leti
cea tech

# ECLIPSE SENSINACT: OPEN PLATFORM FOR SMARTER CITIES

sensiNact

Marie-Sophie Masselot | September 2018

CONTEXT : THE SMART CITY CHALLENGE

ECLIPSE SENSINACT OVERVIEW

DEPLOYMENTS

THE URBAN TECHNOLOGY ALLIANCE

Senses of the city

City data sources

Brain
of the city

**Smart City Platform**

Data collection, analysis, knowledge, extraction, planning, action

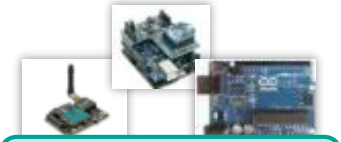
Senses
of the city

Social networks

Mobile applications

WorldWideWeb

Legacy Devices


IoT Devices

City data sources

Life
of the city

Citizen-centric
services

Brain
of the city

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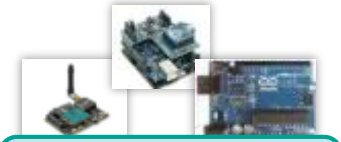
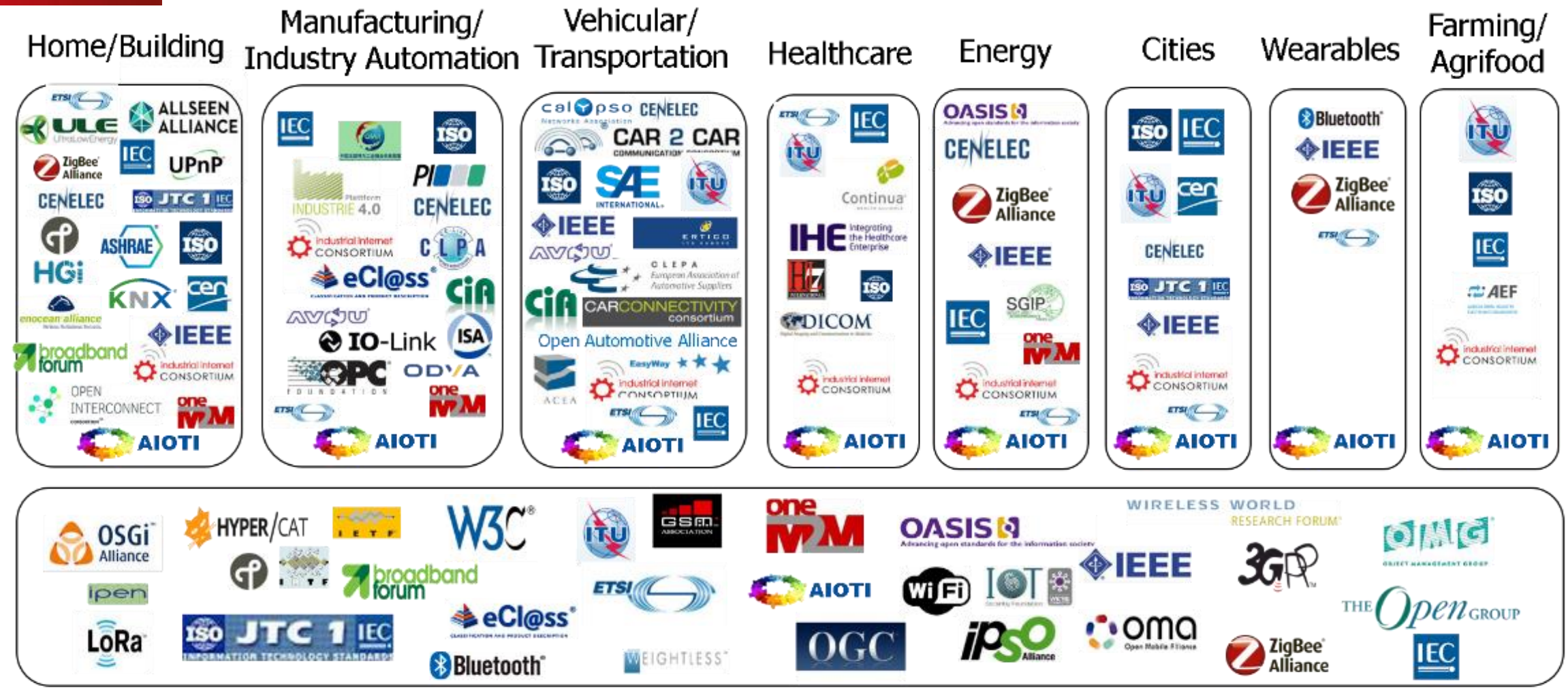


IoT Devices

City data
sources

# CURRENT IOT SDO/ALLIANCES LANDSCAPE




Source: AIOTI WG3 (IoT Standardisation) – Release 1.3

# STILL MANY TECHNICAL CHALLENGES

**Heterogeneity/Interoperability**

How to handle the numerous types of devices, protocols, standards?

**Scalability**

How to handle the big number of connections/big data coming from millions of devices?

**Dynamicity**

Plug&play, self-configuration, self-management, self-matchmaking

**Dependability**

Rapid prototyping yet reliable dependable applications

**Security and privacy**

By design

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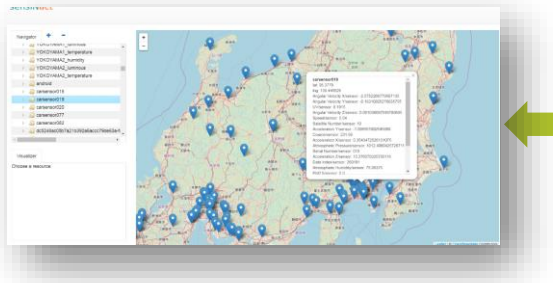
# ECLIPSE SENSINACT BIG PICTURE



