

Sustainable Urban Planning in Athens

**Report of the 1st COP meeting in Athens
October 8th 2009**

Municipality of Egaleo,
Iera Odos 364, Egaleo, Athens, Greece
Conference room: "Dimitris Trepas".

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Executive Summary

The Bridge project aims at bridging the gap between the bio-physical sciences and urban planners and demonstrating the advantages of accounting for environmental issues during the planning process. As such a number of Community of Practise (CoP) meetings are being held to connect city planners with researchers and other stakeholders. On the 8th October 2009 the first CoP meeting was convened in the Municipality of Egaleo, Athens, Greece. The 51 participants included BRIDGE researchers, academics, urban planners, architects engineers and researchers all interested in sustainable urban planning. Most of them are working in the technical and planning dept. of the Municipality of Egaleo, which is the case study area of Athens.

The initial meeting served two purposes. The first was to enable the Bridge partners and Athens planners to get to know each other and through a number of talks to identify key issues of sustainable development in Athens and especially in Egaleo. Second, through group discussion, to identify Egaleos':

- Planning priorities;
- Sustainability objectives;
- Indicators with which to assess progress towards sustainable development;

A real life project has been selected for the demonstration/validation of the DSS.

The 1st Athens COP meeting identified the following priorities for sustainable city planning in Athens:

Summary of priorities for sustainable city planning in Athens

- Thermal discomfort
- Energy
- Quality of building stock
- Transport
- Green spaces
- Land use of Eleonas

The sustainability objectives that were identified are the following:

Summary of sustainability objectives in Athens

- Improve air quality
- Improve energy efficiency
- Reduce CO2 emissions
- Reduce thermal discomfort
- Improve the urban fabric
- Increase green and open space areas
- Improve mobility

Sustainable Urban Planning in Athens

The associated sustainability indicators were not thoroughly discussed due to time constraints so only a preliminary list was produced with the help of BRIDGE researchers:

Sustainability Objective	Indicators
Improve Air Quality	<ul style="list-style-type: none">• Concentration of pollutants (NO_x, SO_x, PM₁₀, PM_{2.5}, etc.); and• Number of days above established air quality thresholds.
Improve Energy Efficiency	<ul style="list-style-type: none">• Energy consumption per capita; and• % of energy from renewable sources.
Reduce CO₂ emissions	<ul style="list-style-type: none">• CO₂ concentration;• % of CO₂ emissions from anthropogenic sources: transport, industry, households; and• Effects of meteorological conditions (e.g. temperature) on concentrations.
Reduce Thermal Discomfort	<ul style="list-style-type: none">• Average outdoor temperature (surface and air); and• Average indoor temperature (particularly in old buildings).
Improve the Built Fabric	<ul style="list-style-type: none">• Building characteristics; and• Number of dwellings where insulation improvements have taken place.
Increase Green Space Areas	<ul style="list-style-type: none">• Area (ha) of urban green space;• Number of trees planted;• Coverage (m²) of green infrastructure (from new plantations and growth); and• % of urban green space of total urban area.
Increase Mobility	<ul style="list-style-type: none">• Number of municipal passenger transport services;• % of population using public transport; and• Number of new car-parking spaces.

The choice of the real life project :

The case study in Athens will comprise the assessment of alternatives for the regeneration of a core avenue in the municipality of Egaleo.

The main issue is the heavy traffic in the avenue and the poor quality of the building stock and pavements in the area; together with the high temperatures experienced in the city as a whole (thermal discomfort).

The different alternatives have been proposed and are evaluated by the University of Athens.

This case study will be used to validate the DSS outcomes (by contrasting the results provided by the University of Athens with those obtained by BRIDGE researchers and, consequently, evaluating the consistency and coherency of the DSS outcomes).

A second CoP meeting is envisaged not before February 2010. This will include further discussions on indicators and the availability of data.

1st COP meeting - Sustainable Urban Planning in Athens

Time: Thursday 8th October - 10:00 to 16:30

Place: Conference Room “Dimitris Trepas”, Municipality of Egaleo, Athens.

1.1 Summary of presentations and discussions

There have been some modifications in the original agenda so as to convene the work schedule of some of the speakers.

(Q: question, A: answer, C: comment)

1.1.1 Welcome

Mat Santamouris, N. Chryssoulakis

The goal for the day was set out i.e. to explore the sustainability issues of Egaleo, Athens and try to connect them to the work of the BRIDGE team.

