

Country Report from Japan

# **Implementation of QZSS Update**

The 53<sup>th</sup> CGSIC Int'l Information Subcommittee

Sept 16, 2013 at Nashville

Hiroshi Nishiguchi  
Japan GPS Council

# *Government Related Issues*

## **Mission of “Office of National Space Policy”**

- A role of Interagency Coordination Office
- To oversee QZSS operation and management
- Governmental Outreach activities

## **Mission of “Space Policy Committee”**

- An Advisory Board to the Prime Minister
- Authorization to assess long term policies relating to the space exploration and budget allocation guidelines
- To replace the legacy “Space Exploration Committee”

# Basic Plan for Space Policy updated on Jan.25, 2013

## (1) Two Basic Policies

- Spreading Space Utilization
- Securing Autonomy

## (2) Three Priority Issues

- Contribute to Enhancement of National Security and Disaster Managements
- Foster Strategic Industries for the 21<sup>st</sup> Century
- Frontier of Space Science

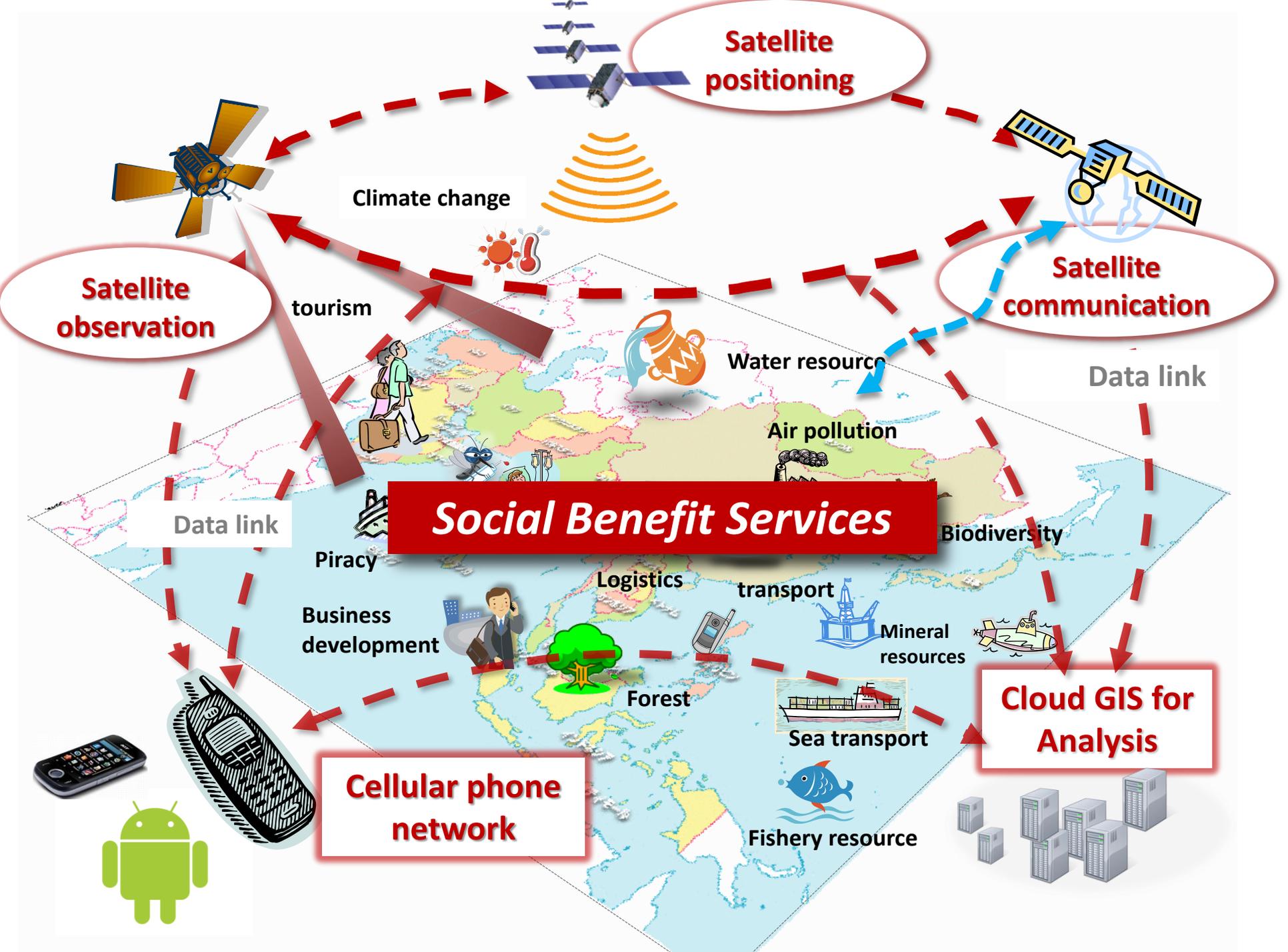
# Basic Plan for Space Policy updated on Jan.25, 2013

