Capacity Management and Simulation

Railway companies are seeking ways to make optimal use of existing railway infrastructure to avoid expensive network expansions. We use cutting-edge tools to determine precisely how these companies can best exploit each and every segment of their railway networks. Our work includes running checks of infrastructure capacity and operational stability as well as ascertaining the effects of railway innovations.

Our simulations depict the complex relationships between railway infrastructure and operations. This ranges from the interactions between infrastructure and train operation to the consequences of disruptions to rolling stock or infrastructure. Our findings show the performance of the system and thus represent an important tool in long-term railway planning.

Our services include:

— Assessing options for shortening travel times and service consolidation
— Analyzing delays and their causes
— Examining the effects of changes in signalling systems, such as the introduction of ETCS L2 BL3 with its associated braking curves
— Developing rolling-stock deployment schemes
— Determining the effects of automatic train operation (ATO) technology and communication-based train control (CBTC) systems

For the simulations of railway operations, we use OpenTrack, a tool developed at ETH Zurich specifically for the interactive simulation of hole railway networks. We war also able to run and control OpenTrack via an API with our own software products in Python. This allows us, for instance, to implement dispatching rules and to introduce additional trains in different traffic situations during our simulations.