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Urban walkability - Young adults' walkability preference profiles and walking behavior in the Helsinki Metropolitan Area

Anna Kajosaari, 8.2.2022

Learning goals

1. Introduction to walkability

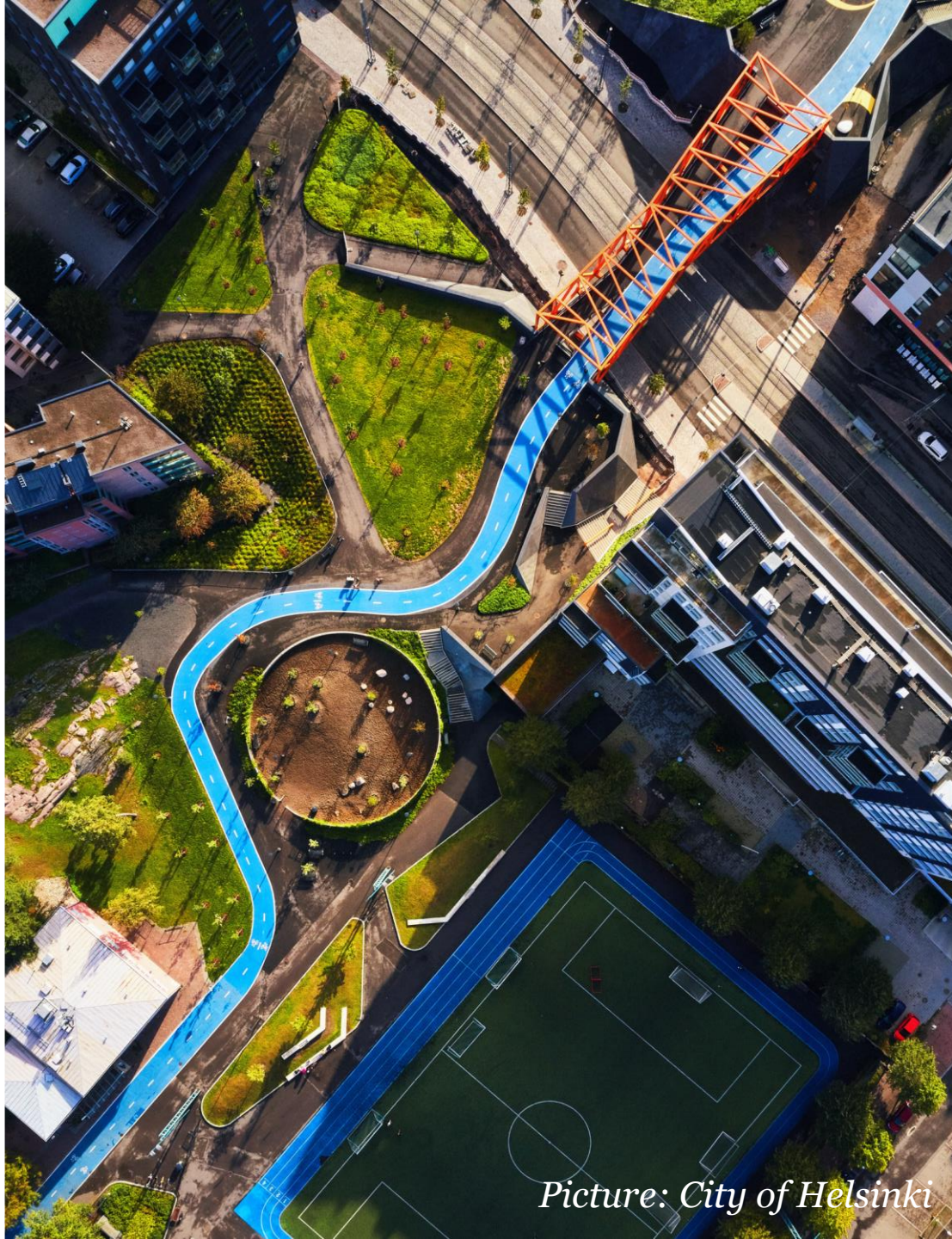
2. Walkability as a predictor of walking behavior

3. Operationalizing walkability

Focus on walkability

- Multidisciplinary concept explored e.g. in public health research, transportation behavior studies, architecture, and social studies

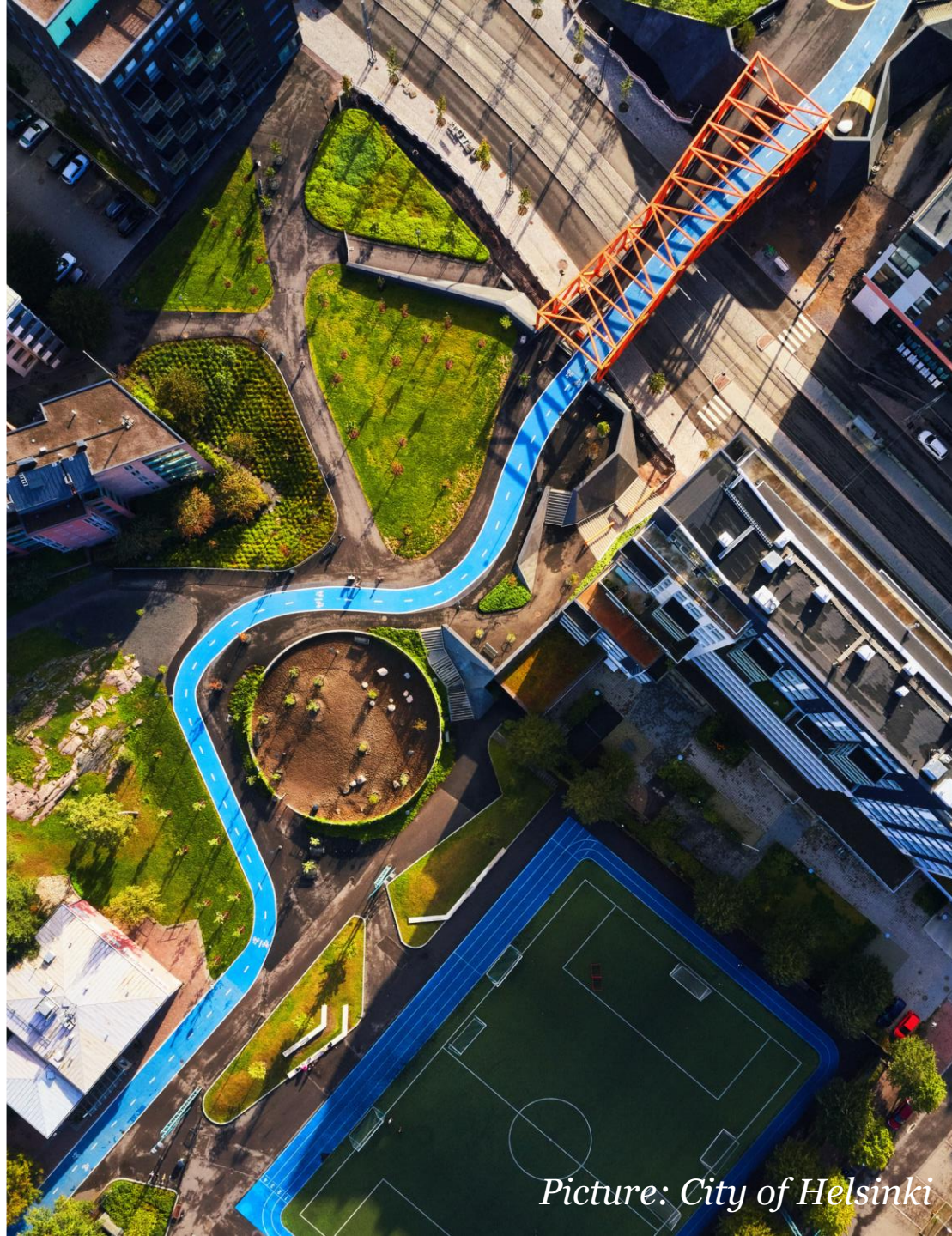
- Understanding the qualities of the built environment that support walking as a mode of transportation



