Front and Lateral Close Proximity Awareness Update

VRU-Proxi IWG #19
216.8

JAPAN

Looking out compensation for the driver's side Eyepoint (Annex 10 Table 3)

Vehicle category	*Measures in [mm]*	*Forward/rearward compensation distance (+: rearward, –: forward)*	*Lateral compensation distance (+: right, –: left)*	*Upward/downward compensation distance (+: upward, –: downward)*
M1	Looking out with stretching forward side of the driver	**20**	**30**	**-5**
	Looking out with stretching upper side of the driver	**10**	**30**	**0**
	Looking out as much as possible for outer side of the driver	**5**	**35**	**-5**
N1	Looking out with stretching forward side of the driver	**20**	**25**	**-10**
	Looking out with stretching upper side of the driver	**10**	**30**	**-5**
	Looking out as much as possible for outer side of the driver	**5**	**35**	**-10**

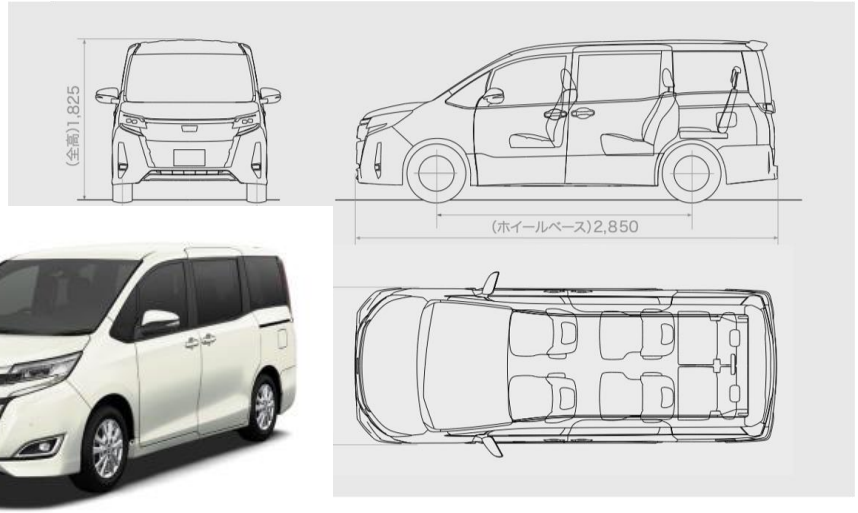
* Values defined based on the study.

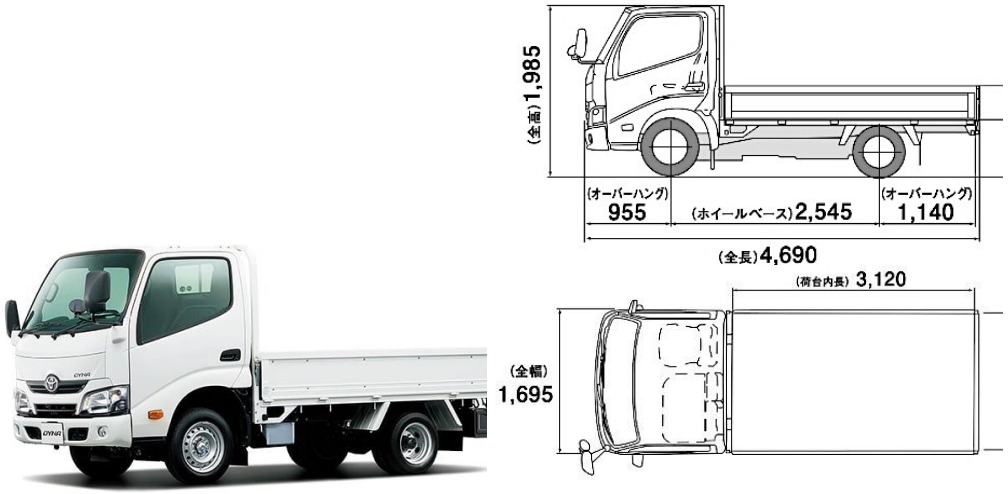
Looking out compensation for the driver’s side Eyepoint Justification (1) Methods

Eyepoint measurements had done with using typical actual vehicles.

