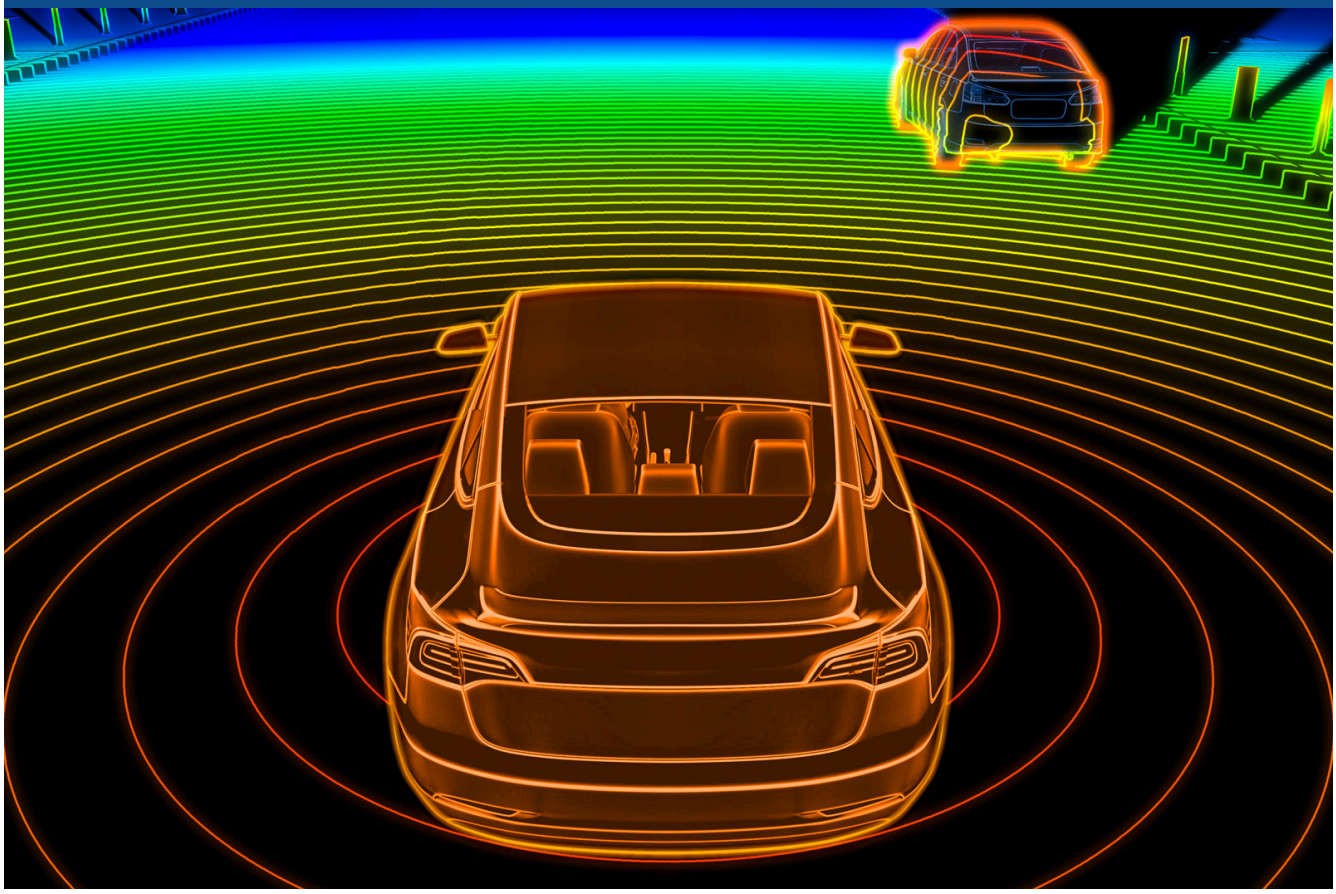
DVN

Sensing & Applications

Monthly newsletter #4.2

APRIL 9, 2025



EDITORIAL

Newsletter Sensing & Applications April 2025,Part 2 - ADAS/AD Applications

Starting in May, this newsletter will only be available to members. A three-month free trial will be offered to newcomers. So: if you haven't already done so, now's the time to sign up for your full membership or to contact us.

