An Introduction to Dynamic Map Platform Co., Ltd.

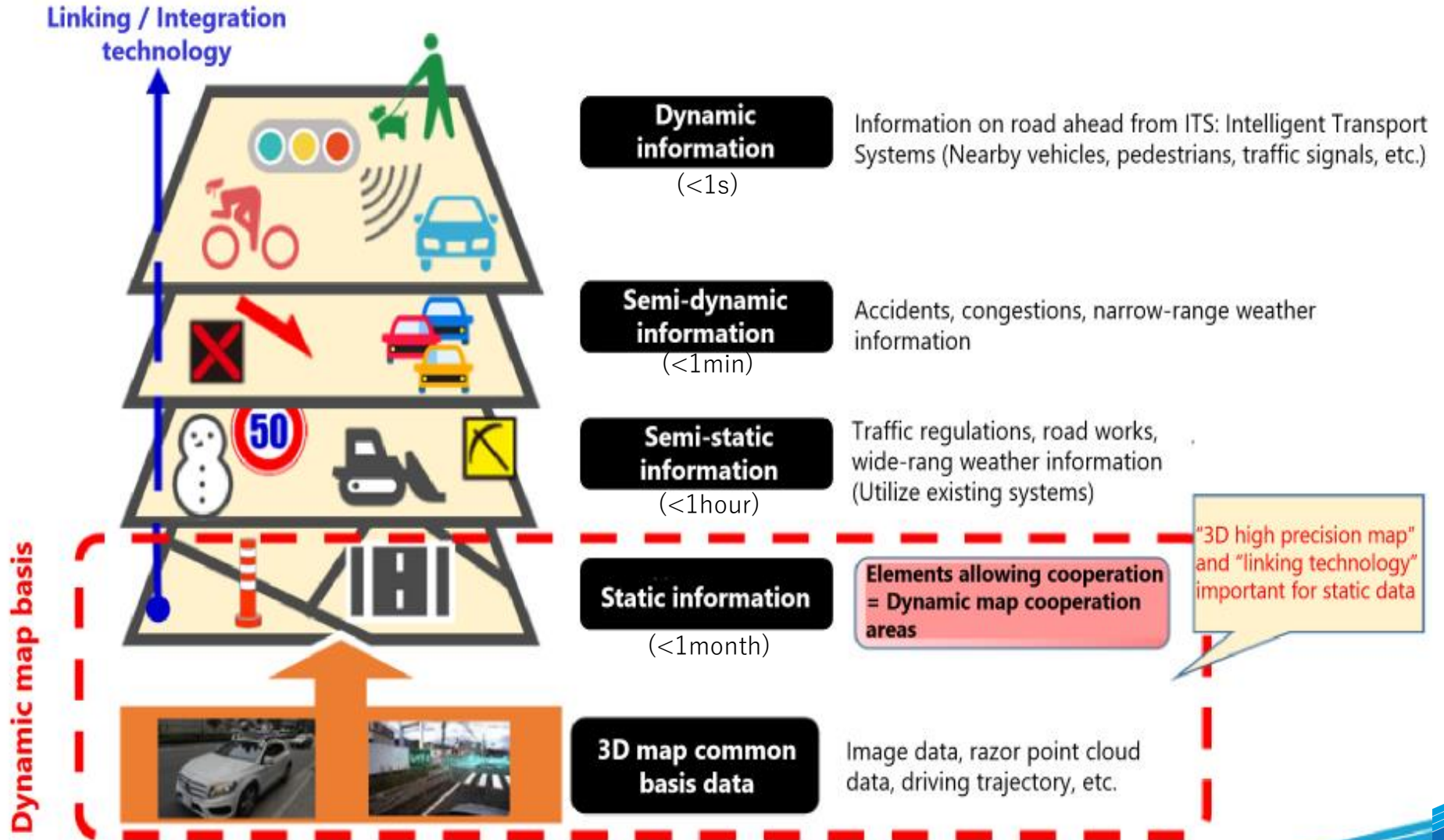## SIP-adus