

Guidelines for Testing of Automated Vehicles

Yuko Sano

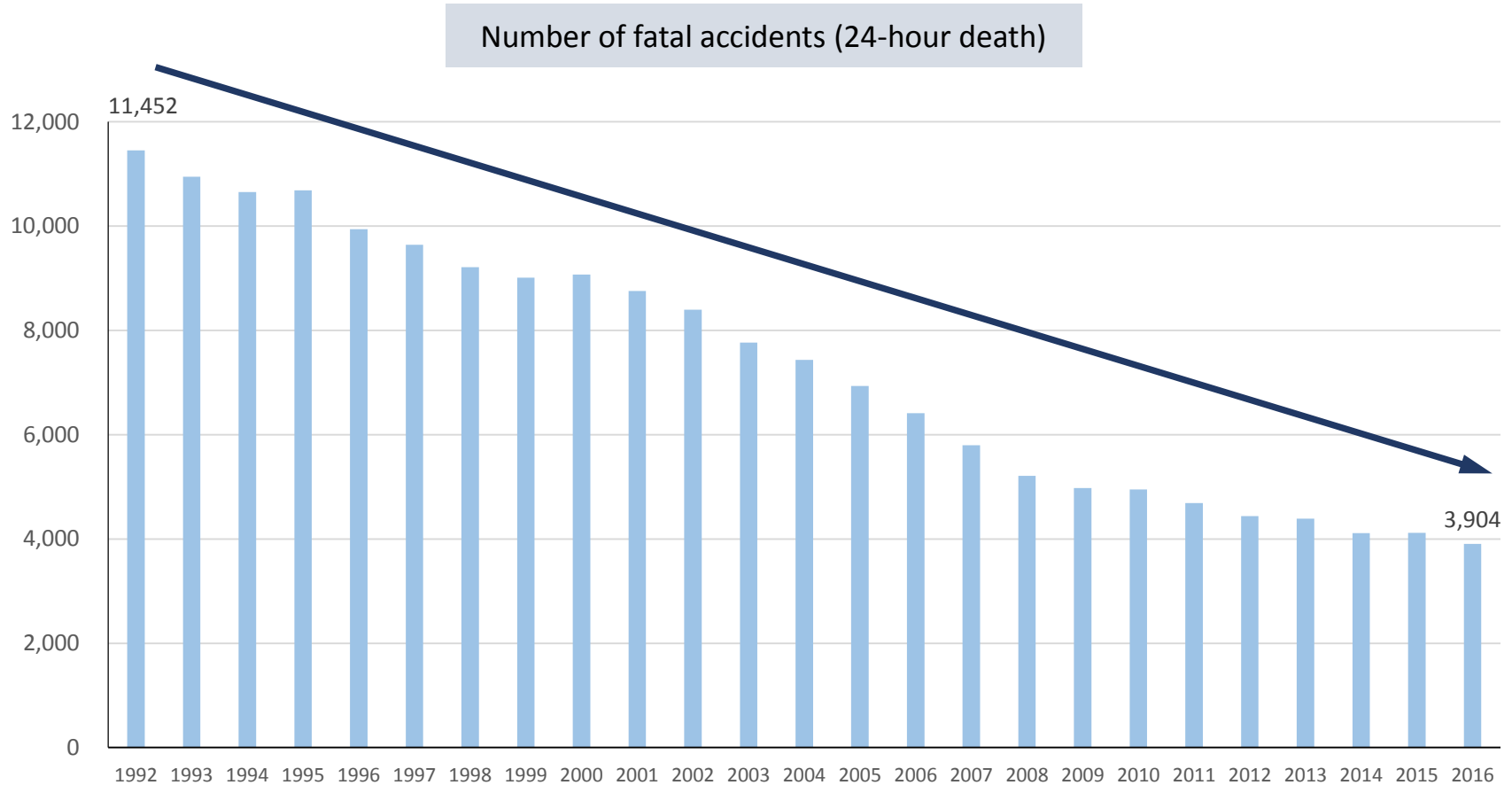
Director for Intelligent Transport Systems,
Commissioner General's Secretariat,
National Police Agency, Japan

Introduction

1. Current traffic situations in Japan
~why we need ITS/AD?~
2. Administrative and Legal Strategies
~promoting ITS/AD~
3. TSPS(Traffic Signal Prediction Systems)
/ DSSS(Driving Safety Support Systems)
~preparing infrastructure~
4. Guidelines for Public Road Testing of AD
~promoting test of AD with flexibility~
5. Further Step

1. Current traffic situations in Japan

The number of death caused by traffic accidents are on a declining trend since 1992. However, the margin of decline has tended to shrink recently.