1.1.2 Welcome and presentation on planning priorities and sustainability objectives for Egaleo

D. Kalogeropoulos, Mayor of Egaleo

Presentation

Major problems of Egaleo:

Increased temperatures during summer- thermal discomfort

- Problems of thermal discomfort
- most of the building stock is poorly or not at all insulated and the building materials used are in many cases not appropriate aggravating this situation and “transferring” this problem inside the households
- apart from thermal discomfort increased temperatures (especially during heat waves) can cause serious health problems (even death) for the sensitive population
- this also results in increased demand for electricity; the network can not cover the needs and in many cases we have power failures; The Greek electricity company tries to increase the supply and consequently more money is spent, and CO₂ emissions are increased due to increased energy consumption

Lack of green and free spaces

- Due to several laws it is not possible for the municipality to buy public spaces and turn them into green spaces

Need for eco friendly materials

Lack of infrastructure

Some facts about the actions of Egaleo regarding sustainable planning

- Egaleo was one of the first Greek Municipalities to sign with the 100 first EU cities for reducing carbon emissions
- The new metro station will contribute to the reduction of CO₂ emissions (reduced traffic)
- Egaleo has finally created a land use map

Discussion

C: There is immediate need for change in the administration at local level and the cooperation of all levels of authority is needed. There is also a need to consult scientists when planning and take advantage of the knowledge available.

C: The interest of the Mayor in environmental issues is obvious

1.1.3 Speech by the Mayor of Maroussi, Athens

Giorgos Patoulis, Mayor of Maroussi

He is very happy to see that there are people (agencies, institutions, local governments) supporting solutions for environmental issues, renewable energies in buildings etc.

Greece has three levels of government central, regional and local. It is important that there is close cooperation between them.

There is growing interest in sustainable planning issues and he is confident that we can have significant results with the close cooperation of scientists and local governments and the national and EU funding.

1.1.4 Presentation of the BRIDGE project

Nektarios Chrysoulakis, FORTH Hellas; BRIDGE project coordinator

First N. Chrysoulakis presents A. Groot and A. Gonzales

Presentation

- The objectives of the BRIDGE FP7 project: to develop a decision support system that helps city planners to decide which planning alternatives are the most sustainable.
- Problem of urban development associated with energy, water and air quality
- The challenge of the BRIDGE project, ***urban metabolism***, was highlighted
- The decision making diagram with components, including alternatives, indicators, criteria and objectives toward the sustainable planning goal
- Components of the DSS: existing models on urban climate, water, air quality and energy; datasets; a decision/weighting device, GIS representation of results.

- The methodology including measurements, modelling the role of the users was explained.
- Demonstration of a mock DSS system for Athens based on GIS
- The vision and roles of users of the DSS was discussed.

Discussion

Q: Does the DSS include the “human factor” and market issues?

A: BRIDGE is an EU funded project focusing on specific aspects. It includes socioeconomic aspects but the models focus on physical flows. Huge funds would be required to include socioeconomic modelling. Therefore socioeconomic aspects are considered as static variables.

Q: Why there is nothing done for the area of Eleonas (degraded area in Egaleo)

A: Greece, until recent years did not include environmental issues in urban planning because there were other priorities. Today we need to take care of environmental issues in order to see the effects the following years. In Egaleo we have huge traffic because of the main axes roads passing through, resulting in air pollution and increased anthropogenic heat. We are trying to change that by a pilot project for the rehabilitation of Thivon Avenue through increased vegetation and other measures that will be presented later in the “real life project”.

C: In Greece the case is totally different compared to other EU cities like Helsinki for example. BRIDGE tries to provide practical solutions and not a theoretical evaluation.

1.1.5 Objectives of the Athens CoP Meeting

Ainhua Gonzales Del Campo, TCD

Presentation

- Objectives of the Athens CoP Meeting: to Gathering local knowledge on key urban planning priorities, issues and challenges; Gathering local views and perceptions on sustainability objectives and associated indicators; determining a case study for testing the BRIDGE approach and the DSS tool.
- Description of the BRIDGE Approach: to interact with city planners in five cities and find out how BRIDGE can help, combine the input from cities with spatial data and model outcomes, do a test run on a case study to compare planning alternatives and assess the sustainability of planning proposals.
- Key BRIDGE aspects are energy, air and water. Description of the steps to develop objectives, criteria and indicators
- Description of the three stages of users and developer interaction: hopefully two meetings in each city and an umbrella CoP in which the COP participants of five cities are combined.

1.1.6 Communities of Practice: Concept and application in the BRIDGE project

Annemarie Groot, ALTERRA

Presentation

- A Community of Practice is a group of people who share the same passion and field of interest e.g. painting, engineering or sustainable urban planning. They meet on regular basis.
- The example of CoBrA is given.
- The difference between a working group and CoP is given
- In the scope of BRIDGE project we hope that a CoP on sustainable urban planning will be created even beyond the support of BRIDGE researchers but this is totally up to the users needs.
- For the BRIDGE project, apart from the local CoP meetings an umbrella CoP meeting will be organised with representatives from the local CoP's.

Discussion

Q: Where and when is the umbrella CoP meeting going to be held?

A: The place will probably be in Dublin. The date has not been decided yet.

Q: How are the local CoP meetings are going to be organised?

A: Afroditi Synnefa is responsible for the Athens CoP. Some preliminary meetings have already been organised mostly between members of the Technical Department of the Municipality of Egaleo. This is the first "official" CoP meeting. We are expecting to see if after today there is interest in continuing CoP meetings, in order to decide on how to proceed for the case of Athens.

