

# UNDERGROUND SCENARIO

- Different infrastructure under the same area
- Unconnected information for the management of assets and systems (damages during maintenance activities)
- Environmental  $\leftarrow$  impact  $\rightarrow$  infrastructure
- Safety and security




**Objectives:** enforce the dialogue between utility companies and Public Administrations to improve the sharing of underground data and the data flow toward and from the Public Administration.

**Benefits:**

- access to updated data, to speed up the planning process, the development and the control of works
- Integration of underground data with territorial data to search for pipelines located in risk zones (hydrogeologic, hydraulic, seismic...) and that need a specific monitoring
- Availability of Apps and Augmented Reality in the daily management of utility networks and to optimize emergency interventions
- Involvement of citizens which are asked to signal, through their smartphones, possible failures of the utility networks (crowd-sourcing)

**6 pilot cases (ES, IT, PT, BE, CZ, PL)**





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## Scenarios

Green energy and underground scenario

GeoSmartCity has to main objective in creating a framework in which Geo Open Data from the cities are exploited towards the Smart City paradigm allowing the development of various added value applications and new specialized services. GeoSmartCity aims at developing at first such a virtuous framework and a line of activity supporting the European Cities in their Smart process. To be effective, GeoSmartCity will implement with various pilot applications two very important strategic scenarios for a Smart City: Green Energy and Underground. It's clear that the added value of GeoSmartCity Hub can be easily extended to support different scenarios other than the two addressed by the project. The proposed approach makes the proposed solution extendable to other important Smart processes and scenarios like culture, geo-mobility, mobility, transport, urban planning, environmental health impact, etc.




### Green energy

The scenario follows "The Covenant of Mayors" movement to increase energy efficiency and use of renewable energy sources on their territories (14,000 signatories to cover 100 million people).

Sustainable Energy Action Plan (SEAP) → CO<sub>2</sub> reduction target by 2020

Unrelated information: buildings, environmental info, planning and infrastructure



### Underground scenario

Different infrastructure under the same area

Unrelated information: for the management of well lines and systems (damages due to maintenance activities)

Environmental → impact → infrastructure

Safety and security

### Pilot cases


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[Reggio nell'Emilia](#)
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### Underground scenario

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## Pilot cases

Operative pilot cases in the frame of underground and green energy scenarios

Together with the GI open data repository and the GeoSmartCity hub, it will be the availability of a set of 11 operative and re-usable pilot cases in the frame of Green Energy and Underground scenarios demonstrating the possibility to replicate the proposed pilot cases in different area and municipalities, guaranteeing the exploitability and the long term viability of the proposed solution. The pilot will build added value services based on the GeoSmartCity hub that will be locally exploited.

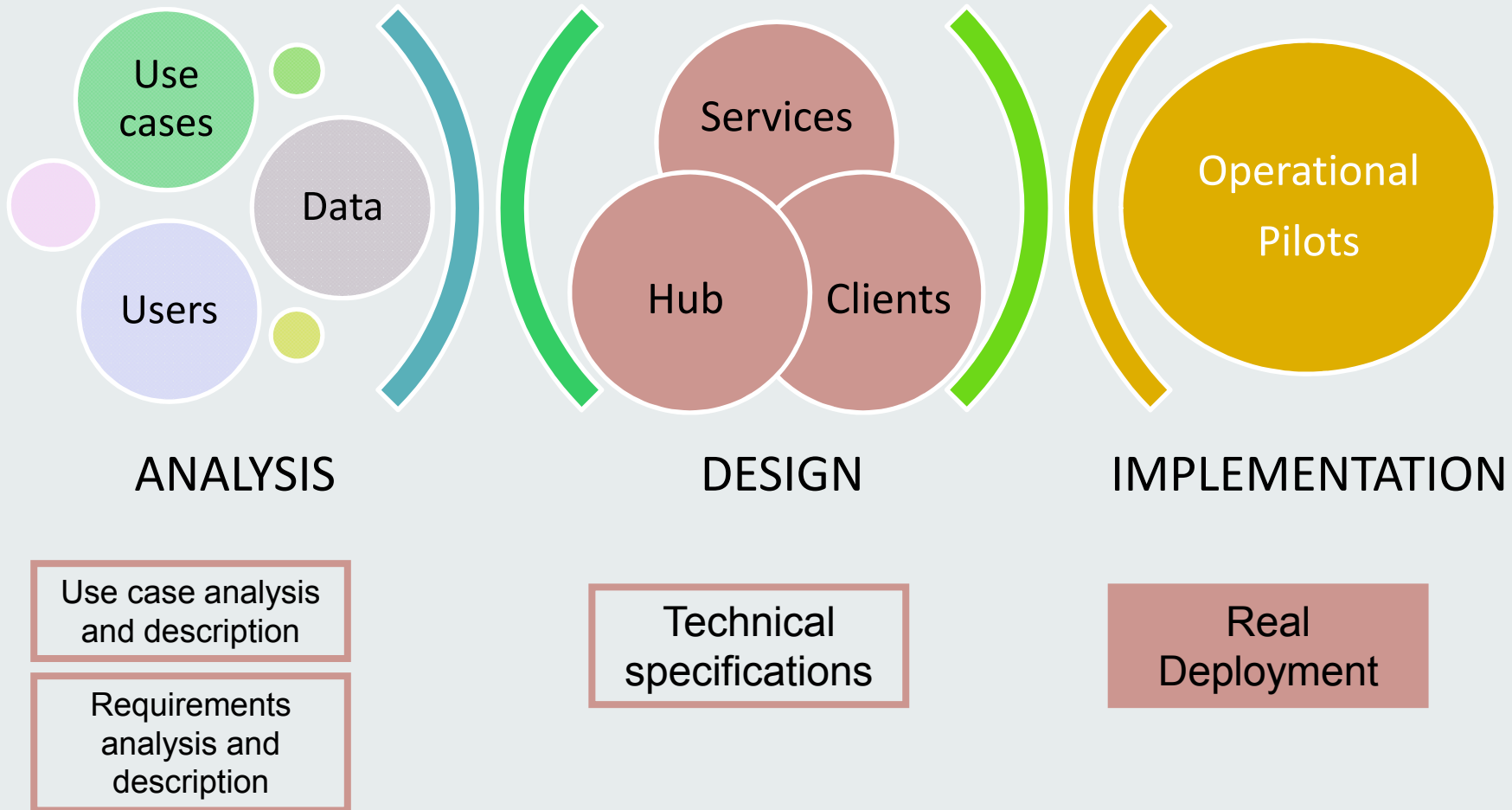
Overall 11 Cities/Regions (with centralized management of services for the cities in the region) are involved in the project. Each City will implement a pilot in the frame of one of the above scenarios.

That will allow to apply and validate the two scenarios in different National and urban and geographical context, as well as a comparison of the different experiences and the share of good practices and lessons in the different cities.

Reggio nell'Emilia	Maroussi	Turku	Girona	Oeiras
IT Green Energy	GR Green Energy	FI Green Energy	ES Green Energy	PT Green Energy and Underground
CRE	EPSILON INTERNATIONAL	TUAS	UdG	MUNICIPIA
SINERGIS s.r.l.	<a href="#">Read more</a>	<a href="#">Read more</a>	<a href="#">Read more</a>	<a href="#">Read more</a>

Flanders region	Genova	Comarca de Pamplona	South Moravia	Ruda Slaska
BE Underground	IT Underground	ES Underground	CZ Underground	PL Underground
VMM	TICASS	TRACASA	INTERGRAPH CS	GEOBID
<a href="#">Read more</a>	CDG	<a href="#">Read more</a>	SRO	<a href="#">Read more</a>
	GISIG		<a href="#">Read more</a>	
	IREN Acqua Gas			<a href="#">Read more</a>
	<a href="#">Read more</a>			

# Use Cases and Requirements





## Status

- 6 pilot sites in EU
- 12 Use cases
- 53 User/System Requirements

## Commonalities

- The improvement of the efficiency of the underground network management (mainly in terms of integration of resources from different actors)
- The citizen involvement (crowdsourcing mobile apps)



## Use cases:

- Consulting real-time data of the water supply and sanitation systems in a GIS viewer.
- Check smart sensor values or incidents in networks

## General Objectives:

- They want to improve the water and sewage GIS existing platform:
- Integrating **real-time information** provided by smart sensors through a SCADA system (a computer system for gathering and analyzing real time data)
- Consult a map with values from sensors or incidents from SCADA

## Main requirements:

- The SCADA system should be linked to the GIS through standardized protocols
- An interface should enable the user to communicate with the SCADA system to consult the real-time data
- The platform should enable the user to generate thematic maps (geoprocessing)





## Use cases:

- Underground Cadastre
- Field works
- Underground networks and environmental hazards

## General Objectives:

- Integrate different underground information layers from different actors (mainly Municipality and Multi-utilities)
- Include **INSPIRE** compliant data in the city underground data management workflow (Harmonisation of gas, water and sewer datasets)
- Use of mobile client for data management
- Use of advanced visualization techniques such as **Augmented Reality**
- Use of a high precision positioning (**GNSS**) device integrated with mobile client for field works
- Intersection between Underground Network and **Environmental Hazard information**



## Use cases:

- Underground Event Management

## General Objectives:

- The Municipality wants to implement an event management platform.
- This platform will take shape in a mobile **crowdsourcing** app for characterization and location of **ruptures in water network**.
- The System shall serve as a Metadata and Open Data provider through Web Services (WMS, WCS, ...).