Nvidia GTC was held in March and there was a lot of discussion about end-end AI models for ADAS and Automated Driving. OEMs are moving from perception stack and rules based driving to large transformer models that can go directly from sensor input to control output which allows the systems to handle complex scenarios and scenarios they have not seen before in a much better way. One critical announcement was that GM will partner with Nvidia going forward, likely marking a shift away from Qualcomm. I have summarized the discussions at GTC from Waymo, Rivian and Wayve in a special report below, in this month's newsletter. The Wayve CEO stated that Lidar is the best way to deliver L4 driving in the near-term. Hesai reported a doubling of shipments of lidar units in 2024 and expects to more than double again in 2025.

The NHTSA FMVSS 571.127 standard for AEB was updated on March 20th with minor amendments on items like auditory signals, visual symbols and some test set-up parameters and comes into effect for vehicles manufactured after September 1, 2029.

Next DVN Events: Our **AEB workshop** is coming to Detroit, April 9th/10th and we are now finalizing speakers for the **June ADAS/LiDAR EAC Conference in China co-hosted with Enmore**. If you are interested in more details, please contact me.

Thank you,

Martin Booth

DVN USA Representative
mbooth@drivingvisionnews.com

SPECIAL REPORT

Special Report : Mercedes CLA Launches with New ADAS Architecture

Mercedes launched the all new CLA on March 10th, 2025 in Rome. This is a brand new entry level new hybrid/EV platform and we are going to focus on the ADAS features in this report.

The software architecture is based on a new version of the MB.OS operating running on Nvidia and other hardware. Four central compute units control chassis dynamics, infotainment, cluster and automated driving. The Nvidia DRIVE™ platform is used for ADAS and Qualcomm Snapdragon Digital Chassis™ for the infotainment domain.

The system connects to the cloud and supports OTA updates. There is a 4th generation (MBUX) virtual assistant that interacts much more intuitively than before using both Microsoft and Google AI agents. There are two screens in front of the driver and an optional screen for the passenger.

For ADAS there are various levels of support to be offered.

At launch, DRIVE ASSIST is to be offered in Europe which includes ACC, AEB and LKA as well as lane change capability and route based speed adaption. 8 cameras and 4 corner radars plus one front mid-range radar are used, as well as ultrasound sensors.

Drive ASSIST PLUS will be offered in a later release with enhanced features depending on what is allowed the local region, including a full highway pilot.

