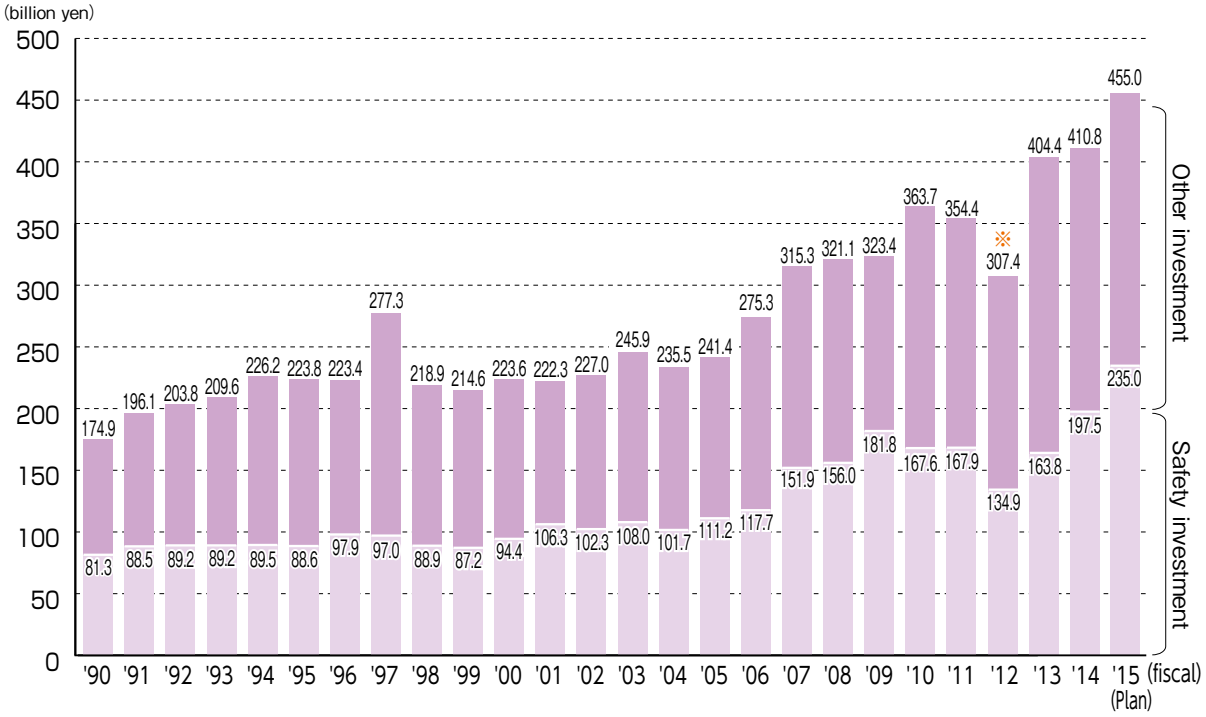
Promoting the priority improvement plan for safety equipment

Investment in safety equipment for "extreme safety levels"

To achieve a more assured level of safety in railway operations, weak points in the current systems must be identified and reviewed from a safety standpoint. Furthermore, safety equipment must undergo intensive and effective assessments in order to prevent the occurrence of accidents in the future. JR East analyses and evaluates all potential areas of risk and takes appropriate measures to ensure that these risks do not become reality, placing priority on facility investments in order to avert any major damage in the case of a major earthquake in the Tokyo metropolitan area.
For improvements to safety equipment, under our five previous 5-year Safety Plans leading up to FY2014, JR East invested more than 3 trillion yen during those 27 years following the company's establishment. In our Group Safety Plan 2018, JR East's sixth 5-year Safety Plan which began in FY2015, JR East has planned to invest approximately 1 trillion yen on safety measures during the five years from FY2015 to FY2019.

