

Cristina Prather Persson
Department of Traffic Planning and Engineering
Lund Institute of Technology Lund • Lund University
Box 118 • 221 00 Lund • Sweden
phone: +46 46 2229378
fax: +46 46 123272
email: cristina.persson@tft.lth.se

INTERREGIONAL RAIL TRAVELLERS' ASSESSMENT OF STATION LOCATION, SERVICES PROVIDED AND ACCESS

1. INTRODUCTION

1.1 Administrative Framework

In 1988 the former Swedish State Railways was parted into two; the Swedish National Rail Administration, responsible for operation, maintenance and construction of the national rail network and The Swedish State Railways (SJ), responsible for traffic, stations and traffic operation and control. To increase and revitalise railway research, which during the last decades had been in decline, SJ initiated a sponsor programme for railway research. My research, which will conclude in a Ph.D.-dissertation summer '97, is financed by this sponsorship as well as by the Swedish Transportation and Communication Research Board (KFB). This paper is a brief presentation of my research.

1.2 Technical Framework and Research Relevance

Many railway stations still in use today, originate from the 1800's, when steam trains were in use and travelling was something quite different. Today's travellers have different needs and require other facilities and services than their earlier counterparts. Not only when it comes to train comfort and travel time, but also when it comes to stations. To renovate an existing station or to build a new station involves substantial economic resources and it is important to invest where benefit can be expected. This implies knowledge of how station facilities are valued and used by the customers – the travellers – before investments are made. Even though the amount of literature on station architecture, construction and history is numerous, there are few studies on station location and facilities, especially in relation to the traveller. This research project is therefore highly relevant since the station – as travel node and as real estate property – is an important source of income for the railway companies.

The purpose of this project is to:

- provide an overview of aspects considered in station projects and to focus on the role of the traveller
 - focus on how railway travellers assess location of and services provided at interregional stations.
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1.3 Main Elements

The project contains four main studies.

- A stated preferences study on assessments and behaviour of **interregional travellers** considering location of, services provided at as well as access to the station.
- A stated preferences study on knowledge of **the Swedish State Railways' station planners** concerning interregional travellers. This study will only be briefly presented in comparison to the railway traveller study.
- A stated preferences study was made on assessments, attitudes and behaviour of **air line travellers** considering access to and services provided at the airport. Basic information and results from this study is published (Brage & Rollén '96).
- An ongoing interview study on **the station planning process**, a qualitative interview study mapping the relevance and importance of the factor "traveller" in the station planning process. Interviews are made with municipal authorities, Swedish State Railways and others involved in major station projects.

This paper presents the railway traveller study as well as the station planner study. The results from the airline and the planning process studies will not be presented further in this paper, since the analysis phase is not fully complete.

2. RAILWAY TRAVELLERS – A STATED PREFERENCES INQUIRY

2.1 Method

The study was conducted during December '93 and the main study was done aboard trains in both directions on the Swedish main line Malmö-Stockholm.



Figure 1 Map over line Malmö-Stockholm with major stations marked

The study was made using questionnaires to be filled in by the travellers. All travellers aboard the trains were given a questionnaire. A total of 1321 questionnaires were collected. A negligible number of people refused to fill in the questionnaire.

The stated preferences method (SP), which was chosen for this study, is a way of letting the respondent assess different hypothetical alternatives according to a chosen design of combinations and levels of the studied variables. By using this inquiry method the respondent can not assess variables as separate factors, but has to assess the alternative as a whole. The major advantage of SP is the fact that it makes possible the study of hypothetical alternatives. Thus this

method was chosen since the complexity of the questions made it difficult to use a more straight forward method like trying different measures in reality.

2.2 Questionnaire

The questionnaire was divided into two distinct parts. The first portion was intended to collect general information about the travellers' interaction with the station and consisted of 33 questions divided into the following five categories:

- "who you are and how you travel", i.e. age, gender, purpose of travelling
- "to the station", i.e. mode, distance
- "from the station", i.e. mode, distance
- "at the station where you entered this train", i.e. time spent at station
- "at a station in general", i.e. sale of tickets, information

The second portion was composed of two sub-questionnaires introduced by an explanation describing the way to grade as well as the implication of the studied variables. These two sub-questionnaires used the SP method and were chosen from a pool of three different SP sub-questionnaires regarding the following three categories:

- access
- services
- location

The SP sub-questionnaires each contained four different alternatives, that were to be graded on a range from 0 to 100. All SP sub-questionnaires had train travelling time as a standard variable, to which all other variables were compared to in the analysis. All respondents received a service sub-questionnaire as well as either a location sub-questionnaire or an access sub-questionnaire.

