RED CI-RTI – Jornada Málaga – Septiembre 2017

CÓMO INCORPORAR LA COMPLEJIDAD, DIVERSIDAD, INCERTIDUMBRE E INTELIGENCIA EN LAS CIENCIAS URBANAS

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Core features of contemporary cities

Complexity

Diversity

Uncertainty

Intelligence

Core features of contemporary cities

Complexity

A complex system is characterized by:

1) A high number of elements

2) A large variety of interrelations among elements

3) Subject to non-linear dynamics

4) Capable of self-organizing as a response to context changes

To approach urban complexity we need a holistic vision

Core features of contemporary cities

Diversity

Urban diversity is generated by:

1) Diverse functions: economic specialization, socio-demographic structure, spatial fabric

2) Diverse stakeholders: supra-municipal stakeholders, local actors and citizens

To approach urban diversity we need governance models

Core features of contemporary cities

Uncertainty

Urban uncertainty is caused by:

1) Multiple changes that affect cities, some of them unforeseeable

2) Cities' operating context is subject to strong and continuous dynamics

3) Cities' evolution processes do not longer depend on manageable local forces

To approach urban uncertainty we need foresight tools

Core features of contemporary cities

Intelligence

In order to prosper and thrive in a complex and uncertain world, contemporary cities need large doses of intelligence

We understand intelligence as the capability of urban stakeholders to use effectively and efficiently new technologies for managing city operations and for making well informed policy decisions

