H E L S I N K I 3D+

Understanding and Open Innovations

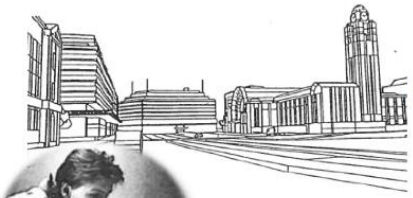
Project Manager/ MSc (Civ.Eng)
Kari Kaisla

3D Specialist/ MSc (Civ.Eng)
Enni Airaksinen

Project Manager/ Architect/MSc (Civ.Eng)
Jarmo Suomisto

Helsinki 3D+ permanent activity in City Executive Office

Helsinki



1984
Graafisen ATK:n käyttö
Helsingin sijaintitieto-
Järjestelmässä
Diplomityö Pentti Kurki

1982
Stereokartoitus-
laitteet ja Inter-
graph työasem

1987
Urban Data Management
kongressi / Ranska
Helsinki 3D-kärkimaa

1988
Ruoholahden
Kilpailumallit
Ksv / Kmo

1990
3D-aineistot
Kmo-ylläpitoon

1997
Kantakartta 3D-
Projekti / Kmo

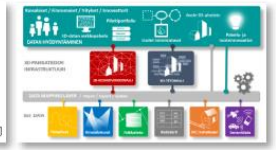
Koko kaupungin 3D-malli
LoD1 Kari Kaisla / Kmo

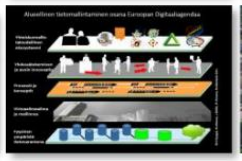
2002
Yleiskaava
Ksv

2005
Koko kaupunki
laserkeilattu

2010-
Rakennusten- ja
projektialueiden malleja
Kmo-aineistoja
Tesfaye Gabriel / Kmo

2010-
3D-visualisointia
Ksv



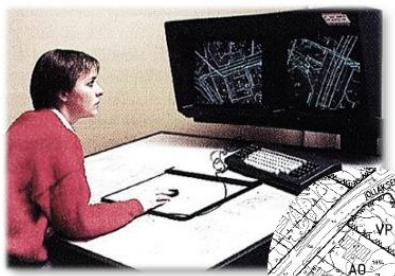


2016
CityGML + Reality Mesh
taksi dataksi

1900 1990 2000 2010 2020

1979
Graafinen ATK
TKK:n opetukseen

1983
Digitaalikartta
Kamppi-Töölönlahti



1986
- 3D-mallinnuksen aloitus
  TTK-tietokeskus
- Kamppi-
  kilpailumalli / Ksv
- Väritulosteet
- Jollas CAD-kaava

Pioneerit
- Pentti Kurki
- Kari Kaisla
- Tuija Salonen
- Kimmo Soukki
- Matti Siren