Picture: City of Helsinki

Terminology

- Walkable *(käveltävä)*
- Walkability *(käveltävyys)*
- Walking distance *(kävelyetäisyys)*



Picture: City of Helsinki

Walkable urban environment

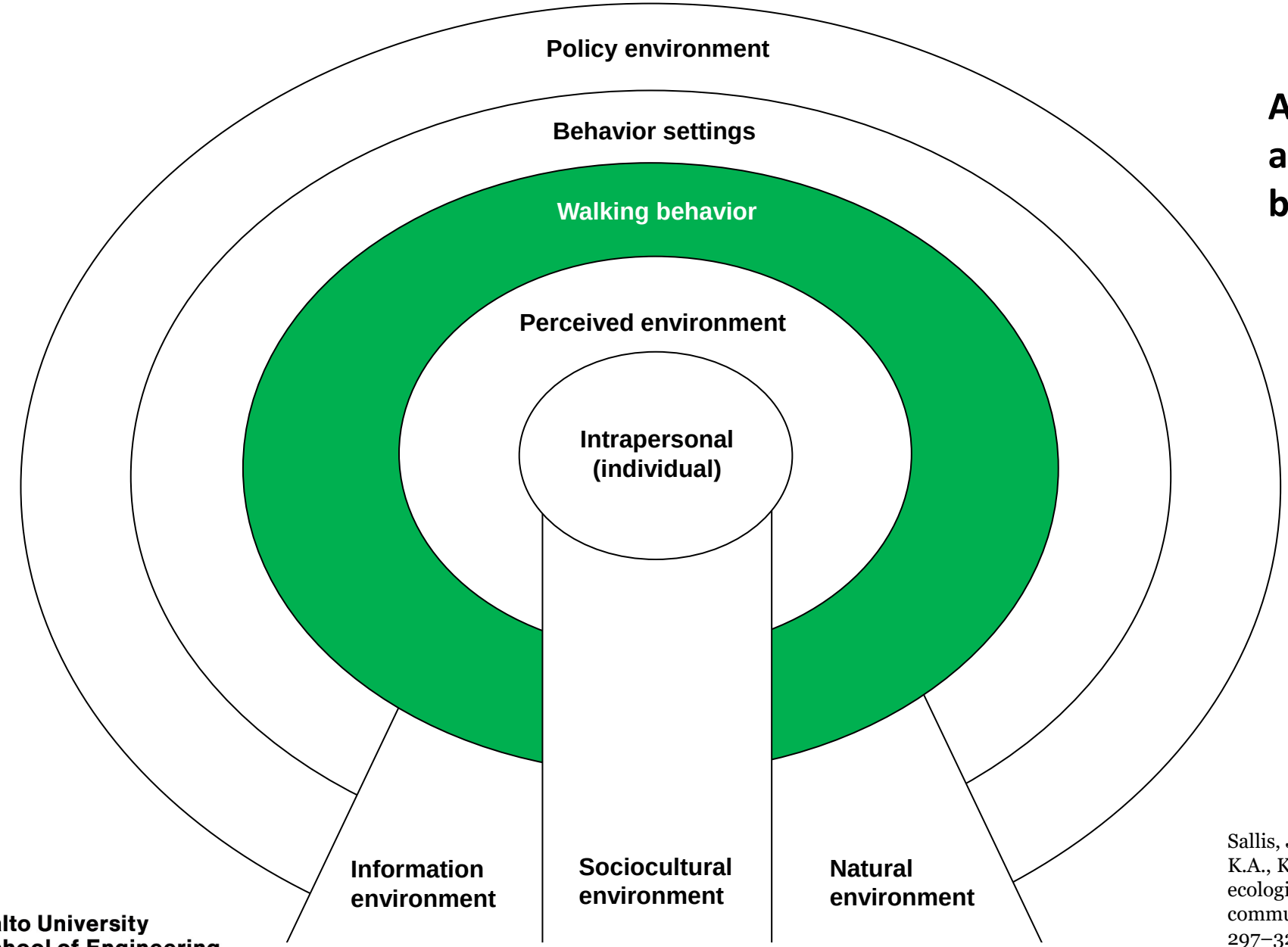
Design

Feature availability

Land use

Urban morphology

A socio-ecological approach to walking behavior



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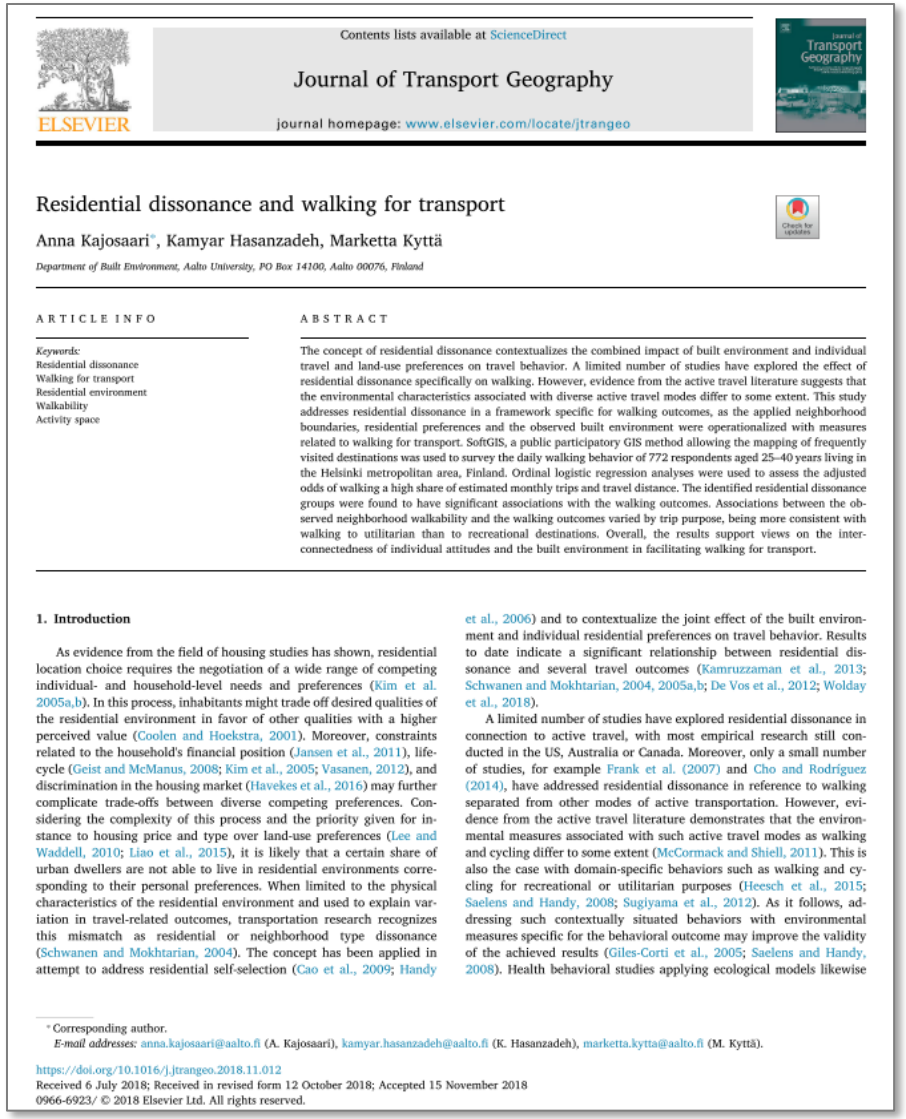
Case: Young adults' walkability preference profiles and walking behavior in the Helsinki Metropolitan Area

Kajosaari, A., Hasanzadeh, K., & Kyttä, M. (2019) Residential dissonance and walking for transport. Journal of Transport Geography, 74, 134-144.



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Residential dissonance and walking for transport

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ABSTRACT

The concept of residential dissonance contextualizes the combined impact of built environment and individual travel and land-use preferences on travel behavior. A limited number of studies have explored the effect of residential dissonance specifically on walking. However, evidence from the active travel literature suggests that the environmental characteristics associated with diverse active travel modes differ to some extent. This study addresses residential dissonance in a framework specific for walking outcomes, as the applied neighborhood boundaries, residential preferences and the observed built environment were operationalized with measures related to walking for transport. SoftGIS, a public participatory GIS method allowing the mapping of frequently visited destinations was used to survey the daily walking behavior of 772 respondents aged 25–40 years living in the Helsinki metropolitan area, Finland. Ordinal logistic regression analyses were used to assess the adjusted odds of walking a high share of estimated monthly trips and travel distance. The identified residential dissonance groups were found to have significant associations with the walking outcomes. Associations between the