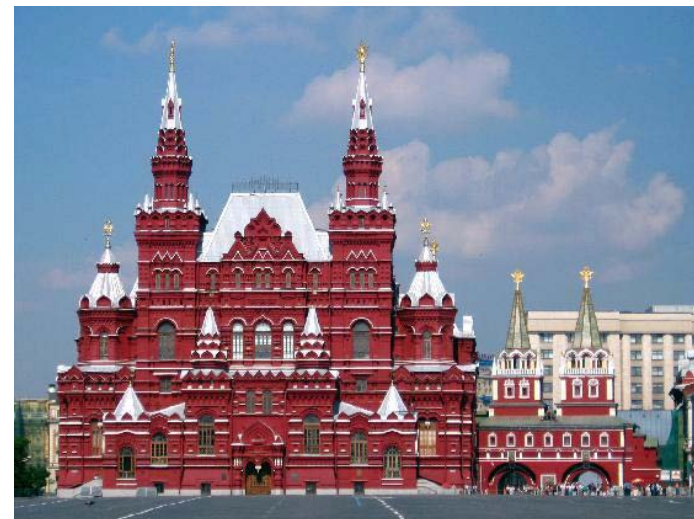




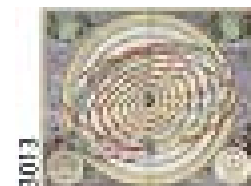
# National Technical University of Athens School of Rural and Surveying Engineering Greece

## *Technical Tool for Upgrading Urban Settlements, not Necessarily Informal*



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SDMuPLIS



European Union  
European Regional  
Development Fund



HELLENIC REPUBLIC  
Ministry of Culture, Education and Religious Affairs  
General Secretariat for Research and Technology



HELLENIC REPUBLIC  
MINISTRY OF ECONOMY  
INFRASTRUCTURE, MARITIME AFFAIRS & TOURISM



COMPETITIVENESS AND  
ENTREPRENEURSHIP  
OPERATIONAL PROGRAM  
OPC II



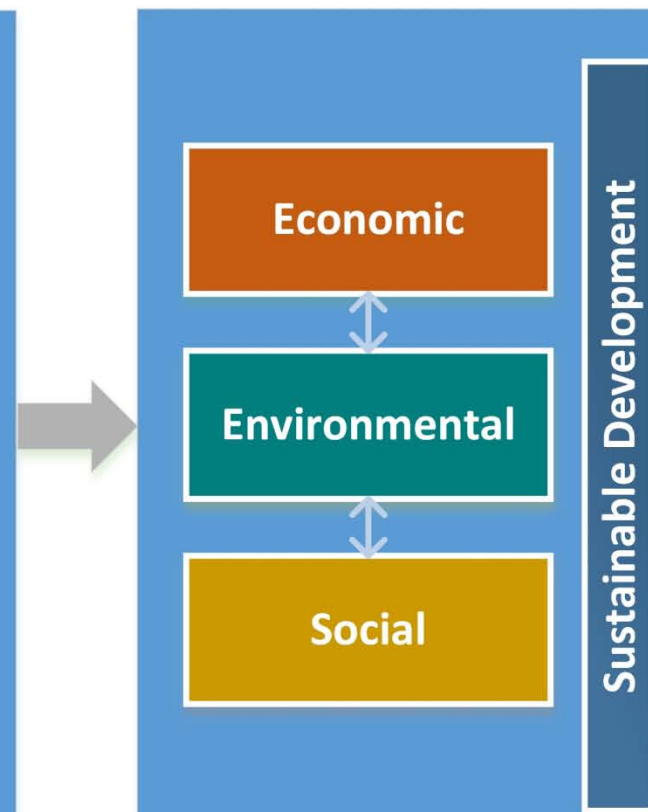
NSRF  
2007-2013  
Programme for Development

regions at the centre of development

Co - financed by the Hellenic Republic and the European Union - European Regional Development Fund,  
in the context of the O.P. Competitiveness and Entrepreneurship (OPC II) and the R.O.P. Attica, R.O.P. Macedonia - Thrace

