Presented at the FIG Congress 2018,
May 6-11, 2018 in Istanbul, Turkey

This project is financed by
the European Union and the Republic of Turkey

National Programme for Turkey 2010 – Instrument for Pre-Accession Assistance

INSPIRing Geospatial Framework For Local Administrations

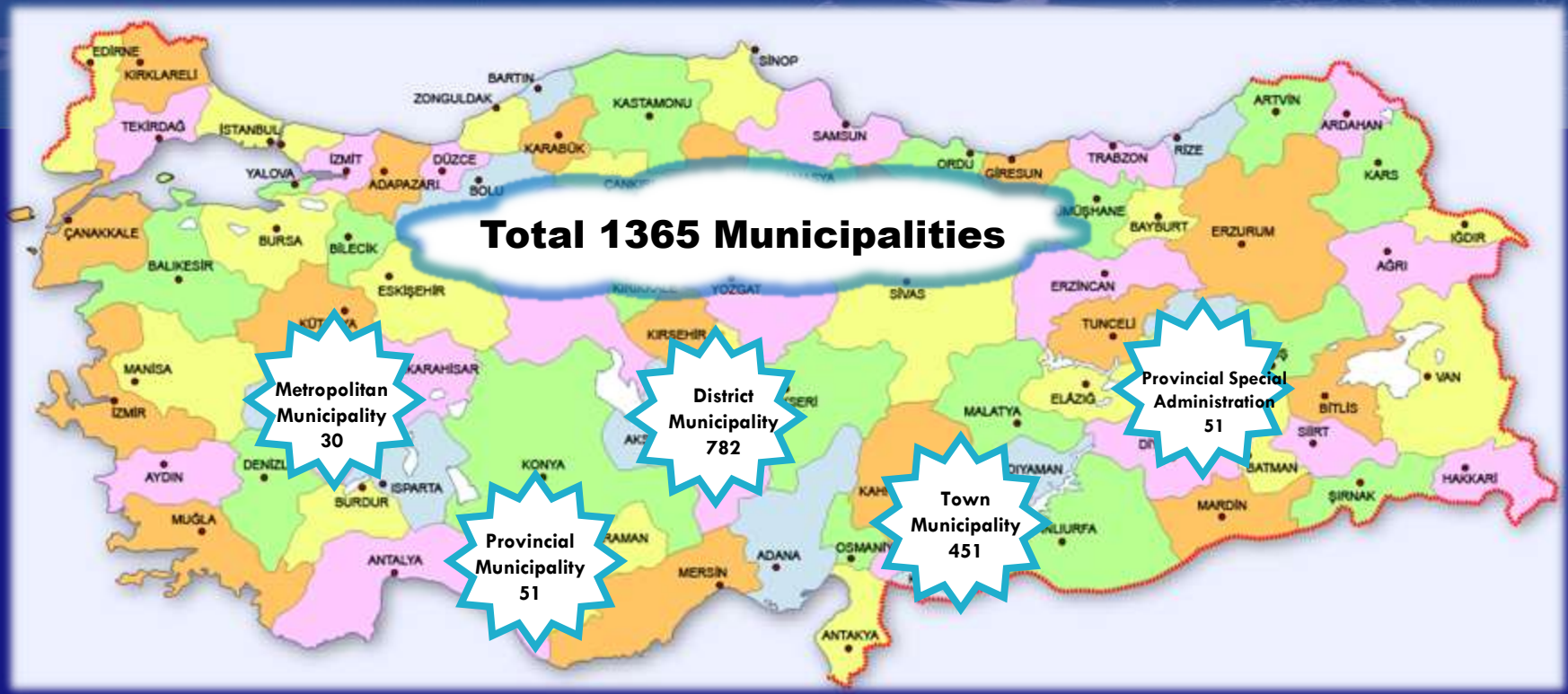
Ali Toksoy, Onur Lenk, Hüseyin Bayraktar, Mahir Güney, Erkan Tın,
Yıldırım Bayar, Yasemin KOÇ

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Outline

- Rationale and Context
- Components of Geospatial Framework
- Achievements

Driving force is the Local Administrations…



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Motivation

All municipalities are the main resources and users of spatial data in INSPIRE context

They may have deficiency in financial and human resources which cause delays for establishing appropriate geospatial infrastructure

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Challenges for Local Administrations

- **Each municipality must make its own IT investment (i.e. servers, software packages, database etc.), and**
- **Train its own staff**
- **Provide 'standard spatial data' through 'standardized services' for other stakeholders**

  - ✓ *…feasibility and cost-benefit considerations shall be taken into account in the development of the implementing rules (INSPIRE D. Article 7 (1))*
  - ✓ *…public authorities are given the technical possibility to link their spatial data sets and services to the network …where spatial datasets and services comply with implementing rules with regard, in particular, to metadata, network services and interoperability (INSPIRE D. Article 7 ,11 (1),12..)*

Solution

- Ministry of Environment and Urbanization (MoEU) **aimed to provide appropriate infrastructure to develop and maintain geospatial elements through cloud system..**

- ✓ On-demand self service,
- ✓ Broad network access,
- ✓ Resource pooling,
- ✓ Rapid elasticity,
- ✓ Measured service.

Data Security

System Security

Interoperability

Cost Saving

Standard Data
High Performance

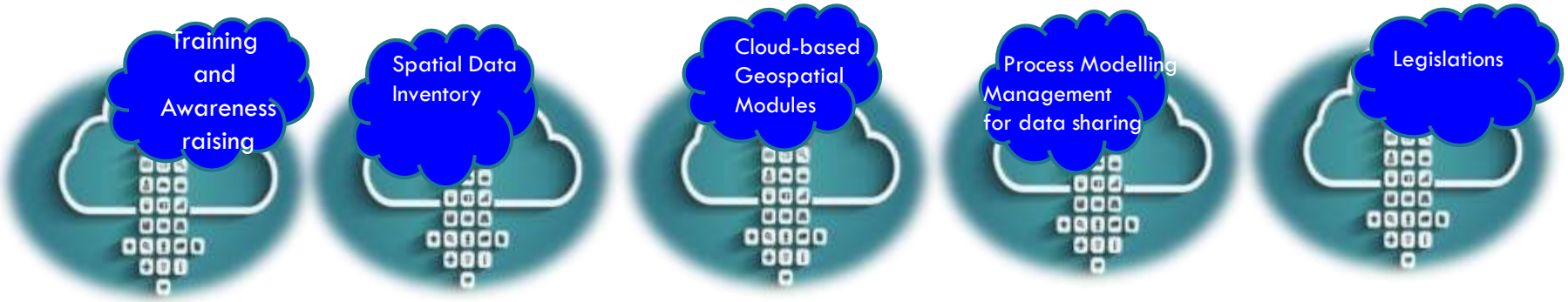
Extendable System

Effective Human Resource

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Components and Expected Results

This project is financed by the European Union and the Republic of Turkey.



Results to be Achieved

1

MoEU has increased its own and other relevant institutions' capacity for future implementation of the INSPIRE Directive.

