GOVERNMENT STATUS REPORT OF JAPAN

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TRENDS OF THE ROAD TRAFFIC ACCIDENTS IN JAPAN

The number of fatalities (those who died within 24 hours) resulting from traffic accidents in 2016 was 3,904. This represents a great decrease in the number of fatalities compared to the previous year. This number is about one-fourth the 16,765 fatalities in 1970, which was the year in which the number of fatalities reached its peak. In addition, the number of accidents resulting in injury or death and the number of injured persons decreased for the twelfth consecutive year in a row since 2004, when the numbers were at their worst.
However, both the number of fatalities and injured persons and the number of accidents resulting in injury remained high in 2016, as there were approximately 620,000 fatalities and injured persons, and approximately 500,000 accidents resulting in injury or death.

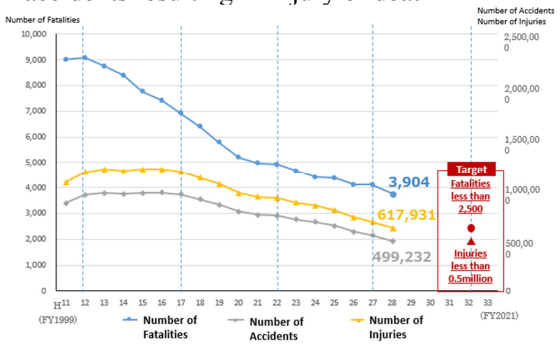

Figure 1. Trends of the road traffic accidents in Japan

New targets were established: to reduce the number of fatalities to below 2,500 (those who died within 24 hours) and to below around 3,500(those who died within 30 days) by 2020 in the Tenth Fundamental Traffic Safety Program for 2016–2020.
The road transport environment is beginning to change greatly due to the change in types of traffic accident victims reflecting the aging society and the introduction of Advanced Safety Technologies including Advanced Emergency Braking System (AEBS). Therefore, on 24th June 2016 the Working Group on Technology and Vehicle Safety of the Council for Transport Policy of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) reported a new target for 2020 to reduce the number of fatalities by implementing vehicle safety measures and evaluating their effect, and setting the policy for reaching the new target.

Future direction of safety measures includes the following:

I. Countermeasures for accidents involving Children and the Elderly.

II. Safety Measures for Pedestrians and Cyclists

III. Countermeasures against Serious Accidents Involving Large-Sized Vehicles

IV. Response to New Technologies such as Automatic Driving

The Four Main Pillars for promoting Vehicle Safety

I. Countermeasures for accidents involving Children and the Elderly

1. Child safety measures

Since the ways children get involved in traffic accidents vary with age group, we need to take safety measures appropriate for each age group.

【Specific Measures】

- Spread and promote safer and easier-to-use child seats conforming to ISOFIX and i-SIZE standards
- Eliminate nonconforming products (Study conformity signs, guide dealers, educate users)
- Promote proper uses of child seats and junior seats
- Reinforce/expand standards on visibility and detection around and behind the vehicle (Utilize camera monitoring systems (CMS), etc.)

Figure 2. Certification given to high performance ISOFIX Child Restraint System

2. Measures against accidents involving elderly victims

In parallel with measures to control their damage, we need to take safety measures to prevent them from being involved in traffic accidents in three directions:

(i) Measures to help elderly pedestrians or cyclists notice approaching vehicles more quickly and take safe actions, taking into account their declining cognitive and physical abilities

(ii) Measures to help drivers notice elderly pedestrians and cyclists more quickly and drive in a way friendly to them

(iii) Measures to help the vehicle avoid collision with advanced safety technologies such as AEBS.

【Specific Measures】

- Make a function to automatically light the headlamps (automatic lighting) at dusk mandatory
- Establish an occupant protection standard that takes into consideration the physical characteristics of the elderly etc.

3. Measures against accidents caused by elderly people

It is necessary to develop measures to help the vehicle, even if an elderly driver makes a mistake in operation, prevent accidents and reduce damage with built-in technologies.

【Specific Measures】

- Develop and spread measures to help the vehicle, even if an elderly driver makes a mistake in operation, prevent accidents and reduce damage with built-in technologies (AEBS, lane keeping devices, Acceleration Control Device for Pedal Misapplication etc.)
- Quicken implementation and sophistication of systems responding to driver's anomaly

Figure 3. Lane Departure Warning System and Advanced Emergency Braking System

II. Safety Measures for Pedestrians and Cyclists

1. Measures for pedestrians

In parallel with the enhancement of damage control measures, it is important to take safety measures to prevent collisions between vehicles and pedestrians or cyclists utilizing advanced safety technologies such as AEBS.

