



# Indicators for Sustainability

How cities are monitoring and evaluating their success



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# Introduction

This paper examines the work that a selection of cities globally has made towards establishing sustainability indicators to monitor the success of their sustainability plans. The research has focused on identifying the commonalities between the cities analyzed to create a tool kit that will serve as a starting point for other cities that are interested in establishing or developing sustainability indicators. This paper will be shared among the cities in the Sustainable Cities Network, and others that are interested in this topic.

The objectives of this paper are to:

- Identify which methodologies or frameworks these cities are using to track sustainability indicators and support city planning.
- Identify and summarize the common key indicators that these cities are using.
- Create a tool kit that will support cities that are in the process of identifying which sustainability indicators they can use to accurately reflect the progress of their sustainability plans.

Framing the context for the development of a toolkit, the paper provides a brief introduction to the concept of sustainability, framing the need for sustainability and its place in the present context of city planning. Then it looks at the work currently being done by international organizations such as the UN, ICLEI, and other think tanks in regards to the development of indicators. Finally, it provides case studies of indicators in practice from selected cities in Africa, Americas, Asia, Australia, Europe and the Middle East.

The tool kit summarizes key learnings and commonalities among the case studies. It showcases the practices that are being employed internationally at municipal levels and which indicators are being used to measure success. The tool kit can be a 'one-stop shop' bank of indicators where cities will be able to see what has been successful in similar situations.

# Problem Statement

The call for cities to engage in best practices for sustainable planning has increased. Sustainability is no longer a buzzword but a reality that must be addressed by cities all over the world.

Sustainable city planning is a relatively new concept that many cities have embraced. However, many still struggle combining or adapting their strategic plans to incorporate the sustainability aspects. Some cities have opted for having a new department for sustainability, whereas many others have decided to take a more holistic approach and integrate a strategic, sustainable plan for their cities.

Whatever the approach taken by a city is, the challenge still remains in translating those plans into tangible actions and setting up indicators that will reflect their progress towards success, considering the specific conditions and socio-cultural environment of the city. City officials must reconcile how to monitor quantitative indicators of sustainability such as air and water quality, with qualitative measures of human well-being and civic engagement.

To summarize, the challenges faced are:

- Identifying relevant data to measure success for the various indicators.
- Selecting indicators that are good measures of sustainability.
- Bridging the gap between academic understanding of sustainability indicators and ecosystem functions and municipal planning of organizational structures, which have traditionally concerned themselves with land use, infrastructure and transportation, social planning, recreation and culture programming.
- Limited staff, time and resources, particularly in smaller communities.
- Availability of data from city departments or other government institutions.

The tool kit created as a result of this paper will address these challenges to a certain extent, by providing a “baseline” of what indicators are being prioritized by other cities worldwide.

# Method

The first step was the selection of cities based on the parameters of population, geographical size, regional representation and stage of sustainability plan (ideally at the implementation and monitoring stages). The cities selected include a good representation of small, medium and larger size cities. Most of the case studies are based on what Municipalities have implemented, but there are also examples on how civil society has participated in collaborating with Municipalities to integrate indicators in their plans and reports.

These case studies provide specific details of each city's experience in sustainability planning and their efforts to monitor indicators for sustainability. Each case study includes the city's overview, current work in sustainability management, list of indicators used and its reporting mechanism. This research was based on literature review, including available official plans and supporting municipal documents as well as interviews with city officials whenever possible.

Once the case studies were completed, the second step was the analysis and comparison of the cities frameworks and indicators. Indicator categories such as “green spaces”, “housing”, and “economic growth” were identified. If five or more cities had one or more indicators in a particular category, it was selected for the toolkit. Then, an analysis of the indicators under each category was conducted, and again, an indicator was included in the toolkit if five or more cities used it.

The third step was to develop the “Get set” section in the tool kit and identify the “key findings”, drawn from insights gained from each city. Finally, the paper was reviewed by academics and city planners to provide feedback and comments.



# Sustainability: The Global Context

The concept of sustainability has been an integral part of development work since the late 1980s. Understandings of sustainability have evolved in the last 25 years since the Brundtland Commission. Defining sustainability is consequently not simple, as it is a broad and deep concept that depends on many factors. In order to provide a basis for understanding sustainability and the subsequent challenges in creating indicators, it is important to understand the most accepted definition of Sustainable Development, which resulted from the work of the Brundtland Commission.

## The Brundtland Commission

Sustainable development is development “that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It contains within it two key concepts:

- The concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs

This definition has been widely adopted by UN, the Organization for Economic Cooperation and Development (OECD) and the World Bank. It is broad, as is the nature of sustainability. However it is important to acknowledge that in formulating this definition, it was the intent of the Commission to place the responsibility of sustainability practice in the hands of national governments. Thus the definition works at the national level where leaders are concerned with broad and basic needs of citizens.

To date, progress towards sustainability has predominantly been investigated at the national level through comparative analysis of nations by the UN Commission on Sustainable Development (CSD). However with the deadline for the Millennium Development Goals (MDGs) approaching, focus is increasing on cities and their capacity to meet sustainability targets. Furthermore it has become evident that irrespective of the MDGs, the demand for solutions to climate change, natural resource depletion and environmental degradation is pressing, especially as the population of the world increases and many people find themselves living in urban centers. Consequently, sustainability planning at the regional and municipal level is nowadays a major concern.

At the regional and municipal levels, sustainability takes on greater complexities shaped by the nature of a place and the varying demands of citizens. Leaders at the regional and municipal levels are faced with the challenge of balancing the broader theoretical demands of sustainability and the specific practical demands of citizens. Further sustainability practices are subject to availability of resources, different environments, and abilities of citizens to engage. These present challenges for planners and policy makers developing sustainability plans. They must present plans with goals and targets that fit within these constraints and then successfully track the outcomes of the sustainability plans. For cities, this is not a small feat and cities will benefit from learning from each other.

# Indicators for Sustainability

Cities and organizations are focusing on the development of indicators to measure progress. An indicator provides information on the state or condition of something. In terms of sustainability indicators, Astleithner et al (2004) narrow this definition to a policy-relevant variable defined in such a way as to be measurable over time and space.

Sustainability indicators can be quantitative or qualitative measures; however, what differentiates them from familiar ecological or economic indicators is their focus on linkages across different sectors. Ecological and economic indicators are still part of sustainability indicators by means of integration.

Indicators are important in holding governments and communities accountable to their sustainability targets and goals (Newman & Jennings 2008). Indicators provide data to guide policy-making and allow for comparisons to be made across municipalities and regions. The impacts and challenges of sustainability policies and plans on the urban environment can also be shown through indicators (Munier 2005).

Indicators are most useful in sustainability planning when linked to sustainability thresholds or targets. Thresholds are scientifically determined points where the state of things will change dramatically. Targets are often determined by policy makers or through public consultation and point to levels that must be met in the future if sustainability goals are to be reached. There are a number of issues associated with the selection, use and reporting of sustainability indicators.

The approach to selecting indicators generally falls into two general categories, top-down or bottom-up. The top-down approach means policy makers define the goals and accompanying indicators, the data collected is usually highly technical and requires experts to interpret. The bottom-up approach is community-based and involves extensive consultation with stakeholders to select appropriate indicators. The key difference in the two approaches is complexity. Top down processes involve more tools that allow for greater depth of analysis, while bottom up processes are more basic and broad. It is possible to combine the approaches to create a hybrid approach; however this depends on the context.

These two approaches reflect the need to develop indicators that are based on accurate scientific data as well as indicators that are easy to understand for the public and decision-makers. A solution to this problem that has been put forward is to select a set of “core” indicators, which span the breadth of a community’s sustainability goals. These core indicators should be easily understood and demonstrate the linkages between multiple sustainability goals. Alongside the core indicators, which will be widely publicized, there would remain a longer list of more technical and specific indicators for use by city staff.

The indicators included in the tool kit consider both types of indicators and the case studies also present examples of how cities are addressing them.



# Sustainability Planning: Frameworks

Sustainability planning at the Municipal level is an opportunity for cities to address in a more innovative, cost effective way the challenges they are facing, and create a vision for the future they want to see in their city considering all aspects of economy, environment and society.

There is no “one size fits all” method for developing a sustainability plan, as each plan should respond to the city’s unique needs. However, there are a number of common aspects that will need to be considered when developing a plan. This section will outline some examples of the frameworks or methodologies that were used by the cities selected for the case studies. It is important to note that most methods offer a holistic view that encompasses the environment, society and economy; a few are focused on the environmental aspects of sustainability as it has become a pressing issue internationally, for example, Greenhouse gas emissions.

These frameworks are:

- Agenda 21
- Aalborg Commitments
- DPSIR (Driving forces, Pressures, State of the Environment, Impacts, Response)
- Cities for Climate Protection Campaign - International Council for Local Environmental Initiatives (ICLEI)
- The Natural Step
- Millennium Development Goals

## **Agenda 21**

<http://www.iisd.org/rio+5/agenda/default.htm>

Agenda 21 is a comprehensive plan of action to be followed globally, nationally and locally by organizations of the United Nations System, governments, and other groups active in any area that has a human impact on the environment. The agenda was adopted by 178

governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, 3-14 June 1992. Subsequently, the full implementation of Agenda 21, the Program for Further Implementation of Agenda 21 and the Commitments to the Rio principles, were reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa from 26 August - 4 September 2002.

Population, consumption and technology are the primary driving forces of environmental change. Hence, Agenda 21 offers policies and programs to achieve a sustainable balance between these forces of change and Earth’s life-supporting capacity. These should be driven by governments with wide participation from non-government organizations and the public, and partnerships with international organizations and businesses. There are 40 chapters in the Agenda 21, divided into four main sections. Each section provides a list of recommended actions required in order to meet the objective of a sustainable balance:

- Social and economic dimensions: focuses on combating poverty, especially for developing countries, changing consumption patterns, promoting health, change population and sustainable settlement in decision making. Sample suggested actions:
  - Halt and reverse protectionism, including unilateral trade barriers that harm developing nations, and promote trade liberalization.
  - Reduce subsidies that lead to unequal forms of competition
- Conservation and management of resources for development, including atmospheric protection, combating deforestation, protecting fragile environments, conservation of biological diversity (biodiversity), control of pollution and

management of biotechnology and radioactive wastes. Sample suggested actions:

- Apply the “polluter pays” principle, and use economic incentives to reduce pollution of the seas
  - To combat desertification, governments should: Accelerate planting programs, using fast-growing, drought-resistant local trees and other plants
- Strengthening the role of Groups such as children and youth, women, NGOs, local authorities, business and workers as well as indigenous peoples, their community and farmers. Sample suggested actions:
    - Governments should incorporate the rights and responsibilities of indigenous people into national legislation
  - Means of implementation, including in science, technology transfer, education, international institutions and financial mechanisms. Sample suggested actions:
    - Countries need to develop tools for sustainable development such as: Quality of life indicators covering health, education, social welfare, and state of the environment and the economy.
    - Involve schoolchildren in local and regional studies on environmental health, including safe drinking water, sanitation, food and the environmental and economic impacts of resource use.

### **Aalborg Commitments**

<http://www.aalborgplus10.dk/>

The Aalborg Commitments were preceded by the Aalborg Charter of European Cities & Towns towards Sustainability, which was signed in 1994 by European cities & towns and provided a framework for the delivery of sustainable development. The charter calls on local authorities to engage in Local Agenda 21 processes (refer to Agenda 21). In

2004, during the 4th European Sustainable Cities and Towns Conference, also known as the Aalborg 10+, the Aalborg Commitments were established and adopted by 620 local governments in Europe. The objective of these ten commitments was to turn sustainable urban development from words into real actions.

By signing the Commitments, cities voluntarily agreed to undertake a baseline environmental review of their city within the first 12 months. Within 24 months, cities must have identified targets for action, in consultation with stakeholders, for a range of environmental issues. Cities must monitor progress in delivering the targets and make regular reports to their citizens. The ten commitments are:

## **1. GOVERNANCE**

**We are committed to energizing our decision-making processes through increased participatory democracy.**

We will therefore work to:

1. Further develop a commonly shared long-term vision for a sustainable city or a town.
2. Build participation and sustainable development capacity in the local community and municipal administration.
3. Invite all sectors of local society to participate effectively in decision-making.
4. Make our decisions open, accountable and transparent.
5. Cooperate effectively and in partnership with adjoining municipalities, other cities and towns, and other spheres of government.

## **2. LOCAL MANAGEMENT TOWARDS SUSTAINABILITY**

**We are committed to implementing effective management cycles, from formulation through implementation to evaluation.**

We will therefore work to:

1. Strengthen Local Agenda 21 or other local sustainability processes and mainstream them into the heart of local government.
2. Deliver integrated management towards sustainability, based on the precautionary principle and with regard to the forthcoming EU Thematic Strategy on the Urban Environment.
3. Set targets and time schemes in the framework of the Aalborg Commitments and create and follow the Aalborg Commitments monitoring review.
4. Ensure that sustainability issues are central to urban decision-making processes and that resource allocation is based on strong and broad sustainability criteria.
5. Cooperate with the European Sustainable Cities & Towns Campaign and its networks to monitor and evaluate our progress towards meeting our sustainability targets.

### 3. NATURAL COMMON GOODS

**We are committed to fully assuming our responsibility to protect, to preserve, and to ensure equitable access to natural common goods.**

We will therefore work, throughout our community, to:

1. Reduce primary energy consumption, and increase the share of renewable energies.
2. Improve water quality, save water, and use water more efficiently.
3. Promote and increase biodiversity, and extend and care for designated nature areas and green spaces.
4. Improve soil quality, preserve ecologically productive land and promote sustainable agriculture and forestry.
5. Improve air quality.

### 4. RESPONSIBLE CONSUMPTION AND LIFESTYLE CHOICES

**We are committed to adopting and facilitating the prudent and efficient use of resources and to encouraging sustainable consumption and production.**

We will therefore work, throughout our community, to:

1. Avoid and reduce waste, and increase re-use and recycling.
2. Manage and treat waste in accordance with best practice standards.
3. Avoid unnecessary energy consumption, and improve end-use energy efficiency.
4. Undertake sustainable procurement.
5. Actively promote sustainable production and consumption, in particular of eco-labeled, organic, ethical and fair trade products.

### 5. PLANNING AND DESIGN

**We are committed to a strategic role for urban planning and design in addressing environmental, social, economic, health and cultural issues for the benefit of all.**

We will therefore work to:

1. Re-use and regenerate derelict or disadvantaged areas.
2. Avoid urban sprawl by achieving appropriate urban densities and prioritizing brownfield site over greenfield site development.
3. Ensure the mixed use of buildings and developments with a good balance of jobs, housing and services, giving priority to residential use in city centers.
4. Ensure appropriate conservation, renovation and use/re-use of our urban cultural heritage.
5. Apply requirements for sustainable design and construction and promote high quality architecture and building technologies.

## 6. BETTER MOBILITY, LESS TRAFFIC

We recognize the interdependence of transport, health and environment and are committed to strongly promoting sustainable mobility choices.

We will therefore work to:

1. Reduce the necessity for private motorized transport and promote attractive alternatives accessible to all.
2. Increase the share of journeys made by public transport, on foot and by bicycle.
3. Encourage transition to low-emission vehicles.
4. Develop an integrated and sustainable urban mobility plan.
5. Reduce the impact of transport on the environment and public health.

## 7. LOCAL ACTION FOR HEALTH

We are committed to protecting and promoting the health and wellbeing of our citizens.

We will therefore work to:

1. Raise awareness and take action on the wider determinants of health, most of which lie outside the health sector.
2. Promote city health development planning, which provides our cities with a means to build and maintain strategic partnerships for health.
3. Reduce inequalities in health and address poverty, which will require regular reporting on progress towards reducing the gaps.
4. Promote health impact assessment as a means for all sectors to focus their work on health and the quality of life.
5. Mobilize urban planners to integrate health considerations in their planning strategies and initiatives.

## 8. VIBRANT AND SUSTAINABLE LOCAL ECONOMY

We are committed to creating and ensuring a vibrant local economy that gives access to employment without damaging the environment.

We will therefore work to:

1. Adopt measures that stimulate and support local employment and business start-ups.
2. Cooperate with local businesses to promote and implement good corporate practice.
3. Develop and implement sustainability principles for the location of businesses.
4. Encourage markets for high quality local and regional produce.
5. Promote sustainable local tourism.

## 9. SOCIAL EQUITY AND JUSTICE

We are committed to securing inclusive and supportive communities.

We will therefore work to:

1. Develop and implement programs to prevent and alleviate poverty.
2. Ensure equitable access to public services, education, employment opportunities, training, information, and cultural activities.
3. Foster social inclusion and gender equality.
4. Improve community safety and security.
5. Secure good quality and socially integrated housing and living conditions.

## 10. LOCAL TO GLOBAL

We are committed to assuming our global responsibility for peace, justice, equity, sustainable development and climate protection.

We will therefore work to:

1. Develop and follow a strategic and integrated approach to mitigate climate change, and work towards a sustainable level of greenhouse gas emissions.

2. Mainstream climate protection policy into our policies in the areas of energy, transport, procurement, waste, agriculture, and forestry.
3. Raise awareness of the causes and probable impacts of climate change, and integrate preventive actions into our climate change policy.
4. Reduce our impact on the global environment and promote the principle of environmental justice.
5. Strengthen the international cooperation of towns and cities and develop local responses to global problems in partnership with local governments, communities and relevant stakeholders.

In 2010, a follow-up survey (Aalborg Commitments Survey 2010) was conducted to assess whether the signatory local government's sustainable performance had decreased, increased or hadn't developed, based on 24 thematic indicators reflecting the themes of the Aalborg Commitments. In addition, the signatories were asked to present three examples of successful concrete achievements and results in their local governments after signing the Aalborg Commitments. The overall conclusion of the survey indicates that a great deal of progress has been made towards sustainable development amongst the local governments which have endorsed the Aalborg Commitments.

**DPSIR (Driving forces, Pressures, State of the Environment, Impacts, Response)**

[http://www.grida.no/graphicslib/detail/dpsir-framework-for-state-of-environment-reporting\\_379f#](http://www.grida.no/graphicslib/detail/dpsir-framework-for-state-of-environment-reporting_379f#)

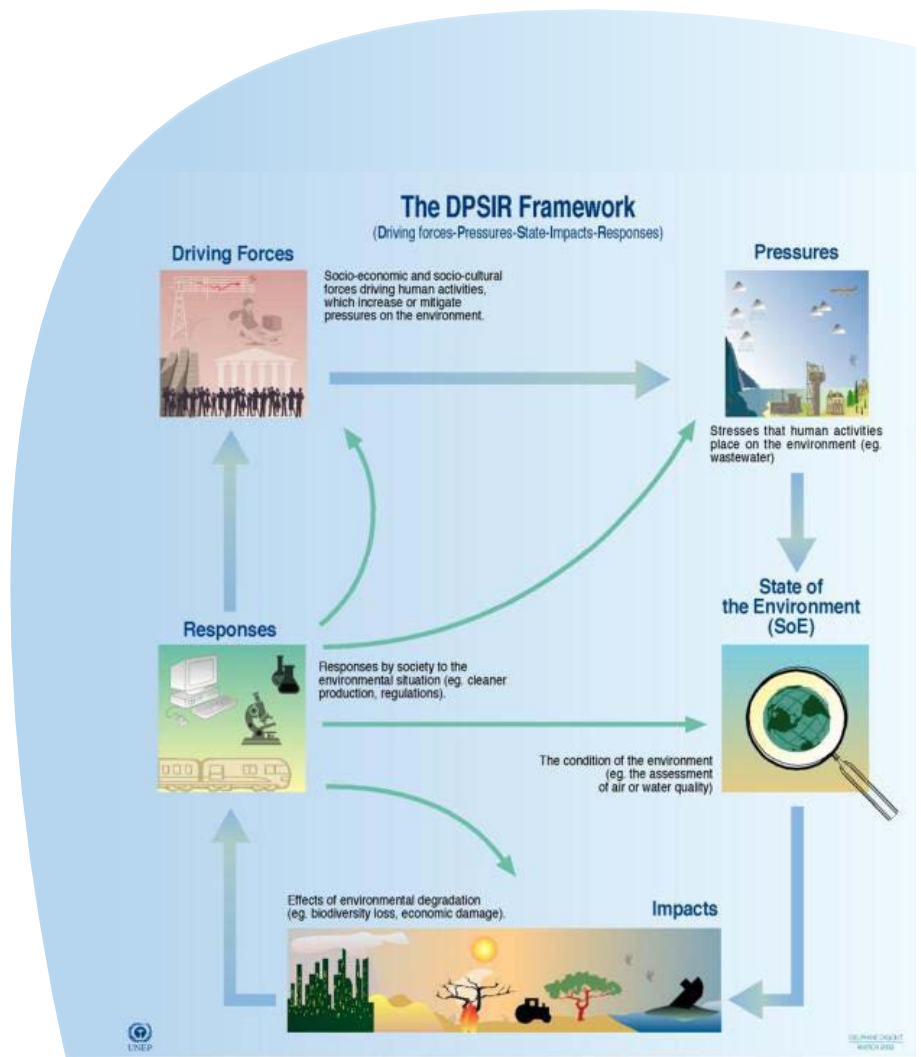
DPSIR is a framework for organizing information about state of the environment. It is a framework adopted by the European Environment Agency to assess and manage environmental problems by describing the interactions between society and the environment. The framework is based on the following components:

- Driving forces of environmental change (e.g. industrial production)
- Pressures on the environment (e.g. discharges of waste water)
- State of the environment (e.g. water quality in rivers and lakes)
- Impacts on population, economy, ecosystems (e.g. water unsuitable for drinking)
- Response of the society (e.g. watershed protection)

The framework assumes that there are cause-effect relationships between interacting components of social, economic, and environmental systems. Driving forces are the socio-economic and socio-cultural forces driving human activities, which increase or mitigate pressures on the environment. Pressures are the stresses that human activities place on the environment. State, or state of the environment, is the condition of the environment. Impacts are the effects of environmental degradation. Response refers to the responses by society to the environmental situation.