2.2.1 SP Sub-Questionnaire – Access

The access sub-questionnaire consisted of four variables – access time, access service, services provided and train travelling time – at three levels respectively. The sub-questionnaires had to be made in eleven different designs adjusted to the respondents access journey by means of transportation mode and approximate access time. Five different main access modes were defined: bicycle, car, bus, taxi and train. The access modes were categorised according to the current access time, defined to less than 10 minutes, 10-30 minutes and longer than 30 minutes and variation in access time for the sub-questionnaire was set depending on current access time. Access service level varied according to the access mode in questions of variation in distance of and covered or not covered passage from station access point to departure platform.

This sub-questionnaire will not be presented further in this paper, since the analysis phase is not fully complete.

2.2.2 SP Sub-Questionnaire – Service

The service sub-questionnaires were designed with four variables on three levels respectively. The service variables were categorised into four different sub-questionnaires A, B, C and D, according to previous studies on assessments of service facilities in public transportation (Gärling 1989, Lindh 1989) and the fourth variable – train travelling time – was set according to the known as-

assessments. Questionnaire A contained variables describing facilities for food, shopping and telecommunications.

Questionnaire B contained variables describing different types of luggage storage, luggage carts and public access. Questionnaire C contained ticketing, information and platform facilities. Questionnaire D contained variables describing internal transfer, waiting facilities and different kinds of restrooms.

These sub-questionnaires will not be presented further in this paper, since the analysis phase is not fully complete.

2.2.3 SP Sub-Questionnaire – Location

The location sub-questionnaire consisted of three variables – location, services provided and train travelling time – at two levels respectively. Location was set to central or external station, services provided to basic or high amount of services and train travelling time to a decrease by 20 or 40 minutes.

Please evaluate the following four scenarios by marking with an X on the scale.
0 = "very bad" and 100 = "very good"

The station where you board this train has the same location as today .
You get to the station in the same way as today, the cost is the same and it takes exactly the same time as today's journey.
The station has a high amount of services provided, like Stockholm Central.
Your journey on this train is 20 minutes shorter than today's journey.

0 _____ 100

The station where you board this train is located outside the city, like an airport.
You get to the station in the same way as today, the cost is the same and it takes exactly the same time as today's journey.
The station has a basic amount of services provided, like Hässleholm station.
Your journey on this train is 40 minutes shorter than today's journey.

0 _____ 100

The station where you board this train is located outside the city, like an airport.
You get to the station in the same way as today, the cost is the same and it takes exactly the same time as today's journey.
The station has a basic amount of services provided, like Hässleholm station.
Your journey on this train is 40 minutes shorter than today's journey.

0 _____ 100

The station where you board this train has the same location as today .
You get to the station in the same way as today, the cost is the same and it takes exactly the same time as today's journey.
The station has a basic amount of services provided, like Hässleholm station.
Your journey on this train is 40 minutes shorter than today's journey.

0 _____ 100

Figure 2 Example of SP sub-questionnaire – location

The description of the location alternatives in the sub-questionnaire was composed such that the only variable was the site, i.e. access time, mode and cost were all the same. The purpose was to study the intrinsic value of having a city centre surrounding the station and not to study differences in access to the station.

2.4 Station Planners at the Swedish State Railways – Comparison Study

An inquiry was made to see what the station planners at the Swedish State Railways know about what the travellers think about the stations. This study was made with planners from the Swedish State Railways in October '94. The planners had to answer a number of direct questions on who they think the typical railway interregional traveller is. They also were asked to fill out a number of SP questionnaires as they thought the traveller would answer them.

The results coincide extremely well with the results from the traveller inquiry both regarding general knowledge of the traveller and knowledge of travellers' assessments.

3. PRELIMINARY RESULTS

3.1 Analysis

Questionnaires lacking necessary information or that were filled in by travellers not fulfilling the criteria of being interregional travellers were rejected. After this process the percentage of the remaining questionnaires that were selected for further analysis was 70% (N=925) of the total collected sample (N=1321).

3.2 The Typical Interregional Traveller

When to describe the typical traveller factors like gender, purpose, class, duration of journey and travel frequency are studied.

gender	male	50%
	female	50%
purpose	on duty	45%
	private	55%
class	1st	20%
	2nd	80%
length/duration	one day	75%
	over night	25%
same train trip	less often than once a month	75%
	more often	25%

Figure 3 factors to describe the typical traveller

3.3 Access to the Station

For the rail traveller study, access journeys have been analysed in terms of time, cost, experience, modal choice and distances (Thuresson '95). The results show that 50% of the travellers travel 6 km or less to the station, compared to the average distance of 44 km. The same kind of relation is shown when access time is studied, where 50% of the travellers have 15 minutes or less to the station and average access time is exceeding 48 minutes. The differences between median and average is due to the fact that there is a small number of travellers with very long access journeys. This is shown by the fact that access distance varies between 50 m and 1149 km and access time varies between 0 min and 24 hours.

