

# Smart City Governance

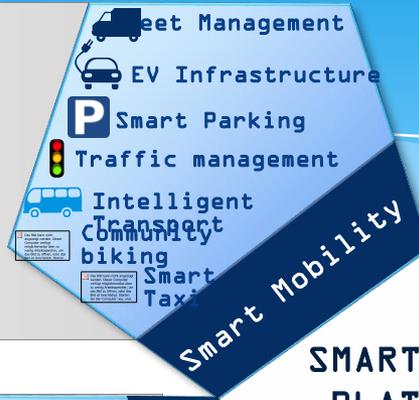
## URBIS Solutions

David Ludlow,  
Assoc. Professor European Smart Cities  
University of the West of England, Bristol

# Integrated smart city model

## Smart Mobility

Services focused on decreasing city traffic density and citizen driving times, and optimizing public services routes.



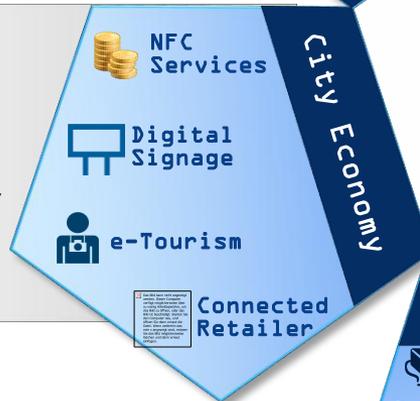
## Energy & Environment

Services to reduce energy consumption (electricity, oil and gas, water, etc.), to better manage waste or to improve environment indicators.



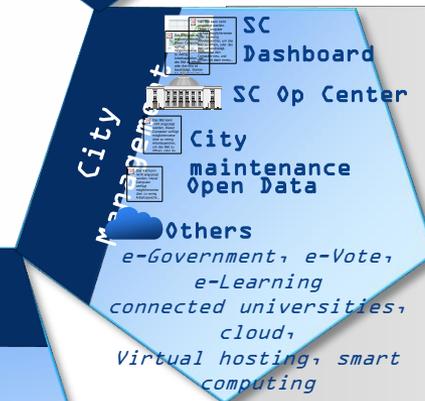
## City Economy

Services focused on modernizing how city businesses are performing and enabling city growth



## City Management

Services focused on modernizing public administration through IT and mobile solutions to better allocate city resources, prioritize investments thanks to an integrated view of the city.



