This study looks in detail at specific barriers encountered by people with travel difficulties in Japan, and the barriers encountered by the visually impaired and wheelchair users in particular. These barriers include vehicles parked on sidewalks or textured paving blocks for the visually impaired, bicycles ridden on sidewalks, bicycles left on the sidewalk, uneven sidewalks, obstacles on sidewalks, undulating sidewalks, steep slopes, barging pedestrians, textured paving blocks that have been improperly laid, buttons on traffic lights for persons with disabilities that have been set up in inappropriate locations, etc.

There is an increasing amount of research and discussion worldwide on the subject of identifying and eliminating barriers – in other words, creating barrier-free environments. In Japan too, research is underway into pedestrian environments for persons with disabilities from a number of different perspectives.

Persons with disabilities and their families often relate stories about the many barriers they encounter. Fujikawa and Shin, both visually impaired, have cited the advantages and disadvantages of textured paving blocks from personal experience. Textured paving blocks, they say, are sometimes only 15 centimeters in length compared to the usual 30 centimeters and there is always the possibility that a visually impaired person might unknowingly step over one of the smaller blocks. They also say that textured block paths are of almost no help and that they are sometimes wrongly positioned in such a way that people can be led straight into a post or wall. Buttons on sonant traffic signals are labeled “for the visually impaired”. Yet, it is obvious that persons with visual impairment are unable to read the labels and, unless a person knows that the button is there, the function is unusable.

“The 30cm Safety Zone” publishing committee, featured ideas from visually impaired persons for laying textured paving blocks safely, and pointed out that the textured paving blocks in front of Chiba Station not only serve no purpose for visually impaired persons but also present a barrier to them.

People with disabilities have been surveyed and researches carried out to identify their lifestyle requirements. E & C Project conducted a survey on 279 visually impaired persons on the inconveniences they encountered in daily living both inside and outside the home. Their result indicates that outside the home, roads and sidewalks are particular hazards in a traffic environment. Nagamatsu conducted an awareness survey of visually impaired persons on the use of everyday facilities, facilities designed for the visually impaired, textured paving blocks and sonant traffic lights. The survey indicates that sonant traffic lights and textured paving blocks play an important role in locating pedestrian crossings. Takayama and Ono in a fact-finding survey of road conditions affecting visually impaired people note that a deeper understanding among those around the visually impaired is of more importance than improving facilities in the creation of a barrier-free environment. Yamamoto, Shibata and Masui conducted a study to identify the information needed to walk by familiarizing sighted subjects with the use of a cane and then blindfolding them. The study revealed that, when walking alone with the use of a cane, the design and installation of textured block paths are of crucial importance.

Yonehara and Shibata surveyed schools for the blind and other facilities for the visually impaired that teach visually impaired people how to make their way around on foot. The survey revealed that in many cases,
a passive approach was adopted in response to the difficult conditions encountered on snow-covered roads. This included wearing bright clothing on snow-covered roads and greater attention to the sound of approaching vehicles. Instructions and methods for improving the environment on snow-covered pedestrian thoroughfares were non-existent.

As mentioned above, research into pedestrian environments for persons with disabilities and barrier-free environments is being carried out from various perspectives: identifying barriers, environmental development such as town planning, human support and understanding of handicaps. However, the scale of the research to date has been small: typically, the study of the needs of the visually impaired, research confined to extremely narrow fields and research involving only specific barriers. A lot of research have also dealt with creating barrier-free environments from a hardware perspective such as eliminating stairs and improving the angle of incline on slopes. However, there has been very little research into improving the public’s understanding of the traffic issues facing those with disabilities.

Thus, as far as the traffic safety needs of disabled pedestrians and their accident experiences are concerned, this report focuses on the comprehensive, exhaustive studies in which the author has played a key role and attempts to identify the barriers present in a traffic environment as perceived by those with disabilities as further information to augment reports received from disabled members of our society, the findings of smaller studies and the results the author’s own ongoing field surveys.

The first standard for a barrier-free environment in Japan was established in 1983 when the “UN Decade for Persons with Disabilities” commenced and the Ministry of Transport formulated guidelines for facilities for disabled persons in public transport terminals. Following this in 1985, the Ministry of Construction issued guidelines for laying paving block paths for visually impaired persons, and in 1991, the Ministry of Transport formulated guidelines for installing escalators in railway stations. Furthermore, in 1995, a 7-year strategy was formulated as a priority implementation project for a new long-term plan for the disabled to run from fiscal 1993 to fiscal 2002. This strategy proposed the development of pedestrian areas and the stepping up of methods to facilitate movement and transportation.