1.1.7 Sustainable specifications for urban climatic refurbishments in Athens

T. Kardomateas, Head of technical services of the Prefecture of Athens

Presentation

- Introduction. Mr. Sgouros, Prefect of Athens really wanted but could not attend this meeting due to prior arrangements. Mrs. Kefalidou - Vice Prefect of Athens responsible for technical works and urban planning, could not attend because she was elected (in the Greek elections of 4th October 2009) and was engaged. Mr. Kardomateas will cover her presentation.
- Major of problems of Athens Greater Area:
 - Environmental degradation due to several reasons e.g. increased urbanisation (without proper planning), the fires that since 1970 have reduced green spaces around Athens, and the inability of the government to maintain large open spaces.

- This environmental degradation has a more serious impact on low income people that represent 20% of the population (income <4000euros/year for a single person).
- 90% of this low income population live in non appropriate (poorly insulated, not airtight etc.) houses having very little means to cope with environmental conditions.
- The Prefect of Athens has decided to spend the Prefecture's funds for developing infrastructure and in works that aim to improve the quality of life of the citizens.
- Reference to the projects that the Prefecture of Athens has carried out.
- Description of the methodology that is being followed in every project. The Prefecture of Athens has decided to incorporate available scientific knowledge in the projects by collaborating with the University of Athens. First an evaluation of the current situation is done by performing measurements at the area to be e.g. rehabilitated. After assessment of the problems, a team of experts proposes some solutions. These proposed solutions are being evaluated using simulation tools in order to find the optimum one.
- Detailed description of some projects that have been carried out by the Prefecture of Athens (objectives and measures to achieve them)
- For most of the projects the sustainability objectives are:
 - decrease of ambient temperatures
 - reduction of the heat island effect
 - increase green spaces
 - improve thermal comfort conditions in outdoor and indoor spaces
 - reduce energy consumption for cooling of the buildings in the area
- It is important to set the parameters that assess the effectiveness of the proposed measures. Also a control mechanism is necessary to insure that the measures were properly applied (i.e. an independent organisation that has the means, instrumentation and accreditation to make this assessment)

Discussion

Q: These proposals presented were made by the Municipalities or the Prefecture?

A: The proposals were made by the Municipalities but the Prefecture has encouraged them to use these technologies and methodology. The same applies for the real life project concerning Egaleo that will be presented later on by Mrs. Xyrafi.

Q: It is not good that the 2 main National Roads pass through the city of Athens because thousands of cars enter only to reach the two main markets and this increases traffic significantly and increases air pollution. Is the Prefecture of Athens planning to change that by i.e. creating parking spaces in the entrance of the city?

A: The Prefecture of Athens does not have the authority to do urban planning and can only collect assess such proposals and then press the central government to do something about that.

Q: Can the BRIDGE project help with that?

A: The BRIDGE project can help with the assessment of such proposals through its DSS.

Q: In your presentation it becomes clear that there is a need for close cooperation between the scientific community and the authorities. In the committees responsible for these decisions, scientists were always present but the decisions did not take into account environmental issues. Do you think that we should reinforce the role of representation of local communities to solve this problem as it is happening in other countries with success?

A: The real problem is to create a two- ways communication between the central government and the local authorities so the local authorities can communicate the needs and problems of the local communities to the central government that can make laws, urban planning etc.

1.1.8 Improvement of climatic conditions of urban areas with low environmental quality. A challenge for the case of Western Athens: The example of the area of Eleonas at Egaleo

Mat Santamouris, National and Kapodistrian University of Athens (Athens Case Study leader)

Presentation

- Economy, Energy and Environment are strongly interrelated parameters. Examples of the impact of each of these parameters on the other two.
- Definition of the problem of the urban heat island effect. According to a study performed at western Athens, it was found the heat island effect is very intense. Temperatures higher by 4 C were found compared another area near the centre of Athens. These results would have been even worse if the reference station was in a rural area.
- According to the measurements performed at Egaleo for the Bridge project, it was found that the air temperature is higher by 5 C in the afternoon again compared to a station near the centre of Athens. Presentation of experimental data supporting that.
- Surface temperatures also affect thermal comfort conditions.
- The consequences of this temperature increase include increased energy consumption. A house in western Athens will consume the double amount of energy for cooling compared to a house in the northern part of Athens and consequently spend more money.

- Measured air temperatures inside low income houses with no insulation and double glazing reveal that the air temperature has reached 42C.
- The problem exists and so do the solutions. However, the people that are mainly affected of this problem can not afford to make rehabilitate their houses.
- According to statistical data older houses, with smaller surface, poor environmental quality and increased energy consumption correspond to low income people.
- Air pollution problems are also important in western Athens and is also transferred into houses
- Description of the Athens Case study (Egaleo) and the measurements performed. It is mostly populated by low income people, and faces socioeconomic problems (large rates of unemployment, low levels of education).
- The analysis of the measurements, reveal that the area is characterised by increased outdoor temperatures during summer and faces thermal discomfort.
- The inhabitants of selected houses where measurements have been performed to assess the indoor environment were also asked through questionnaires to evaluate thermal comfort conditions. It was found that a significant percentage feels thermal discomfort.
- The solutions that require funding can be summarised into three axis: improve houses, improve public buildings and improve urban environment (rehabilitation of urban spaces e.g. by using cool materials)

Discussion:

C: The Mayor of Egaleo makes some comments on the role of authorities in these projects. He fully supports these projects.

