

# The M-database –

A multi-disciplinary and scientific data platform

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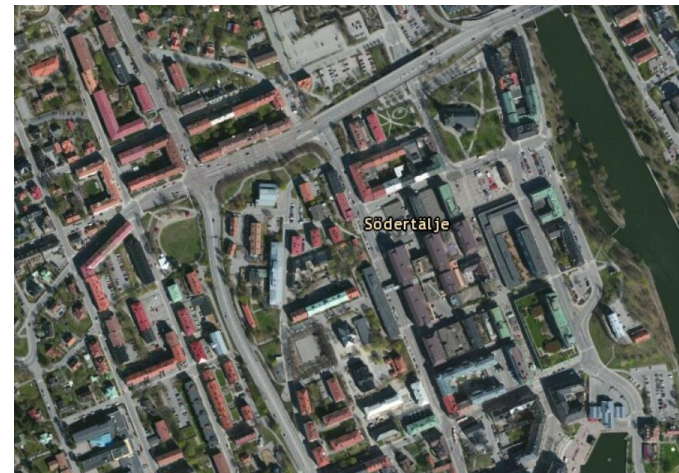


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# How do we experience our environment?

## **The 2014 Nobel Prize in Physiology or Medicine**

with one half to  
**John O'Keefe**

and the other half jointly to  
**May-Britt Moser and Edvard I. Moser**

**for their discoveries of cells that  
constitute a positioning  
system in the brain**

How do we know where we are? How can we find the way from one place to another? And how can we store this information in such a way that we can immediately find the way the next time we trace the same path? This year's Nobel Laureates have discovered a positioning system, an "inner GPS" in the brain that makes it possible to orient ourselves in space, demonstrating a cellular basis for higher cognitive function.

Source: [http://www.nobelprize.org/nobel\\_prizes/medicine/laureates/2014/press.html](http://www.nobelprize.org/nobel_prizes/medicine/laureates/2014/press.html)



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## Background

## Visualizations

## Research Projects

The M-database is both a product and a research project at Lund University and Malmö University in Sweden.

## Challenges

**The main purpose of the project is to construct a sustainable platform for geospatial data-intensive research and education within and outside the universities (Malmö University and Lund University in Sweden)**

One of the main challenges has been to find maintainable structures for data collecting, editing and data sharing.

**Data sharing**

**Multiple objectives**

**Content**

**Lesson learnt**

# Background

*How the M-database came about*



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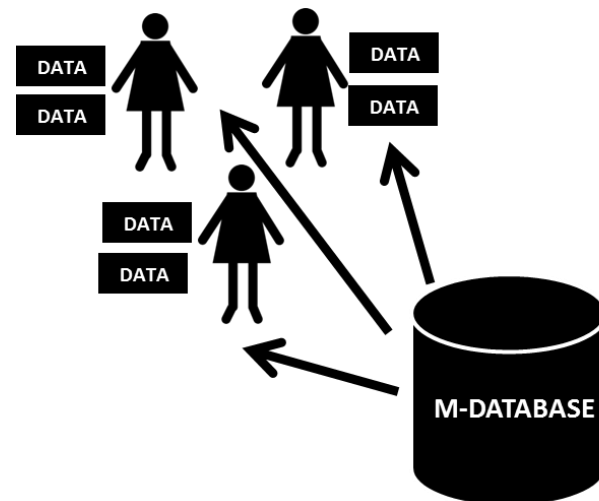
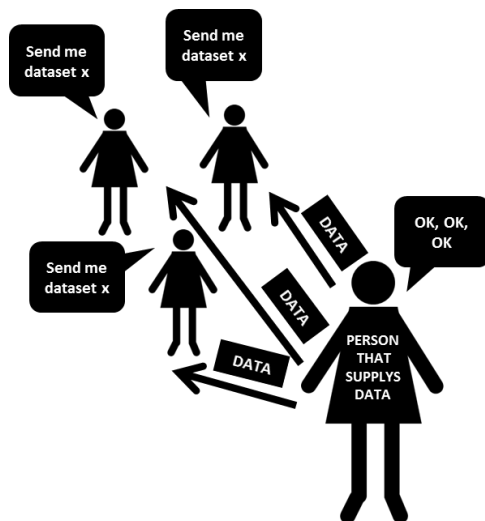
**Large scale production of geographical data: Quantity enables**  
*However*  
**Supply dispersed, data quality issues**

