# FIWARE: transforming cities into engines of growth

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Open APIs
for Open
Minds

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# FIWARE: helping Smart Cities in their transformation journey
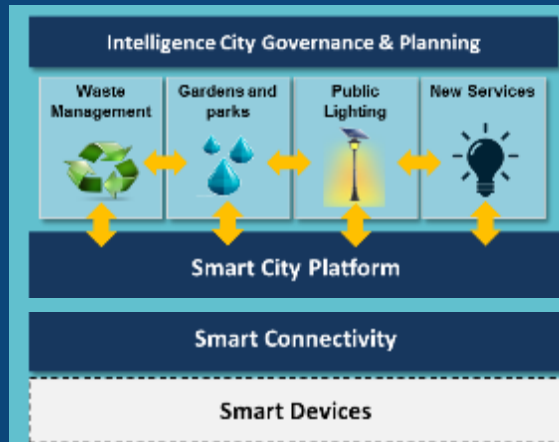
**1** — **2** — **3** — **4**

## Efficient and Open

- Vertical solutions (some being IoT-enabled) bringing efficiency in silos
- Historic data as open data
- Information still in vertical silos, no global picture



## Truly Smart

- Horizontal platform gathering "right-time" context info from different vertical services
- Common information models
- Smart City Governance Solutions



## Unleashing Right-time Open Data

- right-time context info published to third parties
- authorization and access control (API management)
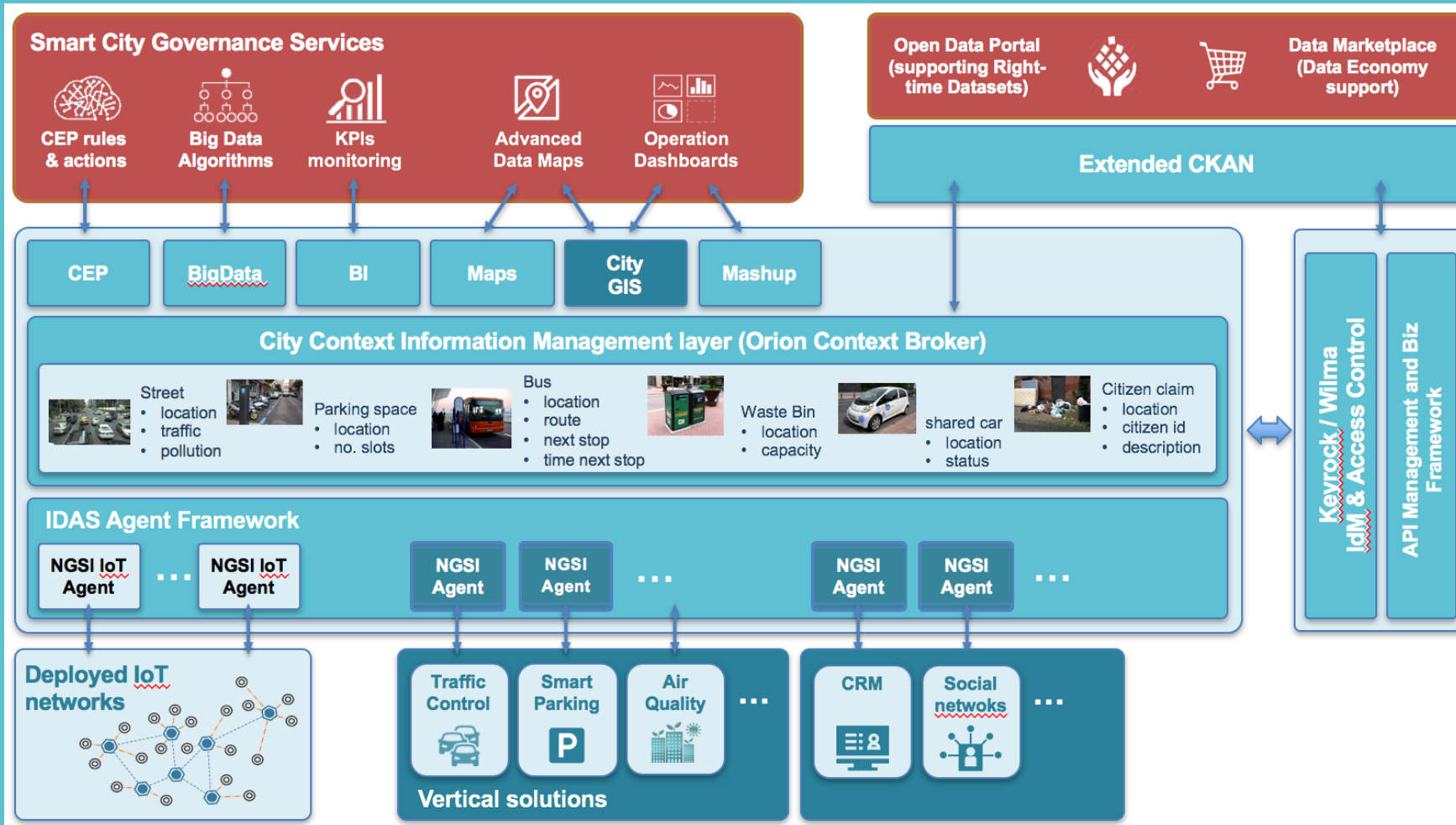- open innovation ecosystem



## Support to Data Economy

- city as a platform including also 3rd party data enabling innovative business models
- open and commercial data enabling multi-side markets
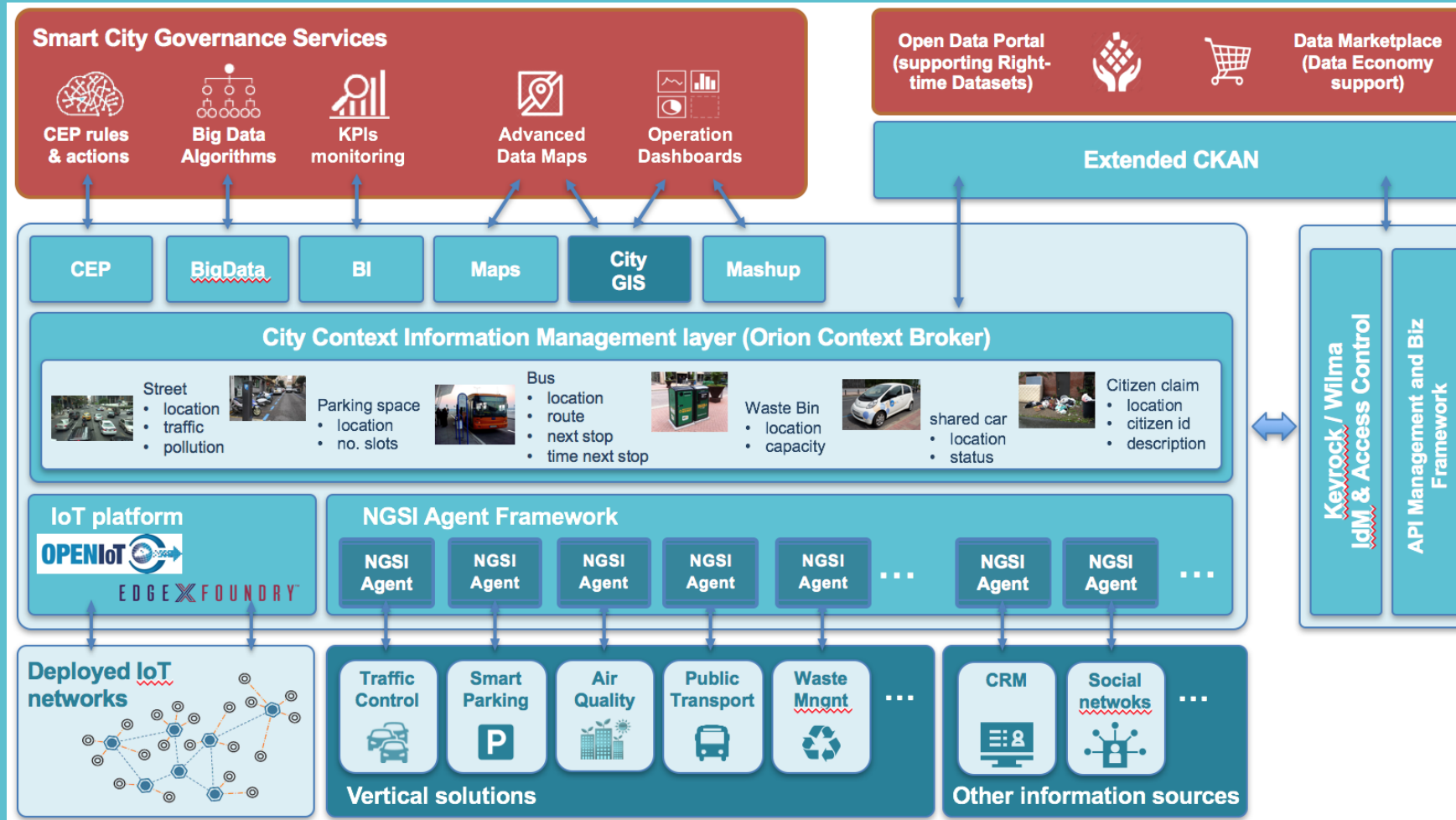


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# FIWARE: Reference Architecture for Smart Cities



- Breaking vertical silos, through a Context Info Management layer with info about what is going on in the city

- Enabling publication of resources by third parties

- Ability to assign price to the acquisition of access rights and definition of pay-per-use schemas

- Biz Framework based on Open TMForum APIs

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# FIWARE: Becoming the de-facto standard

**OPEN & AGILE SMART CITIES**

**100+ cities**
**22 countries**

- Common APIs:
  - ✓ FIWARE NGSI to start with
- Standard Data Models:
  - ✓ CitySDK and more, collaboratively
- Platform for Open Data/API publication
- Driven by implementation approach

**CEF DIGITAL**
European Commission

FIWARE NGSI and Context Broker Technology has been selected to become a CEF (Connecting Europe Facility) Building Block

**NIST**
**National Institute of Standards and Technology**

FIWARE has been recognized as major contributor for a shared IoT-Enabled Smart City Framework. The initiative is led by NIST

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# FIWARE: Becoming the de-facto standard

**The GSMA has published a Reference Architecture for IoT Big Data Ecosystem which recommends to mobile operators**

**FIWARE NGSIv2 should be supported by implementers delivering the IoT Big Data ecosystem**

**TM Forum, the global industry association for digital business, is working with FIWARE to deliver the key building blocks for enabling and connecting Smart City ecosystems.**

**TM Forum is supporting FIWARE NGSI REST-based APIs for real-time access to contextual information for cities.**

**ETSI has announced the creation of a new Industry Specification Group on cross-sector Context Information Management (ISG CIM) for smart cities applications and beyond.**

**FIWARE NGSIv2 is the starting point for the CIM API to be specified**

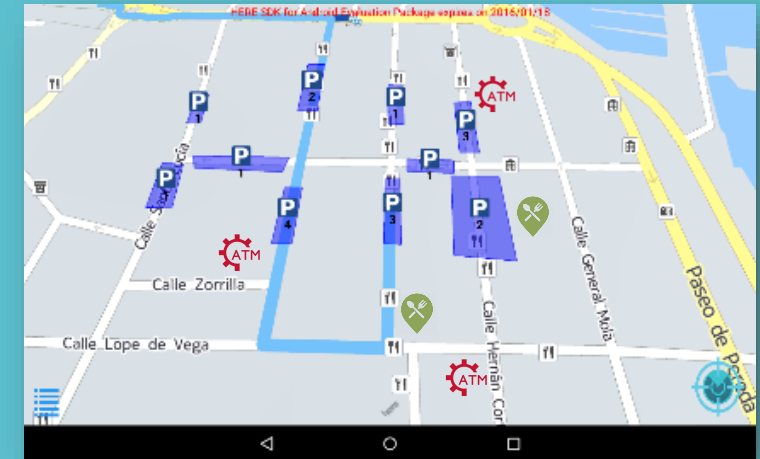# Driving definition of Common Information Models for the City



**Alarms**
Events related to risk or warning conditions which require action taking.

**Environment**
Enable to monitor air quality and other environmental conditions for a healthier living.

**Civic Issue tracking**
Data models for civic issue tracking interoperable with the de-facto standard Open311.

**Device**
IoT devices (sensors, actuators, wearables, etc.) with their characteristics and dynamic status.

**Indicators**
Key performance indicators intended to measure the success of an organization or of a particular activity in which it engages.

