Mitchell paper factors affecting accessibility

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Abstract

Lessons on transport accessibility based on 40 years experience, illustrated by photographs of accessible and inaccessible situations with explanations of the reasons for the inaccessibility.

1 INTRODUCTION

The words 'accessibility' and 'mobility' are be used frequently. This short paper discusses what is meant by these words, and particularly explores the concept of accessibility and the factors that affect it.

2 MOBILITY

Mobility is a relatively straightforward concept. In the transport context it means to be able to move about physically. In other contexts it is used to mean moving economically or socially between classes.

To achieve mobility, a person needs the physical means to move about. These include legs, skis, wheelchairs, horses, automobiles, public transport and special transport, to name but a few. For effective mobility, appropriate infrastructure must be available for the vehicle or other means of mobility. Thus a footway that provides unrestricted mobility for pedestrians would prevent mobility for people in wheelchairs if it had kerbs that were not dropped at appropriate places. A metre of snow prevents mobility for a person without skis.

In addition to the physical means of mobility being available, a person is only mobile if they have funds to pay the cost of travelling, documentation to authorise travel (if needed), and knowledge of the existence of the means of travel and of how to use it.

3 ACCESSIBILITY

Access to an activity or service means the ability to participate in the activity or make use of the service. Access to a service does not imply being able to travel to the service, since the service could be brought to you or could be accessed on-line. It is not necessary to go to a shop if the shop will accept orders by telephone or on-line and deliver goods to your house. Similarly, access to an activity or person may well be achievable without physical mobility. But if access to something can only be achieved at a particular location, then accessibility requires the mobility to reach that location.

Accessibility requires knowledge, ability and financial means (Table 1).

Table 1 Accessibility requires

Knowledge	Know a system exists Know how to use it
Financial means	Money for fares

Knowledge	Know a system exists Know how to use it
Ability	Accessible infrastructure Accessible vehicles Trained personnel Policies for accessibility Confidence

Most of all, accessibility requires providers to put the user first.

To determine in detail the factors that must be in place to allow access, it is sometimes easier to consider the factors that can prevent accessibility. Let us take a service such as shopping as an initial example. We can only have access to a shop if we know it exists and if we know enough about the goods it stocks to know if it is likely to have the items we want (knowledge). If the shop offers an on-line home delivery service we can only access the shop via that service if we know it exists, we have a computer and we know the web address of the shop. We must also have the money for the items we want to purchase and a credit card or account with the shop (financial means).

If we wish to purchase our items by visiting the shop, we need the mobility to reach the shop from wherever we happen to be. This mobility will probably involve travel by a powered mode (automobile, bus, taxi, train) plus a linking access stage on foot or in a wheelchair (ability). The use of the powered mode will involve many factors such as car availability, licence holding, availability of parking and fear of driving in congested traffic for the car driver; availability of service, knowledge of the services and timetable, and the fear of waiting at a stop or station for the bus or train; cost and the fear of unlicensed operators for the taxi. Many of these factors are already considered by transport planners, along with the time and cost of travelling, as relevant items when predicting the transport mode that people will choose to use.

The pedestrian access link can be made difficult or impossible by distance or gradient, by weather, by pavement conditions (particularly for people with visual impairments or using a wheelchair), by lack of street lighting or by fear in a dangerous part of town. Finally, for a person in a wheelchair, access to the shop itself can be prevented by a step, a door with a stiff spring, or insufficient space within the shop. Once we are in the shop, access to the item we wish to purchase can be prevented by an unhelpful shop assistant.

All of this makes the process of daily living sound an almost impossible challenge, which must overstate the position for most of us. The point I am trying to illustrate is that for one of the commonest activities of daily life, many of the factors that can inhibit access have nothing to do with the design of vehicles or the provision of 'accessible' services, necessary as these are. It is also important to appreciate that only one of the factors listed needs to be wrong to prevent access. It is essential for the complete chain of information (knowledge), money (financial means), confidence, accessible vehicle, appropriate infrastructure (ability) and helpful staff to exist before access becomes possible. In practise, lack of information of what services are available may well be a more common barrier than the physical design of vehicles or infrastructure.

Where there are barriers of any kind (knowledge, financial means, ability), they can often be reduced or overcome by 'human' means. Advisory services, well trained and helpful staff in transport companies, physical help to use otherwise inaccessible vehicles and assistance with the cost of travel can provide access to technically inaccessible systems or services. Disabled people travelling in lower income countries report that readily available help often makes up for physically inaccessible vehicles and infrastructure.

Accessibility means much more that making it possible to move about. It is a fundamental requirement for an inclusive society. By taking the trouble to discover what different people need to be able to participate in an activity, and then providing those features, we are showing that we treat everyone as equal and are determined that no one will be excluded.

4 ACCESSIBILITY OF TRANSPORT SERVICES

Let us now concentrate on the physical accessibility of vehicles and infrastructure. There is often a tendency to regard a transport system that can be used by someone in a wheelchair as accessible, and one that cannot

as not accessible. Whether the person in a wheelchair can use the system without assistance is often not defined. This is a gross over-simplification; impairments can be locomotive (walking difficulties, wheelchair user), tactile (grasping, holding or touching), sensory (visual, hearing or speaking problems), cognitive and other (ECMT, 1986). These impairments limit the abilities of the individual in some respect, and we all have some physical or mental limitations.

