



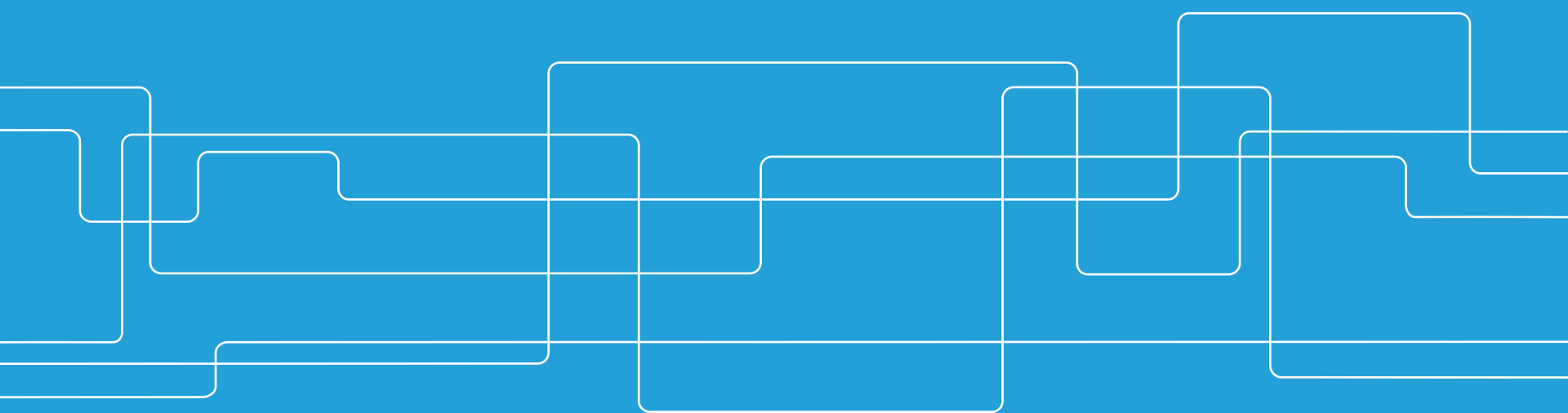
Determinants of passengers' perceived security at railway stations

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Motivation



Flemingsberg – secure or not so secure?



Aim and objectives

To assess passengers' declared perceived security at railway stations by localization

The analysis involves

- environmental attributes of railway stations and surrounding areas
- city's and neighbourhood's context
- passengers' individual/socio-economic characteristics

Theoretical framework

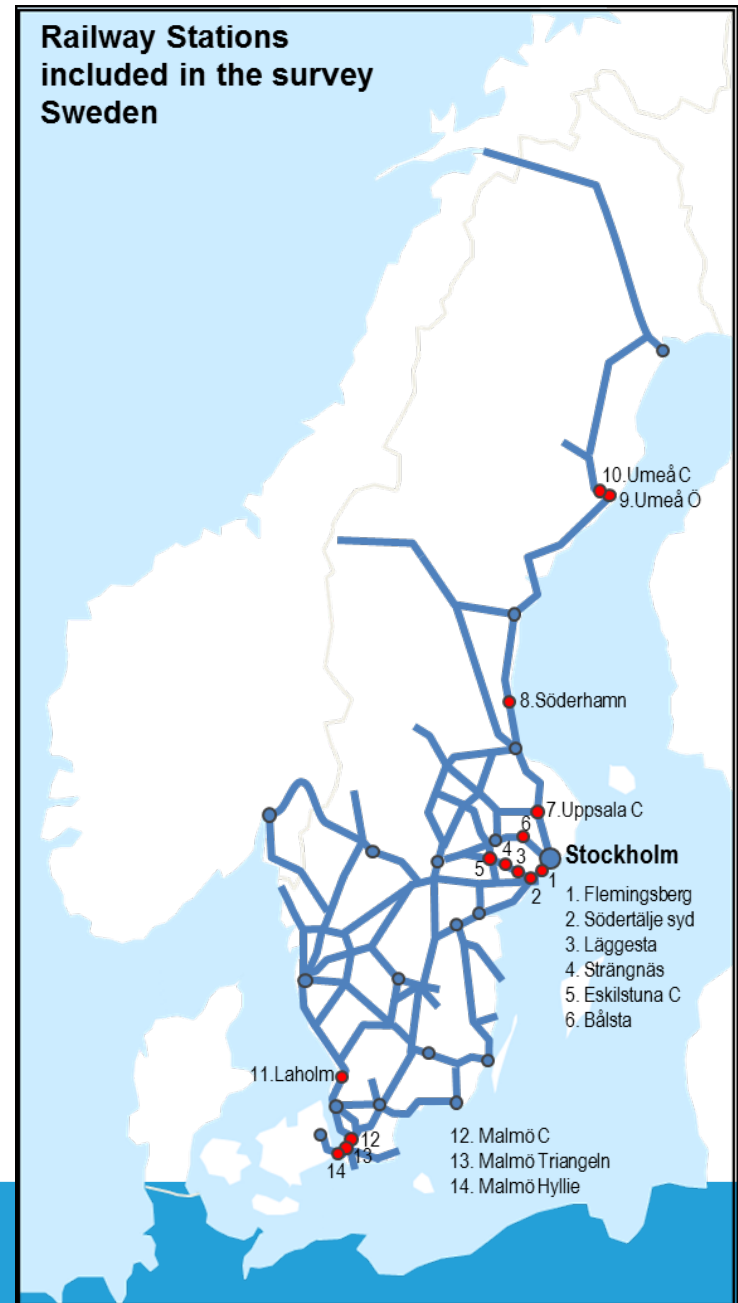
Passengers' declared perceived security is a function of individuals profile and the types of environments he/she exposed at the station and surrounding areas.



