GMV Automotive Business Unit

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GMV-PUBLIC

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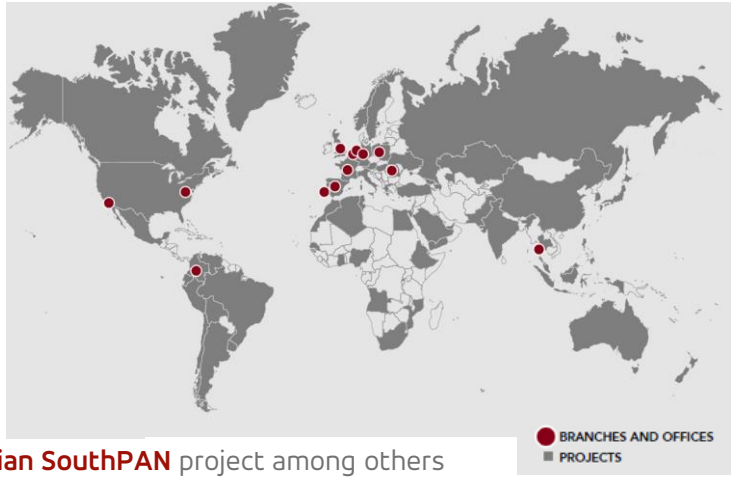
Our key figures



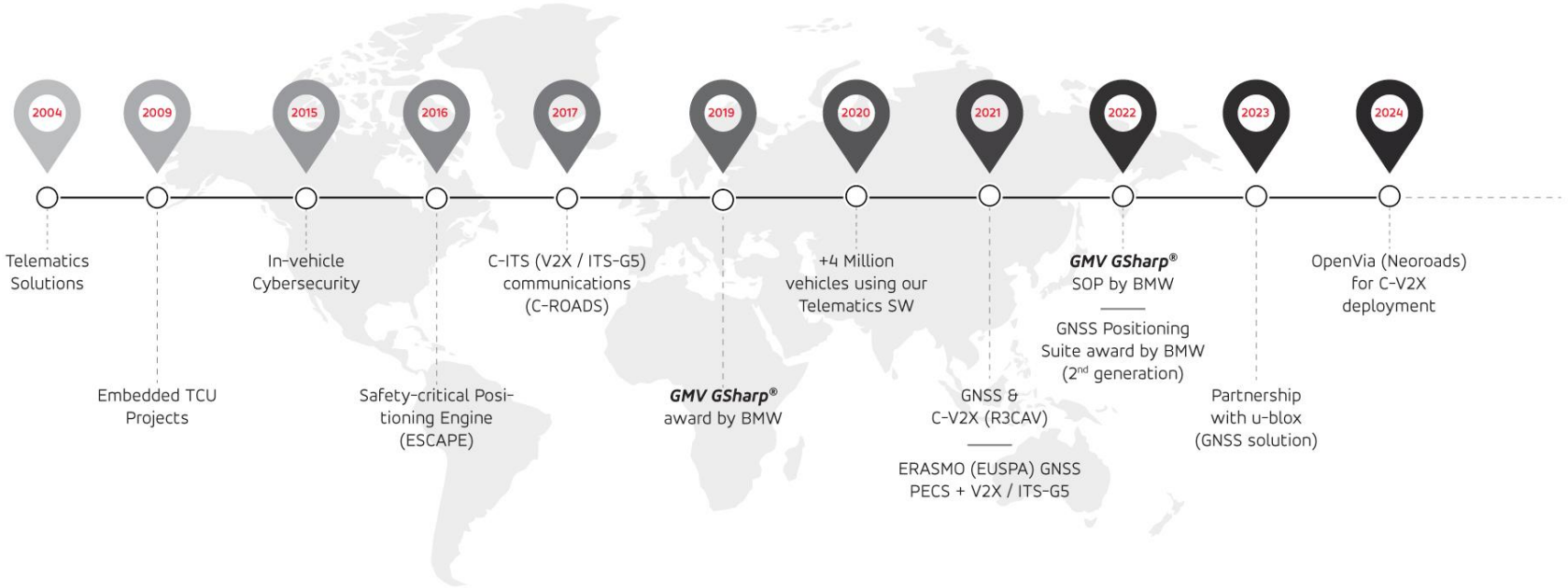
Who we are:

- ✓ Founded in **1984**
- ✓ **+ 3,100** employees
- ✓ **+ 375** Million EUR (+ 10% R&D Investment)
- ✓ Global Presence: **13** countries in **3** continents
- ✓ Customers: **80** countries (**+ 1,600** customers)
- ✓ Presence in **Space, Aeronautics, Cybersecurity, Defence & ITS** (incl. AUT)
- ✓ Leaders in **GNSS** and **safety-critical** systems: **EGNOS, Galileo** and **Australian SouthPAN** project among others

... and in Automotive:

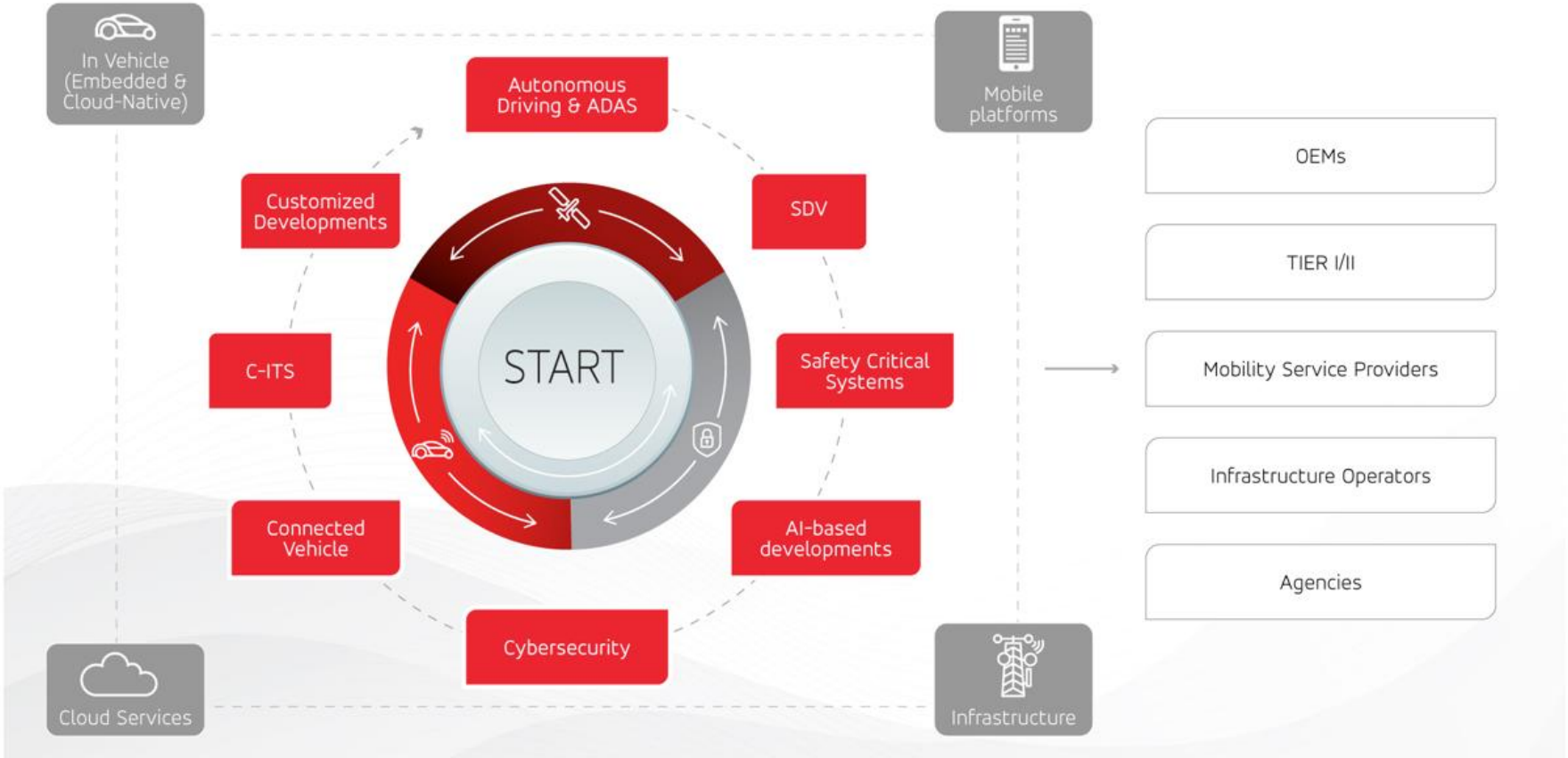
- ✓ **+ 20 years** supplying Solutions to OEMs & TIER-Is
- ✓ **Software Defined** company, a right partner for **SDV**
- ✓ Leaders on cutting-edge technology for **safe and precise GNSS positioning** with **Connected Autonomous Vehicles**
- ✓ **Patents** for highly precise and safe GNSS solutions for AD and Cybersecurity
- ✓ Deep strength on **embedded SW** and **Cloud-native** applications over different platforms.
- ✓ Experts on **digitalization for mobility** applications, **C-ITS** services and **V2X** communication technologies