A transport system is accessible to an individual with a set of impairments if, by good design and appropriate operation, that system can be used by the individual without the need for the individual to use any of the functions that their impairment prevents them using. Good design can reduce the physical requirements involved in using a system to a level that is possible. For example, a person with impaired ability to walk and climb may well be able to use a bus if it has low steps, good handrails and adequate seat space, but be totally unable to use a bus where the entrance has steep steps and no handrails. A sub-set of this is that the system is accessible if the individual has assistance to perform the impaired functions that are necessary for the use of the system.

The use of a wheelchair enables a person whose ability to walk is impaired to move about, provided the infrastructure is suitable. In practice, many people in wheelchairs are able to move further and faster than people who can walk, but whose walking is impaired by respiratory or circulatory disease, or by arthritis. But this advantage for the person in a wheelchair is nullified by a kerb, a flight of stairs or a patch of muddy ground.

To make a transport system accessible, the designer must know the functions of the potential users that are impaired, understand what those impairments prevent the passenger from doing, and design the system so that to use the system the passenger does not need to do things that are impossible. Because different people have different impairments, transport systems need different features to make them accessible to different groups of users.

Thus, the large group of ambulant disabled people who can walk, but with difficulty, can climb steps if they are shallow and have good handrails, and who need handholds to help balance, need vehicles or infrastructure designed to good standards to be useable. But these standards also make the vehicles or infrastructure easier and safer for able bodied people to use. People with impaired vision are helped by good colour contrasts, the use of bright colours and well-lit signing using large clear letters or symbols. Again, these features help everybody. People in wheelchairs need ramps in place of steps or kerbs, good surfaces, lifts for large height changes. These features can help others, certainly help other people with wheeled luggage (prams, baby buggies, shopping trolleys) and can help the more impaired of ambulant disabled people.

Once the design of a system makes it physically accessible to its users, it is necessary for the system operator to ensure that its users know of its existence, have the information they need to be able to use it, and are not prevented from using it by operating practices, rules or some lack of security that undermines the users' confidence in the system. The barriers of information and confidence can be just as great as those of high steps, steep gradients or long walks.

However much effort is put into making systems accessible, they will never be useable by the whole population. There will be people who are housebound or chair- or bed-fast, people with behavioural problems, people who need constant assistance. It is not realistic to expect mass transport systems to be useable independently by people so severely impaired that they cannot leave their house without assistance. What it is reasonable to expect, and what is becoming the case for new transport systems, is that people should not be prevented from using a system only because of deficiencies of physical design or of operating procedures.

5. FACTORS CAUSING INACCESSIBILITY

When we see a system that is inaccessible it is worth trying to work out the reasons for the choices that have been made. People are not stupid, and if the system has features that make it inaccessible to some group, the reason is usually provide advantages that are a higher priority than accessibility. For example, in parts of the world buses are still built on truck chasses (Figure 1). This provides a robust low-cost vehicle, suitable for rough roads and easy to maintain, but the penalty is a high floor and steep steps. The operator has prioritised practicality over ease of use by passengers

Factors that operators have been known to prioritise over passenger access include staff convenience, short term profitability, time-keeping (if passengers in wheelchairs take a long time to board). Most city centre railway stations require passengers to climb to high-level platforms to take a train. The reason is that the city was there before the railway, so the tracks were built well above ground level to avoid cutting the existing street network. It is less expensive to build the tracks well above ground, on embankments, than to tunnel underground. Figure 2a shows Leipzig main station, which now has an elevator to platform level, but located behind of the staircase where most passengers do not use it, Figure 2b. Lack of knowledge and poor signing?

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An example of good information provision is shown in Figure 3, a notice on the platform of Tokyo station used by the airport train. It is clear and avoids travellers who are probably stressed being worried when the coach for their reserved seat does not come in initially.

Factors that seem to be essential for accessibility is for the operator to prioritise passenger convenience above other issues, and to try to see the passenger's journey from the point of view of the passenger.

6. CONCLUDING REMARKS

A system is accessible to a particular group of impaired people if, by design and operating procedures, it can be used by those people without requiring them to do anything that their impairment makes impossible. It is up to the system designer and operator to identify the functions that are made impossible by the impairments of particular user groups, and from the start design the system to avoid the need to perform those functions.

Access is limited by much more than the physical design of a system. Lack of information, lack of money and lack of confidence can all inhibit access. The complete chain of information, confidence, money, an accessible vehicle and accessible infrastructure is necessary before a journey can be made. Failure of any one link of that chain makes the whole journey impossible. And the journey is only desired if the destination is accessible and provides an activity sought by the traveller.

We are all impaired in some way or other. Designing systems to be accessible means designing them to be easy to use for as wide a spectrum of people as possible. Even though some people's impairments probably mean that the use of mass transport systems will always be beyond them, the better the design of a system, the wider the spectrum of the population it can serve and the easier and safer it is for all its users.

Accessibility is a fundamental requirement for an inclusive society. By providing the policies, features and operating procedures that avoid requiring passengers to perform some action that is impossible for them we are showing that we treat everyone as equal and are determined that no one will be excluded.

7. REFERENCE

ECMT Transport for disabled people International comparisons of practice and policy European Conference of Ministers of Transport, Paris, 1986.

Keywords

TRANSED, AME50, accessibility, mobility