

L I F E O 3 T C Y / C Y / O 1 9

# URBAN GUARD

Capacity building for enabling the incorporation of sustainability parameters in urban spatial development and planning policies and practices through the use of indicators in Cyprus

## Layman's Report

PROJECT PARTLY FUNDED BY THE  
EUROPEAN COMMISSION



LIFE PROGRAMME – Third Countries

PROJECT BENEFICIARY:



REPUBLIC OF CYPRUS  
MINISTRY OF THE INTERIOR  
DEPARTMENT OF TOWN PLANNING AND HOUSING

## Introduction

Spatial planning in Cyprus is regulated by the Town and Country Planning Law, which was first voted by the House of Representatives in 1972. Nevertheless, this Law, along with its relevant regulations and subsidiary ordinances which had become effective in the meantime, was only fully applied in 1990 without any drastic revisions or updating. This resulted in a number of weaknesses in the application and enforcement of the legislation and created diverse planning problems, which were particularly complicated in urban areas.

Development in the main urban areas of the island is now planned and controlled through Local Plans and, in some cases, Area Schemes published and regularly revised under the provisions of the planning legislation. Local Plans contain a written statement with planning policies and maps of designated land use, building densities and main road networks. Planning in government-controlled areas of the island not covered by Local Plans is exercised through a general Development Plan published under the provisions of the same legislation called the *Policy Statement for the Countryside*, which is accompanied by detailed designated land use and building density zones for most of the countryside and rural settlements. These Development Plans (Local Plans, Area Schemes and Policy Statement) should be able to monitor and effectively address spatial development issues through their periodic review, as required by the current planning system.

The URBANGUARD project aimed to produce indicators which will be utilised by planners and authorities responsible for preparing and reviewing Development Plans, by local administrators, stakeholder organisations and other special interest groups making suggestions for plan reviews, as well as by the wider public.

The availability of indicators relevant to the sustainability of urban planning will facilitate the incorporation of urban sustainability indicators into the spatial planning process in Cyprus. Further it will improve the tools that enable a more productive form of public participation and a higher level of governance.

## Project Description

As a first step, potential sustainability indicators were collected from a large pool of international, EU and local indicators. Selection of the final set of indicators was driven by current planning practices and in particular by the urban policy areas over which Planning Authorities have competency through Development Plans. These thematic policy areas are:

- Residential development
- Commercial and office development
- Industrial and workshop development
- Tourism development
- Transport and utility infrastructure
- Health, education and community services
- Sport and recreation
- Heritage and culture
- Environment and landscape

Indicators were therefore grouped in compatible policy areas. The main goals on which the formulation of these policies is based are:

- Viable and efficient distribution of land uses
- Sustainable use of natural resources and improvement in the quality of the environment
- Urban containment, compact development, action against sprawl
- Sustainable mobility and accessibility, adequate provision of amenities and infrastructure
- Protection and sustainable management of cultural heritage and historic neighbourhoods
- Revitalisation of urban centres and reinforcement of their role as focal points of urban agglomerations
- Social integration and cohesion
- Economic viability of urban development
- Urban cohesion
- Mixed use development (mixing of compatible uses)
- Protection of the quality of life
- Sustainable tourism development

The above goals played a key role in the selection of the final list of the URBANGUARD indicators and the elaboration of each indicator's methodology sheet, considering the spatial characteristics and socio-economic conditions of the island's settlements.

A wide acceptance of the indicators was considered of utmost importance as it is prerequisite to their successful implementation. Special efforts were invested in securing the mutual agreement of competent government services, local authorities and special interest organisations. A series of meetings and consultations were therefore undertaken, supplemented by written communications with relevant stakeholders.

The indicators can be categorised into two sets. Firstly, there is a main set of 100 urban sustainability indicators, with a core subset comprising selected indicators which are directly related to the national spatial planning policy. Covering the spectrum of areas over which the final users are legally competent, these *Key Spatial Development Indicators* will constitute the main subset to be used in monitoring and assessing urban policy sustainability. A second, auxiliary set comprises an additional 128 basic indicators whose sole role is to provide information and data utilised as normalising factors in evaluating other indicators.



In house workshop for training DTPH personnel  
on the use of the URBANGUARD tool, September 2006

Project activities thus involved research and acquisition of knowledge on indicator applications, the development of a generally accepted common set of national sustainability indicators, the development of the URBANGUARD planning analysis tool and the implementation of a pilot test for the system created, a number of actions to support the transfer of skills to urban policy stakeholders, as well as the production of the URBANGUARD system guide manual for future users.

## The Pilot Study

A section of Strovolos Municipality was chosen as the pilot study area, in which the project team evaluated the sustainability indicators in an attempt to test the functionality of the system, identify and rectify problems where possible, and gain experiences in the URBANGUARD tool's implementation. The pilot area was selected in September 2005 and is shown in **Figure 1**. It consists of six environmental areas with a population of about 50,000 that cover about 50% of the Municipality of Strovolos.

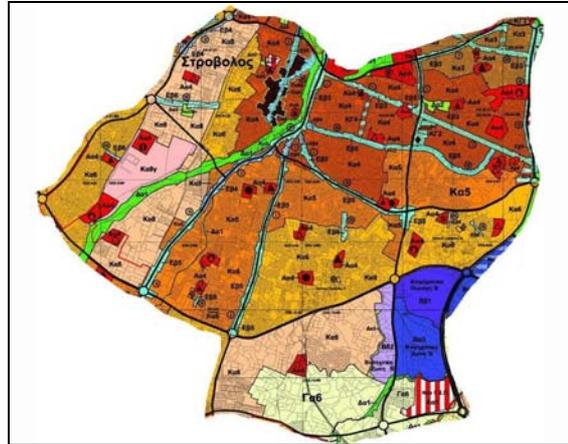


Figure 1. The pilot study area

This specific area was chosen because it satisfied a number of relevant criteria which would allow the evaluation of the indicators. In particular:

- it is large enough for its analysis to produce meaningful results
- it includes a wide spectrum of land uses (historic core, extensive commercial areas, new residential areas still under development etc)
- it is served by several major road arteries, some with intense planning problems, such as congestion, incompatible uses and noise pollution
- updated population and town planning data is available for this area at a sufficient detail for the purposes of the pilot study

# Project Results

## The Indicators

A total of 100 indicators were selected as the basis for assessing the sustainability of urban policy. Out of this list a core subset of about 30 indicators was selected, based on feedback received from the Department of Town Planning and Housing and the experience gained by the project team during the pilot study. These 28 **Key Spatial Development Indicators** directly relate to national, regional and urban spatial policies, and will constitute the main set to be utilised by planners and decision makers at national and local levels in monitoring and assessing urban policy sustainability.

The chosen Key Spatial Development Indicators are the following (unless otherwise mentioned, all values are collected at Environmental Area level; in addition, all values are to be calculated based on existing Development Plan provisions):

1. Gross Domestic Product (GDP) at Local Authority level.
2. Public expenditure on basic infrastructure at Local Authority level.
3. Public expenditure on service provision to citizens at Local Authority level.
4. Total potential population capacity within development boundaries.
5. Actual population within development boundaries as a percentage of total potential population capacity.
6. Ratio of the potential population capacity of developed residential areas to their actual population.
7. Percentage of undeveloped land within designated residential zones.
8. Retail and office land use as a percentage of total development within designated commercial areas.
9. Percentage of total retail and office development occurring outside designated commercial areas.
10. Ratio of retail expenditure in Central Business Districts to total retail expenditure at Development Plan level.
11. Percentage of designated tourist zones developed.
12. Residential land use as a percentage of total development within designated tourist zones.
13. Modal split for public transport.
14. Traffic Volume Index.
15. Percentage of total population living outside catchment areas of bus stops.

16. Ratio of community services by category (including day-care centres, centres for the elderly etc.) per capita.
17. Percentage of total population living outside catchment areas of health, education and community services by category.
18. Percentage of total area designated as public green space.
19. Percentage of total population living outside catchment areas of public green spaces.
20. Density of basic entertainment establishments (including community centres, restaurants etc.).
21. Percentage of assessed heritage structures designated as Listed Buildings (Town and Country Planning Law).
22. Percentage of Listed Buildings restored.
23. Expenditure on Listed Building and Ancient Monument restoration (including archaeological excavations) as a percentage of GDP.
24. Percentage of total area designated as open space.
25. Percentage of total area designated for nature protection.
26. Intrusion of development into areas of high environmental value.
27. Intrusion of development into good agricultural land.
28. Number of protected landscapes with management plan at Development Plan level.