Tool for monitoring, and for
**rapid and dependable**
application building

Third parties

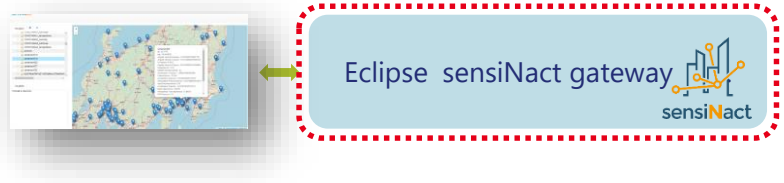
Eclipse sensiNact gateway

sensiNact

Heterogeneous devices
Heterogeneous protocols
Heterogeneous data models

IoT platforms

# ECLIPSE SENSINACT GATEWAY



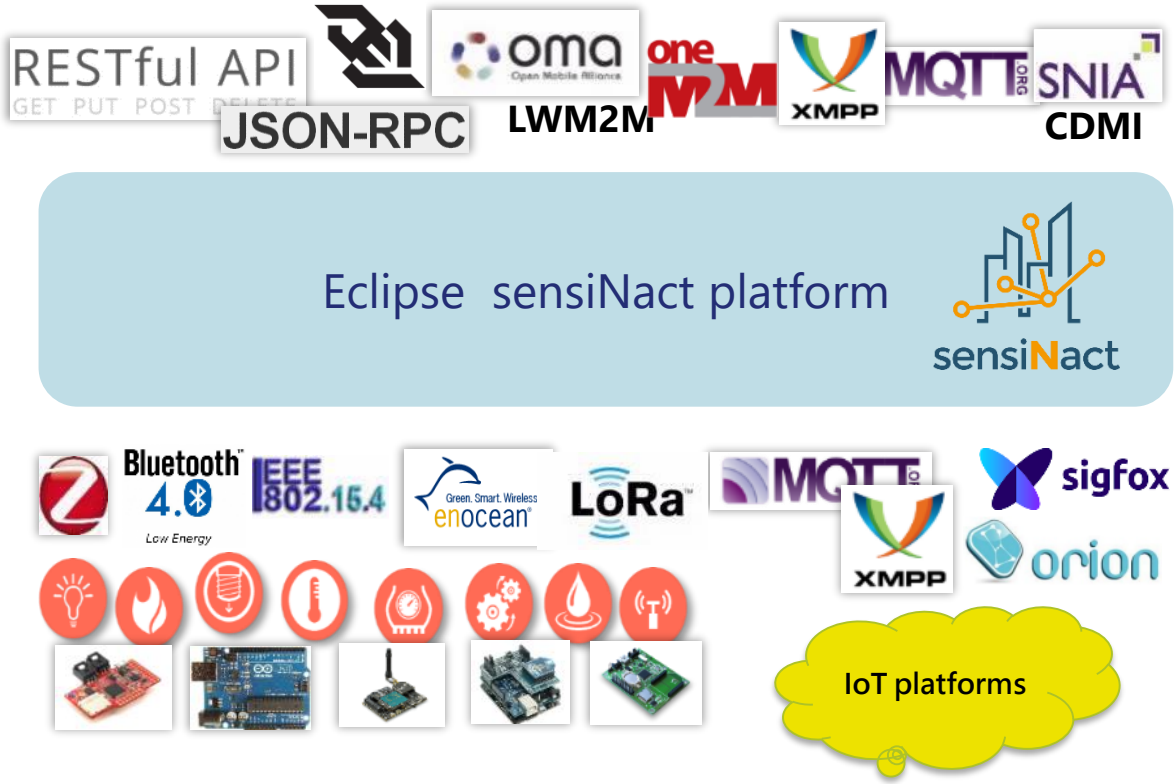

Homogeneous access to

Live data

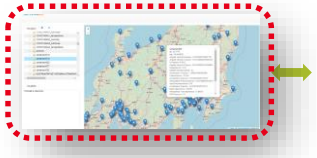
on-demand, periodically, event-based

Historic data

Using big data storage backend

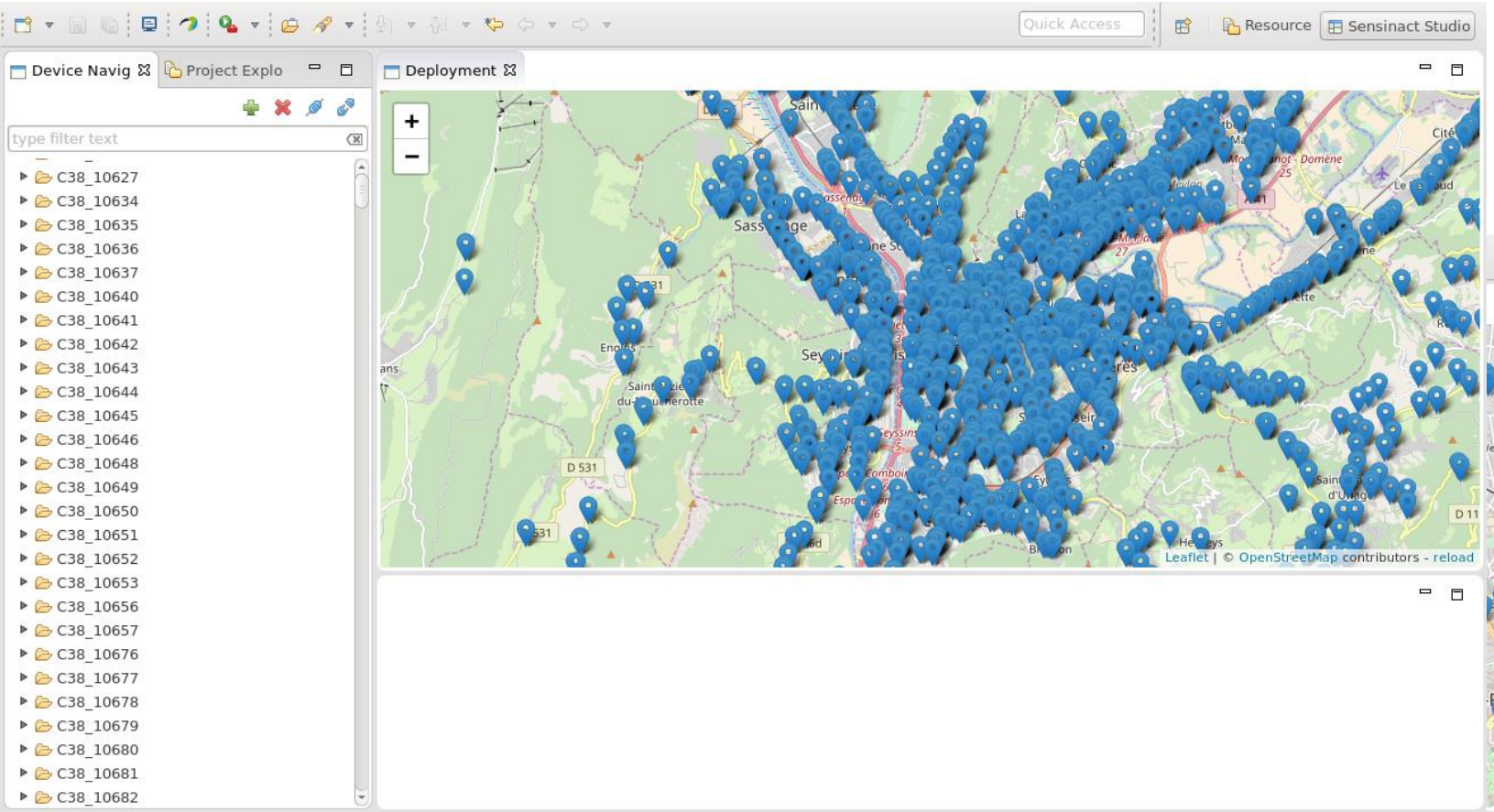


