

Submitted by the expert of Japan

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Japan proposal for Transition time

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Summary of the Research

Research	Assumed condition	Response time	Remark
SAE Technical Paper 2015-01-1407, 2015, doi:10.4271/2015-01-1407	Drowsy driving Highway junction Without sub-task	Average 2.7s Maximum 4.0s Minimum 1.9s Standard Dev. 0.9s	In the case of drowsy driving: Collision: 100 % (Level 5 of low alertness) 70 % (Level 4 of low alertness) 43 % (Level 3 of low alertness)
TOYOTA	Straight highway (normal driving) With sub-task (video watching or gaming)	Average 1.8s Maximum 3.6s Minimum 1.2s Standard Dev. 0.5s	
NTSEL	On a highway: (1) Malfunction when running a curve (2) Malfunction when changing lanes (3) Merging vehicle approach (4) Lane decrease With sub-task (touching a figure on screen)	(1) Malfunction when running a curve Average 1.0s Maximum 1.8s Minimum 0.4s Standard Dev. 0.3s (2) Malfunction when changing lanes Average 1.1s Maximum 2.0s Minimum 0.5s Standard Dev. 0.3s	<ul style="list-style-type: none"> • (3) and (4) are excluded from response time determination since whether the driver manually avoided collision or not is evaluated. • In (3) and (4), collision was avoided with 4s (experiment was not conducted for 2s).

Based on these research results, we propose 2 to 4 seconds as the transition time.
(If we consider drowsy driving, at least 4 seconds are needed.)