Workshop 2017
Dynamic Map
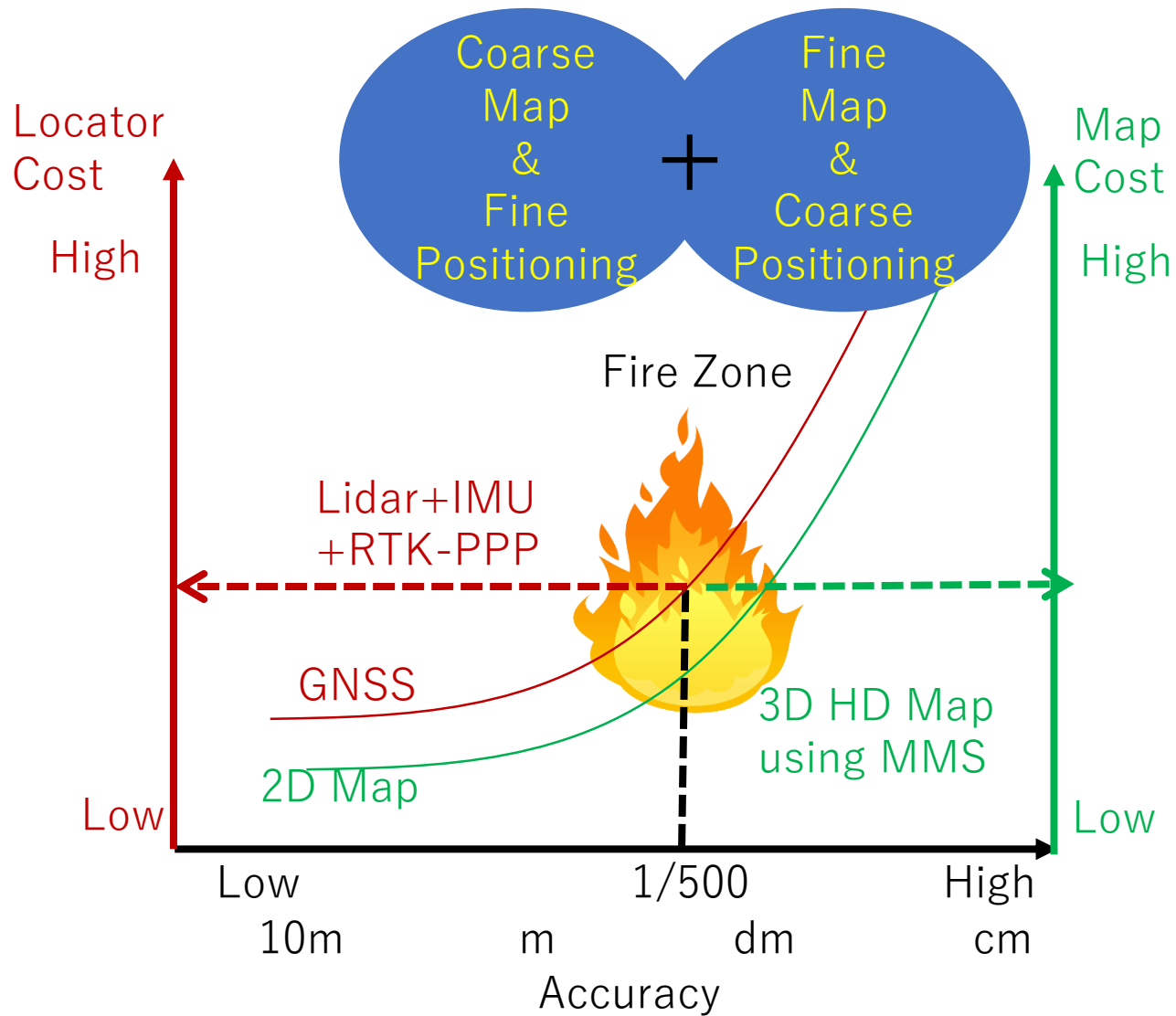
ダイナミックマップ基盤株式会社
2017年11月14日