ΕΣΠΑ 2007-2013, Δράση «Διμερής Ε&Τ Συνεργασία  
Ελλάδας- Ισραήλ 2013-2015»  
ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΘΡΗΣΚΕΥΜΑΤΩΝ  
Γ.Γ.Ε.Τ.  
ΕΥΔΕ - ΕΤΑΚ

*UNECE WPLA workshop on “Real Estate rights’ and cadastre registration as elements for  
development of land management system, Moscow, 25-26 June 2015*



# Formalizing the Informal

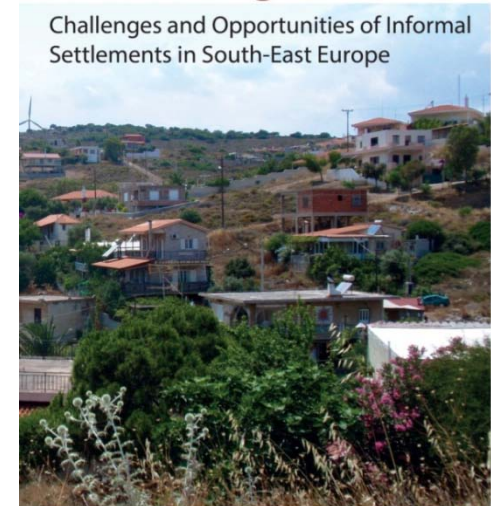


- ❑ Rapid urbanization, Inefficient LM, Urban Sprawl
- ❑ Many in the UNECE region live in informal settlements
- ❑ housing is not only a shelter but a *tool to create wealth*
- ❑ Unclear property rights & use regulations cause “*uncertainty*”, “*economic exclusion*” and “*social unrest*”

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE  
INTERNATIONAL FEDERATION OF SURVEYORS

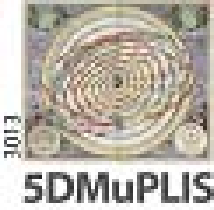
## Formalizing the Informal

Challenges and Opportunities of Informal Settlements in South-East Europe





We are expected to provide solutions:  
**functional, reliable, affordable, inclusive & fit-for-purpose**



To satisfy a world that cannot wait!

## Best Use of Urban Land

energy efficiency vital green  
spaces  
utility services  
Health  
Transport  
Increased urban densities  
3d city modeling



Urban land readjustment  
Self financed & small projects  
Voluntary participation  
Property valuation  
Redistribution of property rights  
Involvement of private sector  
Affordable housing

....



....



# PROCEDURE TO PROVIDE PRIVATE OR/AND STATE LAND FOR A SMALL SCALE URBAN LAND RE-ADJUSTMENT



- Adjudication of existing property rights and rights to use
- 3D cadastre and planning at a certain time  $t_1$
- Collection of all necessary spatial data about the valid land use regulations at  $t_1$
- Calculation of the value of each property at  $t_1$
- Implementation of new regulations, parcel merging and construction of new buildings at  $t_2$  with increased plot to building ratio; calculation of values at  $t_2$
- Redistribution of property rights to the old owners according to their old value plus a small 'profit' that will cover all type of costs
- The remaining new properties at  $t_2$  belong to the constructor to cover his expenses and profit but also to provide a % of those to a target group for affordable housing according to the agreement with the state



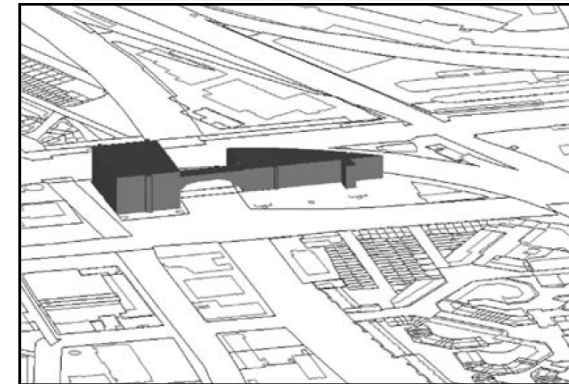
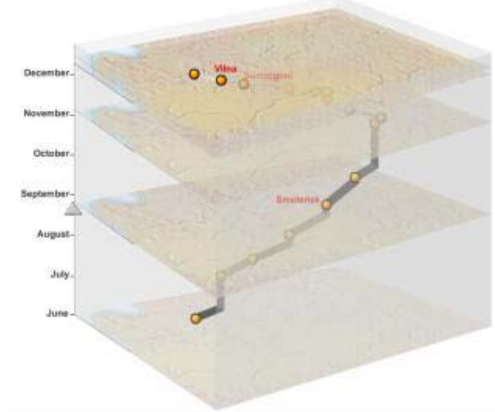


