

# STATUS REPORT OF REPUBLIC OF KOREA

Ministry of Land, Transport and Maritime Affairs  
Korea

## Jongsoo KIM

Sr. Researcher  
Division of Advanced Safety Vehicle  
Korea Automotive Testing and Research Institute  
Korea

### INTRODUCTION

The decrease in fatality became slow since 2004 as shown in Figure. 1. This trend led the government to establish the comprehensive accidents reduction policy of ‘Reduce traffic fatalities by half’ with the collaboration of six Ministries in 2008. The main goals of the traffic safety policy are to achieve an average level of traffic safety indices among OECD member countries by 2011 and to reduce fatalities to 3,000 by 2012. The policy included measures regarding the pedestrian protection, drunken driving, school zone improvement, commercial operators and public promotion.

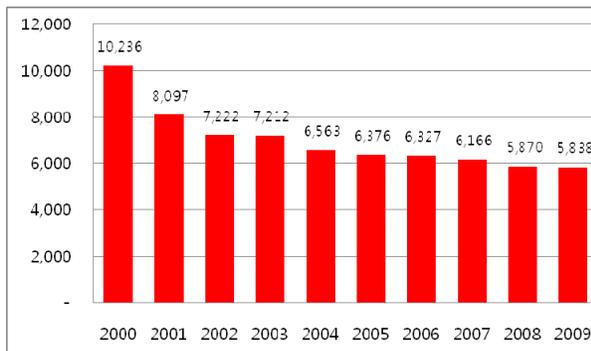


Figure 1. Fatalities Statistics since 2000.

### TRAFFIC ACCIDENTS ANALYSIS

While the total fatalities and injuries decreased slowly in recent years, the fatalities per 100,000 people and 10,000 vehicles improved from 21.8 and 7.4 to 12.0 and 2.8 between 2000 and 2009. The total number of accidents relatively remains unchanged around 220,000. The characteristics of traffic accidents in 2007 were analyzed to find out where the improvement could be made to further reduce

casualties and injuries. By collision type, vehicle-to-vehicle collisions accounted for 75% of accidents, while vehicle-to-pedestrian collisions for 21%. In terms of fatalities, pedestrian fatalities accounted for 36%, while fatalities in vehicle-to-vehicle accidents for 41.4%. The government needs to address the protection of vulnerable pedestrians.

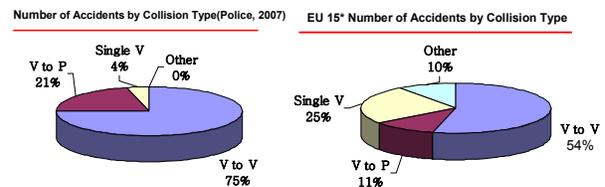


Figure 2. Accidents by collision type (2007).

Among fatalities of vehicle-to-vehicle accidents, side impacts represented 40.7% of fatalities. According to the statistics of EU 15 countries, vehicle-to-vehicle collisions accounted for 54% of accidents, while fatalities due to these collisions accounted for 50%.

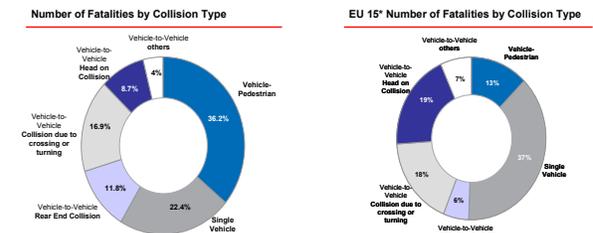


Figure 3. Fatalities by collision type (2007).

The recent trend to be noted was the increase in new SUV sales in the past several years due to the artificially created price difference between gasoline and diesel. The new SUV sales jumped from 8% in

late 1990 to 68% in mid 2000. This trend will raise compatibility issues later on. Another issue to be addressed is an emergency rescue system. According to the 2006 fatalities statistics 1,488 victims died at scene and 2,443 victims died under treatment.

## ADVANCED SAFETY VEHICLE RESEARCH & DEVELOPMENT PROJECT

### Overview

In the past decade new advanced safety technologies incorporated with information have been emerged and proliferated in the motor vehicles. These new technologies may be assessed with new safety concepts apart from conventional safety concepts. As new advanced features drew attention, the public demand these features to reduce and prevent traffic accidents. A study on the establishment of roadmap of advanced safety vehicle project was completed mid 2009. The advanced safety vehicle project was launched late 2009. It spans almost 8 years and its budget is about 18 million dollars from government grant with 6 million dollars matching fund from industries. Eleven organizations, comprising research institutes, academia and industries, are participating in the project.

The goal of the project is to develop advanced safety vehicle technologies and their assessment procedures. A regulatory system will be established based on the assessment procedures. The project has three main fields; mitigation of casualties, improvement of active safety technology and safety integrated with information technology.

### Roadmap

The project has been being carried out in three stages.

