

ADAS & Autonomous Vehicles

New players jump on the localization bandwagon

10-minute Insight

Albert Einstein once said that you can't use an old map to explore a new world. Maps and localization are becoming an increasingly important part of the automotive industry's push towards autonomous driving. Accurate localization allows vehicles to respond in a more predictive manner, operate in bad conditions and safely stop in cases of emergency.

In this insight we analyze how the growing importance of localization is leading to an influx of new players (e.g. chipset suppliers like Nvidia) as well as more M&A (e.g. Bosch's acquisition of Atlatc). We also explore which use cases are generating buzz and what this means for car makers that are questioning the role they themselves should be playing within the localization eco-system.

Target audience

Product planning Strategy

Investors Engineering

Focus market(s)

USA EU China



What is happening?

Silicon

Sensor

Perception

Localization

Vision Processor

Logos for Texas Instruments, Ambarella, and Toshiba.

Central Platform

Logos for NVIDIA, Renesas, Xilinx, Qualcomm, ZF, Intel, and APTIV.

Mono Vision

Logos for ZF, veoneer, BOSCH, iMOTION, APTIV, Mando, MAGNA, and Continental.

Stereo Vision

Logos for DENSO, BOSCH, HITACHI, veoneer, and Continental.

Imaging Radar

Logos for METAWAVE, arbe, ZF, UHNDER, Continental, and ECHODYNE.

Perception SW/CV Algorithm Suppliers

Logos for algolux, PHANTOM AI, NODAR, AMOTIVE, cortica, Seoul Robotics, Arriver, helm.ai, and cartica.

Radar

Logos for APTIV, veoneer, DENSO, GPR, intel, MAGNA, Continental, BOSCH, and ZF.

Lidar

Logos for intel, INNOVIZ TECHNOLOGIES, DENSO, AAEYE, LUMINAR, Valeo, Continental, AEVA, and Velodyne Lidar.

Localization Players

Logos for here, NVIDIA, MOBILEYE, TOMTOM, woven planet, BOSCH, verizon, Qualcomm, Trimble, and ublox.

Key takeaway

The ecosystem of companies developing localization services continues to grow in response to increased momentum towards L2/L3/L4 driving automation.

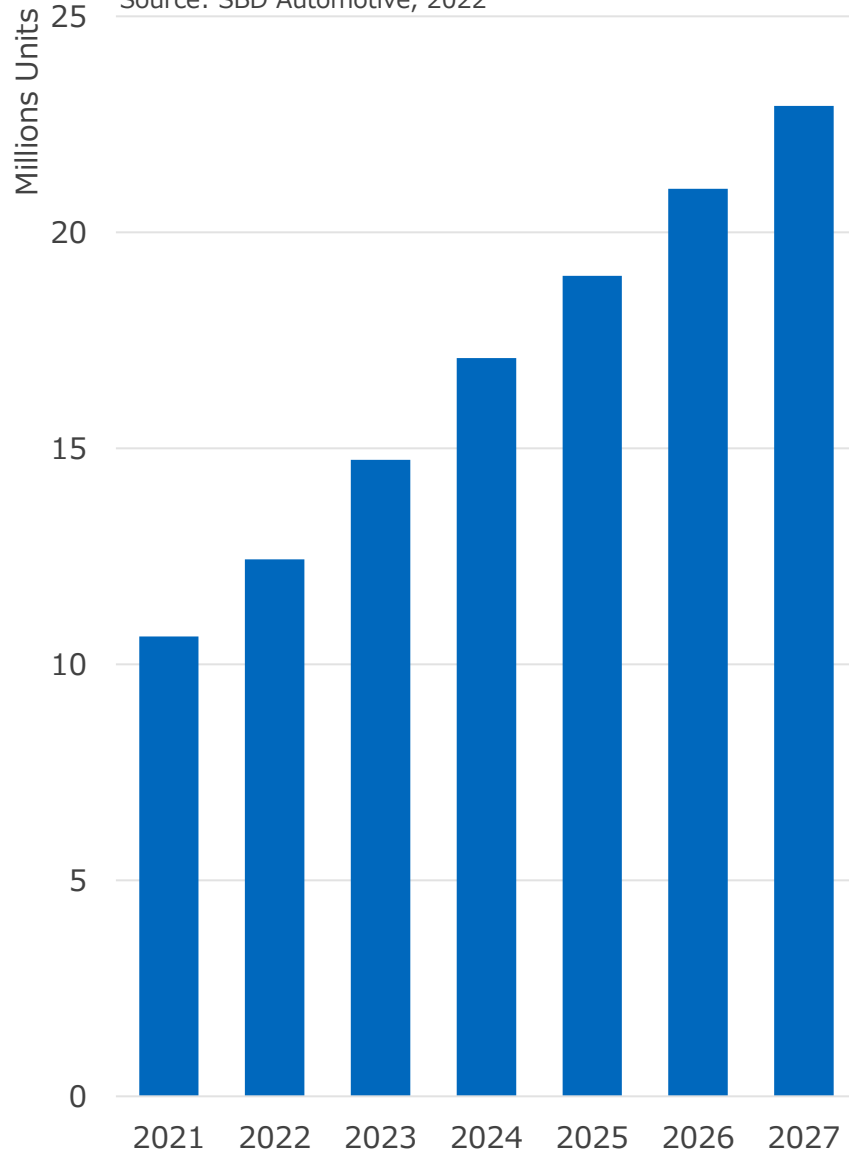
- New players outside of the automotive industry such as tech giants and consumer electronics developers have entered the space.
- Traditional suppliers too are acquiring and integrating new map-related expertise to improve their ADAS and AV offerings.
- Maps have become a shared memory that is referenced by localization systems to calculate position match.
- Different sensors are integrated to balance robustness and affordability. Cameras, radar and lidar contribute to improved localization and provide redundancy and versatility for better safety and advanced autonomous driving.