Who We Are

- DMP is the only company in Japan dedicated to creating the foundation for high-quality, high-precision three-dimensional positioning information

- Leveraging innovative technologies from our founding shareholders, our positioning satellites and proprietary algorithms provide cost-effective and time-efficient tools to classify spatial data for the creation of accurate and robust static maps explicitly for autonomous vehicles' use

- The 10 major Japanese OEMs will be looking to use DMP's mapping solution, with our approved specifications, in Japan and potentially in North America

- DMP is actively mapping Japanese highways, with an aggressive schedule for completing all roads and highways in Japan. In addition, DMP is currently working with strategic partners to begin mapping other countries in Asia.

- DMP has sample data for Silicon Valley which will be available to test upon request at a later date
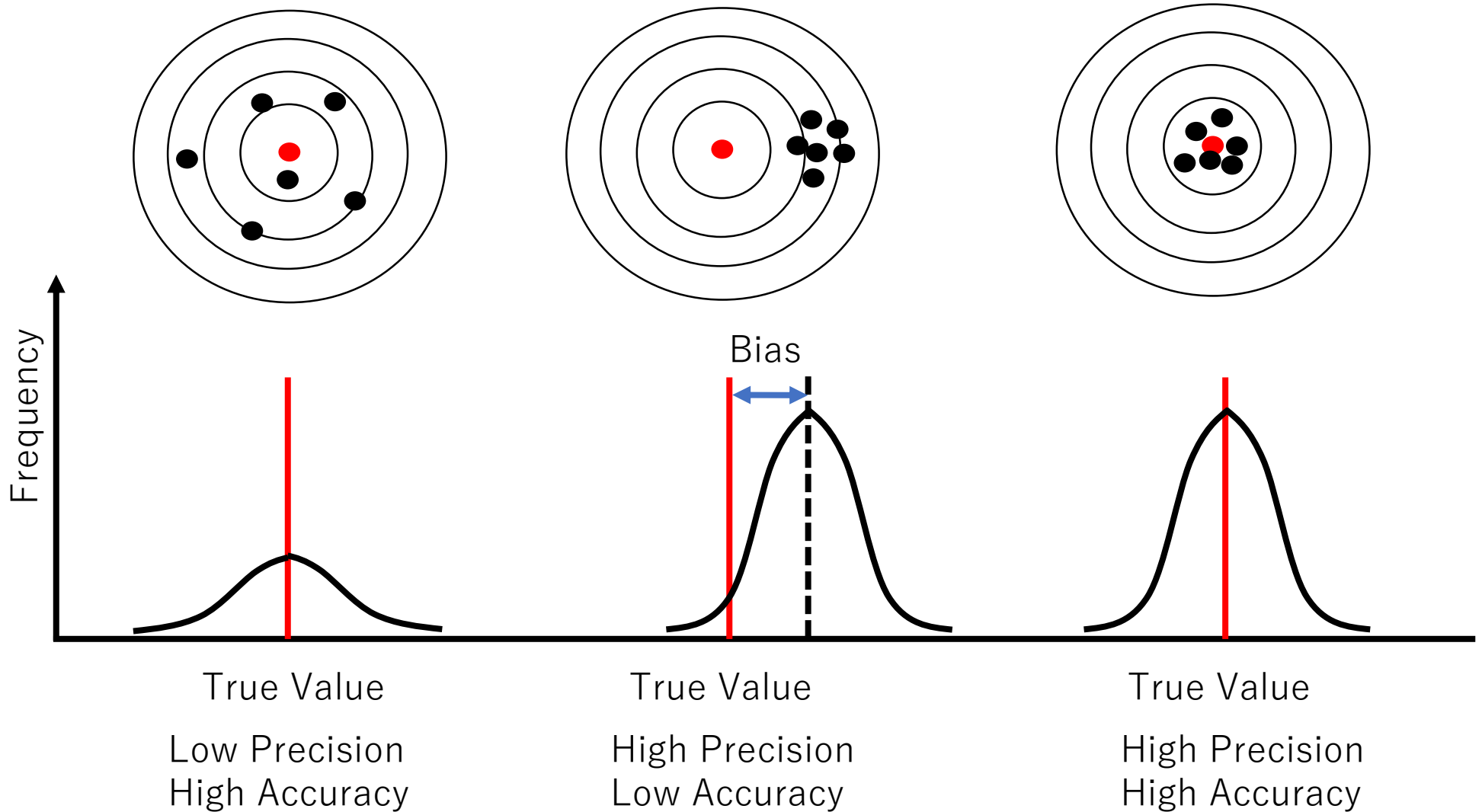
High-Precision 3D Static Map Layer