45 Participants
- Male 22, Female 23
- Average Age 44.8 years old (Min 20, Max 77)
- Average Height 164.2 cm (Min 146.5 cm, Max 187.3 cm)
- Average sitting height 88.6 cm (Min 79.7 cm, Max 99.7 cm)

Used vehicle
M1 Toyota Noah, N1 Toyota Dyna



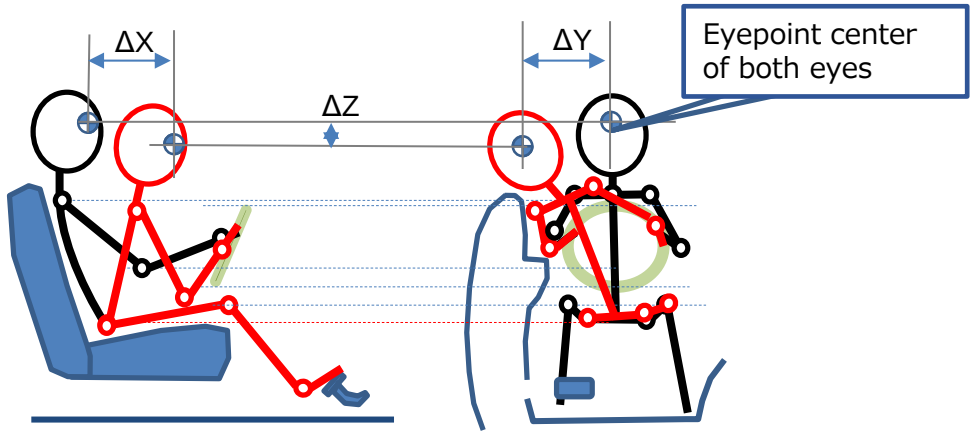


Looking out compensation for the driver's side Eyepoint Justification (2) Methods

Measurements
Eyepoint was measured under 4 conditions.

Basic posture: Normal driving posture
Forward stretching posture: The posture with looking out and put eyepoint forward without hip lifting from the seat
Upper stretching posture: The posture with looking out and put eyepoint upward without hip lifting from the seat
Outer stretching posture: The posture with looking out and put eyepoint outward without hip lifting from the seat

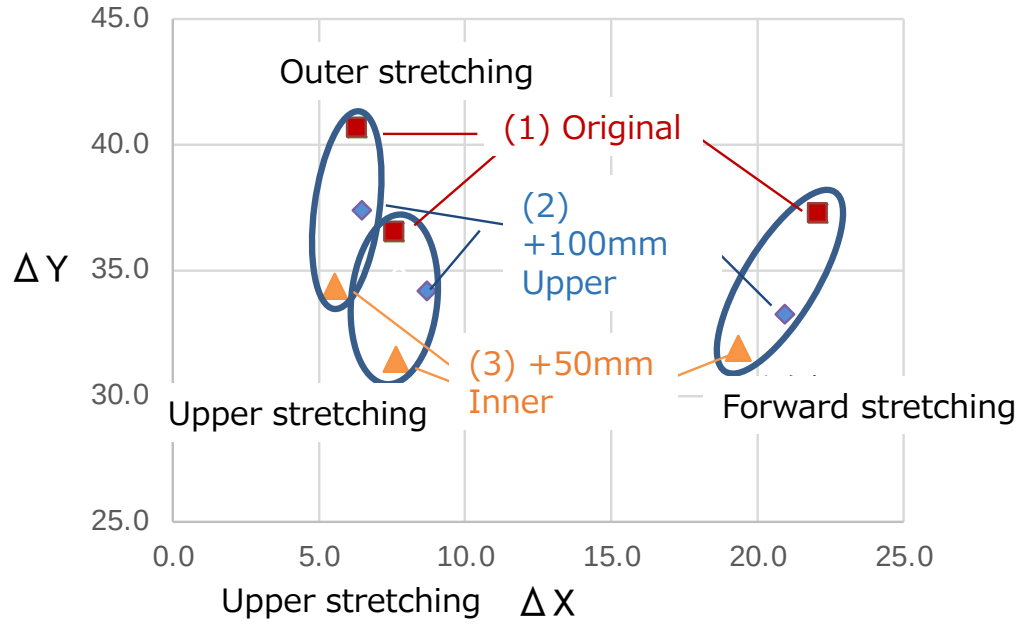
Amounts of eyepoint movement from basic posture were calculated for three stretching postures.