## SMART CITY PLATFORM

Data Collection & Analysis  
M2M  
Transactions

## Security & e-Health



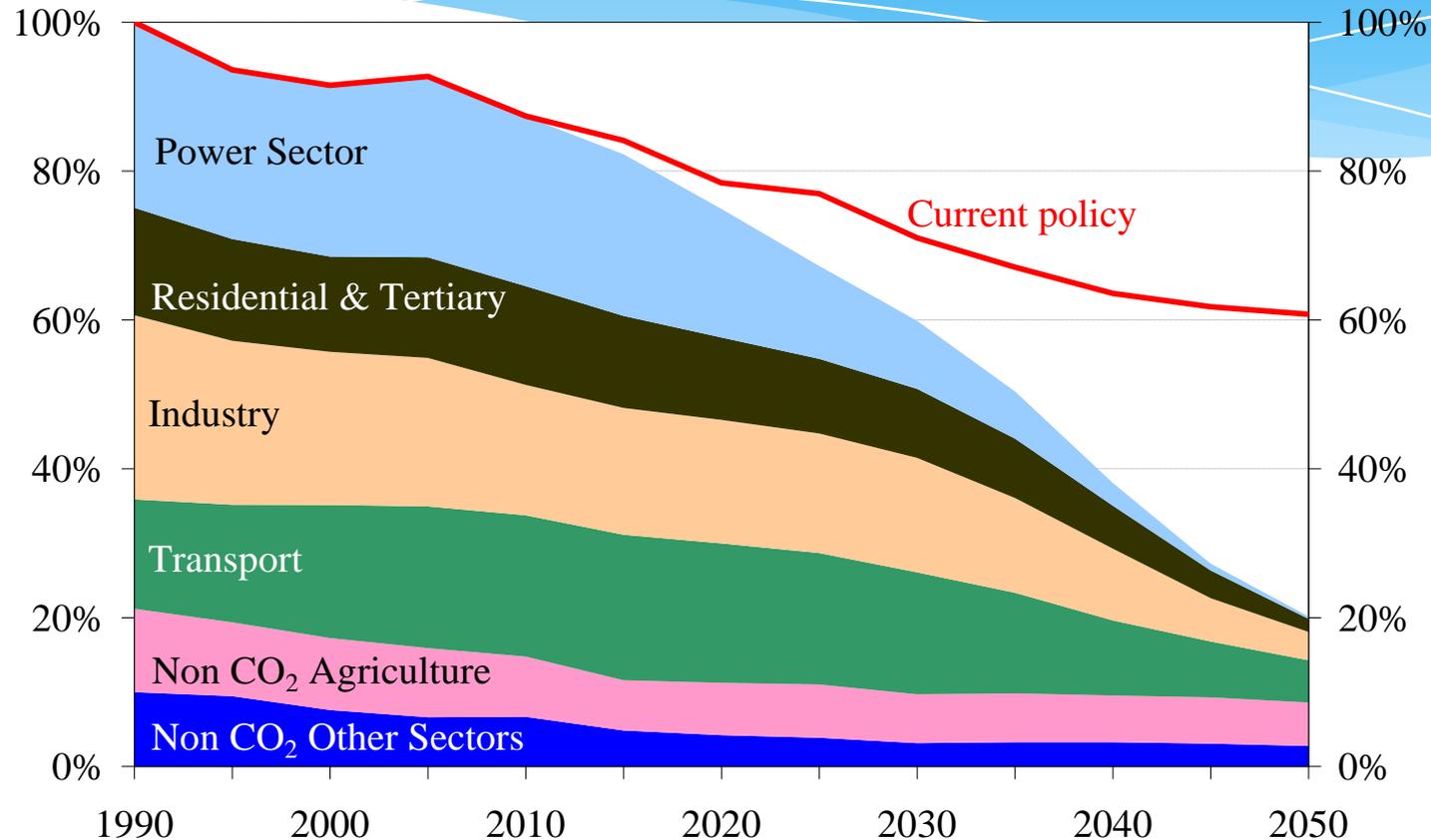
## Security & e-Health

Services focused either on crime prevention and prosecution and health care system quality and efficiency.

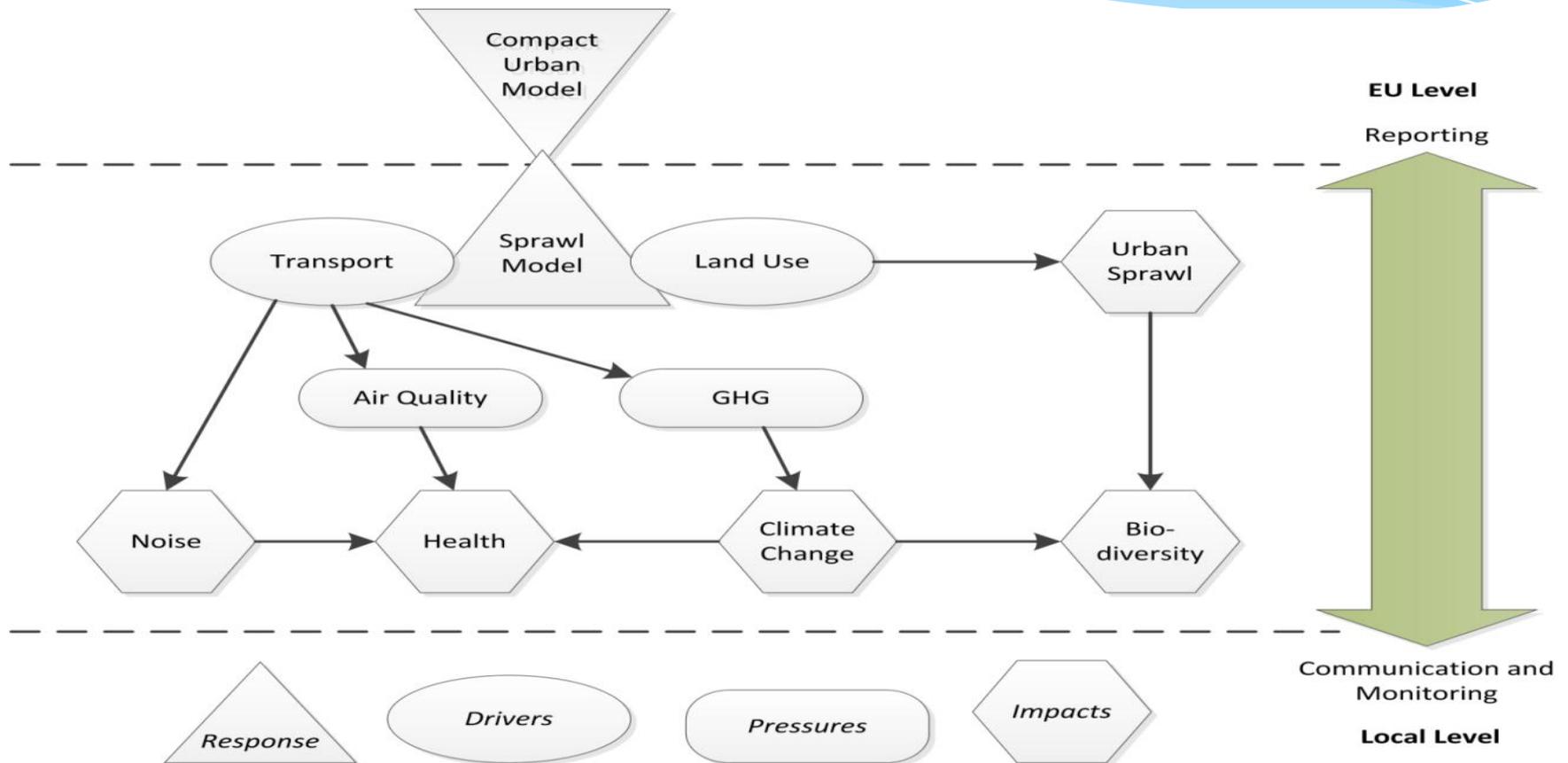
# urban management challenges

- \* **Urban Management – multiple challenges**
- \* finite resources and energy efficiency
- \* climate change impacts and environmental vulnerability
- \* demographic change and social cohesion
- \* economic and financial crisis
- \* Hence management complexity and **need an integrated governance to manage this complexity**
- \* **Drivers of change – global and local**