# Security of tenure

Development of a **5D multi-purpose LIS** ,  
based on existing commercial software

for 3D management of various data  
extracted from national, regional or local  
databases (e.g., architectural, surveying,  
cadastral, economic, property values,  
property rights, etc)

in **3 spatial dimensions** (ownerships &  
constructions) + **time** (changes, the 4<sup>th</sup>  
dimension) +  
**scale** (different Level of Details, the 5<sup>th</sup>  
dimension)

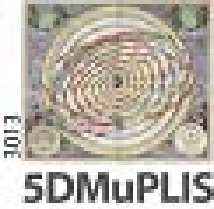


ITET ISR\_3013



**5DMuPLIS**  
**5 Dimensional**  
**Multi-Purpose Land**  
**Information System**

# CASE STUDY



**Study area:** A region consisting of 10 urban blocks in a suburb in the eastern part of Athens, Greece

**Data used for the creation of the 3D models:**

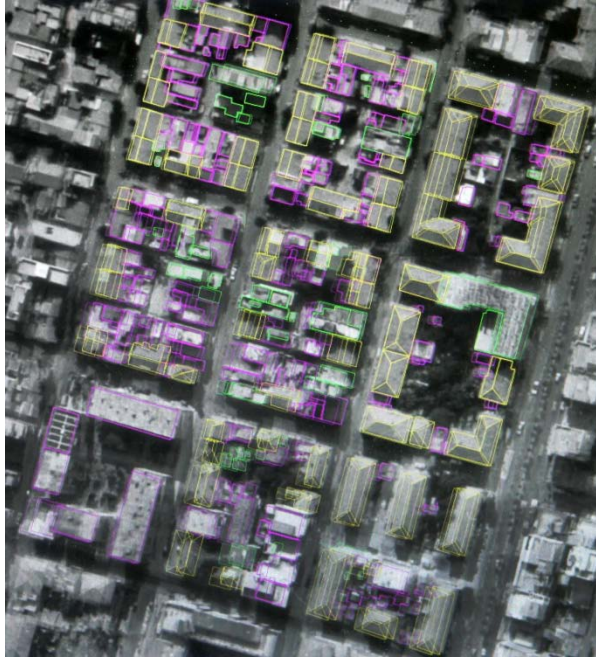
Two stereo pairs of aerial images, at a scale of 1:7000, taken in **1983** and in **2010**

**12 GCPs**  
were  
measured

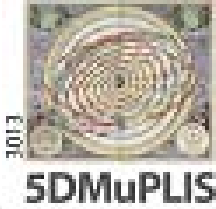
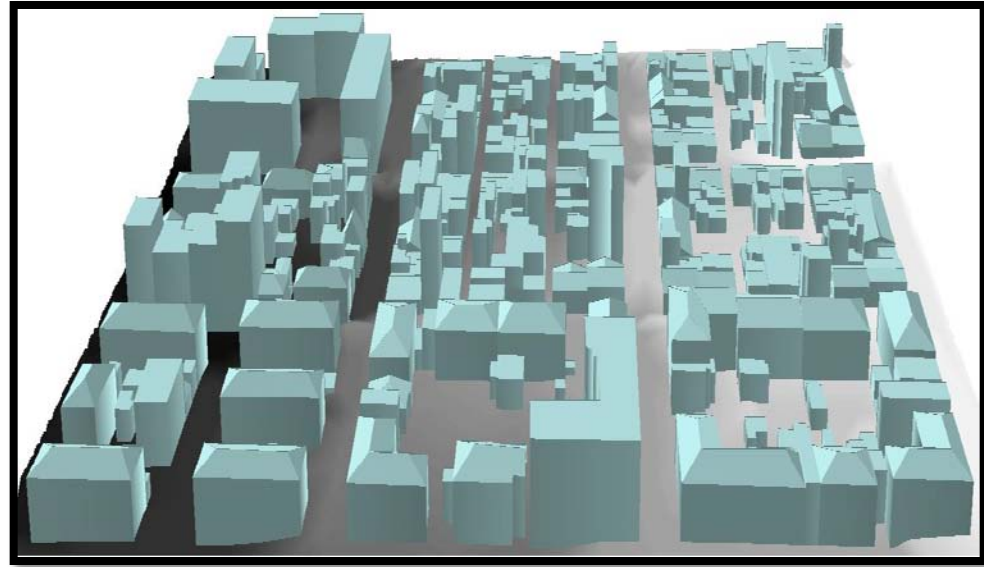