## The GIS Tool

In order to facilitate the monitoring and assessment of indicators, a GIS based tool has been developed using the ArcGIS software package by ESRI. In conjunction with the ArcGIS package, a Microsoft Access database has been developed which allows for the entry and analysis of data, as well as the entry of relevant metadata. The database is coupled with and utilised as part of the GIS tool.

The main uses of the tool are:

- To import the geographic and indicator data and metadata
- To evaluate and process the indicator data
- To provide spatially distributed indicator data
- To aid the preparation of reports in the form of maps, tables and text

The tool, which can simultaneously calculate the value and spatial distribution of all indicators included in the system, incorporates a series of basic data to which indicator-specific information is overlaid in order to provide spatially distributed information pertaining to the selected

indicators. The following geographic and demographic data of the area under study are required.

- Cadastral maps from the Department of Lands and Surveys (DLS)
- Administrative boundaries (DLS)
- Existing road Networks (DLS and Public Works Department, PWD)
- Survey Area Boundaries from the Statistical Service (CYSTAT)
- Population distribution (CYSTAT)
- Household distribution (CYSTAT)
- Designated building densities (based on published Development Plans)
- Designated land use (based on published Development Plans)
- Environmental Area Boundaries (based on published Development Plans)
- Ring zones, as defined by URBANGUARD, within which a number of indicators related to the function of metropolitan areas are evaluated

The URBANGUARD tool will play a key role in assisting planners and planning process stakeholders to evaluate urban development trends and promote the enforcement of sustainable spatial policies. Development Plans will thus be monitored more efficiently and effectively, while decision makers will be enabled to evaluate proposals and suggestions for plan revision with concrete criteria based on solidly documented sustainability factors.

Environmental Area: 120  
Parish: Χρυσελευσία  
Municipality: Δήμος Στροβόλου  
Region: Λευκωσία  
Country: Κύπρος

Indicator Name: Unemployment rate by sex  
Description: Unemployment rate.  
Brief Definition: Unemployment rate is the ratio of unemployed people to the labour force.  
Alternative Definitions: The unemployment rate is

Unit: %  
Year: 2007  
User: sa

Formula: no.unemployed/labour force  
Value: 0.15 Calculate...

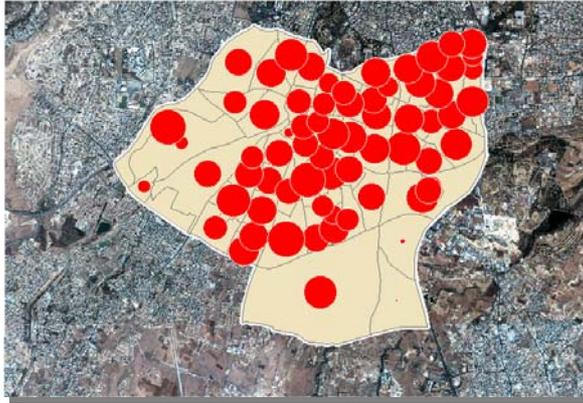
Add Edit Delete  
Record: 1 of 3

**Figure 2.** Variables entry form

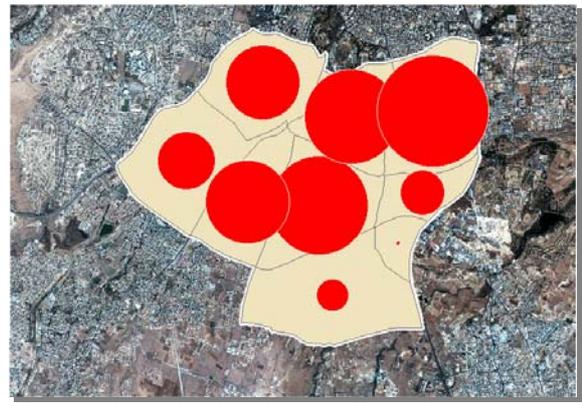
The URBANGUARD tool has the following capabilities:

- **It facilitates the direct entry of primary indicator data into the database.** Each datum is entered for a specific geographic cell and time period. A multiple layer of geographic scales has been structured, namely Survey Area, Environmental Area, municipality, urban ring zone, greater urban area or Development Plan (e.g. Nicosia Local Plan) and country. The tool already incorporates a database of the codes and associated maps for the cells included within each scale. Thus, the user needs to select the appropriate scale and cell code and subsequently enter the datum value.
- **It facilitates the uploading of maps.** In this case data are entered via the uploading of "shape-files" and associated attributes. The cell location of entered data is automatically detected by the GIS. Examples of data entered graphically include:
  - Location of parking lots with car capacity entered as an attribute
  - Location of bus stops with the frequency of stops and code of route entered as attributes
  - Polygons of areas where their characteristics are entered as attributes as for example land use zone code.
- **It processes information via the GIS.** Several indicators need to be assessed via the application of the GIS tool. The system is designed to process graphically entered data, assess the value of indicators and populate the database with these values. Such processing refers to the calculation of values per unit area, whereby the unit surface area is calculated by the GIS. The entered values are stored in the database. Data entry is made by following the same steps described for the entry of basic map-derived data.
- **It simultaneously evaluates multiple indicators whose values may be interlinked**
- **It helps prepare preset as well as customised reports and maps**
- **It allows data visualisation from the database through a 'join' facility with the GIS.** Some thematic maps have already been prepared which, when activated, produce maps of pre-selected basic background maps and data. Visualisation of indicator results is achieved by
  - Colour-coding, whereby each colour denotes a range of values
  - Numbers appearing within each reference area
  - Scaled symbols appearing in each reference area where the size (e.g. radius of a circular symbol) indicates a value within a pre-described range.

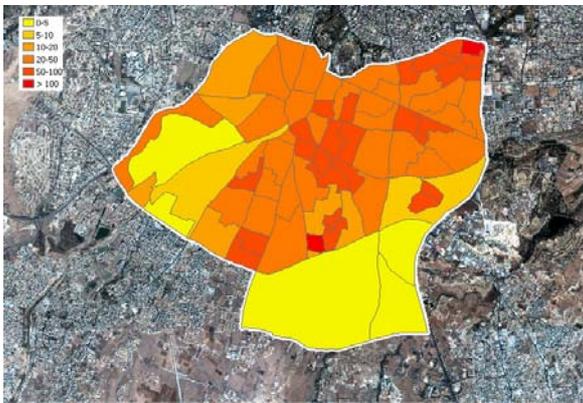
Activation of thematic maps is achieved through the normally available ArcView interface.



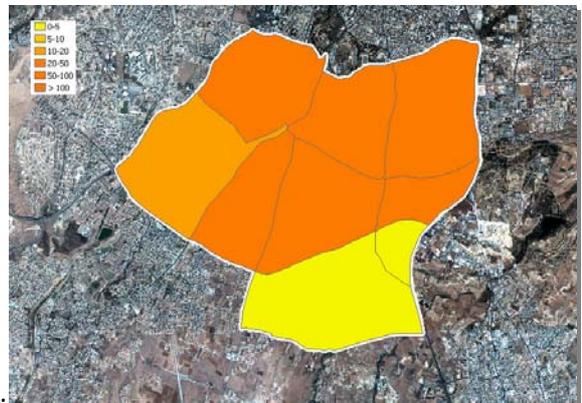
*Population distribution by Survey Area*



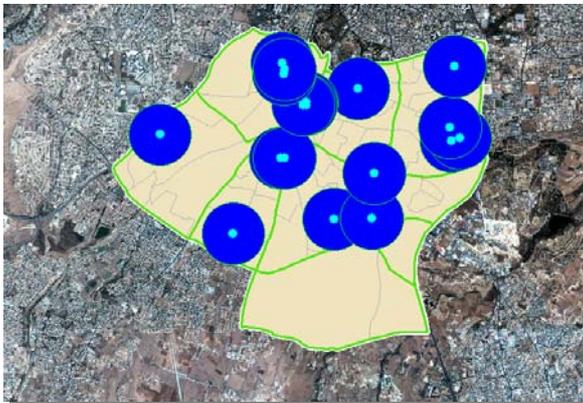
*Population distribution by Env. Area*



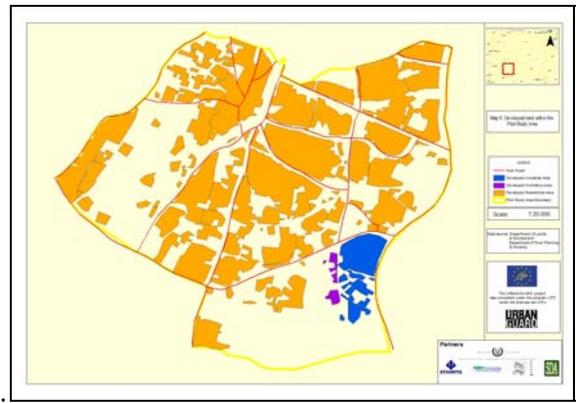
*Population density by Survey Area*



*Population density by Environmental Area*



*Kindergarten catchment areas*



*Development distribution by land use type*

Examples of thematic maps of the pilot study area generated through the use of the URBANGUARD tool