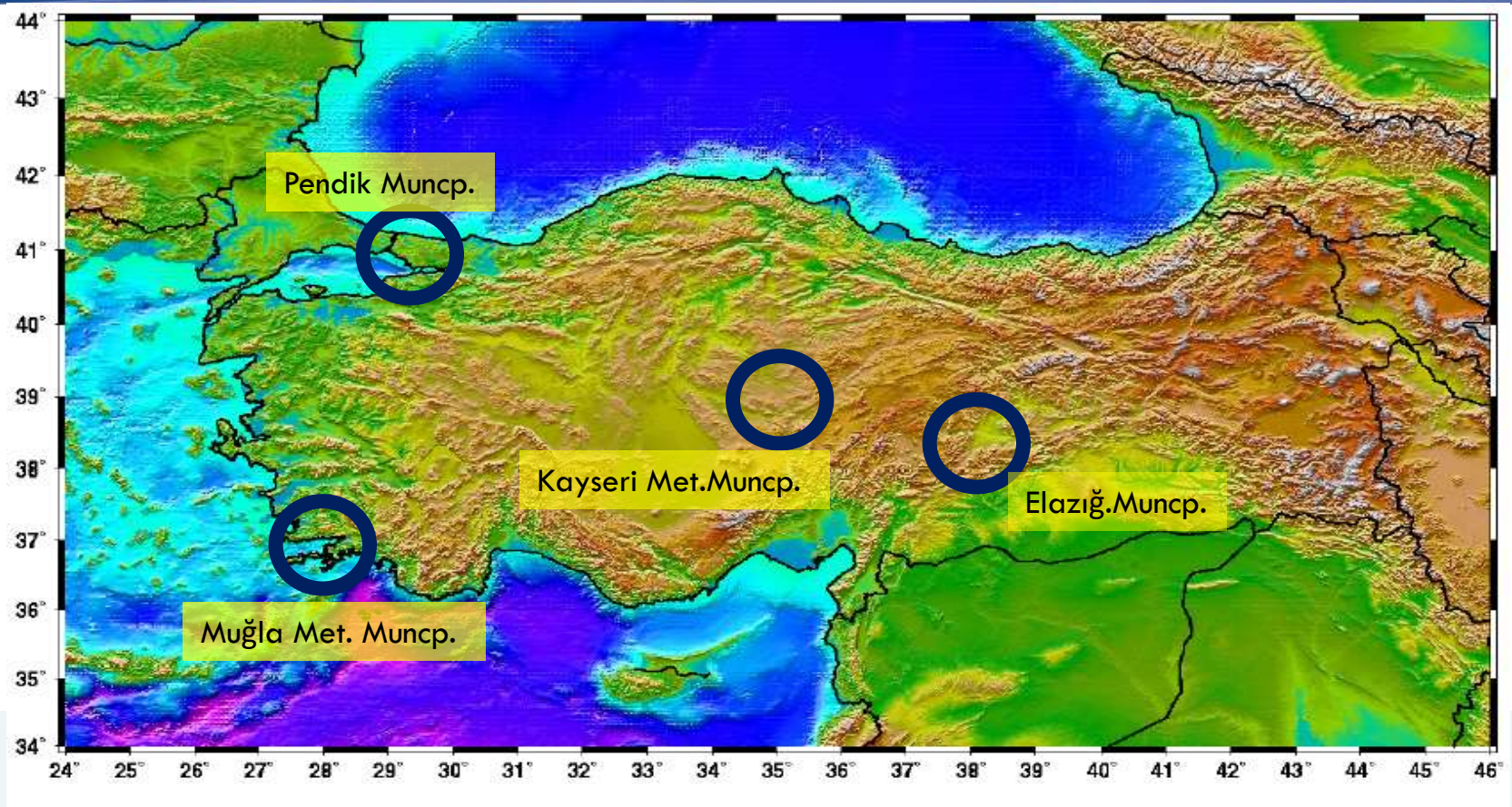
2

Raised awareness for related stakeholders and decision makers.

3

More environmentally friendly land planning has developed in line with the EU spatial planning approach

Pilot Areas for Spatial Data Inventory



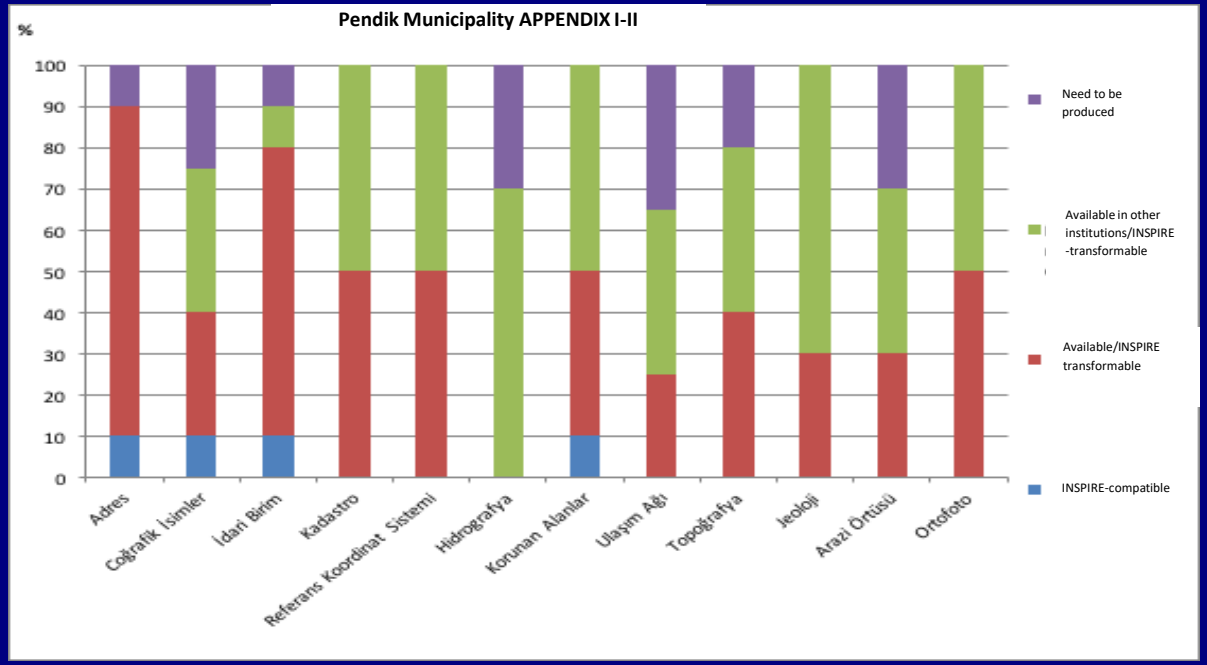
Data Assessment in Pilot Areas

- Almost each municipality has data sets that correspond to data themes such as administrative unit, address, cadaster parcel, transportation, topography, reference systems, protected sites, transportation networks, buildings and land use as internal parts of their local GIS/UIS projects.
- In this context, it is possible to produce and transform the data sets to INSPIRE standard at levels to fulfill basic and compulsory types of details and attributes.

