GeoSmartCity

open geo-data for innovative services and user applications towards Smart Cities

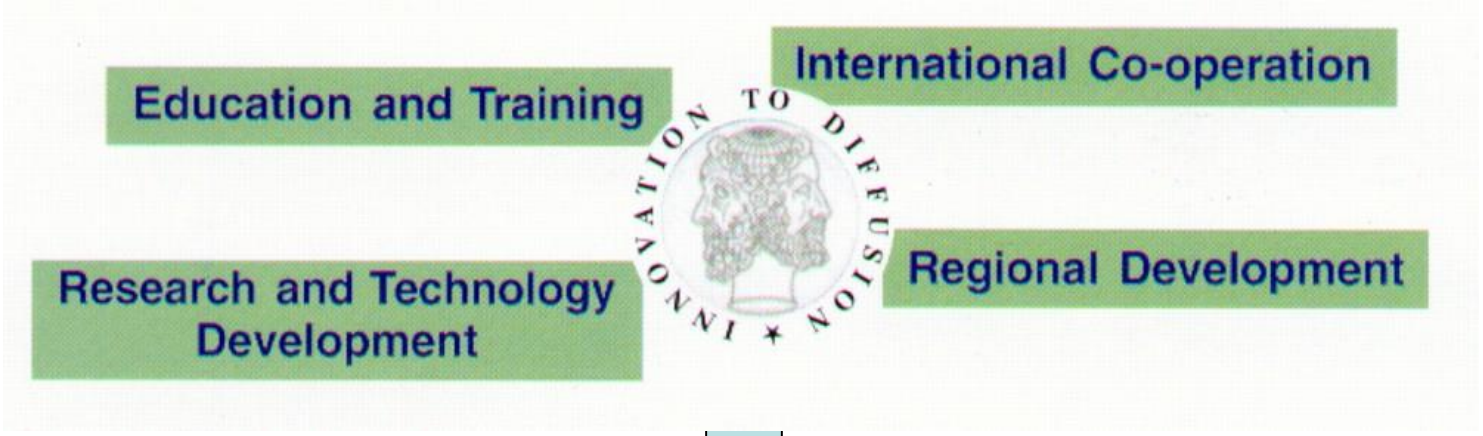
CIP ICT-PSP Project n. 621150
Start date 01-03-2014, duration 36 months

Objectives of the Association

A European Network for innovation and technology transfer in the GI sector and its application domains (territorial planning, water resources and utility networks, coastal management, nature conservation….) for:

- Sharing experience among universities, companies, National and local Bobies and users
- Promoting and developing projects of common interest, with particular reference to the EU programmes

Activity ➡ EU Projects – Thematic Networks



- Promotion of initiatives and EU projects, also with the establishment of thematic networks (participated by several organisations) such as:
  - Water resources Management
  - Coastal Management
  - Nature Conservation
  - ……

Member of the Copernicus Academy

- Applications and technical solutions in line with the EU Directives for Geographic Information (INSPIRE, SEIS Communication for a Shared Environment Information System for Europe, etc.)

Our latest European projects

GeoSmartCity	GeoSmartCity	*Open geo-data for innovative services and user applications towards Smart Cities*
eENVplus	eENVplus	*eEnvironmental services for advanced applications within INSPIRE*
LIFE+IMAGINE	LIFE+IMAGINE	*Integrated Coastal Area Management Application Implementing GMES/Copernicus, INSPIRE and SEIS Data Policies*
LINKVIT	Linkvit	*Leveraging INspire Knowledge into Vocational Innovative Training*
i-locate	i-locate	*Indoor/outdoor location and asset management through open geodata*
giCASES	giCASES	*Creating a University-Enterprise Alliance for a Spatially Enabled Society*

Open geo-data for innovative services and user applications towards Smart Cities

GeoSmartCity implements a platform to share and public geographical open data coming from different sources, such as Public Administrations, Multi-utilities, Companies and Crowd-sourcing.