## **Environmental impact and cost-benefit of the project**

The main benefits of URBANGUARD arise from the fact that it has acted as a catalyst for the competent planning authorities of Cyprus to incorporate transparent sustainability parameters into the spatial planning process. The proposed system of indicators and associated tool, the experience and awareness-raising derived from the project and the multitude of opportunities to consult with various government departments, local authorities and stakeholders have improved both the capacity and the commitment of the Department of Town Planning and Housing to implement sustainability assessment indicators.

URBANGUARD was primarily concerned with capacity building and thus no direct impacts on the environment have resulted during the project's lifetime. Benefits are foreseen to be achieved through the ongoing application of the URBANGUARD tool, which aspires to provide a driving force towards achieving sustainable spatial development practices. Given the Department of Town Planning and Housing's commitment and the wide acceptance of the URBANGUARD tool within other government departments and local authorities, its continued application will have significant positive effects.

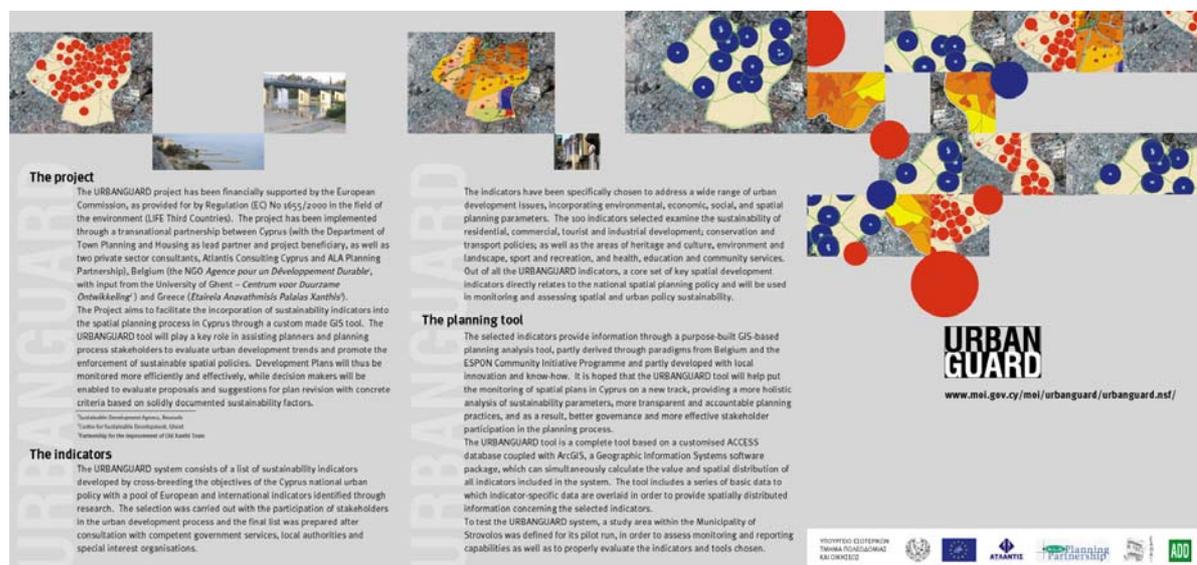
Undertaking the establishment of the sustainability indicator system through a LIFE EU-funded project has significantly improved the efficiency of such a task. The multinational approach has helped to produce a balanced system that combines local policies, practices and interests with EU policies and goals. Secondly, it has helped tremendously with the level of acceptance and authority of the project team, thus removing elements of resistance that usually act as barriers to the implementation of sustainability indicators.

# Transferability of project results

The indicator system created through URBANGUARD addresses the major sustainability issues faced by urbanised and urbanising areas and provides a solid basis for the systematic collection of information for both the assessment of urban sustainability and the formulation of urban development management policies and goals.

Further, the tool developed through the project has an open and extendable architecture which allows it to be easily extended to cover a wider geographic area. As it also allows for the addition of new indicators, the system is readily transferable to other areas in Cyprus, making the system readily extendable over all government controlled areas.