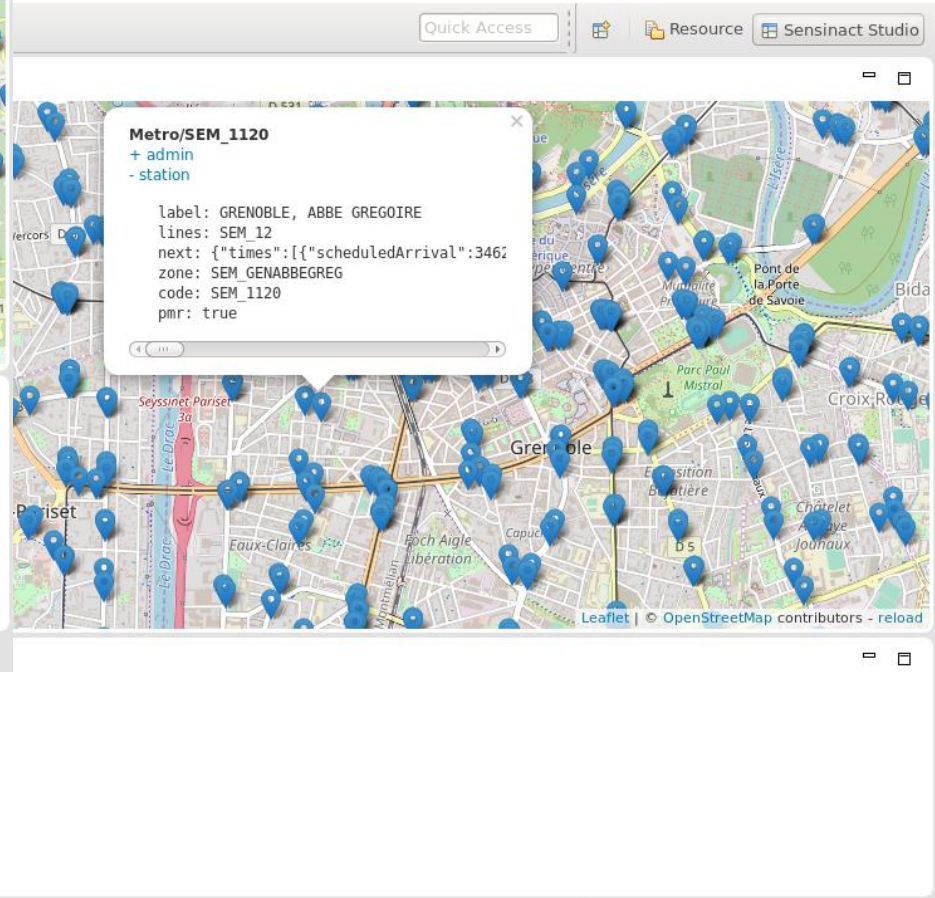
# ECLIPSE SENSINACT STUDIO



Eclipse sensiNact gateway

sensiNact



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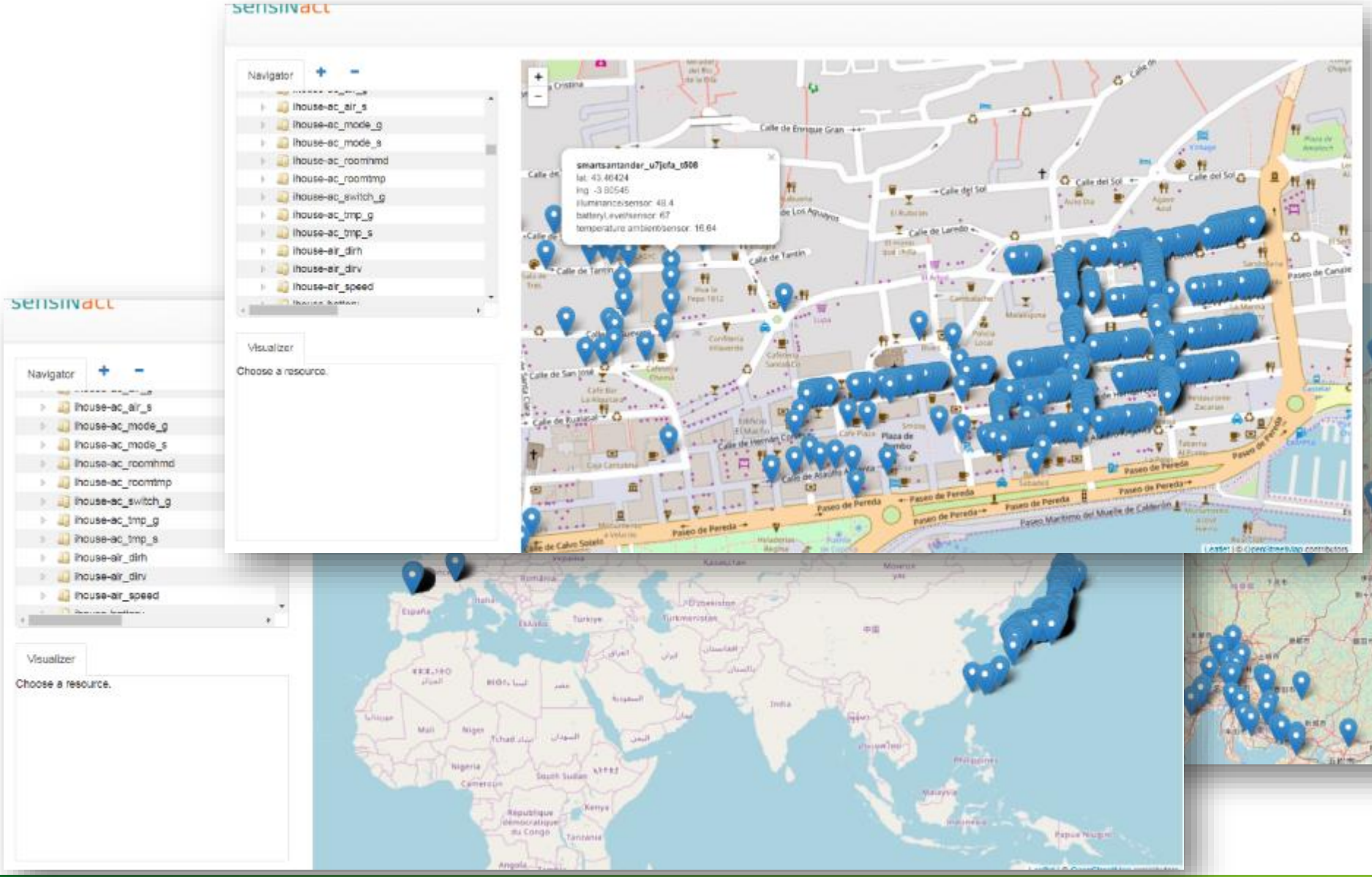
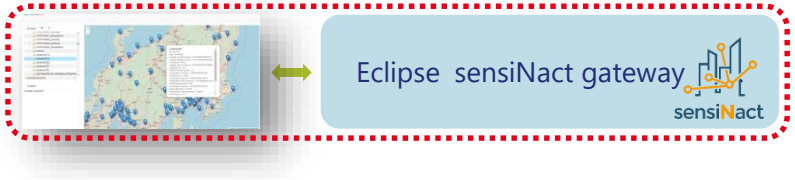