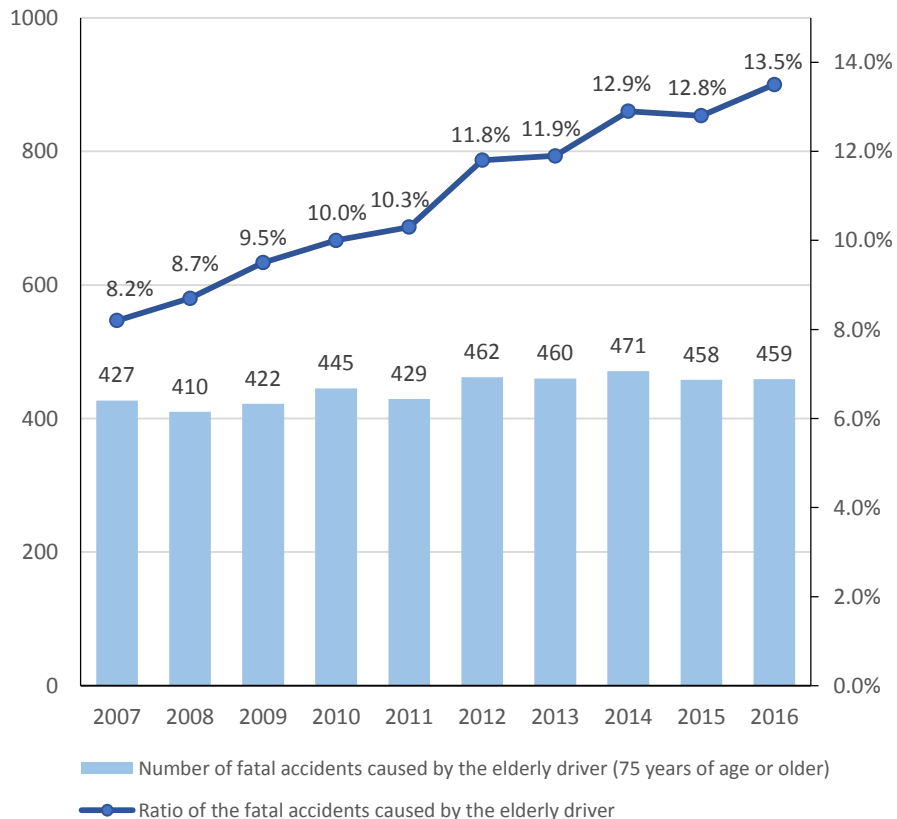
→ We set a national goal to reduce the number to under 2,500 in 2020.

1. Current traffic situations in Japan

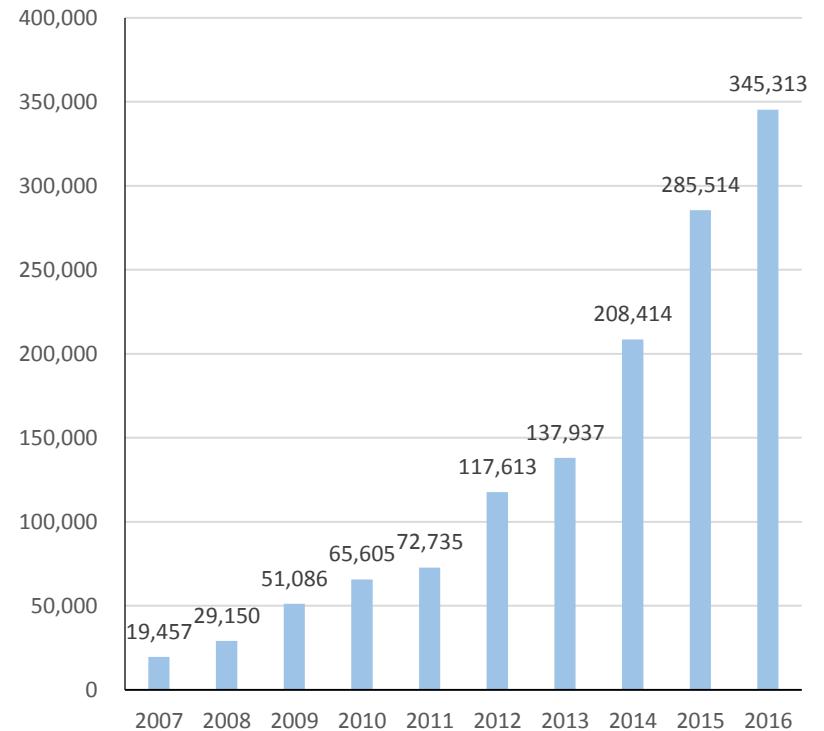
Population Aging:

The ratio of the fatal accident caused by the elderly driver (75 years of age or older) is increasing.
The number of returning driver's license is increasing (the problem of personal mobility).