## Main requirements:

- An authenticated user must approve the crowdsourcing inputs to appear on the map.
- The web client should ensure different authentication levels depending on user roles.
- Open data: All information must be available to be used by applications from other stakeholders.



## Use cases:

- Mobile application

## General Objectives:

- Focus the provision or **volunteered geographic information** (VGI) through a mobile app to report a problem on the public underground infrastructure.
- Use of mobile clients by municipalities and companies technicians (equipped with innovative visualization features such as **Augmented Reality**) to support the management and update of existing data on the field.

## Main requirements:

- Take a picture, determine local position, user comment and send it to appropriate service.
- Read data from dedicated WFS and display them in AR environment.



## Use cases:

- An integrated WebGIS platform giving the ability to verify/update basic information on the underground networks and to share the data in order to clarify the ownership issues.

## General Objectives:

- Similar to the Genova case, this pilot also focuses on the **integration and harmonization of the underground network** data coming from the municipality and the Utility companies.
- Data and specialized services will be integrated in existing GIS platform supporting an integrated approach on the management and maintenance of the networks.

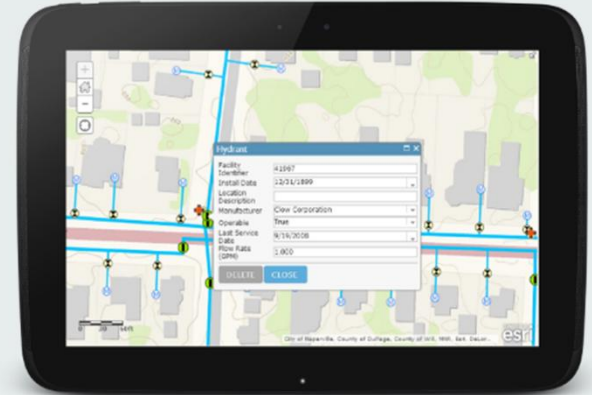
## Main requirements:

- Mobile and web clients
- Authenticated access to information and permission roles



## Use cases:

- Mobile application for the management of the sewage database
- Crowd-sourcing tool




## General Objectives:

- Focus on the conformance of the Flanders sewer network data to **INSPIRE** specifications
- Manage sewage network from a **mobile/web client** application
- Integrate in the system a **crowdsourcing** component so the sewage database can be consulted by the public in order to report possible anomalies or remarks.

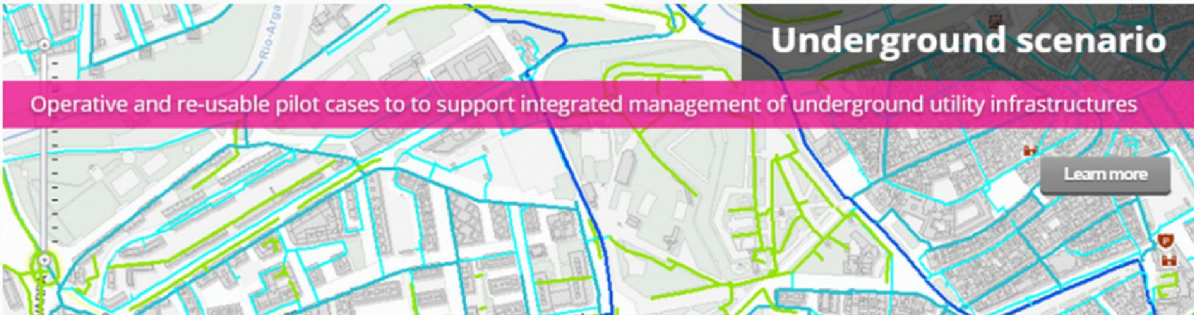
## Main requirements:

- The application must give the opportunity to professionals to enter data, upload different files and to propose changes to geodata.
- The updates (by the users) are live but will only be implemented in the sewage database after validation.






