What is in a passenger's mind?

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Abstract

In the Netherlands as well as other European countries there has been a strong focus on people with reduced mobility (prm) in the development of public transport.
An ageing population, equal rights for people with functional impairments and the expected growth of mobility for all people asks for new designs of the public transport system (vehicles, stations, information etc.). This challenge of taking the broadest diversity of people into account, so-called design for all, is rapidly becoming visible in the coming years.
P5 and Intergo however have the feeling that more can be reached if we would focus more on the problems all passengers experience. In finding solutions for this, public transport may become a real alternative for all potential passengers and for prm in particular.

Keywords: Smart transport, design study, design for all, public transport

1. History and developments

In 1995 the European Commission published the final report of the COST 322 action: Low floor buses [1]. This report describes how the low floor bus system works in achieving easy access for all customers. It is intended to give decision makers guidance on the range of options from which to choose the best solution for local public transport needs. The prelude of the report concludes with the following: 'Taking into account all the advantages which the system offers, it is possible to say: It pays to make access easier for all'.

In 2001 the European Commission published a Guideline for buses [2], in which is stated that buses class 1 (city buses with room for standing passengers) should meet specific requirements for prm. Parallel to this in 1999 the European Commission published the final report of the COST 335 action: Passengers' accessibility of heavy rail systems [3], in which requirements are formulated for rolling stock design, the gap from platform to train, stations and information and training.

The European Commission and the Dutch Government have the policy to improve the participation in society of elderly and persons with impairments.

In 1999 the Dutch Ministry of Transport stated by law that local governments, when tendering/outsourcing public transport to transport organisations, should consider accessibility for the elderly and handicapped. In a letter to the Parliament [4] the Minister of Transport formulated an approach to come to accessible public transport and set the goals: in 2010 public transport by road (buses and taxi's), in 2030 public

transport by rail (train, lightrail/metro/underground, tram) should be accessible for all. The Ministry of Transport has recently made major efforts, for exemple [4], to inform decision makers on how to meet these goals.

In 2005 the situation for buses seems on the way, although still much has to be done to make all busstops accessible. The situation for trains is difficult to judge – the Dutch Railways are still monopolist and their investment policy is not transparant. The Dutch Railways, now consisting of several organisations (such as transport organisation NS reizigers and infrastructural management Prorail) have a strong background in the field of accessibility [5] and this is used in recent tendering procedures for short distance trains, which will be delivered before 2010.

2. Design for all

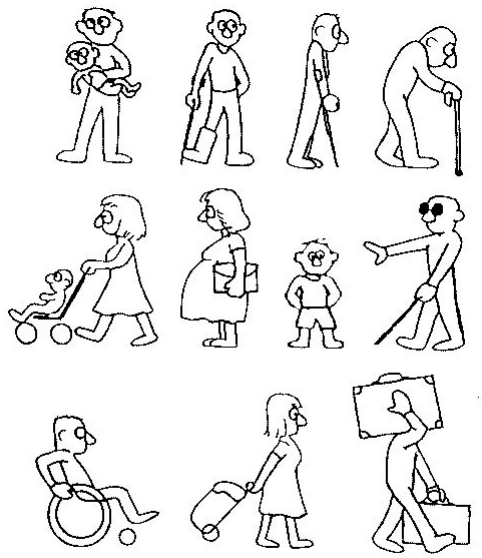
In CEN/CENELEC Guide 6 [6] the term "Accessible design" is defined as follows:
Design focussed on principles of extending standard design to people with some type of performance limitation to maximize the number of potential customers who can readily use a product, building or service which may be achieved by:

- Designing products, services and environments that are readily usable by most users without any modification,
- By making products or services adaptable to different users (adapting user interfaces), and,
- By having standardized interfaces to be compatible with special products for persons with disabilities.

The following notes are made:

- Terms such as design for all, barrier-free design, inclusive design and transgenerational design are used similarly but in different contexts.
- Accessible design is a subset of universal design where products and environments are usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

In Cost 335 [3] this definition is illustrated, showing the diversity of people with reduced mobility.



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Cost 335 clearly describes the main barriers for prm:

- Physical barriers (acces to trains, access to stations and station facilities)
- Financial barriers (costs of journey)
- Information barrier (information available and comprehensible)
- Confidence barrier (certainty of making total journey, assistance available)
- Time barrier (booking arrangements, connections).