DYNAMIC MAP PLATFORM

Dynamic maps are real-time maps with dynamic information incorporated in static maps

Linking / Integration technology

Dynamic map basis

Layer	Description
Dynamic information (<1s)	Information on road ahead from ITS: Intelligent Transport Systems (Nearby vehicles, pedestrians, traffic signals, etc.)
Semi-dynamic information (<1min)	Accidents, congestions, narrow-range weather information
Semi-static information (<1hour)	Traffic regulations, road works, wide-rang weather information (Utilize existing systems)
Static information (<1month)	Elements allowing cooperation = Dynamic map cooperation areas
3D map common basis data	Image data, razor point cloud data, driving trajectory, etc.

"3D high precision map" and "linking technology" important for static data

Alternative Fact of Map & Positioning

What "SEIDO(精度)" is

Frequency

True Value

Low Precision
High Accuracy

True Value

High Precision
Low Accuracy

True Value

High Precision
High Accuracy

Bias

Error Factors in Satellite Positioning

Satellite Clock Error

Satellite Orbit Error

Inter-Signal Bias Error

QZS

GNSS

Signal In Space
（SIS）

Altitude
500 to 80 km

Altitude
11 to 0 km

Ionospheric Delay Error

Tropospheric Delay Error

Corrections
by receivers

CORS

Signal In Reference (SIR)

Corrections
by Applications

Multipath Error

Dilution of Precision (DOP)