## (3) Four(4) social infrastructure

- Augmented and Implemented Space-based PNT
- Space-based Remote sensing
- Advanced Tele-Communication & Broadcasting Satellite
- Space Transport Capability

## (4) Six basic pillars

- Space use for Peaceful Purposes
- Enhancement of Better Quality of Life
- Encouragement of Industrial Competitiveness
- Progress of Social Benefit Services
- Large Contribution to the International Community
- Consideration to the Global Environmental Concerns



# QZSS Satellite (Space Segment) Contract

**An entrusted company was awarded for manufacturing 3 satellites etc. on March 29, 2013.**

Counterparty: Mitsubishi Electric Corporation

Total amount of contract: ¥50,267,595,000

Contract Period: March. 29, 2013 to March. 31, 2017

# QZSS O&M PFI Contract

**The Concessionaire “SPC” ( Special Purpose Company ) was awarded for QZSS Operation & Maintenance on March 29, 2013;**

Concessionaire : a consortium “QZSS Service Company Limited”

Representative Company: NEC Corporation

Member: Mitsubishi UFJ Lease & Finance Company Limited

Cooperative Company: Mitsubishi Electric Corporation

Total Amount of Contract: \117,284,273,802

Contract Period: March. 29, 2013 to March. 31, 2033

# Back Up

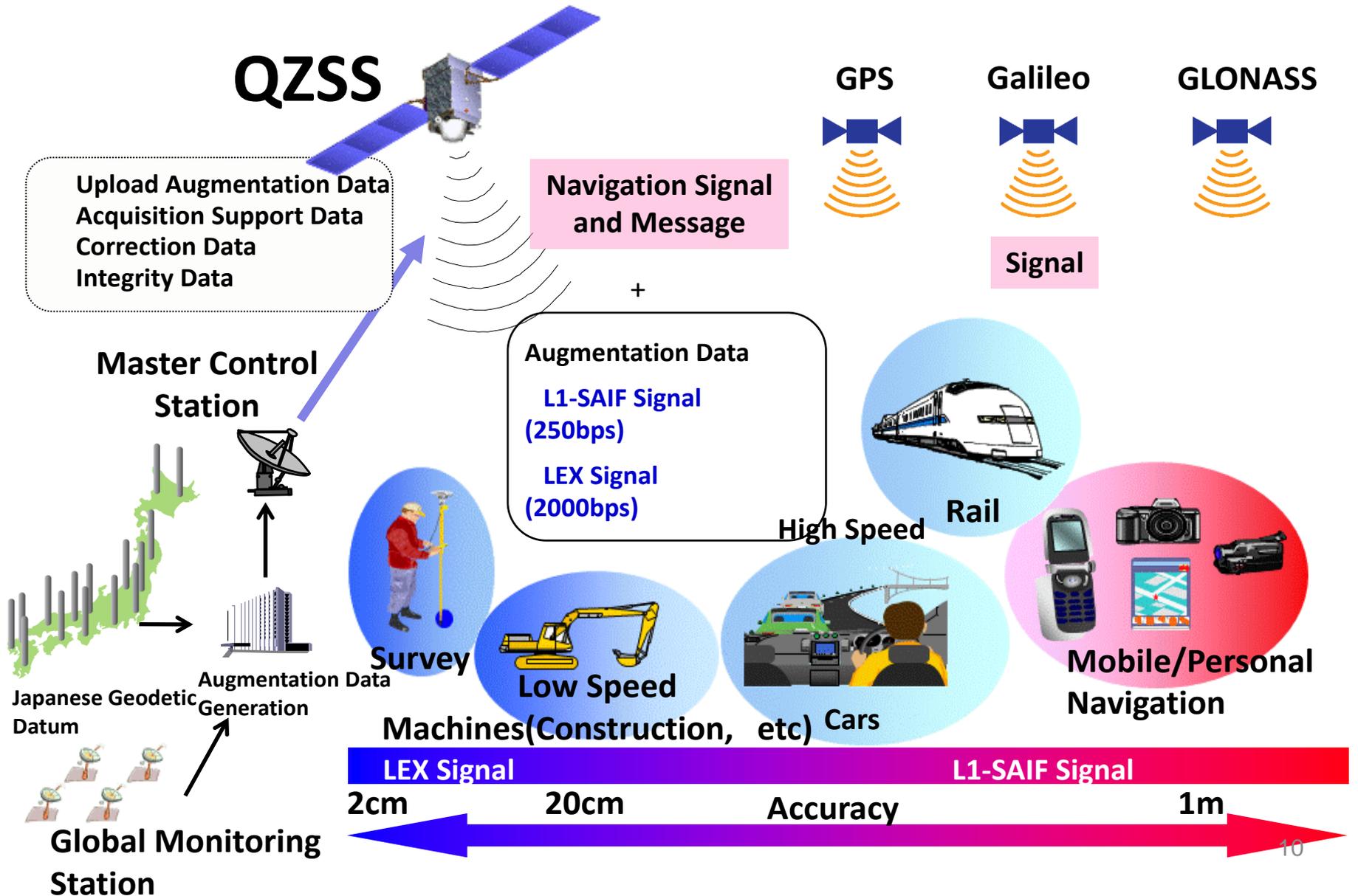
For reference ;