**Inspire** *Infrastructure for Spatial Information in Europe*  
Make geodata streamlined and accessible

**Lund & Malmö University**  
Scattered data collection  
Duplicating data

*Solution*

**Construction of M-database**  
**Accessible and sustainable platform**



# Challenges

*How the M-database expanded*

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*Outside the universities:*

**Similar problems:**

**Scattered data supply and collection**

*Consequently:*

**The M-database expanded from researchers to civil servants.**

*Beneficial at first:*

**Entry to internal datasets and key members of staff**

*Eventually: Introduced several challenges:*

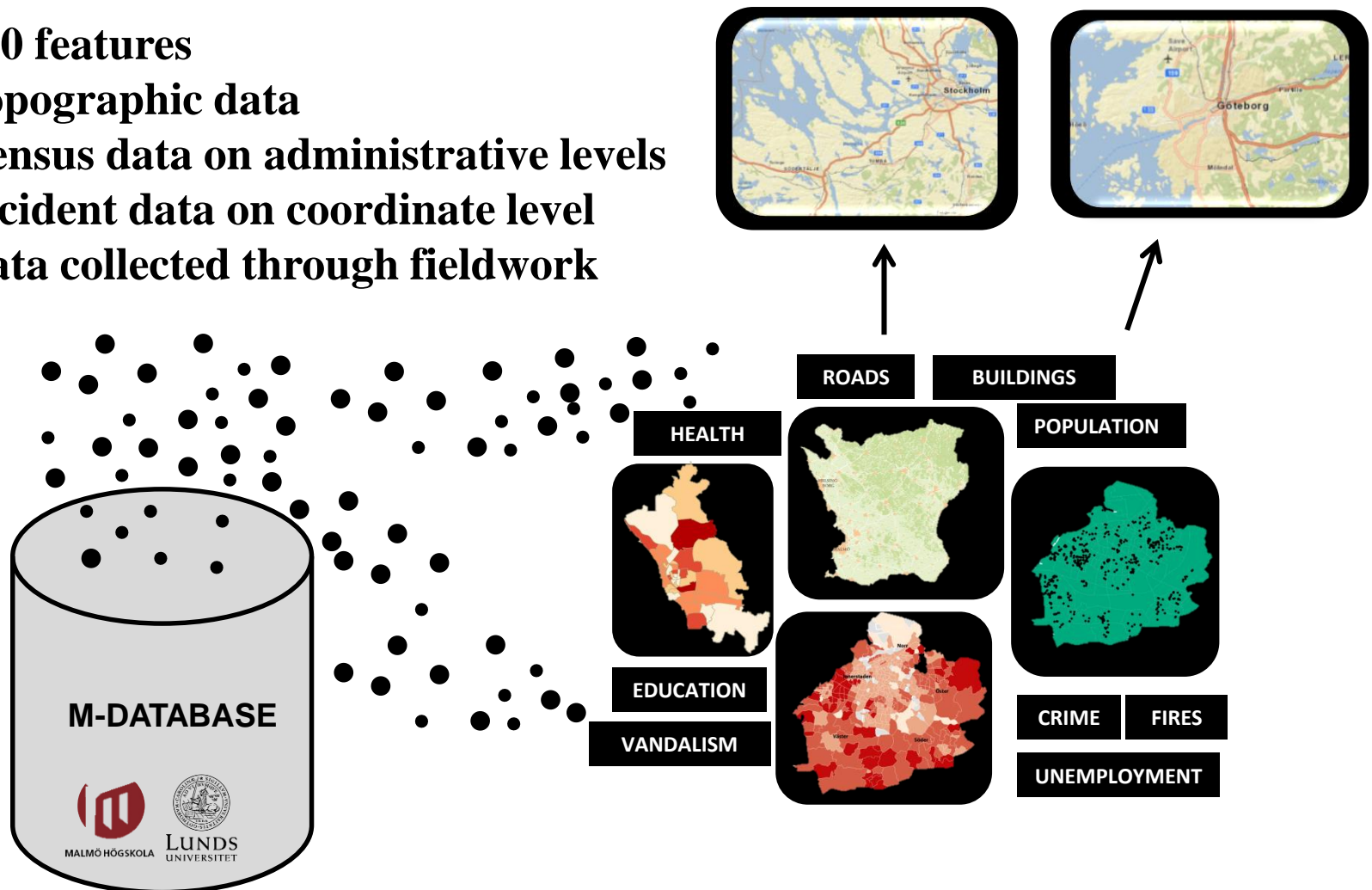
- **Privacy**
- **Objectives, how to serve the public**
- **Collaboration**
- **Agreement**

