

**SIEMENS**

*Ingenuity for life*

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Siemens Digital Industries Software

# Create the trust your customers need

Develop safe transport solutions  
that protect human lives with  
Autonomous Vehicle Development.

[siemens.com/AVD](https://www.siemens.com/AVD)

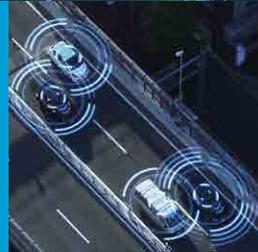
Trend #1

**Consumers demand smarter technology** in their vehicles, but also **increased safety & reliability**



Trend #2

**Powerful digital technologies are disrupting forces** in the automotive industry



Trend #3

**With increased complexity, a need for completely new approaches to vehicle development** arises



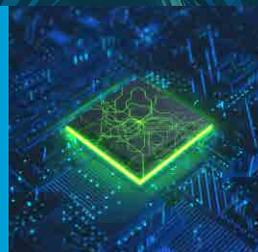
Trend #4

**Intense competitive pressure from technology companies, forcing automakers to take action and adapt**



Trend #5

**Customized system-on-chip devices (SoC) as a brand differentiator** in the market



The automotive industry is undergoing an **extraordinary transformation** disrupting existing approaches to vehicle development.

Firstly, **shifting consumer demand** is shaping the market with customers expecting to enjoy the benefits of **advanced assistance systems** and **autonomous vehicles**. The right tools will be needed to test & guarantee the safety and reliability your customers need.

With new **digital technologies** comes **disruptive innovation**. But are automakers ready to manage the **increased complexity** and **deliver on innovation** at the right speed and cost?

To develop the future vehicles, **traditional approaches** to vehicle development **will have to be replaced** for more efficient and digital systems where **integrated engineering and verification** are at the heart of the processes.

Delivering on all the above is even more challenging when the market is dominated by **fierce global competition** from **technology players and startups** who are also looking to **grasp the opportunities of the self-driving revolution**.

Finally, because **SoCs** are one of the main elements in AV technology, it is now **critical to develop them** rather than sourcing them elsewhere. **SoCs will be a brand differentiator**.

Having the right tools to build these smart, safe self-driving vehicles is the key to succeed.

## Key Drivers



**Consumers expect smarter, connected, safe & reliable products**



**New digital technologies make adaptation a must**



**A shift towards digital, integrated, collaborative approaches is needed to tackle the increased complexity & competition**

# Is your business ready to drive the innovation the world is waiting for?

## From chip to the city, integrate, digitalize and close the loop

From chip design to complex full vehicle validation, Siemens offers a full set of autonomous vehicle solutions for all key technical disciplines to help automakers overcome the challenges of this complex technology.

### Siemens Autonomous Vehicle Development, an integrated, comprehensive approach to deliver tomorrow's sophisticated vehicles

**Autonomous Vehicle Development (AVD)** is a holistic, chip-to-city solution powered by advanced simulation technology. AVD encompasses software, services, application development and transportation solutions enabling **closed-loop engineering**, testing and deployment of autonomous vehicles.

By merging the real and virtual worlds, **Artificial Intelligence** is used to continually feed **performance data** into the development process and back to drive smarter decisions and achieve **optimized results**.

#### Take the digital leap

With the development of autonomous vehicles (AVs) higher levels of **automation and integration are required**. Traditional siloed approaches won't suffice to tackle the increased complexity. Instead, individual systems must be integrated within a comprehensive digital solution.

Because AVs will rely heavily on customized **Artificial Intelligence chips**, **exhaustive testing and validation will be required** to guarantee the safety of passengers and of the surroundings too.

But do you have the right tools?

#### Mastering AVD through the Digital Twin

At the heart of this **digital transformation** is the concept of a comprehensive digital twin of the vehicle, covering every aspect of the vehicle and its associated processes, over its entire lifecycle.

With the digital twin automakers can **manage any aspect of AV performance and development** using accurate models.

It also enables a **collaborative digital environment** where all engineering domains can work in parallel, seamlessly, while eliminating integrating issues.

#### Creating the trust your customers need

**Testing and validating are key** when developing new complex AV technology.

A digital twin of the AV systems on the level of the chip, electronics, vehicle, and city infrastructure is a powerful tool to **create massive scenario simulation** and achieve optimized validation faster. Paradoxically, this virtual environment enables greater insight into the real-world performance of the vehicle.

**With AVD you can drive innovation while achieving a simplified workflow, improved performance and validation, faster time to market and optimized final results.**

 Improved engineering effectiveness

 Reduced development cycle time

 Improved efficiency and execution, both in design stage and throughout the product lifecycle

 Increased market agility

# Digitalization is the key to autonomous vehicle innovation

## Transition to virtual simulation, testing and engineering to succeed

With a **\$7T market worth forecast by 2050**, automakers need to move fast to **overcome the challenges** of the AV complex technology and capture their share. In order to **remain competitive** in such a demanding industry with **technology players** trying to get ahead of the game, a radically new approach that enables **greater innovation and efficiencies** is needed from the start of every project.

Companies **must take the appropriate actions** and transform their vehicle development programs.

To assist you in this challenging task, the **Siemens Digital Industries Software solutions designed for AVD** offer you an **agile, model-based development** system with integrated data flows and software-based simulation capabilities.