- Demonstration using “MICHIBIKI”
- Current Status of MGA (Multi-GNSS Asia)
- International Human Resources Development

# Application Demonstrations as of December, 2012



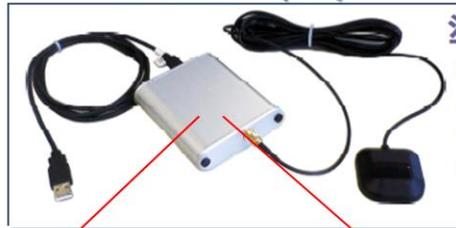
# Application of QZSS Augmentation Signal



# L1-SAIF Application :Personal Navigation

## Verification of a position-fix accuracy improvement

Receiver(Rx)



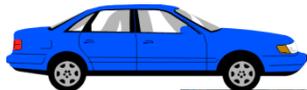
Board

■ with QZS

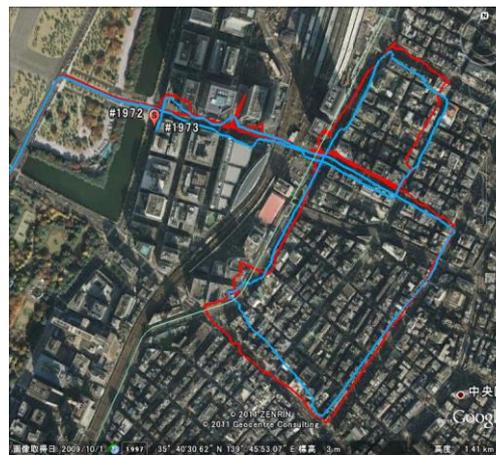
■ other receiver

### Summary

- 1) Positioning accuracy(2D-RMS) is improved from 1.6 [m] to 0.8[m] by using L1-SAIF message.
- 2) QZS improved the performance of positioning ability compare to not using QZS.
- 3) QZS has advantage to increase the number of satellites

