:

‘Collectively 75 per cent of Canadians, Americans & Europeans with disabilities who are physically and financially able to travel do so with their caregivers, family and friends. The current economic climate dictates that we target this emerging market.’

10.3. Making public transport affordable

A key public policy debate in many cities is whether, and if so how, to subsidize the cost of travel for disabled and older people. A range of different models exist, ranging from financial support for the individual disabled or older person to subsidy for the transport provider. The most effective system will depend on many factors including whether the transport system is publicly owned or private.

The cost of public transport is a major factor for many disabled and older people in both developed and developing countries and the introduction of free or reduced fare policies has enabled many people to travel who could not otherwise have done so.

There is a wide variation in the levels of subsidy and when and where it is available. To give a few examples:

- In Dhaka, Bangladesh, blind and disabled travellers can ride on buses free;¹²⁸
- In Seoul, Republic of Korea, the Senior Pass provides free travel on the metro for those aged 65 and over, but not on buses.¹²⁹
- In Beijing, China, people aged over 70 travel free on public transport.
- In the United Arab Emirates disabled people now get a 50 per cent reduction in taxi fares;¹³⁰
- Cities in Mozambique, Malawi and India have policies to provide fare concessions of up to 100 per cent. However, these are often not implemented or enforced.¹³¹

This can also be a contentious issue. In Guangzhou, China, a disabled man is taking legal action against the metro company for refusing to recognize his ‘disability certificate’ as entitlement to reduced fares on the system. He claims that the metro’s decision is against the city policies supporting disabled people.¹³²

127. Caribbean 360, 2010.

128. Sen and Kidd, 2010.

129. Mackett and Gim, 2010.

130. Abu Dhabi Government Portal, 2010.

131. Venter et al, undated.

132. Quanlin, 2010.

There are also widespread reports, predominantly from developing countries, that in practice these fare concessions are not recognized. There are still many places where such concessions are not available or where they have little value because people cannot get to the bus stop or onto the bus.

Where the link between disability and poverty is strong, there is a clear need for free or reduced fares to enable people to travel. However, there needs to be a re-think on the part of Governments in developed countries about whether diverting resources into improving and upgrading accessible transport and infrastructure would bring greater benefits.

The challenge is to encourage governments and city authorities to work with disabled and older people to agree the most effective way for limited resources to be spent on improving accessibility.

11. Urban Transport Institutions and Governance

There is a wide range of institutions at international, national, regional and local levels which all have an important role in promoting improvements to mobility and independent living in cities.

At the global level the United Nations Convention on Rights of Persons with Disabilities is a key catalyst for change. The Convention places an obligation on signatories to provide access to the physical environment and to transport. There is a clear stated link between access to transport and the ability of disabled people to use basic services including health, education and employment. The Convention refers to the ‘progressive realization’ of the goal of accessibility. It must be seen not as a one off but as a step-by-step process. To get that process started, it is important to build up sufficient momentum among stakeholders, including disabled people, technical experts and policy makers to think innovatively and to implement change.

The US builds the Convention into its Memoranda of Understanding in working with other countries on disability and accessibility issues in urban transport and other fields.

The EU has introduced a legal requirement in the General Regulation on the European Regional Development Fund, the European Social Fund and the Cohesion Fund to include accessibility as a non-negotiable condition of funding.¹³³ In addition, the EU Public Procurement Directive states that the use of ‘design for all’ and accessibility requirements should be included whenever possible in the technical documentation for public bids.¹³⁴

To support these requirements, the European Commission produced a toolkit for those using EU Structural and Cohesion Funds.¹³⁵ The toolkit clearly states that:

‘Accessibility should be a characteristic of all those products and services that are offered to the public and are financed through Structural Funds. In particular, accessibility to the built environment, transport, information and communication technologies is key to inclusion for people with disabilities.’

The toolkit also provides guidance and examples on integrating accessibility into the mainstream.

However, there is also evidence that even when laws exist, disabled people may still be denied access. Problems cited by disabled people in developing countries include:¹³⁶

- No facilities such as ramps and landing stations to get on and off transport even when required by law; and
- No priority seats for disabled people available in public transport services, even when required by law.

The gap between policy and practice remains a key concern. There is often a major gap at the detailed level of ensuring that a budget has been assigned to implement the policy and that specific staff have been tasked to carry out the policy and that they are held accountable.

