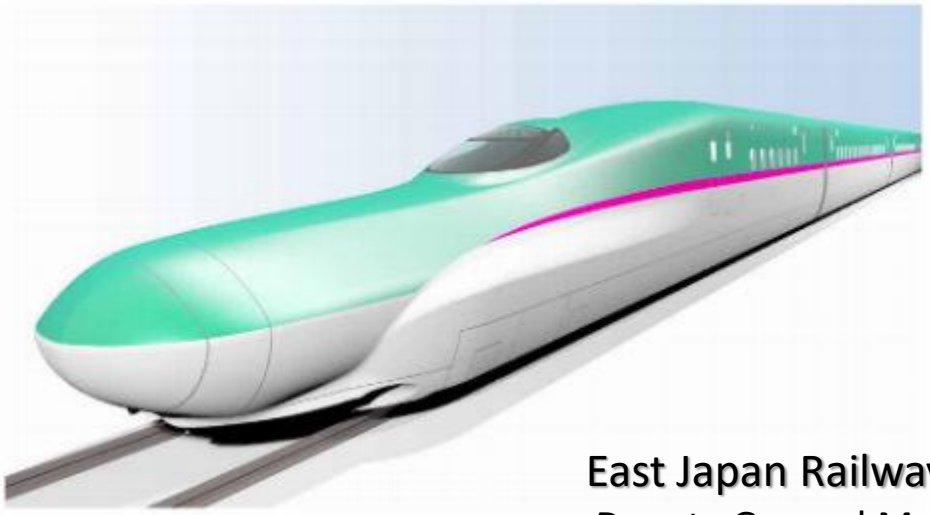
GNSS Utilisation in the East Japan Railway Company



East Japan Railway Company
Deputy General Manager of Signalling System Management Center,
Electrical & Signal Network System Department
Takashi KAWANO

JR East Consultants Company
General Manager of ICT Business Department
Mitsuaki KOBAYASHI

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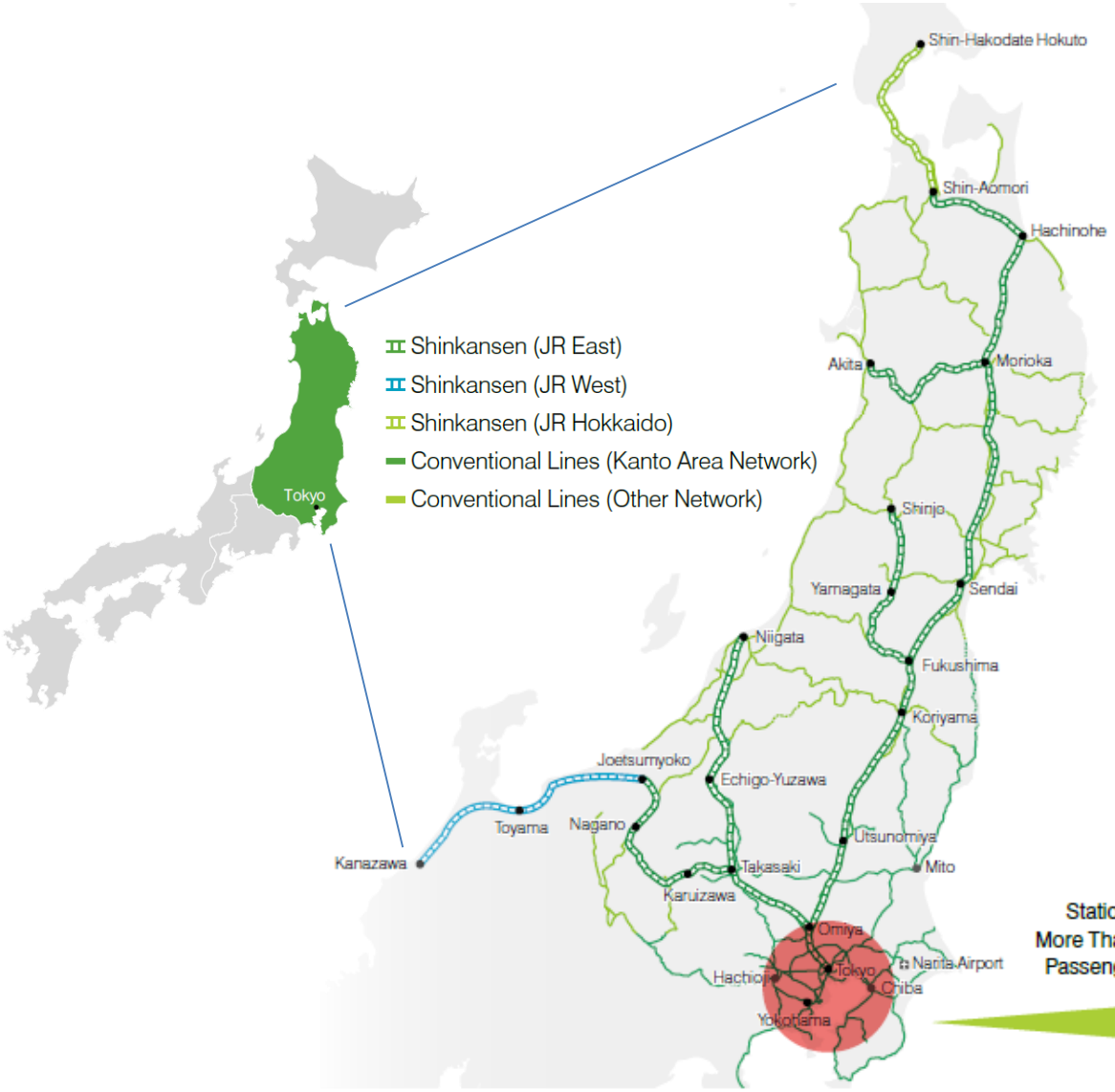
Service Areas of the JR East



