TRENDS IN SMART CITY INFRASTRUCTURES

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Thanks to
Jan Höller, Péter Mátray
and many others

VATICAN CITY 2005

POPE BENEDICT XVI SUCCEEDING JOHN PAUL II

VATICAN CITY 2013

POPE FRANCIS SUCCEEDING BENEDICT XVI

SMART CITY

Dozens of definitions

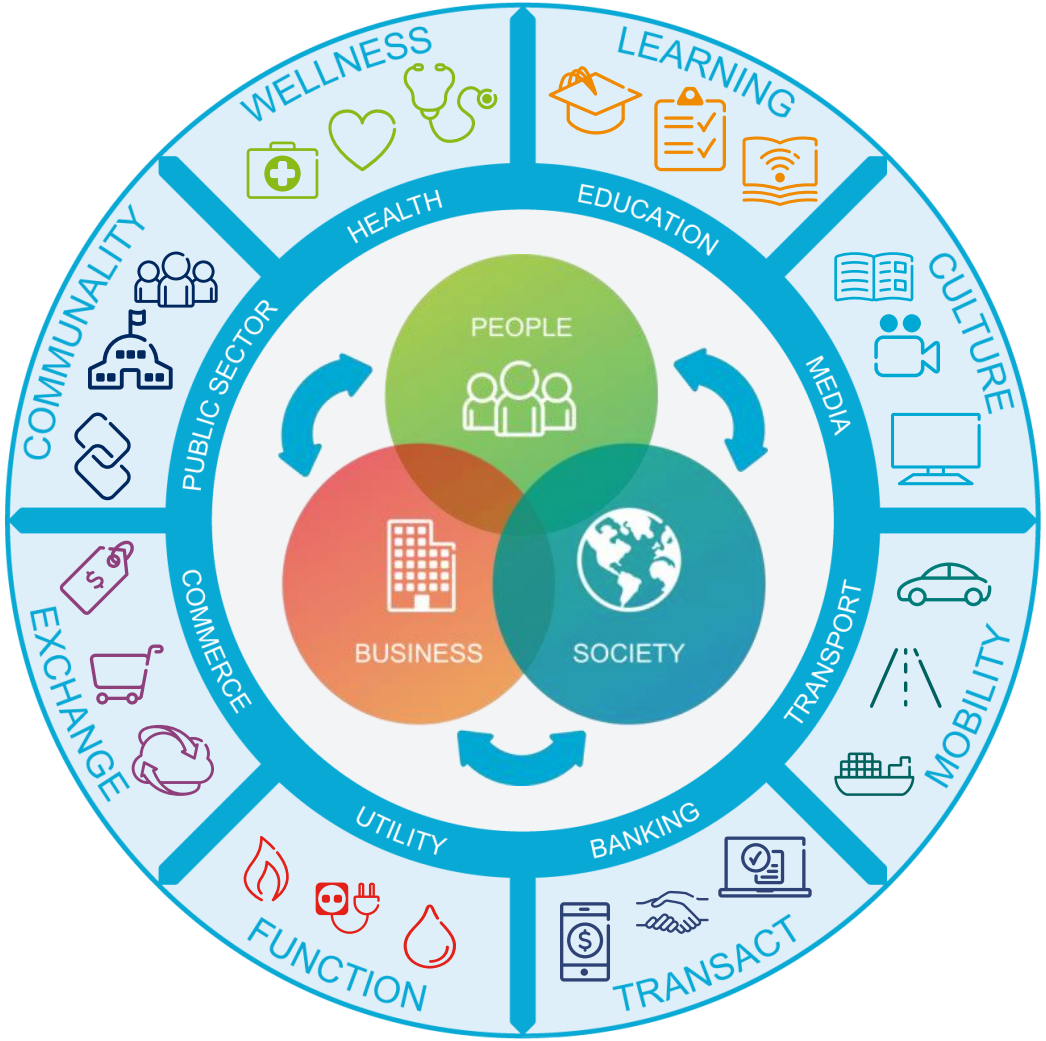
Not dumb ≠ smart

Smart city
has well organized infrastructure,
is well operated,
cooperates with all interested parties

