GOVERNMENT STATUS REPORT OF JAPAN

Masayuki Shima
Director,
International Affairs Office,
Engineering Planning Division,
Engineering and Safety Department,
Road Transport Bureau,
Ministry of Land, Infrastructure, Transport and Tourism of Japan

TRENDS OF THE ROAD TRAFFIC ACCIDENTS IN JAPAN

The number of fatalities (within a 24-hour period) resulting from traffic accidents in 2008 was 5,155. This represents the eighth consecutive year that the number of fatalities has been decreasing, as well as a further drop below last year's number, which was the first time in 54 years since 1953 that the number of fatalities reached the 5,000 range. This number was also below one-third the 16,765 fatalities in 1970, which was the year in which the number of fatalities reached a peak. In addition, the number of accidents resulting in bodily injury and the number of injured persons decreased for the fourth consecutive year in a row since 2004, when the numbers were at their worst, and the number of injured persons fell below 1 million for the first time in 10 years.

However, the number of fatalities and injured persons and the number of accidents resulting in bodily injury remained high in 2008, as there were approximately 950,000 fatalities and injured persons, and approximately 770,000 accidents resulting in bodily injury.

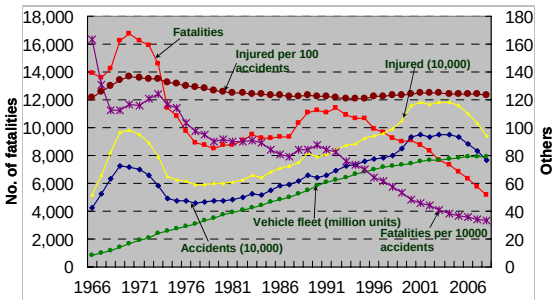

Figure 1. Trends of the road traffic accidents in Japan

With regard to reducing the number of traffic accidents, in order to achieve the national government's mid-term goal of "reducing the number of fatalities from traffic accidents to below 5,000 people by 2012" as indicated in the Prime Minister's policy speech in 2003, the targets of reducing the number of fatalities to below 5,500 and reducing the number of injured persons to below 1 million people by 2010 were established in the Eighth Fundamental Traffic Safety Program for 2006 to 2010.

Taking the state of past traffic accidents into consideration, this mid-term goal by the national government of reducing the number of fatalities to below 5,000 will be achieved in the near future, and as of the present moment, the targets in the Eighth Fundamental Traffic Safety Program will be reached two years in advance.

Based on these circumstances, in January of this year a new target by the national government to "halve the number of fatalities caused by traffic accidents to below 2,500 within approximately the next 10 years" was established in statements, etc. made by the Prime Minister.

The figure below shows the reduction in the number of fatalities based on safety measures for vehicles. In this diagram, the straight line from 1999 to 2010 represents the target for the reduction in the number of fatalities from traffic accidents that was established in 1999, and the curve extending to 2015 represents the estimated performance in the reduction of accidents based on safety measures for vehicles and subsequent reductions in the number of accidents that are anticipated.

According to analysis results based on traffic accident data, the target for the number of fatalities resulting from traffic accidents that is

based on safety measures for vehicles and that was initially established in 1999 was achieved 5 years early, and this is assessed as being largely due to the effects of measures for mitigating damage from vehicles through expanding and reinforcing safety standards and implementing vehicle assessments.

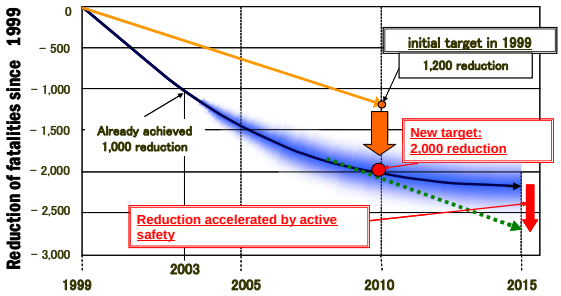

Figure 2. Targets for traffic safety by vehicle safety measures

Upon achieving this target, the following targets were newly established in 2006, in aiming towards further reductions in the number of fatalities (Transport Policy Council Report from June 2006).

(1) Reducing the annual number of fatalities in 2010 by 2000 people as compared to 1999, through safety measures for vehicles

(2) Prominently expanding active safety measures after 2010, and ensuring that the annual number of fatalities continues to decrease in 2015

As it is anticipated that the effects of damage mitigation measures will become saturated in accordance with the popularization of vehicles that conform to passive safety standards, in the future, it is important to continue promoting damage mitigation measures and to accelerate the introduction of technology related to active safety measures in order to further reduce the number of traffic accidents.