【Specific Measures】

- Examine the reinforcement/expansion of pedestrian protection standards (Expansion of test areas e.g. A-pillar, etc.)
- Promote the development and spread of AEBS for pedestrian (JNCAP (Daytime: 2016, Nighttime: 2018))
- Advanced lighting technologies (make automatic lighting mandatory, study making automatic high beam mandatory, evaluate the performance of variable light distribution headlamps (JNCAP))- Promote the spread of nighttime pedestrian monitoring systems (JNCAP)
- Expand standards on visibility and detection around and behind the vehicle (utilize CMS, etc.)
- Make mandatory "vehicle approaching annunciators" on electric vehicles and HV, etc.
- Study warning sounds for large sized vehicles while turning right/left and reversing
- Promote the development of Intelligent Speed Adaptation (ISA) etc.

2. Measures for cyclists

It is necessary to verify the effectiveness of the pedestrian protection standard considering where cyclists hit their head.

【Specific Measures】

- Study a head protection standard taking into cyclists into account
- Promote the development of AEBS assuming bumping bicycles from behind
- Understand characteristics of bicyclist behaviors utilizing dashboard camera (drive recorder), etc.
- Expand standards on visibility and detection around and behind the vehicle (utilize CMS, etc.)

III. Measures against Serious Accidents Involving Large-Sized Vehicles

Once involved in an accident, large-sized vehicles such as buses and trucks are likely to cause serious damage. So it is essential to take adequate measures such as; actively adopting advanced safety technologies available,

promoting safety measures such as ensuring the driver's safe driving and proper operation management, enhancing the inspection and maintenance of poor maintenance vehicles.

【Specific Measures】

- Continue/expand purchase subsidy and tax exemption for trucks and buses with advanced safety technologies (AEBS, electronic stability control systems, lane departure warning systems, etc.)
- Expand standards on visibility and detection around and behind the vehicle (utilize CMS, etc.)
- Study warning sounds for large-sized vehicles while turning right/left and reversing
- Study systems detecting bicycles, etc. around the vehicle and notifying the driver of their presence
- Quicken implementation and sophistication of systems responding to driver's anomaly
- Promote the spread of systems responding to driver's anomaly after their commercialization (purchase aid, etc.)
- Make the installation of dashboard cameras on chartered buses mandatory
- Grant purchase aid for next-generation travel recorders, etc.
- Study measures to help chartered buses improve their passengers' seatbelt wearing rate etc.

IV. Response to New Technologies such as Automatic Driving

Automatic driving technologies are roughly divided into two categories: "driver assistance technologies" which assume a human driver and "fully automatic driving technologies" which do not assume any human driver. It is vital, while maximizing the potential of new technologies, to prevent "new types of accidents" caused by those technologies.

Recently, in case of "driver assistance technologies" the vehicle is required to ensure that:

- The driver recognizes the state of the system at all times properly;
- The command of operation is taken over safely between the human driver and the system;
- The human driver monitors the safe driving by the system; etc.

For further advancement of driver assistance technologies and the commercialization of fully automatic driving technologies, we will need further advancement of environment recognition technologies and control technology, utilizing not only control technologies based on sensor information and digital maps sent by onboard cameras, radars, etc. and highly accurate self-location estimation technology (control of autonomous systems), but also dynamic information on traffic congestions, construction work, etc. and communication information between roads and vehicles, vehicles and vehicles, and vehicles and pedestrians, and the development of those technologies has started.

Also, with the advancement of automatic technology, it has been pointed out that we need to develop standards on measures against hacking (e-security) and the maintenance of function during usage (e-safety).

【Specific Measures】

- Develop UN regulations on Automatically Commanded Steering Function early and adopt domestic ones
- Promote cyber security measures
- Establish standards on warnings upon system failures and recording of their nature
- Improve regulations on accident records, etc. including videos
- Promote the research and development of HMI responding to advanced driver assistance technologies
- Respond to demonstration experiments on public roads aimed at fully automatic driving etc.

Figure 4. Experiment in the Okinawa Prefecture
※Referred from the HP of National Institute of Advanced Industrial Science and Technology.

CONCLUSION

Measures that are being taken in Japan have been described above. When promoting these measures, we gather and analyze traffic data, and run a PDCA cycle with the cooperation from various stakeholders.

But in order to promote international harmonization in the aspects of further advancing safe and environmentally friendly vehicles in the future, it is perceived that approaches made in coordination with the World Forum for the Harmonization of Vehicle Regulation (WP.29) under the UN will become increasingly important.