TOWARDS BILLIONS OF CONNECTED THINGS

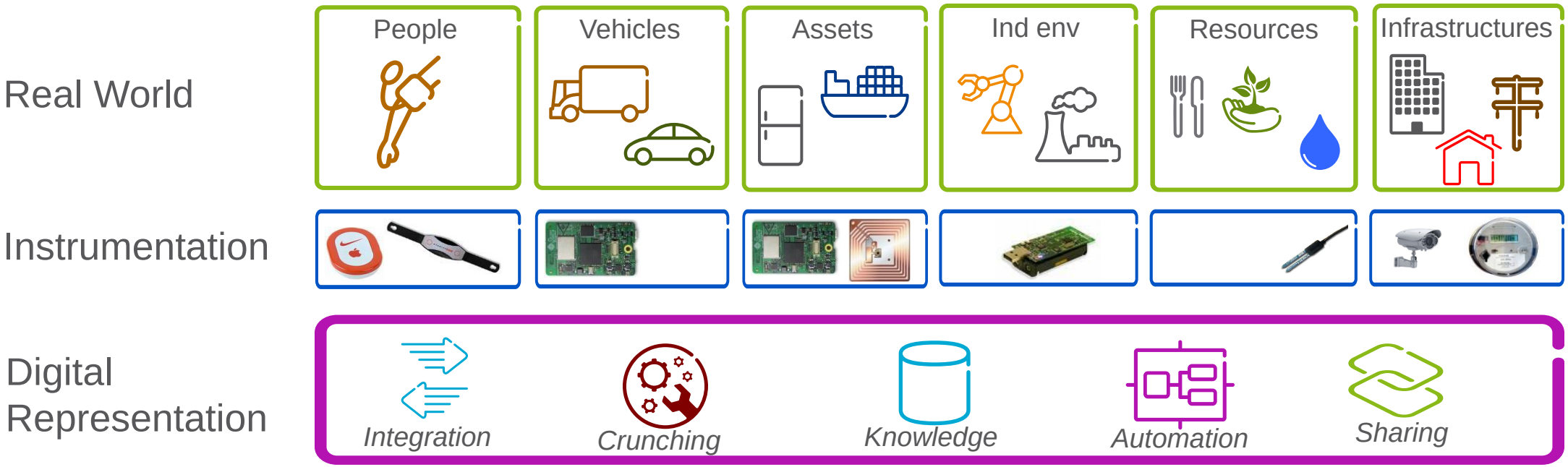
TRANSFORMATION - BIG PICTURE

- POWER SHIFT
- RESOURCES
- TECHNOLOGY
- ENVIRONMENT
- URBANIZATION



- INTERNET OF THINGS
- DATA AND INSIGHTS
- SOCIAL MEDIA
- CLOUD AND NETWORKS
- OPEN INNOVATION

WHAT DOES IT TAKE IN PRACTICE?