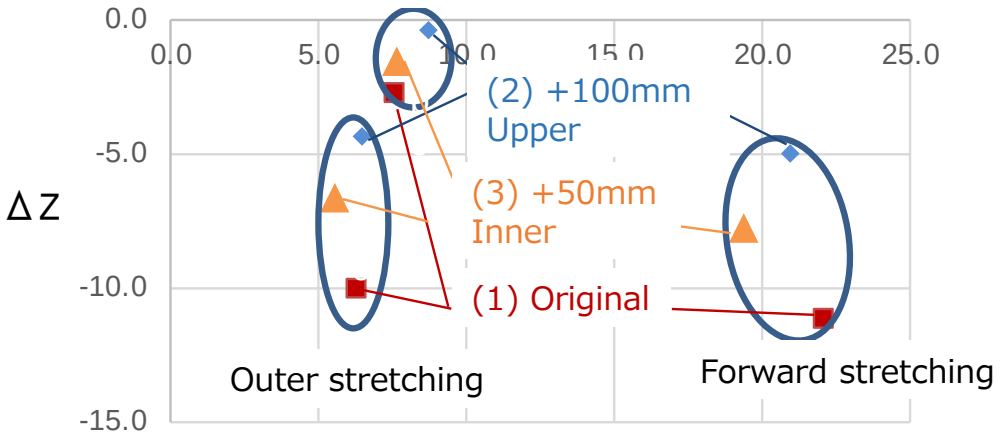


Measurements had done with
- original vehicle

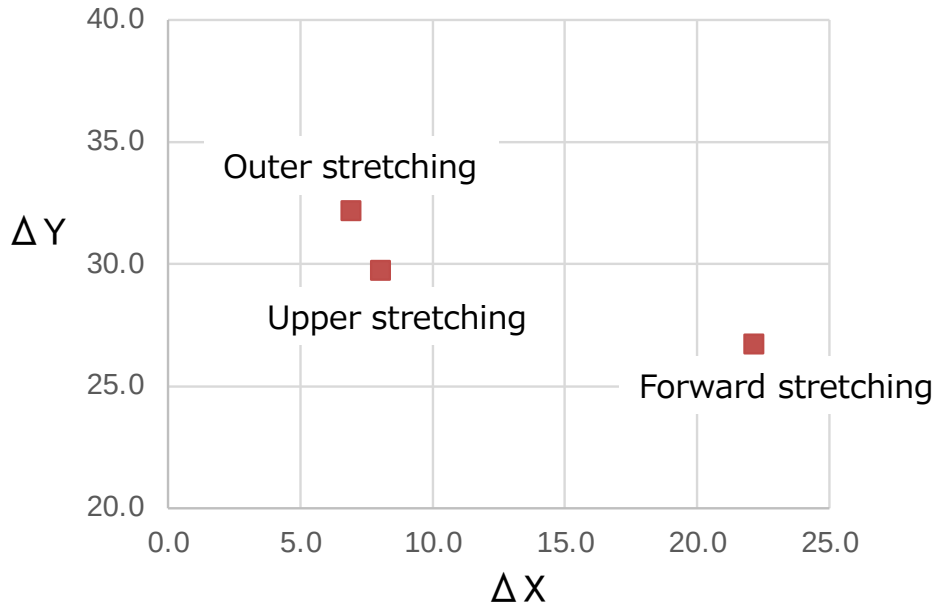
M1 only added
- +100 mm (upper side) modified door waist line
- +50 mm (inner side) modified door trim thickness

