Current Status of Japan's Policy on Automated Driving Technology

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Outline of the Presentation

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2. Why Automated Driving Technology Matters
3. Status of Japanese Government's Policy for Deployment
4. Status of International Activities
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1.Introduction of JASIC

- Japan Automobile Standards Internationalization Center (JASIC) is a non profit organization that promotes the international harmonization of vehicle technical standards through various activities including the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29).
- Its headquarters is located in Tokyo, Japan. JASIC has three overseas offices: Geneva in Switzerland, Jakarta in Indonesia, and Washington, DC, in the US.

2. Why Automated Driving Technology Matters (1)

- Safety
  - *In Japan*, there were more than 4,000 traffic accident fatalities *in 2015*
  - 96% of accidents are primarily attributed to driver behavior
- Congestion/Environment
  - Economic loss associated with environmental damage ex. Congestion at a sag on the highway
- Mobility
  - In particular, the declining availability of public transportation services in rural areas and the aging population

2. Why Automated Driving Technology Matters (2)

Automated driving technologies can:

- Reduce traffic accidents ex. Automatic brake, Lane keeping etc.
- Reduce congestion ex. Adaptive Cruise Control etc.
- Solve the shortage of truck drivers, reduce CO2 emissions ex. Platooning etc.
- Improve the mobility of the old etc. ex. Last one mile to and from public transportation etc.
- Assist drivers in specific situations ex. Auto parking in small urban parking lots etc.

3. Status of Japanese Government's Policy for Deployment

3. 1 Projection of Development of Automated Driving Technology

Automated driving on the highway, etc.

Expected time of deployment	Present (already applied practically)	Early 2020s	After late 2020s
Technologies for automated driving towards practical application	• Advanced Emergency Braking Systems • Adaptive Cruise Control • Lane Keeping Assist	• Overtaking • Automated merging/separating (automatically commanded steering)	• Fully automated driving
Progress of development by OEM etc. (and expected deployment)	• On the market	• Test runs of prototype vehicles (with a target of practical application around 2020)	• Researching a wide range of issues
Role of government	• Promotion of technology already applied practically • Spreading information on proper understanding and use of new technologies among users	• Amendment of UN-Regulation 79 (around 2016-2017) * → Informal WG on Automated Commanded Steering Functions chaired by Germany and Japan at WP29	• Providing relevant legislative frameworks — ensuring safety — liability for accidents etc.

Source: "Public-Private ITS Initiative/Roadmaps 2015" (revised by the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society on 2015 June), http://japan.kantei.go.jp/policy/it/index_e.html

* The current international regulation prohibits automatically commanded steering at the speed of above 10km/h.

3. Status of Japanese Government's Policy for Deployment

3.2 Cross-Ministerial Strategic Innovation Promotion Program

- Main Research Areas
  - I. Developing and substantiating automated driving systems
  - II. Preparing fundamental technology to reduce fatalities by traffic accidents and decrease congestion
  - III. Building international cooperation
  - IV. Developing for next generation transportation systems

Automation Level	Technology	Expected time for commercialization
Level 2 System controls a combination of acceleration, steering and braking with full monitoring by the driver	Tracking, following systems	Mid 2010s
	Steering for Avoiding collision	
	Automated driving in multiple highway lanes	2017
Level 3 System controls all acceleration, steering and braking. In an emergency, driver intervention/control is required	Automatic merging etc.	Early 2020s
Level 4 All acceleration, steering and braking is controlled without the driver	Full automated driving	After Late 2020s

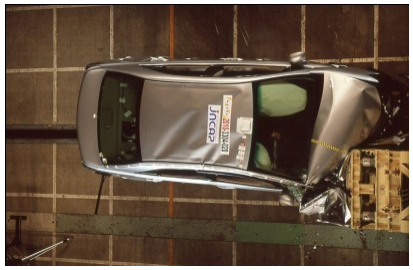
3. Status of Japanese Government's Policy for Deployment

3.3. JNCAP(Japan New Car Assessment Program)

- JNCAP started the assessment of automatic emergency braking and lane departure warning systems in FY 2014. Further development will be planned.

