



Smart Cities

Best Practices of Efficient, Sustainable and High Life Quality Cities:
Fernando Tomás, Smart Cities Group of IDOM



Transport in Smart Cities

Vilnius, 11 June 2014

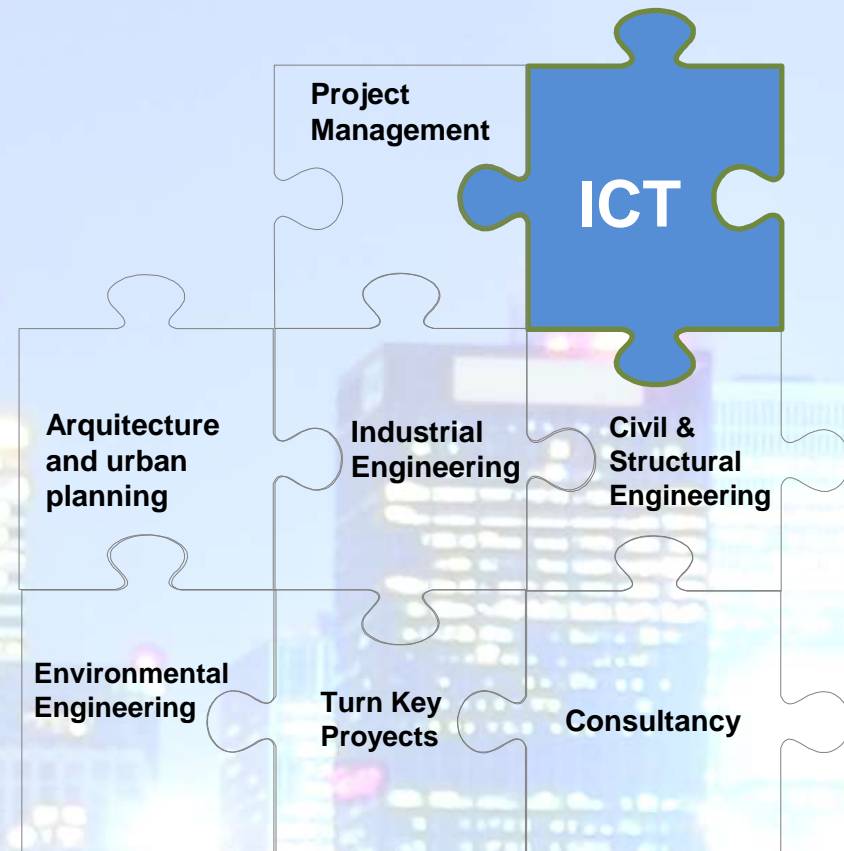
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About IDOM

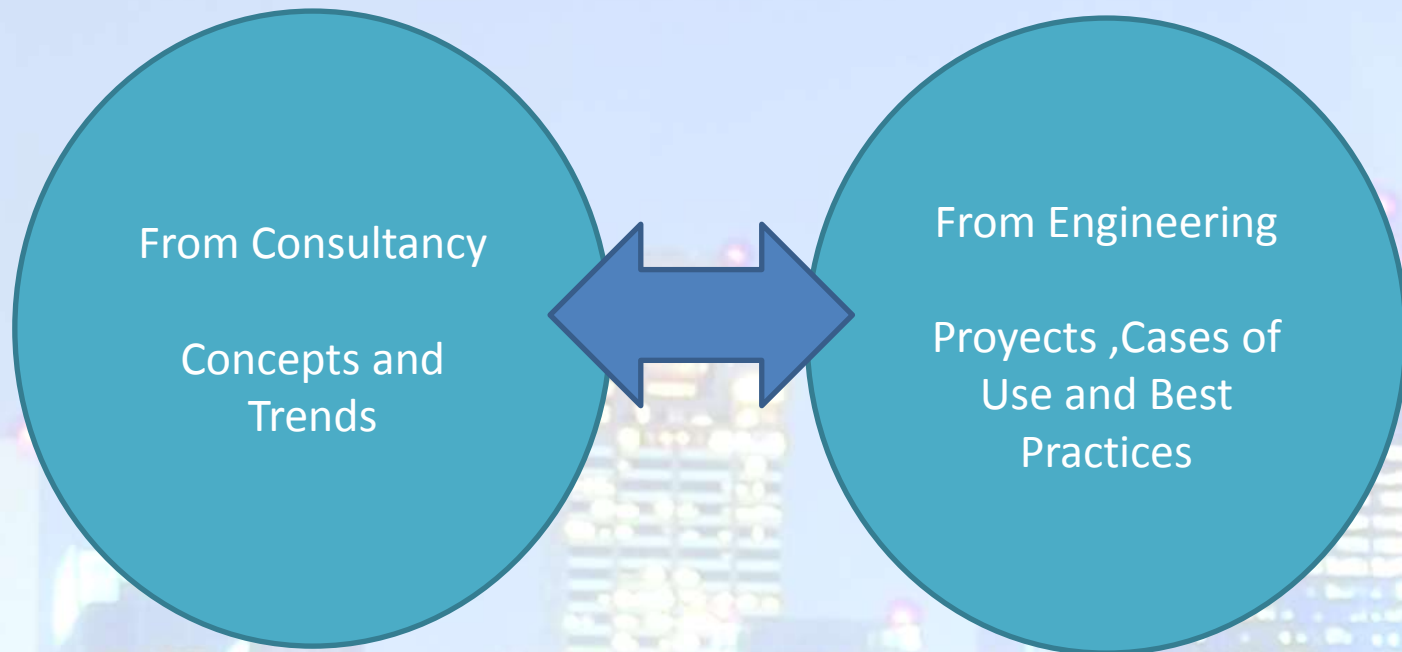
About IDOM

- Professional services
- Engineering, Consultancy and Architecture
- Founded in 1957
- Association of Professionals
- Over 2.400 Professionals
- Offices in 14 countries
- Projects in more than 100 countries