# What does the M-database contain?



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- 800 features
- Topographic data
- Census data on administrative levels
- Incident data on coordinate level
- Data collected through fieldwork



# Process

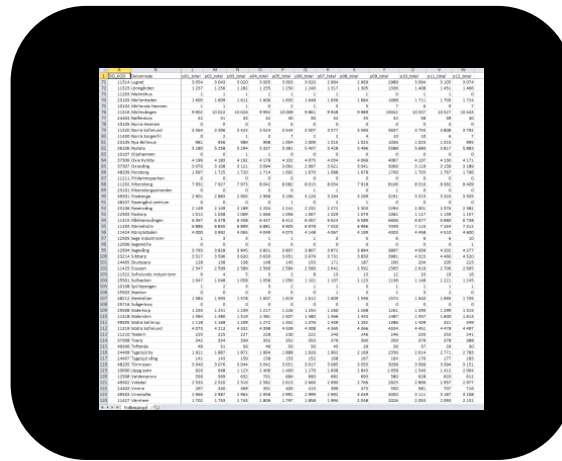
*How the M-database was constructed*



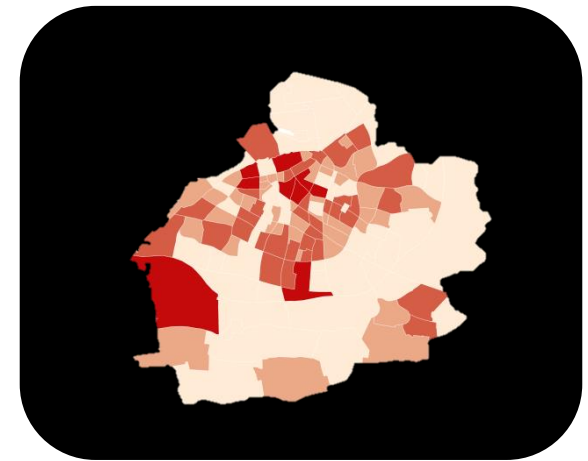
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**Data collected from stakeholders**



