

Implementation of one-person operation of 4-car 315 series trains and installation of a safety confirmation support device that uses image recognition technology

We work to restrengthen our management capabilities by using the latest technology. As part of our business reforms to create an efficient business execution system, we have been working toward implementing one-person operation of four-car 315 series trains using cameras installed on the side of the cars (hereinafter referred to as “side-mounted cameras”).

In this situation, in order to improve safety, we have considered the use of image recognition technology that detects people approaching trains using images from the side-mounted cameras. Now that we are confident that this technology can be put to use, we are pleased to announce that we have decided to equip four-car 315 series trains with a safety confirmation support device that uses image recognition technology. We would also like to inform you about future plans for one-person operation of four-car 315 series trains.

1. Verification results of image recognition technology

- Starting in June 2023, four-car 315 series trains equipped with side-mounted cameras were put into service. As a result of having AI learn data taken at various times and in various weather conditions, verifying image recognition technology, and improving its detection accuracy, it was confirmed that it is possible to detect people approaching a train.

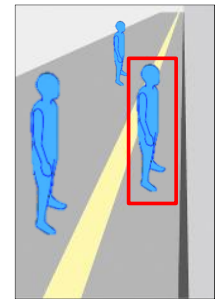


Image of passenger detection

2. Overview of one-person operation and a safety confirmation support device using side-mounted cameras (Attachment 1)

- On trains with a driver and a conductor on board, the conductor operates the doors. Meanwhile, on one-person operated trains equipped with side-mounted cameras, the driver checks the images of the platform from the cameras on a monitor in the driver's cab and operates the doors.
- A safety confirmation support device automatically detects people approaching the train after the doors close, using images from two side-mounted cameras installed on the front and rear sides of each car, and notifies the driver with an alarm or other means so that the driver can stop the train. In this way, this device can better support the driver in checking safety, leading to improvement in the safety of one-person operation using side-mounted cameras.

3. Implementation plan for one-person operation of 4-car 315 series trains (Attachment 2)

- This one-person operation will be implemented on the Kansai Line (between Nagoya Station and Kameyama Station) and the Taketoyo Line during FY2025.
- From FY2026 onwards, this one-person operation will be gradually implemented on the Tokaido Line (between Mishima Station and Numazu Station, between Hamamatsu Station and Toyohashi Station, between Ogaki Station and Maibara Station), the Gotemba Line, and other lines.

4. Other

- The images captured by the side-mounted cameras are intended to detect approaching passengers and to allow the driver to check platform safety, but are not intended to identify specific individuals.

Overview of one-person operation and a safety confirmation support device using side-mounted cameras

○ How the driver checks platform safety (one-person operation)

<Present (2-car train)>

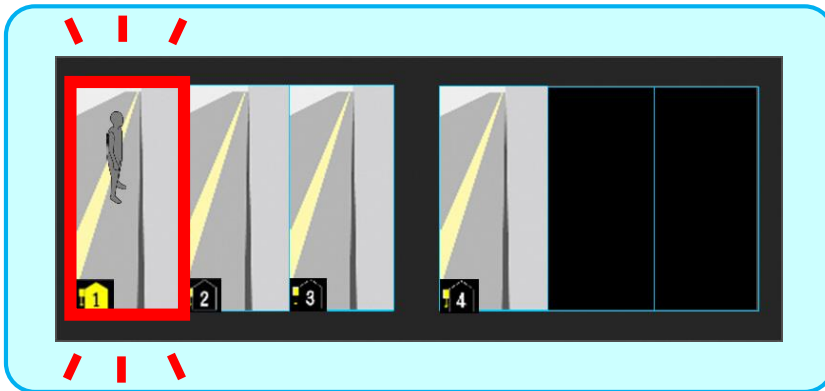
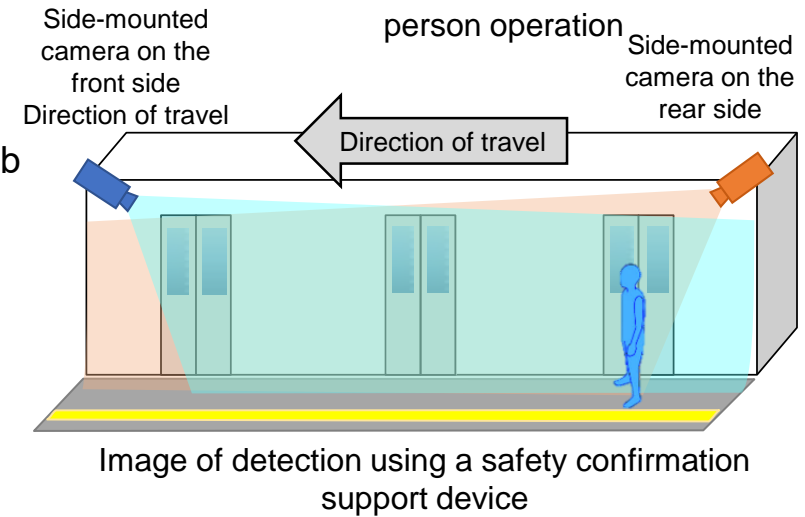
- Check passengers getting on and off the train directly or with a convex mirror for one-person operation installed on the platform
- Check platform safety with a convex mirror for one-person operation when the train departs



