Paolo Nesi



Smart city, big data e control room.
Il progetto REPLICATE e Snap4City

13 APRIL 2021
ORE 09:30

ONLINE link here

SMART TALKS

100% OPEN SOURCE

EU GDPR COMPLIANT

PEN Test Passed

SNAP4CITY on EUROPEAN OPEN SCIENCE CLOUD MARKETPLACE

SNAP4 Appliances and Dockers Installations

SNAP4CITY

LIVING LAB

KM4CITY

Be smart in a SNAP!



Dottorato in Architettura e Culture del Progetto

giulia.turci3@unibo.it

Design del Prodotto Industriale e Advanced Design • UNIBO

Dipartimento di Architettura • UNIBO

@exhibitlab_adu

SCALABLE SMART ANALYTIC APPLICATION BUILDER FOR SENTIENT CITIES

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO | DISIT

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

SNAP4CITY

Powered by KM4CITY

scalable Smart aNalytic APplication builder for sentient Cities: for Living Lab and co-working with Stakeholders

https://www.Snap4City.org



100% OPEN SOURCE

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

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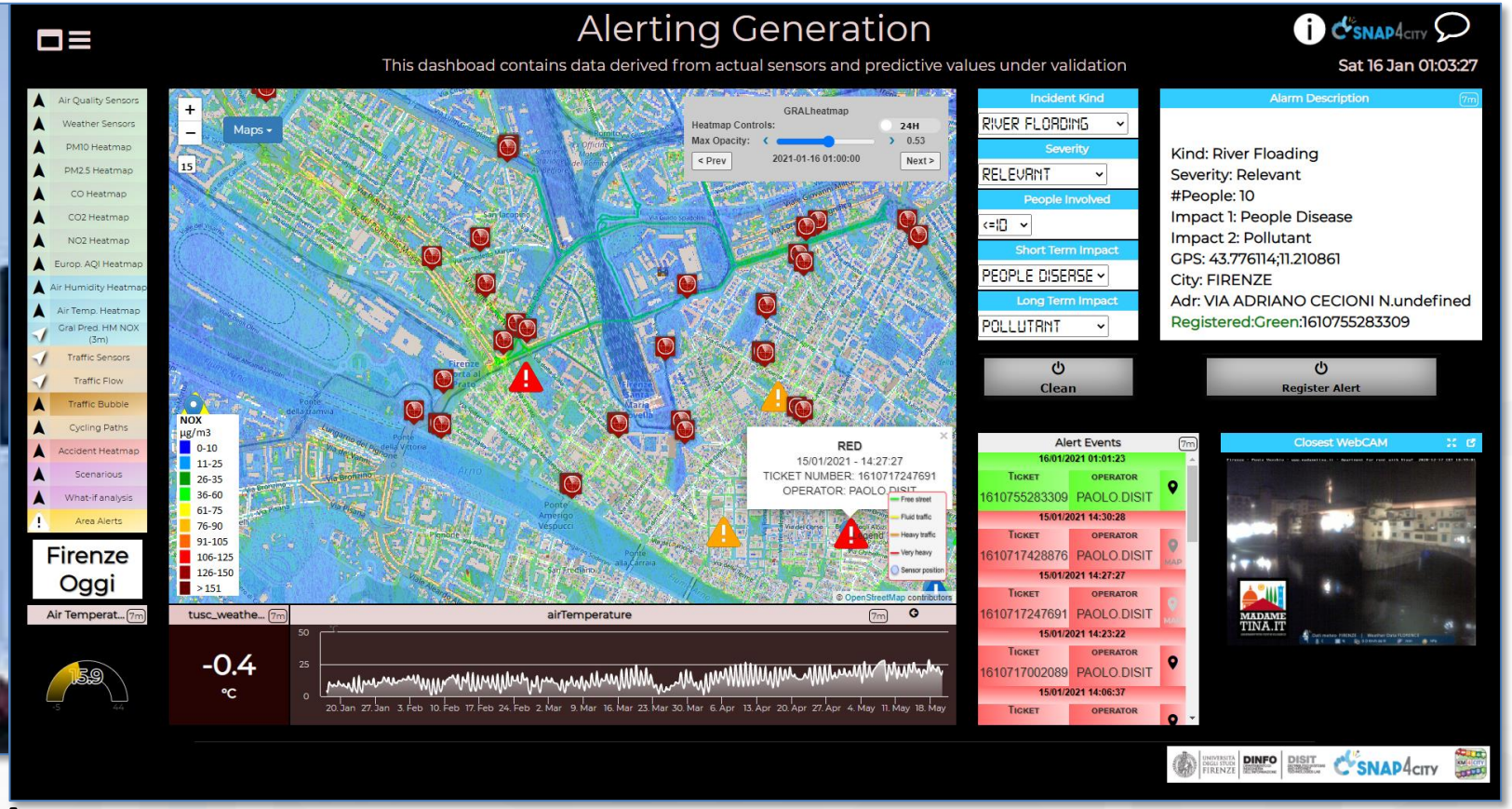
Control Room

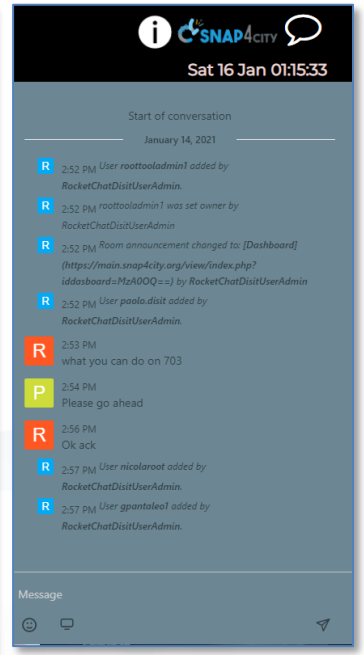




Registering Alerting events



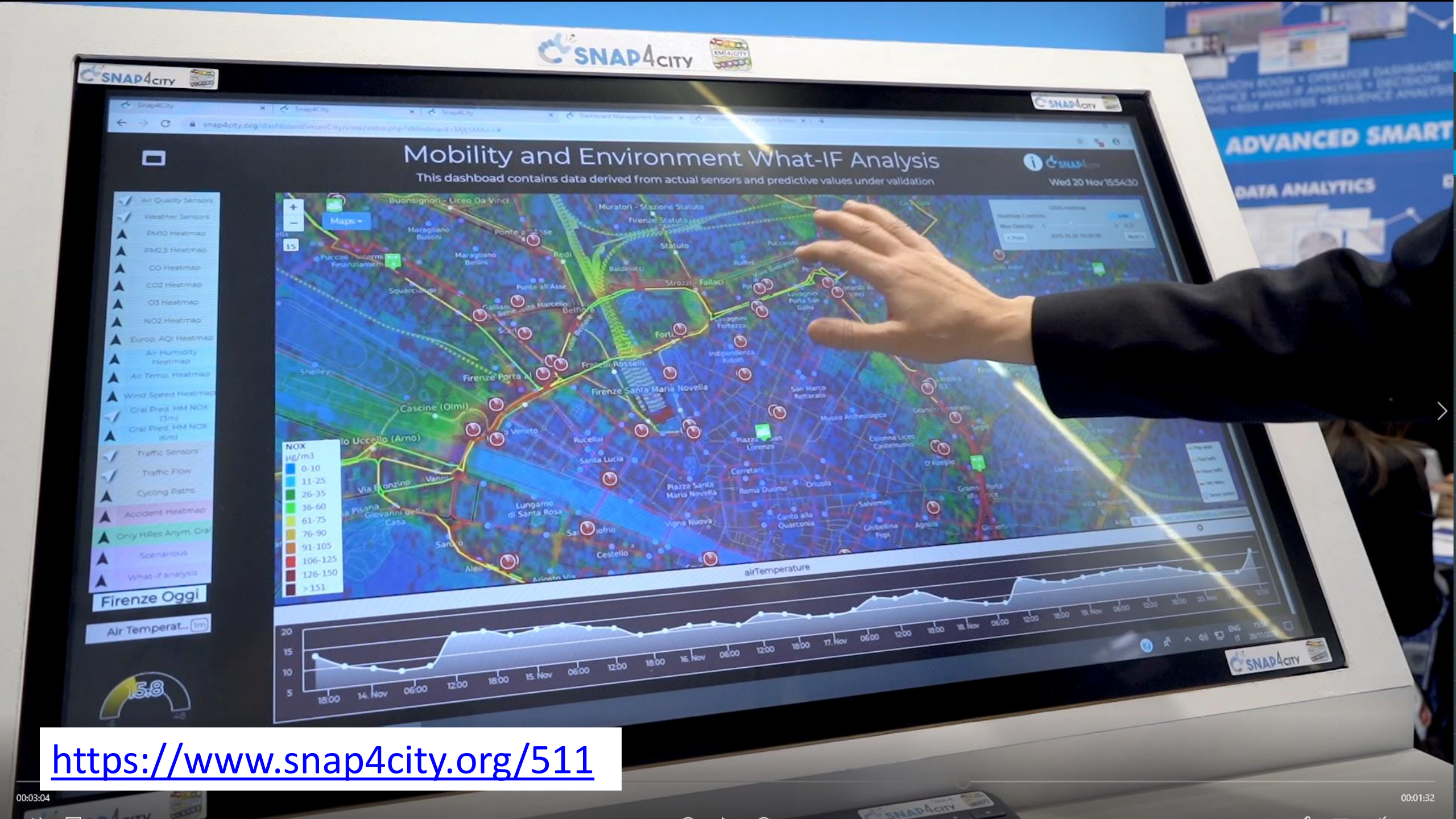




Control Room Operator

- **Monitor** traffic flow, Environment, Car parking, Cycling, First aid, temp., …
- **Registering Events: classification**
- **Changing status**
- **Acting**

https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MzA0OQ==



https://www.snap4city.org/511

00:03:04

00:01:32

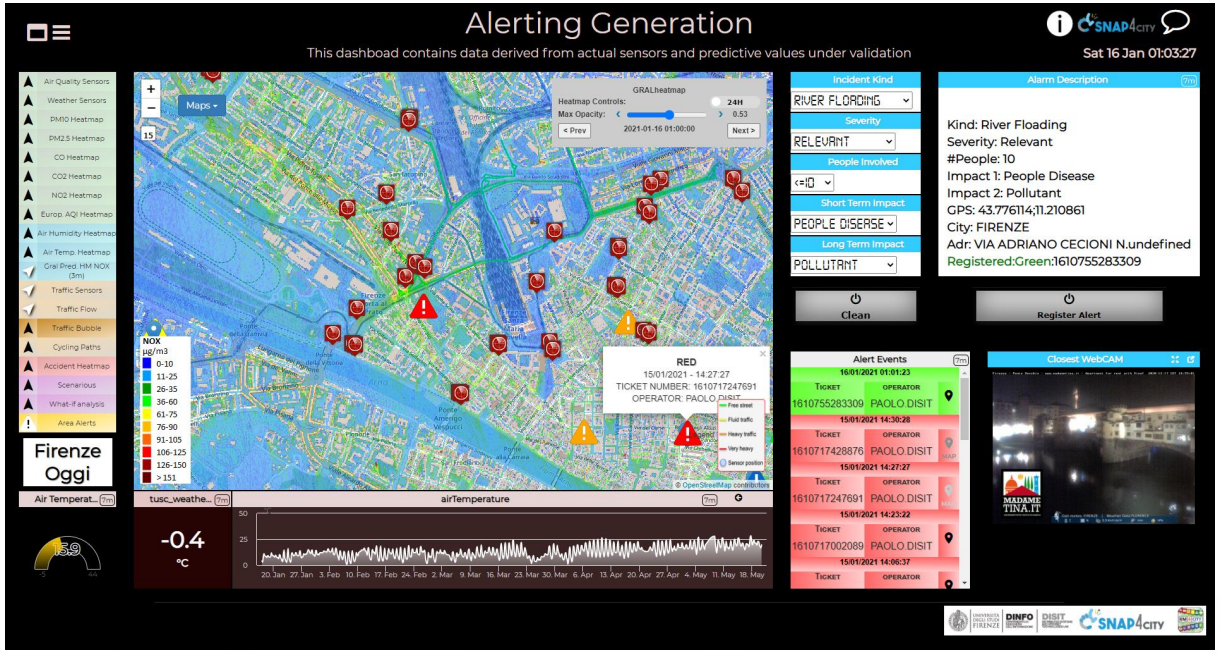
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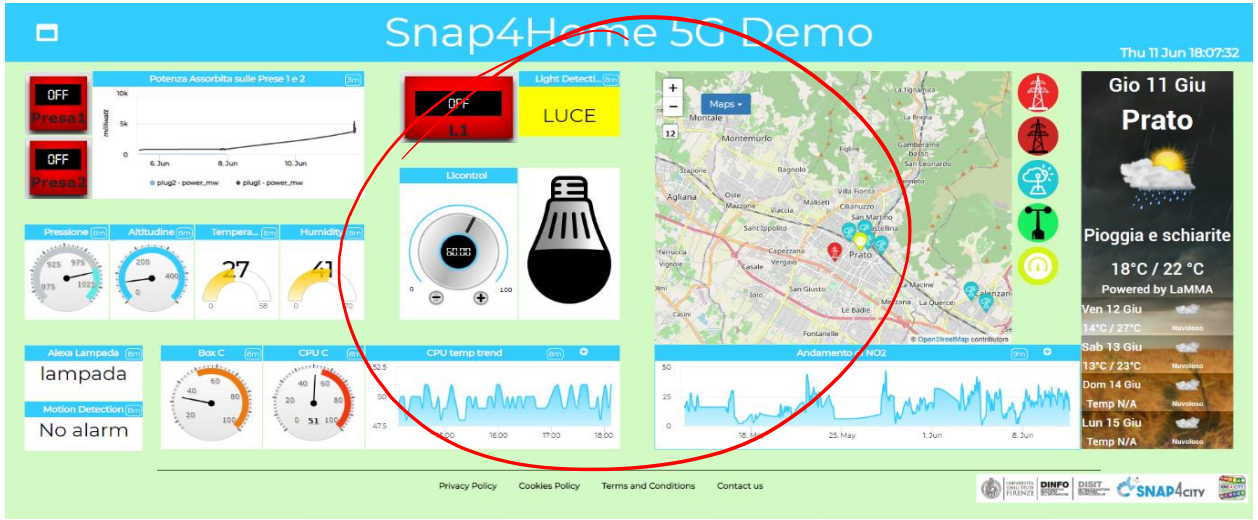
ServiceMap

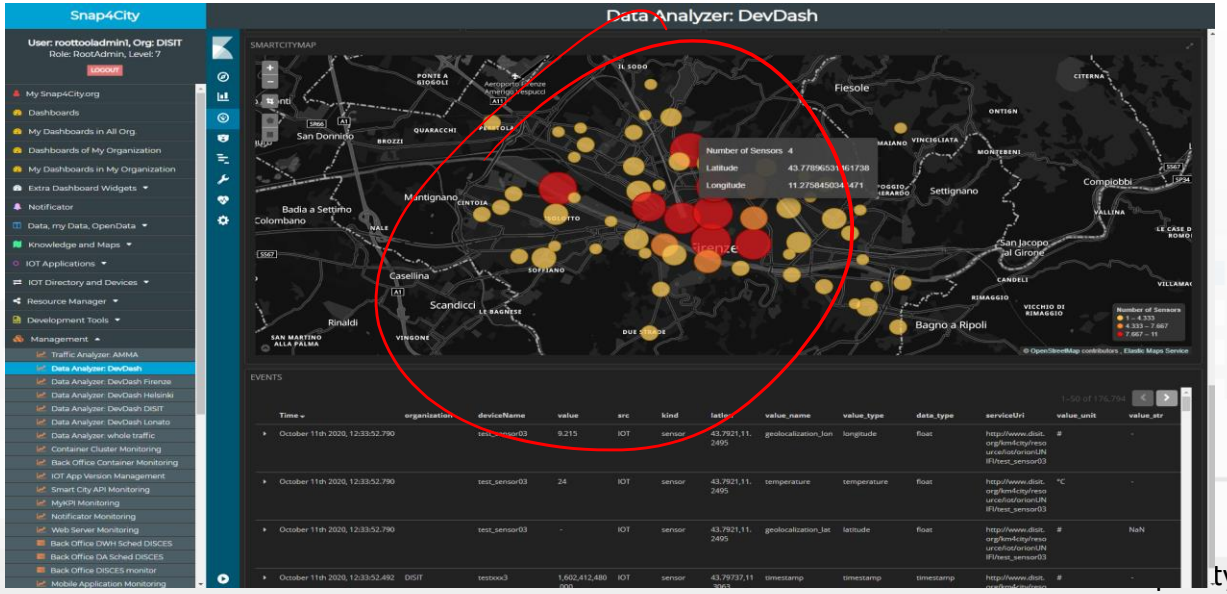
SNAP4CITY | KM4CITY

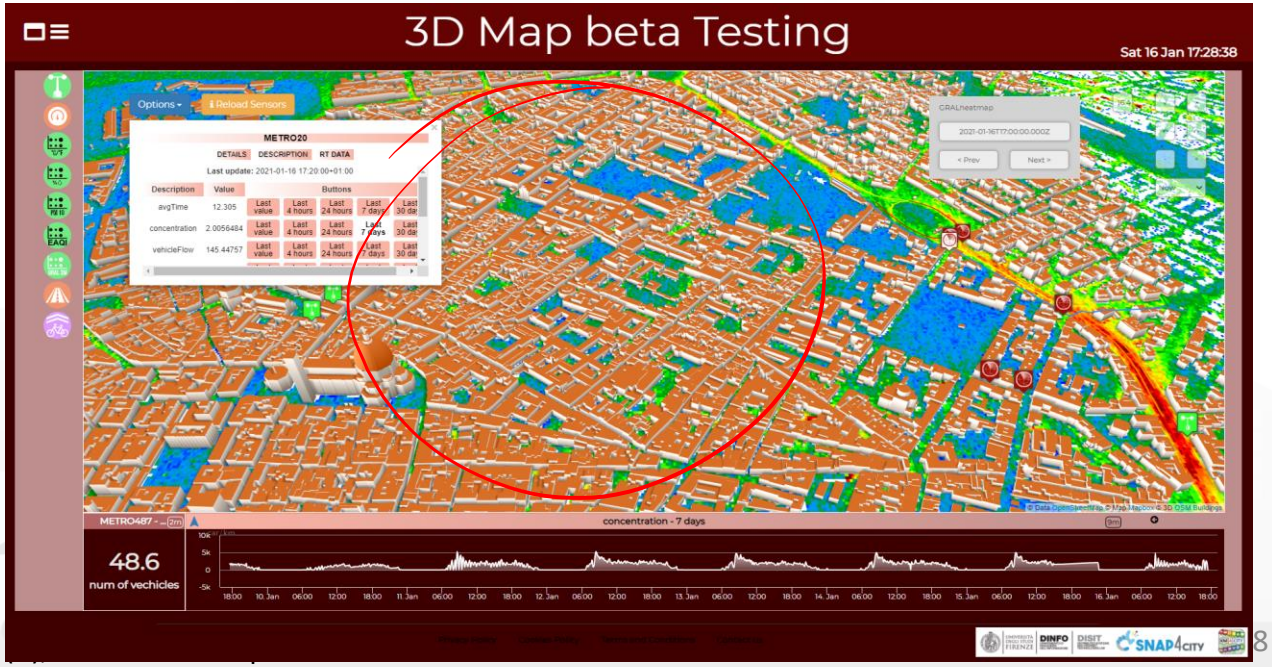


Dashboards


Alerting Generation
This dashboad contains data derived from actual sensors and predictive values under validation
Sat 16 Jan 01:03:27
Incident Kind
RIVER FLOADING
Severity
RELEVANT
People Involved
Short Term Impact
PEOPLE DISERSE
Long Term Impact
POLLUTANT
Alarm Description
Kind: River Floading
Severity: Relevant
#People: 10
Impact 1: People Disease
Impact 2: Pollutant
GPS: 43.776114;11.210861
City: FIRENZE
Adr: VIA ADRIANO CECIONI N.undefined
Registered:Green:1610755283309
Clean
Register Alert
Alert Events
Closest WebCAM
Firenze Oggi
airTemperature
-0.4


Snap4Home 5G Demo
Thu 11 Jun 18:07:32
Potenza Assorbita sulle Prese 1 e 2
Light Detecti...
LUCE
Gio 11 Giu
Prato
Pioggia e schiarite
18°C / 22 °C
Powered by LaMMA
Alexa Lampada
lampada
Motion Detection
No alarm
Box C
CPU C
CPU temp trend
Andamento NO2
Privacy Policy
Cookies Policy
Terms and Conditions
Contact us


Snap4City
Data Analyzer: DevDash
SMARTCITYMAP
EVENTS


3D Map beta Testing
Sat 16 Jan 17:28:38
METRO20
concentration - 7 days
48.6
num of vechicles

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SNAP4CITY
www.snap4city.org

KM 4 CITY

Powered by FIWARE

SNAP4 Appliances and Dockers Installations

FREE TRIAL

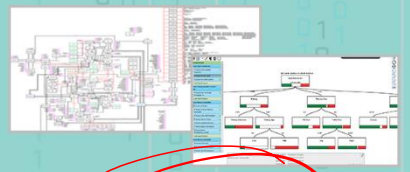
PEN Test Passed

EU GDPR COMPLIANT

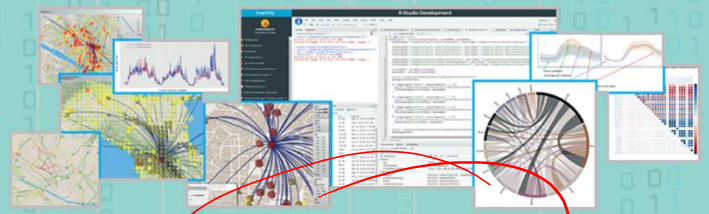
100% OPEN SOURCE



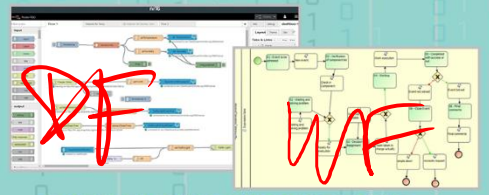
DASHBOARDS AND APPS - CONTROL ROOMS - DECISION SUPPORT SYSTEMS - WHAT-IF ANALYSIS



EXPERT SYSTEM
KNOWLEDGE BASE
STORAGE



BIG DATA ANALYTICS
ARTIFICIAL INTELLIGENCE
BUSINESS INTELLIGENCE
MACHINE LEARNING

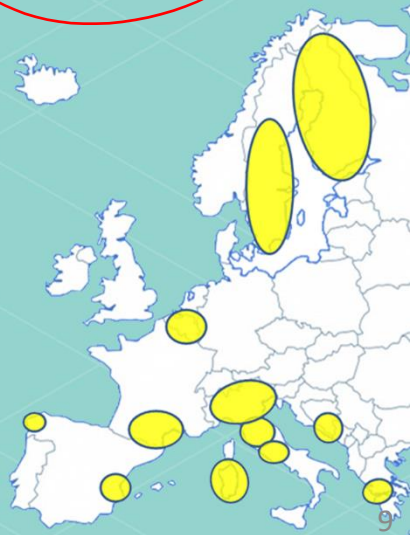


DATA FLOWS, WORKFLOWS
MICROSERVICES
MANAGEMENT



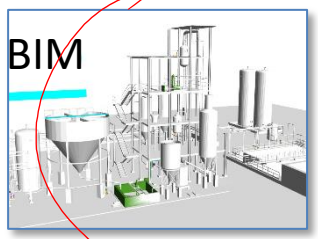
METHODOLOGIES
COURSES AND COMMUNITY
LIVING LABS
DEVELOPMENT TOOLS





Concept

BIM

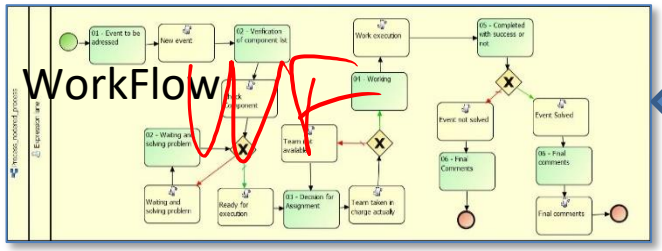


KPI, POI, MyKPI, …

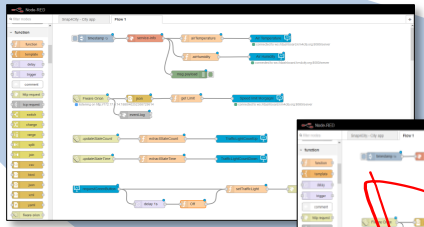
API, External Services

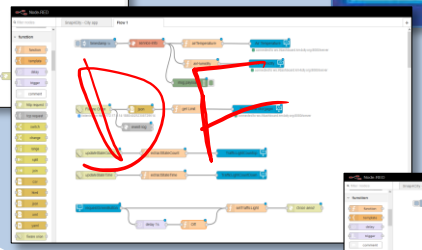
Web Scraping

WorkFlow

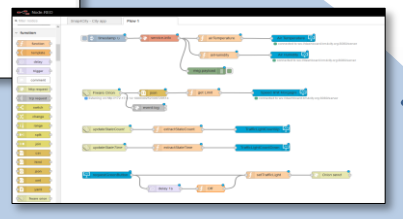








Data Analytics,
Artificial Intelligence



IOT Apps

IOT Broker

FIWARE



ckan

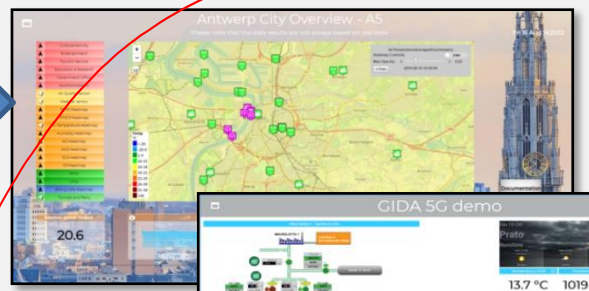
LD, LOD



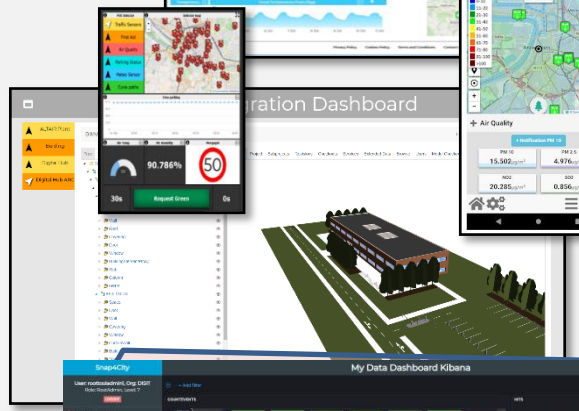
GIS

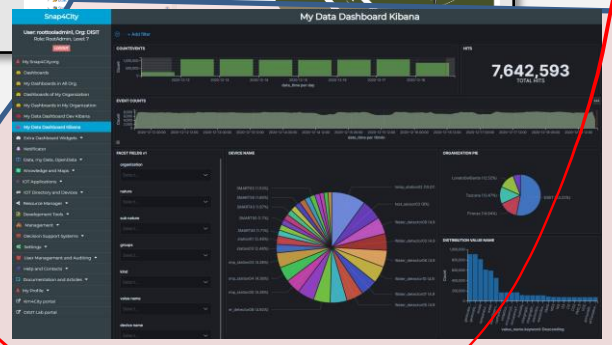
Big Data

KB









Dashboards and Apps

FI-WARE

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

SCALABLE SMART ANALYTIC APPLICATION BUILDER FOR SENTIENT CITIES

TOP



Some complete Use Cases

Florence



Smart City Control Room
Florence Metropolitan City

COMUNE DI FIRENZE

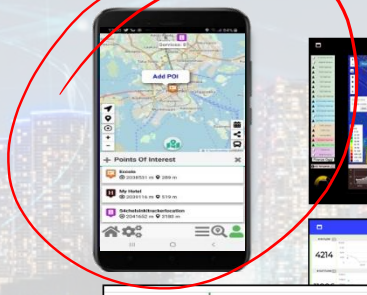
reference

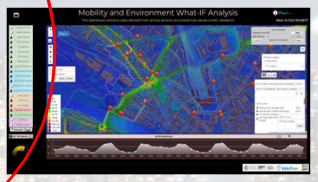
SNAP4CITY

KM 4 CITY

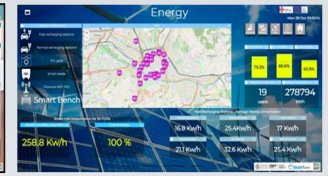
- **Multiple Domain Data**
  - mobility and transport, accidents, public transport, parking, traffic flow, Traffic Reconstruction, …
  - civil protection, gov data, covid-19, social & social media, people flow, tourism, energy, …
- **Multiple dash/tool Levels & Decision Makers**
- **Historical and Real Time data**
  - Billions of Data
  - Predictions, what-if analysis
- **Services Exploited on:**
  - Multiple Levels, Mobile Apps, API
- **Since 2017**



