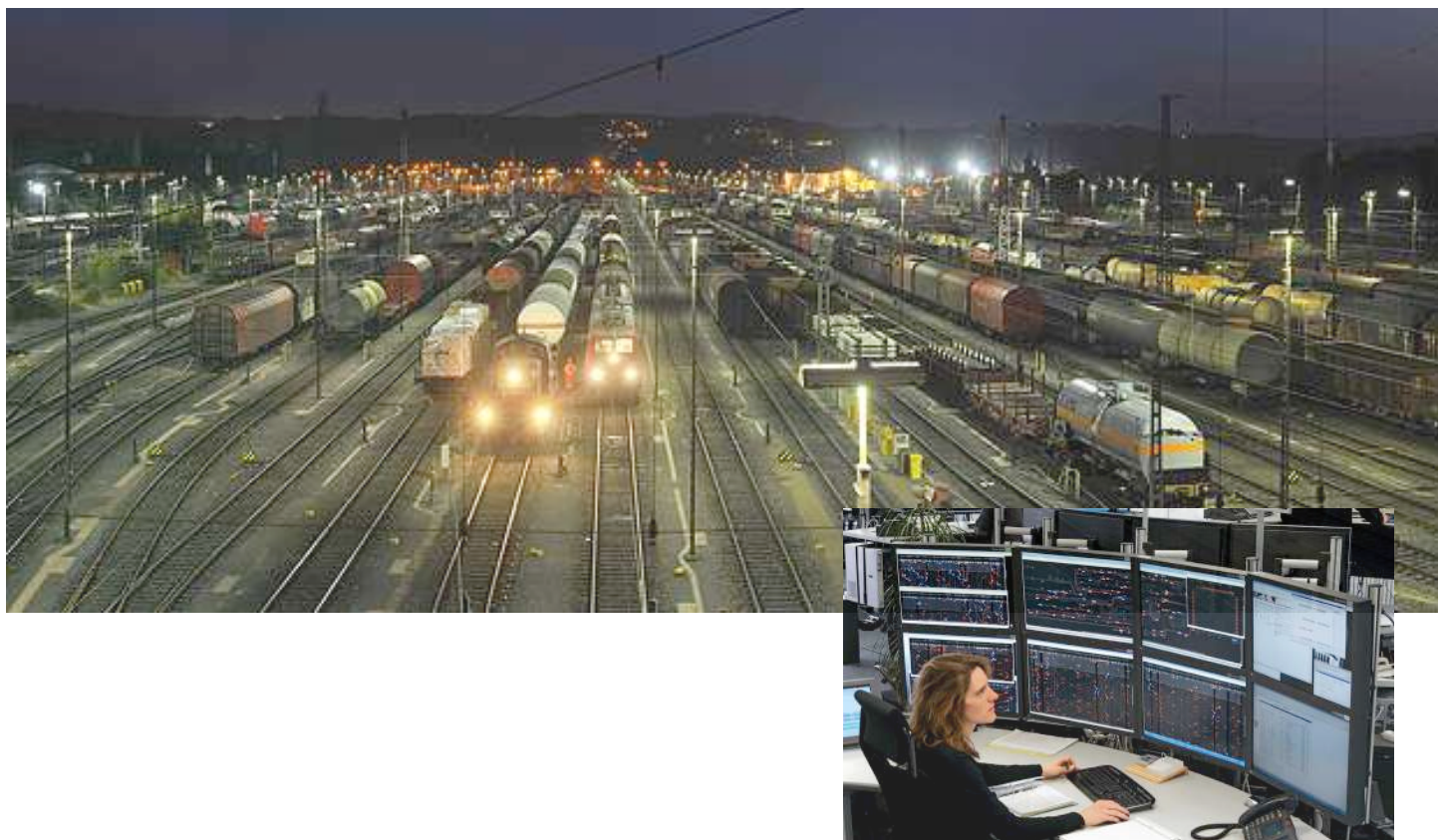


Objectives for real-time freight traffic management



Objectives for real-time freight traffic management

Initial situation

Rail traffic is expected to grow significantly in the near future. The Swiss railway network is already among the most heavily used in the world and operations will be approaching the stability limit. An optimal use of available capacity is therefore paramount. In order to limit the propagation of delays and the ripercussion of negative consequences on other track users, real-time dispatching is used. This includes several measures, like e.g. reordering of trains, prioritising or even cancelling a train run in some situations. Today this task is performed mostly by hand by the dispatcher, but keeping an overview of all consequences related to a rescheduling measure is difficult and a more systematic approach is needed.

Goal

This thesis aims at formulating an objective function which takes into account the interests of all relevant stakeholders, complies with the current legal framework and is suitable for rescheduling in a context of mixed traffic. In fact, most objective functions suggested

in literature focus either on passenger or on freight services.

Methods

Literature review, identification of legal framework, and interviews with industrial partners were used to develop a solution to the problem illustrated above.

Main findings and conclusion

The thesis shows that the objective function is better formulated in monetary units. In fact, even though a formulation in time units is possible, it has no theoretical concept to support it: variables are transformed with the mere goal of reproducing existing operating rules. The variables considered in the objective function are: energy consumption, operating costs of the railway undertaking, passenger delays converted with the value of time (to take into account the number of passengers concerned by a rescheduling measure) and freight train delays. They, too, need to be converted with the value of time. In order to reflect the 'isolation' rule, existing on SBB network and stating that heavily delayed trains lose every priority,

an artificial reduction in the value of time is necessary. This result can be regarded critically, since passengers' (or freight service customers') discomfort actually continues to increase.

Also, due to lack of data, it was not possible to properly represent the situation where a freight transport chain breaks.

Client

These results will become part of a project mandated by SBB

IVT contribution

First draft of an objective function suitable for mixed traffic

Used methods

Literature review, identification of legal framework, interviews with industrial partners

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