The platform includes specialized web services to integrate public geographical data with other geo-refenced data (public or private) useful for the smart management of urban infrastructures and public services in the context of the **Smart City** initiative and the **Digital Agenda** for Europe.

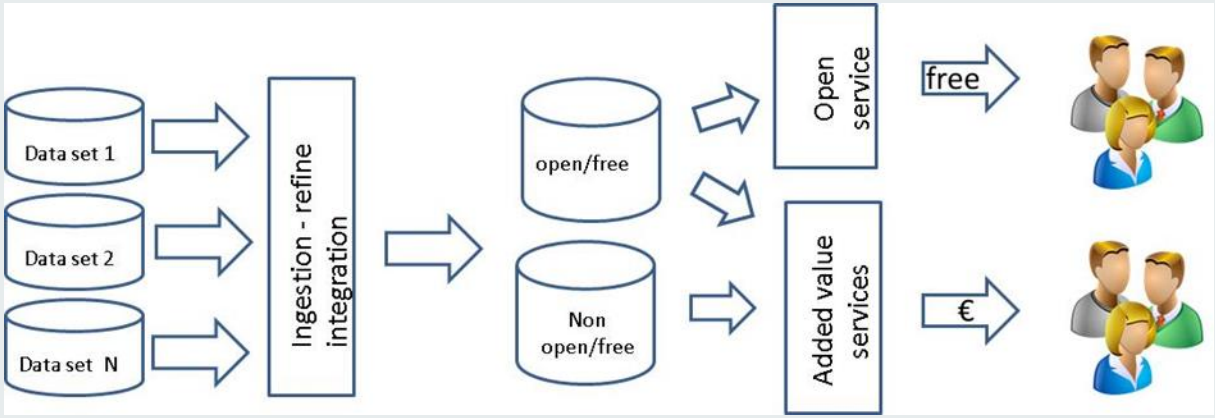
Partnership

Objectives

- Support Cities to 'open' their data to professionals and citizens
- Establish a cross-platform, re-usable, able to publish open-(GI) data, in an urban context, but with a European dimension
- Provision of tools and facilities to integrate GI data/info with open data
- Framework and services to integrate proprietary/restricted data with open (GI) data of the City

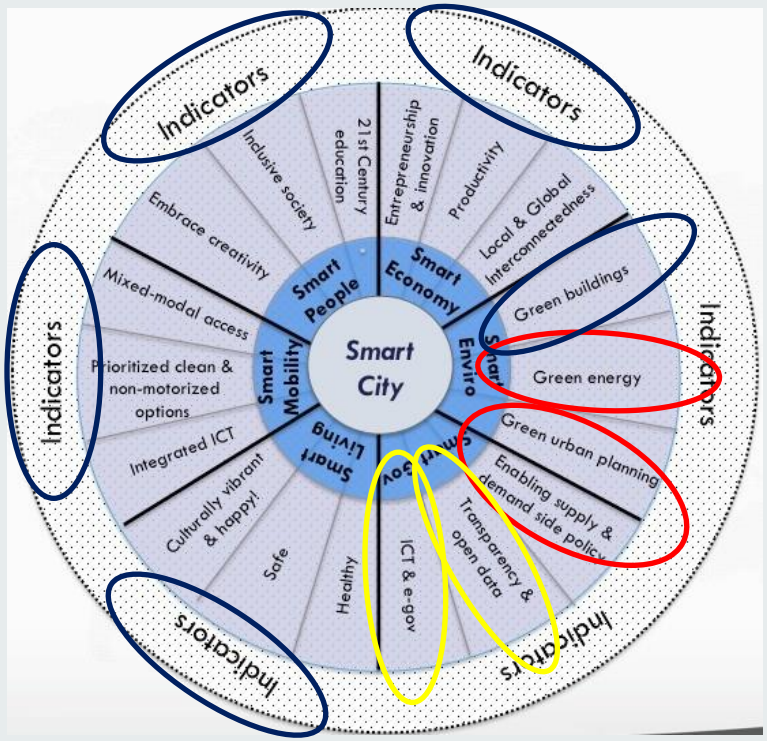
Objectives vs Exploitation

- Open infrastructure to build new business model for PAs and SMEs
- PPP (Public Private Partnerships): collaborative management of Open(GI) data
- Integration of restricted data in a secure way



