



Summary

Every transfer counts

The resistance travellers have to transfers
during train journeys

Mathijs de Haas & Floor Verheij | August 2026

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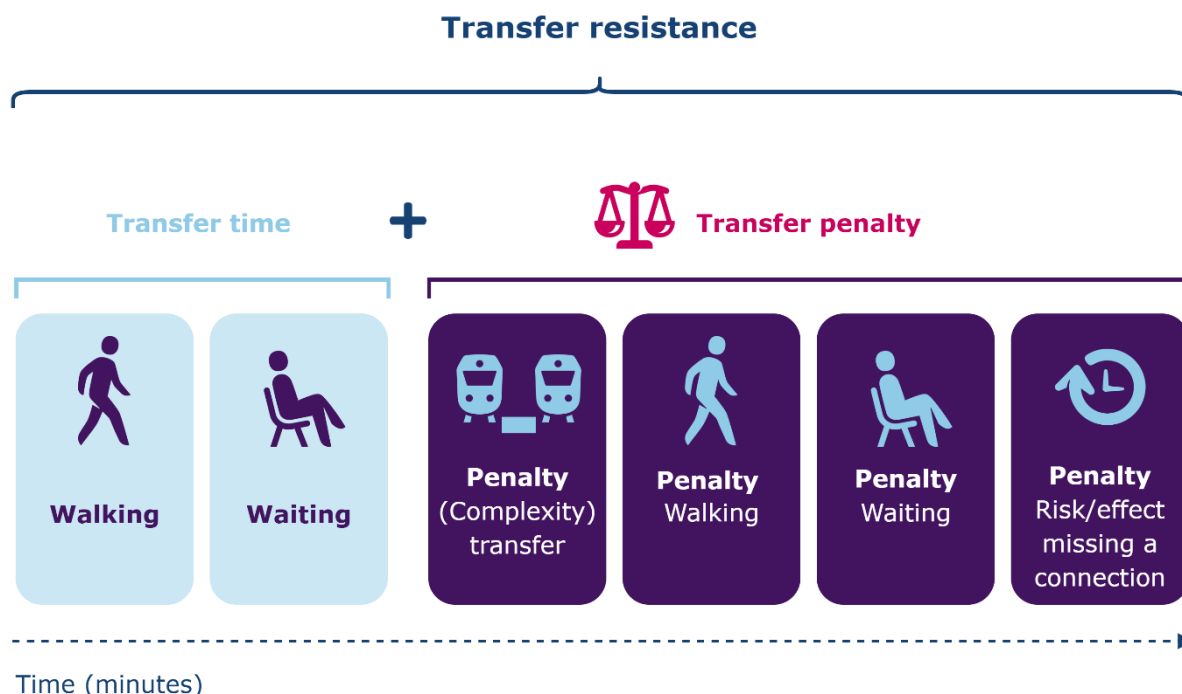
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Summary

Having to transfer during a train journey makes the train less attractive to travellers. The Dutch government plans to take a decision in early 2027 on the organisation of the rail market for the period after 2033. Forms of market organisation other than the current one may, among other things, lead to more or fewer transfers, as well as potentially requiring more transfers to a different operator. We therefore examined what is known in the literature about the additional resistance travellers experience when transferring during a train journey. The attractiveness of a train journey is determined not only by the number of transfers; the characteristics of those transfers also play a role. The literature provides little insight into whether travellers evaluate a transfer to a different operator differently from a transfer with the same operator.

The literature shows that travellers assign a penalty to a transfer that can be expressed in minutes. This penalty represents the number of additional minutes of travel time travellers would be willing to accept in order to take a direct train rather than make a journey involving a transfer. The transfer penalty is additional to the actual time required for the transfer; see Figure S.1, which also provides an outline of the components of the transfer penalty. Comparing studies of the transfer penalty is made more difficult by the fact that not all studies are clear about which elements they include in the transfer penalty and whether or not the actual time required for the transfer is included.

Figure S.1 Components of transfer resistance and the transfer penalty in train journeys



The transfer penalty depends strongly on the characteristics of the transfer

Various characteristics determine the size of the penalty. For example, travellers give walking or waiting time up to twice the weight of the actual time involved. Although a long waiting time leads to a higher penalty, a very short waiting time is also less desirable. Scheduled waiting time also

provides a buffer, so that a small delay does not immediately cause travellers to miss their connecting train. The complexity of a transfer also plays a role. Having to cross a station involves not only a longer walking time but also a greater cognitive load for travellers than simply having to cross the platform, resulting in a higher penalty for such a transfer.