About IDOM

Smart Cities. IDOM's Vision



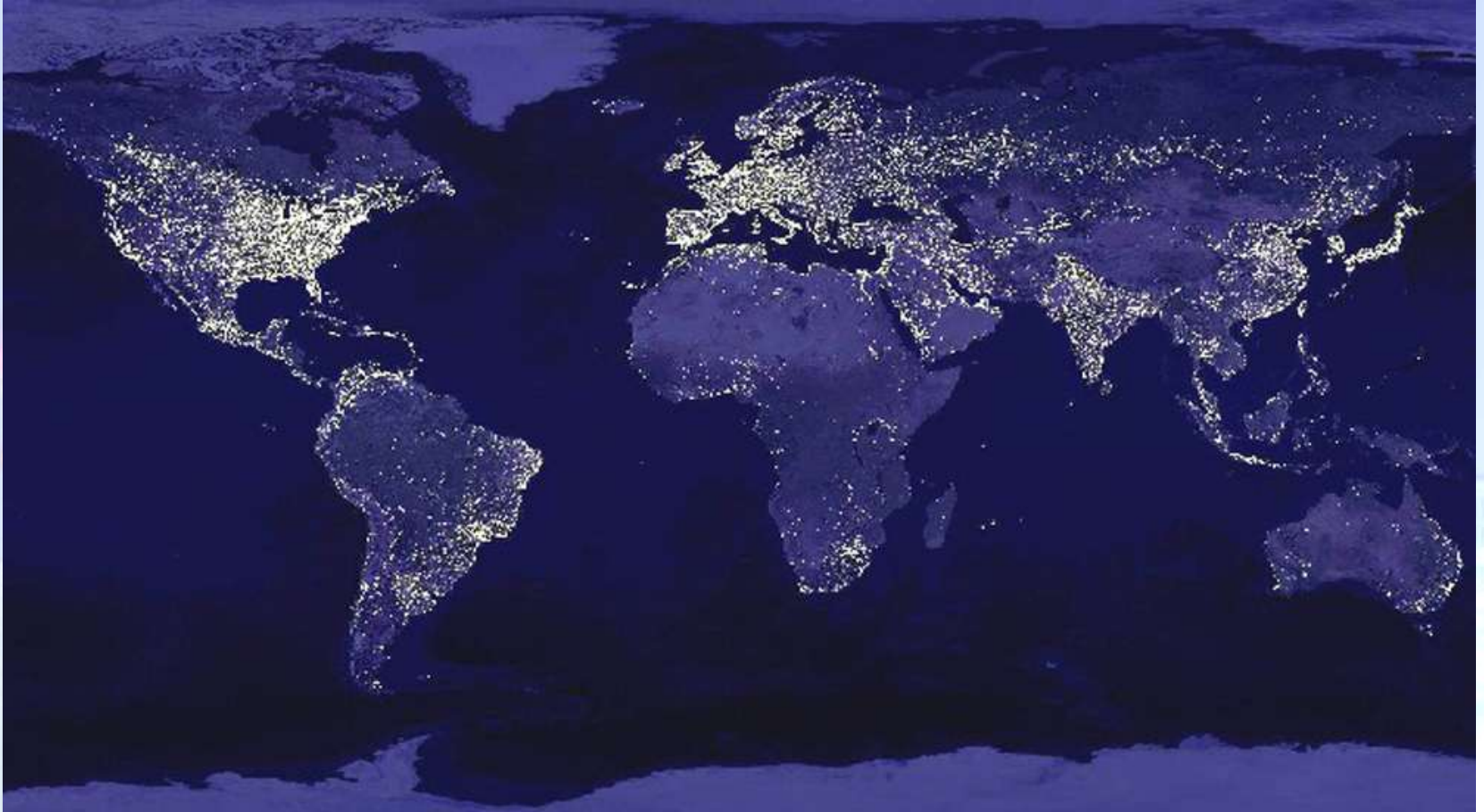
From concept to real implementation
From experience to knowledge

Reference works

- Electric Vehicle Charging Point deployment
- Light Rail Projects (Bilbao, Lund, Cuenca, Murcia)
- BRT Projects (Aguascalientes, Castellón)
- Metro Projects (Bogotá, Riyad, Hanoi, Ho Chi Minh)
- Ticketing and Integrated Payment Systems with Intelligent card
- MARTA project: R&D in intelligent mobility
- ECOTRANS project: R&D in hydrogen mobility
- Carbon Footprint calculations in San Sebastián
- Mobility Management Plan of Bilbao
- Deployment of sensor networks in Smart Santander
- Definition of the Smart City Strategy for Pamplona
- Milla Digital Project & Wi-Fi for the citizens in Zaragoza
- Next Generation Access Network (Igualada, Barcelona)
- Sustainable Urban Development in Mexico
- Energy Efficient Refurbishment of buildings
- Smart Meters Deployment in Andalucía

What is a Smart City?

¿How is the world today?



Urban and Connected

How is the world today?

Some Figures

- We are more than **7.000.000.000** people today on Earth (3 times more than only 80 years ago).
- The urban surface occupy only 1,5% of the land were human being can live. (No oceans, desserts, poles, jungles, or high mountains are taken into account)
- More than 50% of global population live in cities (And is expected to be 70% in 2050)

So we like cities, but are they efficient?