# AN OPEN SOURCE PROJECT



sensiNact smart city platform has joined eclipse

https://projects.eclipse.org/projects/technology.sensinact

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DEPLOYMENTS

THE URBAN TECHNOLOGY ALLIANCE

# HETEROGENEOUS SENSORS

Environmental monitoring

Smart irrigation

mobile nodes
on city buses and taxis

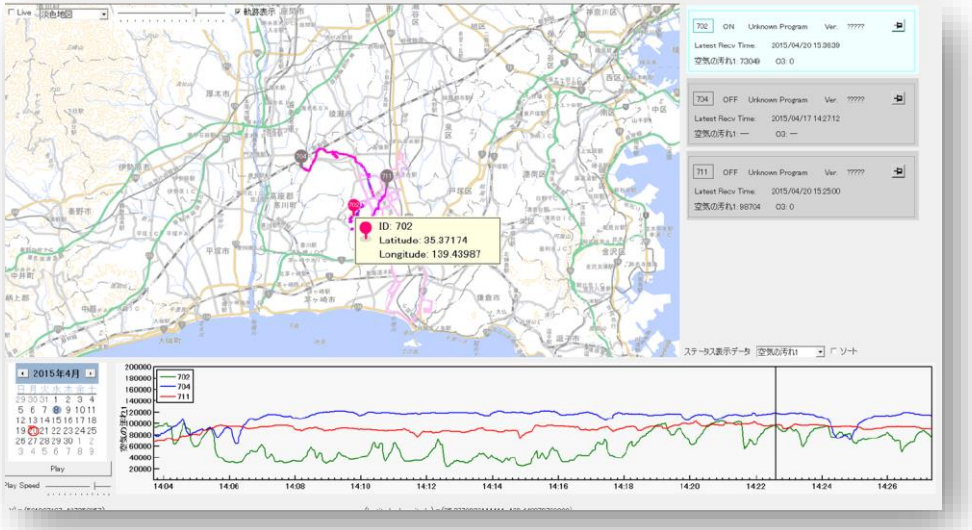
Smart shoping

Parking sensors

Guiding drivers

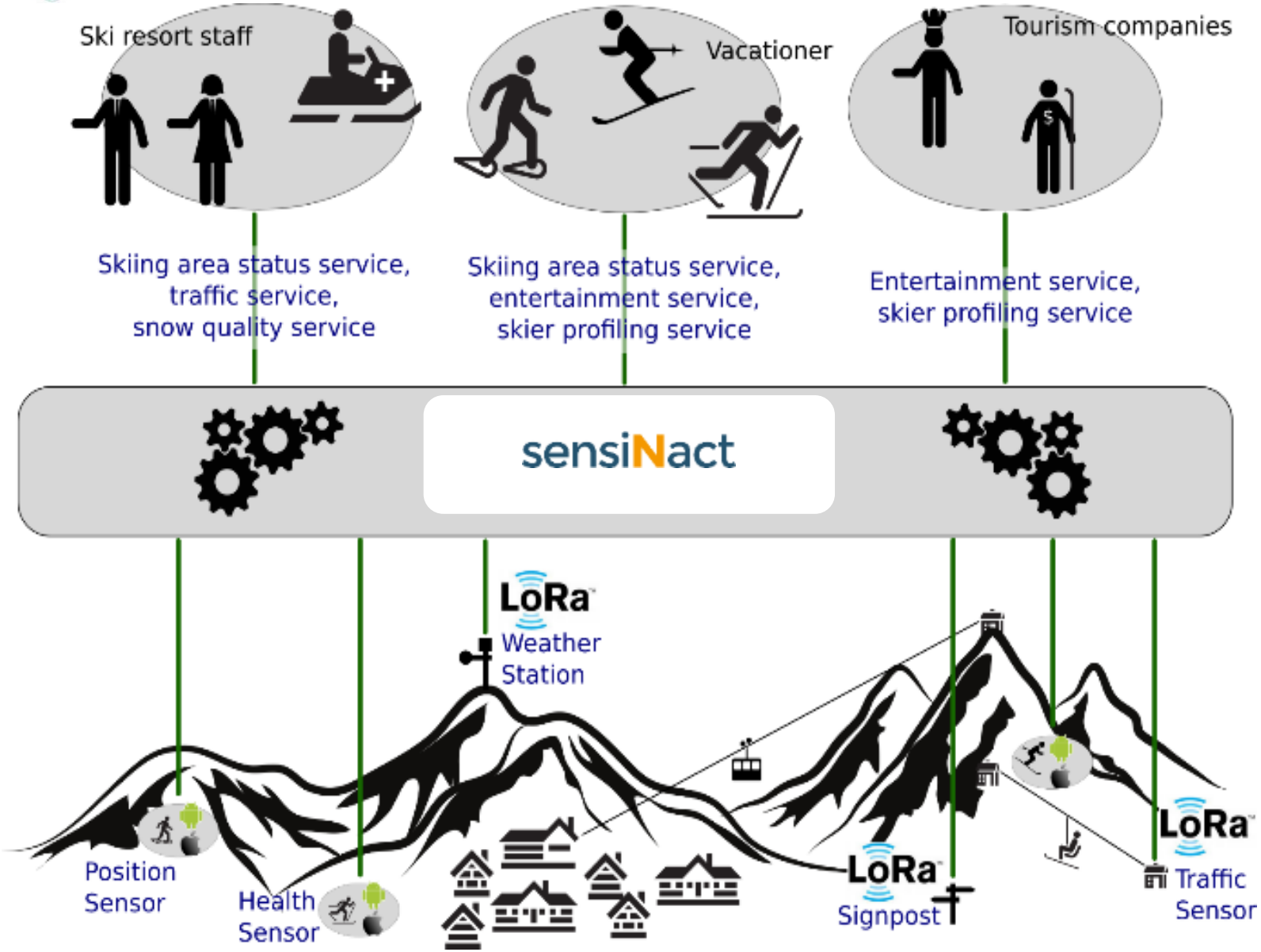
Trafic sensors

# REALTIME GARBAGE TRUCKS TRACKING



# BUILDING A SMART SKI RESORT

Chamrousse,
PyoengChang



## LoRa band

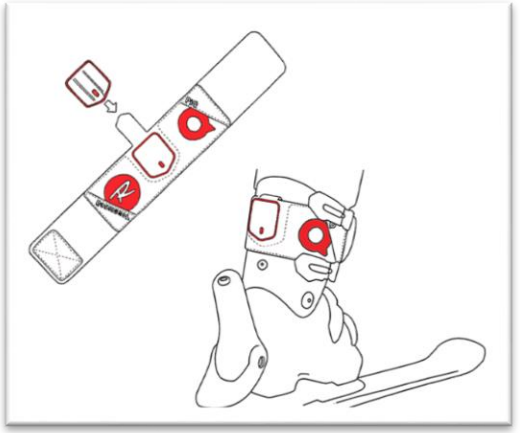
- GPS location

## PIQ Robot

- Number of turns with maximum angle ski
- Maximum angle of the skier from the vertical
- Number of turns with maximum velocity
- Maximum speed of entry into the turn of the skier
- Number of jump with maximum air time
- Maximum air time
- Number of jump with best score rotation
- Complexity of the jump
- Descent height