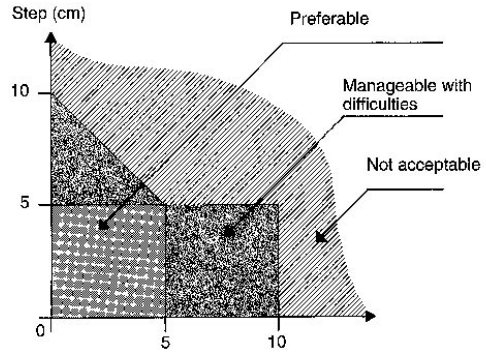
These five elements, of which passengers' confidence is the most important, make up the concept of total accessibility for all.

3. What is changing in public transport?

CROW has recently published the first parts of a comprehensive guideline for accessible public transport [4]. In this approach the following five types of travellers are used, next to 'the ordinary traveller': People with auditive impairments (in the Netherlands 1.5 million people - 0.5 million wearing hearing aids), with visual impairments (in the Netherlands 0.6 million people – 16.000 people are blind), with motoric impairments (in the Netherlands 1.75 million people – 175.000 people are wheelchairusers), with cognitive ergonomic impairments (orientation,

memory, speech, language/literacy) and people with temporary impairments (injury, women in pregnacy, heavy or large luggage, prams/buggies).

The most critical physical barrier is the gap between platform and vehicle [3].



Ideally the gap has a maximum of 2 cm, both in horizontal and vertical direction, which makes it possible for wheelchair users to smoothly acces and exit the vehicle. Because rail systems have wear, which leads to variations in these distances of more than 5 cm, and bus stops generally are not planned in a straight route, but requires steering aside, in practice this is only feasible using ramps.

Because these ramps are costly, need extra time and supervision for boarding, P5 carried out a research for AGV and the Municipality of Amsterdam [7] in which a feasible gap was formulated. Electrically powered wheelchairs and scooters generally are able to manage a vertical gap of 7 cm and a horizontal gap of 10 cm. Most users of manually propelled wheelchairs and rollators are able to manage a vertical and horizontal gap of 10 cm, by lifting the front wheels. Users that are not able to lift the front wheels, will need assistance – but most likely this is also the case when they have to travel longer distances.

For other prm a small gap is not strictly necessary, but makes using public transport more comfortable. Not the pure fact that the physical step is smaller, but more the fact that the step can be taken at once without extra orientation first, is important for older people – they experience smaller chance to be bumped over by other travellers.

Next to the gap and general accessibility issues for people with walking difficulties and wheelchair users (availability of lifts and ramps), a strong focus should be on markings and signage for vision impaired. For the blind tactile marking (guidepaths and audible information) can be necessary.

For people with auditive and cognitive impairments general signage is important. When the Dutch Railways decide on designing or placing information, they usually take mainstream travellers as their reference point. But their guideline for (for instance) information in trains is more critical, taking people with vision problems into account. The way in which information is placed in station building is based on the principle that primary information should always be visible. This means that, viewed from the primary route, information is displayed repeatedly. For those with cognitive impairments this is convenient in finding their way around the station. For everyone this means confirmation they are doing the right thing.

Intergo [8] conducted a project that involves the issue of travel information and way finding versus commercial information in railway stations. Guidelines have been designed, based on psychology and human factors, for achieving the correct balance between commercial signboards and travel information in an unambiguous and systematic way.

These requirements are not different from the requirements from the viewpoint of prm, as formulated in [4].

4. A different approach

P5 consultants and Intergo have done several projects on ergonomics of public transport in general and for prm in particular. From their point of view the studies on accessible public transport so far still have a too narrow focus on physical aspects. Of course level access from platform to vehicle, availability of lifts and ramps and markings and signage for vision impaired are a major point in making the public transport accessible.

However the solutions so far can only accommodate a limited amount of prm, even if we take the large group of temporary impaired people into account. If we really want to make public transport an alternative for all potential travellers, still much has to be done to enlarge the ‘mental’ accessibility – building the confidence of the traveller that public transport always provides the expected quality. Examples are information lacks in

a normal chain of public transport (most people easily overcome these problems – but they influence their sense of comfort of the system) and problems because of delays and deviations.

By exploring the implicit needs of the diversity of 'ordinary travellers' major improvements can be made to the public transport system. In this way we can come to future smart public transport: Not a system for people who don't have an alternative, but a system with enough quality and comfort to serve as an alternative for people now choosing to travel with their own car. These major changes will then also provide an opportunity to implement the necessary solutions for prm. Design for all, after all!

5. Cases for an interactive session

In an interactive session an inventory is made of the problems 'mainstream' travellers experience and this is related to the problems prm face when using public transport. This gives insight in the diversity of needs of 'mainstream' users, which give better opportunities to give way to the concept of 'mental' accessibility for all.

Together with the audience we will try and find solutions to come to future smart public transport: Not a system for people who don't have an alternative, but a system with enough quality and comfort to serve as an alternative for people now choosing to travel with their own car.

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