Objectives vs Exploitation

- Open infrastructure extandable to different SmartCity contexts



- Two application scenarios:

✓Green Energy (5 pilot cases)
✓ Underground (6 pilot cases)

ICT Objectives

- Harmonised environment to integrate different operational protocols and standards, based on existing infrastructures
- Re-use of specialized services based on open standards
- Integration of new base/specialized services
- Ingestion and data integration engine composed by:
  - Harmonised data storage (based on GI standard, open data format)
  - a set of ingestion and data relation services:
    - Ingestion toolkit of GI data (open/restricted)
    - Ingestion toolkit of not-GI data (open/restricted)
    - Refine and reconcile toolkit to link and interconnect data
    - Crowd-sourcing base services based on location services

Outcomes

1. ***GeoSmartCity Hub***

   A cross-platform, re-usable and open hub able to publish open geographic information and to provide specialised services based on open standards services.

2. ***Innovative Services***

   Services platform to View, analyze, extract data from the GeoSmartCity OpenData Hub; Universal Discovery Services; BI and Geoprocessing service platform; Ingestion and data integration engine.

3. ***GeoSmartCity Target Data Models***

   Data Models for the Underground and Green Energy scenarios, including methods and processes for data harmonization and validation.

Outcomes

4. ***Green Energy Scenario***

   Operative and re-usable pilot cases to facilitate diffusion and management of renewable energy within cities.

5. ***Underground Scenario***

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

6. ***GeoSmartCity Training Framework***

   Designed in order to make available existing knowledge and transfer the outcomes of the project towards the target groups of users. The Training Framework complements and support dissemination and exploitation, fostering Capacity Building

City Pilots and Scenarios

Turku

Flanders Region

South Moravian Region

Comarca of Pamplona

Ruda Slaska (Katowice area)