# EU GHG emissions towards an 80% reduction (100% = 1990) by 2050

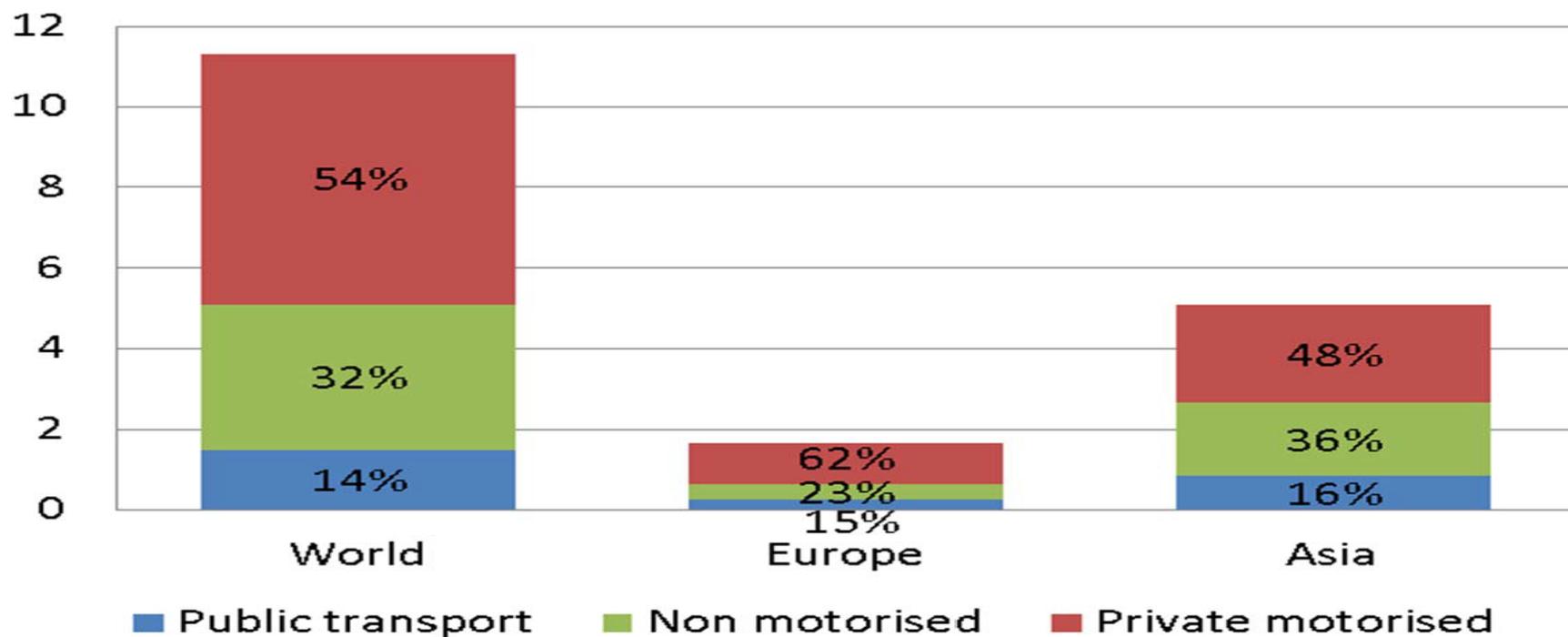


# urban complexity + integrated urban management



# urban mobility 2020 – business as usual

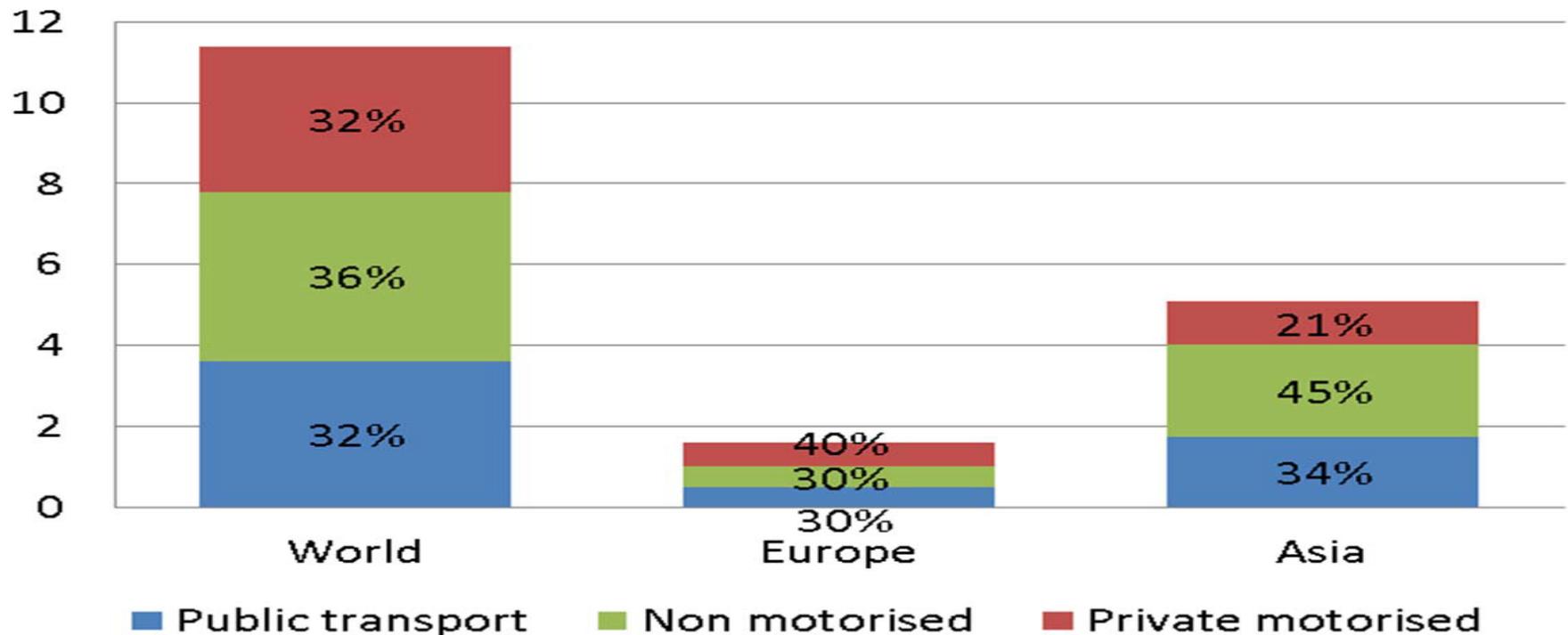
## Daily trips in cities (billions)



# Win-win potentials - urban mobility

2025 = PTx2

Daily trips in cities (billions)



# energy consumption for urban mobility

	2005	2025 PTx2	% change
<b>World</b>	700 MToe	720 MToe	+3%
<b>Europe</b>	140 MToe	110 Mtoe	- 21%
<b>(% world total)</b>	20%	15%	
<b>Asia</b>	124 Mtoe	208 Mtoe	+68%
<b>(% world total)</b>	18%	29%	