Local Government	Data Availability	INSPIRE	
		Compatible Data	Transformable Data
Kayseri Metropolitan Municipality and Talas Sub-Provincial Municipality	55 %	7 %	48 %
İstanbul- Pendik Sub-Provincial Municipality	59 %	9 %	50%
Elazığ Municipality	45 %	4%	41%
Muğla Metropolitan Municipality	49 %	5%	44%

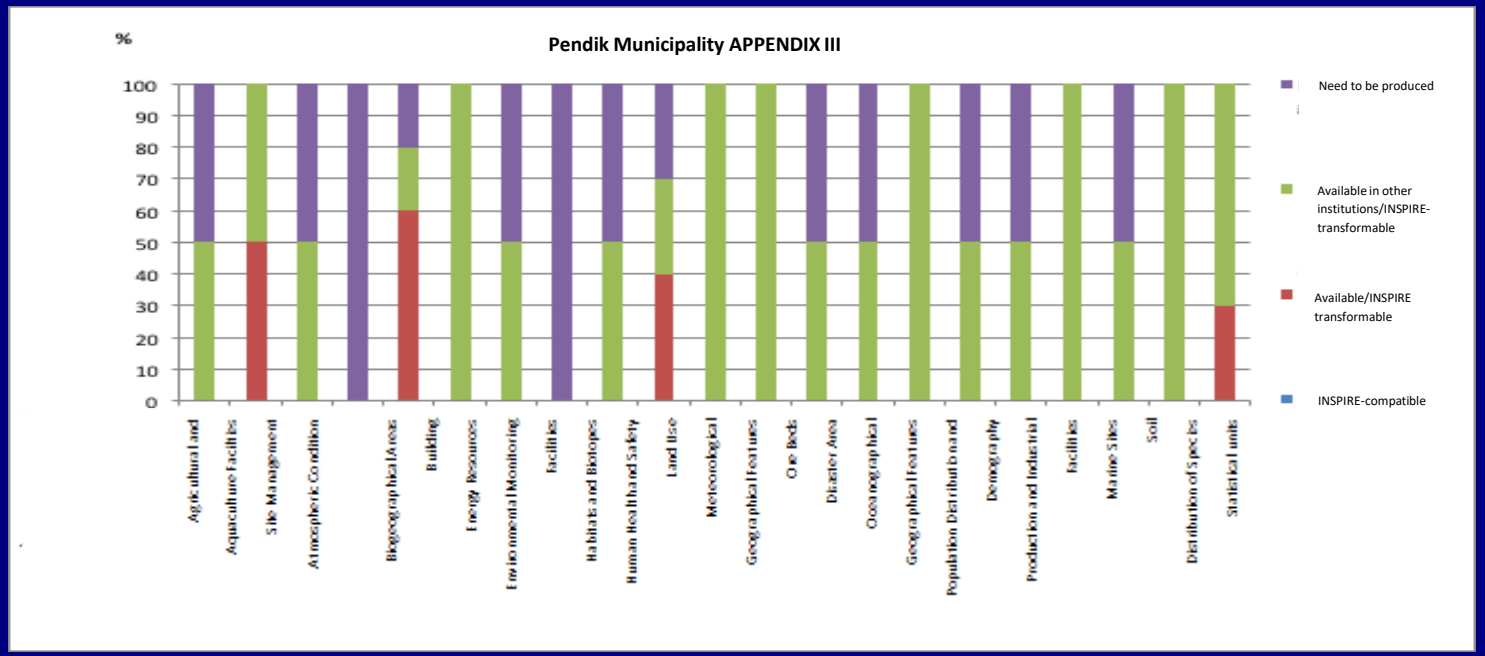
REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Data Assessment in Pilot Areas



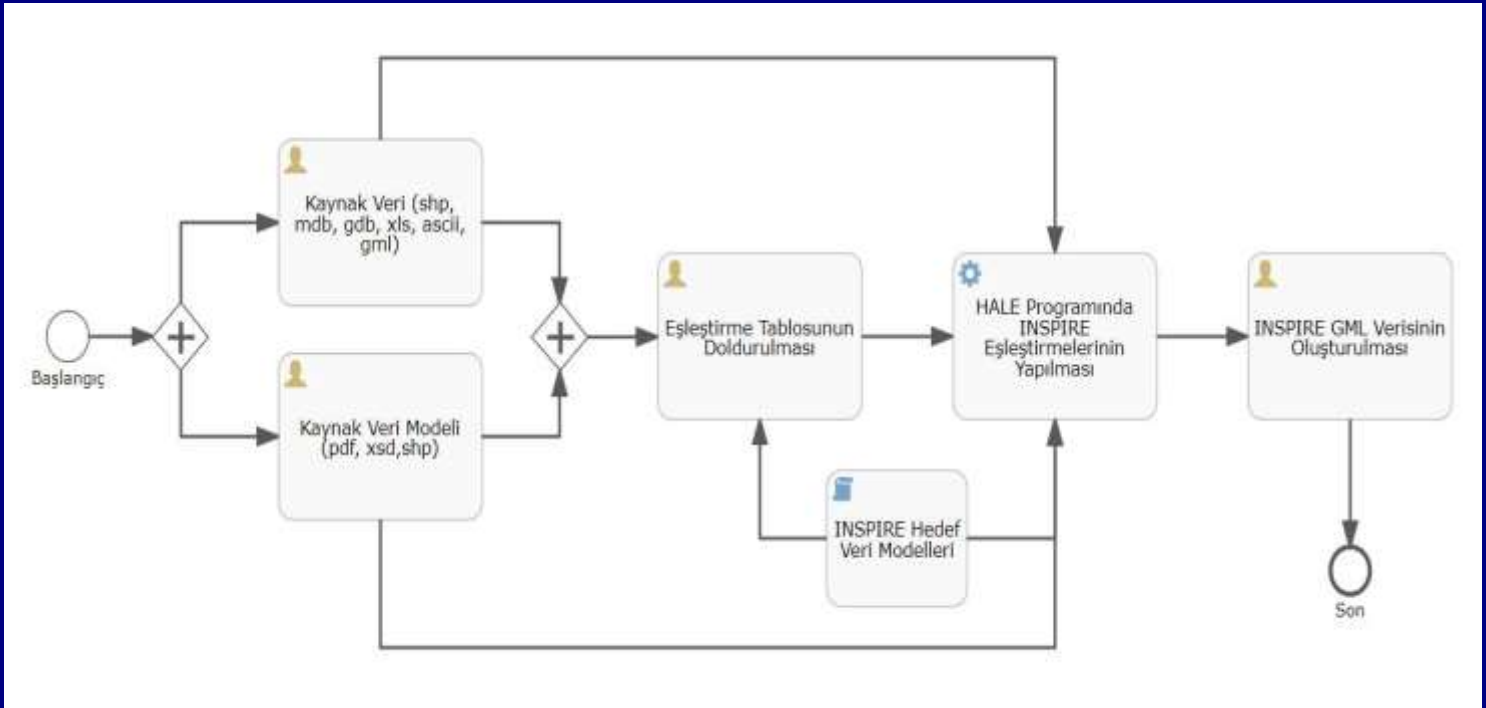
REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT AND URBANISATION