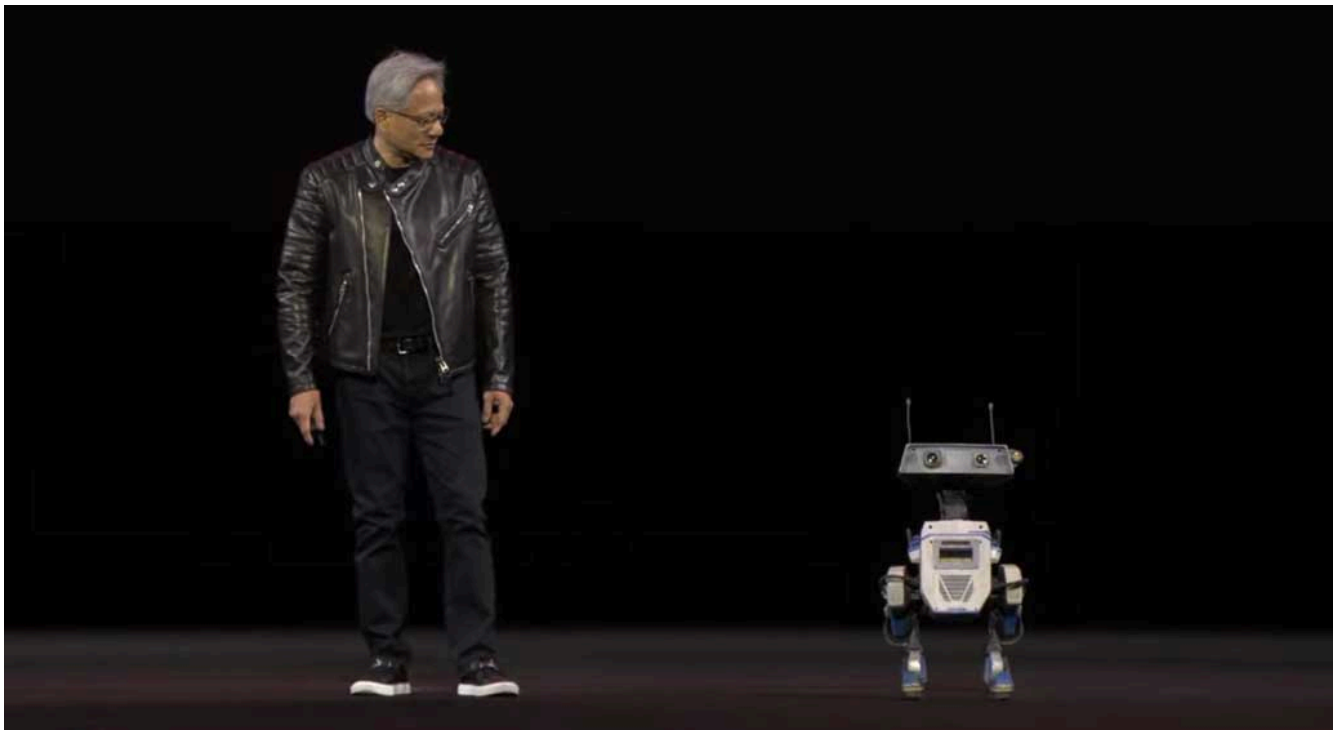
Drive ASSIST PRO adds two additional cameras enabling L2++ features including for urban pilot, where it will be first launched in China for regulatory reasons and perhaps in the US market in 2026. The urban pilot is apparently based on the work that Mercedes has done with Momenta and works without the need for HD mapping. The system will even do U turns which is especially difficult for automated driving systems.

There is also a surround view 360 degree parking assist.

There is no plan right now to offer L3 driving (that is offered on the S-Class or EQS) since lidar and other hardware requirements to do that are not appropriate at the price point of the more entry level CLA.

SPECIAL REPORT

Special Report: Nvidia GTC March 18th 2025



Jensen Huang spoke about how AI is reaching an inflection point and how data center build-out is expected to reach over a trillion dollars shortly. Software itself is transition from human generated to AI generated. He announced that GM is also now partnering with Nvidia for AI and will use Nvidia DRIVE AGX for ADAS systems and in-cabin safety as well as AI and digital twins in manufacturing and for robotics training. This likely marks a move away from Qualcomm. Nvidia has developed an OS for the data center to control and allocate all of the compute that is being deployed. Beyond Blackwell, he previewed Vera-Rubin that is the next generation exaflop class compute (Vera has 88 ARM cores and Rubin has up to 576 GPUs). They are also developing 3-D stacked silicon photonics ethernet switches with port speeds of 1.6 Tbps. Finally, he spoke about open sourcing their humanoid robotics foundational model.

Dragomir Anguelov , VP, Head of Research, Waymo spoke about LLMs for training and how increasing compute power and larger models are making their autonomous driving better. They are building the Waymo Foundational Model to improve on stand-alone visual models. AI is used to help build a simulator that can then test the Waymo Driver for safety. This can save driving millions of miles. Predicting the behavior of other road users is one of the keys to improving the driving stack. 3D Gaussian Splatting is used for sensor simulation at reasonable compute load versus previous methods. They also have an editor to alter time of day, weather and add objects into the scene so they can take a physical generated scenario and generate multiple permutations for training.

