Trimble

Precise Positioning for Automotive

Keeping the connected vehicle: On Point. In Lane. On Time.

Trimble precise positioning solutions offer unparalled performance, safety and flexibility to support the most critical automotive systems that can benefit from greater precision: ADAS, navigation, telematics, C-V2X and more. Our decades of experience has helped enable dozens of the largest automotive brands and millions of semi-autonomous miles. We're ceating a better, safer driving experience for passenger vehicles and commercial fleets.

Trusted

by General Motors®, Nissan® and others to deliver lane-level positioning

240+ million miles

of semi-autonomous driving enabled to date, and counting

15+ OEM customers

across the automotive industry

30+ years

of automation and machine control expertise to deliver smart and innovative autonomous solutions

Image Credit: **General Motors**

Trimble Positioning Ecosystem

Whether you require a full positioning system, resolution to a specific problem, or a system designed from the ground up, we have the right positioning solutions to steer your business forward.

Trimble Professional Services

Over 30 years of engineering, network management and technology consultation to serve as your partner of choice to better

Trimble RTX® Correction Service

Best performing precise positioning solution when considering accuracy, convergence and accessibility

ProPoint Go™ Positioning Engine

Unparalleled performance, safety compliance and integration flexibility

GNSS / Inertial Fusion (Dead Reckoning)

Crucial element to any robust, multi-faceted positioning solution for maintaining precise positioning in GNSS challenged environments (i.e. tunnels)

GNSS / IMU Modules

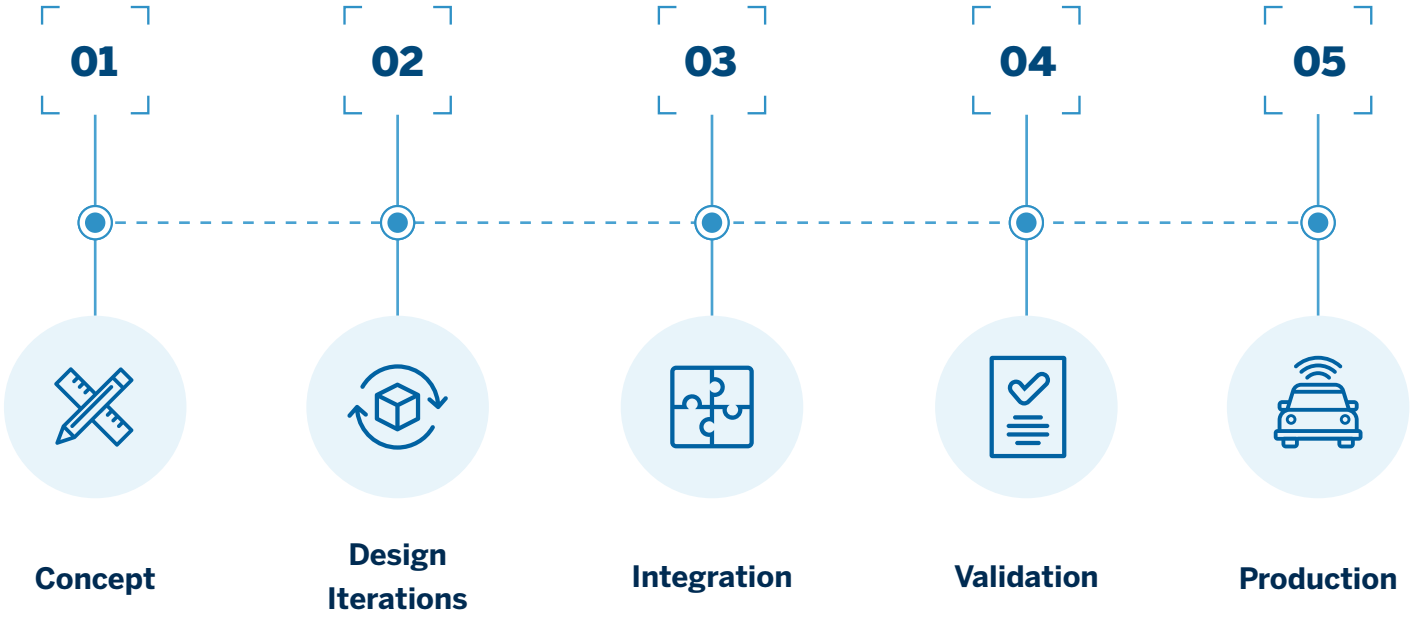
A suite of chipset boards and enclosures are available for easy, flexible integration into any ADAS stack

Ground Truthing / Testing and Validation

Trimble GT systems offer best in class testing performance for validating vehicle positioning systems

Trimble partners throughout your development

AV & ADAS localization development process



Trimble Professional Services

Ground Truthing & Mapping Systems

Positioning Stack: ProPoint Go™ + Trimble RTX®

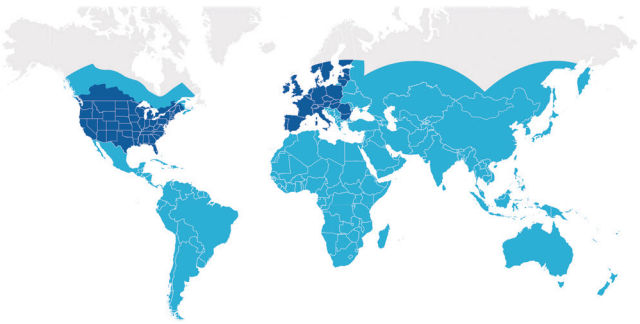
Why is precise positioning important for autonomy?

