100% OPEN SOURCE

EU GDPR COMPLIANT

PEN Test Passed

Powered by FIWARE

SNAP4CITY on EUROPEAN OPEN SCIENCE CLOUD MARKETPLACE

Node-RED

SNAP4CITY

KM4CITY

SNAP4 Appliances and Dockers Installations

Be smart in a SNAP!

Overview

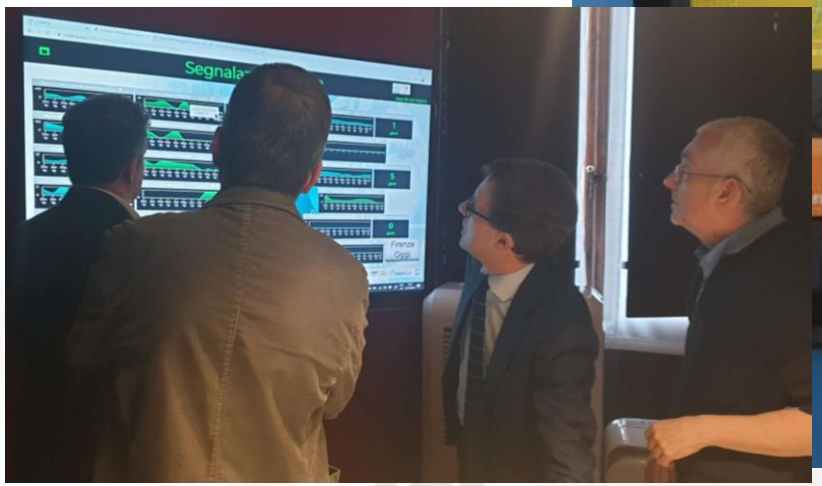
https://www.Snap4City.org

Paolo Nesi, paolo.nesi@unifi.it
https://www.Km4City.org
https://www.disit.org

SCALABLE SMART ANALYTIC APPLICATION BUILDER FOR SENTIENT CITIES

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO | DISIT

Major of Florence City



http://www.darionardella.it/il-sindaco-dario-nardella-in-missione-a-madrid-e-barcellona/

Smart City Control Room
Florence Metropolitan City

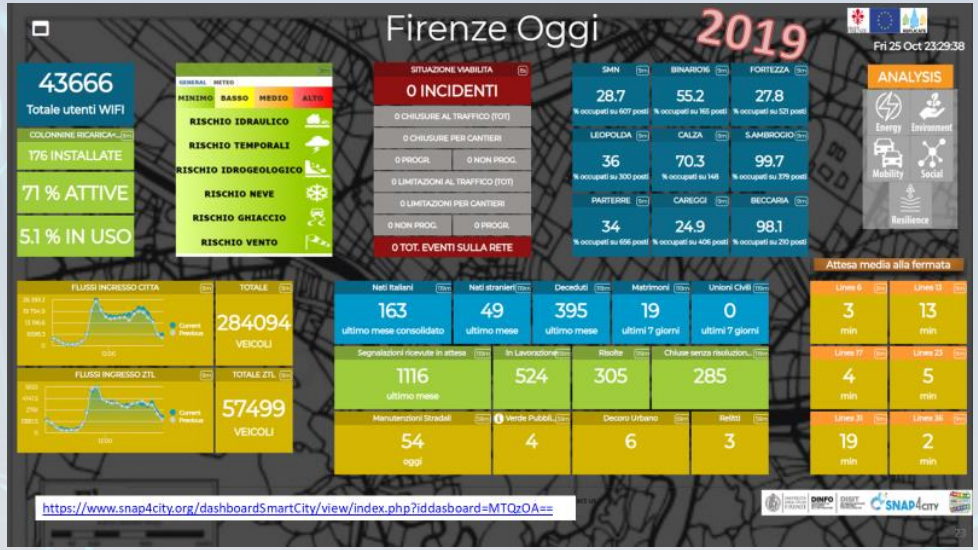
COMUNE DI FIRENZE

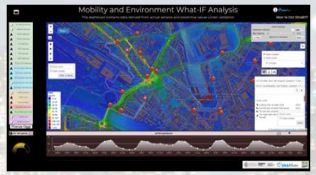
reference

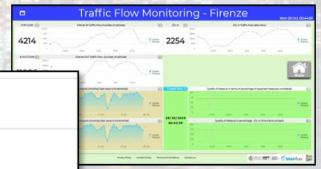
SNAP4CITY

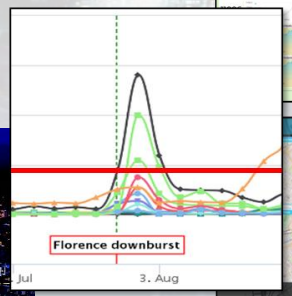
KM 4 CITY

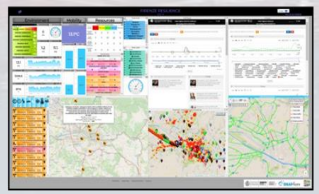
- **Multiple Domain Data**
  - Thousands OD, POI, IOT, etc.
  - ***mobility and transport***: accidents, public transport, parking, traffic flow, Traffic Reconstruction, KPI, …
  - **and**: security, civil protection, gov KPI, covid-19, social media, people flow, tourism, energy, culture, …
- **Multiple dash/tool Levels & Decision Makers**
  - Real Time monitoring, Alerting, quality assess.
  - Predictions, KPI, DSS, what-if analysis
- **Historical and Real Time data**
  - Billions of Data
- **Services Exploited on:**
  - Multiple Levels, Mobile Apps, API
- **Since 2017**

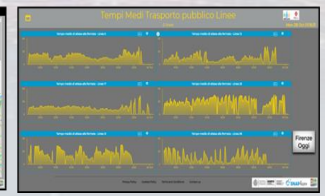










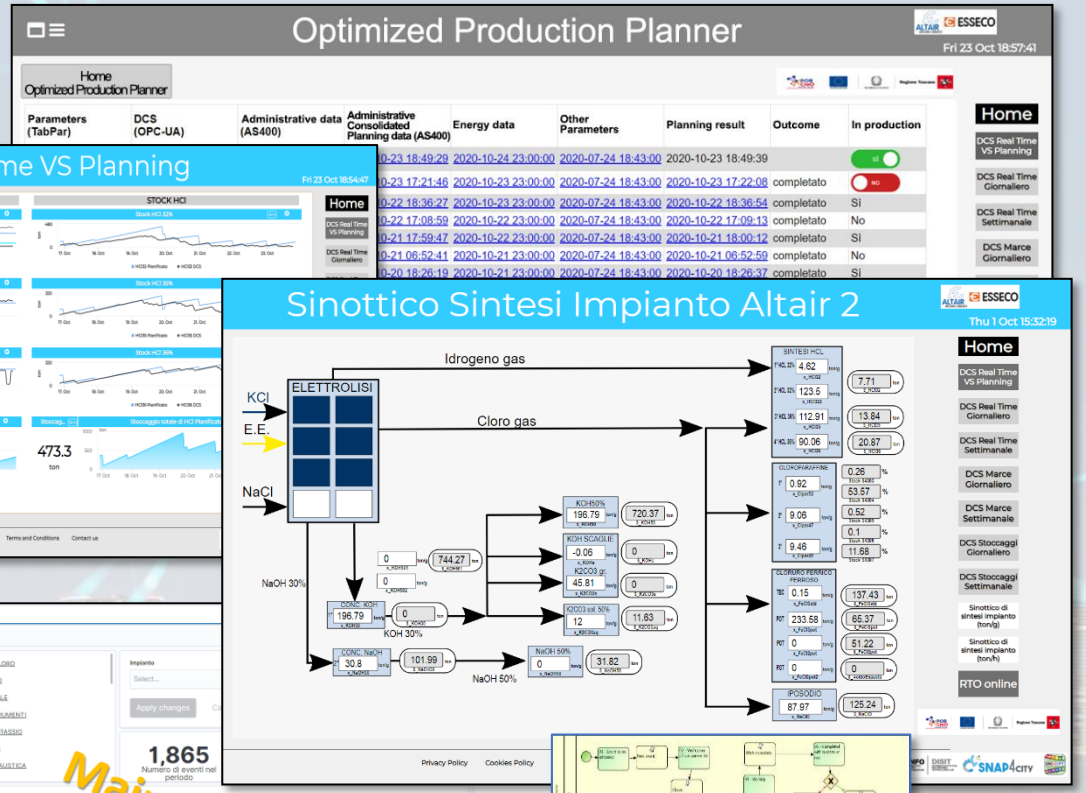


Altair Control room

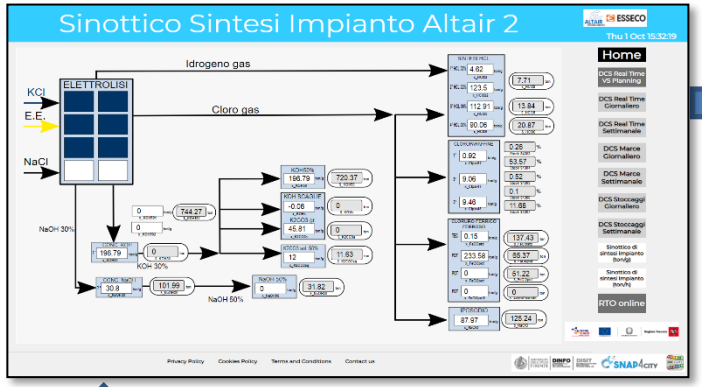
Snap4Altair Decision Support supervision and control, Industry 4.0

reference

- **Multiple Domain Data**
  - Distributed Control System: energy, flows, storage, chemical data, settings, ..
  - Cost of energy, Orders,
  - Production Parameters
  - Maintenance data
- **Multiple Levels & Decision Makers**
  - Optimized planning on chemical model
  - Business Intelligence on Maintenance data
- **Historical and Real Time data**
  - Billions of Data
- **Services Exploited on:**
  - Multiple Levels, Mobile Apps, API
- **Since 2020**

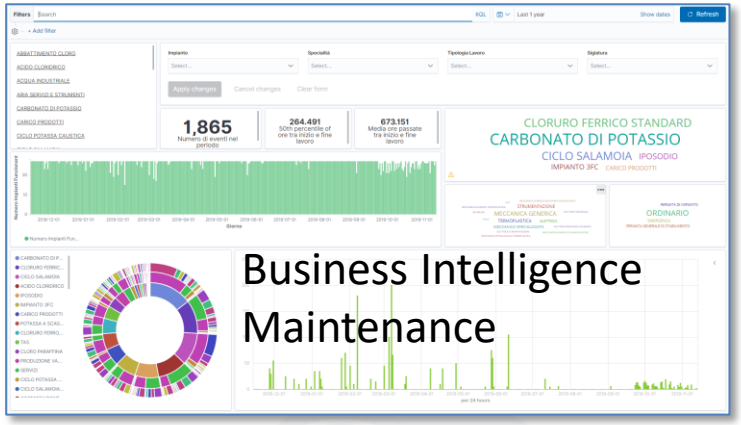


Workflow for Ticket/Team Management

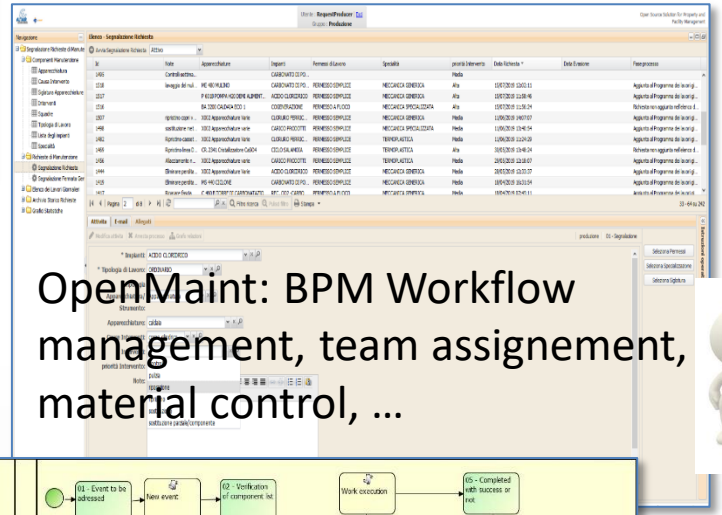


Dashboards and actions

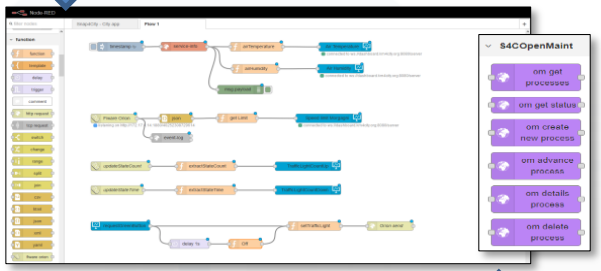
Consumptions/productions

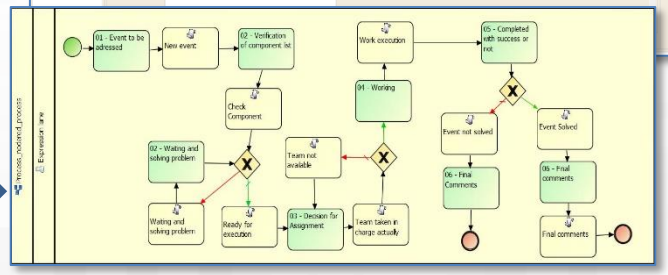


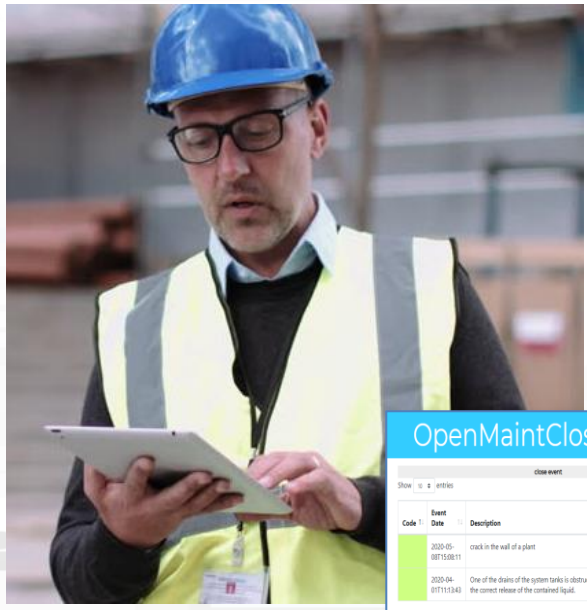
Events/actions

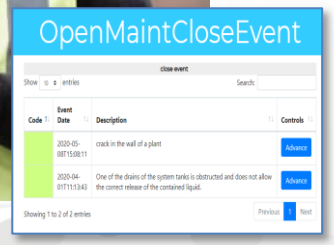


OpenMaint: BPM Workflow management, team assignement, material control, …









IOT App, Data event firing, event detection and firing Critical event management

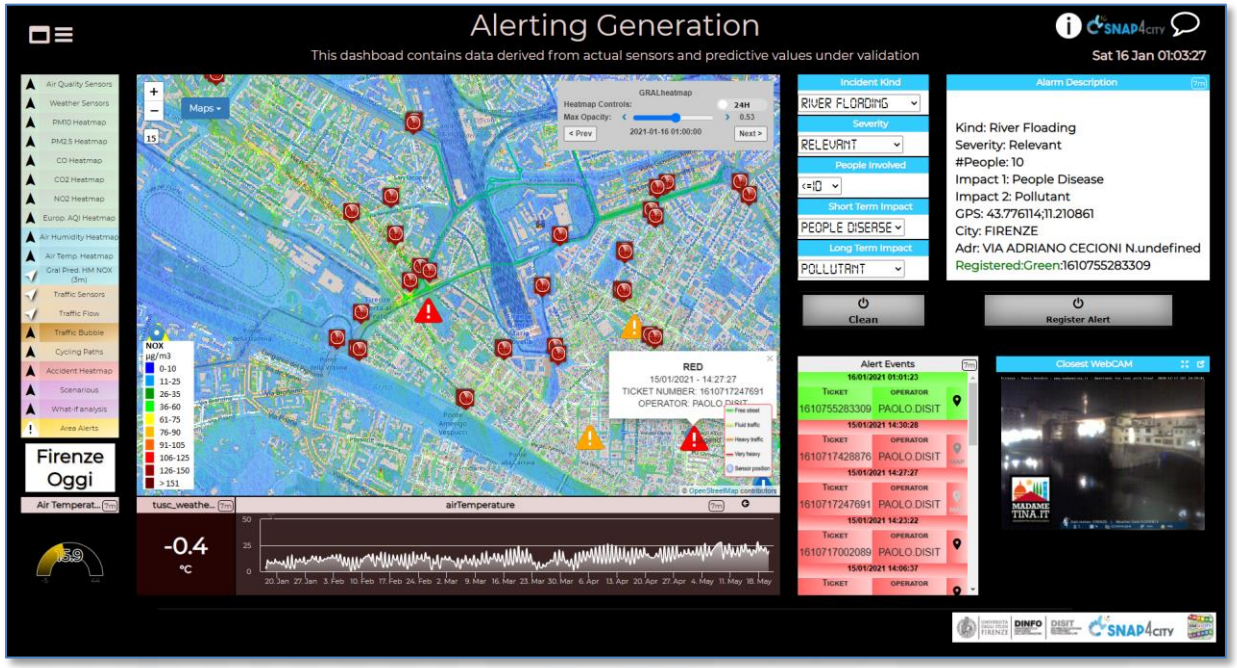
Requirements and Objectives

- Serve as a **City Dashboard**, **App User Interface**, etc.
  - Real time and historical data, any device, sensors and actuators
  - Sensors, KPI, maps, data trends, real time data, charts, etc.
  - Multi domain, smart city + industry 4.0 scenarious
- Referral / **historical data, and Open Data**:
  - shadow, access (API, storage, any protocol), production of OD, export
- **Data Driven Real Time communication &** processing:
  - IOT Applications, IOT edge, multiple operating systems, embedded systems, **MicroServices**
  - in/out data driven from/to the field into: applications, notifications, etc.
- **Data Analytics**: ANY Machine Learning, ANY Visual Analytics, reasoning, …
- **Serve as Living Lab**: open innovation, co-working; collaborative work; sharing: data, processes, dashboard, experiences, solutions, ….
- Experimented on **large scale cases**

resolute
REPLICATE
Sii-Mobility
SELECT for Cities
EIP-SCC
European Network of Living Labs