observed neighborhood walkability and the walking outcomes varied by trip purpose, being more consistent with walking to utilitarian than to recreational destinations. Overall, the results support views on the interconnectedness of individual attitudes and the built environment in facilitating walking for transport.

1. Introduction

As evidence from the field of housing studies has shown, residential location choice requires the negotiation of a wide range of competing individual- and household-level needs and preferences (Kim et al. 2005a,b). In this process, inhabitants might trade off desired qualities of the residential environment in favor of other qualities with a higher perceived value (Coolen and Hoekstra, 2001). Moreover, constraints related to the household's financial position (Jansen et al., 2011), lifecycle (Geist and McManus, 2008; Kim et al., 2005; Vasanen, 2012), and discrimination in the housing market (Havekes et al., 2016) may further complicate trade-offs between diverse competing preferences. Considering the complexity of this process and the priority given for instance to housing price and type over land-use preferences (Lee and Waddell, 2010; Liao et al., 2015), it is likely that a certain share of urban dwellers are not able to live in residential environments corresponding to their personal preferences. When limited to the physical characteristics of the residential environment and used to explain variation in travel-related outcomes, transportation research recognizes this mismatch as residential or neighborhood type dissonance (Schwanen and Mokhtarian, 2004). The concept has been applied in attempt to address residential self-selection (Cao et al., 2009; Handy et al., 2006) and to contextualize the joint effect of the built environment and individual residential preferences on travel behavior. Results to date indicate a significant relationship between residential dissonance and several travel outcomes (Kamruzzaman et al., 2013; Schwanen and Mokhtarian, 2004, 2005a,b; De Vos et al., 2012; Wolday et al., 2018).