Generate
Corrections

User Position
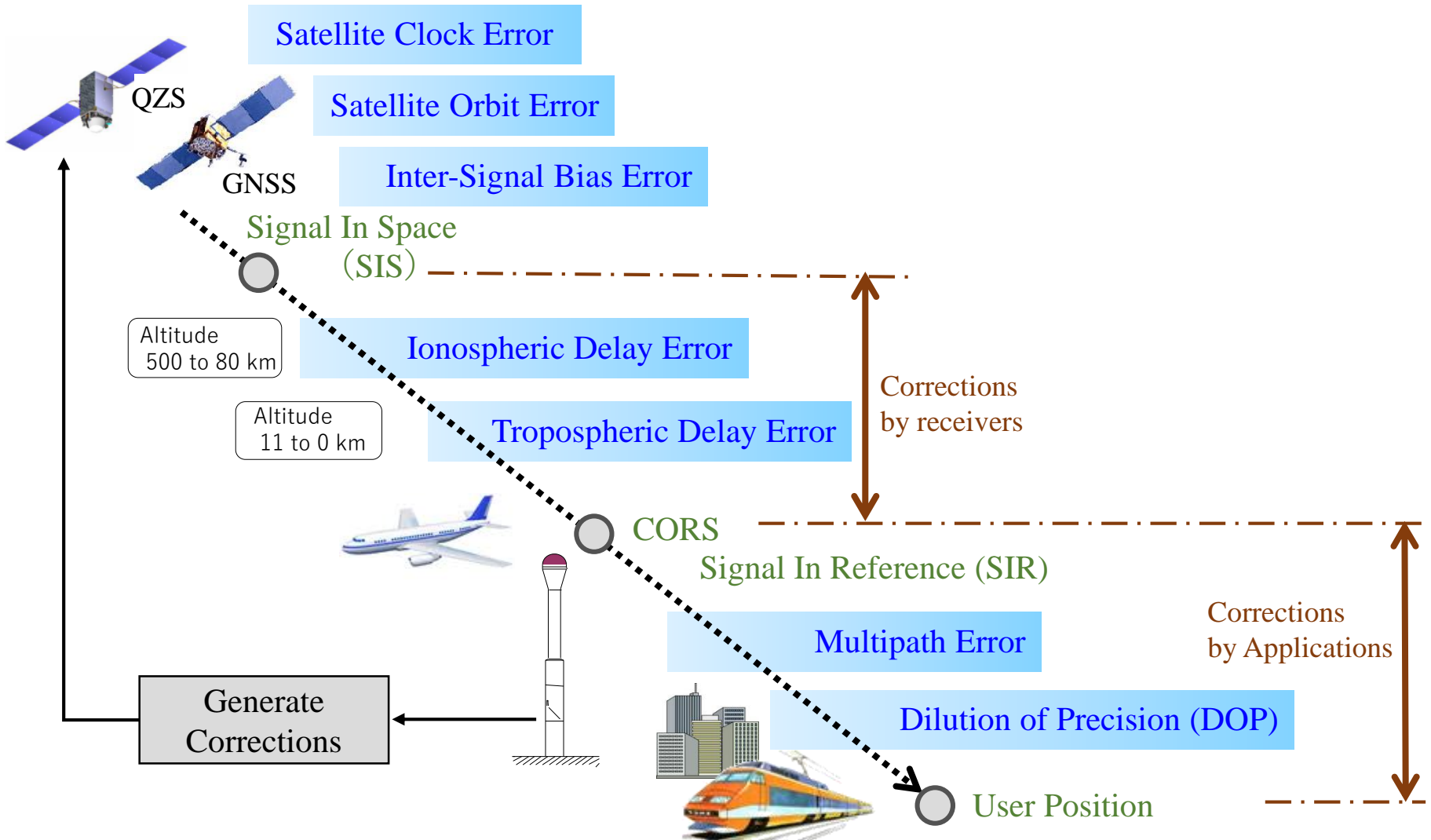
Vertical Total Electron Content Map

HORRIZONTAL RMS (2011/5/16～2012/8/20)

Legend:
- 1. North Area
- 2. North East Area
- 3. Hokkaido Area
- 4. Tohoku Area
- 5. Kanto Area
- 6. Izu Islands
- 7. Ogasawara Islands
- 8. Hokuriku Area
- 9. Chubu Area
- 10. Kinki Area
- 11. Shikoku/Chugoku Area
- 12. North Kyushu Area
- 13. South Kyushu Area
- 14. Okinawa Area

