

Final report – Feasibility study on using Socio-Economic Cost Criteria in Case of Capacity Shortages

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Executive summary and recommendations

There is a need to improve and harmonize railway capacity allocation methods in Europe to increase resource efficiency, simplify administration for train operators, and improve transparency, fairness, the fostering of competition and incentives for frugality in the use of scarce capacity.

This report concerns the feasibility of introducing capacity allocation across Europe according to prioritization criteria based on socio-economic valuation. A similar method has been in use in Sweden for over ten years, showing feasibility on a national scale for the annual timetabling process. Feasibility aspects that are new or more pronounced in the TTR process compared to the existing capacity allocation process include Advance planning, the process of allocating Rolling planning capacity during the running timetable period, and synchronization between countries regarding international traffic. These aspects are all topics of the current report, and particular emphasis will need to be placed on all of them in the design of a system in line with the current proposal.

Regarding Advance planning, which is the process before railway undertakers apply for train paths, we find that there is a need for infrastructure managers to value the utility of the targeted traffic offered in the Capacity supply. The result of such a valued traffic offer should, if performed correctly, also attract railway undertakers and should lead to a socio-economic efficient use of available infrastructure.

The capacity for the new product segment Rolling planning is to be reserved during the Advance planning and safeguarded through annual allocation. This capacity is then available for railway undertakers to request during the running timetable period. Here the sizes of the product segments need to be determined correctly to get the best utility from the available infrastructure. The reservation of capacity for future use must be based on well-founded data and valuation methods.

Extending socio-economic priority criteria to a European level raises the question as to whether country-specific values or average European values should be used. Here it should be noted that it is not the total value of the timetable itself that is interesting, it is the conflict resolution effects on the timetable that matters. Hence it is the quotient of the cost parameters that is important, not their absolute values. The quotient of the country-specific cost parameters are fairly similar between countries, leading to small or no differences in prioritization of timetables in different countries. Therefore, prioritization will be fairly equal from country to country when using either country-specific categories or European common categories, the exception being near borders with large absolute differences in country-specific cost parameters.

We find that the method presented in this report is possible to implement and that it has several advantages compared to methods based on administrative criteria in which precedence is given based on predefined set of rules where, for example, a certain type of train service or train path is prioritized. There are, however, development needs of the method that result in a set of recommendations. These are summarized in the following bullet points.

RECOMMENDATIONS

- The proposed valuation framework works for basic valuation of adjustable train-paths that are used in advance planning (referred to as bandwidths in TTR), but there is an uncertainty regarding the amount of adjustments needed when scheduling the final train path in the annual timetable. This amount must be budgeted and cannot be measured exactly in these process steps.

- The parameter values for traffic can be either country-specific or a European average, depending on data availability and local considerations. The decision on which data source to use can be made on a national level. However, it is important to use values in a consistent way for all types of traffic within each country.
- The value of traffic may change when the train crosses the border, i.e. national socio-economic cost values may apply.
- Harmonized operational cost parameter values for Europe should be developed for passenger services, similar to those that already exist for freight services.
- The prognosticated capacity products in the Rolling planning segment should have prioritization classifications. The calculated values of traffic within the Rolling planning segment should be compared to that of the Annual timetable segment, and the amount of traffic allocated within each segment should be updated yearly with the aim to reach equal valuation in the two segments.
- The same rules and parameter values should, as far as possible, be used throughout the capacity allocation process.
- The model should include associations (relations between two trains) in the valuation, including transfers between passenger services and rolling stock circulation.
- As a first step, trains and associations can be valued rather than passenger and freight flows. To implement a valuation calculus based on passenger/freight flows requires data that is not currently available. This is however an area for future development.
- A generalized form of association between two flows of traffic should be introduced as a new object to be published in the capacity model. This is in some respects analogous to bandwidths as a generalized form of train-paths.
- To make the model easier to understand, manage and adapt to different areas, the model should allow the possibility to define new train classes rather than only using fixed classes of specific train configurations and/or mix of passenger and cargo.
- A development work is needed to properly handle denial of capacity requests (“exclusions” in this report) and large revisions compared to the capacity request, especially for international freight traffic. We propose a direction for such development work based on the cost of using an alternative transport, railway or other transport modes, and, in some cases, the value of goods. We also propose a simplified method to be used in the meantime while the other model is developed.