In Kathmandu, Nepal, disabled activists complain that, in spite of accessibility legislation, they are routinely refused access to buses. Bus operators say that they cannot take the time to pick up disabled passengers because police will penalize them for late running. They

133. Official Journal of the European Union, 2006, Article 16.

134. European Parliament and Council, 2004.

135. European Commission, 2009.

136. Leonard Cheshire Disability and United Nations Economic Commission for Africa, 2009.

are willing to make modifications to vehicles and services only when the Government gives them subsidy to cover costs.¹³⁷

Similar concerns come from Ghana where, in spite of the requirement of the Disability Act of 2006, that *'the needs of persons with disability are taken into account in the design, construction and operation of the transportation network,'* a new footbridge over the Lapaz-Malam motorway extension in Accra has been built without access for disabled pedestrians.¹³⁸

It is not all bad news, however. One example of Government action to require accessibility in an unregulated market comes from Tanzania¹³⁹ where the Government has introduced both a regulatory framework and a Consumer Consultative Council to represent the interests of all public transport users. Any operator wanting to run a bus service In Dar es Salaam must first meet with the Council. The Council has had a significant impact on the type of services provided.

Hong Kong is another example of systematic monitoring and enforcement against very clear requirements and goals. A long-term and systematic plan has been developed by the city authorities and is being rolled out progressively (see Box 16).

Box 16. Government duties to deliver accessibility, Hong Kong

The Hong Kong Government has a duty to ensure that public transport is accessible to people with disabilities and impaired mobility. The duty is part of the Government's overall responsibilities placing an obligation on Government agencies to create inclusive services that will meet the needs of the community including disabled and older people.

In 2002, the Hong Kong Transport Department formulated a new vision 'Transport for All' and adopted a '5-Better strategy' to guide stakeholders and provide directions for planning in order to make transport services and facilities more accessible to the disabled people. The '5-Bettters Strategy' includes:

1. Better accessible transport services for all;
2. Better public transport infrastructure and facilities for all;
3. Better streets and pedestrian areas for all;
4. Better planning standards, guidelines and procedures; and
5. Better partnership for actions and results.

Since that time, the Transport Department has been working with the transport operators in Hong Kong to guide and promote improvements to access. These include the MTR (underground) system, main line rail, light rail and buses.

Source: Lai, 2010.

In summary, good governance is a key component of successful accessibility. Political engagement and the support structures necessary to deliver improvements must all be in place to make a real and sustainable difference.

137. The Kathmandu Post, 2010.

138. The Chronicle, 2010.

139. Kikoyo, undated.

12. Towards Sustainable Urban Transport

This chapter draws together the issues discussed in previous chapters and assesses lessons that can be learned and conclusions that can be drawn to create a stronger basis from which the needs of disabled and older people for independent mobility can be recognized and delivered in both developed and developing countries.

12.1. Economic perspectives

The benefits that accrue from enabling disabled and older people to live independently are clear. Reduced dependence on welfare and support services (where they exist), greater likelihood of economic self sufficiency, access to employment, education and services are all well documented. The challenge is that the costs fall on transport and highways budgets while the benefits are generally felt in health and welfare budgets.

There is an urgent need to re-think the economic and fiscal basis for accessibility. Previous attempts to argue the case for a coherent approach to funding accessibility have largely been unsuccessful, but it is important to continue to pursue options for change.

One approach could be to incorporate access to transport, in its fullest sense, within an official measure of economic progress. This issue was explored at a workshop organized by the International Transport Forum and the World Bank in January 2010.¹⁴⁰

It is also important to recognize that there is a considerable cost in **not** enabling disabled and older people to retain independent mobility. In those countries with a comprehensive welfare system, the cost of providing for the daily needs of someone who is unable to go out independently, or who relies on specialist transport services, is considerable.