Data Assessment in Pilot Areas



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

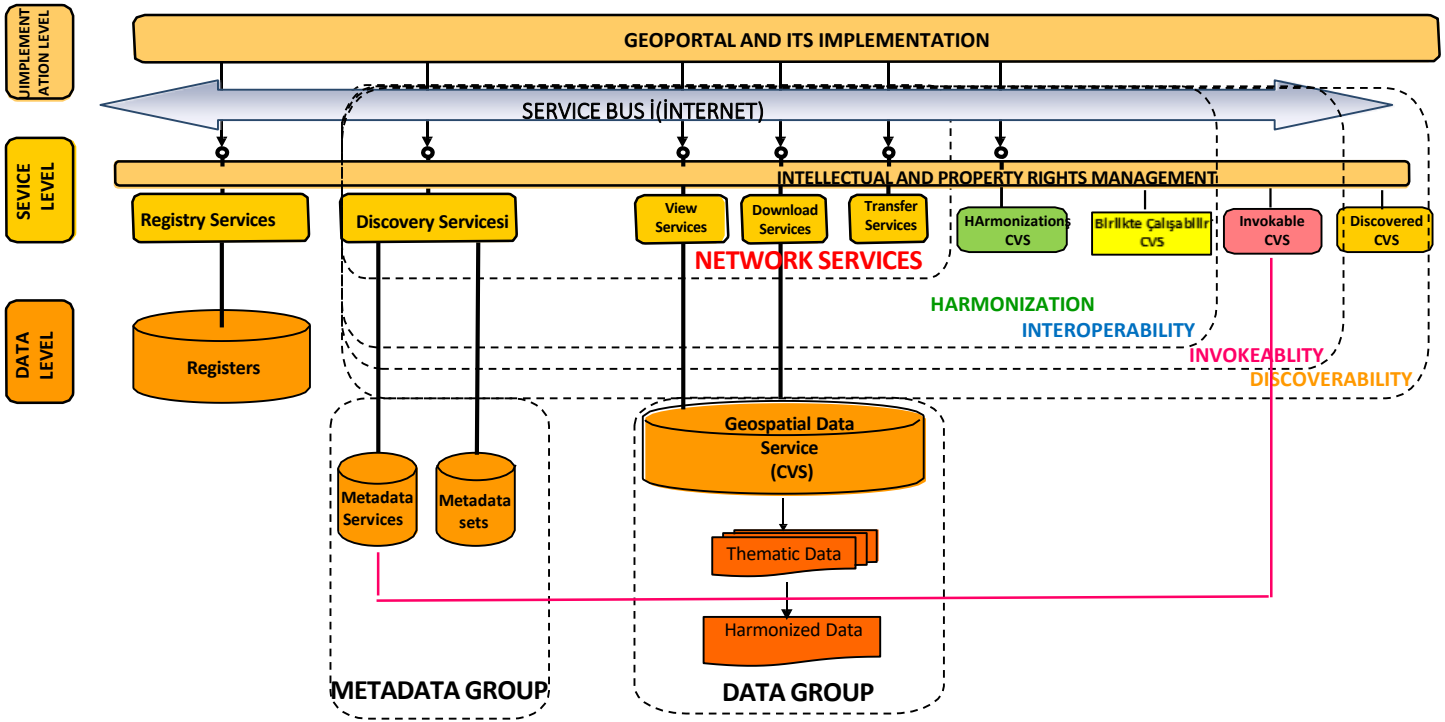
Formation of INSPIRE GMLs



Visited about 50 Data Stakeholder Public organizations

This project is co-financed by the European Union and the Republic of Turkey.

Standard Geospatial Data through Standard Geospatial Service for an Effective Geospatial Frame



NATIONAL STAKEHOLDERS

WMS / WFS/ WCS

OGC

GEO-MODULES & SERVICES

PROCESS MODELS

META

DATA

MoEU

MoEU DIRECTORATES

DISASTER RECOVERY CENTER

PUBLIC (THROUGH E-GOVERNMENT)

Web Browsers

MUNICIPALTIES

WMS / WFS/ WCS

OGC

Municipality 1

Municipality 2

Municipality N

Cloud-based Geospatial Modules

- *Cloud Storage*
- *Cemetery Module*
- *Topographic Map*
- *Expropriation*
- *Infrastructure*
- *Building Information Management*
- *Building Inventory Module*
- *Address Assessment*
- *Urban Information Module*
- *Application of Article-18*
- *Process Management*
- *INSPIRE Data Management Module*
- *Cloud Infrastructure*
- *Training Portal*

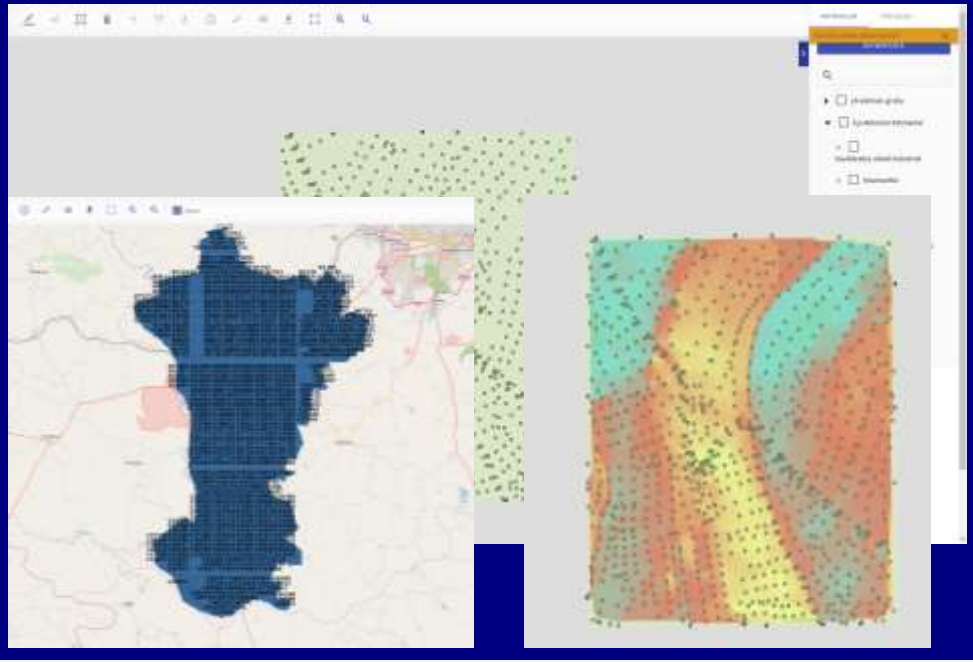
REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Cloud-based Geospatial Modules

