National Road Safety Action Plan in China

Dr. Yan Wang

July 14, 2011
Washington DC, USA
Outline

1. Initiative of “Road Safety Action Plan”

2. Phase I

3. For Next Phase?
Principles of the Action Plan

- **Innovation**
  - According to China’s reality & Multi-ministry cooperation

- **Demand Oriented**
  - Solve primary traffic safety problems in China

- **Integration**
  - Adopt comprehensive countermeasures

- **Focus**
  - Focus on prevention and control of accidents of mass injuries and fatalities.

- **Demonstration**
  - Implement demonstration & Establish standards, specifications, guidelines, etc.
Goals of the Action Plan

1. Under a cooperative working mechanism among the three ministries mentioned before, a series of research results on road safety with good practical effect are anticipated.

2. Greatly improve the ability of road accidents prevention, pre-warning, control and emergency rescue. Decrease Fatal and serious injured accident.

3. Through years of consecutive efforts, fatalities in road traffic accidents and the number of serious traffic accidents decline, and the mortality approaches the level of moderately developed country.
Activities of the Action Plan

- Traffic participants behaviors intervention technology
- Vehicle safety and transportation organization technology
- Road traffic management and safety enforcement technology
- Road infrastructure safety enhancement technology
- Accidents with mass injuries and fatalities
Activities of the Action Plan

1. Traffic participants behaviors analysis technology
2. Traffic participants behaviors monitoring and intervention technology
3. Identification and pre-warning technology of abnormal condition of commercial vehicle drivers
4. Training, test and management technology for drivers
5. Adaptation analysis of drivers to traffic environment
6. Road safety communication and education technology
Activities of the Action Plan

1. Vehicle safety performance inspection technology
2. Transportation organization safety technology
3. Commercial vehicle operation monitoring technology.
Activities of the Action Plan

1. Safety assessment technology during road design and operation period
2. Road infrastructure disease monitoring, pre-warning, repairing technology
3. Operation safety monitoring and emergency management technology for large bridge and tunnel
4. Traffic safety monitoring, pre-warning and risk control technology under adverse weather.
Activities of the Action Plan

1. Traffic enforcement technology
2. Accidents management and emergency rescue technology
3. Traffic organization and safety enhancement technology under abnormal condition
4. Accidents analysis and reconstruction technology
5. Rapid dealing technology of serious traffic accidents
6. Identification and control technology of traffic violation.
Objects of the Action Plan

Include

• Arterial highway
• Expressway
• Rural low-volume road

Not include

• Urban road and street
The way of Implementation

- Research
- Standard & specification
- Demonstration
Funding of the Action Plan

- Research
- Central Government
- Local Government
- Demonstration
Phase of the Action Plan

Phase I
(2009~2011)

Next Phase?
Outline

1. Initiative of “Road Safety Action Plan”

2. Phase I

3. For Next Phase?
Project in Phase I (2009~2011)

Comprehensive prevention and control technology of fatal and serious injured accidents and demonstration

- **Sub.1**: Traffic safety data integration and exchange platform construction technology and demonstration.
- **Sub.2**: Road network in mountain area safety enhancement technology and demonstration.
- **Sub.3**: Expressway safety and information service technology and demonstration.
- **Sub.4**: Commercial vehicle operation safety enhancement technology and demonstration.
- **Sub.5**: Road users safety enhancement technology and demonstration.
- **Sub.6**: Traffic safety monitoring, assessment, and management technology of road network.
- **Sub.7**: Road traffic enforcement technology and demonstration.
Targets in Phase I

1. Preliminarily develop the systematic road safety technology.

2. By implementing large scale demonstration projects, establish series of road safety technology specifications.

3. Improve the level of safety of demonstration road network significantly.

Specific Objectives in Phase I

Large scale of demonstration projects

1. National road safety information integration and analysis platform
2. >5000km road network for safety technology demonstration
3. >5 provinces participate in traffic safety remote education and training demonstration
4. >5000km regional road network for safety enforcement and emergency management demonstration
5. >5 provinces participate in commercial vehicles safety inspection and admittance management demonstration
Specific Objectives in Phase I