## Crowd detector

- Number of persons in a given area



# SMART FARMING

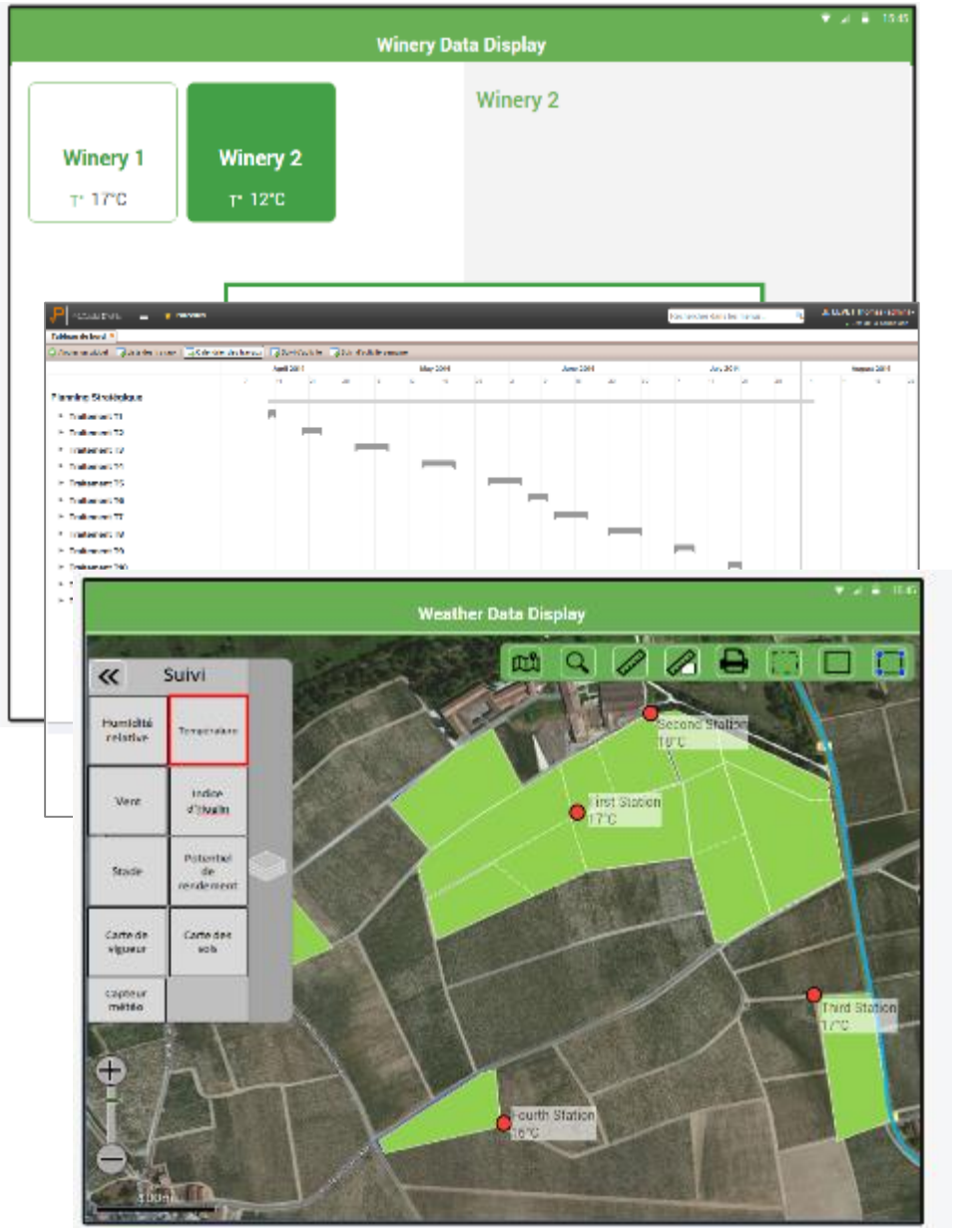
- Sensors for monitoring weather conditions: distributed in 5 vineyards of 125 hectares,  with a density of at least 1 device every 2.5 hectare.
  - ✓ 9 Weather stations sensing Temperature, Hygrometry, Barometric pressure, Wind speed and direction, Solar radiation,  Rainfall.
  - ✓ 35 sensors for Temperature and Hygrometry

- Sensors for monitoring winery conditions.
  - ✓ 27 sensors for Temperature and Hygrometry.
  - ✓ 26 Water meter readers.
  - ✓ 9 Electricity meter readers.

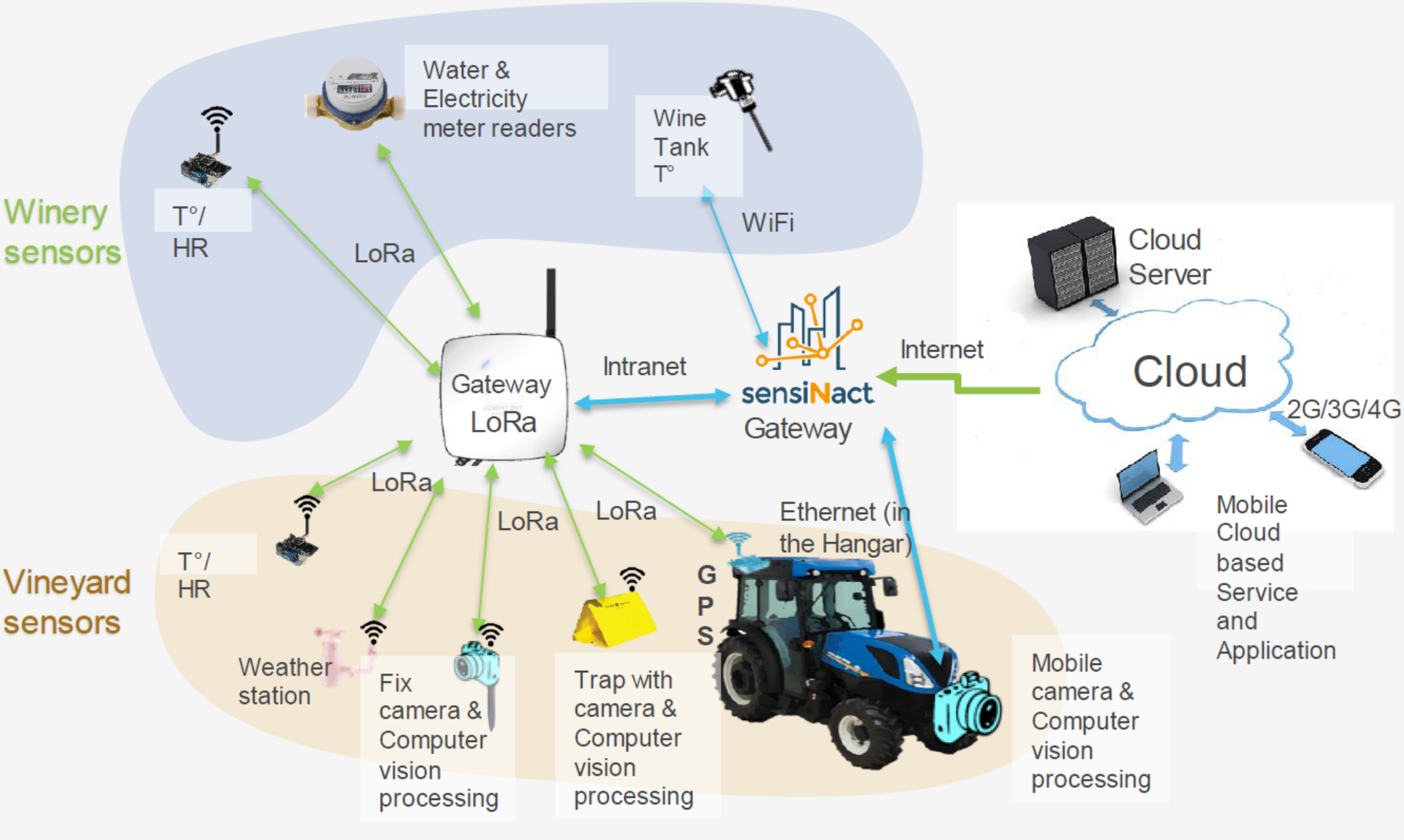
DENIS DUBOURDIEU DOMAINES
Vignerons à Bordeaux depuis 1794

# SMART FARMING

- Improve the vine yield and wine production by defining, and implementing an IoT system able to gather the data, coming from different vineyards and cellars, to perform data analysis, system and risk management, and decision making.
- Provide to middle and small winegrowers and producers new tools to optimize resources (manpower, fertilizers, materials, electricity, water, etc.) and preserve the environment by reducing the use of pesticides, carbon print, etc.
- Deploy a cost effective precision viticulture management and a global vineyard control system in order to increase competitiveness.
- Optimize the use of inputs in wine-making by controlling all environmental factors affecting the process (temperatures, humidity, oxygen, etc.).