To approach urban intelligence we need smart initiatives

Urban features retrofit
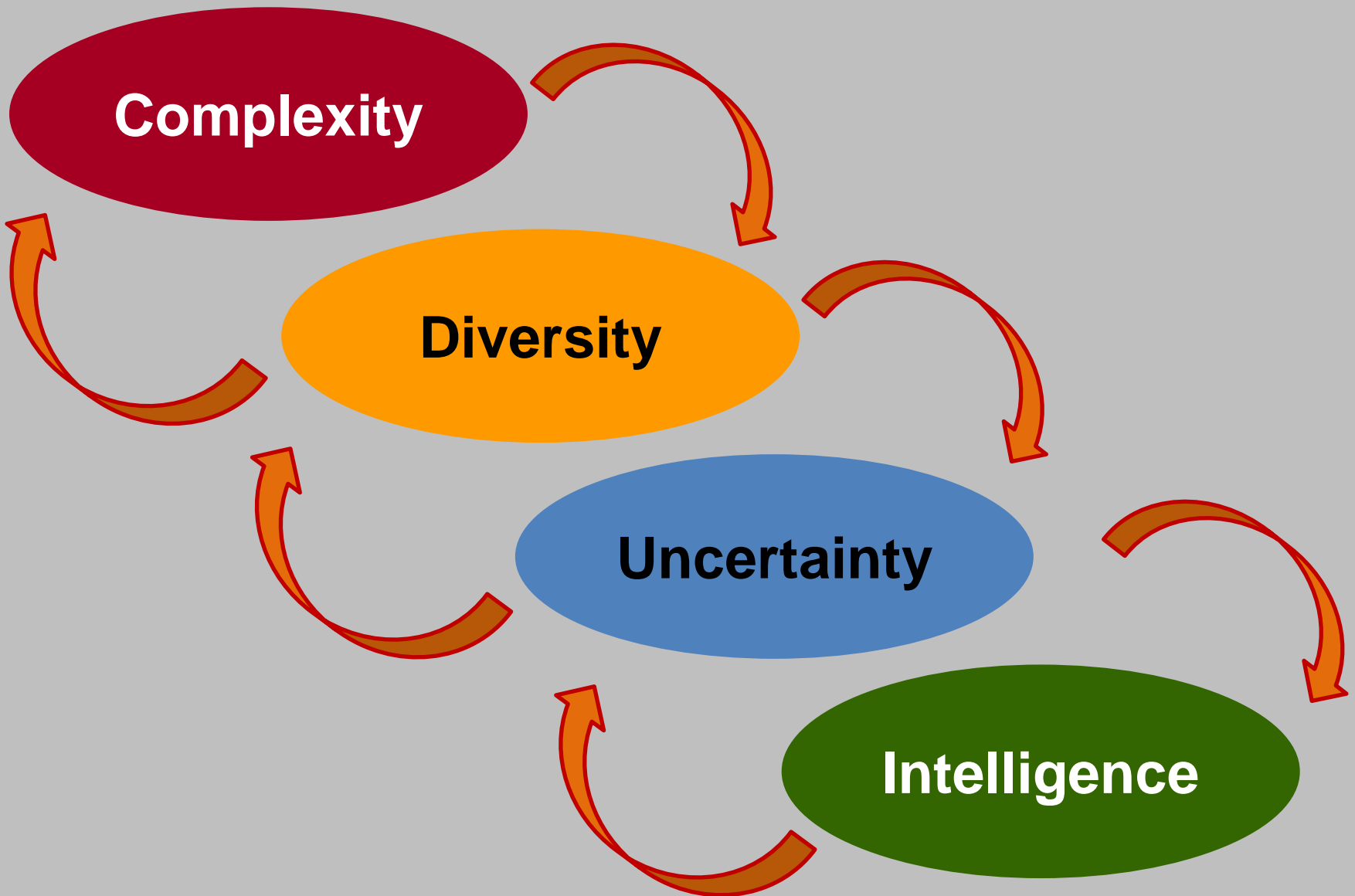
- Complexity
- Diversity
- Uncertainty