Growing in the Automotive Market!

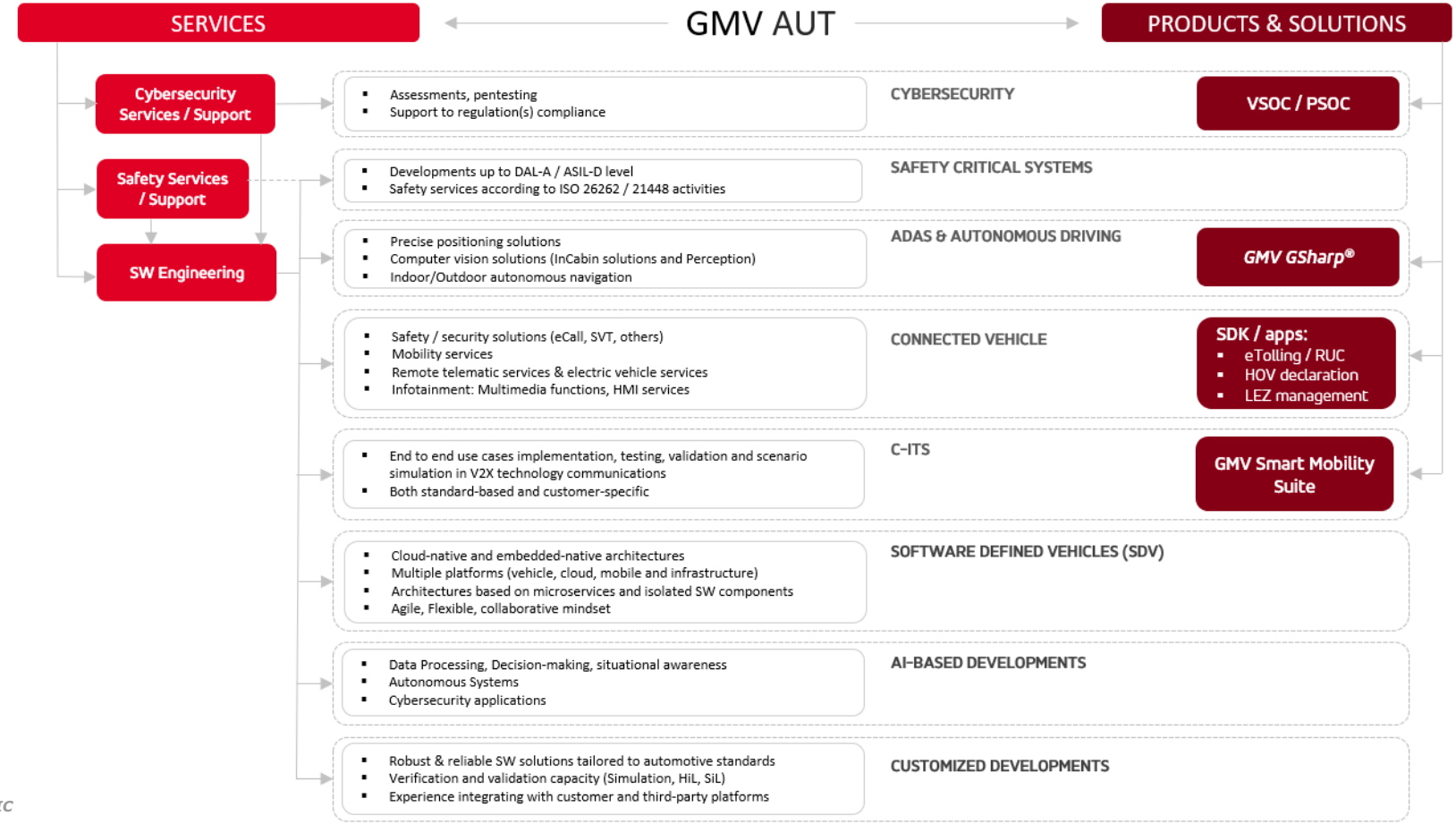


Our market at GMV Automotive: Customers & Collaborations

GMV Automotive Solutions Portfolio



Overview of GMV in Automotive



GMV-PUBLIC

ADAS & Autonomous Driving

AD & ADAS

SDV

Functional Safety

AI

Cybersecurity

Connected Vehicle

C-ITS

Customized Projects

What are our main strengths?

- ✓ World Leaders in GNSS-based solutions.
- ✓ Best **Precise Positioning** solutions in the market.
- ✓ Expertise to create **computer vision solutions** involving different technologies: cameras, radar, LiDAR, UWB, etc.
- ✓ **InCabin**: Occupancy Detection, CPD, Driver Monitoring, Driver Identification, etc.
- ✓ Environmental Awareness (**perception**) & **vision-based navigation**: presence and interaction, obstacle detection, semantic segmentation, visual odometry, sensor fusion, map fusion, SLAM mapping, etc.
- ✓ Vehicle **Kinematics and Dynamics characterization**. Improved Navigation by means of sensor fusion (IMU, Wheel odometry, visual odometry)
- ✓ Indoor and Outdoor **Navigation**.

What have we done in this area?

- ✓ **GMV-GSharp® highly precise and safe** positioning product: **brochure**
- ✓ **Vision-Based Autonomous Navigation System** for Fast Traversal Planetary Rovers
- ✓ **Autonomous robots** (including object detection, semantic segmentation, etc.)

Software Defined Vehicles

- AD & ADAS
- SDV
- Functional Safety
- AI
- Cybersecurity
- Connected Vehicle
- C-ITS
- Customized Projects

What are our main strengths?

- ✓ Mastering at creating **isolated SW components** (HW-independent) that can be designed, developed and tested **independently** following an **agile approach**
- ✓ Experience applying **cloud-native solutions** for different applications and very complex systems, at every element of the ecosystem (**in-vehicle**, servers, infrastructure, mobile phones, etc.).