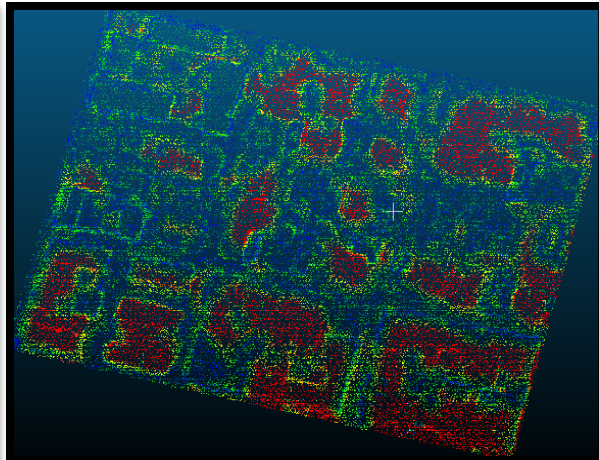
Stereo plotting  
of the study area using  
the **1983** stereo pair



3D model  
(**1983**, LoD1)



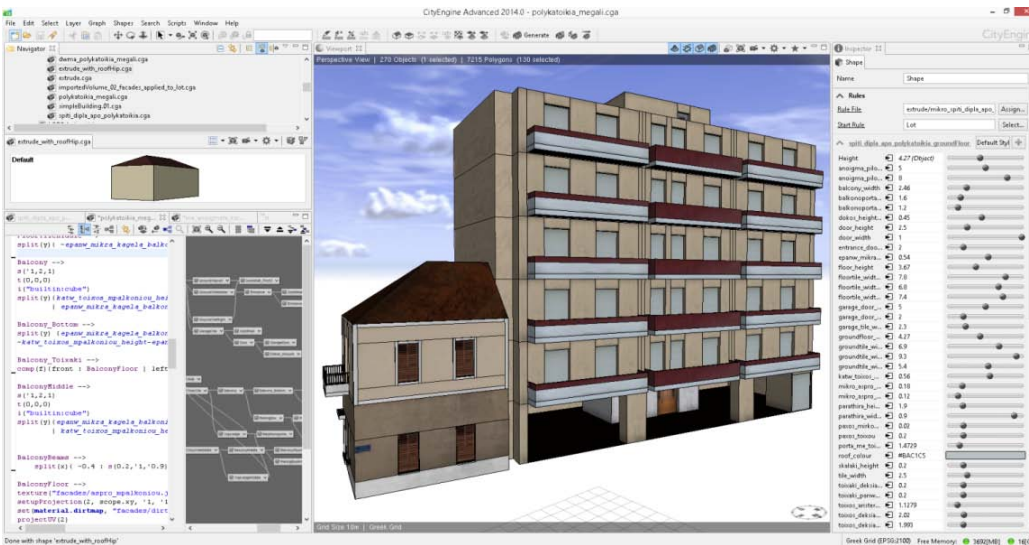
Automatic change detection, 3d model  
updating (**2010**,LoD1)







## LoD2, facades of buildings using orthophotos



Connection & update  
of cadastral data base  
with the 3d city model



Buildings at at  $t_1$



Replacement by a  
New building at  $t_2$



3d cadastral information in various time periods