Assessment of crash safety performance: FY2005-

Full frontal collision test



Offset frontal collision test

Side impact test

Neck protection on rear collision

Pedestrian head protection performance test

Pedestrian leg protection performance test

Assessment of preventive safety performance: FY2014-

Automatic brake (for vehicle detection)

A system which detects vehicles ahead, warns the driver, and controls the brake

Performance evaluated by deceleration relative to test velocity

Lane departure warning system

A system which warns the driver that the vehicle is drifting, or has drifted from the lane.

Performance evaluated by alarm timing

To be evaluated/introduced:

FY2015: Rearview video systems around the vehicle

FY2016: Automatic brake(for pedestrian detection)

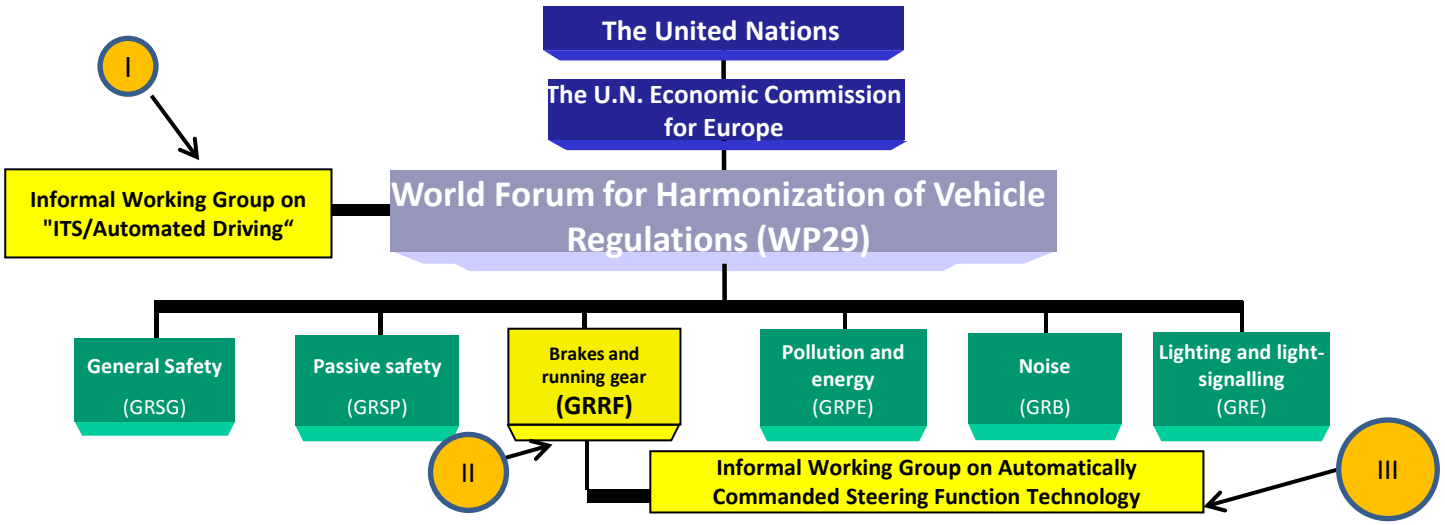
4. Status of International Activities

- Japanese government also addresses technical and legal issues by actively participating in international discussions
  - WP.29 (The UNECE World Forum for Harmonization of Vehicle Regulations)
  - G7 etc.

4. Status of International Activities

4. 1 Discussion at WP.29 (1)

- Informal working group on "ITS/Automated Driving" was established in WP.29 in November 2014.
- In addition, Informal working group on Automatically Commanded Steering Function technology (ACSF) was established under the control of GRRF in February 2015.



Committee body	Chair	Main accomplishment
I Informal Working Group on "ITS/Automated driving"	UK and Japan	• Established in November 2014 - Discussion on Automated Driving Technologies enabling drivers to benefit from a higher degree of automation of the driving task - Discussion on the most advanced technology including full autonomous driving technology (driverless vehicles)
II Working Party on Brakes and Running Gear (GRRF)	Chair: UK Vice-Chair: Japan	• Coordination of various regulation proposals regarding automated driving technology, including Advanced Emergency Braking System (AEBS) • Promotion of discussion on automated driving (from February 2015)
III Informal Working Group on Automatically Commanded Steering Function Technology	Germany and Japan	• Established in February 2015 • Review of the current speed limitation (10km/h) with the purpose of permitting ACSF functionality.