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## Underground scenario

Operative and re-usable pilot cases to support integrated management of underground utility infrastructures

[Learn more](#)



The ICT-PSP European project GeoSmartCity establishes a cross-platform, able to publish open GI and to provide specialized services based on open standards.

### Pilot cases

The potentiality of GeoSmartCity is demonstrated through the development of 11 operative and re-usable pilot cases in the frame of the two scenarios: Green-Energy and Underground. [Learn more](#)

### Virtual hub

For integration and publishing of local, web based, real-time sensor or user-generated open geo-information. [Learn more](#)

### Innovative services

To facilitate the day-to-day operation and management of key municipal infrastructure sectors and public utilities activities. [Learn more](#)



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## Oeiras

Portugal



✓ [Poster Green Energy](#) (766Kb)

✓ [Poster Underground](#) (1.405Kb)



### Objectives

#### Scenario: Green Energy

The overall objective is to monitor energy consumption in public buildings and thus achieve to set goals for reducing consumption. Data will be provided/uploaded by registered householders/occupants. Owners and other Urban Developers will provide information about energy efficiency and calculate solar potential.

#### Scenario: Underground

The Oeiras Municipality wants to implement an event management platform. This platform will take shape in a mobile crowdsourcing app for characterization and location of ruptures in water network.

### Oeiras

[www.municipia.pt](http://www.municipia.pt)

Taguspark Ed. Ciência II

n.º11, 3.ºB 2740-120 Porto Salvo

Portugal

38° 44' 13.8264" N, -9°

18° 18.0828" E

### Scenario

Green Energy and

Underground

### Responsible partners



### Links of interest

• [Panoramic view](#)

## Flanders region

Belgium



### Objectives

This pilot focus on the conformance of the Flanders sewer network data to the INSPIRE specifications.

Sewage database is managed from a mobile client application available for different professionals able to perform different kind of operations

The Pilot also have a crowdsourcing component since is foreseen that the sewage database can be consulted by the public in order to report possible anomalies or remarks.



Characterization and location of ruptures in water network.

### Flanders region

Belgium


51° 5' 42.0064" N, 4° 26' 52.015" E

### Scenario

Underground

### Responsible partners






The screenshot displays the GeoSmartCity website interface. The main navigation bar includes links for Project, Applications, Training, Publications, News, and Contact. The left sidebar shows a map of Europe with markers for various pilot cases, including Oeiras (Portugal), Flanders (Belgium), and Genova (Italy). The main content area is titled "Genova" and "Italy". It features a large "G" logo with "GeoSmartCity" and "nova" text. The "Objectives" section describes the project's goals, including the integration of utility networks and the use of underground data. The "Comune di Genova" section provides contact information and a map of the city. The "Scenario" section lists "Underground" as the focus. The "Responsible partners" section mentions "ITCaso".








The screenshot displays the GeoSmartCity website interface. The top navigation bar includes links for Project, Applications, Training, Publications, News, and Contact. The main content area is titled 'Comarca of Pamplona' and is categorized under 'Spain'. It features a map of the region and a list of resources: a Poster (1.169kb), a Presentation (1.180kb), and another Poster (1.414kb). The 'Objectives' section describes the pilot's aim to improve groundwater management efficiency and real-time data integration. A large photograph of a cityscape is shown below the objectives. On the right, a sidebar provides additional details: the location 'Comarca de Pamplona', coordinates (42° 48' 52.5" N, 2° 35' 50.9" W), the scenario 'Underground', and the responsible partner 'tracasa'.




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## South Moravian Region


Czech Republic



**Objectives**

This pilot focus on two aspects. The first one is the provision or volunteered geographic information (VGI) to report a problems on the public underground infrastructure.

The second is based on the use of mobile clients by municipalities and companies technicians (equipped with innovative visualization features such as Augmented Reality) to support the management and update of existing data on the field.



- Poster (894kb)
- South Moravian Underground scenario (1.008kb)