Provided by SPAC
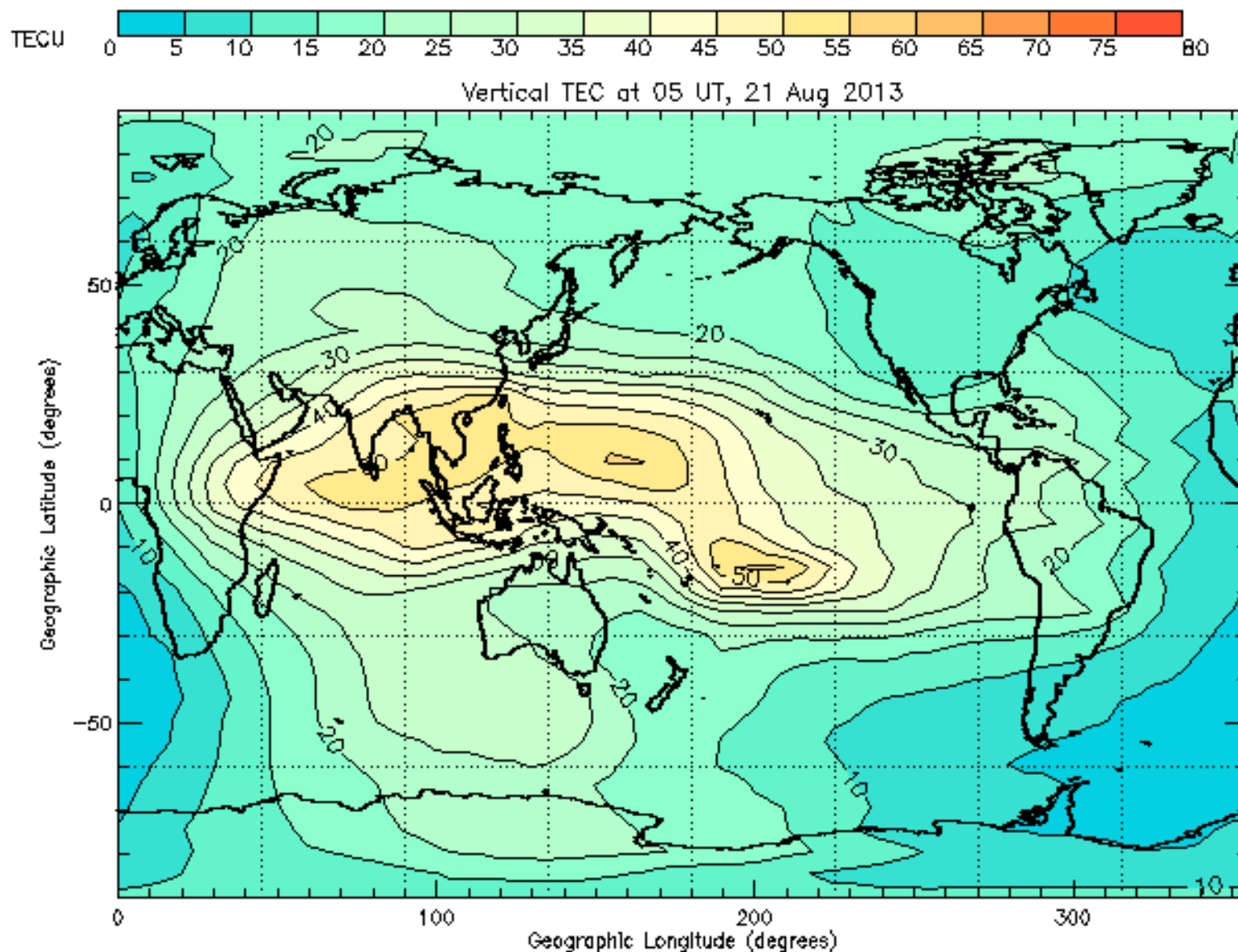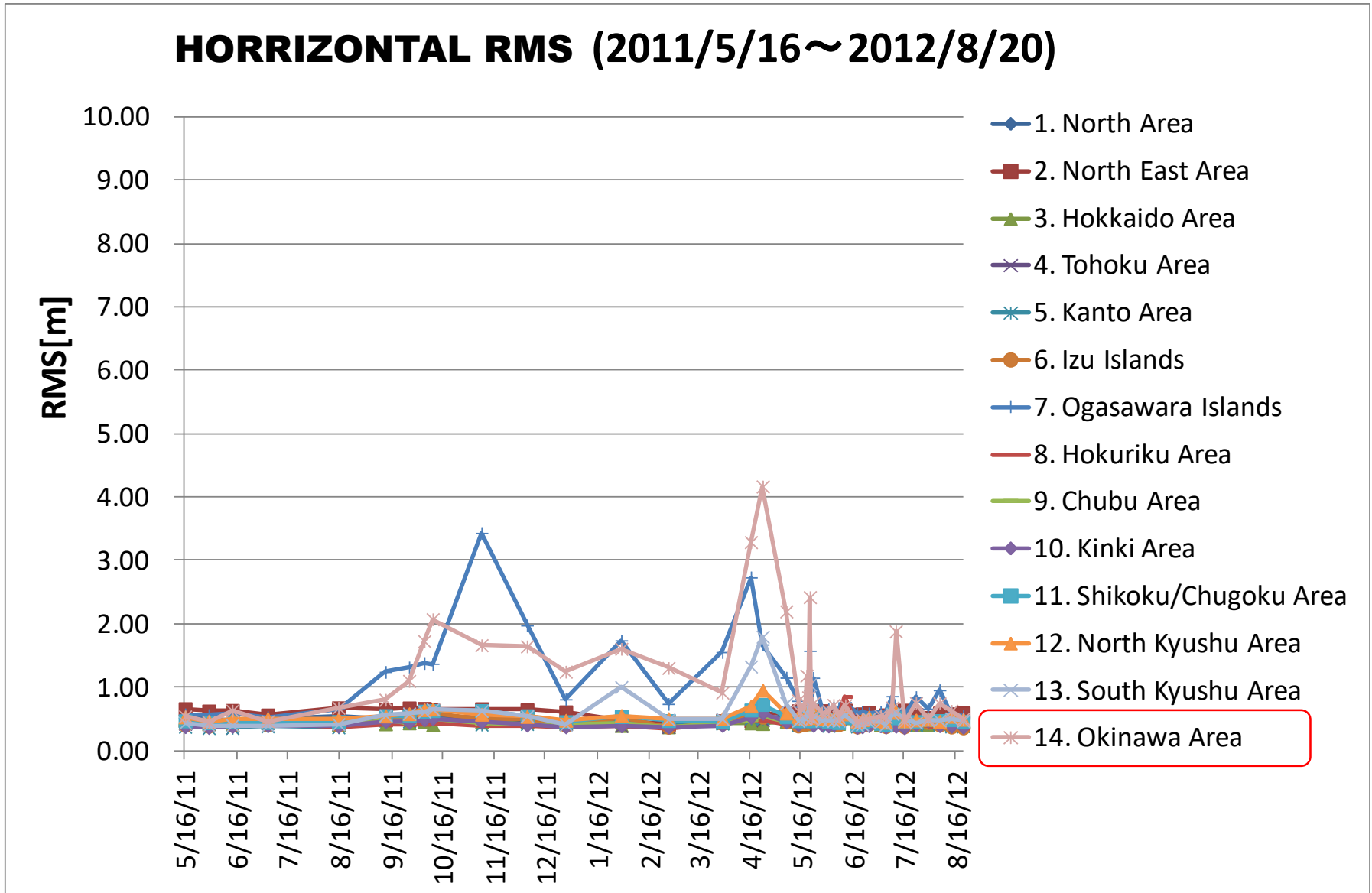
By the end of 2018
