## 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


## 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 $\mathrm{CO}_{2}$ 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)

- 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



## Public transport analysis 2014

Accessibility to Tapiola library, 30 min: 115000 inhabitants


## Public transport analysis 2016

Accessibility to Tapiola library, 30 min: 160000 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


Data provided by Helsinki city planning office / Regional council of Uusimaa

# Potential future accessibility to Helsinki city centre 



# Potential future accessibility to major shopping centres 



Travel time to shopping centers in 2013 (minutes)

| 0-10 | 51-60 | * | Shopping Center |
| :---: | :---: | :---: | :---: |
| 11-20 | 61-70 |  |  |
| 21-30 | 71-80 |  |  |
| 31-40 | 81-90 |  |  |
| 41-50 | 91-125 |  |  |



Travel time to shopping centers in 2050 (minutes)

| 1-10 | 51-60 | $\dot{*}$ | Shopping Center |
| :---: | :---: | :---: | :---: |
| 11-20 | 61-70 |  |  |
| 21-30 | 71-80 |  |  |
| 31-40 | 81-90 |  |  |
| 41-50 | 91-105 |  |  |

## How many people can be reached? <br> 2013 vs 2050



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## As a curiosity: "Potential $\mathrm{CO}_{2}$ future"

Door-to-door approach:


## As a curiosity: "Potential $\mathrm{CO}_{2}$ future"



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

| 0,01-0,14 | 0,21-0,22 | Old Railway | New light rails |
| :---: | :---: | :---: | :---: |
| 0,15-0,16 | 0,23-0,32 | New Railway | Ring road |
| 0,17 | 0,33-1,00 | Old Metro |  |
| 0,18-0,20 | 1,01-27,38 | New Metro |  |



## Key messages:

- Future developments in infrastructure, modal shares, and emission levels could lead to substantial cut in $\mathrm{CO}_{2}$ emissions (within this study setting, given the assumptions)
- Largest $\mathrm{CO}_{2}$ savings occur in areas where the current public transport connections


## Uncertainties in analyses

- The future is very uncertain in all aspects


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
- Human behavior and societies' values particularly challenging to predict


## Thank you:

