

# Ensuring urban public transportation mobility for people with intellectual disabilities

## 1. Background and goals

As of the end of 2006 there were around 550,000 persons diagnosed with intellectual disabilities in Japan, accounting for approximately 0.4% of the population.

The Law for Buildings Accessible to and Usable by the Elderly and Physically Disabled Person and the earlier version of the Transportation Barrier-Free Law were combined into the Law for Promoting Easy Mobility for the Aged and the Disabled Person, which went into effect in December 2006.

Due to these policies, various handbooks and guidelines related to human response and facilities development have been published, but in many cases these resources remain unknown to transportation operators in the field. This has led to insufficient addressing of issues related to persons with intellectual disabilities.

Against such a background, this project was formed and research began in 2011 with the goal of examining policies related to international trends in ensuring mobility for persons with intellectual disabilities, and thereby uncovering issues needing to be addressed in Japan.

## 2. Research content

### 2-1. International case study 1: SITES (Curitiba, Brazil)

The SITES handicapped student bus system, started in Curitiba, Brazil in 1983, uses standard buses incorporated into an established transit system. In that system, buses from various locations in the city arrive at a connecting terminal in the northeast downtown area at a time. Students board buses at the stop closest to their home and head for the connecting terminal. Students from all schools use the buses and students with a variety of handicaps share the same system. At the connecting terminal, they can change to buses heading for their

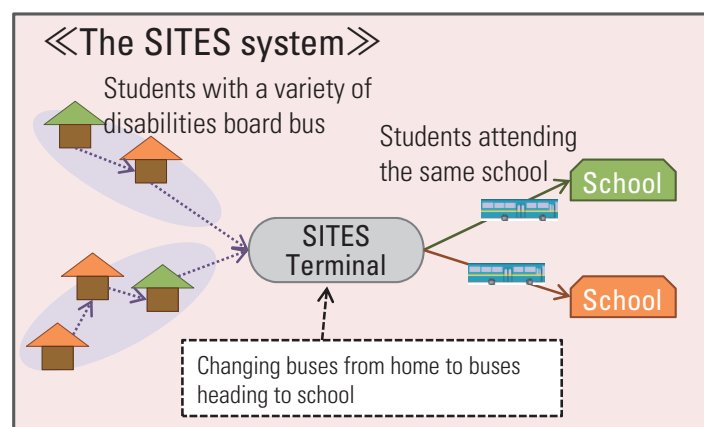


Figure 1. The SITES system

individual schools.

Interviews were conducted with intellectually disabled students changing buses at the SITES terminal, as well as personnel, such as bus drivers and accompanying guides. This resulted in new findings, including that there was little trouble related to changing buses and that the system presented a platform for exchange that leads to increased sociability in participants.

## 2-2. International case study 2: The MogLi project (Germany)

MogLi is a research project supported by the German Federal Ministry of Education and Research related to mobility for the intellectually handicapped. The project targets special needs schools in the town of Nordhorn and their students. The project began an experimental attempt to utilize chartered buses for students, in which bus operators and local police serve as guides. After verification experiments were complete, the system was put into place, and guided busing is now performed on a regular basis.



Figure 2. Explaining how to ride the bus to school

## 2-3. Domestic experiment 1: Stop mark display experiment

Installing stop marks for students is ineffective without accompanying education regarding the meaning of those signs; unknowing students will simply pass by without heeding them. We therefore performed an experiment in which student-oriented stop marks were installed in the vicinity of target schools for three months, and during a field trip, the meaning of the signs were explained to students. This experiment had two goals: elucidating the effect of pre-education including field trip-based class instruction regarding stop marks to students at special needs schools, as well as finding issues related to class instruction on stop marks.

The experiment targeted elementary and junior high students who commute by school bus, not high school students who were able to travel to school on their own.

We were able to see results in post-interviews with school personnel, but for only a few months after the experiment, and thus were not able to observe improvement of students' understanding beyond that. However, we expect that continued education will result in students' increased learning of traffic rules.



