Active Safety Study and Potential Technical Application in China Based on Real World Accident Data

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Autoliv

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Background

Vehicle production in China[1]

Total road traffic fatalities[2]

Data Source:
[1] Actual data from CAAM; Forecast data from HIS
Background

- CIDAS conducted by CATARC
- China In-depth Accident Study
  - 2011 July
  - 6 target cities
  - At least one 4-wheeled vehicle involved and one injured person involved
  - 21 sponsors
Background

FATALITIES BY ROAD USER CATEGORY

WHO 2013 REPORT

- Riders motorized 2- or 3-wheelers&Cyclist: 28%
- Pedestrians: 25%
- In vehicle occupant: 45%
- Other: 2%

CIDAS ~2014July

- Riders motorized 2- or 3-wheelers&Cyclist: 32%
- Pedestrians: 30%
- In vehicle occupant: 36%
- Other: 2%
Traffic Safety of Electric PTW in China

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Traffic Safety of Electric PTW in China

In China, until end of 2013, electric PTW population: 181 million, and electric PTW sales of 2013 is almost 10 times of 2010[1].


Data Source [1]: China Bicycle Industry Association
Traffic Safety of Electric PTW in China

Accident Database → PC-Crash Reconstruction → Matlab Simulation

FOV Coverage

- Fatal cases (n=17):
  - FOV:40 degree: 47%
  - FOV:60 degree: 88%

- Non-fatal cases (n=43):
  - FOV:40 degree: 44%
  - FOV:60 degree: 70%
Pedestrian Protection in China

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- STATS 19 (2008) national accident database
  Injured cases

  Injured and non-injured cases

- CIDAS (2011-) in-depth on-the-spot database
  Injured cases
Pedestrian Age and Gender

- Child 0-7 yrs: 4% (CIDAS), 10% (STATS), 13% (OTS)
- Child 8-15 yrs: 5% (CIDAS), 28% (STATS), 27% (OTS)
- Adult female: 32% (CIDAS), 27% (STATS), 23% (OTS)
- Adult male: 59% (CIDAS), 35% (STATS), 37% (OTS)

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Pedestrian Walking Speed

- Walking: 72% CIDAS, 65% OTS
- Running: 11% CIDAS, 35% OTS
- Unknown: 14% CIDAS
- Stationary: 3% CIDAS

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Pedestrian Crossing Direction

- Crossing from the nearside:
  - CIDAS: 42%
  - STATS: 57%
  - OTS: 59%

- Crossing from the offside:
  - CIDAS: 41%
  - STATS: 36%
  - OTS: 36%

- Other:
  - CIDAS: 17%
  - STATS: 7%
  - OTS: 5%
In Car Occupant Protection

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In Car Occupant Protection
Background

- **CIDAS**
- China In-depth Accident Study
  - 2011 July until 2014 July
  - 6 target cities
  - At least one 4-wheeled vehicle involved and one injured person involved
  - 21 sponsors

- **GIDAS**
- Germany In-depth Accident Study
  - 1999 until 2014 December
  - 2 target cities: Hanover and Dresden.
  - At least one person injured
  - 15 sponsors

![In Car Occupant Injury Distribution](chart)

IN CAR OCCUPANT INJURY DISTRIBUTION
(VRUs excluded)

- **CIDAS**
  - Severely & Fatally Injured: 45%
  - Uninjured & Outpatient: 55%

- **GIDAS**
  - Severely & Fatally Injured: 12%
  - Uninjured & Outpatient: 88%
In Car Occupant Protection
Severe and fatal passenger car accident_CIDAS (2011 July-2014 July)

- Over Speeding
- Limited Braking
- Failure in Giving Way
- Drunk Driving
- Fatigue Driving
Potential Active Safety Technology for China

**Automatic Emergency Braking (V2V)**
Continuously monitors the area in front of the vehicle to detect slow moving vehicles.

**Automatic Emergency Braking (VRU)**
Continuously monitors the area in front of the vehicle to detect vulnerable road users.

**Night Vision**
Uses infrared camera technology to highlight animals and pedestrians on the road at night which may not be visible to the naked eye.

**Blind Spot Detection**
Monitors the presence, direction and velocity of vehicles in adjacent lanes.
Potential Active Safety Technology for China

**Traffic Sign Recognition**
The system keeps the driver informed of the speed limit and other traffic signs on the road.

**Eyes On Road**
Detect if the driver looks away from the road and is sleepy/drowsy.

**Queue Assist**
In slow-moving traffic and congestion it makes driving easy and comfortable.

**Adaptive Cruise Control**
Automatically adjusts the vehicle speed to maintain a safe distance from vehicles ahead.
- **CNCAP 2018+:** Active safety and pedestrian protection will be introduced.

1. Side crash - Bigger MDB
2. Crash test method update
3. Crash dummy study
4. Passive pedestrian testing
5. Active safety test & assessment
6. New energy vehicle safety (EV mainly)
TRAFFIC SITUATION IN CHINA IS QUITE DIFFERENT FROM DEVELOPED COUNTRIES, ACTIVE SAFETY TECHNICAL APPLICATION WILL BE HELPFUL TO REDUCE TRAFFIC ACCIDENTS, INJURIES AND FATALITIES IN CHINA.

LET’S DO IT TOGETHER!

THANK YOU
Every year, Autoliv’s products save over 30,000 lives and prevent ten times as many severe injuries.