Comparison of Visibility of Traffic Lights Location Design in Different Countries

異なる信号灯器位置による信号視認性の国際比較

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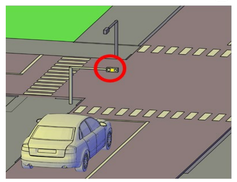
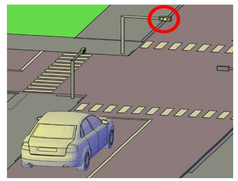
1. Introduction – different traffic lights location

One of the most important features of intersection design is location of traffic lights. In general, there are two kinds of it in different countries.

Near-side Design



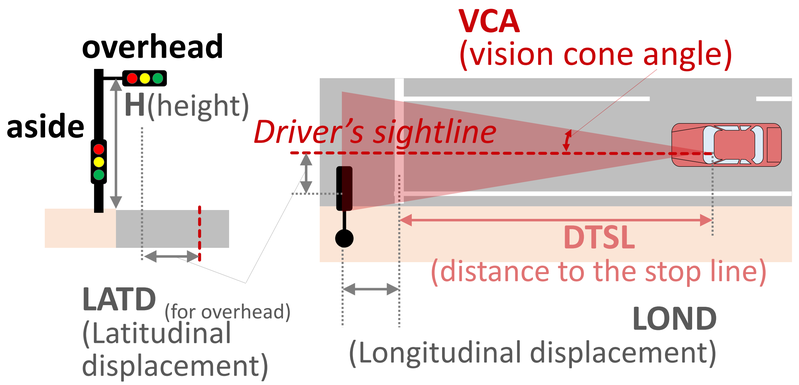
Far-side Design



2. Measurement of traffic lights location

- LOND and LATD are measured through Google Maps & Street View, and H is collected from the manuals in different countries.
- VCA is calculated for evaluating driver's visibility.

$$VCA = \frac{180}{\pi}\tan^{-1}\left(\frac{\sqrt{(h-1.08)^2 + LATD^2}}{DTSL + LOND + 2}\right)$$



3. International comparison

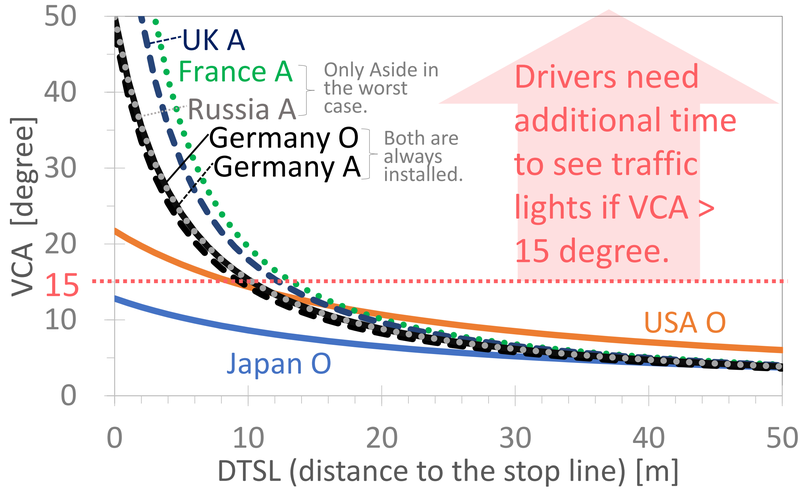
- The variation between **min. and max. LOND** is much wider in **far-side** than in **near-side.**
- The LATD in near-side design is **NOT** significantly changed between countries.
- For far-side, USA has 10m less Max **LOND** than Japan.

Country	LOND[m]		H [m]	Max. LATD[m]		
	Min	Max		Lane1	Lane2	Lane3
Far-side Design						
USA O	16	45	7.8	2.5	0.5	3.5
Japan O	20	55	5.6	0.5	3.5	65
Near-side Design						
Russia A	3	10	3.0	3.0	6.0	9.0
Russia O	3	10	5.0	2.5	0.5	3.5
France A	0	6	3.0	3.0	6.0	5.0
France O	1	6	6.5	1.0	2.0	5.0
UK A	1	7	3.0	3.0	6.0	5.0
Germany A	3	7	2.5	3.0	6.0	5.0
Germany O	3	7	4.5	1.0	2.0	5.0

*O – overhead, A – aside, refer to left illustrate

4. Evaluation of Visibility

- Japan and USA in far-side design have better visibility while **DTSL is less than 10m**, but all cases in different countries are quite similar while **DTSL is over 10m**, especially over **20m**.



- While a vehicle is **following** others at intersection, **near-side design** is better at visibility due to projection of sightline that far-side traffic lights may be **blocked** by former ones.

5. Conclusion

- The **far-side** design is better in visibility for **leading** vehicle in a lane, but **near-side** is better for **followings**.
- Visibility of traffic lights is quite **similar in different countries** while using the same design.

For more detail, please refer to the paper by F., Kashimov, et al.(2021) [link to the paper]

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