The same basic concept, especially the methodology and system structure used, may also be applied to areas outside Cyprus. However, in such cases it is likely that some modifications to the indicators will be needed in order to tailor the system to reflect local urban policy as well as data availability conditions. It is also considered inevitable that modifications to several fields of the methodology sheets will be required.



The image shows a project information page for URBANGUARD. It features a large graphic on the right side composed of various colored circles (red, blue, yellow, orange) and satellite images of urban areas. The text is organized into sections: 'The project', 'The indicators', and 'The planning tool'. The 'The project' section describes the financial support from the European Commission and the transnational partnership between Cyprus, Belgium, and Greece. The 'The indicators' section explains the system's composition of sustainability indicators. The 'The planning tool' section details the GIS-based analysis tool. At the bottom right, there is a logo for 'URBAN GUARD' and a website URL: [www.moi.gov.cy/moi/urbanguard/urbanguard.nsf/](http://www.moi.gov.cy/moi/urbanguard/urbanguard.nsf/). Logos for the European Union, ATAMTE, Planning Partnership, and ADD are also present.

**The project**

The URBANGUARD project has been financially supported by the European Commission, as provided for by Regulation (EC) No 1655/2000 in the field of the environment (LIFE Third Countries). The project has been implemented through a transnational partnership between Cyprus (with the Department of Town Planning and Housing as lead partner and project beneficiary, as well as two private sector consultants, Atlantis Consulting Cyprus and ALA Planning Partnership), Belgium (the NGO Agence pour un Développement Durable, with input from the University of Ghent - Centrum voor Duurzame Ontwikkeling) and Greece (Εταιρεία Αναπτυξιακής Παράταξης Χανθίου).

The Project aims to facilitate the incorporation of sustainability indicators into the spatial planning process in Cyprus through a custom made GIS tool. The URBANGUARD tool will play a key role in assisting planners and planning process stakeholders to evaluate urban development trends and promote the enforcement of sustainable spatial policies. Development Plans will thus be monitored more efficiently and effectively, while decision makers will be enabled to evaluate proposals and suggestions for plan revision with concrete criteria based on solidly documented sustainability factors.

Technological Development Agency, Brussels  
Centre for Sustainable Development, Ghent  
Financed by the Department of Urban Planning

**The indicators**

The URBANGUARD system consists of a list of sustainability indicators developed by cross-breeding the objectives of the Cyprus national urban policy with a pool of European and international indicators identified through research. The selection was carried out with the participation of stakeholders in the urban development process and the final list was prepared after consultation with competent government services, local authorities and special interest organisations.

**The planning tool**

The selected indicators provide information through a purpose-built GIS-based planning analysis tool, partly derived through paradigms from Belgium and the ESPON Community Initiative Programme and partly developed with local innovation and know-how. It is hoped that the URBANGUARD tool will help put the monitoring of spatial plans in Cyprus on a new track, providing a more holistic analysis of sustainability parameters, more transparent and accountable planning practices, and as a result, better governance and more effective stakeholder participation in the planning process.

The URBANGUARD tool is a complete tool based on a customised ACCESS database coupled with ArcGIS, a Geographic Information Systems software package, which can simultaneously calculate the value and spatial distribution of all indicators included in the system. The tool includes a series of basic data to which indicator-specific data are overlaid in order to provide spatially distributed information concerning the selected indicators.

To test the URBANGUARD system, a study area within the Municipality of Strovilos was defined for its pilot run, in order to assess monitoring and reporting capabilities as well as to properly evaluate the indicators and tools chosen.

**URBAN GUARD**  
[www.moi.gov.cy/moi/urbanguard/urbanguard.nsf/](http://www.moi.gov.cy/moi/urbanguard/urbanguard.nsf/)

ΠΡΟΤΥΠΟ ΕΠΙΧΕΙΡΙΣΙΑΣ ΣΥΣΤΗΜΑΤΟΣ ΠΟΛΕΩΣΗΣ  
ΚΑΙ ΟΡΧΗΣΤΡΗΣΗΣ

ΕΥΡΩΠΑΪΚΟ ΚΑΙ ΕΛΛΗΝΙΚΟ ΚΡΑΤΟΣ  
ΑΤΑΝΤΕ  
Πλάνη ΠΑΡΤΝΕΡΣΗΠ  
ADD