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Benefits of Punctuality Improvements for the Paris Suburban Railway Network

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Prepared for the Syndicat des Transports d’Île de France
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Summary

Trains that are delayed or cancelled have a direct impact for the passenger: he has to wait longer, and may become uncertain about his arrival time. If he then misses a connecting train or bus with a low frequency service his journey time will increase further. All of this leads to extra “costs”.

The costs associated with unpunctuality are incurred by the suburban train users themselves and by society. The summation of these costs makes up the (social) cost of unpunctuality. The value of this cost is currently not well known, as there has been little interest in valuation of punctuality effects up until a few years ago. This is why it was seen as necessary by STIF to undertake an in-depth research project aimed at providing all the elements necessary to estimate such values, and to calculate the impacts of punctuality improvements that can be envisaged. That is the subject of the present study.

The main objective of this study is therefore to provide a robust operational methodology which enables STIF to assess possible alternative investments aimed at improving the quality of the suburban rail services to and from Paris. The methodology is needed to assist the decision-making process regarding possible alternative projects (combinations of measures) to improve the punctuality of suburban rail services. Punctuality is defined here as the provision of rail services with actual train departure times from and arrival times at stations as published in the timetable.

Given that there was little information readily available about the many elements associated with the unpunctuality of trains, and the value that passengers attach to improving the punctuality of suburban rail services, a comprehensive research programme was carried out. This was structured in three main phases:

1. Background research. This included a review of international literature, a statistical analysis of train delays in Paris, and a survey of passenger arrival patterns.
2. Qualitative research of the impact of unpunctuality. This included three focus group discussions.
3. Quantitative analysis of the impacts of unpunctuality. This included a survey among 1200 travellers in which they were asked to make a number of choices between (hypothetical) services that had different travel times, frequencies of delay, in-train comfort and the provision of information about delays.
After the completion of these three phases a seven-step methodology has been developed (see Figure S.1) to assess possible investments and to calculate the perceived value of all punctuality benefits to all passengers (both existing and new). To aid users with the necessary calculations, a Microsoft Excel tool has been built. Travel times, delay probabilities, comfort and information levels before and after the project are the inputs. The direction of the line, its general regularity level and its passenger mix in terms of purposes also need to be specified. Based on the results of the stated preference study, the daily impact of the project on passengers, expressed in equivalent minutes of travel time, is calculated. This impact can be different for passengers of different segments (based on their journey purpose). Next, this impact is converted into monetary units (benefits per passenger, in euros), using an appropriate value of time. The benefits over all passengers are simply calculated by multiplication by the total number of passengers.

The number of passengers using a service may also be expected to change, because of changes in the rail level-of-service. This change in demand is estimated using appropriate travel time elasticities. When this is added to the benefits already calculated, the total monetary benefits of the project are determined.

![Figure S.1 Outline of the methodology](image-url)