Requirements and Objectives

- **Responsiveness**
  - *event driven*, secure.
  - From IOT devices to dashboards and vice versa
  - Including Data Analytics on streams
- *We trusted that*
  - *Wider requirements analysis and*
  - *And developed on the basis of multiple EC and national projects has posed the basis for larger acceptance of the solution*

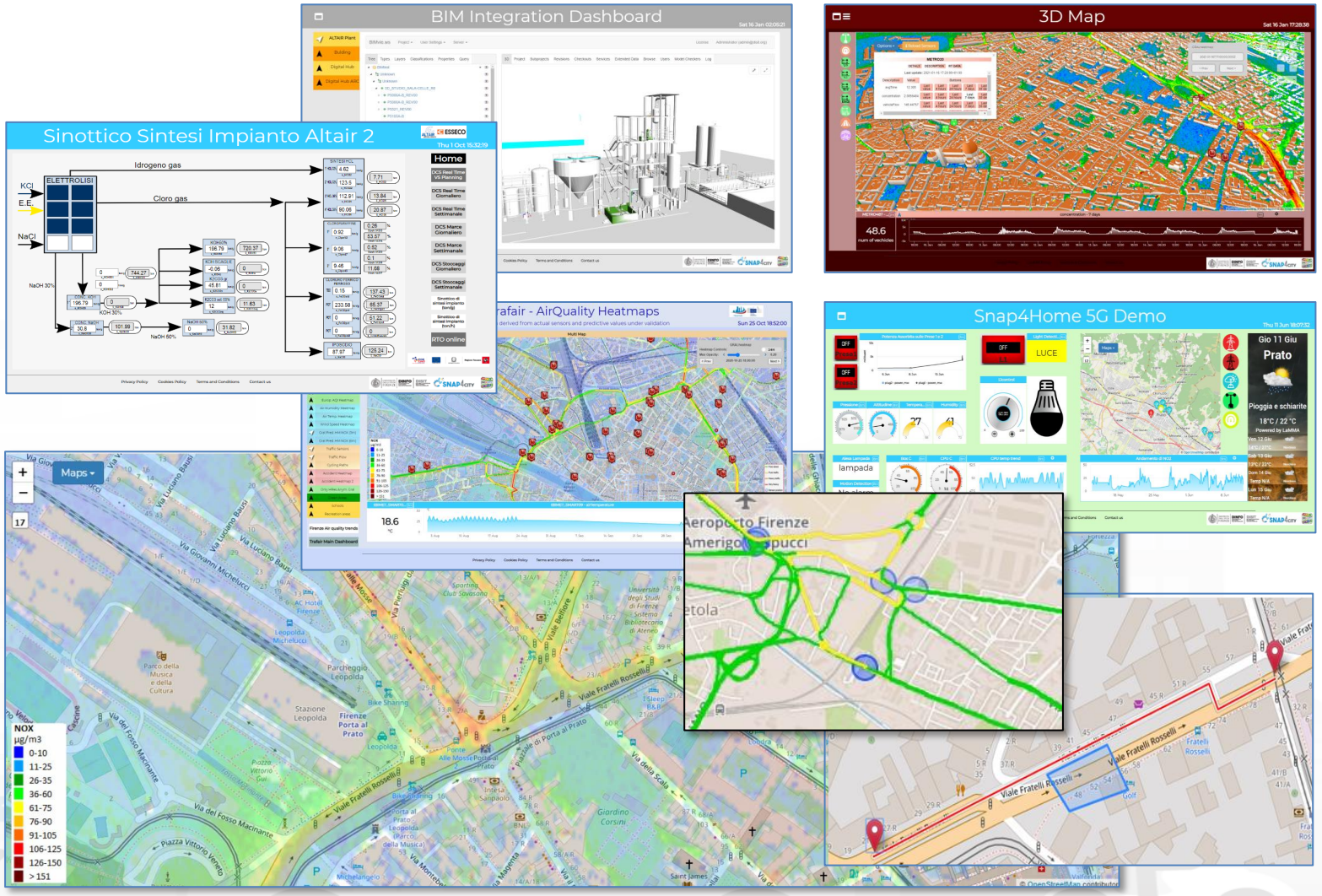


Information in Smart City is not so simple

- Data Coverage:
  - POI, IOT, shapes,..
  - maps, orthomaps, GTFS, ..
  - GIS: WFS, WMS, ….
  - calibrated heatmaps, ..
  - traffic flow, typical trends, ..
  - trajectories, events, ..
  - 3D, BIM, Workflow, ..
  - Dynamic icons/pins, ..
  - OD Matrices, scenarios, ..
  - prediction models, ….
  - decision support, ….
  - Synoptics, animations,
  - social media, Routing, etc.

Need a huge amount of standards

←back and forward→



https://www.snap4city.org/65

Standards and Interoperability

Compliant with: AMQP, COAP, MQTT, OneM2M, HTTP, HTTPS, TLS, Rest Call, SMTP, TCP, UDP, NGSI, LoRa, LoRaWan, TheThingsNetwork, SigFOX, DATEX II, SOAP, WSDL, Twitter, FaceBook, Telegram, SMS, OLAP, MySQL, Mongo, HBASE, SOLR, SPARQL, EMAIL, FTP, FTPS, WebSocket, WebSocket Secure, ModBUS, OPC, GML, RS485, RS232, WFS, WMS, ODBC, JDBC, Elastic Search, Phoenix, XML, JSON, CSV, db, GeoJSON, Enfuser FMI, Android, Raspberry Pi, Local File System, ESP32, Libelium, IBIMET/IBE, OBD2, SVG, XLS, XLSX, TXT, HTML, CSS, KNX, Enocean, Zigbee, DALI, ISEMC, Alexa, Sonoff, HUE Philips, Tplink, BACnet, TALQ, Copernicus, Protocol Buffer, IFC, XPDL, etc.

Non functional requirements

- **Open Source** based 100%
  - any **Standard**
- **Multi tenant:** to cope with multiple organization with a single installation
- **Scalable, Robust, Distributed** and Decoupled, modular, Service Oriented, open to external services and data sets, big data
- **Heterogeneous**: any device, private and public, custom and..
- **Security** by Design: HTTPS, TLS, … compliant with EC
- **User Centric** Design: privacy by Design (and **GDPR**), personalized, personal data management, ...

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

SNAP4CITY
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KM 4 CITY

Powered by FIWARE

SNAP4 Appliances and Dockers Installations

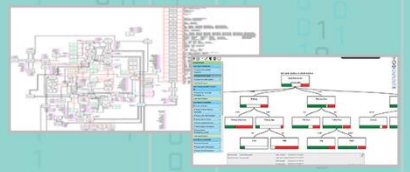
FREE TRIAL

PEN Test Passed

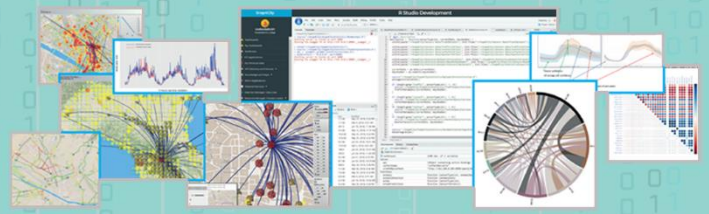
EU GDPR COMPLIANT

100% OPEN SOURCE

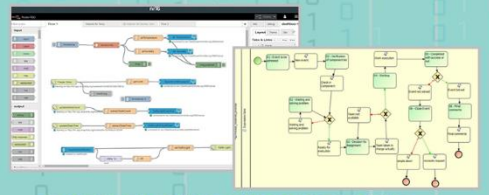
DASHBOARDS AND APPS - CONTROL ROOMS - DECISION SUPPORT SYSTEMS - WHAT-IF ANALYSIS



EXPERT SYSTEM
KNOWLEDGE BASE
STORAGE

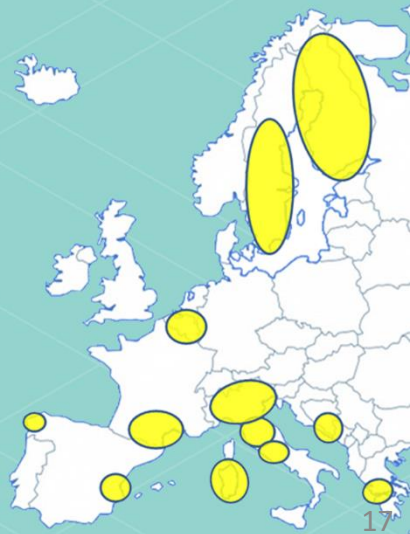


BIG DATA ANALYTICS
ARTIFICIAL INTELLIGENCE
BUSINESS INTELLIGENCE
MACHINE LEARNING



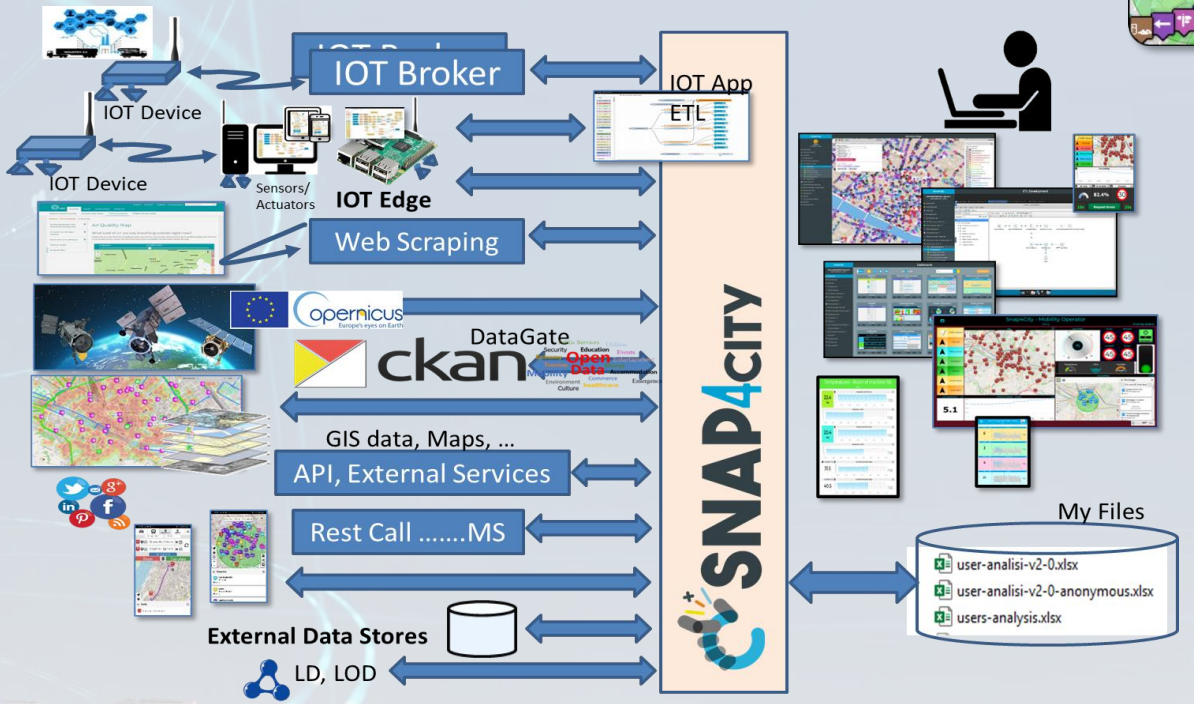
DATA FLOWS, WORKFLOWS
MICROSERVICES
MANAGEMENT

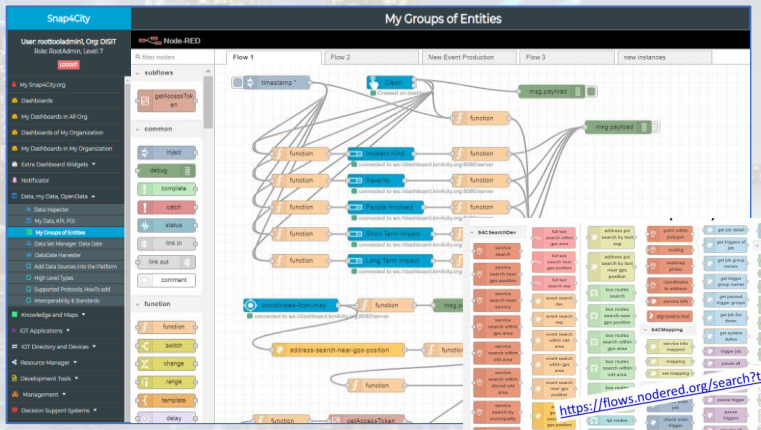
METHODOLOGIES
COURSES AND COMMUNITY
LIVING LABS
DEVELOPMENT TOOLS

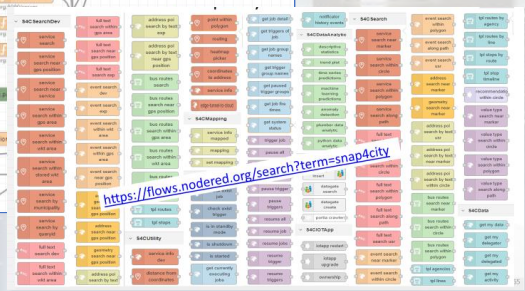


Ingestion, aggregation → exploitation

- **Ingestion & aggregation**
  Snap4City tools
  - Any format, any channel, any data, any broker, any protocol, …
  - Knowledge base, **Km4City** Ontology for modelling entities and aggregation
- **Exploitation of Aggregated info via Snap4City**:
  - **Smart City API** for Apps and third party
  - **MicroServices** data driven develop via visual language Node-RED