Reggio nell'Emilia

Girona

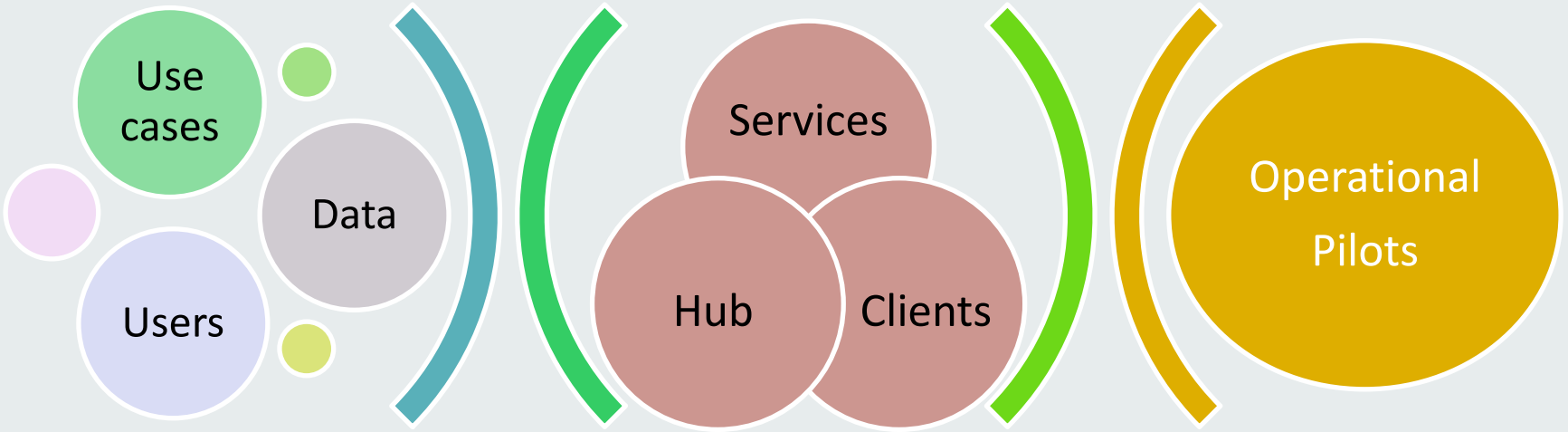
Genova

Maroussi

Oeiras

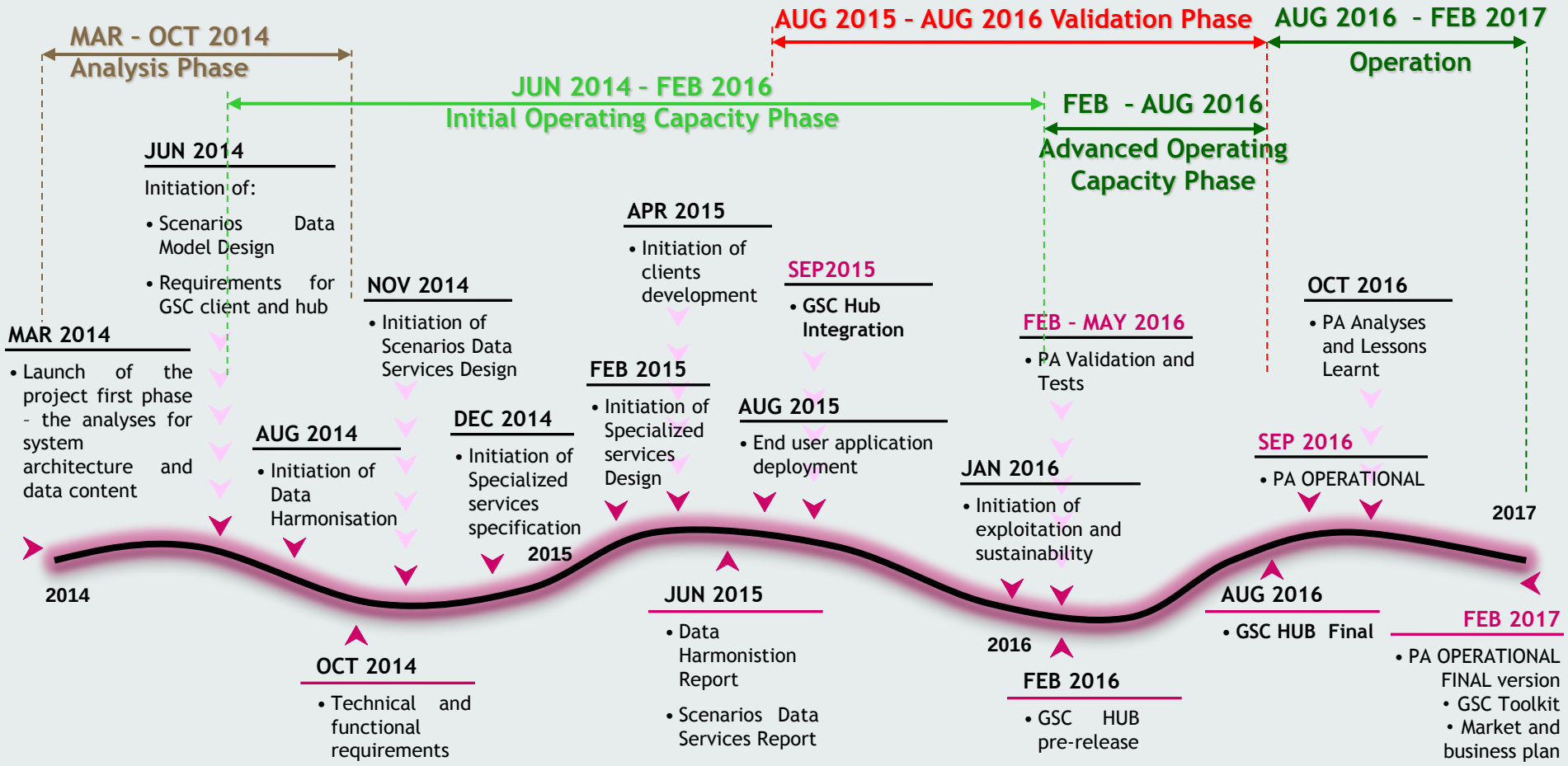
Oeiras

PROJECT PHASES



ANALYSIS	DESIGN	IMPLEMENTATION
Use case analysis and description	Technical specifications	Real Deployment
Requirements analysis and description		