For local governments, a driving force could be the need to keep unemployment levels low. In order to do so, the local government will create new opportunities by building for example a new shopping center or an industrial zone. These activities exert 'pressures' on the environment, as a result of production or consumption processes, which can be divided into three main types: (i) excessive use of environmental resources, (ii) changes in land use, and (iii) emissions (of chemicals, waste,

radiation, noise) to air, water and soil. As a result of these pressures, the 'state' of the environment, i.e. the air, water, soil, is affected; and these changes in the state may have environmental or economic 'impacts' on the functioning of ecosystems, their life supporting abilities, and ultimately on society quality of life. A response to this impact would be the local government formulating a new policy to regulate so that it is for example, LEED certified.





## **ICLEI – Cities for Climate Protection Campaign**

<http://www.iclei.org/index.php?id=iclei-home>

ICLEI was founded in 1990 as the 'International Council for Local Environmental Initiatives'. It is an international association of local governments and organizations who have made a commitment to sustainable development. ICLEI provides technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level.

In 1993, ICLEI led the establishment of the Cities for Climate Protection (CCP) Campaign, which is an initiative that aims to facilitate emissions reduction of local governments using a five stages methodology developed by ICLEI and supported by software tools also developed by ICLEI. The five stages are:

1. Measurement
2. Commitment
3. Planning
4. Implementing
5. Monitoring

Presently the program engages over 1000 local governments that are integrating climate change initiatives into their planning processes. The CCP achieves this by assisting cities with the integration of policies and means of measurement that reduce greenhouse gas emissions, improve air quality and promote sustainability. Application of the five-milestone process is used to help cities achieve their goals.

The methodology of the five-milestone process is simple, and focused on standardization, such that cities can easily follow and achieve their goals:

- Milestone 1. Conduct a baseline emissions inventory and forecast: Based on energy consumption and waste generation, the city calculates greenhouse gas emissions for a base year and for a forecast year
- Milestone 2. Adopt an emissions reduction

target for the forecast year. The city establishes an emission reduction target for the city.

- Milestone 3. Develop a Local Action Plan. The city develops a Local Action Plan with input from all stakeholders that describes the policies and measures that the local government will take to reduce greenhouse gas emissions and achieve its emissions reduction target. The plan should include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff. It is also recommended to incorporate public awareness and education efforts into the plan.
- Milestone 4. Implement policies and measures. The city implements the policies and measures as defined in the city's Local Action Plan.
- Milestone 5. Monitor and verify results. Once measures are implemented a first time, continuously monitor progress on the implementation of measures

Ultimately the five-milestones are intended to be flexible and adapt to the varying needs of the cities that utilize the framework in their climate change processes. As such it can be applied across multiple contexts.

In addition to the area of climate, ICLEI also offers guidelines and tools for areas of Sustainability such as Water and Biodiversity, as well as more specific topics such as Sustainable Procurement and Eco-mobility.

### **The Natural Step Framework**

<http://www.naturalstep.org/>

The Natural Step (TNS) is an international organization that specializes in sustainability solutions from the household to the community level with the goal of creating a better world for all. TNS uses a planning approach called 'backcasting from sustainability principles' which involves beginning with the end goal. Starting with the description of success the process calls for the linking of the future with the present context, answering the question "what shall we do today to get there?" The TNS framework centers on five core concepts:

- The Sustainability Challenge: Curbing the demand for resources, is the next challenge. All communities are impacted by the changes to air, water and ecosystems. The best option is to reduce the pressure.
- Backcasting: Driven by the end result, backcasting is the process of deciding what the desired outcome for the future is, then determining how to achieve it.
- The Sustainability Principles: The TNS Framework is based on defining the system conditions for a sustainable society, determined from scientific research. The result is four sustainability principles that provide the parameters for society to operate sustainably.
- Backcasting from Sustainability Principles: The sustainability principles have been translated into long-term goals: Reduce and eliminate contribution to the accumulation of materials from the earth's crust, the accumulation of substances produced by society, the ongoing physical degradation of nature, and conditions that undermine people's ability to meet their basic needs.
- The ABCD Planning Process: The ABCD planning process is the backcasting from sustainability principles in action. There are four steps: Awareness, Baseline Analysis, Compelling Vision, and Down to Action. A feedback loop allows for revisiting of steps as new considerations for sustainability arise.

TNS recognized that sustainability planning is an iterative process. It calls for Integrated Community Sustainability Plans to be reviewed periodically to assess what is working and develop new ideas for success. Indicators for measuring the success of plans are not suggested directly by TNS, rather it is the prerogative of communities to develop their indicators and take ownership of them. Ownership on all levels is the key to the success in the TNS approach. Buy in from all stakeholders is required. TNS ultimately calls for a shift in lifestyle.

## **Millennium Development Goals**

<http://www.unmillenniumproject.org/>

In September of 2000 the largest gathering of world leaders in human history convened for the Millennium Summit at United Nations headquarters in New York. The leaders committed their nations to a new global partnership to reduce extreme poverty and setting out a series of time-bound targets, with a deadline of 2015, that have become known as the Millennium Development Goals.

The objective of the Millennium Development Goals is to eradicate poverty in all its facets: income poverty, hunger, disease, lack of adequate shelter, and exclusion, while promoting gender equality, education, and environmental sustainability. The goals also represent the basic human rights of each person on the planet to health, education, shelter, and security.

The eight goals and their corresponding targets are:

Goal 1: Eradicate extreme poverty and hunger

- Target 1A: Halve the proportion of people living on less than \$1 a day
  - Proportion of population below \$1 per day (PPP values)
  - Poverty gap ratio [incidence x depth of poverty]
  - Share of poorest quintile in national consumption
- Target 1B: Achieve Decent Employment for Women, Men, and Young People
  - GDP Growth per Employed Person
  - Employment Rate
  - Proportion of employed population below \$1 per day (PPP values)
  - Proportion of family-based workers in employed population
- Target 1C: Halve the proportion of people who suffer from hunger
  - Prevalence of underweight children under five years of age

- Proportion of population below minimum level of dietary energy consumption

Goal 2: Achieve universal primary education

- Target 2A: By 2015, all children can complete a full course of primary schooling, girls and boys
  - Enrollment in primary education
  - Completion of primary education
  - everyone will get into school

Goal 3: Promote gender equality and empower women

- Target 3A: Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015
  - Ratios of girls to boys in primary, secondary and tertiary education
  - Share of women in wage employment in the non-agricultural sector
  - Proportion of seats held by women in national parliament
  - For girls in some regions, education remains elusive
  - Poverty is a major barrier to education, especially among older girls<sup>1</sup>
  - In every developing region except the CIS, men outnumber women in paid employment
  - Women are largely relegated to more vulnerable forms of employment
  - Women are over-represented in informal employment, with its lack of benefits and security
  - Top-level jobs still go to men — to an overwhelming degree
  - Women are slowly rising to political power, but mainly when boosted by quotas and other special measures

Goal 4: Reduce child mortality rates

- Target 4A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate
  - Under-five mortality rate
  - Infant (under 1) mortality rate
  - Proportion of 1-year-old children immunized against measles

Goal 5: Improve maternal health

- Target 5A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio
  - Maternal mortality ratio
  - Proportion of births attended by skilled health personnel
- Target 5B: Achieve, by 2015, universal access to reproductive health
  - Contraceptive prevalence rate
  - Adolescent birth rate
  - Antenatal care coverage
  - Unmet need for family planning

Goal 6: Combat HIV/AIDS, malaria, and other diseases

- Target 6A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS

- HIV prevalence among population aged 15–24 years
- Condom use at last high-risk sex
- Proportion of population aged 15–24 years with comprehensive correct knowledge of HIV/AIDS
- Target 6B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it
  - Proportion of population with advanced HIV infection with access to antiretroviral drugs
- Target 6C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
  - Prevalence and death rates associated with malaria
  - Proportion of children under 5 sleeping under insecticide-treated bednets
  - Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs
  - Incidence, prevalence and death rates associated with tuberculosis
  - Proportion of tuberculosis cases detected and cured under DOTS (Directly Observed Treatment Short Course)

#### Goal 7: Ensure environmental sustainability

- Target 7A: Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources
- Target 7B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss
  - Proportion of land area covered by forest
  - CO<sub>2</sub> emissions, total, per capita and per \$1 GDP (PPP)
  - Consumption of ozone-depleting substances
  - Proportion of fish stocks within safe biological limits
  - Proportion of total water resources used
  - Proportion of terrestrial and marine areas protected
  - Proportion of species threatened with extinction
- Target 7C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation (for more information see the entry on water supply)
  - Proportion of population with sustainable access to an improved water source, urban and rural
  - Proportion of urban population with access to improved sanitation
- Target 7D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum-dwellers
  - Proportion of urban population living in slums

#### Goal 8: Develop a global partnership for development

- Target 8A: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system
  - Includes a commitment to good governance, development, and poverty reduction – both nationally and internationally

- Target 8B: Address the Special Needs of the Least Developed Countries (LDC)
  - Includes: tariff and quota free access for LDC exports; enhanced program of debt relief for HIPC and cancellation of official bilateral debt; and more generous ODA (Official Development Assistance) for countries committed to poverty reduction
- Target 8C: Address the special needs of landlocked developing countries and small island developing States
  - Through the Program of Action for the Sustainable Development of Small Island Developing States and the outcome of the twenty-second special session of the General Assembly
- Target 8D: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term
  - Some of the indicators listed below are monitored separately for the least developed countries (LDCs), Africa, landlocked developing countries and small island developing States.
  - Official development assistance (ODA):
    - Net ODA, total and to LDCs, as percentage of OECD/DAC donors' GNI
    - Proportion of total sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation)
    - Proportion of bilateral ODA of OECD/DAC donors that is untied
    - ODA received in landlocked countries as proportion of their GNIs
    - ODA received in small island developing States as proportion of their GNIs
  - Market access:
    - Proportion of total developed country imports (by value and excluding arms) from developing countries and from LDCs, admitted free of duty
    - Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries
    - Agricultural support estimate for OECD countries as percentage of their GDP
    - Proportion of ODA provided to help build trade capacity
  - Debt sustainability:
    - Total number of countries that have reached their HIPC decision points and number that have reached their HIPC completion points (cumulative)
    - Debt relief committed under HIPC initiative, US\$
    - Debt service as a percentage of exports of goods and services
- Target 8E: In co-operation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries
  - Proportion of population with access to affordable essential drugs on a sustainable basis
- Target 8F: In co-operation with the private sector, make available the benefits of new technologies, especially information and communications
  - Telephone lines and cellular subscribers per 100 population
  - Personal computers in use per 100 population
  - Internet users per 100 Population

In July 2011, a progress report was published that demonstrated that despite significant setbacks caused by the 2008-2009 economic crisis, the world is on track to reach the MDG poverty-reduction target by 2015. Some of the world's poorest countries, including Burundi, Rwanda, Samoa, Togo and the United Republic of Tanzania, have made the greatest strides in education. Every region has made progress in improving access to clean drinking water. Investments in preventing and treating HIV have caused new HIV infections to drop by 21 percent since 1997, when they peaked. The number of deaths of children under the age of five declined from 12.4 million in 1990 to 8.1 million in 2009.

However, due to the combination of high food prices, climate change and the impact of the international financial and economic crises, disparities in achievement of the Millennium Development Goals can be seen within and between countries. The know-how necessary to achieve the goals exist, but progress requires a focus on proven strategies, policies and interventions and making a radical break with those that do not work. The World leaders' Millennium Development Goal Summit in New York that took place in September 2010 identified a 5 year action plan to ensure the goals would be met. This plan can be summarized under these eight actions:

1. Support country-led development and effective governance
2. Foster inclusive and pro-poor economic growth
3. Increase public investments in education, health, water and sanitation, and infrastructure
4. Invest in women and girls and advance their economic, legal and political empowerment
5. Scale up targeted interventions, including social protection and employment programs
6. Support climate adaptation, enhance access to energy and promote low-carbon development
7. Accelerate domestic resource mobilization to finance the MDGs
8. Ensure the Global Partnership creates an enabling environment for the MDGs

The interim conclusions from this effort are, among others, that collaboration among countries is necessary in order to conserve and sustainably use natural resources. Also, community-based ecological initiatives can create employment opportunities. Finally, strengthening risk-reduction capacities in countries exposed to natural disaster is vital to avoid reversal on MDG achievements.



# Sustainability Planning: Global Reports

Globally, there are a number of reports produced that can be very useful in the process of developing a sustainability plan. Most of these reports are either nation or region wide, however some initiatives have started compiling information at the Municipal level and allow cities to benchmark their progress against other cities of similar realities.

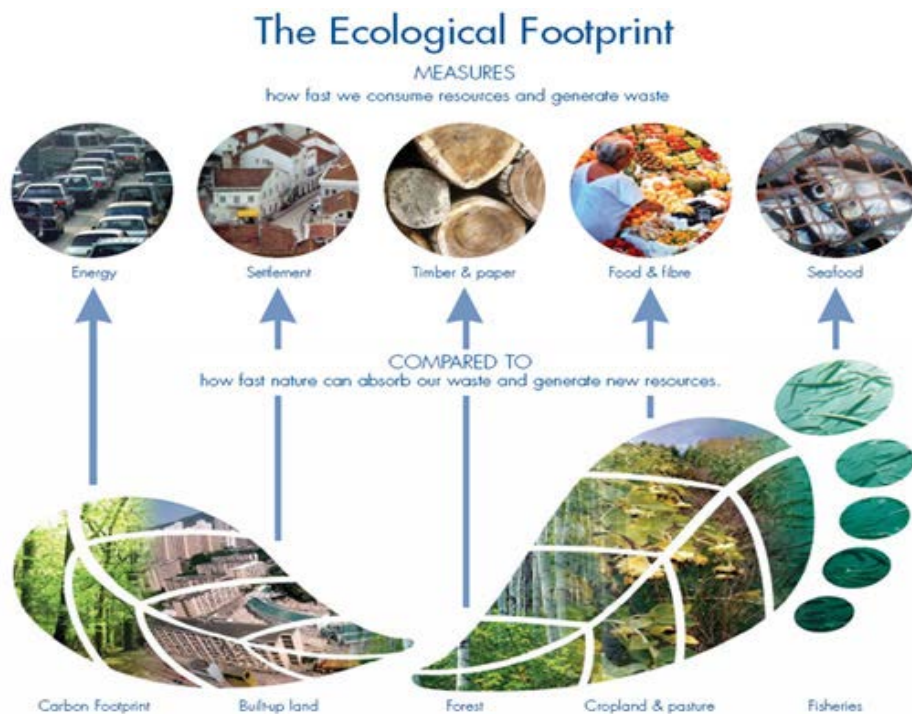
In this research, the following reports were considered or used at some extent by the cities included in the case studies:

- Ecological Footprint
- Global City Indicators Program (GCIP)
- Human Development Index
- IPCC Assessment Reports

## **Ecological Footprint**

<http://www.footprintnetwork.org/>

The Ecological Footprint has emerged as the world's premier measure of humanity's demand on nature. This accounting system tracks, on the demand side (Footprint), how much land and water area a human population uses to provide all it takes from nature. This includes the areas for producing the resource it consumes, the space for accommodating its buildings and roads, and the ecosystems for absorbing its waste emissions such as carbon dioxide. These calculations account for each year's prevailing technology, as productivity and technological efficiency change from year to year.



The accounting system also tracks the supply of nature: it documents how much biologically productive area is available to provide these services (bio-capacity ). Therefore, these accounts are able to compare human demand against nature's supply of bio-capacity.

It now takes the Earth one year and six months to regenerate what we use in a year.

We maintain this overshoot by liquidating the Earth's resources. Overshoot is a vastly underestimated threat to human well-being and the health of the planet, and one that is not adequately addressed.

By measuring the Footprint of a population—an individual, city, business, nation, or all of humanity—can assess the pressure on the planet, which should help manage our ecological assets more wisely and take personal and collective action in support of a world where humanity lives within the Earth's bounds.

Conceived in 1990 by Mathis Wackernagel and William Rees at the University of British Columbia, the Ecological Footprint is now in wide use by scientists, businesses, governments, agencies, individuals, and institutions working to monitor ecological resource use and advance sustainable development.

### **Global City Indicators Program (GCIP)**

<http://www.cityindicators.org/>

The Global City Indicators Program (GCIP) was established by funding from the World Bank. Recognizing that cities are cultural and economic centers that rely on effective policy making to manage growth and development, GCIP sets out to support cities through the development of a database from which cities can draw upon to formulate policy.

With the goal of assisting cities with monitoring performance the GCIP includes a set of indicators that are standardized, consistent and comparable over time and across cities. The indicators are a part of a comprehensive system that will:

- Enable elected officials, city managers, and the public to monitor the performance of cities over time;
- Facilitate comparisons across cities and over time
- Provide enhanced government accountability demanded by policy makers and the public.

To date the indicators have been tested in nine pilot cities: Toronto, Montreal, Vancouver, Sao Paulo, Bogota, Cali, Belo Horizonte, Porto Alegre and King County. The indicators have been divided into two categories as follows:

City Services	Quality of Life
<ul style="list-style-type: none"> <li>• Education</li> <li>• Finance</li> <li>• Governance</li> <li>• Recreation</li> <li>• Social Services</li> <li>• Transportation</li> <li>• Wastewater</li> <li>• Water</li> <li>• Energy</li> <li>• Fire &amp; Emergency Response</li> <li>• Health</li> <li>• Safety</li> <li>• Solid Waste</li> <li>• Urban Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Civic Engagement</li> <li>• Economy</li> <li>• Shelter</li> <li>• Subjective Well-being</li> <li>• Culture</li> <li>• Environment</li> <li>• Social Equity</li> <li>• Technology &amp; Innovation</li> </ul>

The methodology used to select indicators was guided by the cities participating in the project. As such, the indicators had to be globally relevant and applicable, and be updateable.

The process for selection was rigorous and resulted in indicators that are:

- Generally available, current, and able to be reported annually
- Readily comparable across cities
- Relevant for public policy decision making
- Linked to established goals (e.g. MDGs, master plans, infrastructure, investment planning)
- Cost-effective to collect
- Meaningful to cities across the globe, regardless of geography, culture, affluence, size or political structure.
- Flexible for refinement and expansion over time
- Understandable and not overly complex
- Clear, as to what to change in the indicator implies.

Ultimately the goal is to have a complete set of Global City Indicators Standard that falls within the International Standards Organization (ISO).

The Global Cities Indicators Program is hosted at the Global Cities Indicators Facility (GCIF) in Toronto, Canada, where the program thrives with support

from the World Bank's Development Grant Facility, the University of Toronto, The Canadian Government, and participating cities. The GCIF provides an opportunity for cities to access a database to collect input, report and monitor indicators over time. It is not intended to foster competition between cities, but to provide cities with the ability to track their own success. Cities are responsible for inputting their own data, and information; they are then able to compare and exchange information on how they are achieving success with other cities in the program.

**Human Development Index**

<http://hdr.undp.org/en/statistics/hdi/>

Emerging from the Human Development Report, the Human Development Index (HDI) measures the average achievements in a country in three basic dimensions of human development: a long and healthy life (health), access to knowledge (education) and a decent standard of living (income). Data availability determines HDI country coverage. To enable cross-country comparisons, the HDI is, to the extent possible, calculated based on data from leading international data agencies and other credible data sources available at the time of writing. The 2011 HDI covers a record 187 countries and territories. A nation's standing is determined by their relation to these goals posts expressed as a value between 0 and 1.

Human Development Index		
Health	Education	Living Standards
Life Expectancy at Birth	Mean years of schooling Expected years of schooling	Gross National Income per capita

The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with such different human development outcomes. For example, the Bahamas and New Zealand have similar levels of income per person, but life expectancy and expected years of schooling differ greatly between the two countries, resulting in New Zealand having a much higher HDI value than the Bahamas. These striking contrasts can stimulate debate about government policy priorities.

The HDI indicators can be adapted for country specific relevant ones provided they meet other aspects of statistical quality. It can also be disaggregated at sub-national level to compare levels and disparities among different subpopulations within a country, provided that appropriate data at the level of disaggregation are available; or can be estimated using sound statistical methodology. The highlighting of internal disparities using HDI methodology has prompted constructive policy debates in many countries.

### **IPCC Assessment Reports**

<http://www.ipcc.ch/index.htm>

The Intergovernmental Panel on Climate Change (IPCC) assesses the scientific, technical and socio-economic information relevant for the understanding of the risk of human-induced climate change. The panel was established in 1988 by two United Nations organizations, the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP), and later endorsed by the United Nations General Assembly through Resolution 43/53.

Its mission is to provide comprehensive scientific assessments of current scientific, technical and socio-economic information worldwide about the risk of climate change caused by human activity,

its potential environmental and socio-economic consequences, and possible options for adapting to these consequences or mitigating the effects. These reports are prepared by teams of relevant researchers selected from government nominations. Drafts of these reports are made available for comment in open review processes to which anyone may contribute.

To date the IPCC has produced four assessment reports on Climate Change based upon the highest quality scientific literature. The Fifth Assessment Report is expected in 2014. The fourth and most recent report notes the observed changes in the Earth's climate including atmospheric composition, global average temperatures, ocean conditions, and other climate changes. For example:

- Carbon dioxide, methane, and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values
- Eleven of the twelve years in the period (1995–2006) rank among the top 12 warmest years in the instrumental record (since 1880).
- Losses from the land-based ice sheets of Greenland and Antarctica have very likely (>90%) contributed to sea level rise between 1993 and 2003.

The IPCC also publishes special reports such as: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation; Renewable Energy Sources and Climate Change Mitigation; and Carbon Dioxide Capture and Storage. The reports are intended to be referenced at national and regional levels, and not only at the governmental level, so that their findings can be understood by user groups and audiences such as policy makers and the media, decision-makers at the community level, education sector, parliamentarians, youth, and the general public.

# Indicators in Practice: Case studies

The cities selected include a good representation of small, medium and larger size cities. All these cities are engaged in a planning effort under a sustainability framework and have done considerable work in developing indicators and tracking them in a continuous basis. The planning framework can be within a holistic perspective, considering the environment, society and economy or they can be more focused on a specific topic, such as greenhouse gas emissions.

