

Summary of SIP–adus project (FY2015)	
Name of the project	<i>Research on automatic controllability for ART</i>
Responsible Organization	<i>Advanced Smart Mobility Co., Ltd.</i>
Name	Keiji Aoki
Object of the Project	
<i>In this research, in order to take advantage of technology components of Automated Driving System into the ART(Advanced Rapid Transit) system, the technology according to the precision docking which is the most important technology for ART will be investigated by using the experimental automated bus.</i>	
Project Summary	
<i>On the precision docking control system, road white line has being used as induction marker widely. However, conventional camera can not detect road white line under the condition of the twilight and against the sun. In this research, high resolution and high dynamic range (HDR) camera and machine vision system has been developed to detect the lateral displacement between white line and the bus, and also the mode based control algorithm for precise tracking of lane marker has been designed. Two kinds of experimental bus equipped with automatic steering control system have been built based on the rigid bus (Length: 12m) and articulated bus (Length: 18m). The ITV camera is mounted on dash board and the camera can capture the front view from 1.0m to 5m. The evaluation test of precision docking control has been carried out with three types of bus stop what are terrace type, wedge type and straight type with curved trajectory for approaching to the bus stop. The gap distance between the bus stop and doors for the precision docking will be required within 6 cm for riding of the wheel chair. The controllability of the precision docking control has been evaluated for three types of bus stop and the control deviation was ± 4.0cm for three types of the bus stop.</i>	
Future plan	
<i>•Smooth vehicle speed control with slow acceleration and deceleration during the precision docking. •Sensing technologies for detection of vehicle position in addition to the machine vision for detecting of white line •Improvement of the reliability and the safety for precision docking control.</i>	