In 2000, a new law was introduced, commonly referred to as the Barrier-Free Law, to facilitate the unhindered movement of the aged and disabled on public transport and work began on installing escalators in railway stations and introducing buses without steps and buses with recessed flooring to allow easy access for people in wheelchairs.

Meanwhile, many urban planning projects are coming to terms with the barrier-free concept. Many municipal governments in Japan have now drawn up by-laws for town planning that make room for welfare considerations. The first to introduce this was Machida City in Tokyo. It introduced welfare environment development clauses for buildings and other structures within its municipality.

From the very beginning, the aspirations of disabled residents for urban planning with a caring perspective have been to be able to enjoy the same living conditions as able-bodied citizens and the opportunity for an independent life. These new by-laws hold great promise for changes to living environments but finding ways of improving existing facilities and checking the development of new facilities is a task yet to be addressed. Residents’ organizations must be established to inspect designs for compliance with by-laws and appraise new facilities when completed. At the same time, more by-laws are needed.

Persons with travel difficulties are people who, while using the road or a motor vehicle, (1) encounter physical barriers, (2) are misunderstood or ignored by those around them, (3) are shut out from or lack information (4) or encounter obstacles to traveling due to institutional barriers. Specifically, the definition covers those with physical handicaps to whom steps, stairs, and doors, etc. present barriers; visually impaired persons to whom obstacles over head or under foot present barriers; those with impaired hearing who have difficulty picking up information by ear such as the sound of approaching cars or announcements; pregnant women who cannot move suddenly; the elderly who have restricted sight, hearing or mobility; the intellectually handicapped who find it difficult to adequately understand road rules and traffic behavior; guide dog users whose numbers are restricted on planes, etc.
This report, however, will focus mainly on the visually impaired and wheelchair users and the problems they face on the road.

3.1 Visually impaired persons

There are over 300,000 visually impaired in Japan. This is the number of people who hold certificates for the disabled which identify them as being visually impaired. Many are not included in this number: the elderly who suffer from reduced vision due to cataracts or some other eye disease, those who suffer from short sightedness or distorted vision but do not have glasses or contact lenses. These people live in a state similar to that of visually impaired persons. In other words, there are more than a few people out walking on the streets who cannot see very well.

People who cannot see at all are called blind, and they are easily recognizable because they walk with a white cane or are accompanied by a guide dog. Those with reduced vision (corrected eyesight around 0.03-0.3) are also visually impaired but, because they do not use canes or guide dogs and because they can react to visual information to some extent, people around them often fail to notice that they have visual disabilities.

Both blind people and persons with reduced vision are not very good at walking on the streets. This may not pose a problem while leisurely walking the street but when going out for a particular purpose, such as to school, shopping, or to the hospital, they need to move quickly, safely and without stress. However, in reality, there are many obstacles on the sidewalks: bicycles that speed along the sidewalk, cars that will not slow down even in narrow roads, and parked cars blocking the sidewalk. Walking for visually impaired persons is a stressful experience as they negotiate the sidewalks trying to avoid painful collisions.

3.2 Wheelchair users

Wheelchairs are convenient means of moving around for those with physical disabilities affecting the lower limbs. They are sometimes used as a temporary aid by those who are unable to walk properly because of injury, and also by those who are ill or who are debilitated by age. The range of disabilities depends on the cause and type of affliction. Many wheelchair users suffer from irregular body temperature or incontinence. For them, finding toilets for the disabled and gaining access to them in a wheelchair is a major problem.

Many wheelchair users in Japan also drive cars. Gaining a driving license and using modified cars is now one of the most important factors in improving the quality of life for these people. Nevertheless, there are many problems associated with driving and parking is one issue in particular that needs to be resolved urgently.

This section cites key research into road transport barriers carried out in Japan to date and lists items that should be resolved as a matter of urgency.

4.1 Illegal and nuisance parking

In a major survey conducted in 1999, blind people were asked whether they had ever bumped into or collided with parked cars. The survey revealed that about 80% had experienced problems with cars. Approximately 20% of wheelchair users reported being seriously inconvenienced by cars.