**Adjusting and selecting**



**Geocoding and transformation into geodata file**

# Different objectives



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Data supply

STAKEHOLDERS



RESEARCHERS

Quality assurance

STAKEHOLDERS



RESEARCHERS

Shared problems

STAKEHOLDERS



RESEARCHERS



Malmö stad

Malmö city  
council

Supply public  
with information



The local  
police

Analyze crime  
patterns spatially



The local emergency  
services

Analyze fire  
patterns

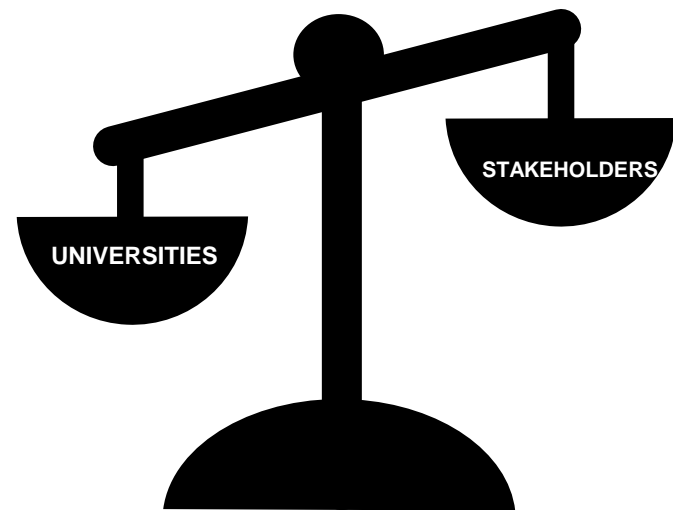


# Mutually beneficial data sharing?



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- 
- **Ownership**
  - **Privacy & confidentiality**
  - **Usage**
  - **Storage**
  - **Public access**
  - **Administrative problems**



