FUTURE CHANGES IN ACCESSIBILITY PATTERNS IN THE HELSINKI REGION



Modal hotspots...





Toivonen et al. 2014

... and shopping center accessibility...



Salonen, Toivonen & Vaattovaara (2012) : Arkiliikkumisen vaihtoehdoista monikeskuksistuvassa metropolissa: Kaksi näkökulmaa palvelujen saavutettavuuteen pääkaupunkiseudulla. Yhdyskuntasuunnittelu 3/2012, 8-27.

... are at least partly reflected by residents' travel behaviour



Salonen, Broberg, Kyttä & Toivonen (2014): Do suburban residents prefer the fastest or low-carbon travel modes? Combining public participation GIS and multimodal travel time analysis for daily mobility research. *Applied Geography*, 53: 438–448.

Why study future accessibility patterns?

Aims and legislation globally, on EU, national and regional levels



2011 EC White paper on transport

- Cut 60% of transport sector's CO₂ emissions (compared to 1990 level)
- phase out conventionally fuelled (oil dependent) vehicles in cities by 2050.

Metropolitan vision A truly polycentric network city where the different centers have a compact mixed-use structure and where the daily mobility of people is largely based on environmentally friendly travel modes, particularly rail-based public transport.

Why study future accessibility patterns in Helsinki?

- An example of a rapidly growing European urban region, trying to base the future daily mobility of its inhabitants on more sustainable grounds
- 2014 2050



- **45 % increase in population** (from 1.4 to ca. 2 million inhabitants)
- **46 % increase in jobs** (from 700000 to ca. 1.05 million jobs)



A truly **polycentric network city** where the different centers have a **compact mixed-use** structure and where the daily mobility of people is largely based on **environmentally friendly travel modes, particularly rail-based public transport**

Good (open) data sources for transport-related analyses

A few future-oriented case studies





- How many people reach certain destinations within certain travel times by PT (and by car) now and in future?
 - What does the change tell about
 - (a) overall level of accessibility?
 - (b) equity of travel modes and competitiveness of PT?
- Testing the usability of the available data in understanding future development in accessibility

Analysis approach



Door-to-door approach:





Door-to-door approach:



A near-future example: Länsimetro



Figure: Länsimetro

Public transport analysis 2014

Accessibility to Tapiola library, 30 min: 115 000 inhabitants



Public transport analysis 2016

Accessibility to Tapiola library, 30 min: 160 000 inhabitants



Looking towards 2050: Light-rails and urban boulevards



Figure: 3D Render/Helsingin kaupunkisuunnitteluvirasto

Changing population patterns and transport networks

New (light) rail-based infrastructure



Potential future accessibility to Helsinki city centre



Key messages:

- In absolute terms, the city center will in future be reached by more people within shorter travel times by both travel modes.
- Car will remain clearly more competitive BUT
- The modal travel time gap is diminishing, leading to increasing equity of the mobility system and increasing lucrativeness of public transport, potentially supporting mode shift from car to public transport.



Potential future accessibility to major shopping centres



Travel time to shopping centers in 2013 (minutes)

Shopping Center

\$





Travel time to shopping centers in 2050 (minutes)

Shopping Center

\$





How many people can be reached? 2013 vs 2050



How many people can be reached? 2013 vs 2050



How many people can be reached? 2013 vs 2050



As a curiosity: "Potential CO₂ future"

Door-to-door approach:



As a curiosity: "Potential CO₂ future"



Future CO2 emissions compared to present (%) Present = 1.0





Key messages:

- Future developments in infrastructure, modal shares, and emission levels could lead to substantial cut in CO₂ emissions (within this study setting, given the assumptions)
- Largest CO₂ savings occur in areas where the current public transport connections

Uncertainties in analyses



Figure 2.8 Predictability and uncertainty *Source:* Van der Heijden, 1996.

- Public and political acceptance of different policies
- Many current trends are contradictory to the desired future development paths

The future is very uncertain in all aspects

 Human behavior and societies' values particularly challenging to predict



Thank you!

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