NATIONAL DISTRACTED DRIVING COALITION

Driver Monitoring Systems

Safety, Privacy & Policy

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What are driver monitoring systems (DMS), or in-cabin sensing?

DMS, also referred to as driver attention systems in some contexts, utilize inward-facing cameras to monitor driver engagement and attentiveness. The camera sends signals to the car and can warn drivers when potential distraction, fatigue, and impairment are detected. This system can work in tandem with Advanced Driver Assistance Systems (ADAS) to enhance braking and lane keeping/lane departure systems.

In-cabin sensing is a broader system increasingly used by Original Equipment Manufacturers (OEMs) which can monitor the entire vehicle cabin rather than just the driver. From a safety perspective, this can ensure drivers and passengers are properly belted, help optimize air bag deployment, and provide additional data to the vehicle to engage other safety features.

What is the purpose of these systems and who uses them?

In the U.S., DMS are primarily used in conjunction with driver assistance systems that allow hands-free driving under certain conditions, while still requiring drivers to remain attentive and responsible for the vehicle. SuperCruise, BlueCruise, and other systems allow drivers to temporarily remove their hands from the wheel but still require them to pay attention to the road at all times. The system can detect distracted drivers and require them to reengage in driving.

In Europe, these systems warn distracted or drowsy drivers to pay attention or take a break. The European New Car Assessment (EuroNCAP) Program is placing greater emphasis on driver monitoring technologies as part of its new Safe Driving stage. It requires all new cars sold in the EU to have DMS installed for safety.[1]

What role does this technology play in automotive safety?

DMS offer the possibility of dramatically reducing behavioral traffic crashes. According to National Highway Traffic Safety Administration (NHTSA), an estimated 12,405 people were killed in distraction-related crashes in 2021, costing taxpayers approximately $158 billion.[2] In 2023, NHTSA estimated that 633 people died in drowsy driving crashes.[3] Many DMS can detect indicators of these behaviors and warn drivers or alert vehicles to take action to prevent crashes.

How do these systems impact consumer privacy?

A growing number of U.S. vehicles come equipped with driver-facing cameras as part of driver monitoring or in-cabin sensing systems. For example, some manufacturers, including Tesla, equip vehicles sold in the U.S. with DMS systems to detect distraction and fatigue. General Motor's electric Hummer is equipped with 17 or more cameras that can monitor drivers as well as the entire area around the vehicle.

While cameras send signals to the vehicle when distraction, drowsiness, or impairment is detected, many systems are designed to not record, save, or transmit identifiable driver information. DMS systems can use edge computing, which means calculations of distraction and other impairment are all done in-vehicle. Among some systems, processing occurs entirely within the vehicle without storing video or transmitting data to the cloud. Edge computing is essential to ensure signals are sent in a split second to alert drivers and engage vehicle safety features like emergency braking and lane keeping.

While DMS use a camera to monitor driver engagement and status, the camera functions as a sensor. Instead of recording recognizable video capturing the driver's face, many systems analyze facial features and eye movement using abstract data points instead of storing driver images.

What is the future of these technologies?

Global safety mandates are increasing the adoption of DMS technology. In 2023, the EuroNCAP Program began awarding points to vehicles using DMS to detect and warn distracted drivers. In July 2024, European regulations began requiring DMS in all new vehicles to detect distraction and fatigue.

This trend is also being adopted in the US with the Insurance Institute for Highway Safety (IIHS) announcing in 2025 they plan to add driver attention systems to their safety ratings including their Top Safety Pick award.

The U.S. Congress approved legislation, the *Infrastructure Investment and Jobs Act*, which requires NHTSA to further study DMS and to begin rulemakings if the technology is proven to save lives.

NHTSA is currently considering a rulemaking to evaluate the role of DMS as part of a broader congressional requirement for alcohol impairment detection. Proponents of DMS point to the ability to detect impairment from distraction, alcohol and drugs, and drowsiness.

The National Distracted Driving Coalition published a **paper** highlighting the importance of technology to prevent distracted driving. An analysis by Seeing Machines projected DMS deployed in 50% of vehicles could save 12,835 lives each year and save taxpayers $164 billion.[4]

Quick facts

- A recent IIHS study showed 9 out of 10 drivers with cars equipped with a DMS camera to detect distraction and drowsiness used it most or all of the time.[5]
- A majority of Americans reported wanting DMS on their next vehicle purchase.
- Starting in 2025, European Regulations require DMS systems in all new vehicles as part of vehicle safety standards.
- DMS cameras can be designed to detect driver distraction and fatigue without recording, storing or sharing video.
- Federal law requires NHTSA to consider DMS as part of future U.S. vehicle safety regulations.

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1. Euro NCAP. (2025, November 26). Euro NCAP announces 2026 protocol changes to tackle modern driving risks. Euro NCAP. **https://www.euroncap.com/en/press-media/press-releases/euro-ncap-announces-2026-protocol-changes-to-tackle-modern-driving-risks**

2. NHTSA (2024). Advance notice of proposed rulemaking: Advanced Impaired Driving Prevention Technology. Docket no. NHTSA-2022-0079-0015. Posted January 5 2024. **https://www.regulations.gov/document/NHTSA-2022-0079-0015**

3. National Highway Traffic Safety Administration. (n.d.). Drowsy driving. **https://www.nhtsa.gov/risky-driving/drowsy-driving**

4. Lenne, Mike. J.T. Griffin, Kyle Wilson, Megan Mulhall, Brook Shiferaw. Seeing Machines Response to the NHTSA ANPRM: Advanced Impaired Driving Prevention Technology. Docket no. (NHTSA-2022-0079. P.33)

5. Cox, Aimee. Eric Teoh, Jessica Cicchino. Subaru drivers' experiences with the DriverFocus driver monitoring systems. August 2025 Insurance Institute for Highway Safety **https://www.iihs.org/api/datastoredocument/bibliography/2344**

NATIONAL DISTRACTED DRIVING COALITION

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The **National Distracted Driving Coalition (NDDC)** was formed in March 2021 to address distracted driving, which is a contributing factor to road deaths and injuries. This road safety issue is a priority concern shared by many organizations across many sectors. A diverse cross-section of entities, representing academia, non-profits, government, advocacy, and industries, including insurance, transportation, automotive and technology, have come together to create a National Action Plan to tackle this important issue.

Disclaimer

The National Distracted Driving Coalition (NDDC), formed by the National Transportation Safety Board, is composed of diverse members and stakeholders representing a variety of organizations, including non-profits, industries, governments and communities. The diversity of views and opinions is a key feature of the NDDC designed to encourage the development of innovative approaches to preventing distracted driving. This strategy enables the NDDC to explore multiple tactics to reduce distracted driving crashes. In light of this diversity, it is unlikely consensus can be achieved across all organizations with respect to materials produced. NDDC participation does not suggest all organizations necessarily agree with, or support, NDDC proposals, recommendations, or educational materials, and it would be improper to impute any one organization's agreement with, or support for, NDDC proposals, recommendations or materials solely on the basis of NDDC participation. Similarly, organizations may advance views or positions that do not necessarily represent the NDDC. Those beliefs, opinions, or statements should be considered to be solely those of the individual organization and not of the NDDC.

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