- Intelligence
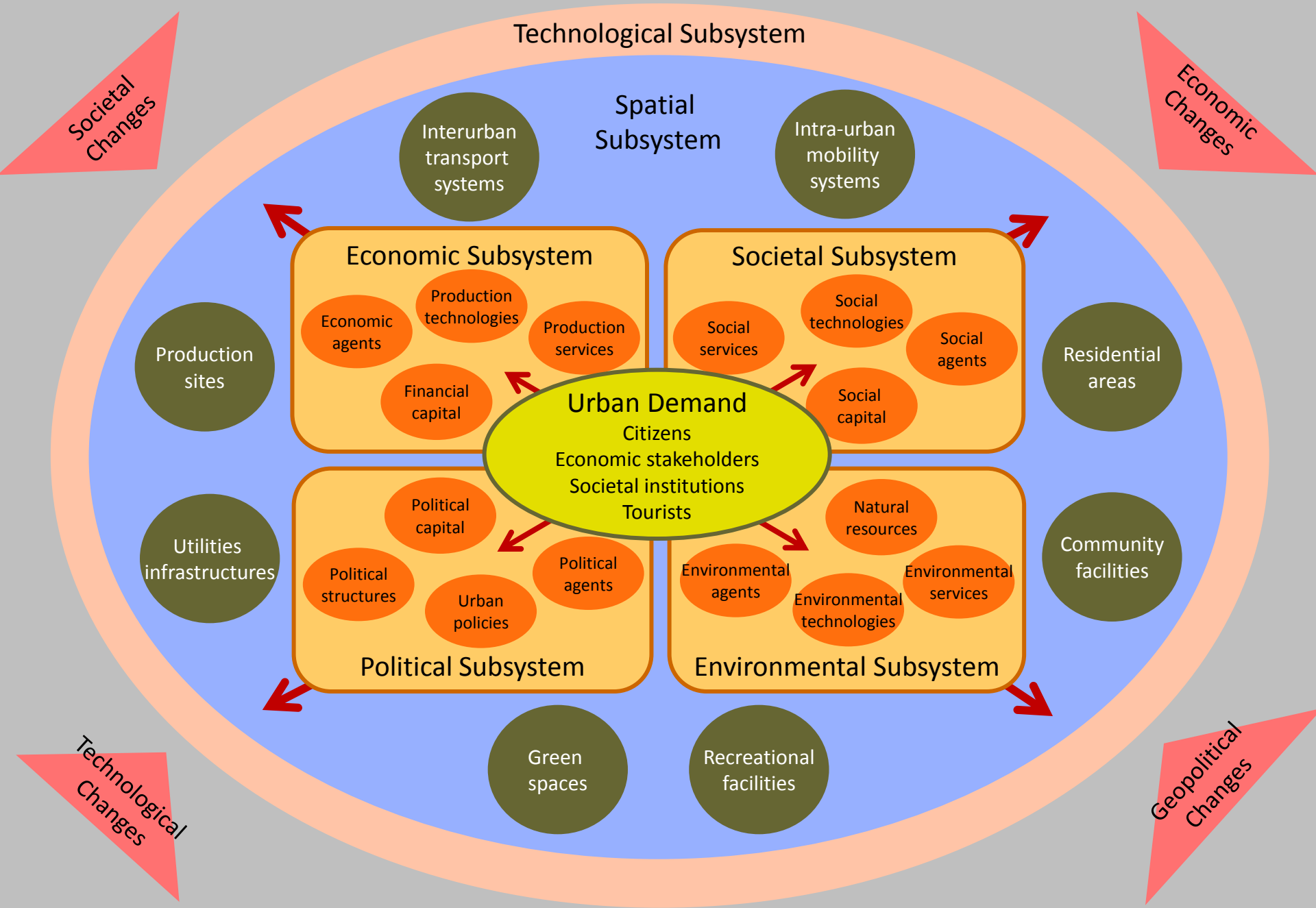
The real estate bubble (2000-2008)
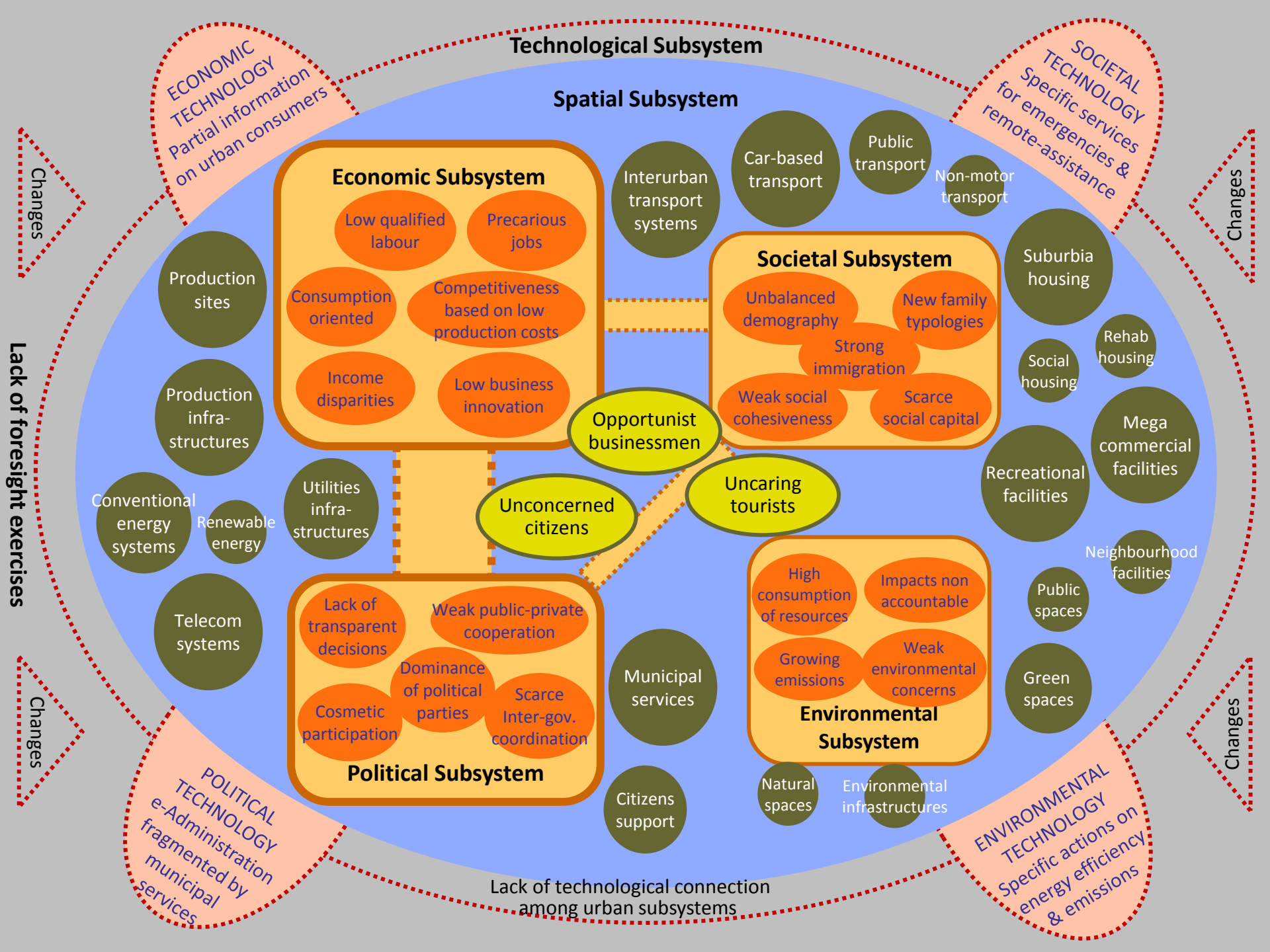
The urban crisis (2009-2014)

