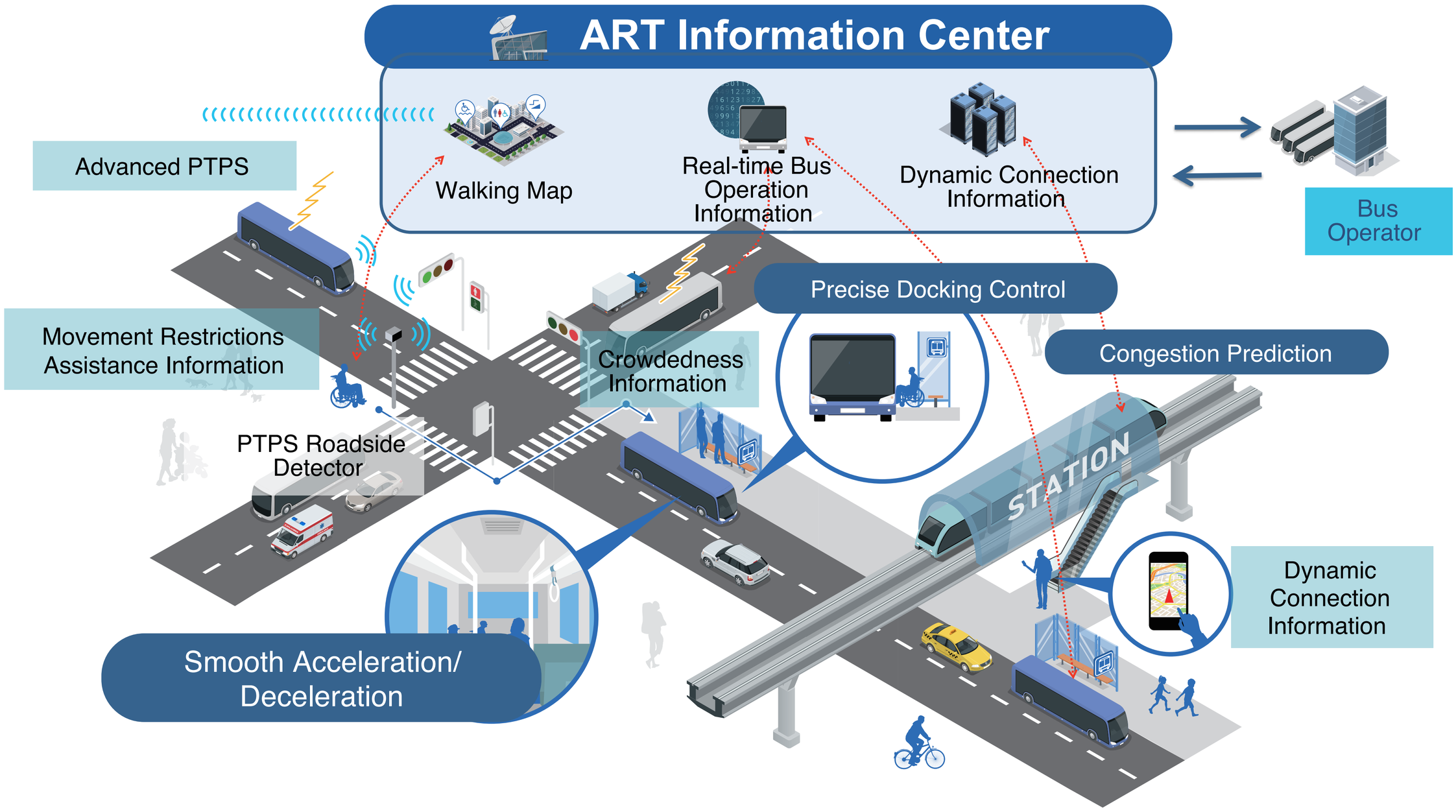
SIP-adus Workshop 2017
on Connected and Automated Driving Systems

Next Generation Transport

Realize consistent accessibility for all people including elderly and handicapped person



Development of sensing and control technology for precise docking control

Integrated sensing and control system for future advanced docking system.

- Sensor fusion technology : Vehicle position, surroundings (pedestrian, bicycle and other vehicle etc.)
- Control technology : Integrated control of steering and braking

Target

① Smoothness at getting on/off at station

- Get on and off safely
- Shorten staying time at station

Target gap ; 40mm±20mm

② Robust control in various environments

- The best routing for docking even in severe condition

Approaching speed ; 40km/h
Length of pulling over in lateral direction ; 3m

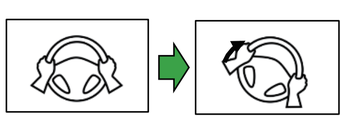
③ Smooth braking and steering control

- Prevention of in-car accident
- Passenger comfort

Maximum acceleration ; 1.0m/s²
Maximum jerk ; 1.0m/s³

④ Cooperative docking control with driver

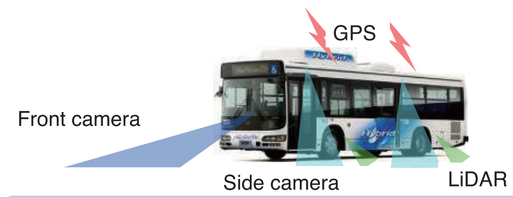
- Maneuvering by driver in case



Development item

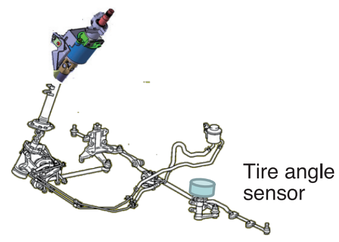
Technology

1) Sensor fusion technology compatible with current road marking



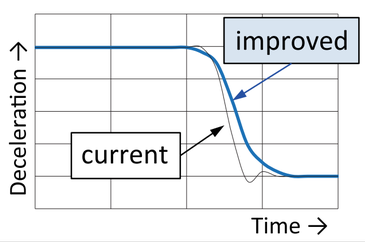
- Robustness in various environments
- Small infrastructure investment
- Fast image processing

2) Improvement of steering system control performance



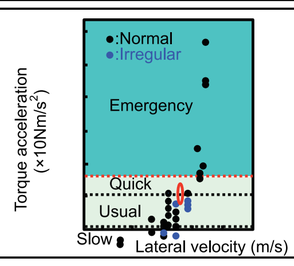
- Advanced steering control reducing dead band or delay caused by mechanical issue

3) Reducing jerk at braking and cornering



- Sophisticated and integrated steering and braking control

4) Harmonizing driver and automated operation



- Precise estimation of driver intention from steering torque or deviation of steering torque