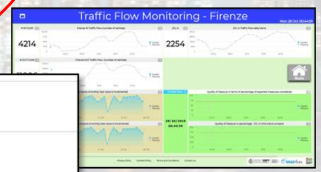








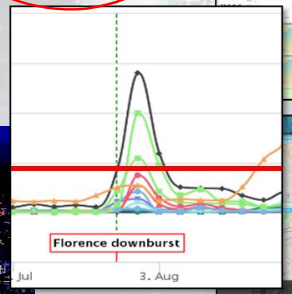






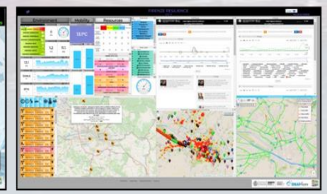


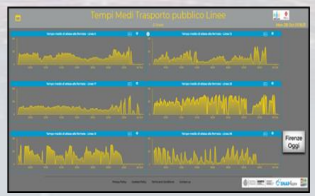








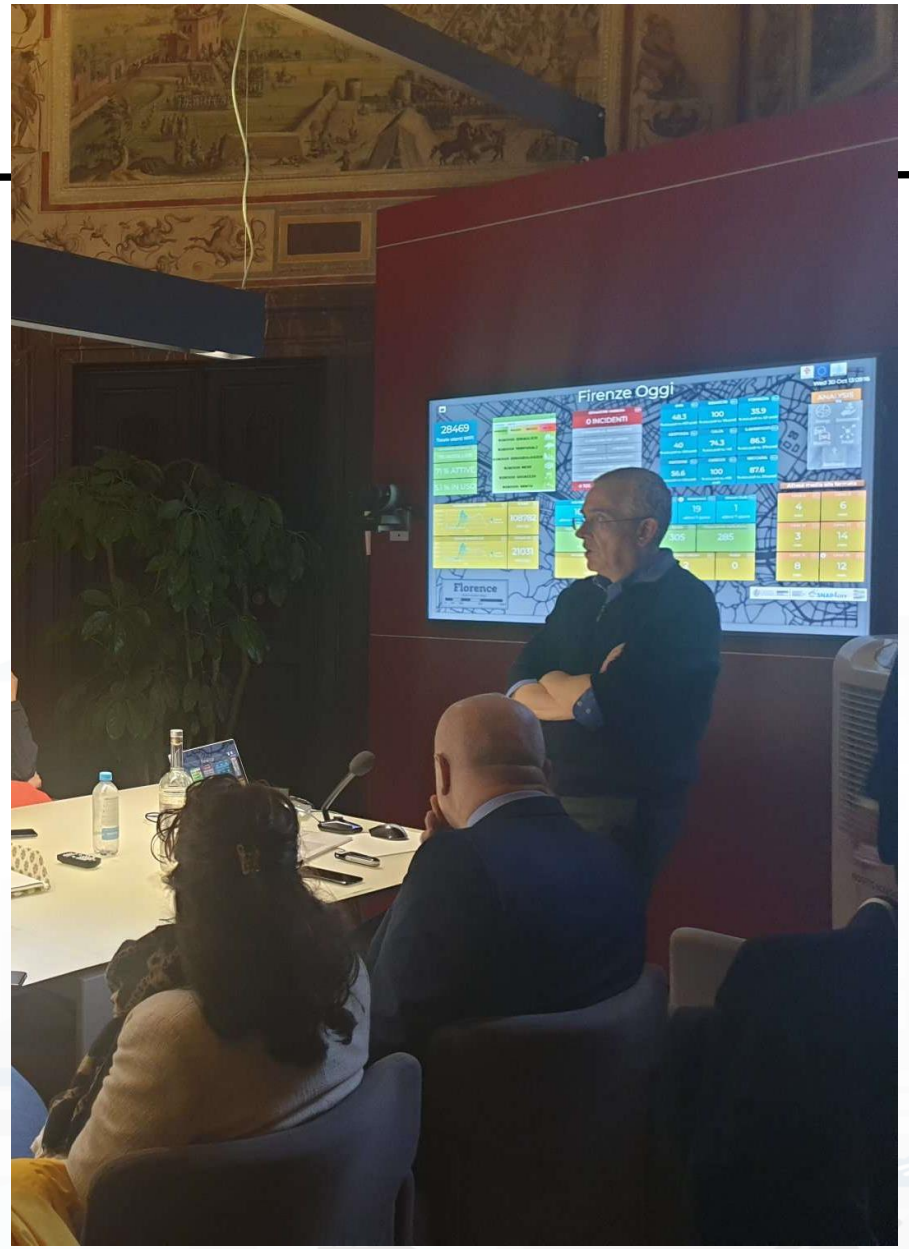








http://www.darionardella.it/il-sindaco-dario-nardella-in-missione-a-madrid-e-barcellona/





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FIRENZE
CITTÀ FARO

Replicate Project @ReplicateEU · Oct 30

Last stop allowed to see the #smartcity #controlcenter an exciting experience and impressive



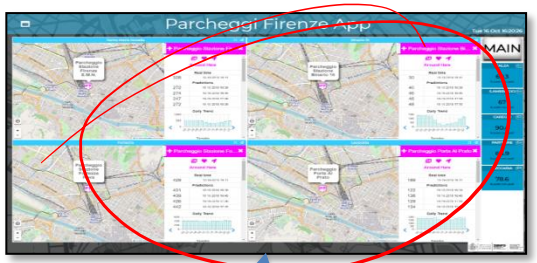
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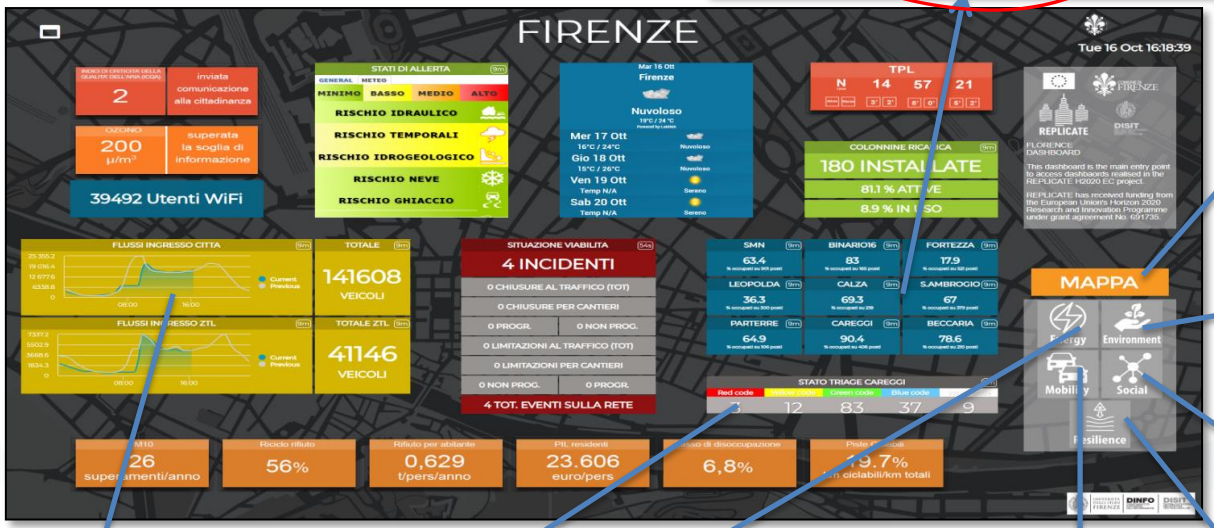
DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

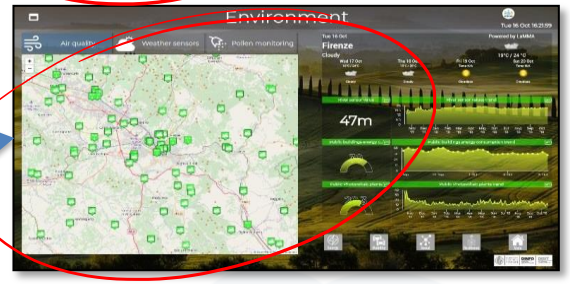
REPLICATE

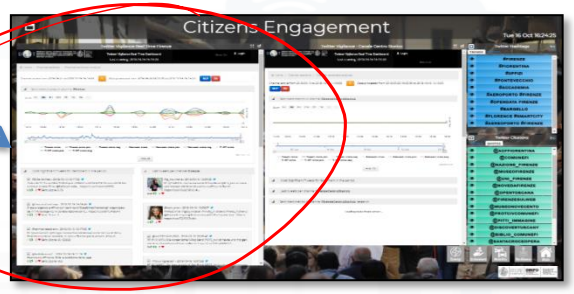
KM4CITY

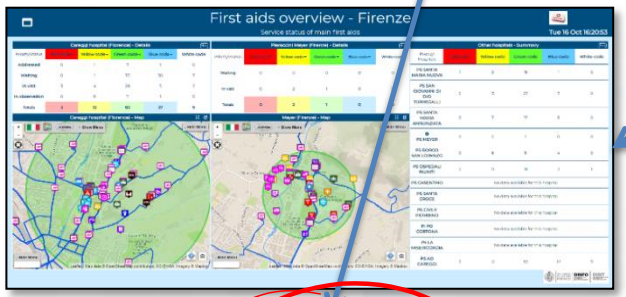


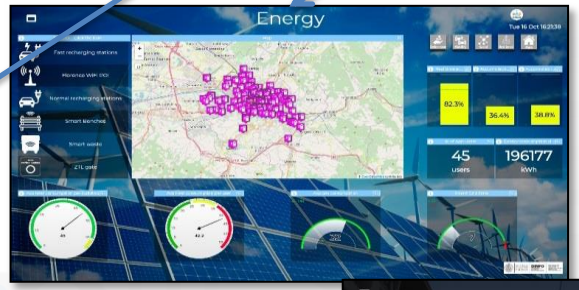


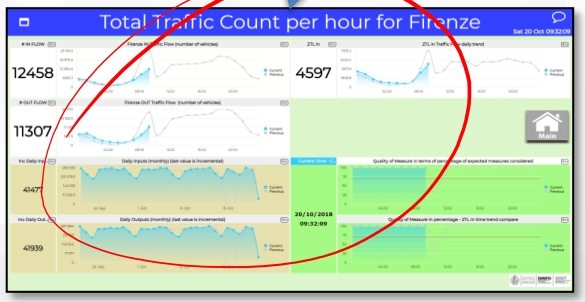




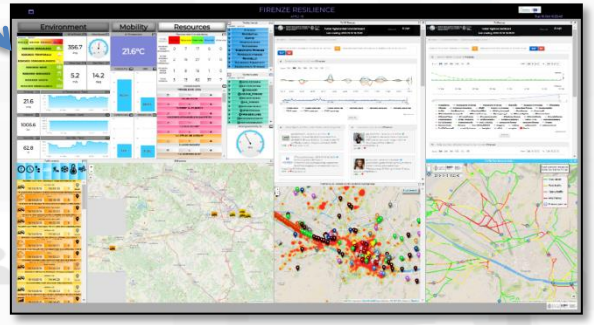






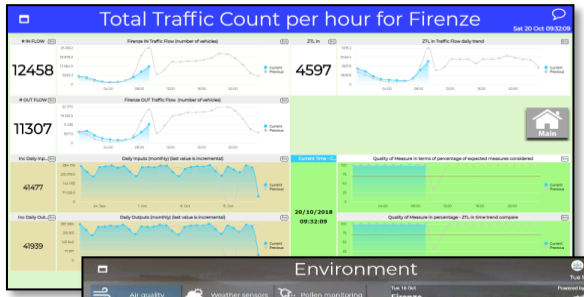






Florence Case

- **Smart City Control Room**
- **Dashboards and Services**
- **Mobile App:** Firenze Where What







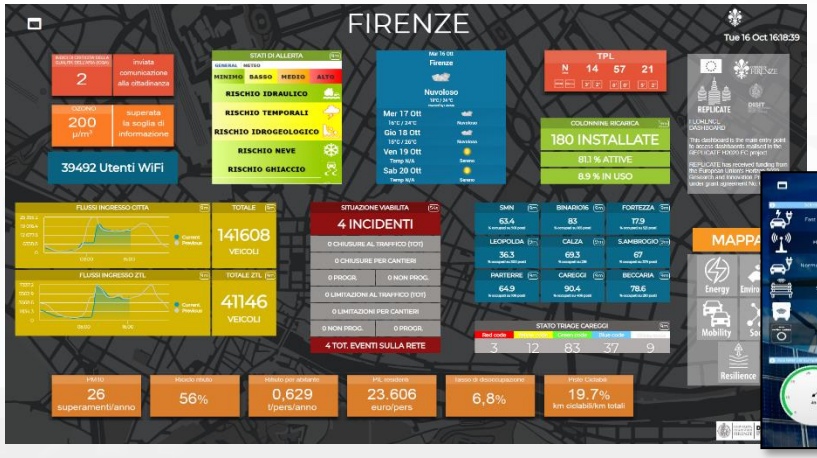
- **Mobility**:
  - quality of public transportation service (mean delay on bus-stops)
  - public transport operators schedule and paths, routing, multimodal routing
  - traffic flow reconstruction
  - Smart parking: predictions
  - Accidents and events, Log, heatmaps
- **Environment**:
  - smart irrigators
  - smart waste
  - Sensors: PM10. PM2.5,…..
  - Heatmaps: PM10, PM2.5, ….
  - NOX predictions
- **Energy**:
  - recharging stations (fast and reg.)
  - consumption meters (smart info)
  - smart light, street lights
- **Weather**
  - Forecast and actual



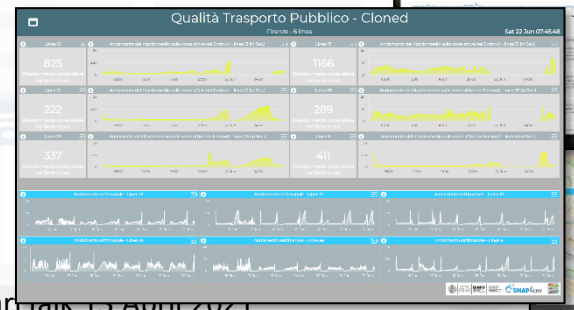
- **Social**:
  - smart benches
  - Twitter monitoring, Sentiment analysis, NLP text
  - TV camera streams
- **People Flows**:
  - Wi-Fi, people flow
  - Origin destination matrices
- **Governmental and Communications**:
  - KPI of the City
  - Digital Signage
  - Civil protection, Resilience (Resolute)
- **Tourism and Culture:**
  - POI, etc.

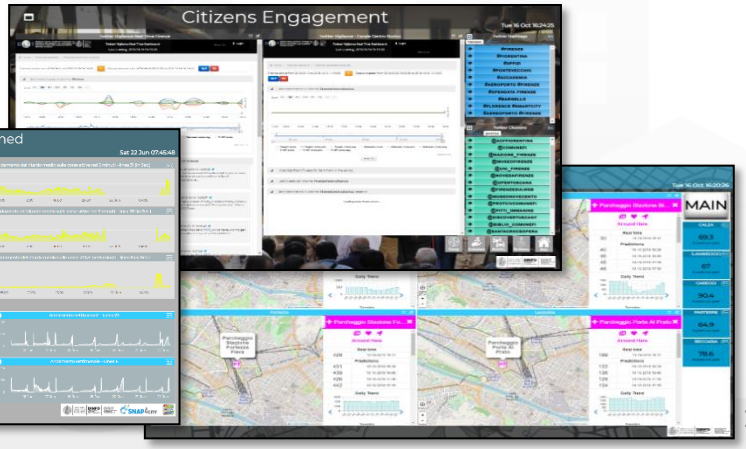
Analysis:

- **what-if routing, scenarios,**
- **traffic flow, environmental predictions**





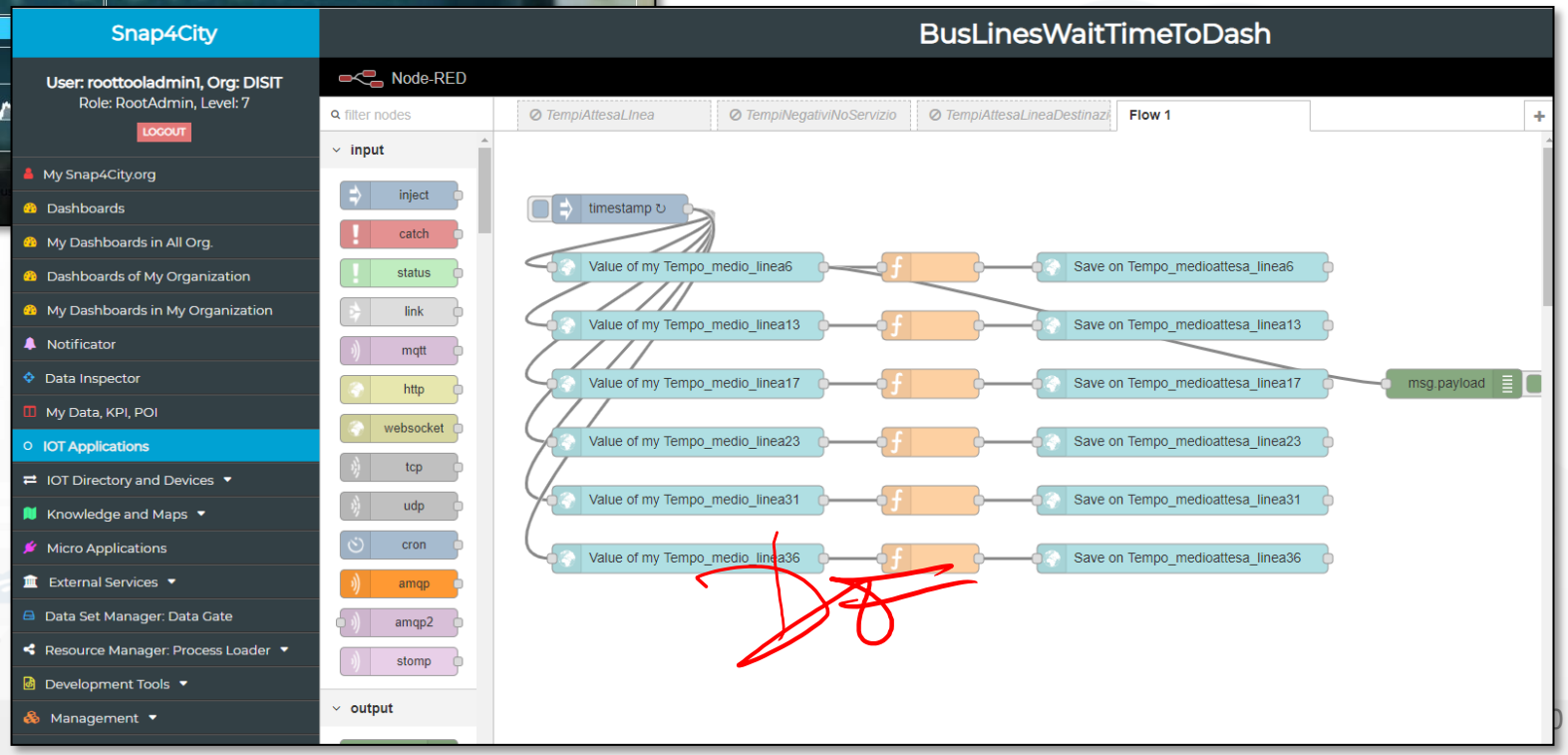




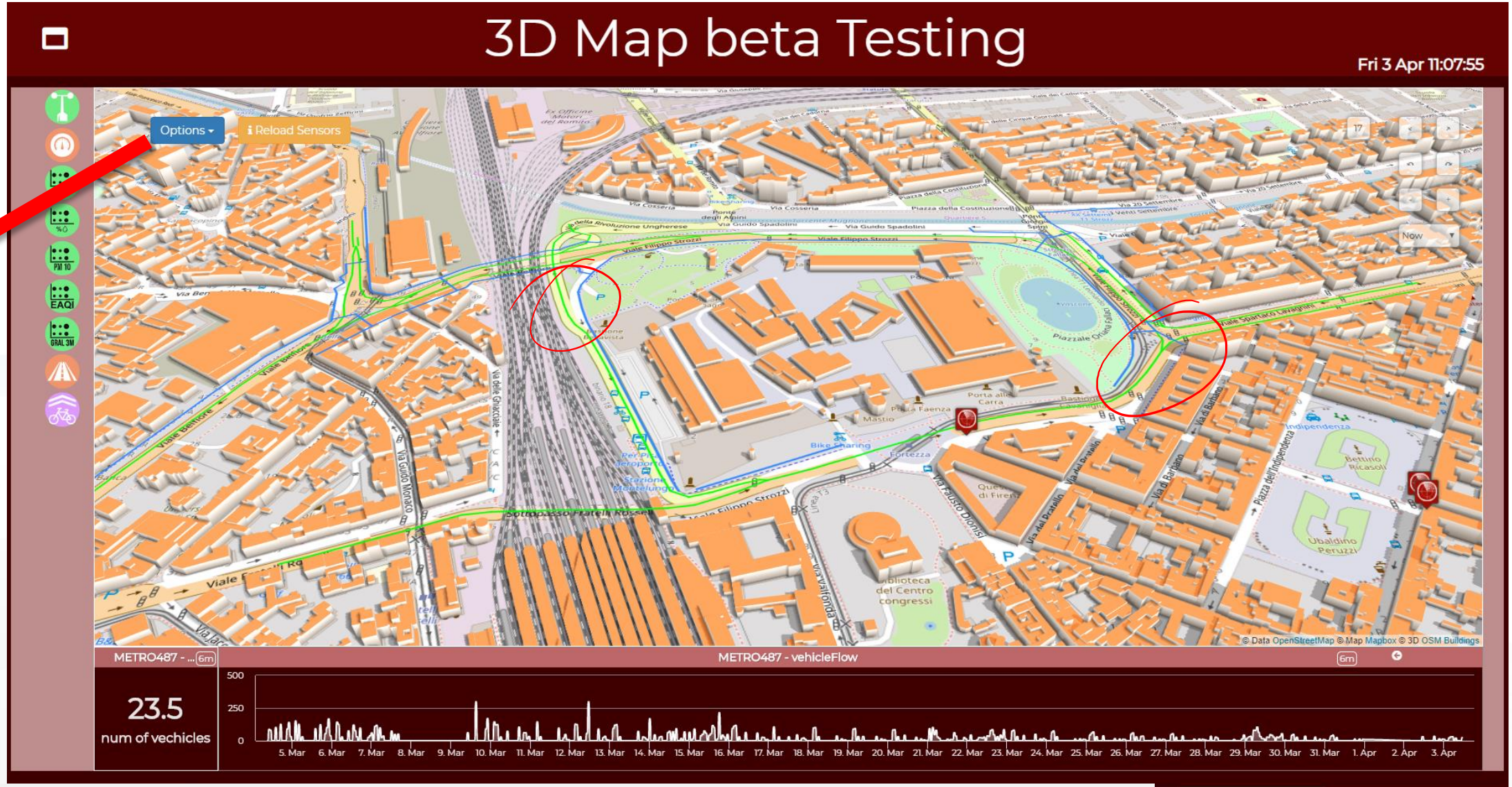
Estimation of the mean waiting time at bus stops



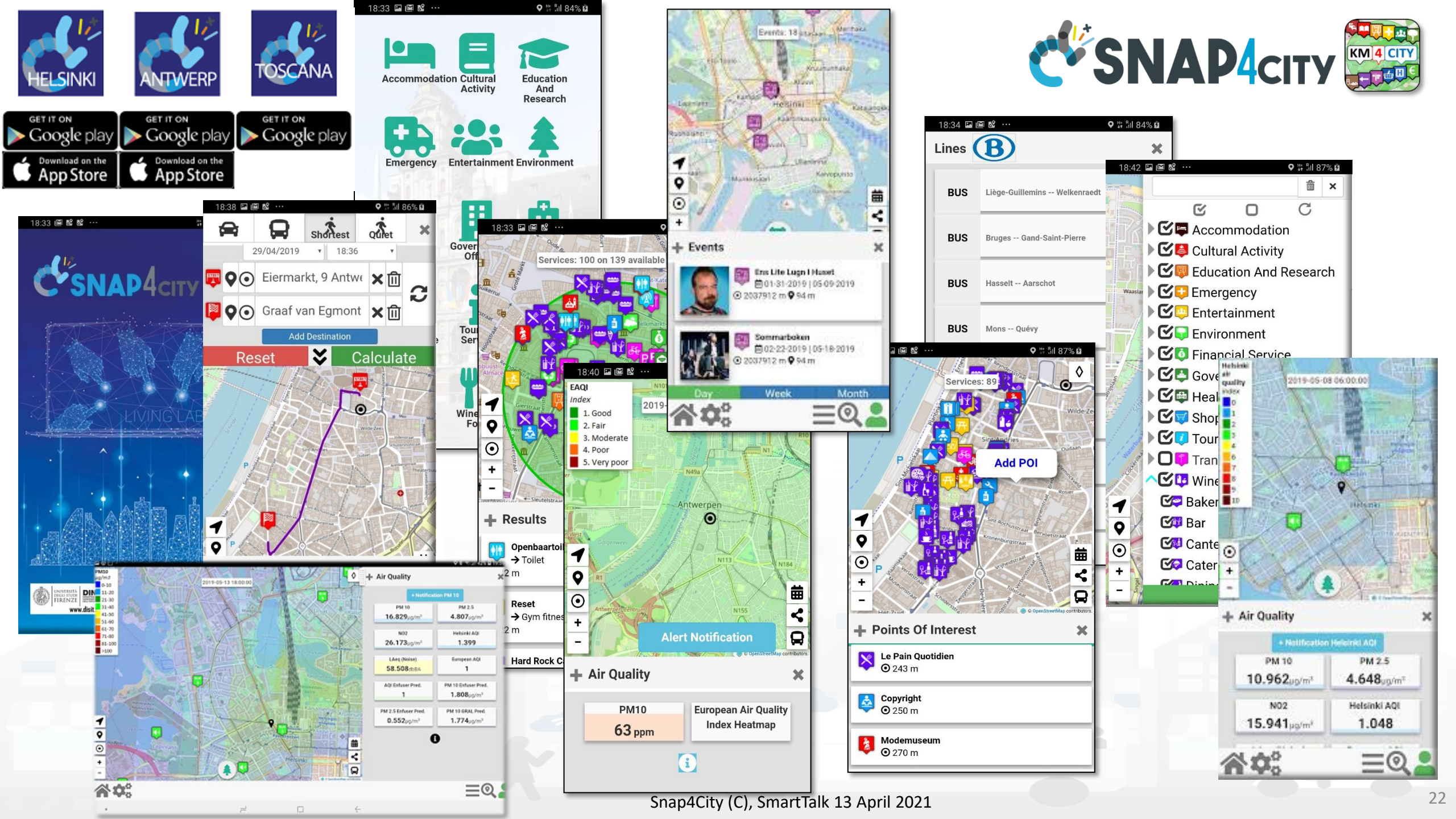




3D views

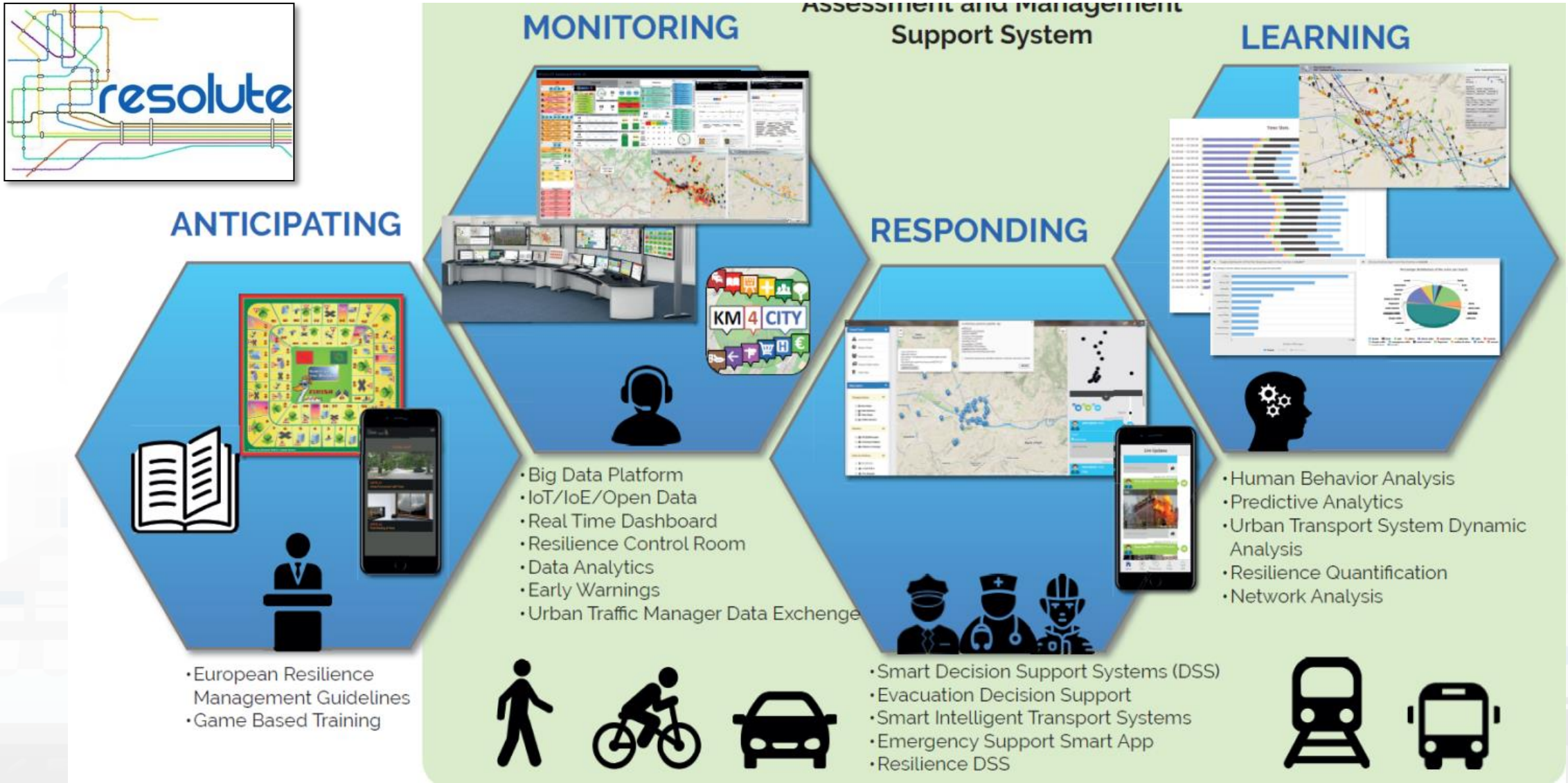


https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjM2MA==#


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Shortest
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Add Destination
Reset
Calculate
Events
Day
Week
Month
Services: 100 on 139 available
EAQI
Index
1. Good
2. Fair
3. Moderate
4. Poor
5. Very poor
Results
Antwerpen
Alert Notification
Air Quality
PM10
63 ppm
European Air Quality Index Heatmap
Lines
BUS
Liège-Guillemins -- Welkenraedt
Bruges -- Gand-Saint-Pierre
Hasselt -- Aarschot
Mons -- Quévy
Add POI
Points Of Interest
Le Pain Quotidien
243 m
Copyright
250 m
Modemuseum
270 m
Financial Service
Bar
Air Quality
PM 10
10.962
PM 2.5
4.648
NO2
15.941
Helsinki AQI
1.048

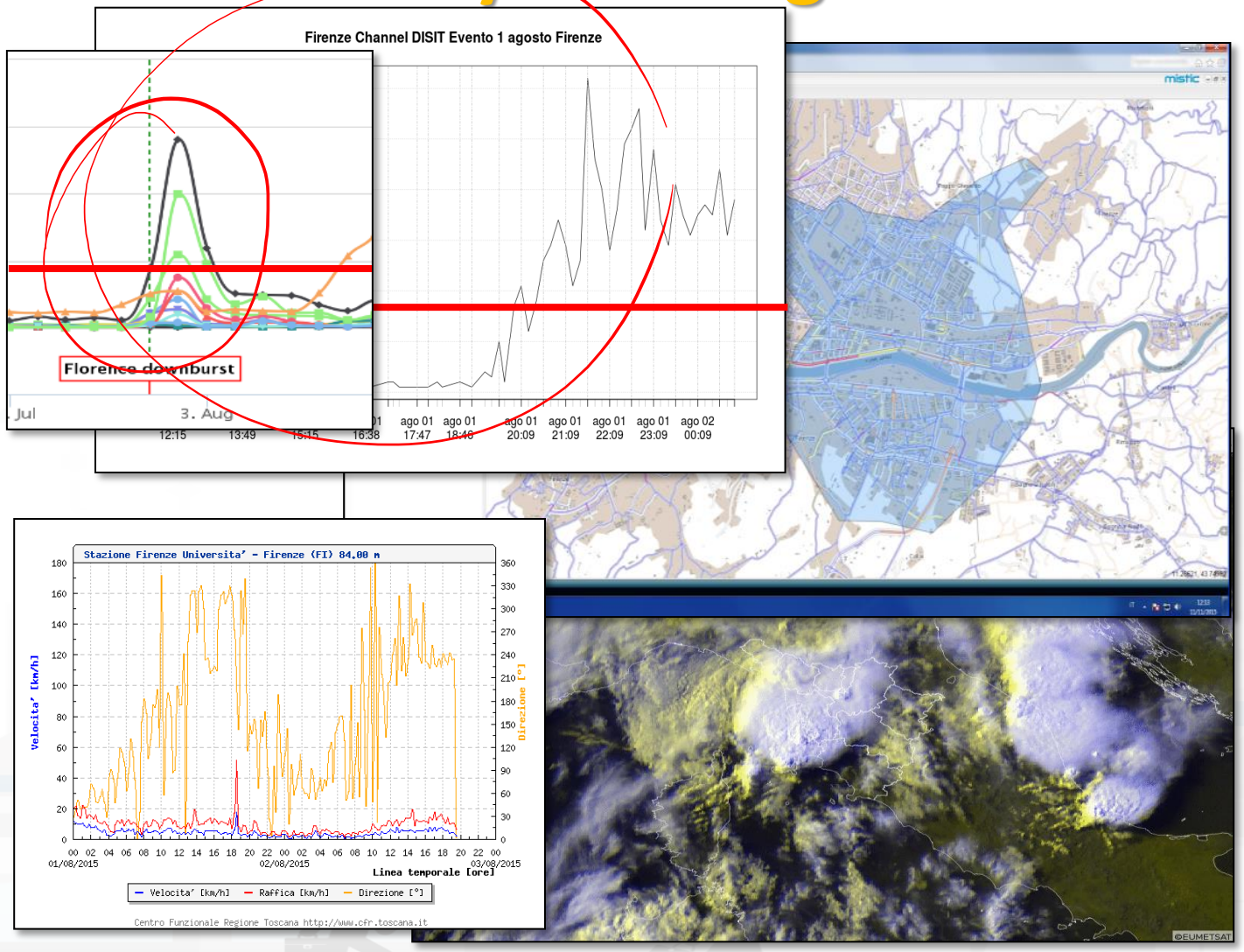

SIGNORVINO

ERMG: European Resilience Management Guide

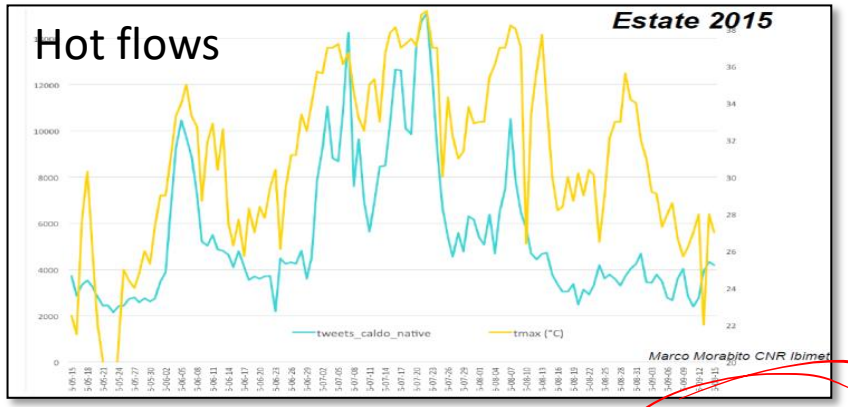


Twitter Vigilance

Early Warning



Predictive models



Attendance at long lasting events: EXPO2015

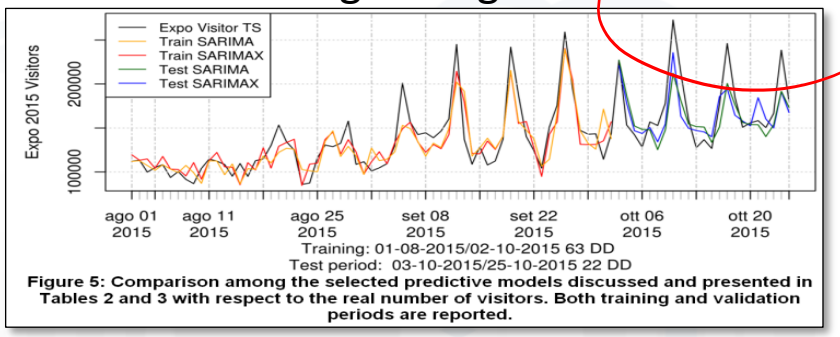
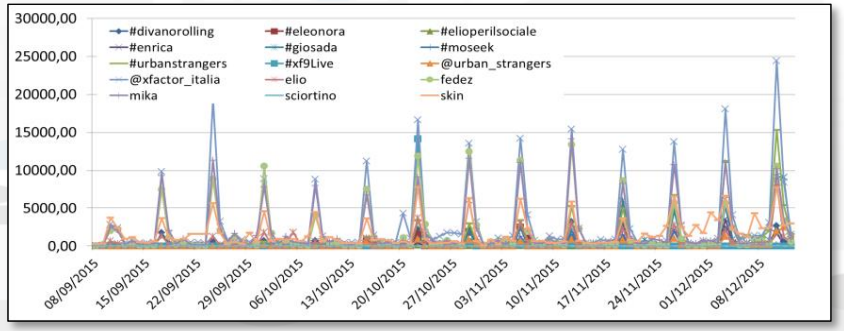


Figure 5: Comparison among the selected predictive models discussed and presented in Tables 2 and 3 with respect to the real number of visitors. Both training and validation periods are reported.

Attendance at recurrent events: TV, footbal



Tuscany Region

Firenze, Pisa, Livorno, Prato, etc.





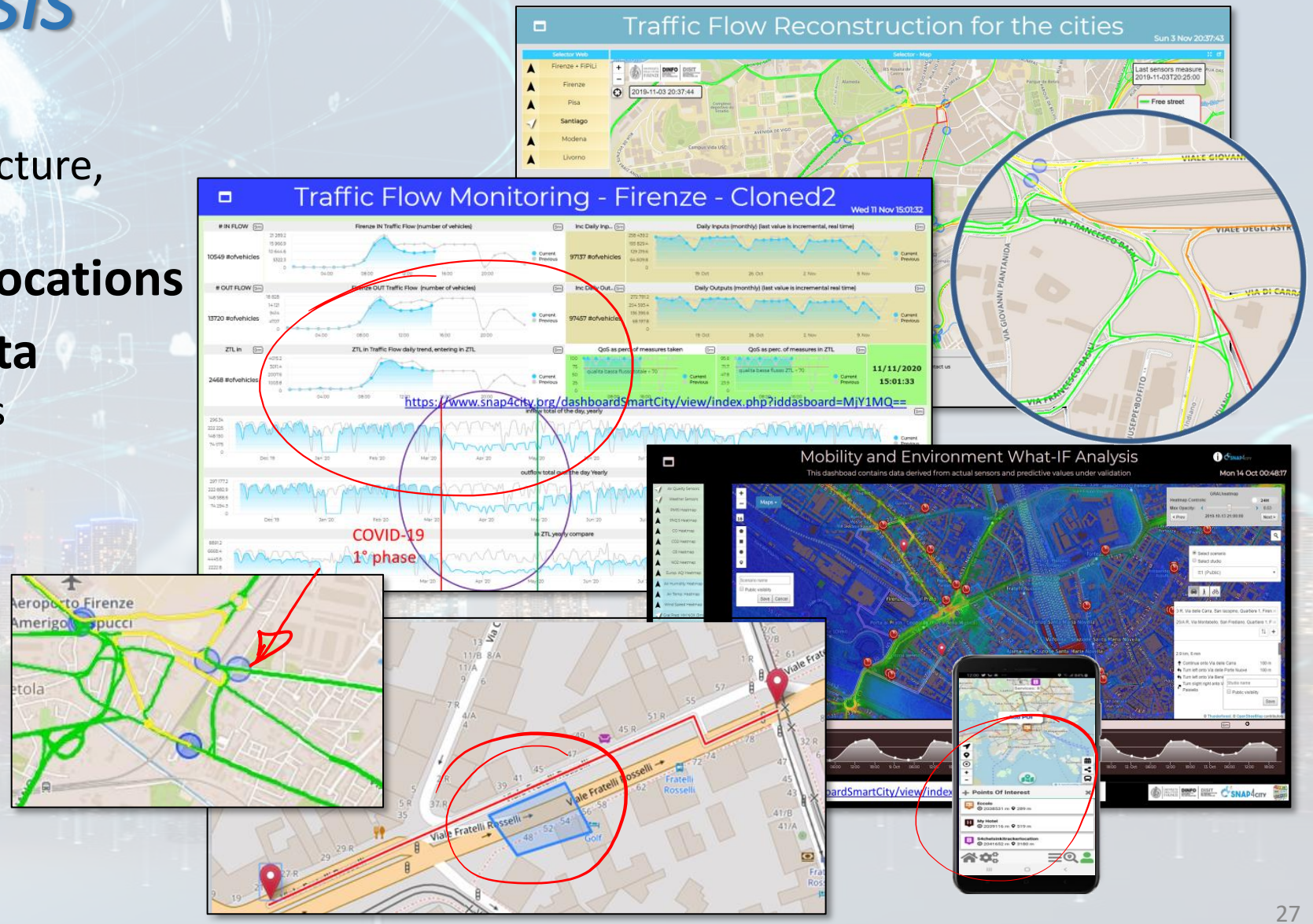


Mobility and Transport
Traffic Flow Analysis

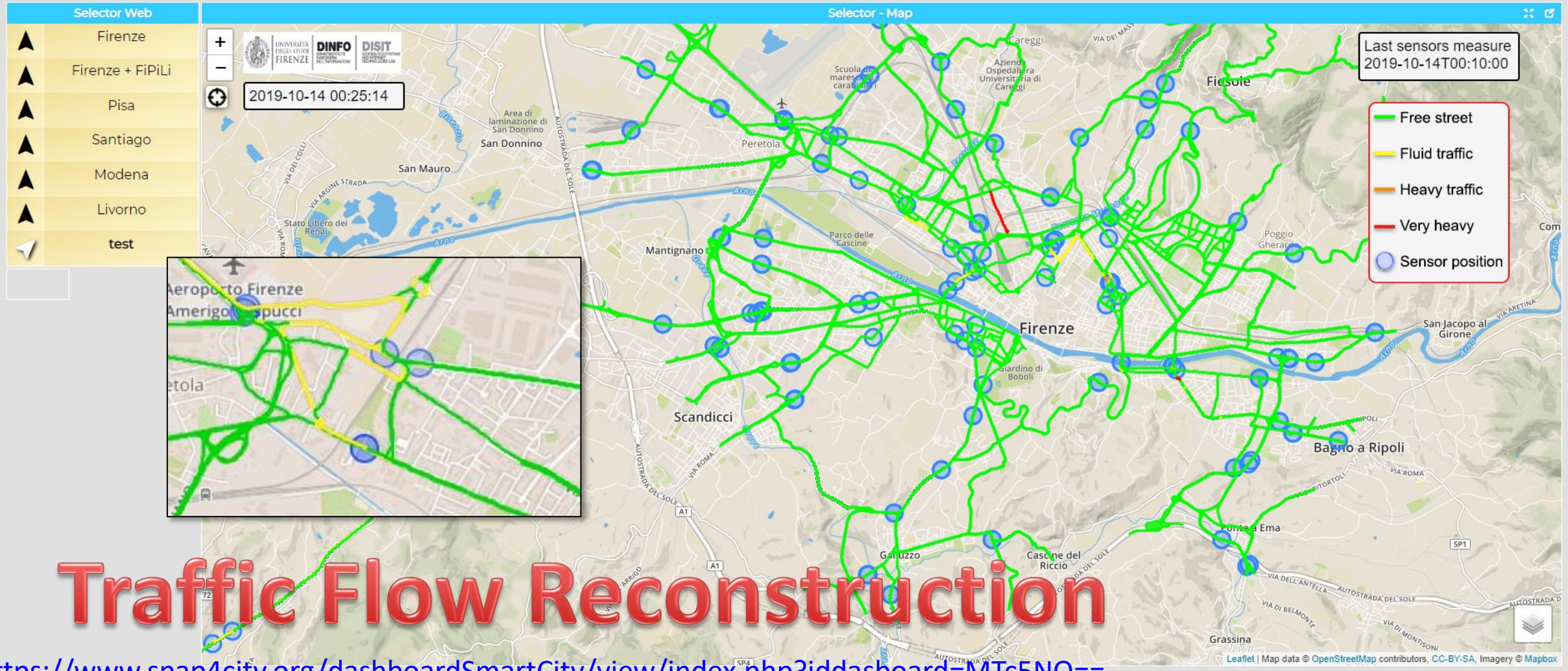
Cities: Firenze, Pisa, Livorno, Modena, Santiago di Compostela

reference

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



Traffic Flow Reconstruction for the cities



Traffic Flow Reconstruction

https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MTc5NQ==

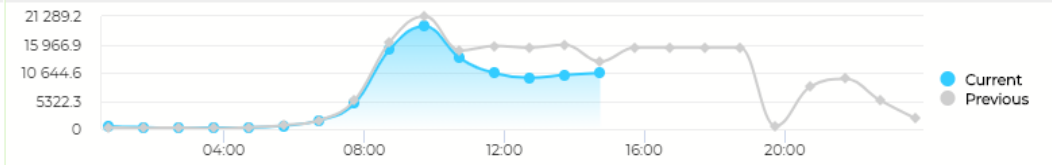
Traffic Flow Monitoring - Firenze - Cloned2

Wed 11 Nov 15:01:32

 # IN FLOW 9m

10549 #ofvehicles

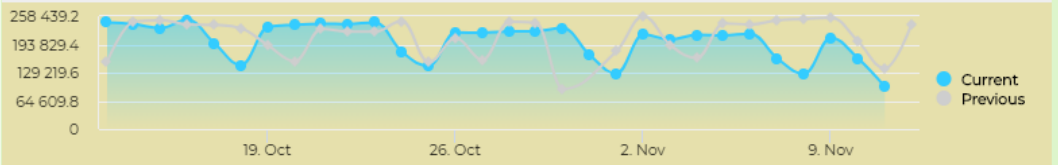
Firenze IN Traffic Flow (number of vehicles) 9m



Inc Daily Inp... 9m

97137 #ofvehicles

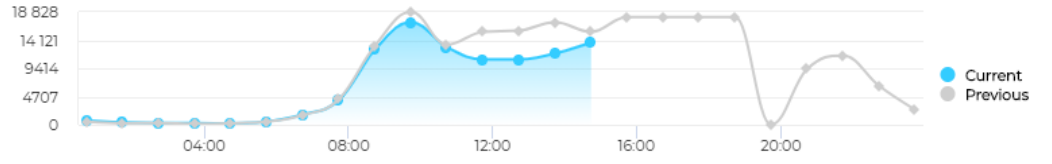
Daily Inputs (monthly) (last value is incremental, real time) 9m



 # OUT FLOW 9m

13720 #ofvehicles

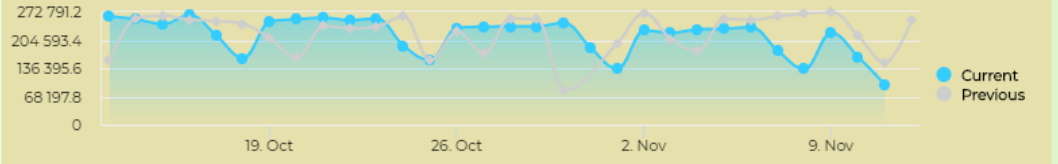
Firenze OUT Traffic Flow (number of vehicles) 9m



Inc Daily Out... 9m

97457 #ofvehicles

Daily Outputs (monthly) (last value is incremental real time) 9m



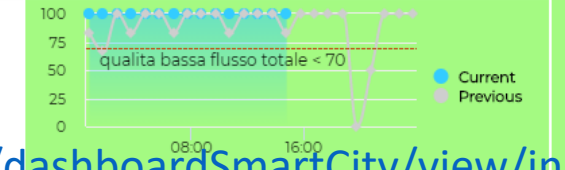
ZTL in 9m

2468 #ofvehicles

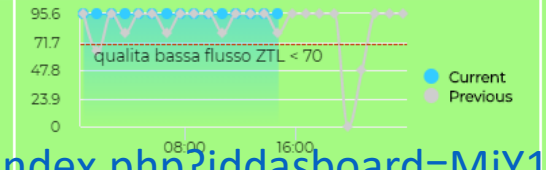
ZTL in Traffic Flow daily trend, entering in ZTL 9m



QoS as perc. of measures taken 9m



QoS as perc. of measures in ZTL 9m

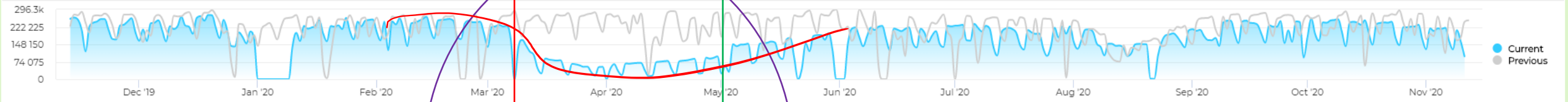


11/11/2020

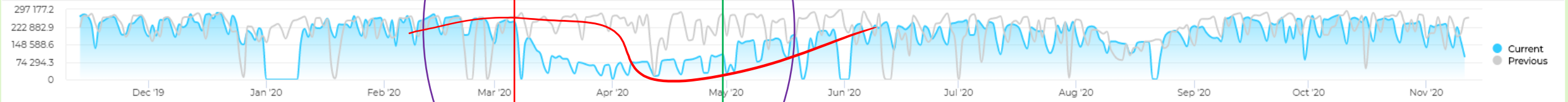
15:01:33

https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjY1MQ==

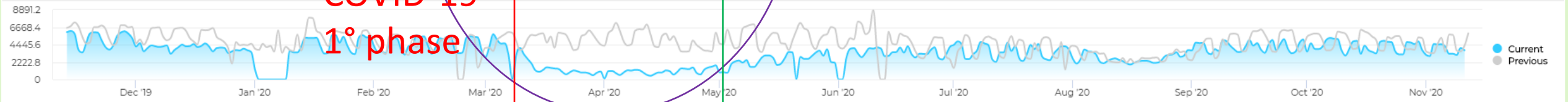
inflow total of the day, yearly 9m



outflow total over the day Yearly 9m



in ZTL yearly compare 9m



COVID-19

1° phase

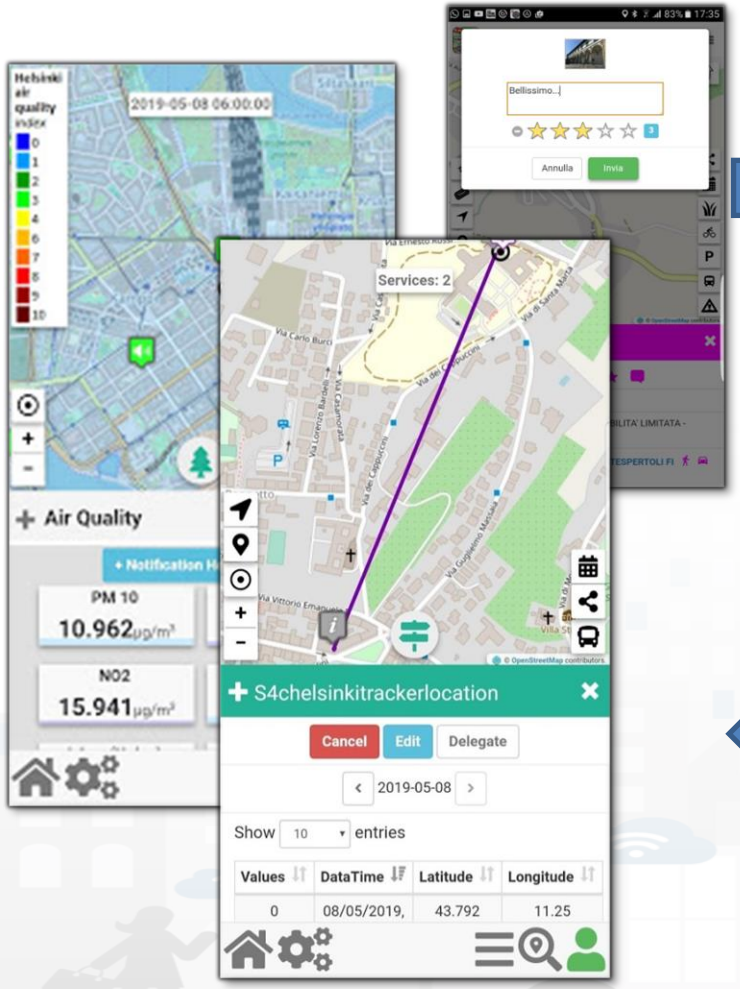
The App is a Bidirectional Device

- GPS Positions
- Selections on menus
- Views of POI
- Access to Dashboards
- searched information
- Routing
- Ranks, votes
- Comments
- Images
- Subscriptions to notifications
- ….

Produced information

- Accepted ?
- Performed ?
- …

Users



Derived information

- Trajectories
- Hot Places by click and by move
- Origin destination matrices
- Most interested topics
- Most interested POI
- Delegation and relationships
- Accesses to Dashboards
- **Cumulated Scores from Actions**
- Requested information
- Routing performed
- …..

Produced information

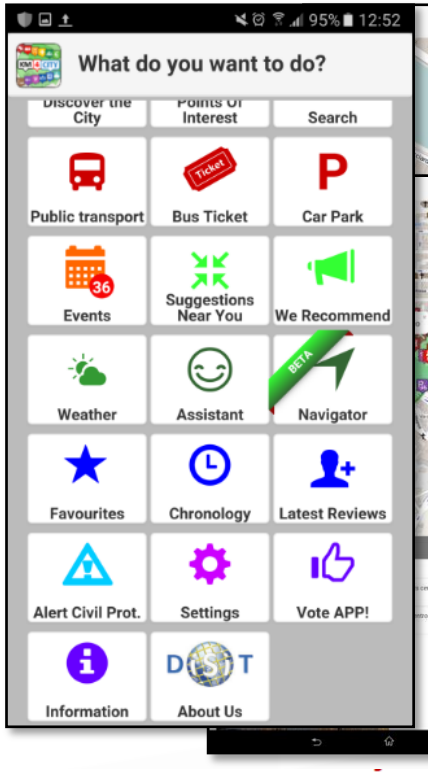
- Suggestions
- Engagements
- Notifications
- …

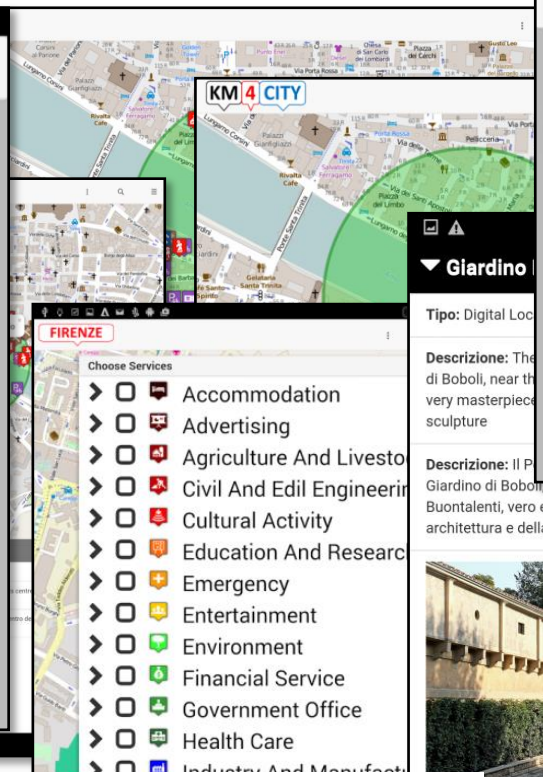
System

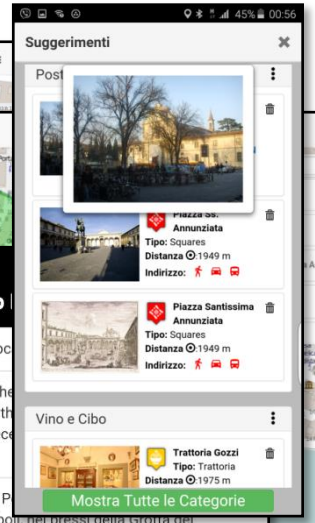
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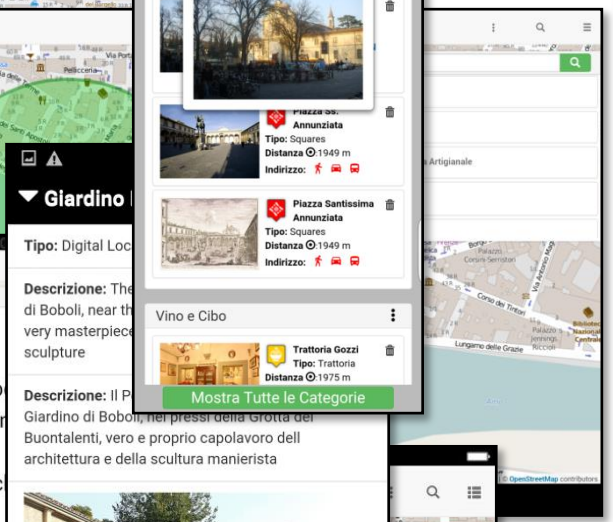
Mobile Apps