The study

14 Swedish railway stations selected.

Criterion: New or rebuilt, and significantly increased supply of middle- or long-distance trains, since 1990





Study survey and database

Aim: To reveal differences between central and peripheral localization of stations

Survey covering:

- Travel behaviour incl. connecting journeys
- Service at station
- Preferences and valuation
- Perceived security
- Overall satisfaction
- Background socio-economics

In total 1400 responses (all 14 stations) among departing train passengers (≥ 50 km journey) collected autumn 2016



Question on perceived security

How satisfied are you with the security* ...

- a) inside the station?
- b) at the platform?
- c) in the connection to the platform?

Answers given on a 5 degree Likert scale for each aspect:
Very unsatisfied (1) to Very satisfied (5)

Answers of aspects a) b) and c) strongly correlate and were combined into a Perceived Station Security (PSS) index.
Whole sample: PSS index=100

The PSS index is then the dependent variable in a linear regression model/Ordinary Least Squares (OLS).

* Swe: Hur nöjd är du med tryggheten ... Mycket missnöjd (1) till Mycket nöjd (5)



Variables tested

A number of other explanatory variables tested but omitted due to strong correlations (Pearson >0.6).

Variables		Range
Dependent	PSS Index (Average=100)	
Explanatory	Duration of stay before departure	1-600 min
	View while waiting in station	(0, 1)
	Built-in (covered) stairs to platform	(0, 1)
	Café, restaurant with seating in station	(0, 1)
	PTA services only (no long-distance services)	(0, 1)
	Reconstruction in progress	(0, 1)
	Avg. time between departures	2.5-33.1 min
	Distance to local/city centre	0.3-3.8 km
	Trains passing platform at speed	(0, 1)
	Station age (since latest reconstruction)	4-26 years
	Age: Young (18-24 years)	(0, 1)
	Age: Elderly (65+ years)	(0, 1)
	Sex: Man	(0, 1)
	Marital status: Married/cohabiting	(0, 1)
	Children: Child(-ren) at home	(0, 1)
	Occupation: Gainfully or self-employed	(0, 1)



Preliminary model

Dependent variable: Perceived Station Security (PSS) index

Explanatory variable	β Model estimates
(Constant)	95.451 (t=60.363)***
Built-in stairs	5.325 (t=2.969)**
Distance to local/city centre (per km)	-1.794 (t=-3.309)***
Reconstruction in progress	-8.796 (t=-3.399)***
Average time between departures (per min.)	0.208 (t=3.212)***
Café, restaurant with seating	2.873 (t=1.763) '**

(T-test in parentheses)

- '**' Significant at the 0.078 probability level
- * Significant at the 0.05 probability level
- ** Significant at the 0.01 probability level
- *** Significant at the 0.001 probability level

Model fit very low, R^2 adj = 0.043



Preliminary results

Increasing the Perceived Station Security (PSS)

- Built-in (covered) stairs between station building and platform
- Longer time between train departures
- Café or restaurant with seating in the station

Decreasing the PSS

- Reconstruction in progress
- Longer distance to the city/local centre

No respondent characteristics (age, occupation, marital status, sex, children at home) proved to be significant.

Results – benchmarking do and don't



Lower perceived security: **Umeå Central**

PSS index=93

- Public access (not built-in stairs)
- Lacks café or restaurant in station
- Renovation of the station building

City centre 0.5 km



Higher: **Umeå Ö (East)**

PSS index=111

- + Built-in stairs
- + Café in station

Local centre 0.2 km

(City centre 2 km)



Preliminary conclusions and future research

- Centrally located stations in general perceived more secure than peripherally located
- The significant environmental/situational variables explains Perceived Station Security (PSS) to a relatively low degree, but significant model and variables
- Respondents' socio-economic characteristics not significant
- How to improve method and analysis to achieve better model fit?

Flemingsberg
– secure or not
so secure?

Rated PSS
index=102 –
slightly above
average!





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