FUTURE RESEARCH IN FINDING SOLUTIONS TO THE SAFETY PROBLEMS IDENTIFIED

To achieve the abovementioned targets for reducing the number of traffic accidents, approaches will be made towards the following measures upon speculating future changes in social structures, such as future developments in IT and the progression of declining birthrates and an aging society.

- Accident analysis by using a drive recorder;
- Promotion of safety measures for pedestrians and the elderly;
- Promotion of neck injury prevention measures;
- Introduction of standards on crash compatibility;
- Research on advanced technologies, etc.

Concrete approaches regarding each of the measures are introduced below.

1. Accident analysis by using a drive recorder

In the event that useful active safety technology is to be popularized as a safety measure, further accurate information, such as the order of priority regarding introduction, cost-effectiveness, and clear information for users, etc., is necessary. Normally, these kinds of analyses are carried out based on traffic accident data, but in the case of active safety measures, there is insufficient information, such as due to the impossibility of acquiring data immediately before an accident, as conventional accident data is obtained based on surveys conducted after an accident occurs. To overcome this problem, there are expectations for drive recorders, etc., which are devices that record data immediately before an accident or when there is a near-miss incident, to provide data for the purpose of accident analysis and effects assessment. As approaches related to such in-vehicle recording equipment, technical guidelines pertaining to event data recorders were specified in March 2008, and methods for evaluating active safety equipment that make use of drive recorders are being reviewed. In the future, there are plans for reviews to be made on methods for gathering, managing, and analyzing the data recorded by drive recorders.

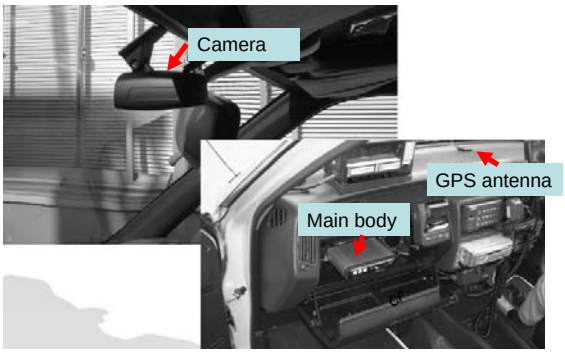

Figure 3. Example of a drive recorder system

2. Promotion of safety measures for pedestrians and the elderly

With regard to accidents involving pedestrians and the elderly, which account for a high percentage of the number of fatalities caused by traffic accidents in Japan, it is necessary to implement popularization and promotion of pedestrian protection performance standards and driving assistance systems for safety of the elderly. As a result, with regard to measures for pedestrians, pedestrian head protection standards were introduced in 2004, and reviews are being conducted on the introduction of pedestrian leg protection standards. In addition, with regard to measures for the elderly, surveys on the assessment of the effects, etc. of driving assistance systems for safety, such as brake assist systems and night vision systems, etc. are being conducted.

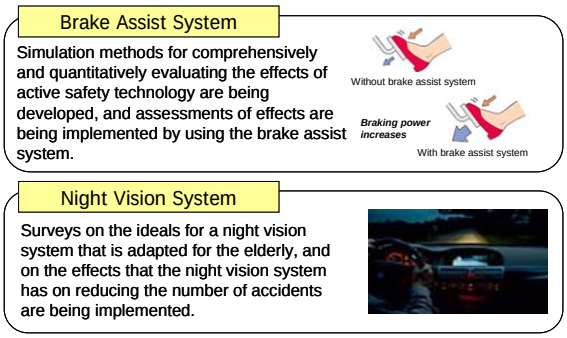

Figure 4. Examples of safety measures for the elderly

3. Promotion of neck injury prevention measures (standardization of dummies)

Accidents involving neck injury account for more than half of the total number of accidents, and as there is an increasing trend in the number of such accidents in recent years, the enhancement of standards for headrests, etc. is being promoted as measures for neck injuries.

At the same time, with regard to assessments of whiplash injuries, which 80% of occupants in rear-end collisions suffer, the mechanism behind the occurrence of whiplash is complex, and as a result, there is not enough scientific clarification and it is also unclear as to which dummies should be used and what items to assess.

In particular, with regard to dummies, there are concerns regarding the consistency of assessments due to differences in structures, etc. of the dummies, and it is necessary for dummies to be standardized by having the research institutions, etc. of each country make approaches by contributing to efforts to elucidate the mechanism behind the occurrence of whiplash injuries and decide on assessment standards and indicators.