# Conclusions and future work

*From research project (in itself) to stable platform for research and education*

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**Shift from a static working environment to an ArcGIS server platform.**

**Education:**

- **ArcGIS desktop**
- **ArcGIS online**

**Three related research projects:**

- 1. Incendiary fires and social processes**
- 2. Residential fires in metropolitan areas - spatial differences and fire safety work in the socially fragmented city**
- 3. Urbandata2decide**

# Research project 1

*Incendiary fires - Social processes of change and preventive measures*



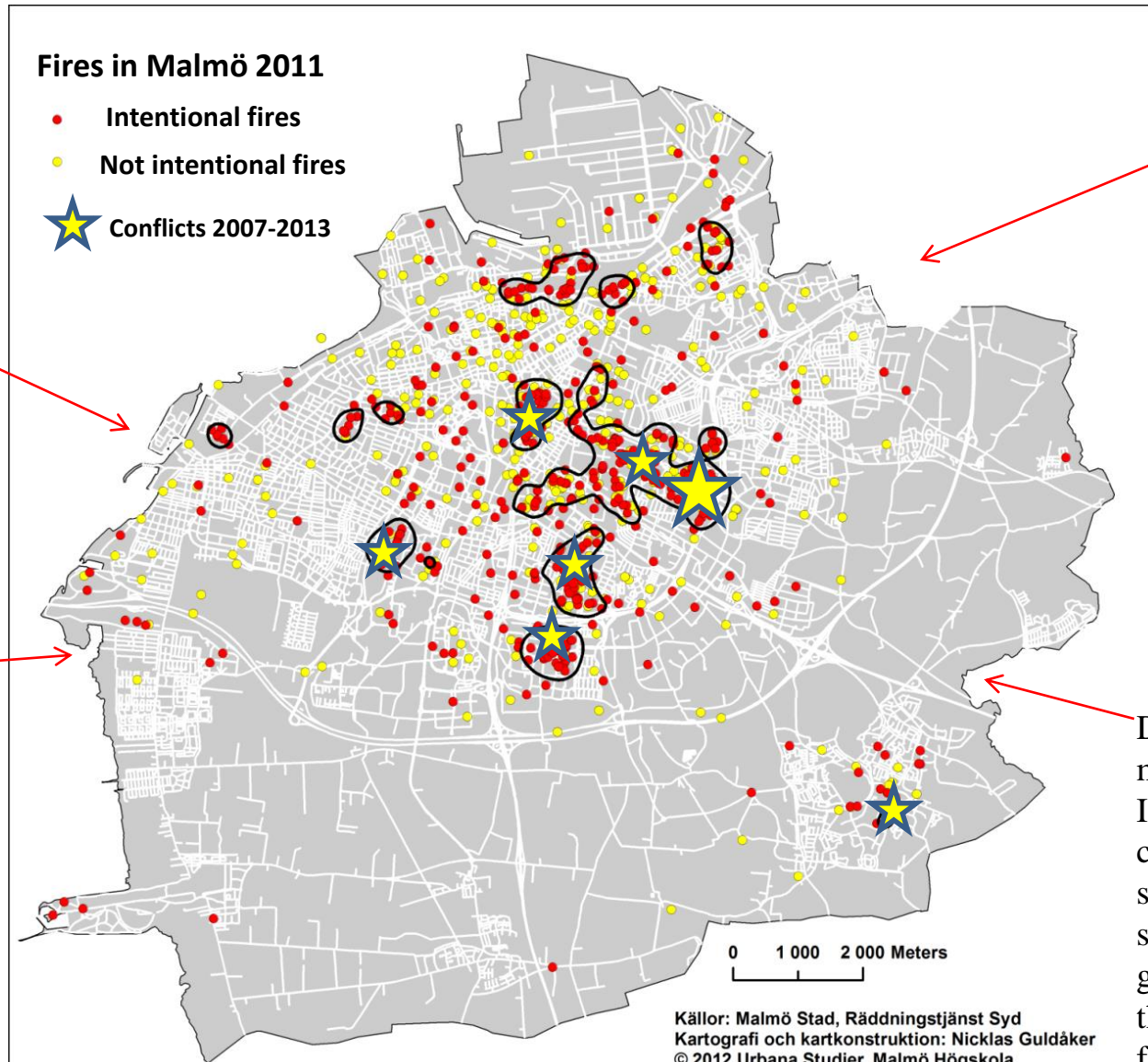
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Patterns of intentional fires determined by different living conditions and different exposure to socio-economic stressors.

