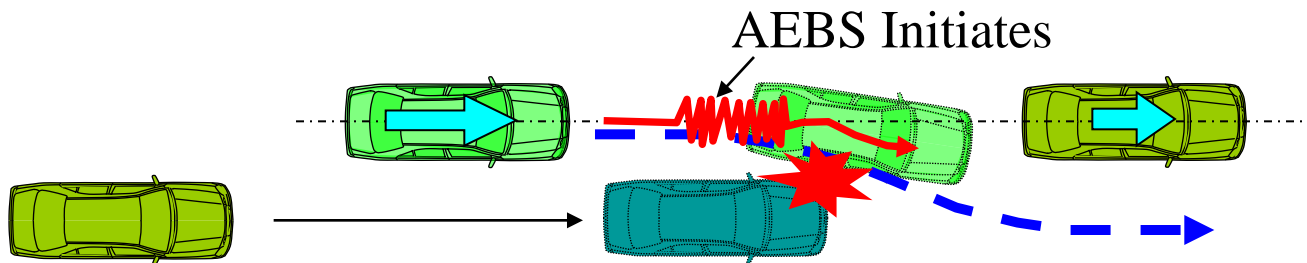


Initiation Timing of AEBS and Interference with Driver Operation

1. Initiation Timing of AEBS

- The vehicle speed reduction requirement will force the initiation timing of AEBS indirectly.
- Inappropriate initiation timing will become the obstruction of driver's avoiding maneuver, which may cause the unsafe condition in some cases.
- Therefore, the appropriate vehicle speed reduction requirement shall be prescribed considering the situation.
- A typical estimated case is as follows.

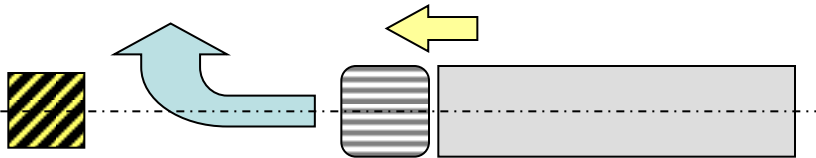
If AEBS works when the subject vehicle tries to overtake the low speed vehicle,
a. The subject vehicle cannot overtake the forward vehicle.
b. There may be a danger that the following vehicle collides with the subject vehicle.



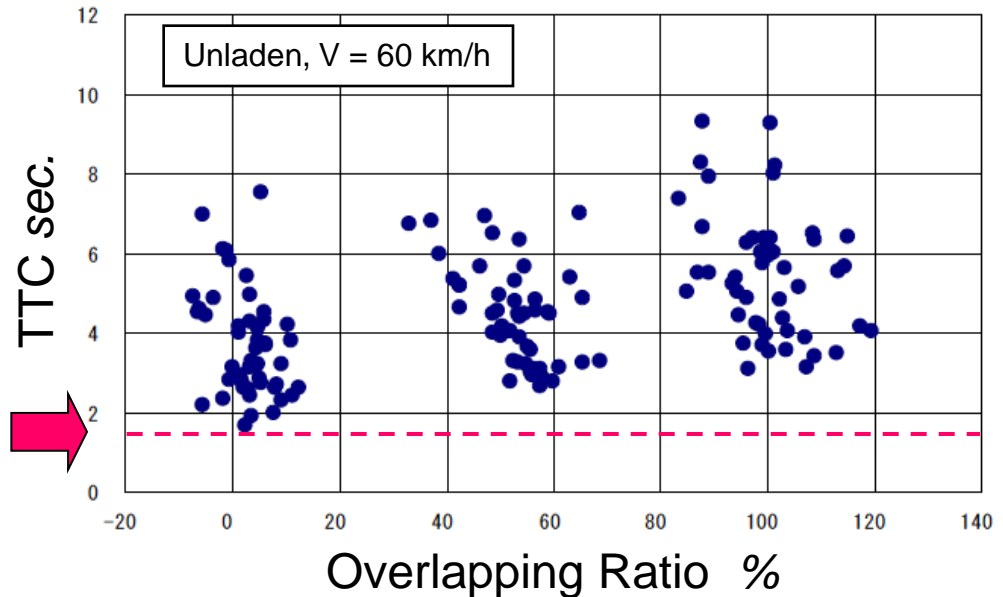
1. Initiation Timing of AEBS

Experiments

“Avoid the obstacle when you feel it is unsafe to get closer.”