■ Trends in safety investment

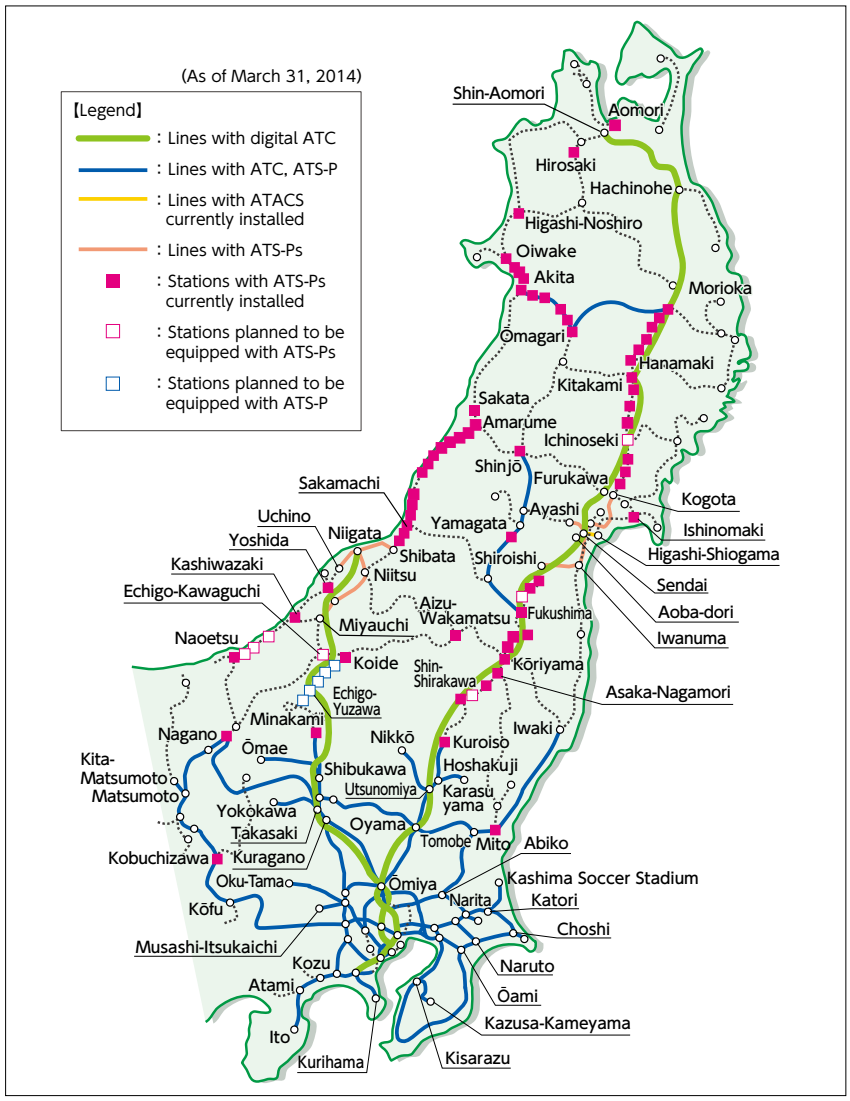


* Due to the effects of the Great East Japan Earthquake, there was a decrease in the FY2012 safety investment.

Installing safety equipment

To prevent collisions between trains, JR East has installed ATS (automatic train stop) and ATC (automatic train control) systems on all of its railway lines. To heighten the current safety level of train operations even further, we are installing ATS-P and ATS-Ps systems, which employ continuous speed monitoring functions. The number of installations is steadily increasing; most are in the Tokyo metropolitan area.
By the end of March 2014, the ATS-P system had been installed on 2,406.1 km of railway line. The ATS-Ps system is currently installed on 210.5 km of line in the Sendai and Niigata regions and at 64 stations. Additionally, JR East replaced the ATS-Ps on the section of the Senseki Line between Aoba-dori and Higashi-Shiogama with its Advanced Train Administration and Communications System (ATACS), a radio-controlled train operation control system, in October of 2011.
In response to revisions to the Ministry Ordinance for technological standards for railways in July 2006, we are working on measures to prevent excessive train speeds at curves, turnouts, and terminals, and on descending grades. Planned improvements at all curves that had been targeted for action were completed by the end of March 2010.