RJ Scaringe, Rivian CEO, spoke about how they are using AI. Rivian developed their own RTOS and software stack that they have now also licensed to VW. Rivians Gen 2 models have much higher levels of compute and a powerful perception stack, and RJ estimates that 20% of the miles driven are now autonomous and expects that to increase to 60-70%+ over the next few years (as Urban Pilot comes to market). Rivian has 3 (Nvidia) zonal computers, for wiring harness reasons. Self-driving has gone from a perception stack and then rules based driving (in their Gen 1 vehicles) to using end-end AI – so you spend less time classifying each individual object to looking at the whole scene and AI making control decisions. LLMs for self-driving do not have "an internet" of data – so each manufacturer needs to generate that and then train. Gen 2 has 240 TOPS (Nvidia Orin) to do the real time inferencing. As the models get larger, they need more GPUs for off-line training.

Alex Kendall, Co-Founder and CEO, Wayve spoke about their end-to-end, multimodal foundation model for autonomous driving. Training was done with reinforcement learning. The complexity of driving in London pushed Wayve to use and end-to-end AI approach. The foundation model understands different sensor models, driving domains and even different platforms and allows the cars to perform complex tasks with scenarios it has not been specifically trained for. Once the model is driving, the next challenge is to "prove" that its safe. Entering into the ADAS market is critical to allow Wayve to collect data and scale into the robotaxi market. They are working to license the model to auto OEMs and fleet partners around the world, including a recent partnership with Uber and it is flexible to work on different hardware. The demos are shown on a Ford Mustang Mach E vehicle with multiple lidar sensors. They were able to adapt from a UK trained model to US driving with 100 hours of additional training and converge in performance at about 500 hours. A "learned" safety sub-system is used to verify the motion plan using secondary hardware. Wayve's GAIA synthetic driving model allows them to generate synthetic scenes for testing long-tail scenarios. LiDAR is the best way to get L4 to market in the near term. They are not publicly commenting on the timing for public roll outs.

Additional announcements from Nvidia partners around GTC including Gatik integrating DRIVE AGX into autonomous trucks, Torc collaborating with Flex and Nvida for scalable compute, Volvo integrating DRIVE AGX into EVs, photo-realstic simulation advances from companies including Plus, Foretellix and CARLA and collaborations with Magna, Lenovo and Nuro.

Magna is integrating the Nvidia Drive AGX Thor SoC into it's next generation of advanced technology solutions and is developing and testing the latest L2+ though L4 software on the platform using Nvidia's Drive-OS.

ADAS/AD APPLICATIONS - BUSINESS NEWSBITES

ADAS/AD Business and Applications – News Bites

VW Cooperates with Mobileye and Valeo on future ADAS (L2+)

VW is planning to enhance safety features in future MQB platform vehicles in collaboration with Mobileye and Valeo. Coupled with its recent announcement with Rivian it appears that VW is moving further away from dependence on its internally developed CARIAD software. Sourcing hardware and software together and streamlining procurement across multiple brands allows VW to reduce complexity and improve efficiency according to Dirk Grosse-Loheide of VW's Executive Committee. Future ADAS features will include hands-free driving (in certain conditions), traffic jam assist, emergency assist, parking assist and augmented reality displays. Valeo will provide the (single, central) compute unit hardware and sensors while Mobileye contributes its Surround ADAS™ platform, including the EyeQ6 processor.

Mobileye's Surround ADAS system is a subset of its SuperVision system that offers full point-to-point navigation including urban pilot capabilities. Surround ADAS is intended to run on a single ECU structure and address lower cost points.

Honda sells 50,000 ADAS Equipped Cars in India

Honda introduced its ADAS system in India in May 2022 in the Honda City. The Honda SENSING system uses a forward looking camera for object and lane marking detection and performs Collision Mitigation Braking, Road Departure Mitigation, LKA and auto high-beam. The 50,000 unit number represents approximately a 30% adoption rate since 2022.

Uber Working with 14 Autonomous Companies – Globally

Uber rolled out its service with Waymo in Austin TX in March and after starting its own robotaxi development in 2015, is now working with 14 autonomous companies to integrate services into its app, including sidewalk delivery companies Avride, Cartken and Serve Robotics. The deal with Waymo involves Uber managing the fleet with services including cleaning, maintenance and charging and Uber set up a separate subsidiary to do that. Uber also handles the pricing and routing .