- ***Building Information Management***

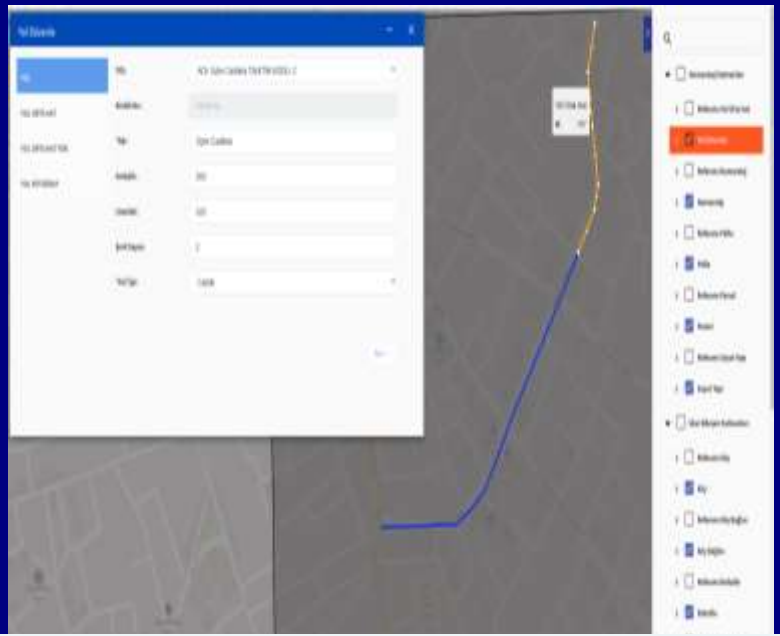
Cloud-based Geospatial Modules

❖ *3D Topographic Map*



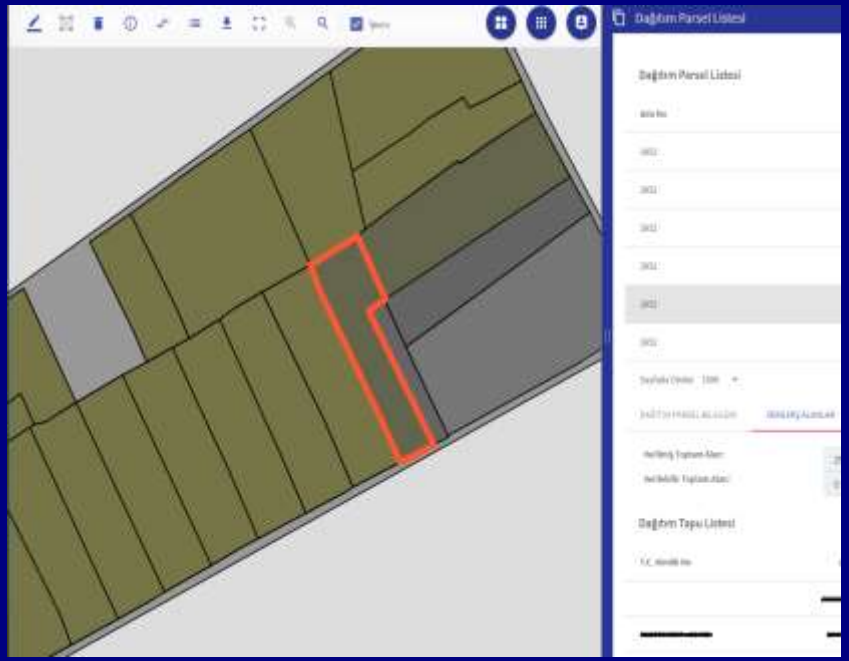
Cloud-based Geospatial Modules

❖ *Address Assessment*



Cloud-based Geospatial Modules

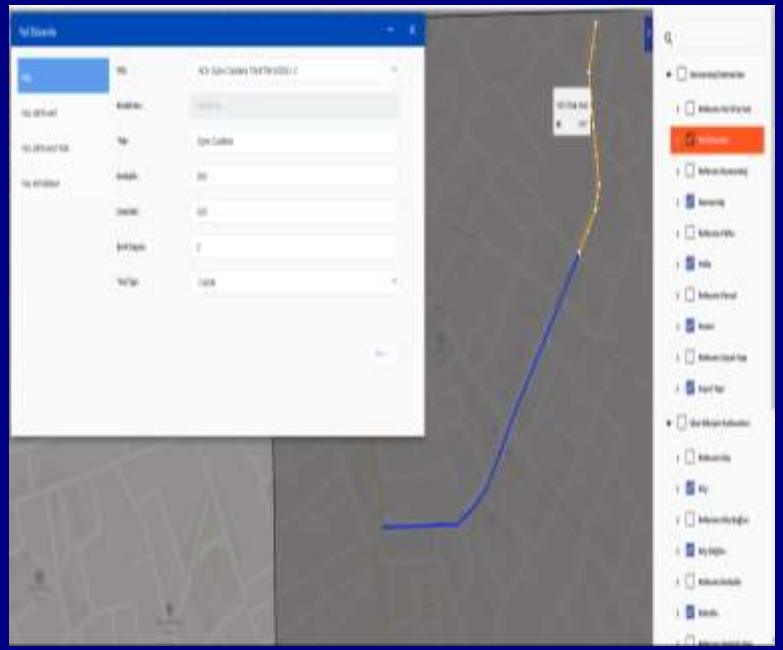
❖ *Application of Article-18*



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Cloud-based Geospatial Modules

