



TEKNILLINEN KORKEAKOULU
Yhdyskuntasuunnittelun tutkimus- ja koulutuskeskus

SoftGIS as a Boundary Object in Participatory Urban Planning & Research

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Centre for Urban and Regional Studies (YTK)
Helsinki University of Technology
Finland





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SoftGIS research team at YTK

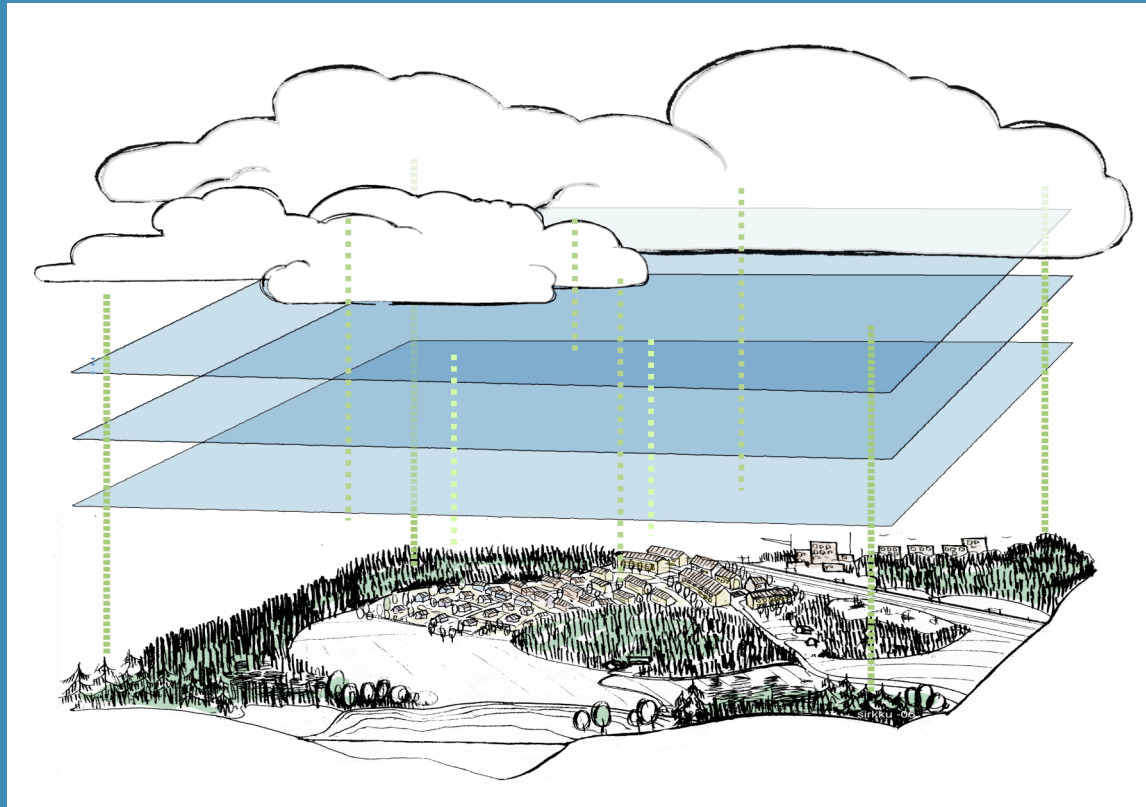
YTK is a multidisciplinary centre of urban and planning research and national provider of continued education for urban and regional planners, within Helsinki University of Technology (TKK), Finland. The centre employs approx. 20 researchers, the total amount of staff being approx. 30 persons.

SoftGIS research team

- Led by D.Sc. Marketta Kyttä with the support of researchers Maarit Kahila and Anna Broberg. Close cooperation with the Department of Architecture at TKK.
- The general aim of the SoftGIS research team is to enable the provision of people's place-based perceptual knowledge in the GIS format, as complementary to the traditional GIS-based types of environmental and demographic data.
- In cooperation with clients and partners, the SoftGIS team develops customized applications of the SoftGIS software for use in the Internet. The applications deal with needs of additional planning information concerning place experiences of specific groups, such as children and immigrants, and specific themes, such as environmental affordances for safety and mobility.
- Soft GIS research is associated with international research developments under the headings of Public Participation GIS (PPGIS) and Post-occupancy Evaluation (POE).