Technological Subsystem

Spatial Subsystem

ECONOMIC TECHNOLOGY Smart initiatives for increasing economic efficiency

SOCIETAL TECHNOLOGY Smart initiatives for making more accessible social services

Changes

Changes

Sectoral foresight exercises

Interurban transport

Public transport

Non-motor transport

Car-based transport

Economic Subsystem

Young labour migration

High unemployment

Growing income disparities

SMEs strongly affected

Societal Subsystem

Ageing population & low fertility rates

Reversed migration flows

Strengthened family units

Grass roots social initiatives

Suburbia housing

Rehab housing

Social housing

Commercial facilities

Recreational facilities

Neighbourhood facilities

Production sites

Utilities

Conventional energy

Renewable energy

Telecom systems

Stranded businessmen

Undiscouraged tourists

Concerned citizens

Urban public spaces

Political Subsystem

Demand for transparent decisions

Demand for political accountability

Discontent with political parties

Demand for participation

Environmental Subsystem

Lesser consumption of resources

Tougher environmental controls

Stagnating emissions

Stronger environmental concerns

POLITICAL TECHNOLOGY Smart initiatives for improving urban governance

ENVIRONMENTAL TECHNOLOGY Smart initiatives for preserving the environment

Changes

Changes

Municipal services

Natural spaces

Environmental infrastructures

Higher technological connection within urban subsystems
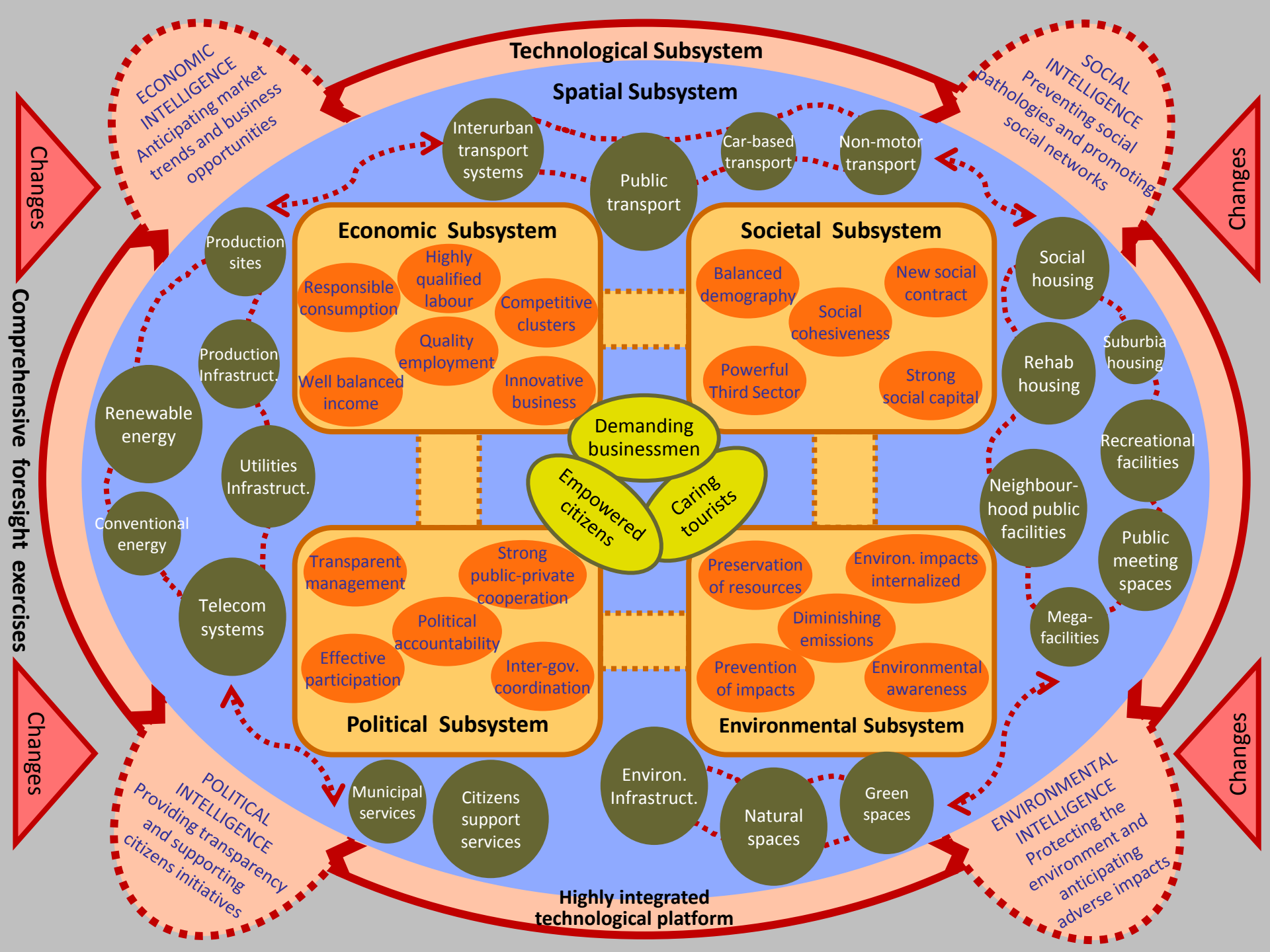
Desired vision for Spanish cities in 2030

This vision was guided by five driving principles:

– create an equitable and cohesive social fabric

– develop an innovative, competitive and resilient economic base

– preserve a healthy and sustainable environment

– establish a collaborative and transparent governance system
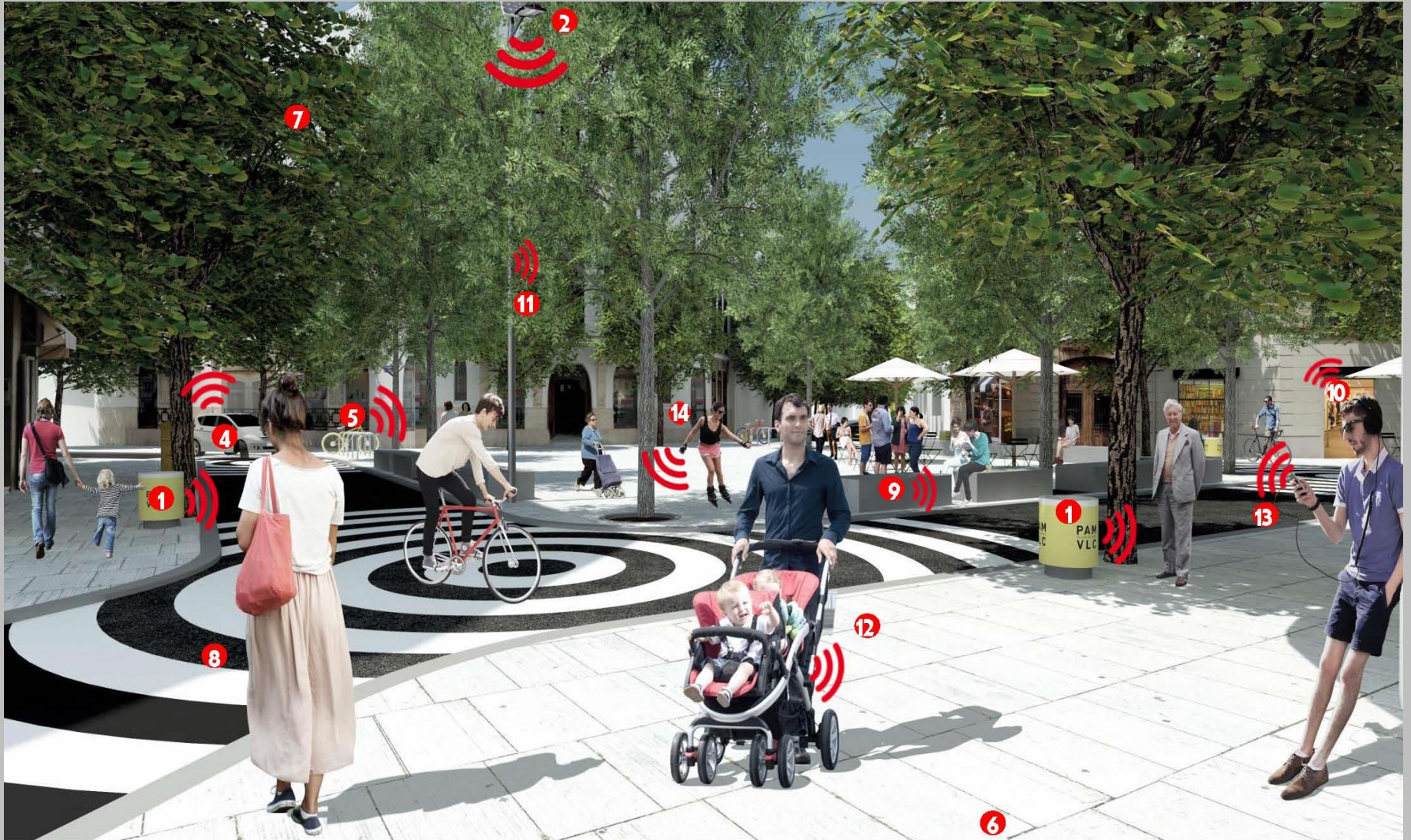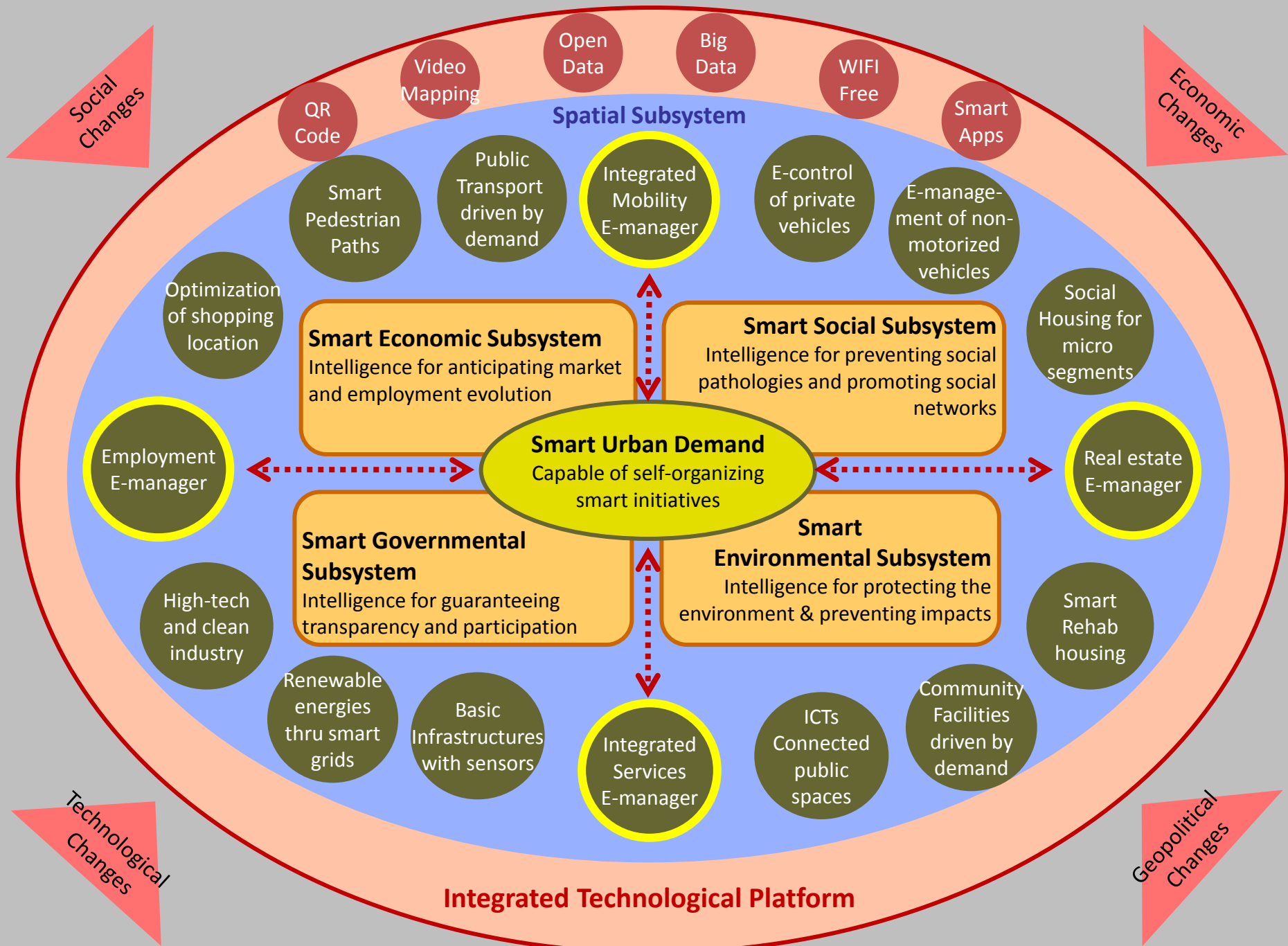
– build a compact and sustainable urban fabric

