

Virtual Vehicle Design

In response to the new mobility demands, there is a need to differentiate vehicles specifically designed for urban environments from traditional medium- and long-distance vehicles. To achieve this, the Body Design and Body Performance departments collaborate throughout the entire concept phase with Virtual Vehicle Design services to **ensure the safety and optimization of vehicle structures aligned with the vehicle's objectives.**



Body Design teams focus on **creating aesthetically appealing and functional vehicle body designs** that cater to the unique requirements of urban settings. This includes considerations for compact size, manoeuvrability, and urban styling trends. By integrating these factors into the design process, vehicles can better navigate crowded city streets and meet the demands of urban commuters.

By working in a coordinated manner, the Body Design and Body Performance departments contribute to the development of vehicles that are tailored to the unique challenges and requirements of urban mobility. These vehicles not only offer a pleasing visual design but also provide enhanced safety, efficiency, and overall performance in urban environments.

Our business units are distributed internationally, enabling us to efficiently adapt to the diverse cultures and requirements of our customers. This global presence allows us to **tailor our services and solutions to meet the specific needs of different markets.**

Overall, our extensive experience, dedicated teams, commitment to safety, and global reach make us a trusted partner in the automotive industry. We are well-equipped to



navigate the challenges of the ever-changing mobility landscape and provide comprehensive solutions to our clients, both established manufacturers and emerging start-ups

Product Engineering Design and Virtual Development encompass a range of crucial activities in the automotive industry

These include:

Styling Feasibility

Ensuring compliance with both legislative requirements and internal OEM standards.

Vehicle Requirement for Product Definition

Defining the specifications and characteristics of the vehicle based on market needs and trends.

Benchmarking and Trends Analysis

Conducting studies to analyse and compare vehicle concepts in terms of performance, features, and design.

Use Case Scenarios

Developing scenarios to determine the suitability and functionality of multipurpose vehicles in different situations.

Packaging Studies involve analysing various aspects of vehicle layout and system integration, including:

Passenger vehicles, Multipurpose vehicles, Commercial vehicles, and Off-road vehicles

Assessing layout and integration of systems based on legal, customer, and ergonomic requirements, as well as passenger and load access and maintenance needs.

HEV/EV/Connected and Automated Vehicles

Integrating hybrid, electric, and connected/autonomous vehicle systems while ensuring compliance with technical and regulatory requirements.

Digital Mock-Up and Data Management

Utilizing digital models to simulate and manage product development, enabling efficient collaboration and data organization.

Exterior and Interior Parts Development

It focuses on designing components that meet project targets and manufacturing strategies:

- **Body in White:** Developing stamped exterior parts for both body-in-frame and monocoque vehicles.
- **Space Frame Design:** Creating tubular structures for small or special vehicles.
- **Body and Chassis Frame Design:** Designing bodies and frames for buses and coaches.

Additionally, **Exterior and Interior Trim Parts Development** includes designing various components such as dashboard elements, cockpit modules, frontend, and rear bumper systems, side door trims, and trunk elements, as well as front and rear seat systems.

Process Quality Control and Technical Feasibility ensure that production and structural requirements are met. This involves assessing factors such as welding and stamping feasibility, assembly sequencing, material thickness, paint access, and tolerances optimization.

Support for Industrialization involves managing **Bills of Materials (BoM)** and **Processes (BoP)**, defining assembly sequences, developing simulation methodologies, and implementing quality control measures (**DFMEA**, **PFMEA**). **Engineering Detail Design for Manufacturing** encompasses the detailed design and engineering for efficient production.

These activities contribute to the successful design, development, and manufacturing of automotive products, ensuring compliance with regulations, meeting customer needs, and achieving high-quality standards.