MOVING TO HORIZONTAL APPROACH

Today

point problem

stove pipe solutions

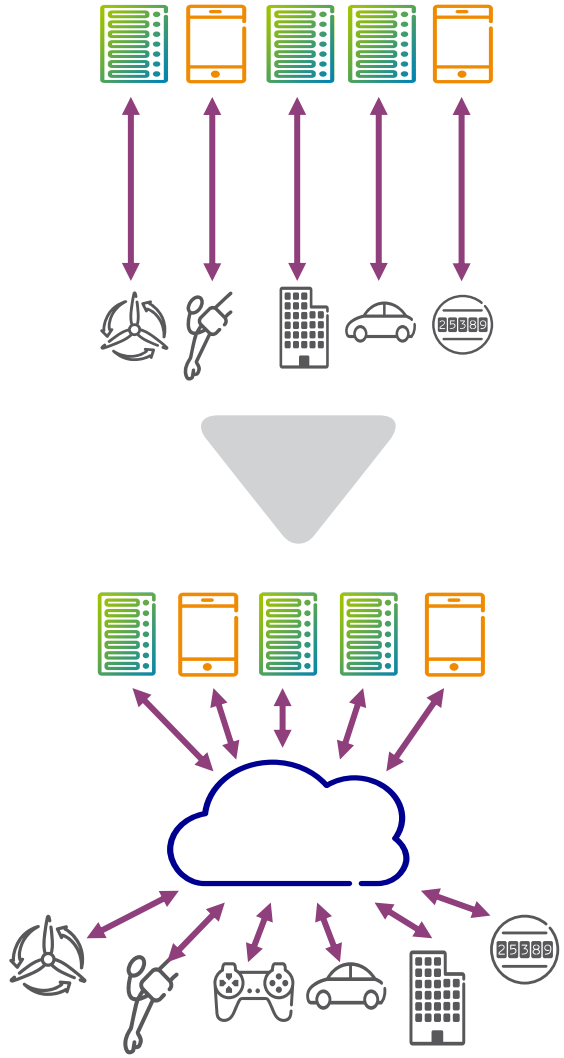
one device type - one app

specific and proprietary technologies

in-house IT

device and connectivity focus

no data sharing



Tomorrow

complex problems

horizontal approach

multi-purpose devices

app innovation

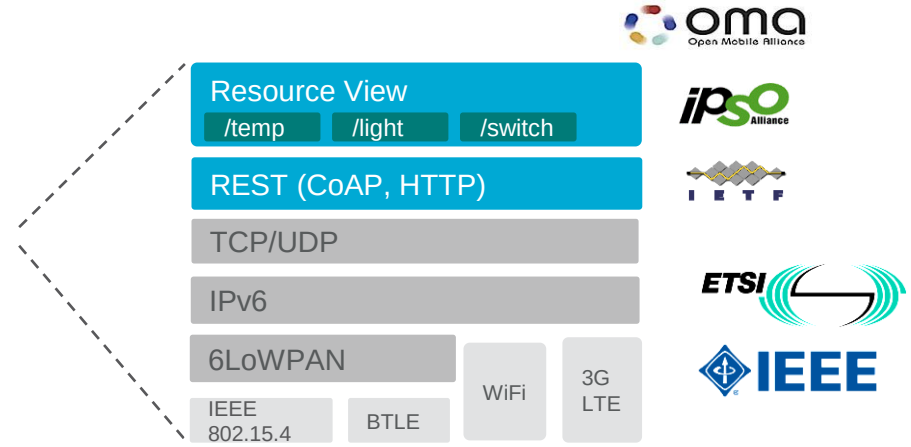
open standards

data and information driven automation

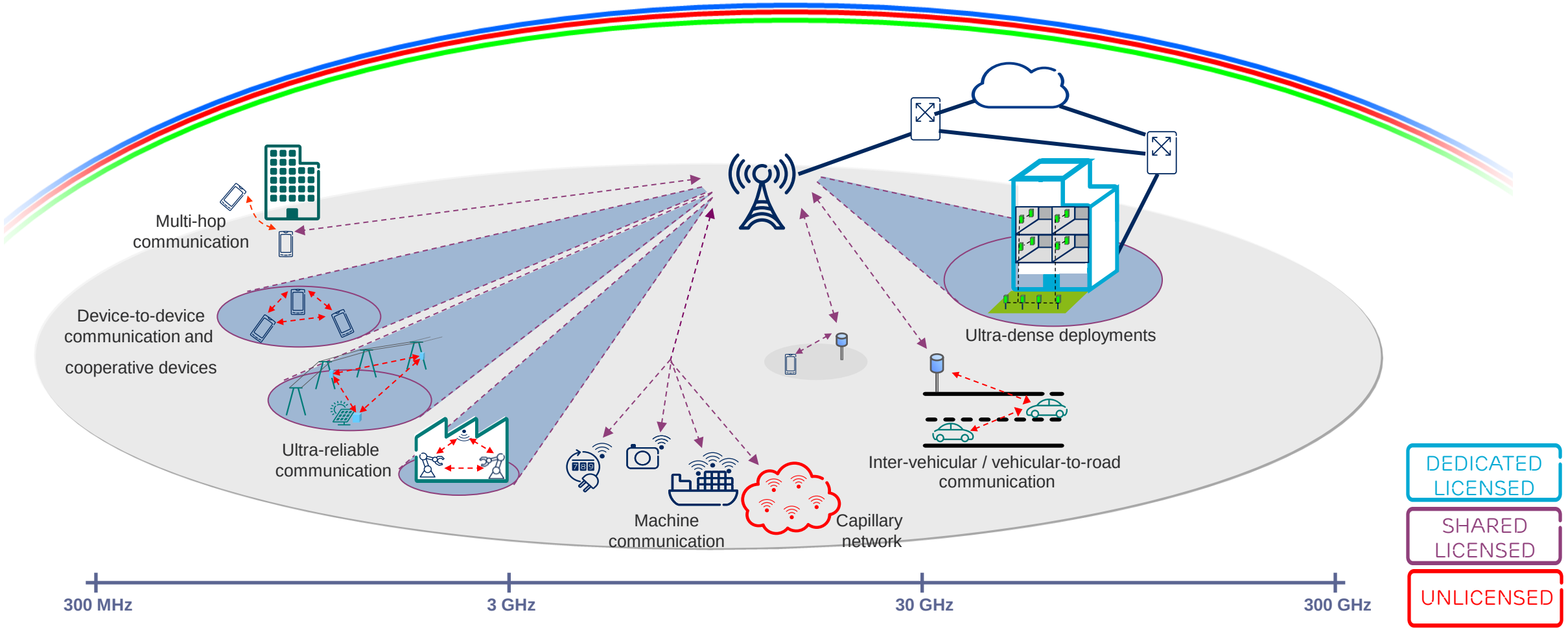
data marketplace

MAKE DEVICES GO MAINSTREAM
IMPROVE INTEROPERABILITY

- Go IP
  - Reduce technology fragmentation
  - Drive IP to the “tiniest of devices”
- Go Web
  - Use standard web technologies
  - Ease enterprise SOA integration
  - Attract the global developer community
- Go Simple
  - Make devices application generic
  - Drive value from devices to cloud enablement
  - Break device silos