Road Map


MAR - OCT 2014
Analysis Phase
JUN 2014 - FEB 2016
Initial Operating Capacity Phase
AUG 2015 - AUG 2016 Validation Phase
AUG 2016 - FEB 2017
Operation
FEB - AUG 2016
Advanced Operating Capacity Phase
MAR 2014
• Launch of the project first phase - the analyses for system architecture and data content
JUN 2014
Initiation of:
• Scenarios Data Model Design
• Requirements for GSC client and hub
AUG 2014
• Initiation of Data Harmonisation
NOV 2014
• Initiation of Scenarios Data Services Design
DEC 2014
• Initiation of Specialized services specification
OCT 2014
• Technical and functional requirements
2014
2015
APR 2015
• Initiation of clients development
FEB 2015
• Initiation of Specialized services Design
SEP2015
• GSC Hub Integration
AUG 2015
• End user application deployment
JUN 2015
• Data Harmonistion Report
• Scenarios Data Services Report
2016
JAN 2016
• Initiation of exploitation and sustainability
FEB 2016
• GSC HUB pre-release
FEB - MAY 2016
• PA Validation and Tests
OCT 2016
• PA Analyses and Lessons Learnt
SEP 2016
• PA OPERATIONAL
AUG 2016
• GSC HUB Final
2017
FEB 2017
• PA OPERATIONAL FINAL version
• GSC Toolkit
• Market and business plan

Training Framework

User resources

GeoSmartCity Repository

Visit our GitHub repository to access all the technical information and source code.

GitHub Repository

Applications Showcase

11 Smart City operative applications demonstrating the added value services of the Hub.

Apps Showcase

User Guides and Training

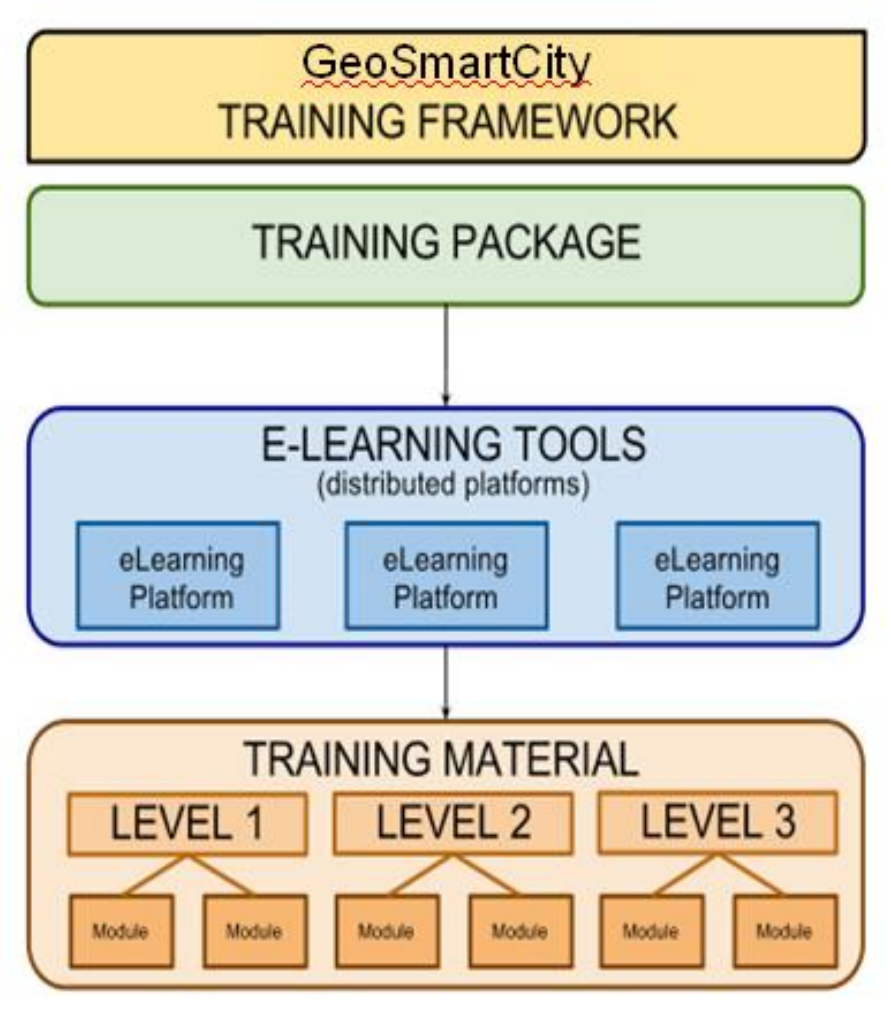
Free e-Learning courses on GIS, INSPIRE and and the technical outcomes of GeoSmartCity.