Hyundai partners with Avride to develop robotaxis

Avride was a spin off from Yandex (Yandex was the Dutch parent company of the Russian internet giant) and is working to integrate its technology into the Hyundai IONIQ 5 that will be rolled out in Dallas later this year in conjunction with Uber. Hyundai was also the primary backer of Motional, in a JV with Aptiv that is still working on L4 technology, but Aptiv decided to no longer allocate capital to that venture last year. The Avride system uses five high-resolution lidars along four radars, eleven cameras and an Nvidia compute platform.

Wayve trains its autonomous driving software in the US

Wayve has started training its self driving software in the US. Every region has unique driving scenarios (like right turns on red in the US), and Wayve trained its fleet with 8 weeks / 500 hours of driving on urban streets and highways. Wayve is backed by Microsoft and uses Nvidia compute platforms. Its software is based on a “foundation” model which can learn from a broad spectrum of unlabelled data. The fact that the model can be retrained with minimal data is key to keeping development costs down. They can also adapt the software to new vehicles with minimal training.

Renault Partners with WeRide

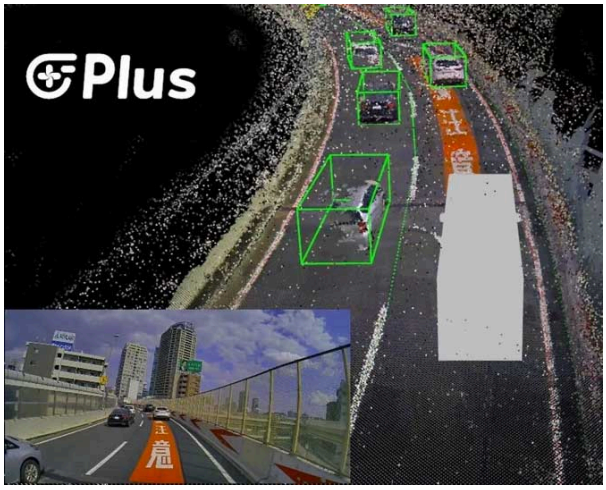
Renault is partnering with WeRide on autonomous electric minibuses. Renault is deploying driverless shuttles in Valence, Barcelona and Zurich airport following its trial last year at the French Open and projects demand for thousands of these buses over the next decade. Nvidia was an early investor in WeRide and WeRide believes they will solve driver shortages in aging societies. The partnership with Renault is one of their first entries into Europe.

ZF Testing L4 Driving in Germany

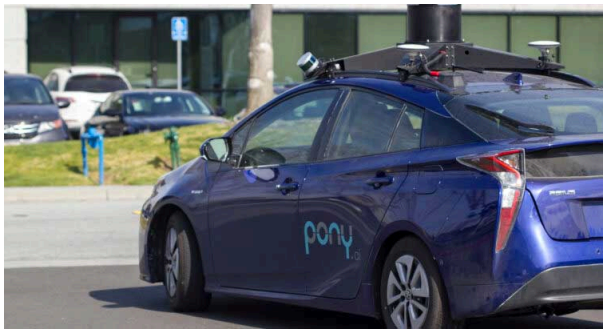
ZF received approval in Germany to start testing L4 vehicles on public roads. The latest shuttle holds up to 22 passengers and can operate on defined routes with mixed traffic. The ZF ProAI computer delivers 1500 TOPS and uses lidar, radar and camera sensors. The software was developed in partnership with Oxa.

Nissan Testing Autonomous Driving in Japan

Nissan has started its first public autonomous driving tests in Japan using a Nissan Serena Minivan equipped with 14 cameras , nine radars and six lidars mounted on the roof. Nissan plans to launch a service in 2027 as part of its Ambition 2030 plan. The technology is developed in house. Nissan has also been testing outside of Japan, in London and other areas of the UK. Nissan has been collaborating with Luminar on the lidar sensors.



Plus and Tier IV partner in Japan
Tier IV is addressing the truck driver shortage in Japan by partnering with Plus. Plus has worked with Traton - Scania/Man/International in Europe and the US to release advanced beta versions of its SuperDrive software last year and has been mapping hub to hub routes in Texas in preparation of commercial deployment. They have also worked with Hyundai and Iveco. It remains to be seen exactly how Plus and Tier IV's open source platform are integrated together. Tier IV also achieved certification for L4 bus service (between the airport and station) in Komatsu, Japan.