The 'soft' GIS

Developing a GIS-based method
for studying the perceived environmental quality



a new layer into the Geographic Information System



SoftGIS-principles

- 1** the operationalization of the perceived knowledge is grounded in the theories of human geography and environmental psychology
- 2** the perceived knowledge is gathered with scientifically valid, reliable and ethical methods
- 3** softGIS methods are developed in co-operation with urban planners, who can use this novel knowledge in their planning practices
- 4** the database makes systematic GIS and statistical analyses possible
- 5** the methods provide a user friendly internet platform for residents to evaluate their everyday living environment



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JÄRVENPÄÄ

POSITIVE QUALITY FACTOR 1: PEACEFUL

Please mark to the map the place, area or route, where this quality factor is located. If it is impossible to locate the factor, press continue-button. [Here you will find some more instructions.](#)

Please continue Previous page End

SoftGIS-tools

Already used in six communities
by about 4000 inhabitants

The first prototype: softGISjarvenpaa

New softGISquality-tools

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NURMIJÄRVI

Missä paikoissa tai alueilla elinympäristössäsi positiiviset ominaisuudet paikallistuvat?

Voit paikantaa samaa laatutekijää useamman kerran (enintään 3 paikannusta per laatutekijä). Jokaiseen paikannukseen jälkeen Sinulla on mahdollisuus kertoa lisää kyseisestä paikasta.

Laatutekijälistä

- A Monipuoliset harrastusmahdollisuudet
- B Turvallinen liikkumisympäristö
- C Helppo liikkuminen julkisilla kulkuneuvoilla
- D Virkistävät kävely- ja lenkipolut
- E Ympäristössä mieli lepää ja rentoutuu

NURMIJÄRVI SUOMI lähennä loitonna

EDELLINEN KESKEYTÄ JATKA

City of Nurmijärvi

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MÄNTSÄLÄN KUNTA

Missä paikoissa tai alueilla elinympäristössäsi positiiviset ominaisuudet paikallistuvat?

Voit paikantaa samaa laatutekijää useamman kerran (enintään 3 paikannusta per laatutekijä). Jokaiseen paikannukseen jälkeen Sinulla on mahdollisuus kertoa lisää kyseisestä paikasta.

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- E Ympäristössä mieli lepää ja rentoutuu

MÄNTSÄLÄ SUOMI

EDELLINEN KESKEYTÄ JATKA

City of Mäntsälä

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KERAVA

Missä paikoissa tai alueilla elinympäristössäsi positiiviset ominaisuudet paikallistuvat?

Voit paikantaa samaa laatutekijää useamman kerran (enintään 3 paikannusta per laatutekijä). Jokaiseen paikannukseen jälkeen Sinulla on mahdollisuus kertoa lisää kyseisestä paikasta.

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KERAVA SUOMI

EDELLINEN KESKEYTÄ JATKA

City of Kerava



POSITIVE QUALITY FACTOR 1: PEACEFUL

Please mark to the map the place, area or route, where this quality factor is located. If it is impossible to locate the factor, press continue-button. [Here you will find some more instructions.](#)