Training offer

Contact and Enquiries

Get in touch with us. Make an enquiry for professional support and training.

Send us a message


GeoSmartCity
TRAINING FRAMEWORK
TRAINING PACKAGE
E-LEARNING TOOLS
(distributed platforms)
eLearning Platform
eLearning Platform
eLearning Platform
TRAINING MATERIAL
LEVEL 1
LEVEL 2
LEVEL 3
Module
Module
Module
Module
Module
Module

Training organisation

The Training Framework is organised on 3 levels:

1. Background knowledge
    - Knowledge on Directives/ Technologies
2. The GeoSmartCity Infrastructure
    - Knowledge on the technical outcomes and adoption of GeoSmartCity.
3. The GeoSmartCity Pilots
    - Knowledge on the Pilot applications using the GeoSmartCity Infrastructure.

1. Backgroud knowledge 1/2

The INSPIRE Directive and related technologies

- Introduction to INSPIRE
- Basic of INSPIRE Data Specification
- Basics of INSPIRE Network Services
- Data Harmonisation
- Procedures for Data and Metadata Harmonization
- Example of Data Transformation
- Metadata and Data validation for INSPIRE
- Introduction to Linked Data

GIS Technologies

- GIS Introduction
- Data Visualization &Cartography
- Geo-Crowdsourcing: Open Street Map workflow

1. Backgroud knowledge 2/2

Thematic Knowledge: Underground Management

- Urban drainage & Sewerage
- Operation And Maintenance Of Underground Assets
- Water Supply System
- Water and wastewater pollution characterisation and sources
- General Aspects Of Waste Water Treatment Plant

Thematic Knowledge: Greeen Energy

- The European Energy Policy Strategy
- Energy efficiency in buildings
- The Covenant of Mayors

2. The GeoSmartCity Infrastructure

- The GeoSmartCity Data Models
- The GeoSmartCity Specialised services
- The GeoSmartCity Hub
- The GeoSmartCity Web and Mobile Clients

3. The GeoSmartCity Pilots

- The GeoSmartCity Pilot Applications

2. The GeoSmartCity Infrastructure

- The GeoSmartCity Data Models
- The GeoSmartCity Specialised services
- The GeoSmartCity Hub
- The GeoSmartCity Web and Mobile Clients

3. The GeoSmartCity Pilots

- The GeoSmartCity Pilot Applications

Leaflet Trainig Framework

GeoSmartCity Training Framework

Open geo-data for innovative services and user applications towards Smart Cities

Smart City management requires integration of geographic data from many and heterogeneous sources, spanning from pan-European data sets (as the ones from the Public Sector Information and the INSPIRE Directives) to local data with "home-made" semantics. In order to analyse and visualize geographic information (GI) through these data sets, it is necessary to integrate the data in terms of formats, access protocols, transformation and coordinate reference system, data harmonization.

