Kajima Corporation and Subaru Corporation Launch Real-World Demonstration Tests of Cooperative Vehicle-Infrastructure Autonomous Driving Using Optical Fiber Sensing Technology

Kajima Corporation Subaru Corporation

Tokyo, June 24, 2025 - Kajima Corporation (Headquarters: Minato-ku, Tokyo; President: Hiromasa Amano; "Kajima") and Subaru Corporation (Headquarters: Shibuya-ku, Tokyo; President and CEO: Atsushi Osaki; "Subaru"), with the cooperation of Osaka City, have launched real-world demonstration tests of cooperative vehicle-infrastructure autonomous driving^{*1} using optical fiber sensor technology, installing optical fiber sensor cables inside the asphalt pavement of an expressway serving as an access route to the Expo 2025 Osaka, Kansai, Japan ("the Expo") site^{*2}.



Real-World Demonstration Tests of Cooperative Vehicle-Infrastructure Autonomous Driving Using Optical Fiber Sensing Technology

Optical Fiber Sensor Cables Installation Location (For illustration purposes only)

Kajima and Subaru, with the aim of realizing safe road infrastructure and reducing traffic accidents in the future mobility society, have been conducting joint research on cooperative vehicle-infrastructure autonomous driving since September 2024. This research is carried out on a circuit simulating a real expressway at Bifuka Proving Ground in the Subaru R&E Center (Hokkaido, Japan), utilizing Kajima's optical fiber sensing technology and the cooperative autonomous driving^{*3} technology developed by Subaru's Technical Research Center.

As part of this initiative, trials were conducted under severe winter conditions to test cooperative vehicleinfrastructure autonomous driving, which requires low-latency and highly accurate data communication from the roadside.

Building on these findings, Kajima and Subaru launched joint research in December 2024 on "Driving Automation Support for Road Infrastructure Using Optical Fiber Sensing Technology," utilizing Hanshin Expressway's Communication-based Joint Research Program.



Demonstration Test of Cooperative Vehicle-Infrastructure Autonomous Driving Using Optical Fiber Sensing Technology in Severe Winter Conditions (Subaru R&E Center)

This time, Kajima and Subaru have installed optical fiber sensor cables in the asphalt pavement of an expressway that serves as an access route to the Expo site^{*2}. On this section, shuttle buses and test vehicles are being operated to detect and measure vibrations and strain on the road caused by passing vehicles. The collected data will be used for road monitoring to support effective road and traffic management.

Furthermore, as a use case of cooperative vehicle-infrastructure autonomous driving, real-time vehicle location data obtained through road monitoring has been shared with autonomous vehicles in a demonstration experiment of merging in tunnel sections, where detecting vehicle positions is generally difficult.

These real-world demonstration tests of cooperative vehicle-infrastructure autonomous driving using optical fiber sensing technology are the first of their kind in Japan, both at a proving ground and on an actual expressway.



Installation of Optical Fiber within Asphalt Pavement

Kajima Corporation, guided by its Vision Statement, "Willingness to take on new challenges leveraging the power of ideas and technology to make imagination and amazement a reality," is committed to research and development aimed at delivering new value to social infrastructure. Embracing openness, diversity, and initiative, the company continues to pursue innovation to meet the evolving needs of society.

Subaru will continue to advance its safety technologies based on the philosophy of "All-Around Safety^{*4}," aiming to achieve zero fatal traffic accidents in 2030^{*5}. In addition, Subaru remains committed to research

and development that contributes to reducing accidents in the future mobility society, delivering on its promise of "Enjoyment and Peace of Mind" as the core value it provides.

- *1 : A system that supports cooperative driving automation by facilitating communication among road infrastructure, autonomous vehicles, surrounding vehicles, and servers.
- *2 : The Ebie Section of the Hanshin Expressway Yodogawa Left Bank Line (Phase 2)
- *3 : A system that supports cooperative driving automation by communicating information among autonomous vehicles, surrounding vehicles, servers, and other relevant entities.
- *4 : Primary Safety, Active Safety, Preventive Safety, Passive Safety and Connected Safety.
- *5 : Zero fatal road accidents among occupants of Subaru vehicles and people involved in collisions with Subaru vehicles, including pedestrians and cyclists.

Reference :

- Envisioning the Future of Infrastructure with Kajima's Optical Fiber Technology (Japanese only) <u>https://www.kajima.co.jp/tech/c_optical_fiber/index.html</u>
- Subaru Installs Local 5G Network at Test Course, Begins Testing Cooperative Driving Automation (August 28, 2024) <u>https://www.subaru.co.jp/news-en/2024_08_28_153204/</u>

4	u		Ц		
7	7	7	7	-	4
,	ı	1	,	1	1