GNSS Utilisation in the East Japan Railway Company

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Service Areas of the JR East

- **Shinkansen**
  - 1,194.2 km

- **Conventional Lines (Around Tokyo Area Network)**
  - 2,535.9 km

- **Conventional Lines (Other Network)**
  - 3,628.2 km

- **BRT (Bus Rapid Transit) Line**
  - 116.5 km

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Stations with More Than 500,000 Passengers Daily
Basic Information of the JR East

Number of Employees
58,550

Number of Stations
1,665

Number of Train
12,416 / day

Passenger Line Network
7,474.8 km

Number of Passengers Served Daily
About 17 million
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The social background

Slowly shrinking population
Advances in IoT, Big Data and AI

Mid-to-Long term Vision for Technological Innovation

1. Safety • Security
2. Service and Marketing
3. Operation & Maintenance
4. Energy and Environment
Revolution in Mobility

1. Safety - Security
   “Predict and Minimize Risk”

2. Service and Marketing
   “Service Now, Service Here, Service for Me”
Revolution in Mobility

3. Operation & Maintenance
“Devising a work style for a smaller productive population”

4. Energy and Environment
“Establishing a Railway-style Energy Grid”
Revolution in Mobility

1. Safety • Security
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Revolution in Mobility
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History of Geospatial Service Expansion at the JR East

1st Railway GIS; 7,500km Aerial Survey

2nd G-Spatial Information; GNSS and ICT

3rd Mobile Solutions; Cloud and APPs

- Expanded business to ICT business (changed name to ICT Division)
- Began G-spatial solutions business
- Completed JR East Railway GIS (covering all of the approximately 7,500 km of lines)
- Established IT Division
- Created "JR-EAST Train Info" (has reached approximately 1,000,000 downloads)
- Created "Tokyo Station GranChannel"
- Started "BRT Location Service" (began operating Kesennuma BRT)
- Established "JRC Cloud Center" inside ICT Division
- Began operation of "Crew Tablets" on all trains
- Installed JR Kyushu version of Railway GIS
- Began "Train Location System"

Our company is working on improving the service of railways through the effective utilization of ICT, and is proposing and delivering the creation of the optimal spaces focusing on railways as a pioneer that is improving customer service. In 2000, we started the development of the "Railway GIS" for the JR East, and in 2004 we completed an operations assistance system that covers all of the approximately 7,500km of track lines, thereby improving railway efficiency and safety. In 2005, we conducted an aerial survey of the entire railway infrastructure.

In addition, we are providing information through the "JR-EAST Train Info" and "Train Location System" services, which are available on trains, and "Crew Tablets" on all trains, and development and operation of the "JR-EAST Train Info". In the future, we will continue to implement the optimal environment and highest convenience for railway spaces and G-spatial using ICT and propose ICT solutions for creating the optimal spaces focusing on railways looking towards the 2020 Tokyo Olympics and Paralympics, and also for delivering the high precision positioning society as driven for by the Ministry of Land, Infrastructure, Transport and Tourism.
Railway GIS Solutions

Supports a wide variety of work with centralized management of the massive amount of railway infrastructure data and visual management and analysis of railway information.
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Conclusion

GNSS technology is one of the important tools for realizing revolution in mobility, and we will continue to utilize location information from GNSS.

- Preparation of seamless position environment with GNSS insensitive area such as station premises and tunnels.
- Collaboration with High-Precision Positioning Social Project, Ministry of Land, Infrastructure and Transport.

We seek to create new values gleaned from data gathered and synthesized of various data represented by positioning data of railway systems.

For realizing revolution in mobility, we will promote greater ‘open innovation’ to make creative use of the newest technologies from around the world.