Light Vehicle AEB NPRM

Meeting with NHTSA & Honda

Product Regulatory Office
American Honda Motor Co., Ltd.

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Meeting Agenda

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Honda Attendees:
Atsuhiro Miyauchi, Vice President, Product Regulatory Office
Alice Lee, Vice President, Product Regulatory Office
Kaitaro Nambu, Assistant Chief Engineer, Regulatory Safety Affairs
Jeff Beck, Government Affairs
David Liu, Manager, Regulatory Safety Affairs

Honda's Safety Commitments

Honda has a longstanding commitment to Safety for Everyone, inside and outside our vehicles

Safety for Everyone

- Honda supports the DOT's Implementation of the National Roadway Safety Strategy (NRSS)
- AEB and PAEB play a significant role in that NRSS

In 2003, Honda developed the world's first AEB system

- Today, the Honda Sensing and Acura Watch suite of ADAS technologies are standard on every vehicle (including AEB)
- Nearly 8 million Honda/Acura vehicles on US roads have this

Honda has also set a goal to achieve zero traffic fatalities involving Honda vehicles by 2050

- Toward our goal of zero fatalities, the Honda Sensing® and AcuraWatch™ systems will continue to evolve towards the elimination of all crash scenarios, especially the much higher severity crash scenarios that cannot be addressed by AEB alone for forward collisions

Advancement of ADAS functions

Honda Sensing standard on all vehicles today

Honda SENSING

Honda Sensing 360 standard on all vehicles by 2030

Overview of Honda Comments

Honda shares the Agency's commitment to eliminating fatalities and provided comments to improve upon this important proposal

Items		Summary of comments	For Today
AEB	Fundamental Concerns	Proposal is beyond the current state of AEB and would require higher levels of authority	
	AEB & PAEB System Requirements	Undefined levels of performance at any speed are not sufficiently objective or practicable	
	Lead Vehicle Higher Test Speeds	Intervention at longer ranges decreases reliability and will increase false activations	○
	Lead Vehicle No Contact	Aggressive intervention will interfere with driver steering and erode consumer acceptance	○
	PAEB Darkness Testing and Higher Test Speeds	Exceeds the recognition capability and reliability range of current camera systems and will lead to excessive false activations.	
	PAEB No Contact	It is critical to place the balance between safety needs and practicability above potential vehicle and test device damage concerns.	
	False Activation	Agree that it is impractical to prescribe regulatory requirements that sufficiently address all possibilities for real world false positive operation	
	AEB System Disablement	Manual deactivation for an AEB system should be allowed	
FCW	10-Degree Cone Location	Excessively stringent and would put safety benefits of AEB out of reach for more consumers.	○
	SAE Symbol	Agree with the Agency that a well-designed warning should instruct drivers on what to do to avoid a hazard.	
	Red Color and Steady Burning	Agree that red has potential merit but disagree on steady burning.	
	Audio Muting	Agree that this is unnecessarily prescriptive	
	Tone, Tempo, Frequency	Agree that audible warnings are the primary warning	
Leadtime	Effective Date	Proposed changes would require a 7-year lead time	
	Phase In	Alternatively, a 5-year lead time with a 4-year phase in period would be amenacle.	

Honda has several high-level concerns about the proposed intent and assumed capabilities for AEB, especially 2 items above

Lead Vehicle AEB Performance Test Requirements

Honda supports challenging requirements for AEB & PAEB to reduce fatalities

Current AEB systems do not have the capability to meet the NPRM requirements to achieve no contact at higher test speeds

- Calling for braking outside the AEB's sensor range capability will have diminished reliability
- This will lead to increased rates of false activation ("phantom braking")

At higher speeds, steering avoidance can occur later than braking. The proposal requires aggressive and early braking when crashes may not truly be imminent