The majority of people surveyed responded that cars parked on sidewalks were among the greatest inconveniences (Photo 1). Even in places where the sidewalk is considerably higher than the road, many drivers park their cars with the passenger-side wheels on the sidewalk so as not to obstruct traffic in the street. Although this action demonstrates consideration for other cars, it presents a major obstacle to passing pedestrians.

Cars parked on textured paving blocks are also major obstacles (Photo 2). This is caused by drivers not realizing the significance of these blocks. License candidates receive some instruction in relation to visually impaired pedestrians. We must assume, however, that
very few driving schools provide adequate instruction concerning parking to allow free passage for the visually impaired or the significance of textured paving blocks.

Disabled persons and the elderly risk their lives every time they have to walk around a parked car (Photo 3). 90% of blind persons and 80% of wheelchair users report having to walk on the roadway at some time or other9,10. Wheelchair users and elderly pedestrians pushing hand carts risk falling over when alighting from the sidewalk onto the road and must look for a ramp to do so in safety. Frequently, they have to go back along the path they have just come to find a ramp. Once on the roadway, they may find it difficult to get back onto the sidewalk and may need to travel some distance along the road. In addition to that, wheelchair users are unable to get back into a capsized wheelchair and fatalities have occurred because of this. This is particularly true at night when a wheelchair on the road is difficult to see.

4.2 Bicycles on the sidewalk

For people with travel difficulties, bicycles rushing past them on the sidewalk seem like flying projectiles. Cyclists must be conscious of people with travel difficulties and ride courteously11.

To be specific, firstly, they must travel on the correct side of the sidewalk and not speed. In Japan, where there are no special bicycle lanes, a white line on the sidewalk separates bicycle and pedestrian traffic. Speeding bicycles frighten not only people with travel difficulties, they also frighten young children and ordinary pedestrians. The visually impaired cannot see where the white line is and, because there are numerous obstacles on the sidewalk, they cannot always walk on the edge. Accidents cannot be prevented unless cyclists avoid danger by staying alert for visually impaired persons with their white canes and wheelchair users.

Secondly, cyclists must not forget to switch their lights on in the evening or when it is raining. Some people with reduced vision find it difficult to see at dusk when the light begins to fade. For them, an approaching bicycle with no lights is only visible at the last moment and can be a startling incident. Bicycles make little noise and without lights, they are almost invisible. If pedestrians are aware that a bicycle is approaching, they can take the appropriate action, such as coming to a halt to wait for the bicycle to pass.

Furthermore, cyclists riding on sidewalks must recognize that pedestrians have priority. We must drive the point home that sidewalks are mainly for pedestrians and that in dangerous situations, cyclists should get off their bicycles rather than make the pedestrian halt. Cyclists should refrain from riding past persons with disabilities, the elderly, young children and pregnant women on their bicycles (Photo 4).

4.3 Bicycles left unattended

Bicycles left cluttered on streets and in front of buildings pose a major obstacle for the visually impaired and for wheelchair users. Walking around unattended bicycles takes time and is extremely perilous. We often find bicycles parked near stations, in front of shops and banks, and other places, blocking up roads and entrances but these are also places frequented by disabled persons (Photos 5, 6).

Many shops do not have bicycle-parking spaces. In that case, we should park bicycles parallel to the road
by a wall or by the guardrail so as not to block the passage of pedestrians.

Needless to say, we should not park bicycles over textured paving blocks and should leave 50cm on either side of the blocks for visually impaired people to pass. Many people also park their bicycles beside textured paving blocks. The bicycle handles protrude over the blocks presenting the danger of a collision (Photo 7).
4.4 Steps, uneven surfaces, signboards, merchandise and litter on sidewalks

A survey that asked wheelchair users whether they had ever been prevented from gaining access to a location because of steps revealed that around 80% frequently face this problem. 20% had fallen off elevated sidewalks trying to dodge people or obstacles. In many cases, narrow sidewalks or obstacles on the sidewalk had caused wheelchair users to fall from the sidewalk while trying to get past parked bicycles and cars, and shop signboards (Photos 8, 9).

The following are major obstacles for people with travel difficulties: uneven sidewalks caused by roots from roadside trees, floor tiles that have come unstuck, subsidence, protruding manhole covers, broken textured paving blocks, grating that traps the front wheels of wheelchairs, etc. (Photos 10, 11, 12).