❖ ***Address Assessment***

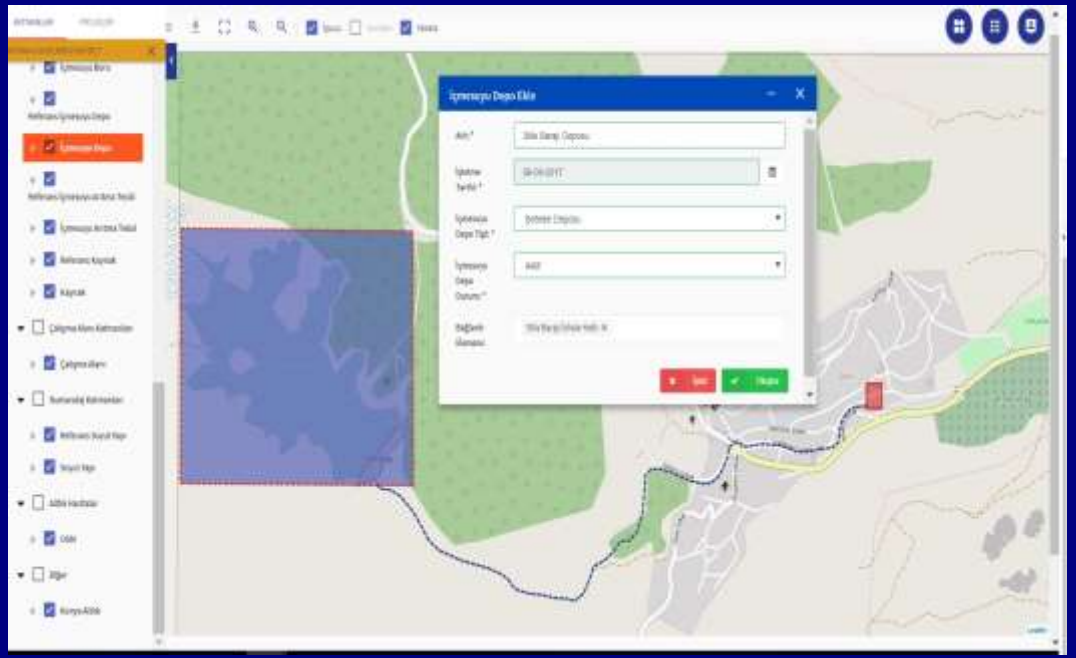


Cloud-based Geospatial Modules

- ***Cemetery Module***

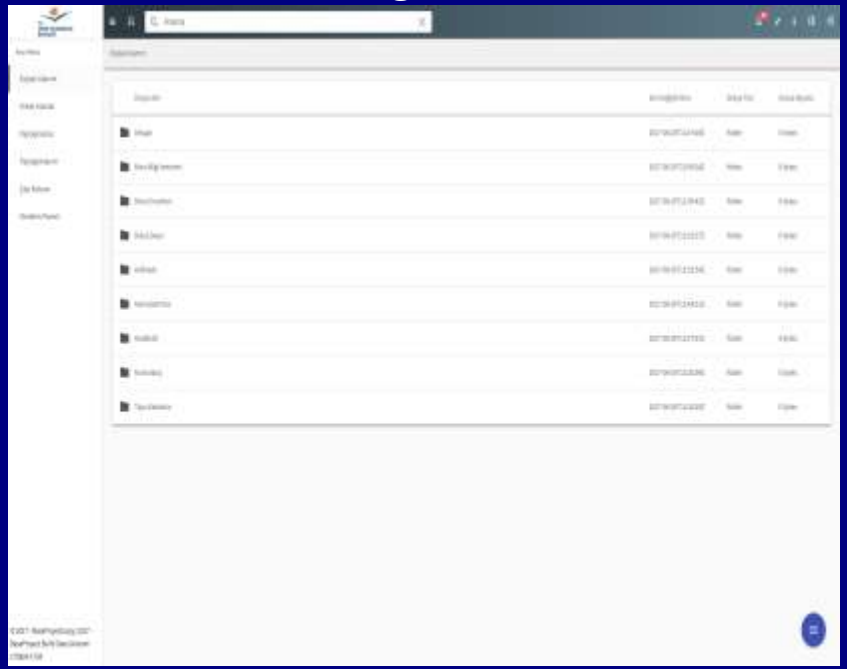
Cloud-based Geospatial Modules

❖ *Infrastructure*



Cloud-based Geospatial Modules

❖ *Cloud Storage*



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Process Modelling & Management

- **Objective:**
  - Provide a common process management environment by constructing "To-Be" process models for Local Governments and putting these models into service via Process Modelling and Management Software running on cloud platform in order to standardize process flows of institutions, enable scalability and process optimization.
- **Target Stakeholders:**
  - Local Governments
  - Provincial Directorates of MoEU
  - 12 Government Institutions

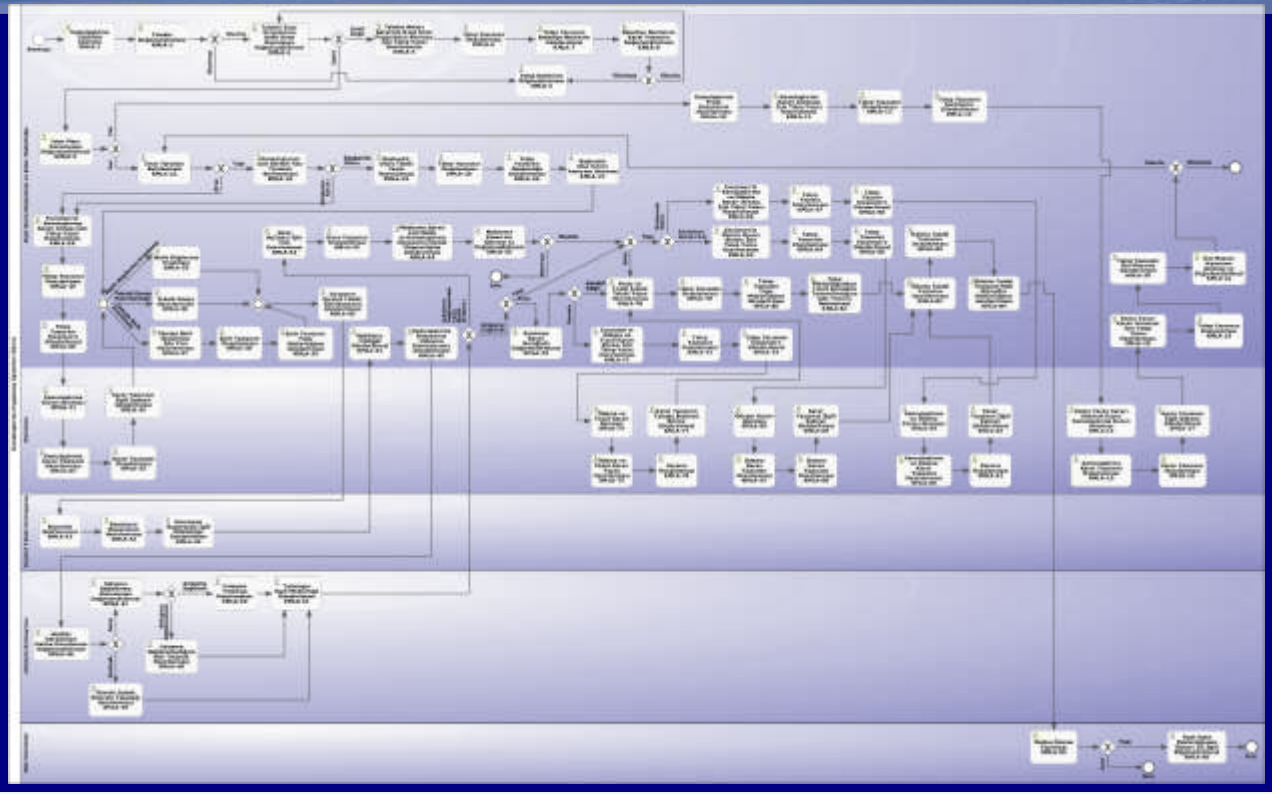
4 Pilot Areas

- **Stages of Implementation:**
  - "As-Is" and "GAP" Analysis – At 4 Pilot Local Governments
  - Business Areas – 6 Major Business Areas Covered
  - "To-Be" Process Modelling – Optimized and Refined Process Flows
  - Cloud-Based Process Modelling and Management Software
  - Synchronization – Between Process Modelling and Management Software & Business Application Software Systems
  - Deployment – Putting Process Models into Service
  - Scale – Measure Performance and Improve Models
- **Target Outcomes:**
  - Upskill institutions in process improvement
  - Provide a common ground for producing standard geographical and administrative data
  - Enable institutions to design and execute their own process models.

