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## Case study: ADSCENE

ADSCENE develops and maintains a scenario database for the validation of various automated driving systems (ADS) and advanced driver-assistance systems (ADAS). TÜV SÜD's experts helped ADSCENE to validate its development process for test scenarios that are used in simulations for the safety evaluation of ADS and ADAS. In addition, the database was inspected to ensure that all required scenarios for homologation purposes were covered.

### Business challenge

The safety of road vehicles during their operation phase is of paramount importance to both the automotive industry and regulatory authorities. Besides building a safety justification, the validation phase must also include methods and tools to prove that ADS and ADAS are safe in all possible driving situations. Scenario-based simulation approaches are therefore vital to enable the computation of a controlled diversity of key variables in many iterations in a safe, fast and documented way, supplementing the traditional approach so that no relevant test scenario is missed.

ADSCENE is a Software-as-a-Service (SaaS) platform providing analysis and management tools for the design, validation (including simulation) and homologation of ADS and ADAS. It is based on two research projects (MOOVE and MOSAR), which initiated the scenario database and developed its taxonomy.

ADSCENE enables users to define relevant scenarios to cover their targeted features, while defining their process to efficiently design and validate ADS, ADAS and higher automation levels. Different data sources are used to populate ADSCENE: accident data, near crash data extracted from specific accidentology databases, normal driving data extracted from open road driving recordings,

### OVERVIEW

Client name	ADSCENE
Industry	Automotive industry
Profile	ADSCENE is an initiative to create a scenario database for the validation of various automated driving systems and advanced driver-assistance systems.
Business challenge	Providing a scenario database for the virtual validation of automated driving systems that is compliant with global standards and regulations.
Our solution	Assessment of a development process for test scenarios, used for the safety evaluation of ADS according to ISO/DIS 34502 and the PEGASUS method. Inspection of the database regarding the breadth of relevant scenarios for homologation against UN R157 and UNECE VMAD NATM MD.
Business benefits	ADSCENE can anticipate current and future needs for scenarios by gaining an in-depth understanding of global standards and regulations. The credibility of the testing scenario database is now proven through TÜV SÜD's independent third-party assessment.

scenarios defined by ADS/ADAS system experts, as well as regulatory and Euro NCAP scenarios.

To follow the state-of-the-art, the database must provide a common and unique data model, as well as ensure data traceability, scalability, reliability and security. Its interface must also be user-friendly and allow access to all types of data (driving data and scenarios). With a range of functions and a large scenario database, ADSCENE must also remain compliant with relevant ADS and ADAS design and validation standards at all times.

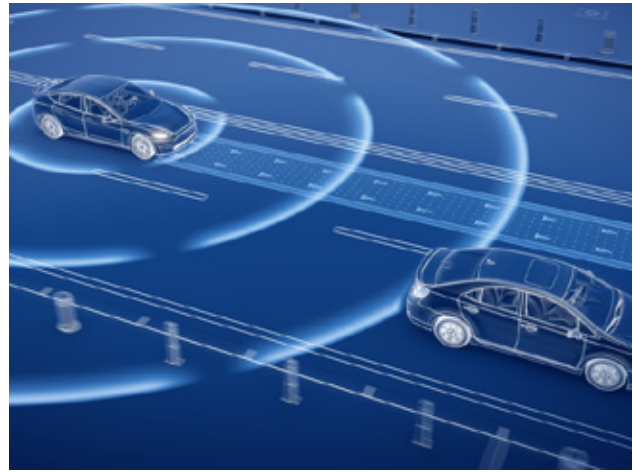
## TÜV SÜD's solution

As an independent third-party service provider with over a century of automotive expertise, TÜV SÜD has strong capabilities relevant to ADSCENE's challenges. TÜV SÜD's experts have a wealth of experience in the fields of ADAS, connected vehicles and ADS, and are also actively involved in the development of the latest global standards and regulations. This includes the development of the first international standards for scenario-based testing (ISO 3450X series). TÜV SÜD's global team is also closely involved with a range of highly autonomous driving projects across the world, including activities as member of the International Alliance for Mobility Testing and Standardization (IAMTS), VVMETHODS and CETRAN.

TÜV SÜD evaluated ADSCENE's scenario processing framework, as well as the set of stored scenarios. This included assessing the process of relevant scenario identification based on ISO/DIS 34502 and using industry best practice methods based on TÜV SÜD's involvement with the PEGASUS project. The set of stored scenarios was then assessed to ensure that it covered the scenario requirements of the ALKS regulation (UN R157) and the NATM master document by UNECE VMAD. The whole project was conducted remotely between France and Germany and was the first project of its kind for TÜV SÜD.

## Business benefits

This project gives insights into the future trend to validate and test autonomous driving systems virtually with a scenario-based approach. TÜV SÜD helped ADSCENE to gain a deeper understanding of the standards and regulations in the field of scenario databases and scenario-based testing, so that ADSCENE remains fully prepared for the needs of current and future customers. Not only did TÜV SÜD's assessment of the quality of the



database confirm compliance with relevant standards, it also identified any gaps that could further enhance ADSCENE. Going forward if there is a type approval request from a regulatory authority, the credibility of the ADSCENE database is now proven.

LAURETTE GUYONVARCH, ROADMAP LEADER, ADSCENE

“ TÜV SÜD has helped us prove ADSCENE's state-of-the-art credentials and their expertise has supported our development team to ensure that our scenario database complies fully with industry standards and regulations. To ensure the safety of ADS technology it is essential to gain the support of independent third-party experts, like TÜV SÜD, to ensure that valid testing scenarios are available.”

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TÜV SÜD is a trusted partner of choice for safety, security and sustainability solutions. It specialises in testing, certification, auditing and advisory services. Since 1866, the company has remained committed to its purpose of enabling progress by protecting people, the environment and assets from technology-related risks. Through more than 25,000 employees across over 1,000 locations, it adds value to customers and partners by enabling market access and managing risks. By anticipating technological developments and facilitating change, TÜV SÜD inspires trust in a physical and digital world to create a safer and more sustainable future.