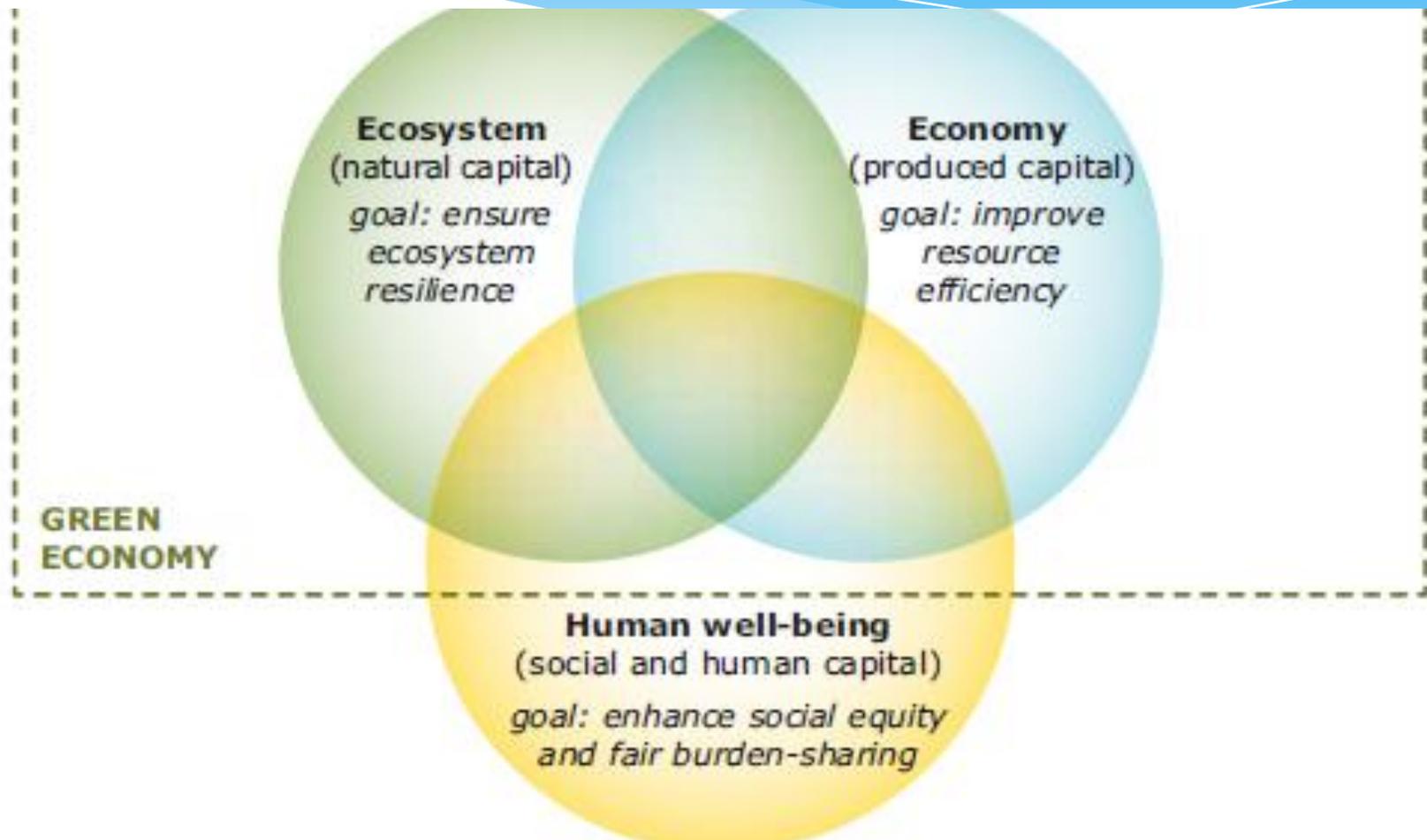
# Policy “Win – Win” potentials

- \* **nature-based solutions** for cities are adaptable, multi-purpose and energy efficient and provide simultaneously environmental, social and economic benefits:
- \* In addition to improvements to energy efficiency – also  
.....
- \* improve city **resilience** to **CC** and natural **disasters** contributing to both **CC adaptation** and **mitigation**;
- \* restore urban **biodiversity, ecosystems** and their **services**;
- \* Improve air and water **quality**, reduce **noise**;
- \* improve **quality of life**, and **social cohesion**.....
- \* Hence offer prospect of substantial policy co-benefits and win-win solutions – *question how to unlock the potential*

# urban planning requirements

- \* Urban planning is central to managing complexity (socio-economic and environmental) in territorial context - and securing win-win policy solutions
- \* **Requires:**
- \* integration of information and analysis (cross departmental/multi-scalar)
- \* Information, intelligence and communication
- \* assessment methodologies, visualisation, simulation
- \* engagement of stakeholders and co-production of plans (bottom up)
- \* **All supported by ICT tools and methodologies**
- \* **Intelligence - communication – assessment - decision**

# Sustainable development - integration framework



# spatial planning - operationalising intelligence

- \* **Intelligence - communication – assessment – decision**
- \* **policy cycle** – operationalising and mobilising intelligence - integrating governance with inter-agency communication
- \* **assessment** of socio-economic and environmental impacts of alternative territorial development options
- \* **stakeholder engagement** regarding alternative development options (co-design and innovation in solutions)
- \* **political decision making** and plan implementation (democracy, legitimacy, trust)

# planning cycles – operationalising intelligence

## **Evaluation and Reporting**

Core document:  
Evaluation Report

## **(Update of) Baseline Review**

Core document:  
Sustainability Report

## **Implementation and Monitoring**

Core document:  
Sustainability Programme

## **Target Setting**

Core document:  
Sustainability Targets

## **Political Commitment**

Core document:  
Council Approval

# Green infrastructure - requirements

- \* green infrastructure planning objectives set in the **strategic planning framework** that extends across the administrative boundaries from city centre to hinterland at the local level
- \* focus here is on the **connectivity** of the network of green (and blue) infrastructures, and the definition of green routeways linking city centre to countryside
- \* gaps in the network must be filled to ensure connectivity that is essential to meet the requirements of the policy. **Gaps in the network only filled at the local level** – where neighbourhood planning is essential to the realisation of city-wide planning objectives

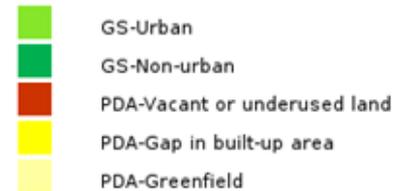
# URBIS Solutions

- \* Green Layer Services developed from satellite images driven by EU Copernicus programme (European Space Agency) support planning of green infrastructure at all levels of governance in an integrated perspective:
- \* **local level** the green layer is integrated with the urban atlas street tree information, as well as socio-economic and proximity (to green open space) indicators to define priorities for green infrastructure neighbourhood planning;
- \* **citywide** green layer/green tree assessments are combined with connectivity/accessibility indicators to define city wide green corridors supporting the recreational and mobility needs of the population;
- \* **EU level** solutions based on the urban atlas offer pan-European comparability of green cities strategies across Europe.

# URBIS Green Layer Services

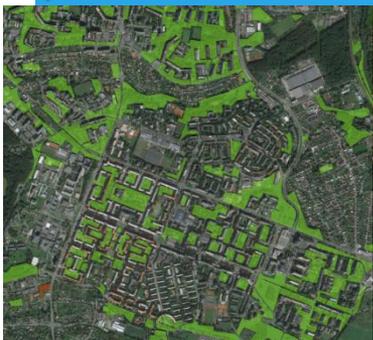
Amount and spatial distribution of gaps, open spaces, pervious areas and urban green in the city.