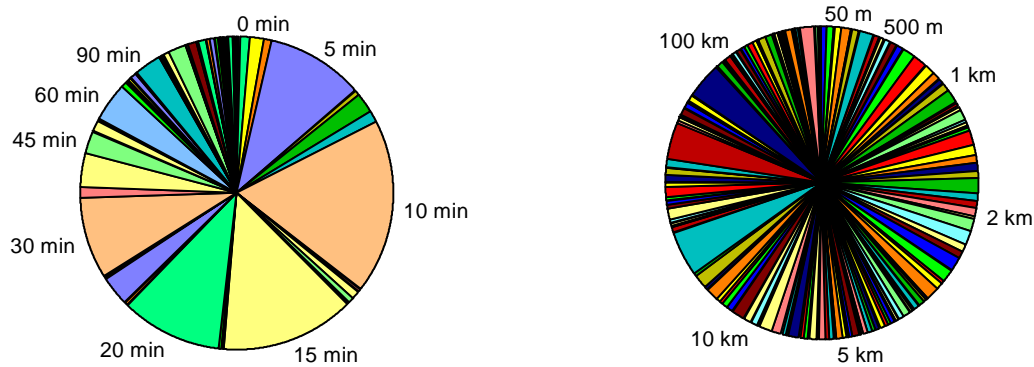


Figure 4 access time and access distance to departure station

The most common individual access mode is walking by 20%, which corresponds to the fact that 50% of the travellers travel 6 km or less to the station. A categorisation of the different access modes shows that the share for public transport including taxi is 40%. This share is increased by 15 percentage points if train transfers are included. The share for car access, i.e. drivers and passengers, is 24%.

3.4 Services Provided

3.4.1 Time Spent at Departure Station

Average time spent at the departure station is 27 minutes, despite the fact that almost 50% of the travellers spend only 15 minutes or less at the station.

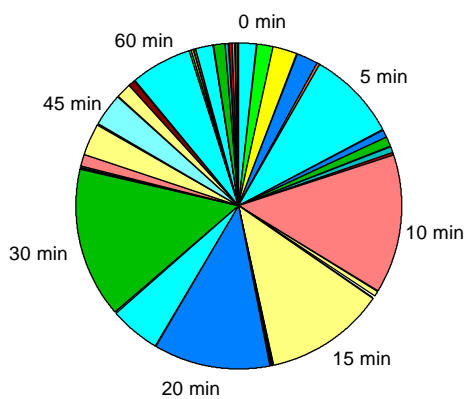


Figure 5 time spent at departure station

There is a difference between traveller categories, in that first class travellers spend less time at the station than travellers in second class and that business travellers spend less time than private travellers. The time spent varies also with type of station. On stations where access is made by regional train, the time spent is shorter than for other stations. An explanation for this could be well coordinated time tables. There is no correlation though between time at departure station and train travelling time. The same is valid for the relation between access time and train travelling time.

3.4.2 Utilisation of Services Provided

Utilisation of station services is defined as the share of use i.e. the utilisation is 40% if 4 out of 10 travellers use the specific service studied.

Despite the relatively short time spent at the station, travellers have time to use a rather large share of the services provided. On average 40% of the services were used at the studied departure stations. The use of services at transfer stations is lower – about 30%, which agrees with the fact that shorter time was spent at the transfer stations. The higher the ratio of utilisation relates directly to the length of the time spent at the station. For travellers spending 5 minutes or less at the station the utilisation was about 30%, while for the travellers spending more than 60 minutes at the station it was about 60%.

The factors measured were ticket counter, information counter, posters, signs, kiosk, restrooms, café, restaurant, telephones and luggage carts. Among these factors different kinds of information, such as signs and posters, were the most used factors (80%), while kiosks and ticket counters were used by only approximately half of the travellers.

3.4.3 Importance of Service Factors

When the importance of service factors at stations were studied the result was that the less travel related the factor was the less important it became and that information factors were very important.

very important	ticket counter taxi TV-screens rest rooms signing rest rooms for disabled weather protection and seats on platform	information posters waiting room public traffic loud speaker calls for departures short time parking telephone boots
important	ticket automat bike parking luggage boxes fast food elevator longer hours restaurant escalators	luggage carts family waiting room long time parking teller machine café automatic doors security guards
less important	shower car rental post office fax	grocery store telephone room manual luggage storage kiosk/newspaper automat on platform
totally unimportant	1st class waiting room	conference room

Figure 6 importance of station service factors, according to the railway passenger study.

3.5 Location

The results from the location sub-questionnaire show that travellers assess a central station location 20 grades higher than an external station. Assessments were made independent of variation in access time, price and mode. The assessment seems to be consistent when analysed in comparison to total train travelling time.

The same sub-questionnaire shows also that the difference in services provided between a station like Hässleholm – at the time of the study a rather small station – and a station like Stockholm C – Sweden's largest station with a large amount of direct and indirect travel related services – is worth only ca 6 grades.

In conclusion, these results show that interregional travellers favour the importance of a central station above the number of services provided at a station.

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