A limited number of studies have explored residential dissonance in connection to active travel, with most empirical research still conducted in the US, Australia or Canada. Moreover, only a small number of studies, for example Frank et al. (2007) and Cho and Rodríguez (2014), have addressed residential dissonance in reference to walking separated from other modes of active transportation. However, evidence from the active travel literature demonstrates that the environmental measures associated with such active travel modes as walking and cycling differ to some extent (McCormack and Shiell, 2011). This is also the case with domain-specific behaviors such as walking and cycling for recreational or utilitarian purposes (Heesch et al., 2015; Saelens and Handy, 2008; Sugiyama et al., 2012). As it follows, addressing such contextually situated behaviors with environmental measures specific for the behavioral outcome may improve the validity of the achieved results (Giles-Corti et al., 2005; Saelens and Handy, 2008). Health behavioral studies applying ecological models likewise

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Planning for walkable residential environments - what about *residential self-selection*?

Residential consonants

Individual walkability preferences = **Neighborhood walkability**

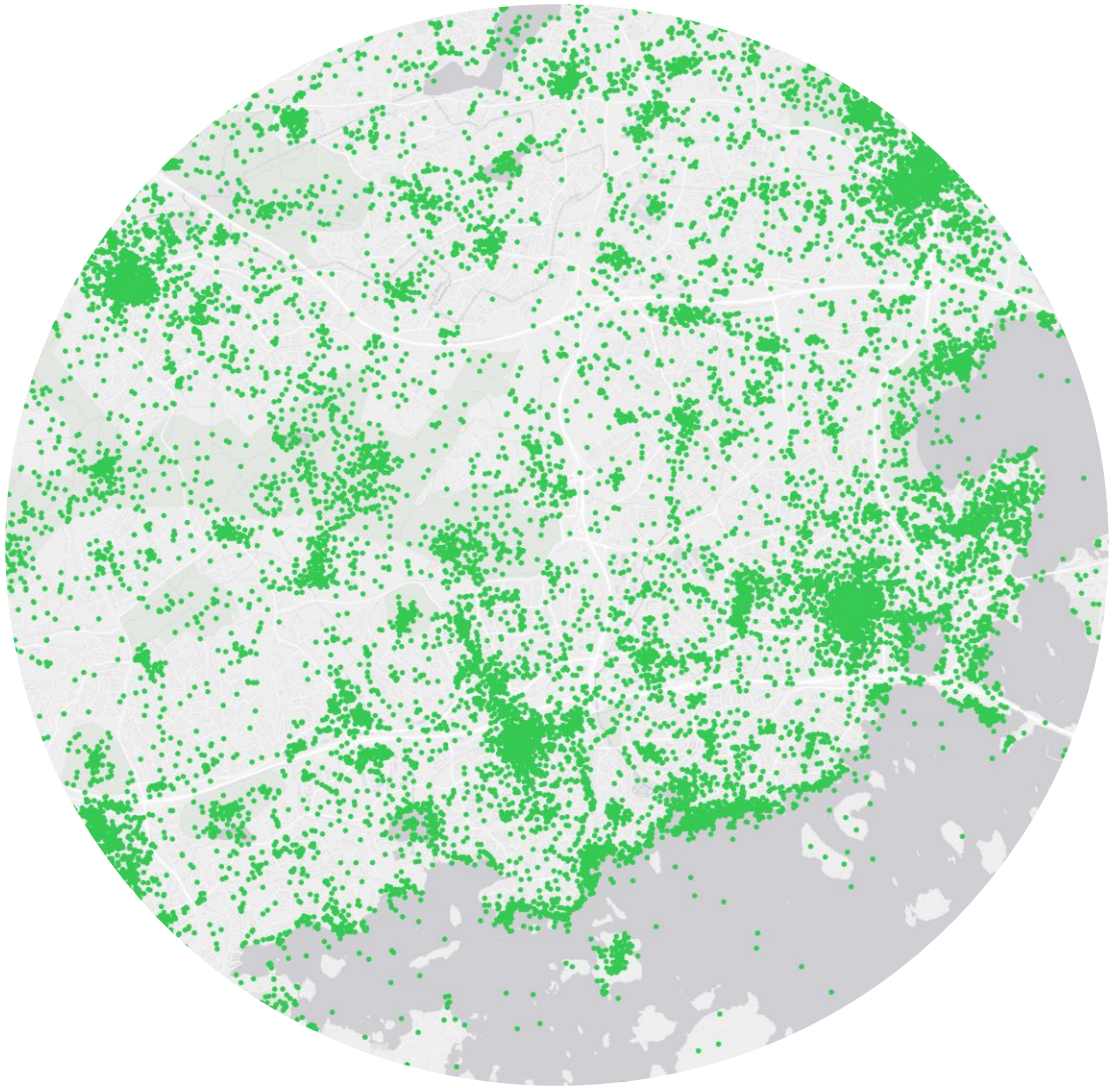
Residential dissonants

individual walkability preferences ≠ **Neighborhood walkability**

Data and methods

Study area and population

- PPGIS-survey
- Helsinki Metropolitan Area, Fall 2016
- Young adults aged 25 to 40 years
- 772 respondents