Please continue

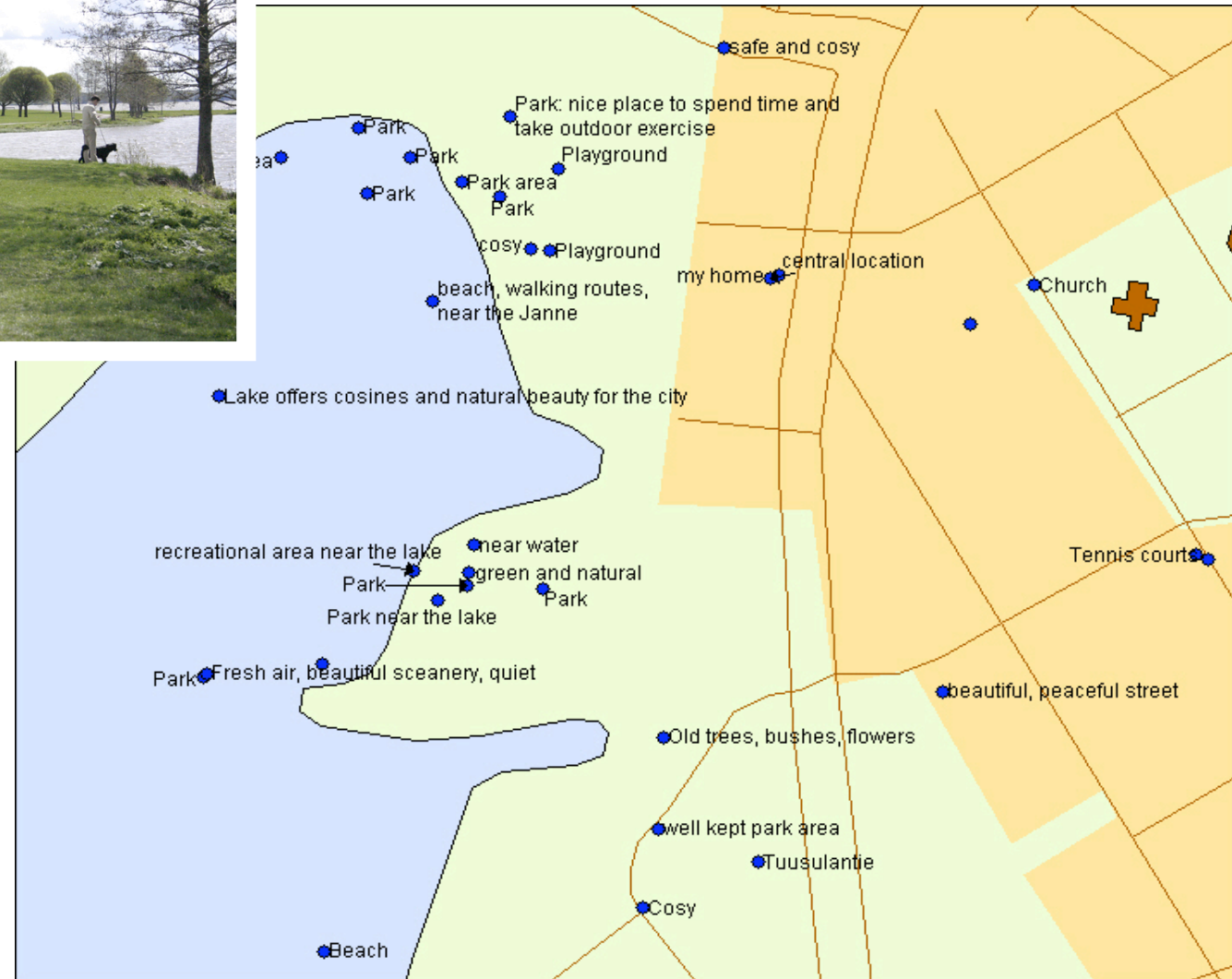
Previous page

End



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Yhdyskuntasuunnittelun tutkimus- ja koulutuskeskus

Positive 'hot spot': The shore and the lake





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SoftGISsafety

Muotiala neighbourhood, City of Tampere

pehmoGIS

Ohje Keskeytä

92 % 100 %

? Onko Muotialassa jotakin seuraavista asioista?

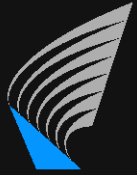
- Q Tallautunut polku
- E Ylikasvanut kasvillisuus
- H Graffiti
- G Juopottelijoita
- K Siisti ympäristö
- L Hyvinhoidettuja istutuksia
- I Kaunis piha
- N Ulkoilevia aikuisia
- M Leikkiviä lapsia
- D Huono valaistus
- B Hylätty auto
- J Hyvinhoidettu piha / rakennus
- P Hyvä valaistus
- C Hoitamaton piha / rakennus
- F Tyhjä tontti
- A Roskia