Q: A study on the resistance of existing (mainly old) buildings to earthquakes is also very important as Greece has increased seismic activity. Does the BRIDGE DSS include this parameter?

A: No the BRIDGE DSS only focuses on energy, water and air pollution.

Q: What is your opinion on increasing green spaces (e.g. using green roofs)?

A: The buildings in the area of Egaleo need major and basic improvements and not using expensive technologies like green roofs that are a good solution for the cases that the basic building problems have been solved like in the case of Germany for example.

Q: If I improve my home will that solve the problem? The urban environment will keep affecting my building.

A: We need to improve the urban environment and in parallel our buildings in order to be able to better adapt to outdoor conditions.

1.1.9 Air quality issues in Athens

V. Assimakopoulou, National Observatory of Athens

Presentation

- Air pollution episodes in Athens are affected by two main parameters:
 - 1) Emission of pollutants from cars, industry and central heating
 - 2) Meteorological conditions that favor build up of pollution concentrations
- The Athens air quality monitoring network is presented.
- The air pollutants monitored by the Ministry of Environment are:
 - O₃ : Ultraviolet Absorption Method),
 - NO/NO_x/NO_x-NO : Chemiluminescence Method,
 - SO₂ : Ultraviolet Fluorescence Method,
 - CO : Infrared absorption,
 - Benzene : Gas chromatography,
 - PM₁₀ and PM_{2.5} : Beta attenuation
- Other methods of air pollutants measurements are described.
- The meteorological parameters measured are:
 - Radiosonde data: wind speed and direction and temperature
 - Measurements of ground based meteorological stations: Wind speed, direction, temperature, relative humidity, cloud cover, solar radiation, sunshine duration, rainfall
 - SODAR-RASS system: wind speed, wind direction and temperature, estimation of mixing height
 - SODAR system: wind speed and wind direction, estimation of mixing height.
- Data on several air pollutants are presented for the centre of Athens
 - CO₂ and SO emissions have significantly decreased.
 - NO₂ emissions remain stable;
 - O₃ concentrations are quite high, they vary from year to year but overall remain stable too.
 - PM₁₀ has significantly increased in the last decade.
- Emergency measures and limit values for the pollutants are presented.

Discussion

C: It is important to start measuring also PM2.5 and PM1 because they are highly toxic and can penetrate and “sit” on human lungs

1.1.10 The use of urban indicators in the Greek planning system- Issues and challenges

Alexandros Karvounis, National and Kapodistrian University of Athens, BRIDGE researcher

Presentation:

- Description of the Greek planning system: Environmental and spatial planning as well as socioeconomic planning is done at three levels: national, regional and local.
- Monitoring of urban policy in Greece in a systematic approach is absent. Information is fragmented and not updated especially in spatial level of building block or neighborhood.
- The use of spatial sustainability indicators can play a key role in assisting planners and other planning process stakeholders to evaluate urban development issues and promote the enforcement of sustainable spatial policies
- Although urban observatories are common abroad, in Greece are approached as innovative actions.
- The application of urban indicators is explained.
- Indicators are separated in two categories: a) urban indicator, which refers to existing situation and b) urban standard, which refers to future needs.
- Indicators and standards are formulating the basic figures of planning for density, population etc, and the guidelines for urban functions location.
- In detail the parameters investigated are: Population, the saturation coefficient λ (which reflects the functional image of the area to which the study and the degree of intensity of residential or other development for the time objective), Density, population Capacity, Standards of land use.
- Regarding environmental indicators, EU Directive 2001/42/EC sets a a framework to carry out supplementing projects and activities.
- The main problems regarding the monitoring of urban indicators in the Greek planning system are: Lack of monitoring structures, Reliability, Frequency measurement, Lack of primary research - cost
- A state of the art monitoring structure is presented that has been developed for the city of Komotini.

2 Summary of discussions during the afternoon session

2.1 Planning Priorities

During the afternoon session there was an open discussion among the participants in order to establish the planning priorities in Athens. The area of focus was Egaleo, which the BRIDGE case study area.