The cities selected were:

Region	City and Country	Population	Sustainability Framework/ Indicators system
Africa	Durban, South Africa	3,500,000	Integral development Plan (IDP), that drew from Millennium Development Goals, Agenda 21 and other international frameworks.
Americas	Bogota, Colombia	7.363.782	Bogotá Cómo Vamos Information System for Statistics Comparison Management Indicators System
	Buenos Aires, Argentina	2,891,082	Individual action plans: 2030 Climate Action Plan 2008 Energy Efficiency Program in Public Buildings Buenos Aires Sustainable Mobility Plan. Water Management, sanitation and air quality Plans
	Ilhéus, Brasil	184,000	SISI – Social Indicators System of Ilhéus based on 70 indicators divided in intra-urban indicators and municipal indicators.
	Portland, United States	583,776	Portland Plan 2011 under a Framework for Equity and divided into nine action areas:
Asia	Kitakyushu, Japan	1,014,608	The Kitakyushu Initiative based on the DPSIR System (Driving forces, Pressures, State of the Environment, Impacts, Response)
	Singapore, Singapore	5,183,700	Singapore's sustainable development strategy based on the Sustainable Blueprint
Australia	Sydney, Australia	183, 616	Sustainable Sydney 2030 plan, based on three pillars: Green, global and connected.
	Yangzhou, China	2,146,980	A Performance-based indicator using the China Sustainable Development Database
Europe	Barcelona, Spain	1,619,337	Barcelona Observatory, Local Agenda 21, the Aalborg Charter and the Lisbon Action Plan.
	Dublin, Ireland	525,383	The Natural Step, Strategic Environmental Assessment and Appropriate Assessment
Middle East	Tel Aviv, Israel	404,400	ICLEI Indicators and the Ecological Footprint

The Frameworks and indicators used by each city are described in the Annex 1.

# Toolkit for Cities

In moving towards developing a monitoring and evaluation toolkit it must be recognized that every municipality has unique features that shape its policies and planning decisions. Therefore it follows that a toolkit itself cannot be a “one size fits all” set of instructions. That said, in designing the toolkit it was assumed that the cities that will use it share two basic characteristics: they recognize that they have an obligation to meet the basic needs of their cities and they are committed to embracing the three pillars of sustainability (economy, environment and society) in a holistic perspective.

The classification that will be presented in the toolkit was developed as a result of the analysis of the information collected from the case studies. The indicators presented in the tool kit are the ones that were used by five or more of the cities represented in the case studies.

The tool kit is divided in two sections:

- “Get set”. This section covers the preparatory aspects that cities should consider before starting the development of their indicators as well as key considerations for the process to develop the indicators.
- Indicators list. This list is classified in the three sustainability categories: Environment, Society, and Economy. And within those, it has subcategories that reflect the indicators most used by the cities studied here.

## “Get Set”

There are a number of aspects a municipality should consider before developing their sustainability indicators. Some of these go back to the planning process as this will be the basis for the indicators. Other aspects are focused on the preparatory work, awareness that needs to be raised amongst staff and stakeholders to create a system of indicators, and finally, some practical suggestions for the process to be successful.

First of all, **define a vision**. Ideally, the city will have already identified a shared community vision and values that are clearly articulated and powerful enough to motivate staff, stakeholders and the community in general. The city could then review different frameworks or methodologies that have been used to develop a sustainability plan.

The framework used to **develop a sustainability plan** can be based on forecasting, backcasting or any other method to decide how they will move towards that vision: what goals, strategies and actions will be taken to get there. It is important to ensure solid stakeholder participation through the process of developing the plan, as this will create engagement and commitment to the plan.

The next step would be to **select the indicators**. It is important to be cognizant of existing models, indicators and data. The city may find information about neighbouring municipalities or others in similar contexts to learn from successful examples. Moreover, looking at the outputs of international conferences could facilitate the city's choosing of a particular/published sustainable framework to follow (e.g. KPI or combined frameworks); city staff from different departments need to be involved in preparing a draft and it can also be done with stakeholders (NGOs, community businesses, state authorities, etc.) to start creating ownership of the indicators.



When developing the draft indicators, it is crucial to consider if the data for them will be available and what systems need to be set in place to facilitate accessing and collecting the necessary information. It is advisable to keep the first draft simple, and not try to cover everything at the same time. It is best to go in short steps to ensure systems are set up to support the monitoring and tracking before adding more indicators.

The next step is to create a baseline that helps the city develop achievable targets and monitoring programs. Targets should ideally be SMART: specific, measurable, achievable, realistic and timed. These targets may also be incremental and manageable. Baselines allow cities to analyse and compare how data have changed over the course of the plan, providing a reference for improvements/declines relative to the baseline.

Community participation and stakeholder engagement is key to create ownership of the plan and transparency throughout the entire process. Cohesion, integrity and trust are also important among the stakeholders to truly achieve a sustainable future for the city. Co-management/adaptive management can be incorporated to create a more decentralized structure of management, enabling greater stakeholder participation.

The last step is to create a report and a reporting mechanism that will allow stakeholders and the community to follow up on the progress of the plan. Reporting timelines should be set from the beginning of the project, and systems should be in place to ensure that this actually happens. Additionally, the integrity of the data will be rooted in its transparency and availability to the public. In order to keep the reporting exercise going, budgets and sustained sources of funding should be secured to ensure the continuity and success of the plan.

**Indicators list**

**ECONOMY**

- **Unemployment rates/Jobs**
  - Underemployment/employment/unemployment rates
  - Percentage of green jobs in the local economy
  - Average professional education years of labor force
  
- **Economic Growth**
  - Annual GDP growth rate
  - Annual GNP growth rate
  - Net Export Growth rates (% increase of country's total exports minus the value of its total imports per annum)
  - Foreign Direct Investments (Capital/Earnings accrued from listed FDI's per annum)

## ENVIRONMENT

- **Green Spaces**

- Percentage of preserved areas/ reservoirs/ waterways/parks in relation to total land area
- Percentage of trees in the city in relation to city area and/or population size

- **Reduce Greenhouse gases / Energy Efficiency**

- Total amount of GHG emissions per city and per capita
- Percentage of total energy consumed in the city that comes from renewable sources

- **Mobility**

- Transportation mode split. (Percentage of each mode of transportation, i.e. private, public, bicycles, pedestrians)
- Average commute time and cost

- **Water Quality/ Availability**

- Total amount of water availability
- Water quality index/score
- Proportion of population with access to adequate and safe drinking water

- **Air Quality**

- Levels of Particulate Matter (PM10 - mg/m<sup>3</sup>)
- Levels of Particulate Matter (PM2.5 - mg/m<sup>3</sup>)

- **Waste/ Reuse/ Recycle**

- Recycling rate (Percentage diverted from waste stream)
- Volume of solid waste generated

## **SOCIAL**

- **Complete neighbourhood / Compact city**

- Access to local/ neighbourhood services within a short distance
- Crime rates
- Measures of income distribution and inequality

- **Housing**

- Percentage of social / affordable / priority housing
- Breakdown of housing sector by property type (owner occupied / rental, single occupant/ couples/family/multifamily etc.)

- **Quality Public Space**

- Percentage of roadways in good conditions
- Percentage of green space (public parks) coverage in relation to city area and/or population size

- **Education**

- Number of schools with environmental education programs
- Adult literacy rate

- **Sanitation**

- Percentage of population with access to water-born or alternative (and effective) sanitary sewage infrastructure

- **Health**

- Mortality rate/ Life expectancy
- Percentage of population with access to health care services

# Key Findings

After studying the selected cities, certain similarities or trends were identified, as well as success factors that were clearly highlighted in one or more case studies.

The similarities or trends are:

**Measuring GHG emissions:** The most striking similarity is that all cities measure GHG emissions and have included targets and specific emission reduction actions in their plans, even in countries where there is no legal national-level regulation requirement to do so. A possible explanation for this, besides the large exposure this topic has had in the public eye, is that there are tools and methods already established for conducting emissions inventories, such as the ones provided by ICLEI. In addition to GHGs, several municipal plans include targets on air pollution and water quality because these are issues that were on the municipal agenda before sustainability became widely known.

**Focus on environment:** It was evident that environmental issues were more common in municipal sustainability plans than social or socio-economic issues. This may be due to plans being on their early stages, or to a lack of understanding on the part of municipal policymakers of the fact that sustainability has to be perceived and tackled holistically. It is interesting to note that in cities where sustainability has been on the public agenda for a long time, these aspects are included in their strategic plans. In Bogota, for example, the Bogotá Cómo Vamos project created a holistic evaluation of the city based on economic, social, education and governance indicators. The municipality also recognized the important role played by civil society in reaching the community's sustainability goals.

**Physical visible actions:** Targets that can be physically demonstrated take priority over targets that are less visible. Examples of visible aspects that were considered by most cities studied here were green space areas, roads, green buildings and bike paths.

**Missing indicators for food.** Only two of the cities studied mentioned an aspect related to food, and both were about access to fresh food or grocery markets. In many countries, health problems related to dietary issues (either excess or lack of food) are an ever increasing threat (WHO 2012). Food security involves availability, access and use of food, and indicators that address this issue will need to be included in a sustainability plan.

The success factors identified are:

**Backcasting:** The soundest recommendation for a reliable sustainability plan is to work with the city's stakeholders to create a strong vision. For example, posing the question: "How would you like your city to be in 20 or 30 years from now?" And then inferring from this vision what needs to change in order to achieve it. This methodology is called "backcasting" and is used by cities building a Sustainability plan with targets and key performance indicators. For example, Buenos Aires' 2030 Action Plan acts as a framework for all the other initiatives carried out by Buenos Aires; though it is about improvements of public systems, it sets opportunities for growth in the economy, the society and the environment.

**Institutionalization:** Change management is more likely to succeed when sustainability is "institutionalized" (DPU 1996) across the different municipal units by building linkages between each unit as though within a systematic web. This might take different shapes according to local context, but the important concept is that everyone is somehow engaged in the plan and it is not only a "sustainability department" responsibility.

**Public/Private Partnerships:** The city needs leaders in both the public and private sectors to work together, and the active participation of the private sector is a must in order to succeed. Partnerships should be looking after the interests of all stakeholders to ensure that it creates a win-win situation for everyone.

**Risk Management:** Municipal authorities need to understand that sustainability planning is also a way of managing risk. Identifying concerns regarding issues that could affect citizens, such as climate change, availability of energy, depletion of non-renewable resources, etc., is crucial to the development of a plan that addresses and manages risks.

**Community participation and stakeholder engagement.** Last but not least, public participation and engagement are key to create ownership of the plan and transparency of the process. Cohesion, integrity, and trust amongst the stakeholders are also very important to truly achieve a sustainable future for the city. Co-management/adaptive management can be incorporated to create a more decentralized structure of management, enabling greater stakeholder participation.

In summary, there are a number of steps that a city will have to go through to develop their plan and identify sustainability indicators as described in the "Get-set" section. The list of indicators provided as common ones can be a starting point, as they reflect the issues that have been considered priorities for most cities studied here, but still need to be adapted and responding to the local needs of each municipality. Finally, there are certain aspects on managing the process, as described in the key findings that would be critical to consider when carrying out the planning process.

# References

- Astleithner, Florentina, Hamedinger, Alexander, Holman, Nancy & Rydin, Yvonne. *Institutions and Indicators – the discourse about indicators in the context of sustainability*. Journal of Housing and the Built Environment. Vol. 19, Iss. 1, 2004, p. 7-24.
- Aalborg Commitments survey. *Sustainable Cities and Towns Campaign*. Aalborg Commitments. 2010. Accessed Jun 8<sup>th</sup>, 2012. <[http://www.aalborgplus10.dk/media/pdf2010/aalborg\\_commitment\\_til\\_web.pdf](http://www.aalborgplus10.dk/media/pdf2010/aalborg_commitment_til_web.pdf)>
- DPU 1996. *The Process of Institutionalizing Gender in Policy and Planning: The web of institutionalization*, DPU, Working Paper no74, UCL, 1996.
- Digout, Delphine 2005. *DPSIR framework for State of Environment Reporting*. UNEP/GRID-Arendal 2005. Accessed Jun 7<sup>th</sup>, 2012. <[http://www.grida.no/graphicslib/detail/dpsir-framework-for-state-of-environment-reporting\\_379f#](http://www.grida.no/graphicslib/detail/dpsir-framework-for-state-of-environment-reporting_379f#)>
- Munier, Nolberto. (2005). *Introduction to sustainability: road to a better future*. Dordrecht, Netherlands: Springer.
- Newman, Peter & Jennings, Isabella. (2008). *Cities as sustainable ecosystems: principles and practices*. Washington, DC: Island Press.
- Reed, Mark S., Fraser, Evan D.G., & Dougill, Andrew J. (2006). *An adaptive learning process for developing and applying sustainability indicators with local communities*. Ecological Economics. Vol. 59. P. 406-418.
- WHO 2012. *Food Security*. World Health Organization. 2012. Accessed Sep 12, 2012. <<http://www.who.int/trade/glossary/story028/en/>>

# CASE STUDIES





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# BOGOTÁ, COLOMBIA

Bogota, the capital of Colombia, is the most populous city in the country with 7,363,782 inhabitants (2005 Census). It is also one of the largest cities in Latin America and figures among the thirty largest cities of the world. Located on a high plateau in the Andes Mountains at 2,630 meters above sea level, its administrative area covers 1,775.98 square kilometres and has a population density of 4,146 people per square kilometre. (Bogota 2012).

The area which is modern Bogota was inhabited by groups of indigenous people before the arrival of the Spanish, who founded the city in 1538. As the capital of Colombia, the city hosts the government and an important part of its administration and is the economic, financial and industrial center of the country. Tourism is also growing, with 292,900 foreigners visiting the city in the first half of 2007 (Metropolis 2012). The city's annual budget is evaluated at US\$6,400,000,000 for 2012 (Budget 2012). The GDP per capita is estimated at US\$8,400 (EIU 2010). In the Latin American Green City Index, Bogota ranks in a good position, above average. As well, among the nine cities with mid-size population (between 5 and 10 million people), Bogota has the most green space per person and the highest share of its population with access to potable water (EIU 2010).

## Sustainability and Indicators

The city of Bogota supports two information systems called Sistema Integrado de Información de Estadísticas Comparadas (SIEC 2012) and Sistema de Indicadores de Gestión (SIG 2012). In these systems, the available information is centralized by the city and divided into three broad areas: social, economic and environmental issues.

- **Sistema Integrado de Información de Estadísticas Comparadas (SIEC) (Integrated Information System for Compared Statistics)**

The SIEC is supported by the Department of Statistics and Fiscal Studies of the District Secretary of the Treasury of Bogota. It is a management model that deals with the production and the use of city indicators, the collection of data and the publication of analysis, including the generation of statistics. The SIEC collected about 163 social, economic and environmental indicators and 29 maps that locate the distribution of data geographically. All this information is presented to the public in compliance with the duty to adequately inform the public.

In 2007, the city of Bogota was involved in an international program, the project Global City Indicators (2007). It proposed a series of 69 indicators for this purpose. The Global City Indicators Facility, supported by the World Bank and the Government of Ontario, provides an established set of city indicators with a globally standardized methodology that allows for global comparison of city performance and knowledge sharing (GCI 2007). In this initiative, Bogota joins other cities such as Cali, Belo Horizonte, Sao Paulo, Porto Alegre, Seattle, Montreal, Toronto and Vancouver.

- **Sistema de indicadores de gestión (SIG) (System Management Guidelines)**

The SIG is supported by the Secretary of Planning (Secretaría Distrital de Planeación, SDP) of Bogota following an act approved by the city that implements the System Management Guidelines outlined in Agreement 067 (2002). The SDP has led the District Capital in the process of collection, consolidation, review, report preparation and publication of the results of the System Management Guidelines. Work has been done in cooperation with the Secretaries of Government, Finance, Housing, Planning, Education, Health, Social Integration, Culture, Environment and Mobility, as well as with heads of industries in order to provide the results of the indicators on an annual basis, following the technical guidelines.

**SIG INDICATORS**

**Attention to Vulnerable groups**

- \* Child Welfare Demand Coverage (%)
- \* Older Adults Welfare Demand Coverage (%)
- \* Older Adults that live on the streets (%)

**Health**

- \* Vaccination rate (age 1 year)
- \* Child Malnutrition (%)
- \* Population registered to receive subsidies
- \* Mortality rate (Maternal and children 5 years or less)
- \* Morbidity rate

**Water, air, geology and biodiversity**

- \* Water pollutants - SST (kg/yr.)
- \* Water pollutants - DB05
- \* Particulate Air Matter (PM 10)
- \* Solid waste disposed in landfills (total and per capita)
- \* Green areas per inhabitant
- \* Number of trees held per year of planting
- \* Portion of trees in the city %
- \* Relationship tree - population

**Housing**

- \* Resettled families coverage (%)
- \* % of legal housing
- \* % of improved housing
- \* Number of potential offered or negotiated housing by the Capital District

**Education**

- \* Preschool attendance (5 and 6 years)
- \* Basic Primary Education attendance
- \* Basic Secondary Education attendance
- \* Technical/ Trades school attendance
- \* Quality in the basic competency tests (applied by area, grade and calendar)

**Safety and Community**

- \* Cultural events beneficiaries
- \* Local Cultural Events
- \* High impact delinquency
- \* Violent deaths
- \* Deaths in traffic accidents
- \* Violent deaths rate by 100,000 inhabitants

**Sewage**

- \* Sanitary sewage coverage %
- \* Rain sewage coverage %
- \* Agreement coverage %
- \* Water Quality Index
- \* Average water fee rate (\$/m3)

**Mobility**

- \* Time of trips (minutes)
- \* Average speed (Km/hr.)
- \* Average speed in public transit (Km/hr.)
- \* Roads in good conditions (%)
- \* Primary and secondary roads in good condition (%)

**CITY INDICATORS**

- \* Life expectancy at birth (years)
- \* Morbidity rate per 1000 inhabitants
- \* Quality deficit in housing
- \* Quantitative deficit in housing
- \* Housing coverage with water/sewage service
- \* Housing coverage with energy services
- \* Housing coverage with gas services
- \* Informal jobs participation (%)

- \* Unemployment rate
- \* Unsatisfied Basic Needs Index - INBI
- \* Human Development Index - IDH
- \* Living Conditions Index - ICV
- \* Consumer Price Index - IPC
- \* Poverty rate
- \* GDP per capita in US Dollars
- \* Telephones per 100 inhabitants

There is one more indicator system that is now in place, and it is driven by society. This initiative, which is known as *Bogotá Cómo Vamos* (1997), was created a few years ago, during the 1997 electoral campaign. Bogotá Cómo Vamos consists of a forum for analysis and debate aimed at having an effect on the Public Administration, the general public and the expert groups working in favour of the city. A series of indicators are discussed and prepared among the partners. They include issues related to Education, Health, Housing and Services, Environment, Traffic, Public Space, Citizen Security, Citizen Responsibility, Public Management, Public Finances and Economic Development (Colombia 2003).

INDICATOR	WHAT IT MEASURES	INDICATORS
Education	changes in coverage, quality and public perception of the service	<ul style="list-style-type: none"> <li>net coverage rates</li> <li>average scores on educational performance tests</li> <li>percentage of knowledge of values</li> <li>citizen scoring of the service</li> </ul>
Health	changes in coverage, quality, and public perception of the service	<ul style="list-style-type: none"> <li>health system coverage rate</li> <li>maternal mortality rate</li> <li>mortality rate for children under 5</li> <li>citizen scoring of the service</li> </ul>
Housing and Services	changes in shortages of priority housing, in coverage of potable water and sanitation services, and public perception of the services	<ul style="list-style-type: none"> <li>deficit in priority housing</li> <li>aqueduct coverage rate</li> <li>rate of coverage of sewage and drainage system</li> <li>citizen scoring of the services</li> </ul>
Environment	changes in pollution levels and public perception	<ul style="list-style-type: none"> <li>number of figures that exceed legal levels of each air pollutant</li> <li>percentage of water treated by industry</li> <li>level of reforestation and green areas</li> <li>citizen perception of pollution</li> </ul>
Traffic	changes in traffic delays and public perception	<ul style="list-style-type: none"> <li>average time spent in traffic</li> <li>citizen perception of changes in traffic, quality of the service, road conditions, and traffic management</li> </ul>
Public Space	changes in the per capita quantity of public pedestrian space and in the coverage of roadways in good condition and public perception	<ul style="list-style-type: none"> <li>percentage of roadways in good condition</li> <li>coverage of rail service/tracks</li> <li>coverage of bicycle paths</li> </ul>
Citizen Security	changes in homicide rates, victimization, and public perception of insecurity	<ul style="list-style-type: none"> <li>homicide rate</li> <li>victimization rate</li> <li>rate of non-reporting</li> <li>citizen perception of insecurity</li> </ul>
Citizen Responsibility	changes in citizen behaviour measured by rates and consequences of infractions of the law	<ul style="list-style-type: none"> <li>accident rate</li> <li>number of summons issued</li> <li>alcohol related deaths</li> <li>evasion rates</li> <li>citizen perception of responsibility and solidarity</li> </ul>
Public Management	changes in perception about public administration, public servants, and local mayors' offices	<ul style="list-style-type: none"> <li>citizen perception of the image, management, trust of the district's public entities</li> </ul>
Public Finances	changes in financial health indicators and international credit risk scores	<ul style="list-style-type: none"> <li>Debt status</li> <li>Expense Status</li> <li>Income status</li> </ul>
Economic Development	changes in productivity, competitiveness, and job market	<ul style="list-style-type: none"> <li>GDP growth rate</li> <li>employment, underemployment, and unemployment rates</li> <li>export growth rates</li> <li>citizen perception of the family economic situation</li> </ul>

The project is the result of an alliance between Casa Editorial El Tiempo, the Corona Foundation and the Bogota Chamber of Commerce. The monitoring measures improved access to goods and services of better quality and take into account the public perception.

