

### The challenge

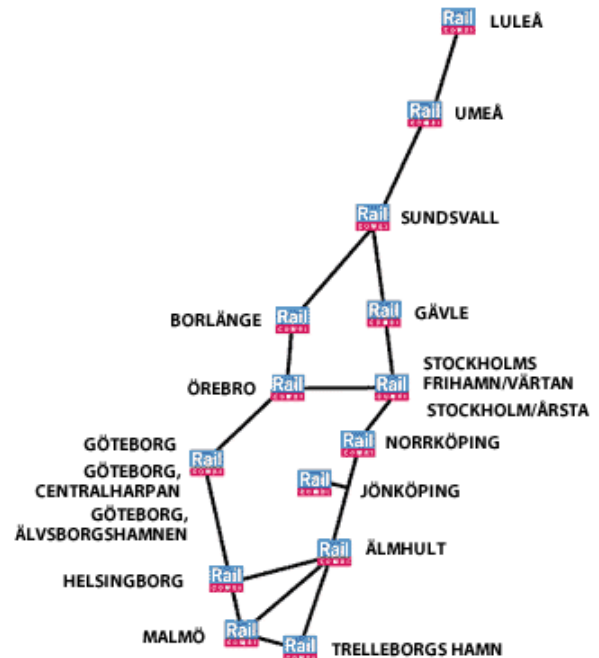
RailCombi (today CargoNet) operates intermodal freight train services between Swedish terminals.

Most of the services were operated by running intermodal wagons in the Swedish wagon-load system, mainly via the marshalling yard at Hallsberg near Örebro. There were connections between all terminals.

In 2003 RailCombi aimed to change and improve cost-efficiency of their services. The idea was to operate an increased part of the services as pure intermodal trains, many through their main terminal at Stockholm Årsta.

Rail Combi needed to forecast how different kinds of changes would affect the system:

- production (tonkms) by intermodal and wagon-load trains,
- size (weight and size) of the trains,
- minimum flow of empty wagons,
- necessary fleet of wagons,
- flows through Stockholm Årsta.



### The solution

Transrail used its own software tool, TSDA (Transport System Design and Analysis) to study the effects of the various system scenarios, both the existing system and new ones. Basis for the studies was Rail Combi's statistics on transported ULDs (semi-trailers as well as containers and swap-bodies of various sizes) for a number of months in 2002.

TSDA enabled us to:

- model the terminal to terminal transport by train and schedule, including waiting times and taking operating days of trains and terminals into consideration,
- calculate the size of each individual train by day and link of the network,
- calculate flows through the terminals and other nodes of the system, thus calculating the necessary number of shunting and marshalling operations per node and day of the period,
- take into consideration the different types of ULDs and to define the necessary wagon fleet, which consisted of different types of wagons capable of loading various combinations of ULDs.
- minimize the wagon fleet at the same time as taking empty transports into consideration.
- a specific viewer tool made it possible to graphically study various aspects of the transport flows.

**Year:** 2003

**Contact:** Per Leander, Phone +46-8-404 09 61, E-mail: [per.leander@transrail.se](mailto:per.leander@transrail.se)

**Transrail Sweden AB:** Allén 6A, S-172 66 SUNDBYBERG, Sweden, Phone +46-8-404 09 90, Fax +46-8-404 09 97, E-mail [transrail@transrail.se](mailto:transrail@transrail.se), Website: [www.transrail.se](http://www.transrail.se)