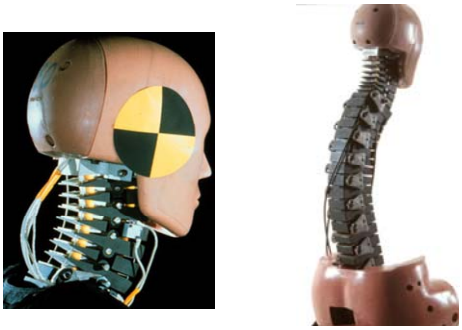

Figure 5. Standardization of dummies

4. Introduction of standards on crash compatibility, etc.

In addition to the above, crash compatibility measures for accidents involving frontal collision are also one of the passive damage mitigation measures for which approaches should be made. Japan considers measures for mini vehicles as being necessary. For the short-term, reviews are currently being conducted on the installation height of structural members so that the structural members interlock when there is a frontal collision.

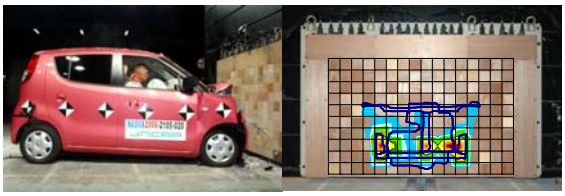

Figure 6. Crash Compatibility

Standards relating to performance for protecting occupants from electric shock after the collision of an electric vehicle or hybrid vehicle were also formulated in November 2007, and in the future, these guidelines will be reflected in reviews pertaining to electrical safety of electric vehicles, etc., on which progress is currently being made in international conferences, etc.

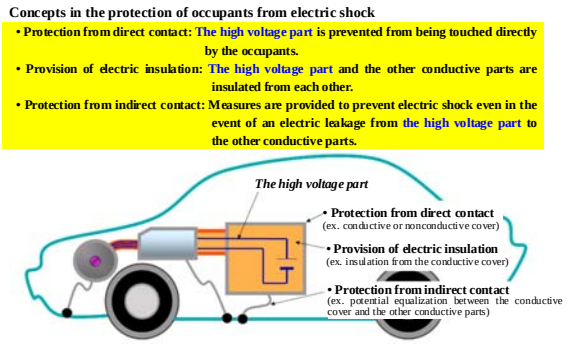

Figure 7. Concepts in the protection of occupants from electric shock

5. Research on advanced technologies

To prevent errors by drivers before they occur and decrease the number of accidents resulting in death and injuries, Japan has, with regard to ASVs, which are vehicles equipped with a system for assisting the driver to drive safely that makes use of advanced technology, established the ASV Project, which is a project to promote the development, practical application, and popularization of technology related to ASV, in 1991, and has been progressing with this project through joint efforts by industry, academia, and government.

For example, with regard to ASV technology that uses communications technology, technological developments are being promoted in the automobile industry through the implementation of experiments on public roads. In January of this year, a Large-scale Field Operation Test on public roads using approximately 30 vehicles equipped with inter-vehicle communications was conducted based on cooperation between the public and private sectors, and currently, the experiment results are in the process of being analyzed.

Figure 8. Communication-based driving assistance system for safety

PUTTING SAFETY TECHNOLOGIES TO WORK

The following table is a list of ASV technologies that are being put to practical use. Several ASV technologies, such as the lane-keeping assistance system and high-speed adaptive cruise control, have already been put to practical use, and are equipped in commercially-sold vehicles.

Table 1. Commercialized technologies from ASV Project

No.	ASV technology	Status		
		1996	2001	2004
1	High-speed adaptive cruise control (ACC)	☆	☆☆☆	☆☆☆
2	Low-speed adaptive cruise control	☆	☆☆	☆☆☆
3	Lane keep	☆	☆☆☆	☆☆☆
4	Damage mitigation brake	☆	☆	☆☆☆
5	Drowsiness warning	☆	☆☆☆	☆☆☆
6	Rear and side obstacle warning	☆	☆☆☆	☆☆☆
7	Curve warning	☆	☆	☆☆☆
8	Night vision	☆	☆	☆☆☆
9	Parking assist	☆	☆	☆☆☆

☆: In-company test, ☆☆: Road running test, ☆☆☆: Commercial use

From among the ASV technologies that are already mature, those with large effects in damage mitigation and accident reduction and

those for which there are large social needs should be disseminated in an early manner, and thus, active dissemination measures that include means for incentives are necessary.

Based on the idea that the damage mitigation braking system in heavy duty vehicles is technology that is suitably applicable to such means for incentives, in Japan, a system where aid for 50% of the costs related to installing the damage mitigation braking system in heavy duty vehicles for commercial use is provided to the purchaser has been implemented since April 1, 2007.

In addition, reviews are currently being conducted on this system regarding further measures that bring compulsory installation of the system into view.

CONCLUSION

Measures that are being taken in Japan have been described above, but in order to promote international harmonization in the aspects of further advanced safety and the environment in the future, it is perceived that approaches made in coordination with the ESV Conference, WP.29, ITS World Congress, etc. will become increasingly important.