Number and the Ratio of the fatal accidents caused by the elderly driver



Number of Returning the Driver's license



National Police Agency (NPA) has been tackling the issues regarding ITS/AD in view of both Infrastructure and the legal framework.

Infrastructure

- Developing TSPS (Traffic Signal Prediction Systems)
- Developing DSSS (Driving Safety Support Systems)

Legal framework

- Participate in the international discussion about The Convention of Road Traffic (1949/1968)
- Sorting out legal and operational issues on AD
- Published the guidelines for the public road test of AD
- Draw up the roadmap for the future deployment of AD

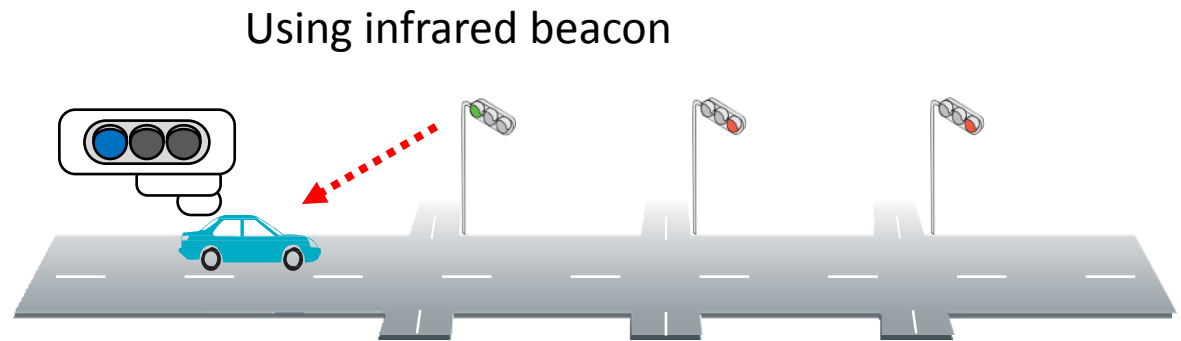
TSPS (Traffic Signal Prediction Systems)

- TSPS encourage safe and eco-friendly driving by providing drivers with driving support information (ex. The color of traffic signals)



Information

- The place of crossroads
- The maximum speed regulation
- The color of traffic signals
- Signal time span etc.