Lähenä
Loitonna

Muotialan kartta
Tampereen kartta

Takaisin

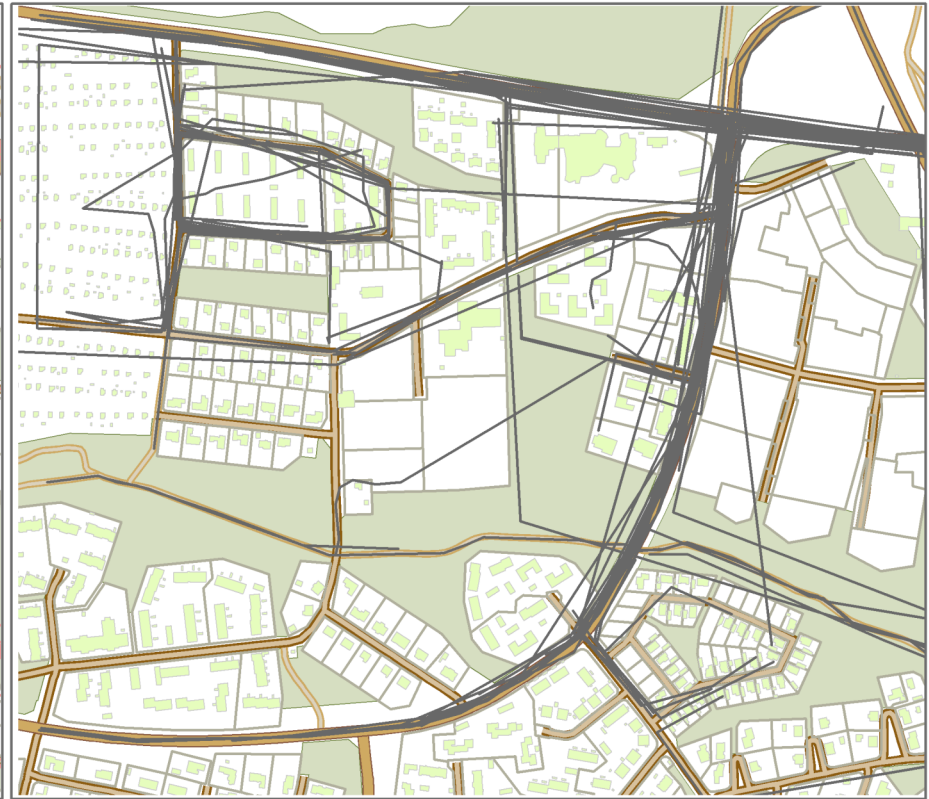
Jatka



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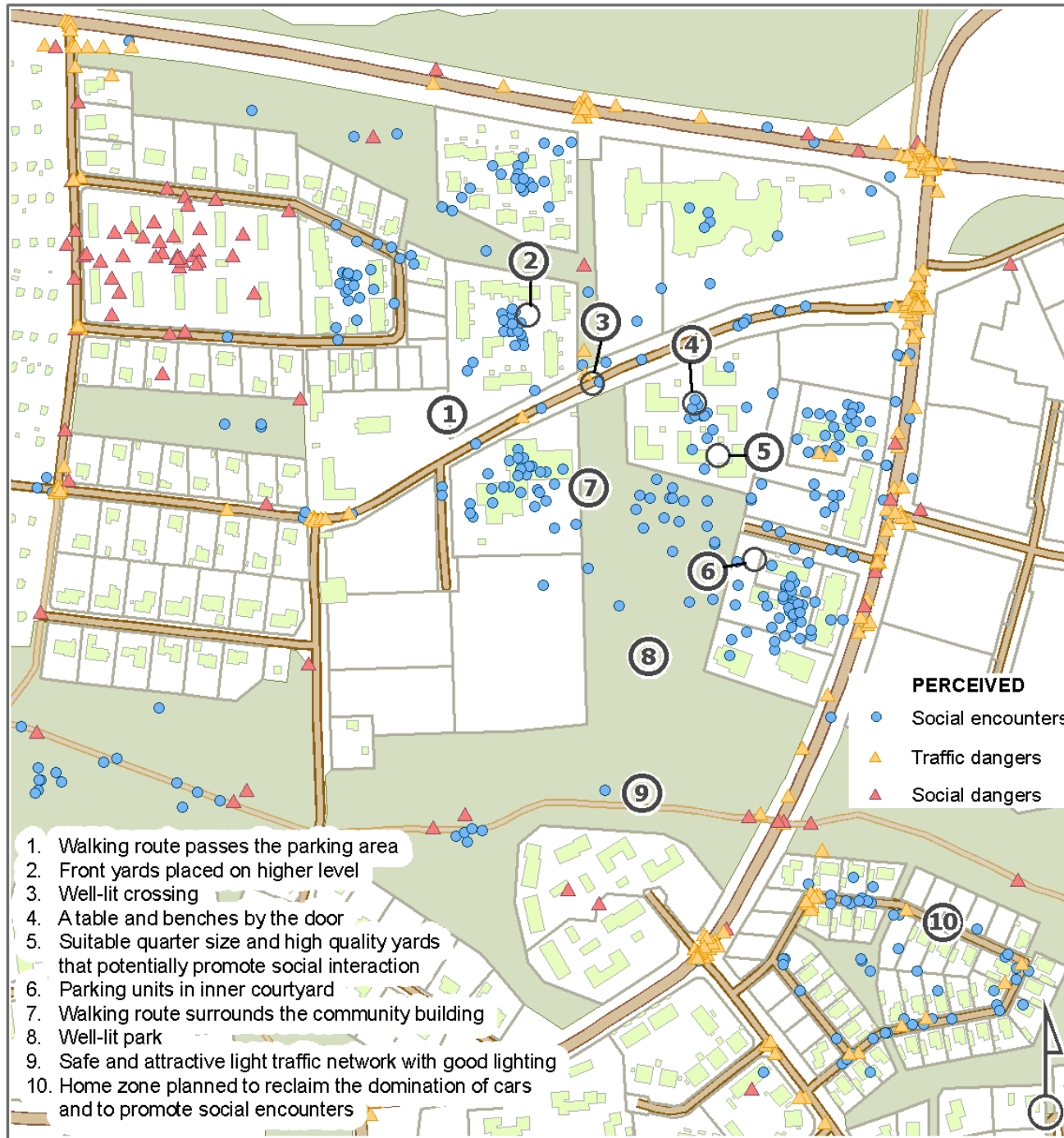
softGISsafety

The pleasant (left) and
unpleasant (right) routes



Ten CPTED principles (applied in Muotiala)

and
inhabitants'
perceptions of
danger and
social
interaction





The softGIS method for children and young people

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Front page



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Turku for children and young people

Click on a picture or
button to start your
adventure!

If you want to know more
about this website, check
what Paavo has to say.



