Evaluating e-government : implementing GIS services in Municipality

Municipality of Thessaloniki - G.I.S. Unit

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ESRI UC - 2016

The GIS Section - subset of the department of "Building and town planning applications" of the Municipality of Thessaloniki.

The Unit has overall responsibility for the following functions:

- techno-economic feasibility studies - operational specifications,

- handling, analyzing and displaying GIS data,

- base maps and representations,

- technical and know-how support,

- development of applications,

- analysis, processing and relating of cartographic as well as data from various sources, and

- demonstrating GIS capabilities and exploring its future potential uses.

The GIS Section consists of five (5) employees,

- a senior Surveying Engineer,

- two team members with working knowledge in geospatial data handling,

- a Computer Science Engineer, and

- a Civil Engineer.

The overview of the presentation …

- the GIS status (until 2008),

- the expansion of GIS (after 2008),

- the new products and datasets that were produced,

and finally

- the future possibilities and trends.

Starting Point …

The project considers the *"Development of a Geographic Information System (GIS) and special applications in the Department of Surveying and the technical services of the Municipality of Thessaloniki (MoT)",*

- optimization of services and the quality of information associated with geo-data.
- the MoT has used the WEB as a versatile simple tool.

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In Front-office, citizens

have access remotely (without a physical presence) to a range of applications for various topics.

.. and in Back-office

Municipal clerks and engineers.

At the same time, a Guide Map of the city of Thessaloniki was developed in order to depict a number of Points Of Interest (POIs). These POIs are calculated to be around 23.000 objects.

Also, a series of applications were designed, implemented and integrated into the Web GIS. These apps are:

- for Digital Planning,

- for Town Planning Implementation Acts,

- apps of City Guide,

- apps of management and monitoring Land adjustment Decisions, and

- finally apps on information on planning parameters, such as building regulations and Land Use.

Apps for Digital Planning

- monitoring,

- management,

- geographical representation of the City planning data, and

- overview of the urban plan of the city.

Till today, **1.355 Digital Plans** have been digitized, geo-referenced and entered into GIS platform, with their State's Official Newspaper in PDF format.

Apps for the Town Planning Implementation Acts

Analog data base of Town Planning Implementation Acts, **since 1920**.

important, not only technically, but also on economic terms.

- digitized by means of the scanning process,

- geo-referenced, and

- finally entered into the GIS platform.

Specifically, the Implementation Act is divided into 3 parts,

- the Topographical Chart,

- the Text of the Act, and

- the Prefect's decision.

Today the system has **4.693 Acts, all in PDF format**.

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Apps for City Guide

• management and display of general information about the city of Thessaloniki,

• access to general information and multimedia applications (images, video etc.), for a number of areas outlined and analyzed within the web site user guide.

Today **23.000 points of interest**, have been recorded (churches, monuments, schools, hotels etc.)

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Apps of management and monitoring Land adjustment decisions

- development of a database which is connected to the digital base map,

- the user is interested about the Implementation of Property Adjustments (PA) that have occurred in the Municipality, and

- also the user can import an ongoing PA into the system.

Apps on information on planning parameters, such as Building Regulations and Land Use

Building Regulations and Land Use acts / digitized and geo-referenced.

Building Regulations,

- the building and the land coverage ratio,

- the integrity of the land,

- the allowable construction height and

- the State's Official Newspaper of the Decree that applies for a specific block.

The user can download Building regulation's acts (in PDF format), as published in the state's official newspaper and their latest amendments.

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The project was completed and handed over in operation at the end of 2008.

- new applications and tools,

- the GIS Unit - update the GIS data.

GIS of Municipality of Thessaloniki – New Apps / Data (after 2008)

Redesign Geo-Portal (2014)

Tool for Building permits

Mobile GIS (iOS & Android) (2012)

Business Permit Certificates of Catering Establishments (2014)

Internal Apps (Not for Public use)

New Building Codes/Regulations

Optimal routes for solid/recycle waste collection - VRP solver   (2016)

Interconnection with "Natural Gas Provider Company S.A." (2015)

Digital mapping of the electricity distribution network   (2016)

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1. Redesign Geo-Portal (2014)

Used technology….