EMERGING 5G SYSTEM



FROM RAW DATA TO INTELLIGENCE

CLOSING THE LOOP WITH CLOUD COMPUTE AND CONTROL

BENEFITS OF CLOUD COMPUTE AND CONTROL

Rich context

Collective knowledge

Easier management

A CLOUD COMPUTE PLATFORM
MAIN PROPERTIES

A set of ***libraries***

for creating complex use-cases

built from very different components

working together via cloud-scale data models

File

In-memory DB

Stream

An ***execution environment***

for submitting mixed applications

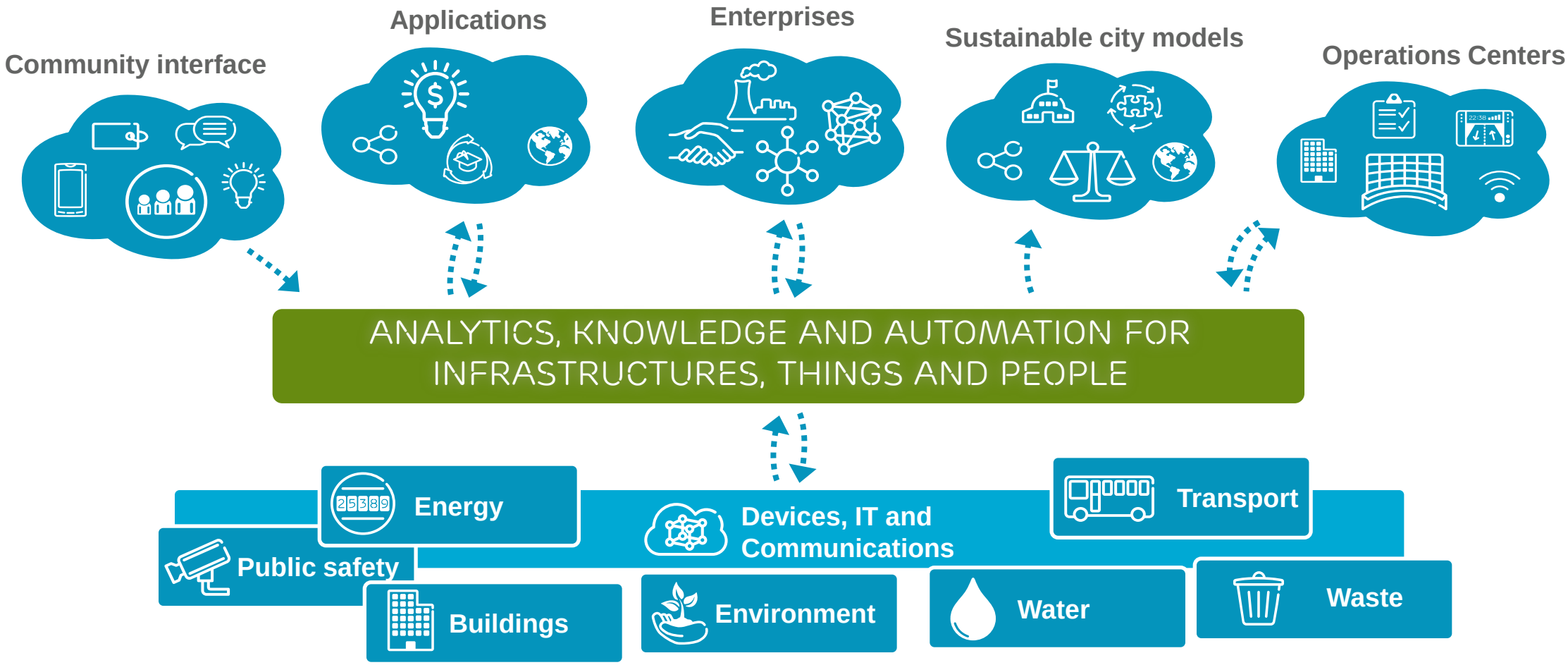
python™

A CLOUD COMPUTE PLATFORM
SDK NEEDS

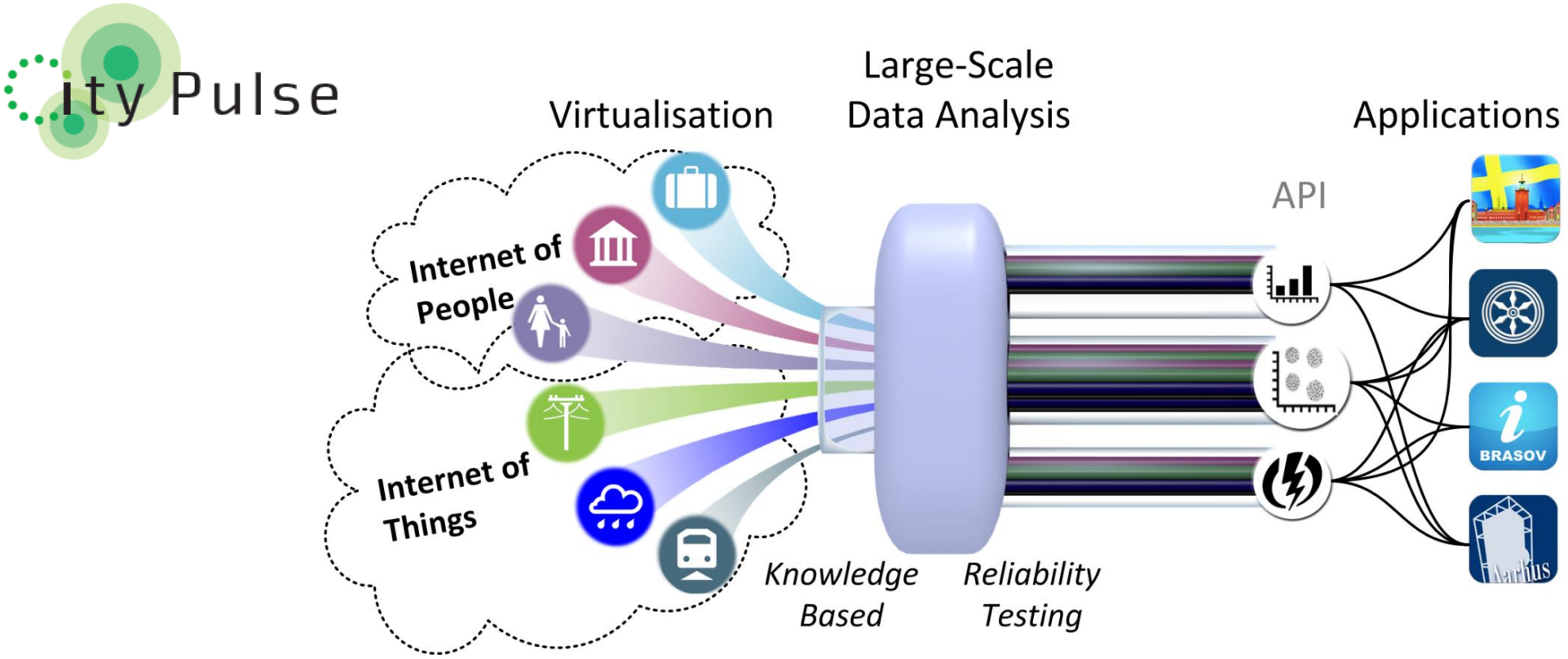
- Plug & play data models:
  - Zero configuration
  - Dynamic auto load-sharing
  - APIs are as simple as possible
- Similar APIs for streams, in-memory & offline DBs and files
- Extra APIs & services:
  - Data model access statistics
  - Workflow API
  - Stream2offline and Offile2stream converters
  - Decoders
  - Adapters: connect external data sources via files or streams

