



CASE STUDY:

UGL Train Carriages Modelling

OVERVIEW

UGL required high accuracy 3D models of Sydney Trains' "Tangara" railcar interiors that needed refurbishment. Overall the Tangara fleet in Sydney consist of nearly 500 carriages. A pilot study across four carriages was undertaken to check the consistency of moulded components to enable strategic planning for the refurbishment design.

SITUATION

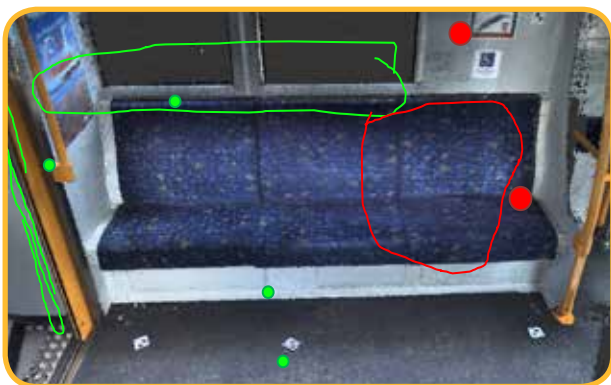
AAM's Digital 3D models of train carriage interior areas included stairwell areas, vestibules, end saloons and drivers' desks were used to recreate and redesign the required areas, knowing they would soundly fit to existing carriages. Features of interest consisted of geometric components like flat panels, complex curved fibreglass parts, hand rails, drivers' consoles and interfacing components.

ACTION

AAM's High Definition Surveys (HDS) team captured the Tangara railcar's interior areas with a Faro freestyle 3D handheld laser scanner, giving the ability to scan in tight spaces with detailed undercut areas which would be inaccessible with many conventional scanners. From this colourised point cloud data, AAM generated high accuracy flexible nurbs 3D models which AGL could then use to design the new refurbishment for the Tangara railcars.

The ability to provide an incredibly detailed and accurate model in flexible digital format was a key client requirement.

AAM's comparative 3D model deviation analysis was used to compare geometry between train carriages to create a colour heat map which displays the variations in shape and therefore enables decision making with regard to optimum design and new componentry.



Photorealistic 3D scan of seating



Train Driver's Console

RESULT

The solution provided by AAM to this challenge delivered the following benefits:

- A highly accurate, detailed 3D model which can be edited to modify design requirements and that can also be used to machine new moulds for refurbishment.
- Detailed current condition of the railcar in the required areas of interest.
- A deviation analysis in an easy-to-read colour heat map showing the difference between designed and built form