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

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

Contents

The social background

Slowly shrinking population
Advances in IoT, Big Data and AI

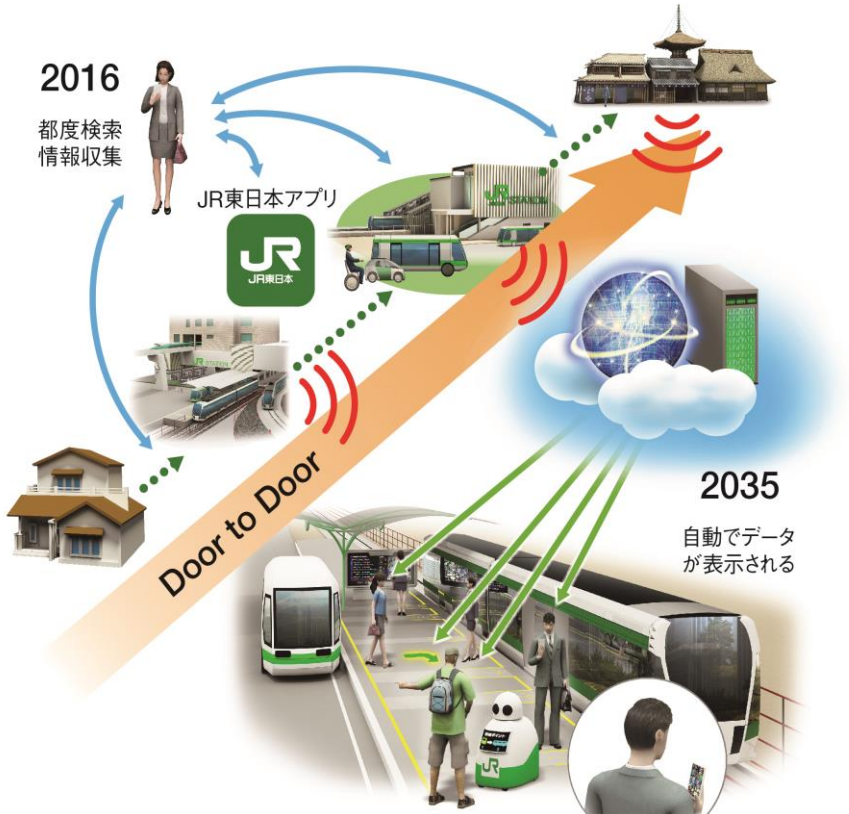
Mid-to-Long term Vision for Technological Innovation

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
"Predict and Minimize Risk"

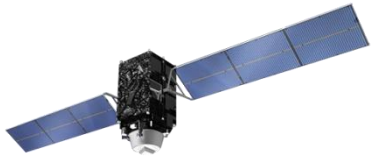
2. Service and Marketing
"Service Now, Service Here, Service for Me"

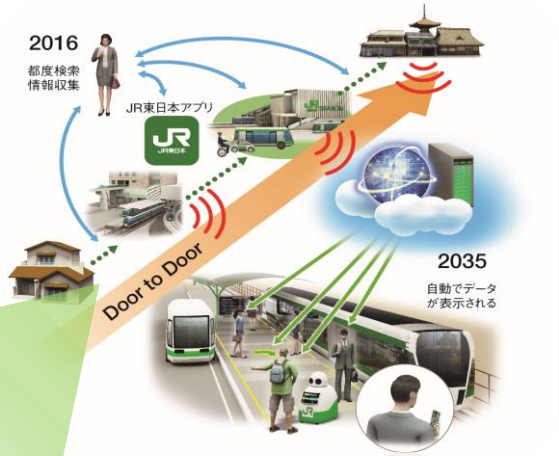
IoT AI Big Data

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





Positioning

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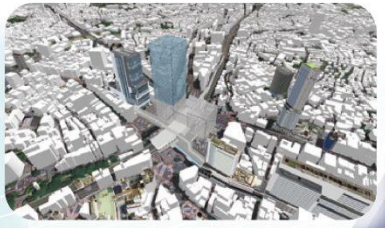
History of Geospatial Service Expansion at the JR East

1st Railway GIS; 7,500km Aerial Survey
2nd G-Spatial Information; GNSS and ICT
3rd Mobile Solutions; Cloud and APPs



- Created "JR-EAST Train Info" (has reached approximately 1,000,000 downloads)

- Established "JRC Cloud Center" inside ICT Division
- Began operation of "Crew Tablets" on all trains
- Created "Tokyo Station GranChannel"

- Started "BRT Location Service" (began operating Kesennuma BRT)

2020

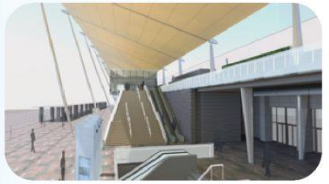
- Expanded business to ICT business (changed name to ICT Division)
- Began G-spatial solutions business

- Began "Train Location System"

- Installed JR Kyushu version of Railway GIS

- Completed JR East Railway GIS (covering all of the approximately 7,500 km of lines)

2015

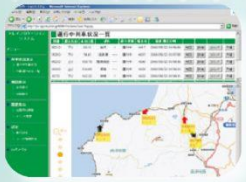


2010

- Established IT Division

2005

- Launched Railway GIS (Geographical Information System)



2000

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 an 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.