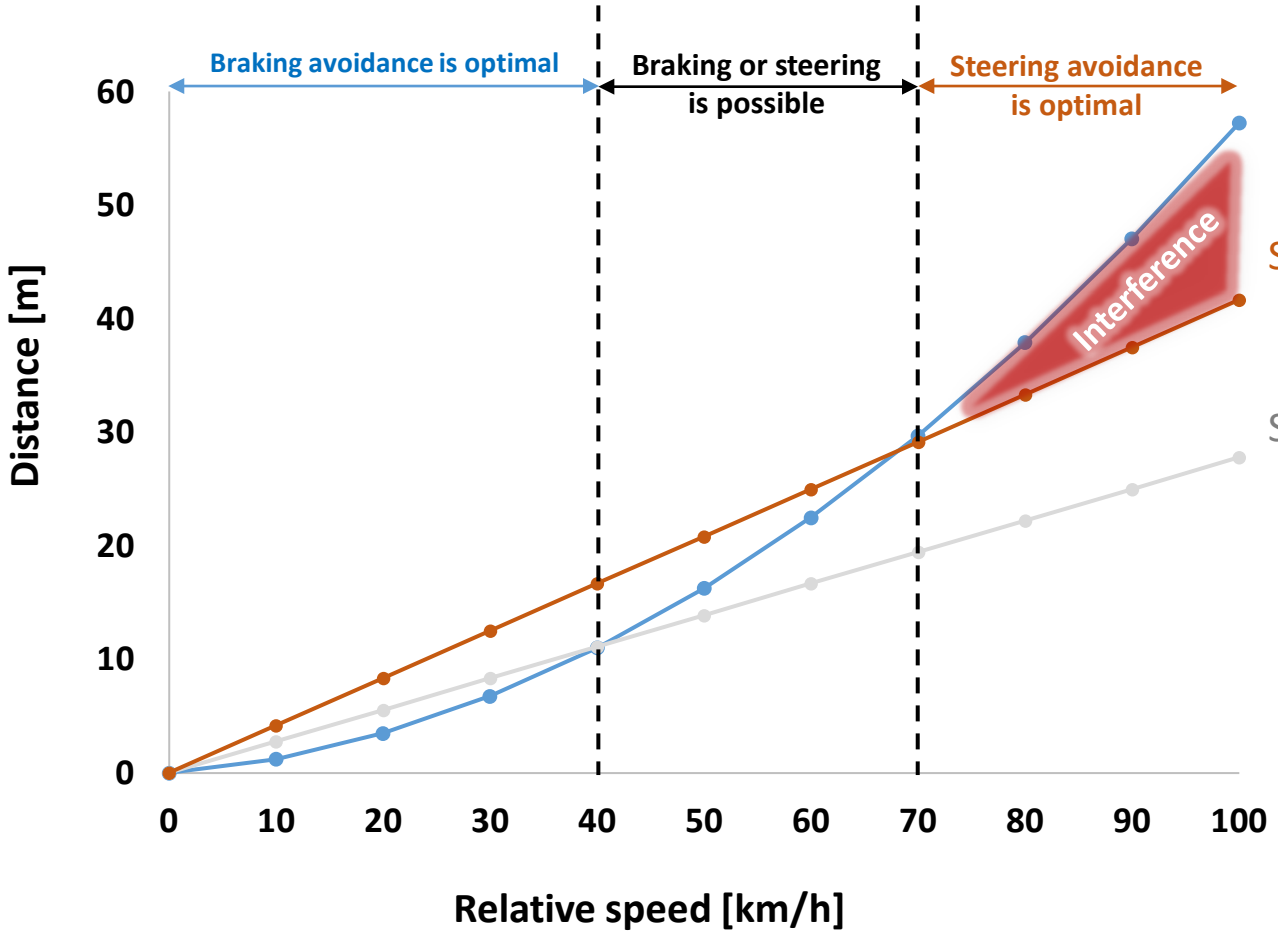
Consumer acceptance of this aggressive level of intervention must be considered by the Agency, even with large scale generational changes to current AEB systems

- AEB that intervenes before/when a driver intends to steer will be viewed as unintended braking
- This will significantly erode consumer acceptance, leading to AEB systems being turned off, negating any potential safety benefits

Honda proposes constructive alternatives that are consistent with the Agency's goals

Collision Avoidance through Braking vs. Steering

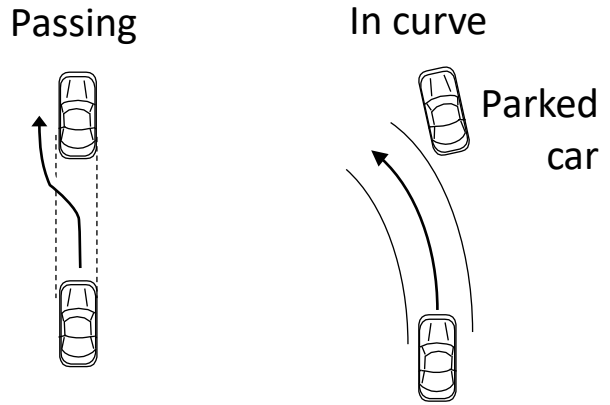
Comparison of headway distances needed with braking or steering to avoid collision (“No Contact”)



