

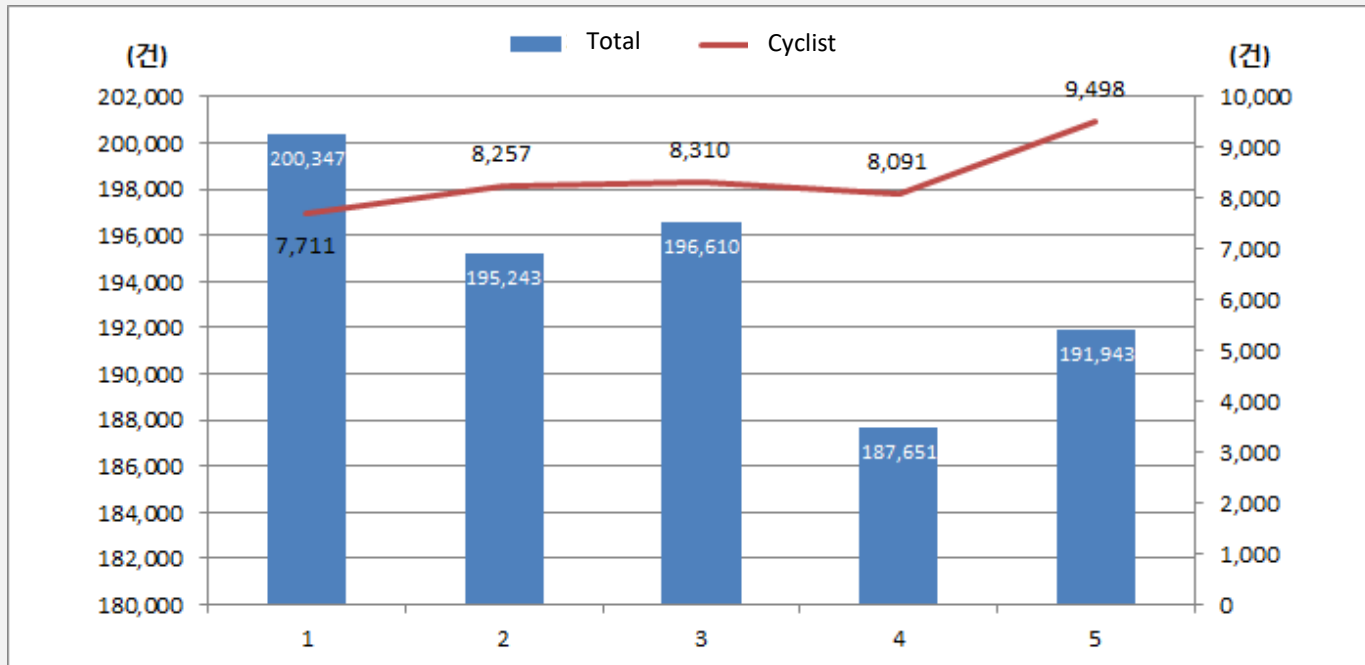
AEBS Car to Cyclist Crash Test Result-HIC/AIS4