Fires used as a conflict practice primarily targeted against the police

Factors as high proportion of children and young people, overcrowding, low level of education and high informal population growth are important structural causes behind intentional fires

Different preventive measures include Improving living conditions, fire safety, focusing on specific social risk groups or individuals that may be potential fire setters



Guldåker & Hallin

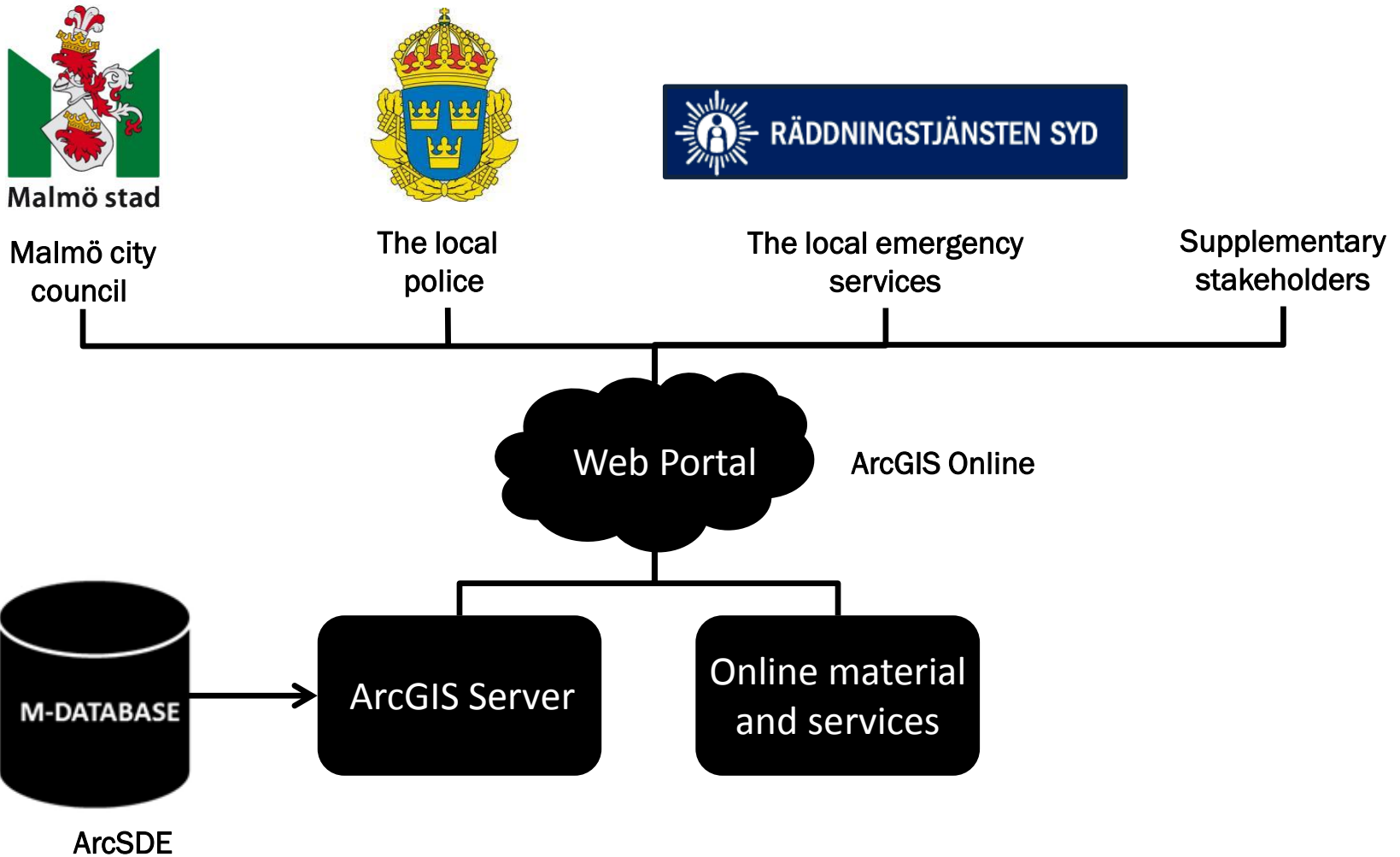
Källor: Malmö Stad, Räddningstjänst Syd  
Kartografi och kartkonstruktion: Nicklas Guldåker  
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Institutionen för kulturgeografi och ekonomisk geografi,  
Lunds Universitet, Sverige

# ArcGIS Server Platform

*Shift from a static working environment to an ArcGIS server platform*



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# Research project 2:

*Residential fires in metropolitan areas - spatial differences and fire safety work in the socially fragmented city*