Figure 3. A stop mark

## 2-4. Domestic experiment 2: Commuting to school by city bus

With the goal of elucidating the effects of educating city bus guidance involving transportation operators

and issues related to performing such education, on January 10, 2013 we performed an experiment with the cooperation of the *Seya Yogo School* (*Yogo* being a Japanese term used in special needs education) in Yokohama, Kanagawa Prefecture, related to bus guidance that targeted students at that school. The contents of instruction are shown in Table 1.

**Table 1. Contents of instruction regarding city buses**

	Item	Method in the experiment
External safety	Explanation of blind spots	Showing dangerous spots at an actual bus stop
	Lining up at the bus stop	Lining up before actually boarding the bus
Getting on and off	Reading destination displays (destination, route number)	Creating a destination (route number) game to explain which buses should not be ridden
	Reading in-bus electronic displays (stop name)	Verbal description while watching the board display
	Description of the stop button	Verbal description (including when to press), followed by one student pressing button
	How to show tickets and bus passes	Explanation of bus passes and prepaid cards, experience showing bus passes to driver, and using card reader for prepaid cards
Safety in the bus	When to stand up	Verbal cautioning
	Points to follow while standing in the bus	Verbal cautioning to hold on to handrails and straps
Manners	Taking turns getting on the bus	Verbal cautioning; actually performing getting on the bus in turn
	Explanation of priority seating	University student volunteers perform the role of injured persons.
	How to sit (when someone else is already sitting)	University student volunteers perform the role of general passenger; describe sitting in an empty seat
	Not making noise, not running	Verbal cautioning

Interviews conducted after the experiment indicated that students hearing explanations by unformed bus drivers or transportation operators had a greater impact than did those delivered by educators or guardians, allowing listeners to better retain the presented information and to recall it when conducting busing guidance.

### 2-5. Domestic experiment 3: Commuting to school by automated guided transit

It is possible that students who are able to travel to school on their own via public transportation also use automated guided transit. We therefore conducted a similar experiment to examine whether students at a domestic special needs school could commute to school via line A on one such automated metro. The experiment was conducted on February 19, 2013 with 26 student participants. The contents of instruction are shown in Table 2.

In post-interviews conducted with *Yogo* school educators, the following comments were noted:

- The difficulty level was low, since students are already able to get to school by themselves. For other students who are not able to get to school by themselves; however, experiential demonstrations would likely be required over verbal explanations.
- Students would likely better understand explanations given in stopped cars or in the station, rather than on moving cars.

**Table 2. Contents of instruction regarding automated metro**

	Item	Explanation and teaching methods
Outside safety	Cautions about platform doors	Verbal cautioning about running to board cars, getting caught in doors, etc.
	Reading electronic displays	Verifying arrival time
Getting on and off	Description of arrival platforms	Verbal confirmation of which station different lines are heading for
	Passing through ticket gates	Explanation and confirmation of prepaid card reader locations
	(How to use ticket vending machines)	Verbal instruction to give depleted prepaid cards to parents and teachers to be recharged
In-car safety	Points to follow when standing from seats	Verbal cautioning
	Points to follow while standing in the car	Verbal caution to hold on to handrails and straps
Manners	Taking turns getting on the car	Verbal cautioning; actually performing getting on the car in turn
	Waiting on the platform	Verbal cautioning to not make noise, and to not run; verification of waiting in line.
	Description of priority seating	University student volunteers perform the role of injured person
	How to sit (when someone else is already sitting)	University student volunteers perform the role of general passenger; describe sitting in an empty seat
	How to spend time in the car	Verbal cautioning to not make noise, not run
Other	Handling emergencies	Description of the intercom call, confirmation of the location of station staff

### 3. Conclusions

This project addressed issues in commuting to special needs schools by examining case studies overseas and by performing verification experiments in Japan based on those overseas findings.

Working to further support the mobility of intellectually handicapped persons in the future will not be possible without the support of not only schools, but also transportation operators, road management personnel, and transportation managers. A future topic is therefore the awareness building activities and the development of systems for promoting common understanding among transportation officials.

### 4. Future outlook

We hope that the results of this research lead to deeper communications between schools for students with intellectual disabilities throughout Japan and area transportation operators, the further expansion of various verification experiments, and furthered accumulation of knowledge.