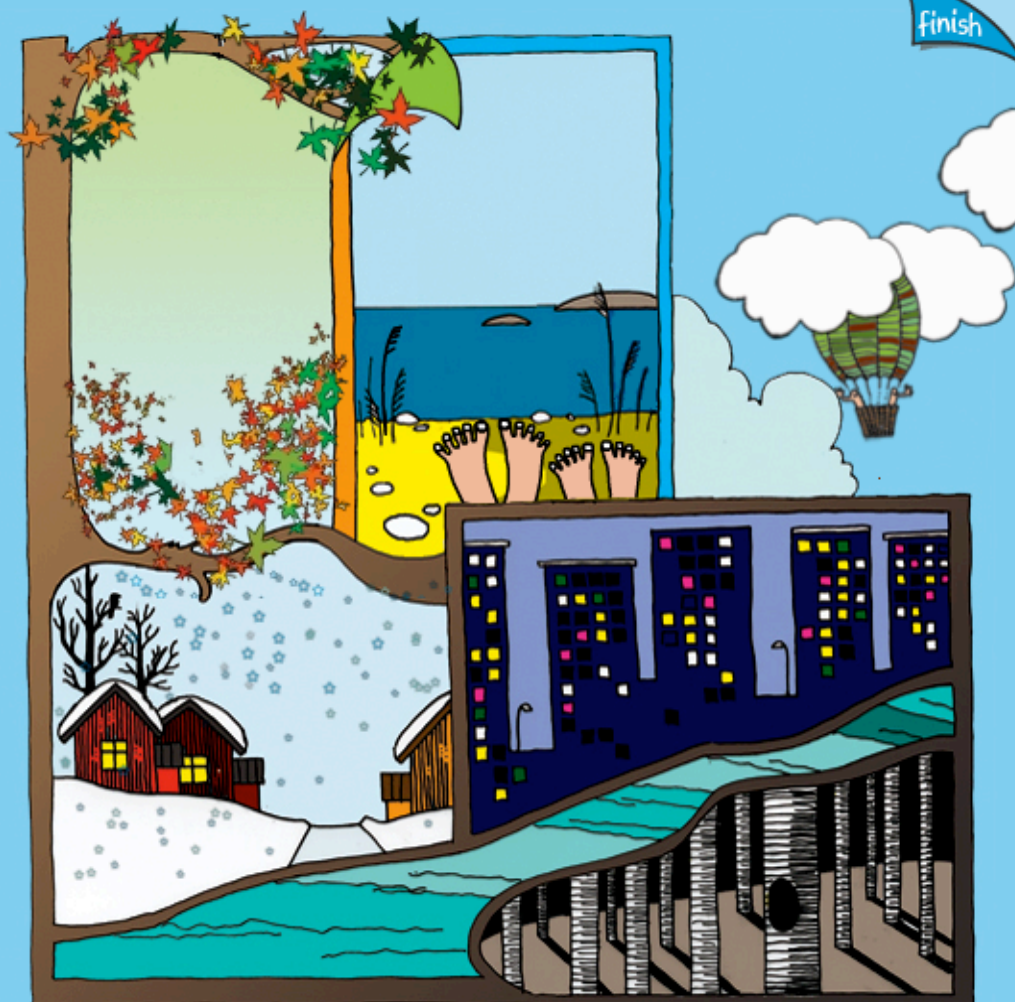
Alone and
together
in Turku

What
do I
do in
Turku?

How
does
Turku
feel?

Leisure
time in
Turku

My
well-
being



The contents of children's softGIS

2007

Alone and together in Turku

Affordances for sociality
Clark & Uzzell, 2002

What do I do in Turku?

Functional affordances (operations)
Kyttä, 2003, 2004; Heft, 1988

How does Turku feel?

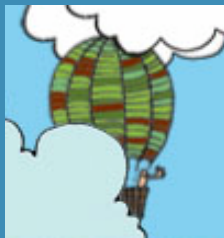
Affordances for emotionality
Miettinen, 2006

Leisure time in Turku

Functional affordances (action)

My well-being

Wellbeing and health
WHO's questionnaire



Mobility
Karolinska Institutet
'Ungdomars möte med trafiken'
Hillman ym. 1990

1. How are you mostly going to school this week?

I go to school...	I go home from school...
<input type="radio"/> On foot	<input type="radio"/> On foot
<input type="radio"/> By bicycle	<input type="radio"/> By bicycle
<input type="radio"/> By bus	<input type="radio"/> By bus
<input type="radio"/> By car	<input type="radio"/> By car
<input type="radio"/> Other: <input type="text"/>	<input type="radio"/> Other: <input type="text"/>

2. Is there something on your way to school that bothers you or scares you?

<input type="checkbox"/> Cars	<input type="checkbox"/> Other children or young people
<input type="checkbox"/> Mopeds or scooters	<input type="checkbox"/> Dogs or other animals
<input type="checkbox"/> Cyclists	<input type="checkbox"/> Darkness
<input type="checkbox"/> Walking alone	<input type="checkbox"/> I don't know
<input type="checkbox"/> Grown-ups	<input type="checkbox"/> Other: <input type="text"/>