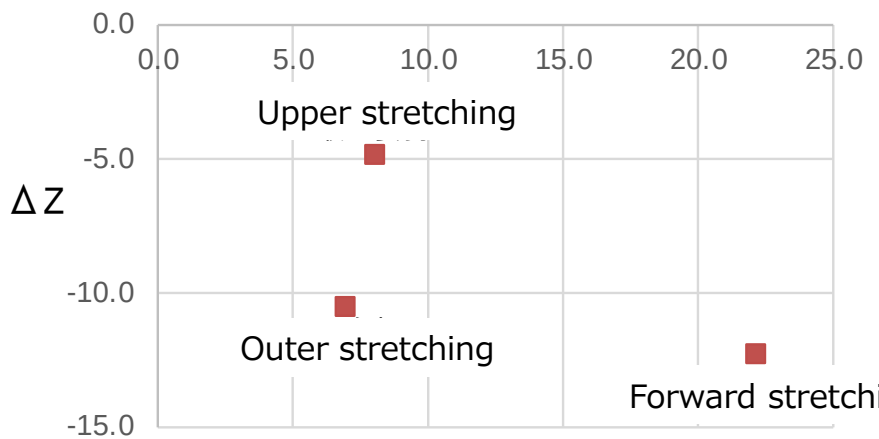
Looking out compensation for the driver's side Eyepoint Justification (3) Results (Average movement)





M1





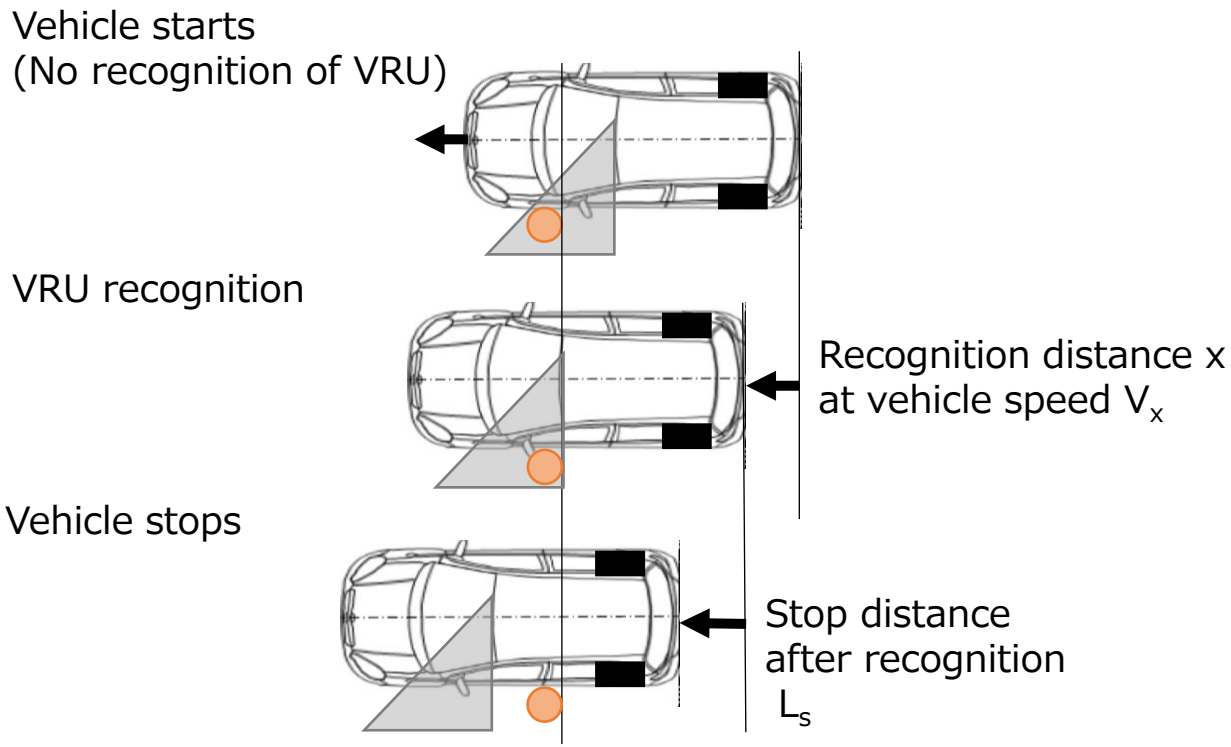
N1

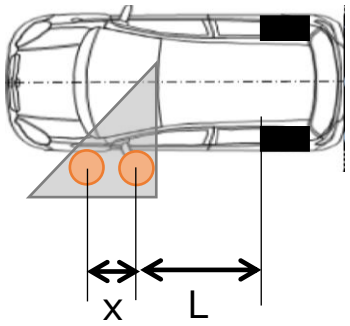
Adjusting values decided based on worst case (small amount of movement)

Justification for EC's query about passenger's side blind spot exemption (1) Concept

Normal vehicle has blind spot for passenger's side by A-pillar and side mirror mount.
If no blind spot allowed, basically all vehicle need to have mirror or camera.
Therefore, Japan studied non-critical condition for accident before domestic application.