AEBS IG 11th meeting
Feb. 2020, Paris

Korea Automobile Testing & Research Institute
Automated Driving Research Office

Cyclist Accident Data

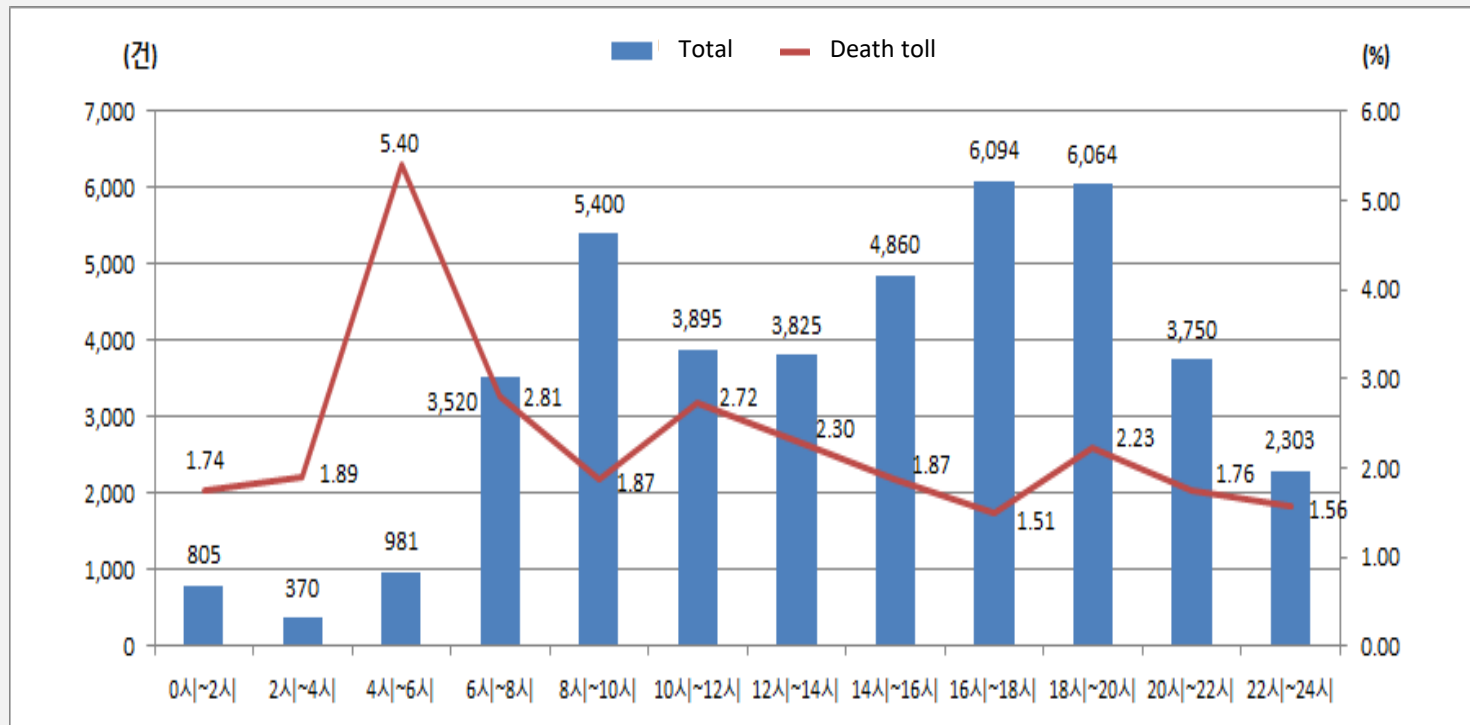
- Accident data for the last five years
 - The total number of traffic accidents decreased 1.03% annually.
 - The death toll decreased 3.81% annually
 - Cyclist accident increase 5.61% annually



Accident analysis by time zone

● Accident analysis by time zone

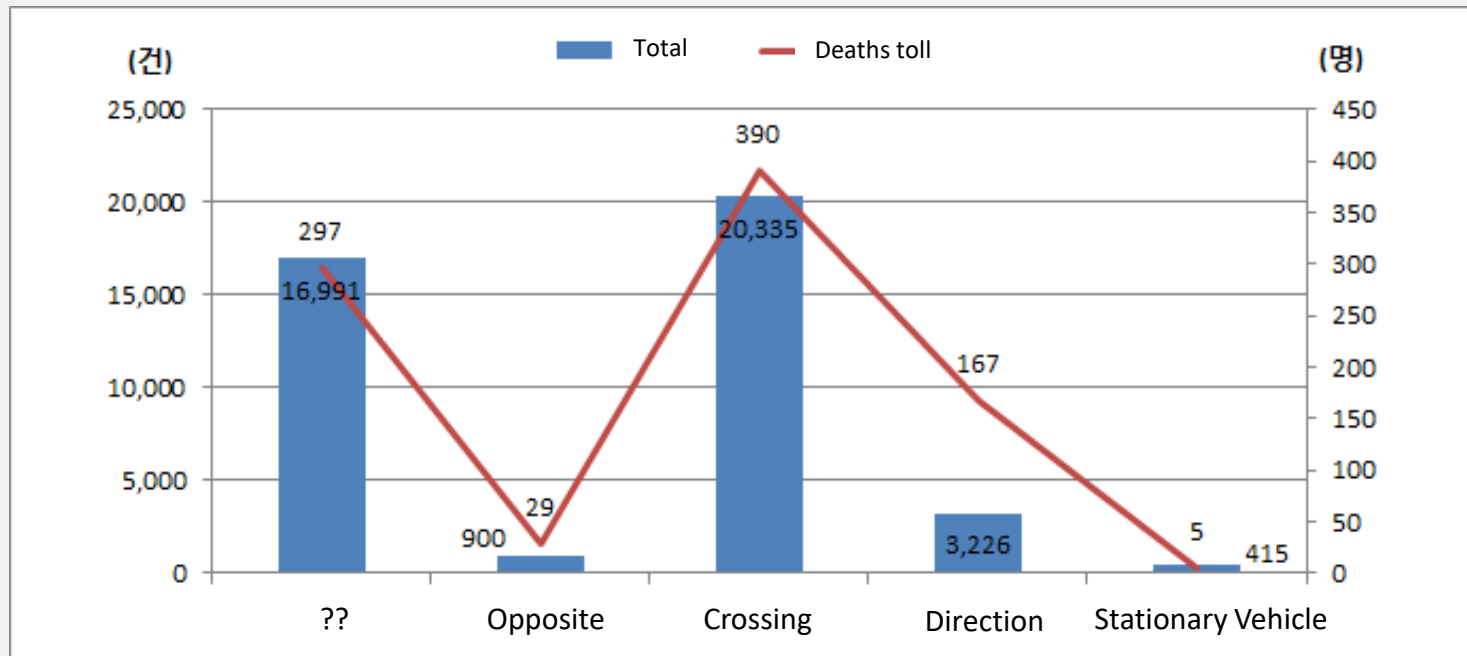
- Between 4 p.m and 6 p.m are the highest followed by 6p.m to 8p.m
- Death toll is highest between 4 a.m and 6 a.m