Hard **vision for Spanish smart cities in 2030**

Soft **vision for Spanish smart cities in 2030**

FUENTE: Gisbert, Ferreres, Pepiol y Hueso, 2014

Social Changes

Economic Changes

Technological Changes

Geopolitical Changes

QR Code

Video Mapping

Open Data

Big Data

WIFI Free

Smart Apps

Spatial Subsystem

Smart Pedestrian Paths

Public Transport driven by demand

Integrated Mobility E-manager

E-control of private vehicles

E-management of non-motorized vehicles

Optimization of shopping location

Social Housing for micro segments

Smart Economic Subsystem
Intelligence for anticipating market and employment evolution

Smart Social Subsystem
Intelligence for preventing social pathologies and promoting social networks

Employment E-manager

Smart Urban Demand
Capable of self-organizing smart initiatives

Real estate E-manager

Smart Governmental Subsystem
Intelligence for guaranteeing transparency and participation

Smart Environmental Subsystem
Intelligence for protecting the environment & preventing impacts

High-tech and clean industry

Smart Rehab housing

Renewable energies thru smart grids

Basic Infrastructures with sensors

Integrated Services E-manager

ICTs Connected public spaces

Community Facilities driven by demand

Integrated Technological Platform

Main findings of the proposed approach

CONTRIBUTIONS

- Systemic approach and foresight work well together

- Improved insight into the relational complexities of cities

- User friendly systemic approach for decision makers

- Foresight is welcomed by strategic planners

- Foresight can improve a city's governance

LIMITATIONS

- Conceptual framework needs to be applied in real cities

- Missing detailed analysis of complex urban relations

- Plug in quantitative models to enrich the approach

- More work to be done to improve stakeholders' involvement

a) Publications in scientific journals

- Cities (2018)

- Journal of Urban Technology (2016)

- Foresight (2016)

- Economía Industrial (2015)

b) International congresses

c) Doctoral dissertations

d) Master's courses

- Planificación estratégica de ciudades

- Ciudad y nuevas tecnologías

- Curso MOOC sobre ciudades inteligentes

e) Technical Studies

- Ciudades y Ciudadanos en 2033

- Validate the friendliness of the approach as a collaborative tool in planning processes

- Illustrate the impact of complex urban operational processes and unexpected change factors into the urban system

- Identify cause-effect relationships among subsystems

- Determine the role of stakeholders in the system's dynamics

- Establish sets of indicators for each subsystem

- Plug-in quantitative models

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