

CMS Monitor Arrangement Evaluation Experiment

- Monitor arrangement study for Class III mirror replacement



National Traffic Safety and Environment Laboratory
(Japan)

IG-CMS II 3rd meeting

Evaluation

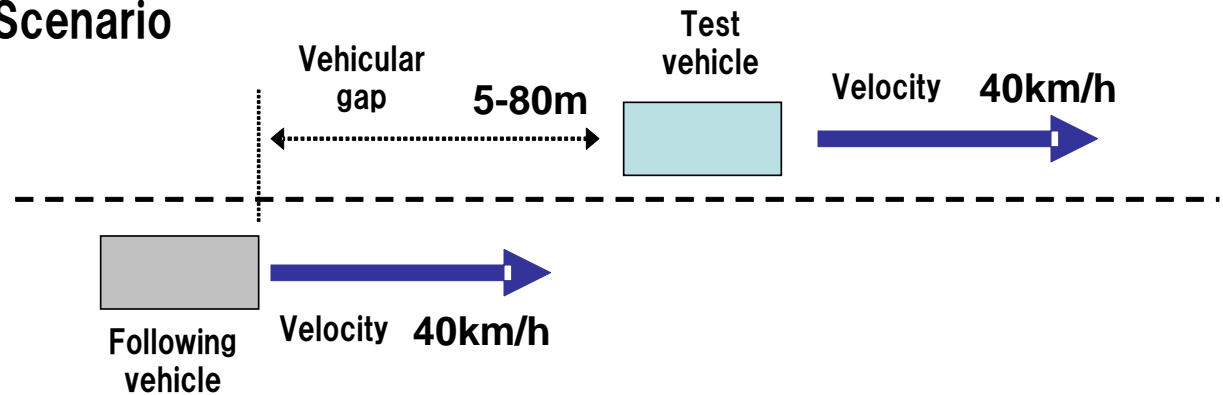
- Contents: CMS Monitor Arrangement Evaluation after about 1 Hour test driving
- Date: 17–19th of March 2014 (time period: 1:30 p.m.– 9:30 p.m.)
- Place: Test Track in National Traffic Safety and Environment Laboratory (Saitama)



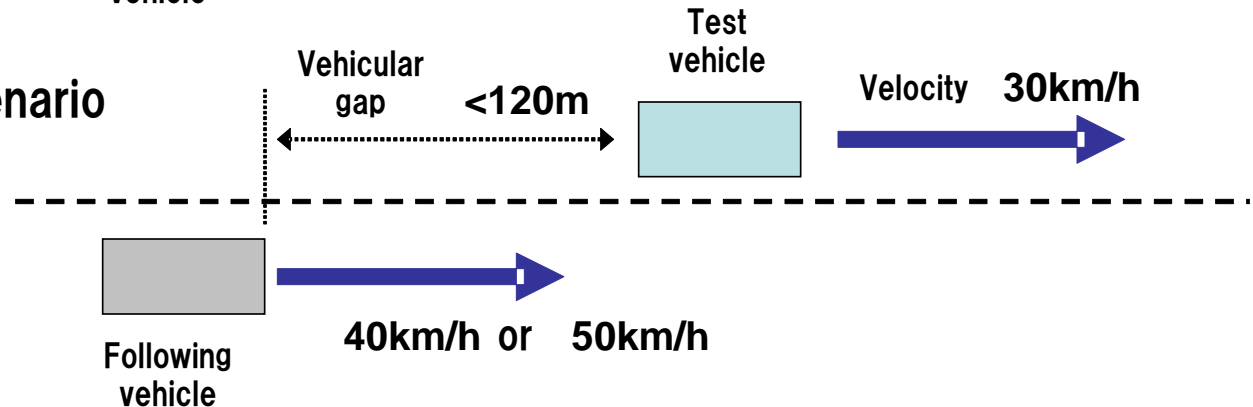
Evaluation (Driving condition)

- Panel conducted the following manoeuvre several times (20–30 times). In each manoeuvre, drivers checked the rearward field of view and following vehicle by mirror or CMS monitor and judged the possibility of his lane change.

1. Same Speed Scenario



2. Overtaken Scenario



Note)

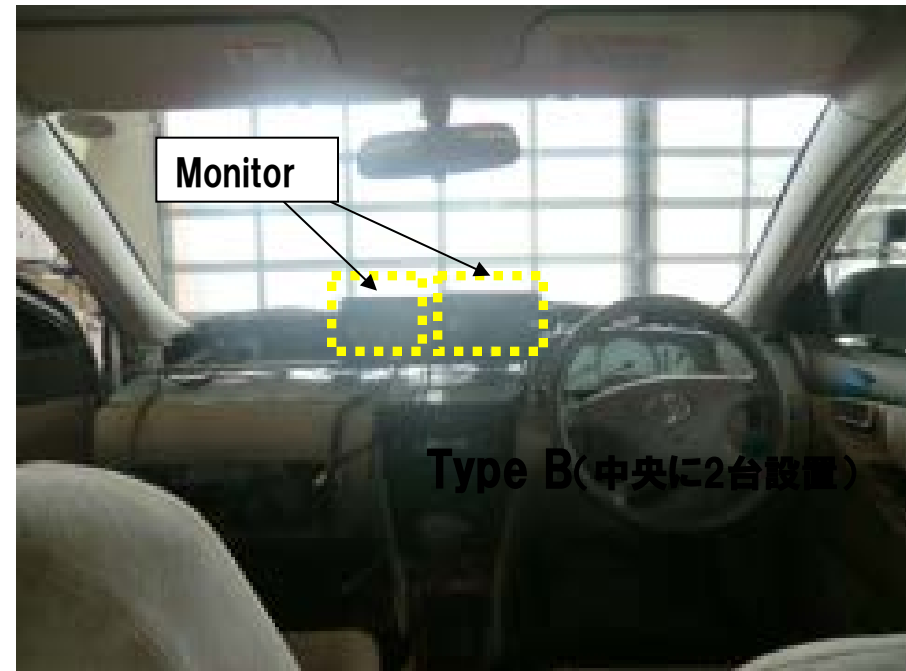
- Following vehicle orientations are conducted in each side (Right lane and Left lane)
- Approx. 1 hour driving per person