NS and ProRail conducted studies of transfer resistance in 2015¹ and 2023 (that is, the transfer penalty plus the actual time required for the transfer). Compared with other, international studies, these studies provide relatively detailed insight into transfer resistance. They appear to provide a plausible picture of transfer resistance in the Dutch context. Based on the 2023 study, transfers with a waiting time of 3 to 5 minutes – giving a transfer time of approximately 5 to 10 minutes when walking is included – result in the lowest total transfer resistance. In this case, the transfer penalty (thus excluding the actual time) ranges from 9 to 25 minutes for short journeys (≤ 45 minutes), and from 12 to 40 minutes for long journeys (> 60 minutes), depending on, among other things, the type of transfer and the frequency of the connecting train. For very tight or, conversely, long transfer times, the penalty can rise to almost 45 minutes.

The most recent study by NS and ProRail does not distinguish between different travellers or journey purposes, whereas the literature does show that the transfer penalty is not the same for all journeys and all travellers. It is plausible that the transfer penalties discussed above are lower for frequent travellers, such as many commuters. For infrequent travellers, for example those who only occasionally take a day trip by train, they are probably higher.

Little empirical knowledge about transfers between different train operators

Little is known about whether the transfer penalty differs between a transfer between two trains operated by the same operator and a transfer between two trains operated by different operators. At present, travellers transferring to a different train operator in the Netherlands generally have to check out with the first operator and check in with the second operator. This requires additional actions by travellers and makes the transfer more complex, making it plausible that this leads to a higher transfer penalty. However, as far as is known, the size of this effect has not been established empirically.

Particularly in a situation with more operators on the rail network, and therefore more transfers between operators, a number of factors may cause the transfer penalty for a transfer between operators to differ from (and be higher than) that for a transfer with the same operator. In addition to having to check in again, these include differences in train tickets, fares, subscriptions and passenger rights that are considered per operator rather than for the journey as a whole. If the characteristics of a transfer to a different operator also differ from those of a transfer with the same operator, for example a longer transfer time or more frequent cross-station rather than cross-platform transfers, this also leads to a higher transfer penalty.

In this context, two directions for further research are relevant. First, more insight is needed into how travellers evaluate characteristics that make a transfer between operators different from a transfer with the same operator, such as checking in and out again and differences in fares, tickets, subscriptions and passenger rights. Second, insight is needed into the consequences of different forms of market organisation for the number and characteristics of transfers. Insight is also needed into how different forms of market organisation lead to differences between operators in, for example, fares, tickets and passenger rights. It is advisable to use several study scenarios, because transfer connections are determined not only by market organisation but also by the final timetable.

Various policy levers to limit differences in transfer penalties between transfers within and between train operators

With a view to a possible situation with more operators on the rail network, there are various policy levers that the Ministry of Infrastructure and Water Management (IenW) can use to limit differences

¹ In 2015, Significance was also involved in the study.

in transfer penalties between transfers with the same operator and transfers to a different operator. This is particularly relevant if those differences turn out to be large.

For example, measures can focus on removing the need to check out and check in again when transferring between operators, and on interoperable tickets. They can also focus on limiting differences in fares, tickets and subscriptions between operators. In doing so, the scope for operators to compete on price must be taken into account, particularly for open-access train services. Measures can also focus on safeguarding passenger rights for the entire journey when travellers use multiple operators, for example by offering through-tickets.

Finally, it is relevant, when allocating capacity, awarding concessions and assessing new open-access initiatives, to pay attention both to the number of transfers travellers have to make and to the quality of connections when transferring between operators. This involves not only ensuring connections between timetables, but also preventing transfers between operators from systematically having less favourable characteristics than transfers with the same operator.

Full memo available in Dutch

The full memo is available only in Dutch on the KiM website via [this link](#). The memo focuses on the following research question:

What is known in the literature about the transfer penalty in train journeys and the extent to which it differs by type of traveller and type of transfer (for example, with the same operator versus between different operators)?

We focus specifically on transfers between trains, rather than transfers between other forms of public transport or transfers required between access and egress transport and the train. Based on the literature, we seek to clarify the total (average) effect of transfers during train journeys and to gain insight into the extent to which different aspects of a transfer carry more or less weight in the discomfort people experience. The focus is on domestic train journeys. Where possible, we distinguish between transfers with the same operator and transfers to a different operator. However, the memo does not aim to clarify the consequences of different forms of market organisation for the number of transfers travellers have to make and the characteristics of those transfers.

About this publication

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