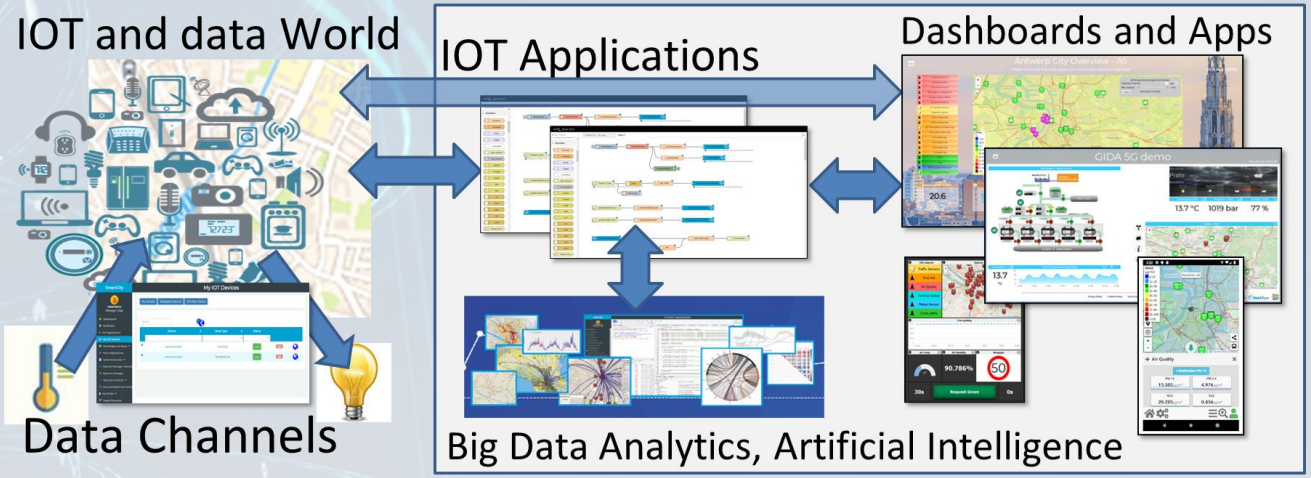


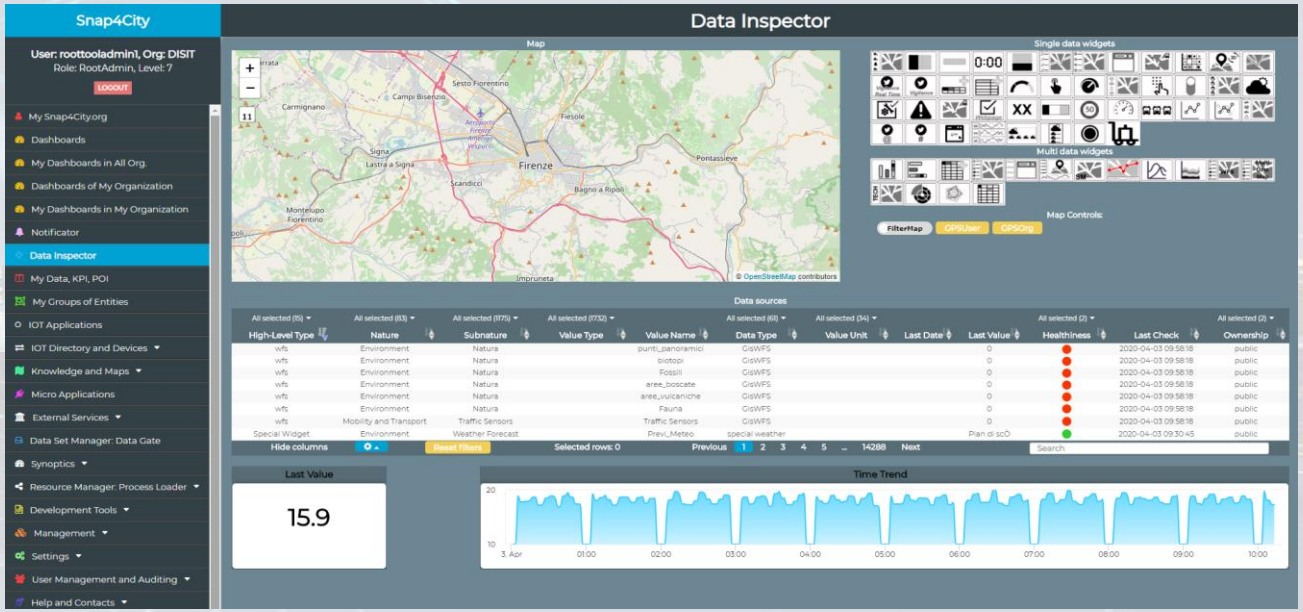


Solutions: reliable, secure and fast to realize

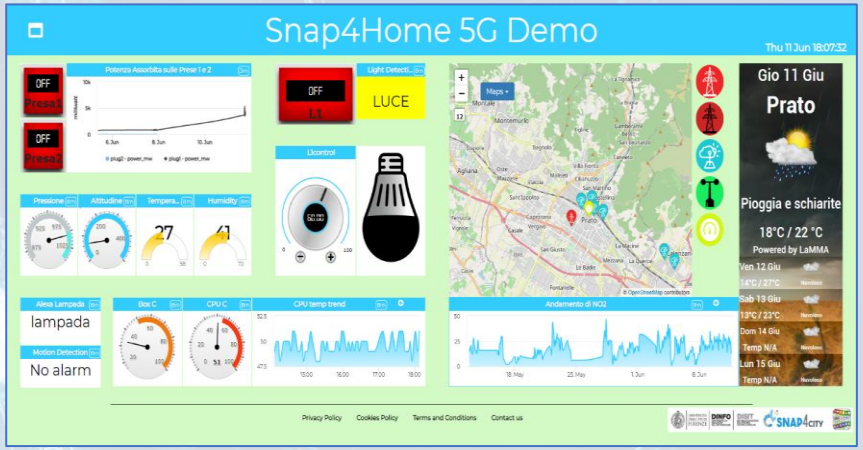
- **Fast Solution building via**
  - **Dashboard Wizard**
  - **Dashboard Builder**
  - **Data Analytic**

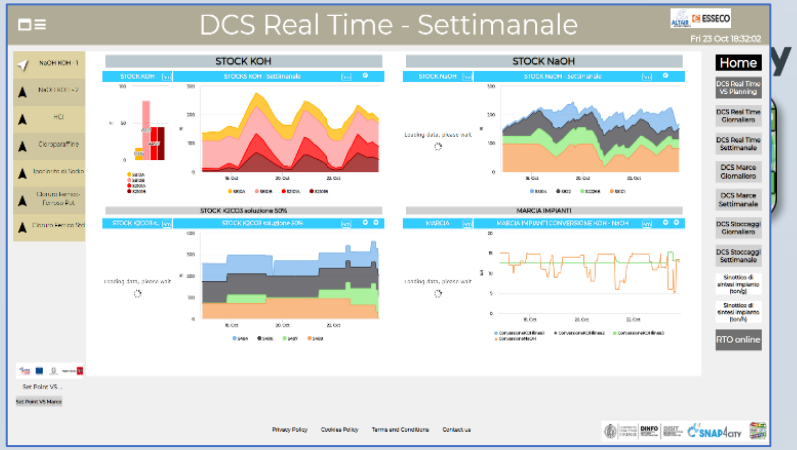
- **Solutions results to be**
  - **Real time data drive**
  - **Secure end-to-end**
  - **GDPR compliant**
  - **Reliable, interoperable**
  - **Auditable, marketable**

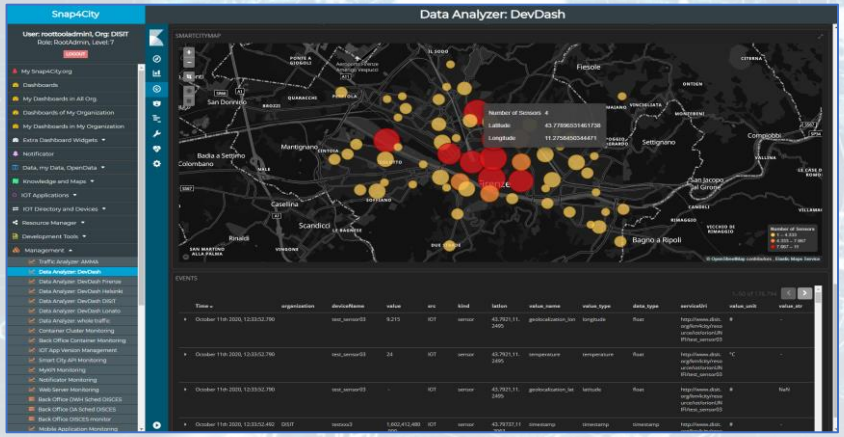


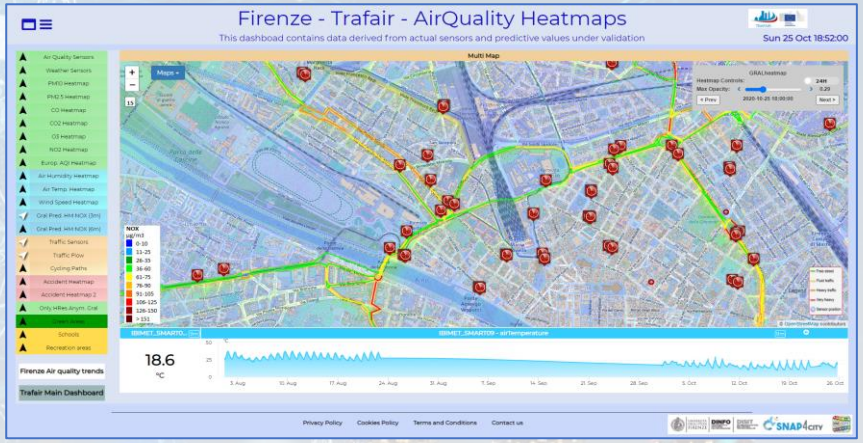


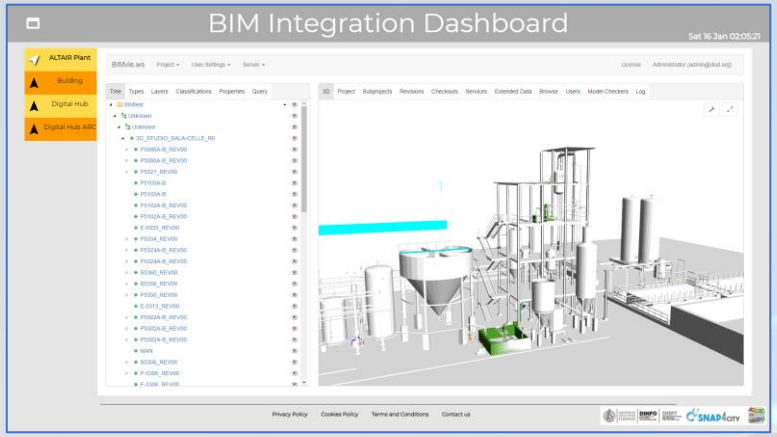

Alerting Generation
This dashboad contains data derived from actual sensors and predictive values under validation
Sat 16 Jan 01:03:27
Firenze Oggi
-0.4

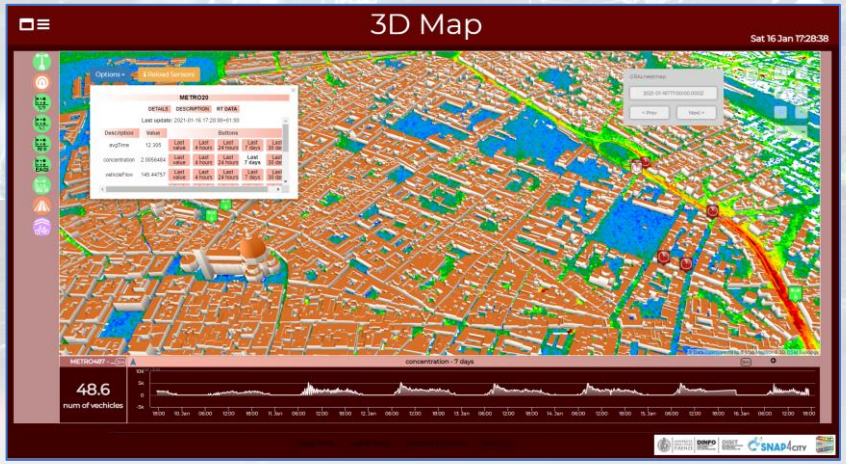

Snap4Home 5G Demo
Thu 11 Jun 18:07:32
LUCE
lampada
No alarm
Gio 11 Giu
Prato
Pioggia e schiarite
18°C / 22 °C
Powered by LaMMA

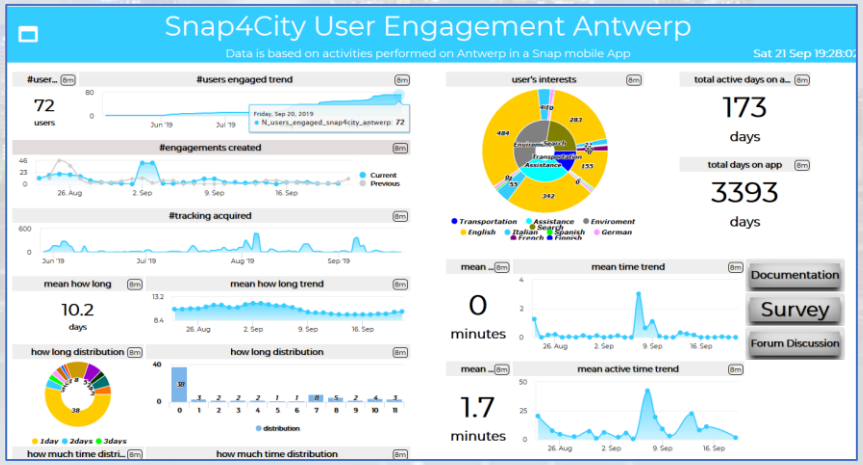

DCS Real Time - Settimanale
Fri 23 Oct 18:32:02
STOCK KOH
STOCK NaOH
Home

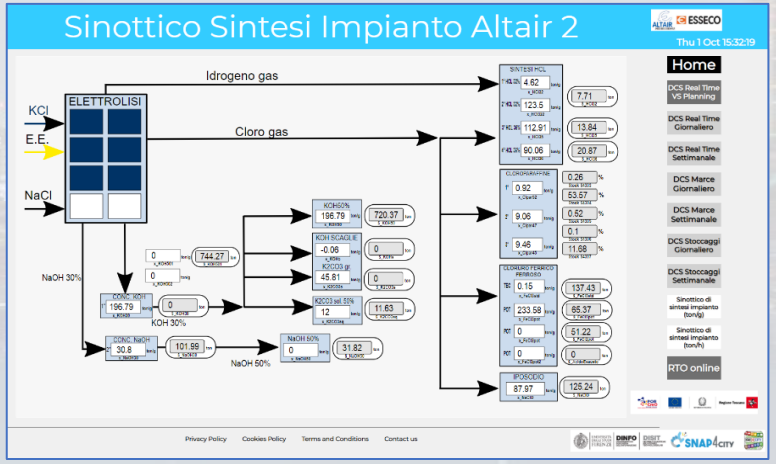

Snap4City
Data Analyzer: DevDash


Firenze - Trafair - AirQuality Heatmaps
This dashboad contains data derived from actual sensors and predictive values under validation
Sun 25 Oct 18:52:00
18.6


BIM Integration Dashboard
Sat 16 Jan 02:05:21


3D Map
Sat 16 Jan 17:28:38
48.6
num of vechicles


Snap4City User Engagement Antwerp
Data is based on activities performed on Antwerp in a Snap mobile App
Sat 21 Sep 19:28:07
72
users
173
days
3393
days
10.2
days
0
minutes
1.7
minutes
Documentation
Survey
Forum Discussion


Sinottico Sintesi Impianto Altair 2
Thu 1 Oct 15:32:19
Home
Idrogeno gas
Cloro gas
ELETTROLISI
KCl
E.E.
NaCl
NaOH 30%
KOH 30%
NaOH 50%

