Rapid Urbanization and Mega Cities: The Need for Spatial Information Management

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- Activity of FIG Commission 3 (2007-2010), synergies, new publications
- Objectives and methodology of the research on SDI for Mega Cities
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- The problems to be managed within Mega Cities
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- Spatial Information to manage Mega Cities
- The Need for Developing New Spatial Tools
- Spatial Information Policy Constraints

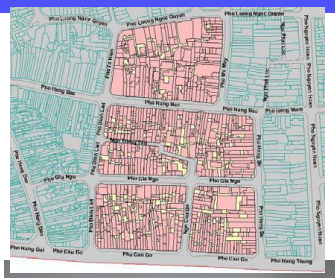
This presentation only includes the main aspects of the FIG publication 48: Rapid Urbanization and Mega Cities: the Need for SIM

World Issues

- Democratization
- Privatization of lands & registration of property rights
- Rapid urbanization (access to property rights, regularization of land)
- Free market economies
- Accelerated development
- Climate change
- Global financial crisis
- New era of peace and harmony

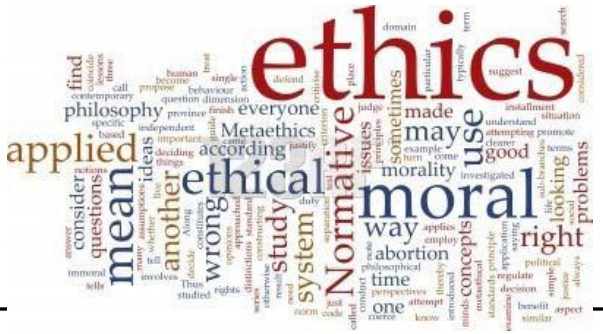
Need for Spatially enabled societies

- Reliable spatial information



- Education

- Professional ethics



2007-2010: rapid urbanization & its impacts

FIG Commission 3 "Spatial Information Management"

- **Identification of spatial tools and general principles, norms and standards for good governance using reliable spatial information, and provision of practical guidance**

  A central theme has been the

  - *formal access to land, property and housing for all*
  - *environmental monitoring*, *climate change disaster prevention and management*

- **Annual Workshops**

  Greece (2007) – Spain (2008) – Germany (2009) – Bulgaria (2010)

- **Expert Group Meetings**

  Athens (2008), Paris (2009)

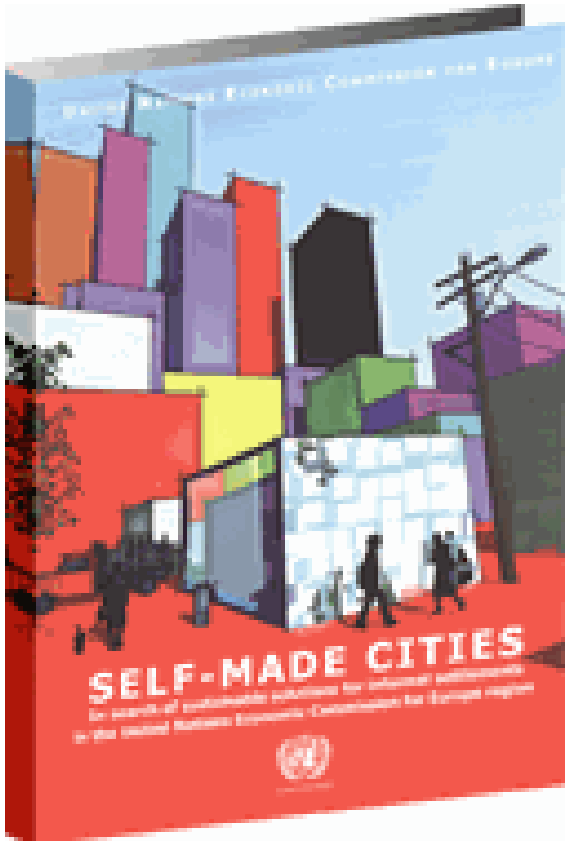
Synergies: FIG UN HABITAT UN/ECE WPLA GLOBAL LAND TOOL NETWORK

UNECE publication: Self-Made Cities

This book describes how more than 50 million people in the UNECE region have come to live in informal settlements and examines the main characteristics of the phenomenon.

The book is published by the UNECE Committee on Housing and Land Management and its Working Party on Land Administration, based on the research initiated by the join FIG Com3 and UNECE Workshop on informal settlements ("Spatial Information Management: Towards Legalizing Informal Urban Development, 2007).

The papers presented at the workshop were used for highlighting the different approaches in the region.



FIG, UNHABITAT, GLTN publication: INFORMAL urban development in Europe

- Politicians may say “It’s informal, so it doesn’t exist”. But it is there. Informal settlers need to be able to enter the economic cycle. Informal settlements are the product of complex socio-political processes that differ significantly from country to country.
- Research on informal development therefore deals with complex issues that can only be addressed through in-depth studies.
- This study, which is a joint FIG/UNHABITAT, GLTN publication covers the problem of informal development in Albania and Greece at a detailed level, engaging with all the many complexities and variables associated with the issues and the different systems and institutions.