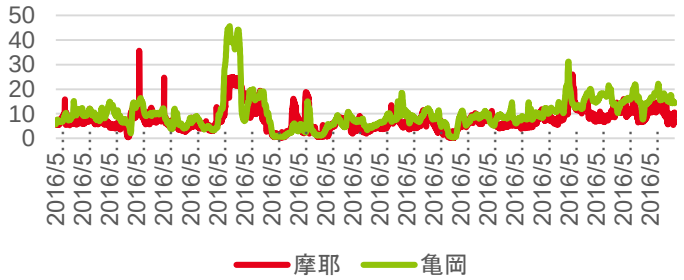


# SMART FARMING



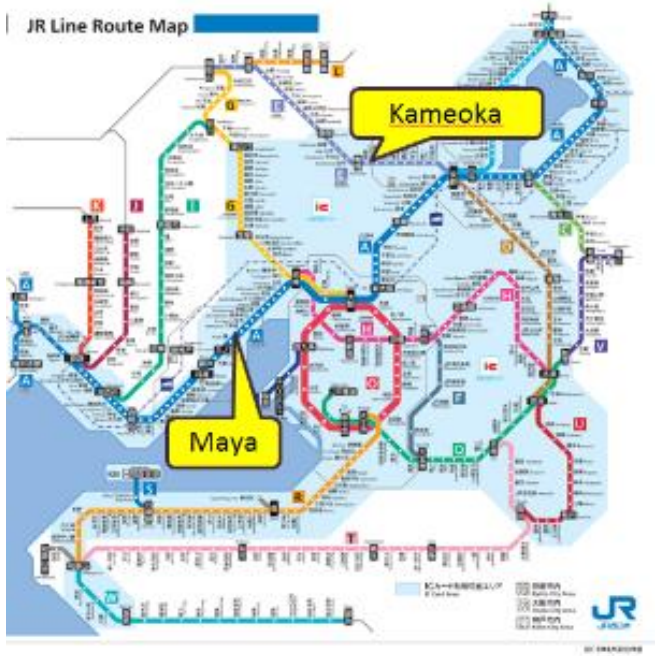
- Environmental Sensors: Temperature, Humidity, Accelerometer, Pollen, PM2.5
- Displays for context-aware advertisement

