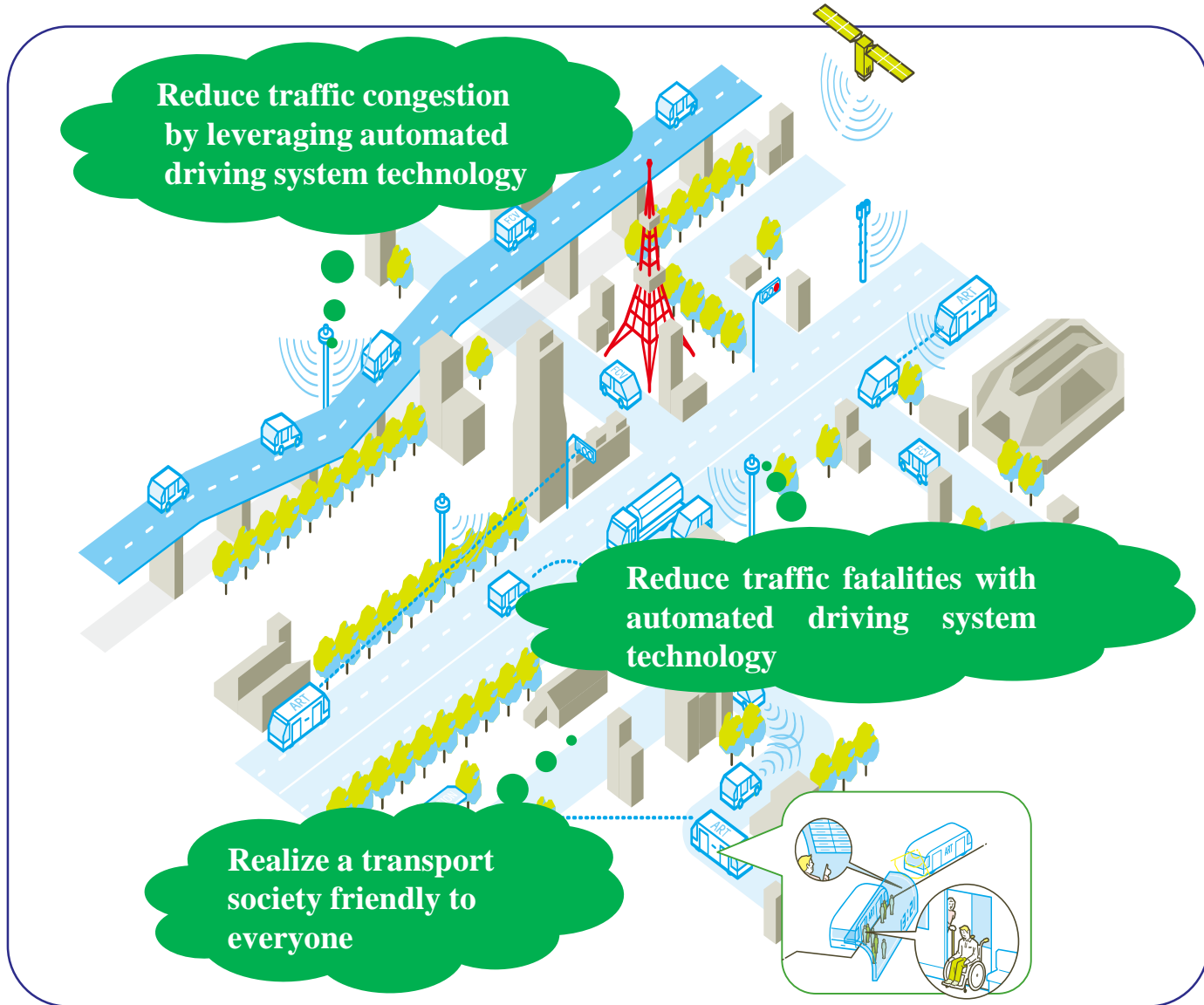