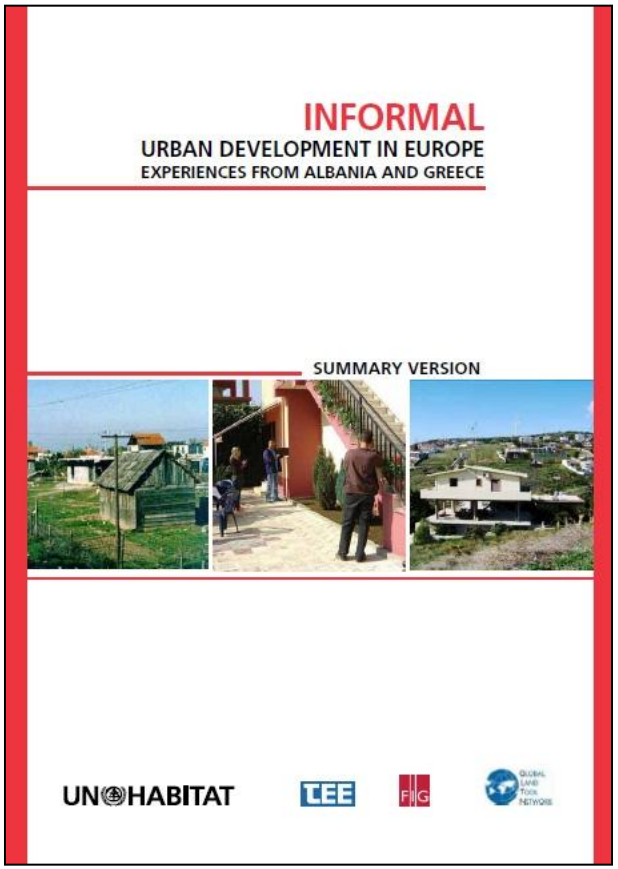
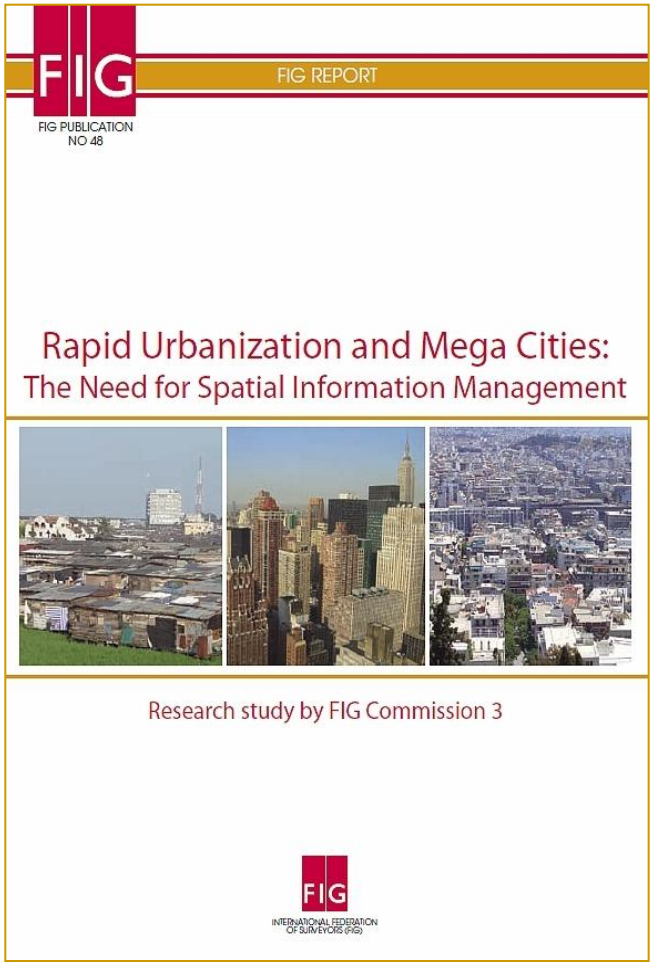


FIG publication 48: Rapid Urbanization and Mega Cities

- As cities get larger spatial information is becoming a key resource in efficient delivery of e-government services, public safety, national security and asset management.

- In this FIG research study, it is proposed that a city-wide spatial data infrastructure linked to similar structures in other levels of government, can provide a sustainable solution to many problems of mega cities.



Objectives of the joint research – Authors of the FIG pub 48

The goal of this research is to investigate the emerging needs, the current trends and the extent of using SDIs in selected mega cities, but also to identify the emerging possibilities for using new technical tools for the governance of sustainable large urban areas applied by the surveying- mapping- data processing community.

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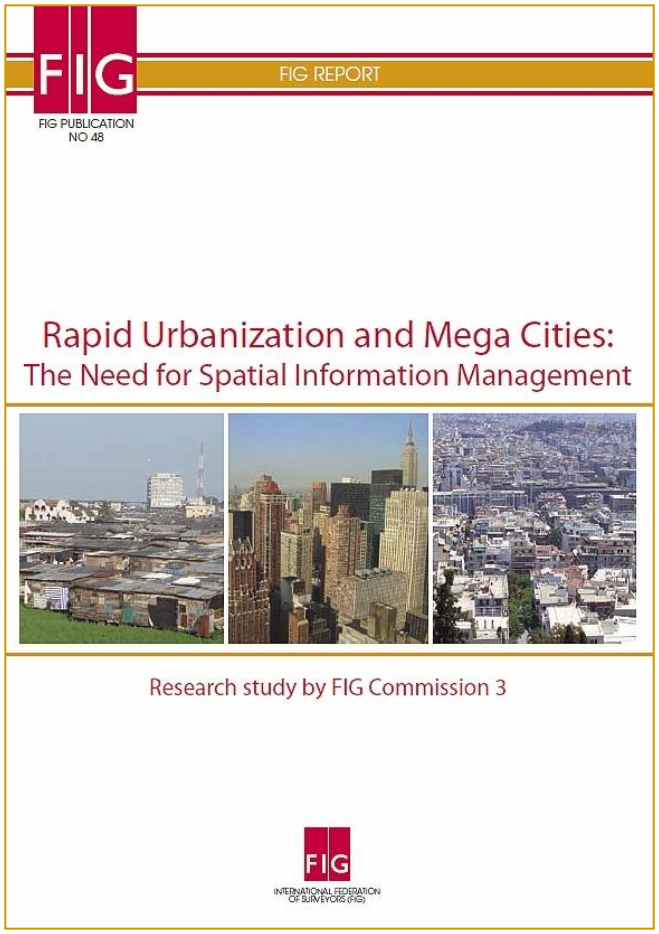


Contributors-methodology

Contributors: Prof Rahmi Celik (Istanbul), Anthony Adeoye (Lagos), Makis Apostolatos, FIG delegates-presenters, Local organizers of the Workshops and meetings, and Prof Stig Enemark.

