

Bosch Showcases Autonomous and Safety Technology for U.S. ADAS Market

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Parking, trilatering, sensor and software technology on display at Experience Days

- ▶ Anywhere Parking technology enabling park assistance even without parking space lines will be shown for the first time in the U.S.
- ▶ Hardware-agnostic video perception software to be shown publicly in the U.S. for the first time after debut at IAA
- ▶ New generation of radar and ultrasonic sensors feature artificial intelligence
- ▶ Trilatering solutions highlight Bosch development of regional-specific solutions based on regional market needs

Plymouth, Mich. – The Advanced Driver Assistance System (ADAS) market is experiencing exponential growth across North America, as numerous automakers now offer SAE Level 2 to 3 ADAS features as optional upgrades across vehicle lineups. Bosch, a pioneering leader in mobility technology, unveiled its latest innovations during the Experience Days, hosted at the Bosch Technical Center in Plymouth, Mich.

In 2023 Bosch expects to once again post double-digit growth globally in the area of driver assistance systems. The company has more than doubled engineering capacity for driver assistance and automated driving over the past five years. And as early as 2026, Bosch expects vehicle computers for driver assistance and infotainment to generate sales of more than \$3.1 billion USD.

“Advanced driver assistance features are becoming a standard offering across the vehicle portfolio and Bosch has been a pioneer in this space for decades,” said Tim Frasier, regional president of Cross-Domain Computing Solutions for Bosch in North America. A recent S&P study highlighted that consumers understand and want ADAS features that provide safer driving, and they expect them to be standard in new vehicles.

“Today, Bosch’s ADAS expertise encompasses a wide spectrum, including alerts, driver task assistance, crash mitigation, and visual and environmental monitoring,” added Frasier.

Bosch Experience Days highlights include:

New parking solution for unique and complex settings

Among the technologies showcased at the event, Bosch introduced its groundbreaking **Anywhere Parking** technology for the first time in North America. This innovation empowers drivers to use the vehicle’s infotainment system to define parking spaces in diverse scenarios, including unmarked pavement, grassy areas, or tight spaces. The system offers the flexibility for manual definition of parking slots on the touch display or selecting from detected parking slots, both in the same or separate views. Drivers can also adjust the parking orientation and position by shifting and rotating the slot on the screen. This advancement increases the availability of automatic parking in complex settings where existing solutions do not support parking assistance and can help contribute to reduced parking accidents and more efficient space utilization.

Software-only solution for video perception

Video-based perception of a vehicle's surroundings is a pivotal advancement in the shift from assisted to fully automated driving and parking systems. Recently at IAA Mobility 2023, Bosch premiered its standalone video-perception software and will showcase the technology for the first time publicly in the U.S. at Experience Days. Bosch’s transformative video perception solution uses camera sensors to capture and meticulously process image data from the vehicle’s surroundings. The resulting dataset becomes a critical resource, empowering subsequent driver assistance and automated driving functions across a spectrum of driving and parking scenarios. The technology is entirely software-based and can be used independently of Bosch hardware on diverse SoCs (systems on chips). This gives automakers maximum flexibility.

New generations of sensors feature artificial intelligence

Surround sensing is indispensable for automated driving functions. Bosch’s new **radar sensors** enable assisted and automated driving functions at SAE Levels 0 to 3. For the sixth generation of these radar sensors, Bosch has incorporated artificial intelligence. This new generation performs better at measuring distance, high speeds, and angular resolution; as a result, objects such as motorcycles can also be reliably detected across the entire field of view.

Bosch will also show a **new generation of ultrasonic sensors** that due to AI-based height classification, offer robust detection capabilities such as estimating the approximate height of an obstacle, including pedestrians and low-reflection objects.

Alongside its existing camera sensors with integrated intelligence, Bosch now also offers new **camera heads** that allow a flexible system for environment perception. Image analysis no longer takes place in the camera itself, but rather in central vehicle computers such as the company's ADAS Integration Platform. Available in 3- and 8-megapixel variants, plus the option of a 12-megapixel version for Level 4 applications, the camera heads are at the cutting edge of image sensor technology.

The combination of hardware and software expertise is one of Bosch's strengths. The company will continue to develop new, intelligent sensors with embedded software. Bosch customers will also be able to put together their own individual, modular, and scalable solutions by combining camera heads and the ADAS integration platform, Bosch's high-performance computer for the ADAS domain.

Trailer solutions developed in North American market

In North America, Bosch has its center of competence related to trailer solutions to support the large number of vehicles in the market that are utilized for towing. The National Highway Traffic Safety Administration (NHTSA) reports approximately 50,000 hitch accidents annually, causing around 21,000 injuries due to negligent towing or faulty hitches. Bosch's **Transparent Trailer View**, a camera-based system assists with visibility around the obstructed view of a towed trailer on the vehicle's display. This technology enables drivers to effectively see 'through' the trailer, enhancing rear visualization to assist with reversing and maneuvering. Furthermore, the system can display interior images of the trailer when a camera is installed inside to monitor the content inside the trailer.

Bosch's **Trailer Hitch Guidance** system provides an efficient means of hitching a vehicle to a trailer. This system employs a rear-view camera and electronic power steering (EPS) to automatically guide the vehicle, aligning it precisely with the trailer coupler and lowering it onto the hitch. Initiated through the touchscreen, the driver can monitor the reversing path on the display, eliminating the need for a second person to guide the vehicle, helping to ensure proper hitching, and assisting with enhancing overall safety.

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About Bosch

Having established a presence in North America in 1906, today the Bosch Group employs 37,000 associates in more than 100 locations in the region (as of Dec. 31, 2022). Bosch generated consolidated sales of \$15.1 billion in the U.S., Canada, and Mexico in 2022. For more information visit www.bosch.us, www.bosch.ca and www.bosch.mx.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 421,000 associates worldwide (as of December 31, 2022). The company generated sales of \$93.1 billion in 2022. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 470 subsidiary and regional companies in over 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 136 locations across the globe, Bosch employs some 85,500 associates in research and development, of which nearly 44,000 are software engineers.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861–1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-four percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The remaining shares are held by Robert Bosch GmbH and by a corporation owned by the Bosch family. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust.

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