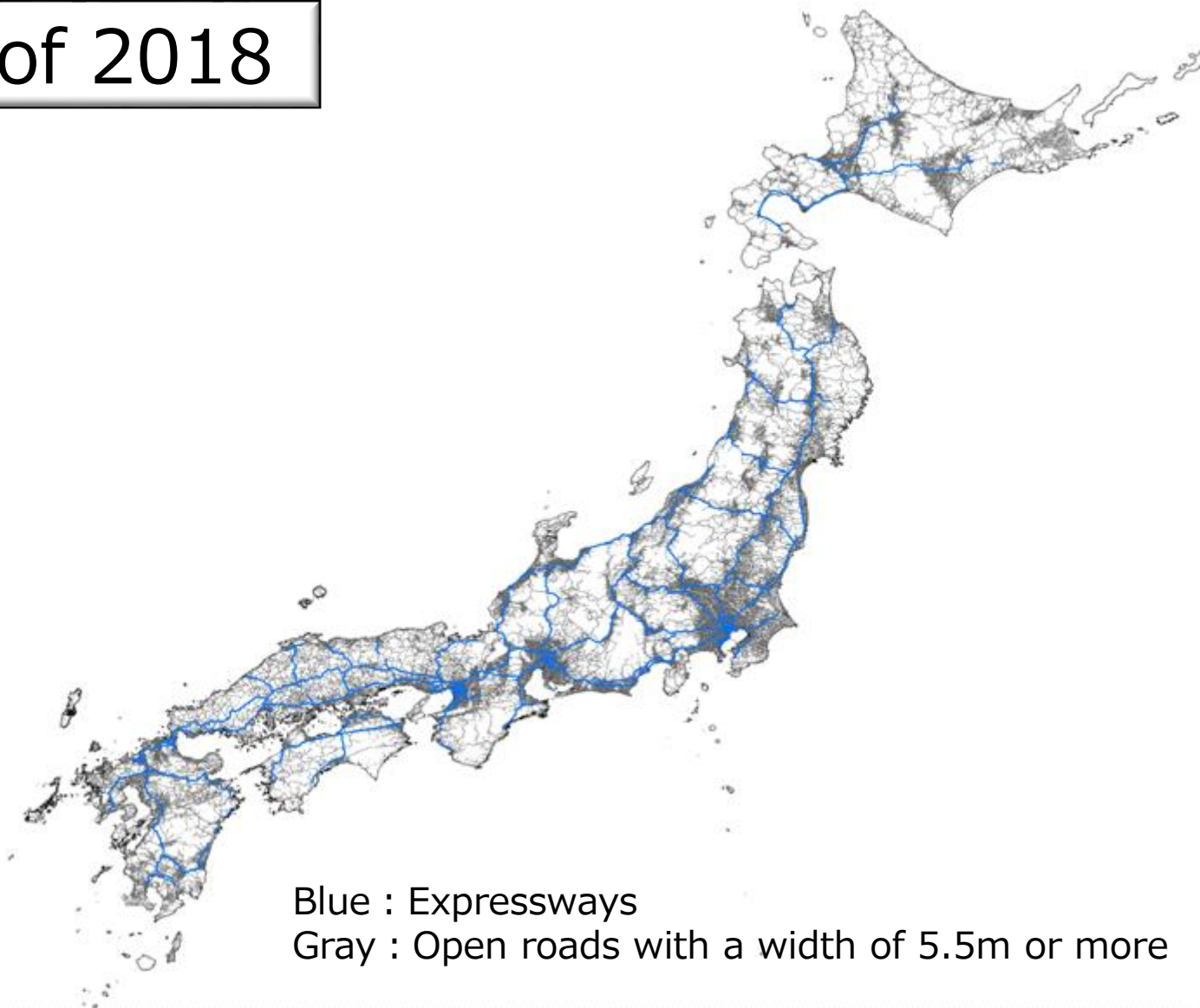
Blue : Expressways
Gray : Open roads with a width of 5.5m or more