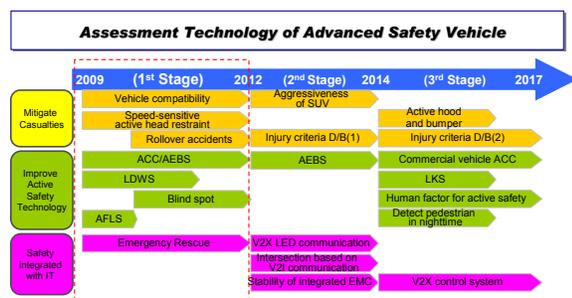


Figure 4. Project roadmap  
Research Fields

### Mitigate Casualties

- Vehicle Compatibility
- Speed-sensitive Active Head Restraint
- Active Hood and Bumper
- Rollover Accidents

### Improve Active Safety Technology

- Adaptive Cruise Control
- Automatic Emergency Braking System
- Lane Departure Warning System
- Lane Keeping System
- Blind Spot Detection System
- Adaptive Front Lighting System
- Night Vision

### Safety Integrated with IT

- Emergency Rescue System
- V2X Communication
- V2X Control System

## HYDROGEN FUEL-CELL VEHICLE SAFETY

The Hydrogen Fuel-Cell Vehicle Safety project was initiated in December 2007. The project will be completed in June 2012. The budget is about 12 million dollars from government grant with 12 million dollars matching fund from industries. The number of participating organizations is 7. The participating organizations form four groups which specialize in four area; policy and system, hydrogen safety, in-use vehicle safety, electrical safety. The goal of the project is to secure the safety of hydrogen fuel-cell vehicles, especially high pressure hydrogen safety and electrical safety.

## ELDERLY PEOPLE-FRIENDLY VEHICLE PROJECT

The elderly people-friendly vehicle project was initiated in October 2006. The project will be completed in June 2011. The budget was about 6 million dollars from government grant with 8 million dollars matching fund from industries. The number of participating organizations is 9. The project was carried out from three view points; comfort in egress and ingress, safety in airbag and safety-belt, night vision. The concept of an elderly people-friendly vehicle is that anything safe for the elderly is safe for any age. At the end of the project a demonstration vehicle for the elderly will be built. The recommendations, rather than regulatory approach, will be issued to build elderly people-friendly vehicles. Senior passengers in elderly people-friendly vehicles

are likely to be injured less severely than those in ordinary vehicles under the similar accident condition. Elderly people-friendly vehicles are expected to cost a little bit higher than ordinary vehicles. An incentive, from government side and insurance company side, will be considered to promote elderly people-friendly vehicles.

## **VEHICLE TECHNICAL REGULATIONS**

New technologies and advanced safety features with proven record of accidents prevention would be incorporated. Also measures will be implemented to disseminate those technologies in 2012 as much as possible. To reduce commercial vehicle accidents the scope of commercial vehicles subject to speed limiter will be expanded. The mandatory installation of brake assist system will be considered in 2011 to assist weak drivers. The electronic stability control system GTR will become mandatory to new passenger vehicles from 2012 and to all passenger vehicles in 2015.

The pedestrian protection GTR will be enforced on new passenger vehicles from 2013 and on all vehicles with GVW of 4.5 ton or less in 2018. To promote the pedestrian protection GTR as early as possible the assessment of pedestrian protection was introduced three years ago. Since the introduction, manufactures have successfully responded to this new regulation. To reduce accidents caused by commercial vehicles, an advanced emergency braking system for large commercial vehicles will be considered in 2011. Once AEBS is introduced, the scope will be gradually expanded.

## **COMPRESSED NATURAL GAS BUS**

In the past high-pressure vessels used in vehicles were managed by the Ministry of Industry. A CNG bus accident in the middle of city drew adverse publicity last year. This led the government to restructure the management of high-pressure vessels used in vehicles. The Ministry of Land, Transport and Maritime Affairs will take responsibility for high-pressure vessels used in vehicles. A periodic inspection system will be introduced.

## **SELF-CERTIFICATION SYSTEM**

### **Recall Notification System**

The recall notification is essential under the recall system. However, owners of recalled vehicles often do not receive the notification. The recall response rates

remain about 80% in the past several years. A new notification system will be introduced in addition to the current system this year. Owners will be notified if their vehicles subject to recall when they bring their vehicles for periodic inspection to inspection stations.

## **KNCAP**

In The Korean NCAP has been introduced in 1999 and has evolved ever since. KNCAP was implemented with one assessment item, and now the number of items is eight, including pedestrian protection. Seven items are assessed by the law, and one item, a pole side impact, is assessed upon manufacturers' requests.

- full barrier frontal collision
- offset deformable barrier collision
- lateral collision
- seat (head restraint)
- pedestrian protection
- rollover propensity
- braking
- pole side impact

A study on the new comprehensive rating system is well under way and will be completed at the end of this year. Upon the completion of the study relevant regulations will be amended in 2012 and implemented in 2013. Vehicles with advanced safety features will be assessed in favor over vehicles without those features (such as a lane departure warning system, automatic emergency braking system) in the new comprehensive rating system.

A new approach to upgrade the KNACP will be tried by putting a 5%tile female dummy in the passenger seat this year. An advanced European moving deformable barrier will be tested also. The labeling guideline was published last year. To further promote the KNCAP to the public the mandatory labeling law will be considered in 2013.

## **INTRNATIONAL ACTIVITIS**

### **Rechargeable Energy Storage System**

At the near completion of an electrical safety regulation for electrical vehicles and hydrogen fuel-cell vehicles, a new informal group of rechargeable energy storage system was established under the auspice of WP29/GRSP/ELSA late 2010. In Korea the regulation for RESS has been implemented in 2009 after two-year research. Korea will actively participate in establishing regulations for RESS with experiences accumulated in the past.

### **Pole Side Impact**

Real world side impact accidents data will be analyzed. Those characteristics will be compared with those of side impact tests. The results will be fed into the development of PSI GTR.

### **World Side Impact Dummy**

Korea will participate in the round robin test of world side impact dummy. The repeatability and reproducibility of WorldSID will be presented. In addition a finite element model will be developed and validated.