■ Railway lines and stations with ATC, ATS-P and ATS-Ps systems



■ Measures to prevent excessive train speeds

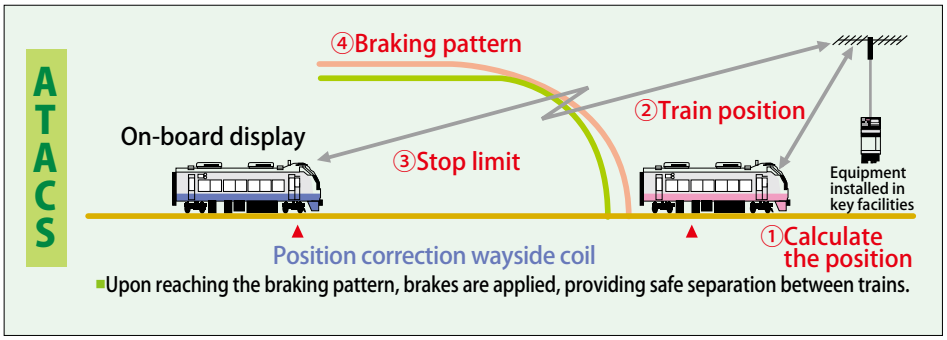
	Target locations	Installations as of the end of FY2014	Planned completion
Curves	1,468 locations	1,468 locations	Completed in FY2010
Turnouts	816 stations	743 stations	FY2016
Line terminals	63 stations	62 stations	FY2016
Descending grades	1,528 locations	896 locations	FY2016

* Including locations which were improved prior to revisions to the ministry ordinance.

Introduction of the Advanced Train Administration and Communications System (ATACS): train control system with radio transmission

ATACS is a train control system utilizing radio transmissions. By using radio communications for the transmission of information between ground and on-board facilities, the system enables the trains to be mainly controlled by on-board equipment, permitting reductions in traditionally required facilities such as signals, connecting cables, and track circuits, which are currently used for the detection of trains.
Eliminating these facilities is expected to reduce the number of facility failures and the number of subsequent transport disruptions.
JR East began using the ATACS system in October 2011 on the Senseki Line between Aoba-dori and Higashi-Shiogama. In December 2012, as one of our 2nd stage functions, JR East released a new function for setting provisional speed limits. From 2014 onwards, we plan to release another new function for controlling road traffic at level crossings.

■ ATACS (image)



Systemization of maintenance work

When starting maintenance work on railway tracks, JR East works to ensure the safety of its trains and maintenance workers by following procedures to set signals to red, so that trains do not enter sections of railway where maintenance work is being conducted. In the past, this was done mainly via telephone from maintenance workers to stations. However, in order to prevent any occurrence of error, including human error, JR East adopted a method for maintenance workers to operate handheld devices to change signals to red, and the devices have since been introduced to major railway sections in the Tokyo metropolitan area. In the future, JR East aims to continue its efforts to improve the safety of its operations through the systemization of its maintenance work in other railway sections as well.

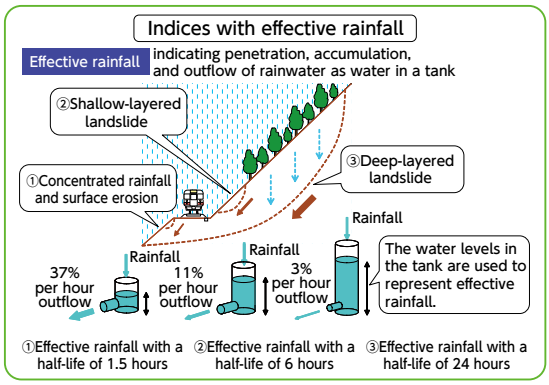
Track closure procedure by a handheld device for maintenance work

The operation center terminal for the confirmation of maintenance work

Introduction of "effective rainfall" as a new indicator

When there is heavy rainfall, we ensure train safety through operational restrictions such as limits to train speed and, when necessary, by suspension of operations. For operational restrictions on conventional lines, we have been using hourly rainfall[*1] and continuous precipitation[*2] as our indices. Since June 2008, we have been using "effective rainfall" as a new indicator that is effective in prevention of landslide disasters due to rainfall. Effective rainfall is the amount of underground water remaining after changes over time in ground penetration and outflow. Using this indicator, we can more precisely predict the occurrence of landslide disasters, improving the safety and reliability of our train operations.