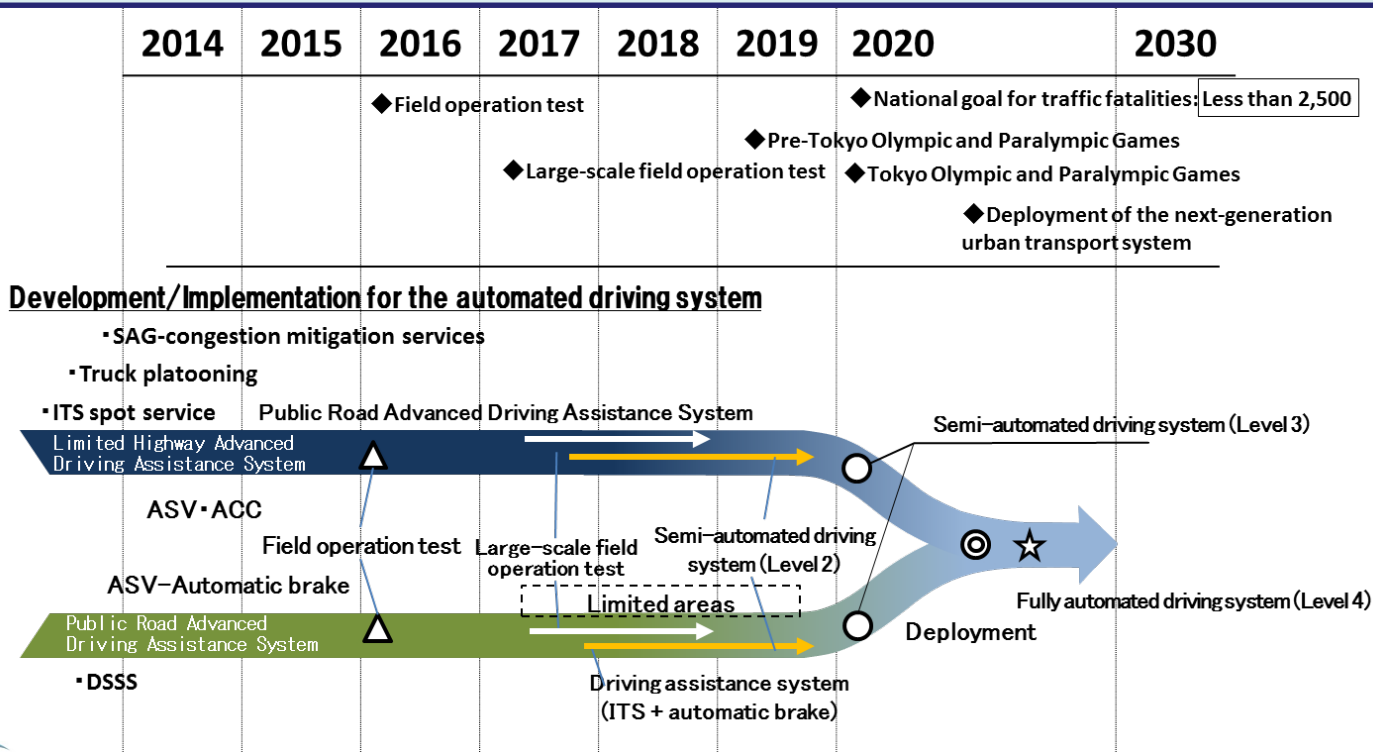