The major problems that the area of Egaleo is facing were discussed in plenum and taking also into account the aspects highlighted during the morning presentations, a number of key planning priorities for the city emerged:

- Poor quality of buildings: The majority of the building stock (more than 80%) was constructed before the 80's. Consequently, these buildings are poorly or not at all insulated, they are not airtight. As a result these buildings can not resist to outside environmental conditions (high temperatures, air pollution) and they consume a lot of energy mainly for cooling.
- Thermal discomfort: The heat-island effect is a significant problem (and extremely intense in the Egaleo area) leading to indoor/outdoor overheating during the summer months, exacerbated by climate change
- Energy: Increased energy consumption mainly for cooling (and related expenses) due to the above mentioned problems.
- Green spaces: Due to bad / no planning there aren't adequate green spaces in the area of Egaleo and major fire incidents have reduced green spaces surrounding Athens.
- Air quality: There are increased CO₂ emissions and air pollution in the area mainly because of heavy traffic (one of the National Roads is passing through Egaleo and also some of the major avenues). Additionally, one end of the Athens metro network is at Egaleo contributing to increased traffic by people who come and park their cars in order to use the metro. The Municipality is trying to reduce this problem through the retrofitting of Thivon Ave. (Real life project) and creating more parking spaces.
- Transport: especially issues associated with poor public transportation and limited car-parking spaces, as well as air quality problems.
- Another major problem of Egaleo is a significantly degraded area called Eleonas. Eleonas is brownfield. About 20% of the area of Eleonas belongs to Egaleo Municipality and the rest belongs to four other Municipalities. Due to political and legal reasons this area is not being retrofitted contributing to further environmental, social and aesthetic degradation of the area and surrounding areas.

Sustainable Urban Planning in Athens

A summary of the discussions and presentations conclusions is given in the following table.

Summary of priorities for sustainable city planning in Athens

- Thermal discomfort
- Energy
- Quality of building stock
- Transport
- Green spaces
- Land use of Eleonas

A mind map was produced during the meeting showing priorities in sustainable urban planning, sustainability problems and objectives in one picture.

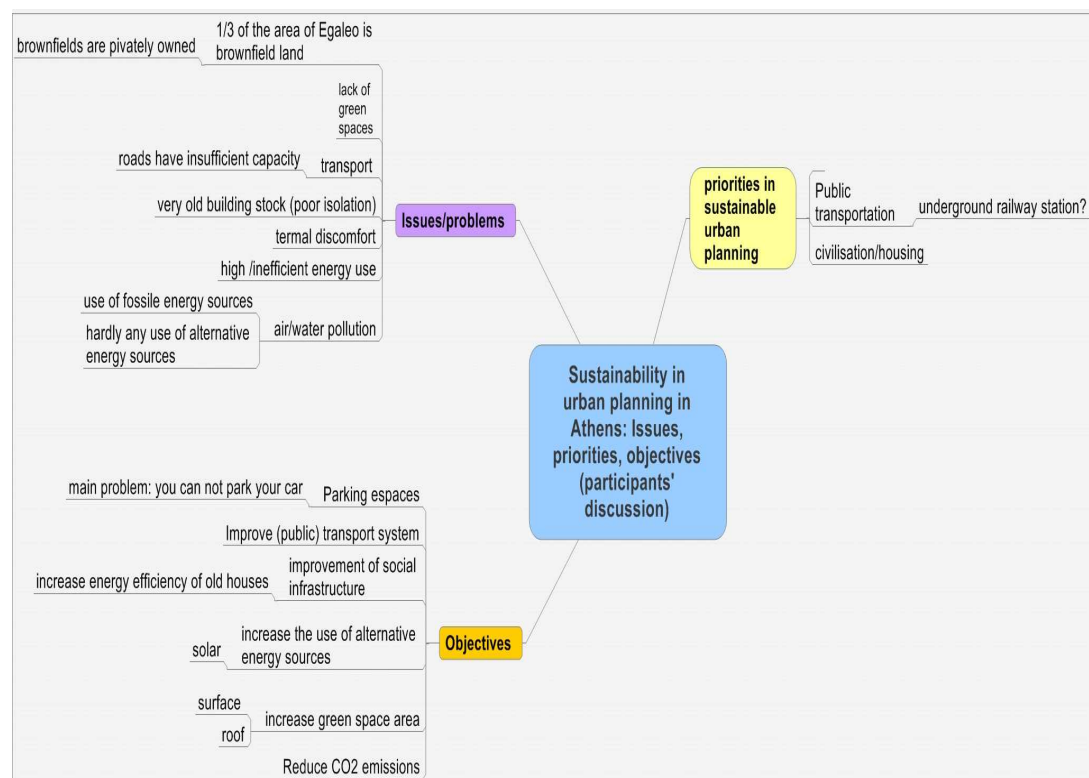


Figure 1: Diagram (produced by A. Groot) showing priorities in sustainable urban planning, sustainability problems and objectives in one picture

2.2 Sustainability Objectives

Based on the above priorities and issues, the core sustainability objectives for the city were discussed and agreed by the participants. These objectives can be summarized as follows:

- **Improve air quality:** minimize emissions, particularly from CO₂, NO_x, and PM.
- **Improve energy efficiency:** and reduce energy consumption mainly for cooling; improve insulation and air tightness in old buildings; promote the use of solar energy, use cool materials.
- **Reduce CO₂ emissions:** improve public transport efficiency and reduce private-car dependency (which will also result in reduced noise levels). Improve energy efficiency of buildings, so less energy is consumed and therefore less fossil fuel is burnt to produce this energy.
- **Reduce thermal discomfort:** mitigate heat-island effect through the use of appropriate materials, planting and shading; increase energy efficiency of old buildings.
- **Improve the built fabric:** renew old buildings to incorporate insulation and improve their energy efficiency; apply cool and photocatalytic materials.
- **Increase green and open space areas:** new parks, tree planting on streets.
- **Improve mobility:** improve public transport efficiency, enhance the capacity of existing roads and provide for car-parking spaces at adequate locations.