### South Moravian Region

- South Moravian Region

Czech Republic

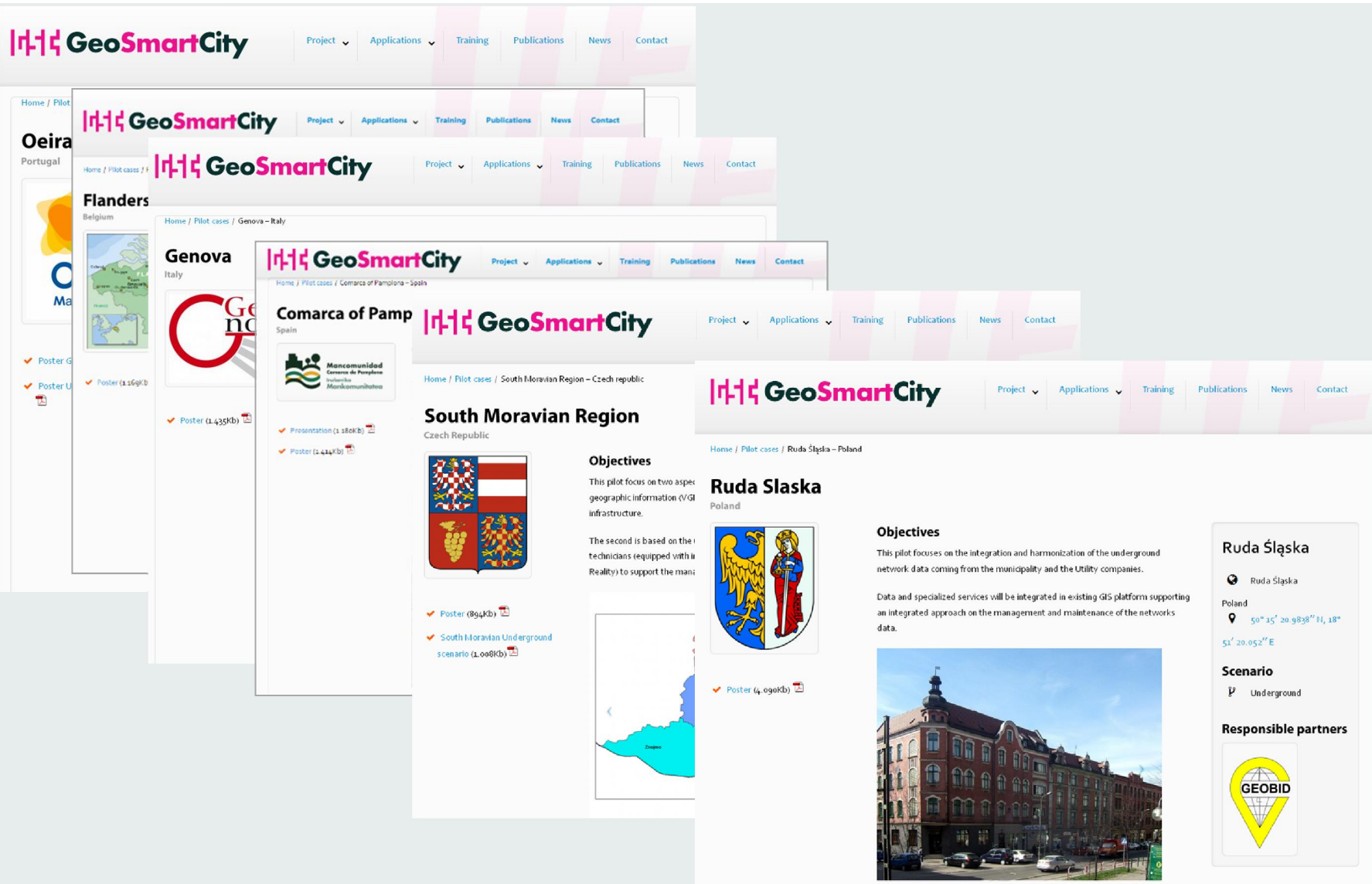
48° 57' 16.0308", 16° 46' 3.684"

**Scenario**

- Underground

**Responsible partners**

INTERGRAPH



The collage displays several screenshots of the GeoSmartCity website, highlighting different pilot cases and project details. The main focus is on the 'South Moravian Region' and 'Ruda Śląska' pilot cases.

**South Moravian Region (Czech Republic)**

- Objectives:** This pilot focus on two aspects: geographic information (VGI) infrastructure. The second is based on the technicians (equipped with Reality) to support the management of the underground network.
- Resources:**
  - Poster (894kb)
  - South Moravian Underground scenario (1.008kb)

**Ruda Śląska (Poland)**

- Objectives:** This pilot focuses on the integration and harmonization of the underground network data coming from the municipality and the Utility companies. Data and specialized services will be integrated in existing GIS platform supporting an integrated approach on the management and maintenance of the networks data.
- Scenario:** Underground
- Responsible partners:** GEOBID

**Other Pilot Cases shown:**

- Oeiras, Portugal
- Flanders, Belgium
- Genova, Italy
- Comarca of Pamplona, Spain