4.5 Undulating sidewalks

Sidewalks slope up and down where there are driveways, entrances for shops, pedestrian crossings and so
forth (in order to eliminate height difference between the sidewalk and the road). Hence, the sidewalks around shopping and residential areas undulate (Photo 13). Furthermore, the sidewalk tilts towards the roadway in these places. Wheelchairs have trouble traveling along places where there is an angle between the left and right sides. Structurally too, they can only sustain a certain angle of incline between the left and right sides before they capsize. The angle is greater the narrower the sidewalk is. Traveling along undulating and tilted sidewalks over a long period causes stress and fatigue, and it is under these conditions that carelessness creeps in and incidents of wheelchairs falling onto roads occur. In fact, such incidents have resulted in fatalities. In November 2000, the Ministry of Construction came up with a standard to fix sidewalk height to 5cm as a solution to the problem of undulation.

4.6 Inappropriately installed ramps

The result of the survey on traffic safety needs revealed that about half the wheelchair users have been to places where the ramps were too steep for them to go up. Apart from that, there were also cases where there were steps around the ramp entrances (Photos 14, 15, 16).

4.7 Pedestrians

Visually impaired persons often collide with other pedestrians. The other person often apologizes for the collision when he or she notices the white cane. Cases seem to be quite common where pedestrians are so engulfed in conversation that they do not notice the blind person's white cane.

In addition, blind persons frequently hit small children (in order to eliminate height difference between the sidewalk and the road). Hence, the sidewalks around shopping and residential areas undulate (Photo 13). Furthermore, the sidewalk tilts towards the roadway in these places. Wheelchairs have trouble traveling along places where there is an angle between the left and right sides. Structurally too, they can only sustain a certain angle of incline between the left and right sides before they capsize. The angle is greater the narrower the sidewalk is. Traveling along undulating and tilted sidewalks over a long period causes stress and fatigue, and it is under these conditions that carelessness creeps in and incidents of wheelchairs falling onto roads occur. In fact, such incidents have resulted in fatalities. In November 2000, the Ministry of Construction came up with a standard to fix sidewalk height to 5cm as a solution to the problem of undulation.
Children below them with their sticks or accidentally kick them. Around half of the blind persons interviewed commented that they have had similar experiences (Photo 17).

Collisions between visually impaired persons and the elderly are the most awkward (Photo 18). A survey revealed that an astonishing 50% of the blind persons had been in such collisions. In most cases, the visually impaired persons ended up injuring the other person. Collisions on stairs in stations and footbridges can lead to serious injuries. In rush hours, everyone is in a hurry and the visually impaired are no exception. There was a case where a visually impaired person collided into an elderly person at some speed, causing the person to fall down a flight of stairs. The person broke a thighbone and required long-term hospitalization. There have also been cases where the elderly have tripped and suffered broken bones.

Wheelchair users frequently collide with pedestrians on sidewalks too. The cause may include the wheelchair user or pedestrian not looking at where he or she is going, the wheelchair user suddenly emerging from a crowd, the pedestrian suddenly changing direction, the wheelchair not being in the pedestrian’s line of sight because it is on low-lying ground. Pedestrians find it difficult to notice wheelchairs because they make no sound when they move. Some wheelchair users have resorted to playing music on low volume when they travel in order to let people around them know that they are there to avoid collisions.

It is important for the public to extend courtesy in order to ensure the safety of people with travel difficulties. To be more precise this involves the following:

* Do not walk abreast on the sidewalk, do not sit down on the streets or sit and walk in a manner that obstructs free passage.
* Do not stand on streets talking and do not leave baggage on the street (especially over textured paving blocks) in a way that obstructs other pedestrians.
* Know situations that may pose dangers to disabled persons and offer assistance in those situations, e.g., when crossing streets, in congested areas, on construction sites, where there is a lot of noise, in places where there are obstructions that cannot be detected using a cane, on rainy days, snowy days or windy days, etc.

4.8 Improperly laid textured paving blocks

The most effective guidance system for visually impaired persons is the textured paving block. Recently, concern for disabled people has increased and barrier-free urban developments have become more common. Textured paving blocks are being laid rapidly across Japan. However, the progress in their installation varies from region to region and there are places where even busy roads and sidewalks have not been installed with these paving blocks. Textured paving blocks show blind people with white canes where to walk and stop, and are vitally important in ensuring their safety. Because of problems in ascertaining where the blocks are leading them to, blind people are not totally reliant on these blocks. Nonetheless, many feel insecure walking in places where there are no textured paving blocks.