Why does it matter?



Global annual sales of L2/L3 vehicles

Source: SBD Automotive, 2022



ADAS/AV use cases requiring localization

Safety:

- Lane level hazards
- Minimum risk maneuver support
- Sensor degradation compensation
- Object trajectory-pedestrian / cyclist
- Road grip forecast

Convenience:

- Hands-free highway
- Lane level guidance
- Augmented reality
- Valet parking
- Hands-free off the highway

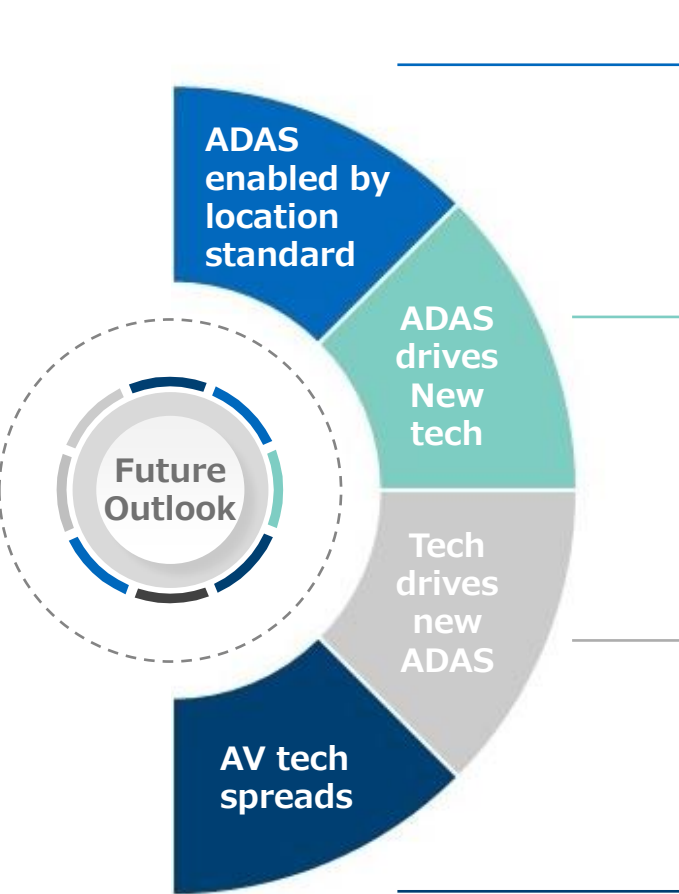
Autonomy:

- Last mile delivery
- Intelligent speed adaptation
- Truck platooning
- L3/L4 passenger car
- Robotaxi

Key takeaway

The localization data & maps market is forecast to reach over \$650 million by 2027, driven primarily by rapidly growing sales of L2/L3-enabled vehicles. SBD has identified over 20 use cases for in-vehicle localization that support safety, convenience and autonomous driving.