3. I'm allowed to go alone...

<input type="checkbox"/> To school	<input type="checkbox"/> On bicycle
<input type="checkbox"/> Home from school	<input type="checkbox"/> On public transport
<input type="checkbox"/> To my hobbies	<input type="checkbox"/> To cross big streets
<input type="checkbox"/> Outside after dark	<input type="checkbox"/> I don't know



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softGISchildren

Background information

pehmogis
ympäristötutkimus

ORIS

Finding your home
You should be able to see your school on this map.
First, use the small map to find the area where your home is, then drag it on the map.
Next find your home - either use the map of all of Turku or the one showing the centre of town - and drag the house shown below to the location where your home is.
Use the arrows on the sides of the map to move in the direction you want to go. Use the + and - buttons to zoom in or out on the map.

show **finish**

Please tell us this first:

Your age: years old

Your gender: girl boy

What kind of house do you live in:

a one-family house a block of flats a terraced or semi-detached house

Does your family have a car? yes no

Pick your school from the drop-down menu:
Pick your school here

Continue

Yliopistonmäki
MÄNTYMÄKI
TALLBACKA
PAATTINEN
MOISIO
RUNOGMÄKI
HALINEN
KESKUSTA
RUIS-SALO
HARITTU
SATAVA
VAKSERTA

KOULUSI = Your school

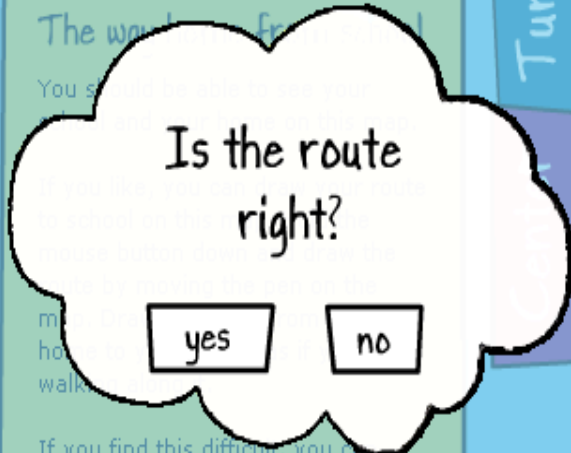
Info



pehmogis
ympäristötutkimus

Turku

The world is full of...
You should...
m...
h...
walk...
If you find this difficult, you can...
move to the next section by clicking...
on the Continue button.