- \* **Urban green sites - to be protected as part of GI**
- \* **Potential development areas - space for city densification**
  - Vacant or underused land
  - Gaps in built-up areas
  - Greenfields with development perspectives



# URBIS Green Layer Services 1/ sites identification

Copernicus Urban Atlas + image analysis results



+

Classification based on Urban Atlas imageries (SPOT5 – 2,5m pixel size)



## 2/ sites characterization

Reference units for analysis: Functional urban blocks  
(Urban Atlas of local urban land use planning databases)



### CRITERIA:

- Amount, distribution and type of open/green space inside the block

Potential for densification?  
(PDAs)

– economical profit

x

Urban green to be preserved?

– ecological profit

## 3/ basis for calculation of indicators

More detailed information about „green and open spaces“ in urban areas than provided by Copernicus Urban Atlas

Indicators describing amount, distribution and characteristics of green/open spaces in analytical units at different levels of spatial detail:

- Sub-city districts
- 1km grid cells
- LAU2
- Core City/Larger Urban Zones

How „dense“ each city is?

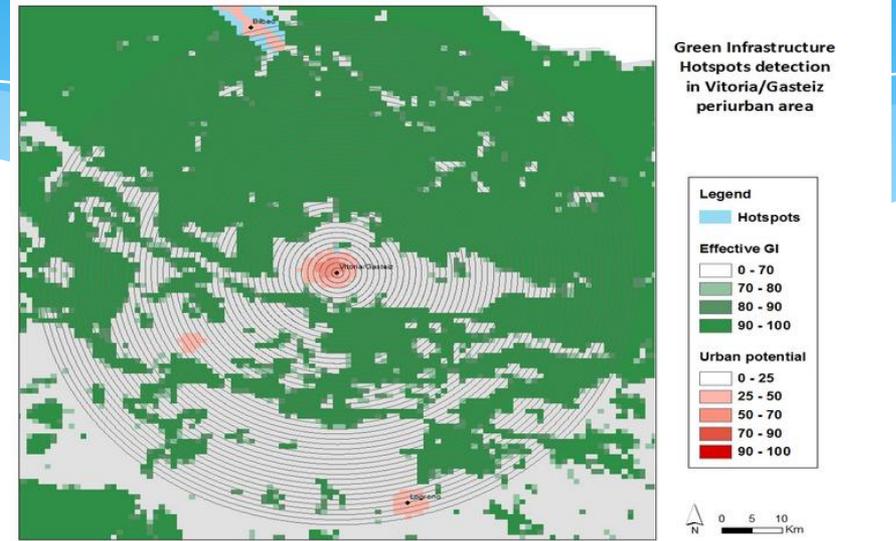
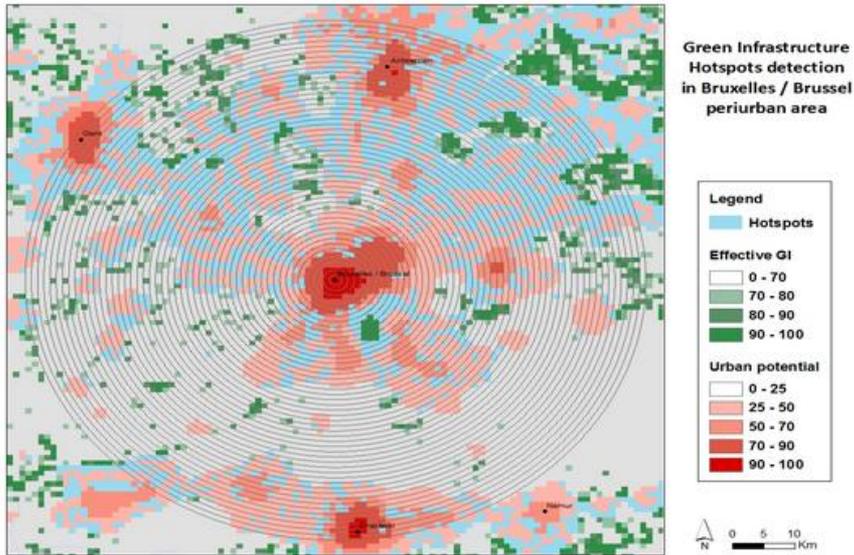
How many open spaces are in the city and how they are distributed?

How this density changes in time?

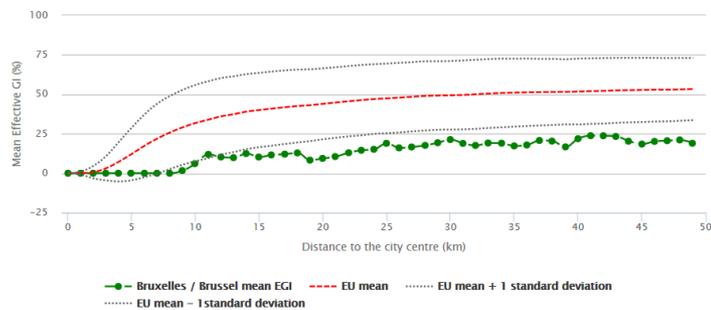
GREEN AREA CHARACTERISTICS to be described:

- CONNECTIVITY (ala EEA fragmentation indicator)
- SPATIAL PATTERN (ala urban sprawl indicator)
- PROXIMITY (to e.g. kindergarden, residential area/blocks etc.)

