

We put the ai into rail

# dessan Model

**dessan Model** is used to evaluate major project designs prior to implementation. By using complex modelling techniques, the exact signalling infrastructure of any part of the railway network can be replicated including mainline, station areas, yards and depot facilities. Options can then be changed in a virtual way to fully test the integrity of the design.

**dessan Model** has been utilised in a diverse range of projects, including:

## Derby Resignalling

This was a £200 million investment to improve the railway in and around Derby station. Hitachi was engaged by Network Rail to produce a detailed micro simulation modelling tool of the planned rail infrastructure. In total, 8 design options were modelled during the project which we were able to demonstrate to train operating companies how the new layout will perform the future including during perturbed operation.

## Stoke Gifford Train Depot

A model of the Hitachi Depot was created from a supplied scheme plan and a location area plan. Real train acceleration and braking data was added for the classes of trains which were scheduled to use the depot.

Real life dwell times were loaded into the simulation:

- Time spent in the maintenance shed
- Time spent refuelling
- Both are based on the length of the train
- A new timetable was created for the depot movements

## Transpennine

The aim was to find Journey Time Improvements (JTIs). A model was created from Manchester to York by connecting up the existing simulations and creating data for sections that weren't based on supplied scheme plans.

Real train acceleration and braking data was added for the classes of trains that were scheduled to traverse in the area and various interventions were implemented:

- Line Speed Improvements across the whole route
- Targeted change in line with route knowledge to ETCS
- Simulation of change to ETCS Signalling across route
- Removal of Signalling Constraints
- Increase of braking rate
- Simulation of ETCS driving runs
- Removal of overlaps

A comprehensive report was produced to indicate the JTIs that could be obtained from each intervention