Similar initiatives to Bogotá Cómo Vamos have been developed in many Latin American cities such as Cali, Rio and São Paulo. An international network has recently been organized. More than 70 citizen initiatives in 10 countries in Latin America contribute to the Latin American Network for Fair, Democratic and Sustainable Cities (Red Ciudades 2012). The network allows the interaction, exchange and coordination of these initiatives to strengthen them locally, and also to expand their scale and potential impact on the continent. One of the next goals of this network is to find the common indicators between different cities and initiatives.

While Bogotá Cómo Vamos uploads data to the organization's website and does press releases, the city generates various publications for the public (SHD 2012). Annual reports are also provided according to municipal laws such as Balance de Gestión Consolidado a Partir de los indicadores del Acuerdo 067 de 2002 (Balance 2012). All data should normally be available on the city's website.

## References

- Agreement 67 2002. *Normas para establecer la publicidad permanente de indicadores de gestión en la administración Distrital. Gobierno de Bogotá.* 2002. Accessed Jun 10th, 2012 <<http://www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=5461>>
- Balance 2011. *Balance de Gestión Consolidado 2008-2011.* Secretaría General de Planeación. Oct 2011. Accessed Jun 10th, 2012 <<http://www.bogota.gov.co/portel/libreria/pdf/INFORMEBALANCEGESTION20082011DEFINITIVO.pdf>>
- Bogotá 2012. *La Ciudad.* Alcaldía Mayor de Bogotá. April 23, 2012. Accessed Jun 15th, 2012. <<http://www.bogota.gov.co/portel/libreria/php/01.270701.html>>
- Bogotá *Cómo Vamos*, 2007. *Hacemos seguimiento a los cambios en la calidad de vida de la ciudad.* Bogotá Cómo Vamos 2012. Accessed Jun 14th, 2012. <<http://www.bogotacomovamos.org>>
- Budget 2011. *El presupuesto de Bogotá.* Alcaldía Mayor de Bogotá. Nov 2, 2011 <[http://www.bogota.gov.co/portel/libreria/php/x\\_frame\\_detalle.php?id=47414](http://www.bogota.gov.co/portel/libreria/php/x_frame_detalle.php?id=47414)>
- Censo 2005. *Boletín Censo General 2005.* Perfil Bogotá. Departamento Administrativo Nacional de Estadística. Sept 13, 2010. Accessed July 10th, 2012. <[http://www.dane.gov.co/files/censo2005/PERFIL\\_PDF\\_CG2005/11000T7T000.PDF](http://www.dane.gov.co/files/censo2005/PERFIL_PDF_CG2005/11000T7T000.PDF)>
- Colombia 2003. *Bogotá How are We Doing"* (Bogotá Cómo Vamos). World Bank. Accessed Jun 15th, 2012 <[http://www.worldbank.org/socialaccountability\\_sourcebook/Thematic\\_SectorAppl/Decentralization/dec\\_5case3.html](http://www.worldbank.org/socialaccountability_sourcebook/Thematic_SectorAppl/Decentralization/dec_5case3.html)>
- Economist Intelligence Unit (EIU) 2010. Latin American Green City Index. Corporate Communications and Government Affairs, Siemens, AG. Munich, Germany. 2010
- GCI, 2007. *Indicadores Globales de la Ciudad de Bogotá.* Global City Indicators. Bogota, Colombia. 2007 <<http://www.cityindicators.org/ParticipantsInfo.aspx?clD=24>>
- Metropolis 2012. *Bogota, a great Metropolis.* Alcaldía Mayor de Bogotá. Accessed Jun 15th, 2012. <<http://www.bogota.gov.co/portel/libreria/php/01.1804.html>>.
- Red Ciudades 2012. *Red Latinoamericana por ciudades y territorios justos, democráticos y sustentables.* AVINA Foundation. Accessed Jun 10th, 2012. <<http://www.redciudades.net/blog>>

SDH 2012. *Secretaría Distrital de Hacienda*. Gobierno de Bogotá. Accessed Jun 12, 2012. <<http://www.shd.gov.co/>>

SIEC 2012. *Sistema Integrado de Información de Estadísticas Comparadas (SIEC)*. Government of Bogota. April 25<sup>th</sup>, 2012. Accessed Jun 12, 2012. <[http://impuestos.shd.gov.co/portal/page/portal/portal\\_internet\\_sdh/economia/siec\\_eco/SIEC](http://impuestos.shd.gov.co/portal/page/portal/portal_internet_sdh/economia/siec_eco/SIEC)>

SIS 2012. *Indicadores de Gestión - Administración Distrital*. April 25, 2012. Government of Bogota. Accessed Jun 15<sup>th</sup>, 2012. <<http://www.bogota.gov.co/portel/libreria/php/decide.php?patron=01.32>>

## BUENOS AIRES, ARGENTINA

Established initially in 1536 as Ciudad del Espíritu Santo y Puerto Santa María del Buen Aire, the Autonomous City of Buenos Aires is the capital of Argentina. The city lies within the greater provincial region also called Buenos Aires. Within the 203.2 square kilometres that constitute the capital, the city carries an approximate population of 2,891,082. (Censo 2010)

Buenos Aires relies heavily on its service sector to produce revenue for the city; the service sector represented 76% of the city's economy in 2011 (Global Services 2011). Examples of services offered in Buenos Aires include software development, call centers, data processing centers and media services (Global Services 2011). Buenos Aires prides itself on industries in food processing, textiles, metallurgy, steel and more importantly, electronics. Multinational computer companies like Google, MCI, Hewlett Packard, Microsoft and Intel have outsourced operations to Buenos Aires (Global Services 2011). Other sources of economic capital include revenue from the city's shipping ports and tourism. Its annual budget for FY 2012-2013 amounts to 32.705 Billion Pesos (Buenos Aires Herald 2011).

### Sustainability

The City of Buenos Aires has a unique plan for sustainability. Unlike other cities that have umbrella strategies or goals, Buenos Aires has adopted individual action plans to reach a common sustainable future. Given that the built environment predominantly surrounds the city, Buenos Aires is simultaneously focusing on reducing carbon emissions by 2030, fostering urban sustainable economic development and increasing social integrity. The city's action plan includes the 2030 Climate Action Plan, the 2008 Energy Efficiency Program in Public Buildings and the Buenos Aires Sustainable Mobility Plan. Other plans include water, sanitation and air quality management. In 2008, Buenos Aires formalized the creation of its Technological City to effectively promote IT services exports and make the city an ICT hub not only in Latin America but also in the world; economic incentives and laws were introduced to attract more investors. Lastly, the city planned to enhance social nodes, cohesion and public health through its Pedestrian Priority Plan in 2011.

### Indicators

#### 2030 Climate Action Plan (EIU 2011)

- Reduce GHG emissions by 32.7% (reduction of 5 million tons of carbon dioxide per year). Measures include: preventing vehicles from entering the city by creating parking space in the periphery
- Improve traffic management by creating lanes for public transport
- Favour pedestrians and cyclists
- Improve vehicle technology
- Reduce the carbon footprint

#### 2008 Energy Efficiency Program in Public Buildings (ICLEI 2011)

- Survey public buildings' structures
- Survey operating electrical equipment and their consumption levels
- Installation of sensors to record temperature and humidity
- Measurement of electrical energy consumption by equipment placed on the principal and sectional electrical boards
- Survey the number of personnel in each office and on each floor during every working hour of the day
- Survey thermal comfort
- Measure lighting above working stations
- Analysis of building's water consumption



- Electricity consumption
- Report under law 3246/09 every 3,5 and 10 years.

### Sustainable Mobility Plan

- Priority of the public transport program
- Exclusive bus lane
- Implementation of Metro bus (bus rapid system)
- Introduction of better bicycle program
- Pedestrian priority program
- Use of different types of transports
- Consumer survey on mode of transportation acceptance
- Average commuter daily trips comparisons
- Amount of cycling and bus lanes introduced are indicators as well

### Water Management (EIU 2011)

- Installation of water meters across the city
- Reduction of water consumption by 40% by end of 2012

### Sanitation (EIU 2011)

- Upgrade outdated sewage system
- Installation of new drains and secondary collectors in 17 water basins around the city by 2012
- Population access to sanitation (%)
- Share of waste water treated (%)

### Air Pollution Management (EIU 2011)

- Implemented new air monitoring network
- 45 facilities monitoring specific pollutants in different parts of the city
- Reduce gas emissions from vehicles by 10% by the end of 2012, through vehicles meeting minimum emission standards.
- Monitor daily nitrogen, sulphur dioxide and suspended particulate matter levels; all measured in (ug/m<sup>3</sup>)

### Technological City Plan (Buenos Aires Gov. 2008)

#### 1. Short Term Goals:

- Creation of the District
- Draft Bill on the Promotion of ICT companies in the City of Buenos Aires
- Work plan with the community of Parque Patricios

#### 2. Medium Term Goals:

- Positioning at a local, regional and international level
- Attraction of investments (ICT, Real Estate Development)
- Development of Infrastructure and Services

#### 3. Long Term Goals:

- Creation of a Consortium of the District's companies
- Research and Development / Competitive Strengthening
- Internationalization of Companies

The main indicators include number of companies coming inside the "city" and generation of the economy.

Pedestrian Priority Plan (NYC Global Partners Innovation 2011)

Objectives

- Adapt public road space in the city center to encourage pedestrian circulation, including more sidewalks and pedestrian walkways between urban centers and transport nodes
- Continue to respect agreements outlined on the 2004 Mobility Pact which designate the use of certain lanes to specific vehicles, such as bus lane for buses
- Promote clean vehicle technology
- Enforce rules to protect pedestrians from traffic hazards
- Regulate street equipment (benches, waste receptacles, etc.) on public roads
- Incorporate the Pedestrian Priority Program into the larger Urban Transport System

Implementation

- Street renewal: widen sidewalks; install lighting and pedestrian traffic signs
- Dock regulation: distinguish dock position and combine dock loading and unloading -with the Waste Collection Basin Trees: incorporate more trees for a public promenade character
- Crosswalks: give pedestrians priority at specific crosswalks
- Equipment: installation of street signs to regulate traffic flow and pedestrian circulation
- Waste: existing waste collection system is replaced by centralized waste receptacles on street corners to facilitate the movement of garbage collection vehicles.

Buenos Aires' municipal law 3246/09 mandates official monitoring and reporting of emissions and energy consumption every 3,5 and 10 years. Therefore, updates on indicators should be available to the public through its municipal website. Moreover, as a member of C40 and ICLEI, Buenos Aires has to annually report gathered data to these two organizations.

**References**

Buenos Aires Herald 2011. *BA City advances in Budget bill debate - BuenosAiresHerald.com*. 18 Nov. 2011. Accessed. June 7<sup>th</sup>, 2012. <<http://www.buenosairesherald.com/article/84985/ba-city-advances-in-budget-bill-debate>>.

Buenos Aires Gov. 2008. *Investor Assistance Center*. Buenos Aires Ciudad - Gobierno de la Ciudad Autónoma de Buenos Aires. n.d. Accessed. June 7<sup>th</sup>, 2012. <[http://www.buenosaires.gov.ar/areas/produccion/promocion\\_inversiones/ingles/distrito\\_tecnologico/plan\\_acciones.php](http://www.buenosaires.gov.ar/areas/produccion/promocion_inversiones/ingles/distrito_tecnologico/plan_acciones.php)>.

Censo 2010. *Provincia de Buenos Aires: Interior de la provincia*. INDEC. Censo Nacional de Población, Hogares y Vivienda. 2010. Accessed Jun 7<sup>th</sup>, 2012. <[http://www.censo2010.indec.gov.ar/preliminares/cuadro\\_resto.asp](http://www.censo2010.indec.gov.ar/preliminares/cuadro_resto.asp)>

Economist Intelligence Unit (EIU). *Latin American Green City Index*. Corporate Communications and Government Affairs, Siemens, AG. Munich, Germany. 2010.

Global Services 2011. *City of Buenos Aires*. Global Services. 18 Oct. 2011. Accessed. June 1<sup>st</sup>, 2012. <[www.globalservicesmedia.com/Destinations/Latin-America/City-Profile:-Buenos-Aires/25/20/11472/GS1110188810139](http://www.globalservicesmedia.com/Destinations/Latin-America/City-Profile:-Buenos-Aires/25/20/11472/GS1110188810139)>.

ICLEI 2011. *Energy efficiency of public buildings in Buenos Aires: The case of an office building*. ICLEI 123 (2011): 1-6. Print.

NYCGP 2011. *Best Practice: Pedestrian Priority Program*. New York City Global Partners 1 (2011): 1-6. Print.



## ILHÉUS, BRAZIL

Ilhéus is a major city located in the southern coastal region of Bahia, Brazil, 430 km south of Salvador, the state's capital. The city was originally founded in 1534 as Vila de São Jorge dos Ilhéus and it is one of the most important tourism centers of the northeast of Brazil. Ilhéus is also the hometown of Jorge Amado, the best known and most popular writer in Brazil.

Ilhéus has a population of approximately 184,000 inhabitants, with a land area of 1850 sq. km (Ilhéus 2012). Administratively, the city is divided into 10 districts, which are subdivided into 53 Villages and Towns. The main indicators are: Human Development Index 0.703 (MDG 2010), R\$ 1,925,639,853.00 GDP and GDP per capita of R\$ 8,782.21 (IBGE 2009) and 42% of the population lives below the poverty line (MDG 2010).

Historically, cocoa production has been the center of the city's economy and still is one of its main sources of revenue, with a processing center where three large multinational corporations produce the liquor that is utilized in the manufacture of fine chocolate. Besides the production of cocoa, palm oil and palm fiber, Ilhéus stands out as a hub of information technology, with several computer manufacturers established in the city. The top five employment generators are public administration, commerce, manufacturing and services and education, while the construction industry has been the fastest growing industry in recent years. The city's economy is based mainly on tourism; many Brazilian and foreign tourists come to visit, attracted by its beautiful beaches and a rich cultural heritage that includes colonial Portuguese buildings, history and culinary distinctions. (Ecodesenvolvimento 2010)

### Sustainability and Indicators

The city of Ilhéus has several initiatives on sustainability, coming, mainly, from the civil society. However, the local government during the last period (from 2009 to 2012), was very open to the participation of civil society in sustainability issues and in a cooperative effort between Municipal authorities and civil society, the Municipal Culture Plan, the Municipal Recovery Plan for the Atlantic, and the Health Law on Solid Waste were developed, and several public policy councils were created. Among the many civil society initiatives, we can highlight the following, some of which have taken place in partnership with the government at the Municipal, State and Federal levels:

<b>Socio Productive Inclusion and Integrated Management of Solid Waste</b>	<p>The process of requalification of the Landfill Itariri is being managed by a Working Group composed of the following stakeholders: the City of Ilhéus, the Urban Development Company of the State of Bahia (CONDER), the Brazilian Institute of Public Administration (IBAM), the Collectors Cooperative of Recyclable Solid Waste - Clean Conscience (COOLIMPA), the Ilhéus Institute and the Residents Association of the Hernane Lopes de Sá neighborhood. The landfill operations were optimized and that meant that the community of scavengers had to be relocated. Their living conditions at the landfill were definitely substandard so the stakeholders worked with them to resettle the families in a safer, better place. The city of Ilhéus is the first one in Brazil to take a really active role in the social inclusion and participation of the scavengers and work with them to improve the landfill operations and at the same time improve the scavengers living conditions. The scavengers are now organized through the Cooperative of Collectors</p>
<b>Use of Sustainable Natural Resources</b>	<p>COOFASULBA - Cooperative for Sustainable Development: Family Farming South of Bahia encompasses 32 associations and 4,000 members, producing chocolate powder that is sold for school lunches in public schools. They also manage the Green Forest Project, which distributed 29,000 native seedlings and fruit in 2011. They have also established a mini factory that uses the forest products as raw materials to create products like candy, pulps and jellies that can later on be sold in the marketplace to increase their income.</p>
<b>Conservation and Biodiversity</b>	<p>INSTITUTO FLORESTA VIVA - The Corridors project aims to consolidate the forest coverage between the Municipal Park Boa Esperança and the State Park of Serra do Conduru, restoring deforested areas (GAMBA 2012). The project is a partnership with the Ministry of Environment, through the Pilot Program for Tropical Forests (PPG7). This is a pioneer project in the region that wishes to connect forest fragments, isolated today, and ensure the formation of the first ecological corridor of southern Bahia. It is a priority area inserted in the Central Corridor of the Atlantic Forest. In reality, it is a mini-corridor within the Central Corridor of the Atlantic Forest, which covers southern Bahia and Espírito Santo. Added to the Serra do Mar corridor, it is part of the Biosphere Reserve of the Atlantic Forest - the title of the United Nations Educational, Scientific and Cultural Organization (UNESCO) for assets considered "World Heritage Site". (Esperança Conduru 2012)</p>

This year, Nossa Ilhéus, a non-governmental organization that aims to strengthen citizen participation, together with the People's Theatre of Ilhéus, the Institute Arapyaú, the Brazilian Social Network for Fair and Sustainable Cities and the Sustainable Cities Program, launched the SISI - Social Indicators System of Ilhéus (SISI 2012) in the Municipal Theatre. Nossa Ilhéus is still carrying out community engagement events to strengthen the discussion around these indicators and the citizens' vision of what they want for their city.

These indicators, which are 70 in total, are divided in two parts:

- The Intra-urban disaggregated into 13 regions for analysis, indicating, through comparative maps, large internal inequalities and regions that have higher demands and urgency to implement better public policies. These indicators are also analyzed in comparison with 27 other cities with the same population size on the same state (Bahia) and also in a comparative analysis of the last 3 years.
- The municipal indicators are analyzed only in comparison with other municipalities using data for the last 3 years.

The permanent monitoring of the evolution of these indicators will allow the Municipality, companies, universities and social organizations, to assess the results of public policies and projects that have been implemented.

SOCIAL INDICATORS SYSTEM FOR ILHÉUS (INDICATORS INTRA-URBAN) (SISI – SISTEMA DE INDICADORES SOCIAIS DE ILHÉUS (INDICADORES INTRA URBANOS))						
Child Education	Elementary Education	High School Education	Work Employment and Income	Housing Conditions	People with Disabilities	
Daycare coverage	Failure rate in public education	Failure rate in public education	Extreme Poverty	Teenagers responsible for their households	People with disabilities against total population	
Pre-school coverage	Public schools drop-out rate	Public schools drop-out rate	Households with income per capita of less than ¼ of minimum wage.	Households without water network coverage	People with disabilities with low income without social benefits	
	Disparity in age of students attending public schools	Disparity in age of students attending public schools	Households with income per capita of less than ½ of minimum wage.	Households without garbage collection		
	Index of development in basic education (initial years)	Illiteracy	Residents with income per capita of less than ¼ of minimum wage.	Households with no sewage system		
	Index of development in basic education (final years)			Households with income per capita of less than ½ of minimum wage.		Households with densities of 4 or more people per household
				Child labor		Residents in high risk areas

**SOCIAL INDICATORS SYSTEM FOR ILHÉUS (MUNICIPAL INDICATORS)**  
**SISI – SISTEMA DE INDICADORES SOCIAIS DE ILHÉUS (INDICADORES MUNICIPAIS)**

Health	Education	Violence Against Residents	Crime	Work and Income	Youth	Public Transit
Child Mortality	Schools without a room for Multifunction Specialist Educational Service (AEE)	Child abuse or violence	Murder	Average salary	Teenage pregnancy	Fatal victims in traffic
Early neonatal mortality (First 6 days)	Schools without facilities and appropriate routes for students with disabilities or reduced mobility	Elderly abuse or violence	Attempted murder	Salary by gender	Youth post-abortion curettage	Non fatal victims of traffic
Late neonatal mortality (From 7 to 28 days)	Public schools without laboratories	Abuse or violence against women	Rape	Concentration of income salary	Male youth deaths	
Post- neonatal mortality	Public schools without internet for students	Homicide	Robbery followed by death	Total jobs	Youth with formal employment	
Fetal death	Public schools without library	Male youth homicide	Robbery in urban buses	Total companies	Average wage for youth	
Low weight at birth			Theft of vehicles			
Insufficient Prenatal medical services			Theft from vehicles			
Caesarean deliveries						
Maternal death						
Post-abortion curettage						
Hospitalization because of breathing issues						
Hospitalization because of diarrhea diseases						
Mortality: Circulatory system						
Mortality: Cervix cancer						
Mortality: Under five years old						
Incidence of dengue						

The basic indicators of this Platform will be used by the newly elected government to produce a Diagnosis document of the current situation, and they will serve as reference for the establishment of a Target Plan, which they need to submit by law of 2008 (Article 73 of the Organic Law, municipal).

Through this reflective process about the city's history and current reality, we believe it is possible to foment social participation and build knowledge about the city of Ilhéus that we want in the future. This will also promote a government plan that will be built on an accurate diagnosis, social participation and tangible goals and measures that really matter to citizens in search of a more just, democratic and sustainable city.