- ArcGIS API for JavaScript
- SQL Server 2014
- ArcGIS for Server 10.3.1
- Custom ASP .NET web services
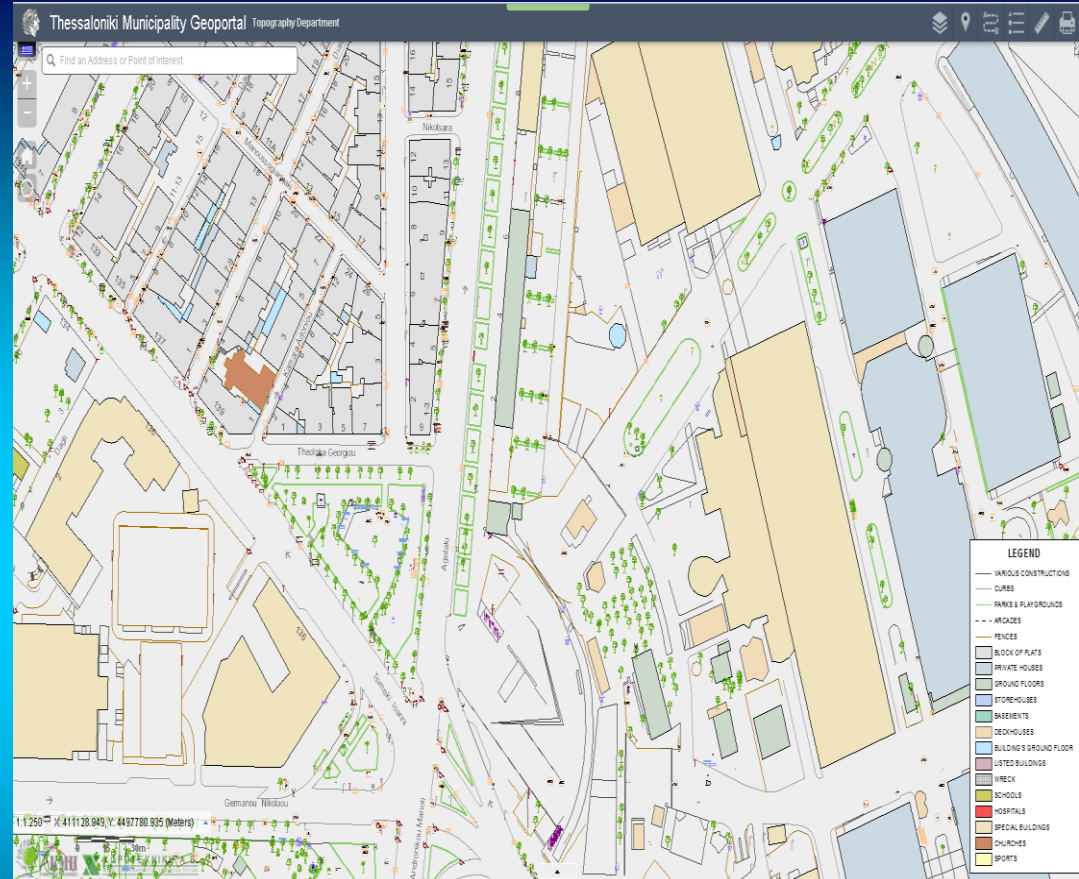
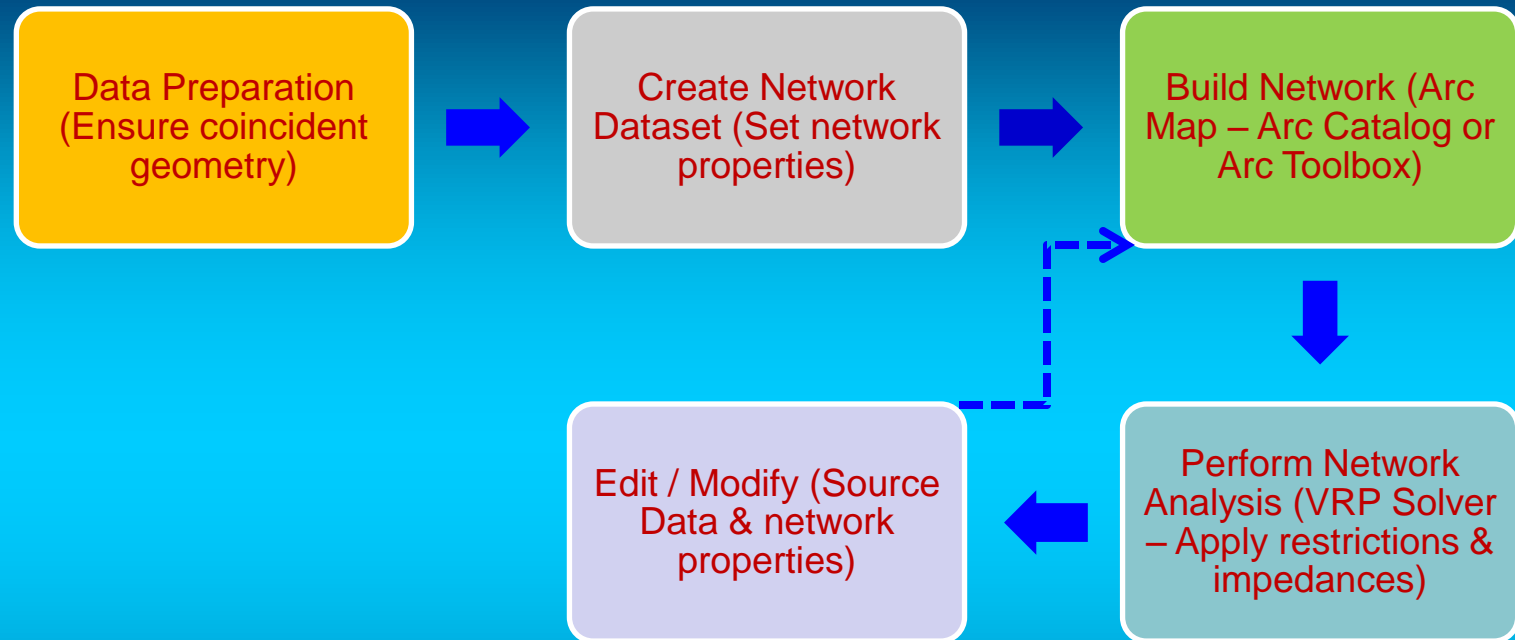**2. Mobile G.I.S. (Smart phones/Tablets) – (2012)**

