

Press release

East Japan Railway Company 10 September 2024

JR East's plans for driverless Shinkansen operation

- Changes in Japan's social environment, such as decrease in population and new work styles, are behind East Japan Railway Company's innovative step toward driverless operation, which will continue to transform the JR East Group into a more efficient and sustainable railway, as set out in the Group's Management Vision "Move UP" 2027.
- Automated operation is expected to further raise levels of safety and reliability in transport, in addition to contributing to greater efficiency in operations. Driverless operation will allow trains to operate more flexibly according to passenger demand and free train crew to perform other important tasks.
- O The Joetsu Shinkansen has been selected as the world's first high-speed railway line to run on driverless operation, to be followed by the Hokuriku Shinkansen and the Tohoku Shinkansen, placing JR East as a vanguard in driverless operation technology among the world's railways.

driverless operation ... Automated operations that do not require a driver to be on board.

1. Plan details for the automation of Shinkansen operation

- JR East will begin work on ground equipment and vehicles with the aim of modifying the system to adjust to GOA2 automatic operation of commercial and deadhead trains between Nagaoka Station and Niigata Depot (60.8 km) within FY2028, and with GOA4 driverless operation on deadhead trains between Niigata Station and Niigata Depot (5.1 km) beginning in FY2029.
- JR East plans to begin GOA2 automatic operation between Tokyo and Nagaoka stations by the mid-2030s, followed by GOA3 driverless operation for commercial trains between Tokyo and Niigata stations, and GOA4 driverless operation for deadhead trains.
- In the future, automatic operation will also be introduced on the Hokuriku Shinkansen and Tōhoku Shinkansen lines.



Driverless operation (GOA4) test run



Plans for automated Shinkansen operation

GOA : Grade of Automation

GOA2: Semi-automated train operation: Driver on board at the front of the train GOA3: Driverless train operation: Crew on board but does not need to be at the front of the train GOA4: Unattended train operation: No crew on board

2. Research and development for driverless operation

Research and development activities are underway to promote the automation of crew tasks, including details such as operating trains properly according to timetables and detection of abnormalities.

(1) Developing system enabling the most efficient driving patterns

 Research and development is underway to ensure that trains are able to accelerate, decelerate and stop accurately as required in driverless operation, in addition to temporary speed restrictions and unscheduled station stops; to be able to drive automatically according to the timetable and operate efficiently while saving energy.

Test runs with E956-series Shinkansen (ALFA-X) have been taking place since FY2019.

 JR East will start using this system with the introduction of GOA2 automatic operation in FY2028.



E956-series Shinkansen (ALFA-X)





- (2) New function to detect abnormal train vibrations (shaking)
- Research and development to further improve the safety of Shinkansen is underway with a function using an existing bogie monitoring device that will automatically perform an emergency stop on behalf of the driver when abnormal vibrations or shaking is detected in operation.
- JR East will start using this system with the introduction of GOA4 fully-automated operation in FY2029.



Configuration of equipment detecting abnormal vibrations

[Reference] Relevant previous press

•JR East and JR West promote technical cooperation for automated Shinkansen bullet train operation [30 May 2023]

https://www.jreast.co.jp/e/press/2023/pdf/20230530.pdf