Content of the PPGIS survey

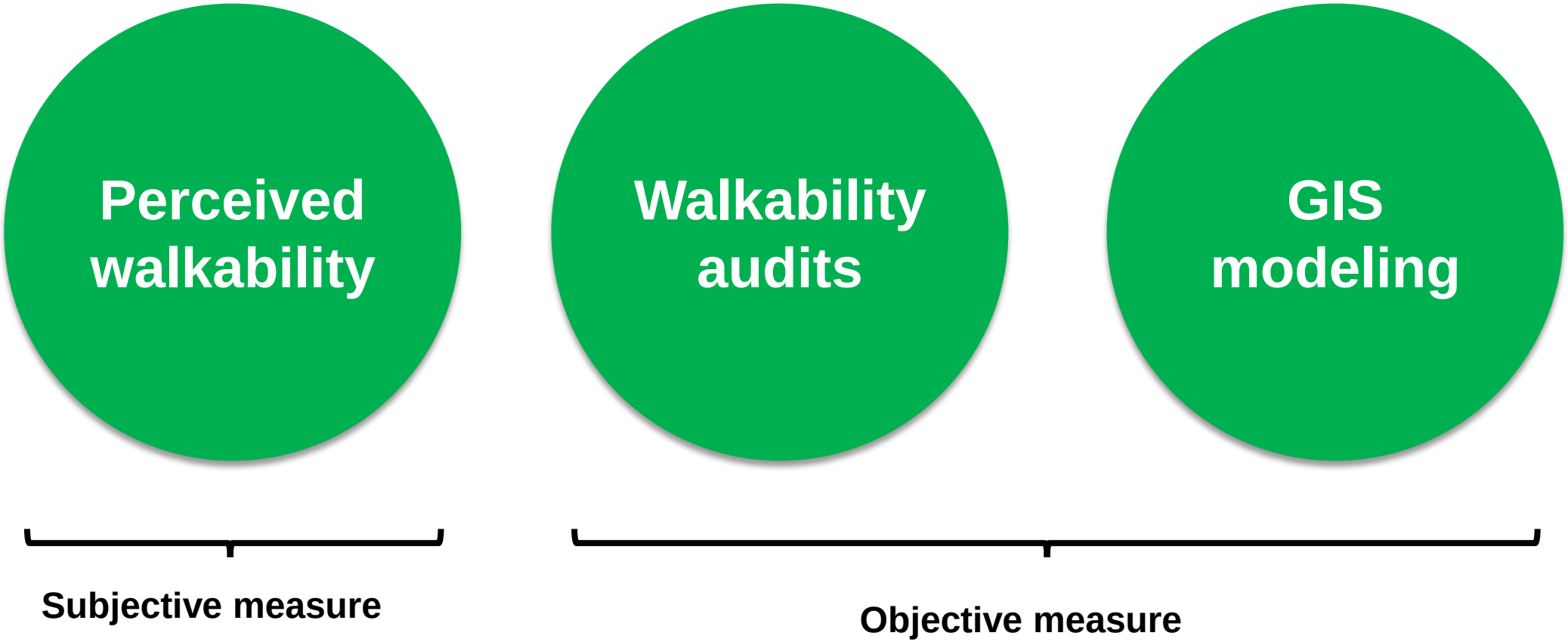
- Personal background variables, attitudes related to residential environment

Respondents mapped the places visited in their day-today life, including

- Utilitarian destinations (e.g. services and running errands, grocery shopping, daycare),

- Leisure-time destinations (e.g., socializing and going out, cultural events, sports and active recreation

How walkable is your neighborhood?



Walkability index (Frank et al. 2010) as an objective measure of walkabilty:

- Residential density
- Commercial density
- Intersection density
- Land-use mix

Ratio of the residential floor area (*SeutuData, HSY*) and the land area with residential land-use (*CORINE land use data, EU*)

Walkability index (Frank et al. 2010) as an objective measure of walkabilty:

- Residential density
- Commercial density
- Intersection density
- Land-use mix

Ratio of the commercial and office floor area (*SeutuData, HSY*) and the land area with commercial land-use (*CORINE land use data, EU*)

Walkability index (Frank et al. 2010) as an objective measure of walkabilty:

- Residential density
- Commercial density
- Intersection density
- Land-use mix

Ratio between the number of intersections and the neighborhood area, non-walkable streets such as highways and motorways excluded (*Digiroad dataset, Väylävirasto*)

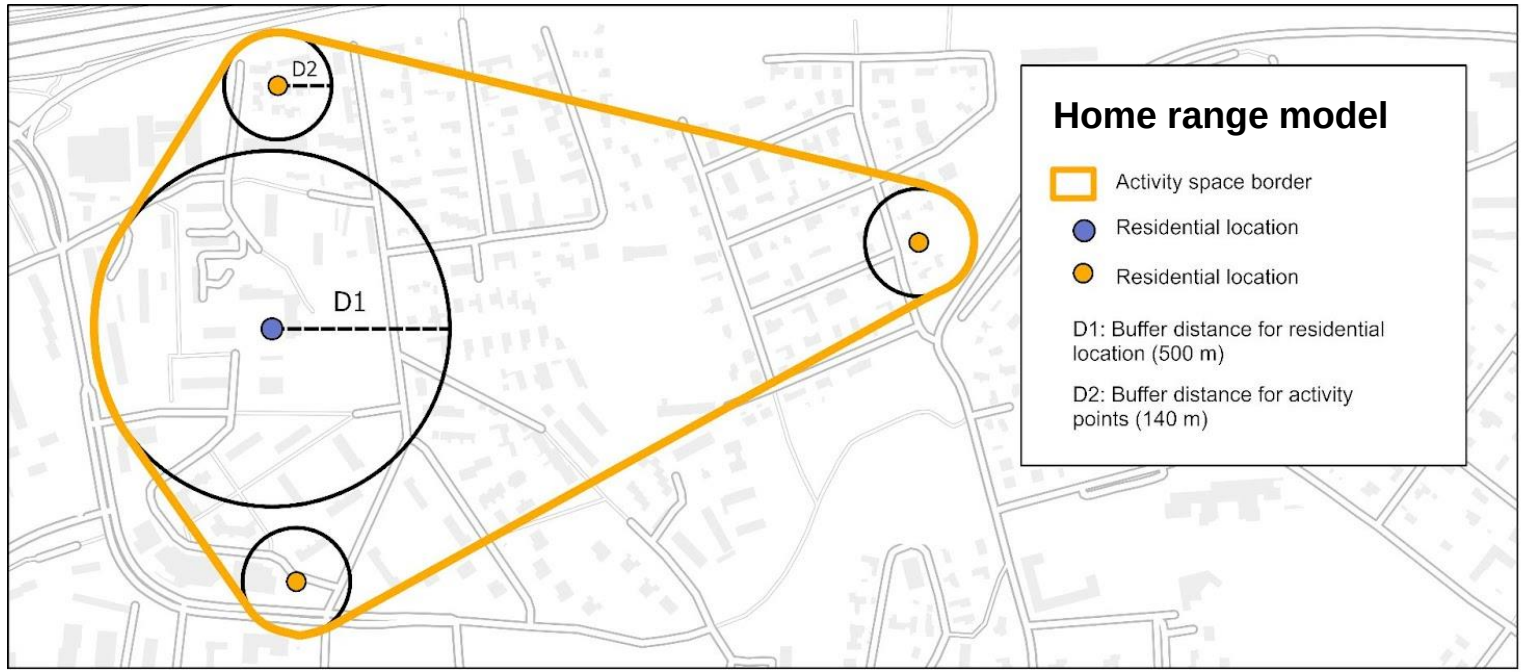
Walkability index (Frank et al. 2010) as an objective measure of walkabilty:

- Residential density
- Commercial density
- Intersection density
- Land-use mix

Diversity of following land-uses: residential, commercial, recreational (greenspace, exercise and recreational areas) and traffic (*CORINE land use data, EU*)

Neighborhood walkability

- Walkability index calculated within individual home ranges
- Based on the index score, respondents were divided to groups with *low*, *middle* and, *high walkable* home ranges



Do you prefer to live in a walkable neighborhood?