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

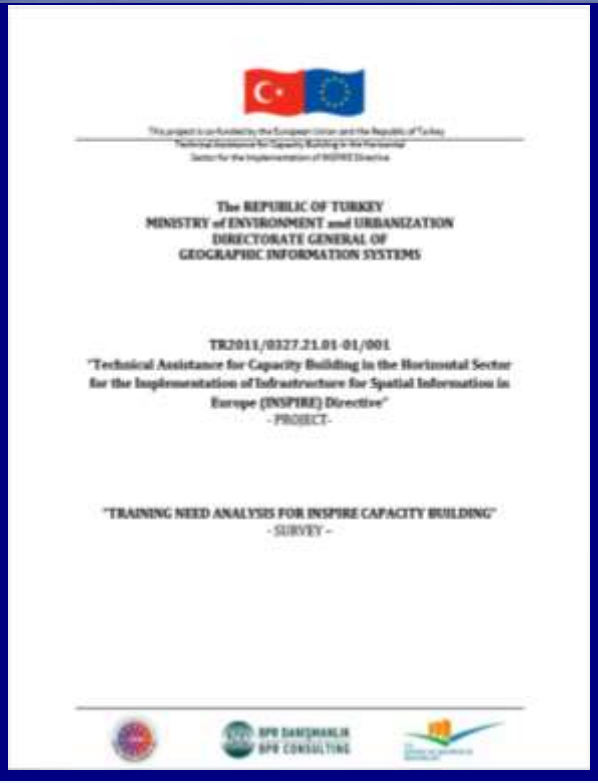
Process Modelling & Management

- BPM Notation
- Activiti – Open Source Business Process Management Platform
- Staff Task Assignment
- Execution of Processes
- Model Pools
- Integration with Application Software Modules



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Training and Awareness raising



The REPUBLIC OF TURKEY
MINISTRY of ENVIRONMENT and URBANIZATION
DIRECTORATE GENERAL OF
GEOGRAPHIC INFORMATION SYSTEMS

TR2011/0327.21.01-01/001
"Technical Assistance for Capacity Building in the Horizontal Sector for the Implementation of Infrastructure for Spatial Information in Europe (INSPIRE) Directive"
- PROJECT -

"TRAINING NEED ANALYSIS FOR INSPIRE CAPACITY BUILDING"
- SURVEY -

- Training Need Analysis Report Prepared where a web-based 'Survey' is carried out
- 1890 participants including 651 from Local Administrations.
- INSPIRE Training Programs (13 Groups) designed for different profile levels of participants according to the survey outputs

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Training and Awareness raising

INSPIRE BASIC: LOCAL GOVER

Geographic Information Systems (GIS)	Geographical Data Infrastructure (GDI)	INSPIRE Implementing Rules

INSPIRE BASIC: PUBLIC INSTITUTIONS - CENTRAL

Geographic Information Systems (GIS)	Geographical Data Infrastructure (GDI)	INSPIRE Implementing Rules	INSPIRE Network Services	IMPLEMENTATION: Data Transformation/Sharing
Basics of GIS and Geographical Data Models	Geographical Data Infrastructure	INSPIRE/TNGIS Data Themes and Rules of Description		
Data Production Techniques and Map Projections	INSPIRE Directive and Relevant EU Policies	Contents of INSPIRE/UIS Data Themes		
Geographical Database Design and Management	INSPIRE/TNGIS Policies, Principles and Components	Interoperability of INSPIRE/TNGIS Conceptual Data Models, Components		
Tasks of Public Institutions and GIS Implementations	Geographical Data Standards, with examples ISO 191XX and OGC Standards	INSPIRE in practice		

INSPIRE ADVANCED: DATA SPECIALIST

Geographic Information Systems (GIS)	INSPIRE Implementing Rules	INSPIRE Network Services	IMPLEMENTATION: Data Transformation/Sharing	IMPLEMENTATION: Data Transformation/Sharing
GIS and Data	INSPIRE Rules of Data	INSPIRE Network Services	Data Harmonization on Thematic field	Data Harmonization on Thematic field
		SPIRE Geoportal	Schema Matching and Data Transformation I	Schema Matching and Data Transformation I
		data and Catalog Service	Schema Matching and Data Transformation II	Schema Matching and Data Transformation II

INSPIRE ADVANCED: NETWORK SPECIALIST

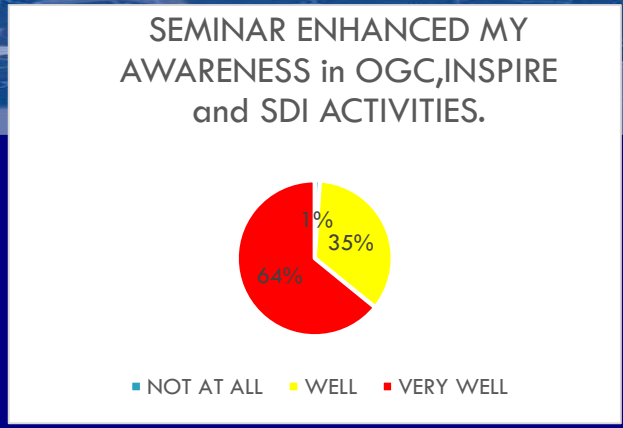
Geographic Information Systems (GIS)	INSPIRE Implementing Rules	INSPIRE Network Services	IMPLEMENTATION: Data Transformation/Sharing	IMPLEMENTATION: Data Transformation/Sharing
GIS and Data Models	INSPIRE Rules of Data Description	INSPIRE Advanced Network Services	Web map Server configuration	Data Harmonization on Thematic field
Data Quality	INSPIRE Data Themes and Data Description Documentation	INSPIRE Geoportal	Web Map Server installation	Schema Matching and Data Transformation I
Geographical Database Design and Management	Interoperability of INSPIRE Conceptual Data Models, Components and Data Sets	Metadata and Catalog Service	Web Map Server management	Schema Matching and Data Transformation II
Geographical Data Standards Sensoe Web	Advanced INSPIRE	Metadata and Data Validation test	Implementation, development and testing	INSPIRE/National Geographical Data portal

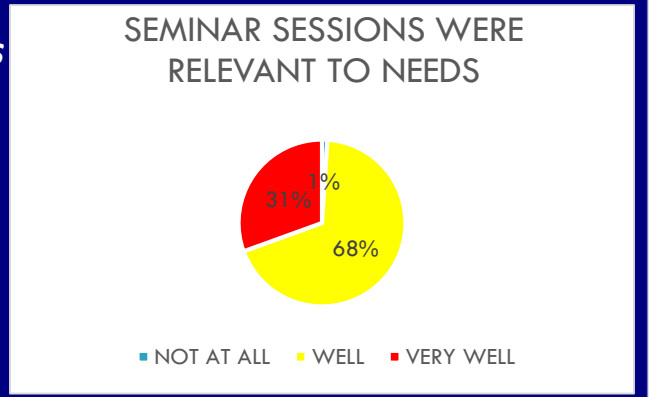
REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Training and Awareness raising

