



**Railway microsimulation
for priority of intervention**

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.

Comparison between design alternatives

For the Technical-Economic Feasibility Plan on doubling the track of the Bologna-Portomaggiore Servizio Ferroviario Metropolitano 2 (SFM2 Metropolitan Railway Service) line in the section between the Bologna via Larga and Budrio station stops, NET Engineering applied micro-simulation for an effective comparison of function and performance in the proposed alternative designs. A simulation model for each alternative was built in the software environment offered by the OpenTrack tool. The features of the infrastructure in the different project scenarios were created, assessing the effects on railway circulation using simulation models. In detail, an operational model was developed for each solution compatible with the specific project infrastructure scenario and as consistent as possible with the forecasts of the Bologna Metropolitan City Piano Urbano della Mobilità Sostenibile (PUMS – Urban Sustainable Mobility Plan) and the Metropolitan Railway Service (SFM), thus based on synchronisation and intensification in rush hours. **In this way, the most efficient and effective alternative was found, both quantitatively and qualitatively, to make possible the levels of service set out by the planning tools, also indicating the essential integrations to optimise the project.**