Methodology

- Identification of experience gained through the past and current FIG Com3 activity to improve management of expanding urban areas
- Review of existing publications and other sources
- Internet research on specific problems of Mega Cities and on existing SDIs
- On site visits to a selected number of Mega Cities and interviews with individual decision makers in city administrations
- Review and assessment of data received from questionnaires
- Expert group meeting in Paris

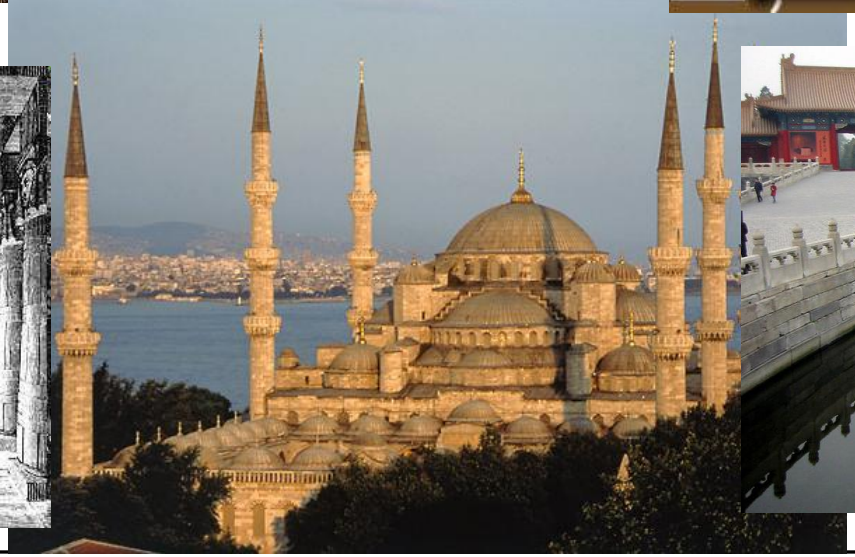
Homo sapiens did not start as an urban citizen!

120,000 years until the end of the last ice age when the very first “human settlement” appeared, and about

6,000 years more until the classical antiquity when people established large cities to live together for

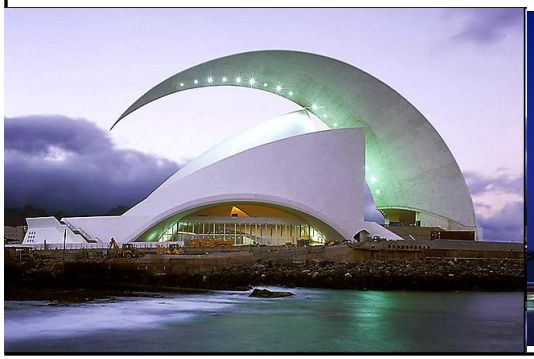
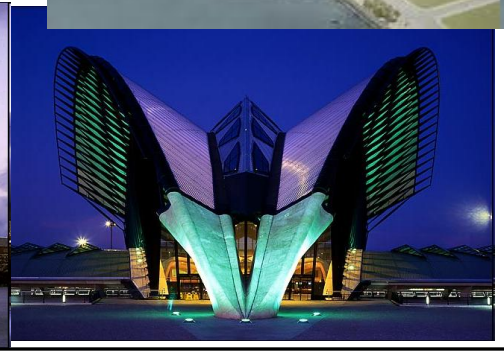
security and prosperity, for trade, but also for worship.

The World Goes to Town



Culture & market have in a way replaced religion

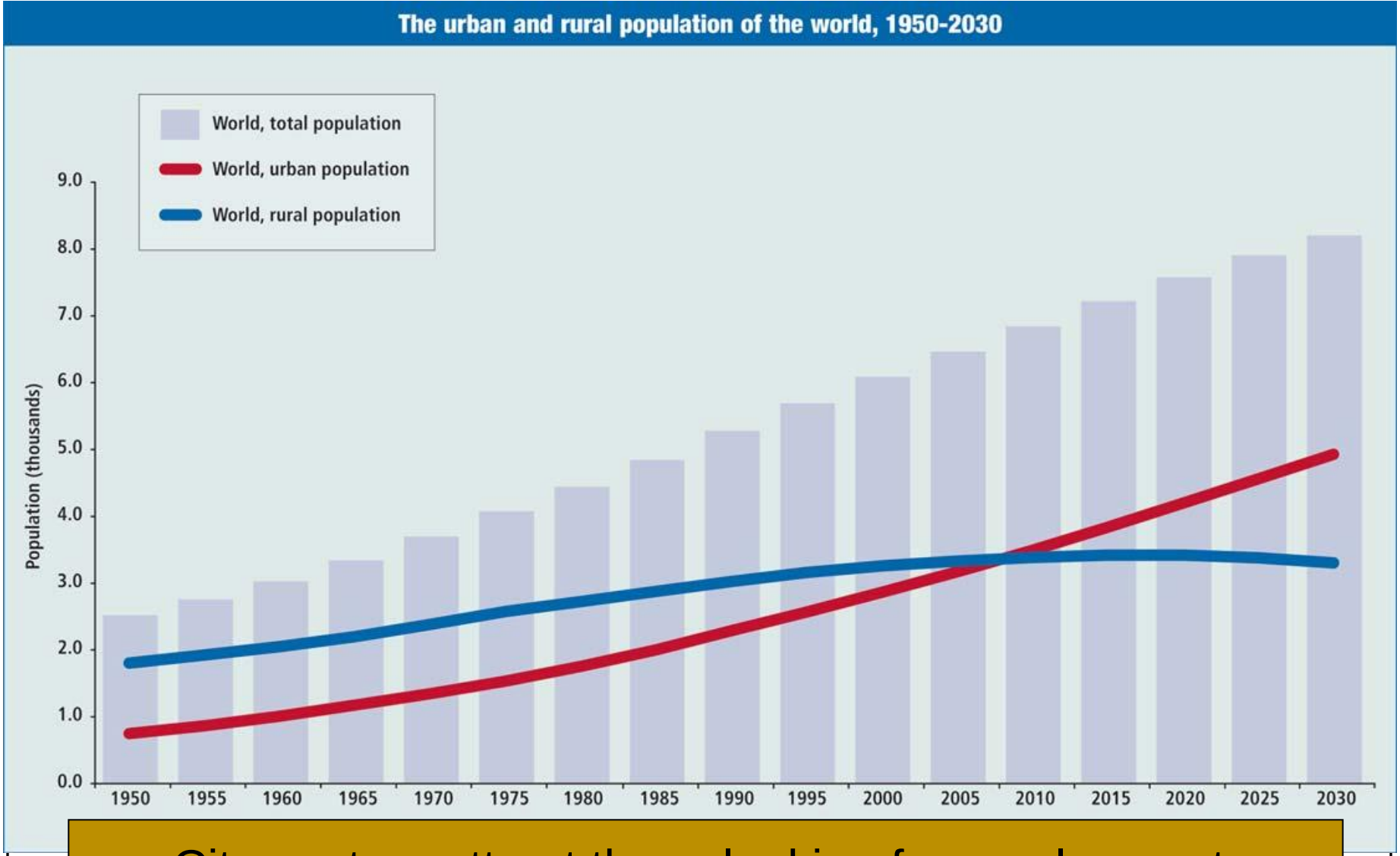
- Visitors,
- Investors, and
- Large international corporations, are attracted by the largest cities worldwide for the museums, exhibitions, cultural events, fashion, theaters, art galleries, etc.
- Cities became centers of learning, innovation and sophistication