1999
Ensimmäinen laserkeilaus
Matti Arponen / Kmo

3D-Tuomiokirkko
Seppo Haikola /
Intergraph

2000
Pistepilvien käsittelyohjelmisto
Terra Scan / Kmo

2000
Töölönlahti
simulaattori
Ksv / Hannu Heinonen
Kmo / Jorma Gröhn

2003
Pasila
simulaattori
Ksv

2008
3D-tulosteita
Näyttelyihin

2015
Käynnistyy

Koko kaupungin
viistokuvaus ja keilaus

Helsinki OGC-jäseneksi

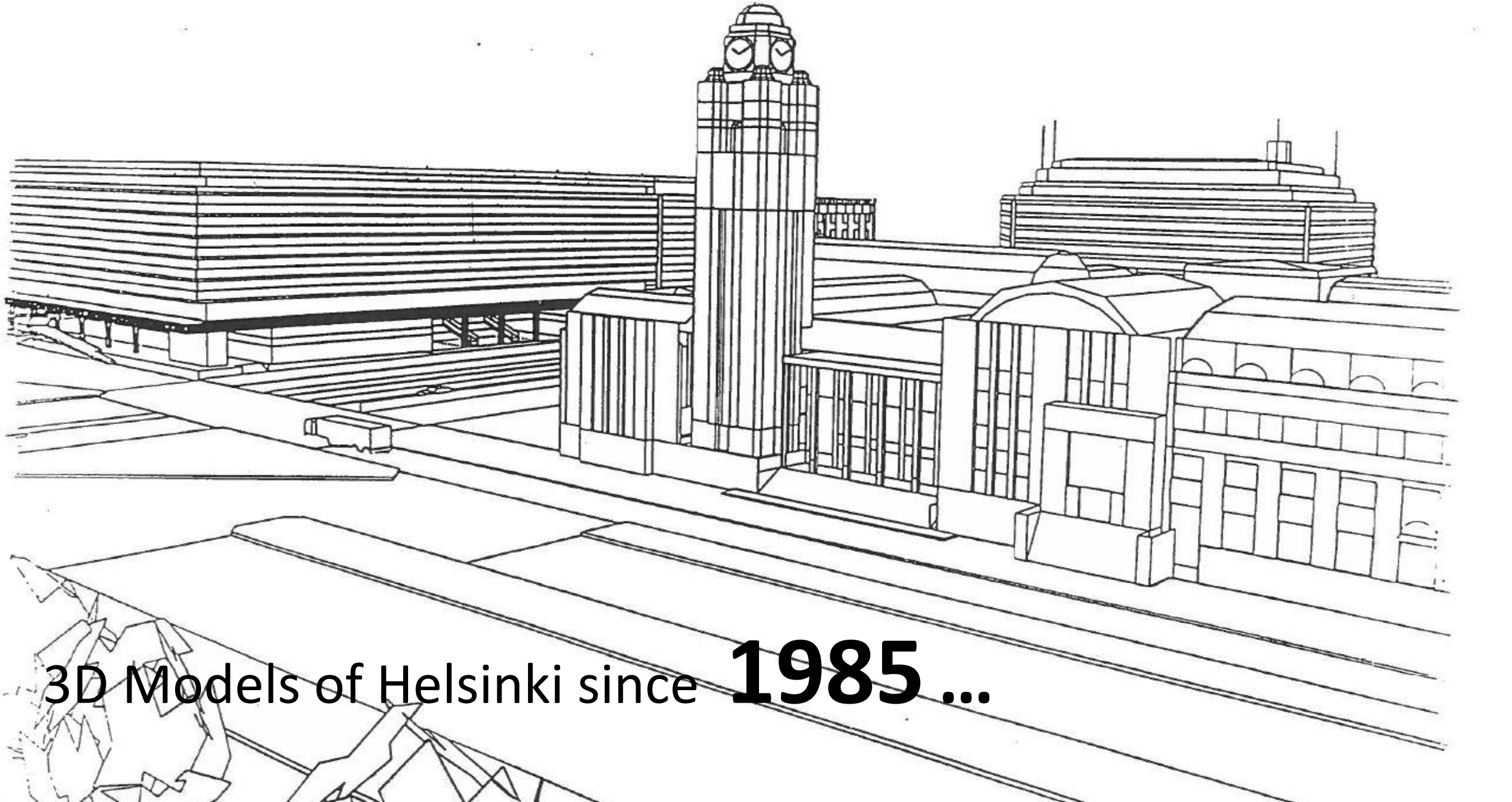
2017
Ko pungin
viistokuvaus ja keilaus

3D-hyötyprojektit

OGC®
Making location count.