Key Takeaways

- Dynamic Map Platform (DMP), Japan's leader in surveying technology and mapping technology for HD maps, is a consortium of leading Japanese companies across diverse sectors, including automotive, mapping technology, and manufacturing. The company has lead funding from the Innovation Network Corporation of Japan

- DMP focuses on creating the static layer map in the most accurate and cost effective way possible, and our cutting-edge technology can serve as the foundation for a global standard for Layer 1 static maps. Our strengths include:

  - Superior precision: DMP possesses unique error-correction technology allowing for an absolute accuracy of 6cm for positioning, 25cm for map data, as well as technology for effective utilization of the RTK-PPP method, which allows for higher precision and time-efficiency

  - More comprehensive map data: DMP's surveying data includes x, y, z, roll, yaw, pitch, and t (time) coordinates, using the t coordinate data for error correction. Furthermore, this comprehensive map data comes in a small data size of KB/km-level for signature data in vector data format extracted from camera images and point cloud data.

  - Extensive know-how and experience: DMP backers have over 25 years of experience with car navigation systems, and our strategic partners have broad experience in highly automatic plotting/mapping of acquired data

  - Wide acceptance from the marketplace: All major Japanese OEMs have agreed to of DMP's specifications for Japan's highways

  - Lower updating costs in the future: DMP is currently developing technology for updating map data through change extraction from satellite images

Thank you for your attention.