**Future Train Traffic Control**

### Control by planning

To plan and control train traffic constitute very complex tasks. The human being, in the role of traffic dispatcher, must be able to take fast and correct decisions and effectuate them efficiently. In the future, we will see faster and more frequent traffic and many independent traffic operators, which also will result in increasing demands on dispatchers and on the technical support systems.

The main objective for our proposed new control strategies and operator interfaces, is to achieve control on a higher and more traffic related level. By doing so, we can move the focus from control of the technical infrastructure, to the continuous reformulation of a functional traffic plan. We call this “control by planning”.

The plan, which always must be feasible, can now most often be automatically executed. In this way the concentration is no longer on the real-time control tasks, but more on analyzing the future development of the traffic system, e.g. to identify eventual conflicts that can be prevented in advance.

Time can be spent on preventing disturbances instead of solving them when they have already occurred.

We see two different roles for the traffic dispatchers. First we have the planner, who has a continuous responsibility for updating the traffic plan, and secondly the executor, who takes over when the plan can no longer be automatically executed. The executor can manually control the traffic in a way similar to today’s control tasks.

### Decision support and automatic functions

As the train traffic control tasks will be complex also in the future, there is a need for efficient decision support systems. The main objectives are to identify conflicts and disturbances as early as possible, to show alternative solutions and to make prognosis of the outcome of suggested control actions.

The normal way to effectuate a traffic plan is, according to our proposal, to automatically execute the plan. This is done by the “automatic executor”, which like a slave will follow the defined plan. It can also, in advance, test the feasibility of the suggested plan. The automatic system is never allowed to change train order or track usage.

### Interaction with the environment

Traffic dispatchers must cooperate with train drivers, traffic operators, power system dispatchers, rescue organizations etc. We have in this project mainly focused on the interaction with train drivers which can be significantly improved.

### A test work-place

For experiments and evaluation we have developed a test work place. The user interface is projected on a large screen. The experiment, where the test person is controlling a simulated train traffic, can be recorded for later analysis.

Read more about the project at [http://www.it.uu.se/research/project/ftts](http://www.it.uu.se/research/project/ftts) or contact Bengt.Sandblad@it.uu.se