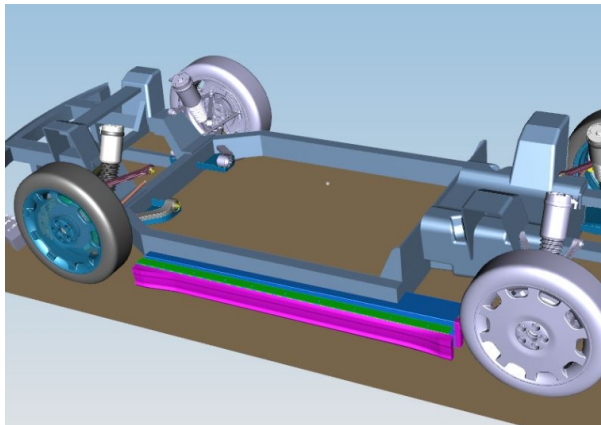


## Stiffness and Fatigue

The Stiffness, Fatigue, and Thermal Analysis team comprises members from business units across various locations, including the Czech Republic, India, Brazil, the UK, and our headquarters near Barcelona.



**Fatigue analysis and strength evaluations** are critical in the design and testing of automotive components. Repeated cyclic stresses from everyday driving can lead to crack initiation and propagation in materials.

Key areas for fatigue analysis include **chassis, suspension, powertrain systems, and closures** like doors and hoods. Multi-axial variable amplitude loading histories are applied to replicate real-world conditions. Solvers like NASTRAN, ABAQUS, FeSAFE, FEMFAT and nCode calculate fatigue life based on stress-life or strain-life approaches using materials data. Correlation between simulation results and physical test data is critical, IDIADA's [long experience in durability testing](#) is added value for good correlation.

Quasi-static load cases are applied early in development to establish baseline strength and fatigue analysis where main issues can be identified, and major rework avoided. In following phases, more detailed fatigue analysis (including dynamic fatigue) allows further improvement of the design with corresponding weight optimization.

Comprehensive fatigue and strength testing validates designs and provides critical real-world testing expertise from senior engineers. Striking the optimal balance between analysis, testing, and cost is essential for automotive programmes to succeed.