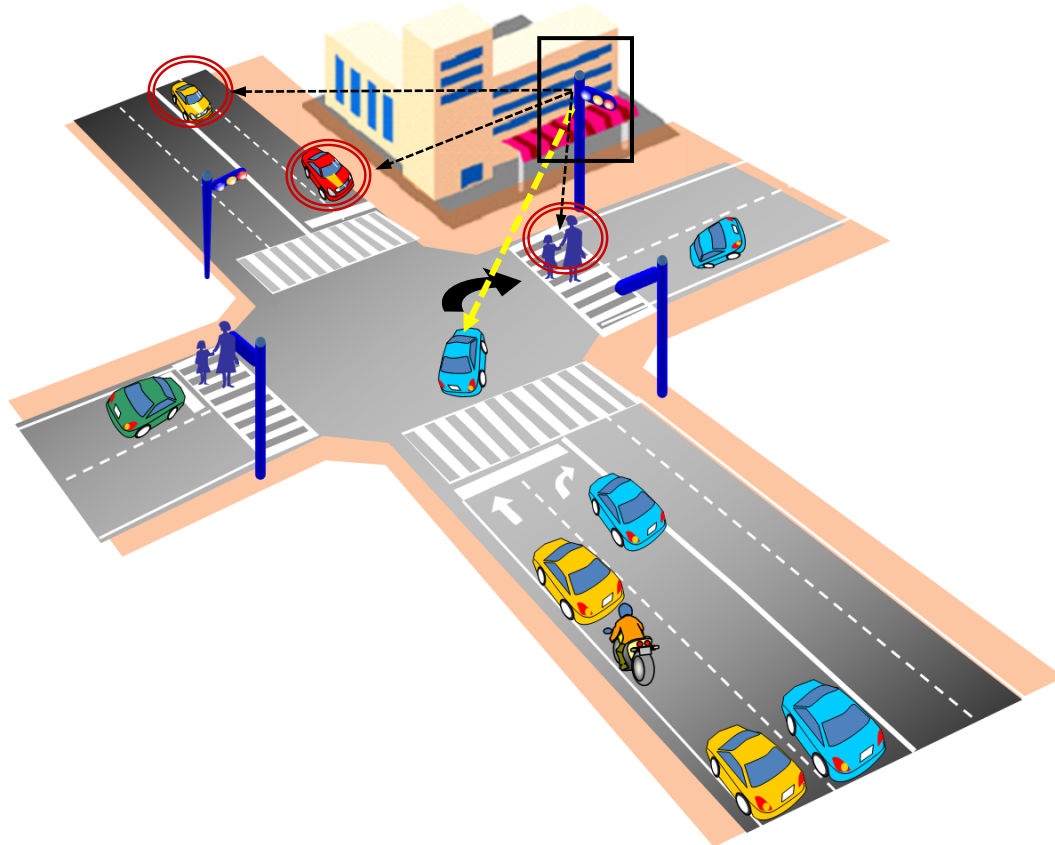


Now we are using infrared beacon.

We are developing the technology of using 760MHz.

DSSS (Driving Safety Support Systems)

- DSSS grasp traffic situations of an area which is hard to see from driver's position using roadside sensors and alert drivers via on-board units and thereby prevent traffic accidents caused by careless oversight such as inattentive driving.



4. Guidelines for Public Road Testing

- Published two guidelines for testing AD on public road.
- Consulted with various expertise, and with public comments for a month

1. Guidelines for Public Road Testing of Automated Driving Systems

- published in May 2016
- guidelines for the test of AD with the driver inside the vehicle.
- any permission/report is not needed as long as the implementing entity follow this guideline.

2. Criteria for the permission for use of roads for public road testing of Driving Automation System with Remote Control Technology

- published in June 2017
- criteria for the permission for the test of AD with Remote Control Technology (the driver is remote from the vehicle)
- the permission is needed for the test

Both are available to read on our homepage (<https://www.npa.go.jp/bureau/traffic/selfdriving/index.html>).

1. Guidelines for Public Road Testing of Automated Driving Systems

Public road test of AD is available regardless of time and place as long as:

- the vehicle complies with the requirements of the Safety Regulation for Road Vehicles (including those specially approved by the Director of a District Transport Bureau),
- The person who assumes the role of the driver is seated in the driver's seat, monitors the surrounding traffic as well as the vehicle's condition at all times, and operates the vehicle in the event of an emergency as necessary in order to ensure safety and thus prevent damage to others, and
- The test vehicle is driven in compliance with the relevant laws including the Road Traffic Act

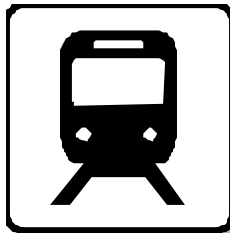
The guideline shows other notes including basic responsibilities of implementing entities, test driver's requirements etc.

2. Criteria for the permission for use of roads for public road testing of Driving Automation System with Remote Control Technology

The image of DAS-RCT

- Only on the restricted area such as “the nearest station - home” (the last one mile)
- The vehicle automatically drives itself on most part.
- The remote driver monitors the driving all the time, and operates when necessary.

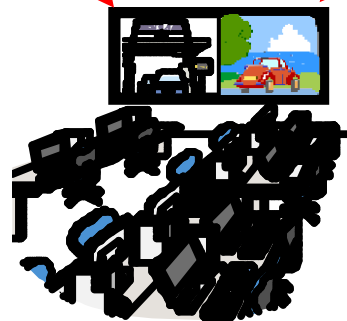
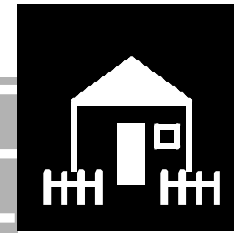
The nearest station



Last one mile



Home



Remote monitor

Assigned remote driver



2. Criteria for the permission for use of roads for public road testing of Driving Automation System with Remote Control Technology

- The public road testing of Driving Automation System with Remote Control Technology (DAS-RCT) is regarded as the action which can be implemented with the permission for use of roads
- With this permission, implementing entity will be able to test DAS-RCT on public road in Japan (the driver has not to be inside the vehicle).
- Stating the case where one driver drives multiple vehicles, etc.
- Based on the international discussion at WP.1 (UNECE)

WP1-72 (April 2016)

The Group was of the opinion that there was no need for amendments to the 1949 and 1968 Conventions on Road Traffic for foreseeable types of experiments (i.e. “**where there is a person who is ready, and able to take control of the experimental vehicle(s); this person may or may not be inside the vehicle**”).

- **Highly or fully automated driving (SAE level 3,4,5)**

For the deployment of highly or fully automated driving (i.e. sometimes the driver no more exists anywhere) we need to further discuss about the convention (1949, Geneva Convention).

- **Platooning**

Recently we have made the roadmap for the deployment of platooning on highways: we aim to implement the platooning (the driver is not inside the following vehicle) in 2020.