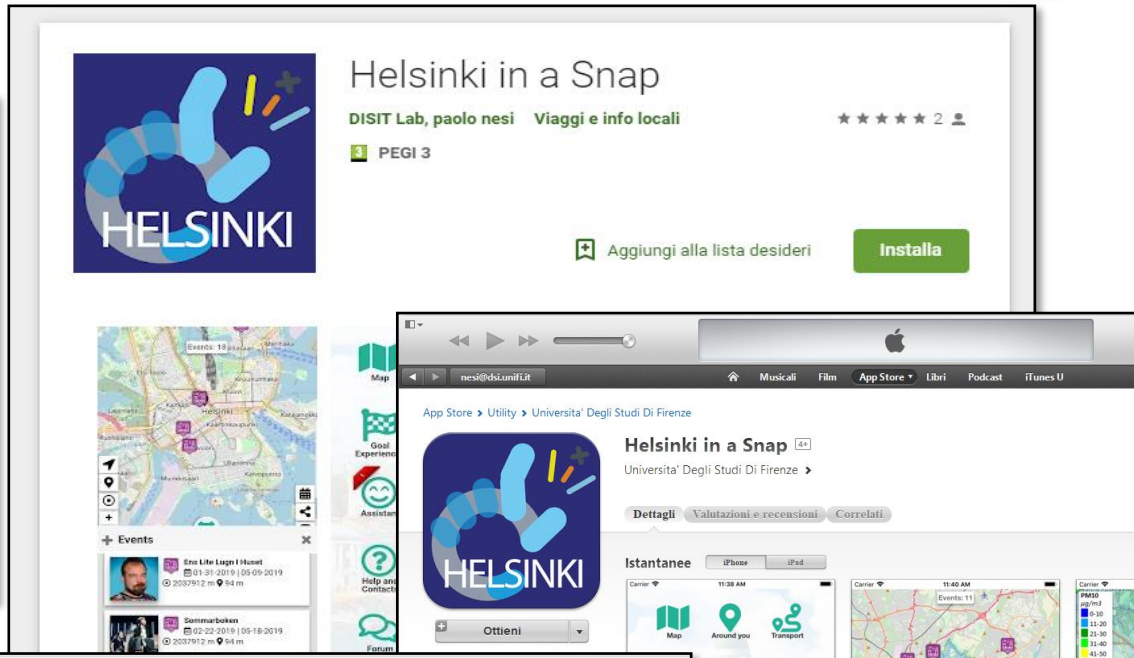
SNAP4CITY KM 4 CITY

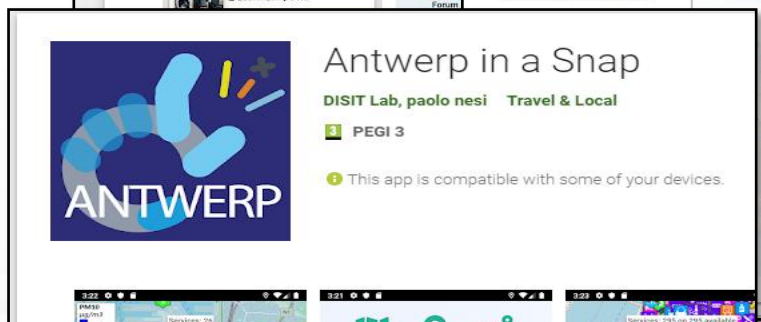


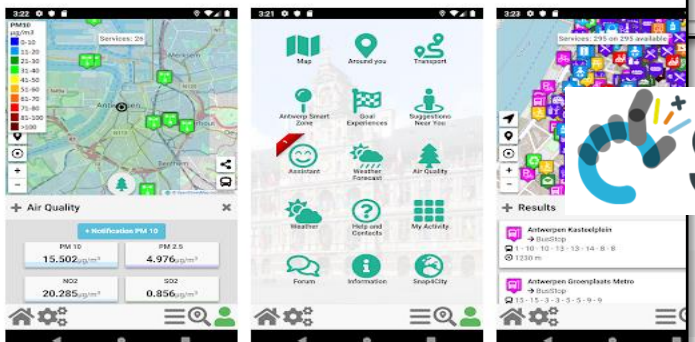












DISPONIBILE SU Google play

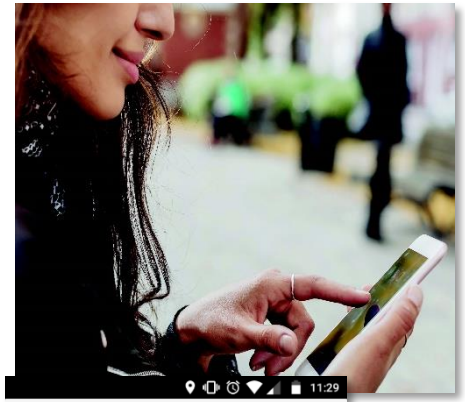
Scarica da App Store

Scarica da Windows Store

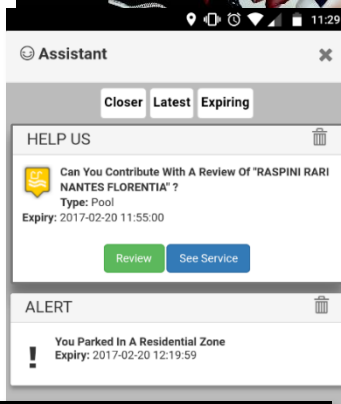
FIRENZE

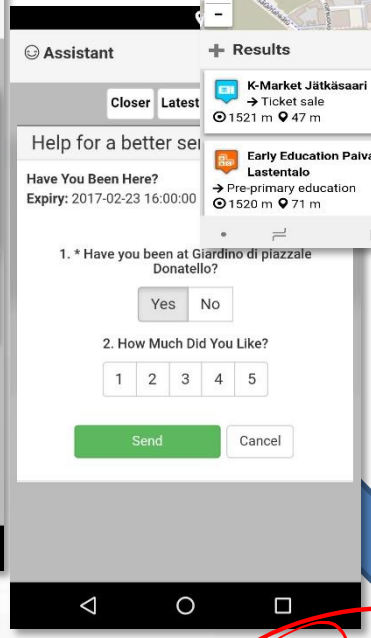
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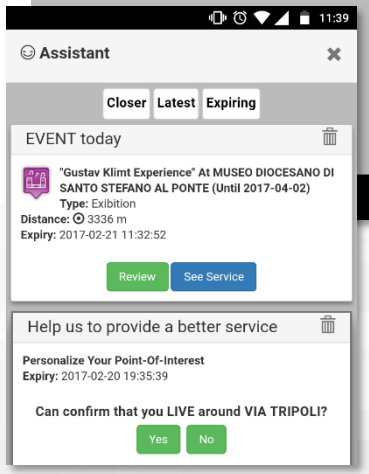
Users' Engagement

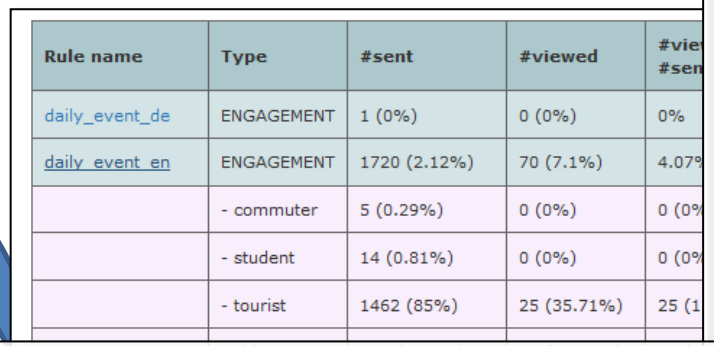




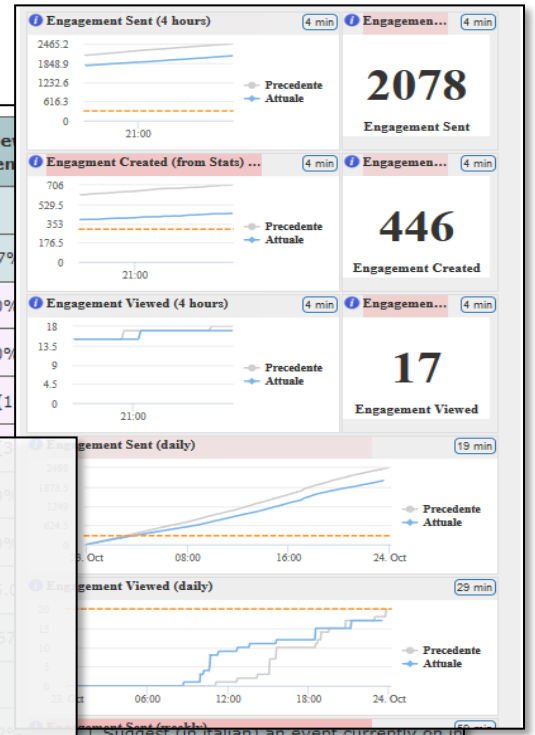








Rule name	Type	#sent	#viewed	#vie #sen
daily_event_de	ENGAGEMENT	1 (0%)	0 (0%)	0%
daily_event_en	ENGAGEMENT	1720 (2.12%)	70 (7.1%)	4.07%
	- commuter	5 (0.29%)	0 (0%)	0 (0%
	- student	14 (0.81%)	0 (0%)	0 (0%
	- tourist	1462 (85%)	25 (35.71%)	25 (1



Inform

Air Quality forecast is not very nice
You have parked out of your residential parking zone
The Road cleaning is this night
The waste in S.Andreas Road is full

Engage

Provide a comment, a score, etc.

Stimulate / recommend

Events in the city, services you may be interested, etc..

Provide Bonus, rewards if needed

you get a bonus since you parked here
We suggest: leave the car out of the city, this bonus can be used to buy a bus ticket

Rules

User context

City context

Suggest (in italian) an event currently on in
Alert (in english) if the user parked in a res
Alert (in spanish) if the user parked in a res
Alert (in italian) if the user parked in a resid
Ask (in german) a contribution for a nearby



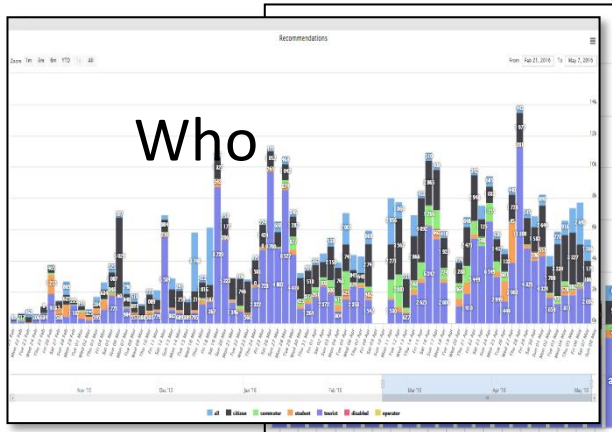
Campaing on Sustainable Mobility

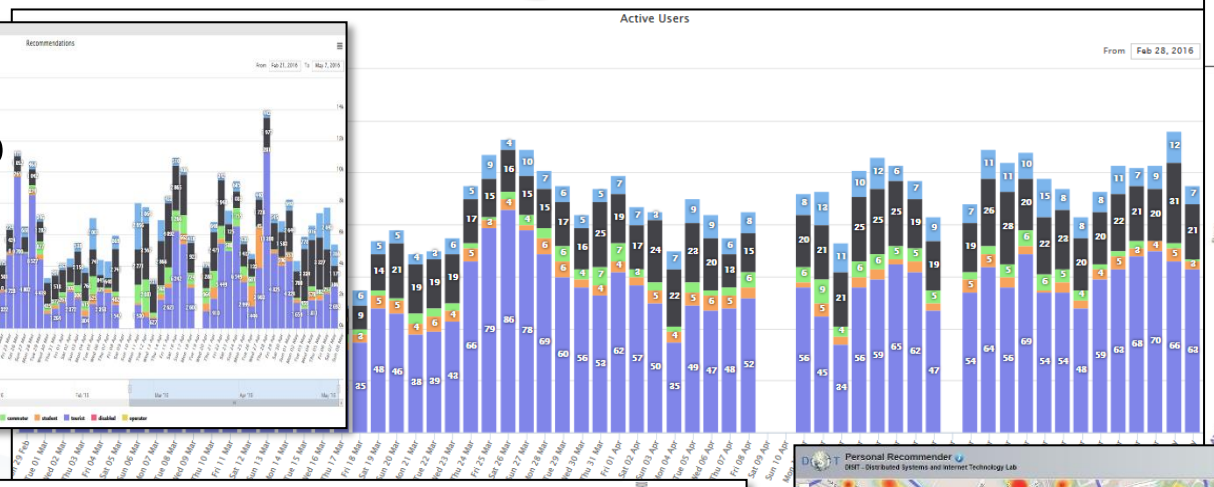
Sii smart.
Sii-Mobility!
Scarica, viaggia, vinci!

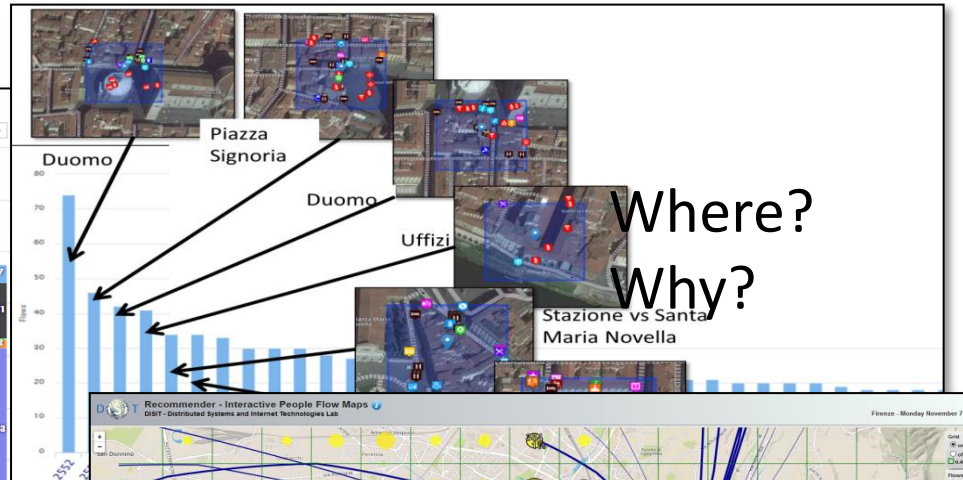


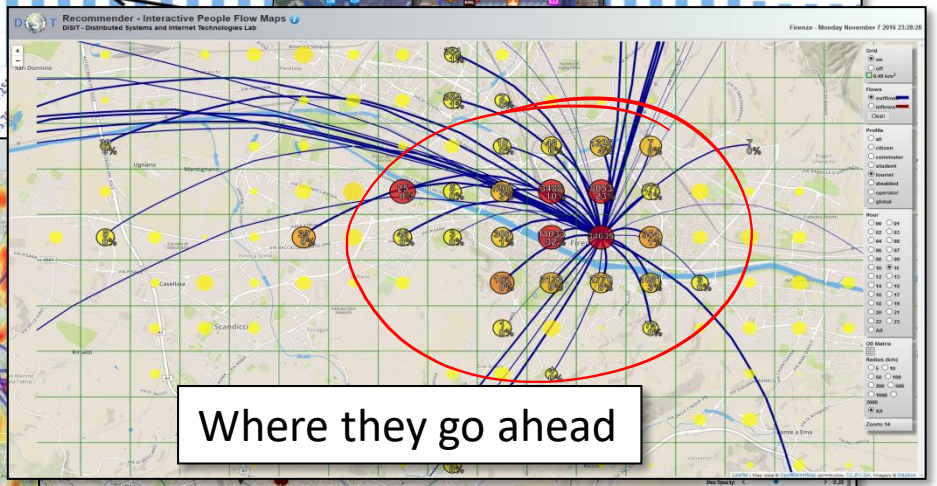
Dal 15 aprile al 15 luglio scegliere il trasporto pubblico ti premia!
Scarica l'app "Toscana dove, cosa", guadagna punti viaggiando in autobus e vinci tanti fantastici premi.
Per maggiori informazioni visita il sito info.sii-mobility.org
TOSCANA
ataf
BUSITALIA
GRUPPO FERROVIE DELLO STATO ITALIANE
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UNIVERSITÀ DEGLI STUDI FIRENZE
DINFO
DISIT

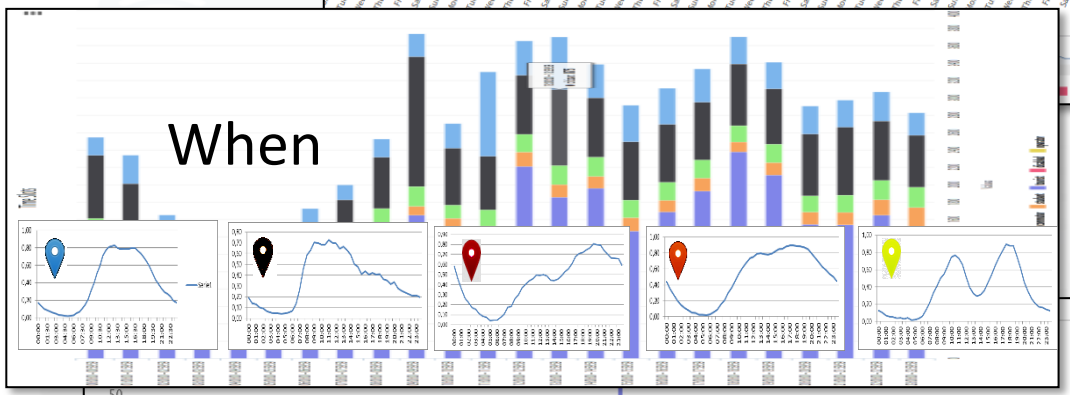
User Behavior Analyser for Collective Profiling

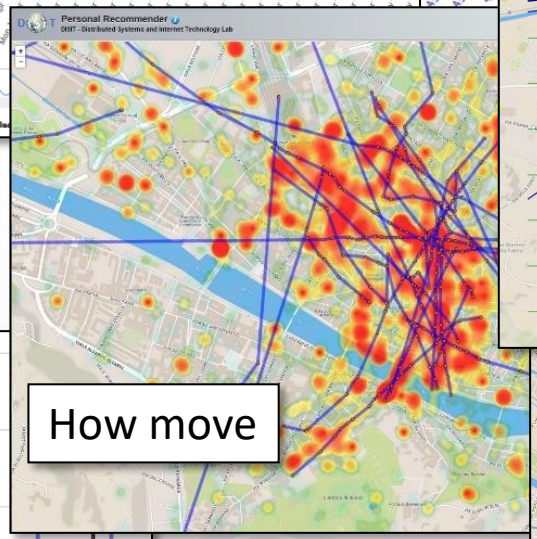


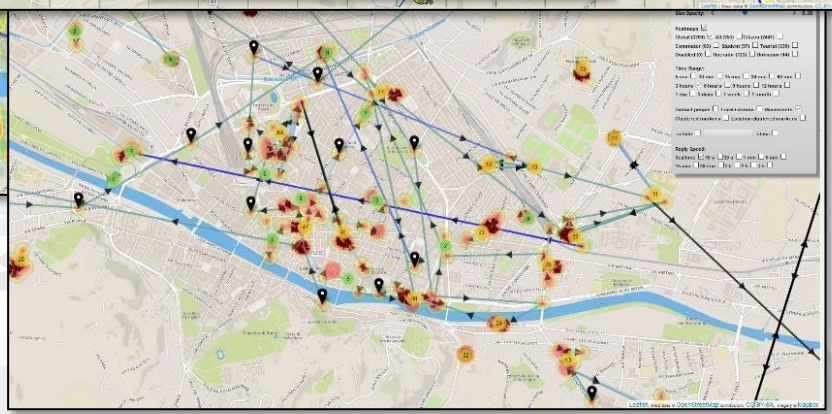


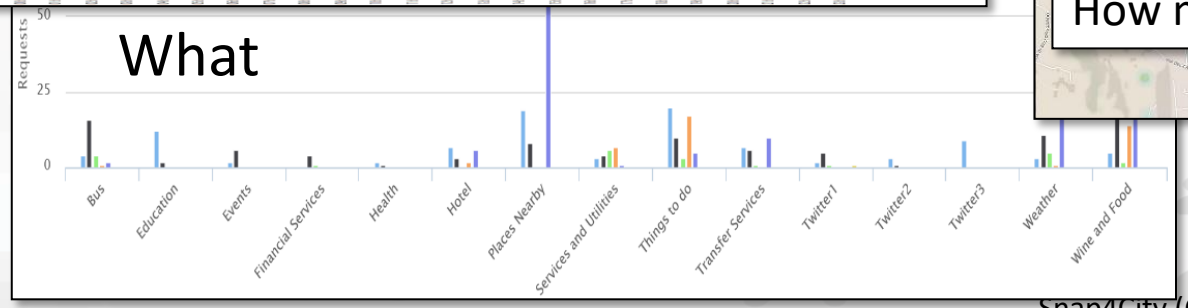












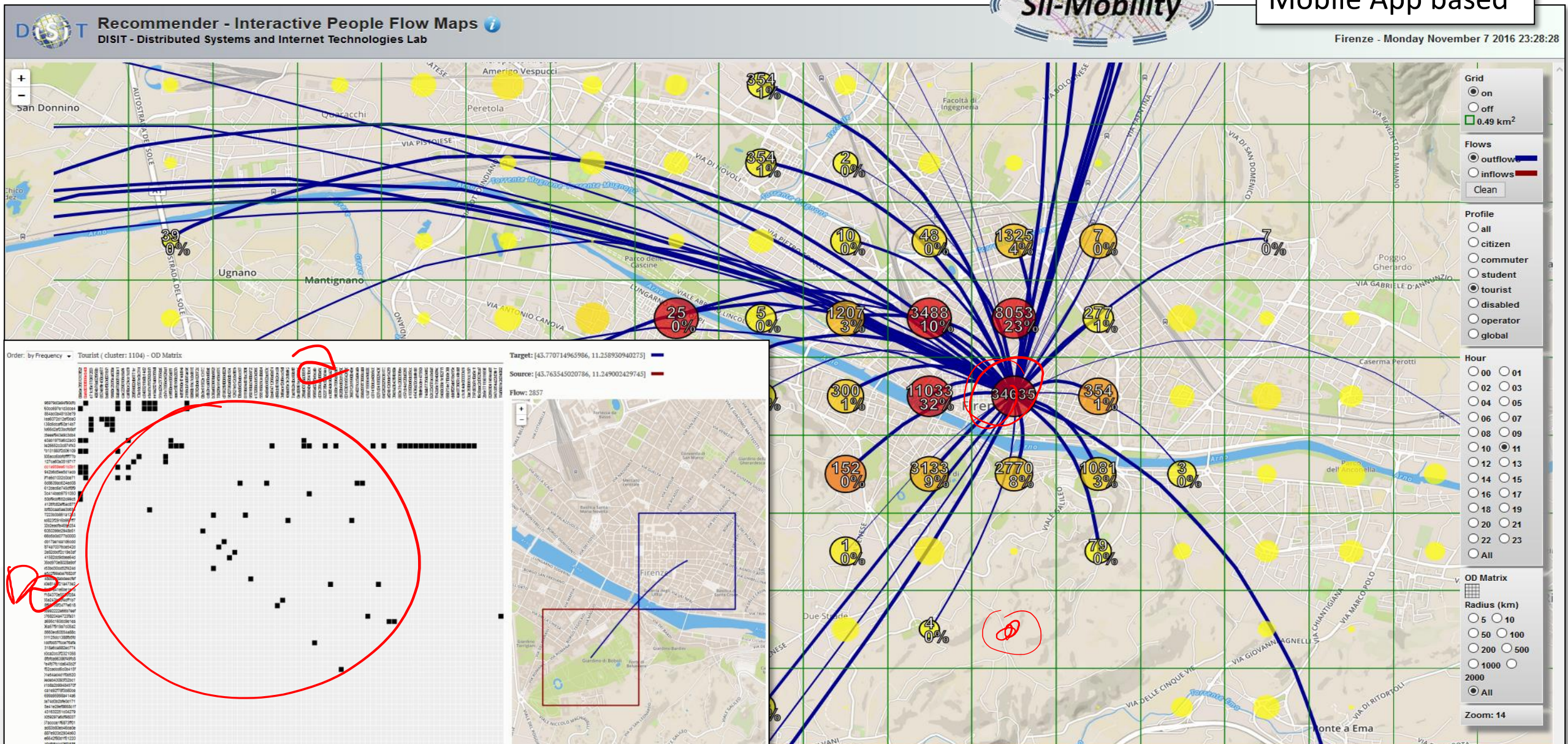
Scalable multiresolution OD matrix

SNAP4CITY

KM4CITY

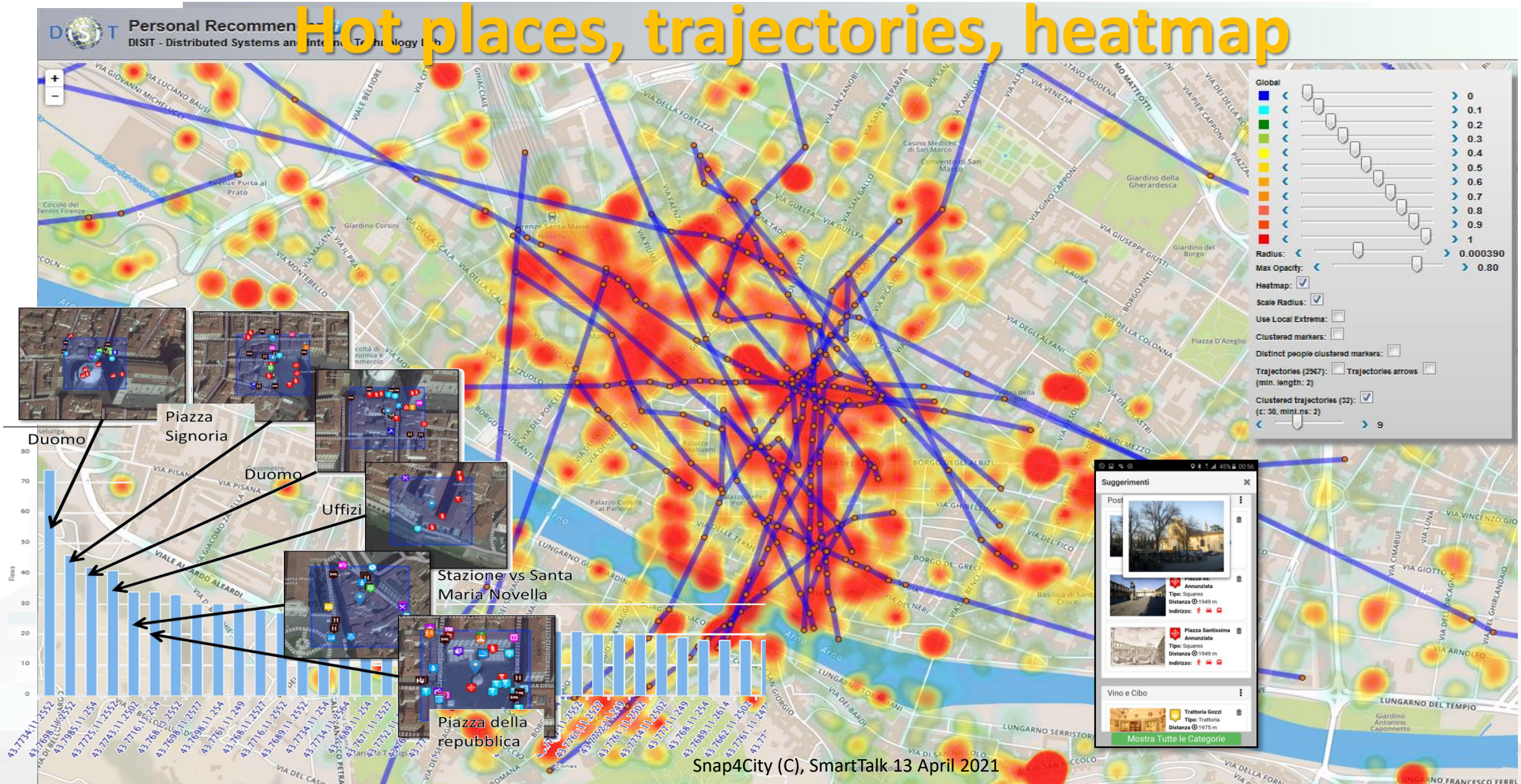
Sii-Mobility

Mobile App based



User Behaviour Analyser

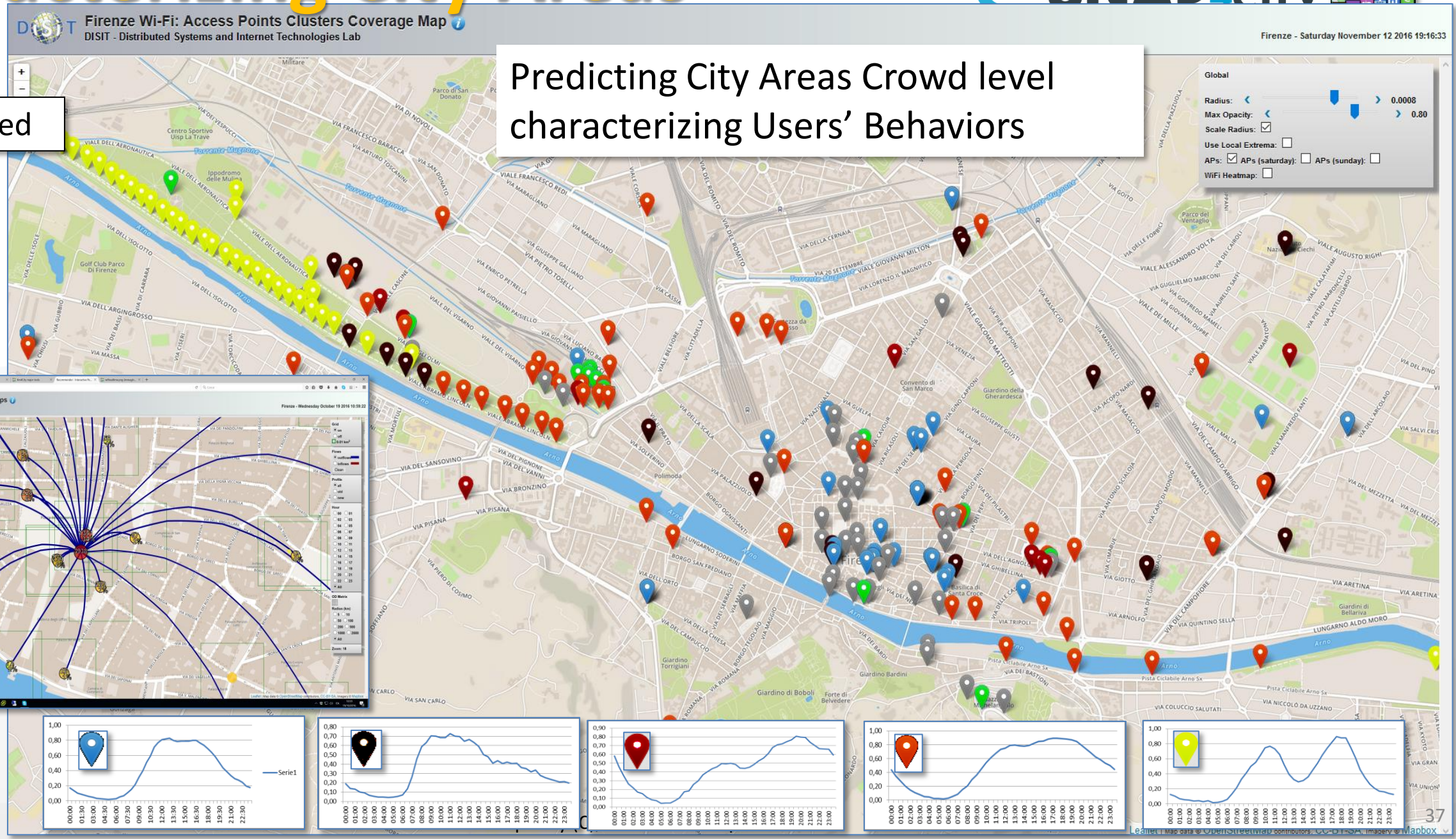
Hot places, trajectories, heatmap



Characterizing City Areas

Wi-Fi based

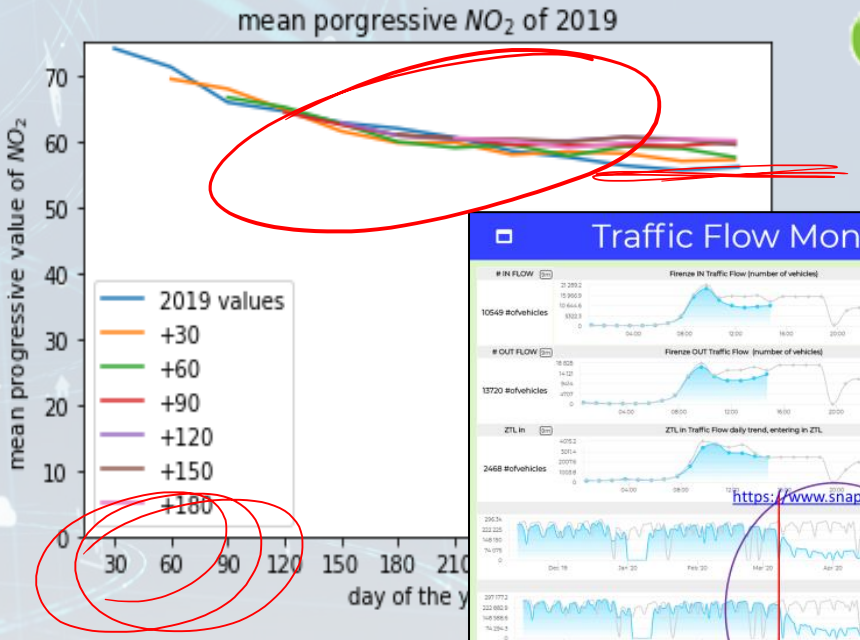
Predicting City Areas Crowd level characterizing Users' Behaviors

