Future Networks in Barcelona

Ajuntament de Barcelona

**5G Deployment:
Vision, focus and projects of the
City of Barcelona**

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Vision

COMMON CITY

CREATIVE CITY

CIRCULAR CITY

DEMOCRATIC CITY

The city of people

Technology as an enabler for:

- ✓ Urban mobility more efficient and sustainable
- ✓ Environmental sustainability
- ✓ Business-friendly and attracting capital
- ✓ Integration and social cohesion
- ✓ Communication and proximity with people
- ✓ Knowledge, creativity and innovation
- ✓ Transparency and democratic culture
- ✓ Universal access to culture, education and health care
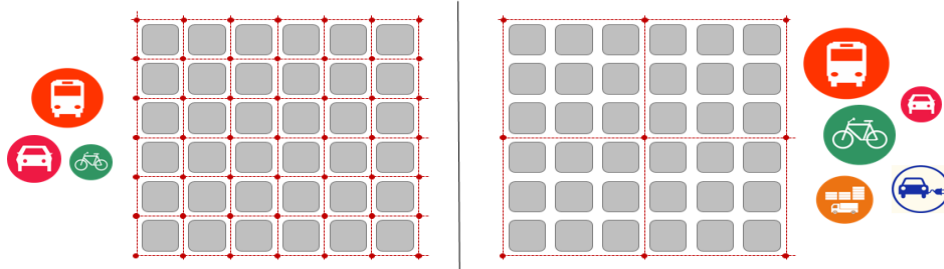
Improve citizens' welfare and quality of life

Economic progress

Our Urban Model: Macroblok Project

CONCEPT

The superblocks are defined theoretically as an "area of urban organization, from which a series of structured transformation strategies towards a new urban model, where mobility and reorganization of public space represent the first step".

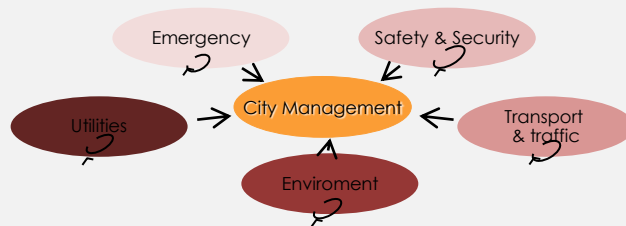Inside the superblocks the traffic and the environmental pollution (noise and gas) are reduced.

SERVICES

Each Macroblock is based on a combination of City user services (US).
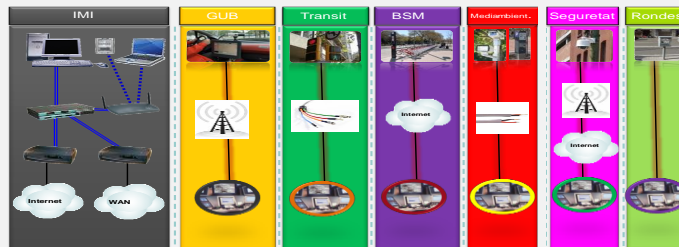
Each US is composed by elements (Basic City Services).

ICT New Paradigms

From Nightmare...

Resources Vertical Management

Today: Vertical Aplications

... To Paradise

Dinamic Management of Services

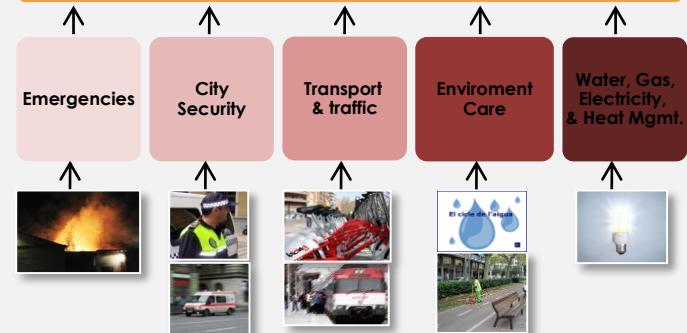**Bidireccional Relationship** between citizens and Administration

Common Data Warehousing & Use of Open Data

Infrastructure

Optical & Wireless integration to enlarge capillarity. Barcelona City Council as own ICT Operator