# In Pursuit of a Transport Society That Brings Smiles to People - Mobility bringing everyone a smile -

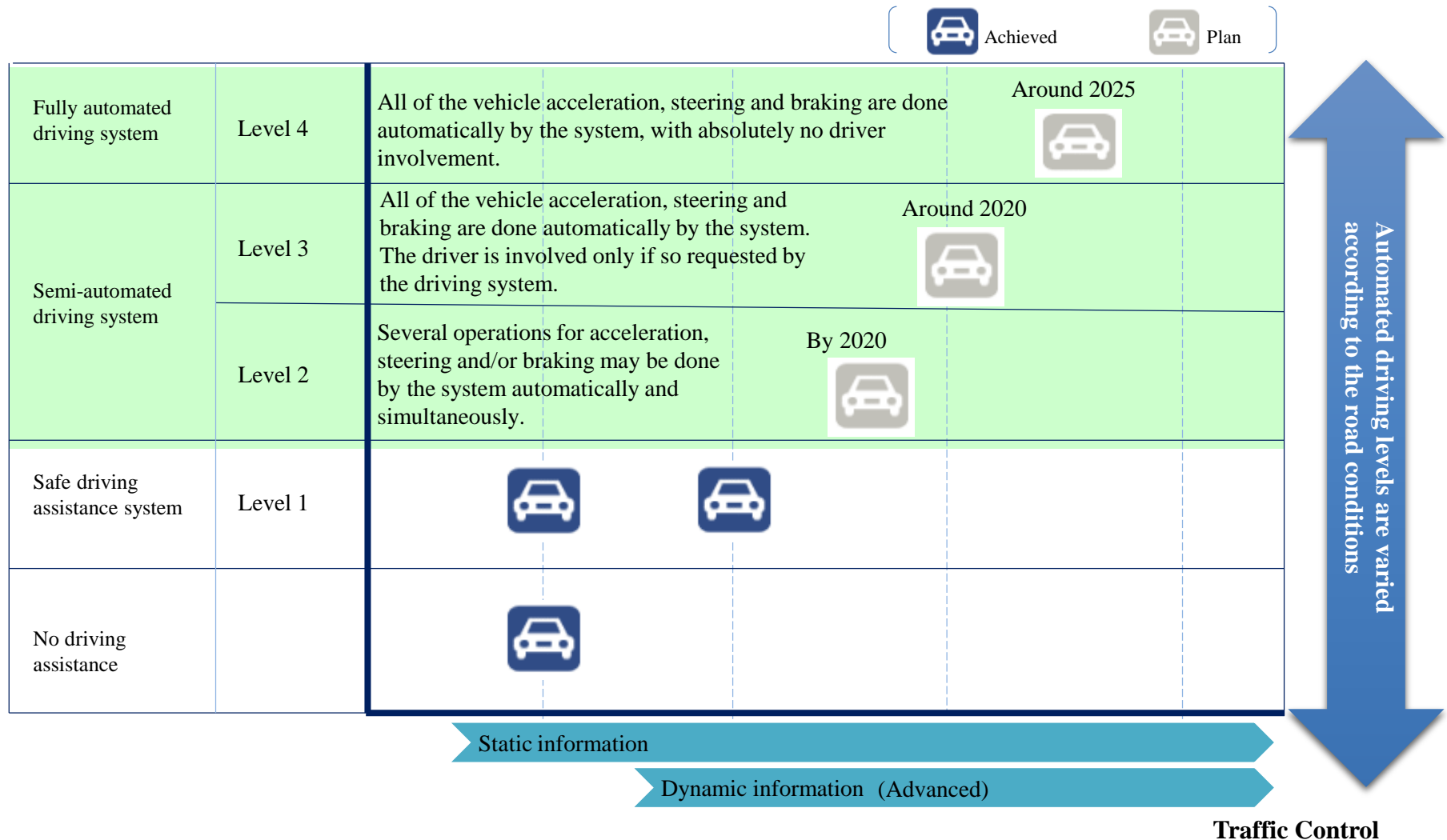


# Goals/Roadmap of the Automated Driving System

1. Achieve national goals incl. reduction in traffic accidents: Building of national infrastructure for achieving national goals
2. Realization/deployment of the automated driving systems: Promotion of deployment through synchronization of thoroughly streamlined research and development and international cooperation
3. Deployment of the next-generation public transport systems: Develop in cooperation with the Tokyo Metropolitan Government, with the Tokyo Olympic and Paralympic Games as a milestone



# Definitions of Automated Driving Levels and Commercialization Targets



At all levels, it is assumed that the driver can get involved in the control of the driving system at any time. As for the semi-automated driving system (Level 3) and the fully automated driving system (Level 4), the government has set the timing as nonbinding targets to help enable commercialization by private-sector companies.