- The cost of traffic jams is between 1%-3% of the GPD
- Cities consume 2/3 of the global energy
- Cities generates 80% of the CO₂
- 60% of the drinking water is lost in network leaks

How are cities today?



But, What do we think an Smart City is?

Brand new concept, related to:



Local Governments,
that look for
Efficiency, and new
services to offer to
the citizens



The citizens. Their
vision of the city,
what they want and
their implication in
the process are
essential



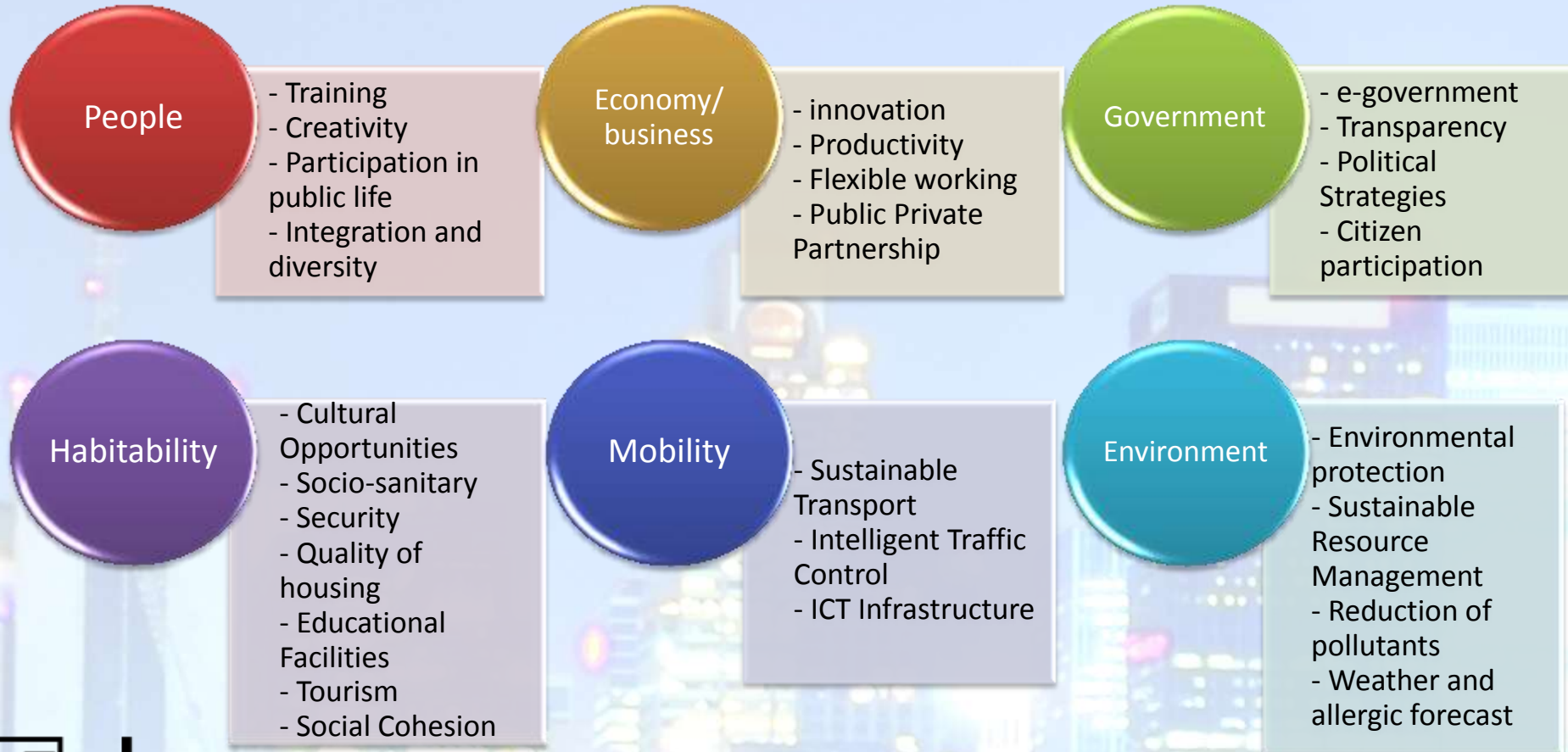
**Energy efficiency and
sustainability.**
Cities can do things
better in
environmental issues.

**Information and
Communication
Technologies (ICT)**
will support and easy
the implementation
of the services



Smart City Areas

A Smart City may consider different areas or environments in the city depending on the services it offers.
Coordinated and coherent development of all of them will identify a smart city.



Key aspect 1. Enhance the potential

The approach of each city to its «Smart City Project» will depend on:

- Its physical environment
- The citizens
- Commercial and Cultural Networks
- Historical Issues

Expressed in TTT:

Technology, Talent and Territory.

There is not a model to be implemented worldwide,
Each city has to discover its own way

Key aspect 2. Win! Earn! Gain!