City fiber infrastructure:
- Barcelona City Council property. Started in 1994.
- High capacity (100 Mbps to 10 Gbps/MPLS)
- >900 Km optical fiber
- Deployed through: Subway tunnels, Services galleries, Sewer system and PPP with telecom operators

City wireless infrastructure:
- Barcelona City Council property. Started in 2007.
- >600 WIFI / WIMAX Routers (30% urban area)
- >2000 WIFI Indoor Nodes
- Deployed through city council poles and premises

Complementary Actions:
- Each civil work in city implies installation of ducts, dark fiber, sensors, networking and wireless devices.
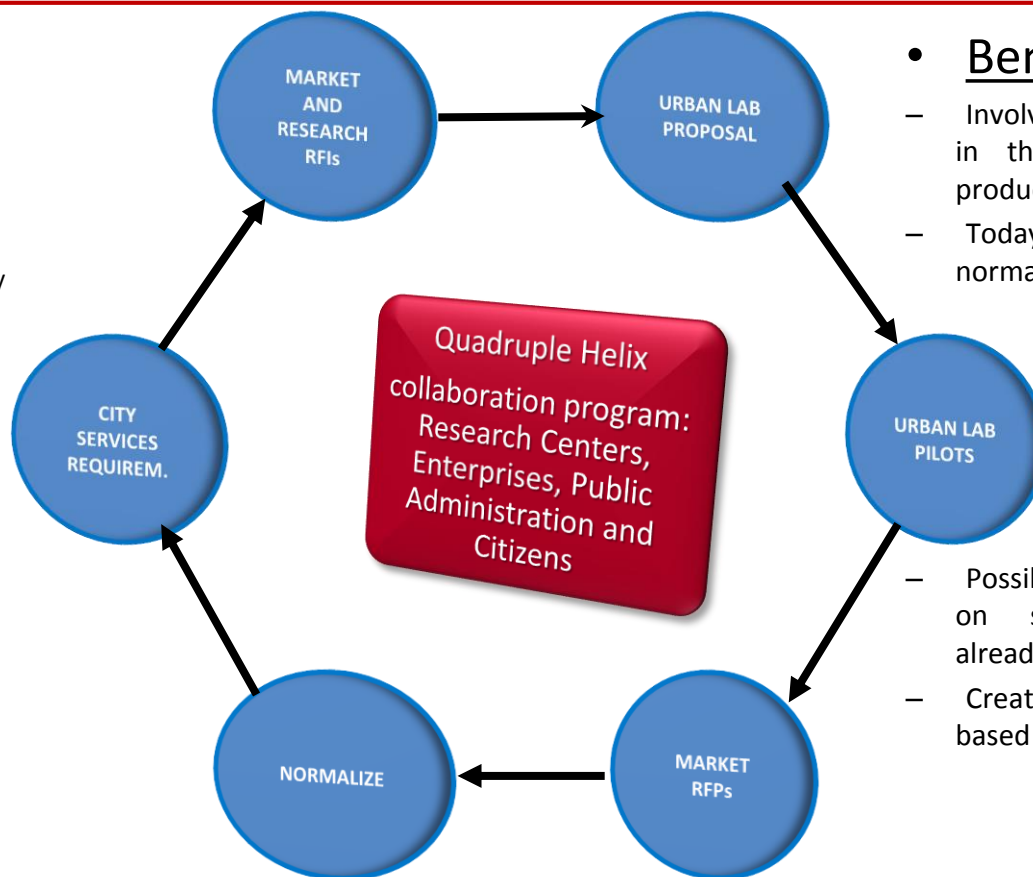- FTTH Deployment extended to almost all the urban city
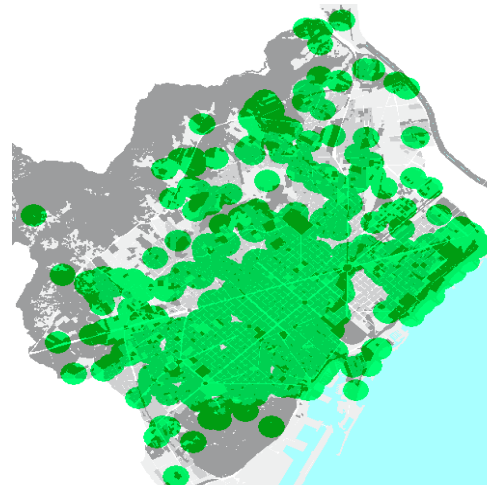
GOAL — **Maximum coverage to allow easy service deployment in the city**