## References

- Ecodesenvolvimento 2010. Ecodesenvolvimento no sul da Bahia. *Uma visão de futuro muito além de Porto Sul*. Itacaré. 2010. Accessed Sept 12, 2012. <<http://acaoilheus.org/downloads/ECOdesenvolvimentoVFINALcDMSORIAS11-11.pdf>>
- Esperança Conduru 2012. Journal eletrônico Esperança Conduru. *O Projeto 2012*. Accessed Sept 13, 2012. <<http://www.esperancaconduru.org/v1>>
- GAMBA 2012. GAMBÁ – Grupo Ambientalista da Bahia, Prefeitura Municipal de Ilhéus. *Plano Municipal de Conservação e Recuperação da Mata Atlântica de Ilhéus*. CONDEMA – Conselho Municipal do Meio Ambiente, Universidade Estadual de Santa Cruz, Ilhéus, 2012.
- IBGE 2009. Instituto Brasileiro de Geografia e Estatística. *Economia 2010*. Accessed Sept 12, 2012. <<http://www.ibge.gov.br/home/download/estatistica.shtml>>
- Ilhéus 2012. Wikipédia. City of Ilhéus. August 2012. Accessed Sept 12, 2012. <<http://pt.wikipedia.org/wiki/Ilh%C3%A9us>>
- MDG 200. Portal ODM. Acompanhamento Municipal dos Objetivos de Desenvolvimento do Milênio. 2010. Accessed Sept 14, 2012. <<http://www.portalodm.com.br/relatorios/ba/ilheus>>
- SISI 2012. Instituto Nossa Ilhéus. Sistema de Indicadores Sociais de Ilhéus (Social Indicators System of Ilhéus). 2012. Accessed Sept 12, 2012. <<http://nossailheu.dominiotemporario.com/indicadores/>>



# PORTLAND, UNITED STATES

The city of Portland, Oregon, with a population of 583,776 (Census 2010), was incorporated in 1851 and spans over 145 square miles (Budget 2011-12). Portland's economy has slowly diversified over the past decades. Steady growth in non-traditional sectors, such as the manufacture of electrical equipment, instruments, and related products, has helped Portland's economy adapt to national and global trends. Semiconductor manufacturers, such as Intel and Wacker Siltronic, have established major facilities in the region. Tektronix, Nike, Providence Health & Services, Kaiser Permanente, and Legacy, as well as retailers Safeway, Albertsons, and Fred Meyer are some of the other major non-government employers in the Portland metropolitan area (Budget 2011-12). The city's total adopted budget for FY 2011-12 is \$3.56 billion, which after eliminating the intra-city transfers, translates to a net budget in FY 2011-12 of \$2.78 billion (Budget 2011-12).

## Sustainability in Portland

The city has a 25 year vision (Portland in 2035) called the Portland Plan (2011), which is organized around a Framework for Equity and divided into nine action areas: Prosperity and Business Success, Education and Skill Development, Sustainability and the Natural Environment, Human Health, Food and Public Safety Transportation, Technology and Access Equity, Civic Engagement and Quality of Life, Design, Planning and Public Spaces, Neighbourhoods and Housing, Arts, Culture and Innovation. In addition to the Portland Plan, the city also has a number of specific initiatives:

- Climate Action Plan (2009). This focuses on the City of Portland and Multnomah County's attempts to reduce carbon on a regional scale and the multiple actions proposed to jump start that effort.
- Portland Five Year Economic Development Strategy (EDS 2009). This plan identifies multiple efforts intended to promote economic recovery and a long-term path to stronger growth. One of the main focus areas is green sector jobs.
- Transportation Plans. The city has adopted a number of multi-modal transportation plans, including most recently the city-wide Streetcar Systems Plan (2009) and the Bicycle Master Plan (2010). These plans have a strong environmental component or issue at the heart of the effort.



Portland Streetcar

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- Land Use and Community Development Plans. Land use plans developed over the last decade all have goals, policies and actions proposed that address sustainability issues, under headings such as “green buildings” and “storm water”. See for example the South Waterfront Plan (2004), which promotes a new dense urban community with a focus on these areas, as well as the North Pearl District Plan (2008) that focuses also on social issues that have been overlooked by past plans.

## **Indicators**

The Portland Plan is organized around three integrated strategies: Economic Prosperity & Affordability, Education, and Healthy Connected Neighbourhoods. Each strategy has a 25 year policy and 5 year action plans. An example of an action plan in the integrated strategy of Education is to increase private sector partnerships with schools, and in doing so, increasing the number of career-related learning options and dual-enrolment high school students taking college credit.

The Portland Plan has 12 measures of success based on nine action areas. The action areas were the starting point for completing background research and for setting goals and objectives for 2035. Some of the indicators are based on industry standard indicators or indexes. Each measure of success uses a number of indicators. The following measures and indicators are in the area of sustainability:

- Transit and active transportation – percentage of residents that take public, active or low polluting transportation to work. Based on the Portland Climate Action Plan’s (2009) recommendation of 70 percent transit and active transportation to work mode split target to achieve adopted carbon emissions reduction goal (80% by 2050)
- Reduced carbon emissions (emissions reduction goal 80% by 2050)
- Complete neighbourhoods
  - Increase in overall score of City of Portland’s 20-minute neighbourhood index.
  - Access to grocery stores
  - Access to parks
  - Neighbourhood business vitality
- Healthier people – these indicators are based on the Human Development Index (HDI), which is a comparative measure of life expectancy, literacy, education, and standards of living for countries worldwide. (HDI 2011).
  - Adults at a healthy weight
  - 8th graders at a healthy weight
  - Percentage of 8th graders that meet federal physical activity guidelines
  - Percentage of adults and eighth graders that eat five servings of fruits and vegetables per day, the federal standard
- Healthier watersheds
  - Portland Water Quality Index (PWQI) Score by Watershed Area within the City of Portland. The PWQI combines eight water quality indicators to assess how close Portland streams and rivers are to meeting water quality standards (including those set by regulators such as Oregon DEQ).
  - Percentage of the city which is under tree canopy
  - Tree canopy percentage relative to poverty rate in the last 12 months

The municipal website has a comprehensive sustainability section which includes the Portland Plan, where the city’s vision, objectives, indicators and performance progress are reported.

According to Troy Doss, Senior Planner, Portland Bureau of Planning & Sustainability, there are two critical success factors for achieving sustainability in a city:

- a. Public/Private partnership. The city needs leaders in both the public and private sectors to work together and the active participation of the private sector is a must to succeed. The city needs to develop attractive incentives for the private sector to make decisions that will benefit not only the business but the community and the citizens in general. For example, the city needs to support the private sector by removing dated prohibitive regulations where innovative initiatives are proposed.
- b. Risk management. There are several risks such as investment risks and public perception involved in sustainability initiatives, and stakeholders, such as developers, need the assurance that the City is willing to work with them and support their risk management plan so that they will be willing to take a higher risk by engaging in initiatives that yield long term return on investment rather than short-term. For example, utilizing more expensive building materials that insulate more efficiently, and as a result require less electricity for heating or cooling.

An additional key learning from the journey to Sustainability is that in order to get people onboard, people need successful case studies from other cities as well as direct continuous assistance.

## References

- Bicycle Plan 2010. *Portland Bicycle Plan for 2030*. Portland Bureau of Transportation. Feb, 2010. Accessed Jun 12<sup>th</sup>, 2012. <<http://www.portlandonline.com/transportation/index.cfm?c=44597>>
- Budget 2011-12. Adopted Budget in brief. City of Portland, Oregon. Fiscal Year 2011-12. Feb N.d. accessed Jun 7<sup>th</sup>, 2012. <<http://www.portlandonline.com/omf/index.cfm?c=55389&a=358662>>
- Census 2010. 2010 Census Profiles. Oregon Cities Alphabetically M-P. Feb 2011. Web Jun 10, 2012. <[http://www.pdx.edu/sites/www.pdx.edu.prc/files/media\\_assets/2010\\_PL94\\_cities\\_M-P.pdf](http://www.pdx.edu/sites/www.pdx.edu.prc/files/media_assets/2010_PL94_cities_M-P.pdf)>
- Climate Action Plan 2009. City of Portland. Bureau of Planning and Sustainability. October 2009. Accessed Jun 10<sup>th</sup>, 2012. <<http://www.portlandonline.com/bps/index.cfm?c=49989&a=268612>>
- EDS 2009. Portland Economic Development Strategy: A five year plan for promoting job creation and economic growth. 2009. Accessed Jun 9<sup>th</sup>, 2012. <[http://www.pdxeconomicdevelopment.com/docs/EDS\\_Brochure.pdf](http://www.pdxeconomicdevelopment.com/docs/EDS_Brochure.pdf)>
- HDI 2011. Human Development Reports. United Nations Development Program. 2011. Accessed Jun 8<sup>th</sup>, 2012. <<http://hdr.undp.org/en/countries/>>
- North Pearl District Plan 2008. City of Portland Bureau of Planning. Dec 2008. Accessed Jun 7<sup>th</sup>, 2012. <<http://www.portlandoregon.gov/bps/article/268304>>
- Portland Plan 2011. The Portland Plan. Proposed Draft. City of Portland, Oregon. October 2011. Accessed Jun 12<sup>th</sup>, 2012. <[http://www.portlandonline.com/portlandplan/proposed\\_draft/pplan-draft-complete.pdf](http://www.portlandonline.com/portlandplan/proposed_draft/pplan-draft-complete.pdf)>
- Streetcar Systems Plan 2009. *Portland Streetcar System Concept Plan: A framework for Future Corridor, Planning and Alternatives Analysis*. Portland Bureau of Transportation. Sep, 2009. Accessed Jun 15<sup>th</sup>, 2012. <<http://www.portlandonline.com/transportation/index.cfm?a=321180&c=35953>>
- South Waterfront Plan 2004. South Waterfront Greenway Development Plan: Design Component Phase I. Portland Parks and Recreation. Dec 2004. Accessed Jun 15<sup>th</sup>, 2012. <<http://www.portlandonline.com/parks/index.cfm?a=175890&c=45643>>



## DURBAN, SOUTH AFRICA

With a land area of 2,297 square kilometres, Durban (Zulu: eThekweni) is the largest city in the South African province of KwaZulu-Natal. A port city on the Indian Ocean, Durban is part of the eThekweni Municipality (EM). Altogether, the EM has a population of close to 3.5 million, of which 21% are unemployed. (Statistics 2008)

eThekweni's GDP amounted to R196.1 billion annually (USD 23.8 billion) in 2010 accounting for 65.5% of KwaZulu-Natal's GDP and 10.7% of South Africa's national output. eThekweni's economy was dominated by tertiary industries that included finance (23%), manufacturing (22%), community services (17%) and construction (3%) in 2010. Comparatively, eThekweni relies upon the tourism industry – owing in part to increased tourism post-World Cup (2010), and in part, to Durban's warm, tropical climate. (IDP 2012)

Environmentally, eThekweni has been described as a “biodiversity hotspot” (Biodiversity 2011). The environment in and around eThekweni includes coastlines, estuaries, rivers, steep escarpments and coastal plains. The largest challenges faced in this region are habitat destruction, eutrophication, and climate change impacts on biodiversity, unsustainable development activities and invasive species (IDP 2012).

### Sustainability in Durban

The eThekweni Municipality has a vision, that, “By 2030 eThekweni will enjoy the reputation of being Africa's most caring and liveable City, where all citizens live in harmony.”

In 2001, the eThekweni Council adopted a ‘Long Term Development Framework’ (LTDF). The LTDF was reviewed to “ensure that sustainability in all its facets is embedded into the Municipality” (IDP 2012). Post review, eThekweni embarked upon the “Imagine Durban Process,” an enabling process that brought a long term, overarching umbrella of sustainability to the development process. Ultimately, the Imagine Durban Process will help guide eThekweni towards resource use, implementation of programs and the effective monitoring and measurement of project outcomes in order to help create a “sustainable city with an educated and empowered citizenry who will enjoy a high quality of life.” (IDP 2012).

The Municipal Systems Act No. 32 of 2000 requires every municipality in South Africa to develop and implement an integrated development plan. In 2012, the eThekweni Council adopted its third generation IDP (IDP 2012), which is in line with the five year term office of the Councillors elected in 2011. It is a strategic document aimed at continuing sustainable development and service delivery imperatives initiated in the previous IDPs. The IDP will be reviewed annually and is used to ensure programs and services align with the eThekweni LTD plan.

Within the IDP, the ‘8-point plan’ is outlined. The Municipality has taken the strategic direction to achieve closer alignment between the Long Term Development objectives and the IDP (in the context of International, National, Provincial and Local development policies).

#### 8 Point Plan:

1. Developing and sustain our spatial, natural and built environment.
2. Developing a prosperous, diverse economy and employment creation.

3. Creating a quality living environment.
4. Fostering a socially equitable environment.
5. Creating a platform for growth, empowerment and skills development.
6. Celebrating our cultural diversity.
7. Good governance and responsive local government.
8. Financially accountable and sustainable city.

The development of the eThekweni IDP drew from:

- the Millennium Development Goals (MDGs)
- National Development Plan
- Delivery Agreement: Outcome 9
- National Government Program of Action 2009-2014
- National Spatial Development Perspective (NSDP)
- Provincial Growth and Development Strategy
- Provincial Priorities
- Provincial Spatial Economic Development Strategy (PSEDS)
- Long Term Development Framework
- eThekweni specific development challenges
- Strategic Priority Areas
- Eight point plan

The implementation of the IDP will follow the process below:



**Integrated Planning and Monitoring Processes**  
Source: eThekweni Municipality

In partnership with Sustainable Cities International, the eThekweni Municipality has identified key priority areas (KPAs) that will guide and inform the city's LTDF. These are:

- Creating a safe city;
- Ensuring a more environmentally sustainable city;
- Promoting an accessible city;
- Creating a prosperous city where all enjoy sustainable livelihoods;
- Fostering a caring and empowering city;
- Celebrating our cultural diversity; history and heritage.

These priority areas will inform eThekweni’s LTDF and will graduate over time to achieve the ultimate goal of creating a sustainable city – as laid out in the municipality’s vision (see below).

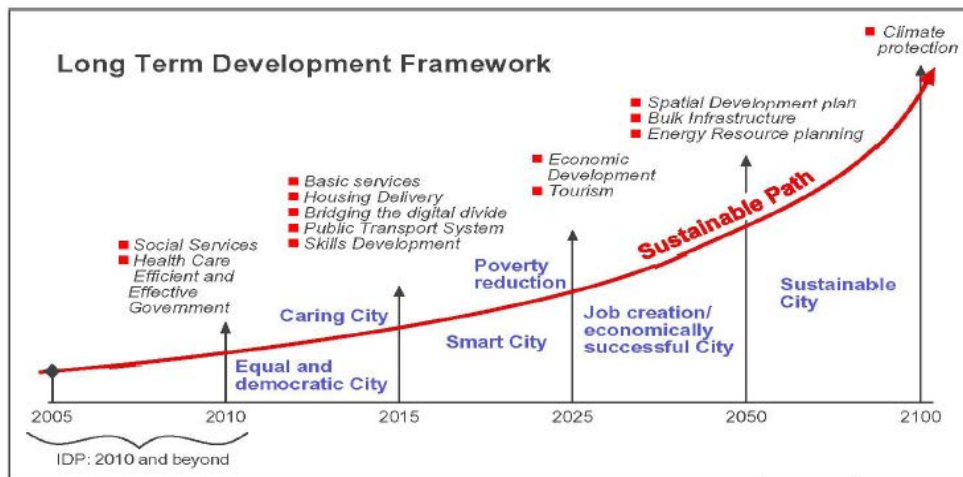


Figure 15: Long Term Development Framework  
Source: eThekweni Municipality

### Municipal Performance Management System: Scorecard

The scorecard sets five broad target areas that can be read in conjunction with the 8 Point Plan and national KPAs in order to assess the progress of eThekweni towards achieving its strategic priorities. The five target areas with their respective strategic areas and key performance indicators (KPI) are:

1. Basic Service Delivery

STRATEGIC AREA	KEY PERFORMANCE INDICATOR
Develop, manage and regulate the built and natural environment.	<ul style="list-style-type: none"> <li>• Develop, update and review Planning tools for managing land use and development</li> <li>• Number of Building Plans finalized within statutory timeframes (30 days &gt;500m<sup>2</sup> &amp; 60 days &lt;500m<sup>2</sup>)</li> <li>• Number of completed buildings processed for valuation within statutory timeframes (14 days for issuing of certificates)</li> <li>• Compliance with the Integrated Coastal Management Act 2009 - Municipal Coastal Management Program (MCMP)</li> <li>• Production of the Annual State of Biodiversity (SOB) Report</li> </ul>
Climate Protection Planning	<ul style="list-style-type: none"> <li>• Implement a Municipal Climate Protection Programme</li> </ul>

<p>Meet Infrastructure and Household service needs and backlogs</p>	<ul style="list-style-type: none"> <li>• The percentage of households with access to a basic level of <b>Electricity</b></li> <li>• The percentage of households with access to a basic level of <b>Solid Waste</b></li> <li>• The percentage of households with access to a basic level of <b>Water</b></li> <li>• The percentage of households with access to a basic level of <b>Sanitation</b></li> <li>• The percentage of estimated indigent households with access to free basic services: <b>Electricity</b></li> <li>• The percentage of estimated indigent households with access to free basic services: <b>Solid Waste</b></li> <li>• The percentage of estimated indigent households with access to free basic services: <b>Water</b></li> <li>• The percentage of estimated indigent households with access to free basic services: <b>Sanitation</b></li> <li>• The number of consumer units provided with access to a FREE basic level of SANITATION by means of a UD toilet, an existing VIP or, for informal settlements, by means of a toilet/ablution block within 200m.</li> <li>• The number of consumer units provided with access to a FREE basic level of potable WATER either by means of an individual hh yard supply (ground tank or metered flow limiter connected to a yard tap) or, for informal settlements, by a standpipe within 200m.</li> <li>• The number of consumer units with new subsidised ELECTRICITY connections captured including housing and rural consumer units</li> <li>• The number of consumer units with new non-subsidised ELECTRICITY connections captured.</li> <li>• The number of additional consumer units provided with a once/week, kerb-side REFUSE removal service.</li> <li>• The km of unsurfaced ROAD converted to surface.</li> <li>• The number of consumer units collecting FREE basic ELECTRICITY (65kWh/month).</li> <li>• The number of consumer units receiving fully subsidised HOUSING.</li> <li>• The % of non-revenue water loss.</li> <li>• Electricity losses (technical and non-technical) as a % of electricity sales.</li> <li>• WASTE RECYCLED as a % of total waste disposed at municipal land fill sites.</li> <li>• Phase 1 of Integrated Rapid Public Transport Network (IRPTN)</li> </ul>
<p>Promoting the Safety of Citizens</p>	<ul style="list-style-type: none"> <li>• Reduction of traffic and by-law violations in eThekweni Metropolitan Area (EMA)</li> <li>• Number of problem buildings assessed and auctioned</li> <li>• Average Deficiency Ratio of Security Companies</li> <li>• Establish a hazard and vulnerability profile and index rating</li> </ul>
<p>Promote Health of Citizens</p>	<ul style="list-style-type: none"> <li>• Number of effective systems developed and implemented in administration system</li> <li>• Number of PHC facilities accredited with national core standards body</li> <li>• Percentage of HIV positive pregnant women eligible for treatment started on ARVs in facilities providing ARVs</li> <li>• Percentage of smear positive TB cases cured of TB</li> <li>• Expand air quality monitoring network by 2 Sites</li> </ul>

## 2. Local Economic Development (LED)

STRATEGIC AREA	KEY PERFORMANCE INDICATOR
<p>Support and Grow the Economy</p>	<ul style="list-style-type: none"> <li>• The number of jobs created through municipality's local economic development initiatives including capital projects</li> <li>• The number of development opportunities created to support the economic sectors.</li> </ul>



3. Good Governance and Public Participation

STRATEGIC AREA	KEY PERFORMANCE INDICATOR
Ensure Accessibility and promote governance	<ul style="list-style-type: none"> <li>• Number of intergovernmental, regional (inter-municipal) and international agreements that complement and enhance existing municipal service delivery programs.</li> <li>• Customer satisfaction based on the Sizakala Survey</li> <li>• All sectors of eThekweni Community participate in Council activities through their representative structures</li> <li>• Number of communication tools implemented in line with the Adopted Communication Strategy and Policy                             <ul style="list-style-type: none"> <li>(a) Percentage of staff and the public that are aware of the systems and mechanisms available to combat corruption and unethical behavior and the extent to which the systems are effective</li> <li>(b) Percentage of forensic investigations and ombuds cases finalized to ensure an effective investigative, auditing and ombuds service</li> </ul> </li> <li>• Percentage of implementation of enterprise wide risk management according to the approved plan</li> <li>• Number of audit projects undertaken to determine the adequacy of internal controls designed to mitigate against identified risks</li> </ul>
Create an efficient, effective and accountable administration	<ul style="list-style-type: none"> <li>• Unqualified audit in terms of performance information</li> <li>• Interventions introduced to improve productivity, efficiency and effectiveness within the municipality</li> <li>• Number of IT initiatives to improve efficiencies, effectiveness &amp; accountability and eliminate wastage of resources</li> <li>• Implementation of identified systems, policies, events and services to promote the interface between the Council, the Administration and Citizenry</li> </ul>
Healthy and productive employees	<ul style="list-style-type: none"> <li>• Develop and implement HR Projects</li> <li>• Provide comprehensive health and safety program to the Clusters/City to reduce the DIFR on annual basis</li> <li>• Reduce the Disabling Injury Frequency Rate (DIFR) on annual basis</li> <li>• The number (/%) of people from employment equity target groups employed in the three highest levels of management in compliance with a municipality's approved employment equity plan</li> </ul>

4. Municipal Transformation and Organizational Development

STRATEGIC AREA	KEY PERFORMANCE INDICATOR
Human Capital Development	<ul style="list-style-type: none"> <li>• % implementation of the Work Place Skills Plan</li> <li>• The percentage of a Municipality's budget actual spent on implementing its workplace skills plan</li> </ul>
Develop the City as a learning City	<ul style="list-style-type: none"> <li>• Number of activities established to promote the city as a centre for learning</li> </ul>

## 5. Municipal Financial Viability and Management

STRATEGIC AREA	KEY PERFORMANCE INDICATOR
Strategic and Sustainable Budgeting	<ul style="list-style-type: none"> <li>• The percentage of the municipality's capital budget actually spent on capital projects in terms of the municipality's integrated development plan</li> <li>• Valuation Roll - Compliance with MPRA provisions with respect to Supplementary Rolls</li> </ul>
Value-for-money expenditure	<ul style="list-style-type: none"> <li>• Availability of vehicles</li> </ul>
Sound Financial Management and Reporting	<ul style="list-style-type: none"> <li>• Outstanding Service Debtors to Revenue</li> <li>• Debt Coverage Ratio (No. of times)</li> <li>• Cost Coverage Ratio (No. of Times)</li> <li>• Gearing Ratio (Debt to Revenue)</li> <li>• Collection Rate - Bulk Electricity 95%,</li> <li>• Collection Rate - Electricity 95%,</li> <li>• Collection Rate - Water 90%,</li> <li>• Collection Rate - Rates 95%</li> <li>• Report from Auditor General</li> <li>• Aligning SCM Processes to ISO 9001</li> <li>• Implementation of the eProcurement System (electronic system)</li> </ul>

Each target area has a corresponding set of baselines, and targets which are described in detail in the IDP.