Compared with the level of safety 3-5 years ahead of project implementations, the level of safety of demonstration road network will be:

1. Annual fatalities per 10,000 vehicle kilometer travelled decrease by 20%
2. Annual number of severe accident per 10,000 vehicle kilometer travelled decrease by 50%
3. Emergency rescue efficiency increase by 50%
4. Legal commercial vehicle safety inspection rate >90%
Subject 1: Traffic safety data integration and exchange platform construction technology and demonstration

Objective

Build up the traffic safety data integration and exchange platform by integrating traffic accident database belonging to police and highway database belonging to highway agency.

Research & Development (R&D)

- Inter-agency traffic safety data platform construction technology
- Traffic safety data collection criteria
- Existing data integration technology
- Traffic safety information service system
Subject 2: Road network in mountain area safety enhancement technology and demonstration

**Objective**

Build up systematic road safety enhancement technology in mountain area, including road network risk assessment system, traffic operation safety control system under adverse weather, new defense and guidance facilities, emergency rescue facilities, etc.
Demonstration on inter-regional arterial road network in mountain area and inter-provincial freeway corridor.

**R & D**

- Systematic road infrastructure safety enhancement technology
- Operation safety management system of road network in mountain area
- Operation safety enhancement technology under adverse weather
- Safety analysis and verification of highway specifications
Subject 3: Expressway safety and information service technology and demonstration

Objective
Develop intelligent expressway safety management and information service system
Develop safety design technology for expressway renewal

R & D
- Expressway safety design technology based on driving behavior
- Intelligent expressway safety management technology
- Integrative expressway safety information service technology
- Operation management technology of national expressway network
- Specification on freeway safety design and service
Subject 4: Commercial vehicle operation safety enhancement technology and demonstration

Objective
Improve operation safety of commercial vehicle by building up safety performance assessment and enhancement technology system

R & D
- Safety performance assessment and inspection technology of commercial vehicle
- Operation safety monitoring technology of commercial vehicle
- Driving safety training, test and evaluation technology for commercial vehicle drivers
- Specification on admittance management of commercial vehicle and drivers
Subject 5: Road users safety enhancement technology and demonstration

**Objective**

Improve traffic behavior safety of all road users by strengthening the effect of drivers training and test as well as the effect of traffic safety communication and education.

**R & D**

- Training and test improvement based on drivers behavior safety analysis
- New traffic safety communication and education technology.
- Interactive traffic safety communication and education platform
- Regulation on traffic safety training, test, communication and education
Subject 6: Traffic safety monitoring, assessment, and management technology of road network

**Objective**

Improve the level of traffic management by developing traffic safety monitoring, assessment and emergency management system of regional road network.

**R & D**

- Traffic safety monitoring technology of regional road network
- Traffic safety assessment and pre-warning technology of regional road network
- Traffic safety information service technology of regional road network
- Traffic enforcement technology
- Specification on traffic safety monitoring, assessment and emergency management
Subject 7: Road traffic enforcement technology and demonstration

Objective

Improve traffic enforcement capability, including accident on-site investigation, analysis and rapid-dealing, etc., especially for serious accident.

R & D

- New technology and equipment of accident rapid-dealing and on-site protection
- Traffic accident investigation and analysis
- Traffic safety enforcement technology and equipment
- Regulations on traffic safety enforcement
Funding in Phase I (2009~2011)

Total funding: 129.2 million US $

Including:

- Central government funding: 44.2 million US $
- Local government funding: 85 million US $

Research

Demonstration

85 million US $
Update in Phase I

- July 2010 to Now: On-going
- Dec. 2009 to June 2010: Done
- Sept. 2009 to Dec. 2009: Done
- Aug. 2009 to Nov. 2009: Done
- June 2009 to Aug. 2009: Done