The implementation of the Smart City approach depends on

PROFITABILITY

- Savings
- New Revenues
- Employment generation

And don't forget the **IDENTITY**



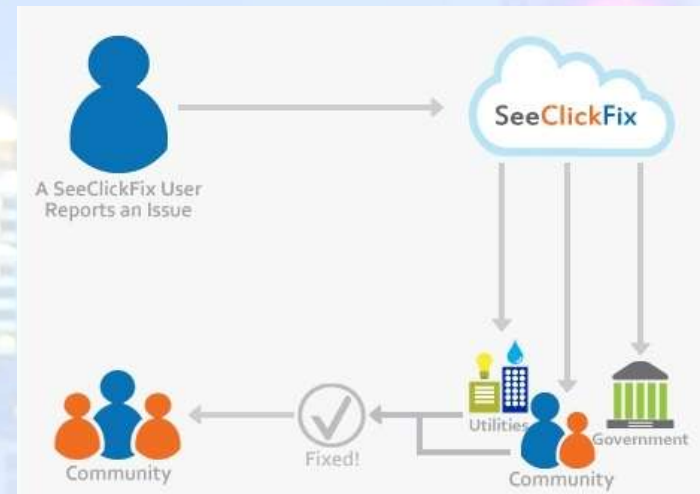
Key aspect 3. Don't forget the citizens!

The citizen as:

- Demand generator
- Services Consumer
- Solution Provider** ← This is new

-And eventually, the citizen is also the «sensor»

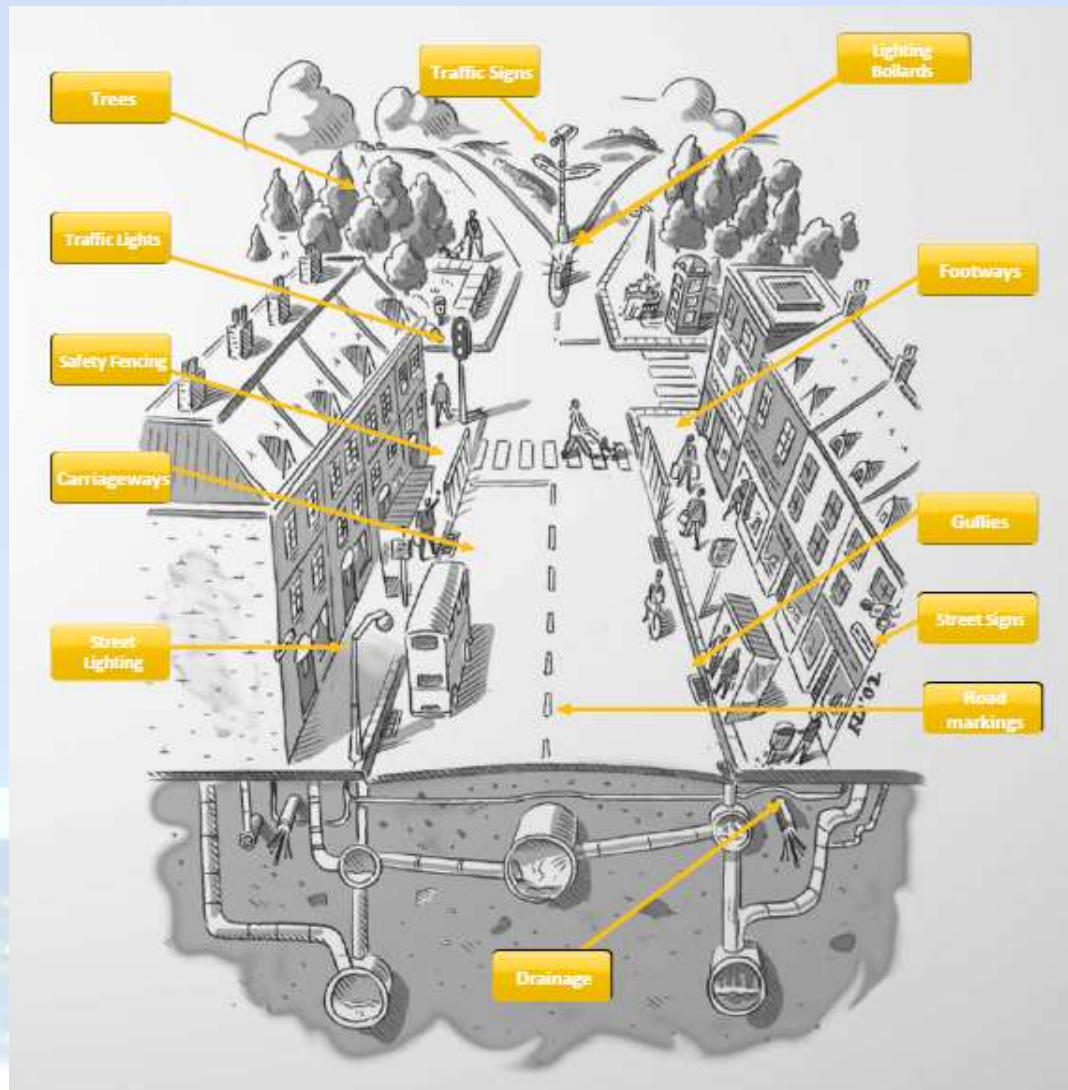
The screenshot shows the NYC BigApps website. At the top, there is a navigation bar with 'Login | Register | Q+A' and a 'FOLLOW US ON twitter' button. Below the navigation, there are tabs for 'OVERVIEW', 'SUBMIT YOUR ENTRY', 'APPLICATION GALLERY', and 'BLOG'. The main content area features a green box with the text: 'A software application challenge in keeping with New York City's drive to become more transparent, accessible, and accountable. \$20,000 in cash prizes. Plus lunch with The Mayor and tons of public appreciation.*' To the right, there is a section for '6,920 SUPPORT THIS INITIATIVE' with a red button that says 'I support this tool' and a 'Why Click?' link. At the bottom, there are social media links for 'Promote this challenge:' and a 'Recent Supporters:' list with 'kanika S., Indonesia'.