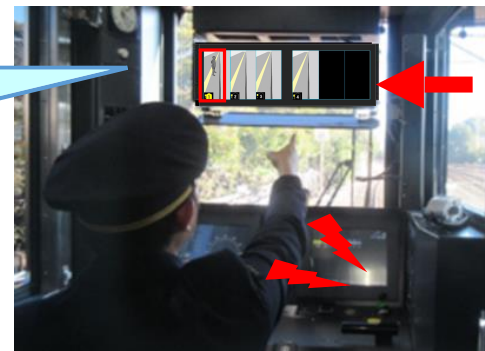
Convex mirror for one-person operation

<Future (4-car 315 series train)>

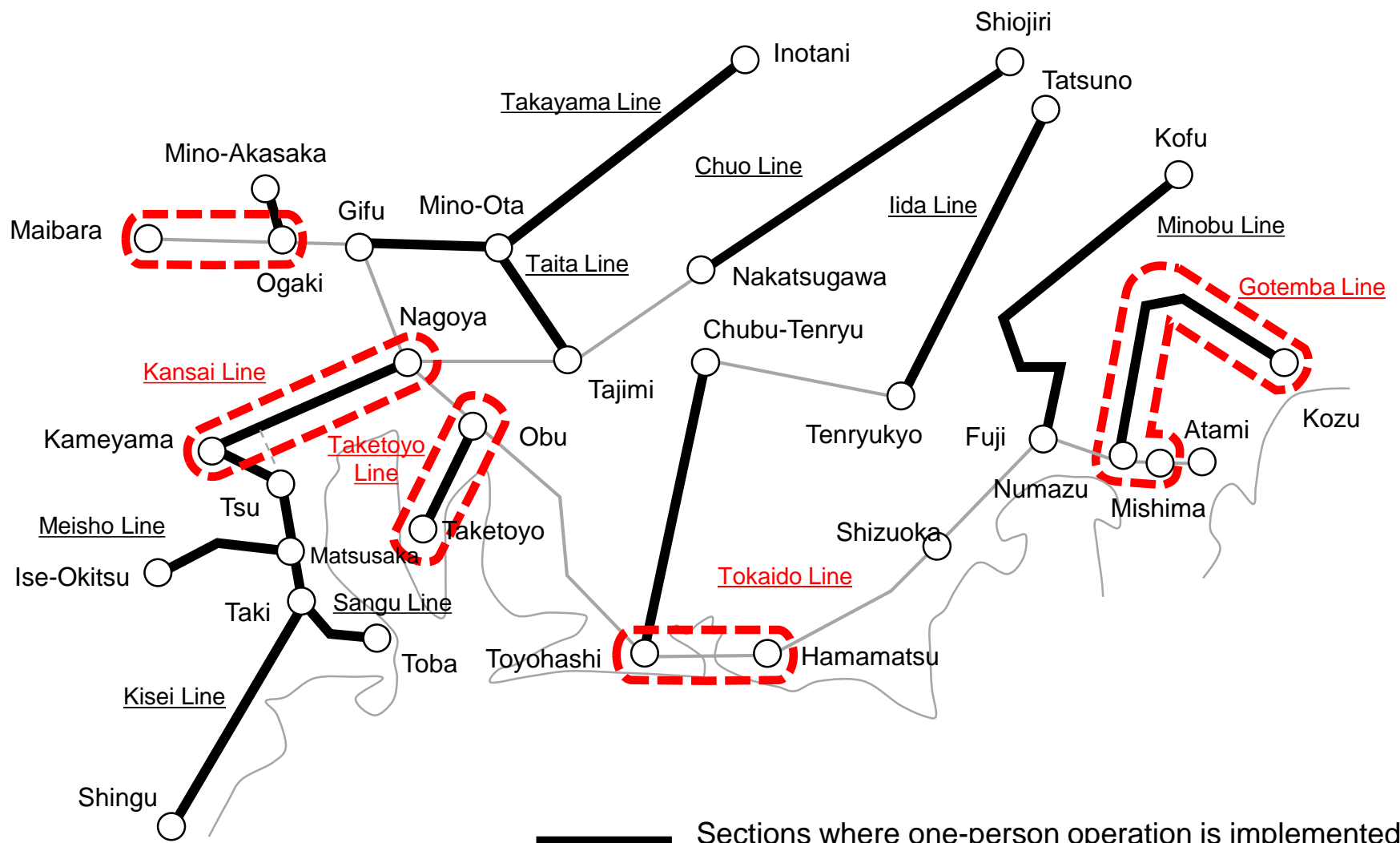
- Check platform safety with images from the side-mounted cameras, which are projected onto a monitor in the driver's cab
 - * Images from the side-mounted cameras on the front side of each car are projected onto the monitor.
- If a person approaches the train after the doors close, this is automatically detected using AI-based image recognition technology.
- The driver is notified of the detection by an alarm or other means.



Monitor display image upon detection



Implementation plan for one-person operation of 4-car 315 series trains



— Sections where one-person operation is implemented (as of June 2024)

⎓ Planned sections for one-person operation of 4-car 315 series trains