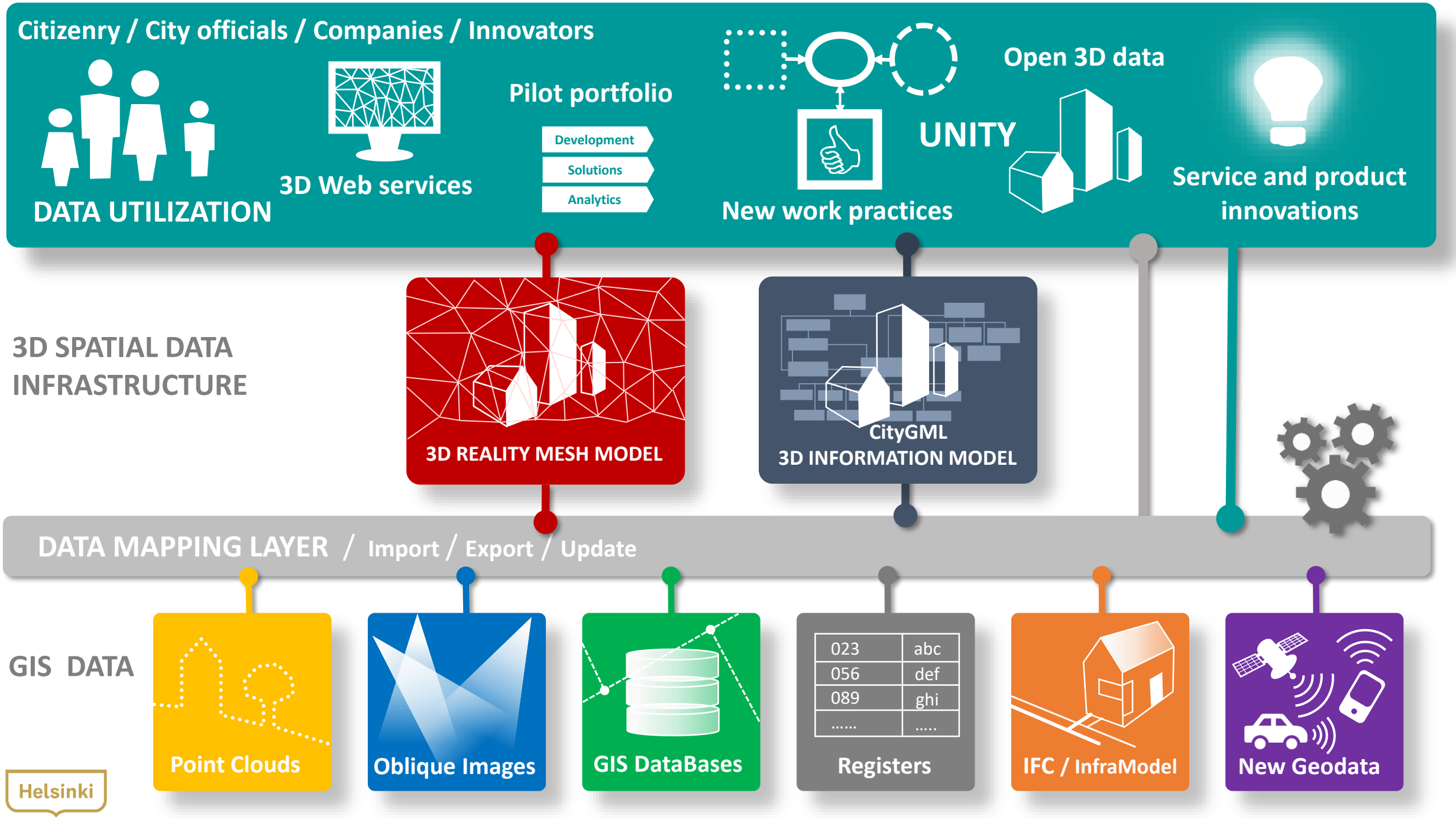
Helsinki

3D+
Kari Kaisla / Enni Airaksinen / Jarmo Suomisto

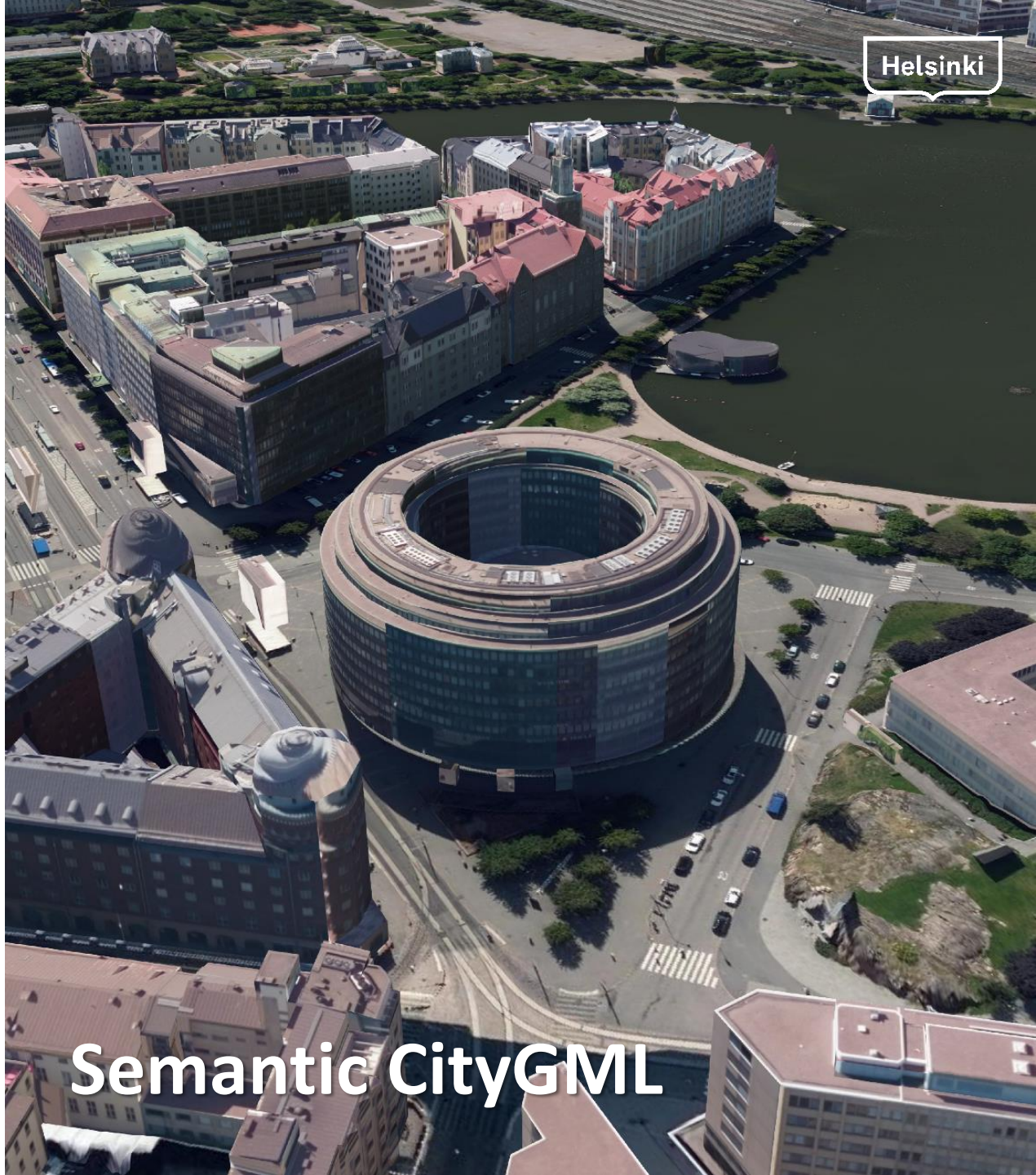


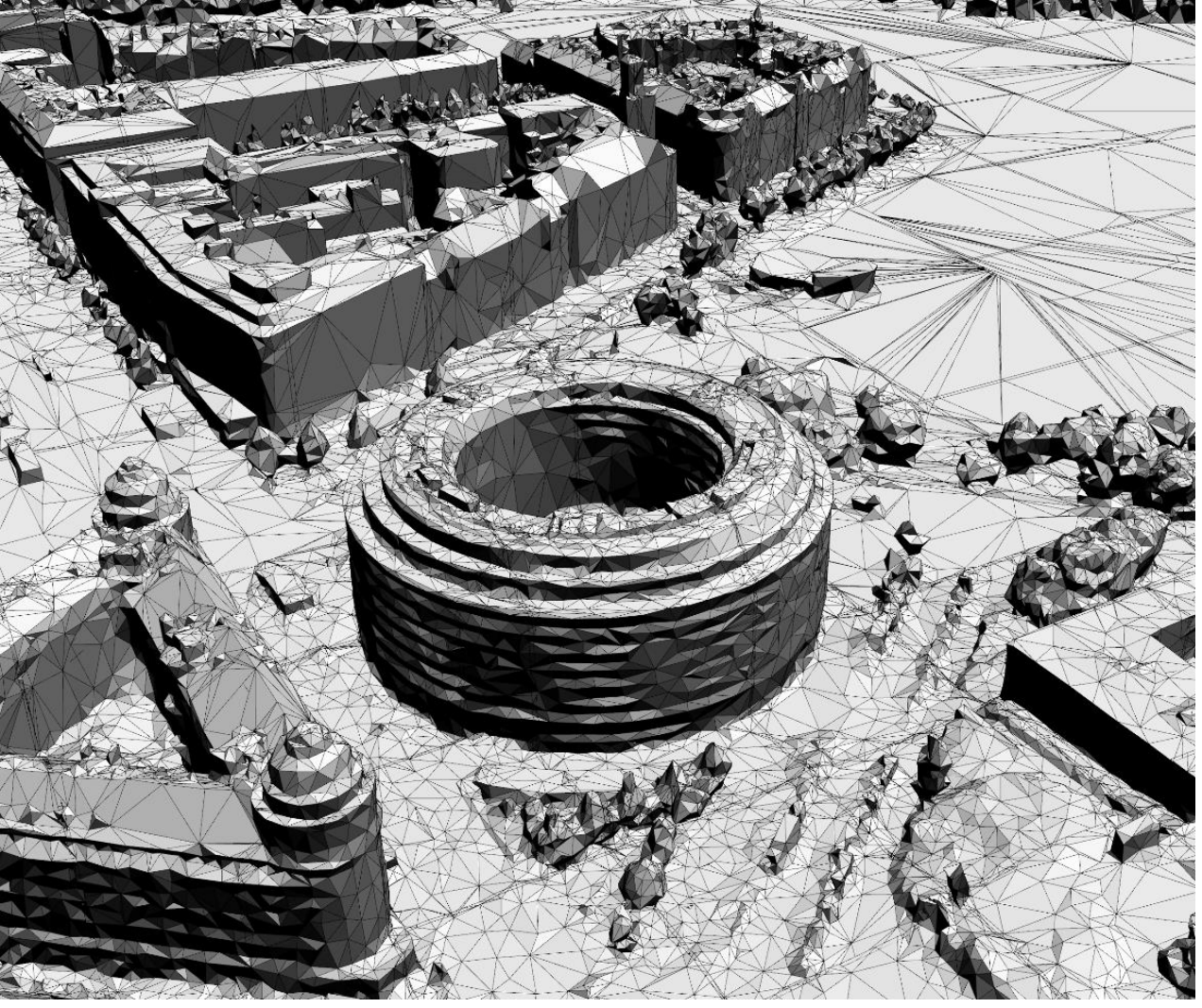
3D Models of Helsinki since **1985 …**

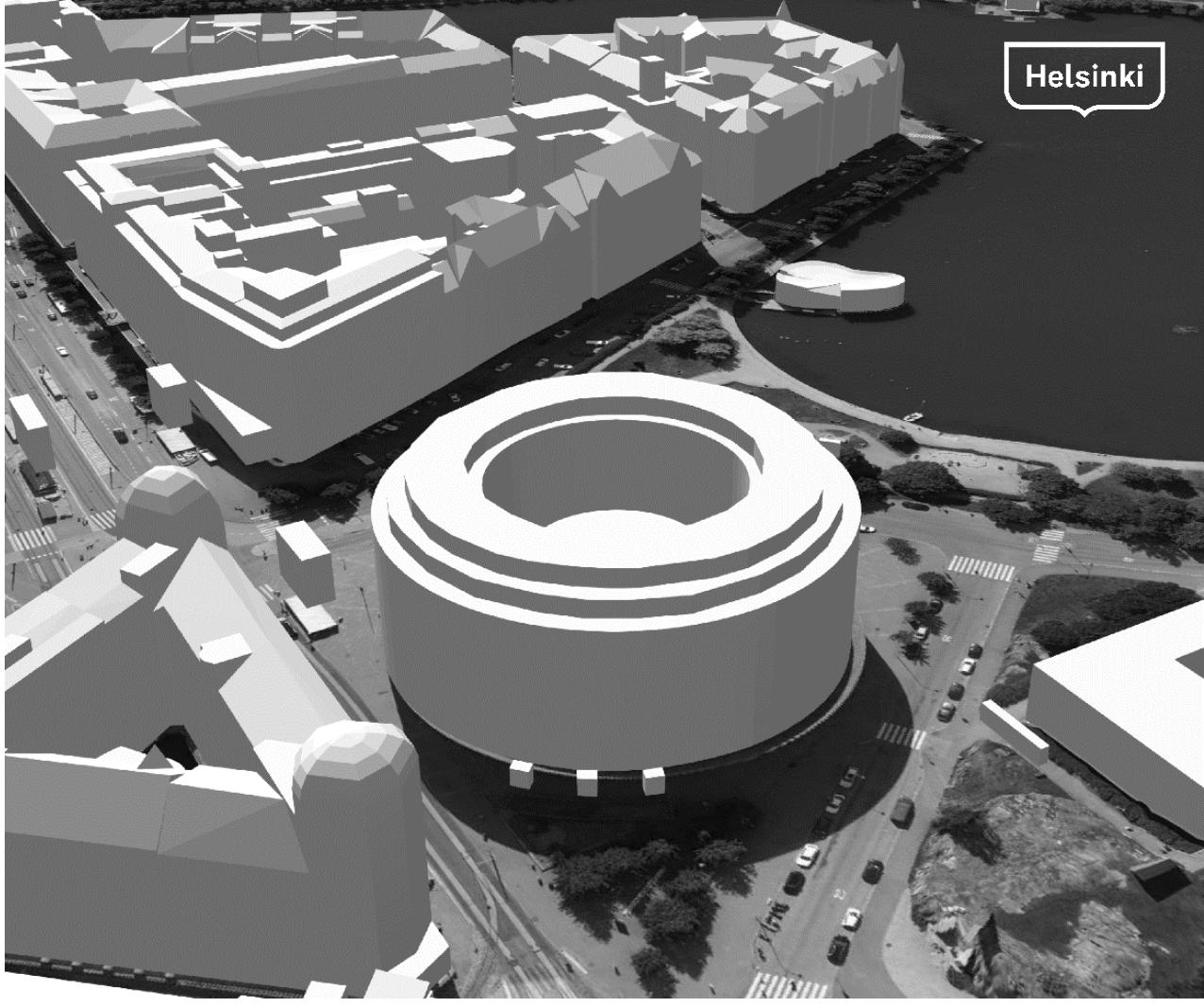
Master Plan **2002**


Citizenry / City officials / Companies / Innovators
DATA UTILIZATION
3D Web services
Pilot portfolio
Development
Solutions
Analytics
New work practices
Open 3D data
UNITY
Service and product innovations
3D SPATIAL DATA INFRASTRUCTURE
3D REALITY MESH MODEL
CityGML
3D INFORMATION MODEL
DATA MAPPING LAYER / Import / Export / Update
GIS DATA
Point Clouds
Oblique Images
GIS DataBases
023 abc
056 def
089 ghi
....
Registers
IFC / InfraModel
New Geodata
Helsinki