Our definition of Smart City

Smart City is the one who uses the data generated in its daily operation to generate **new information** that enables **better management, sustainability** and **competitiveness** and therefore **high quality of life** for its citizens, who actively collaborate in the whole process.

Which systems can be «Smarter»?



Which systems can be «Smarter»? And how?

City System	Examples of Smart Solutions
Transportation	Sensors and analytics technologies that predict the arrival of trains, buses or other public transportation options; parking information solutions and send alerts about space availability or expired meters; fleet management system with an eye toward proactive maintenance.
Healthcare	Applications including telemedicine, electronic records management, health information exchanges, and hospital and clinic asset management.
Education	E-learning and connected campus technologies, including content management and unified communications.
Public Safety & Security	Sensor-activated video surveillance systems; enhanced 911 systems that automatically identify the caller's location.
Building Management	Smart meters and monitoring devices that help monitor and manage water consumption, heating, air-conditioning, lighting and physical security technologies.
City Administration	Automated workflow applications for everything from registering a business to renewing a driver's license.
Waste Management	Sensors that detect when trash pick-ups are needed or that notify authorities about landfill toxicity.
	SOURCE: FORRESTER RESEARCH

We already have most of this!

Services like:

- Lighting
- Security
- Waste Management
- Power Supply
- Water Supply
- Traffic
- Public transport

Are managed by intelligent systems today in many cities.

¿What is the new stuff?

A block diagram of the Smart City

A Smart City:

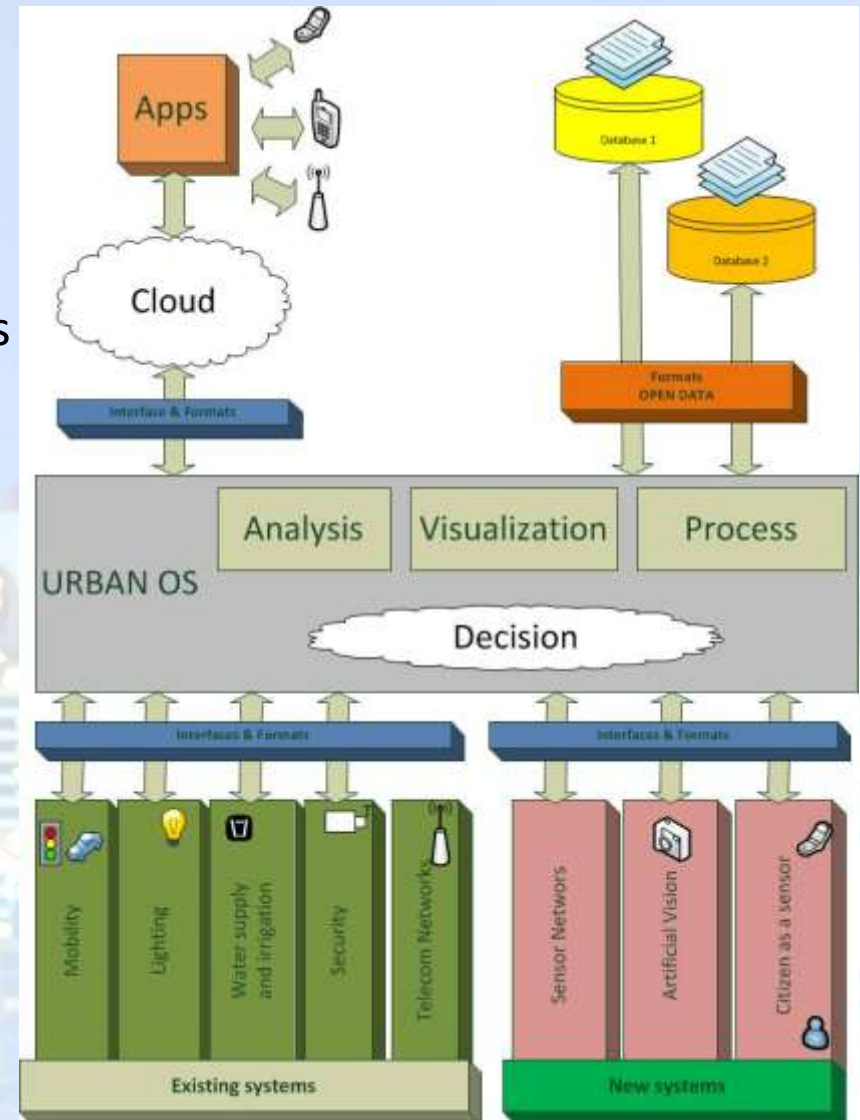
- Integrates existing services
- Is ready to implement new services almost plug&play
- Generates and uses its own databases and uses third party generated ones.

Obtaining results:

- Better management of the city
- Creation of an innovation ecosystem
- Collaboration