For iOS devices …

http://phobos.apple.com/WebObjects/MZStore.woa/wa/viewSoftware?id=547 388095

For Android devices …

https://play.google.com/store/apps/details?id=gr.thessaloniki.mobilegis

3. Study - Design (Optimal routes for solid/recycle waste collection) – (2016)

The ESRI Network Analyst extension (10.3.1 - **VRP analysis & solver**) was

used to calculate the most efficient routes for the fleet vehicles to take.

(VRP solver workflow)

```
Data Preparation        Create Network         Build Network (Arc
(Ensure coincident  →   Dataset (Set network  → Map – Arc Catalog or
geometry)               properties)             Arc Toolbox)
                                                        ↓
Edit / Modify (Source   ←   Perform Network
Data & network              Analysis (VRP Solver
properties)                 – Apply restrictions &
                            impedances)
```

Various parameters such as vehicle capacity, service time and break time have been used. Depot locations and network dataset were also employed.

Finally, the existing waste collection route was modeled, in order to compare with the optimal routes calculated.

The GIS Section - performing network analysis - optimal routes of solid/recycle waste collection,

- the types of waste collection vehicles,
- the location and type of the waste buckets

The project is focused on,

- reducing **travel time** and overall km's driven, and
- reduce the **travel cost** for collection and transport of municipal waste.

4. Digital mapping of the electricity distribution network / (2015 - Oct.16)

The existing interactive application :

- connects the corresponding department of the Municipality with real time field information as well as citizens' complaints.

- monitoring the existing network for the location of possible areas of damage,

- study of the energy efficiency of the street lighting network based on statistical data of the type of lamps, and

- measure the intensity of lighting according to time and consumption.

The effective management of such an infrastructure can result in **significant resource savings** arising from maintenance and energy and hence set the basis for a **Greener City**.