Global proportion of the urban population increase

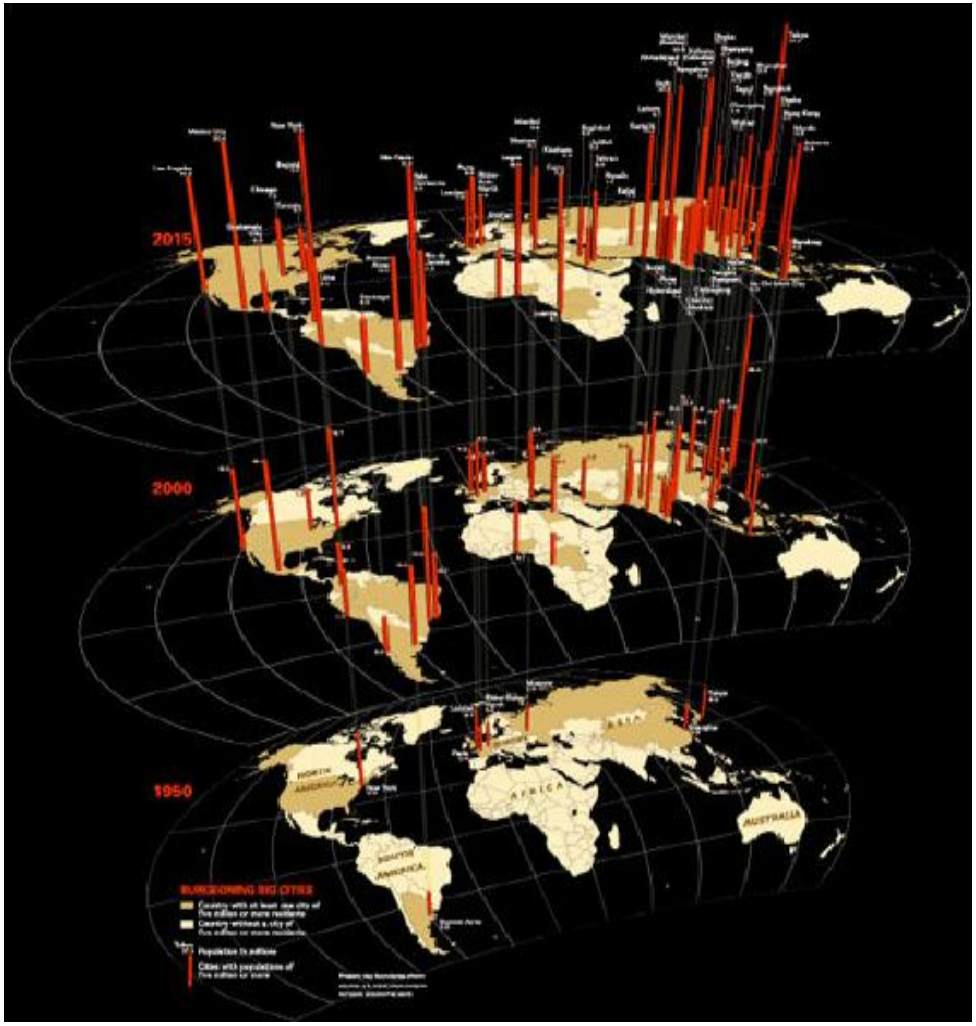
Year	Urban population	Proportion
1900	220 million	13 %
1950	732 million	29 %
2005	3.2 billion	49 %
2030	4.9 billion	60 %

Source: UN Population Division



City centers attract those looking for employment, education and better living conditions

Megacities: home to 10 million or more



- 2015 Latin America, Central Africa, Asia
- 2005 Latin America, India, North America, Asia
- 1950s New York, Tokyo, Buenos Aires, European Capitals

Over half of this growth will be in Asia

Urbanization can be viewed as an indicator of development

- Concentration of the most dynamic economic activities in urban areas often produces economies of scale and leads to social and economic benefits
- It is a matter of human rights that people are free to choose where they will live

However….

- Nobody wants to live in a city which is congested, suffers constant blackouts and frequent floods, with few parks, awful schools and clinics, devoid of any buildings of charm and character, governed by incompetent public sector
- It is a matter of good governance to achieve sustainable urban growth
- Restrictions on private rights in the use of land in terms of air, soil and water pollution have to be applied and accepted by all market participants. All must assume the costs of the natural resources they consume, knowing that their competitors do the same!

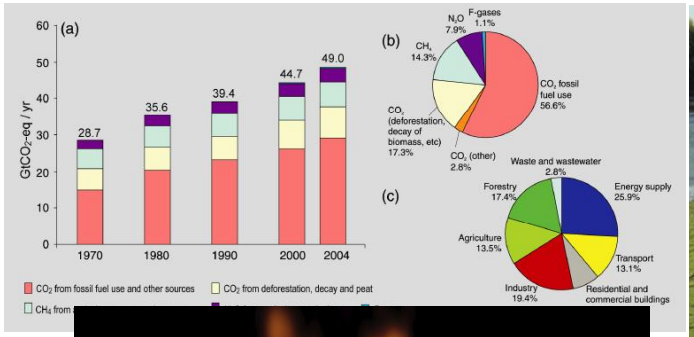
Problems to be managed within Mega Cities

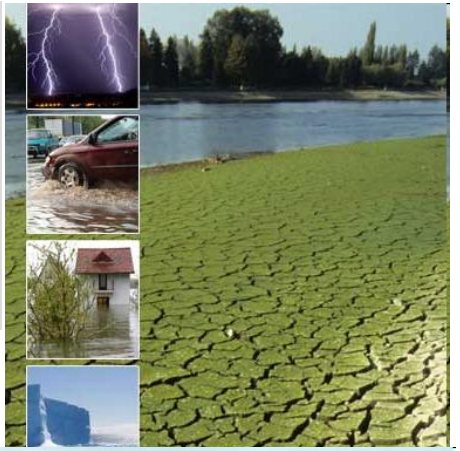
- Transport, Traffic congestion
- Energy inadequacy
- Informal development, lack of services
- Insecurity, crime
- Water, soil, air pollution
- Poor natural hazards management
- Climate change