Reality Mesh


Helsinki
Semantic CityGML

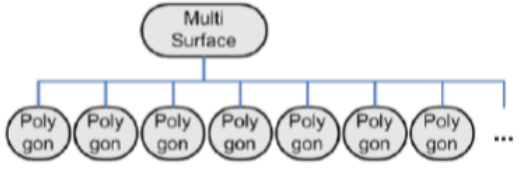




Semantics

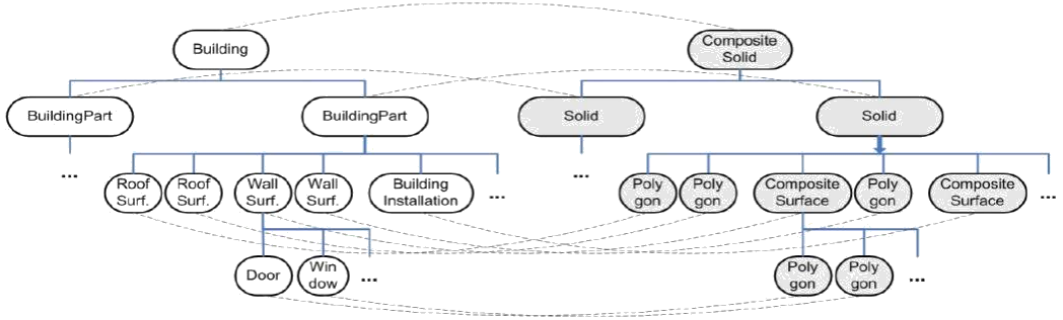
∅

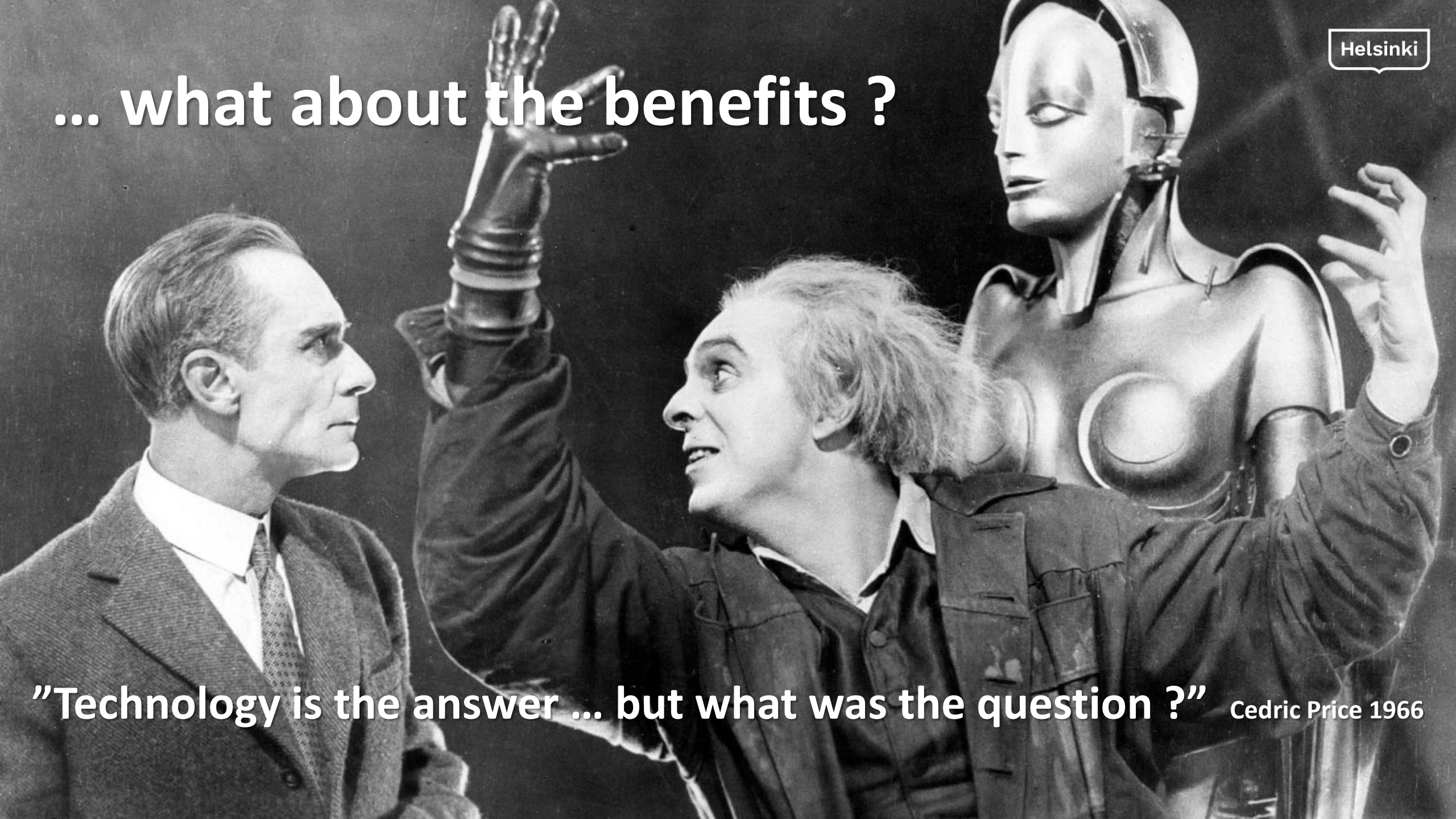
Geometry



Semantics

Geometry




Helsinki
… what about the benefits ?
”Technology is the answer … but what was the question ?” Cedric Price 1966