- Intelligent Speed Assistance (ISA) has become mandated in Europe and hands-free active driving assistance (SAE Level 2) is increasingly being pushed by OEMs – both these features benefit from localization.
- Known position allows vehicles to respond in a more predictable manner and improve safety in emergency situations, and in combination with maps allows operation in difficult weather.
- The raised awareness of the importance of localization is attracting more players to localization, including OEMs that want to do it themselves.



1

- Standardization of electronic horizon interface through ADASIS has laid groundwork for first production use cases

2

- Strategic acquisitions by OEMs and suppliers continue as new localization technologies are developed.
- Premium and volume vehicle development push for better tech as well as more use cases
- GNSS accuracy is improved thanks to better technology & higher number of satellites

3

- Data collection scales up, enabling ADAS to behave more naturally in new use cases
- Big tech will explore new options to commercialize data collected from cars and phones

4

- High-accuracy localization for freight trucks and robotaxis will spread to larger areas and fleets
- Low-Earth Orbit (LEO) satellites further improve autonomous driving data & positioning

Key takeaway

As the complexity of advanced localization techniques increases, it will be key for OEMs and Tier 1 suppliers to avoid vendor lock-in. They will have to either develop in-house capabilities (at least partially) or choose localization/mapping partners and architecture wisely.

- Mobile wireless networks will offer 5G technology to offer localization without expensive additional sensors.
- OEMs will steward vast amounts of data collected from their customer vehicles, which gives best value when used in collaborative crowdsourcing.
- New technology has increased the effectiveness of the global satellite constellation, as has the number, increasing from around 29 GPS, up to around 94 with multi-country GNSS. Longer-term, Low-Earth Orbit (LEO) will bring thousands of satellites for autonomous driving and general positioning.

Who to watch out for?



Joining the competition for HD Mapping against established players



“ Drive is essentially an AI chauffeur, it is full stack, end to end and open for developers to use. Nvidia Drive map is a multi-modal map engine and includes camera radar and lidar. It can localize to each layer of the map independently which provides diversity and redundancy for the highest level of safety. By the end of 2024 we expect the map and a digital twin of all major highways in North America western Europe and Asia about 500,000 km.

Jensen Huang, Nvidia CEO

[Read more](#)



“ The planned acquisition of Atlatec further expands our expertise in the field of high-resolution digital maps and makes us even more diversified. It makes Bosch the only company that can offer its customers all the necessary building blocks of automated driving – from actuators and sensors to software and maps – from a single source. We are thus consistently expanding our strong position in this area

Mathias Pillin, president of Bosch Cross-Domain Computing Solutions

[Read more](#)

Key takeaway

Following the 2021 acquisition of Deep Map, Nvidia is offering DRIVE Map for AV and volume production deployment of SAE Level 2 hands-free & Level 3 ADAS.

- By acquiring Atlatec, Bosch has gained the capability to build HD maps, complementing the existing radar crowdsourcing with TomTom.
- HERE has expanded the flexibility of its offering to include lidar point clouds and tools to allow OEMs to make their own map collections.
- Woven Planet is at a crossroads. If agility is maintained, the Automated Mapping Platform could expand and mature. If internal stakeholders focus only on research, proof of concepts may not mature to widespread products.
- Companies like Apple may bring big data expertise to provide alternative localization methods. Vehicle sensors may be augmented or replaced by phones and edge computing.

How should you react?



1

Explore

Cut through the buzz around localization by identifying use cases fitting strategic vision and providing commercial value while considering the accuracy of positioning technology.

2

Optimize

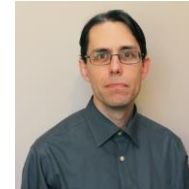
Evaluate use cases to specific regions and products, considering implications in the technology selection, such as cost, data use, computation complexity, and fit to broader perception strategy.

3

Source

Ecosystem choices and system architecture will be driven by location technology expertise of associated sensor, data, and software partners.

Authors



Howard Abbey
Specialist



Riccardo Del Bello
Research Analyst



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- Strategic Advisory
- Technology forecast
- Supplier evaluation / due-diligence

Interested in finding out more?

Most of our work is helping clients go deeper into new challenges and opportunities through custom projects. If you would like to discuss recent projects we've completed relating to **maps or localization**, please [contact us](#).