New control strategies and user interfaces for train traffic control

Support disturbance handling
- support when it is most needed

Reduced system complexity
- facilitates real time decision making

Automatic functions for
- trainway testing and booking
- trainway reservation and locking

Automatic functions are
- **usable** and working also during severe disturbances
- **predictable** and easy to understand

Automatic functions do **not** autonomously change:
- track usage
- train order

The human operator is continuously in control

Control by planning in real time
- continuous replanning based on actual accurate information

Planning is separated from execution
- no "surprises" during execution

Decision support for optimisation
- simulates, evaluates and suggests alternative solutions

The human traffic controller
- decides criteria for simulation
- accepts, modifies or rejects suggested solutions

Operator-process interface

Integrated information
- Simultaneous presentation of overview and details with high precision
- Shows exactly what will be executed
- Shows conflicts and deviations
- facilitates continuous situation awareness

A model for systems analysis

Four requirements to control a dynamic system:
- Goal (G)
- Model (M)
- Observability (O)
- Controllability (C)

Implemented interface prototype