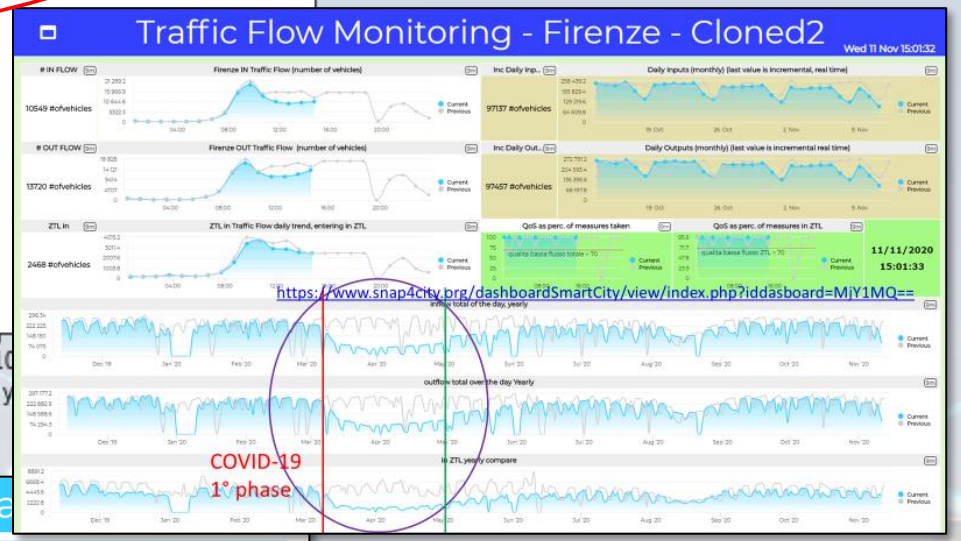


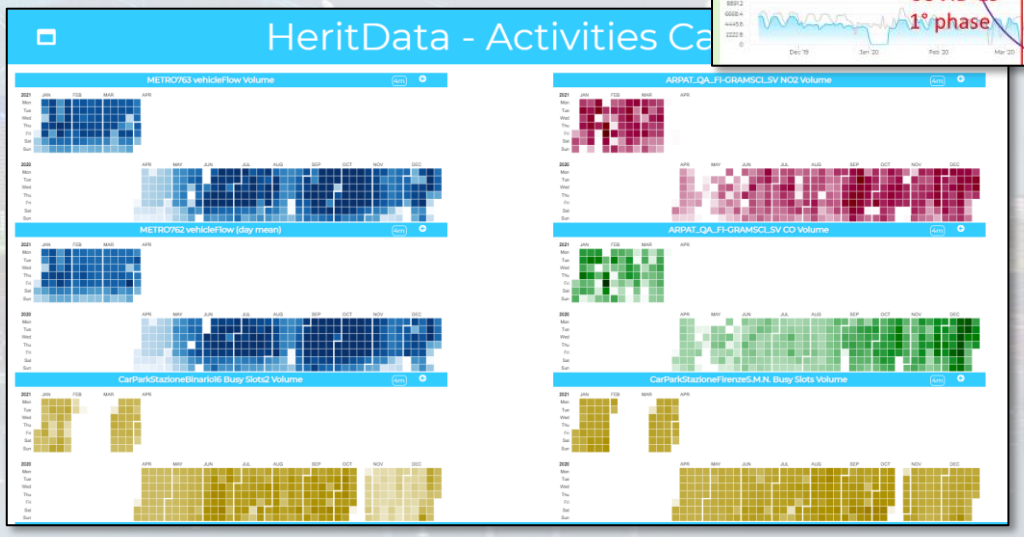
Impact of COVID-19

Cities: Firenze, Pisa, Livorno, Toscana

- **Multiple Domain Data**
  - Traffic, environment, People, parking, stock options, Twitter, tc.
- **Decision Makers Multiple Locations**
  - NO2 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.

Antwerp

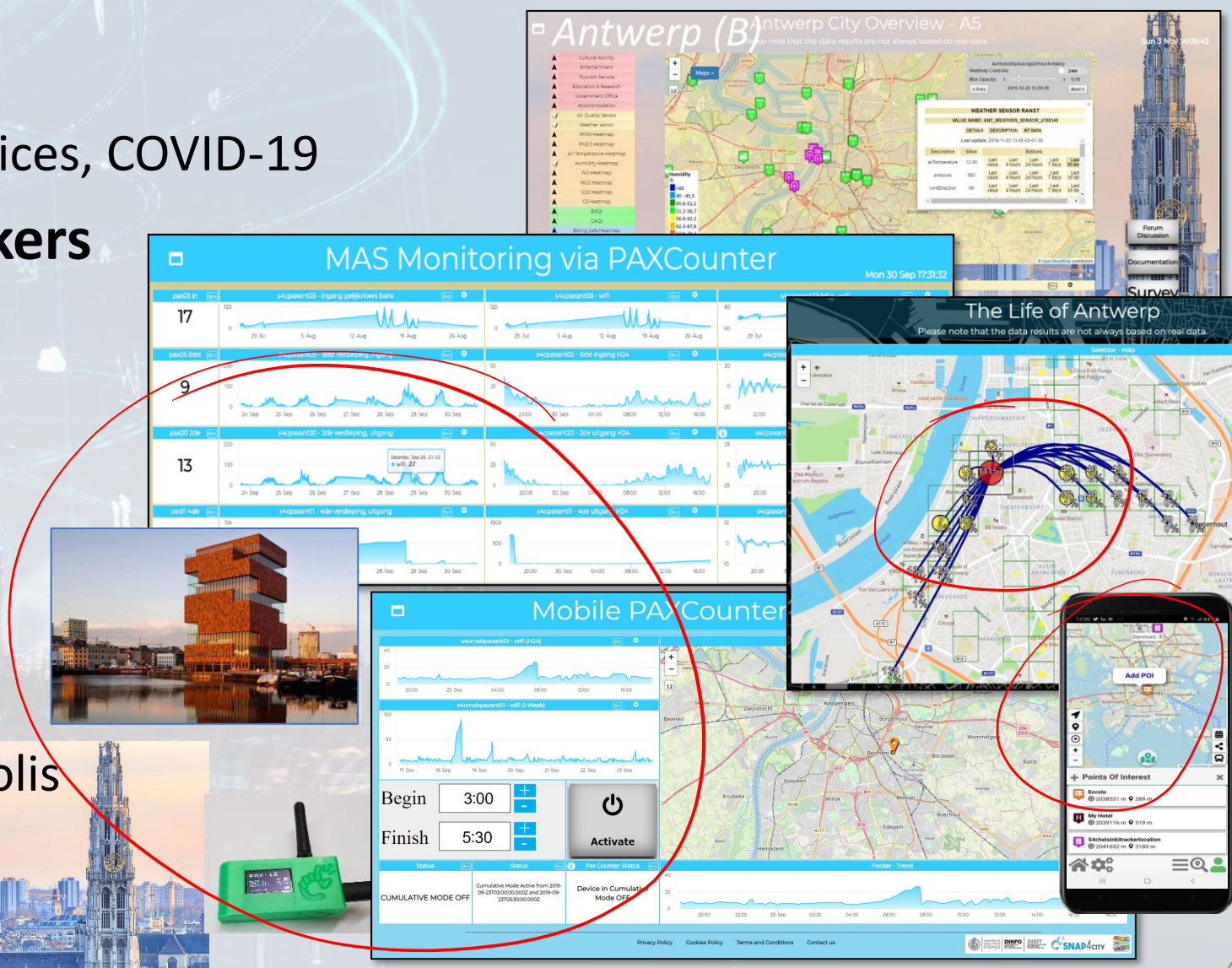


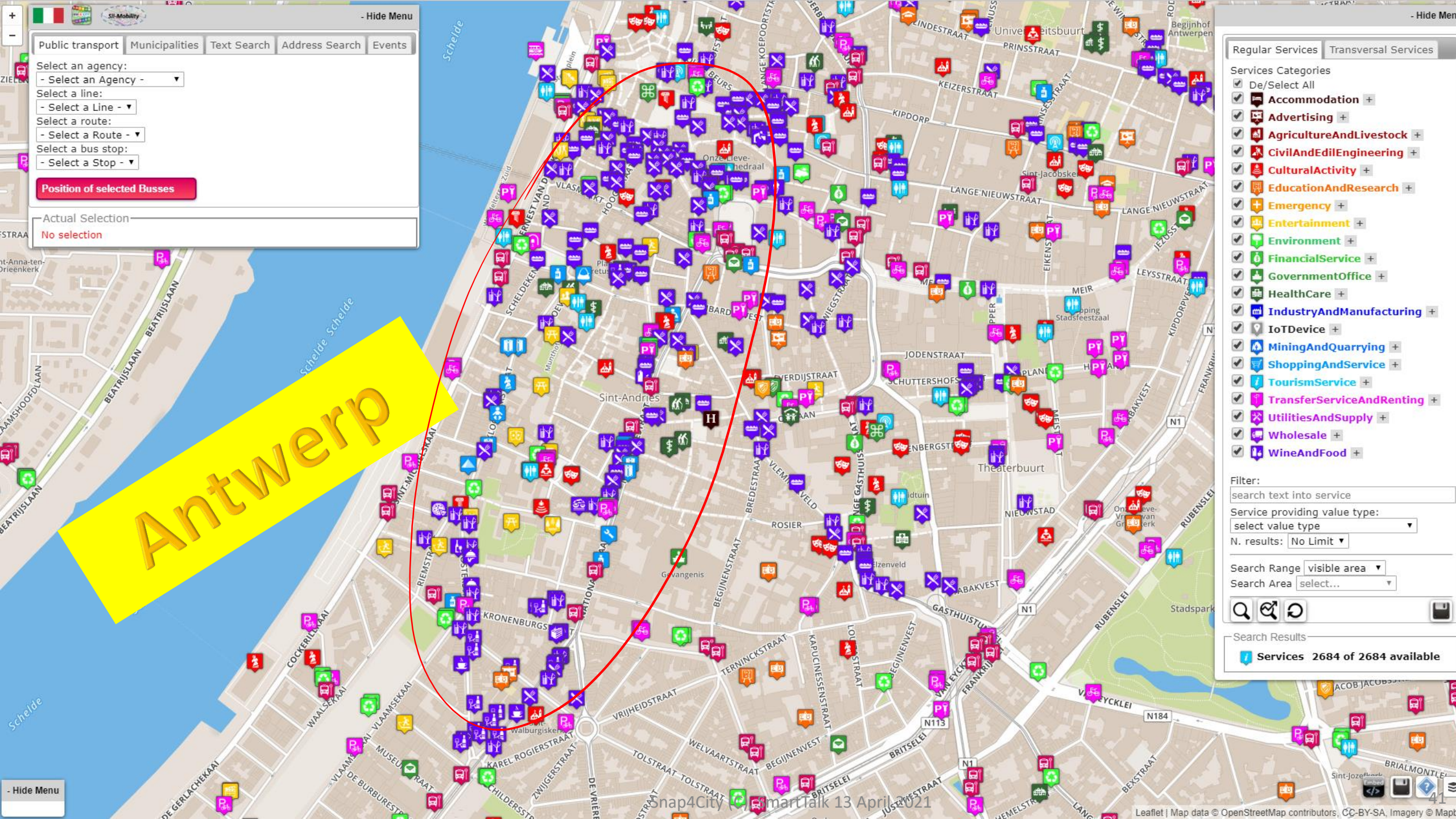
People Monitoring on Pub Services DIGIPOLIS Antwerp

reference

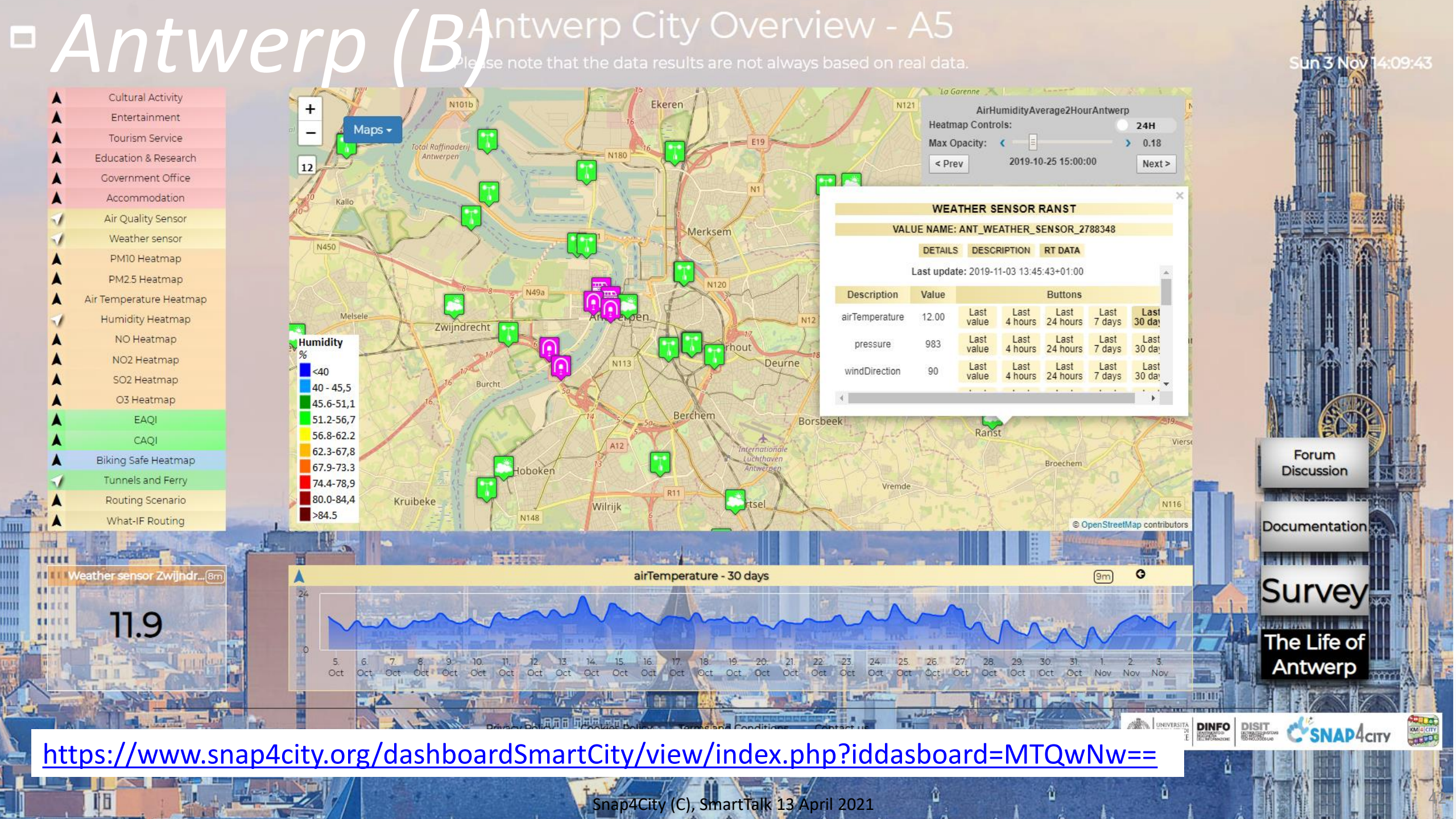
- **Multiple Domain Data**
  - PAX Counters: museum, pub services, COVID-19
- **Multiple Levels & Decision Makers**
- **Historical and Real Time data**
  - 20 fixed PaxCounters
  - 2 Mobile PaxCounters
  - Business Intelligence Dashboards
- **Services Exploited on:**
  - Dashboards, Mobile Apps, API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






- Hide Menu
Public transport
Municipalities
Text Search
Address Search
Events
Select an agency:
- Select an Agency -
Select a line:
- Select a Line -
Select a route:
- Select a Route -
Select a bus stop:
- Select a Stop -
Position of selected Busses
Actual Selection
No selection
Antwerp
- Hide Menu
Regular Services
Transversal Services
Services Categories
De/Select All
Accommodation
Advertising
AgricultureAndLivestock
CivilAndEdilEngineering
CulturalActivity
EducationAndResearch
Emergency
Entertainment
Environment
FinancialService
GovernmentOffice
HealthCare
IndustryAndManufacturing
IoTDevice
MiningAndQuarrying
ShoppingAndService
TourismService
TransferServiceAndRenting
UtilitiesAndSupply
Wholesale
WineAndFood
Filter:
search text into service
Service providing value type:
select value type
N. results:
No Limit
Search Range
visible area
Search Area
select...
Search Results
Services 2684 of 2684 available
Schelde
Sint-Andries
Theaterbuurt
Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapb

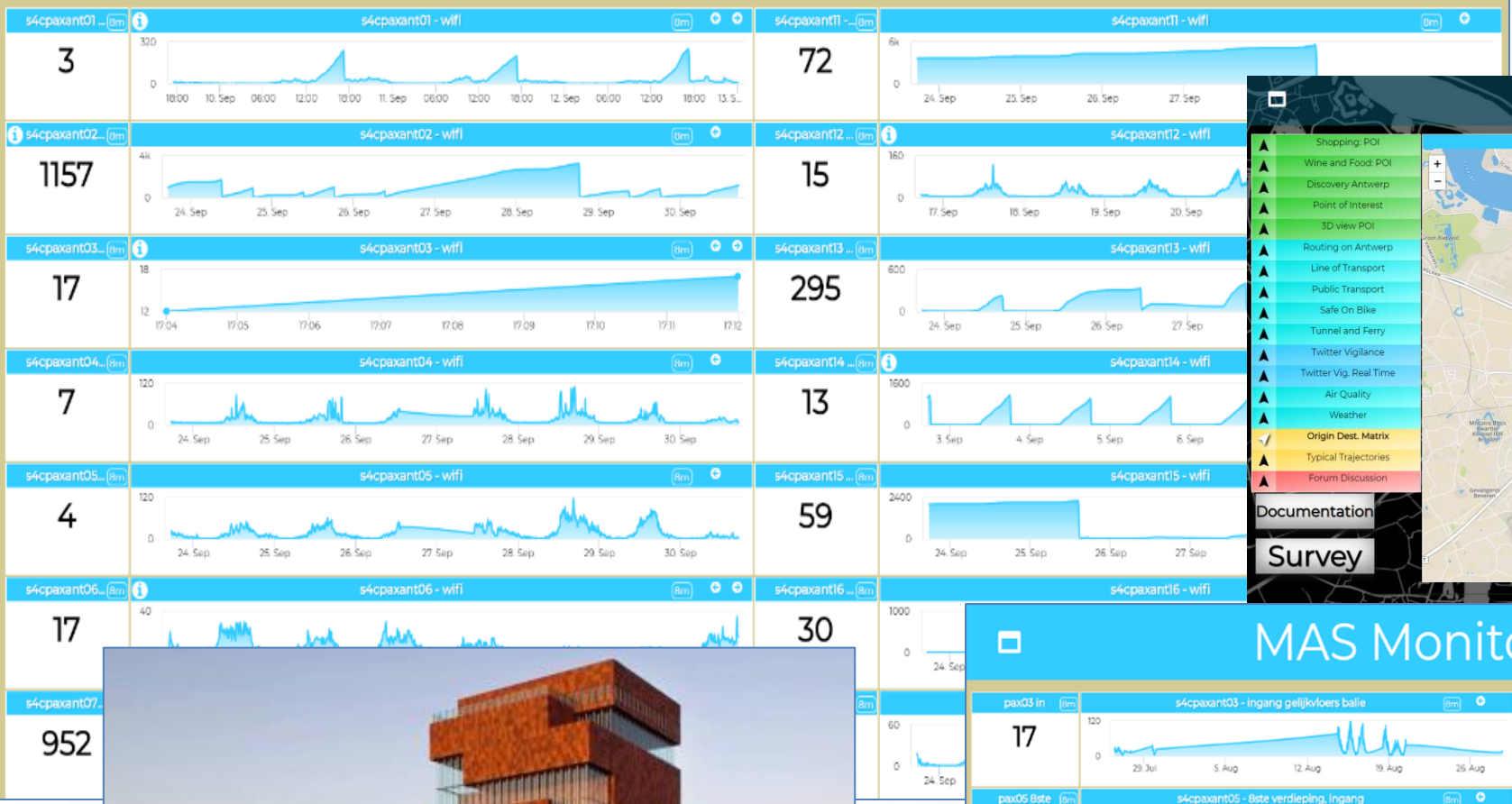
Antwerp (B)



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

PAXCounter real time and trend

Mon 30 Sep 17:18:48





SNAP4CITY

KM 4 CITY



MAS Monitoring via PAXCounter

Mon 30 Sep 17:31:32



2018

Programmable PAX counting



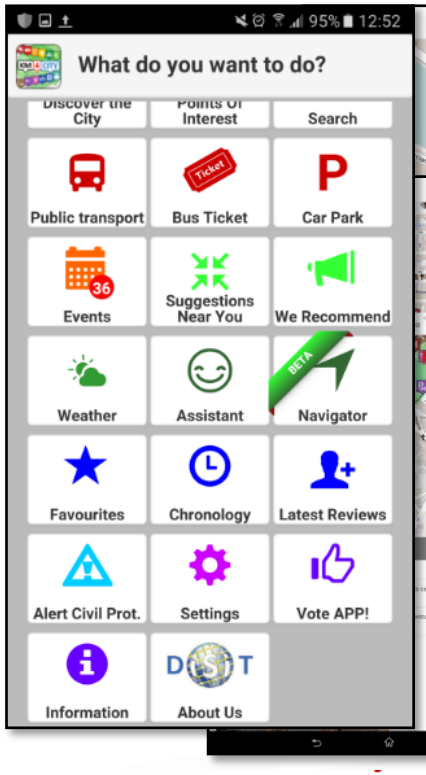


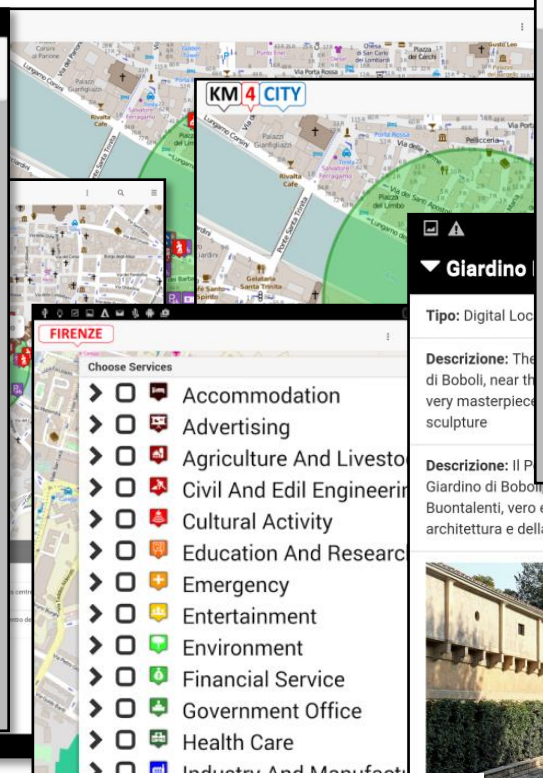
Antwerp

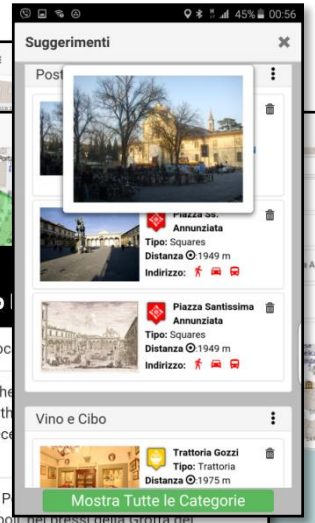
UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE | DISIT DISTRIBUTED SYSTEMS AND INTERNET TECHNOLOGIES LAB

