

The resistance of an interchange between trains

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The resistance of an interchange between trains

Travellers experience interchanges as something negative.

They have a resistance against it, but the severity of this resistance and which factors contribute to this resistance are not known precisely and are different per research. We carried out a new more detailed survey to obtain more information how to reduce the resistance of interchange in the Netherlands.

Several hypotheses regarding the resistance factors and resistance characteristics were tested for different trip purposes.

These tests were based on data obtained from a questionnaire with 'Stated Choice' choice situations, that were answered by respondents from the customers panel of NS.

The results of these hypotheses demonstrate that in-vehicle time, transfer time, transfer type (cross-platform or cross-station), costs, number of transfers and additional waiting time all contribute significantly to the disutility of a train journey with a possible interchange.

Remarkable results of the survey:

- The resistance experienced by the traveller that is caused by an interchange is underestimated in the current models used by NS.
- The resistance caused by an interchange is higher on short journeys than on long journeys
- The optimal transfer time for a passenger is four minutes (shorter creates stress, longer creates "lost time"). People with a trip purpose 'commuting or business' value a transfer time longer than 4 minutes more negative. 'Social recreational' travellers value a transfer time of less than 4 minutes more negative.
- The additional waiting time after missing a connecting train, counts heavily in the valuation of the interchange.
- 'Social recreational' travellers and 'commuting or business' travellers value cross platform transfers more positive opposed to cross station transfers. This valuation is even more pronounced in 'social and recreational' travellers.

By implementing the results of this survey in the models used by NS, we aim to optimize our timetables regarding interchanges.

The current allocation model (TRANS) provides an allocation that can be compared with the allocation based on the models from this study, but only for long journeys and for interchanges with relatively little resistance.

For shorter trips TRANS allocates too many travellers to the routes with an interchange instead of routes without an interchange. Implementation in the growth model of NS will lead to a model with a higher sensitivity for changes in the number of interchanges and changes in the characteristics of an interchange.