> OVERVIEW

The business environment in which JR East operates is changing rapidly because of the diversification and increasing sophistication of customer needs, the aging of the population, Japan's low birth rate and deregulation. As part of its adaptation to this environment, the JR East Group established the Research and Development Center of JR East Group in December 2001. The Center will serve as an integrated organization for the Group's R&D activities, which were previously dispersed. Through this center, JR East carries out technological development to further enhance safety, reduce costs and undertake other timely objectives.

The R&D focus for the JR East Group is the *e@train* concept. We refer to the newest and best form of "what the railway of the future should be" as *e@train*. It integrates the technological advancements and human imagination of the times and is subject to constant improvement as we harness ongoing technological developments and new ideas. The aim of this concept is to develop a safe, punctual, comfortable and easy-to-use railway system that is capable of meeting the diverse needs of customers. We will realize this goal by applying our accumulated technical knowledge and advanced technology to the creation of new value.

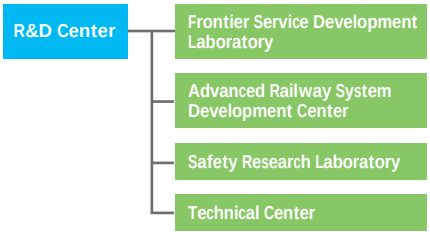
The letter "e" stands for various meanings, including "enjoyment," "environmental friendliness," "entertainment" and "economy."

> TOPIC

Principal *e@train* Research Themes

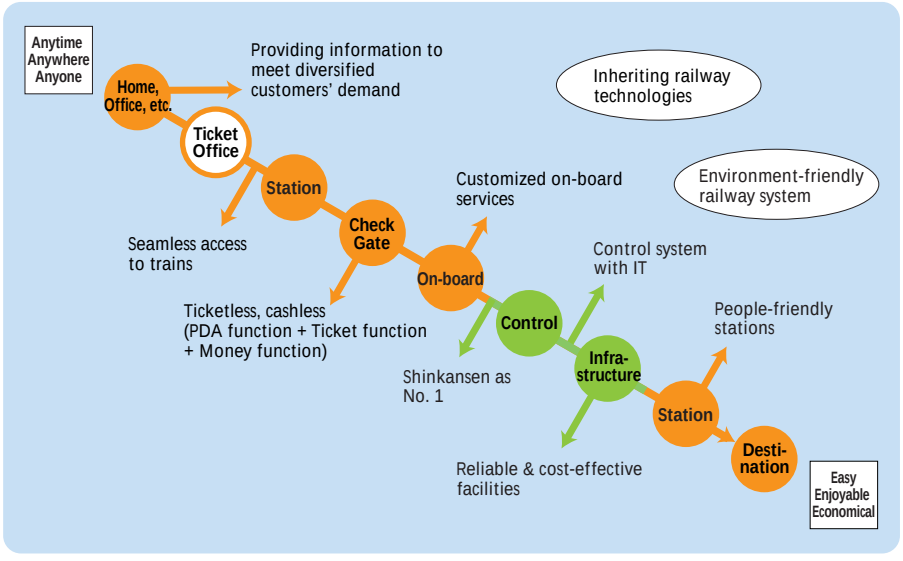
With the aim of realizing its *e@train* railway concept, each of the four R&D facilities of the Research and Development Center of JR East Group currently carries out the following research.

Research & Development Center of JR East Group



Research and Development Center of JR East Group
Opened in December 2001, the new Research and Development Center is located in Saitama City, about 30 minutes by train from central Tokyo.

New Railway Concept "e@train"



• FRONTIER SERVICE DEVELOPMENT LABORATORY

Marketing

This facility carries out innovative primary research in marketing, for example by conducting surveys to predict future trends. Because the Company's services in the past tended to be biased toward those centered on hardware, personnel have been recruited from outside of the JR East Group.

Services Using IT

JR East is conducting research and development related to a variety of high-tech service enhancements based on advanced information technology. This includes realization of ticketless and cashless transactions by the further development of *Suica,* development of a security system geared to railway stations and the development of ticket sales terminals with voice recognition capabilities.

• ADVANCED RAILWAY SYSTEM DEVELOPMENT CENTER

Advanced Commuter (AC) Train

The *AC Train* is a next-generation commuter train designed to meet passenger needs in the 21st century. Track trials commenced in February 2002.

The World's Best High-Speed Rail System (Shinkansen)

With the aim to make its Shinkansen system the world's best high-speed rail system, JR East continues to develop improved trains and infrastructure for its Shinkansen. JR East is developing faster, more comfortable and more environment-friendly Shinkansen.

Renovation of Control System Advances

Previously, train location was detected by using track circuits. In the new IT-based train control system *ATACS*, a train detects its location by itself. By introducing *ATACS,* we will continue to reduce costs by efficiently allocating the ground and on-board equipment, to further improve safety and to improve transportation efficiency by using IT to the full.

• SAFETY RESEARCH LABORATORY

Preventing Major Accidents

The Safety Research Laboratory leads R&D activities relating to the elimination or reduction of the four types of risk affecting safety: collisions, level crossing accidents, natural disasters and derailments.

• TECHNICAL CENTER

Maintenance Cost Reduction

The Technical Center carries out a variety of development activities relating to the reduction of maintenance costs. Project areas include labor-saving equipment and mechanization systems.

The *AC Train*
A train which addresses the needs of the 21st century, such as cost reduction, improved transport reliability, improved passenger services, improved transportation accessibility and environment-friendly operation.

East-i
This next-generation integrated electrical testing vehicle operates on Shinkansen tracks. It handles tasks that previously had to be performed manually, such as track inspections and testing of contact wires.

TC type low-maintenance track
This track was designed to minimize labor requirements for maintenance tasks.