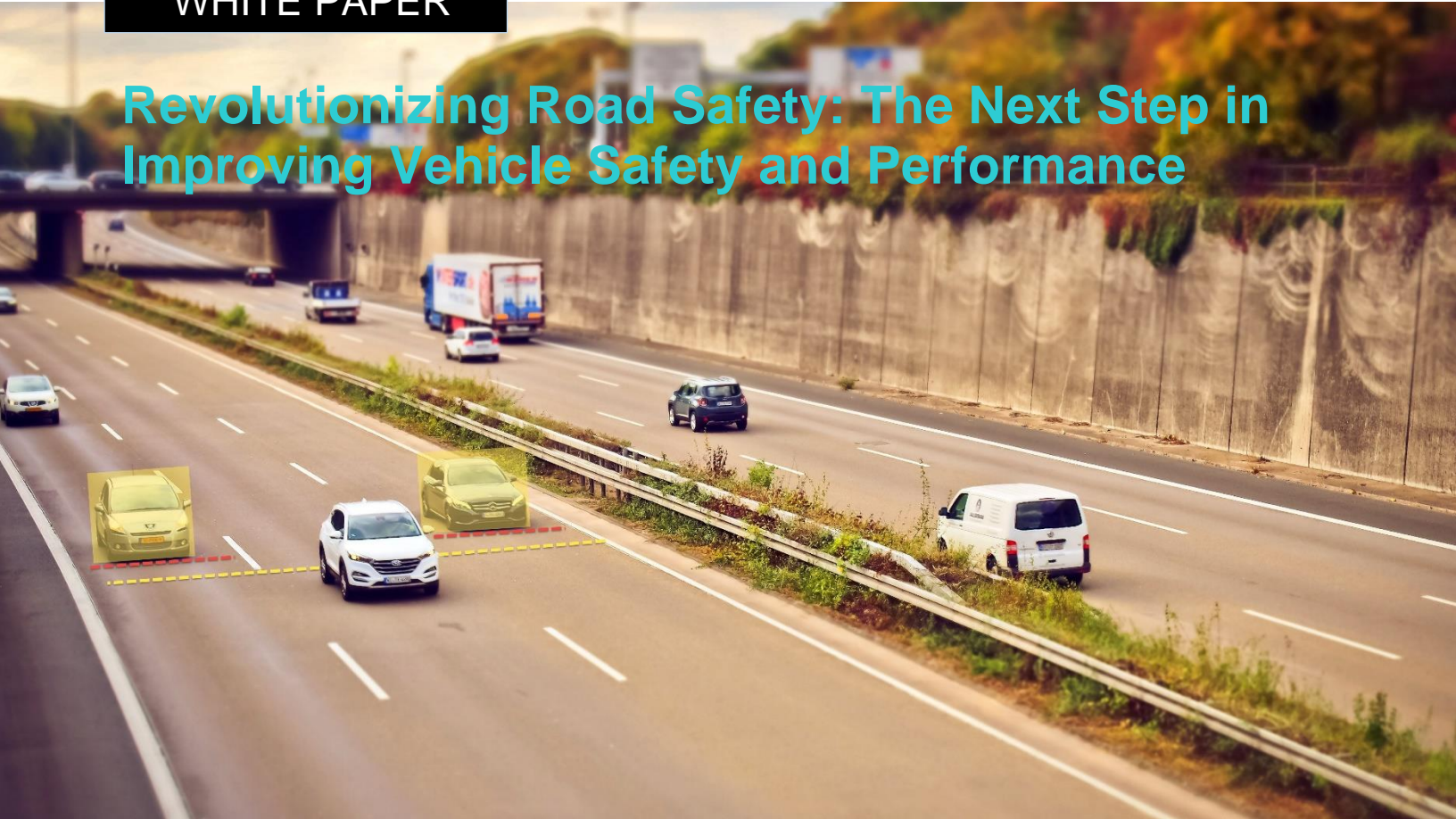


WHITE PAPER

Revolutionizing Road Safety: The Next Step in Improving Vehicle Safety and Performance



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Abstract

The USA's National Highway Traffic Safety Administration (NHTSA) recently proposed [amendments to its new car assessment program \(NCAP\)](#), overhauling its testing of advanced driver assistance systems (ADAS) for safer roads. The proposed changes include adding four new ADAS features and modifying the existing test criteria for the lane departure warning (LDW) feature. The four ADAS technologies proposed are blind spot detection (BSD), blind spot intervention (BSI), lane keeping support (LKS) and pedestrian automatic emergency braking (PAEB). In addition, for the first time in its history, U.S. NCAP will extend to enhance the protection of pedestrians through the addition of PAEB.