(Web App Builder) – Electrical Panels (452 objects)

"Collector for Arc GIS" – "Web App Builder" Apps
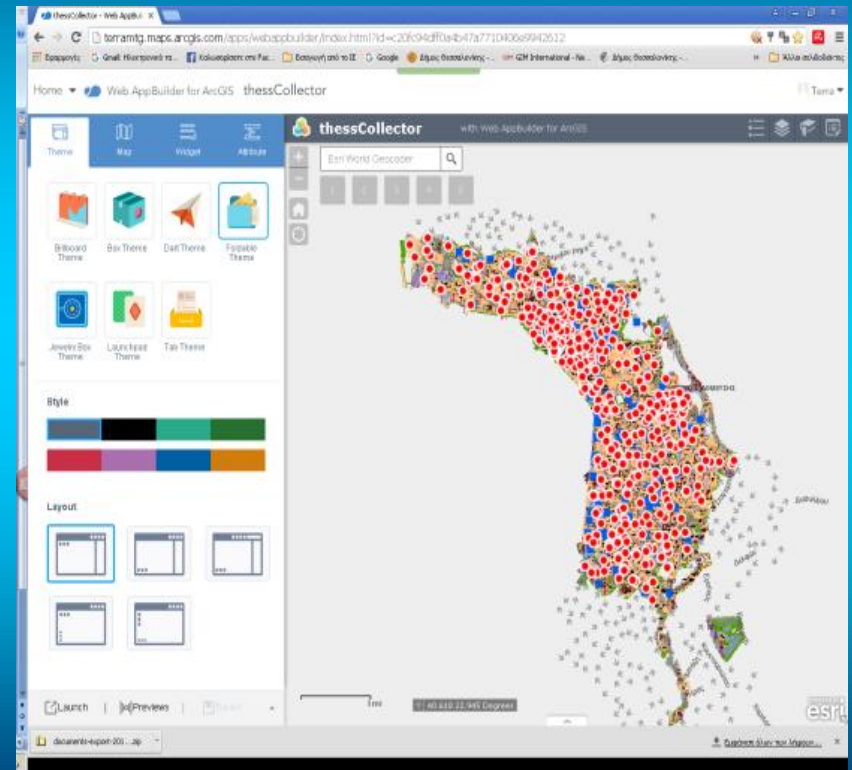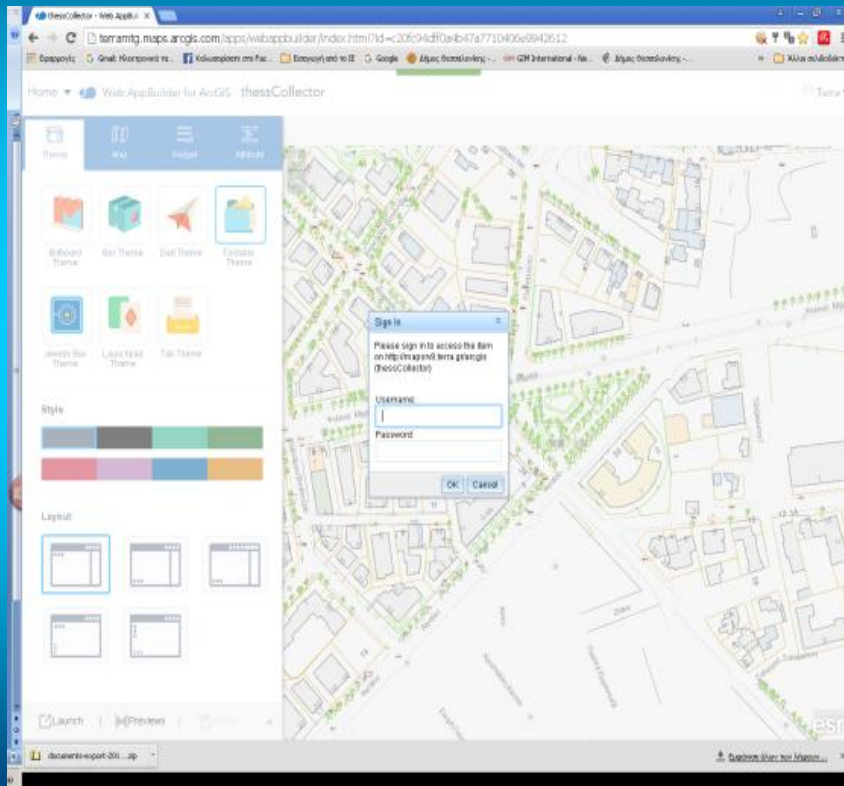
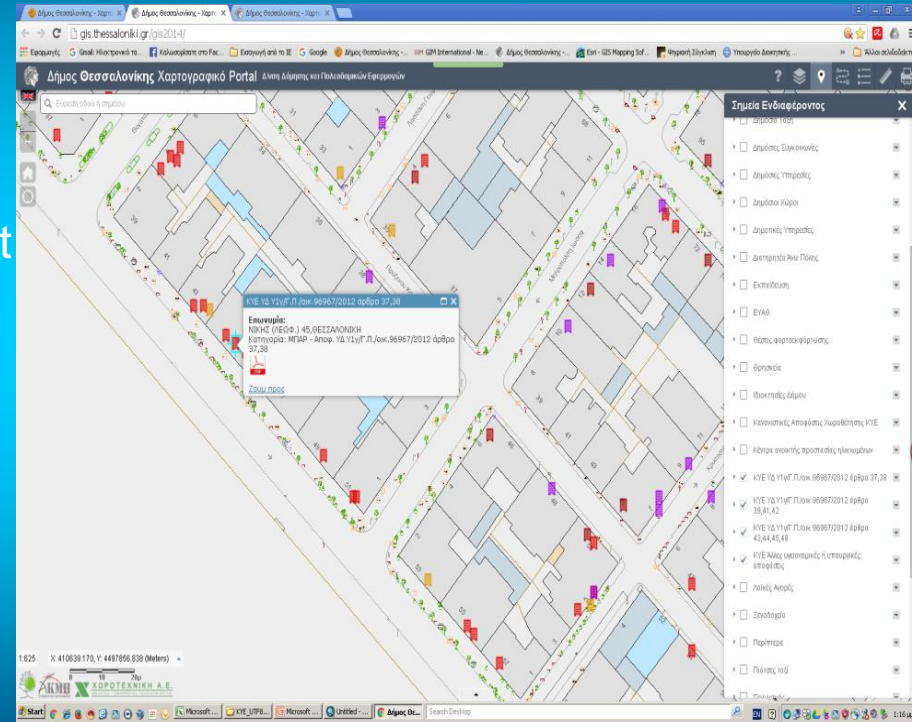## Register of Pillars (Data