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*Project aim:*

**To analyze underlying determinants of structural fires in metropolitan areas.**

*Method:*

**Analyzing fire statistics in relation to spatial, physical and demographic (socio-economic) variables.**

**Collaboration with the emergency services, local authorities and other stakeholders in the metropolitan areas!**

*Research questions:*

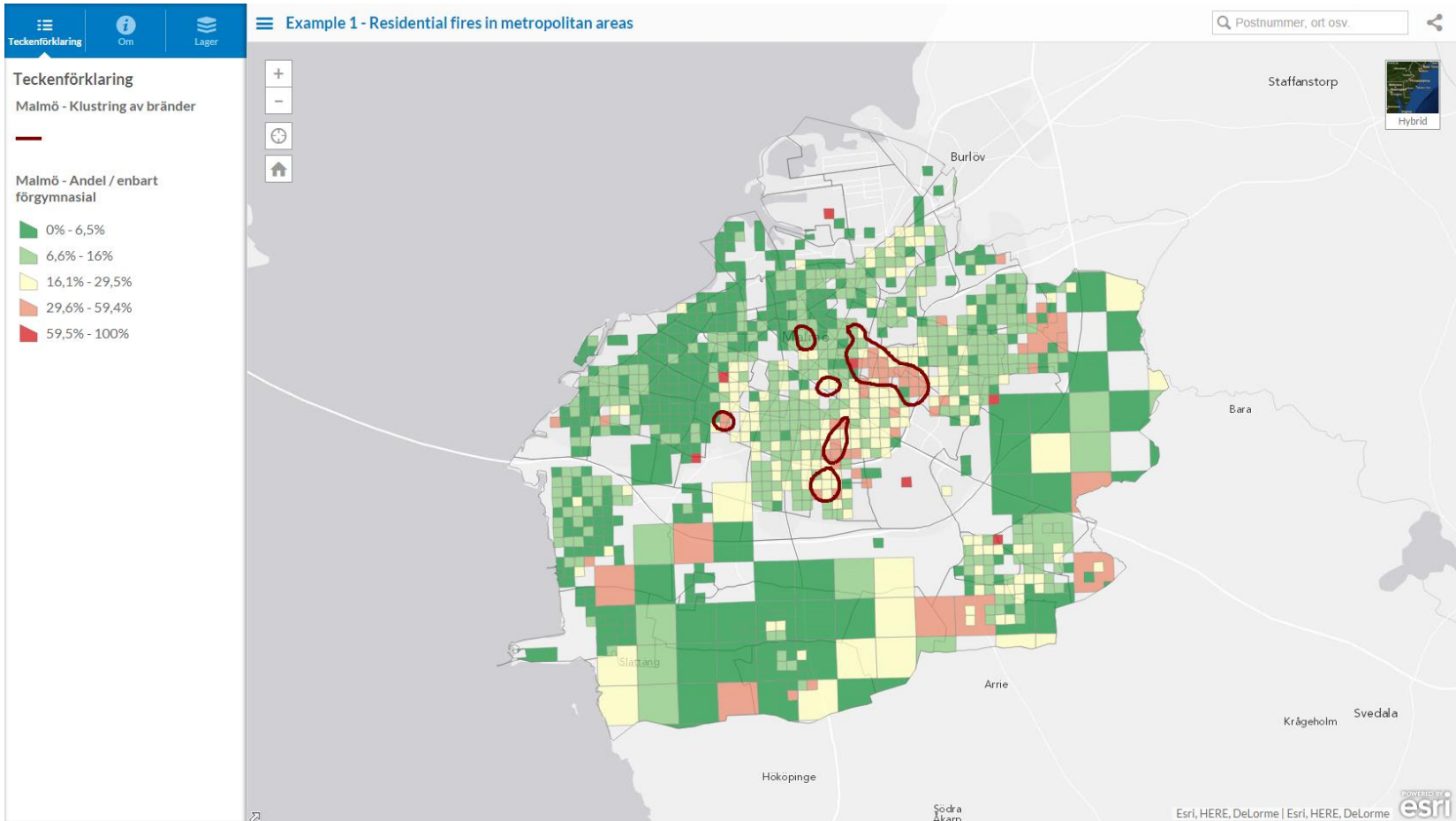
- **Why are there differences in the number of fires between metropolitan areas in Sweden?**
- **Are there differences between different types of fires in the cities of Malmö, Gothenburg and Stockholm?**

# Research project 2

## *Demonstration 1: Residential fires in metropolitan areas*



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# Research project 3

*UrbanData2Decide*

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*UrbanData2Decide:*

**An interdisciplinary collaboration between social science universities, IT universities and research institutes in Europe**

*Project objective:*

**Aims to develop new methods to combine existing big data pools and expert knowledge into one optimal framework to support local governments towards a holistic decision making process**

*Investigation of relevant stakeholders case:*

**Recurring conference call hosted by a local police chief every Friday for relevant stakeholders that are active in his jurisdiction.**



# Research project 3

## Demonstration 2: UrbanData2Decide



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