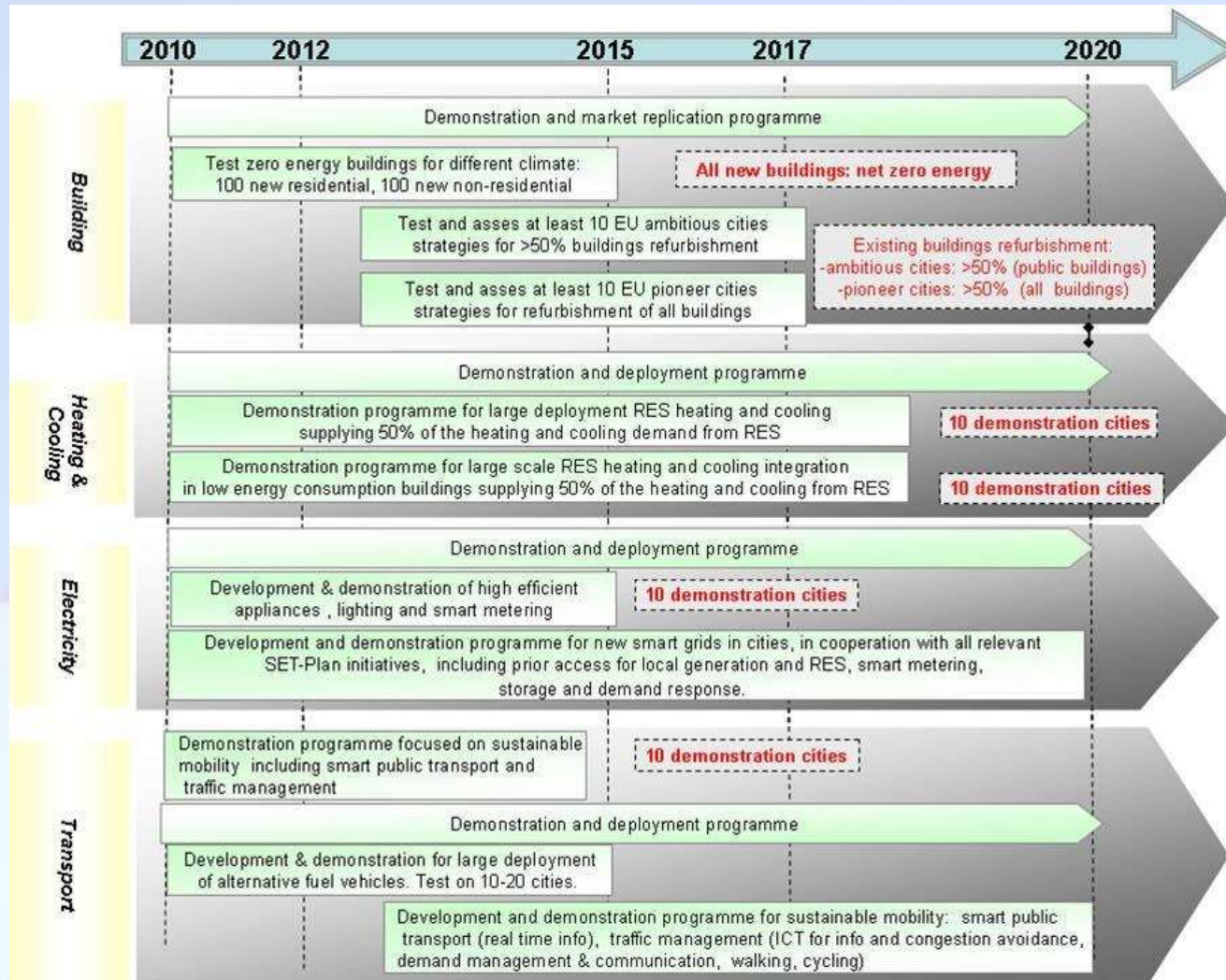
Main fields of development:

- Data formats
- Interfaces
- Urban OS



Context in Europe

The European Initiative on Smart Cities



Initiatives: The covenant of Mayors



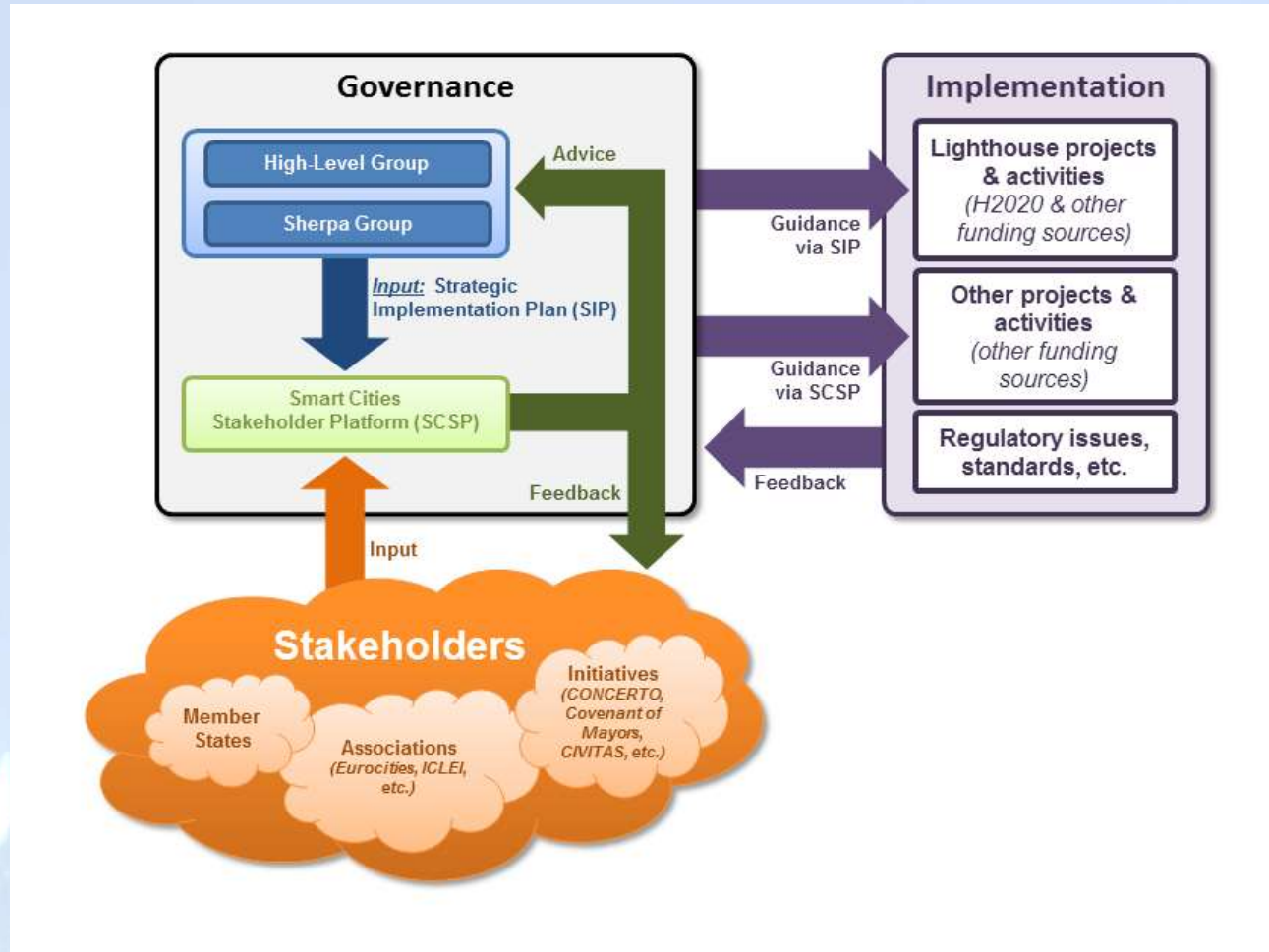
Initiatives: EU Directive 20-20-20



- 20% more efficient
- 20% carbon emissions reduction
- 20% renewable generation



Initiatives: EIP Smart Cities and Communities

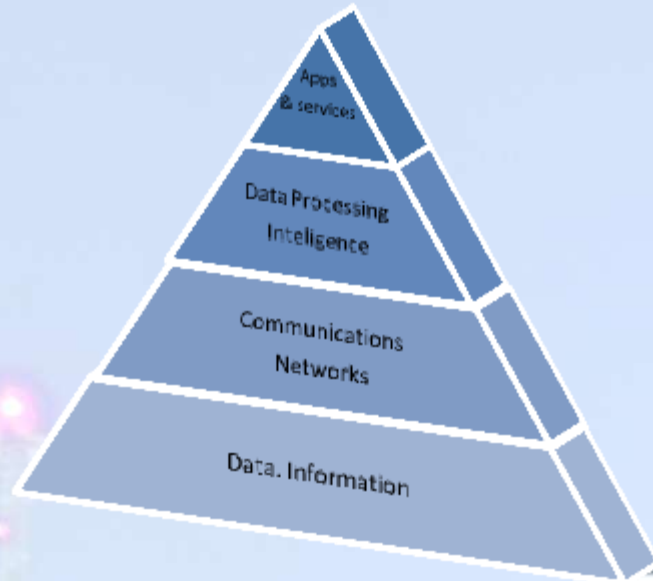


Key elements of the Smart City and their roles

The role of Energy in the Smart City projects

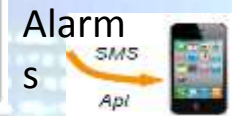
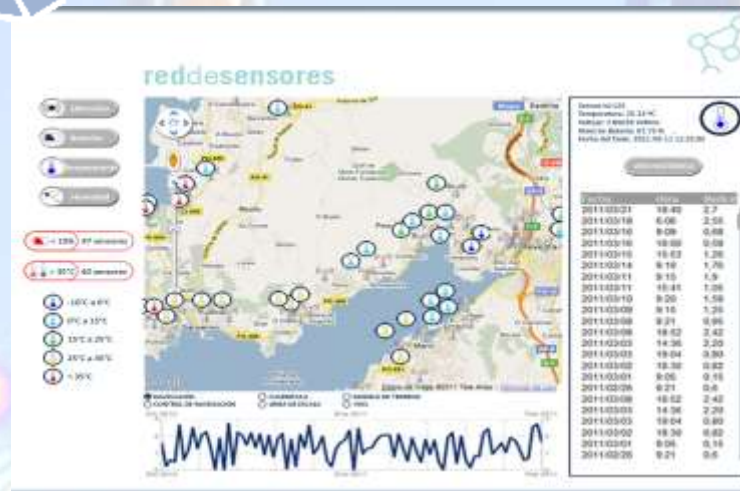
- Energy is expensive to obtain: Many investing funds dedicated to R&D oriented to energy generation and energy efficiency. The cities offer the perfect environment to test this innovation in real environments.
- Although most of the projects want to probe technologies related to Energy: Smart Grids, Electric Car, Renewable Sources, LED lighting, Adaptive Lighting, etc.
- This technologies require ICT in order to manage them
- Funding for the Smart City technologies are obtained (not only but) from energy savings and operation efficiency.