Accident case is run over by rear wheel in this bind spot.
To determine the condition of vehicle speed and VRU location in order to vehicle can stop safely.





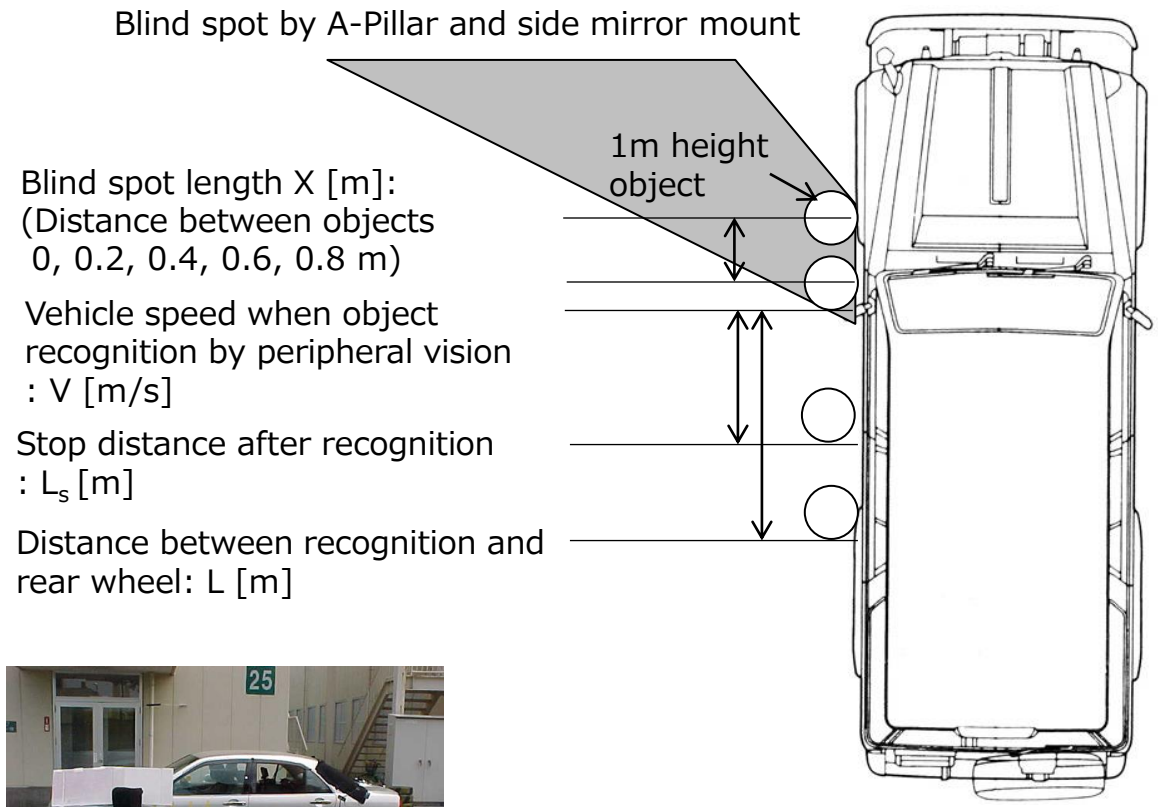
If Ls<=L,
vehicle can stop before run over by rear wheel.

