SMART & SUSTAINABLE CITIES & SOCIETIES
FROM A GIS & GEODATA PERSPECTIVE
- THE DANISH EXPERIENCE

Søren Zebitz Nielsen, GIS & Smart City Consultant, Sweco Denmark
IT for Urban Development – platforms for the operation of Smart Cities

Manage who does:

- What?
- Where?
- When?
- Why?
- How?
Open authoritative geodata provide insights to municipalities
Solutions to support the workflows from data to decisions
Communities and cities of the future create larger and more complex volumes of data. Sweco can help to identify patterns and trends in data in time and space, which we can act upon. This creates value by providing overviews and insights.

**Analytics**
What happened

**Predictions**
What might happen

**Prescription**
What might be a good idea to do
Our customers are:
- 98 Danish municipalities
- State
  - Ministry of Environment and Food
  - Ministry of Energy, Utilities and Climate
  - Ministry of Industry, Business and Financial Affairs
  - Ministry of Transport, Building and Housing
- Regions
  - Region Zealand
- 46 Swedish municipalities
- Supply companies
- Private companies
- Grenland/Asiaq

We are:
- 85 employees - engineers, computer scientists, geographers, land inspectors

http://softwarebysweco.com/
Cities today

- Liveable
- Sustainable
- Resilient
- Equitable
- Improves quality of life for its citizens

Challenges

- Holistic and inter-disciplinary approach
- Think across silos
- Open data and open standards
- Internet of Things (IoT)
- Digitization and data-sharing across the organization
- Data visualization and real-time data
- Citizen involvement and co-creation
- For people - focus on the human scale and improving the quality of life in cities
The Danish Smart City ‘landscape’

- Universities
- Municipalities
- Utility companies
- Living Labs
- Organisations
- Standardisation
Copenhagen Smart City Street Lab

Street Lab is a laboratory in the city center where new solutions can be tested under real urban conditions.

The objective is to test the solutions for their potential and limitations, to assess what can be scaled to larger areas of the city.

Projects include:

- Smart parking,
- Care of urban nature
- Waste management
- Measurement of air quality
- Measure flows of people

https://cphsolutionslab.dk/en
Smart City / Smart Society – Why? How? What?

- For people – public participation and co-creation
- Efficiency - more and better public services for less
- Better cities - liveable, sustainable, resilient cities and societies

- Holistic thinking - going across the 'silos'
- Data and technology driven

- The next step in the digitalization of society

Smart Cities are first and foremost a cultural and organizational transition

*We think holistically and work across disciplines to help cities and communities become smarter*
‘Classic’ projects

‘Smart’ projects

Data others can use internally and externally during and after - static data and / or dynamic real time data from sensors

‘Smart’ focuses on relationships and value creation in these

The relationship with other departments and other projects internally and externally - what opportunities are there to work across silos?

Data project will need from others internally and externally
Illustrating what Smart Cities are really about

People

Place

Connection

Intersection

The Sweco logo is based on the old sign for “fixed point”, which also means “right here.” To Sweco the logo represents an intersection, a point where people with different experiences, knowledge and approaches meet. In this meeting new dynamics, ideas and opportunities are born.
IoT sensor data
Sweco Danmark IoT gateway

Sensors

GIS & IT systems

Data driven decisions
Dataflow from sensor to system

Sigfox, LoRaWAN, or NB-IoT channel

Interface to IoT Gateway

Sigfox, LoRa, or NB-IoT server
Point data and time series from measurements. Patterns in time and space
RenoTrack – optimized route planning
IoT sensors in rat traps
IoT data visualization in web maps and analysis in Spatial Suite webGIS

http://showcase.spatialsuite.dk/spatialmap?
IoT data in mini-maps and dashboards embedded in homepages
Drone data

Drone survey of remaining coal supply for a power plant
Drone surveys and distribution of data on the web

3D point clouds

Ortophotos

Airport tarmac survey

Drone video in webGIS

360 panoramas
Traffic behaviour data
Tracking cyclists’ and pedestrians’ behaviors in traffic