The ICT-PSP European project GeoSmartCity establishes a cross-platform, able to publish open GI and to provide specialized services based on open standards services protocols. Starting by the availability of the open GI through open standards, the platform gives the possibility to integrate them with other public/private data in order to design the specialized services needed to implement the two addressed Smart City scenarios: Green Energy and Underground.

The GeoSmartCity Training Framework is designed in order to make available existing knowledge and transfer the outcomes of the project towards the target groups of users. The Training Framework complements and support dissemination and exploitation, fostering Capacity Building.

Background Knowledge

The INSPIRE Directive and related technologies

Introduction to INSPIRE
Deals with the main elements of the INSPIRE Directive: its context and background, the scope and major chapters of the Directive, an overview of the related implementing rules.

Basic of INSPIRE Data Specification
The module aims to teach the INSPIRE data specification development approach; it explains the standardized approach, the different interoperability components to be taken into account and how this was implemented in INSPIRE.

Basic of INSPIRE Network Services
The module introduces the concept of a Service Oriented Architecture (SOA). It describes and illustrates the 5 types of INSPIRE network services. It explains the link to existing standards of ISO and OGC (e.g. CSW) and also discusses the INSPIRE implementing rules that are applicable including conformity aspects.

Data Harmonisation
This module explains the basic concepts of data harmonisation in general and specifically schema translation.

Procedure for Data and Metadata Harmonisation
This Module explains how to transform heterogeneous source datasets and metadata according to the relevant INSPIRE target schemas.

Examples of Data Transformation
This module provides transformation examples of a source dataset into a dataset compliant to the INSPIRE Data Specifications.

Metadata and Data validation for INSPIRE
This module provides validation examples of datasets and metadata against the Requirements of the INSPIRE Data Specifications.

Introduction to Linked Data
The objective of this training module is to acquire know how on the basic concepts of Linked Data principle.

TRAINING MODULES

Background Knowledge

The INSPIRE Directive and related technologies

- Introduction to INSPIRE
- Basic of INSPIRE Data Specification
- Basic of INSPIRE Network Services
- Data Harmonisation
- Procedure for Data and Metadata Harmonisation
- Examples of Data Transformation
- Metadata and Data validation for INSPIRE
- Introduction to Linked Data

GIS Technologies

- GIS Introduction
- Data visualization & Cartography
- Geo-Crowdsourcing: Open Street Map workflow

Thematic Knowledge: Underground Management

- Urban drainage & Sewerage
- Operation and Maintenance of Underground Assets
- Water Supply System
- Water and wastewater pollution characterization and sources
- General aspects of waste water treatment plant

Thematic Knowledge: Green Energy

- The European Energy Policy Strategy
- Energy efficiency in buildings
- The Covenant of Mayors

GeoSmartCity

GIS Technologies

GIS Introduction
Provides definition about what is a GIS, which are the key components of a GIS, which are the inputs of the system, and how important it is the role that geodata plays in the whole system.

Data Visualization & Cartography
The module is designed to explore the basics of cartography, learn how to build better maps and discover different types of data visualization according to new tendencies.

Geo-Crowdsourcing: Open Street Map workflow
The training module seeks to highlight the OSM wokflow: starting with the capture and acquisition of geographical information, to editing and publishing the data.

Thematic Knowledge: Underground Management

Urban Drainage & Sewerage
This course aims at providing an explanation of the elements and processes involved in the urban drainage systems and a recommendation of appropriate application.

Operation and Maintenance of Underground Assets
Deals with having an overall understanding of processes, activities and authorizations needed to intervene on the underground infrastructures.

Water Supply System
The learner will be provided with an understanding of the basic principles and knowledge of water supply system.

Water and Wastewater Pollution Characterization and Sources
The module provides an overview of the water pollution and its origins providing an introduction to water quality guidelines, regulations and performance criteria.

