

## Case Study: **Simusolve Australia**



MSC Apex®

# Complete structural model of the vehicle assembly, in less than 100 hours.

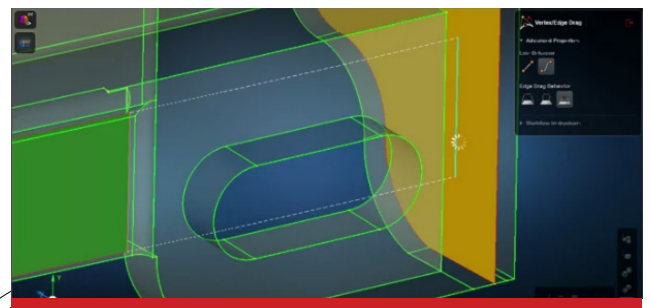
### Industry Challenge

Simusolve Australia was tasked with the structural evaluation of the preliminary design of a fabricated “road registered” supercar. The structural system involved various vehicle sub-assemblies, comprised of over 100 individual components made from metallic, carbon composite and elastomeric materials. The data was supplied as a single structured Parasolid assembly file – generated from SolidWorks. Simusolve was required to do internal load and stress surveys, torsion and beaming stiffness assessment, as well as modal response and confirmation of internal load paths.

The assignment was quite challenging due to several factors. First, the sheer scale of the mesh creation activity would have been sufficiently challenging on its own. However, when combined with the need to manage and organise such a large number of components and subassemblies, their structural interfaces and properties, and the problem became even more difficult. Traditional pre-processors struggle to handle problems of this magnitude. In addition, the team needed to make rapid changes to the geometry in order to assess design changes arising from analysis insights.



FEA model and CAD geometry in MSC Apex



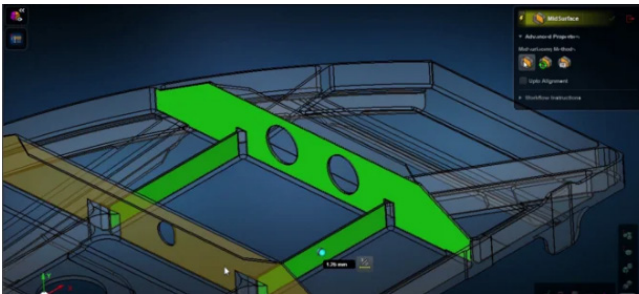
Direct geometry modification in MSC Apex

## MSC Solution

Simusolve chose MSC Apex as the pre-processing tool to support analysis for preliminary design of a new high-performance supercar, currently under development by Mason Hughes Automotive in South Eastern Australia. MSC Apex Modeler is a CAE specific direct modeling and meshing solution that streamlines CAD clean-up, simplification and meshing workflow.

With both resource and schedule constraints, the team needed to turn to the next generation of modelling software in order to meet these business objectives. Despite having had no experience with MSC Apex, it's publicised rapid CAD to Mesh modelling tools, hierarchical multi component model manager and solver options which include the industry standard MSC NASTRAN made MSC Apex an obvious choice.

From an analyst's point of view, MSC Apex software is extremely intuitive. Not only does it facilitate the rapid construction of complex topologies, but the associativity between geometry and FEM entities makes post-construction changes and refinements straight forward and rapid. This is a key competitive advantage to have when analysing to support preliminary design efforts. Over 1000 hours of use, the team was able to use many subtle design features that offer the analyst productivity and efficiency gains, from the anti-fatigue GUI colour scheme and design, to automatic hierarchically sensitive model attribute organisation.



Fast frame structure redesign in MSC Apex

## Key Highlights:

**Product:** MSC Apex

**Industry:** Automotive

**Challenge:** Structural evaluation of the preliminary design of a fabricated “road registered” supercar

**Solution:** Complete structural model of the vehicle assembly was completed and analysed in less than 100 hours

## Benefits

The team was able to complete and analyse a complete structural model of the vehicle assembly, in less than 100 hours. The training required to achieve this result was acquired during that time, via the intuitive and highly accessible interactive user cues and onboard tutorials with minimal support/advice from MSC.

Simusolve's customer was astonished by the rate of progress and return on investment. The team was able to make a number of recommendations to guide the design process as it matured into release level data. As a result, the customer was able to accrue the benefit of structural insights and optimisations that will set it apart from its low volume competitors.

For more information on MSC Apex and for additional Case Studies, please visit: [www.mscsoftware.com/en-indopacific/node/2912](http://www.mscsoftware.com/en-indopacific/node/2912)