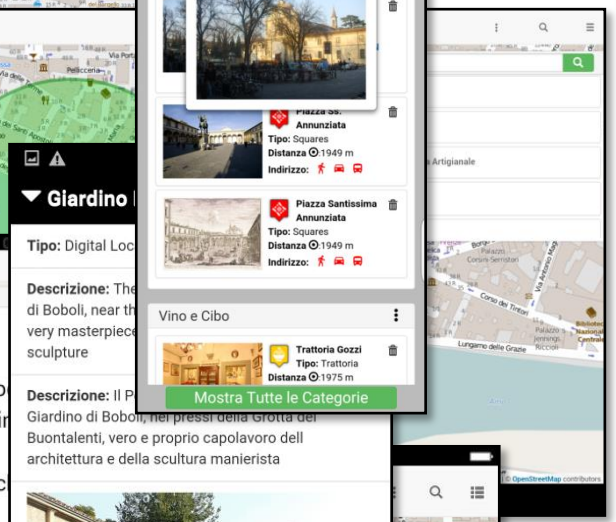
Mobile Apps

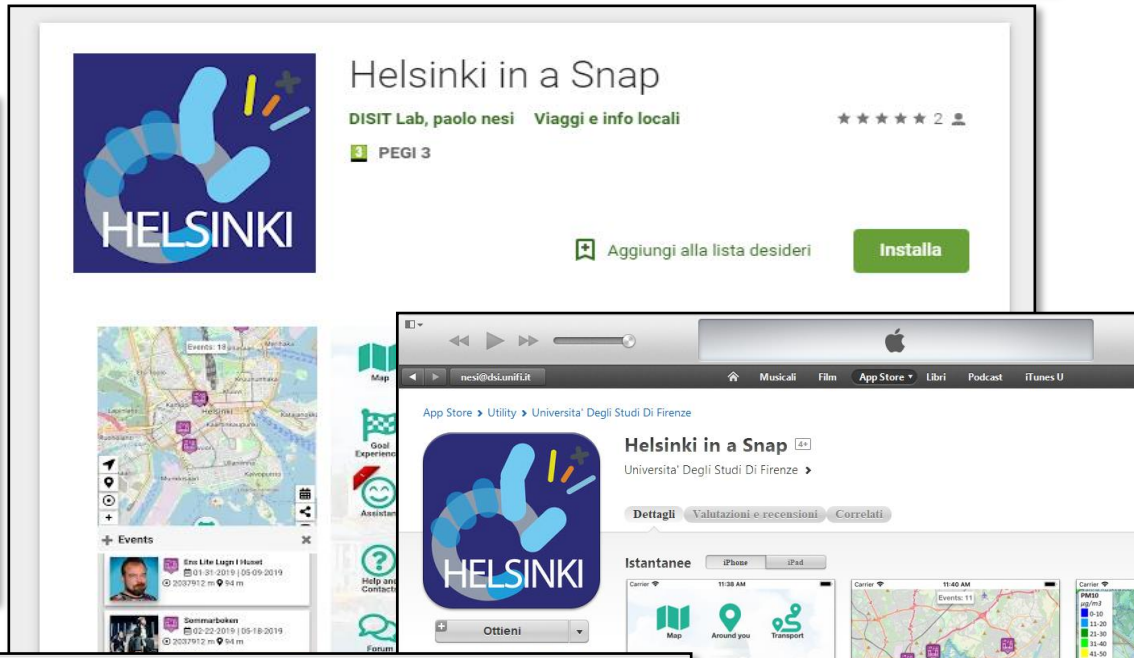
SNAP4CITY KM 4 CITY

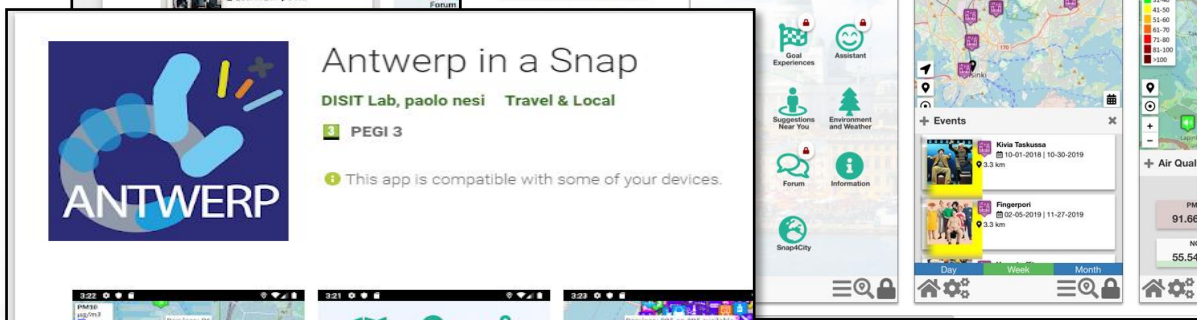


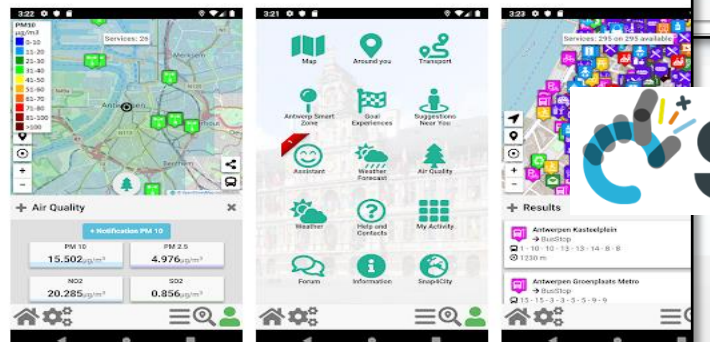












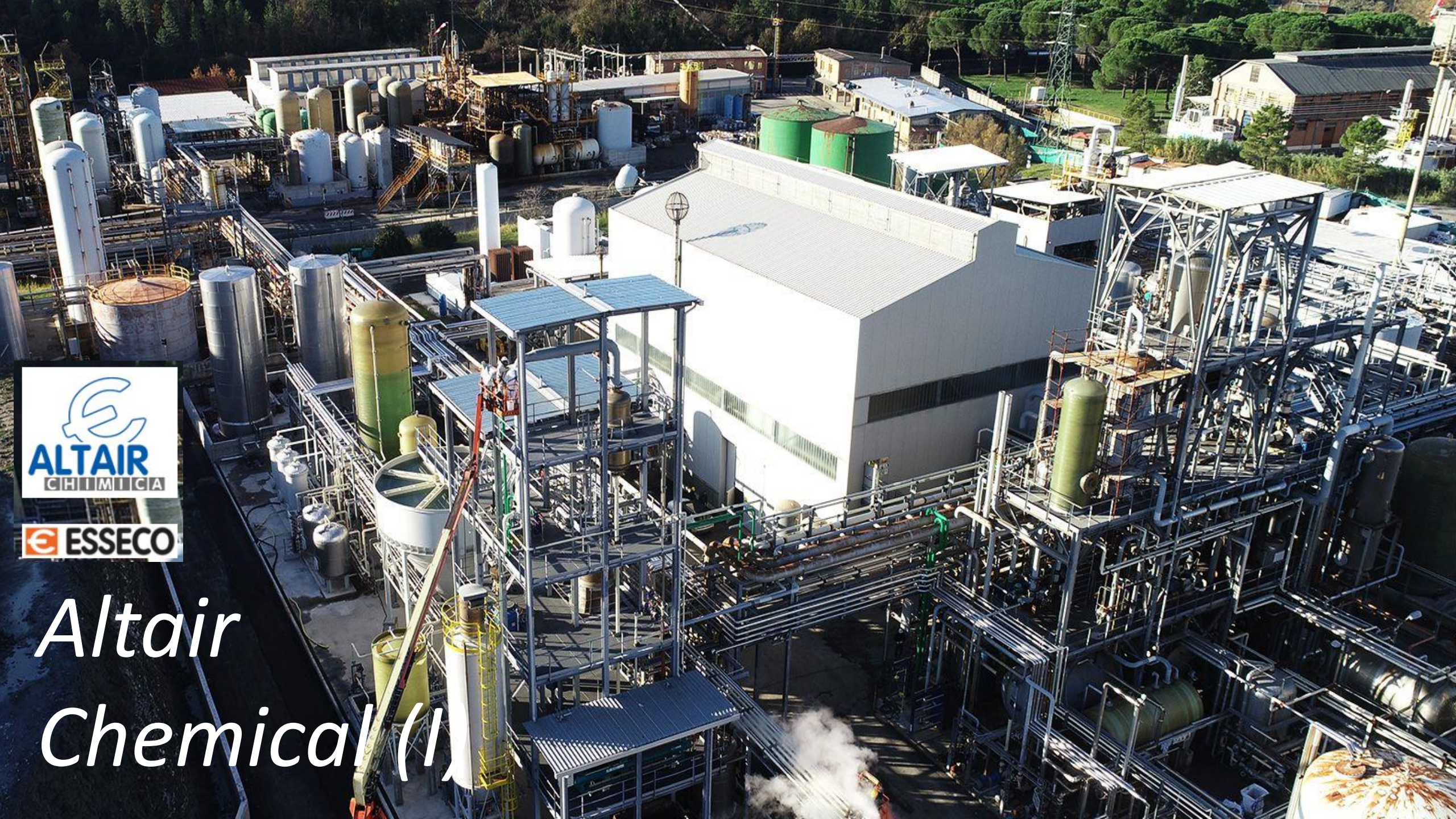
DISPONIBILE SU Google play

Scarica da App Store

Scarica da Windows Store



SNAP4CITY



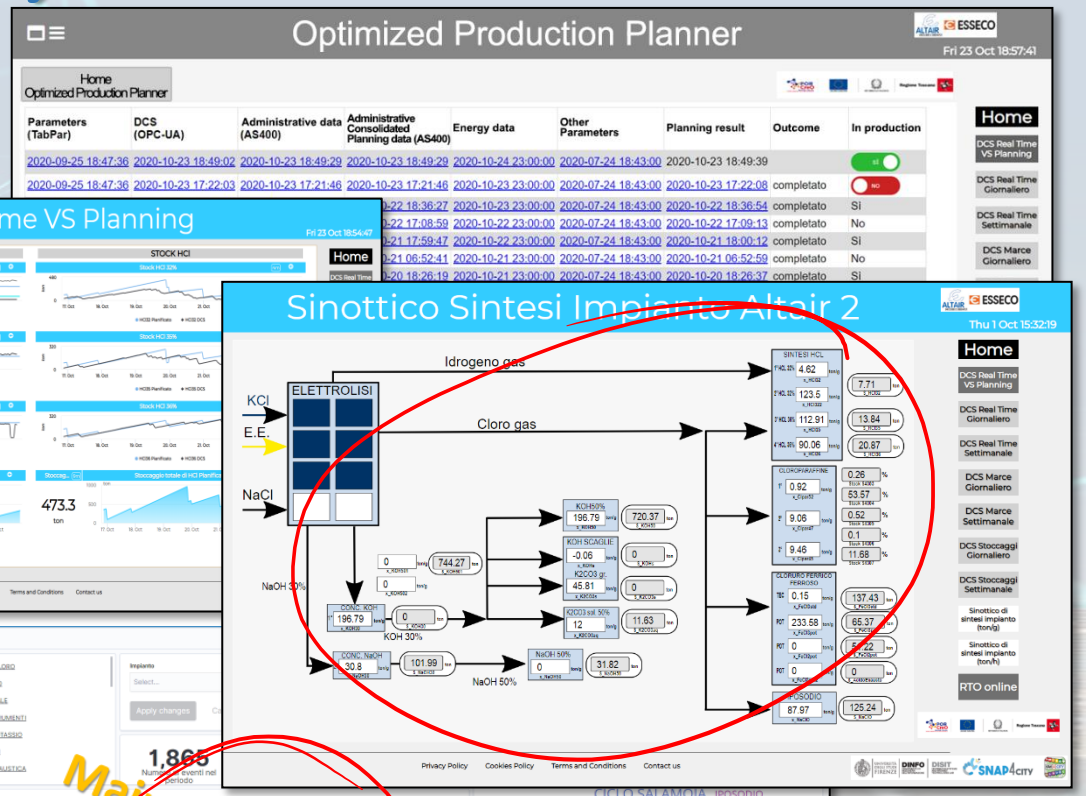
Altair Chemical (I)

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**
- **Historical and Real Time data**
  - Billions of Data
  - Optimized planning on chemical model
  - Business Intelligence on Maintenance data
- **Services Exploited on:**
  - Multiple Levels, Mobile Apps, API
- **Since 2020**

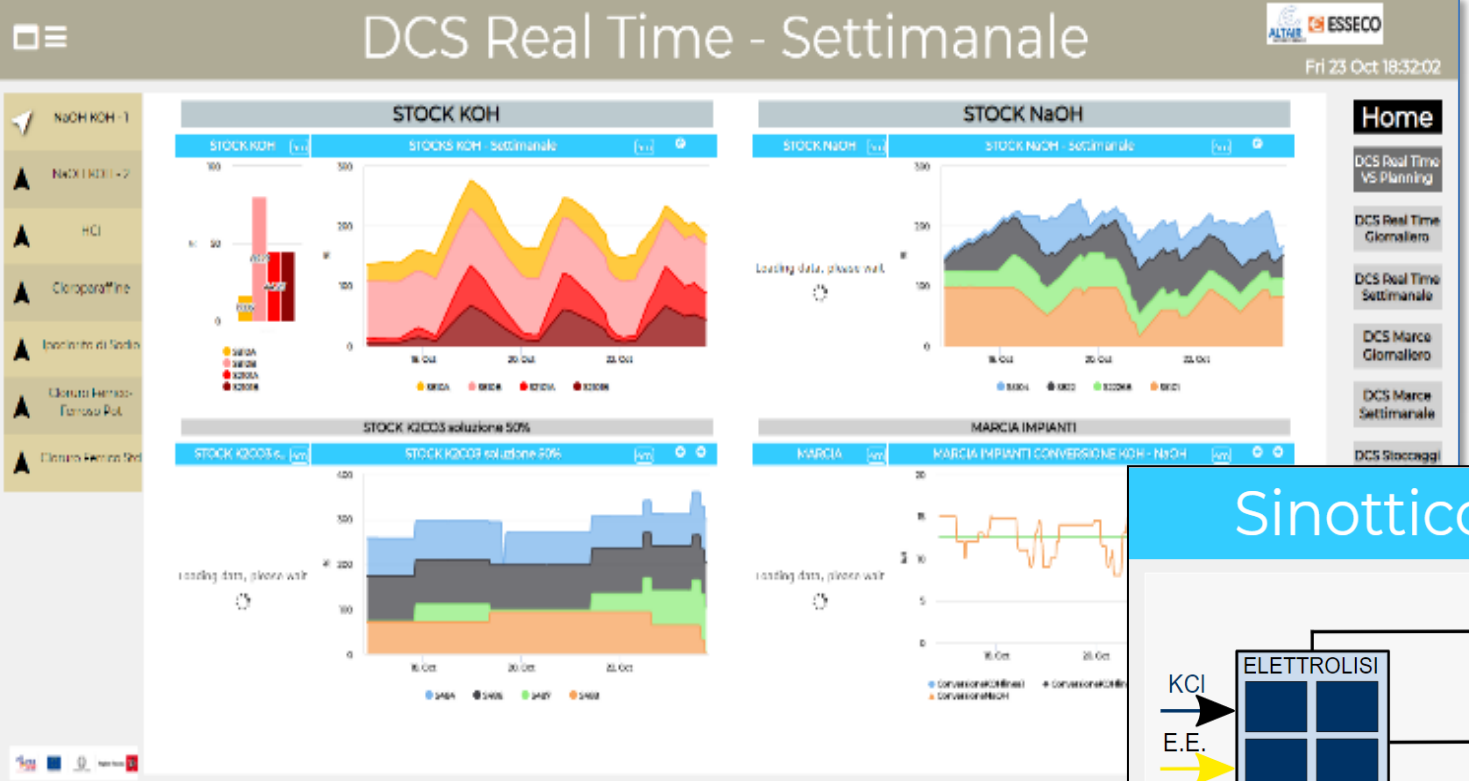


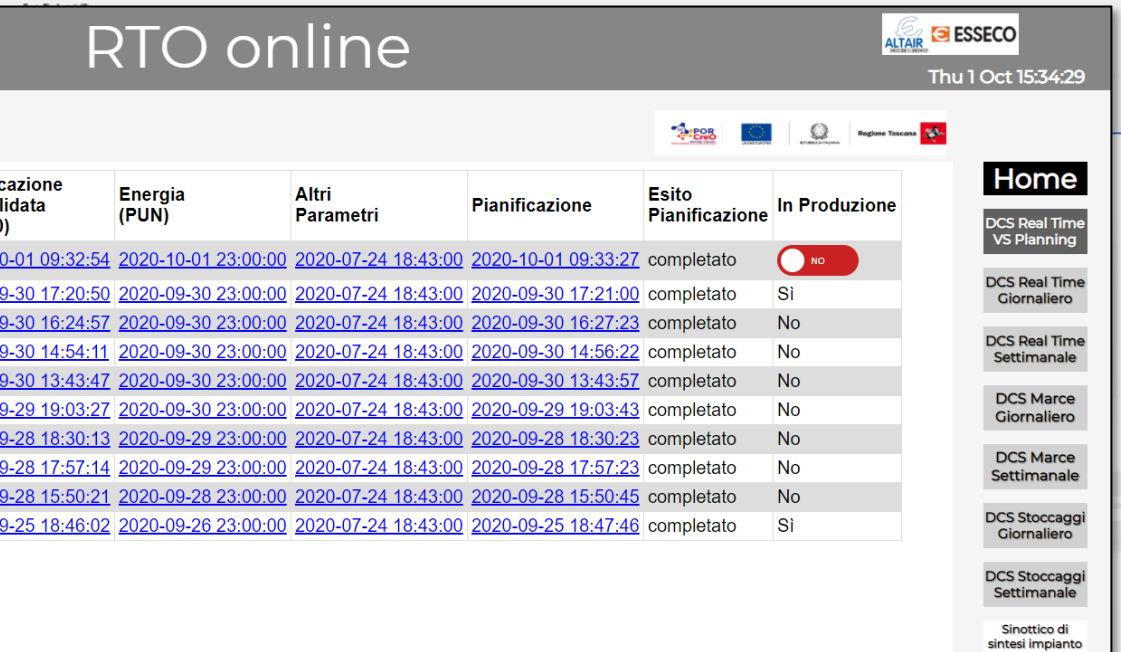


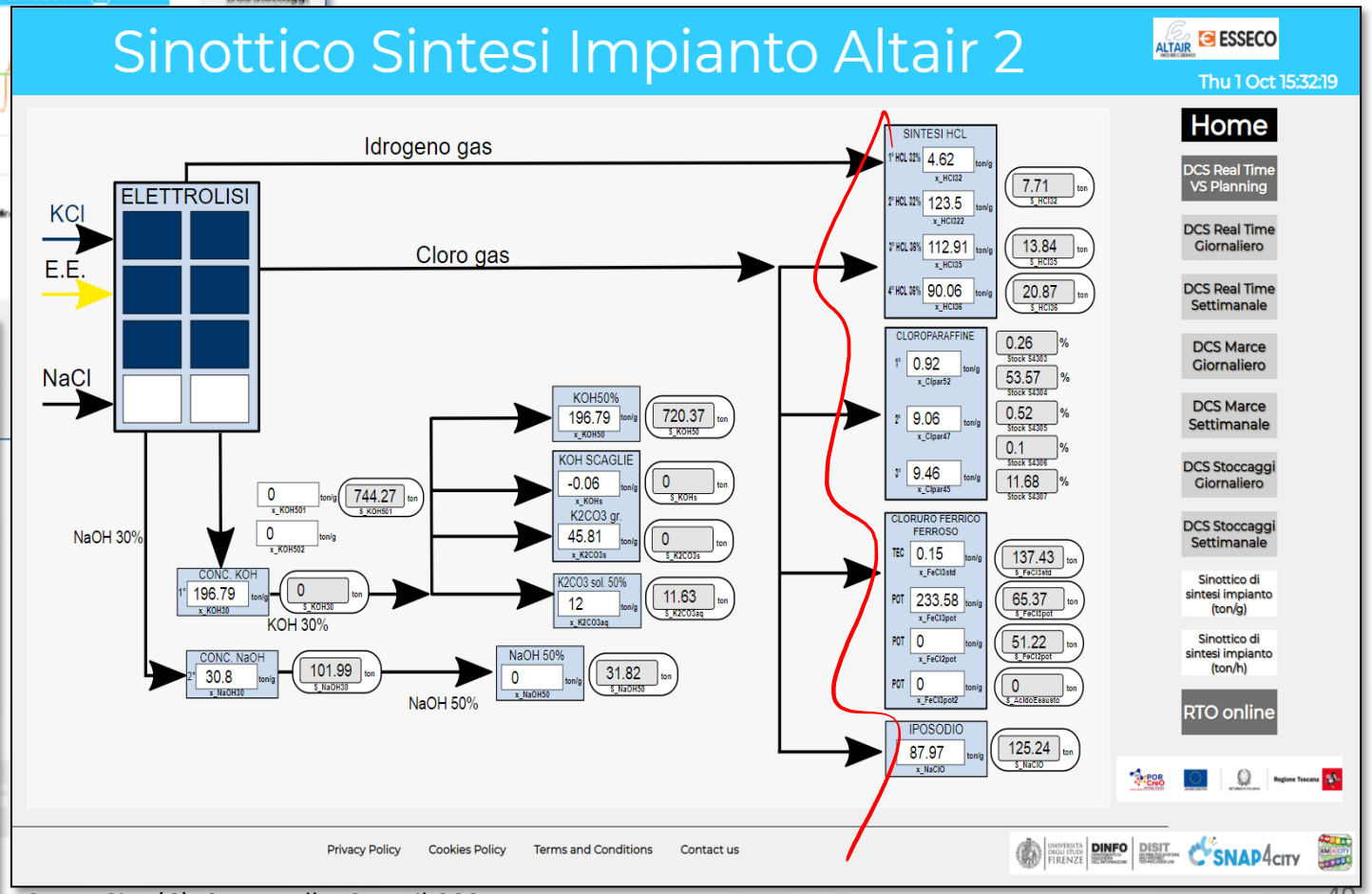




Altair Control room


DCS Real Time - Settimanale
Fri 23 Oct 18:32:02
STOCK KOH
STOCK NaOH
STOCK K2CO3 soluzione 50%
MARCIA IMPIANTI
Home
DCS Real Time VS Planning
DCS Real Time Giornaliero
DCS Real Time Settimanale
DCS Marce Giornaliero
DCS Marce Settimanale
DCS Stoccaggi

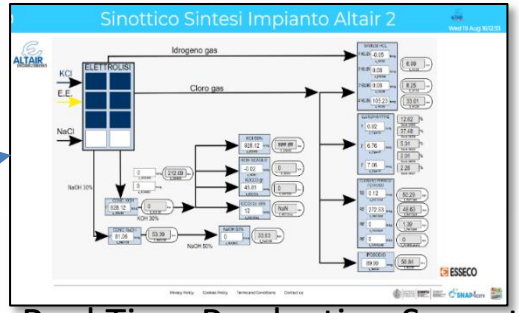

RTO online
Thu 1 Oct 15:34:29
Energia (PUN)
Altri Parametri
Pianificazione
Esito Pianificazione
In Produzione
2020-10-01 23:00:00
2020-07-24 18:43:00
completato
NO
2020-09-30 23:00:00
Sì
No
2020-09-29 23:00:00
2020-09-28 23:00:00
2020-09-25 18:47:46
Home
DCS Real Time VS Planning
DCS Real Time Giornaliero
DCS Real Time Settimanale
DCS Marce Giornaliero
DCS Marce Settimanale
DCS Stoccaggi Giornaliero
DCS Stoccaggi Settimanale


Sinottico Sintesi Impianto Altair 2
Thu 1 Oct 15:32:19
Idrogeno gas
KCl
E.E.
NaCl
ELETTROLISI
Cloro gas
NaOH 30%
KOH 30%
NaOH 50%
SINTESI HCL
CLOROPARAFFINE
CLORURO FERROSO
IPOSODIO
Home
DCS Real Time VS Planning
DCS Real Time Giornaliero
DCS Real Time Settimanale
DCS Marce Giornaliero
DCS Marce Settimanale
DCS Stoccaggi Giornaliero
DCS Stoccaggi Settimanale
Sinottico di sintesi impianto (ton/g)
Sinottico di sintesi impianto (ton/h)
RTO online
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Cookies Policy
Terms and Conditions
Contact us