- Demonstration
- Research and development
- Propose technical solutions
- Technology demand analysis
- Safety situation investigation
Update of Demonstration

- **Nov. 2009**: Define the demonstration road network together with local highway agency
- **Feb. 2010**: Finish the technical proposal of demonstration
- **June 2010**: Make arrangements for demonstration
- **Aug. 2010**: Finish sample design
- **Oct. 2010**: Full implementation of demonstration
Outline

1. Initiative of “Road Safety Action Plan”

2. Phase I

3. For Next Phase?
Why Next Phase?

Phase 1
(On-going)

- Statistic, passive
- Mechanical Properties-based
- Protection facilities & equipments

Next Phase
(In preparation)

- Traffic Safety Initiative Protection
- Advanced Technology Application, e.g. Internet of Things, Beidou Navigation System, etc.
- Human Behavior-based Intervention
- Multi-agency Collaborated Traffic Emergency Management Platform
Objectives of Next Phase

- Forecasting, active pre-warning and pre-control of significant risk
- Improve the efficiency of emergency management and rescue
- Further reduce the rate of fatal and serious injured accident and mortality rate
- Maximize protection of people’s lives and property

New Technologies
- Internet of Things
- Beidou Navigation System
- Behavioristics

Research Objects
- Expressway
- Rural road and low-volume road
- Commercial vehicle

Preliminary Basis
- Integrated applying the safety facilities and monitoring equipment proposed in Phase 1
Tasks of Next Phase

1. Accident Active Prevention and Control Technology of Expressway
2. Safety Enhancement Technology of Rural Road (low-volume and in Mountain Area)
3. Operation Safety Monitoring Services Technology of Commercial Vehicles
4. Traffic Participant Behavior Analysis & Intervention Technology
Task 1 of Next Phase

**Problems**

- Weak safety supervision of Road key infrastructure (e.g. Large bridge and tunnel)
- Lack of safety information collection and integration technology
- Monotonous traffic safety service mode for drivers
- Inefficiency of on-site first aid in serious traffic incidents

**Researches**

- Safety status monitoring, pre-warning and management technology of road key infrastructure
- Driving environment monitoring and comprehensive utilization technology and system
- Interactive driving safety service technology
- On-site emergency rescue and remote assistance technology for serious traffic incidents
Task 2 of Next Phase

Safety Enhancement Technology of Rural Road (low-volume and in Mountain Area)

Problems

- Low level of safety standard of rural low-volume road in developed region
- High frequency of serious car-fall accidents on highways in mountain area
- Frequent occurrence of natural disasters on highway in mountain area
- The huge risk caused by road environment change in urban fringe

Researches

- High-availability protection facilities and control & optimization technology
- Driving safety pre-warning and control technology in severe environment/on dangerous road sections
- Natural disaster forecasting, prevention and monitoring technology of highway in mountain area
- Traffic control and intervention technology in traffic environment converting sections
Task 3 of Next Phase

Operation Safety Monitoring Services Technology of Commercial Vehicles

Problems

- Lack of effective ways of monitoring and real-time control to traffic violation, e.g. speeding, fatigue driving, etc.
- Lack of accurate on-route safety information service to commercial vehicle drivers
- High accident risk caused by the complex road and vehicle situations in rural passenger lines

Researches

- Driving process supervision and traffic violation real-time intervention technology based on Beidou Navigation System
- Personalized safety information service technology
- Driving safety enhancement technology of rural passenger vehicles
Task 4 of Next Phase

Traffic Participant Behavior Analysis & Intervention Technology

**Problems**

- Less training methods of driving behavior under abnormal situation
- Lag of behavioral characteristics researches of traffic participants
- Infancy of active driving intervention technology researches and applications

**Researches**

- Major driver’s safety driving behavior training technology under abnormal situation based on training venues
- Behavior characteristics of traffic participants apperception and intervention technology
- Human factor-based driving operation intervention technology
THANKS!