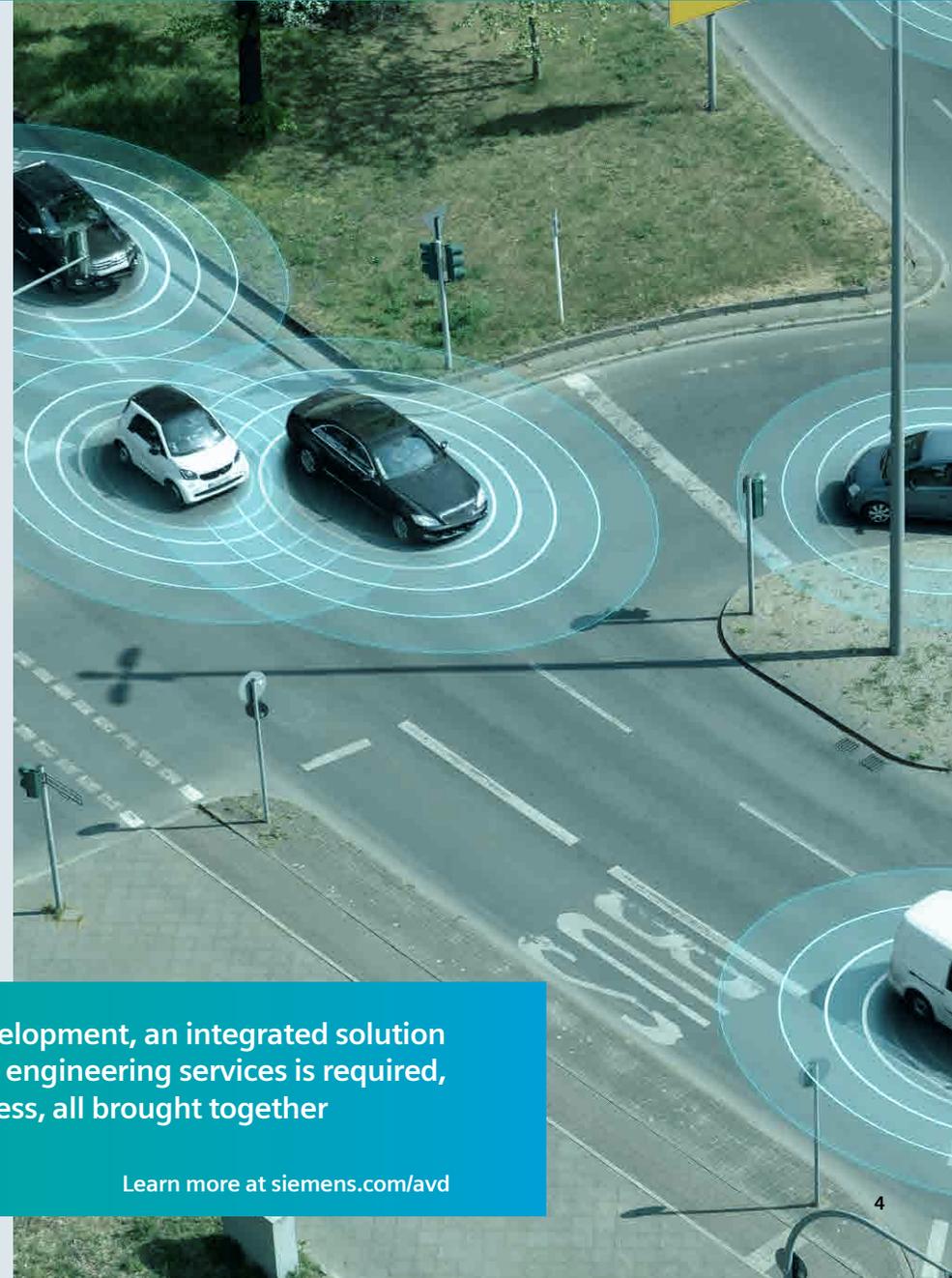
The only way forward to develop the future vehicles is harnessing the **power of digitalization**.

### It's time to be at the forefront of innovation

- **Rethink your design & product development processes** by adopting a **digital, comprehensive, integrated approach** to autonomous vehicle development.
- **Achieve a closed-loop process** where data is fed continually into the development process and back for improved performance results.
- **Make full use of the available technology** to develop and **integrate sophisticated sensors** into the vehicle's architecture.
- **Break down silos and blur boundaries between engineering disciplines, teams and organizations** so your company can achieve engineering effectiveness, from chip to the city.
- **Perform exhaustive testing and achieve greater design flexibility** using industry-leading **simulation technology: the digital twin**.
- **Use artificial intelligence to create advanced software algorithms** and optimize validation processes. **Guarantee the safety & reliability** your customers need.
- **Increase efficiency & productivity** with AVD, reduce development cycle time and **bring innovation to the market faster**.

To take the lead in autonomous vehicle development, an integrated solution of simulation, testing, virtual validation and engineering services is required, supporting a closed loop development process, all brought together in a comprehensive digital twin.

Learn more at [siemens.com/avd](https://www.siemens.com/avd)



### About Siemens Autonomous Vehicle Development:

Siemens' AVD digital solutions help OEMs optimize their returns by enhancing efficiency, productivity and innovation across the enterprise. This holistic automotive industry solution enables development teams to stay integrated from start to finish, from individual components to full systems. Siemens' digital twin technology allows a seamless, synchronized, integrated environment throughout multiple disciplines involved in AV development offering advanced simulation capabilities. Siemens' digital twin technology is especially valuable in fast-moving high-tech markets with emerging technologies like 5G, the IoT and Artificial Intelligence.

With an emphasis on an integrated, digital development environment, and advanced chip- to full-vehicle simulations, Siemens is helping automakers and their suppliers create safe, commercially viable autonomous vehicles, on time and on budget.

For more information on Siemens Autonomous Vehicle Development, visit [www.siemens.com/AVD](http://www.siemens.com/AVD) or follow us on [LinkedIn](#) and [Twitter](#).

**Siemens Autonomous Vehicle Development,**  
Where today meets tomorrow.

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