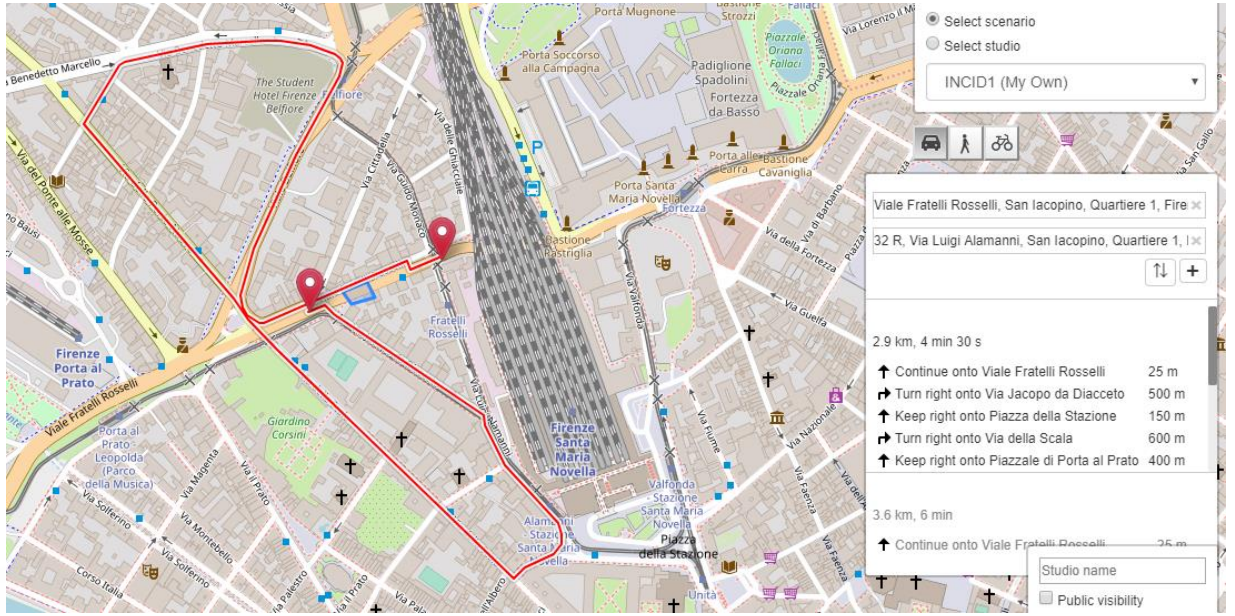
What-If Analysis

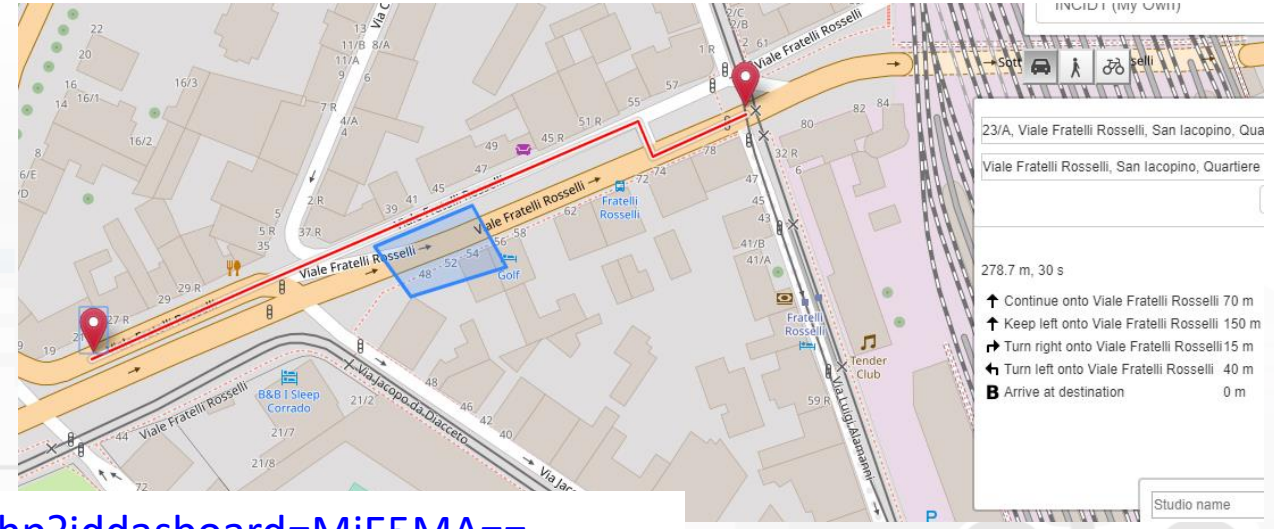
Accidents and elements blocking Points and Shapes taken into account for:

- Routing
- Traffic Flow reconstruction
- Evacuation paths
- Rescue team paths

Assessment on the basis of changes:

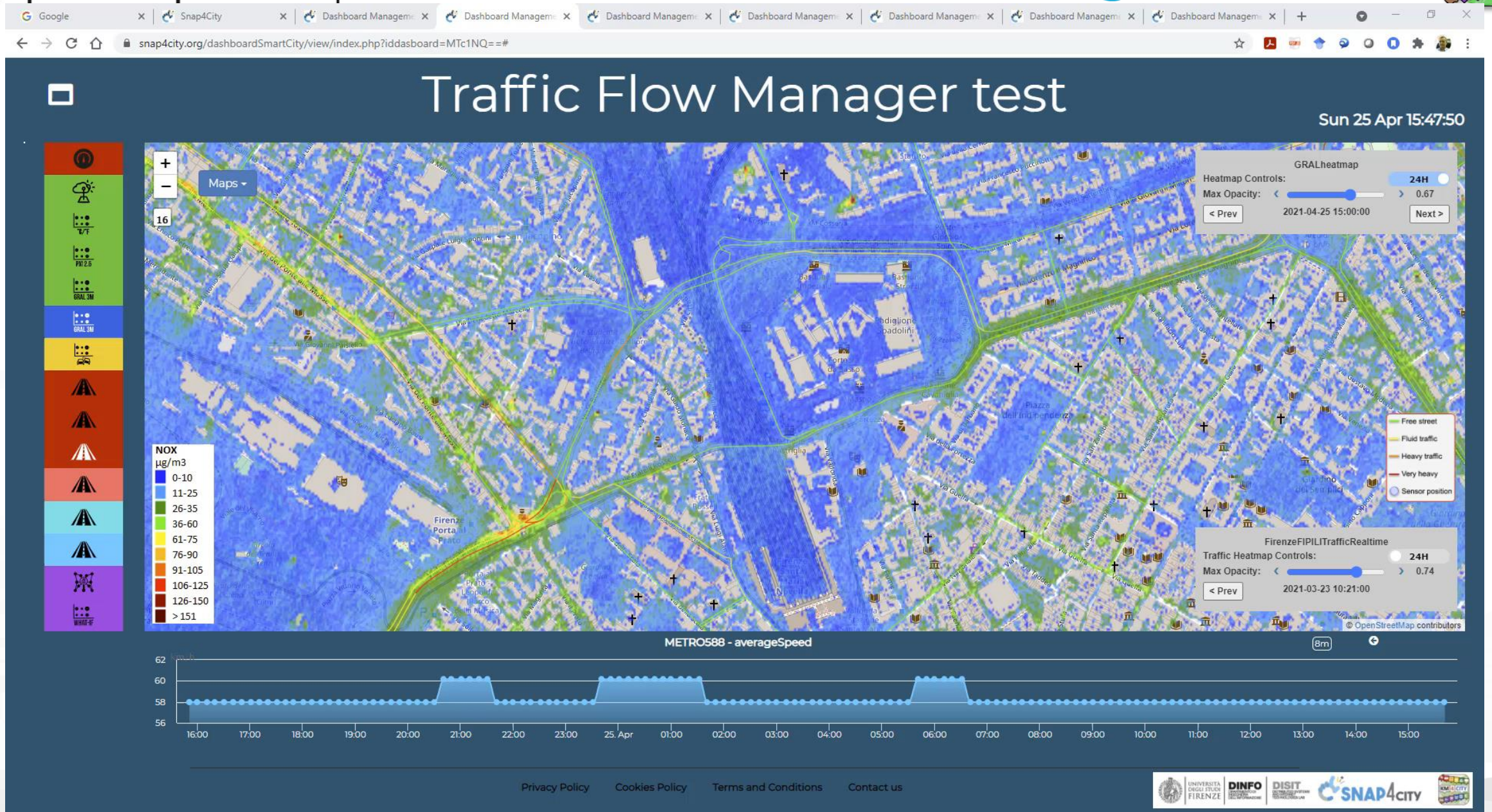
- Mobility demand assessment
- Mobility Offer assessment





https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjE5MA==

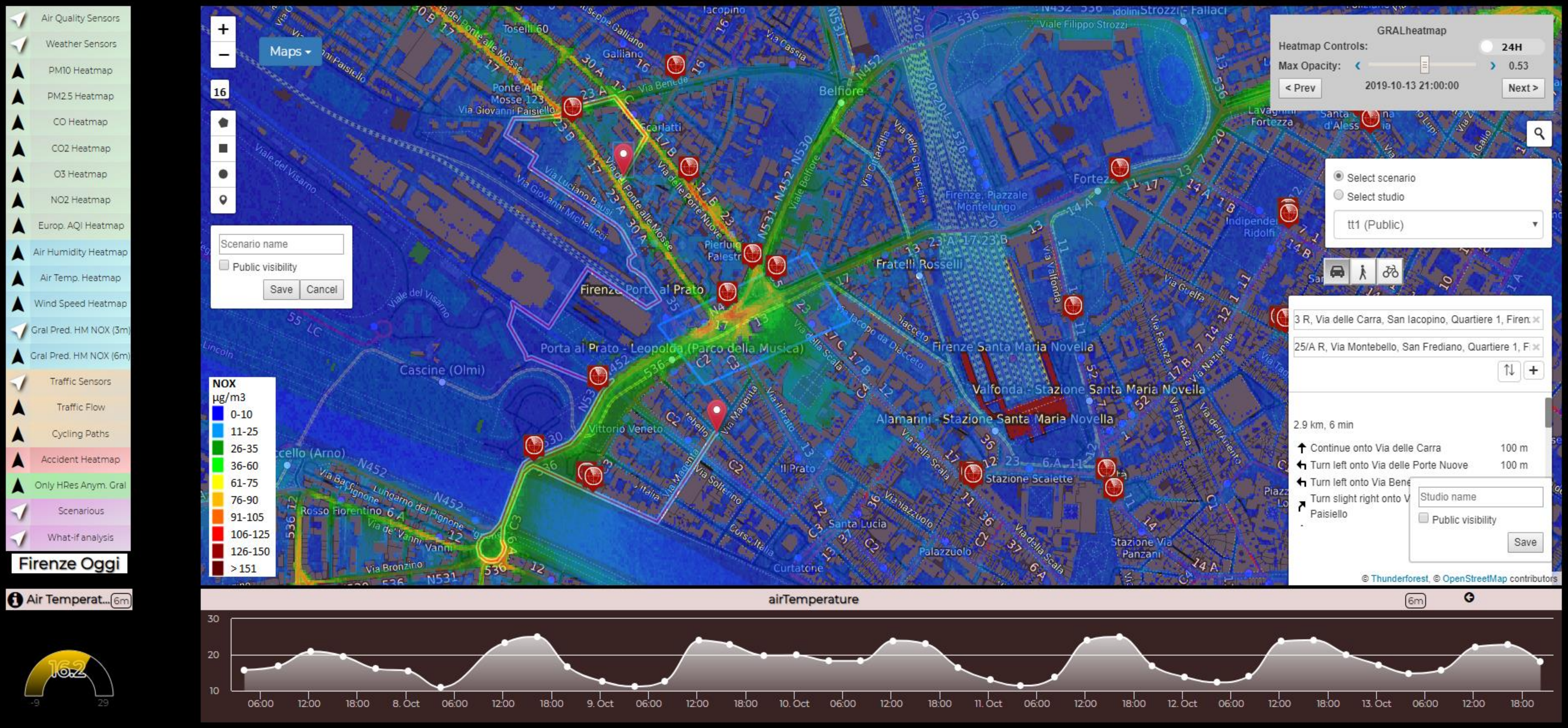
Traffic vs NOX



Mobility and Environment What-IF Analysis

This dashboad contains data derived from actual sensors and predictive values under validation

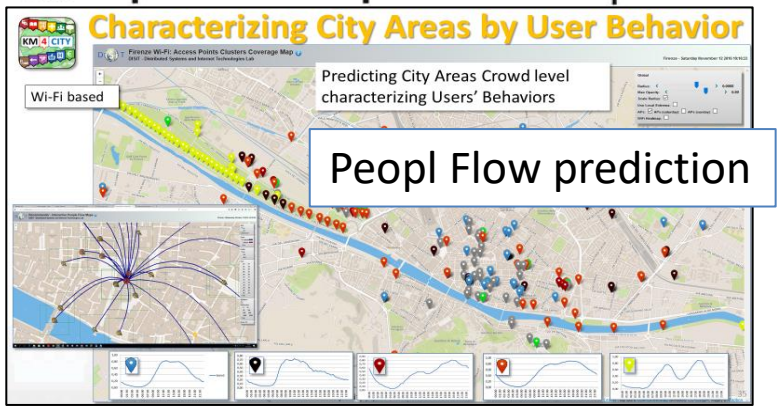
Mon 14 Oct 00:48:17



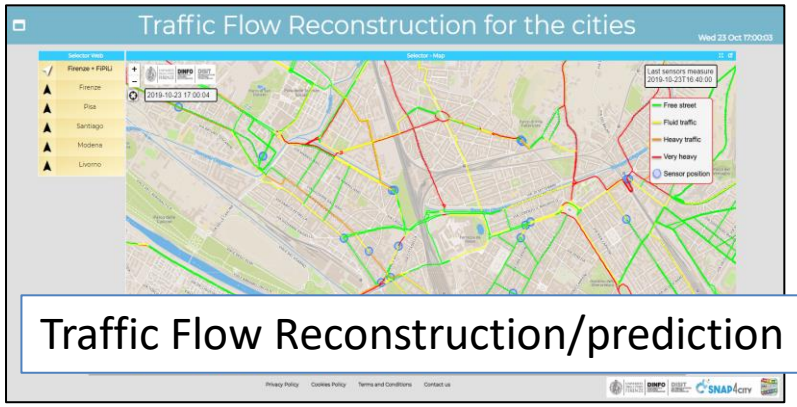
https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjE5MA==

Data Analytics

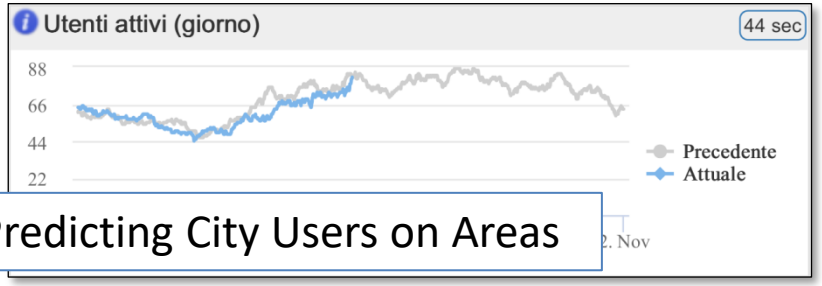
Characterizing City Areas by User Behavior



Peopl Flow prediction



Traffic Flow Reconstruction/prediction



Predicting City Users on Areas

Free Parking Predictions

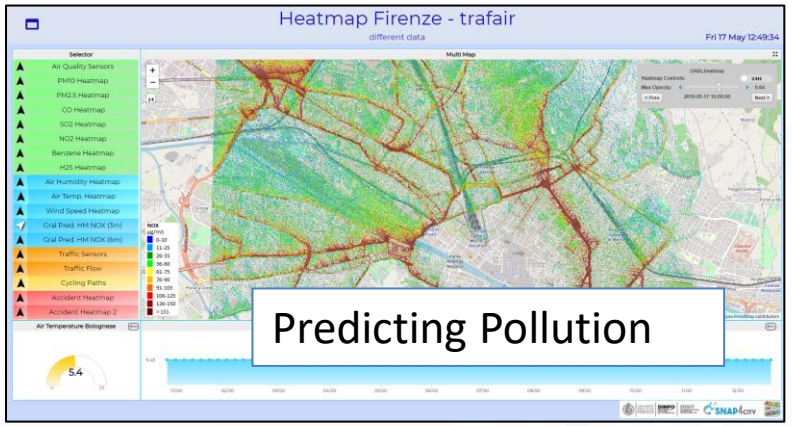
Careggi car park			
Model features	BRNN model results		
	R-squared	RMSE	MASE
Baseline	0.974	24	1.87
Baseline + Weather	0.975	24	1.75
Baseline + Traffic sensors	0.975	24	2.04
Baseline + Weather + Traffic sensors	0.975	24	1.87

Active on Mobile Apps as:

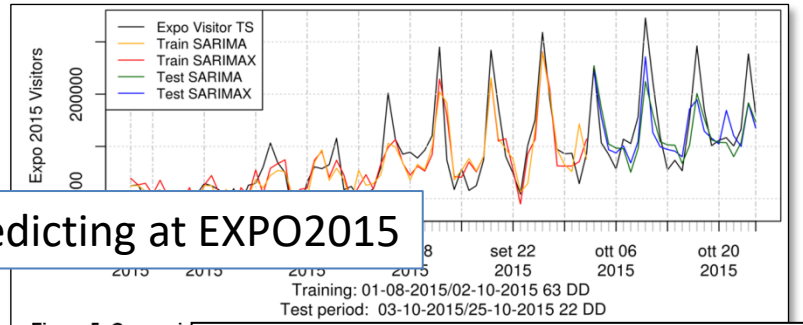
– «Firenze dove cosa»

