The advanced route guidance system

Toyota Tsusho Corporation
NEXT mobility electronics business dept.
Connected group
Dec 18th 2018
Lane-class congestion data cannot be generated due to low accuracy (5 to 10m) of position data by utilizing only GPS.

Lane-class congestion data can be generated by utilizing QZSS, MADOCA and Multi-GNSS Receiver.
Voice Guidance Image

Providing “A lane level” route guidance by using “A lane level” traffic information

- Smooth
- Congestion
- Jam

Please move to a right lane. This lane is going to be congested.

User interface Image

Pop-up display and Voice Guidance corresponding to high accuracy traffic information

Received the high-accuracy traffic info. The estimated arrival time of the new route will be **10 minutes** earlier.

OK
Project organizations

PMO

Toyota Tsusho Corp.

Project Management

Japan Research Institute Ltd.
Advisory for QZSS and Satellite technologies

Zenrin DataCom Co., Ltd.
The Advanced Navigation Software

NEXTY Electronics Corp.
Lane by lane traffic information

Toyota Tsusho NEXTY Electronics Thailand
Lane by lane traffic information

Chulalongkorn Univ. Michibiki Sora
• Local reference station
• Evaluation QZSS Augmentation services

Howa Taxi East Innovation
Taxi and Truck

Global Positioning Augmentation Service Corp.
MADOCA Augmentation Data

Magellan Systems Japan, Inc.
Multi-frequency Multi-GNSS receiver

Navigation System

Prove System

Japan

Thailand
Demonstration - Location

7 Routes in Bangkok
Route1 Ratchadapisek
Route2 Lat Phrao
Route3 Rama 4
Route4 Sathorn
Route5 Kanchanapisek
Route6 Don Muang Tollway
Route7 Long Route
※Bangkok is the second worst traffic jam cities in the world

Select multiple routes such as ‘heavy traffic’, ‘local road’ and ‘highway’ to evaluate feasibility of this project correctly
Demo Navi truck chose ‘turn left only’ lane because it was smooth, then detour. Finally Demo Navi truck arrived earlier than Conv Navi truck.
Problems and Requirements

Problems

- Taking long ‘Time to First Fix’ (TTFF) (20 to 30mins)
  Solution: Improvement of MADOCA data
- Cost reduction/Miniaturization of a multi-GNSS receiver
  Solution: Implement on 1 chip
- Non-optimization UI of guidance system
  Solution: Conduct user tests and reflect their feedback
- Undeveloped high definition map (lane-class)
  Solution: Prepare maps by map vendor

Requirements

- Immediate official Service-In of MADOCA distribution
- Making ‘free of charge’ for MADOCA distribution both within and outside Japan
Launch the advanced route guidance system in Thailand then expand the system to ASEAN country.