

BUILD RELIABLE INFORMATION AND COMMUNICATIONS INFRASTRUCTURE

NEC has built highly reliable information and communications infrastructure based on ICT for many years, so it can help establish a society where people can lead safer, more secure and comfortable lives.

Here, we present traffic management systems for expressways that underpin the foundation of the transportation network.

Traffic Management Systems for Ensuring the Safety and Security of Expressways

Leveraging Years of Expertise and Advanced Technological Prowess to Build Expressways with Customers

The Shin-Tomei Expressway opened in April 2012. The new route has dispersed traffic and eased congestion between Tokyo and Nagoya, contributing to more efficient and safer driving.

NEC delivered a traffic control system to Central Nippon Expressway Company Limited (NEXCO Central) for the new expressway.

NEC has supplied traffic management systems to expressway operators since 1984. Deliveries have been for the Tomei Expressway, the Meishin Expressway, the Hokuriku Expressway, the Tohoku and Joban Expressways, and the Chuo Expressway. Our traffic management systems are the fruit of this expertise and advanced technological capabilities and tackling various systems operations challenges in the field with customers.



Road information boards at the turnoff for the Shin-Tomei Expressway



Tomei Expressway and Shin-Tomei Expressway (Excerpt from NEXCO Central's website)

Systems That Drivers and Operators Can Trust

Japan has a nationwide network of expressways: social infrastructure that is essential for trucks to transport massive volumes of cargo and for passenger cars to travel efficiently. Traffic management systems function around the clock, 365 days a year so drivers using these expressways can travel safely, securely, and comfortably.

NEXCO Central has positioned the provision of real-time traffic information as a pivotal concept in the development of new traffic management systems. On the Tomei Expressway, the collection of road data and the supply of traffic information is at roughly five-minute intervals. By realizing the concept of reducing the interval to about one minute, or five times quicker than today, more realistically reliable information can be obtained with few time lags.

It is essential to build a comprehensive information environment in which personnel at expressway control centers housing traffic control systems can accurately assess road conditions based on information gathered in real time, with information being quickly shared and confirmed in the center. A vital priority is to make networks more robust and highly reliable so systems can remain operational even after major disasters.



Traffic information is provided by information terminals at service areas

Facilitating Real-time Information Provision with High-speed Processing of Big Data

Expressways already deploy traffic counters, rain, wind, and other weather information sensors, seismographs, boards that inform drivers about traffic conditions, and other facilities.

The Shin-Tomei Expressway offers vastly improved equipment for inputting and outputting information. For example, traffic counters are positioned at intervals of one kilometer, compared with two-kilometer intervals on the Tomei Expressway. Furthermore, data are collected every minute on the Shin-Tomei and Tomei expressways. For this, much greater processing power is required.

NEC's Big Data processing technologies process the huge amounts of collected data, delivering information almost in real time to drivers through road information boards, highway radio transmissions, Vehicle Information and Communication System (VICS*)-enabled car navigation systems, service area information terminals, and other means.

A Grandstand View of Tomei and Shin-Tomei Expressways' Road Conditions on a Giant Screen

At its Tokyo control center, NEXCO Central installed a 4 meter by 18 meter display that comprises 64 46-inch LCDs.

Screens show conditions on the Tomei Expressway,



The giant screen at the control center

Shin-Tomei Expressway, and related highways that the center controls. They also show at a glance and in real time where accidents, congestion, weather changes, earthquakes, or other phenomena have occurred.

Traffic controllers keep tabs on constantly changing information on screens, issuing accident response and traffic restriction instructions as needed to locations.

Quick and Stable Collection, Processing and Provision of Various Information via Optical IP Networks

The speed of networks underpinning new traffic management systems has been accelerated using optical IP technologies so they can gather, process, and rapidly deliver vast amounts of information.

Furthermore, innovations in network structure create a framework in which communications remain stable even if failures occur.

We are also constructing backup systems so that if the Tokyo control center goes down in a major disaster, counterpart centers can take over its tasks.

Aiming to Realize Safe, Secure and Comfortable Transportation Infrastructure

It is said that effectively harnessing Big Data and networks can contribute to resolving various issues arising from motorization, including increases in traffic accidents, congestion, and air pollution. NEC will take even more advantage of its expertise in using such tools to pursue the challenge of creating new value and thereby contribute to the realization of safe, secure, and comfortable transportation infrastructure.

* VICS (Vehicle Information and Communication System): An information and communication system that communicates congestion, traffic restrictions and other road traffic information in real time and displays text and graphics on car navigation systems and other in-vehicle devices.