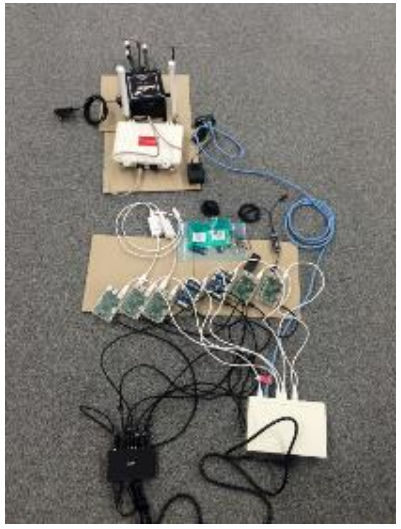
Data analysis



Kameoka Station

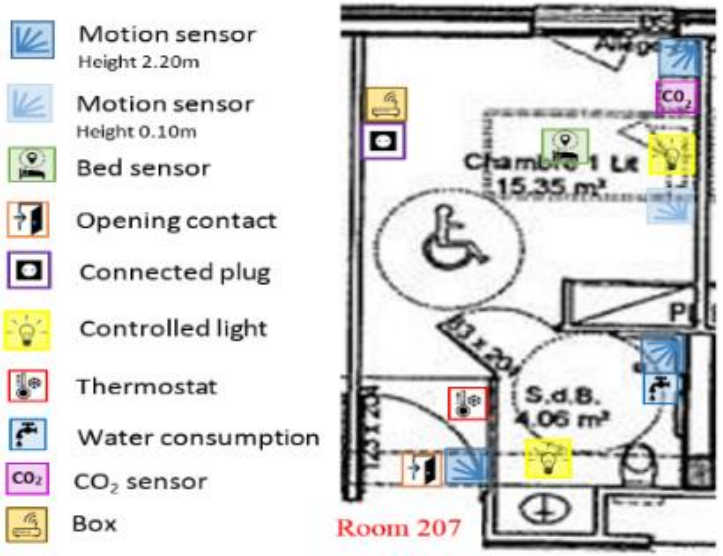
Maya Station



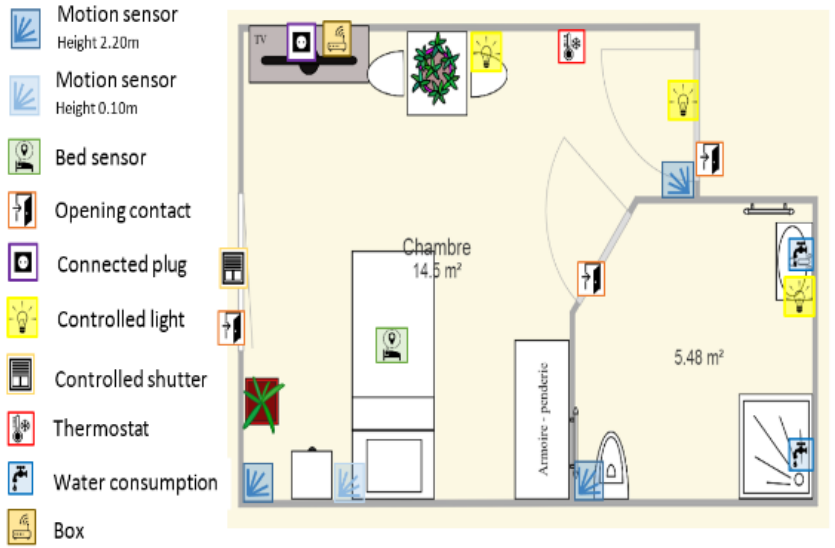


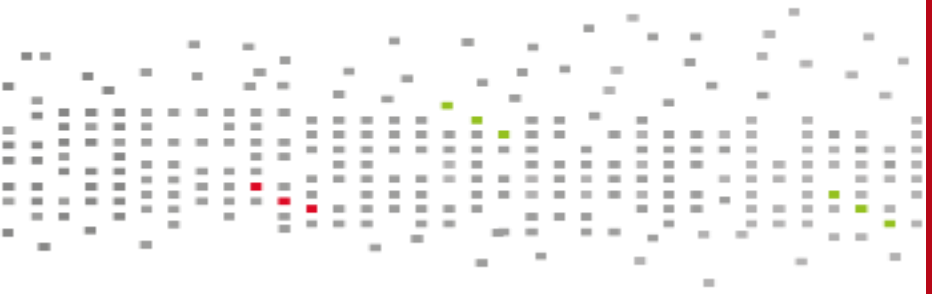
# SENSINACT: A “CARE” TECHNOLOGY

## Korian deployment



## PTL deployment





CONTEXT : THE SMART CITY CHALLENGE

ECLIPSE SENSINACT OVERVIEW

ECLIPSE SENSINACT KEY CONCEPTS

THE URBAN TECHNOLOGY ALLIANCE

# LET'S JOIN FORCES AND ADDRESS URBAN CHALLENGES TOGETHER

- Yes, each city is unique; yet, today's worldwide economic, social and environmental challenges are related
- Many technical requirements are common, they should be addressed globally.
- Mutualize resources, cooperate and exchange lessons learnt and best experiences among cities all around the globe

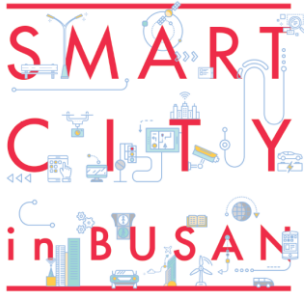
**We are creating an alliance to define the cities of tomorrow**

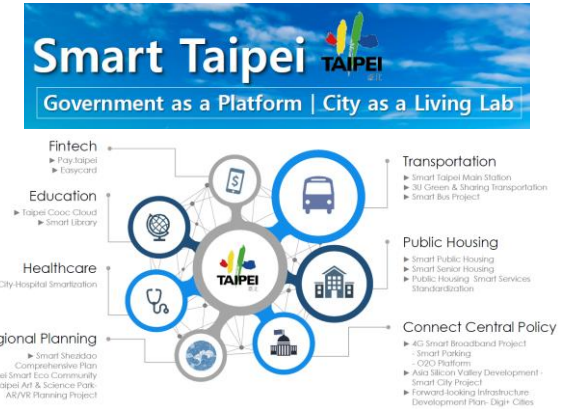
## Urban Technology Alliance

# INITIAL CITY TESTBEDS (CONTINUOUSLY GROWING COMMUNITY…)

CONFIDENTIAL

- Grenoble
- Busan
- Santander
- Sejong
- Daejeon
- Taipei
- Bristol
- Mitaka
- Miyazu
- Houston
- Chamrousse
- Saitama
- Changshu
- A Coruña
- Fujisawa
- Tsukuba
- …

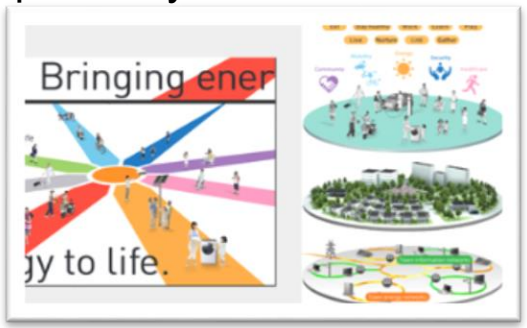


Grenoble Capital of the Alps
Capital of Innovation

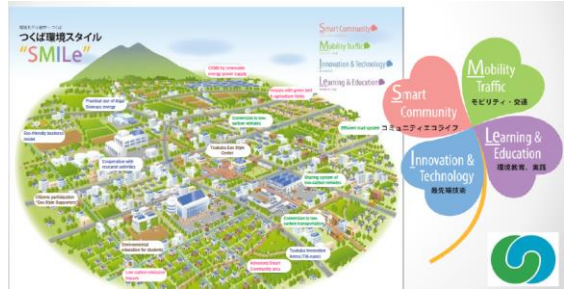
Smart ski resort
in Chamrousse

Fujisawa, 1st smart town of
Japan, “city of the future”



Tsukuba

City of Science
Low carbon society



# KEY ACTIVITIES AND DELIVERABLES

- Matchmaking between cities and solution providers
  - Cities, tell us about your problems;
  - Solution providers, show us your innovative concepts;
  - UTA composes teams with complementary expertise addressing specific needs of city members
    - Cities, IoT platform providers, M2M network operators, hardware vendors, data analytic tool providers, utility companies, application developers, citizen associations, etc.
- Organize pilot deployments in the member cities for proof of concept validation
- Share use cases, recommend standards and best practices, provide reference architectures
- Help implementing trials, building integration plans, defining KPIs
- Validate and label trials with respect to functional and non-functional requirements
- Provide ethical guidelines and recommendations on citizen acceptance
- Build a technology/community agnostic marketplace, foster creation of partnerships
- Share success stories, business cases, lessons learnt, evaluation studies and testbed reports within the UTA community

Build teams

Organize test deployments

Create partnerships

Raise your voice!

# Thank you for your attention!