There is some data from the US which quantifies the benefits and costs of a travel training programme which aims to give disabled and older people confidence to transfer from door-to-door 'paratransit' services and onto public transport. It is estimated that the City of Fremont Travel Training Programme produced a Benefit/Cost ratio of 1.9: 1. The same report also notes that:¹⁴¹

'Public transportation practices directed at reducing personal immobility are economically beneficial'. The savings to society come from:

- *Avoiding medical institutionalisation;*
- *Reducing the demand on more expensive and oversubscribed paratransit services;*
- *providing an alternative to a costly ambulance ride for medical care;*
- *increasing the purchasing power enjoyed by transit riders with access to jobs or to broader market choices; and*
- *relieving other agencies funded by tax dollars of transportation responsibilities and, thereby, increase their productivity.'*

There is also evidence of the impact that losing mobility can have on both the physical and mental health and well being of older and disabled people. It is therefore important to consider the expenditure on providing accessibility as an investment from which socio-economic benefits will follow at the macro level.

140. <http://www.internationaltransportforum.org/>.

141. Transit Cooperative Research Program, 1999.

In developing countries, for disabled people unable to move about independently there is little prospect of being able to find work or support a family. The presence of a disabled or older person in a family will increase the economic burden on that household.

At the most basic level, increasing the availability of suitable wheelchairs and other mobility aids and prioritizing access improvements (however simple) on neighbourhood or community levels will start to break the cycle of disability and poverty.

Re-positioning accessibility as a benefit rather than a cost would be a major step forward in making the case for routine investment in accessibility. Instead of focusing on the immediate costs of accessibility (such as putting ramps on buses or dropping kerbs) there would be a focus on the costs of **not** making such adjustments in terms of loss of independence and mobility, inability to access healthcare or the labour market.

Combining this approach with an emphasis on ‘universal design’ would also shift the balance of cost and benefit. If vehicles and systems are designed to be better for everyone so that ridership increases and more revenue is generated, the case for accessibility becomes commercial rather than social. Mainstreaming must be the policy goal.

Where there is investment in new transport infrastructure, accessibility must be a non-negotiable condition of the funding. Building in accessibility from the earliest design stage has very little cost impact. Trying to retrofit accessibility is always costly and often impossible.

In developing countries, to maximize the benefit from investment in systems such as BRT and light rail/metro systems, it is vital to ensure that a more holistic approach is taken to how the scheme fits within the city’s pedestrian landscape and how people with mobility problems can access it.

Tourism is another significant economic driver for change: Tourists from developed countries increasingly expect access wherever they travel. In both North America and Europe there are air passenger regulations requiring access at airports and on board aircraft so the numbers of disabled people travelling by air is increasing significantly. Disabled and older tourists from these and other countries are also demanding higher levels of accessibility. For those countries dependent on tourism revenue, the need for better access should be an important economic factor.

International sporting events, such as the Olympic and Paralympic Games are also important global economic drivers which are often harnessed. The major access improvements at New Delhi railway station, the transit hub for the 2010 Commonwealth games, are one example. In South Africa and Poland, international football events have stimulated the pace and level of investment in accessible public transport.

Accessibility is still not a mandatory requirement in many areas of transport investment either in developed or developing countries. Even in cases where funding has come from an international body, it has not always been included as a condition. As a result, non-accessible vehicles and infrastructure are perpetuated far longer than is necessary in many cases. This is a major wasted opportunity.

There is a need both for wider adoption of non-negotiable principles of accessibility within national and international funding frameworks and for greater emphasis on monitoring and enforcement. This would seem to be the only effective way to break the cycle of investment which perpetuates barriers.

12.2. Governance, legal frameworks and political priorities

Strong governance and a clear legal base are essential to successful funding and delivery of accessible transport and infrastructure. Positioning accessibility issues in the global consciousness is also key. There is little understanding in the general population of the detrimental impact that lack of mobility can have on people's lives. There needs to be greater momentum at international as well as at national government levels (in many countries) to raise accessibility up the political and public agendas.

One vital measure is to ensure that national or city level surveys or censuses use a functional rather than a medical classification of disability so that an accurate picture of the level of need and disadvantage is obtained rather than the significant underestimate current in most developing countries (see Chapter 1). This change of classification is an essential first step to engaging political attention on the scale of the economic and social consequences of a lack of mobility.

At national level, many developed countries have introduced either civil rights legislation or technical standards or both to ensure that public transport and the built environment are accessible. This is a valuable framework but only works where it is regularly monitored and systematically enforced.

Many countries lack the administrative structures to implement a mandate for accessibility. There is also clear evidence in some countries of limited or no collaboration between different sectors and levels of government and agencies.