These objectives will be used to determine sustainability targets (mainly based on European Directives and requirements) and indicators.

2.3 Indicators

Indicators were not discussed at the CoP meeting due to time constraints. However, the urban indicators currently being measured in Athens were presented by Alexandros Karvounis. Taking these and the objectives established during the afternoon discussion into account, the following preliminary indicators are proposed:

Sustainability Objective	Indicators
Improve Air Quality	<ul style="list-style-type: none"> • Concentration of pollutants (NO_x, SO_x, PM₁₀, PM_{2.5}, etc.); and • Number of days above established air quality thresholds.
Improve Energy Efficiency	<ul style="list-style-type: none"> • Energy consumption per capita; and • % of energy from renewable sources.
Reduce CO₂ emissions	<ul style="list-style-type: none"> • CO₂ concentration; • % of CO₂ emissions from anthropogenic sources: transport, industry, households; and • Effects of meteorological conditions (e.g. temperature) on concentrations.
Reduce Thermal Discomfort	<ul style="list-style-type: none"> • Average outdoor temperature (surface and air); and • Average indoor temperature (particularly in old buildings).
Improve the Built Fabric	<ul style="list-style-type: none"> • Building characteristics; and • Number of dwellings where insulation improvements have taken place.
Increase Green Space Areas	<ul style="list-style-type: none"> • Area (ha) of urban green space; • Number of trees planted; • Coverage (m²) of green infrastructure (from new plantations and growth); and • % of urban green space of total urban area.
Increase Mobility	<ul style="list-style-type: none"> • Number of municipal passenger transport services; • % of population using public transport; and • Number of new car-parking spaces.

Note that the above indicators are preliminary only. These will be further discussed at the second Community of Practice meeting and contextualized to the BRIDGE components (i.e. water, air quality and energy). Moreover, note that the availability of data was not explored due to time constraints.

2.4 Selecting a Real Life project

The real life project in Athens will comprise the assessment of alternatives for the regeneration of an avenue in the municipality of Egaleo.

2.4.1 Bioclimatic design (retrofitting) of Thivon Avenue in the Municipality of Egaleo

Fotini Xyrafi, Architect Engineer, Landscape Architect

- Description and characteristics of Thivon Avenue that is running through 6 Municipalities of Athens.
- The retrofitting focuses in the part of Ave. Thivon that passes through Egaleo.
- The major identified problems are:
 - Heavy traffic load
 - Increased air pollution
 - Environmental problems due to the neighboring industrial area of Eleonas
 - Lack of open and green spaces
 - Lack of parking spaces
 - Degraded urban infrastructure e.g. destroyed pavements making very difficult the mobility of pedestrians, especially for disabled people.
 - poor quality of buildings
 - “Visual pollution” (e.g. huge publicity panels etc.)
 - high temperatures experienced in the city as a whole (thermal discomfort).