- ✓ **Microservices-based architectures** designed to guarantee agility, testability, deployability, availability, extensibility & **scalability**, high robustness and minimize SW regressions.
- ✓ **Flexibility** with technologies and programming languages: Containers (Docker), Orchestrators (Kubernetes), Orchestrator Management (Rancher), CI/CD (Jenkins, Git), Storage and Distribution (Docker Registry), etc. When microservices cannot apply, solutions using microkernels, middleware, HAL, etc. are available.
- ✓ **Secure Dev-Ops and Secure OTA** capabilities, according to latest regulations. Including testing and Simulators, HiL, SiL, etc. to speed up delivery time
- ✓ **Flexible and collaborative** mindset.

What have we done in this area?

- ✓ Precise positioning product integration into BMW architecture
- ✓ **GMV Smart Mobility Suite**
- ✓ **ITS-Suite** for public transport: Brochure
- ✓ Enhanced Galileo Green Lanes: web

Functional Safety and Critical SW Development

- AD & ADAS
- SDV
- Functional Safety
- AI
- Cybersecurity
- Connected Vehicle
- C-ITS
- Customized Projects

What are our main strengths?

- ✓ Large experience in developing **Safety Critical SW** in different markets (+30 years), up to **DAL-A** (avionics equivalent of **ASIL-D**)
- ✓ **Independent RAMS** (Reliability, Availability, Maintainability & Safety) team providing engineering, management, techniques and training for different areas and projects where functional safety is required (Safety and Mission Critical Systems, High reliable and available Systems, Critical Software development)
- ✓ Experience working in **real-time** systems
- ✓ Possibility to offer **safety services** under the framework of **ISO 26262 & ISO 21448** (Safety Analysis, Safety Assessment, etc.)