WHAT IS A SMART CITY?

THE SMART CITY
AN INTEGRATED OPEN ENVIRONMENT



THE SMART CITY
SMART AND SUSTAINABLE ENVIRONMENT



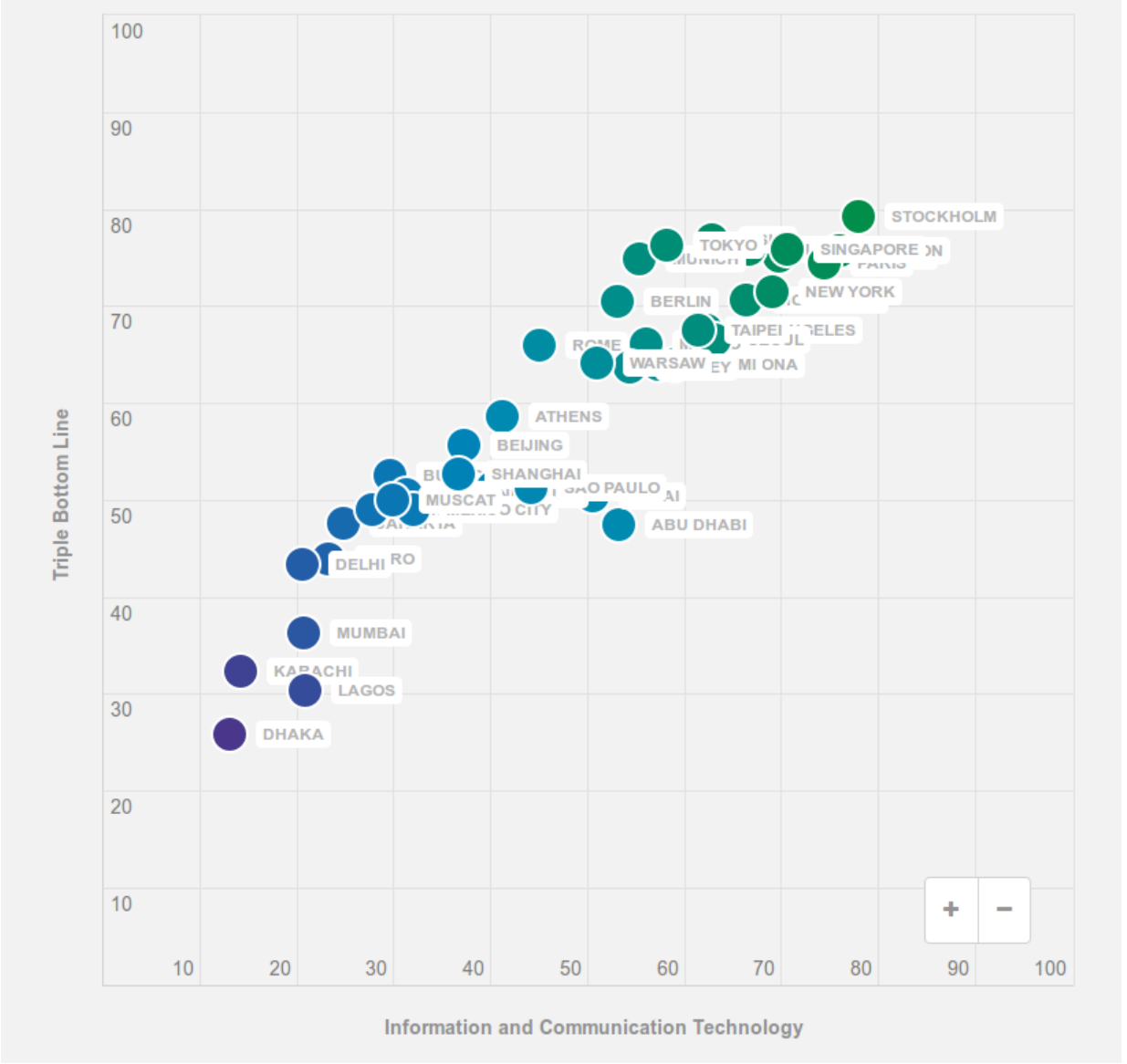
SEVENTH FRAMEWORK PROGRAMME

Source: www.ict-citypulse.eu

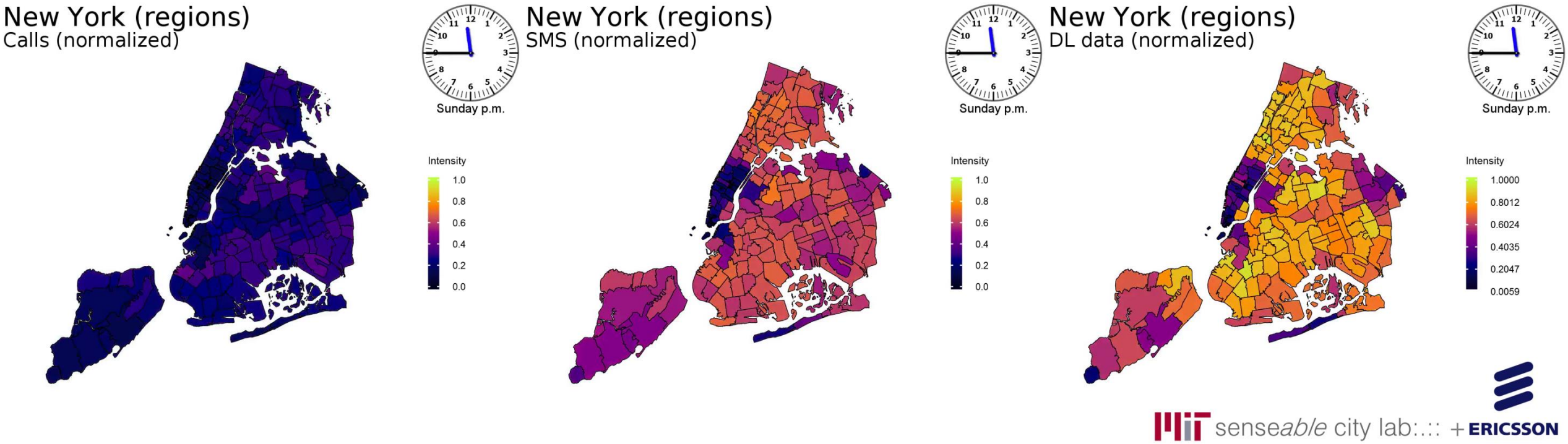
NETWORKED SOCIETY CITY INDEX

- The Networked Society City Index shows a strong correlation between ICT maturity and Triple Bottom Line development (social, environmental and financial)
- Cities that show high ICT maturity include Stockholm, London, New York, Paris and Singapore

Source:
http://www.ericsson.com/thinkingahead/networked_society/city-life/city-index/graph

