Railway microsimulation for timetable verification

Dynamic micro-simulation of circulation is a support for railway planning and design. It can be used for both infrastructure design and the definition of operating programmes, allowing checks to be made, bringing out any problems in achieving the planned functional and performance aims, suggesting possible optimisations and restoring an ex ante evaluation to the proposed design.

OpenTrack, the software used for micro-simulation and one of the most used internationally, gives a detailed reproduction of the dynamic behaviour of all the railway system elements like their mutual interaction, allowing analysis of all the technical-operational aspects of the railway circulation simulated.

Defining an operating programme

NET Engineering was responsible for the definition of a challenging operating programme, able to respect not only the client's requirements, mixed traffic with the overlapping of long-distance services with high frequency metropolitan ones but also the various constraints dictated by the specific nature of the infrastructure, in the sphere of the Marmaray suburban railway line (Istanbul, Turkey) project.

The result was an operating programme able to bring together the different requirements and circulation methods (mobile block for metropolitan services, fixed for long distance), achieve the planned frequencies (one train every 2'20'' in the central part of the rush hour), with a clock-face timetable with frequency diversified between the rush hour and other times, and able to deal with the constraints of the infrastructure (uneven distribution the vehicle depots) and the operational requirements (fixed start-up and close-down times).

Development of the project with the support of the dynamic micro-simulation tool brought out the critical points underway, indicating and checking the corrections and suggesting optimisations. In addition, it provided analytical data at all steps on which to develop discussions with Turkish Railways, the Final Customer.