Climate change:

urban areas generate 80% of greenhouse gas emissions

The 20 largest cities consume 80% of the world's energy



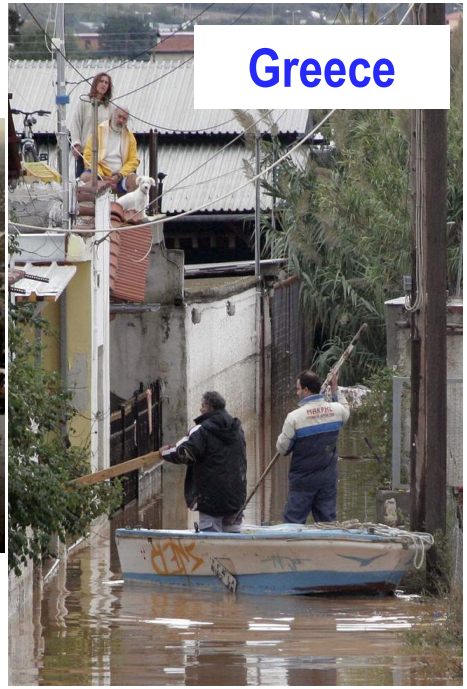


Results of rapid urbanization hit rich and poor alike

UK

Sao Paulo

New Orleans


Greece

Delhi

Hanoi

Place matters - all have a spatial dimension

- Food, water and energy insecurity
- Informal development, high urban densities, dilapidated city centers
- Lack of green areas and of buildings reflecting local cultural heritage,
- Transportation problems, traffic congestion and accidents
- Lack of basic services, insecurity of tenure, informal real estate markets
- Unsustainable land use and inefficient land administration systems
- Creation of slums, criminality
- Difficulty in natural hazards management
- Water, soil and air pollution, climate change
- Weak institutions to resolve conflict
- Inefficient administration, bad governance

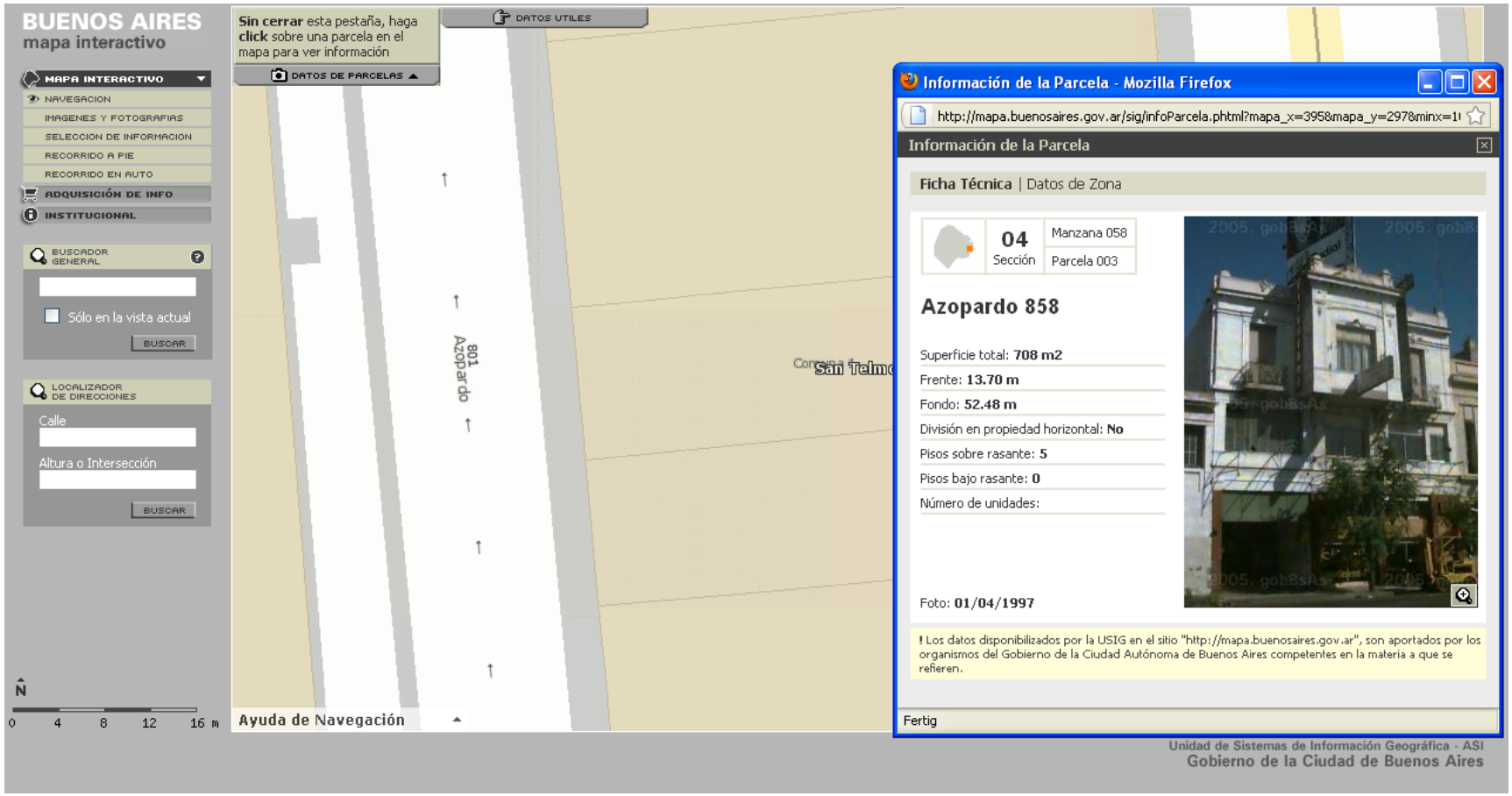
City governance - Findings of the research

- All cities have different interpretations of what constitutes an SDI.
- Most cities have no strategic framework to guide and create their SDI
- Missing capabilities included no spatial data policies and standards, common metadata, formal data sharing arrangements between units or agencies, or shared data access mechanisms
- It is not clear what connection there is between national and local strategies for SDI use or how national strategies will meet the needs of cities