LeddarTech, an automotive software provider that enables ADAS and AD, applauds the PAEB's initiative as an essential element of road safety and encourages an expanded testing program of ADAS applications under extended conditions, including and not limited to weather changes.

From Good to Great: The Next Step in Improving Vehicle Safety and Performance

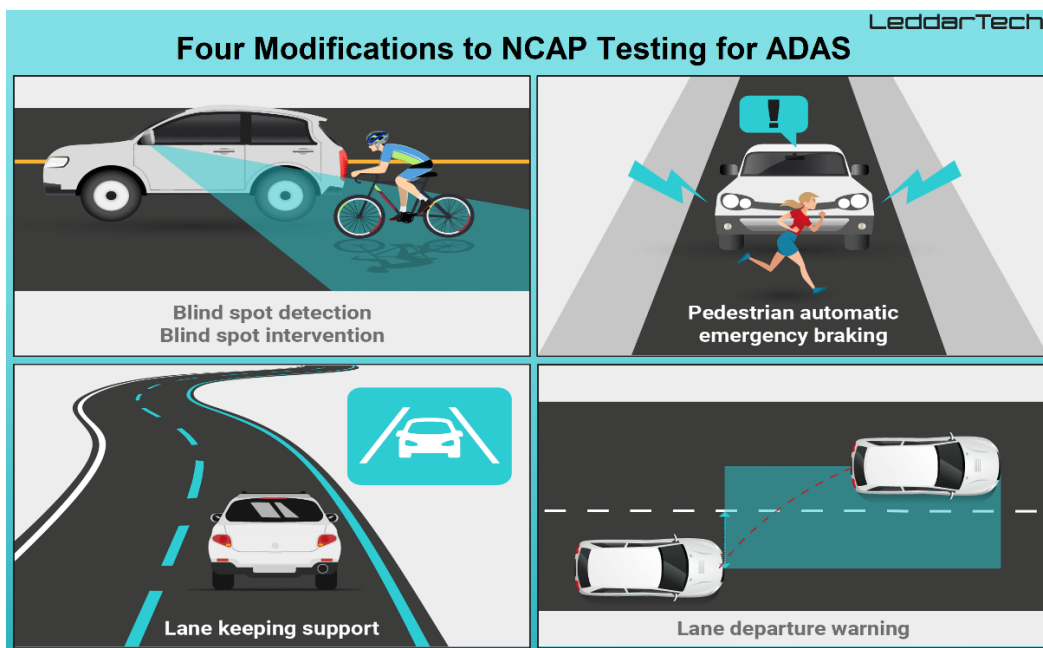
Blind spot detection and intervention systems use a radar-camera architecture to detect vehicles in a car's blind spots. NHTSA has proposed three test procedures for blind spot warning systems: the straight-line converge test, the straight-line diverge test and the straight-lane drive-by test. Each test is performed from the left and right of the vehicle and the blind spot warning must be presented to the driver within 300 milliseconds of the vehicle entering the blind spot zone.

Adding PAEB to the NCAP is a significant step forward in pedestrian safety. The system detects potential collisions with pedestrians or bicyclists while the car is traveling and automatically applies brakes to avoid or mitigate a collision. PAEB covers four common pedestrian crash scenarios when a vehicle is:

- ✓ heading straight and a pedestrian is crossing the road
- ✓ turning right and a pedestrian is crossing the road
- ✓ turning left and a pedestrian is crossing the road
- ✓ heading straight and a pedestrian is walking along or against traffic

Scenarios 1 and 4 are proposed for inclusion in U.S. NCAP, but not scenarios 2 and 3 due to concerns by commenters over a significant number of false positive detections and that sensors would need an expanded field of view.

Lane departure warning systems typically use a camera-only solution to detect when a car has veered out of its lane. The existing NCAP test procedure for LDW systems does not include testing the system in adverse visibility conditions, such as rain, snow, hail, fog, smoke or ash. The camera must not be saturated during tests, such as when the sun is oriented 15 degrees or less from the horizontal. In December 2015, the [NHTSA highlighted concerns](#) about missed detections resulting from reflecting sunlight, lines being covered with water or other unforeseen anomalies resulting in missed detections. The agency was also concerned about consumers disabling LDW due to high false positive rates and sought feedback from the industry. NHTSA proposes changes in testing requirements and performance benchmarks to increase adoption and discourage disabling.