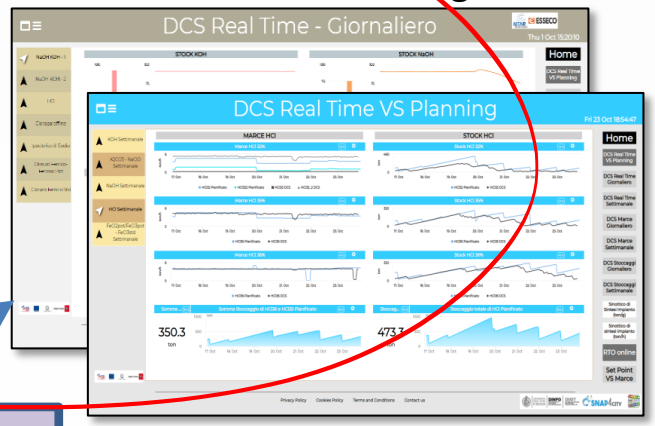
Plant Status

Production Plan



Real Time Production Synoptic

Production vs Planning



Data Storage

Decision Support



AS400

Orders

Data Ingestion

Other Costs

Energy Service

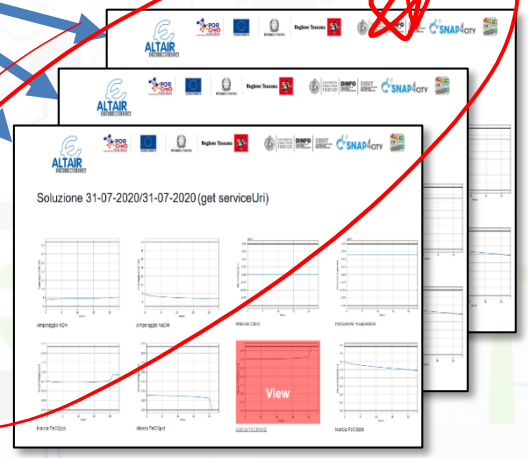
Transportation

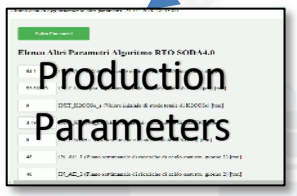
Production Plant Management

Optimized Production Planner

Possible Plan

Possible Plans

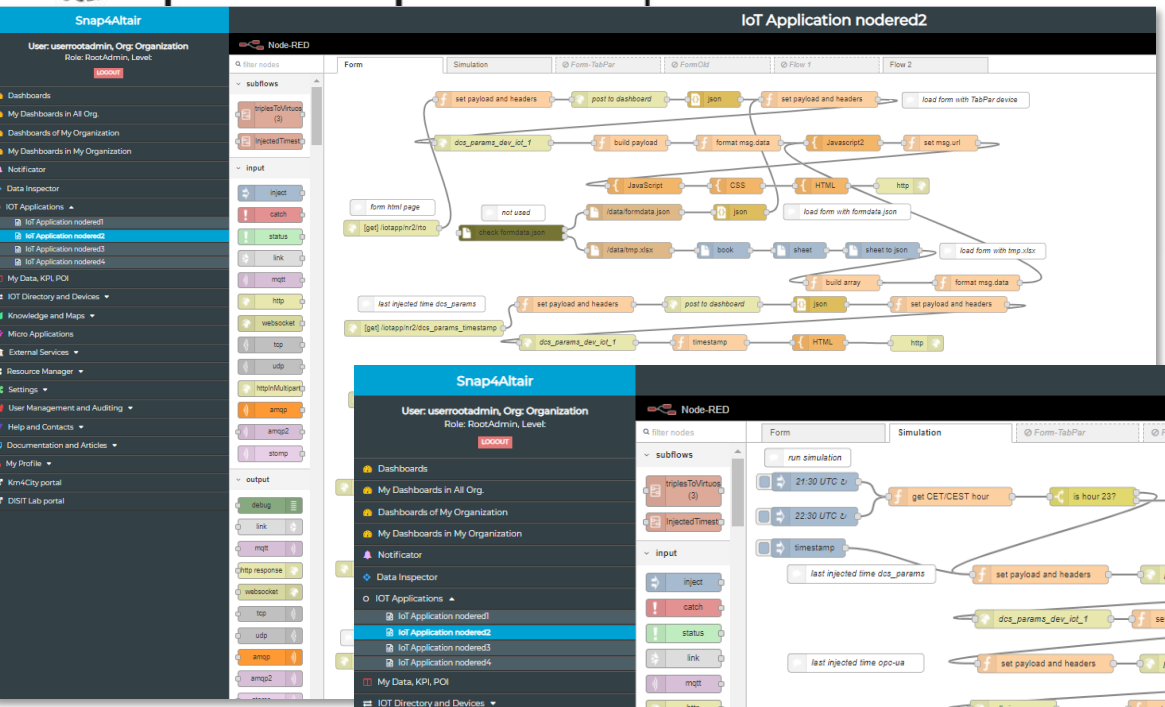


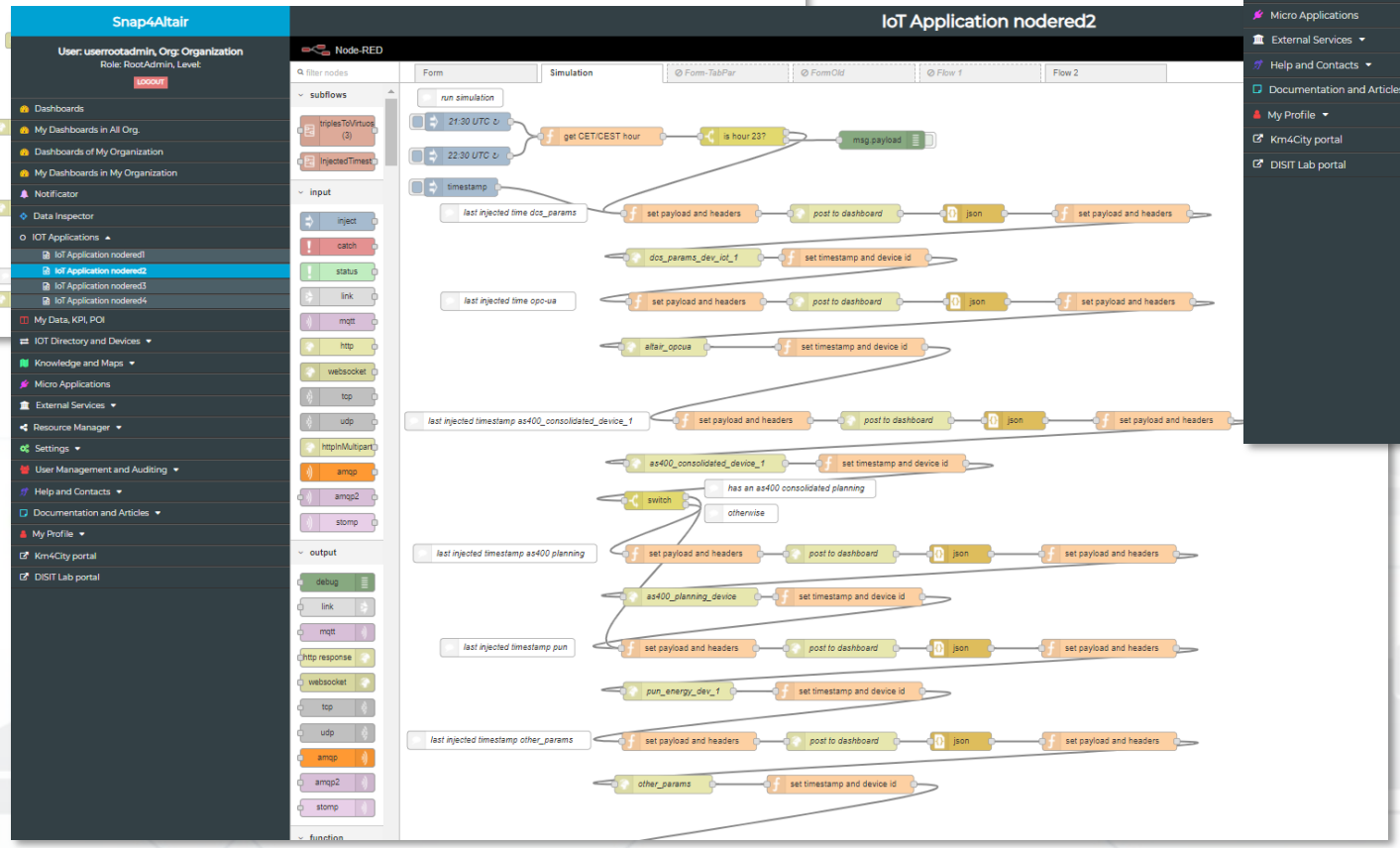


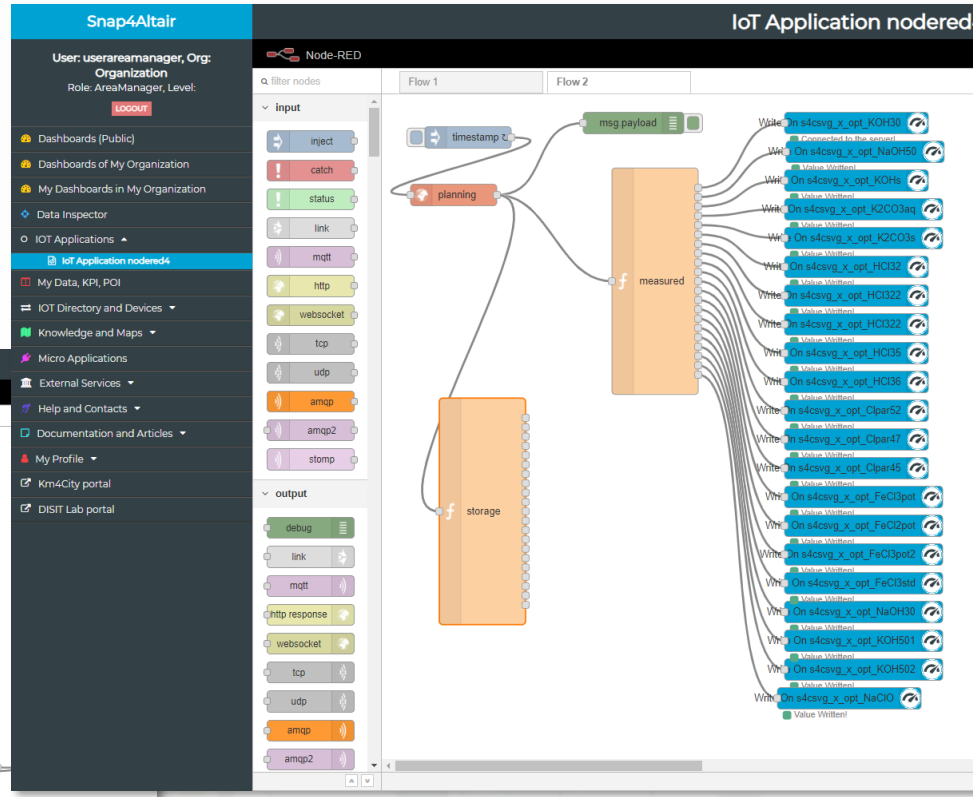


Plant Management

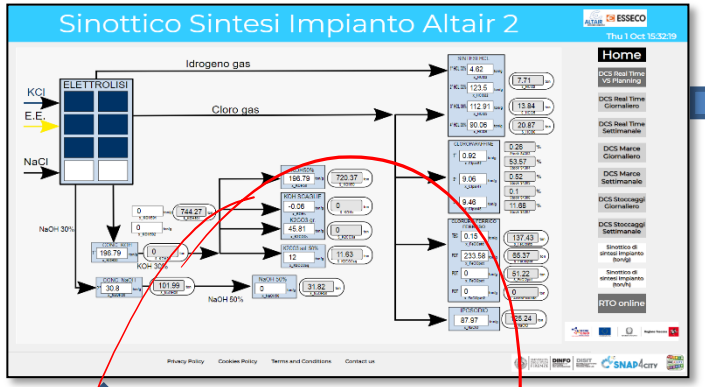
Some Altair Flows



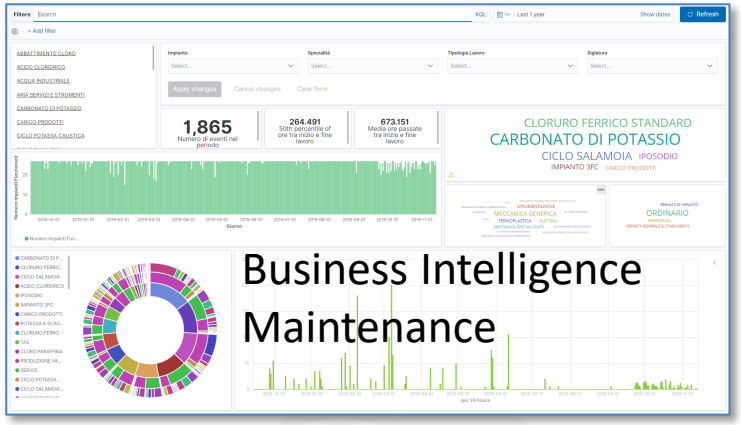




Workflow for Ticket management

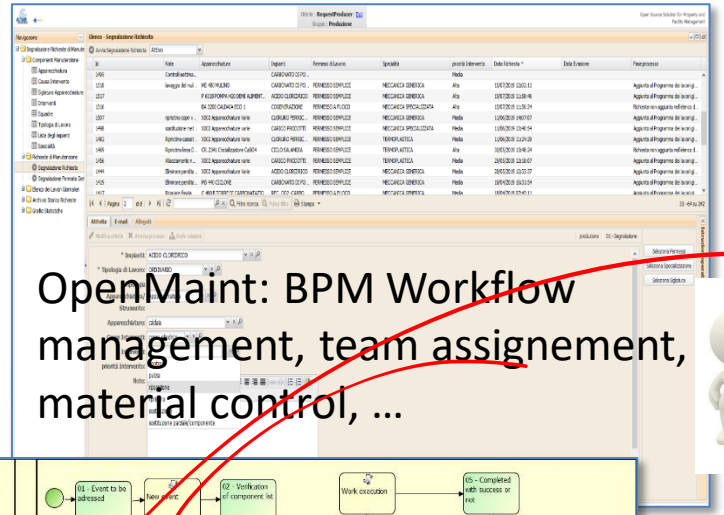


Consumptions/productions

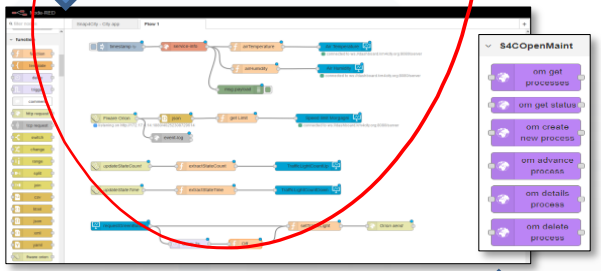


Dashboards and actions

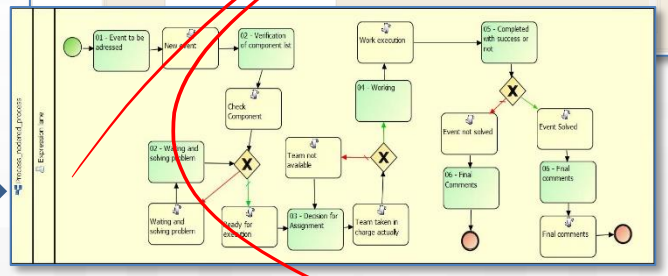
Events/actions

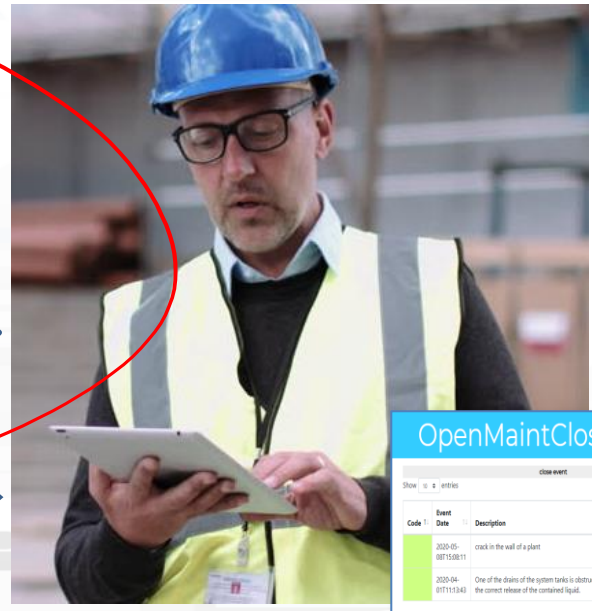


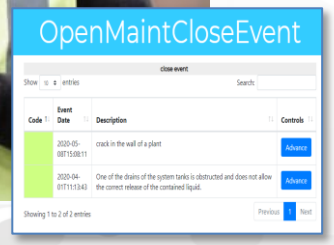
OpenMaint: BPM Workflow management, team assignement, material control, …











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

Filters | Search | KQL | Last 1 year | Show dates | Refresh

+ Add filter

- ABBATTIMENTO CLORO
- ACIDO CLORIDRICO
- ACQUA INDUSTRIALE
- ARIA SERVIZI E STRUMENTI
- CARBONATO DI POTASSIO
- CARICO PRODOTTI
- CICLO POTASSA CAUSTICA

Impianto: Select...

Specialità: Select...

Tipologia Lavoro: Select...

Siglatura: Select...

Apply changes | Cancel changes | Clear form

1,865
Numero di eventi nel periodo

264.491
50th percentile of ore tra inizio e fine lavoro

673.151
Media ore passate tra inizio e fine lavoro

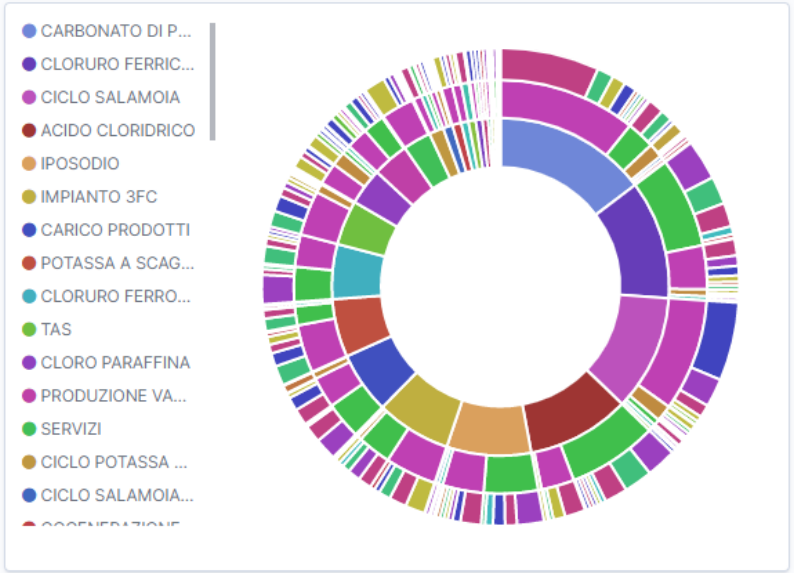
CLORURO FERRICO STANDARD
CARBONATO DI POTASSIO
CICLO SALAMOIA
IPOSODIO
IMPIANTO 3FC
CARICO PRODOTTI

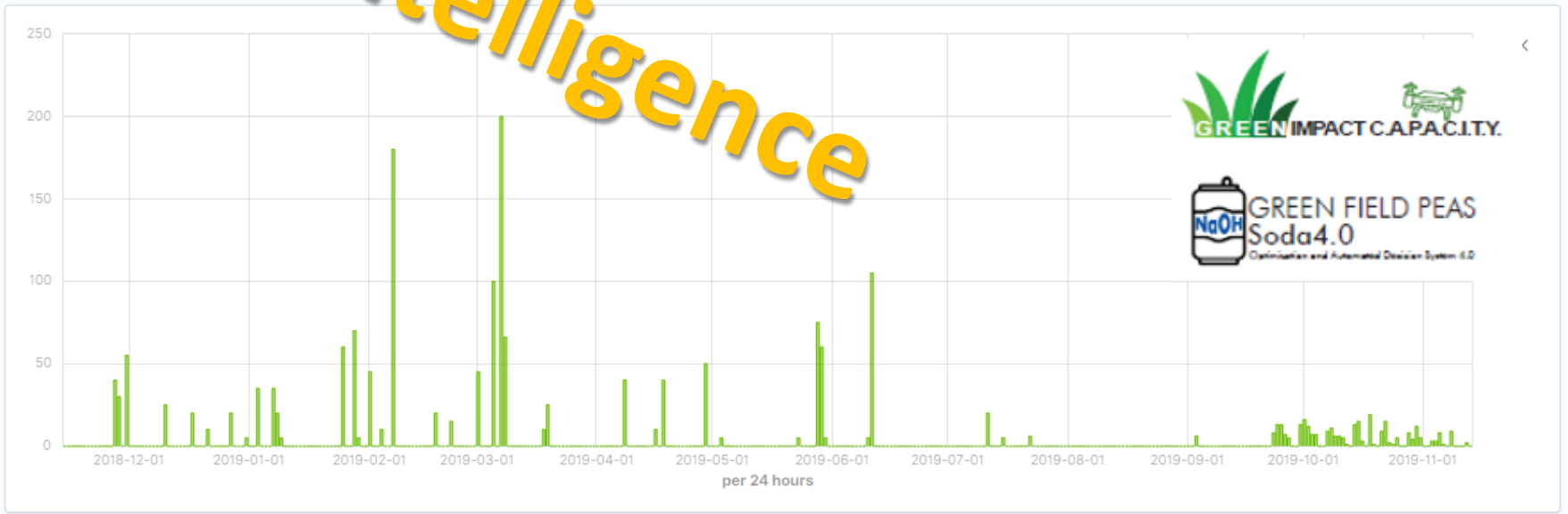
Maintenance Intelligence



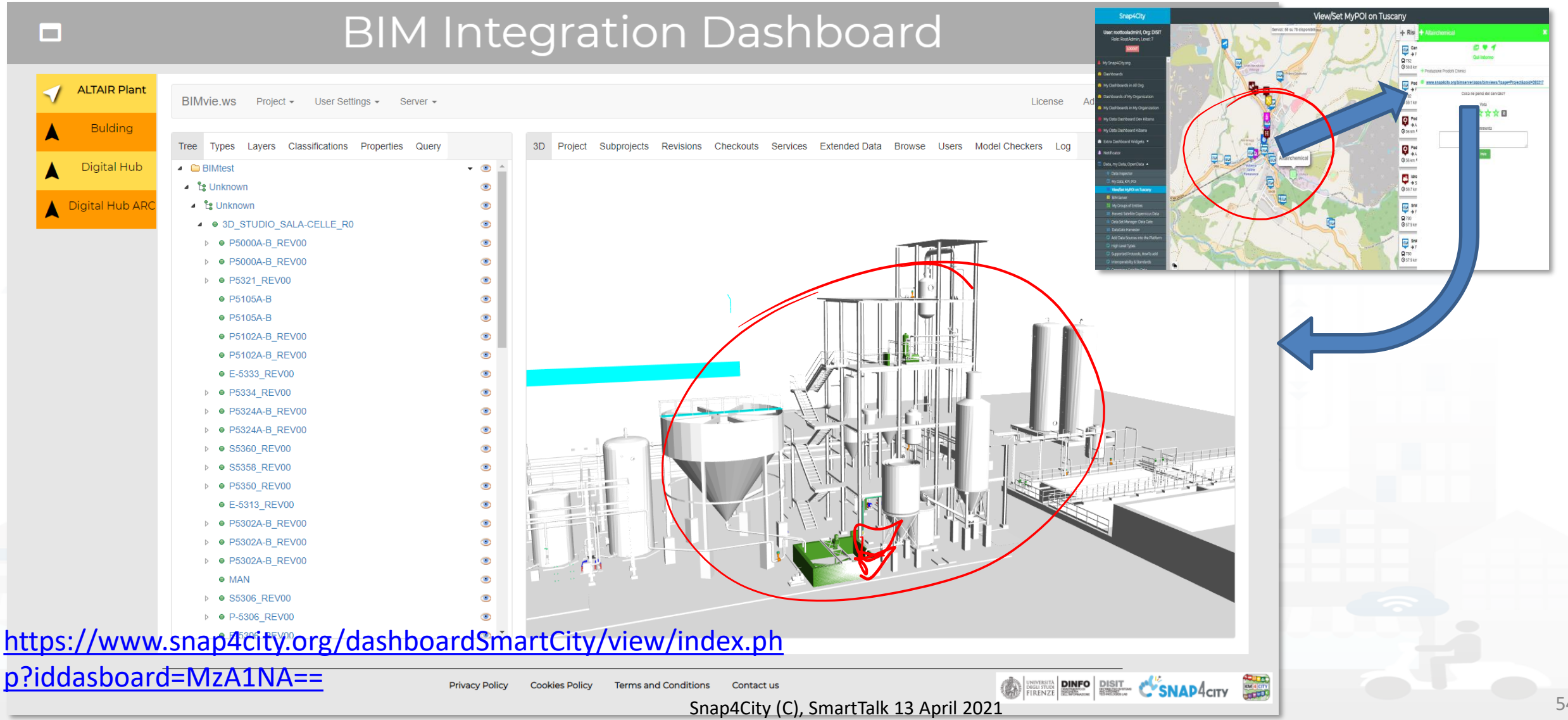








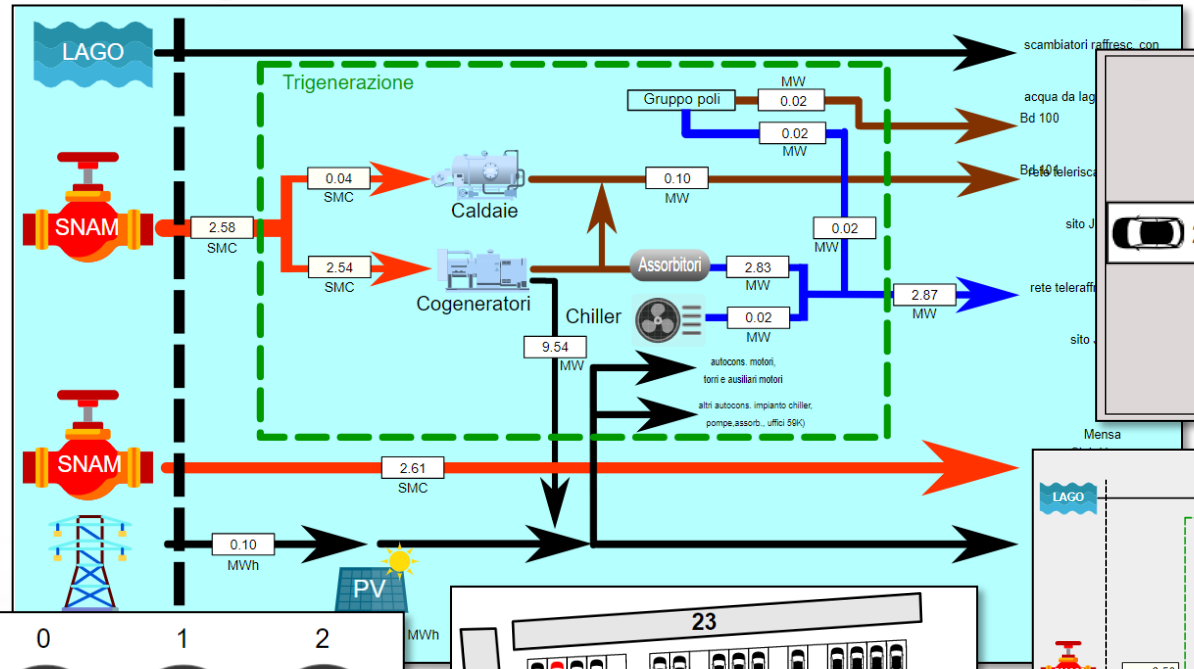
BIM view of the Altair Chemical Plant

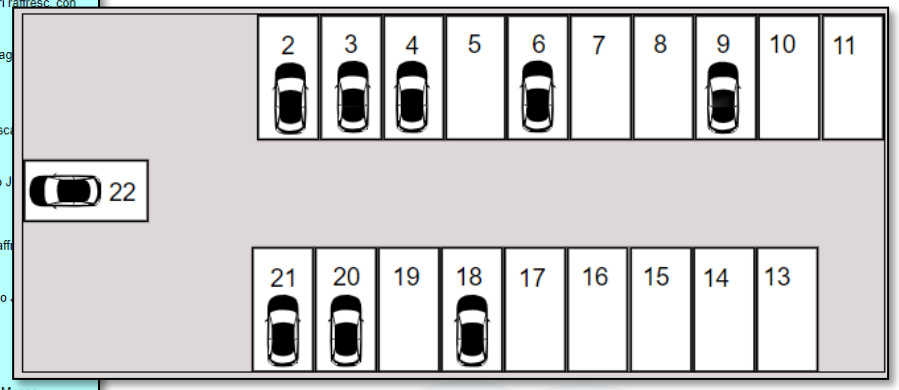


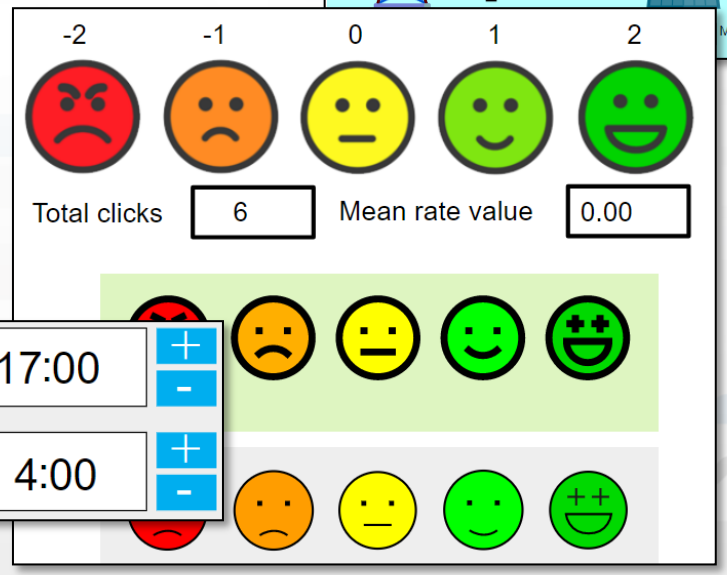
https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MzA1NA==

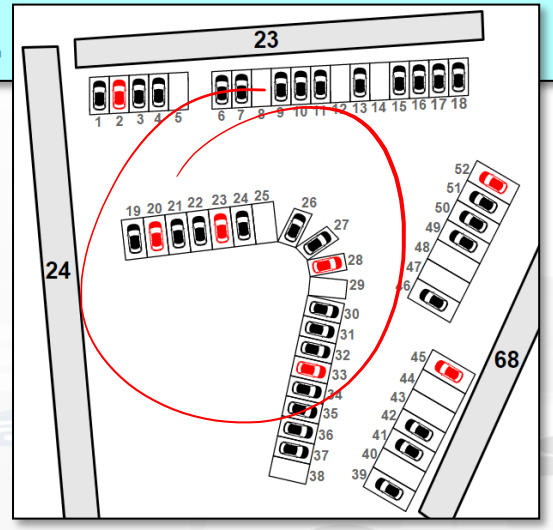
Special Custom Widgets

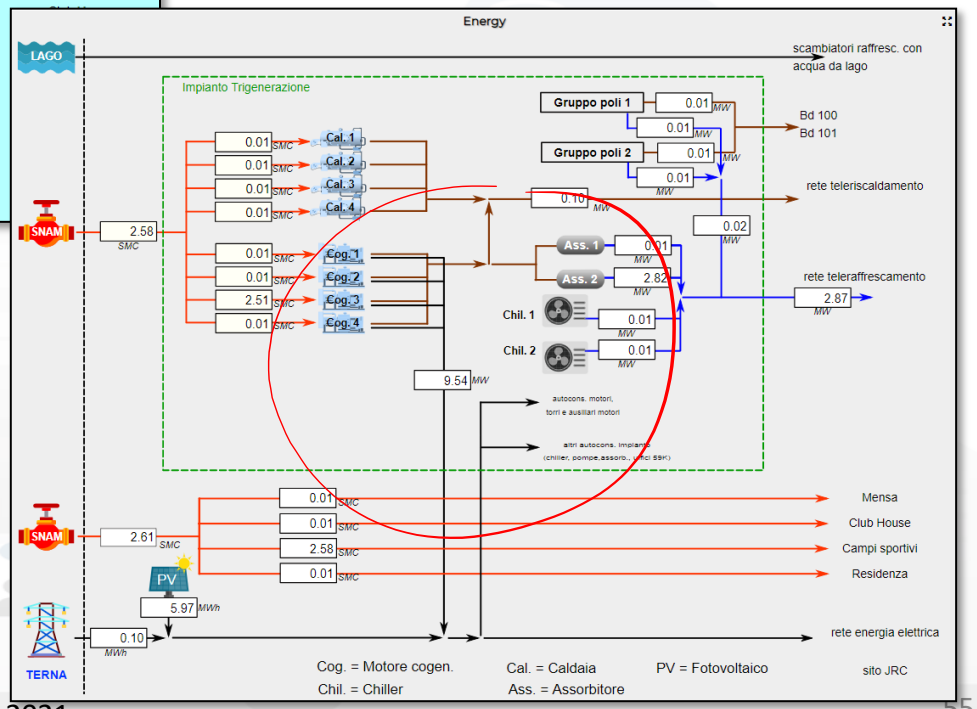
- Smart parking
- Smart Energy
- Smart Light
- Smart ….
- Energy View
- Custom Controls











Tuscany Region

Firenze, Pisa, Livorno, Prato, etc.





