



**Needs of statistics on freight  
train reliability – a pre-study**

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Memorandum  
Report 2017:7**



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# Summary

At present, the official statistics on rail traffic in Sweden only comprise passenger trains. The reliability of freight trains should also be included in the statistics. This leads to questions on which information should be included and how it should be described. This pre-study is a knowledge base of the necessary development of the official statistics in Sweden, and is centered on the users' current and potential needs of statistics on freight train reliability.

In this context, reliability is the ability of a transport system to follow the timetable, upon which users have organized their activities. A traffic disturbance, such as delays or cancelled trains, creates unreliability in the transport system, which should be characterized in more ways than the frequency of the disturbances in order to meet different users' needs of statistics. To produce the necessary statistics, one must answer the following questions. Which units and variables should be included? Which domains should be included? Which statistical measures should be presented?

This study shows that the relevant units are vehicles and traffic disturbances. The necessary variables are scheduled, arrived and cancelled vehicles, as well as vehicles that are adjustments/late changes of the timetable. Variables on timetable deviations for vehicles running on the network are also necessary. In this aspect, there are differences between passenger and freight trains as the latter group relatively often depart or arrive ahead of schedule, which is also important to capture with statistics. In addition, there is a need of variables for the duration of traffic disturbances and the recovery times when a vehicle is delayed.

Regarding the domains, the variables should in principle be as geographically disaggregated as possible to meet all the different users' needs of statistics. For example, freight customers and train operating companies are more interested in measurement points where the delivery of the train transport takes place, while researchers also need information on various measurement points between a vehicle's origin and destination to estimate the causal relationships between different actions and transport reliability. Different causes of cancellations and other deviations from the timetable are also important domains. Furthermore, the definition of late cancellations should vary as the conditions for rescheduling a freight transport varies between different logistic solutions. This is also related to the need of statistics on the duration of traffic disturbances (with different time intervals as the domain); statistics that will offer freight customers and train operators a greater capacity to respond to traffic disturbances. Moreover, domains that capture the time-sensitivity of a transport are necessary in order to estimate a value of transport time variability for freight trains. Such domains can be the group of products transported and its weight.

There are many statistical measures that can be used to present and describe the variables. Even if the available information can enable users to create their own measures, the authority presenting the statistics needs to choose the measures that will summarize the statistics. This choice should be made with respect to the needs of user groups such as the public, the media, decision makers and infrastructure users (train operating companies and freight customers). Buffer Index and Misery Index are measures that can be useful in this respect, in addition to measures such as the punctuality of the transport and the so called combined performance measure (captures both regularity and punctuality). Moreover, graphs on the

distribution of deviations from the timetable can be important to present as it provides an overall view of the reliability of the transport system.





Transport Analysis is a Swedish agency for transport policy analysis. We analyse and evaluate proposed and implemented measures within the sphere of transport policy. We are also responsible for official statistics in the transport and communication sectors. Transport Analysis was established in April 2010 with its head office in Stockholm and a branch office in Östersund.

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