4. Status of International Activities

4. 1 Discussion at WP.29 (2)

① Primary agenda (from ToR) of IWG on ITS/AD

- **Definitions of Automated Driving Technologies**
- **General issues**
  - Responsibilities related to ADT, including matters which are outside the scope of WP29
  - Specifying legal restriction such as Road Transport act.
- **Organizing the view of international regulations on ADT**
  - Establishing the principles to create regulations for individual systems
  - Considering reliability and ensuring safety of the ADT (such as OBD) while it is in use
- **Organizing the view of Security guideline**
- **Others**
  - Consideration for actions in the event of requested ADT guidance from every GR
  - Exchanging information and opinions on the latest technology including Full Automated Driving system (driverless) technology and views of the technology in each CPs

② Agenda for the IWG on ACSF for R79 amendment

Discussions within the scope of Drivers Assistance System on a Motorway

＜**Subjected system**＞

- **After classifying into 5 Categories, establishing necessary safety regulations**
  - ・Category A : ACSF in lower speeds, such as parking
  - ・Category B : ACSF which keeps the vehicle within its lane
  - ・Category C : ACSF which operates single maneuver commanded by driver
  - ・Category D : ACSF which operates single maneuver when confirmed by driver
  - ・Category E : ACSF which continuously performs control of category D

＜**Item lineup for regulations** (shall be organized by each system category)＞

- **Monitoring Drivers**
- **Override**
- **Handover of operation from system to driver**
- **e-safety**
- **e-security(cyber security etc.)**

Cooperation of WP29 and WP1(Road Traffic Safety)

4. Status of International Activities

Amendments to Regulation No. 79 to include Automatically Commanded Steering Function (ACSF) > 10 km/h

Function of Category-E

A function which is initiated/activated by the driver and which can continuously determine the possibility of a maneuver (e.g. lane change) and complete these maneuvers for extended periods without further driver command/confirmation

Precondition

- Any lane change maneuver shall be initiated only if:
  - the vehicle is travelling on a motorway and
  - any traffic that can affect the safe maneuver shall be identified by equipment installed on the vehicle and
  - the vehicle equipment can analyze speed and distance of the identified traffic to ensure a safe maneuver (e.g. does not cause a deviation to the flow or direction of other traffic).

4. Status of International Activities

4. 2 Discussion at G7

- Meeting of G7 Transport Minister
  in Frankfort (17-19th of September2015)
  - The G7 Ministers, the European Commissioner for Transport and leading industry representatives discussed two topics:
    - The modernization of infrastructure as the basis for growth,
    - Prosperity and jobs and the advancement of automated and connected driving.

- G7 declaration on automated and connected driving

  With regard to automated driving,
  - coordinating research, promoting international standardization within an international regulatory framework,
  - evolving the technical regulations and
  - ensuring data protection and cyber security

- The next G7 Transport Ministers' Meeting will be hosted by Japan in Karuizawa, Nagano on September 24th and 25th, 2016.

5. Recent Topics (1)

5.1 Legal Issues

- Domestic
  - In April, Japan National Policy Agency issued a report from its study group on legal issues regarding automated driving and issued a draft guideline for automated driving vehicle tests on the public road for public comments.
- International
  - Discussion under WP.1 about the treatment of automated vehicles under Geneva Convention (which governs international road traffic rules) is ongoing.

5. Recent Topics (2)

5.2 Enhancing the Development of Automated Driving Technology

- In March, a joint study group set up by Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and Ministry of Economy, Trade and Industry (METI) issued a report for enhancing the development.
  - The report:
    1. Identifies eight strategic collaborative areas: mapping , communication, social acceptance, ergonomics (HMI etc.), functional safety, cyber security, recognition technology, and decision technology;
    2. Shares the future vision of automated driving technology;
    3. Suggests enhancing activities for establishing international standards etc.;
    4. Suggests enhancing collaboration among industry, academy and government.

6. Summary

- Automated driving technology is important for improving safety, congestion/environment and mobility.
- Japanese government promotes automated driving vehicle technology through
  - Cross-Ministerial Strategic Innovation Promotion Program (SIP) and other programs including JNCAP.
- Japan also actively participates in international discussions including WP.29 where harmonized international vehicles standards are discussed.
  - JASIC continues contributing to discussion at WP.29.

Thank you for your attention.