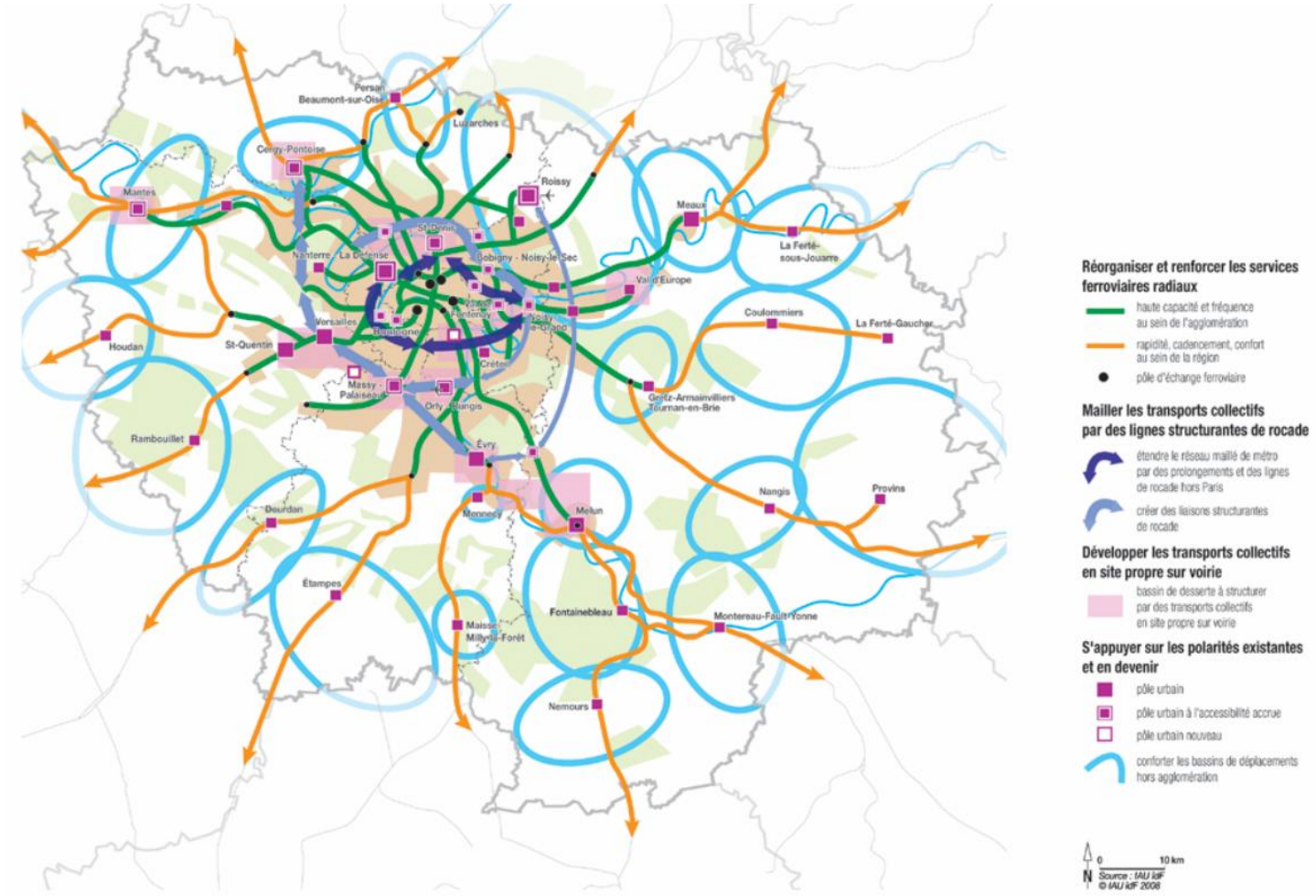
City governance - Findings of the research

- Unclear and *overlapping responsibilities* amongst internal and external agencies in areas such as **planning**, **infrastructure**, **development and land use controls**, **transportation**, **environmental management** and **water management**.
- Rationalization of functions and effective levels of cooperation and information sharing are needed
- *Political differences often create tensions* in the consistent implementation of projects.
- Many Mega Cities support some level of *civil society participation* in the planning and design of their services.
- *Spatially enabled web based services* are providing new opportunities to more closely involve citizens in land administration functions