Analysis of accident type

● Cyclist Accident Type

- **Crossing accident : 48.57%(Direction : 7.7%)**
- Deaths toll : 43.91%(Direction : 18.8%)
- Death rate from cross impact accidents is the highest at 5.17%



Crash Test Result

● Analysis of Injury

- Causes of death due to pedestrian impact
 - Head 55.7%, Chest 9.4%, Legs 7.1%, Waist 3.2%

	Collision Speed (30km/h)	Collision Speed (60km/h)
HIC (Head Injury Criteria)	451	1,876
AIS 4 (Abbreviated Injury Scale)	4.9	98.8

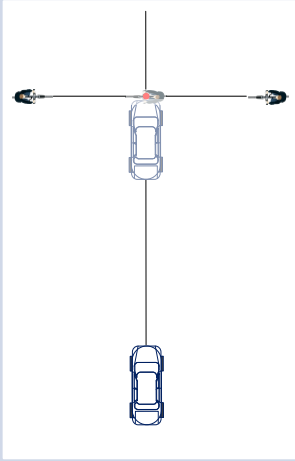
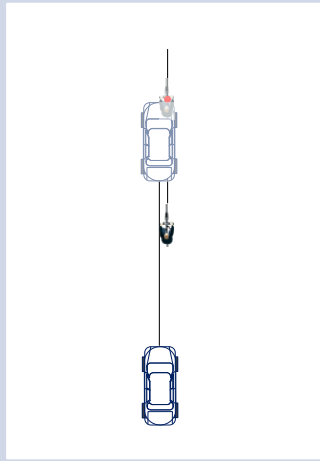
- Korea regulation No.102(Safety Pedestrian)
 - 2/3 area of head impact : HIC 1,000 or less(fatal injury 15%)
 - 1/3 area of head impact : HIC 1,700 or less(fatal injury 72%)
- AIS 4 means mortality rate 7.9~10.6%
- Next page....simulation HIC



Simulation-HIC/AIS4

- Scenario(Ref. ENCAP & Accident data)

- Cyclist Crossing Nearside(Non obstacle)
- Cyclist Longitudinal Direction(impact point 25%)

Vehicle Speed(km/h)	BCN_O			BLD-25%		
	HIC	AIS4		HIC	AIS4	
20	192.44	0.00		-	-	
30	451.00	4.90		42.11	0	
40	817.78	26.31		192.44	0	
50	1292.78	57.61		451.00	4.90	
60	1876.00	98.80		817.78	26.31	

- Test Result

- Crossing Scenario : Impact Velocity 30km/h
- Cyclist Longitudinal Direction(impact point 25%)



Summary

● Car to Cyclist Cross Scenario

- The requirement values shall determined at a **collision velocity of not more 30km/h**, depending on the impact test results and the simulation results.
- Proposal : min. speed reduction 20 or 30km/h?

● Car to Cyclist Longitudinal Scenario

- The requirement values shall determined at a **collision velocity of not more 50km/h**, depending on the impact test results and the simulation results.
- Proposal : min. speed reduction 50km/h or less?

● Future Plan

- KNCAP will perform the cyclist test from 2020.
- We will reanalyze HIC and AIS4 by referring to the results of KNCAP test.