	Factor 1 Density	Factor 2 Services	Factor 3 Recreation	Factor 4 Car dependency
I can be comfortable living in close proximity to my neighbors	.631			
I like living in a neighborhood where there is a lot going on	.523			
I am comfortable riding with strangers	.440			
Living in a multiple family unit would not give me enough privacy	-.375			
Having shops and services within walking distance of my home is important to me		.691		
I don't mind travelling a bit longer for the services I use		-.613		
I want to live close to vast nature and recreational areas			.734	
I appreciate tranquillity and calmness in a residential area			.550	
I like to have a large yard at my home			.355	
I appreciate good travel connections by car				.718
I don't mind getting around using public transportation				-.492
For short distances, I prefer getting around in an active way such as walking or cycling				-.447

Do you prefer to live in a walkable neighborhood?

Cluster 1

Preference for walkable neighborhoods

- High residential density
- Prefer close-by services
- Prefer active modes of transportation and PT

Cluster 2

No preference

- No clear preference on residential density or transport mode
- Appreciate calm residential areas and access to nature

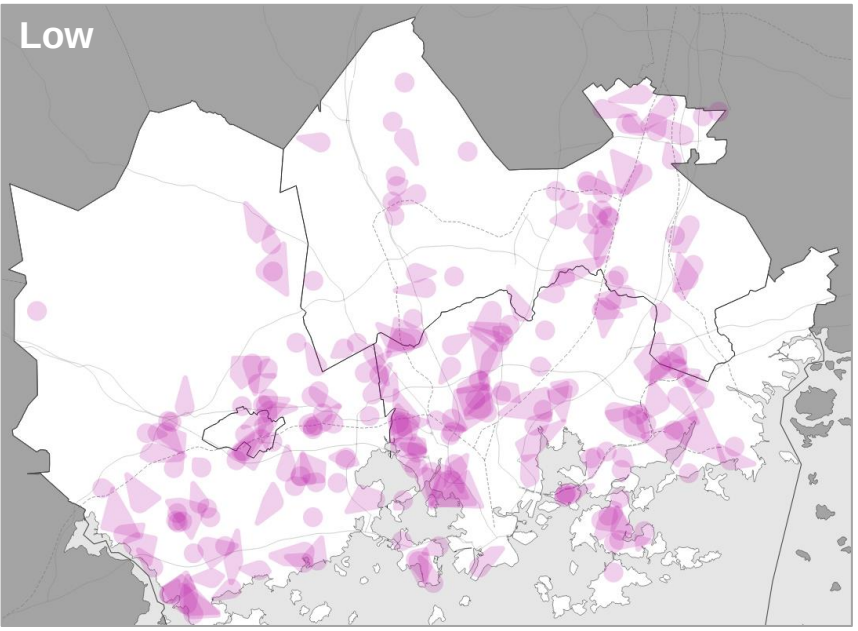
Cluster 3

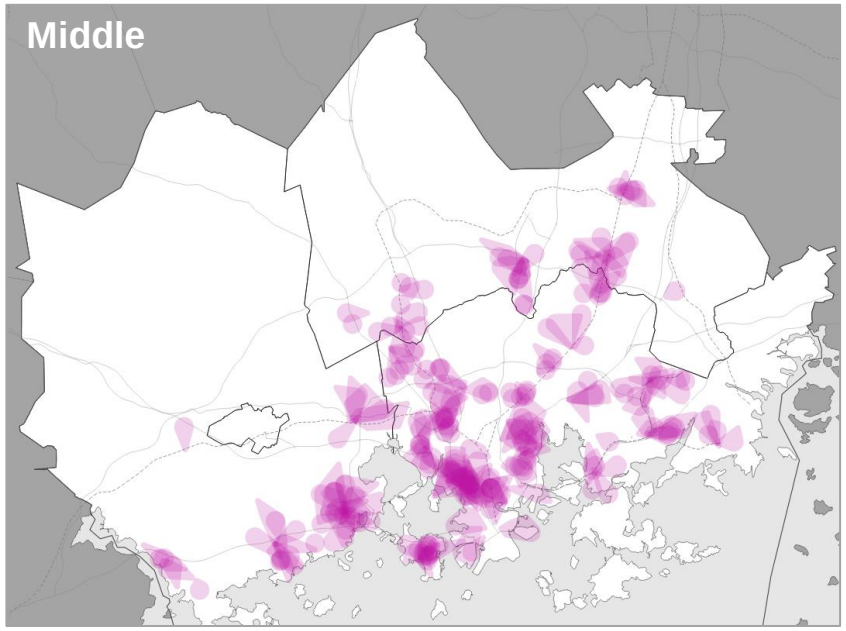
Preference for car-dependent neighborhoods

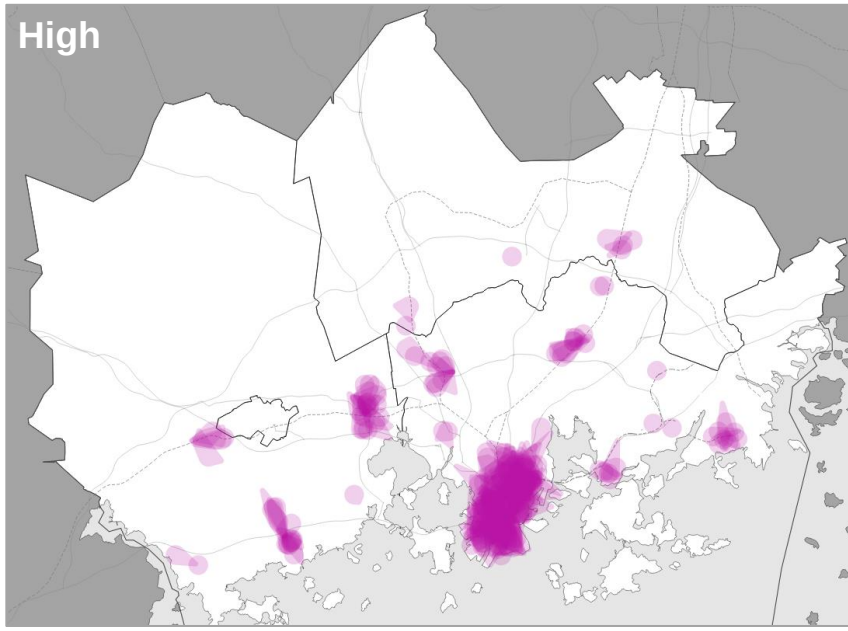
- Low residential density
- Willing to travel for services
- Car dependent