*1: Hourly rainfall: the total rainfall over a one-hour period
*2: Continuous precipitation: the total continuous rainfall over a 12-hour period



Effective rainfall indices

Measures to prevent accidents at rail crossings

When the company was established in 1987, there were 247 accidents during the year at rail crossings with roads. In FY2014, the number had been drastically reduced to 36. Approximately 60% of all rail-crossing accidents involve automobiles. We have installed devices such as obstacle detectors, which are capable of detecting an obstacle such as an automobile stalled on a crossing and stopping trains, and we have increased the number of crossing warning devices in a higher position for better visibility. Larger crossing gates have been installed; the barrier arms are thicker than usual. These are expected to provide better visibility day and night. We are also promoting a wide range of public relations activities for the prevention of rail crossing accidents, appealing to drivers for their cooperation and understanding.

In addition, for countermeasures against secondary accidents resulting from derailments at level crossings with roads, derailment prevention guards have been installed at these crossings. The long-term solution is to decrease the number of rail crossings, and we are cooperating with local governments, neighboring residents, and the police to increase the number of overhead crossings.

As examples of our most recent efforts, in 2005 JR East began working to improve safety at the Sojiji Temple rail crossing on the Tokaido Line near Tsurumi Station, where there had been more trouble than at other rail crossings in the Tokyo area, because it is on a curve with limited visibility. The overhead pedestrian crossing was rebuilt to be barrier-free and in FY2011 the rail crossing was closed during rush hours. Closed hours were extended to between 6:00 and 21:00 in FY2012, and, as a result of our agreements with concerned parties, from April 1, 2012, this rail crossing has been closed to road traffic at all times.

Learning lessons from an accident at a rail crossing on the Iiyama Line between Morimiyanohara and Ashidaki on February 1, 2011, JR East has introduced a rule to stop trains at stations when the warning signals at a crossing are being activated due to causes such as equipment failures, and when pedestrians and automobiles are allowed to use the crossing, to ensure that train operations do not endanger pedestrians or automobiles. JR East also formulated a procedure for field staff to prevent failures in safety confirmation.

A crossing warning device located in a higher position for better visibility

A large crossing gate

Station platform safety

In FY2014, there were 88 accidents in which customers fell from platforms onto tracks or came into contact with trains. JR East is installing protection-related devices, including emergency train-stop systems, on our platforms to ensure customer safety. Customer awareness and cooperation are also vital to safety on our platforms, and we are implementing our "Zero Platform Accident Campaign" through posters, as a measure to heighten this awareness.

As a major measure to prevent accidents involving customers on platforms, JR East is introducing automatic platform gates on the Yamanote Line. In FY2014, we started the use of these gates at Otsuka, Sugamo, Komagome, Shin-Okubo, Mejiro, Takadanobaba, and Tamachi stations. In FY2015, we plan to install these gates at Okachimachi, Uguisudani, Tabata, Yurakucho, Harajuku, Gotanda, and Nishi Nippori stations. With the exception of six stations, Shinagawa, Hamamatsucho, Shimbashi, Shibuya, Shinjuku, and Tokyo stations, which require large-scale improvement work, we plan to complete installations at all stations on the line by FY2016. For routes other than the Yamanote Line, we plan to install automatic platform gates mainly at stations used frequently by visually challenged customers, while discussing these matters with concerned organizations.

For stations where the daily number of passengers exceeds 100,000, JR East is currently working to install an increased number of dot-Braille blocks that indicate which direction is away from the edge of the platform.

Automatic platform gates on the Yamanote Line

■ Installation status for platform doors