

## Press Information

### **Kyocera to Participate in Self-Driving Bus Test Project on JR East BR Lines**

#### **Seven companies to test autonomous bus technologies for public transit**

**Kyoto/London, December 13<sup>th</sup>, 2018.** Kyocera announced that it will participate in a self-driving bus test project organized by the “Mobility Innovation Consortium,” an organization to promote autonomous driving led by East Japan Railway Company (JR East). Other corporations participating in the test project will include Advanced Smart Mobility Co., Ltd., Aichi Steel Corporation, SoftBank Corp., Nippon Signal Co., Ltd. and NEC Corporation.

Project tests, which will occur between December 2018 and March 2019, are designated to evaluate self-driving technologies for bus transit applications, including automated lane-maintenance control, speed control, parking assist, and alternating passage tests on JR East’s Bus Rapid Transit (BRT) lines. Kyocera will support the installation and maintenance of roadside units for vehicle-to-infrastructure communications. Through multiple BRT experiments, the companies aim to identify and solve technology issues that stand in the way of commercializing autonomous bus transit. The project is designed to evaluate technologies and public demonstration rides will not occur at this phase.



**Experimental self-driving bus**

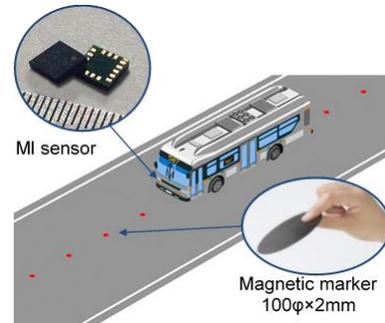
\* A driver will be present on the self-driving bus in case of emergency during self-driving testing.

## Project Overview

The tests will be conducted using specially modified autonomous buses provided by Advanced Smart Mobility. Technologies under evaluation include the following:

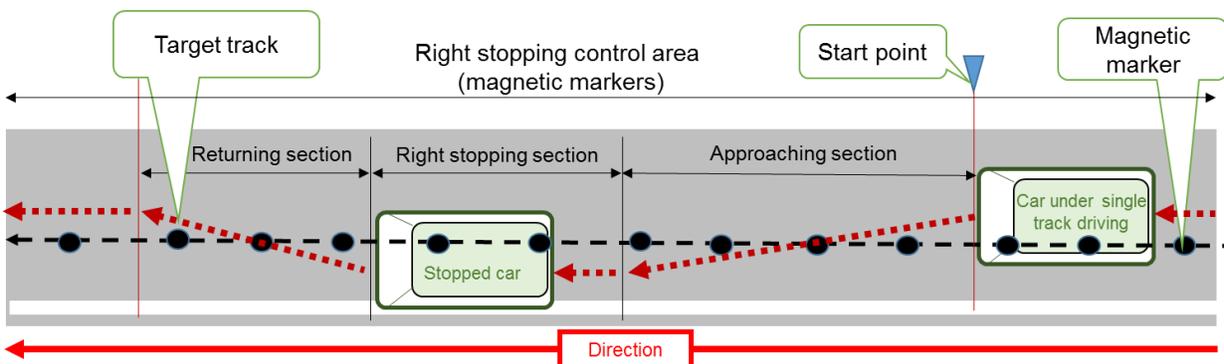
### 1. Lane-Maintenance and Speed Control

High-sensitivity Magnetic Impedance (MI) sensors on the bus read information from magnetic markers placed on BRT routes to identify the vehicle's exact position. Tests will verify the smooth and seamless operation of the bus autonomous lane-maintenance and speed control systems. By automatically controlling the vehicle's brakes and accelerator, the test evaluates typical operation at speeds of 40km/h or lower, with stops at designated positions.



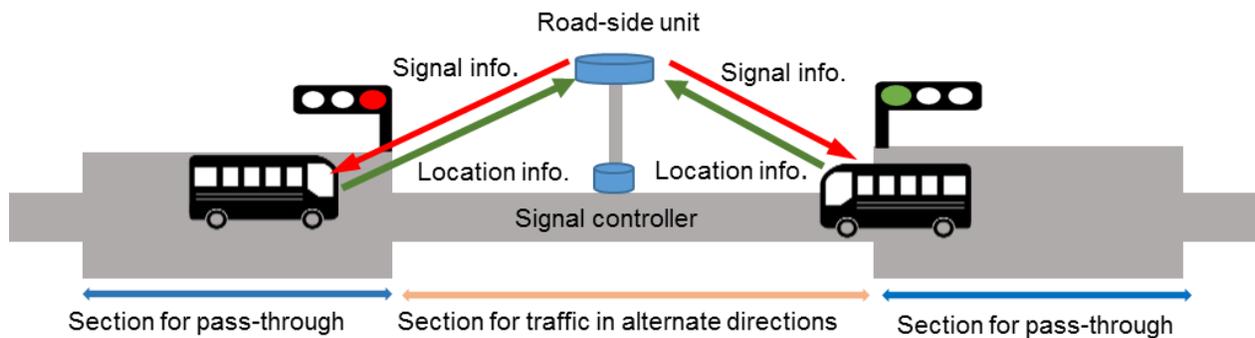
### 2. Precision Docking

Stopping tests utilize magnetic markers that communicate spatial information to stop the bus automatically as it reaches the platform of the BRT station.