**Parking**
Real time and static parking data (on street and off street) interoperable with the EU standard DATEX II.

**Parks & Gardens**
Data models intended to make an efficient, effective and sustainable management of green areas.

**Point of Interest**
Specific point locations that someone may find useful or interesting. For instance, weather stations, touristic landmarks, etc.

**Street Lighting**
Modeling street lights and all their controlling equipment towards energy-efficient and effective urban illuminance.

**Transportation**
Transportation data models for smart mobility and efficient management of municipal services.

**Waste Management**
Enable efficient, recycling friendly, municipal or industrial waste management using containers, litters, etc.

**Weather**
Weather observed, weather forecasted or warnings about potential extreme weather conditions.

- Portable Governance Solutions

- Vertical solutions more easy to plug or replace

- Sharing of best practices between cities made easier

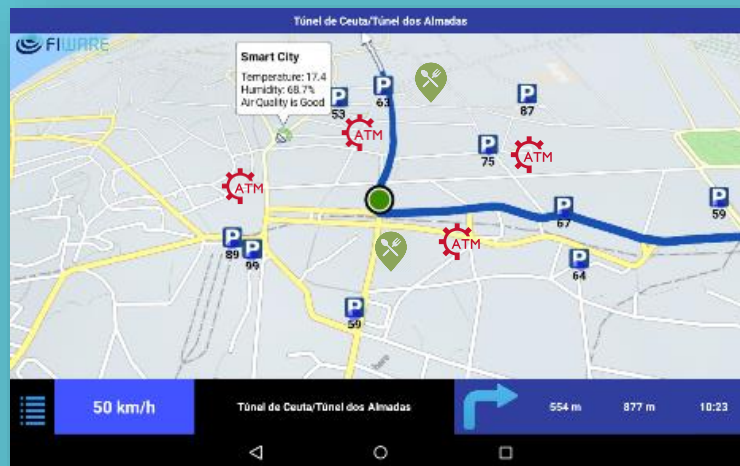- Smart Cities as a market where it will be more attractive to invest

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# FIWARE case example: enriching car navigation through front-runner smart cities using third-party data

**City of Santander**



- Car navigators can display context information about available parking slots published by cities or other data from third parties it has acquired the right to access to
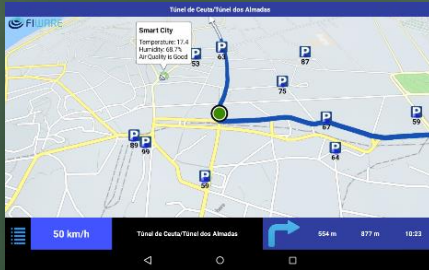- The car can share speed info with the city if the drivers agree and both get something in return

**City of Porto**



- Users can receive recommendations from smart home systems ("do you want me to switch on the heat before you arrive?")
- Users may have paid for apps developed around data and recommendations used from the car (discount restaurants around)

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# It's time to execute!

challenge 1

challenge 2

challenge k

challenge n

front-runner OASC cities

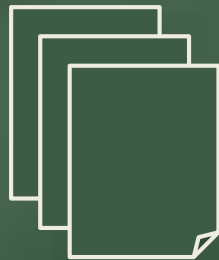| City 1 | City k |
| City 2 | . . . |
| City 3 | City n |

UC 1 ✓ + City 1 City 3 = challenge 1

UC i ✓ + City 2 City n = challenge m

(cities and solution/platform providers collaborate in defining common information models for selected challenges)

*common information models*

**Transference to Market**

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**Reference Architecture – Open APIs**

**Common Information Models**

**Paving the way towards transforming cities into platforms enabling the Data Economy**

# Thank you!

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