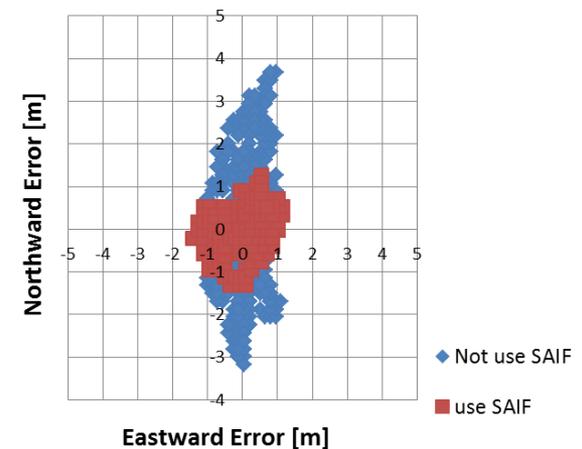


Road test at Yokohama

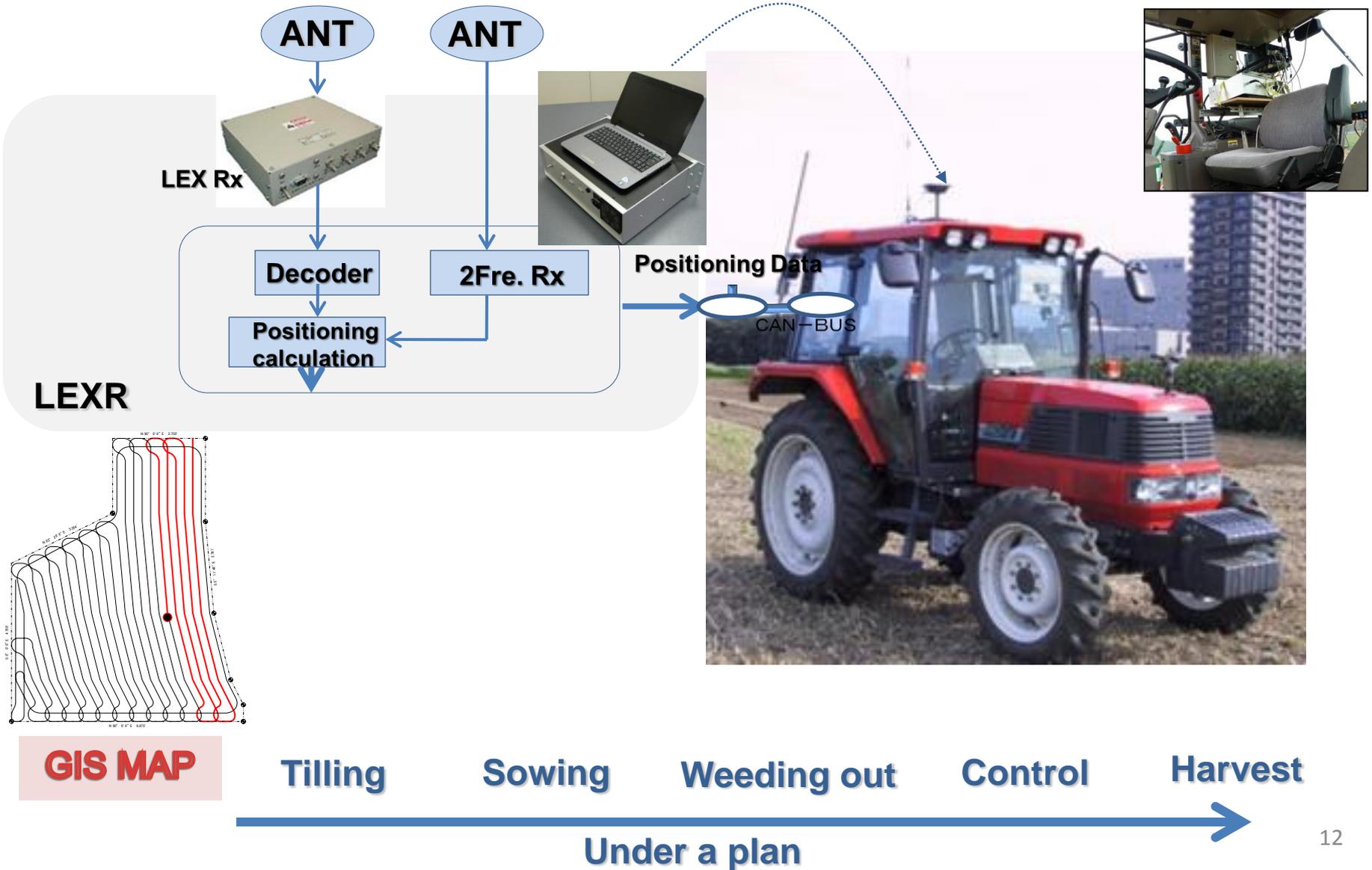


Road test at around Tokyo station

Horizontal Error



# LEX Application: IT Aided Automatic Operation

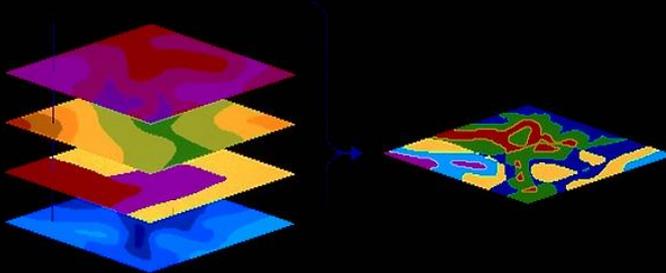


# Precision Agriculture

- Precision Agriculture addresses -
  - Production of high-quality foods and feeds at a site-specific (individual) optimized use of resources for production
  - Economical and ecological improvements in agricultural production
- Precise Positioning with Satellites are effective

## Site Specific

### The Geographical Information System : A Soil Specific Crop Management Tool



Field Information Layers:

- 1) Soil Survey Map
- 2) Aerial CIR Image of Crop
- 3) Management History
- 4) Aerial CIR Image of Bare Soil

Variable Rate Map  
(scale = 1:4,000)

## Economical and Ecological Improvements



# Mission of IT Automated Driving WG

- Prove QZSS-LEX corrections effect for Autonomous Vehicle Control
  - Evaluate LEX Corrections for Vehicle Control Applications such as Farming and Construction Machines (Slow Dynamic Vehicles)