Training and Awareness raising

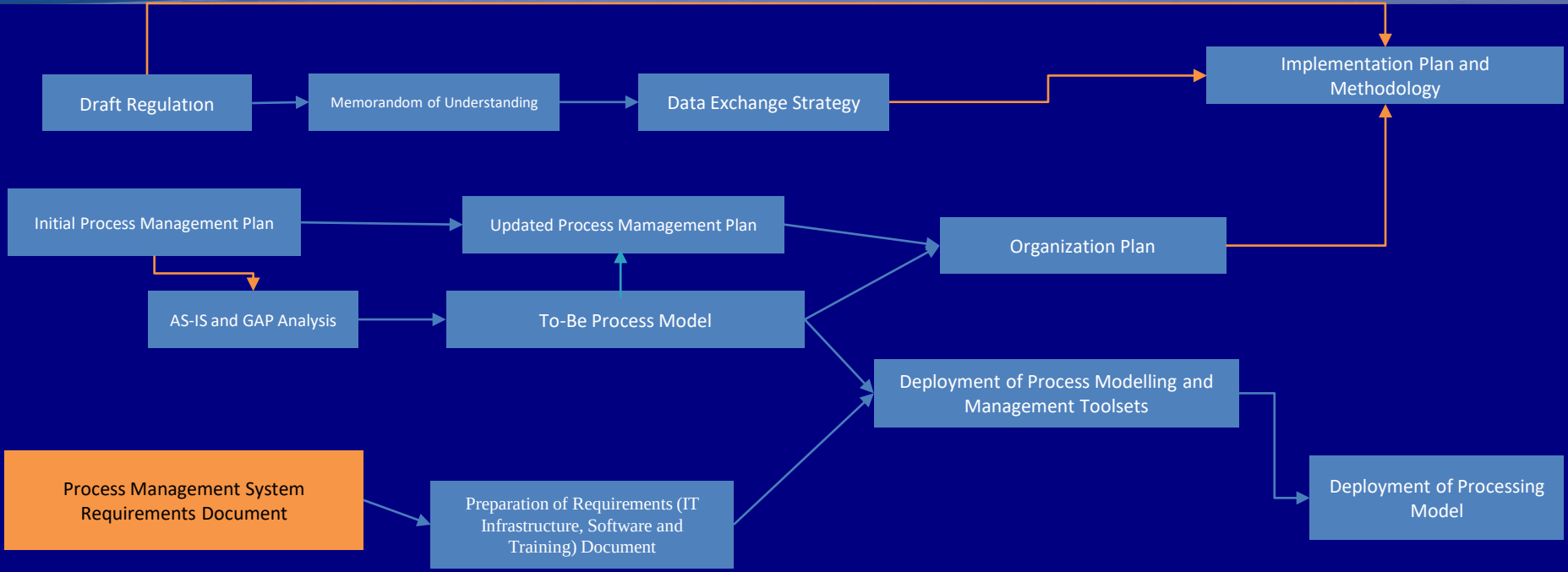
- **4 Seminars (Professionals and Stakeholders);**
  - *OGC Overview, OGC Standards*
  - *INSPIRE Overview, OGC Standards*
  - *Best NSDI-Focused Practices and INSPIRE Relations*
  - *Developing 3D City Models with CityGML*
  - *Use of INSPIRE Implementation Schemas for Data Harmonization*
  - *Best Practices for INSPIRE Data Harmonization*
  - *National Spatial Data Infrastructure ('SDI') Implementations in Turkey*
- **2 Technical Study Visits**
  - *Spain and Italy*
- **3 Work-shops**
- **2 INSPIRE Conference Participation**





REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Legislations; INSPIRE Impact Analysis



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Regulations and INSPIRE Impact Analysis

Legislative Regulation

Memorandum of Understanding

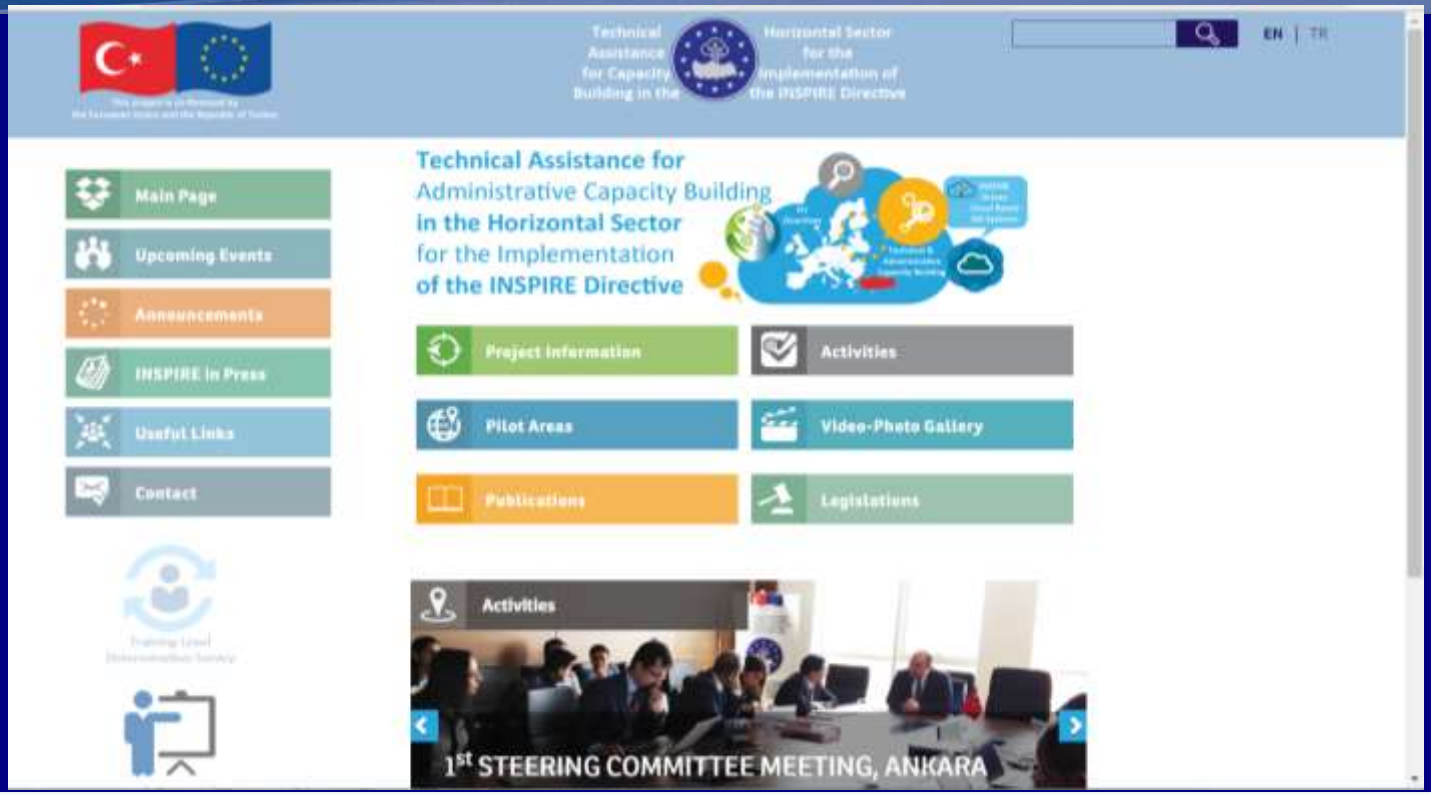
Data Exchange Strategy

To Be Plan

Organization Plan

Implemetation Plan and Methodology

Project web site (www.inspire.gov.tr)



REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

Onur Lenk (honour2404@gmail.com) Team Leader (On behalf of Consortium)
Yıldırım Bayar (dyildirim.bayar@csb.gov.tr) Department Director ,MoEU (On behalf of Beneficiary)

This project is financed by the European Union and the Republic of Turkey.

This publication has been developed with the financial assistance of the European Union.

The contents of this publication are the sole responsibility of BPR Consulting and can in no way be taken to reflect the views of the European Union.