– «Toscana dove cosa»

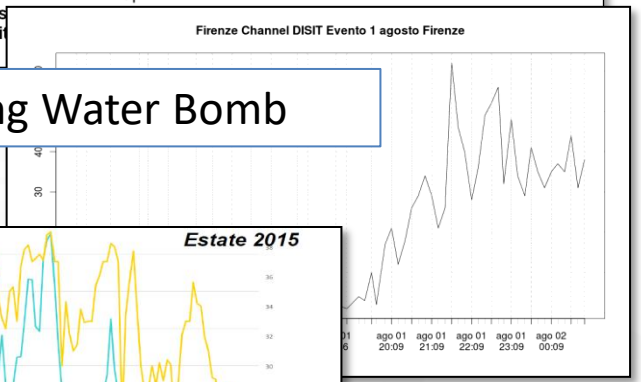
Precision: 97,5%



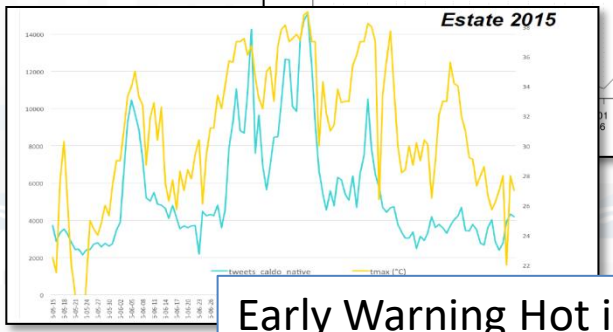
Predicting Pollution



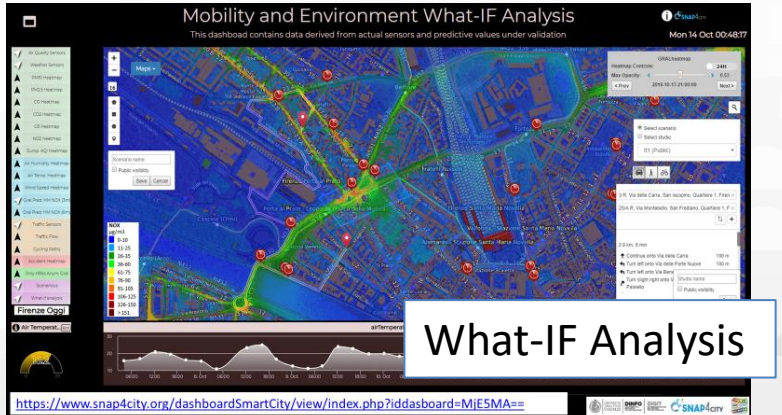
Predicting at EXPO2015



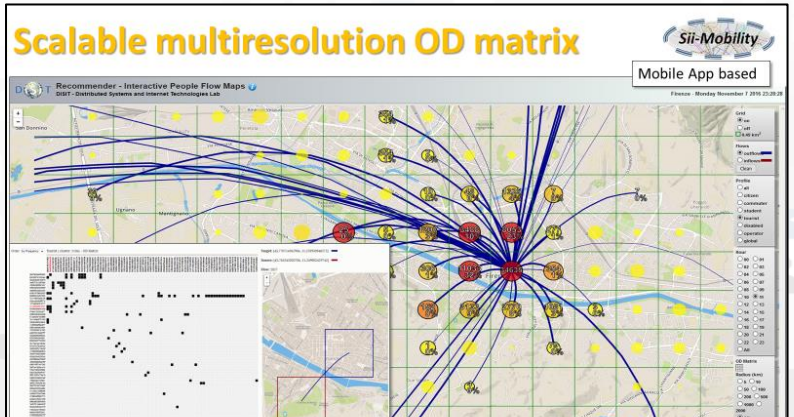
Early Warning Water Bomb



Early Warning Hot in Tuscany



What-IF Analysis

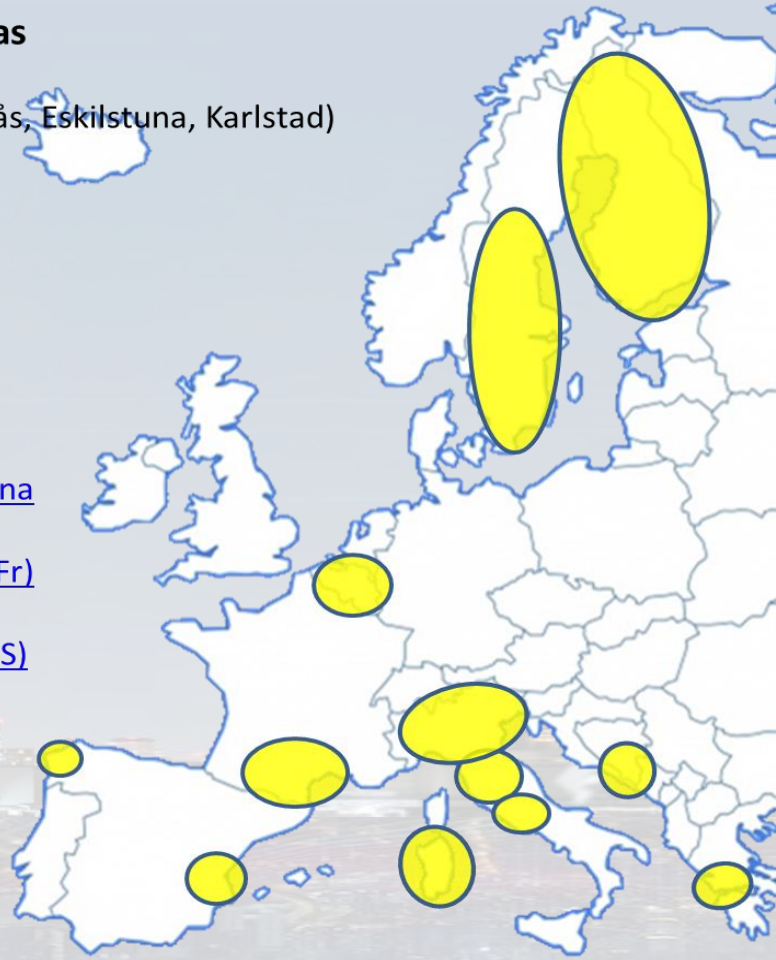


2021: Snap4City/Industry Numbers

- > 100 Protocols
- *Mobility, energy, people flow, environment, Industry 4.0, tracking, smartbed, smart ambulance, Tourism, smart light, culture, etc…*
  - 5 running installations
  - 13 projects, 12 pilots on 9 Countries
- **On the largest deploy**
  - 17 Organizations / tenant
  - > 4800 users on https://www.Snap4City.org
  - > 1200 Dashboards
  - > 15 mobile Apps
  - > 2 Million of structured data per day
  - > 500 IoT Applications/node-RED /Docker
  - > 680 web pages with training
  - > 40 videos, training videos

Main Organizations/areas

- Antwerp area (Be)
- Capelon (Sweden: Västerås, Eskilstuna, Karlstad)
- DISIT demo (multiple)
- Dubrovnik, Croatia
- Firenze area (I)
- Garda Lake area (I)
- Helsinki area (Fin)
- Livorno area (I)
- Lonato del Garda (I)
- Modena (I)
- Mostar, Bosnia-Herzegovina
- Pisa area (I)
- Pont du Gard, Occitanie (Fr)
- Roma (I)
- Santiago de Compostela (S)
- Sardegna Region (I)
- SmartBed (multiple)
- Toscana Region (I), SM
- Valencia (S)
- Venezia area (I)
- WestGreece area (Gr)



Mobility and Transport Traffic Flow Analysis

Cities: Firenze, Pisa, Livorno, Modena, Santiago di Compostela

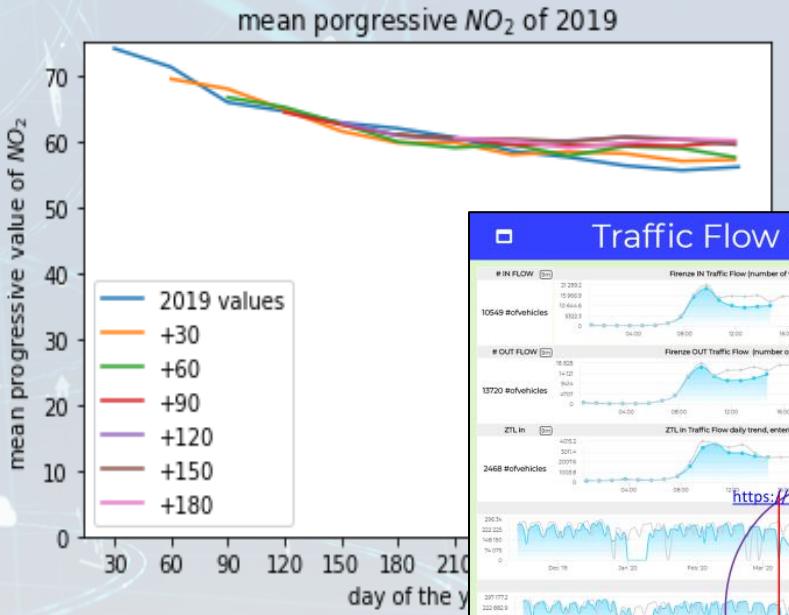
reference

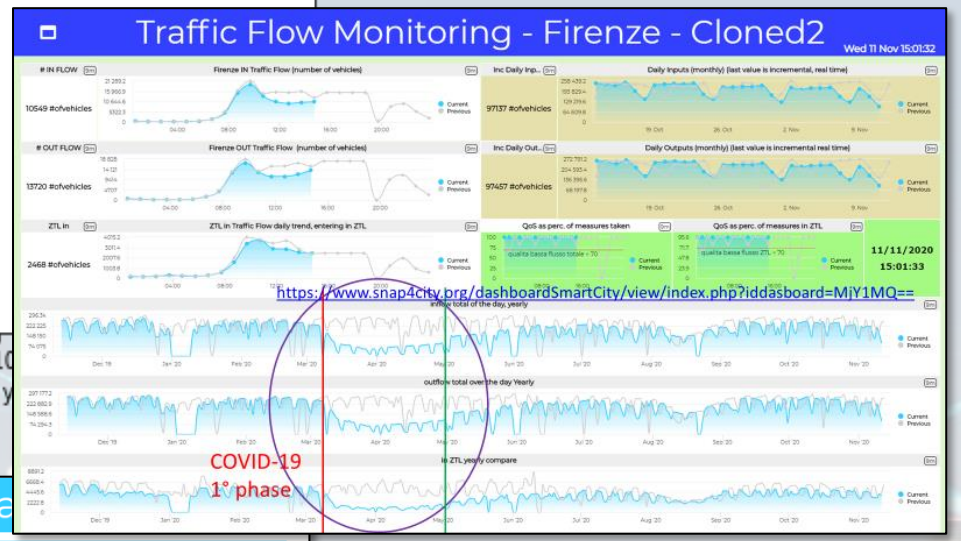
- **Multiple Domain Data**
  - Traffic Flow sensors, city structure, weather
- **Decision Makers Multiple Locations**
  - Real time Monitoring, predictions
  - Traffic Flow Predictions,
  - Traffic Reconstructions, routing
  - Dashboards, What-IF analysis
  - Mobile App, people flows
- **Historical and Real Time data**
- **Services Exploited on:**
  - Dashboards, Mobile App
- **Since 2017, 2019**

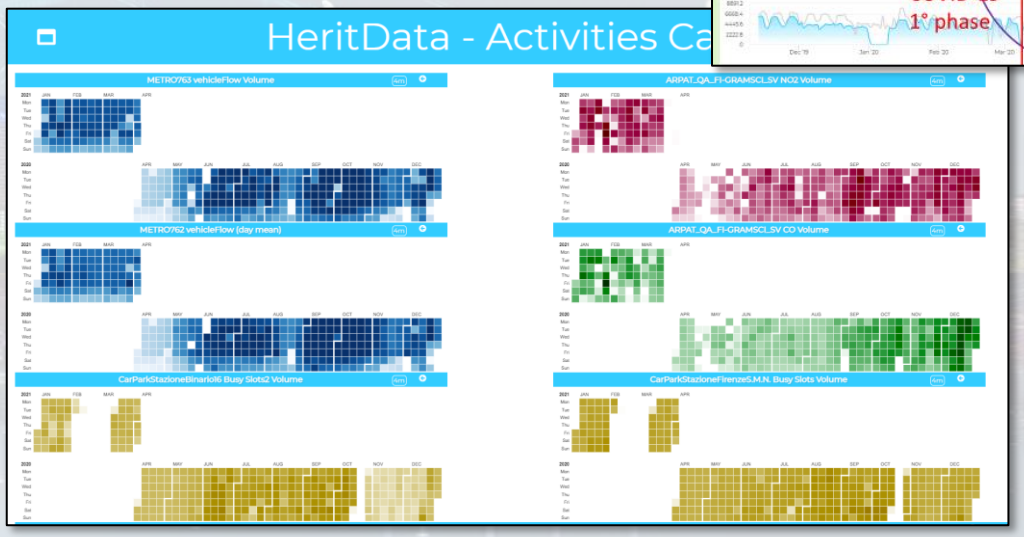
Impact of COVID-19

Cities: Firenze, Pisa, Livorno, Toscana

- **Multiple Domains Data**
  - Traffic, environment, People, parking, stock options, Twitter, tc.
- **Decision Makers Multiple Locations**
  - NO2 long term predictions
  - Twitter analysis
- **Historical and Real Time data**
- **Services Exploited on:**
  - Dashboards
  - Social media,
  - Sentiment Analysis
- **Since 2019, 2020**







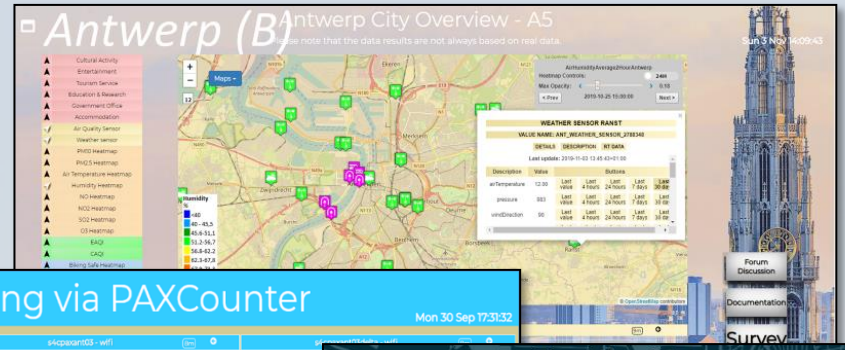
metric	model30	model60	model90	model120	model150	model180
MAE	1.21	1.31	1.52	2.04	2.31	2.37
RMSE	2.16	2.61	4.18	6.77	7.83	7.93
MAPE	1.99	2.20	2.65	3.57	4.07	4.18
R2	0.91	0.83	0.80	0.54	0.45	0.14

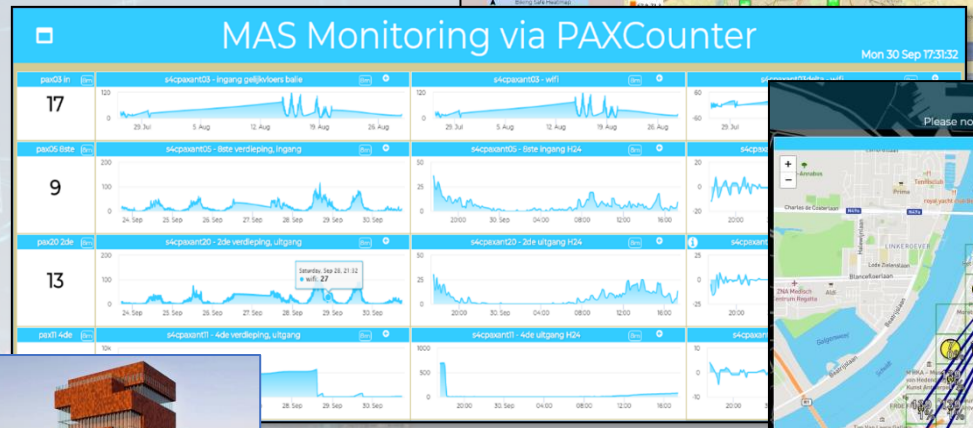
Table 4. Assessment of the predictive models with respect to the actual values of the 2019.