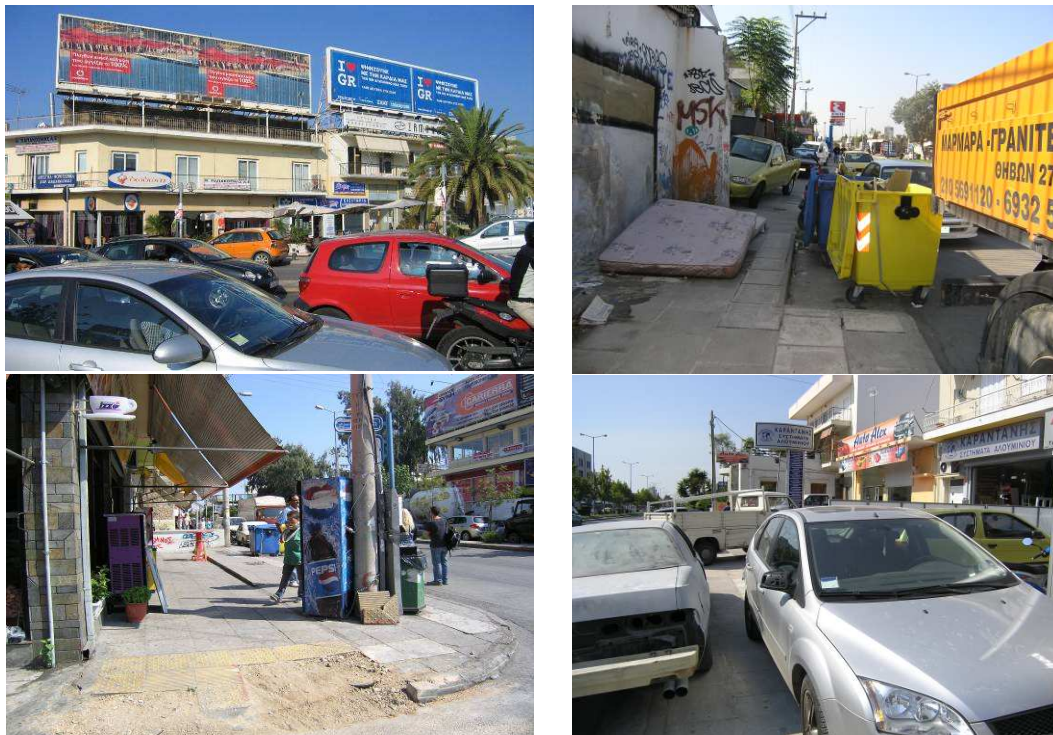


Figure 2: Pictures depicting some of the problems of Thivon Ave. (Athens case study)

- The objectives of the regeneration are to a) create thermal comfort conditions, b) improve the microclimate, c) increase green spaces and improve ventilation/ air circulation conditions, d) appropriate choice of materials e) respect the traditional architectural style of the area.
- Some of the proposed interventions include:
 - Use of photocatalytic cool asphalt (with self cleaning, anti pollution properties, antimicrobial properties)
 - Use of ceramic tiles on pavements (cool materials that do not absorb sunlight, natural materials, easy to clean)
 - PV, and PV lighting devices
 - Installation of Earth to air heat exchangers for cooling and ventilation
 - A bioclimatic solar tower that collects air pollution from near the road and transfers it at a height over the canopy. It also collects solar energy that can be used and is aesthetically pleasing.
 - Use of pergolas for shading
 - Increasing green spaces by tree (already mature, appropriate, non allergenic) and bush planting for microclimate improvement and shading.
 - rehabilitation of the main squares around the avenue
- The goal of this project is to create an oasis in this problematic area and present a pilot project that other municipalities will also follow.

M. Santamouris: This project is still in progress. We have evaluated the current situation by performing extensive measurements (some presented during the morning session). What was presented here is an effort to propose solutions for the identified problems. Currently the proposed solutions are being evaluated by the University of Athens. As a result of this analysis, some changes to the current proposal may occur to optimize the solution.

The first results show that the proposed plan will decrease the outdoor temperature.

D. Kalogeropoulos: This project tries to convert a place that is a heat island to a cool oasis and give life to the surrounding area.

M. Santamouris: The idea is to use simple and not sophisticated technology to improve the thermal conditions in the city: efficient planning and small cost and solutions easy to maintain in order to improve a neighborhood (the most expensive things is the photovoltaic pavement).

C: Maintenance is also very important

Q: Did you consider any planning alternatives? What were the assessment criteria? What is the time frame of the project?

A: During the planning phase several alternatives have been proposed. The Assessment Criteria of Alternatives are:

- Reduction of ambient temperature by 2oC at 1.8 metres.
- Reduction of surface temperature by 4oC.
- Improvement of thermal discomfort by 25%.
- Decrease of the cooling hours by 20%.
- Decrease of the cooling load by 15% in the nearby buildings.

Q: Did you consider any socioeconomic criteria:

A: There is no socio-economic criteria; only thermal/environmental criteria (the models used for evaluation do not include these kind of criteria and focus on climatic parameters). However, it is expected that the proposed measures will also have a socioeconomic affect by regenerating the area, increasing its value an giving life to the area at all aspects (boosting the market, it will attract more people etc.)

Q: What are you planning to do with existing traffic when implementing this project (construction phase)?

A: This would temporarily move transport related issues (congestion, air pollution, etc.) to other parts in Athens however it is not the responsibility of the people involved in the project to deal with that at this time.

This case study will be used to validate the DSS outcomes (by contrasting the results provided by the University of Athens with those obtained by BRIDGE researchers and, consequently, evaluating the consistency and coherency of the DSS outcomes).

2.5 Outlook to 2nd CoP meeting

The organization of the next CoP meeting is still under discussion but will not be organized before February 2010. The participants were very positive in attending a second CoP meeting.

In the second CoP meeting there will be further discussion on the indicators and the list will be finalised and contextualized to the BRIDGE components (i.e. water, air quality and energy). The availability of data will be explored.

Furthermore, it was stated that it would be interesting to present a comparison with the case study areas of the other countries.