- ## How works:
- Once the proposal is accepted, the municipality assigns a project manager, who will:
- ✓ Study and agree on the feasibility of the proposed project.
- ✓ Facilitate the access to the infrastructures
- ✓ Negotiate with local contractors installation and maintenance for proposed living lab.
- ✓ Participate in results analisis
- Costs associated with the project are not covered by the municipality.
- However, if project have interest for BCN we provide funding programs in order to collaborate with entities.

MARKET AND RESEARCH RFIs

URBAN LAB PROPOSAL

CITY SERVICES REQUIREM.

Quadruple Helix collaboration program: Research Centers, Enterprises, Public Administration and Citizens

URBAN LAB PILOTS

NORMALIZE

MARKET RFPs

- ## Benefits
- – Involvement of city-knowledge in the development of new products and research actions.
- – Today integrated in all city and normal operations.

- – Possibility of generating patents on state-of-the-art products already tested in a city.
- – Creation of economical activity based in these actions

Based in Innovative Public Procurement of EU!!!

5G Technology is coming but not mature, so it is difficult to evaluate cities and citizens impact.
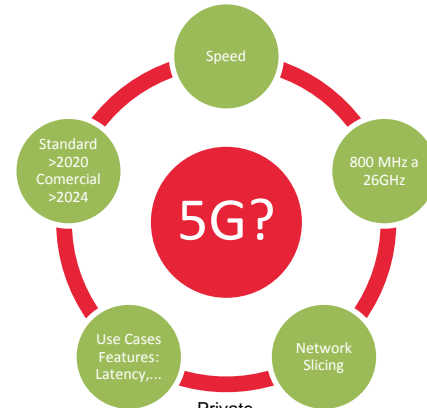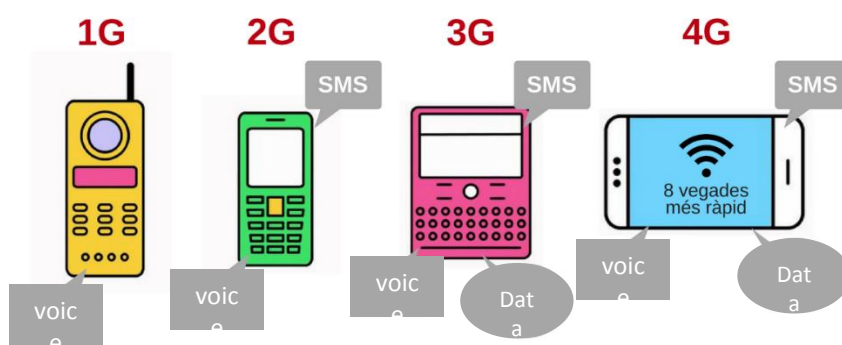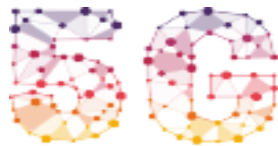

OPEN issues:

- USE cases paradigma. Speed? Latency?
- Macrostations vs Smallcells / Terminal Technology
- How integrate Legacy? Devices Reduction?
- Worldwide Massive Impact in Technology and Society
  - What about:
    - Digital Divide?,
    - Enviroment Impact?
    - Urban Furniture and Radomos?

