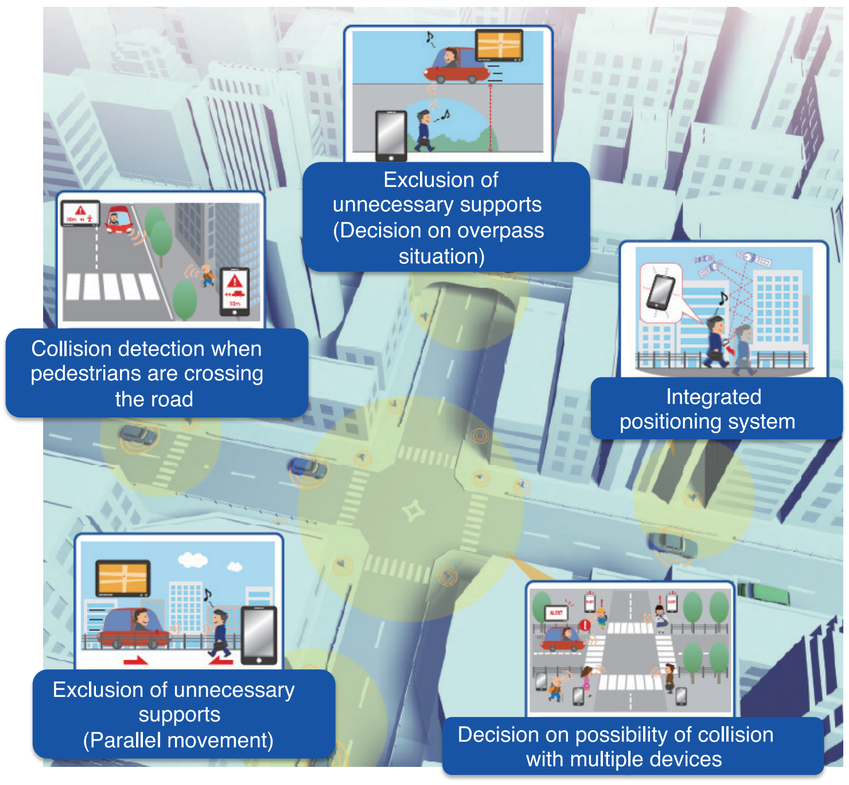
SIP-adus Workshop 2017
on Connected and Automated Driving Systems

Connected Vehicles

V2P(Vehicle-to-Pedestrian)Communication
＋Prototype and basic verification for demonstration experiment

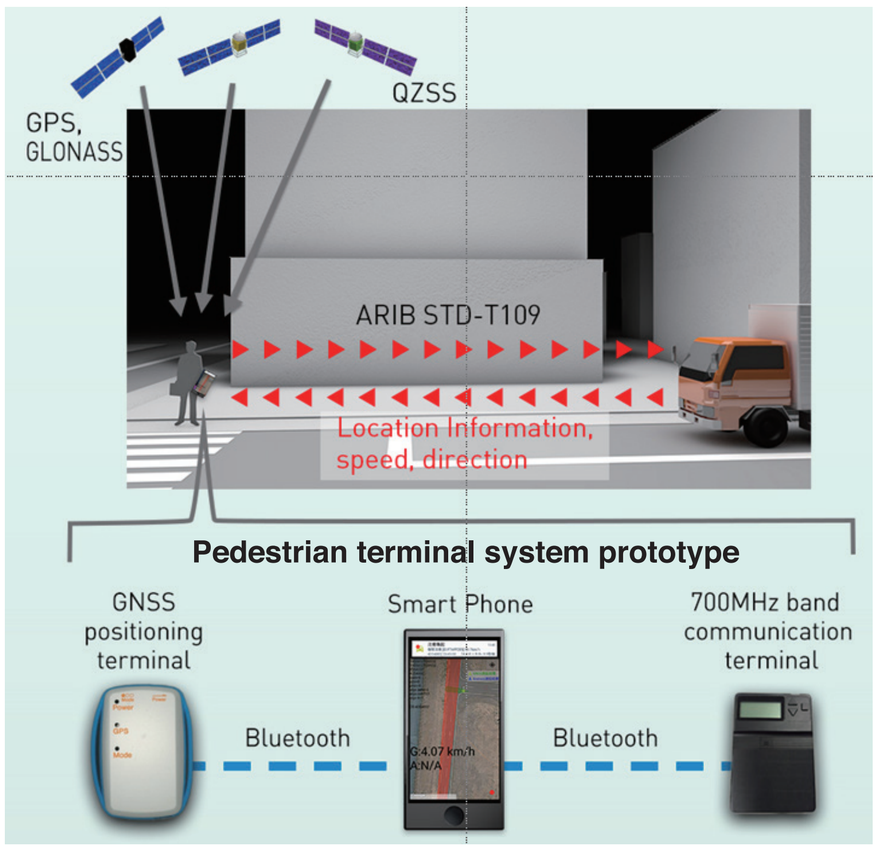
■ Objective

Reduce traffic accidents especially involving VRUs through realizing direct V2P communications that supply supports to both pedestrians and drivers timely and appropriately.