Collector) – 5264 objects are captured
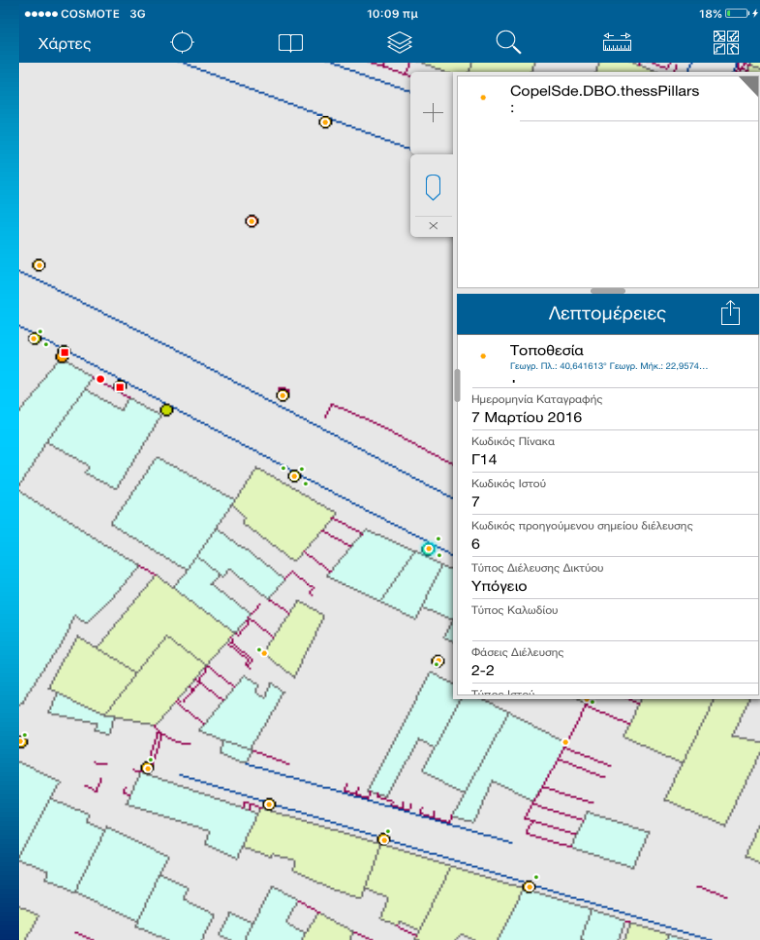
Register of Lights (Data Collector) – 5662 objects are captured
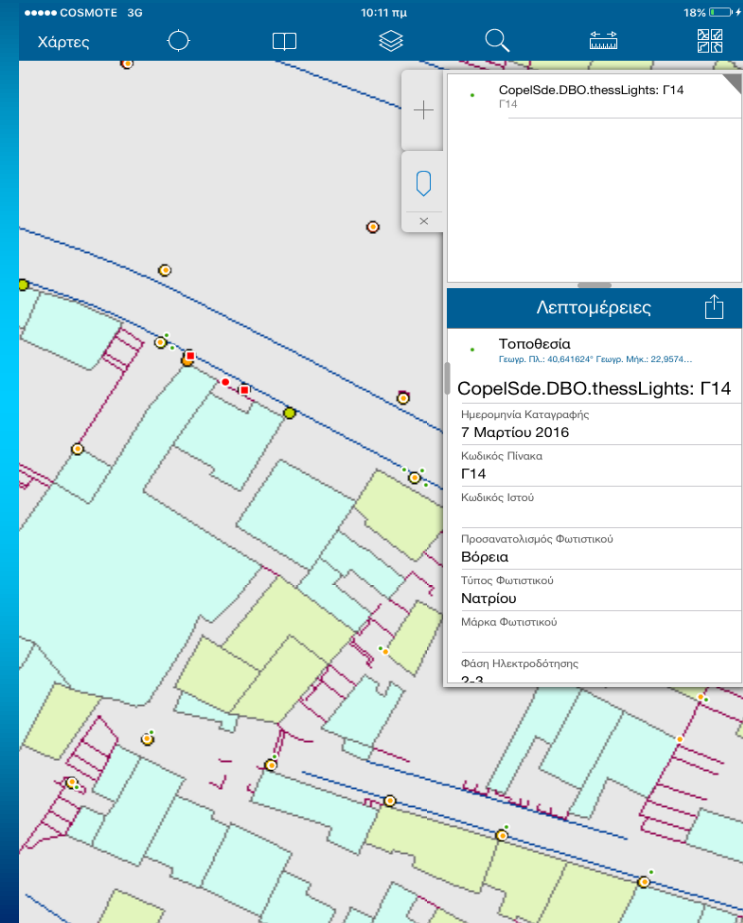
Register of Shafts (Data Collector) – 3967objects are captured