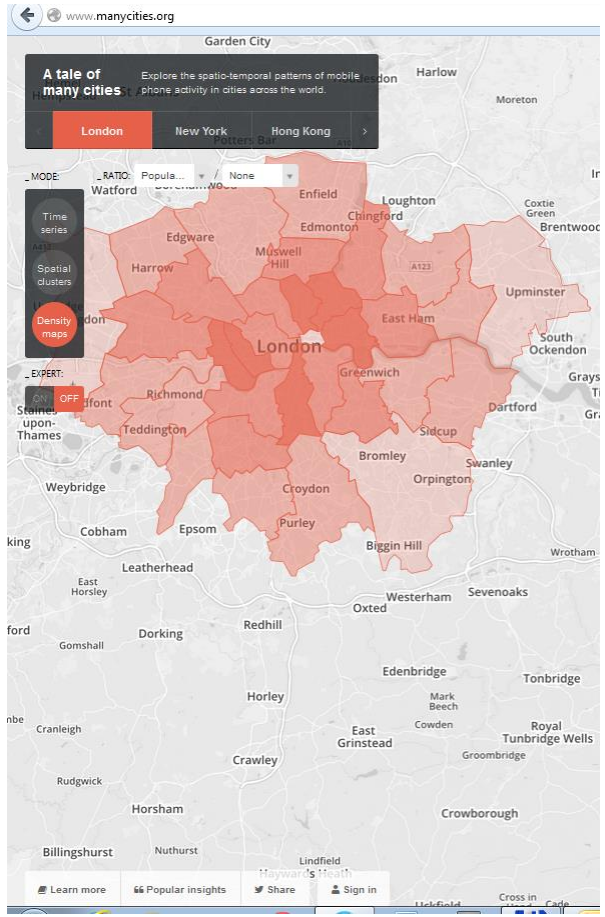


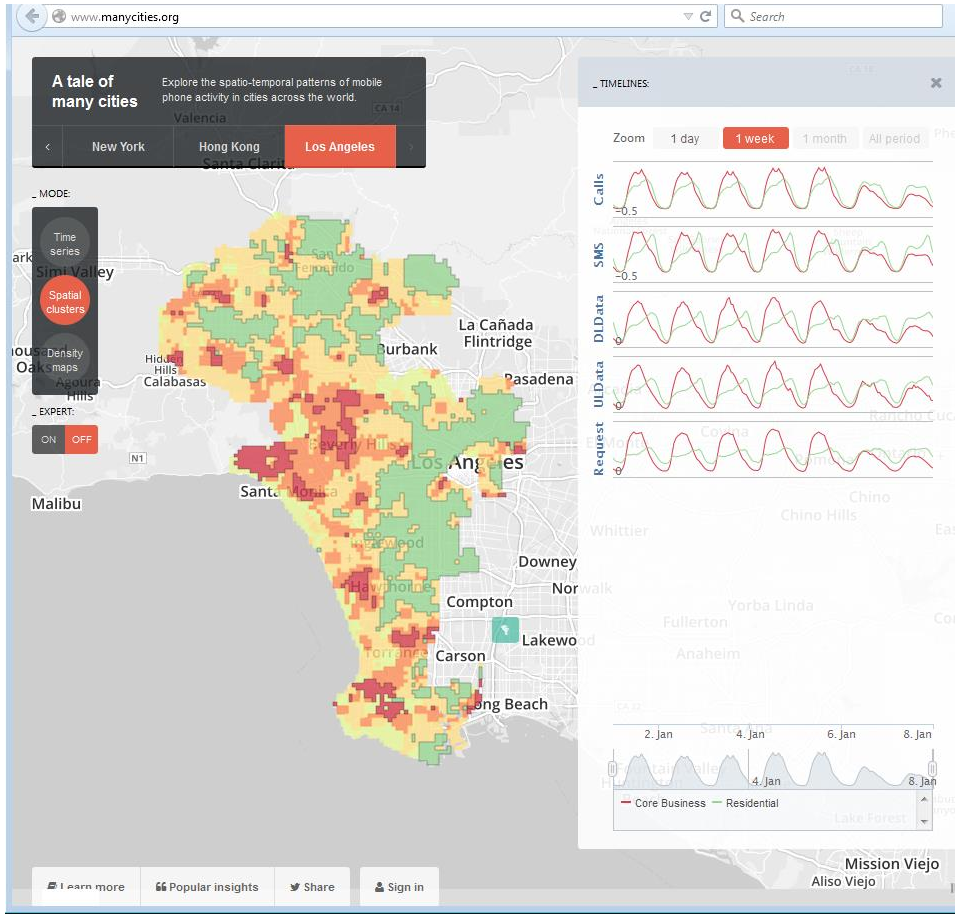
STRUCTURE OF CITIES

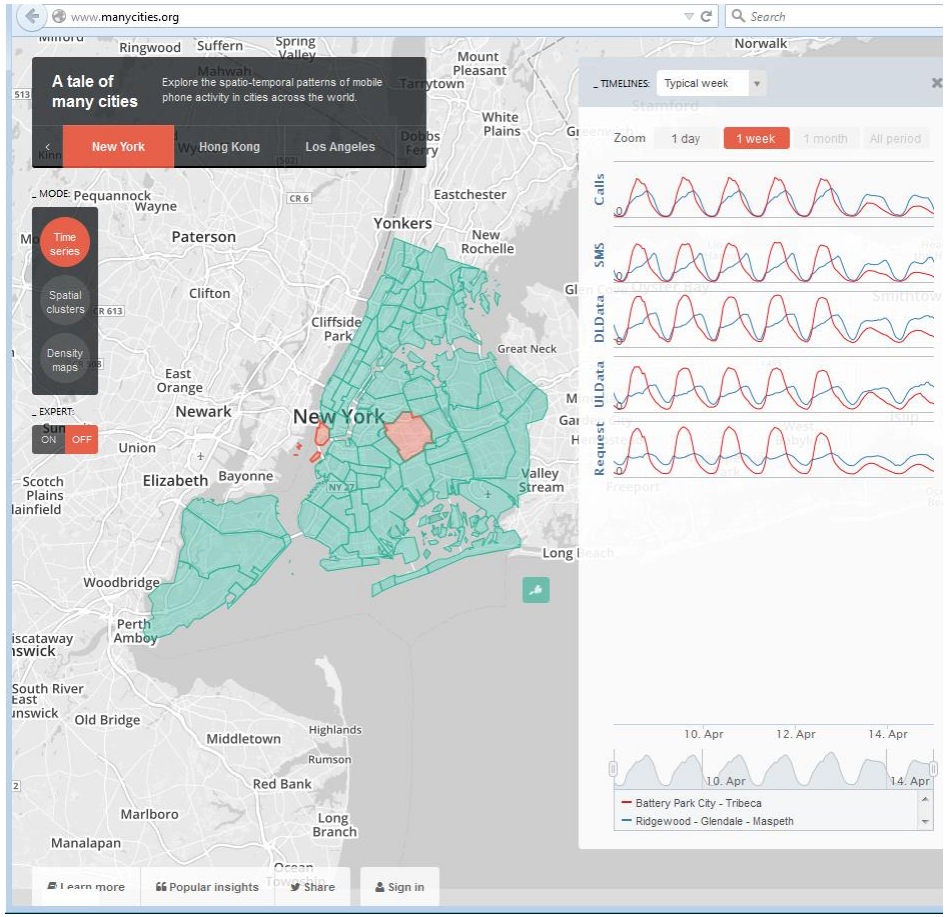


senseable city lab:.:: + ERICSSON

MANYCITIES.ORG





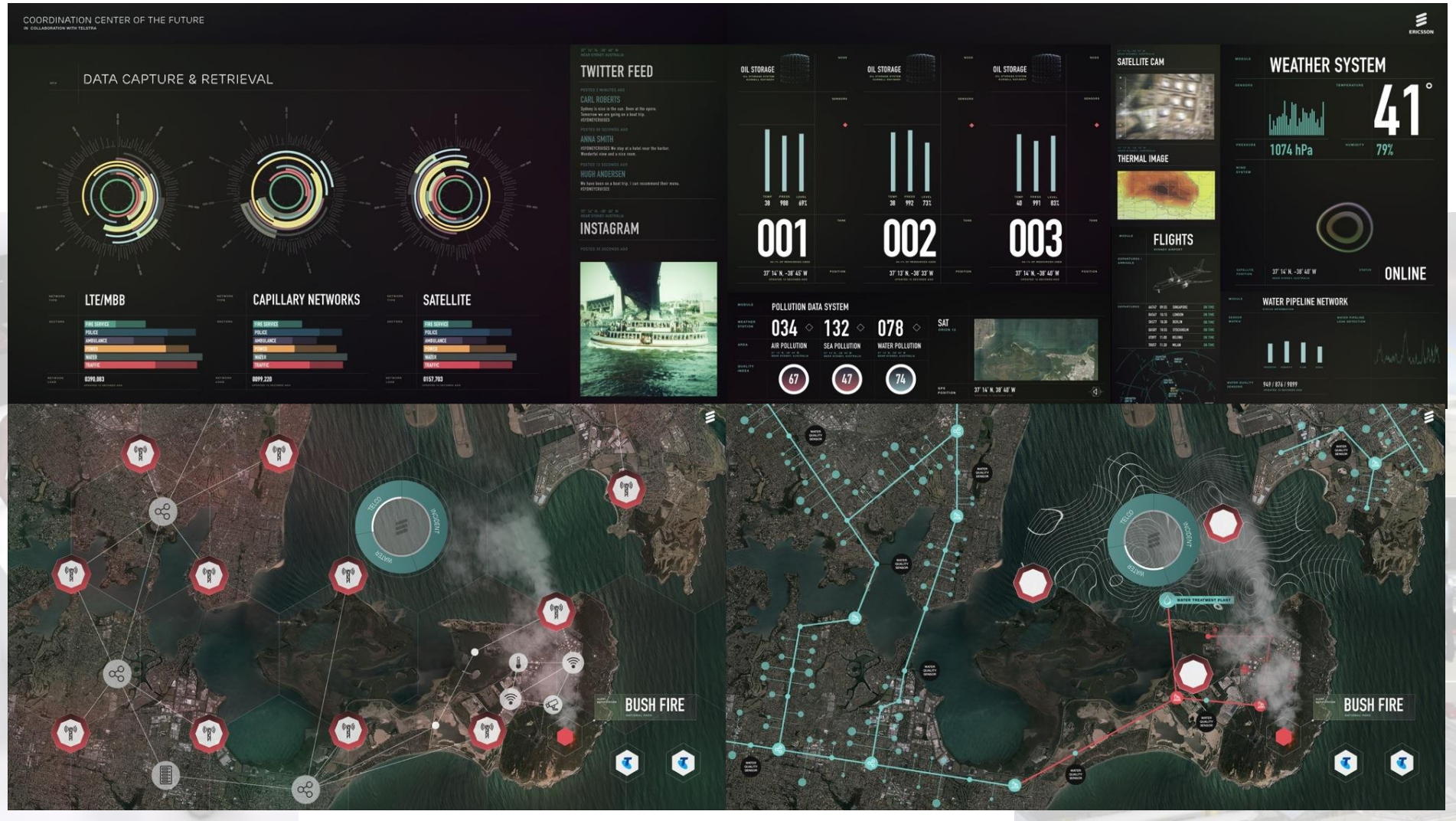


GARBAGE TRUCKS IN COOPERATION

- Why “just” collecting the garbage?
- Garbage trucks go around the whole city
- Garbage trucks should check
  - Street lights
  - Potholes
  - Status of environment
- Thinking further at some cities: dust bins report fill level so collection can be optimized

The operation of smart cities requires strong cooperation between partners of the cities

CITY OPERATIONS CENTER



THE SMART CITY
A TAKE AWAY SUMMARY

- Integrated open environment, which provides analytics, knowledge and automation for infrastructures, things and people
- Drive transformation and utilize horizontal approach
- Utilize big data technologies
- Create data driven models
- Able to measure and compare status even in real-time
- Open data: city and its data are for all
- Cooperate, cooperate, cooperate

CHALLENGES I DID NOT MENTION

Privacy

- Regulations lagging

Business models

- Incentives
- New roles

Security

- Authorized access
- Actuation
- E2E in tiny devices

Data reliability

- Trust and Provenance
- QoI
- Liability

Life cycle management

- “No cost”
- Planning-deployment-operations

Semantic interoperability

- Modelling and Representation
- Discovery and matching

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