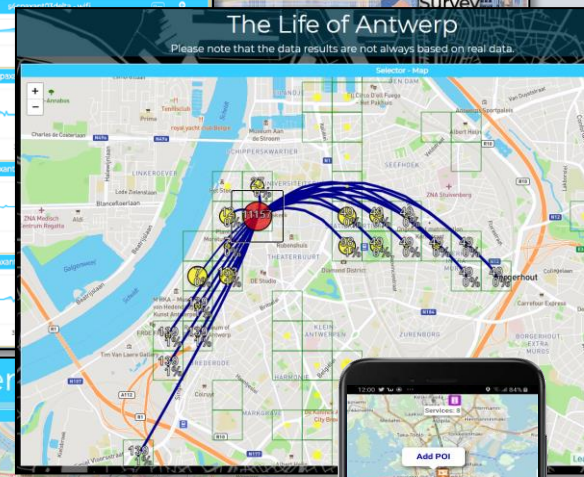
People Monitoring on Pub Services
DIGIPOLIS Antwerp

reference

- **Multiple Domain Data**
  - PAX Counters: museum, pub services, COVID-19
- **Multiple Levels & Decision Makers**
  - Business Intelligence Dashboards
  - People flow, OD flows
  - Detection of critical conditions
- **Historical and Real Time data**
  - 20 fixed PaxCounters
  - 2 Mobile PaxCounters
- **Services Exploited on:**
  - Dashboards, Mobile Apps, API/data
  - Fully Controlled Devices by Digipolis
- **Since 2019**





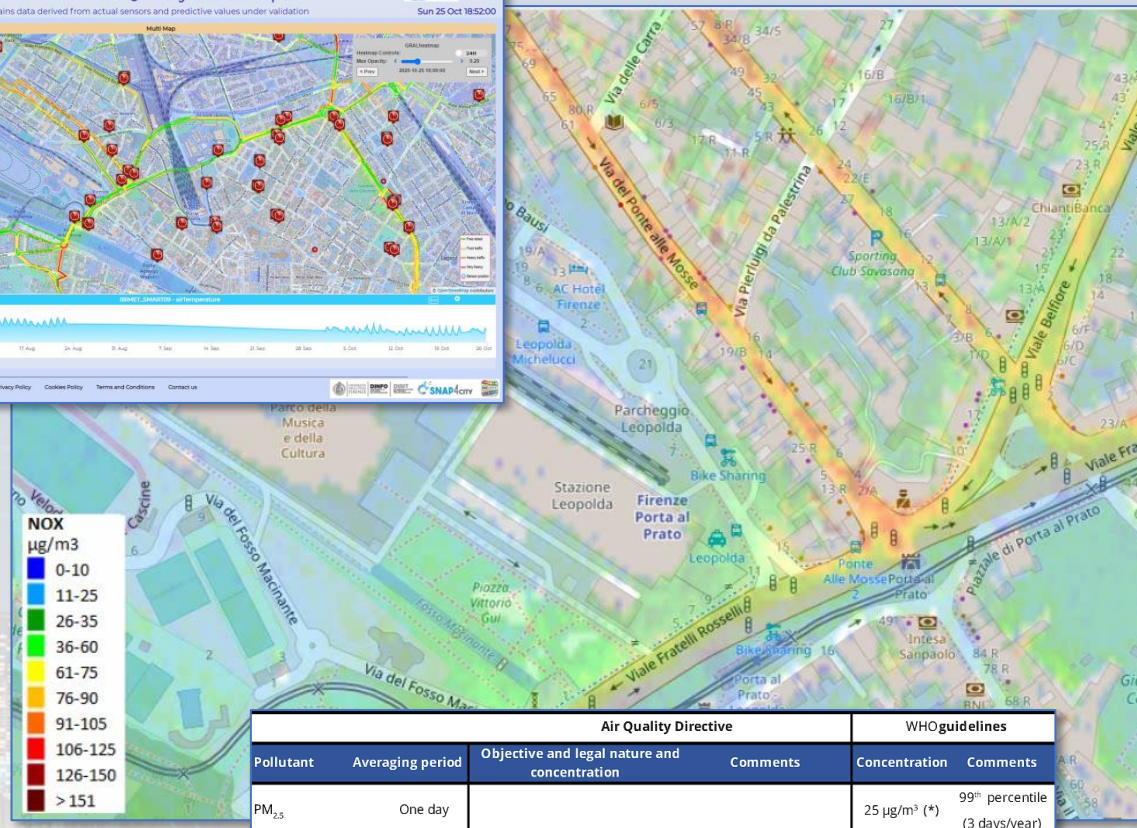


Environment and Quality of Life
Air Quality Predictions

Cities of: Firenze, Pisa, Livorno

reference

- **Multiple Domain Data**
  - Traffic Flow data, Pollutant: NOX, CO2, PM10, PM2.5, O3, ….
  - 3D City structure, weather, …
- **Multiple Decision Makers**
  - Pollutant Predictions: NOX, NO2, ..
  - City officers, energy industries
  - Dashboards, What-IF analysis
  - Traffic Flow Reconstruction
- **Historical and Real Time data**
  - Billions of Data
- **Services Exploited on:**
  - Dashboards, Mobile App
- **Since 2020**

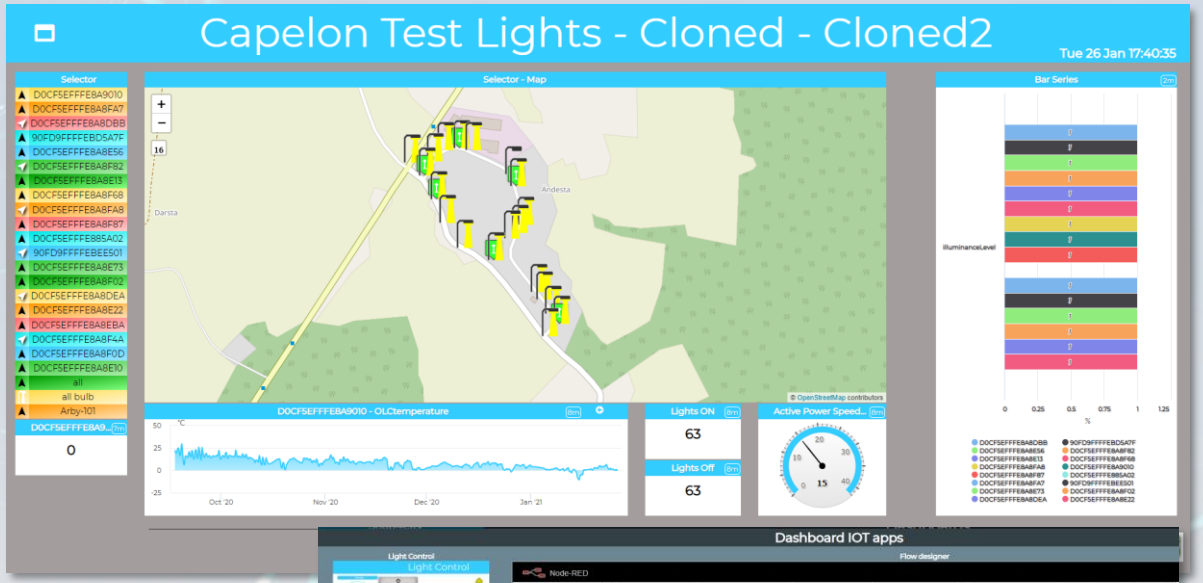


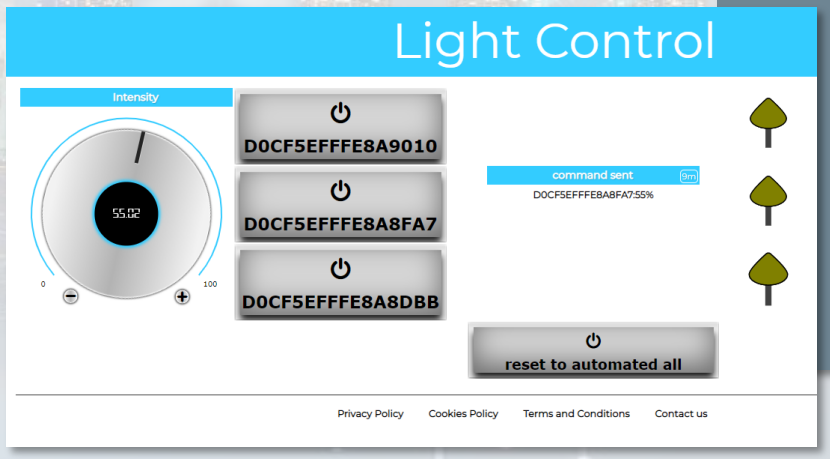
		Air Quality Directive		WHO guidelines	
Pollutant	Averaging period	Objective and legal nature and concentration	Comments	Concentration	Comments
$PM_{2.5}$	One day			25 µg/m³ (*)	99th percentile (3 days/year)
$PM_{2.5}$	Calendar year	Target value, 25 µg/m³	The target value has become a limit value since 1 January 2015	10 µg/m³	
PM_{10}	One day	Limit value, 50 µg/m³	Not to be exceeded on more than 35 days per year.	50 µg/m³ (*)	99th percentile (3 days/year)
PM_{10}	Calendar year	Limit value, 40 µg/m³ (*)		20 µg/m³	
O_3	Maximum daily 8-hour mean	Target value, 120 µg/m³	Not to be exceeded on more than 25 days per year, averaged over three years	100 µg/m³	
NO_2	One hour	Limit value, 200 µg/m³ (*)	Not to be exceeded more than 18 times a calendar year	200 µg/m³ (*)	
NO_2	Calendar year	Limit value, 40 µg/m³		40 µg/m³	

Smart Light Control of CAPELON

reference

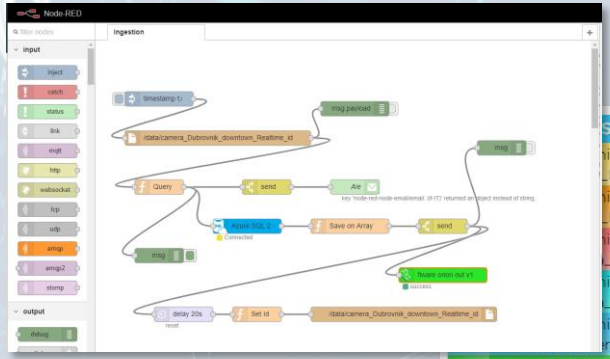
- **Energy Domain**
  - Smart Light
  - IoT Orion Broker FIWARE
- **Dashboards**
  - Map coverage on Sweden
  - Monitoring and real time control
  - Energy control, analytics
  - Direct control
- **Historical and Real Time data**
- **Services Exploited on:**
  - Multiple Levels, API
  - Dashboards
- **Since 2020**

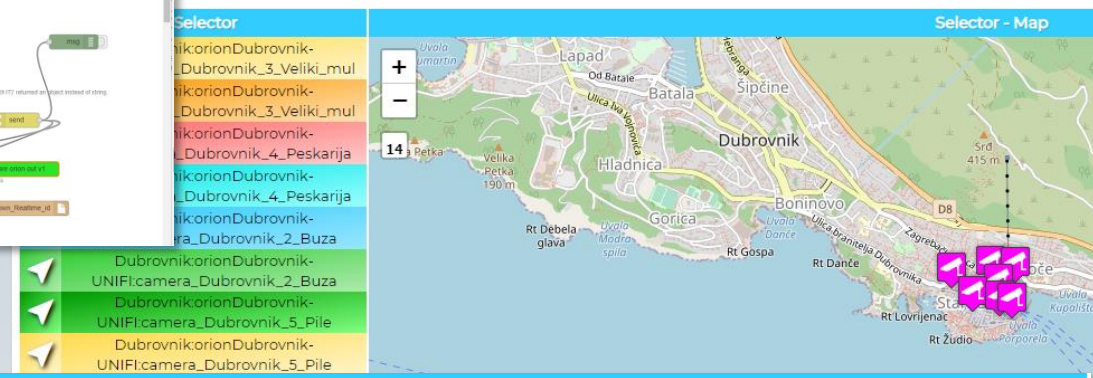


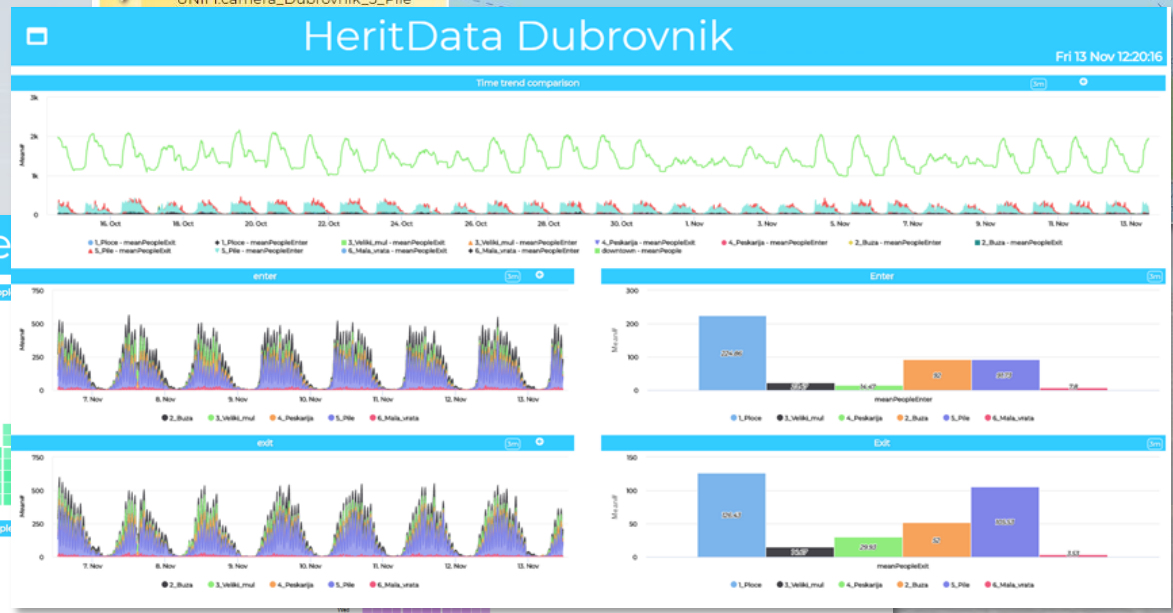


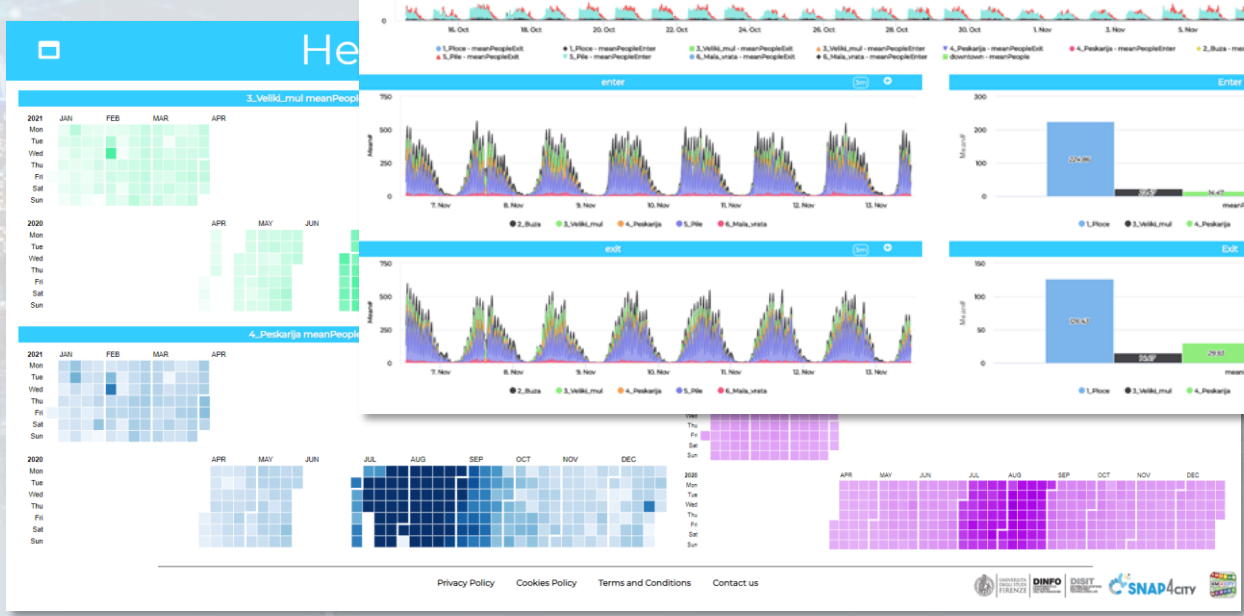
Dubrovnik

- **Tourism Domain**
  - Counting People
  - TV Cameras and WiFi
  - Social Media
- **Dashboards**
  - Monitoring and real time control
  - People flow
  - Twitter Vigilance
- **Historical and Real Time data**
- **Services Exploited on:**
  - Dashboard
- **Since 2020**