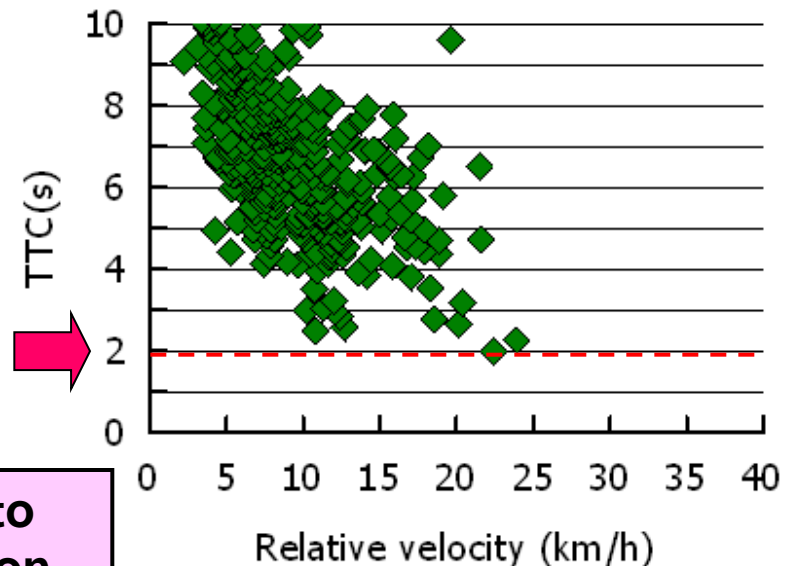
No interference $TTC < 1.6$ sec.



Measurement in Real World

The steering timing for collision avoidance in large trucks

No interference $TTC < 2.0$ sec.



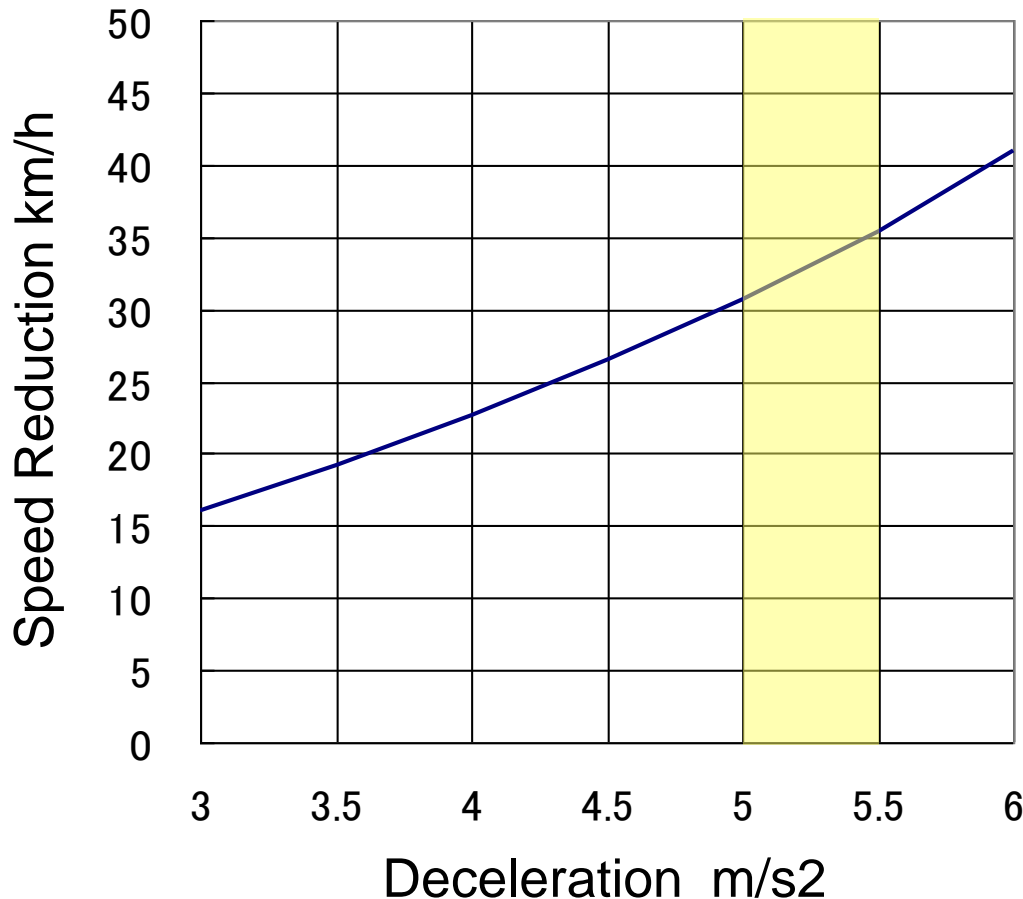
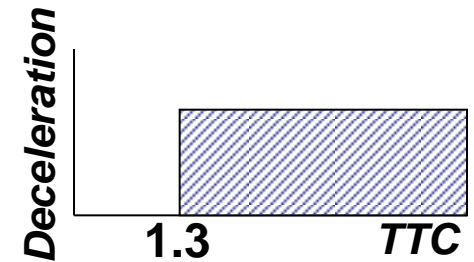
AEBS shall be activated at $TTC < 1.6$ sec. to avoid the interference with driver operation.