Braking Distance to Avoid Contact (NPRM)

Steering Distance to Avoid Contact
(1.5 sec to contact, Moderately risky)

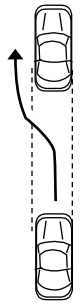
Steering Distance to Avoid Contact
(1.0 sec to contact, Extremely risky)



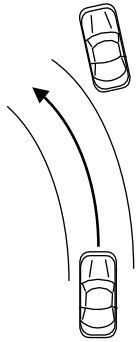
To avoid contact at higher speeds, braking must start before intended steering intervention (1.5 sec to contact)

Real World Examples of AEB Interference with Steering

Passing



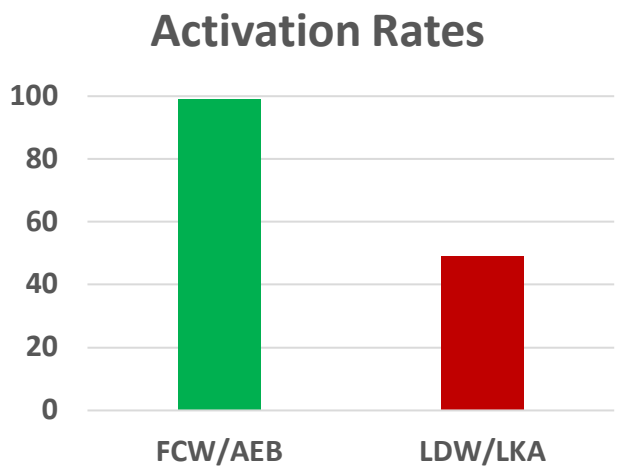
In curve



At higher speeds, AEB that avoids contact would likely interfere with driver steering in these situations

Comparison of Potential Outcomes (AEB)

	AEB Performance	Consumer Acceptance	Safety Benefit/Risk
NPRM	• Higher Test Speeds • No Contact • Braking Intervention **BEFORE** Steering intervention	**Significant reduction in AEB "on" rates**	• **Extremely unlikely for severe injuries and fatalities to occur (only if AEB is "on")** • **False activations will increase**
Honda's Proposed Alternative	• Higher Test Speeds • **Reduced Impact Speeds** • Braking intervention **AFTER** Steering Intervention	**Nearly 100% AEB "on" rates**	• **Extremely unlikely for severe injuries and fatalities to occur** • **No increase in false activations**



EDR Reported Driver Usage of Crash Avoidance Systems for Honda Vehicles (NHTSA):

Crash Avoidance System	On	Off	% On
FCW/AEB	149	1	99%
LDW/LKA	73	77	49%

Allowing reduced impact speeds can retain the safety benefits without diminishing consumer acceptance.

Key Issue 2: FCW Visual Warning Location Requirements

Honda agrees with the Agency's approach to require an audio-visual warning

The proposed visual warning location (within a 10-degree cone of driver's line of sight) is excessively stringent, would require Head Up Display, and the safety benefit is not adequately justified

Honda proposes alternative requirements for the FCW visual warning that meets the Agency's goals without excess cost, ensuring safety benefits for more consumers

Comparison of Potential Outcomes (FCW)

	FCW Visual Warning	HMI Considerations	Safety Benefit/Risk
NPRM (Head Up Display)	• Secondary to audible warning • Located within 10-degree cone of driver's line of forward sight	• Within forward line of sight • **Diverts focus** from imminent hazard ahead • **Visibility depends on many variables** (roadway background; weather; image brightness, color, position) • **Inappropriate for a mandatory visual warning modality**	**Substantial cost increase will put AEB benefits out of reach of more consumers** (less than 10% of vehicles have HUD)
Honda's Proposed Alternative	• Secondary to audible warning • Located within **60-degree** cone of driver's line of forward sight	• Within **peripheral view** • **Prioritizes focus** on imminent hazard ahead • **Visibility ensured, consistent with FMVSS 101 requirements** • **Appropriate for a mandatory visual warning modality**	**Cost of AEB is not increased**

Allowing FCW in peripheral view meets the safety needs without increasing costs to consumers.

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