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# **Volunteered Geographic Information: How to guide volunteers to produce accurate road network data**

**Dr. Dionysia – Georgia Perperidou**

**Ass. Prof. Vasilis Vassalos**

**Presentation: Nikolaos Zacharias**

Athens University of Economics & Business

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The presented data were result of the THALES EERNV Research Project, co-financed by Greece and the European Union

# Production & Distribution of digital Geographic Information & Data

## From the second half of 20<sup>th</sup> Century

- Under the responsibility of official public institutions or agencies
- Adoption of GIS use by the 1980's (World Bank 2014)
  
- 1990 US Federal Geographic Data Committee (FDGC) promotes coordination, production & dissemination of geospatial data at USA
- 2007 European Union, INSPIRE Directive sets common Implementation Rules for production & Dissemination of geospatial data
  
- International Organization for Standardization publishes ISO 19113 and ISO 19114 on quality principles for geographic data and framework for quality evaluation on geographic data respectively

# Volunteered Geographic Information

*«The widespread engagement of large numbers of private citizens, often with little in the way of normal qualifications, in the creation of geographic information, a function that for centuries has been reserved to official agencies» (Goodchild 2007)*

VGI data are:

- Informal
- Inaccurate
- Produced by unqualified volunteers

*But still VGI data are available to all and are based on*

- Creating georeferenced point and lines
- Followed by tags (attributes)

# Urban road network representation

*“Urban road networks plays a significant role in cities functions, in citizens’ way of life and travel patterns, and in urban expansion, since the creation of new residential areas is always followed by road network expansion”*

*(Perperidou 2010)*

In real world urban road network is a complex network.  
Its road do not have the same length, width or importance.  
All elements have a specific location on earth surface.

Its Digital Representation includes:

- roads length,
- roads width (determined by the number of lanes),
- roads direction – one way roads two-way roads,
- traffic lights locations, for controlling traffic at road junctions,
- traffic rules for uncontrolled road junctions,

# Official Road Network Datasets

- Produced by public agencies and institutions
- Use georeferenced aerial or satellite orthophotos
- Public bodies employ qualified & expert GIS professionals & cartographers
- Follow certain photo-interpretation rules like:
  - a. Deep knowledge of specific scientific field
  - b. Knowledge of principles, methods & techniques of photo-interpretation
  - c. Knowledge of general and specific models, which exists in the under investigation area
  - d. Ability to participate in multi-disciplinary projects.

# OpenStreetMap - OSM

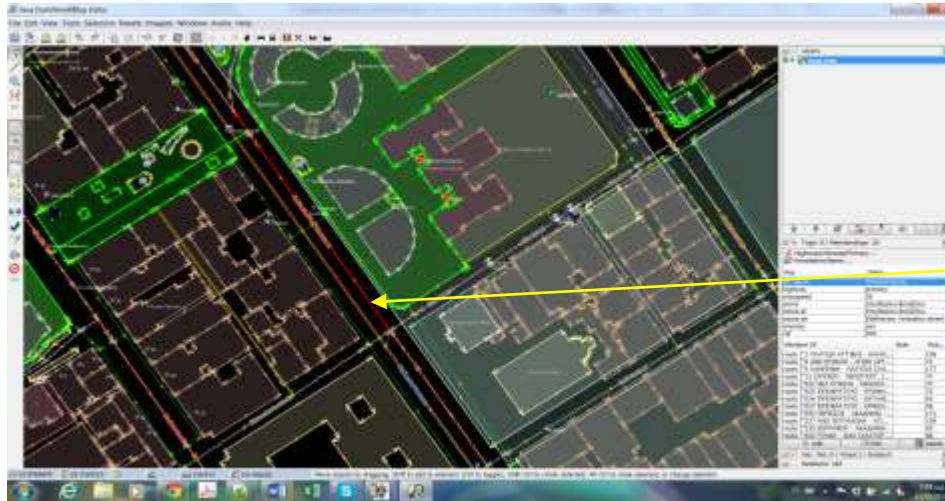
- Creation & provision of free geographic data such as street maps
- Involvement of OSM community
- Anyone can participate regardless of educational or professional background
- Production of nodes and lines
- OSM contributors are not familiar with photo-interpretation rules
- Road network characteristics are not represented

# OSM data for Municipality of Athens

- The OSM Athens community is less committed than other OSM communities
- The OSM datasets for Athens Municipality have large scale errors, inconsistencies and poor quality
- There is no involvement of experienced professionals
- The most serious errors of the datasets are:
  - a) Incorrect lanes number and road width, especially in central roads (roads of the primary road network)
  - b) Incorrect roads direction
  - c) Incorrect representation of one way roads as two way.
  - d) Incorrect position of traffic lights and incorrect phases and cycles.

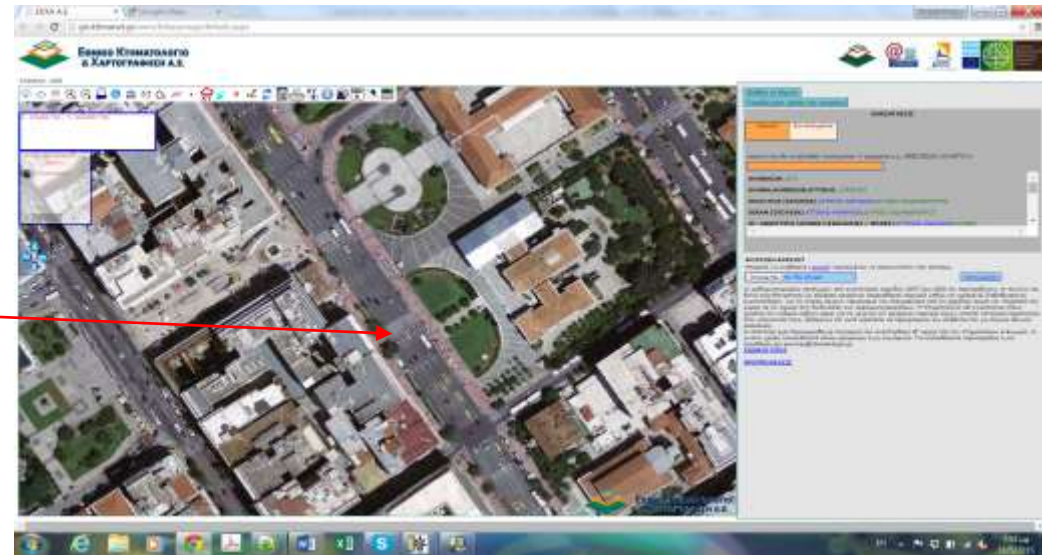


# OSM data for Municipality of Athens examples



Panepistimiou Av.  
represented in OSM dataset  
as one lane

Panepistimiou Av. is 5 lane  
urban artery





# Simple photointerpretation rules for OSM volunteers 1/2

## **OSM volunteers should follow certain rules**

1. Recognize the basic characteristics of a road: road length, number of lanes (throughout its length) & direction.
2. Road lanes are separated by white painted lines.
3. Use official orthophotos, especially in cases of uncertainty and in order to follow photo-interpretation rules (like National Cadastre and Mapping Agency for Greece) for example to verify number of lanes and road direction (or directions)
4. Use other image sources like Google street view for improving the photo-interpretation outcome

# Simple photointerpretation rules for OSM volunteers 2/2

5. Get familiar with OSM Highway International Equivalence for road classification in different countries.
6. Follow the road classification for each country
7. Get familiar with the roads that have the intention to represent
8. Respect the number of lanes of each road that is represented. Road lanes are separated by white lines. Bus lanes are separated by yellow lines



***Thank you for your attention!***

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