## References

- Biodiversity, 2011. eThekwini Municipality. What is biodiversity? Accessed on Apr. 4, 2012. <http://www.durban.gov.za/Documents/CityServices/EnvironmentalPlanning/Biodiversity.pdf>
- eThekwini Municipality 2011. eThekwini Municipality. About eThekwini Municipality. Accessed on Mar. 10, 2012. [http://www.durban.gov.za/Discover\\_Durban/Pages/AboutEM.aspx](http://www.durban.gov.za/Discover_Durban/Pages/AboutEM.aspx)
- IDP 2012. eThekwini Municipality. Integrated Development Plan (IDP), 5 Year Plan 2012/13 to 2016/17. Pg. 18,21, 246. Accessed online on Mar. 15, 2012. [http://www.durban.gov.za/Resource\\_Centre/IDP/Documents/11085\\_1.PDF](http://www.durban.gov.za/Resource_Centre/IDP/Documents/11085_1.PDF)
- Statistics 2008. Statistics South Africa. Community Survey, 2007; Basic Results, Municipalities. Accessed on Mar. 17, 2012. <http://www.statssa.gov.za/Publications/P03011/P030112007.pdf>

Kitakyushu is located in the Fukuoka Prefecture in Kyushu. The city has a population of approximately 1,014,608 and an area of 483.15 km<sup>2</sup> as of 2005 (Kitakyushu 2011). Certain publications include Shimonoseki on Honshu, to form the center of an area known as the Kitakyushu metropolitan area. Our research focuses solely on the city of Kitakyushu consisting of 7 wards, of which Kokurakita Ward is the administrative center. The seven wards are Kokurakitaku, Kokuraminamiku, Moji-ku, Tobata-ku, Yahatahigashiku, Yahatanishiku and Wakamastuku

Kitakyushu was officially founded in 1963. However, the geographical area around the city had taken off in development around 1600. During the 19th



century, Meiji government recognized the geographical advantages of the Kitakyushu area for Japan's marine and land traffic. Rapid construction of railroad lines and port facilities in addition to commercial development made Kitakyushu area one of the most important distribution bases in Japan. Around the same time, Yahata Steelworks, founded in 1901, contributed to Japan's manufacturing power.

### Sustainability in Kitakyushu

In February 1963, Kitakyushu, an international, industrial and trade city was established. Located on the straight line between Shanghai and Tokyo, geographical advantages have led Kitakyushu's industry to incorporate different dimensions over time. Automobile-related industry, high-technology industries including industrial robots, IC-related products and biotechnologies are all being generated in this city. The city aims to become "an International and Technological City with Waterfront, Green Environment and Human Contact".

Their achievement in recovering from environmental damage due to rapid development has been noted internationally. Kitakyushu has been the host city for the Kitakyushu Initiative, a project designed to conduct research on sustainability and share experience among countries of the Asian Pacific region.

Traditionally, top-down approaches have been readily received in Kitakyushu. However, after the emergence of Local Agenda 21, and the grass-root organizations gaining popularity and importance, studies and practices of "bottom-up" approaches are becoming popular. Since the Kitakyushu Initiative took place in the city and around the Asia Pacific region from 2000 to 2010, researchers have put forward a preliminary indicator-based sustainability management system for the participating cities.

The Kitakyushu Initiative aimed to bring together practices and experiences of Kitakyushu city and other cities in the Asia Pacific region to provide an effective guideline for this region. As of 2010, 61 cities in 18 countries around the Asia Pacific region participated in the Initiative. Kitakyushu itself set targets to reduce CO<sub>2</sub> emissions to 74,000 tons by 2013 (ER 2010). An example of a policy-based system (top-down approach) is the adoption of the Driving forces, Pressures, State of the Environment, Impacts, Response - DPSIR System (Dhakar 2002).

CATEGORIES	DESCRIPTION
Driving force indicators	Underlying causes such as demography, urbanization, lifestyle, economic situation, poverty, local government
Pressure indicators	Activities affecting the environment directly, e.g., emissions of pollutants, CO2, waste volumes etc.
State indicators	Observed changes, such as rising global temperature
Impact indicators	Effect of changes in the environment, such as degrading human health, increased frequency of flood events, etc.
Response	Responses from the government or society in the form of actions

Several limitations have been identified from past practices of the DPSIR system. The system does not capture the complexity and dynamics of causes and effects of the problem. The interdependency between isolated chains of indicators cannot be accounted for by the system.

Despite their search for a more community-driven system for Kitakyushu city and other cities alike, the proposed system still has its roots in the DPSIR system. Their approach added new elements which reflect the vulnerability of human systems to cope with the changes in the environmental systems. (Dhakal 2002). It is similar to the Environmental Sustainability Index (ESI) of the World Economic Forum in this aspect, but they have adjusted the model to make it relevant for Kitakyushu and other cities. The system does not isolate causes and effects as in DPSIR; instead, it includes four elements: State of environmental system, Stress of activities on the System, Vulnerability of Socio-economic Systems and Responses and Capacity to Cope.

## Indicators

### Maintaining environmental systems

Air quality	<ul style="list-style-type: none"> <li>• SO2 concentration</li> <li>• TSP concentration</li> </ul>
Water availability	<ul style="list-style-type: none"> <li>• % of population with access to adequate and clean water</li> <li>• water renewable rate of the source</li> </ul>
Water quality	<ul style="list-style-type: none"> <li>• BOD concentration of inland water bodies</li> <li>• COD concentration of coastal water</li> </ul>
Urban green	<ul style="list-style-type: none"> <li>• % of green area in the total land use</li> </ul>

### Reducing environmental pressures

Reducing pressure to air quality	<ul style="list-style-type: none"> <li>• SO2 emissions per unit of city area</li> <li>• TSP emissions per unit of built-up area</li> <li>• VOCs emissions per unit of built-up area</li> <li>• Coal consumption per unit built-up area</li> <li>• Number of vehicles per unit paved road length</li> <li>• Number of cars per 1000 population</li> <li>• Share of mass transportation in travel mode</li> </ul>
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Reducing pressure to water system	<ul style="list-style-type: none"> <li>• Water use per capita</li> <li>• Share of ground water in total water supply</li> <li>• Volume of municipal wastewater discharges per capita</li> <li>• Volume of industrial wastewater discharges</li> <li>• Annual BOD discharges</li> <li>• Annual COD discharges</li> </ul>
Reducing waste	<ul style="list-style-type: none"> <li>• Per capita waste generation</li> </ul>
Reducing consumption pressure	<ul style="list-style-type: none"> <li>• Ecological footprint</li> <li>• Population density of built-up area</li> </ul>

### Reducing vulnerability

Availability of basic human needs	<ul style="list-style-type: none"> <li>• % of population with access to tapped water</li> <li>• % of water demand met with tapped water</li> <li>• % of population with access to sewage system</li> <li>• % of total solid waste collected</li> </ul>
Human health	<ul style="list-style-type: none"> <li>• Number of doctors per 1000 population</li> <li>• Number of hospital beds per 1000 population</li> <li>• Child mortality</li> </ul>

### Improving response strategies

Institutional capacity	<ul style="list-style-type: none"> <li>• Number of environment staffs in city government per 100 thousands population</li> <li>• % of industries complied with emission control regulations</li> <li>• % of vehicles complied to emission control regulations</li> </ul>
Economic and social capacity	<ul style="list-style-type: none"> <li>• % of budget of local government allocated for environment</li> <li>• Gross city product per capita</li> <li>• Adult literacy rate</li> <li>• Household below poverty line</li> </ul>
Efficient energy use	<ul style="list-style-type: none"> <li>• Share of renewable energy in total energy use</li> <li>• CO2 per capita from energy use</li> </ul>

As of now, there are no published results shared by the city of Kitakyushu on the Implementation of this proposed system. The approach was shared with participating cities in the Initiative. The Kitakyushu Initiative started in September 2000, and the second cycle of the Kitakyushu Initiative lasted from 2005 - 2010. Seminars, field study and reports are available in the City of Kitakyushu website [kitakyushu.iges.or.jp](http://kitakyushu.iges.or.jp).

### References

- Dhakal, Shobhakar 2002. *Indicator related research for Kitakyushu Initiative*. Institute for Global environmental Strategies. 2002.
- ER 2010. *Environmental Commitment Report 2007-2010*. Kitakyushu Initiative for a Clean Environment March 2010. Accessed Jun 8<sup>th</sup>, 2012. <[kitakyushu.iges.or.jp](http://kitakyushu.iges.or.jp)>
- Kitakyushu 2011. Population 2005. Data of Kitakyushu. City of Kitakyushu. 2011. Accessed Jun 7<sup>th</sup>, 2012. [www.city.kitakyushu.lg.jp/english/file\\_0068.html](http://www.city.kitakyushu.lg.jp/english/file_0068.html)



# SINGAPORE, SINGAPORE

Singapore is a small island city-state located in Southeast Asia. It has a population of 5,183,700 with a growth rate of 2.1%, and a total land area of 712.4 square kilometres. (Singapore 2011a) Malaysia and Indonesia are its closest neighbours. Since becoming a sovereign nation in 1965, under the leadership of the People's Action Party, it has become an example of success in the region. Ensuring that its citizens are provided the basic life necessities by the government has steadily guided its growth.

Singapore's economic story is one of success. Since the city-state's independence in the 60s it has built its economy from the ground up with forward-looking policies to ensure economic growth. The result has been Singapore boasting the strongest economy in the region with a GDP of \$326,832.4 Billion Singapore Dollars. (Singapore 2011a) The base of the economy is: electronics, chemicals, financial services, oil drilling equipment, petroleum refining, rubber processing and products, processed food and beverages, ship repair, offshore platform construction, life sciences and entrepôt trade. Singapore has established itself as a destination for international firms due to the ease with which companies can do business. Pro enterprise policies coupled with low tax have made it a desirable place for businesses and the expatriates that come with international firms.

In Singapore it is the Ministry of National Development (MND) that oversees urban planning and transportation. Its functions are akin to a municipal government The MND's mission is to: develop world-class infrastructure; create a vibrant and sustainable living environment; and build rooted and cohesive communities for Singapore. Its annual budget in 2012 is \$2.5 billion SGD. (IMCSD 2009)

## Sustainability in Singapore

The City State of Singapore presents a unique case study for sustainability. As it is all urban, the city is a living experiment for pure urban sustainability. The city is conscious of its finite resources and dependency on imports of basic necessities such as water, fuel and agricultural goods to sustain the island nation of 4.5 million people on less than 700 sq. km. It is likely that this awareness has bred a culture of innovation that enables Singapore to be a leader in sustainable best practices such as rainwater harvesting, reverse osmosis to produce NEWater, efficient public transport and green space, to name a few.

In order to create Singapore's sustainable development strategy, the Inter-Ministerial Committee on Sustainable Development (IMCSD) was created and the output was the Sustainable Blueprint (IMCSD 2009). The Blueprint defines what sustainable development is for Singapore (IMCSD 2009):

- Efficient: Development occurs with less resources and waste
- Clean: Development occurs without polluting the environment
- Green: Development preserves greenery, waterways, and natural heritage

Keeping true to Singaporean tradition in policy making, the Blueprint follows a ‘Singapore Way’ and upholds the principles of (IMCSD 2009):

- **Long-Term, Integrated Planning:** We will align our policies - from energy to transport to industry and urban planning - and take a long-term and complete view of our needs and circumstances. Indeed, this ability to plan and act in unison towards the overall goal of sustainable growth is one of our key strengths
- **Pragmatic and Cost Effective Manner:** We have to secure our twin goals of promoting economic growth and a good environment in the most cost-effective way. We must constantly ask ourselves “what works”, and we will not shy away from long-term measures that are necessary, even if they entail short-term costs. But we will pace the implementation of these measures and provide help to temper and soften the short-term costs for businesses and individuals
- **Flexibility:** The challenges to maintain economic growth and a good environment will span many decades. We therefore have to remain nimble, and adjust flexibly to changes in technology and in the global environment. We will invest in building our capabilities today to give us more options to better respond to the challenges of tomorrow.

Supporting the principles are four key priorities/strategies (IMCSD 2009):

- **Improve Resource Efficiency:** focused on reduction of cost and achieving growth with fewer resources
- **Improve the Quality of Our Environment:** controlling pollution, improving the landscape, and maintaining high public health standards
- **Build Up Our Knowledge:** Learning and cumulating knowledge on growing in an environmentally friendly way.
- **Encourage Community Ownership and Participation:** Engaging all stakeholders from business, NGOs and community leaders to citizens in the process of sustainable development

The Blueprint sets the stage for Singapore’s vision and goals for 2030, by presenting its achievements in the past and present (IMCSD 2009). Notable is the foresight that was premise for the policies that shaped present day Singapore. There is a consciousness that exists in regards to the challenges that will arise as the city-state grows, not only within itself but within the region and globally. The Government recognizes that “Sustainable development can only be achieved through long-term attention and effort”.

For 2030 attention is being given to (IMCSD 2009): 1. Population growth with limited resources, 2. Competition for resources worldwide, and 3. Environmental risks.

PRIORITY	GOAL/INDICATOR
Energy - Greater Efficiency and Diversification	Reduced our energy intensity (per dollar GDP) by 20% from 2005 levels by 2020 and by 35% from 2005 levels by 2030
Waste – Towards zero landfill	Improve our recycling rate from 56% in 2008 to 65% in 2020 and 70% in 2030
Water – Towards self-sufficiency and greater efficiency	Reduce total domestic water consumption from 156 litres per capita per day in 2008 to 147 litres per capita per day by 2020 and 140 litres per capita per day by 2030

Air Quality – Cleaner Air	<p>Reduce the annual mean for ambient fine Particulate Matter (PM<sub>2.5</sub>) from 16ug/m<sup>3</sup> to 12ug/m<sup>3</sup> by 2020 and maintain it at this level till 2030.</p> <p>Cap ambient Sulphur Dioxide (SO<sub>2</sub>) levels at 15ug/m<sup>3</sup> by 2020 and maintain it at this level till 2030.</p>
Clean, Blue and Green, Physical Environment	<p>Increase the green park space by 900ha to 4200 ha by 2020, and reach a park provision of 0.8ha per 1,000 population by 2030</p> <p>Increase the length of our park connectors (linear parks) from 100 km in 2007 to 360km by 2020</p> <p>Introduce 30 ha of sky rise greenery by 2020 and 50 ha of sky rise greenery by 2030</p> <p>Open 820h of reservoirs and 90km of waterways for recreational activities by 2020 and have 900 ha of reservoirs and 200km of waterways open for recreational activities by 2030</p>
Capability and Expertise	Build Singapore into an outstanding knowledge hub in the latest technology and services that will help cities grow in a more environmentally friendly way.
Environmentally Responsible Community	Build a community in Singapore where everyone adopts a more environmentally responsible lifestyle. Environmental responsibility will be part of our people and business culture.

Overall, Singapore's Blueprint builds on its historical efforts to manage growth and build itself within the constraints that its faces. The Blueprint itself is unique to Singapore; however it does have resemblances to the OECD Green Growth framework as it is based largely on economic outcomes.

## References

- Inter-Ministerial Committee on Sustainable Development (2009). *Lively and Liveable Singapore: Strategies for Sustainable Growth*. Ministry of the Environment and Water Resources and Ministry of National Development
- Singapore 2011a. Singapore at a glance. Sep 2011. Accessed Jun 8th, 2012.  
<<http://app.www.sg/who/1/Singapore-at-a-Glance.aspx>>
- Singapore 2011b. Living Conditions. Sep 2011. Accessed Jun 8th, 2012.  
<<http://app.www.sg/who/195/Living-conditions.aspx>>
- Singapore Government 2009. Sustainable Singapore: A lively and livable City. Sept 2009. Accessed Jun 10<sup>th</sup>, 2012.  
<<http://app.mewr.gov.sg/web/Contents/ContentsSSS.aspx?ContId=1034>>



Sydney was founded 224 years ago on January 26, 1788, when Arthur Philip settled in Sydney Cove on Port Jackson under instructions of the British Government; on February 7, 1788, the city was officially named Sydney (Macey 2007). However, radio carbon dating suggests that the Sydney region had been inhabited by indigenous Australians for at least 30,000 years. (Macey 2007). To date, within the city's 26.15 sq. km area, it holds approximately 183, 616 people as of 2011 (Sydney 2009).

## SYDNEY, AUSTRALIA

Sydney is considered to be the financial and economic hub of Australia. The largest economic sectors in Sydney as measured by the number of people employed include property and business services, retail, information technology, and health and community services. Overall, the city has a working population that is just over 4% of the Australian total workforce. However, it is the workplace to 20% of the entire Australian finance sector; 13% of the Australian total Information, Media and Technology industry sector workforce; and 11% of national employment in Creative and Performing Arts activity. In addition, Sydney carries resources like diamonds (50 % of the world reserves), tin, titanium and lead, and is the second world producer of gold, nickel and uranium (30 % of the world reserves) (Easy Expat 2008). Similarly, Sydney's tourism sector is very dynamic as well (Easy Expat 2008). For 2012, the city's budget was \$125.198 M. (Sydney 2011)

### Sustainability in Sydney

In 2006 the City of Sydney initiated actions to come up with the Sustainable Sydney 2030 plan. Its aim is to make Sydney **GREEN, GLOBAL & CONNECTED** (UNCSD 2012).

1. **GREEN** – Sydney will be internationally recognized as an environmental leader, with outstanding environmental performance, and new 'green' industries driving economic growth. Green targets include reduction of CO2 emissions, decreasing regional footprints and protecting native ecologies. Areas of action are: retrofitting buildings, the Green Infrastructure Plan (includes energy, waste, water), Smart Green Business program (water saving)
2. **GLOBAL** – Sydney will remain Australia's most significant global city and international gateway with world-class tourism attractions and sustained investment in cultural infrastructure, icons and amenities. Targets include accommodating business activities connected to high quality jobs while supporting quality of life needed to attract and maintain innovation.
3. **CONNECTED** – Sydney will be easy to get around with a local network for walking and cycling and transit routes for connecting the City's Villages, City Center and Inner Sydney. Targets are to have neighbourhoods be focal

points. The city is to be diverse and inclusive and celebrate and support its indigenous people by committing to partnerships with various levels of governments, national and international cities for cultural and trade exchanges, and the private sector for funding and community engagement.

Within this vision, Sydney came up with an action framework in 2011 to support its long term 2030 vision. This particular framework was taken from the City of Sydney's Community Strategic Plan in 2011. The goals clearly encompass the 3 sides of sustainability- economic, environmental and cultural. Their goals are:

1. Globally Competitive City
2. Leading Environmental Performer
3. Integrated Transport for a Connected City
4. A City for Walking a Cycling
5. A lively, engaging City Centre
6. Vibrant local communities and economies
7. A cultural and creative city
8. Housing for a diverse population
9. Sustainable Development, renewal and design
10. Implementation through effective governance and partnerships

Each of these goals has their own action plans, with strategies outlined to reach the goal.

### Indicators

In order to measure Sustainable Sydney 2030's success, the following indicators and targets will be maintained (Sustainable Sydney 2011):

- 1) The City will reduce GHG emissions by 70% compared to 2006 levels.
- 2) The City will have the capacity to meet up to 100% of electricity demand by local electricity generation and 10% of water supply by local water capture.
- 3) There will be at least 138,000 dwellings in the City for increased diversity of household types, including greater share of families.
- 4) 7.5% of all City housing will be social housing, and 7.5 % will be affordable housing delivered by not-for-profit or other providers.
- 5) The City will contain at least 465,000 jobs with an increased share in finance, advanced business services, education, creative industries and tourism sectors.
- 6) Trips to work using public transport will increase to 80% for both residents of the City and those travelling to the city from elsewhere.
- 7) At least 10% of City trips will be made by bicycle and 50% by pedestrian movement
- 8) Every resident will be within a 10minute (800m) walk to fresh food markets, childcare, health services and leisure, social, learning and cultural infrastructure.
- 9) Every resident will be within a 3 minute walk (250m) of continuous green links that connect to the Harbour Foreshore, Harbour Parklands, Moore, Centennial or Sydney Parks.
- 10) The level of community cohesion and social interaction will have increased based on at least 45% of people believing most people can be trusted.

Sydney's path for 2030 not only touches upon local/state/federal laws, but it also involves environmental/business groups as well as international memorandums. Sydney publishes reports of their indicators to fulfill commitments to the United Nations Environmental Accords - Green Cities Declaration, United Nations Division for Sustainable Development - Agenda 21, Montreal Ozone Protocol 1987, Kyoto Protocol to the United Nations Framework Convention on Climate Change, Johannesburg World Summit on Sustainable Development 2002, Stern Review on the Economics of Climate Change 2006 and Intergovernmental Panel on Climate Change Assessment Reports.

Locally, the city of Sydney publishes an annual State of the Environment Report to illustrate its progress on achieving its environmental and sustainable goals. The State of the Environment report goes towards the Climate Change in the Sydney Metropolitan Catchments CSIRO 2007, Environmental Planning and Assessment Act 1979, House of Representatives Standing Committee on Environment and Heritage Sustainable Cities Report 2005, Local Government Act 1993, National Greenhouse Gas Inventory 2004, New South Wales State of the Environment 2006, NSW Greenhouse Plan 2005, Protection of the Environment and Operations Act 1997, Protection of the Environment Operations Amendment Act 2005 and Sydney Metropolitan Catchment Management Authority Draft Catchment Action Plan 2006.

Finally, Sydney also reports to the following environmental groups as members of their organization: A Clean Energy Future for Australia 2004, C40 Large Cities, ICLEI, Business Case for Early Action, Empowering Change: Clean Energy Solutions on Climate Change, Green Energy Watch, Recipe for a Liveable Sydney, CoAG Climate Change Taskforce, and The Great Opportunity: 25% Renewable Energy for New South Wales (ICLEI 2012).