ANNEX I: Agenda

10.00–10.10	Welcome and objectives for the meeting	Prof. Mat Santamouris NKUA
10.10- 10.15	Welcome	D. Kalogeropoulos – Mayor of Egaleo – President of Local Union of municipalities and communities of Attica - Urban planner
10.15 -10.30	Introduction of participants	All
10.30 – 10.40	BRIDGE project presentation	N. Chrysoulakis FORTH - BRIDGE project coordinator,
10.40-10.50	Objectives and working approach of the meeting	A.Gonzalez, A. Groot, A. Synnefa –BRIDGE researchers
10.50-11.10	Major refurbishment projects to improve sustainability and climatic conditions in the major Athens area. (short discussion among participants)	C. Kefalidou- Vice Prefect of Athens responsible for technical works and urban planning
11.10-11.30	Sustainable specifications for urban climatic refurbishments’ in Athens (short discussion among participants)	T. Kardomateas - Head of technical services of the Prefecture of Athens
11.30-11.45	Coffee break	
11.45 – 12.10	Energy efficient and climatic responsible project in Egaleo city (short discussion among participants)	D. Kalogeropoulos – Mayor of Egaleo
12.10-12.20	Air quality issues in Athens (short discussion among participants)	V. Assimakopoulou – researcher, National Observatory of Athens
12.20-12.45	The use of urban indicators in the Greek planning system- Issues and challenges (short discussion among participants)	A. Karvounis – Urban planner- BRIDGE researcher
12.45 -13.30	Discussion on planning priorities and sustainability objectives	All
13.30- 14.30	Lunch	
14.30-14.45	Presentation of the Athens case study (Egaleo)	M. Santamouris – BRIDGE case study leader
14.45-15.05	Presentation of a real life project: “Bioclimatic design of the main axes Ave. Thivon at Egaleo”	F. Xyrafi –Architect engineer/ landscape architect
15.05- 16.30	Discussion on indicators - <i>What indicators can be used?</i>	All
16.30-17.00	Follow up	M. Santamouris

ANNEX II: List of participants

i/i	Name	Institution/ Company
1	Annemarie Groot	ALTERRA, Netherlands
2	Afroditi Synnefa	National and Kapodistrian University of Athens, Greece (CoP Coordinator)
3	Mat Santamouris	National and Kapodistrian University of Athens, Greece (Athens case study leader)
4	Nektarios Chrysoulakis	FORTH, BRIDGE coordinator
5	Yannis Matsinos	University of Aegean
6	Stathopoulou Marina	National and Kapodistrian University of Athens, Greece - BRIDGE researcher
7	Adaktylou Nektaria	National and Kapodistrian University of Athens, Greece- BRIDGE researcher
8	Katerina Katsiabani	National and Kapodistrian University of Athens, Greece- BRIDGE researcher
9	Kostas Tsoutsouras	Municipality of Ag. Barbara (western Athens)
10	Fotini Xyrafi	ALD landscape architects
11	Ainhoa Gonzales	Trinity College Dublin, BRIDGE researcher
12	Alexandros Karvounis	National and Kapodistrian University of Athens, Greece- BRIDGE researcher
13	Iouliani Theona	Prefecture of Athens
14	Tsekouras Giorgos	Prefecture of Athens
15	Mandilara Vassiliki	Municipality of Egaleo
16	Balatsouras Ioannis	President of professionals of Eleonas
17	Kopitsi Chrysi	Repr. of OESE to the EU
18	Korellas Panagiotis	Prefecture of Athens
19	Sotiriou Elena	Municipality of Egaleo
20	Pounis Dimitris	Municipality of Egaleo
21	Samoulis Sofoklis	Municipality of Egaleo
22	Skoura Maria	Prefecture of Athens
23	Bazis Lampros	Prefecture of Athens
24	Daglos Ioannis	Prefecture of Athens
25	Giannopoulou Maria	Prefecture of Athens
26	Karahalios Giorgos	Municipality of Egaleo
27	Athanasiadou Dimitra	Municipality of Egaleo
28	Aslanidou Eleni	Municipality of Egaleo
29	Tridimas Giorgos	Municipality of Egaleo
30	Oikonomou Vaggelis	Municipality of Egaleo
31	Maragou Efrosyna	Municipality of Egaleo
32	Stoumpou Vassiliki	Municipality of Egaleo
33	Tzortzi Maria	Municipality of Egaleo

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i/i	Name	Institution/ Company
34	Myti Anthoula	Municipality of Egaleo
35	Rodatos Giorgos	Municipality of Egaleo
36	Tzempelikos Dimitrios	Municipality of Egaleo
37	Nikoloudi Panagiota	Municipality of Egaleo
38	Nikolopoulou Christina	Municipality of Egaleo
39	Peta Dimitra	Municipality of Egaleo
40	Kypraios Mihalīs	Municipality of Egaleo
41	Hyta Evaggelia	Municipality of Egaleo
42	Birbas Christos	Municipality of Egaleo
43	Assimakopoulou Vassiliki	National Observatory of Athens
44	Sfyris Dimitrios	Municipality of Egaleo
45	Kyriakopoulos Panagiotis	Municipality of Egaleo
46	Kolyvakis Nikolaos	Municipality of Egaleo
47	Kanelopoulou Evaggelia	Municipality of Egaleo
48	Dimitris Kalogeropoulos	Mayor of Egaleo
49	Giorgos Patoulis	Mayor of Maroussi
50	Theodoros Kardomates	Head of technical services of the Prefecture of Athens
51	Katerina Berli	Municipality of Egaleo