■ Key technologies of V2P

- 700MHz band communication
- High-accuracy positioning
- Safety support and exclusion of unnecessary supports



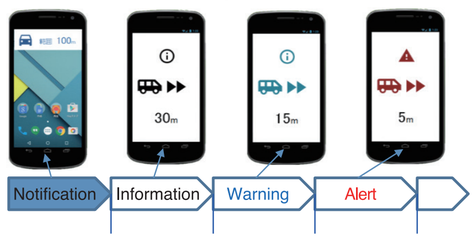
■ R&D Progress (FY2016)

Ⅰ. Pedestrian Safety Support and exclusion of unnecessary supports

■ Penetration of V2X systems

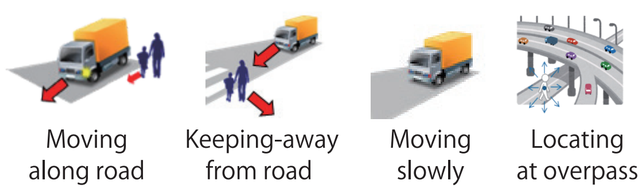
To ensure receptivity support supplying time and manner are examined. As a result a multi-step alarming method is developed that prompts different actions according to TTC and avoids excessive reactions.

Prompt evasive action step by step according to TTC



■ Exclusion of Unnecessary Supports

To reduce false alarm rate and to save power, safe states where supports are not necessary should be detected and excluded.

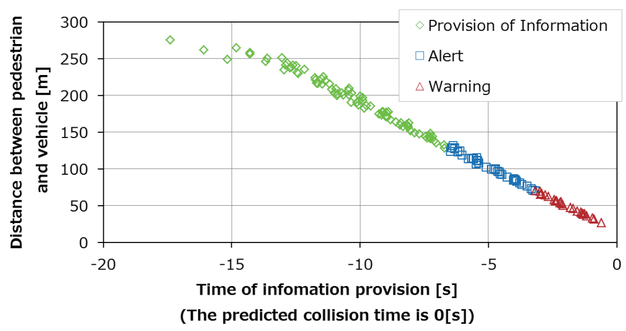


■ Results of Experiments

Experiments at test field (JARI) and at public road

Information provision time when pedestrians are crossing a one-lane road

We confirmed stepwise support from experiment results.

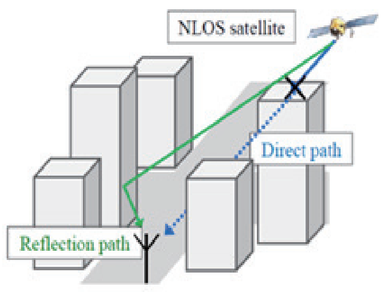


Unnecessary Support Exclusion	Result	Locating at overpass
Moving along road	△	Cause orientation inaccuracy during stationary
Keeping-away from road	△	<Same as above>
Moving slowly	○	
Locating at overpass	○	Misjudgment in the middle of the slope

Ⅱ. High-accuracy positioning

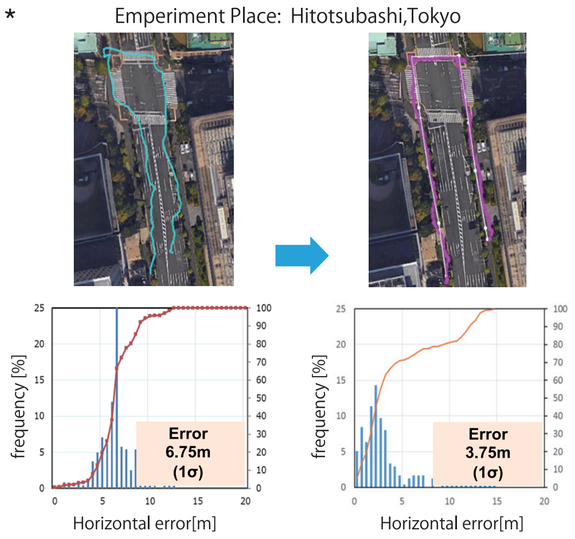
■ 3D Map Adoption

As a complement to GNSS positioning 3D map is adopted to improve location accuracy. *
→ Possibility of horizontal error 3 m



*: Evaluating and receiving technology from the University of Tokyo and licensing
Source：Urban Pedestrian Navigation Using Smartphone-Based Dead Reckoning and 3D Map-Aided GNSS

Emperiment Place: Hitotsubashi,Tokyo



Confirm effectiveness by experiment