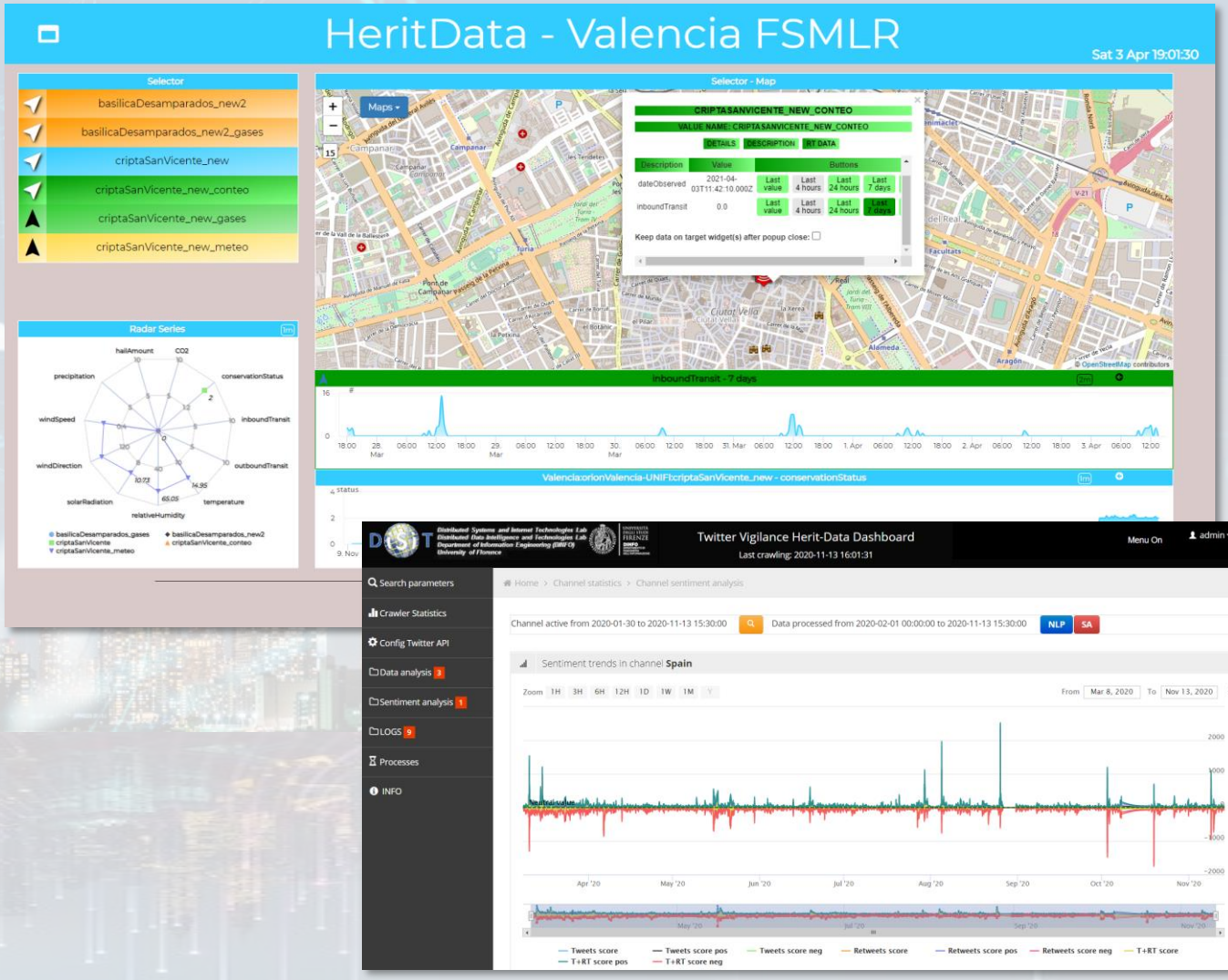






Valencia, FSMLR

- **Tourism Domain**
  - Counting People
  - Environmental data
  - Social Media
- **Dashboards**
  - Monitoring and real time control
  - People flow
  - Twitter Vigilance
- **Historical and Real Time data**
- **Services Exploited on:**
  - Dashboard
- **Since 2020**



https://www.snap4city.org/4

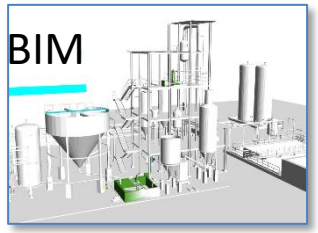
- Scenario: SnapBot: Real Time Smart City services via Telegram
- Scenario: Copernicus Satellite Data
- Scenario: SmartBed, Materasso Intelligente
- MicroServices Suite for Smart City Applications
- Scenario: MODBUS for Snap4Industry Snap4City Applications
- Scenario: MOBIMART Interreg: MOBilità Intelligente MARe Terra
- Scenario: City of Roma case, mobility and environmental data
- Scenario: Herit-Data video and aims
- Scenario: Control Room vs Video Wall
- Scenario: Snap4Home the case of: Alexa, Philips, Sonoff, TP-link, etc. (Italiano)
- Scenario: how to manage maintenance and accidents workflows
- Scenario: Snap4Home, how to exploit Snap4City solution on home automation
- Scenario: Energy Monitoring
- Scenario: Multipurpose User Engagement Tools
- Scenario: 5G Enabled Water Cleaning Control (smart city, industry 4.0)
- Scenario: High Level Control of Industrial Plant (industry 4.0)
- Scenario: Vehicle Monitoring via OBD2
- Scenario: Events and Museums Monitoring in Antwerp
- Scenario: High Resolution Prediction of Environmental Data
- Scenario: Mobility and Transport Analyses in multiple cities
- Scenario: People Flow Analysis via Wi-Fi
- Scenario: Antwerp Pilot on Environmental Data
- Scenario: Helsinki Pilot on Environmental Data
- Scenario: Firenze Smart City Control Room
- Scenario: Mobile & Web App: Toscana Where What … Km4City, Toscana in a Snap
- Scenario: Helsinki Pilot on User Behaviour
- Scenario: Antwerp Pilot on User Behaviour

Scenarious

- Data Analytic: Origin Destination Matrices, Algorithms and tools
- Data Analytic: Traffic Flow Reconstruction
- Data Analytic: in general, and the cases of Antwerp and Helsinki
- Data Analytic: Predicting Air Quality
- Data Analytic: Analyzing Public Transportation Offer wrt Mobility Demand

Concept

BIM

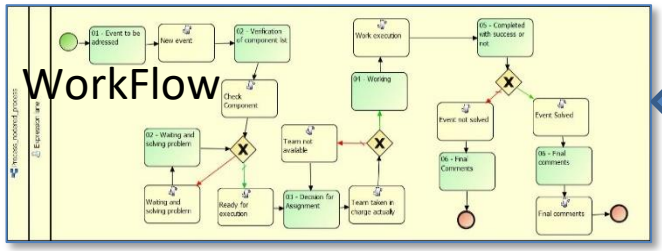


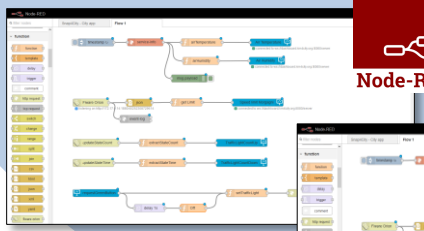
KPI, POI, MyKPI, …

API, External Services

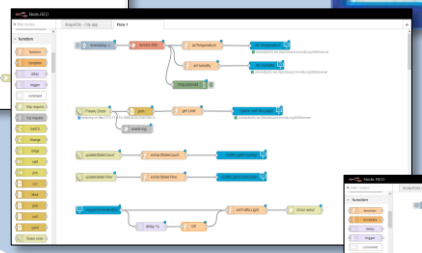
Web Scraping

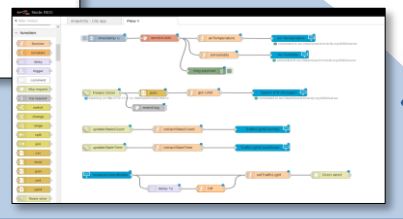
WorkFlow



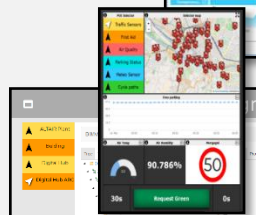


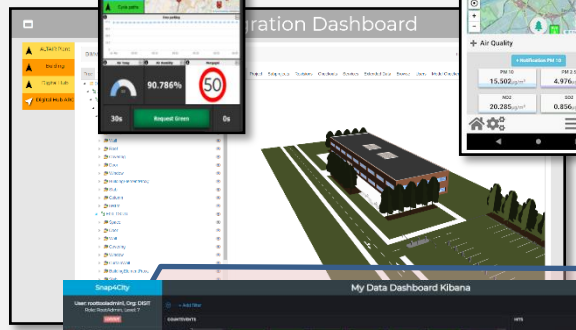
Node-RED





Data Analytics,
Artificial Intelligence





IOT Brokers

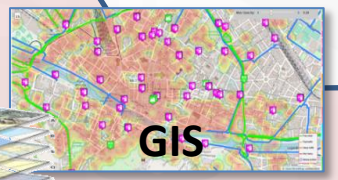
IOT Broker

IOT Broker

IOT Apps

FIWARE

ckan

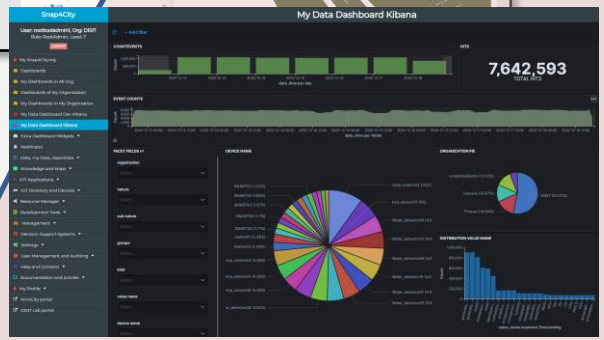


GIS

Big Data

KB

LD, LOD



Dashboards and Apps

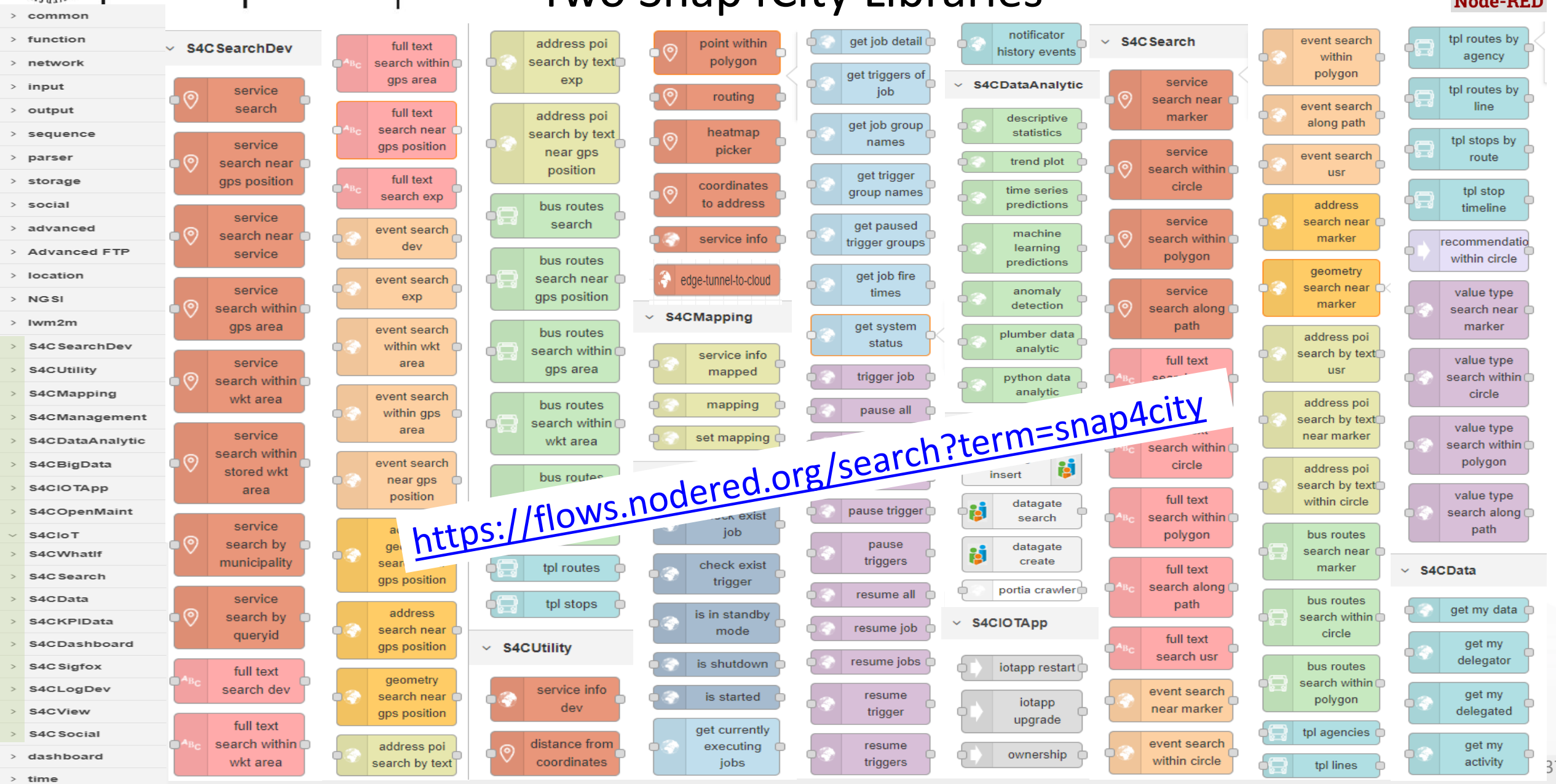
FI-WARE

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

April 2021 collection

Two Snap4City Libraries

SNAP4CITY | Node-RED



https://flows.nodered.org/search?term=snap4city

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

April 2021 collection

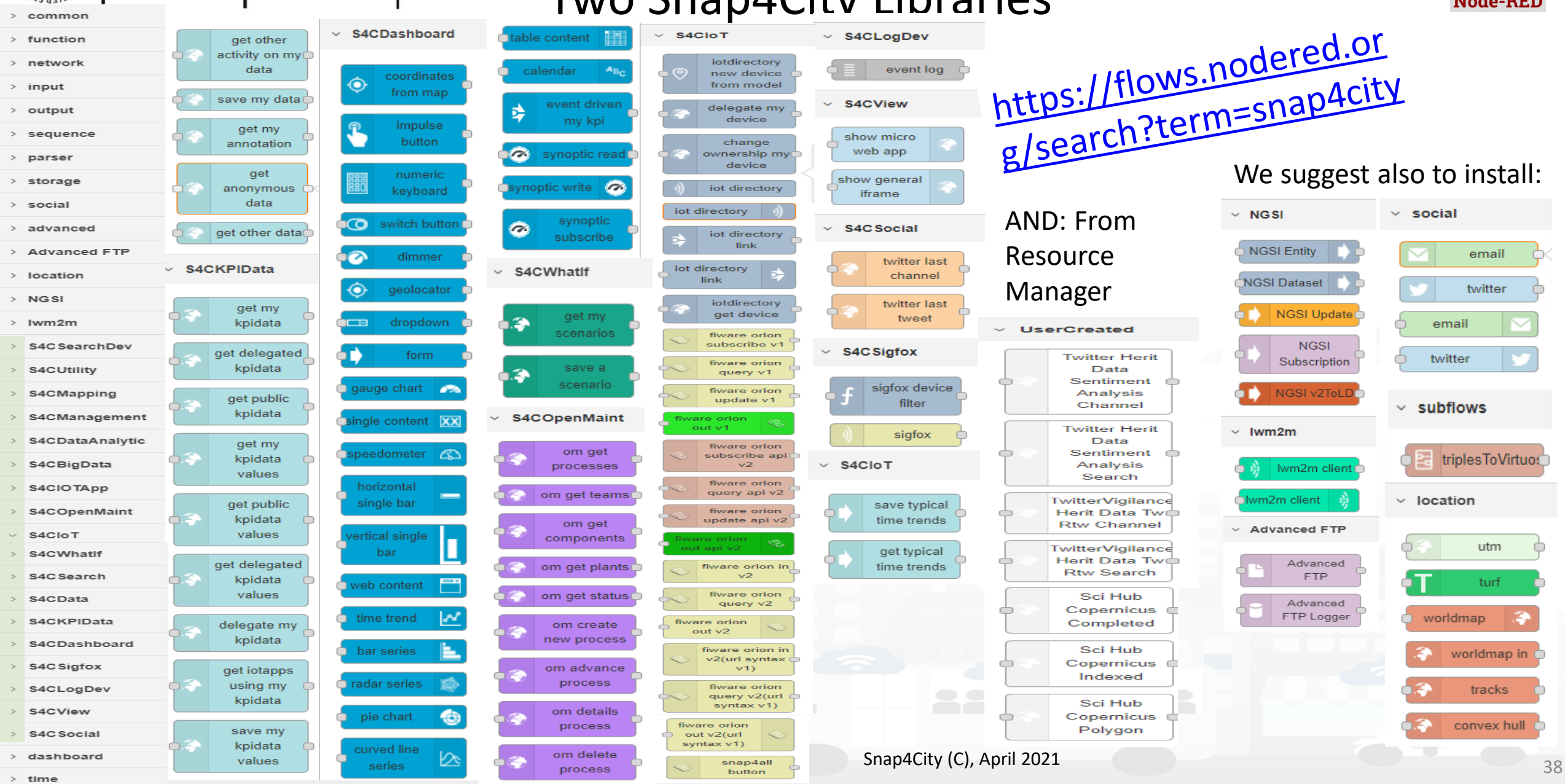
Two Snap4Citv Libraries

SNAP4CITY | Node-RED

https://flows.nodered.org/search?term=snap4city

We suggest also to install:

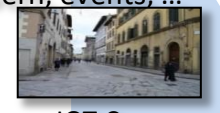
AND: From Resource Manager



Smart City Functional Architecture

Transport systems Mobility, parking

Public Services, Govern, events, …



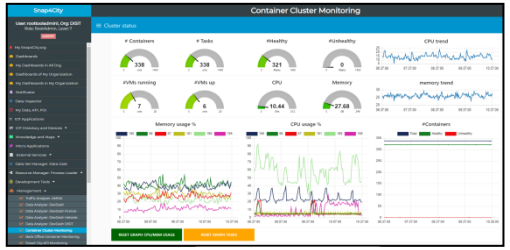
Sensors, IOT Cameras, Wi-Fi

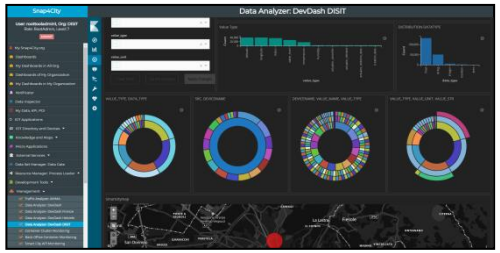
Environment, Water, energy

Shops, services, operators

Social Media

Social Media Crawler and Manager





Back-End ← → Front-End

Data Sources, External Services *PULL Data*

Data Sources, Brokers, External Services *Data Driven, Real Time*

Data Ingestion, aggregation, regularization, reconcile: IOT Directory, NIFI, special tools

Knowledge base Semantic Reasoners

Indexing and aggregating Elastic Search

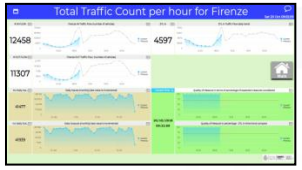
Federation

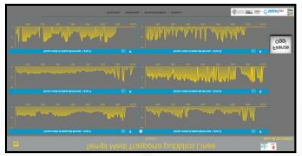
Search and Query, Smart City API, Web Socket Server, GIS, Facet, semantic

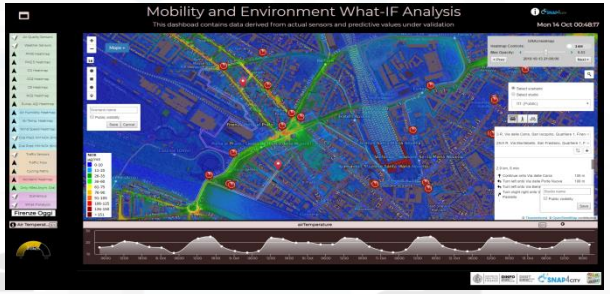
Data Analytics, Simulations, Special Tools R Studio, Tensor Flow, Python, ….

IOT Applications, Business Logic Node-RED + Snap4City MicroServices

Rendering Acting, Widgets, Synoptics, MicroApps User interface, Drill down, maps, heatmaps







Inform, announce, Act!, warning, alarms, What-IF, ..

Authentication, Authorization, Platform & Processes Management, Data Inspector, Digital Twin, …

https://www.snap4city.org/577

On Line Training Material (free of charge)

	1st part (*)	2nd part (*)	3rd part (*)	4th part (*)	5th part (*)	6th part (*)	7th part (*)
what	General	Dashboards	IOT App, IOT Network	Data Analytics	Data Ingestion processes	System and Deploy Install	Smart City API: Web & Mob. App
PDF							
Inter active							
Video1							
Video2							
Video3							
Video4				none		none	none
duration	2:55	3:16	3:41	2:00	2:48	2:35	1:47

DISIT lab roadmap vs model and tools' usage

2013
Km4City Ontology 1.1

- Tuscany, Road Graph
- Mobility
- culture, tourism
- Events
- Parking
- Services
- Linked open graph

2014
- Weather Forecast
- Real Time Wi-Fi
- Entertainment
- LOD

- Twitter Vigilance
- Social Media Analytics, Sentiment Analysis

Km4City 1.4

2015
Km4City 1.5

- Resilience Decision Support
- Smart First Aid
- User Behaviour Analysis, predictions
- Risk Analysis

ckan, resolute

H2020 (2015-18)

2016
(2016-21) H2020 REPLICATE

- Smart Energy
- Sustainable Mobility
- Control Room
- Dashboard

Km4City 1.6.2

Sii-Mobility (2016-21) MIUR

SII-MOBILITY SCN

- Infomobility
- Mobile App
- Routing
- Multimodality

FIWARE

2017
Km4City 1.6.4

Sii-Mobility

- Origin-Destination and trajectories
- Traffic Reconstruction
- Offer Analysis
- OBU, smart devices

E0I5 digital ecosystem (Powered by EXPO MILANO 2015)

(2016-19) MIUR

GHOST SIR

- Sardinia Region Smart City Strategies and plan

GREEN IMPACT C.A.P.A.C.I.T.Y.

GREEN IMPACT
POR FESR 2014-2020

- Industry 4.0
- Critical Plant
- Monitoring

- IOT/IOE, IOT App
- Living Lab
- Maker Support
- IOT Edge
- Smart City IOT
- GDPR,
- Privacy & Security

life weee (2017-20)

- Smart Waste

2018
MOSAiC MObility 4.0 for SmArt (i) City (POR CreO, Regione Toscana)

(2018-20)

- Mobility Demand / Offer Analytics and Strategy

Sii-Mobility

- User engagement
- Bike Sharing
- Data Analytics ++
- Social Predictions
- OBD2

IOT/IOE

Km4City 1.6.6

Node-RED

SNAP4CITY

SELECT for Cities H2020 (2017-19)

2019
5G (2018-21)

5G tech
Energy
Industry 4.0
Synoptics

TRAFAIR

CEF (2018-21)

- Traffic and Mobility Impact on Pollution
- NOX predictions

EUROPEAN OPEN SCIENCE CLOUD

SIRIUS

LAID Smart Bed (POR CreO, Regione Toscana)

- Smart Health

GREEN FIELD PEAS Soda4.0 (NaOH) Optimization and Automated Decision System 4.0 (POR CreO, Regione Toscana)

- Industry 4.0

bee smart city

- Smart Lonato

Reverberi Enetec Gruppo MPES

- PCP Award

SELECT for Cities 1° place award to SNAP4CITY

SNAP4CITY

SNAP4CITY roadmap

2019

EUROPEAN OPEN SCIENCE CLOUD

LAID Smart Bed

- Smart Health

GREEN FIELD PEAS Soda4.0 Optimization and Automated Decision System 4.0

- Industry 4.0

bee smart city

Smart Lonato del Garda

Reverberi Enetec Gruppo MPES

2020

Winner of Select4Cities PCP

CAPELON

- Smart Light
- Sweden

Km4City 1.6.7

smartGARDAlake

Interreg MARITTIMO-IT FR-MARITIME MOBI MART

- Smart Mobility
- PISA, PUMS
- Living Lab

Interreg Mediterranean HERIT-DATA

- Smart Tourism
- 6 Areas
- Data Analytics
- Extended platform

JRC EUROPEAN COMMISSION

Winner of Open Data Challenge of enel x

PC4City (2020-21)
Monitoring Predicting slidelands

2021

JRC EUROPEAN COMMISSION

Smart Ambulance (2021-22)

Enterprise (2021-22)
Industry 4.0

Almafluida (2021-22)

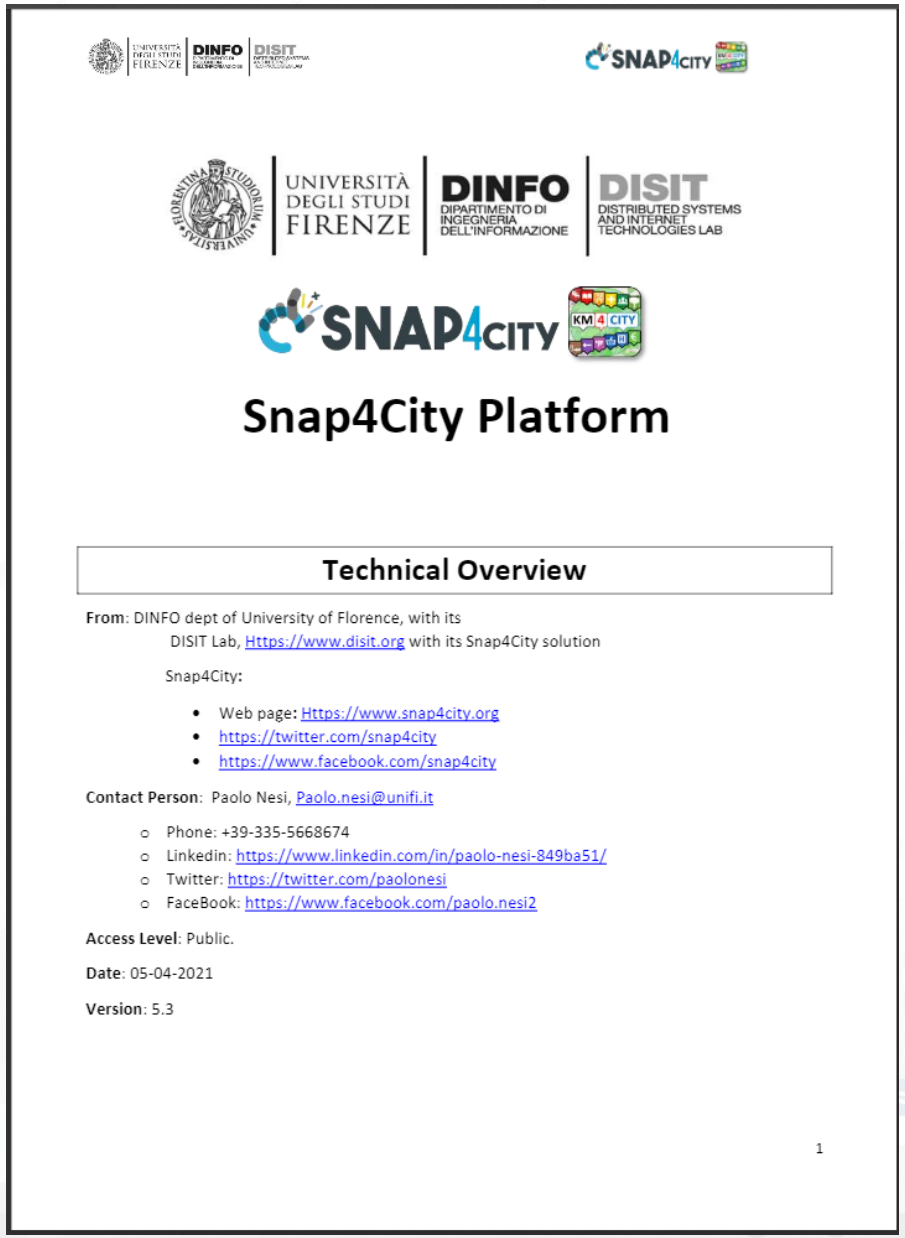
AMPERE (2021-22)
Industry 4.0

2022

Main running instances

- Sii-Mobility → mobility and transport, sustainability
- REPLICATE → ICT, smart City Control room, Energy, IOT
- RESOLUTE → Resilience, ICT, Big Data
- GHOST → Strategies, smart city
- TRAFAIR → Environment & transport
- MOSAIC → mobility and transport
- WEEE Life → Smart waste, environment
- Smart Garda Lake → Castelnuovo del Garda, SMARTEA
- 5G → Industry 4.0 vs SmartCity
- Green Impact → Industry 4.0, Chemical Plant
- SmartBed (Laid) → smart health
- Green Field Peas (Soda) → Industry 4.0, Chemical plant
- MobiMart and PISA Agreement → data aggregation, mobility and transport, Living Lab
- Lonato del Garda → smart parking, environment
- Herit Data → tourism, culture and management
- ISPRA JRC → site management and services
- Capelon (Sweden) → smart light solutions

Overview



Snap4City Platform

Technical Overview

From: DINFO dept of University of Florence, with its
DISIT Lab, Https://www.disit.org with its Snap4City solution

Snap4City:

- Web page: Https://www.snap4city.org
- https://twitter.com/snap4city
- https://www.facebook.com/snap4city

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- Phone: +39-335-5668674
- Linkedin: https://www.linkedin.com/in/paolo-nesi-849ba51/
- Twitter: https://twitter.com/paolonesi
- FaceBook: https://www.facebook.com/paolo.nesi2

Access Level: Public.

Date: 05-04-2021

Version: 5.3

1

- April 2021
- https://www.snap4city.org/drupal/sites/default/files/files/Snap4City-PlatformOverview-April-2021-V5-3.pdf

TOP

SNAP4 Appliances and Dockers Installations

Installing Snap4City

Installations

https://www.snap4city.org/471

To get an updated version read it!

DCL: DataCity-Large (2020 edition)

Opt. Services
- Chat Manager
- Routing Server
- Engager Server
- …… Server
- ……. Server

External Services
Energy
Mobility
GIS
Waste
…
Digital Signage
Security
Environment
Weather

Servers
- R Studio Server
- Python Server
- OpenMaint
- CKAN DataGate

MCLSCont

IOTOBSFs
IOT Broker
IOT Orion Broker
IOT Context Broker
ProxyFilter Security
FIWARE

IOTDSES
Balancer
APACHE nifi

ESSTORE
kibana
elasticsearch

Other Brokers

FIWARE
IOT ORION Broker
Quantum Leap

SSM2ORION

Snap4CityMAIN
Dashboard Builder, Wizard, Widgets, IOT App1 Notificator, WS Server, Data Inspector, User Stats, ExternalSrv, Resource Manager, MicroApps, Authorization/Authentic, MyKPI, MyPOI, Synoptic, IOT Directory

SuperServiceMap, ASCAPI
KB/ServiceMap
LOG/FLINT
Virtuoso
KBSSM

HeatMap Server
Manager [GeoServer]

Living Lab support
Drupal, CRM

Balancers

Acknowledgements

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- Thanks to the European Commission for founding. All slides reporting logo of **REPLICATE H2020** are representing tools and research founded by European Commission for the REPLICATE project. **REPLICATE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation Programme (grant agreement n° 691735).
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SNAP4CITY

KM 4 CITY

100% OPEN SOURCE

Be smart in a SNAP!

SNAP4 Appliances and Dockers **Installations**

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