Socio – Economical Ecosystem

Open Innovation

Processes

Virtual Worlds

Data Storages

© H.Hyyppä, M.Ahlavuo, L.Miikki, JP Virtanen, M.Markkula 2011

USE CASES OF 3D CITY MODELS

Helsinki

The Most Functional City in the World

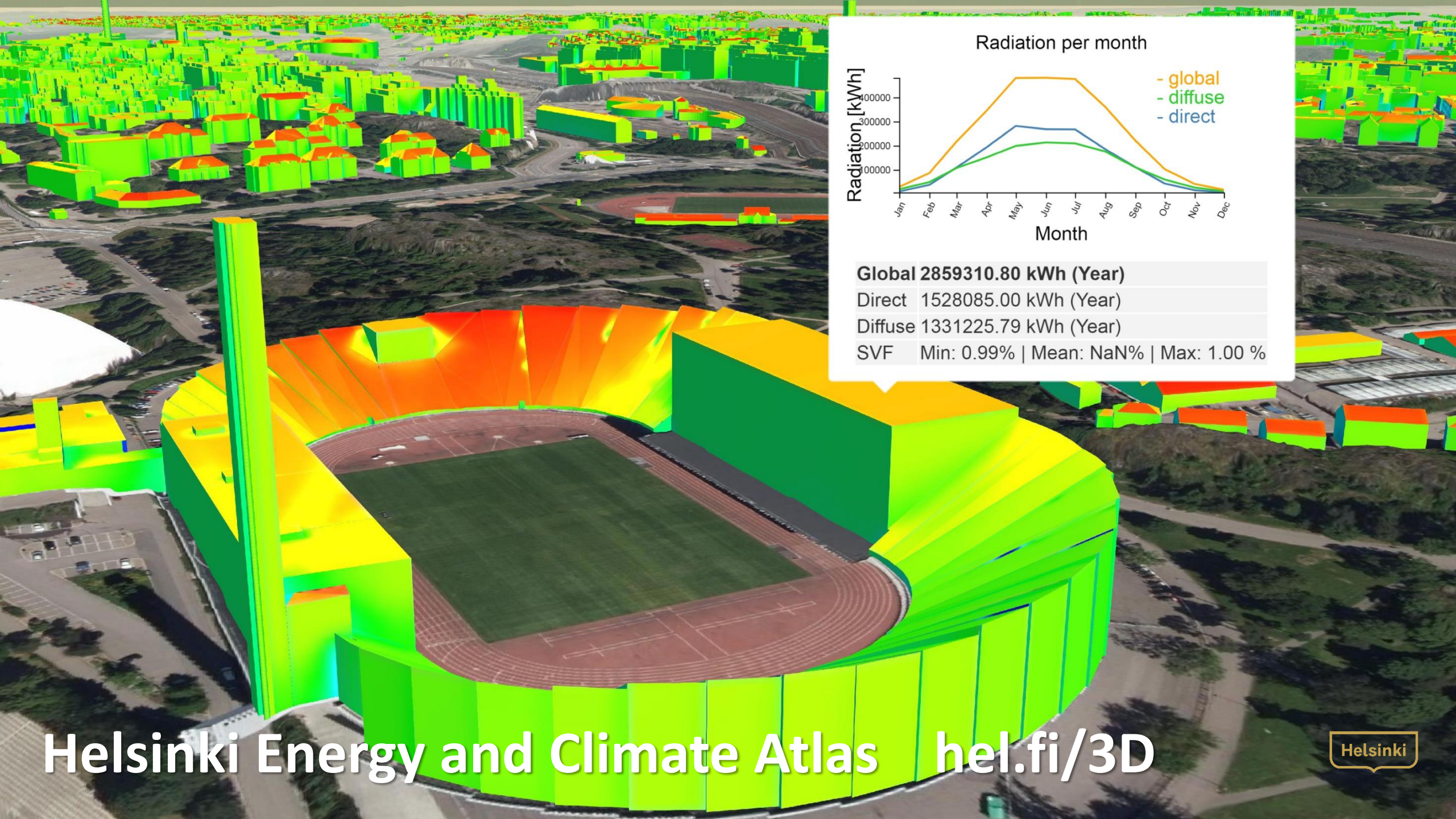
Helsinki City Strategy 2017–2021

Helsinki

Hallitulla rytminmuutoksella nopeampaan ja ketterämpään toimintakulttuuriin

Maailman toimivin kaupunki

1 29



Helsinki Energy and Climate Atlas hel.fi/3D

Helsinki

Content

Aurinkoenergialaskenta: kartta.hel.fi/3d/solar

Helsingin 3d-kaupunkitietomalli: kartta.hel.fi/3d

Kartat ja 3d-mallit

Rakennusaineistot

Rakennusten perustietoja

Kuntarekisteritietoja

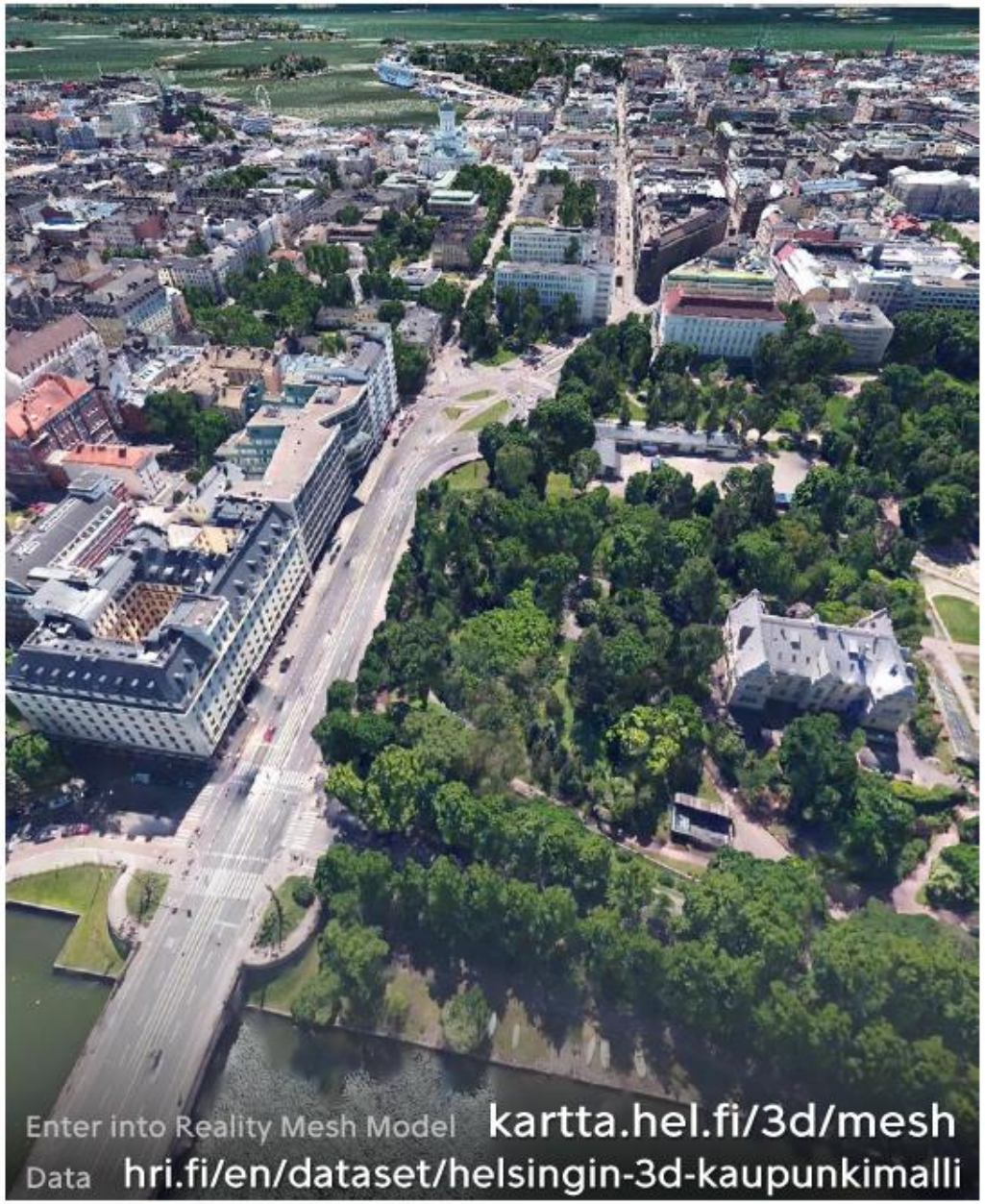
Rakennusten energia- ja korjaustietoja

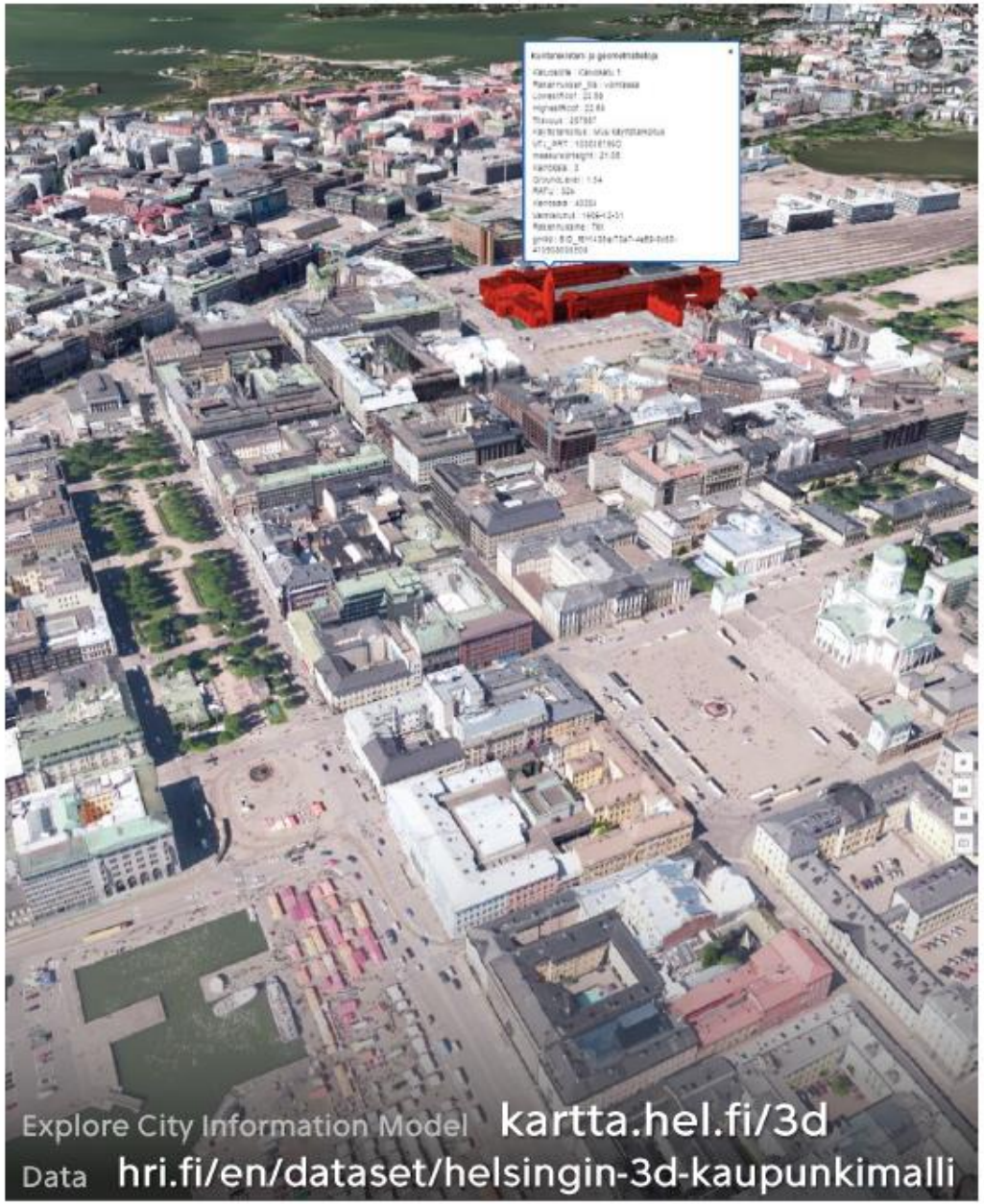
Rakennusten kulutustietoja

Create PDF

Create Link

Reset settings





City Models as Open Data www.hel.fi/3D

Helsinki

Digital Twins of Kalasatama

KIRA-digi project report

KIRA-digi

Ympäristöministeriö
Miljöministeriet
Ministry of the Environment

Helsinki

x.3.2019

The Gemini Principles

Purpose:
Must have clear purpose

Public good
Must be used to deliver genuine public benefit in perpetuity

Value creation
Must enable value creation and performance improvement

Insight
Must provide determinable insight into the built environment

Trust:
Must be trustworthy

Security
Must enable security and be secure itself

Openness
Must be as open as possible

Quality
Must be built on data of an appropriate quality

Function:
Must function effectively

Federation
Must be based on a standard connected environment

Curation
Must have clear ownership, governance and regulation

Evolution
Must be able to adapt as technology and society evolve

THE OBJECTIVES OF THE PROJECT

1 PRODUCTION OF THE TWIN MODELS

2 SHARING THE TWIN MODELS AS OPEN DATA

3 TWIN MODELS AS A SMART CITY-DEVELOPMENT PLATFORM

4 TWIN MODELS AS A SIMULATION PLATFORM

5 TWIN MODELS IN CITY´S PROCESSES

Helsinki
Horizontal wind flow
at height of 5 m
velocity
[m/s]
16.0
14.2
12.5
10.7
8.9
7.1
5.3
3.6
1.8
0.0
south wind
15 m/s
Y
X

3D+

Thank You!

Helsinki