# Technologies Required for the Automated Driving System

Elements constituting the "automated driving system"

## Vehicle



**Recognition**  
認知

Maps, Communications, Sensors



**Judgment**  
判断

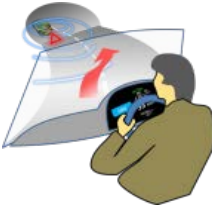
Control/Artificial intelligence



**Operation**  
操作

Hydraulic, Electric motors

## HMI



**Human Machine Interface**

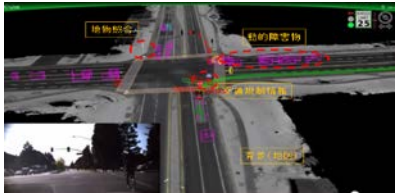
Harmony with people

Enhanced


- Self location estimation
- Surrounding environment recognition

are important for the automated driving system

Dynamic Map

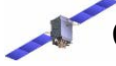


High-definition digital map




Information from communications

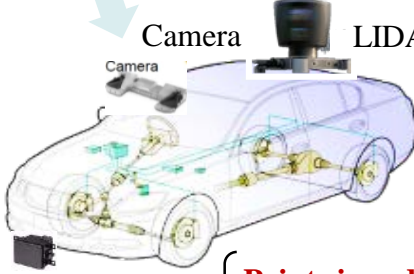
Autonomous (in-vehicle) sensor



GPS



Radar



Camera    LIDAR

Points in red: Area of Cooperation (not suitable for competitive approach)

Base technology

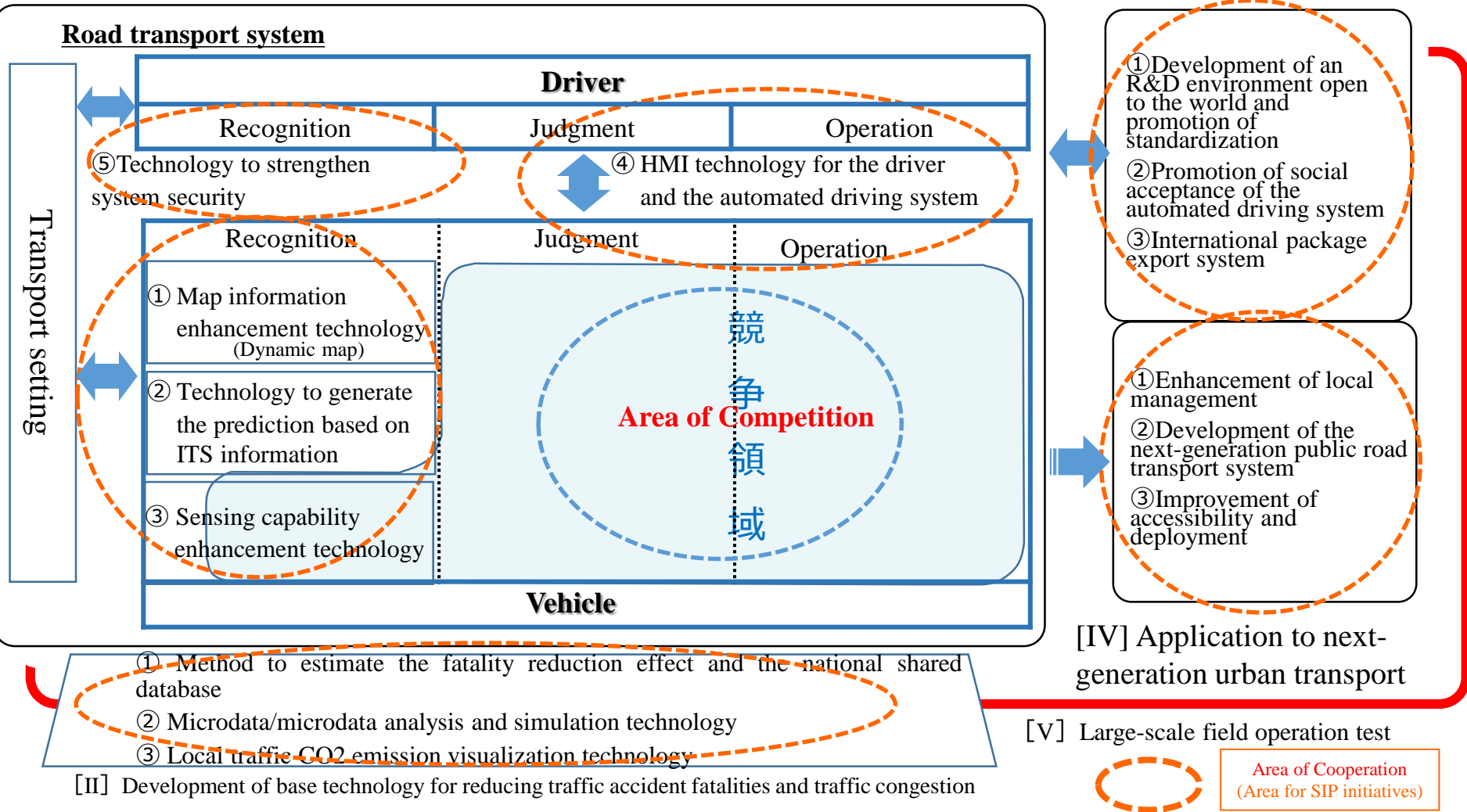
Security, Simulation and Database, etc.