5. View Business Permit Certificates of Catering Establishments (CE) / (2014)

Almost, data of 9.500 CE was entered into a geo-database, with infos such as,

- the name of the CE,
- the category of the CE,
- their addresses, and finally
- site inspection certificates in,PDF format
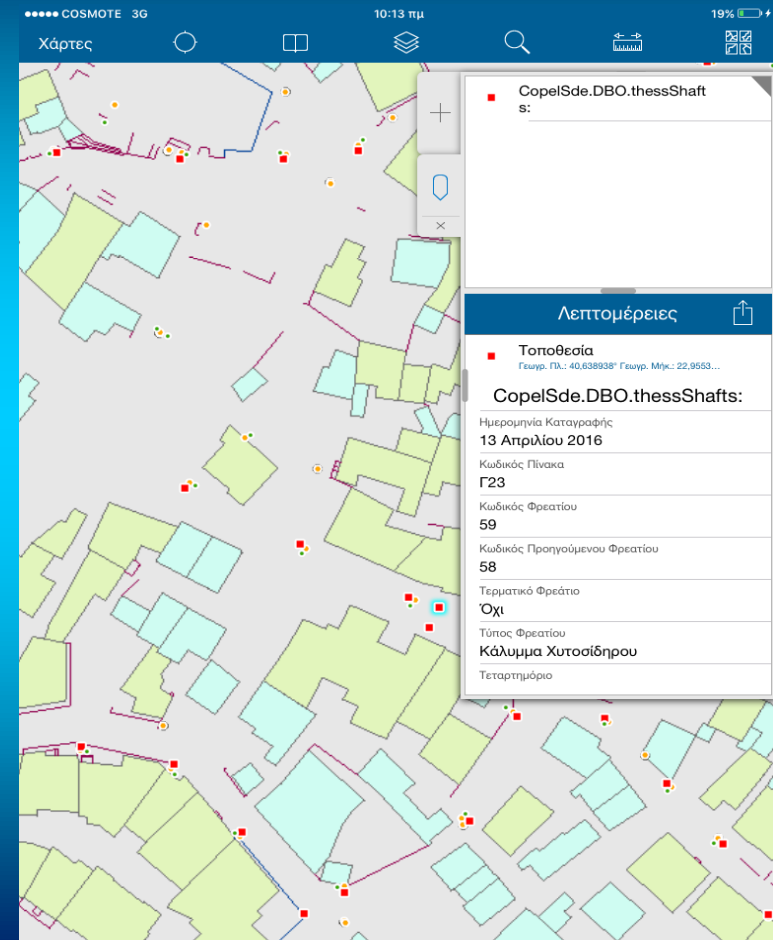
The **intention** is for :