Organize a PPP Working Group

5GBarcelona is a public-private initiative working to transform the metropolitan area of Barcelona into an **open and neutral city-wide lab** for the validation and adoption of 5G technologies and verticals in a real-life environment.The initiative is powered by

Current Use Cases under development in 5GBarcelona

Industry 4.0 (mMTC)

Health – Ambulance (Multi-connectivity)

Health – Assisted Surgery (URLLC)

Connected Car (MEC – low latency)

Public Transport (5GPICTURE - mmWave)
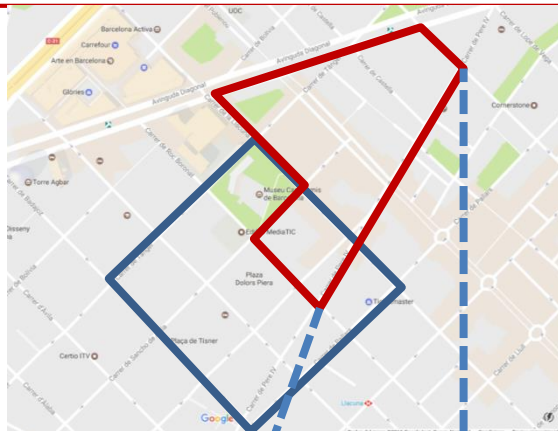

Remote Media Production (5GCITY – Infra. Slicing)

Goal: cross-sector 5GBarcelona use cases and possibility to use existing pre-5G infrastructure
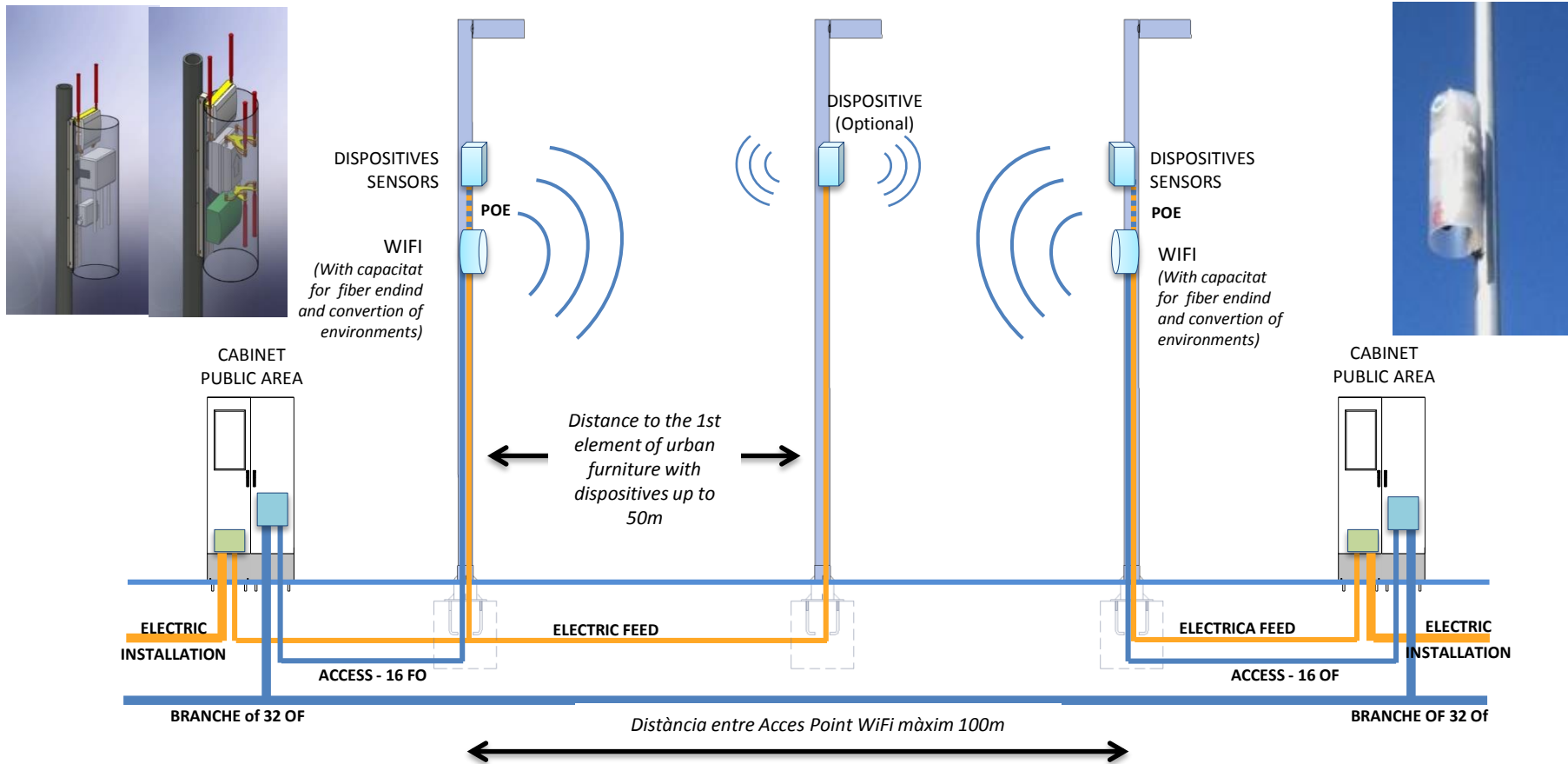
- Close of testbed Area (in red), City is deploying a Macroblock project included in Urbanism City Plans and funded by City. Several projects will be deployed in this area with additional Funds from different programs:

  - **Growsmarter provides multifunctional pole**

  - **FLAME (H2020 Topic ICT-08-2017/Grant Agreement 731677) :** Develop advanced IT city infrastructures to validate future internet media services. City Perspective: MEC Servers Hierarchy (Pole, Cabinet,…)

  - **5G-CITY (H2020 Topic ICT-2016-2/Grant Agreement 761508):** Develop the concept of 5G small cell neutral operator, from a city centric perspective. City Perspective: Urban Furniture Antena Integration for Small Cells and Neutral Operator as driver to fight Digital Divide

Normalize and its integration with ITC at public space

DISPOSITIVE
(Optional)

DISPOSITIVES
SENSORS

POE

WIFI
(With capacitat for fiber endind and convertion of environments)

DISPOSITIVES
SENSORS

POE

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CABINET
PUBLIC AREA

CABINET
PUBLIC AREA

Distance to the 1st element of urban furniture with dispositives up to 50m

ELECTRIC
INSTALLATION

ELECTRIC FEED

ELECTRICA FEED

ELECTRIC
INSTALLATION

ACCESS - 16 FO

ACCESS - 16 OF

BRANCHE of 32 OF

Distància entre Acces Point WiFi màxim 100m

BRANCHE OF 32 Of

Defining Scenarios and Use Cases for Neutral Operator

Oveview of FLAME testbed

5GCITY: A DISTRIBUTED CLOUD & RADIO PLATFORM FOR 5G NEUTRAL HOSTS

Challenge: Develop the concept of neutral operator, from a city centric perspective.
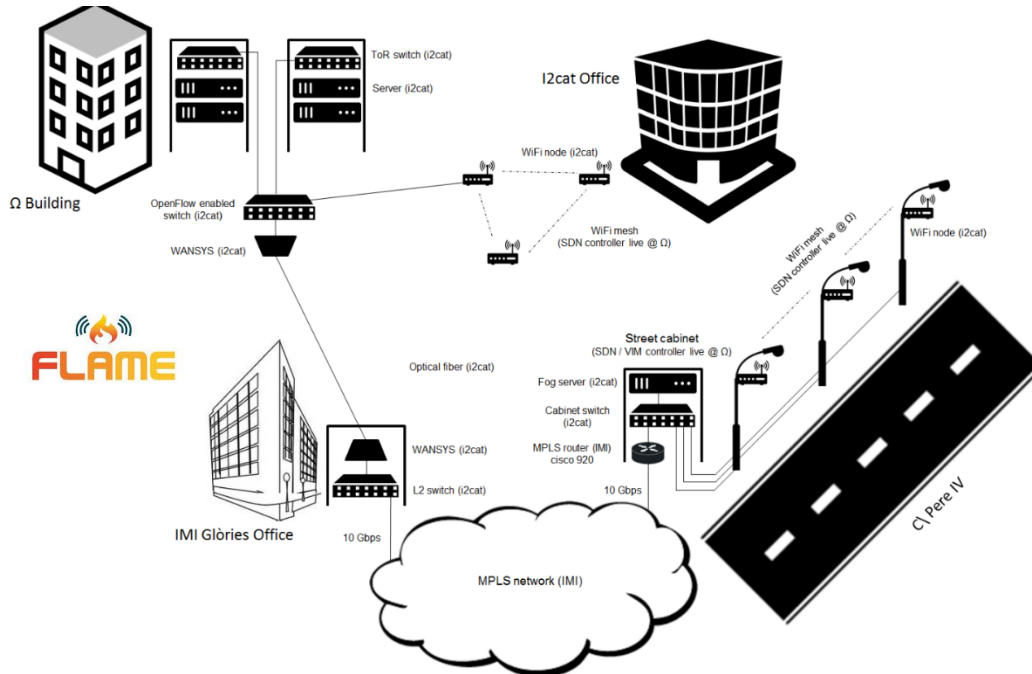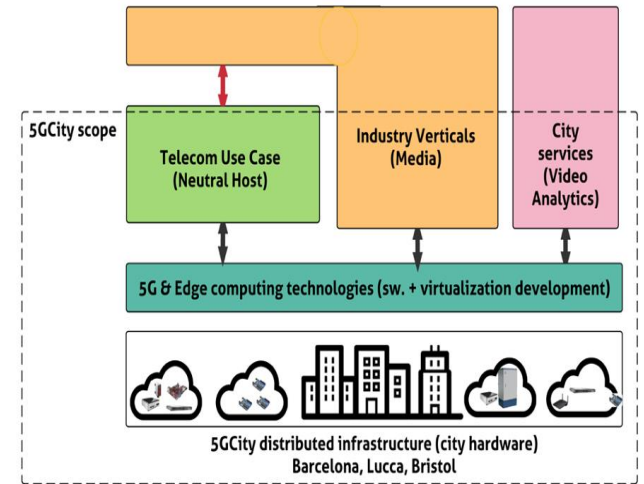That means: Urban Furniture Antena Integration for Small Cells and Neutral Operator as driver to fight Digital Divide