Pony AI Scales Up Its Robotaxi Fleet
Pony has more than 300 robotaxis in China and plans to expand the fleet by more than 1000 this year, get to 10K by 2028 and become profitable by 2029. Pony also secured a permit for paid driverless operation in Shenzhen. Pony plans its own AV (with SAIC) with a target cost of $40,000 including the sensors and compute. Tesla has targeted a lower price point for its vehicle, but so far has not done any large scale public testing. Pony uses both Luminar and Robosense lidars.

Zoox resolves braking issue as it prepares for commercial robotaxi operations
Zoox had to recall 258 vehicles to resolve an issue that was causing the robotaxis to brake hard when a motorcycle approached quickly from behind or a cyclist entered a crosswalk. This was done as a software update. Separately, NHSTA has ruled that robotaxis without rearview mirrors and brake pedals (like Zoox) do not meet current safety requirements for on-road operation, which will either require them to add these features or petition for an exemption.

REE Automotive signs MOU to produce thousands of autonomous vehicles.
The deal, with an unnamed global tech company leverages REE's P7 modular electric truck platform powered by its own zonal compute architecture capable of over the air updates. REE had been working with Navya on Level 4 autonomous software. Navya is based in France and was started in 2014, delivering its first and last mile passenger transport solution in 2015.
From the DMW to operate its robotaxi with a safety driver but would need a separate permit to operate driverless.
Tesla is behind Waymo and other operators in getting the required state licenses for robotaxi services and it will take some time to catch up.

Tesla Robotaxis service approval in California
Tesla was awarded the approval from the California CPUC allowing the company to own and control a fleet of vehicles and transport employees on pre-arranged trips which is a pre-requisite for starting robotaxi service.

Waymo to expand to Washington DC
Waymo announced that it will expand operations to Washington DC in 2026, using its own Waymo One App. Waymo is working with the city to change the rules requiring a safety driver. It's estimated that Alphabet is spending around $1.5B a year on Waymo R&D and they raised $5.6B in late 2024 to expand service. It's not clear at what scale this becomes profitable but I would estimate this happens at a fleet size in the low 10K's.

Xaiomi Fatal Accident
A Xiaomi SUV crashed in China killing all three occupants. The car was apparently in NOA mode when it detected an obstacle, braked but then crashed into the side of the road at a speed of 97kmph. The accident gained widespread coverage on the internet in China with people starting to question Xiaomi's "intelligent driving" and the company's advertising claims.
It is going to be impossible for driverless cars to avoid all accidents or to prevent drivers using their systems not-as-intended, however high profile crashes like this will slow down adoption of these technologies and OEMs need to be more careful on how they promote use of the systems.

Stars Technology to use Seyond Lidar
Stars is developing self-driving container moving platforms and plans to use Seyond lidar as a core perception unit. More than 800 million containers are moved each year and the specialized equipment required to do this is another market for autonomous driving and advanced sensors.

Caterpillar to use Luminar Lidar
Caterpillar will integrate Luminar's Iris lidar in its next generation autonomous solutions. The off-road trucks will use two Luminar Lidars. While the off-road market is relatively small these trucks can cost up to $5M and the cost of the hardware for autonomous operation is relatively small compared to the safety benefits it brings.

LiDAR versus Tesla Tests

Mark Rober put out a YouTube video showing some tests of a Luminar lidar equipped vehicle versus a Telsa Model Y. A simple AEB test at 40mph passes with the lidar, but fails with the Telsa (in manual drive mode) but passes in Autopilot. Next he tries the AEB on the dummy in fog. Again, it passes with the lidar car, but fails with the Tesla Autopilot. A third test uses simulated rain in front of the dummy, again the lidar car passes and the Tesla fails. Then he tries driving into blinding lights. Both cars pass that test. Finally the most controversial test, with a painted “wall” that looks like the road continues. Of course, the lidar picks up the solid object, but the Tesla fails – this is not a very realistic test though.