## References

Easy expat 2008. *Information for Expatriates, Expat Guides - International Relocation Portal: Move, Work, Live Abroad - Easy Expat. Economy of Sydney, Overview Australia.* Accessed July 23, 2012. <<http://www.easyexpat.com/en/sydney/overview/economy.htm>>

ICLEI 2012. *ICLEI - Local Governments for Sustainability.* ICLEI Oceania: Delegate profiles. Accessed July 23, 2012. <<http://www.iclei.org/index.php?id=oceania-cop15-delegates>>.

Macey, Richard (15 September 2007). "Settlers' history rewritten: go back 30,000 years". *The Sydney Morning Herald*. Retrieved 15 September 2007.

Sustainable Sydney 2011. *Sustainable Sydney Community Plan.* City of Sydney, 2011. Print.

Sydney 2009. Population. City of Sydney 2006-2031 - Forecast.id@." *Population Forecast.* June 2009. Accessed July 23, 2012. <<http://forecast2.id.com.au/Default.aspx?id=148&pg=5000>>.

Sydney 2011. *Sydney at a Glance* City of Sydney Accessed July 23, 2012. <<http://www.cityofsydney.nsw.gov.au/AboutSydney/CityResearch/AtAGlance.asp>>.

UNCSD 2012. *Rio+20 - United Nations Conference on Sustainable Development.* Rio+20 : Sustainable Sydney 2030. Accessed July 23, 2012 <<http://www.uncsd2012.org/index.php?page=view&type=99&nr=241&menu=20>>.

Yangzhou is a prefecture-level city with a metropolis population of approximately 2,146,980 and an area of 2,310 km<sup>2</sup> (Census 2010). The same census announced that the prefecture-level city consisted of 3 metropolis districts, two county-level cities and one county, has a total area of 6,678 km<sup>2</sup> and a population of 4,459,760. From these six areas, the city is further divided into 87 towns and townships and 11 sub-districts.



## YANGZHOU, CHINA

Yangzhou boasts 2,500 years of history. However, the historical Yangzhou region was not defined in the exact same way as it is today. Yangzhou City was officially founded in January, 1949 and is located on the northern bank of the Yangtze River near the Central Eastern part of China, centered on the Guangling District, an area of well-developed industries. This geographical advantage has made the city one of the wealthiest among China's. The three main industries established in the city are Electrical Machinery & Equipment Manufacturing, Transportation Equipment Manufacturing & Chemical Materials and Product Manufacturing. Recently, Yangzhou has also undertaken the production of solar energy through the manufacturing of solar cells. Tourism and craft industries also generate significant revenue for the city.

### Sustainability in Yangzhou

Yangzhou is one of the first few Chinese cities to develop a sustainability plan in building an eco-polis or eco-city. The city's general budget for 2010 is approximately 30.72 billion USD. The forecasted environmental expenses in the same year are 950.5 million USD, about 3.1% of the forecasted expenses (Budget 2010)

Yangzhou city has adopted a multiple-indicators approach in monitoring sustainable urban development. From 1991-2000, the city followed a performance-based indicator system, which evaluates the achievement of an eco-polis by the status of sustainability it has reached. This first approach made use of 5 aggregated indicators, reflected in five different models:

MODELS	UNIT	CHARACTERISTICS
Genuine Saving Rate (GSR)	Percentage	Test of "weak sustainability": if national income can make savings growth greater than depreciation of human-made and natural capital, development is considered sustainable.
Genuine Saving Rate (GSR)	Currency	Includes societal, economic and environmental factors, and respectively calculates their benefits and costs to measure local sustainability.
AEANDP	Currency	Amends traditional accounting system of national economy to attach a price to natural resources and deduct economic loss due to environmental pollution. Continuously negative AEANDP indicates a decrease in urban sustainability.
Eco-footprint (EF)	Land area	Test of "strong sustainability": calculates two indicators at a particular population and economic scale: (1) the biologically productive area needed to maintain resource consumption and waste absorption; (2) biologically productive area that a region can provide. Judges whether the regional productive consumption activity is within the carrying capacity of the local or defined ecosystem by comparing the two indicators.
ISEW	Currency	Reflects the sustainable economic welfare and living quality of members of the whole society.

The five indicators gave different results, as expected, as each of them measured sustainability trends with a different focus. An integrated indicator framework (UESDI) was therefore implemented to demonstrate the general trend through five support systems: the resource support system; the economic support system; the environmental support system; the institutional support system and the societal support system.

The China Sustainable Development Database (CSD) lists the whole set of indicators and sub-variables used by different cities. A paper (Wang 2011) reported that Yangzhou had made use of 17 aggregated indicators and 79 sub-variables. Another paper (Zhenguo 2005) reported that Yangzhou had achieved average standing according to the evaluation using this system during 1991-2000. The 17 categories were listed as economic level, resource efficiency, development potential, ecological industries, enterprise behavior, environmental quality, pollution emissions, pollution treatment, ecological conservation / design, social equity, education / medical treatment, living quality, population dynamics, consumption behavior, cultural landscape, social ethic and government behavior. The values of each aggregated support system indicator are usually plotted in a pentagon to represent the integrated index.

For the 20 year-period from 2000 to 2020, Yangzhou started planning its eco-polis with a focus on future sustainable development. The city sets goals for each of the three stages in its implementation within the 20 years. The achievements of the goals are corroborated by comparing the third and second class index of the city with the standards stipulated by the National Environmental Protection Agency. The new system consists of 3 aggregated indicators, development status, development dynamics, and development strength. This approach also follows the SENCE (Social-Economic-Natural Complex Ecosystem) (Wang 2011) concept and reduces the 79 basic variables to 25 basic variables

## Indicators

### Development status

Economic growth	<ul style="list-style-type: none"> <li>• GDP per capita (104 Yuan)</li> <li>• Land Productivity (104 Yuan/km<sup>2</sup>)</li> </ul>
Living conditions	<ul style="list-style-type: none"> <li>• Average life expectancy (years)</li> <li>• Housing index</li> </ul>
Environmental quality	<ul style="list-style-type: none"> <li>• Area of water body with quality better than National Environmental Standards (NES) class III</li> <li>• Annual ratio of days with air quality better than NES class III</li> <li>• Forest coverage</li> <li>• Ratio of people satisfied with their environment</li> </ul>

### Development dynamics

Economic dynamics	<ul style="list-style-type: none"> <li>• Annual GDP growth rate</li> <li>• Energy efficiency (industry GDP 10,000 Yuan/ton of SCE)</li> <li>• Ratio of the government revenue in total GDP (%)</li> </ul>
Social dynamics	<ul style="list-style-type: none"> <li>• Reciprocal of Gini index (social equality)</li> </ul>
Environmental dynamics	<ul style="list-style-type: none"> <li>• Restored rate of degraded land</li> <li>• Ratio of discharged industrial sewage that was treated and met national standard</li> <li>• Recycled and reused rate of household garbage</li> <li>• Utilization rate of domestic animal dejection</li> </ul>

**Development potentials**

Economic potentials	<ul style="list-style-type: none"> <li>● Authentication of ratio of ISO 14,000 enterprises</li> <li>● Annual rate of investment in fixed assets accounting to GDP</li> <li>● Ratio of R&amp;D employment</li> </ul>
Social potentials	<ul style="list-style-type: none"> <li>● Average education years of adults</li> <li>● Average professional education years of civil servants</li> <li>● % of governmental policies that accord with eco-city planning</li> </ul>
Eco-service enhancement potentials	<ul style="list-style-type: none"> <li>● Ratio of investments in environment accounting for GDP</li> <li>● Ratio of preserved areas of the territory</li> <li>● Ratio of citizens that participate in and aware of environmental management</li> </ul>

Data used in the assessment are collected and provided by the local and national governments. Results are usually published on research papers, official websites and news articles.

**References**

Budget 2010. Reports on the 2009 Budget Implementation and the 2010 Budget Bill of Yangzhou City. Office of Yangzhou Municipal People’s Government. January 19, 2010. Accessed Jun 15, 2012. <[www.yangzhou.gov.cnxxgkdescxxgk\\_descxs.jspmanuscriptid=90d8a77d042448fa816742764a9d9e2b&zt=>](http://www.yangzhou.gov.cnxxgkdescxxgk_descxs.jspmanuscriptid=90d8a77d042448fa816742764a9d9e2b&zt=>)>

Census 2010. Data of Yangzhou. City of Yangzhou. September 23, 2011. Accessed Jun 10, 2012. <[>www.yangzhou.gov.cn/mlyz/Newmlyz1\\_index.shtml<](http://www.yangzhou.gov.cn/mlyz/Newmlyz1_index.shtml)>

Wang Rusong, Zhou Tao, Hu Dan, et al (2011). Cultivating eco-sustainability: Social–economic–natural complex ecosystem case studies in China. Ecological Complexity, 2011.

Zhenguo Ye et al 2005. Research of Indicator System of Yangzhou Ecopolis Development. Academic Thesis 2005, Nanjing Agricultural University, Accessed Jun 14, 2012 <[>wenku.baidu.com/view/2822bb106edb6f1aff001f17.html<](http://wenku.baidu.com/view/2822bb106edb6f1aff001f17.html)>

# BARCELONA, SPAIN

Barcelona is the second largest city in Spain with a population of 1,619,337 (Barcelona 2010). Its municipal area covers 101,4 sq. km making it one of the most densely populated cities in the world with 15,970 people per sq. km. Its foundation dates back to Roman time, when it became an important place, seat of state and commercial power. Today, as capital of Catalonia, Barcelona is an administrative and political center. Several international organizations have set up headquarters in the city. It is also an important financial and industrial center. The place is known for its economy related to tourism, trade fairs and cultural activities. The city's annual budget is estimated at 2,260 million Euros for 2012 (Budget 2012).

## Sustainability in Barcelona

Barcelona has participated in many initiatives on sustainability indicators such as the Urban Ecosystem Europe established by ICLEI (UEE 2010). However, its main monitoring system is based on the Barcelona Observatory and the Barcelona Agenda 21 Indicators.

- **Barcelona Observatory**

Like most European cities, Barcelona has developed a data system of selected indicators called the Barcelona Observatory (2011). The tool contains a description of the evolution of selected economic indicators and a comparison of Barcelona's position with that of other cities around the world. Several topics are considered: City for Business, The Knowledge Society, Tourism, Sustainability and Quality of Life, Prices and Costs, Labor Market and Training.

- **Barcelona Agenda 21 Indicators**

In addition to the Barcelona Observatory, a specific tool was created by the municipality to assess its policies in the field of sustainability: the Barcelona Agenda 21 Indicators (2002). Those indicators were implemented to monitor and assist the local Agenda 21. In 1995, Barcelona started the process of promoting the Agenda 21 with the signature of the Aalborg Charter. This document has been ratified by 1200 cities and has greatly supported Local Agenda 21s in the European setting.

Since 1995, many initiatives were designed to boost the Agenda 21 in Barcelona. To manage this process, the Municipal Council for the Environment and Sustainability (CMMAS) was created in 1998. This Council contains representatives from the business world, the Administration, unions, civic associations, ecological movements, universities and sustainability experts. A rewarding engagement process led, in 2002, to the adoption by the city of the Barcelona Agenda 21. The Citizen Commitment to sustainability was approved with its ten main objectives and one hundred lines of action (ten for each objective).

Since the beginning of their work, the CMMAS considered important to evaluate the actions proposed for the Agenda 21. In addition, the Aalborg Charter and the Lisbon Action Plan formulated the importance that these sustainability indicators could have for the urban setting. In the year 2000, European municipal leaders expressed in the Hanover Declaration (3rd Conference of Sustainable Cities) their commitment to the sustainability indicators in the following terms: "We are committed to introducing indicators for local sustainability, in accordance with which we will fix the objectives, watch over progress and inform about the results obtained". Barcelona was one of the signing parties that committed to adopting these indicators as a working tool.

The implementation of the indicators is organized according to the ten objectives of the Commitment for sustainability adopted by the city of Barcelona. Each objective has several indicators to assess it. One more was created to assess all objectives and concerns, which is the degree of citizen satisfaction. The data are collected from departments and other partner institutions of the city every year. The overall system used monitors the development of the city of Barcelona over time. The set of indicators proposes a first diagnostic about the city. The publication and the usage of this information is a review tool for the advances made and in order to make decisions.

### INDICATORS

Objective 1: Protection of green spaces, biodiversity and increasing urban green spaces

1. Green area per inhabitant
2. Birds Biodiversity

Objective 2. Promote a compact and diverse city, with a quality public space

3. Availability to public spaces and basic services
4. Index of urban renovation

Objective 3. Improve mobility and make pedestrian life a welcoming setting

5. Modes of transport of the population
6. Proportion of roads with priority to pedestrians

Objective 4. Obtain optimal levels of environmental quality and create a healthy city

7. Level of noise pollution
8. Environmental quality of the beaches
9. Quality of the air
10. Birth life expectancy

Objective 5. Conserve natural resources and promote the use of renewable ones

11. Total water consumption per inhabitant
12. Public consumption of groundwater
13. Energy consumption from renewable sources

Objective 6. Reduce waste production and strengthen the culture of reusing and recycling

14. Generation of urban solid waste
15. Collection of organic material
16. Selective waste collection

Objective 7. Increase social cohesion; enforce mechanisms for equity and participation

17. Academic failure
18. Population finishing university studies
19. Accessibility to housing
20. Degree of association

Objective 8. Foster economic activity oriented towards sustainable development

21. Number of organisations with environmental certification

Objective 9. Progress in a culture of sustainability through environmental education and communication

22. Number of schools that participate in environmental education projects



Objective 10. Reduce the city's impact on the planet and promote international cooperation

23. Annual equivalent CO2 emissions

24. Number of points of sale or consumption of fair trade products

Indicator related to all the objectives of aforementioned commitment to sustainability

25. Degree of citizen satisfaction

Since 2003, a report is published every year. The last one was in December 2011 for the 2010 data. It is available online (Indicators 2010). The city of Barcelona has also published many booklets on its sustainability policy available in Catalan, Spanish and English.

### References

Agenda 21 2002. *L'Agenda 21 de Barcelona: El teu compromís amb el planeta*. Ajuntament de Barcelona. Jul 2002.

Accessed Jun 4th, 2012. <<http://www.bcn.es/agenda21>>

Barcelona 2010. *Población de la Ciudad 1900-2010*. Ajuntament de Barcelona. Jan 2010. Accessed Jun 2nd, 2012.

<<http://www.bcn.es/estadistica/castella/dades/anuari/cap02/C020101.htm>>

Barcelona Observatory 2011. *Observatori Barcelona*. Ajuntament de Barcelona. Jul 2011. Accessed Jun 8th, 2012.

<<http://www.observatoribarcelona.org/inici>>

Budget 2012. *Pressupost General 2012*. Ajuntament de Barcelona. Dec 2011. Accessed Jun 3rd, 2012.

<[http://w110.bcn.cat/Ajuntament/Continguts/NOVA%20ESTRUCTURA/Home/govern\\_ciutat/L'acció%20de%20Govern/pressupost\\_general\\_2012\\_definitiu.pdf](http://w110.bcn.cat/Ajuntament/Continguts/NOVA%20ESTRUCTURA/Home/govern_ciutat/L'acció%20de%20Govern/pressupost_general_2012_definitiu.pdf)>

Indicators 2010. *Indicators 21*. Ajuntament de Barcelona. 2011 Report. Accessed Jun 8th, 2012.

<<http://www.bcn.es/agenda21>>

UEE 2010. *Urban Ecosystem Europe*. Informed Cities: Making Research work for Local Sustainability. N.d. Accessed Jun 7th,

2012. <<http://informed-cities.iclei-europe.org/index.php?id=7597>>



## DUBLIN, IRELAND

The City of Dublin is located in the east of Ireland at the mouth of the Liffey River. It occupies a 114.99 square kilometer area and has a population of 525,383. The annual budget for the city is \$795.9 million Euros. (Council 2012). It is the economic centre of Ireland, boasting a diverse economy with the following sectors serving as its base: Financial services, ICT and Electronics, Professional services and the creative Industries. Beyond Ireland, Dublin has been a knowledge hub for Europe, being a centre of innovation until the recent recession. In spite of this the city attracts tourists, local and international, with its rich history, culture and vibrant entertainment and leisure scene.

### Sustainability in Dublin

The Dublin City Development Board (DCDB) Strategy (2012) has provided the basis for the current sustainability strategy that the council has implemented. In late 2010 the city of Dublin adopted the Dublin City Development Plan 2011-2017 (2010) which describes its policies and objectives for creating a sustainable and vibrant city.

The Dublin City Development Plan 2011-2017 (2010) is presented as a 6-year plan; however it is built on a vision of Dublin becoming 'the most sustainable, dynamic and resourceful city region in Europe' in the next 25 to 30 years. Dublin City Council is striving to make the city 'the choice' for people to live, work and experience. Moving towards these goals the council has employed several methodologies to formulate its vision. Civic engagement has been one tool used by the council to develop the future vision of the city. The vision is also founded on the principles of sustainable development found in the Framework for Sustainable Dublin and the Dublin City Council's 6 Themes Approach.

THEME	FOCUS
Economic	Developing Dublin City as the heart of Dublin Region and the engine of the Irish Economy with a network of thriving spatial and sectoral clusters, a focus for creative talent and creative assets
Social	Developing Dublin as a compact city with a network of sustainable neighbourhoods which have a range of facilities and a choice of tenure and house types, promoting social inclusion and integration of all ethnic communities
Cultural	Making provision for cultural facilities throughout the city and increase awareness of our cultural heritage and promoting safe and active streets through design of buildings and the public realm
Urban Form and Spatial	Creating a connected and legible city based on active streets and quality public spaces with a distinctive sense of place
Movement	Helping to build an integrated transport network and encouraging the provision of greater choice of transport. Planning and zoning objectives will be brought together to increase the opportunities to live and work close to transport hubs and corridors
Environmental	Providing for an overall framework involving key principles, strategies and objectives to drive a vision of "sustainable Dublin" over the next 25 to 30 years, making sure that buildings can adapt to changing needs and encouraging better waste management strategies

The result of the Council's efforts is a core strategy composed of 3 interwoven strands, which in turn are supported by 9 (nine) priorities summarized here:

1. A compact, quality, green, well-connected city, which generates a dynamic, mixed use environment for living, working, social and cultural interaction
  - Shaping the City Structure, including the Inner City
  - Connecting and sustaining the city's infrastructure
  - Greening the City
  - Fostering Dublin's character and culture
2. A smart city, creating real long term economic recovery
  - Making Dublin the heart of the region
  - Revitalizing the City's economy
  - Strengthening the city as the national retail destination
3. A city of sustainable neighbourhoods and socially inclusive communities.
  - Providing quality homes in a compact city
  - Creating good neighbourhoods and successful communities

Achieving success is based on an integrated approach, recognizing that the delivery of core strategies within a sustainability framework requires cooperation at all levels. As such delivery is centered on five tools.

1. Area-Specific Plans: The Dublin City Council has taken into consideration the needs of areas within the city and developed local area plans to meet specific needs. Focusing on key developing areas is essential to shaping the city.
2. Zoning and Standards: Having clear guidelines on what type(s) of development are permitted in areas and fit within the sustainability framework are vital to delivery of the core strategies.
3. Framework for Sustainable Dublin: Reducing the eco-footprint and addressing climate change requires a systematic approach. The Framework for Sustainable Dublin "is based on best international practice and is tailored to the needs of Dublin City."
4. Monitoring Indicators: As the plan is dynamic and active, indicators are essential for tracking progress. The plan has a supporting set of indicators to measure success. Additionally, the Strategic Environmental Assessment and Appropriate assessment both used to guide the development of the plan will also be monitored in relation to the success of the plan.
5. Engagement with City Stakeholders: Civic engagement is necessary to achieve the vision of a Sustainable Dublin. The Council has chosen to use on-line forums and discussions to interact with citizens on sustainability.

The figure below summarizes the Development Plan 2011-2017, in particular the linkages between the philosophy, core strategy, priorities and delivery.