What have we done in this area?

- ✓ Precise **GNSS positioning** system with integrity for **BMW Group** (ASIL-B): **GMV GSharp ®** (brochure)
- ✓ **GNSS** (Safety Critical Systems **EGNOS** and **Galileo** (web)
- ✓ **Space** sector (EXOMARS, Space Rider, MIURA 1, MIURA 5, etc.).
- ✓ **Aeronautics & Defence** (EURODRONE, EUROFIGHTER, etc.)

AI-Based developments

AD & ADAS

SDV

Functional Safety

AI

Cybersecurity

Connected Vehicle

C-ITS

Customized Projects

What are our main strengths?

- ✓ Expertise applying AI and ML algorithms in different areas
  - ✓ Data processing, decision-making support, situational awareness.
  - ✓ Autonomous systems
  - ✓ Cybersecurity applications
- ✓ Key actor in the application of IA for **safety critical environments**
- ✓ Part of discussion groups on AI and its **regulatory implications in the EU**
- ✓ Data Sharing initiatives in place, like the creation of "Data Spaces" promoted by the European Commission, which can improve AI algorithms while ensuring GDPR compliance and **respecting privacy and confidentiality**.

What have we done in this area?

- ✓ In the field of **ITS** and **automotive**: occupancy prediction, range prediction, KPI generation, estimation of time of arrival (ETA), **cybersecurity**, etc.
- ✓ Combining AI with **robotics** for innovative solutions in **space exploration** and **autonomous surveying**.
- ✓ Application of AI in the **farming production chain**.
- ✓ AI-based solutions for **precision medicine**.
- ✓ Solution for the **legal sector** to automate the detection and extraction of information from judicial notifications.

Cybersecurity in Automotive

- AD & ADAS
- SDV
- Functional Safety
- AI
- Cybersecurity
- Connected Vehicle
- C-ITS
- Customized Projects

What are our main strengths?

- ✓ Leadership in setting cybersecurity **Standards** (part of ISO 21434 definition working group)
- ✓ Strong **synergies** between automotive and classic IT cybersecurity (especially important for SDV platforms)
- ✓ Expertise in Automotive Cybersecurity **Regulation Compliance**.
- ✓ **Innovation** in Connected and Autonomous Vehicle Security (V2X connectivity, AI-based IDPS, etc.)
- ✓ **Security by Design** concept applied to internal and external developments.

What have we done in this area?

- ✓ Consulting activities (**improvement of processes**, **training**, **cybersecurity assessments**, etc.) for several TIER-1s (Ficosa, Antolin).
- ✓ **Pentesting** activities for OEMs and TIER-1
- ✓ Evolution of GMV's CERT (**web**) into a Product Security Operational Centre (**PSOC**) and capability for Vehicle Security Operational Centre (**VSOC**)

Connected Vehicle

- AD & ADAS
- SDV
- Functional Safety
- AI
- Cybersecurity
- Connected Vehicle
- C-ITS
- Customized Projects

What are our main strengths?

- ✓ Extensive experience and knowledge in developing **applications & services** running in different vehicle platforms (Telecommunication Box, location Box, Gateways, etc.).
- ✓ Expertise in **Advanced Vehicle Communication** Technologies (both in-vehicle and external).
- ✓ Pioneers in the use of **GNSS satellite positioning for vehicle monitoring**, including the concept of **integrity,** and location-based services (**LBS**).
- ✓ Innovative **Mobility Solutions**: sustainable, efficient, and eco-friendly, including management of **Low Emissions Zones (LEZ)** using GNSS technology.
- ✓ GNSS-Based Solutions for **Electronic Tolling,** exploring smartphones as onboard payment methods for urban and highways.

What have we done in this area?

- ✓ Development of **connected vehicle applications**:
  - ✓ **Safety & security solutions:** Emergency call (eCall, ERA-GLONASS, private eCall), Helpnet, DENATRAN SVT.
  - ✓ **Mobility services:** Carsharing, PAYD&UBI, Fleet management, Highway services.
  - ✓ **Remote telematic services & EV services:** collection and processing services of data received from both the vehicle and the server.
  - ✓ **Infotainment:** Multimedia functions, HMI services.
- ✓ Apps and SDKs for solutions about:
  - ✓ **eTolling / Road user charging:** (Satelise)
  - ✓ **High Occupancy Vehicle (HOV)** declaration.
  - ✓ **Low Emission Zone (LEZ)** charging SDK based on GNSS.