LeddarTech's front-view and surround-view perception products based on low-level sensor fusion have shown reduced false alarms in performance testing and enable turn-assist applications for a safer road. Additionally, LeddarTech has demonstrated strong performance in adverse conditions such as rain, snow, fog and direct sunlight that render a camera useless or degraded.

LeddarTech supports the proposed updates to the U.S. NHTSA's NCAP as a significant step forward in enhancing road safety for all road users. As engineers working on advanced driver assistance systems and autonomous driving, it is crucial to keep updated with these proposed changes to ensure that we create safe and reliable systems for all road users.

LeddarTech Low-Level Fusion and Perception Software and Products Address NCAP and GSR Standards

LeddarTech's low-level fusion and perception software solution, [LeddarVision™](#), is a high-performance, cost-effective, hardware-agnostic and scalable solution that delivers accurate 3D environmental models. This scalable software supports all SAE autonomy levels by applying AI and computer vision algorithms to fuse raw data from sensors employed in L2 to L5 applications. Its low-level or raw data fusion technology detects very small obstacles on the road with better detection rates and fewer false alarms than legacy "object fusion" solutions. Unclassified obstacles are also detected, providing an additional layer of safety to the vehicle. LeddarVision helps to resolve many limitations of existing ADAS perception architectures and provides superior performance, often surpassing object-level fusion performance in adverse scenarios.

LeddarTech recently released the LeddarVision Front-View (LVF) product family for customers seeking to develop entry-level ADAS safety and highway assistance. **The [LVF-E](#), [LVF-H](#) and [LVS-2+](#) are three distinct front-view and surround-view comprehensive low-level fusion and perception software stacks that optimally combine sensor modalities to enable Level 2/2+ ADAS applications achieving a 5-star NCAP 2025/GSR 2022 rating.**

This White Paper does not constitute a reference design. The recommendations contained herein are provided “as is” and do not constitute a guarantee of completeness or correctness.

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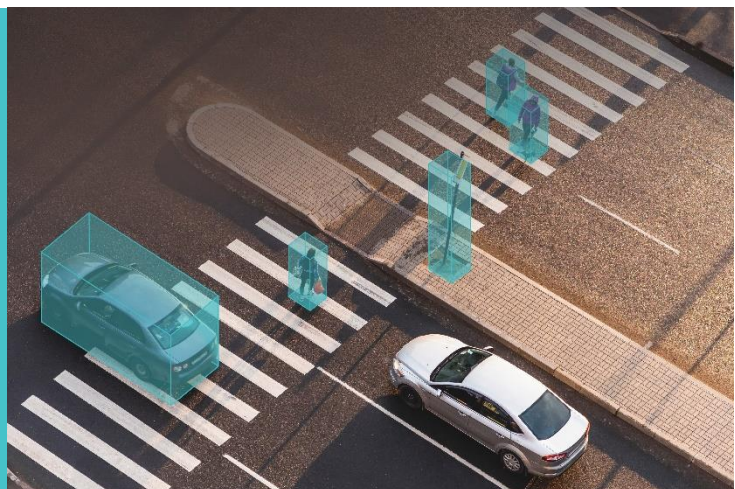
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About LeddarTech

A global software company founded in 2007 and headquartered in Quebec City with additional R&D centers in Montreal and Tel Aviv, Israel, LeddarTech develops and provides comprehensive AI-based low-level sensor fusion and perception software solutions that enable the deployment of ADAS, autonomous driving (AD) and parking applications. LeddarTech’s automotive-grade software applies advanced AI and computer vision algorithms to generate accurate 3D models of the environment to achieve better decision making and safer navigation. This high-performance, scalable, cost-effective technology is available to OEMs and Tier 1-2 suppliers to efficiently implement automotive and off-road vehicle ADAS solutions. LeddarTech is responsible for several remote-sensing innovations, with over 160 patent applications (87 granted) that enhance ADAS, AD and parking capabilities. Better awareness around the vehicle is critical in making global mobility safer, more efficient, sustainable and affordable: this is what drives LeddarTech to seek to become the most widely adopted sensor fusion and perception software solution.

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