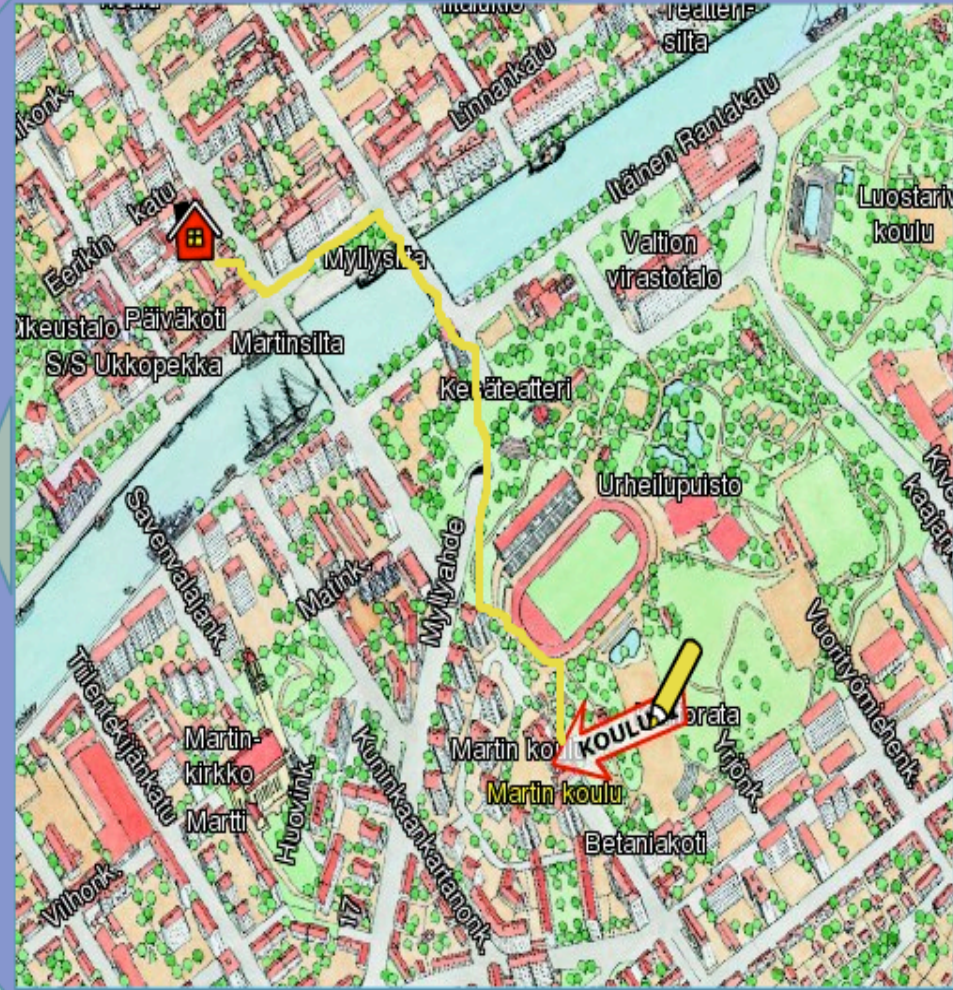


yes

no

KOULUSI = Your school

Continue



show + KOULUSI

finish



The affordances for emotionality

pehmogis

ympäristötutkimus

How does Turku feel?

Think about how different places feel to you. You can mark each place on the map up to 3 times. Click on the ball, drag it over the map and let go. When you have finished marking, click Continue.

- clean
- noisy
- safe
- exciting
- quiet
- ugly
- boring
- dark
- dangerous
- dirty
- beautiful
- a good place to be
- calm
- bad air to breathe
- unsafe
- good air to breathe
- my own:

Continue

Turku
Center

show + KOULUSTI

finish



Children's softGIS

The perceived wellbeing



pehmogis
ympäristötutkimus

finish

Well-being survey

Your height and weigh What is your opinion of your health?

Height cm

Weight kg

- It is
- very good
 - quite good
 - average
 - rather bad
 - I don't know

Is there something that stops you from moving

- no
- yes, what:
- I don't know



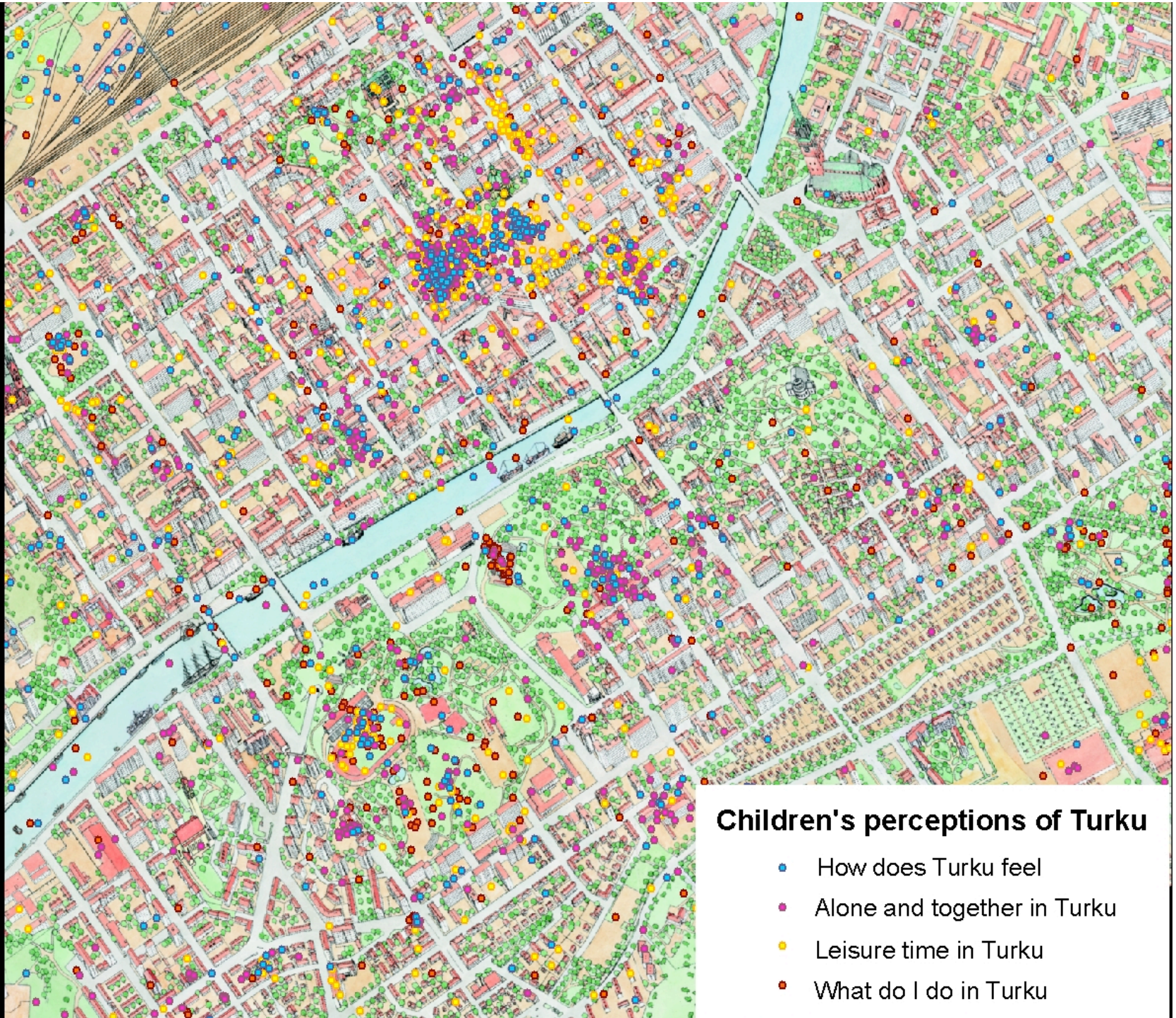
During the past SIX MONTHS, have you had any of the following symptoms and how often? Please answer each question.