- the citizens - latest valid information on Catering Establishments and any other type of business they seek.

- provide additional support - better control of the issued permits, and hence

- assist in decision making of the department.

6. View Building permits (… on developing stage) / (2016)

<u>**Data with Fields:**</u> Building type, number of storeys, building permission number and date of issue, postal code and percentage of land cover.

7. **Internal G.I.S. (Dept of Building and town-planning applications & Dept of Recycling and Management of Urban waste) / (2014-16)**

Expropriation withdraws acts,

- planning issues.

Thousands of garbage buckets,

- spatially referenced, with their descriptive information.

(For example : Department of Building and Town Planning)

A digital geo-referenced database of the expropriation withdrawal acts,

- potential of spatial referencing and relating each expropriation withdrawal acts' tabular data with a specific address on the map,

- a private URL,

- granting authenticated access to the desired users and distinct credentials are created to differentiate between viewing and editing types of users

Developed with ASP .NET Technology, C# and Arc Gis OnLine

GIS of Municipality of Thessaloniki

8. New Building Codes/Regulations (2015-16)

9. Interconnection with Natural Gas Provider Company S.A. / (2015)

Memorandum of cooperation - sharing of specific geo datasets:

- the GIS section of the Municipality of Thessaloniki / a WMS service with access authentication connection (username and password),
- the Natural gas company uses an ArcMap service connection, with credentials.

- saves time on unnecessary exchange of official documents, and
- the economic viability of the implementation of projects of the Municipality is improved and this reflects to the outcome city services offered to the residents.

The GIS Unit, supports all the Departments of the Municipality (Technical's e.t.c) to the management of their geo-data and is in compliance with the EU Directive INSPIRE by creating a Spatial Data Infrastructure (SDI) platform.

"OPEN DATA" - Law 4305/2014

http://opendata.thessaloniki.gr/

http://opengov.thessaloniki.gr/smart-city/smart-pillars/smart-government

In the future …

- encouraging the active contribution of the public in the decision making process

- making use of the capabilities of GIS can assist in taking appropriate actions to predict and accommodate the continuous change in the surrounding space.

AND

"Collection and registering of heterogeneous data (economic, social etc) in one
Geo-information model *with homogenization of all the information systems of the Municipality of Thessaloniki"* ,

- expansion of the GIS infrastructure in the Municipality :

  - since the data will be entered, analyzed, edited and displayed
  - Linked and Big Data in ArcGis Online and Dashboards

The project will operate through an **Enterprise License Agreement contract (ELA)**.

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All the workflows are improving the framework for organizing and maintaining data. The GIS success illustrate the need for elements such as :

- saving money,

- saving time,

- increasing productivity,

- improving data accuracy,

- making better decisions,

- complying with State,

- effectively managing assets, and

- improving access to Government.

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Until today (2016 - google analytics)

Web GIS (date of start 12/2008) => 1.534.366 page views

Mobile GIS (date of start 8/2012) => 424.685 unique visitors & 284.587 downloads του λογισμικού (183.635 for iOs & 100.952 for Android)

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Thank you