Cooperative ITS (C-ITS)

AD & ADAS

SDV

Functional Safety

AI

Cybersecurity

Connected Vehicle

C-ITS

Customized Projects

What are our main strengths?

- ✓ **Application layers** developed at every element of the V2X ecosystem
- ✓ End to end use cases implementation, testing, validation and scenario simulation in V2X technology communications
- ✓ Experience with multiple **Services & Use Cases**, both standard-based or customer-specific
- ✓ Hybrid communications: **802.11p (ITS-G5) and Cellular C-V2X (5G).**
- ✓ Integration with our **GNSS Positioning Suite** for AD and our **GNSS eTolling.**
- ✓ Cooperation with **OEMs & TIER Is**.
- ✓ Compatible with main **OBU & RSU suppliers**.

What have we done in this area?

- **C-Roads** European Platform (**V2I**): Spain (**Madrid Calle 30**) & Portugal
  - ✓ Use Cases: **HLN, RWW, V16, VMS, Roadwork, Stopped Veh.** (**DGT 3.0**)...
  - ✓ **802.11p (ITS-G5)** and **Cellular C-V2X (5G).**
- **C-Streets Project (802.11p (ITS-G5))** for urban environment.
- **R3CAV**: 3GPP C-V2X uses cases for autonomous driving
- **OpenVia** 3GPP C-V2X for intelligent roads, use cases for highways
- **ERASMO**: Multisensor and V2X communications (IEEE 802.11p) integrated with GNSS Engine for autonomous driving.
- **GMV Smart Mobility Suite** Solution ready to integrate with third-party platforms

Customized Developments

- AD & ADAS
- SDV
- Functional Safety
- AI
- Cybersecurity
- Connected Vehicle
- C-ITS
- Customized Projects

What are our main strengths

- ✓ **More than 20 years** developing custom specifications for **automotive** applications
- ✓ Profound knowledge of automotive **standards** and **processes**
- ✓ **Agile** methodology
- ✓ **Robust and reliable** software solutions tailored to the automotive industry's stringent safety and performance standards.
- ✓ Our proficiency in **verification, validation**, and compliance with industry regulations ensures that the SW components developed maintain the highest levels of **safety**, **security**, and **reliability**.
- ✓ Experience and capacity to integrate with **customer** and/or **third-party** platforms, including **CI/CD**
- ✓ **TISAX** certification (Information Security Assessment): your assets are protected.

What have we done in this area?

- ✓ Multiple **Telematic services** for FICOSA along different platforms for numerous OEMS

High-Quality Automotive SW Engineering

Why GMV?

- ✓ **Knowledge of automotive industry** (+ 20 years supplying Solutions to OEMs & TIER-I/IIs): solutions, customers, market, standards/certifications, processes, etc.
- ✓ **Highly skilled** engineers.
- ✓ **Knowledge and Synergies** from very different **sectors** (space, aeronautics, etc.)
- ✓ Mastering of **Cross-domain technologies** (embedded, mobile, cloud, infrastructure)
- ✓ **"SDV-ready"** both at **mindset** (agility, flexibility, collaborative) and **technology-wise.**
- ✓ Worldwide leadership in **positioning and navigation**
- ✓ Extensive experience in **Safety Critical** systems
- ✓ Deep **Cybersecurity** expertise (both IT and automotive)
- ✓ **Simulation** and **V&V** capabilities
- ✓ **Computer vision** and **Machine learning** capabilities
- ✓ **HW design capabilities** (prototyping, low scales) under very specific requirements and certifications

Some of our Notable Achievements

- ✓ Projects with BMW for Autonomous driving:
  - ✓ GEN 1: link
  - ✓ GEN 2: link
- ✓ CLEPA Innovation Awards 2022: Winner Smart & Safe: link
- ✓ Partnership with u-blox: link
- ✓ GMV website (success stories): web

u-blox and GMV Join Forces to Deliver Cutting-Edge Safe Positioning Solutions for Automotive Applications

Thank you!

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INNOVATING SOLUTIONS