### 3. Narrow Road "Alternating Passage" Capability

Through radio communication between the bus and location-detection systems, this test will verify the bus's ability to negotiate passage on a BRT roadway wide enough for just one vehicle, as another vehicle approaches from the opposite direction.



#### 4. Other Experiments

In addition to the experiments listed above, the companies will conduct location-detection tests using GPS to verify navigation and distance-measurement systems.

#### Location and Time Period

Location	Ofunato line around BRT Takekoma Station (Rikuzen Takata City, Iwate Prefecture)
Time Period	December 12, 2018 – March 8, 2019

\* Time period includes equipment installation and removal.

\* Tests are conducted on BRT roads. Drivers will use alternative public roads during the experiment time period.

#### Roles of Each Company

East Japan Railway Company	<ul style="list-style-type: none"> <li>• Responsible for overall test</li> <li>• Maintaining BRT lanes</li> </ul>
Advanced Smart Mobility Co., Ltd.	<ul style="list-style-type: none"> <li>• Leader of collaborative experiments</li> <li>• Responsible for self-driving vehicles and vehicle control systems</li> </ul>

Aichi Steel Corporation	<ul style="list-style-type: none"> <li>• Responsible for providing and placing magnetic markers</li> <li>• Duties related to maintenance and control of the magnetic marker system</li> </ul>
Kyocera Corporation	<ul style="list-style-type: none"> <li>• Responsible for vehicle-to-infrastructure communication</li> <li>• Installing roadside units (LTE, ITS)</li> <li>• Maintaining vehicle-to-infrastructure communication</li> </ul>
SoftBank Corp.	<ul style="list-style-type: none"> <li>• Responsible for Multi-GNSS terminals</li> <li>• Installing Multi-GNSS terminals</li> <li>• Positioning quasi-zenith satellite</li> </ul>
Nippon Signal Co., Ltd.	<ul style="list-style-type: none"> <li>• Responsible for signal apparatus installation</li> <li>• Installing signal light and signal control equipment</li> <li>• Signal control and management</li> </ul>
NEC Corporation	<ul style="list-style-type: none"> <li>• Responsible for target track creation</li> <li>• Control of magnetic marker system</li> </ul>



For more information on Kyocera: [www.kyocera.co.uk](http://www.kyocera.co.uk)

## About Kyocera

Headquartered in Kyoto, Japan, Kyocera Corporation is one of the world's leading manufacturers of fine ceramic components for the technology industry. The strategically important divisions in the Kyocera Group, which is comprised of 264 subsidiaries (as of March 31, 2018), are information and communications technologies, products which increase quality of life, and environmentally friendly products. The technology group is also one of the oldest producers of solar energy systems worldwide, with more than 40 years of experience in the industry.

The company is ranked #522 on Forbes magazine's 2017 "Global 2000" listing of the world's largest publicly traded companies. With a global workforce of over 75,000 employees, Kyocera posted net sales of approximately €12.04 billion in fiscal year 2017/2018. The products marketed by the company in Europe include printers, digital copying systems, microelectronic components, and fine ceramic products. The Kyocera Group has two independent companies in the United Kingdom: Kyocera Fineceramics Ltd. and Kyocera Document Solutions.

The company also takes an active interest in cultural affairs. The Kyoto Prize, a prominent international award, is presented each year by the Inamori Foundation — established by Kyocera founder Dr. Kazuo Inamori — to individuals and groups worldwide who have contributed significantly to the scientific, cultural, and spiritual betterment of humankind (converted at approximately €764,000 per prize category).

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## Contact

Kyocera Fineceramics Ltd.  
Daniela Faust  
Manager Corporate Communications  
Hammfelddamm 6  
41460 Neuss  
Germany  
Tel.: +49 (0)2131/16 37 – 188  
Fax: +49 (0)2131/16 37 – 150  
Mobil: +49 (0)175/727 57 06  
[daniela.faust@kyocera.de](mailto:daniela.faust@kyocera.de)  
[www.Kyocera.de](http://www.Kyocera.de)