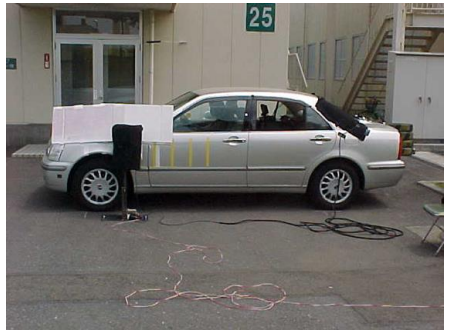
Ls is in proportion to Vx.
Therefore, formula can express as

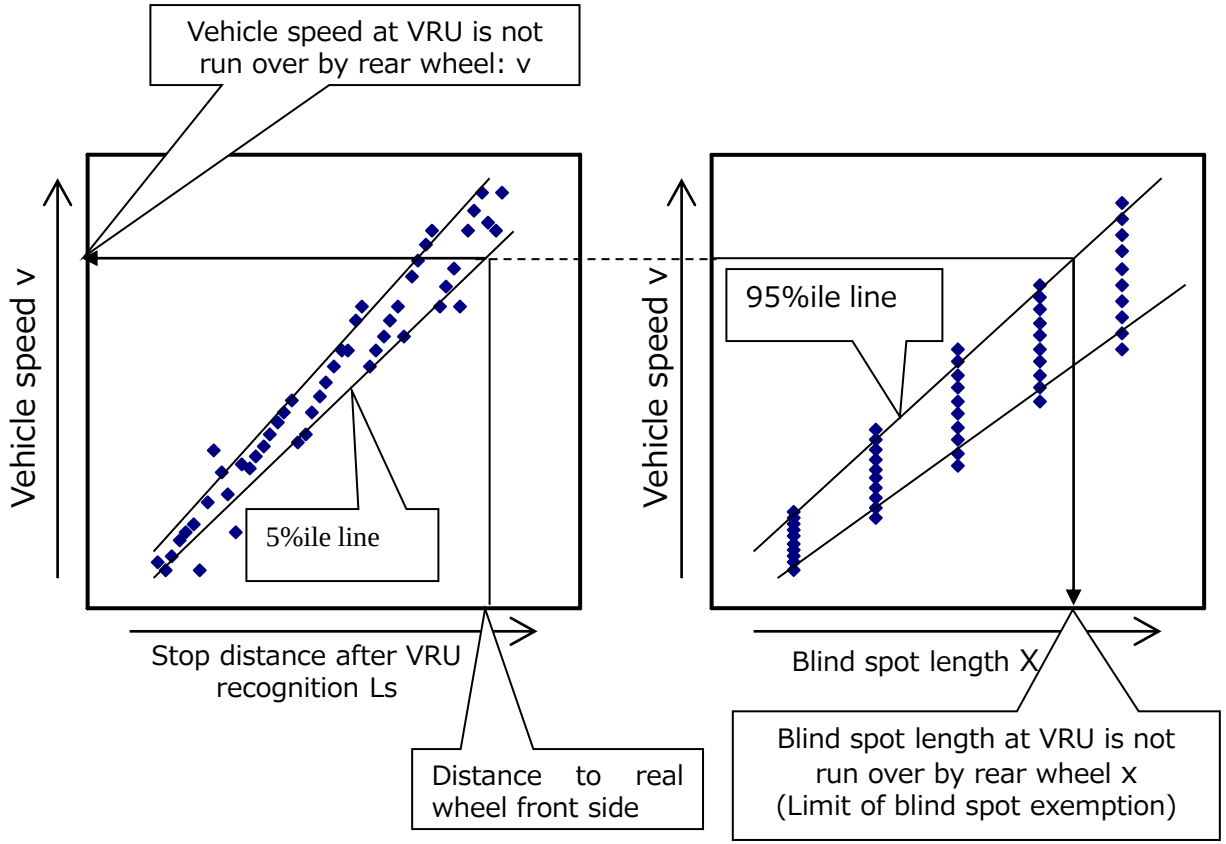
x<=aL+b

Justification for EC's query about passenger's side blind spot exemption (2) Methods