Public access to parcel information of the City of Buenos Aires



The greater Paris master plan project – Transportation



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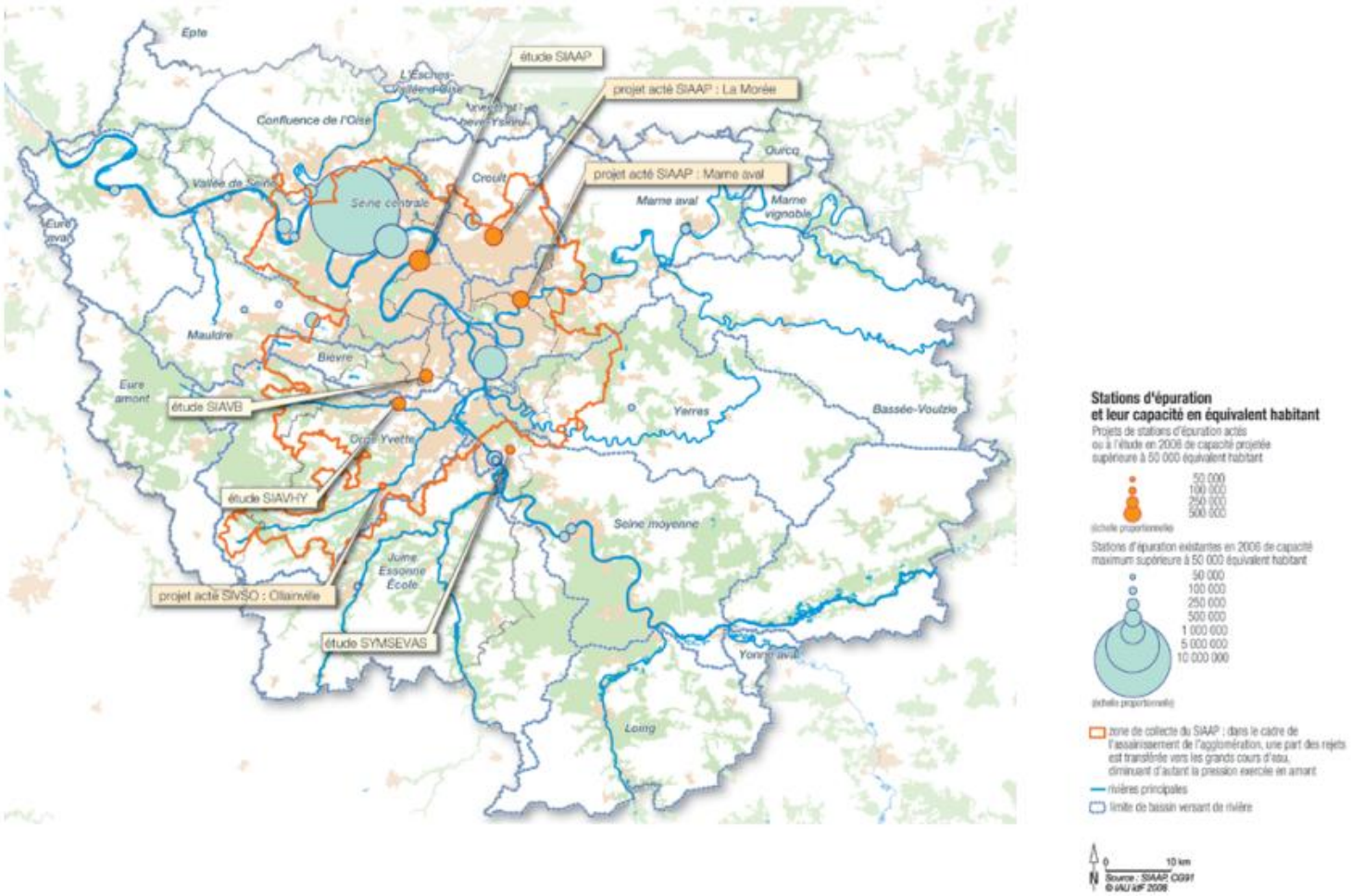
source : Schéma directeur de la région Île-de-France, projet adopté par délibération du Conseil régional le 25 septembre 2008, sous réserve de contrôle de légalité

The greater Paris master plan project – Water sanitation



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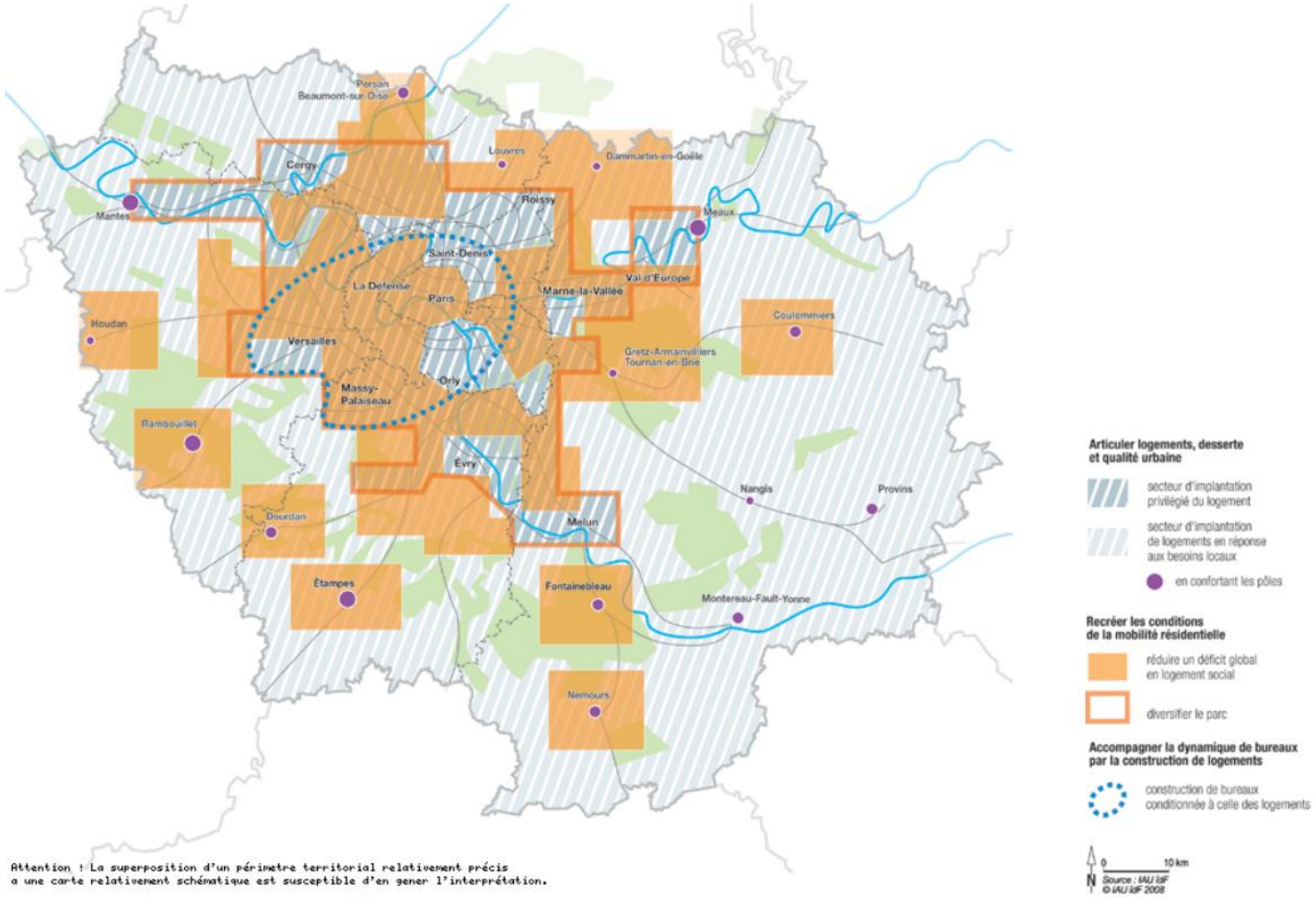
The greater Paris master plan project – Housing



Attention ! La superposition d'un périmetre territorial relativement précis a une carte relativement schématique est susceptible d'en gener l'interprétation.