The blocks are especially important on street intersections. Some textured paving blocks indicate that there is an intersection ahead (they indicate danger and are called warning blocks). The sidewalk often slopes onto street intersections and without textured paving blocks,
blind people face the danger of unwittingly wandering onto the road.

In reality, however, many textured paving blocks are not laid uniformly or accurately. Many visually impaired people want immediate improvements because these blocks pose a danger2 (Photo 19).

Items placed on top of the blocks make walking difficult and quite often, dangerous. Some visually impaired people prefer to walk alongside textured paving blocks checking the humps with the tip of their sticks because walking over them is tiring. As already mentioned, to enable them to do so, we must leave at least 50cm either side of the blocks free of obstacles. Bicycles and motor-cycles are the most common and most cumbersome obstacles. Many people park their bicycles on the blocks without a hint of guilt. Shop items and merchandise, display boards, signboards, litterbins, baby carts, and other things are often left on the blocks too (Photo 20).

4.9 Textured paving blocks pose obstacles to wheelchair users

Textured paving blocks that are so important for the visually impaired sometimes pose obstacles to wheelchair users. A survey10 that asked wheelchair users if they have ever been inconvenienced by textured paving blocks revealed that around half felt they have. The bumps on the blocks deflect the front wheels making it difficult to move forward, the bumpy ride makes it hard to continue on a direct course ahead and the perpetual vibrations induce fatigue (Photo 21).

Even so, roughly 40% replied that although the blocks are awkward for wheelchairs they were an element that had to be endured. Quite a number replied that even though they sometimes feel the blocks to be an obstruction, they recognized their importance for the visually impaired. Other views included comments such as wheelchair users needed to coexist because they were not the only ones with disabilities, and although of some inconvenience to wheelchair users, as an essential aid to visually impaired persons textured paving blocks should remain.

Many obstacles that confront wheelchair users can be avoided if textured paving blocks are laid in appropriate ways in appropriate places. A typical example of improperly laid blocks is those laid on ramps. Visually impaired persons usually use the stairs because they do not need ramps. Guiding visually impaired persons along ramps using textured paving is not only pointless but may
also trigger another problem – collisions between wheelchair users and the visually impaired (Photo 22).

4.10 Unsuitable positioning of traffic light buttons for people with disabilities

Crossing the road is a dangerous activity for people with disabilities. Visually impaired people are unable to distinguish the different colored lights at standard pedestrian crossing traffic lights that are not fitted with audio alerts. They must decide when to cross by listening for the cars stopping and from the activity of the people around them. This also applies to people with guide dogs who also rely on the movement of the people around them rather than a sign from the dog.

Wheelchair users and people with physical disabilities need time to cross the road and it is sometimes difficult for them to get across before the traffic light changes. Elderly people and expectant mothers are also faced with the same problem.

Many traffic lights that are compatible with the needs of people with disabilities have now been installed. When the buttons for people with disabilities on these traffic lights are pushed, the “Walk” signal remains on for a longer period than usual. However, quite frequently the location or position of these buttons is unsuitable. They are sometimes located over a step or ledge and out of reach of people in wheelchairs; hidden from visually impaired people because they are located away from the textured block paving; covered by shrubbery or surrounded by parked bicycles; positioned on the road side of the traffic light so that people have to step onto the road to press the button; broken and pose a risk of injury to a finger; or covered in grime which is then transferred to the finger and onto the person’s clothes or belongings (Photos 23, 24).

This report has set out the main obstacles that exist in a road environment but there are many other examples which have not been included. In Japan, many obstacles also exist when riding in a vehicle. Fortunately, Japan is well on the way, in terms of systems and public sentiment, to becoming a barrier-free society.

Traffic safety for disabled people cannot be measured in terms of consideration and care alone. Rather than invent vague slogans, each one of us must look to see what can be done and what must be done, and convey this to drivers and pedestrians. This means that we must improve the level of comprehension of disabilities in our population 18.

First, it is important to realize the conditions faced by those with travel disabilities and their needs. By understanding what difficulties people with disabilities and wheelchair users face, what their requirements are and what they think, we will understand what needs to be done by the government, schools, driving schools, vehicle manufacturers, families, and communities.

TRANSPORT FOR THE PEOPLE WITH DISABILITIES: BARRIER-FREE


(The above 18 publications are all in Japanese.)