Results

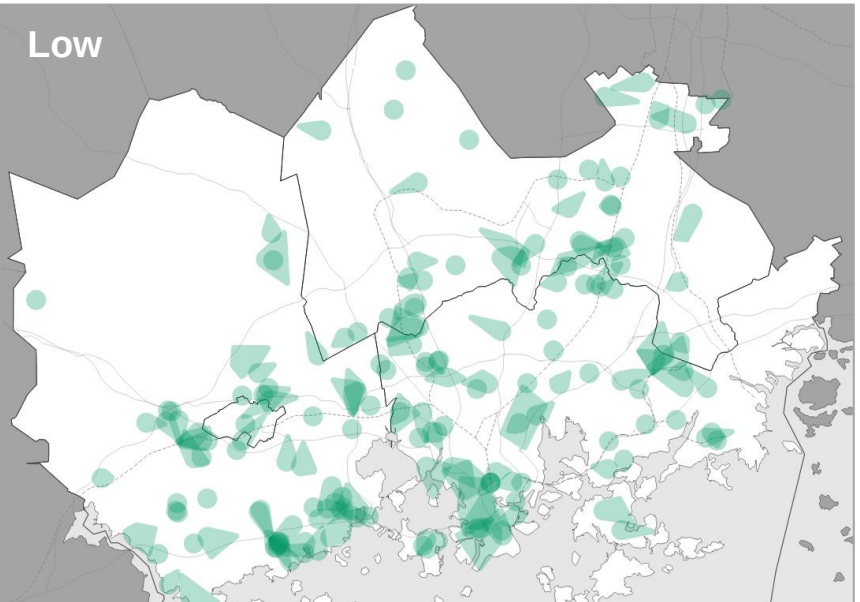
Walkability index

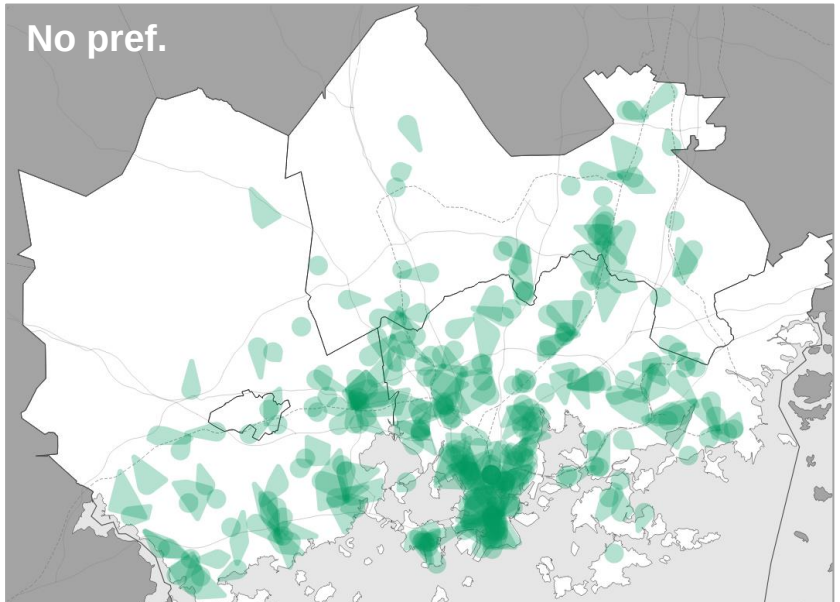


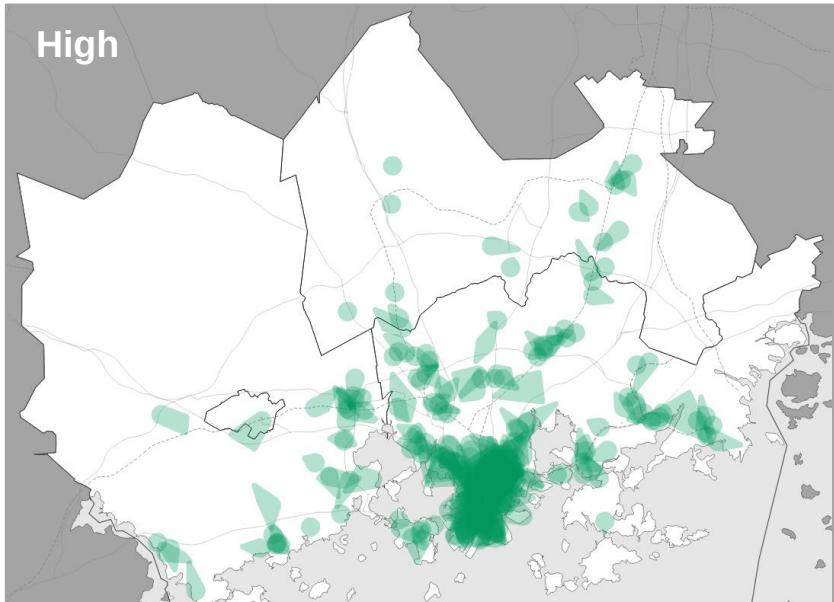




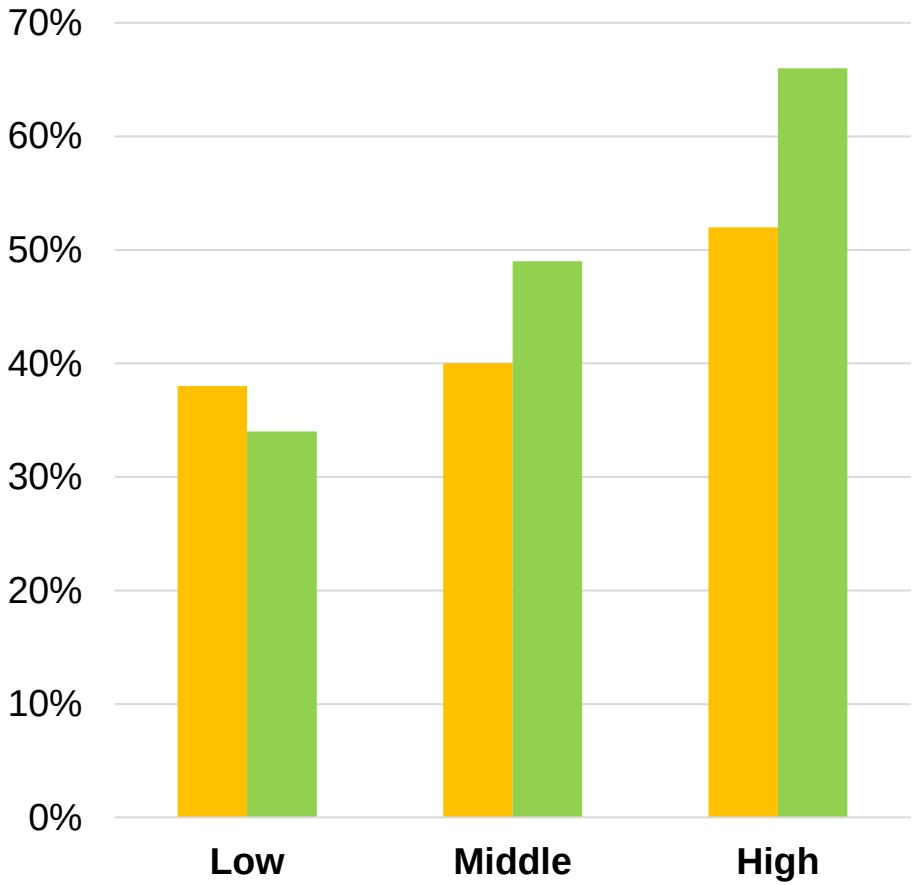
Walkability preference



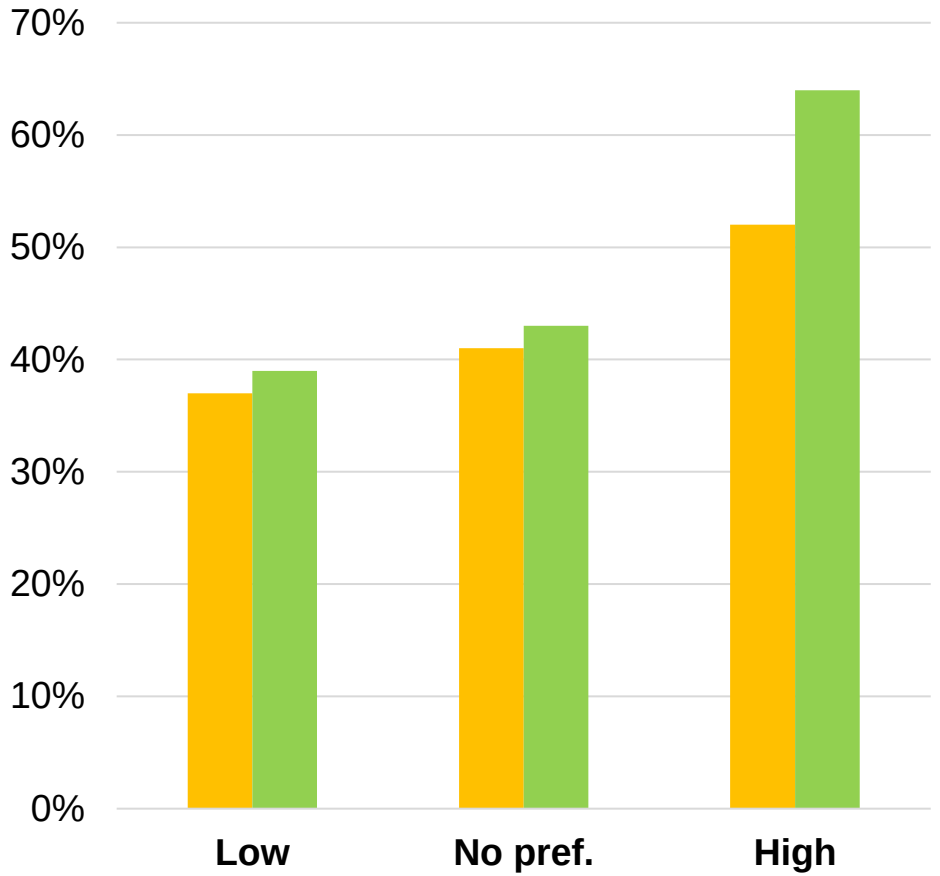




Walkability index



Walkability preference



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Trips to leisure destination

Trips to utilitarian destination

Joint influence of neighborhood walkability and residential preferences on walking behavior

- Ordinal regression analyses
- Outcome variables: Share of walking trips and walking distance by trip purpose (utilitarian or leisure)
- Adjusted for gender, age, education, household income, employment status, and household structure

Results of the regression analysis

- The walkability index was associated with walking behavior
- However, different interactions by trip purpose
  - Walking to utilitarian destinations had the strongest associations with observed walkability
  - Walking to leisure-time destinations was associated both with walkability preference and observed walkability

Results of the regression analysis

- Walkable neighborhoods increase the likelihood of walking to everyday errands (e.g. grocery shopping, daycare) – also for residents that prefer more car-dependent neighborhoods
- Walkable neighborhoods increase walking to leisure destination – however, this is also strongly influenced by the willingness to walk
- The results support the interconnectedness of both intrapersonal and built environment characteristics in facilitating walking

Conclusions

- While walkability is easy define as a planning objective, multiple ways exist to operationalize walkability
- Evidence-based planning requires research connecting walkability measures and changes in walking behavior
- More local and context-sensitive walkability measures are needed

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