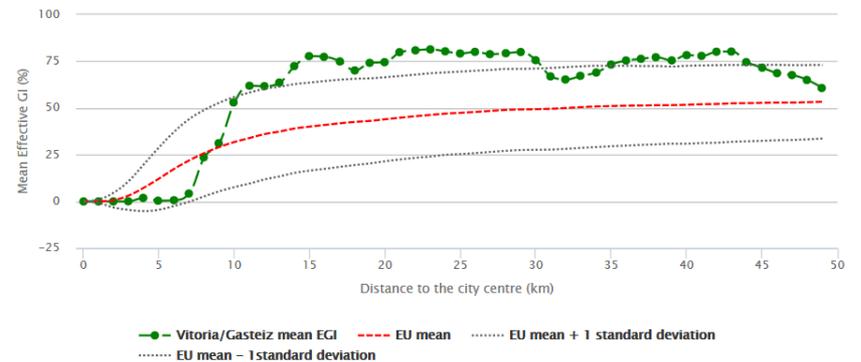
# Urban – Peri-urban



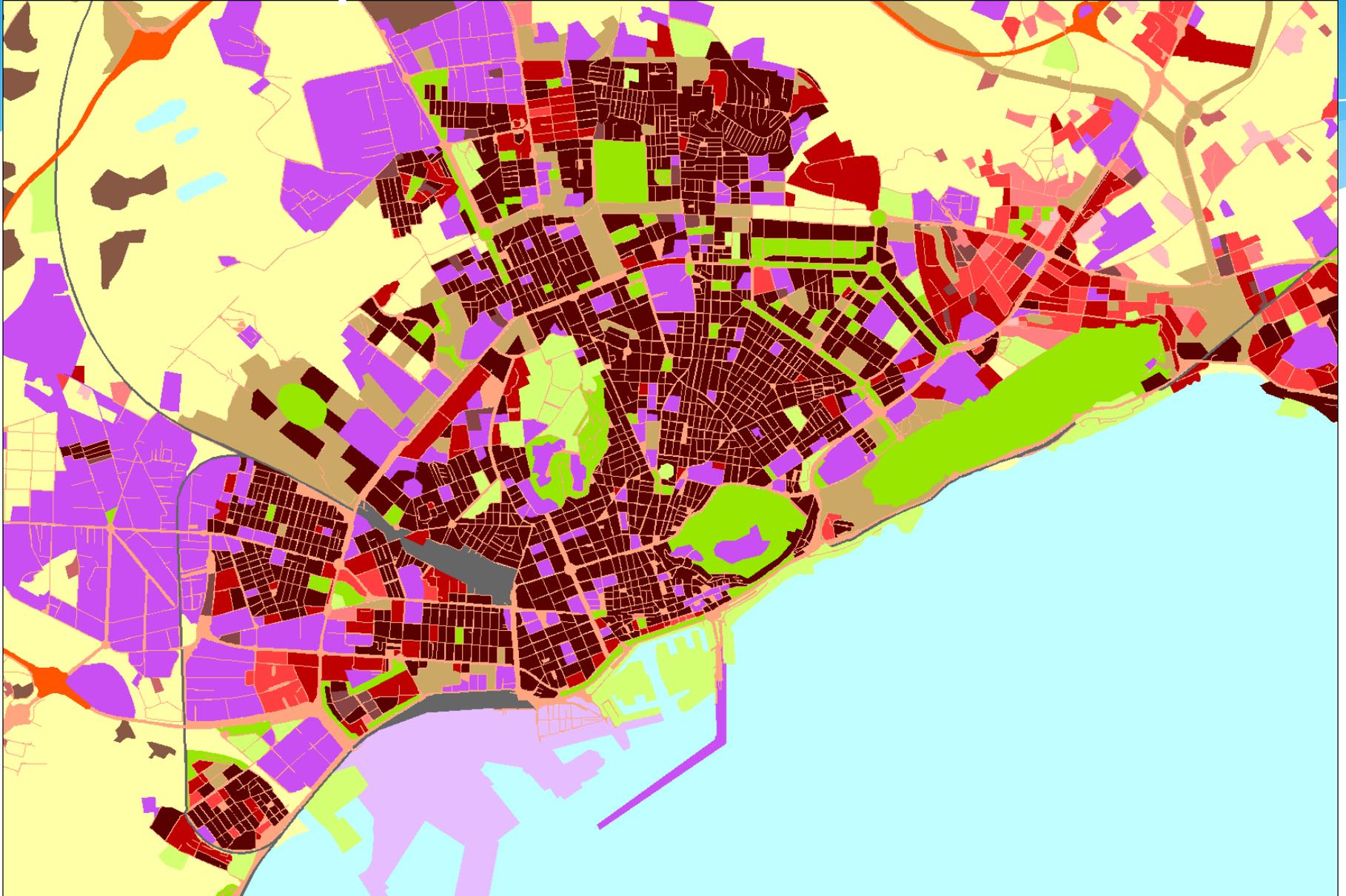
Mean Effective Green Infrastructure



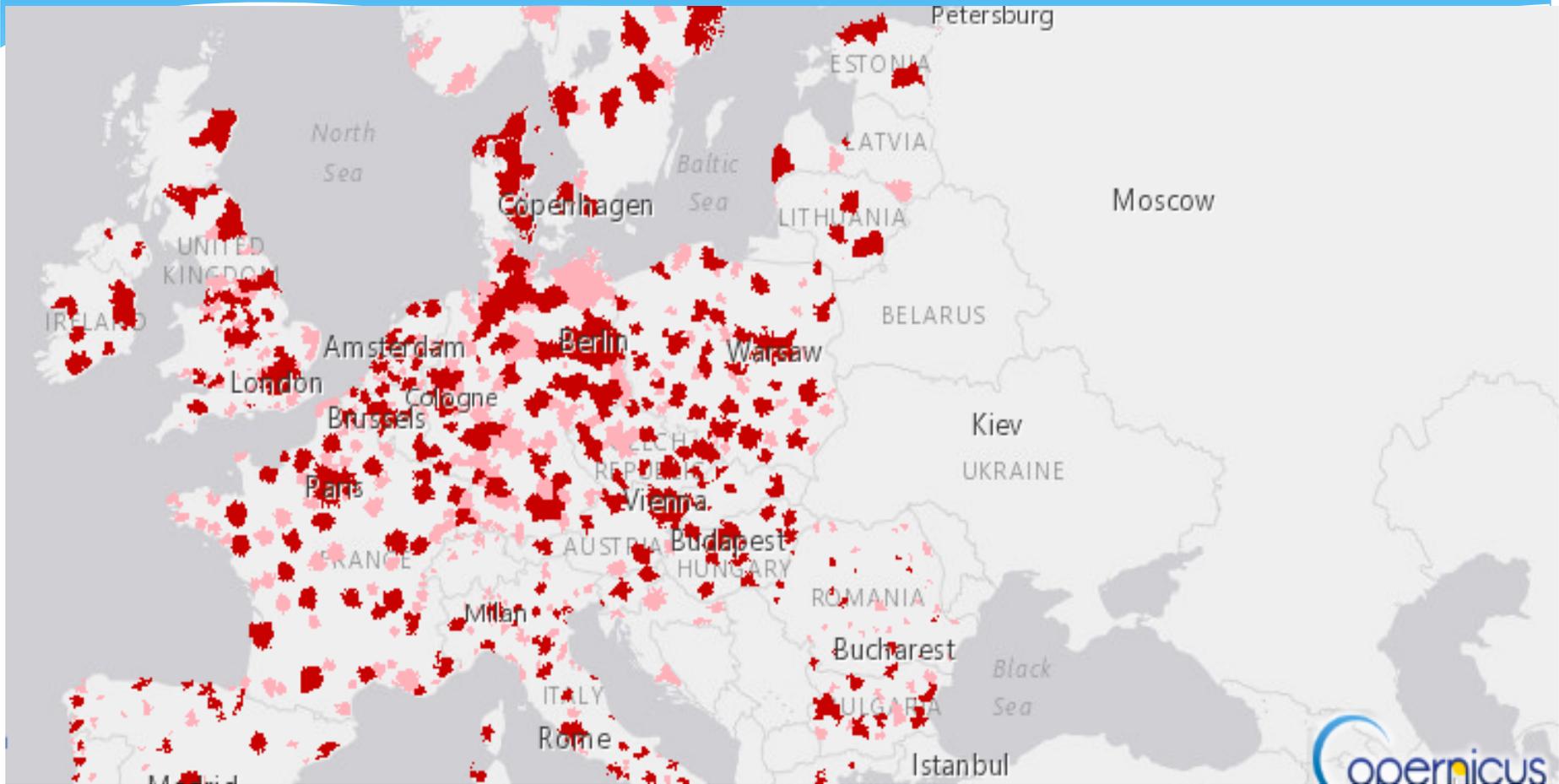
Mean Effective Green Infrastructure



# Copernicus Urban Atlas



# Copernicus urban atlas – 700 cities



# Conclusions

- \* strong consensus in both European and global contexts surrounds the opportunity for spatial planning to assist in efforts to develop more sustainable cities and citizens
- \* “win-win” potentials define broad socio-economic and environmental policy co-benefits
- \* delivery of “win-win” potential is a major urban governance challenge in view of the integrated complexity of the issues
- \* smart city solutions driven by EU funded projects working directly with cities are creating new intelligence, new communication channels, and new assessment methodologies essential to the delivery of integrated urban management
- \* smart city solutions developed in the context of open governance and stakeholder engagement are furthermore breaking new ground in the co-production of city plans, and defining the new political pathways to implementation



Thank you!