General Aspects of Waste Water Treatment Plant
This course is designed to offer an overview of the various treatment processes including physical, chemical and microbiological treatment of water and wastewater.

Thematic Knowledge: Green Energy

The European Energy Policy Strategy
The module traces the path of the European energy policy evolution, starting from the beginning of the common European energy policy (2005) to the present days, highlighting goals, challenges and critical issues.

Energy Efficiency in Buildings
Overview of the building energy performance assessment activity and its role into improving the global energy consumption into the building sector.

The Covenant of Mayors
To provide a general overview of the Covenant of Mayors initiative, its history and further evolution.

The GeoSmartCity Infrastructure

A set of Modules to transfer the technical results of the project and the Infrastructure:

- The GeoSmartCity Data Models
- The GeoSmartCity Specialised Services
- The GeoSmartCity Hub
- The GeoSmartCity Web and Mobile Clients

The GeoSmartCity Pilot

The GeoSmartCity Pilot applications
A set of Modules to transfer the results of the GeoSmartCity Pilot applications.

UNDERGROUND SCENARIO:
Pilots of: Comarca of Pamplona (ES), Flanders Region (BE), Genova (IT), Oeiras (PT), Ruda Slaska (PL), South Moravia (CZ).

GREEN ENERFY SCENARIO:
Pilots of: Girona (ES), Maroussi (GR), Oeiras (PT), Reggio nell'Emilia (IT), Turku (FI).

The GeoSmartCity Infrastructure

- GeoSmartCity Data Models
- GeoSmartCity Specialised Services
- GeoSmartCity Hub
- GeoSmartCity Web and Mobile Clients

The GeoSmartCity Pilots

- The GeoSmartCity Pilot Applications

PARTNERS

GISIG, Geographical Information Systems International Group – ITALY
IREN S.p.A. - Italy
Dedagroup Public Services s.r.l. - Italy
INTERGRAPH CS s.r.o. - Czech Republic
AVINET - Norway
EPSILON ITALIA s.r.l. - Italy
TRACASA - Spain
Comune di Genova - Italy
TICASS - Italy
TUAS - Finland
EPSILON International SA - Greece
VMM - Belgium
GEOBID sp.z - Poland
Universitat de Girona - Spain
Comune di Reggio nell'Emilia - Italy
Município - Portugal

More info at: www.geosmartcity.eu

GeoSmartCity Community

- The final outcome of GeoSmartCity project is a long-term sustainable open network of stakeholders.
- All the interested organisations are very welcomed

More details about the Network potentialities and opportunities in the Round table and discussion about the "GeoSmartCity follow-up and exploitation"

Many thanks for you interest for GeoSmartCity!

Giorgio Saio
(g.saio@gisig.it)

Agenda

	European and Local Policies in the context of Smart Cities
14:20 – 16:00	• Geospatial solutions for a location-enabled society (Francesco Pignatelli, European Commission, DG JRC, Unit B.6 - Digital Economy) • Building Energy Use – assessment methods based on location data (Hans Bloem, European Commission, DG JRC, Unit C.2 - Energy Efficiency & Renewables) • Smart Applications are driver or passenger of the INSPIRE Directive? (Carlo Cipolloni, ISPRA, Italian INSPIRE Technical Responsible) • Smart Cities and Smart Urban Planning: linking SDI and data on the web (Danny Vandenbroucke, KU. Leuven) • Smart City experiences of the Municipality of Genoa, the Geographical Information aspects (Paolo Castiglieri, Municipality of Genoa)
	GeoSmartCity outcomes
16:00 – 17:30	• The GeoSmartCity HUB and Services (Maria Cabello – TRACASA) • The Green Energy Scenario and Pilots • The Underground Scenario and Pilots (Piergiorgio Cipriano – DEDAGROUP Public Service) • The pilot case of Genova (Marco Dorazi – Comune di Genova; Stefano Bellio – IREN S.p.A)
17:30 – 18:00	Round table and discussion: “GeoSmartCity follow-up and exploitation”