1. Initiation Timing of AEBS

Estimation of Speed Reduction

Average deceleration applied from TTC1.3.*

* 0.3 sec. considered for the delay of brake activation.



2. Examples of Interference with Driver Operation

Example 1

System recognized a vehicle **A** as an obstacle which was moving slowly on an exit-road.



Example 2

Forward vehicle **A** decelerated for left turn.



2. Examples of Interference with Driver Operation

Example 3

Forward vehicle **A** decelerated for right turn.



Example 4

Forward vehicle **A** decelerated for right turn.



2. Examples of Interference with Driver Operation

Example 5

Forward vehicle **A** was driven slowly .



Example 6

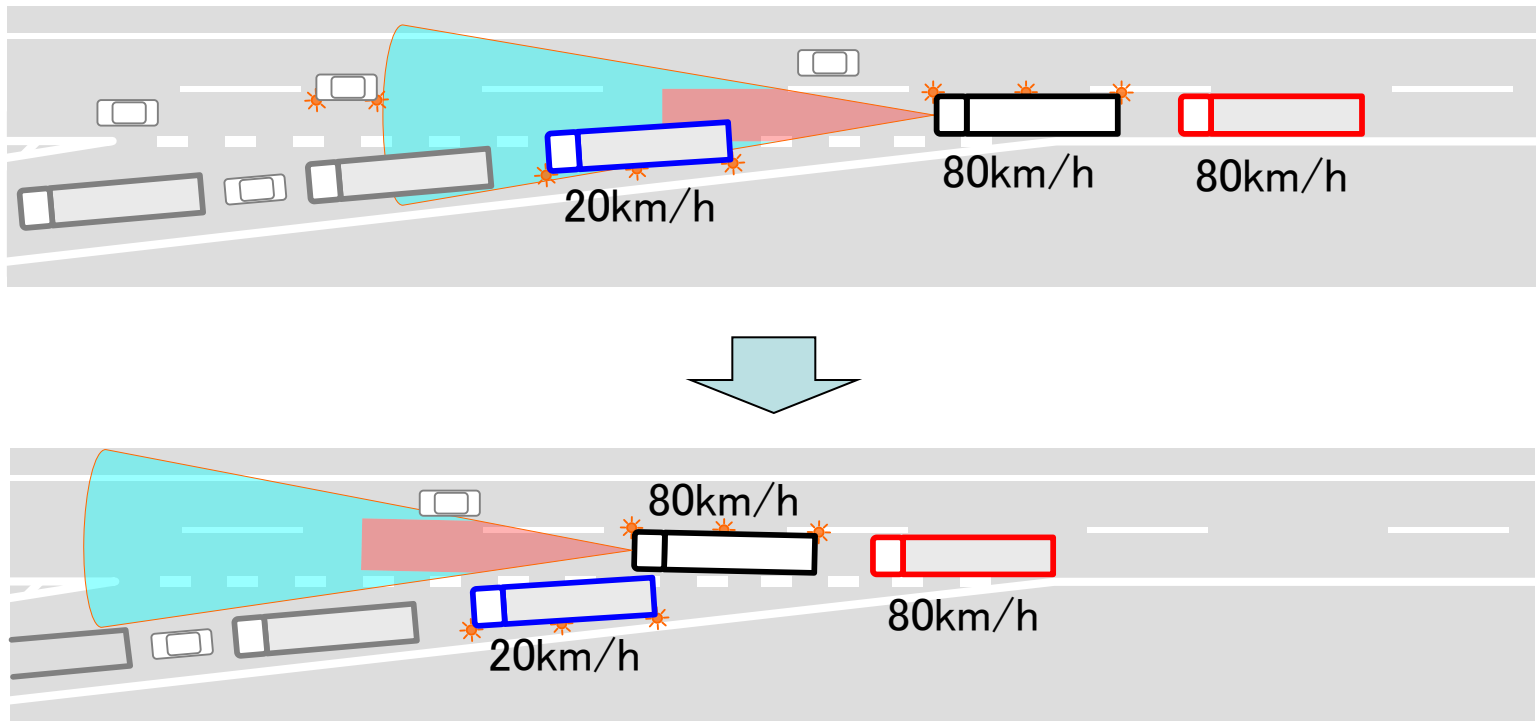
Forward vehicle **A** decelerated to merge to the left lane.



2. Examples of Interference with Driver Operation

Example 7

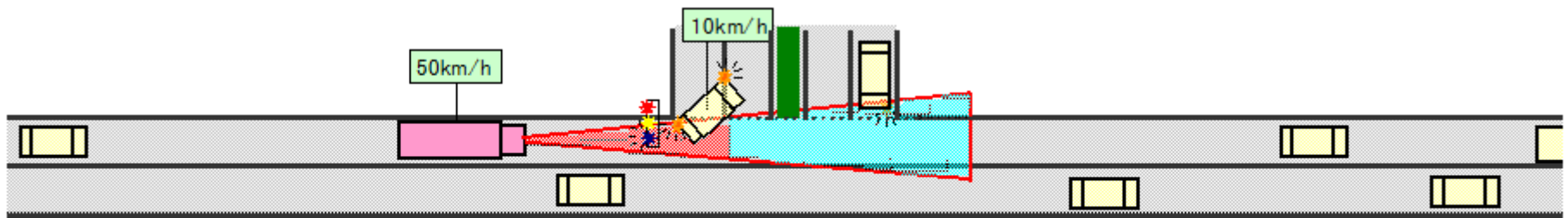
System recognizes a vehicle which is moving slowly on an exit-road as an obstacle and another truck is following with short distance.



2. Examples of Interference with Driver Operation

Example 8

Forward vehicle decelerated for left turn and the driver is confident that he can go without decelerating.



2. Examples of Interference with Driver Operation

Example 9

Forward vehicle **A** decelerated for right turn.



Example 10

Forward vehicle **A** decelerated because vehicle **B** tried to cross the traffic.



2. Examples of Interference with Driver Operation

Example 11

Forward vehicle **A** decelerated because vehicle **B** got into the traffic.



3. Examples of False Activation to Stationary Object

Example 1

System recognized a signboard **A** in a curve as an obstacle.



Example 2

System recognized a sidewalk **A** in a curve as an obstacle.



3. Examples of False Activation to Stationary Object

Example 3

System recognized a pillar **A** in a curve as an obstacle.



Example 4

System recognized an overhead signboard as an obstacle.



END