As the only global source of absolute position, GNSS precise positioning ties you directly to the lane that you're driving in – and keeps you there.

GNSS absolute positioning compliments relative sensors and precise maps enabling the vehicle to know where it is and what is around it at all times. Unlike relative sensors, GNSS positioning is not impacted by rain, snow or dirt, providing a reliable input for safe driving.

Protection Levels (PL) at a user defined Alert Limit (AL) and target Integrity Risk (IR) can deliver confidence in the position out of the solution, to support safe ADAS and AD system performance.

V2X promises increased road user, pedestrian and cyclist safety through improved communication between all parties in the vicinity of a road. Reliable absolute position information is a critical enabler of many V2X solutions.



Trimble RTX Fast areas were designed to support the dynamic needs of the automotive industry and meet the most stringent compliance standards for safety and reliability.

Trimble RTX built for the road

Trimble RTX is the leading precise point positioning (PPP) technology available today.

Recognized as the best performing positioning solution for accuracy, convergence and accessibility, and trusted by millions of customers worldwide.

Flexible and redundant delivery options via IP/cellular, L-band satellite and Sirius XM satellite streams.

A single, global network with fast convergence coverage across the major automotive regions around the globe for driving applications – scalable to mass markets.

Easy, flexible integration with GNSS IC-agnostic and sensor-agnostic approach.

Corrections delivered via L-band satellite link, Sirius XM and the internet

< 2.5 cm

Static performance:
< 2.5 cm horizontal error (95%)
Convergence time:
< 1 minute (Trimble RTX Fast)
< 15 minutes (Trimble RTX Standard)

~ 10 cm

On-road, dynamic precise positioning of ~ 10 cm in the open sky

Why partner with Trimble?

01 Heritage of innovation with 1000+ patents

02 Decades of real-world experience over numerous vehicle programs

03 End-to-end positioning solutions - from correction services to full-stack positioning systems

04 Customized solutions for any sensor and autonomy level

05 Safety first approach with ASIL certification & ASPICE standards

06 Hardware agnostic solutions to support your dual sourcing needs and flexibility

07 One global network to support your global automotive programs

The Trimble Safety Suite

Trust your position

To provide a safe absolute position on the road, the patented Trimble integrity and protection level solution combined with ASIL certified software assures the reliability of position outputs.

Industry compliant software safety

Automotive SPICE compliant.

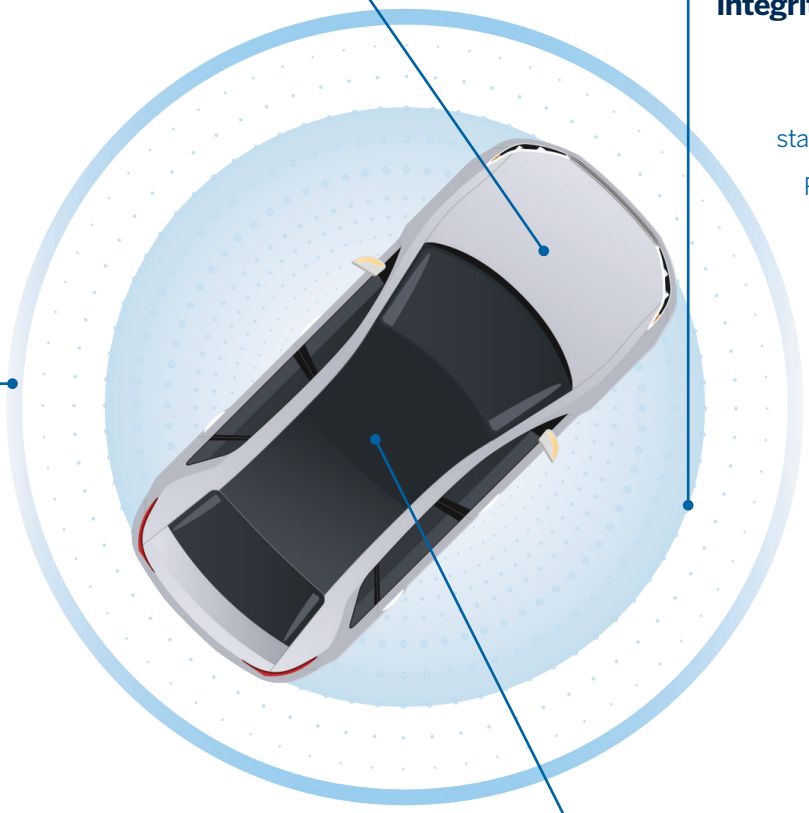
Software certified to an ASIL standard.

Trimble automotive software is written to ASIL-B minimum and ASPICE Level 3.

Integrity monitoring solution Patented and proven

Dedicated network of base stations for integrity monitoring.

Pre and post signal broadcast integrity checks authenticate positioning accuracy.



Software safety protection level

Our integrity methodology is adopted from aviation safety approaches. Our integrated protection level solution assures that the probability of the real error of a position estimate exceeds the estimated error with a target integrity risk (TIR) of 10^{7} per hour.

True position

positioningservices.trimble.com/en/automotive

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