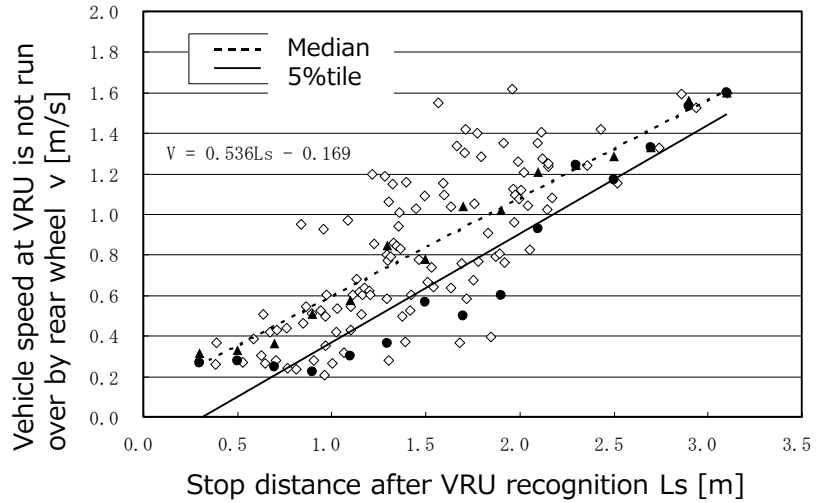
30 Participants (20s~50s, Male 14, Female 16)

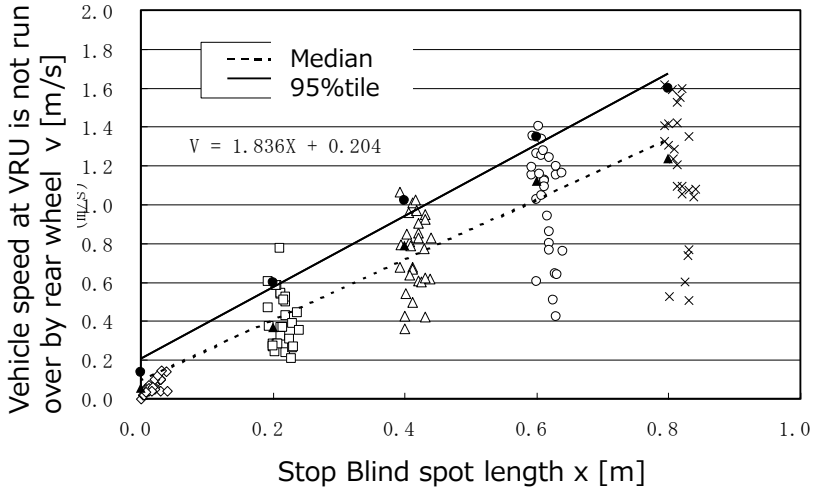


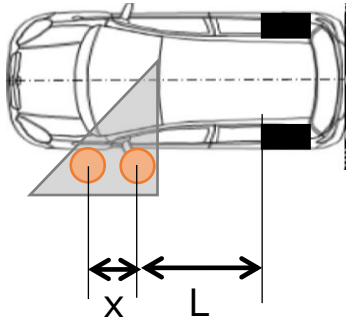




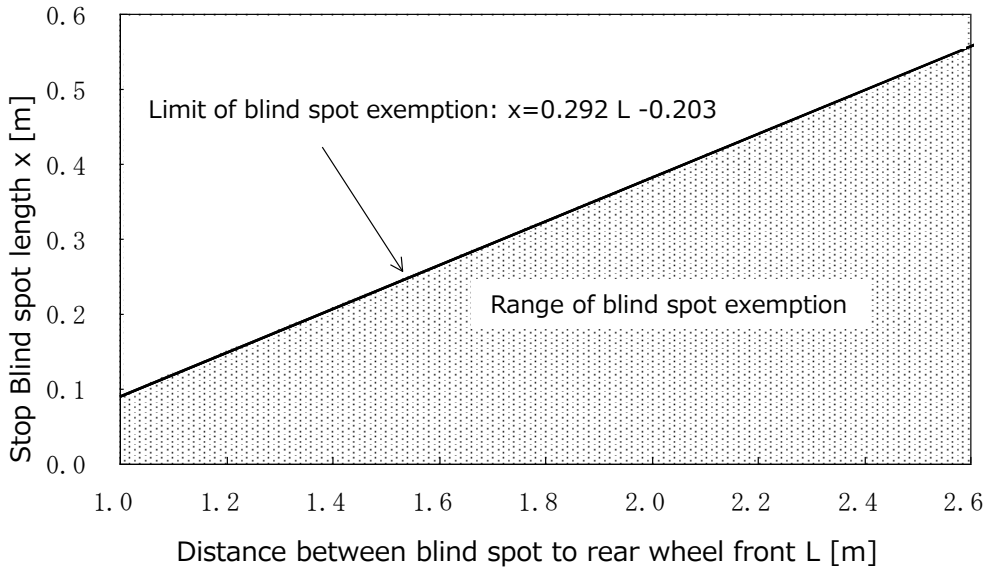
Justification for EC's query about passenger's side blind spot exemption (3) Results