City Council Role

Vision: 5G is a new twchnology with expected impact in services and infraestructure. So it is key for cities participate in its definition and Deployment under a PPP and citizen friendly perspective.

Mision: Drive 5G deployments to enforce Barcelona challenges: equity, circular economy, open and sustainable. That means several action points:

1. Promoting 5G tecnologies in its Deployment,

2. Regulating use of públic space and urban furniture integration,

3. Testing Neutral Operator Concept from infrastructure and host perspective as tool to fight against digital divide caused by coverage.

4. Early Adopter of 5G tecnologies in City Services, preventing application digital divide

5. As a consequence improve Operation and Maintenance of new implementations

6. And finally ...

And Finally providing info to standardization bodies via direct report and/or UNE CTN 178 WGs

ISO/TC268
"Sustainable Development in Communities"

ISO 37120: Indicators for City Services and Quality of Life (PUBLICADA)
ISO/TR 37150: Smart Community Infrastructures. Review of existing activities relevant to metrics(PUBLICADA).
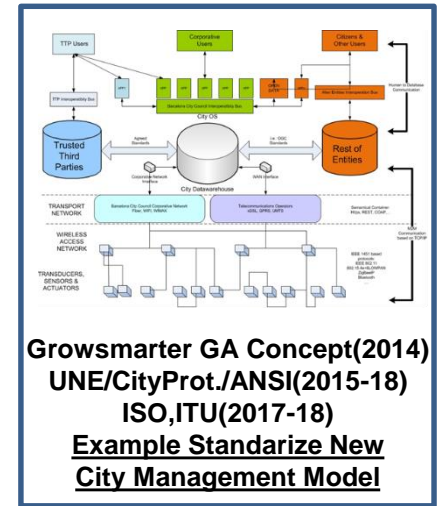
International Electrotechnical Commission

SEG
"Strategic Evaluation Group on Smart Cities"

International Telecommunication Union

FG-SSC
ITU-Focus Group on Smart Cities SG20

Y.SC-platform"Platform Interoperability for Smart Cities & Communities"

SSCC-CG
"Smart Cities Coordination Group on Smart and Sustainable Cities and Communities"

EU Related Organizations

Growsmarter GA Concept(2014)
UNE/CityProt./ANSI(2015-18)
ISO,ITU(2017-18)
Example Standarize New City Management Model

We expect participate in 5G as Y.4000,4100&4200 family Rec

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