Monitor Arrangement

- CMS Monitor arrangement test condition



(a) Type A
(Mounted at Fender Mirror orientation)



(b) Type B
(Mounted in Vehicle Center orientation)

Figure. CMS monitor arrangement test condition

Other Test Condition

- Camera Location

- CMS Camera mounted close to Class III mirror
- Only one of the two field view (mirror or monitor) can be seen by the Driver



CMS applied
(Class III mirror was covered)



Class III mirror applied
(CMS was off)

- Image on the monitor

- Adjusted to the same image on class III mirror for each driver
(The image on the monitor also contain the image of a part of the bodywork)



An example of the image on CMS monitor

Evaluation sheet

Q. Which condition do you prefer? (with comment)

1. Central location for both monitor (Type B)

2. Draw

3. Split in each side (Type A)

4. Other

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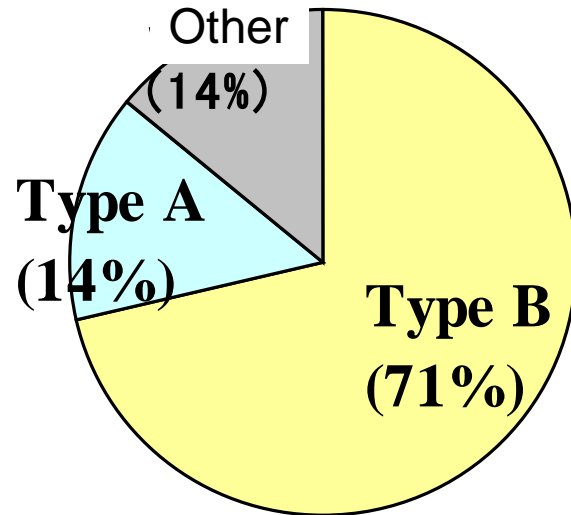
Panel

- N=7 (All Driving license holder)

Panel No.	Age	Gender	Acuity (L – R)
1	26	Male	1.2 – 1.2
2	39	Female	1.5 – 1.5
3	40	Female	1.2 – 1.2
4	42	Female	1.5 – 1.2
5	47	Female	0.9 – 0.6
6	40s	Male	1.2 – 1.2
7	NA	Female	1.0 – 1.5

Note) All panel were gathered by public recruitment

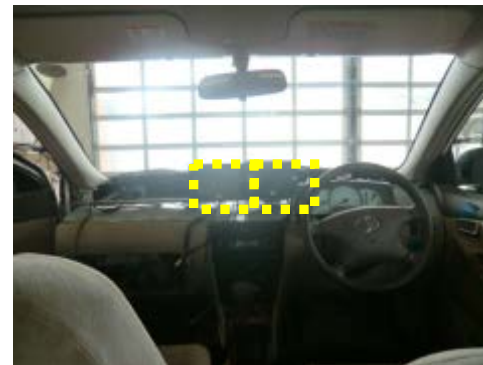
Evaluation Result



Q. Which condition do you prefer?
(After driving)



Type A
(Mounted at Fender Mirror orientation)



Type B
(Mounted in Vehicle Center orientation)

Evaluation Result

Comments for monitor location (Examples) : Total 4 comments

Panels prefer Type B:

1. Easy to check the monitor image due to smaller eye movement.
2. Felt uncomfortable at the beginning due to different location, but changed to feel better at the driving manoeuver process. Because it make it easier to get the sense of distance to the following vehicle due to getting the image of both side at once.

Panels prefer Type A :

3. Monitors are annoying because it easily come into view.

Panels chose “Others”:

4. Type B may be easier to be seen. Type A had been felt better at the beginning, but later it began to be felt worse due to bad location.

Conclusion

■ In case that a part of body work were visible in the image on the monitor, backward field of view become easily to be recognize to the greater part of drivers with central mounted CMS monitors (R & L) rather than the CMS monitors divided into right and left for the driver.



(Rationale)

1. Centralized monitors location can reduce the visual shift from drivers' front field of view

2. Different images can be seen at once, and It makes drivers easier to recognize depth perception. (Effect of Pseudoparallax; pseudo visual parallax)

3. Drive can instinctively define the image of left side or right side with the image which include a part of body work even if monitors were located in center portion of the vehicle.

Future examination

■ Study with the image which is not include a part of bodywork