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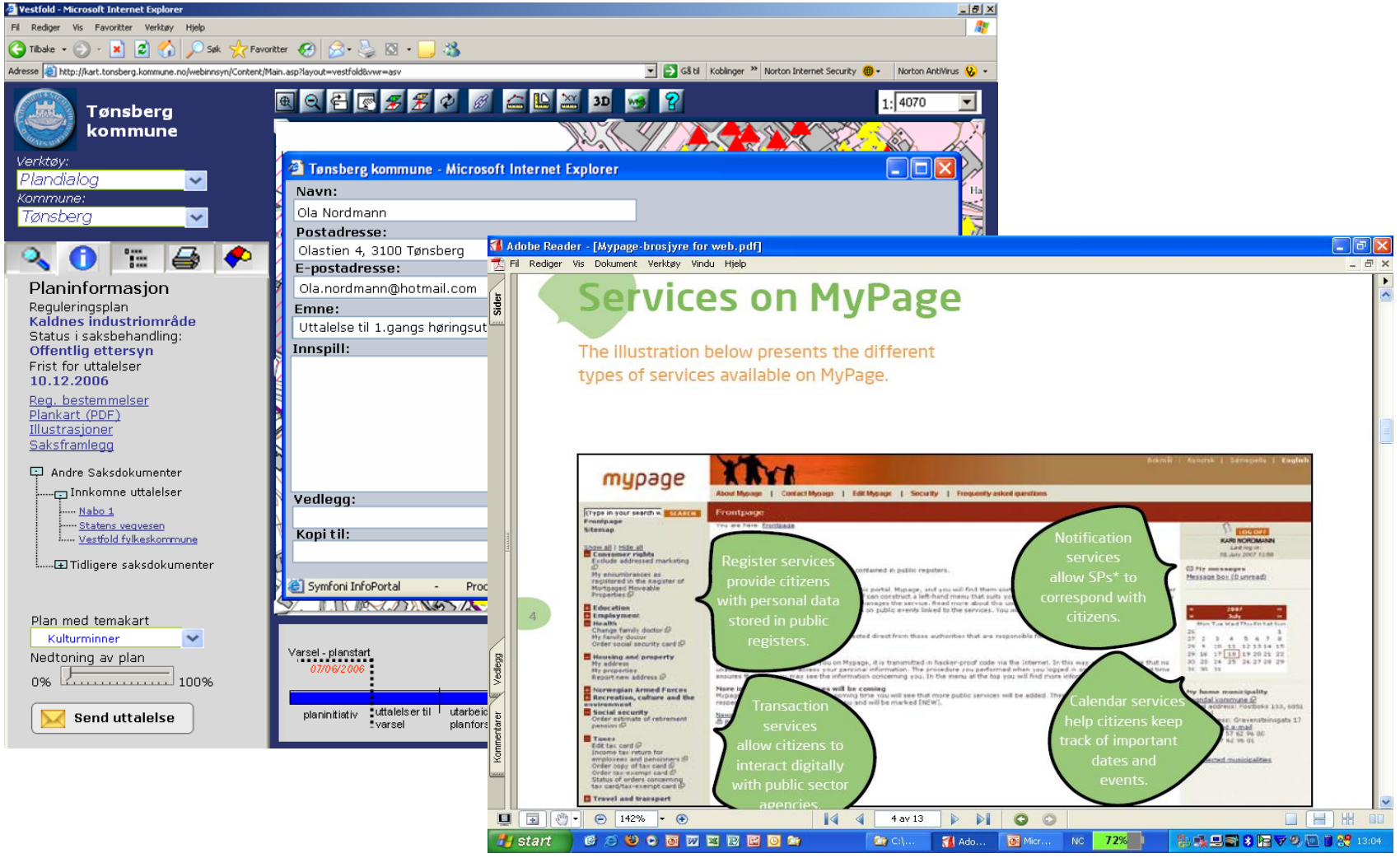
SDIs and Digital Planning Dialogue



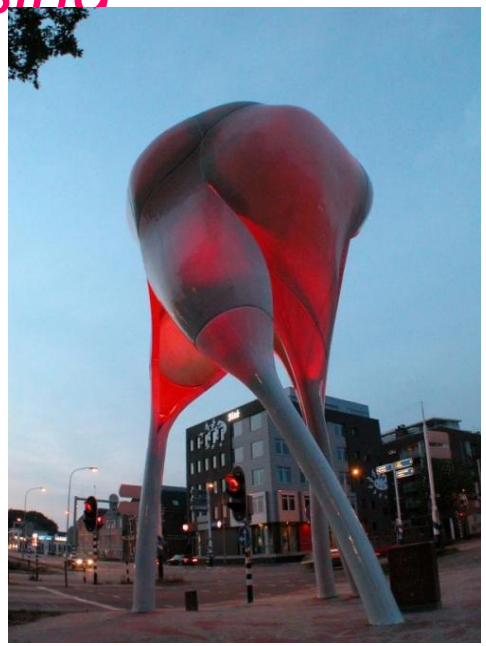
Innovative uses of spatial information tools to manage Mega Cities

- In Mega Cities within *developing countries*, where informal settlements are the norm, growth is rampant and administrative structures limited, then *traditional sources of location information and change intelligence is not readily available.*

- *New tools, techniques and policies are required*, all within shorter timeframes than previously accepted. Moreover, they must be flexible enough to meet traditional needs, e.g., land administration functions, but be designed to be *interoperable and integrate within the city wide SDI to also support disaster management*, environmental management, health and transportation

These tools include

- Tools for: data collection and maintenance, data integration and access, data analysis, 3-D city modelling, *citizen centric urban sensing*



Interactive D-Tower in the Netherlands

Spatial information policy constraints

- **Megacity SDI will only occur when senior management are convinced of the *benefits* and the need for a mega city *information strategy***
- **Citizen awareness includes a risk of popular mistrust concerning privacy issues.**
  Policy frameworks must be established *legally* for the appropriate use of spatial information.
- **Raise public awareness about the *benefits citizens* will enjoy through SDI**
  (increased *transparency* in city governance and *public participation*)

Spatial information policy constraints

- **Citizen participation in information gathering suggests certain risks like:**
  - the concern for ***privacy***;
  - ***suspicion*** **of governmental intrusion** and loss of public support;
  - the issue of ***quality*** of data collected by non professionals;
  - **the danger of *miss-use* of citizen-provided information by repressive governments**;
  - the question of the ***capacity*** of governmental agencies to monitor, evaluate, and interpret the volumes of data collected