Lack of understanding and awareness about the need for accessibility also impacts on the quality of implementation and monitoring and often means an absence of enforcement even after laws have been passed.

One model to address this problem could be the creation of oversight groups at city levels to represent the interests of stakeholders, and to ensure correct and timely implementation and follow up.

Another obstacle to coherent progress can be the multiplicity of agencies involved, often without strategic planning or communication between them. It is evident that disability and therefore accessibility are cross-sectoral issues so there needs to be co-ordination between the different parties to optimize progress.

At national and city levels, the way in which public transport is funded and regulated can have a major impact on whether it is possible to influence or require change to increase accessibility. Unregulated systems are much less likely to be responsive to the needs of a population who are not travelling because they cannot get to the bus stop or on the bus.

There are many similar examples of failure – at both national and city levels – where laws or other commitments that have been made are not implemented. This is in some ways worse than having made no commitment because expectations among disabled and older people have been raised of better times ahead. The only effective way to tackle this disconnect between word and deed is by setting out a detailed timetable against which actions will be taken. It is also important to engage disabled and older people in monitoring and reporting on implementation.

12.3. Indicators of accessibility

Another factor impeding progress is the absence of any meaningful indicators of accessibility to measure the difference that initiatives make to disabled and older people's lives. Without

such indicators, money is spent in areas that bring little practical benefit. If the bus stops are inaccessible, counting the number of low-floor buses is a useless measure of progress! The measures need to be user based, not provider based.

Several international bodies are working to define indicators, and there is also work at national and regional levels, but it is important to ensure that indicators are based on practice rather than theory otherwise they may be too complex to be useful.

12.4. Research and knowledge transfer

In developing countries, in particular, research needs to focus on practical application and implementation, with an emphasis on affordable low-cost solutions.

There is also a need for knowledge transfer that is appropriate to the economic, cultural and geographical circumstances of the area rather than simply passing on approaches from developed countries. Although there are initiatives already in place to develop and promulgate appropriate information and advice, for example through the work of Access Exchange International, the availability of such advice is still patchy.

Setting up an international knowledge transfer database would be a major step. This could help to ensure that expensive mistakes which exclude disabled and older people are avoided and that, even where resources are scarce, at least some small steps to improve accessibility can be made at low cost.

12.5. Engagement with disabled and older people

Establishing and formalizing effective stakeholder engagement is fundamental to success. It is particularly important to ensure that stakeholder organizations are fully representative of the whole spectrum of disability issues and are well briefed on legal and other frameworks. The process by which they are established needs to be robust so that there is continuity of input.

Community-based engagement with disabled and older people to identify priorities for improvement has been shown across the world to be an effective and cost-effective way to ensure that real progress is made.

Experience from China indicates that the result has been greater sensitivity on the part of city leaders, government officials and contractors to the needs of disabled people. This in turn has resulted in higher quality workmanship and effective mainstreaming of accessibility issues.

Training of all front line transport staff to understand the needs of disabled and older people is vital. Senior management in transport companies should also be trained to embed a culture of understanding throughout the organization.

It is equally important to provide mobility training for those disabled and older people who have not previously been public transport users or for those who become disabled in later life. People who lose their sight in older age, for example, may remain housebound without training on how to navigate safely around the city. Basic mobility aids such as long canes for detecting kerb edges and obstacles along the footway can be enormously helpful if training is provided in how to use them safely and with confidence.

Training is a relatively low-cost activity but is often overlooked even where significant sums have been invested in improving access to vehicles and infrastructure. And yet it may hold the key to sustaining independent mobility.

12.6. Final thoughts

There has been very significant progress in many cities in developed countries over the past 25 years to improve access to public transport and the pedestrian environment for disabled and older people. But there are still many mistakes made and gaps left where access should now be a matter of routine.

In the cities of developing and transitional countries, however, there is still a very long way to go. Even the most fundamental requirements for mobility: a safe pedestrian route and a means to access local facilities are not yet available. Where international funding is helping to renew vehicles and infrastructure it is too often seen as an isolated investment so the opportunity to provide good pedestrian links or to join up with other transport systems is lost.

The key to change may well lie in the demographic trends. The vast and growing numbers of older people around the world cannot be self-sufficient without mobility. Understanding of this point may be the trigger that raises accessibility up the political and economic agendas worldwide.

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