Summary of SIP-ADUS project (FY2015)

Name of the project	Investigation of reducing the time taken for boarding and alighting of public transportation
Responsible Organization	Toyota Tsusho Corporation

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Object of the Project

It is said that, in order to improve the regularity and speed of bus services, it is necessary to reduce the time taken to board and alight. Fare collection and anchoring wheelchairs for passengers have a significant impact upon the time taken. We therefore considered a new system to resolve these two issues with the aim of reducing the time taken for boarding and alighting.

Project Summary

- A system which does not require fare collection when boarding or alighting

We investigated examples of systems in Japan and overseas which do not require fare collection when boarding or alighting such as proof-of-payment and apparently free-of-charge systems. We documented new technologies being used for fare collection and inspection and punishment systems to deter fare avoidance.

In order to reduce the time taken to board and alight buses, based on the principle that enabling passengers to use all doorways for boarding or alighting reduces time required for movement within the bus, we considered a candidate system to increase convenience for passengers and simultaneously reduce boarding and alighting time, with the potential for introduction on bus services in Japan. This involves the installation of IC card reader/writer devices at all entries and exits to the bus and uses human body communication technology adding a system whereby payment is possible without swiping an IC card. In addition, with the proof-of-payment created by the introduction of this new system, we considered a system to detect fare evaders, using proximity sensors and comparing that with fare collection timing as an inspection system to ensure fare collection.

- A system for anchoring wheelchairs that is operable by the passenger themself

We investigated wheelchair anchoring systems in Japan and overseas for which are designed for wheelchair users who independently take public transport. We documented wheelchair anchoring systems used on bus services in Japan based on the opinions of wheelchair users in regards to riding (1) rear-facing, (2) forward-facing and (3) side-facing. It became clear that an easy system for anchoring was desirable. We investigated systems that accommodated multiple wheelchairs while ensuring sufficient aisle space installing a roller-coaster-like safety bar at the fore of wheelchair space and additional anchorage using a seatbelt to restrict movement of the wheelchair and control both forward movement when braking suddenly and oblique forward movement when turning.

Future plan

We must test the new fare collection and inspection, and wheelchair anchoring systems that we investigated this fiscal year and verify the degree of time reduction for boarding and alighting, the feasibility of the systems, their safety etc. If the results, effectiveness and safety can be confirmed, the systems can be introduced to a portion of the bus network for public testing and verification to see the impact and eliminate any issues arising. It is hoped that in the future, these can become standard systems for scheduled buses.