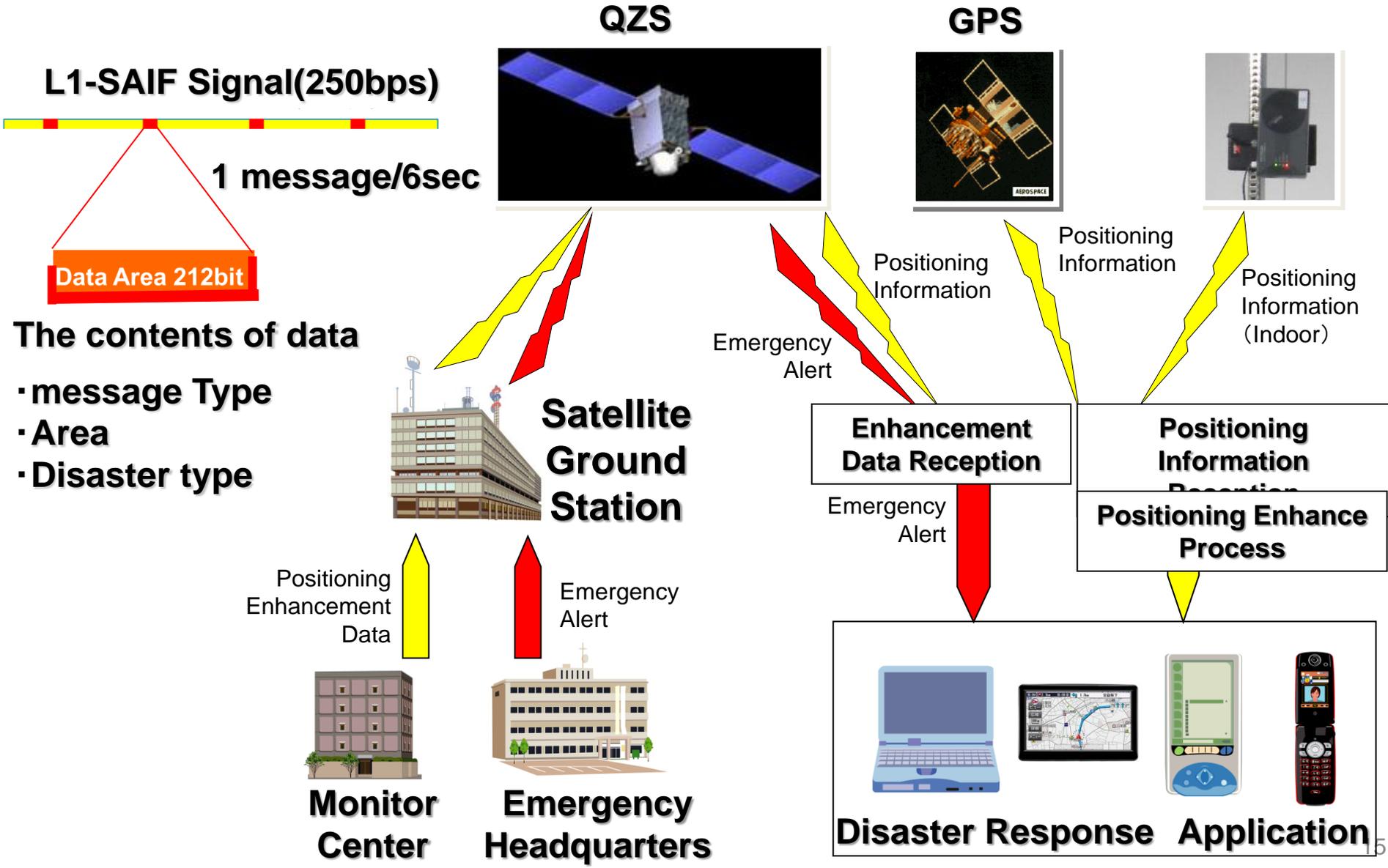


- Evaluation of using QZSS-LEX for vehicle positioning and its precise control
  - Geo Spatial Data Maintenance (Field Maintenance)
  - Un-manned Operation
  - Realize Precision Agriculture using QZSS LEX correction



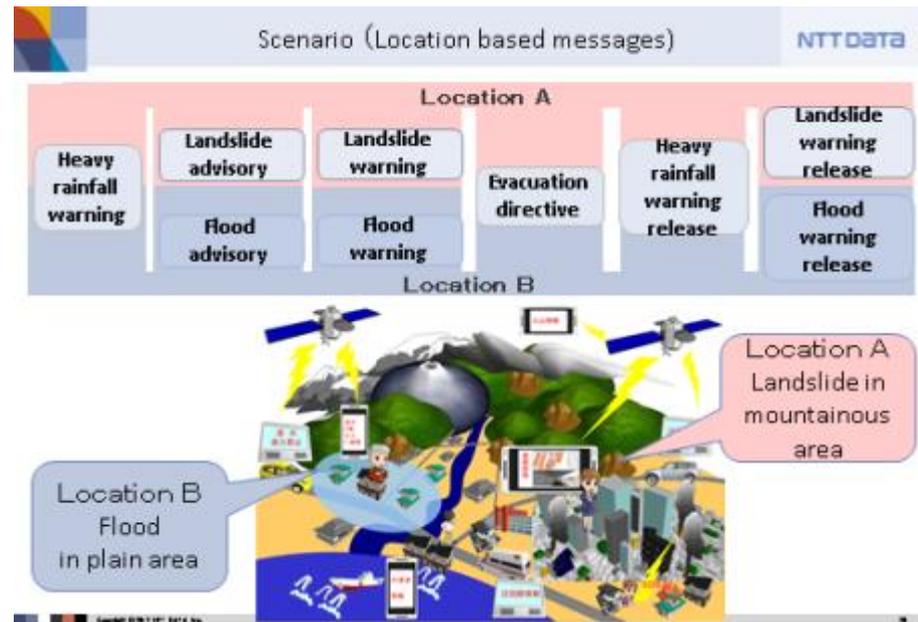
Planting rise Robot  
(Courtesy National Agricultural Research Center)

# Red Rescue System Configuration



# QZSS Emergency Message Demonstration:

Demonstration: People in Malaysia can receive short messages via QZSS, and use emergency information such as early warning and evacuation information based on location.



(c) NTT DATA, Inc.



# Asia Oceania Multi-GNSS Demonstration Campaign

- Campaign consists of three main activities:

## Establishment of Multi-GNSS Monitoring Network



## Application Demonstration

### Disaster Mitigation



### Precise Positioning



### ITS



### LBS



Other, ionospheric observation etc

## Regional Workshop



4<sup>th</sup> Workshop, Dec. 2012 @ Kuala Lumpur, Malaysia:

3<sup>rd</sup> Workshop, Nov. 2011 @ Jeju, Korea:

2<sup>nd</sup> Workshop, Nov. 2010 @ Melbourne, Australia

1<sup>st</sup> Workshop on GNSS, JAN. 2010, @ Bangkok, Thailand