Realization of automated driving requires wide-ranging research and development, including the autonomous system and cooperative system and so on.

# Scope of the Automated Driving System

[I] Development/implementation of the automated driving system

[III] Building international cooperation



[II] Development of base technology for reducing traffic accident fatalities and traffic congestion

[IV] Application to next-generation urban transport

[V] Large-scale field operation test

SIP has been promoting development work centering on the **area of cooperation**, and will discuss an expansion of the **area of cooperation** going forward.

# Roadmap

2014

2015

2016

2017

2018

## System Implementation WG

**Development of the automated driving system**

- Development of the structured business model for developing dynamic maps
- Development of HMI guidelines for the takeover between the driver and
- Implementation of the vehicle-to-vehicle, vehicle-to-infrastructure and vehicle-to-pedestrian communication systems
- Building of the driving video database
- Strengthening of information security

- **Field operation test on dynamic map deployment** on urban roads and limited highways
- **Field operation test on Levels 3 and 4 deployment**
- **Field operation test in areas designated for pedestrian accident reduction**

## Reduction of traffic accident fatalities

**Development of base technology for reducing traffic congestion**

- Development of the simulation of accident reduction effect calculation and testing in model cities
- Proposal of the timing of achieving the national goal of reduction in traffic accident fatalities
- Testing of the method to measure the CO2 emission reduction effect

- **Development of the mechanism for the state, cities and citizens to turn the PDCA cycle for achieving the national goal**
- **Field operation test in areas designated for pedestrian accident reduction**

## Next-Generation Urban Transport WG

**Application to the next-generation urban transport**

- Development and testing of the ART vehicle control system
- Cooperative development of infrastructure information system (PICS and PTPS, etc.)
- Development and implementation of global standard accessibility on sites (Tokyo, etc.)

- **Commencement of the test operation of ART**
- **Field operation test on accessibility in areas for citizens' enhanced independent awareness**

## International Cooperation WG

**Building of international cooperation**

- Development of the domestic structure for developing and creating the international cooperation structure
- Development of an R&D environment open to the world

- **Promotion of social acceptance and system improvement**
- **Realization of the global standardization initiative**