	Seldom or never	About once a month	About once a week	Almost every day	I don't know
Neck or shoulder pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low back pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Abdominal pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being strained or nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being irritated or angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having difficulties in sleeping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Headache	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being tired, weak or feeling faint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Continue

Preliminary results





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Now: the technical and visual improvements of softGIS-tools

pehmoGIS HELSINKI

1. Taustatiedot 2. Kulkureitit 3. Elinympäristön arviointi 4. Parannusehdotukset 5. Palaute Ohje

Parannusehdotukset

Voit merkitä kartalle suojeltavia, kohennettavia tai poistettavia kohteita sekä merkitä talojen, viheralueiden tai reittien lisäyksiä ympäristöön.

- Säilytettävä kohde
- Kohennettava kohde
- Poistettava kohde
- Uusi viheralue
- Uusi rakennus

[Takaisin](#) [Jatka](#)

KARTTA ILMAKUVA Piilota karttamerkit

- Julkinen rakennus
- Teollisuusrakennus
- Asuinrakennus
- Teollisuusalue
- Hautausmaa
- Urhelikkettä
- Metsä
- Puisto
- Vesistö
- Avokallio

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”[Boundary object] is an analytic concept of those scientific objects which both inhabit several intersecting social worlds *and* satisfy the informational requirements of each of them. Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds.”

- Star & Griesemer 1989, 393

Boundary objects in Berkeley's Museum of Vertebrate Zoology, 1907-39

**UNIVERSITY
ADMINISTRATION:**
Prestige,
national-class status,
external
funding

**SPONSOR
(Alexander):**
Commitment to
conservation and
educational
philanthropy

RESEARCHERS (Grinnell):
Extention to the theory of
evolution - The evolution of
the environment

**BOUNDARY
OBJECTS:**
· Standardized forms
· Idealized maps
· Coincident
(geographical)
boundaries
· Repositories

TRAPPERS:
Monetary pay-offs,
hunting information

COLLECTORS:
Preservation of
California's fauna
for future
generations



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URBAN PLANNERS & DESIGNERS:
Possibility to run data on residents' place perceptions in GIS-based surveys

SoftGIS as a boundary object

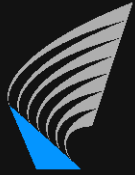
SoftGIS toolkit

RESEARCHERS/
Ecological psychology:
Studying perceptual aspects of the living environment (Kyttä)

'Affordance'
(J.J. Gibson)

RESEARCHERS/
Human Geography:
Mapping place experiences (Kahila, Broberg)

PEOPLE:
Possibility to indicate to planners meanings attached to one's own living environment with a medium easy enough to use and access



- Critique to Star & Griesemer: The concept of boundary object is used in describing coordination and exchange of information between well-established activities and groups – not in the **mutual creation of new knowledge and concepts** that characterise **co-configuration work** and **knot-working** between professionals and their clients (Virkkunen & Tenhunen 2007)
- Co-configuration work (Victor & Boynton 1998)
 - An emerging phase in the development of production and work
 - Configuration knowledge: systemic learning and understanding of the dynamic interactions between the producer, the product and the client
 - Customer-intelligent products that adapt to customers' needs continuously over time
 - Supported by technological innovations such as the Internet, neural networks and artificial intelligence. ICT as a medium for continuous product development and the clients' direct involvement in this
- Knot-working (Engeström, Engeström & Vähäaho 1999)
 - A shared problem or object emerges case-specifically and ties different professionals and other actors from different organizations temporarily together
 - Reflective problem-solving and networking "at the spot"
 - "The center does not hold"



■ Boundary objects as **activity concepts** (Virkkunen & Tenhunen 2007)

- The emergence of a BO as an activity concept that organizes co-configuration work by offering a new shared object and motive
- BO as an unfinished idea, yet serving as an inviting conceptual tool for further creative cooperation
- Crucial to BO in multi-actor developmental work is the new creative activity and networking it generates

e-participation tools
as activity concepts
in urban planning &
research?