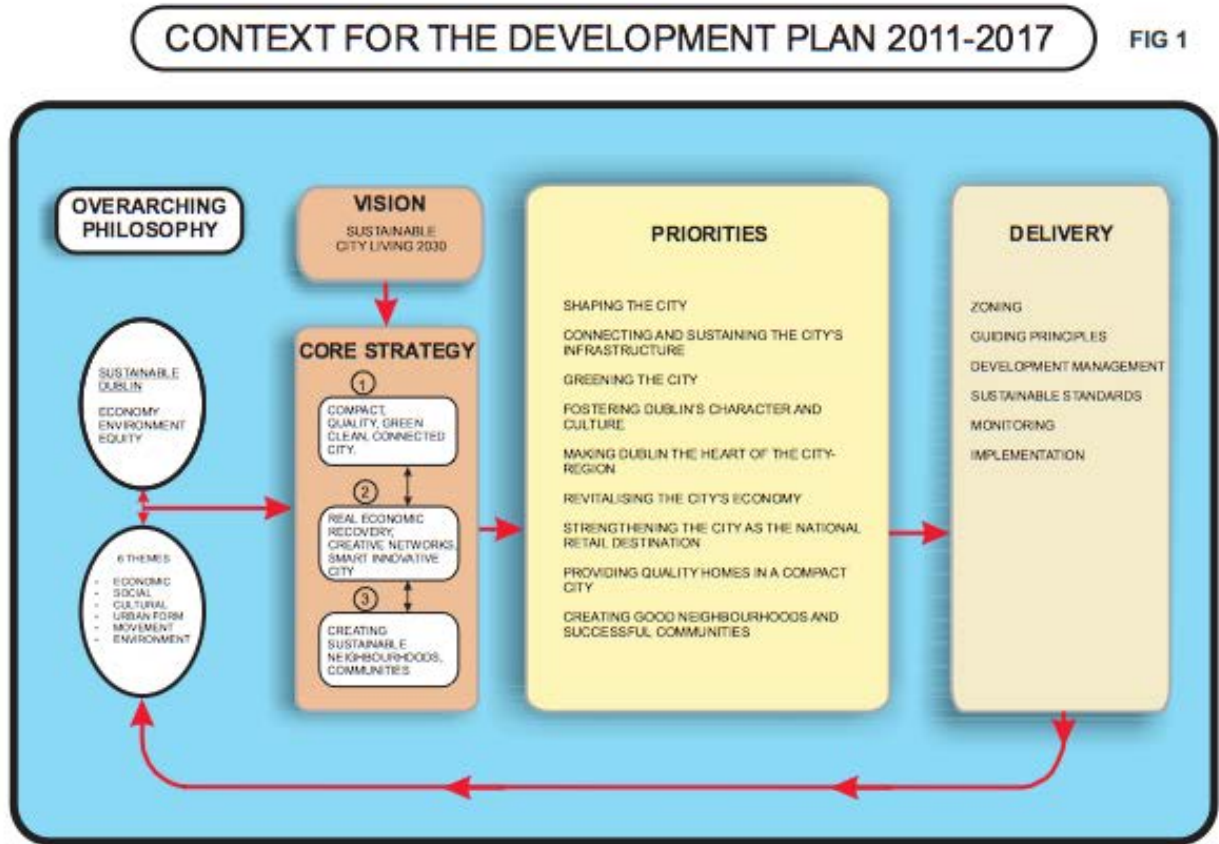


Figure 1. Context for the Development Plan 2011-2017

Monitoring is essential to tracking the success of the development plan. Every two years a progress report is to be submitted. Measuring the objectives in a transparent manner is being achieved through the SMART approach (Specific, Measurable, Achievable, Realistic and Time-bound), as described in the Dublin City Development Plan 2011-2017 (2010). Additionally a separate monitoring and review exercise will be used to assess the plan, the Strategic Environmental Assessment (SEA 2010) and Appropriate Assessment (AA). The SEA primary goal is to protect the environment through guaranteeing that consideration is given to the environment at the beginning stages of the planning process. The AA essentially supplements the SEA by providing a scientific assessment of the Development Plan. The reports are one means of demonstrating that the plan is working. Indicators which quantify progress, give tangible results to the success of the plan.

### Strategic Environmental Assessment – Indicators

The indicators presented in the table below were developed to test the development plan against the European standards for environmental protection (SEA 2010). Their objective is to identify if the plan is having positive, negative or no impact on the environment.

OBJECTIVE	INDICATORS
Promote the creation of a sustainable, compact and healthy city in which to live, recreate and work	Status of drinking water and drinking water sources Status of bathing waters Ecological status of water bodies Average density of new residential development

<p>Protect and enhance the diversity of habitats and species in the city</p>	<p>Total area of designated sites (Natura 2000 and pNHA's)                  Total area of Conservation Areas                  Survey and monitor extent and distribution of invasive species                  Survey and monitor distribution of butterfly populations                  Survey and monitor distribution of bat populations                  Survey and monitor street trees of Dublin City</p>
<p>Identify opportunities for new habitats, buffer zones and wildlife / green corridors</p>	<p>Increased area of wetlands/Swales/SUDS/ in square metres on new developments                  Length of channel converted from culvert to natural channel                  Survey and mapping of migratory routes of protected species                  Length of linked green corridor</p>
<p>Protect good air quality status and minimise the output of Nitrogen Oxides (NOx) and Particulate matter (PM10)</p>	<p>Values of monitored pollutants in the air, including the levels of Nitrogen Oxides (NOx ) and Particulate matter (PM10)</p>
<p>Reduce noise where necessary and maintain the environmental acoustic quality where it is good</p>	<p>% of residential properties exposed to high sound levels</p>
<p>Reduce waste of energy and maximise use of renewable energy source/ generation</p>	<p>Total share of renewable energy for heat                  Total share of renewable energy for public buildings and installations, including traffic                  Number of (social) housing units, public buildings and community centres connected to district and group heating systems                  Number of CHP units within the private housing and commercial sectors                  Number of A and B rated buildings within the social and private residential sector and as a percentage of the total stock                  Number of A and B rated buildings within the commercial and public buildings sector and as a percentage of the total stock                  Average energy consumption of new residential housing stock</p>
<p>Minimise emissions of greenhouse gases</p>	<p>Tonnes of CO2 /capita/year                  Tree canopy cover within the city area to contribute to carbon sequestration (no. of trees)</p>
<p>Reduce and manage the risk of flooding</p>	<p>Number of planning permissions compliant with the Floods Directive and OPW / DoEHLG's 'Flood Risk Management in the Planning Process' standards                  Number of planning permissions incorporating flood risk assessment and conditions requiring appropriate flood resilient measures for new developments                  Number of flood defences, flood defence structures and features identified in the development plan                  Number of Sustainable Urban Drainage Systems and flood defence features required in new planning applications</p>
<p>Reduce traffic levels by encouraging modal change from car to more sustainable forms of public transport and encourage non-car dependent development</p>	<p>% change in modal split                  Number of pedestrians and cyclists crossing the canals as measured by the annual cordon survey</p>
<p>Reduce the generation of waste and adopt a sustainable approach to waste management</p>	<p>% of waste recycled                  Tonne of waste per capita per year                  Tonnes of (methane producing) organic waste diverted from landfill.                  Landfill gas capture rates</p>

Protect and enhance the city's cultural, including architectural and archaeological, heritage	Percentage of Protected Structures 'at risk' Number of Architectural Conservation Areas (ACAs) Number of archaeological sites investigated
Conserve and enhance areas and elements of the city landscape	Change in area parks and number of trees planted
Preserve and enhance the city landscape vegetation carbon sink through photosynthesis	Percentage of area of vegetation as carbon sink
Preserve or enhance area of natural rainfall infiltration to water table within the city landscape to minimise storm water flooding	Percentage of area of city landscape as pervious area
Preserve or enhance linkage in city landscape to support wildlife corridors and protect riverside zones	Length of linked landscape corridor
Give preference to the use re-use of brownfield lands, rather than developing greenfield lands	Total area of brownfield development

### Climate Change Strategy - Indicators

The Dublin City council has laid out its climate change strategy that is aligned with the National climate change strategy. It consists of five focus sections and its respective indicators (Climate Change Strategy, 2008).

#### Energy

1. Total Share of Renewable energy for social housing, public buildings and installations, including traffic
2. Number of social housing units, public buildings and community centres connected to district and group heating systems, assessed against the annual budget
3. Number of CHP units within the private housing and commercial sectors, assessed against an annual budget

#### Planning

4. Number of A and B rated buildings within the social and private residential sector and as a percentage of the total stock
5. Number of A and B rated buildings within the commercial and public buildings sector and as a percentage of the total stock.

#### Transport

6. Number of pedestrians and cyclists crossing the canals as measured by the annual cordon survey
7. Number of passenger-trips on Dublin Bus and LUAS per year

#### Waste Management

8. Tonnes of (methane producing) organic waste diverted from landfill
9. Share (%) of waste that is recycled

#### Biodiversity

10. Tree Canopy Cover within the city area to contribute to carbon sequestration (no. of trees)
11. The total amount of Z9, Z10 and Z12 lands zoned in the Dublin City Development Plan (hectares)

General Indicator

12. Tonnes of CO2/capita/year

## Indicators

The Dublin City Indicators look beyond Dublin (Cudden 2010). The indicators are intended to compare Dublin's success to countries in Europe and internationally. Indicators are therefore primarily economic indicators.

CATEGORY	INDICATORS
General Economic	<ul style="list-style-type: none"> <li>• Harmonised Competitiveness Indicators – Price competitiveness</li> <li>• Retail Sales Index Volume</li> <li>• Private Care Registrations (first time)</li> <li>• National Accounts &amp; Quarterly Accounts – GDP and GNP, Exports, Share of World Trade, Personal Expenditures on Goods and Services</li> </ul>
Employment and Labour Force	<ul style="list-style-type: none"> <li>• Quarterly National Household Survey – how many people are employed</li> <li>• Unemployment % Rate</li> <li>• Labour Force participation</li> <li>• Long Term Unemployment (LTU)</li> <li>• Educational Attainment</li> <li>• Sectoral Trends</li> </ul>
Property/ Construction	<ul style="list-style-type: none"> <li>• Number of Planning Permissions – Units Granted</li> <li>• Total Commencement Notices- Residential Units</li> <li>• Housing Completions</li> <li>• Number of New House Registrations</li> <li>• Housing Affordability – Dublin Monthly Repayments as % of Net Income</li> <li>• House Price Index</li> <li>• Residential Rental – Average Rents</li> <li>• International House Price Index</li> <li>• Commercial Property – Office Rents; Occupancy cost per workstation</li> <li>• Dublin Office Vacancy Rate</li> <li>• Retail Rents – Global ranking</li> </ul>
Foreign Direct Investment	<ul style="list-style-type: none"> <li>• Number of FDI Projects in Ireland Vs. Dublin</li> <li>• Number of projects by business activity/ by sector</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>• Number of tourists to Ireland vs. Dublin</li> <li>• Number of tourists to Dublin by origin</li> <li>• No. of Hotel rooms in Country</li> <li>• Cost of hotel rooms in Dublin vs. international cities</li> <li>• Number of Cruise liners visiting Dublin</li> </ul>
Price Competitiveness	<ul style="list-style-type: none"> <li>• Rankings in Top 50 cities Cost of Living</li> <li>• Average monthly oil prices</li> <li>• Inflation Annual Rate of Change</li> </ul>

Overall Dublin is implementing sustainability practices similar to The Natural Step framework, while combining components from other sources to create a comprehensive and integrated plan to achieve its vision of a Sustainable Dublin.

## References

- Council 2012. Dublin City. *Council Spending and Revenue*. 2012. Accessed Jun 12, 2012. <http://www.dublincity.ie/YOURCOUNCIL/ABOUTTHECOUNCIL/COUNCILSPENDINGREVENUE/Pages/CouncilSpendingRevenue.aspx>
- Cudden, J. and O'Leary, H. (2010). *Dublin City Indicators "A Commentary on Dublin's Performance"*. Dublin City Council – Think Dublin Research Series.
- Climate Change Strategy 2008. *Climate Change Strategy for Dublin City 2008-2012*. Prepared by the Environment & Engineering Strategic Policy Committee in Association with Codema (City of Dublin Energy Management Agency). 2008. Accessed Jun 9<sup>th</sup>, 2012 <[http://www.dublincity.ie/YourCouncil/CouncilPublications/Documents/climatechangeLOW\\_ENG.pdf](http://www.dublincity.ie/YourCouncil/CouncilPublications/Documents/climatechangeLOW_ENG.pdf)>
- DCDB Strategy 2012. Dublin City Development Board Strategy 2012. Dublin City Council. 2012. Accessed Jun 8<sup>th</sup>, 2012. <[http://www.dublin.ie/disp\\_list.aspx?catId=98&Page=0&letter=&noOfPages=2](http://www.dublin.ie/disp_list.aspx?catId=98&Page=0&letter=&noOfPages=2)>
- Dublin City Development Plan 2011-2017. Dublin City Council. Accessed Jun 8<sup>th</sup>, 2012. <<http://www.dublincitydevelopmentplan.ie/>>
- SEA 2010. Environmental Report of the Dublin City Development Plan 2011-2017: *Strategic Environmental Assessment (SEA)*. Dublin 2011. Accessed Jun 12, 2012. <[www.dublincity.ie](http://www.dublincity.ie)>





## TEL AVIV-YAFO, ISRAEL

The city of Tel Aviv-Yafo in the state of Israel has a population of 404,400 residents (Tel Aviv-Yafo 2010). Tel-Aviv spans over 52 sq. km. (20 sq. mi.) with a density (people per sq. km.) of 7,606 people per square kilometre (Tel Aviv-Yafo 2009). Tel Aviv-Yafo was founded in 1909, and its budget for 2011 was 3,860 billion NIS (Budget 2011). The city's main economic activities are split as follows: business

activities - 25%; wholesale, retail trade & repairs - 11%; banking, insurance and finances - 11%; manufacturing - 8%. In comparison to Jerusalem, Haifa and Israel in general, employment in Tel Aviv-Yafo focuses to a larger degree on the financial-economic sector.

In fact, the employment data clearly highlights the status of the city as a national financial-economic center: 39% of all those employed nationally in the banking, insurance and financial sectors work in Tel Aviv-Yafo, as do 23% of all those employed in business activities. 16% of Israel's banking offices are situated in the city, and 55% of the country's bank employees work in the city.

### Sustainability in Tel Aviv

Sustainability is one of three primary goals under Quality of Life theme in the city's annual plan, which is based on Tel Aviv-Yafo's strategic plan (2005). The city has prioritized the promotion of sustainability, environmental protection and expanding the city's green spaces, with the focus on treating the problem of recycling waste and trash accumulation, (the average amount of garbage produced in the Tel Aviv-Yafo municipality is three times the amount produced throughout the rest of the country), and on lowering of air pollution levels. Under the umbrella of the strategic plan, there are numbers of plans being established per objective:

- GHG reduction (20% reduction from 2000 baseline by the year 2020),
- Pollution reduction, in cooperation with the Ministry of Environmental Protection
- Recycling, with pilot projects already in place in certain neighbourhoods
- Water treatment improvement.

Tel Aviv-Yafo recently commenced a project to measure the Ecological Footprint of the city. The Ecological Footprint analysis (EF 2012) is a tool used around the globe, from Chile (Wackernagel, 2007) to California (EF Analysis 2011), as an indicator of environmental sustainability by examining to what extent a city (or nation or individual) exploits its natural resources. Measuring the Ecological Footprint of a city allows local governments to track a city's demand on natural capital, and to compare this demand with the amount of natural capital actually available.

An additional recent initiative in Tel Aviv-Yafo is the Tel-O-Fun, in which the city joined other large European cities in offering residents and visitors bikes for rent. Tel-O-Fun offers hundreds of bikes for rent, at rental stations across the city, in a simple, efficient and convenient manner. Tel-O-Fun bikes are available 24 hours a day, all year round, in a self-service format. No need to order in advance.



Tel Aviv-Yafo Tel-O-Fun rental bicycles  
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## ICLEI indicators

The city has signed a convention amongst the 15 self-government cities of Israel, which receive no balancing grants from the government and are managed as self-sufficient economies, for Air Pollution Reduction and Climate Protection (Forum 15, 2008). This convention is based on the international methodology of ICLEI (ICLEI 1990) and its Cities for Climate Protection (CCP) program. The CCP (2008) Program is a 5 milestone process with the objective of initiating local mitigation and adaptation actions in both developed and developing countries, and providing key inputs in global climate advocacy efforts of cities and local governments.

The Israeli convention was adapted to the local conditions in Israel and an additional section was inserted discussing air pollutant emissions. This methodology was distributed by means of a detailed guide with accompanying calculation sheets for performing the technical calculations. Specific to Sustainability, the city is focusing on the following:

- Air pollution and GHG reduction
- Increase recycling (garbage separation)
- Infrastructure development
- Green standards in public and private buildings
- Material reuse
- Energy efficiency
- Water conservation
- Sanitation improvements in specific neighbourhoods and downtown area
- Maintenance of public order in commercial and entertainment districts.
- Water pollution

Under each of these areas, there are a number of targets:

- Air pollution and GHG reduction
  - Approval of guidelines for green building and pilots
  - Changes in timing of 2000 traffic lights to improve traffic flow
  - Reduction of 5% in air pollution level from 2010 level
  - Reduction of 20% in GHG by 2020
  - Addition of 14 CCT
  - Approval of guidelines and plans to reduce GHG
  - Encouragement to ride bikes in at least 10 junior high schools
  - No more than 8% of the city's current fleet (627) will be found polluting

- Water conservation
  - Integration of water conservation in science curriculum in all junior high schools
  - 10% reduction in water consumption in all schools
  - Water conservation awareness activities in all schools
- Water pollution (river and ocean)
  - Number of sewage incidents below 10/year
  - Completion of planning and licensing of pumping station for summer water in South Park
- Increase recycling
  - Coordination of activities with the clean fund, advancement of pneumatic garbage collection project
  - Garbage separation activities in 200 educational institutions
  - 20% recycling of total waste
  - Installation of advanced recycling facilities in at least 10 educational institutions
  - 60% of schools will integrate in curriculum the subject of recycling expansion
- Green standards in public and private buildings
  - Implementation of green building principles in 100% of public building and incorporation of urban ecology
  - Implementation of 3 new building projects that incorporate ecological elements
  - In 100% of new building projects the building and development code is implemented
  - Establishment of sustainability and green building principles in city's planning
  - Implementation of green building principles in new buildings and improvements in
  - 100% of public buildings
  - Training of staff
  - Energy efficiency in 20% of public buildings
  - Approval of work plan to green building and city campuses
  - Creation of guidelines for building approvals and approval by local committee
  - Partnership between Israel Council for Green Building, Machon Hatkanim, Forum of 15, National Council and Academic Institutions.
  - Development of 150 acres of green space
  - Approval of development of infrastructure projects (parks etc.)
  - Renovation of 150 public monuments
  - Piping improvements in certain neighbourhoods
- Maintenance of public order in commercial and entertainment districts.
  - Implementation of municipal policy on public order and business
  - Inspection of 10,000 businesses
  - 4000 smoking inspections at businesses
  - 98% maintenance of employees – public order inspectors
- Sanitation improvements in specific neighbourhoods and downtown area
  - Establishment of public order and improvement of quality of life amongst Florentin neighbourhood and downtown
  - 20% decrease in sanitation calls related to Florentin neighbourhood and downtown
  - Resident satisfaction from state of sanitation in annual municipal survey
  - Enforcement of pet waste cleanup

- Energy efficiency
  - Installation of four new intersections with LED and replacement to LED of 5 existing intersections
  - Begin implementing a structured work plan for energy efficiency
  - Installation of ten solar facilities in additional school roofs
  
- Material reuse:
  - Paving of eight roads from recycled material
  - Increase number of green certified daycare and elementary schools to 45
  - Construction of 4 additional roads using shredded glass
  - Reuse programs at 5 schools

The city communicates in English and in Hebrew its efforts and progress on Sustainability in a dedicated Sustainability section on the city's official website (Sustainability 2012). The city's strategic plan includes sustainable objectives, and every 6 months the city produces a progress report to indicate performance against the targets set in this plan (report not available on website). The city is also required to submit to the Forum 15 an annual progress report, which is subsequently submitted to ICLEI, and published on its website.

When posed the question “what are the key lessons learned from the Sustainability efforts the city is undergoing?”, the city's Deputy City Architect and chief Sustainability and Green Building Coordinator responded that it is critical to understand that in a parallel with all the activity progress at the municipal level, the various matters being handled under the Convention require increased and focused activity from the national government; otherwise the Convention's goals will not be met. The reason is that municipal authority over many matters is quite limited, while other matters depend chiefly on primary legislation or on economic tools that are mainly in the hands of various government ministries. The city's Sustainability Coordinator applied the concept of the Web of Institutionalization (DPU 1996) as a mechanism to “institutionalize” Sustainability within the different municipal units by building linkages between each unit as though within a systematic web. Engaging multiple departments simultaneously increases awareness and facilitates progress.

## References

- Budget 2011. Tel Aviv-Yafo Municipality. 2011. Accessed Jun 8th, 2012. <<http://www.tel-aviv.gov.il/Cityhall/Pages/Budget.aspx?tm=69&sm=&side=107>>
- CCP 2008. The Five Milestone Process. ICLEI. 2008. Accessed Jun 7th, 2012. <<http://www.iclei.org/index.php?id=810>>
- DPU 1996. *The Process of Institutionalizing Gender in Policy and Planning: The web of institutionalization*. DPU. Working Paper no74. UCL. 1996
- EF Analysis, 2011. *Ecological Footprint Analysis San Francisco-Oakland-Fremont, CA*. Global Footprint Network. Jun 2011. Accessed Jun 9th, 2012. <[http://www.spur.org/files/Ecological\\_Footprint\\_Analysis.pdf](http://www.spur.org/files/Ecological_Footprint_Analysis.pdf)>
- EF 2012. *Footprint for Cities*. The Global Footprint Network 2012. Accessed Jun 12th, 2012. <[http://www.footprintnetwork.org/en/index.php/GFN/page/footprint\\_for\\_cities](http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_for_cities)>
- Forum 15, 2008. *The Convention of the Forum 15 for Reducing Air Pollution and for Climate Protection*. Forum 15. The Israeli Forum for Self-Government Cities. Feb 2008. Accessed Jun 5th, 2012. <[http://www.forum15.org.il/en/article\\_page.asp?id=163](http://www.forum15.org.il/en/article_page.asp?id=163)>

ICLEI 1990. *About ICLEI*. ICLEI – Local Government for Sustainability. 2008. Accessed Jun 8<sup>th</sup>, 2012.

<<http://www.iclei.org/index.php?id=about>>

Strategic Plan 2005. *Strategic Plan for Tel-Aviv Yafo*. Tel Aviv-Yafo Municipality.2005. Accessed Jun 10<sup>th</sup>, 2012. 2

<<http://www.tel-aviv.gov.il/english/StrategicProgram.htm>>

Sustainability 2012. *Sustainability 2012*. Tel Aviv-Yafo Municipality. Accessed Jun 10<sup>th</sup>, 2012. <<http://www.tel-aviv.gov.il/english/Environment.htm>>

Tel Aviv-Yafo 2009. Density Statistics. Tel Aviv-Yafo Municipality. 2009. Accessed Jun 10<sup>th</sup>, 2012.

<<http://www.tel-aviv.gov.il/english/CityInNumbers.htm>>

Tel Aviv-Yafo 2010. *Population of localities numbering above 2000 residents*. Central Bureau of Statistics. The State of Israel.

2012. Accessed Jun 7<sup>th</sup>, 2012. <[http://www.cbs.gov.il/population/new\\_2010/table3.pdf](http://www.cbs.gov.il/population/new_2010/table3.pdf) >

Wackernagel, Mathis 2007. *The Ecological Footprint for Santiago de Chile*. May 2007. Accessed Jun 8<sup>th</sup>, 2012.

<<http://www.tandfonline.com/doi/abs/10.1080/13549839808725541>>

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