The role of IC Technologies



Source: BBVA

ICT as the glue and the facilitator of new urban developments



The role of Transport

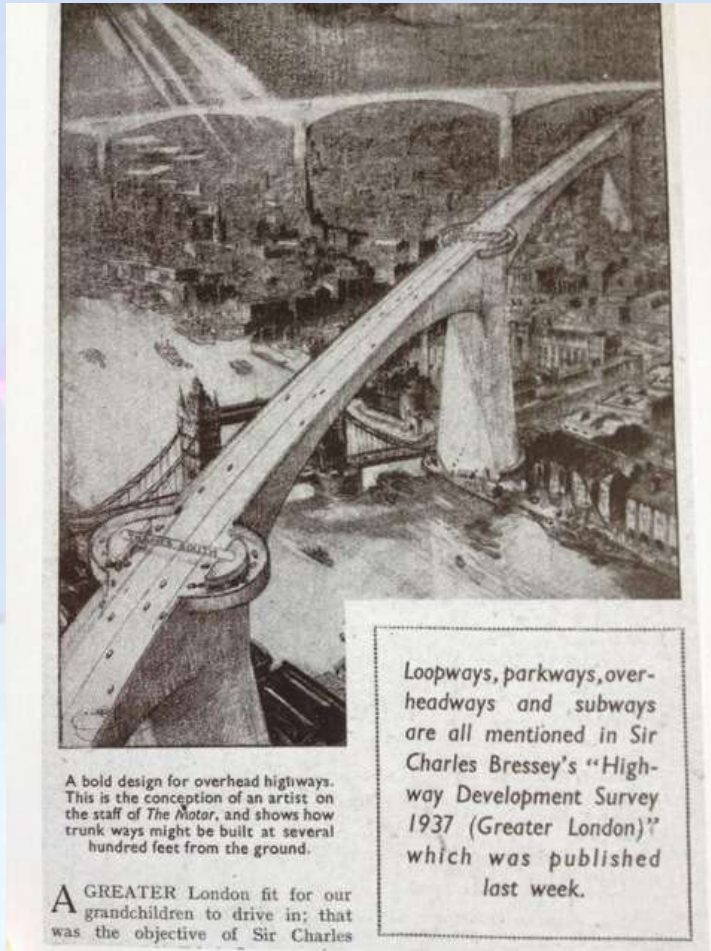
- Enhance mobility
- Reduce CO2 emissions
- Gain public space for the city



Mobility and Transport are felt essential in quality of life perception

Mobility in the Smart City

Mobility in the Smart Cities



Traffic Management

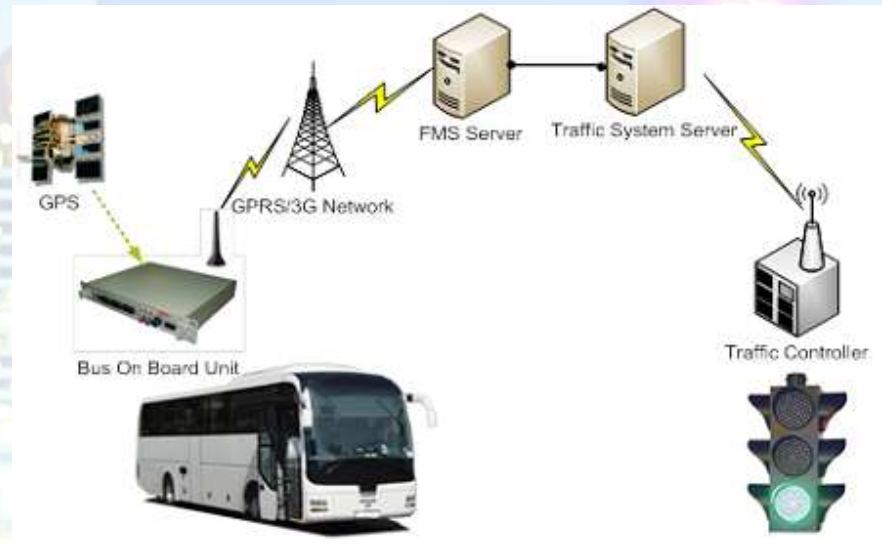
Improvements in Traffic Management Centers

- Automatic Incident Detection
- Priority Schemes
- Traffic responsive policies



That come together with

- Camera deployment
- Sensors deployment
- Broadband networks required



Traffic Management

Demand Management

Demand Management: Stockholm's urban toll

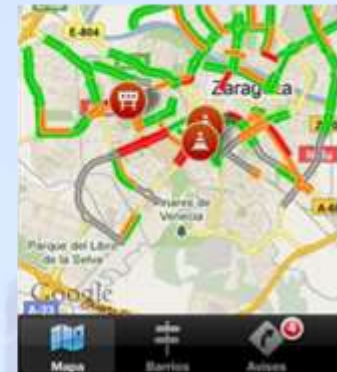


Interaction type: Infraestructure- Vehicle
Technology: Artificial vision (pasive)
Architecture: Centralized

Traffic Management

Demand Management

Demand Management: Route time calculation in Zaragoza



Interaction type: Infraestructure- Vehicle
Technology: Bluetooth dialogue. Interaction.
Architecture: Centralized

Public Transport

High capacity modes even in medium cities

Tramway (Light rail): PROS More capacity, cleaner, less noisy. CON Higher costs
BRT: PROS Faster to implement, Lowest Cost CON: Less capacity, noise, pollution



Public Transport

Integrated ticketing
and payment schemes
can be used together in
other urban services



Parking Management

15% of traffic in city centres is people looking for a parking spot

- On-surface
- Underground
- Free Spot Detection
- Park meters
- Guidance Systems

On Street Parking management in Smart Santander



Interaction type: Infraestructure- Infraestructure

Technology: Magnetic Detection. M2M link

Architecture: : Decentralized

Parking Management



Alternative Modes

Sometimes cities can develop
Transport modes fitted to its own
geographic constraints



New Actors

- Car Sharing
- Public bike schemes
- Connected car



eMobility



Trending Topics

- Opendata
- OpenInnovation
- Sensors
- Apps
- Social Networks
- Urban OS
- Conectivity
- Efficiency
- Savings
- Competitiveness
- Excelence
- PPP
- Internet of Things
- Smart grid
- Smart Metering
- Participations
- Electric mobility



Thank you!



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