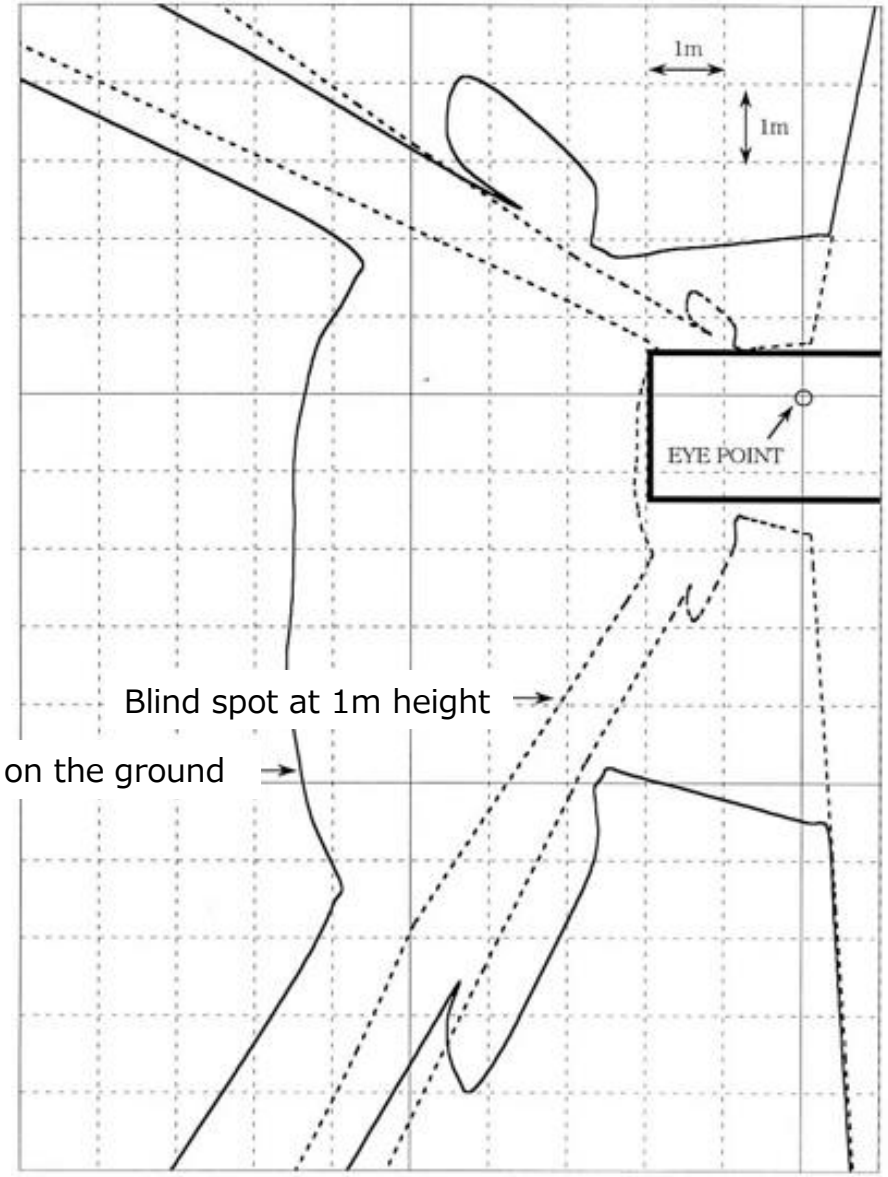


Blind spot exemption
x<0.292L-0.203



Appendix

Example of blind spot projection



Imported MPV (1-Box)