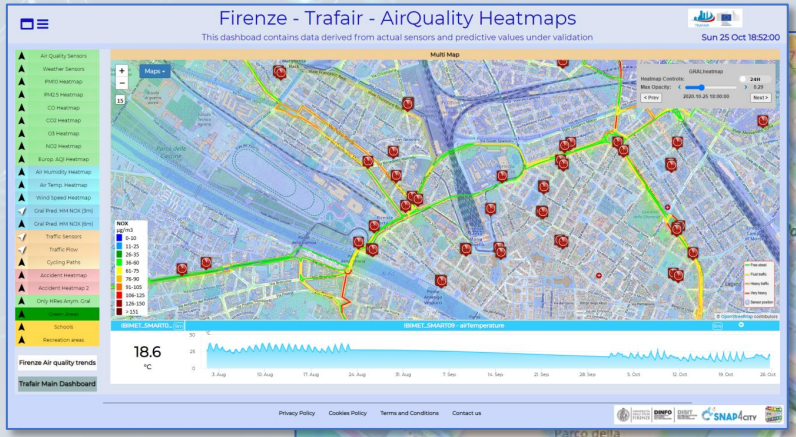


Environment and Quality of Life
Air Quality Predictions

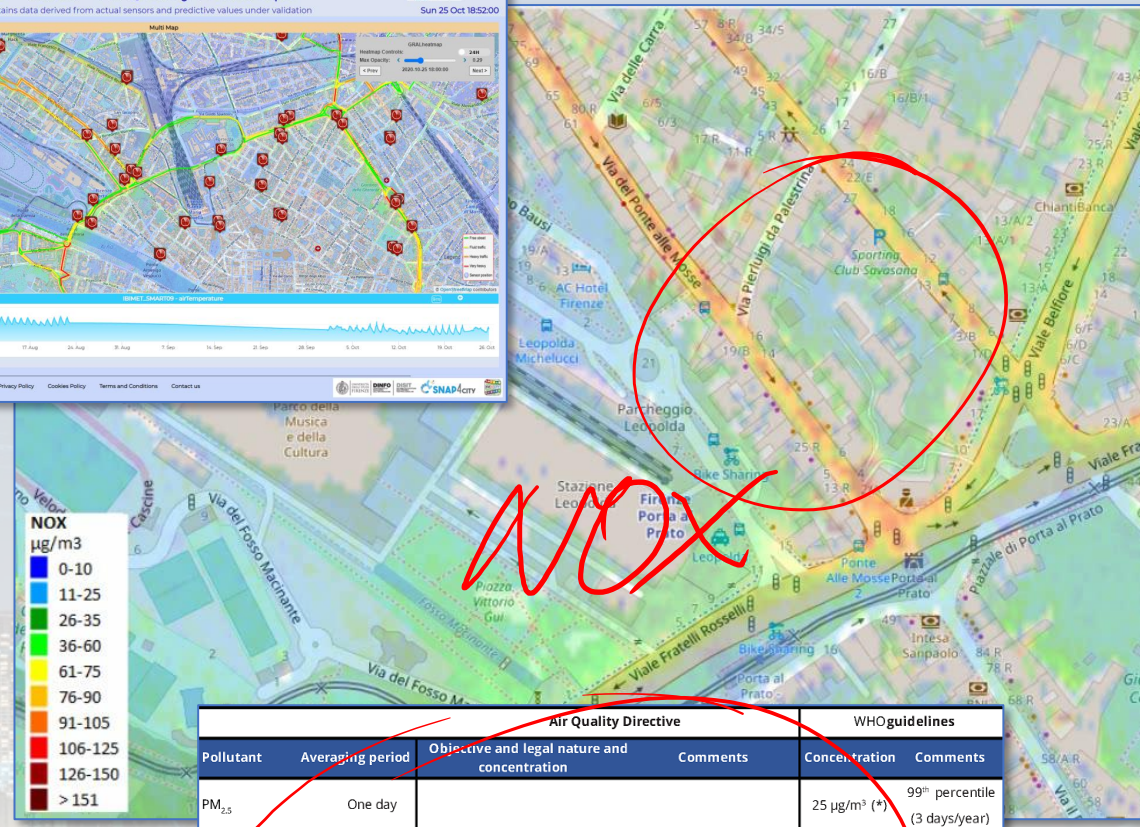
reference

Cities of: Firenze, Pisa, Livorno

- **Multiple Domain Data**
  - Traffic Flow data, Pollutant, 3D City structure, weather, …
- **Multiple Decision Makers**
  - City officers, energy industries
- **Historical and Real Time data**
  - Dashboards, What-IF analysis
  - Pollutant Predictions,
  - Traffic Flow Reconstruction
- **Services Exploited on:**
  - Dashboards, Mobile App
- **Since 2020**



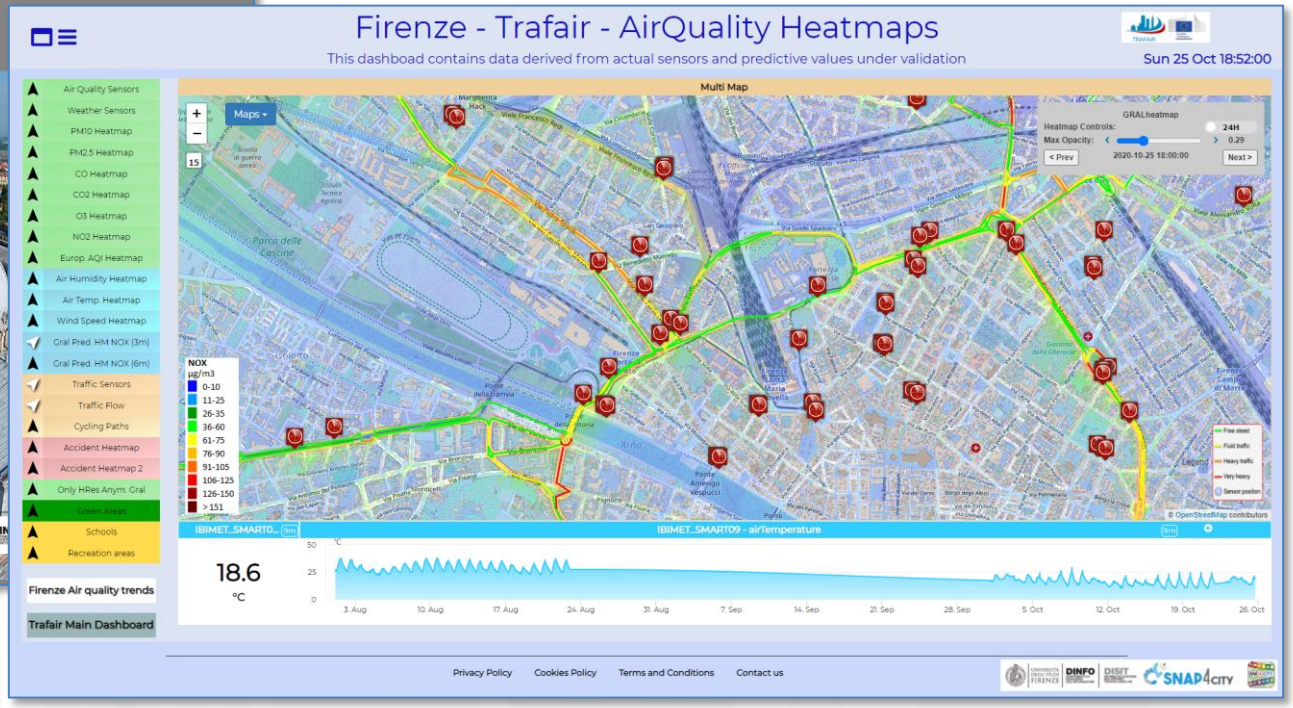


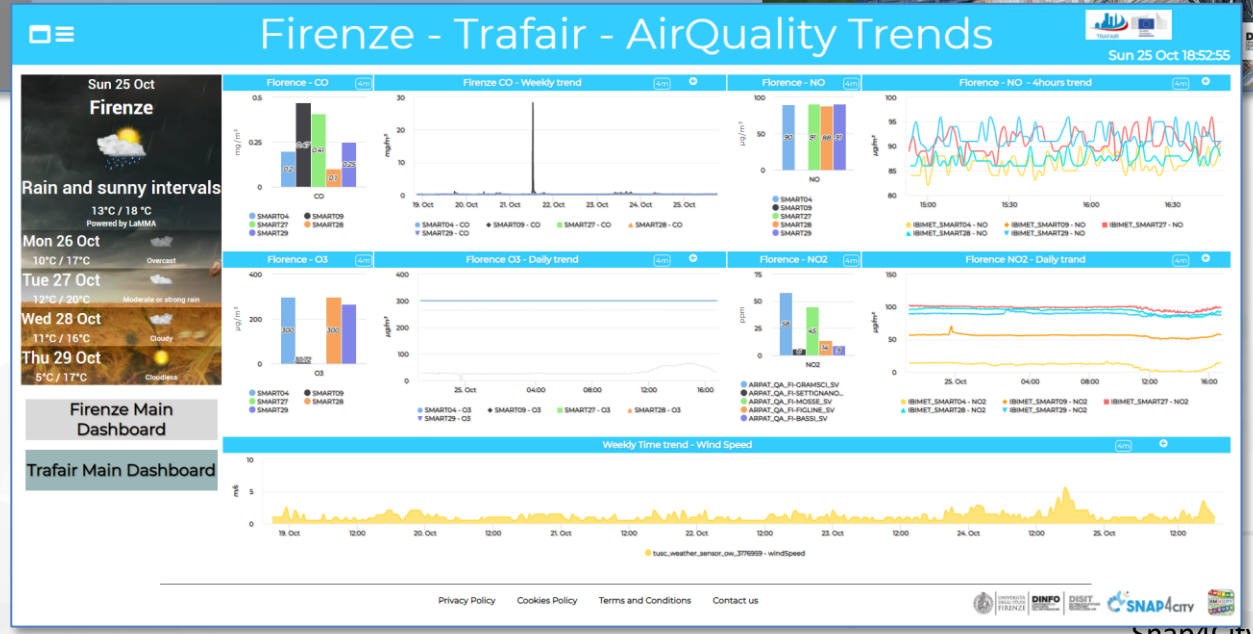


		Air Quality Directive		WHO guidelines	
Pollutant	Averaging period	Objective and legal nature and concentration	Comments	Concentration	Comments
$PM_{2.5}$	One day			25 µg/m³ (*)	99th percentile (3 days/year)
$PM_{2.5}$	Calendar year	Target value, 25 µg/m³	The target value has become a limit value since 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	

https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjY4MQ==







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

https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjU0Mg==

Traffic Flow Reconstruction for the cities

Sun 3 Nov 20:39:47

SNAP4CITY

KM4CITY

Selector Web

- Firenze + FiPiLi
- Firenze
- Pisa
- Santiago
- Modena
- Livorno

Selector - Map

2019-11-03 20:39:47

Last sensors measure
2019-11-03T20:30:00

- Free street
- Fluid traffic
- Heavy traffic
- Very heavy
- Sensor position



Multi Map

GRALheatmapPisa
Heatmap Controls: 24H
Max Opacity: 0.49
< Prev 2019-11-03 18:00:00 Next >

NOX
µg/m3
- 0-10
- 11-25
- 26-35
- 36-60
- 61-75
- 76-90
- 91-105
- 106-125
- 126-150
- >151

Selector - Map

2019-11-03 20:44:08

Multi Map

15

NOX
µg/m3
0-10
11-25
26-35
36-60
61-75
76-90
91-105
106-125
126-150
>151



Livorno

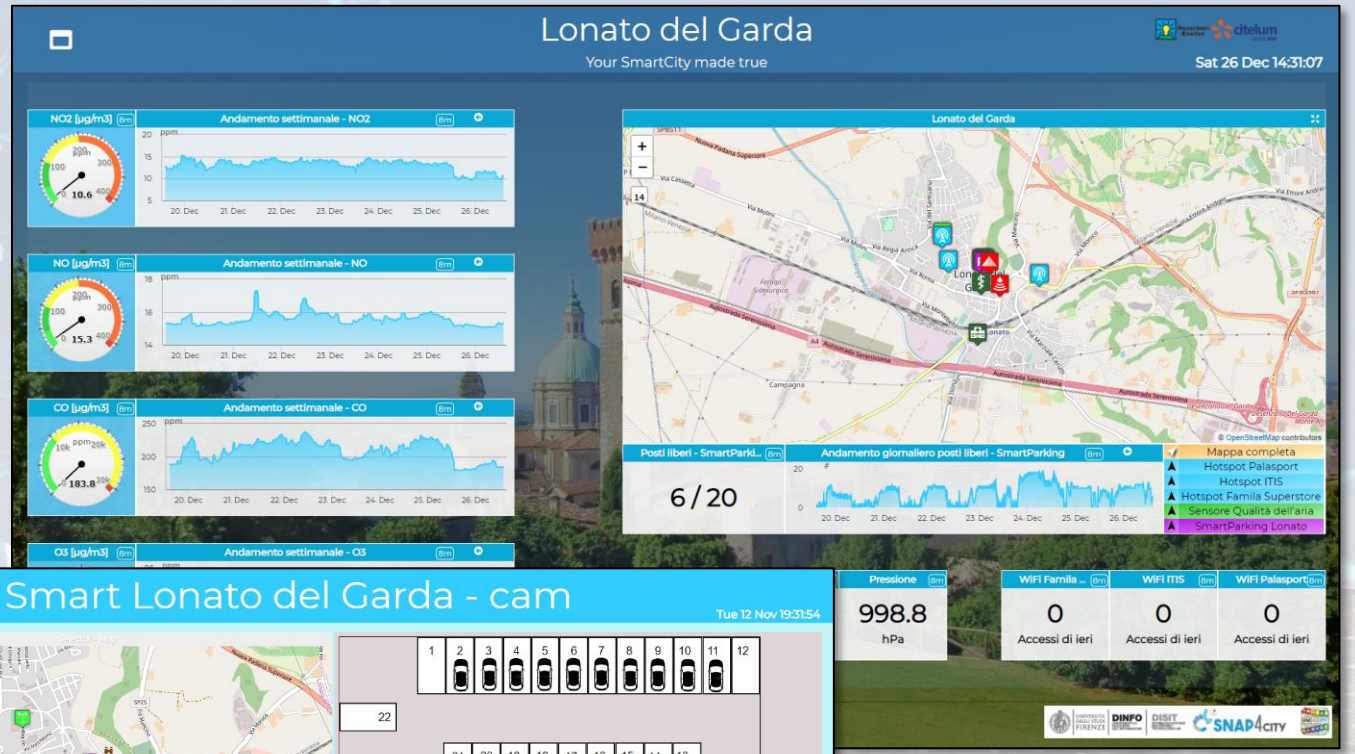
Snap4

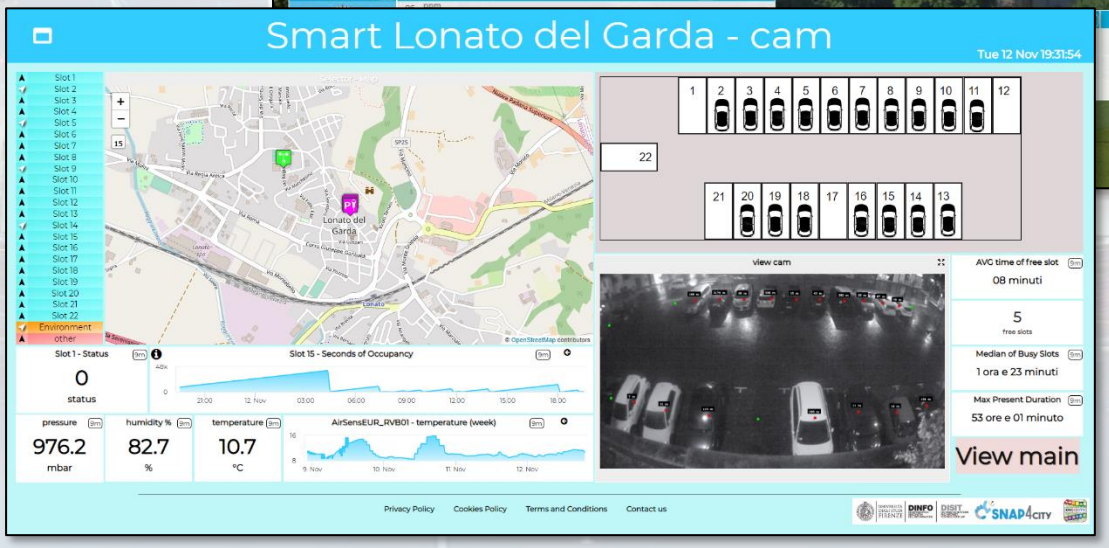

Lonato del Garda

Smart City / Smart Parking + Environment
Reverberi, Lonato del Garda

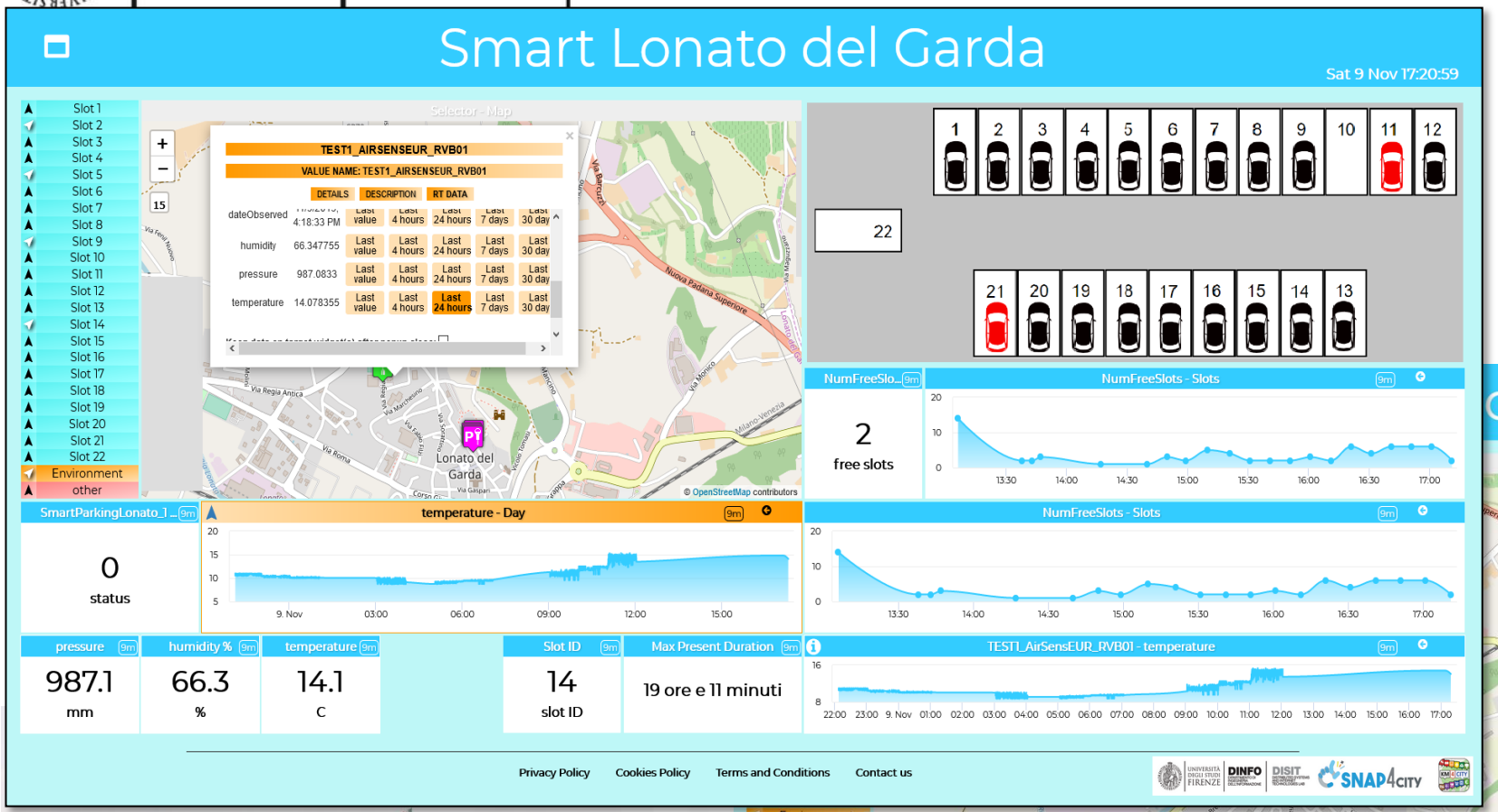
reference

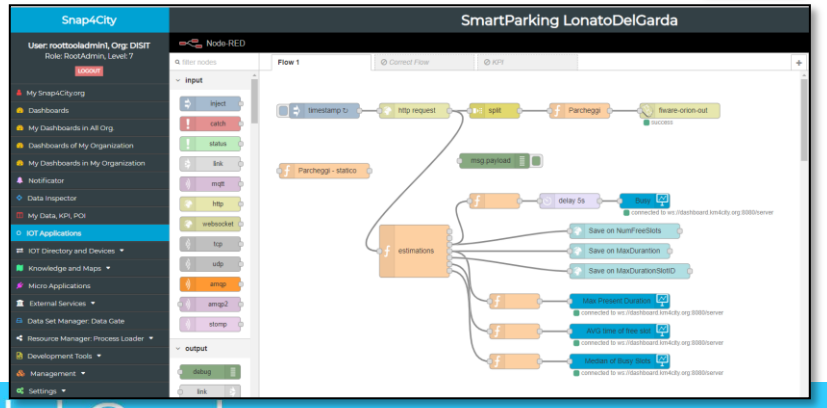
- **Multiple Domain Data**
  - Smart Parking, Environment, Wi-Fi
- **Multiple Decision Makers**
  - City Officer, operators
- **Historical and Real Time data**
  - Dashboards
- **Services Exploited on:**
  - Dashboards, API
- **Since 2019**



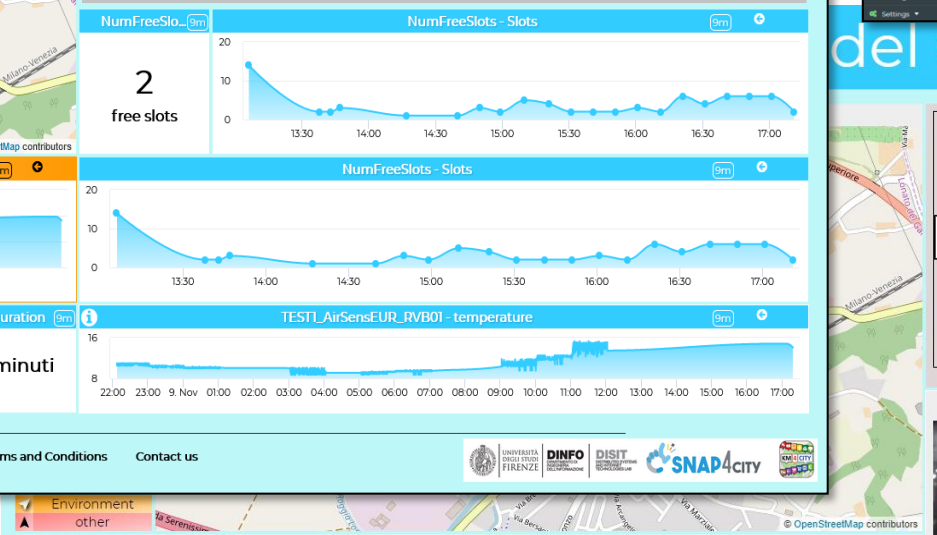


Smart Parking Monitoring







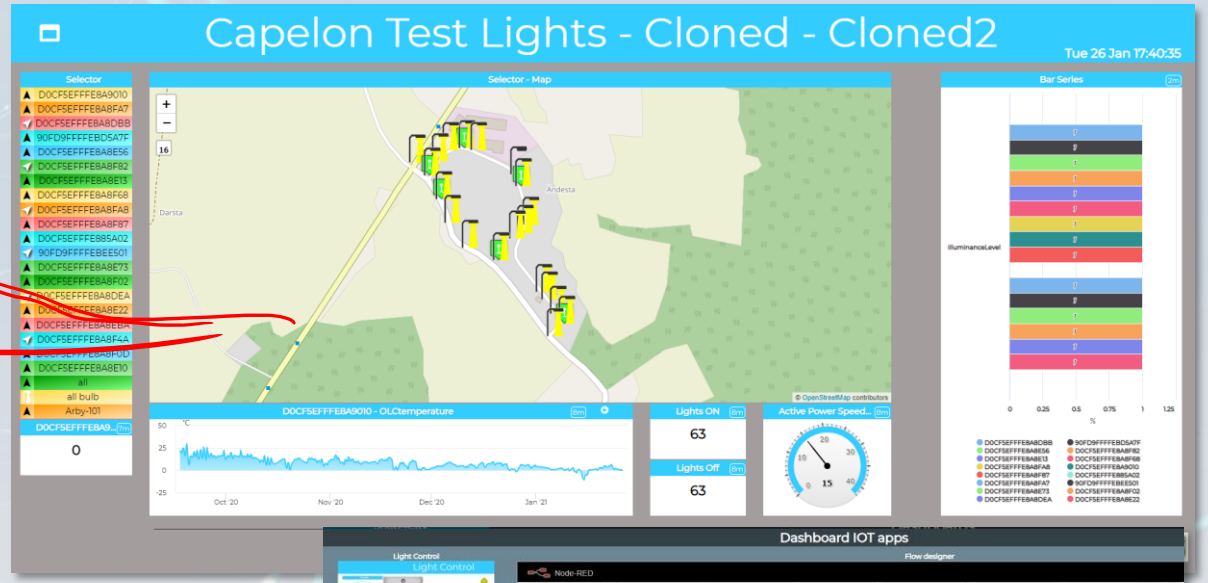


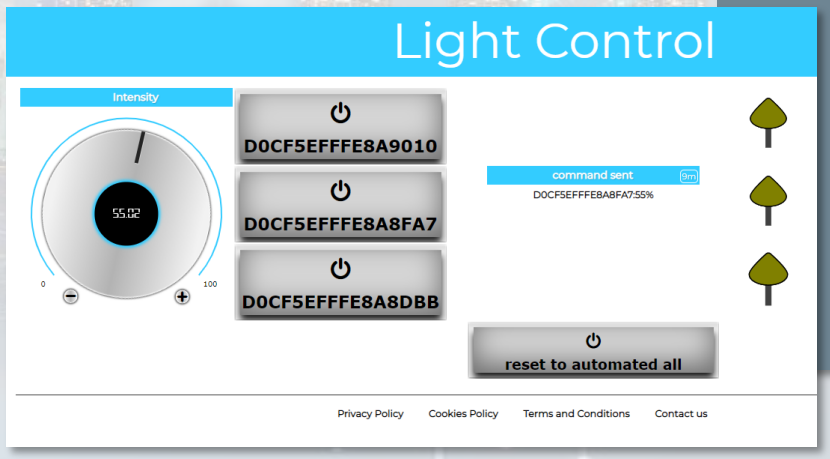

Västerås

Smart Light Control of CAPELON

reference

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

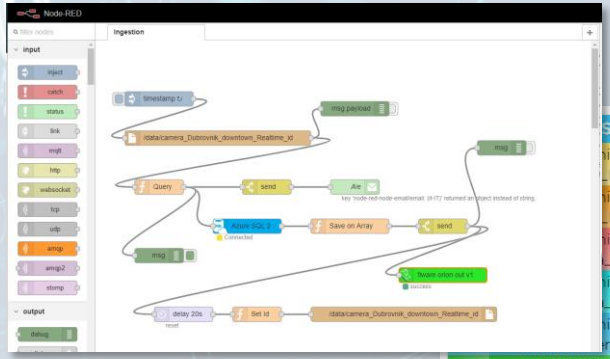


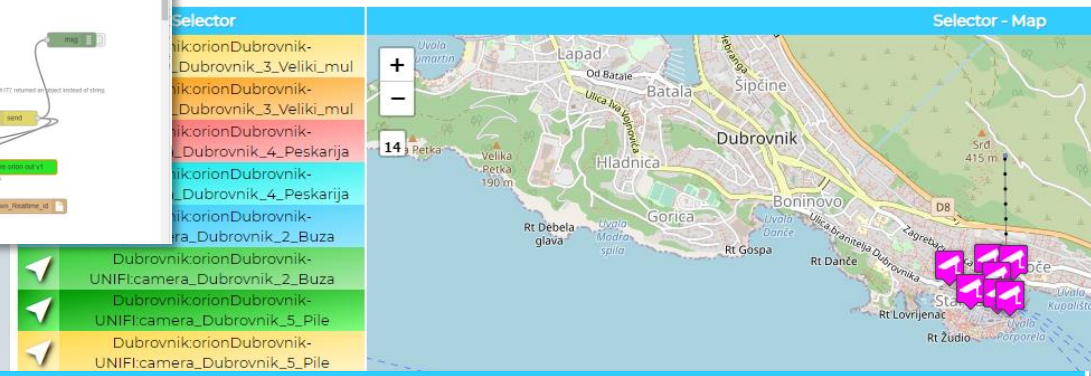


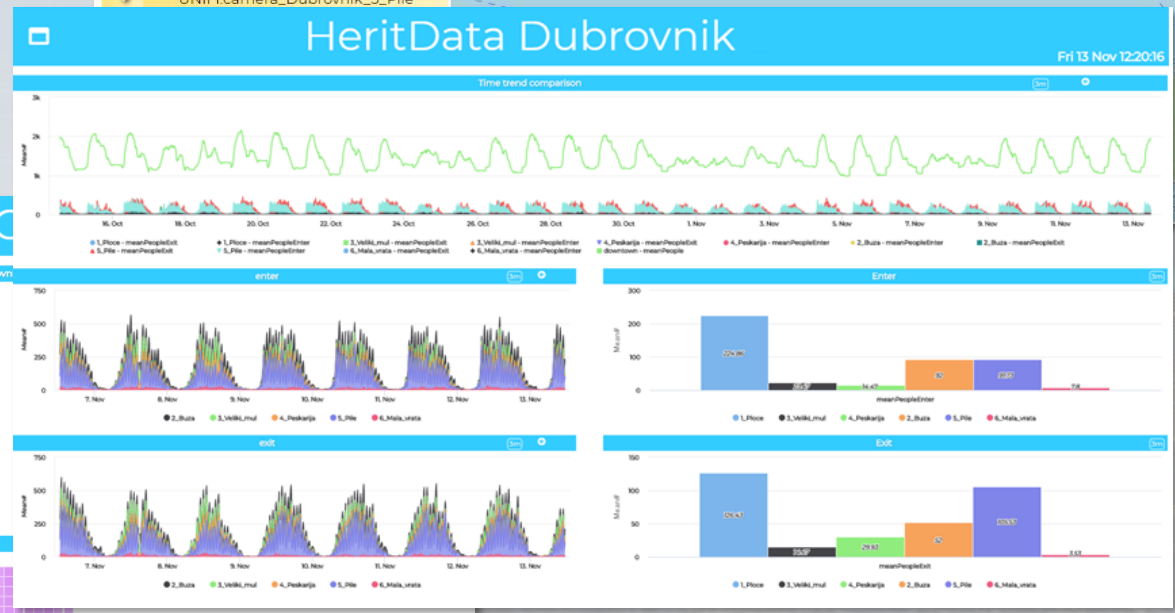

Interreg
Mediterranean
HERIT-DATA
Dubrovnik

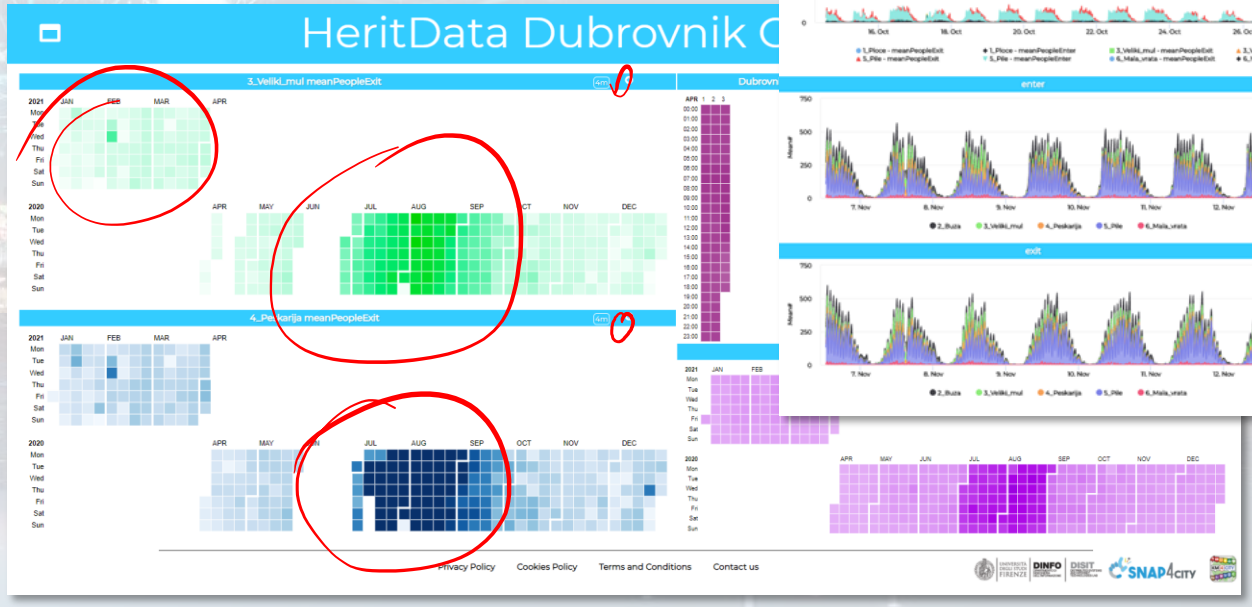
Dubrovnik

- **Tourism Domain**
  - Counting People
- **Dashboards**
  - Map coverage
  - Monitoring and real time control
- **Tech:**
  - Snap4City
  - Twitter Vigilance
  - Historical and Real Time data
- **Since 2020**





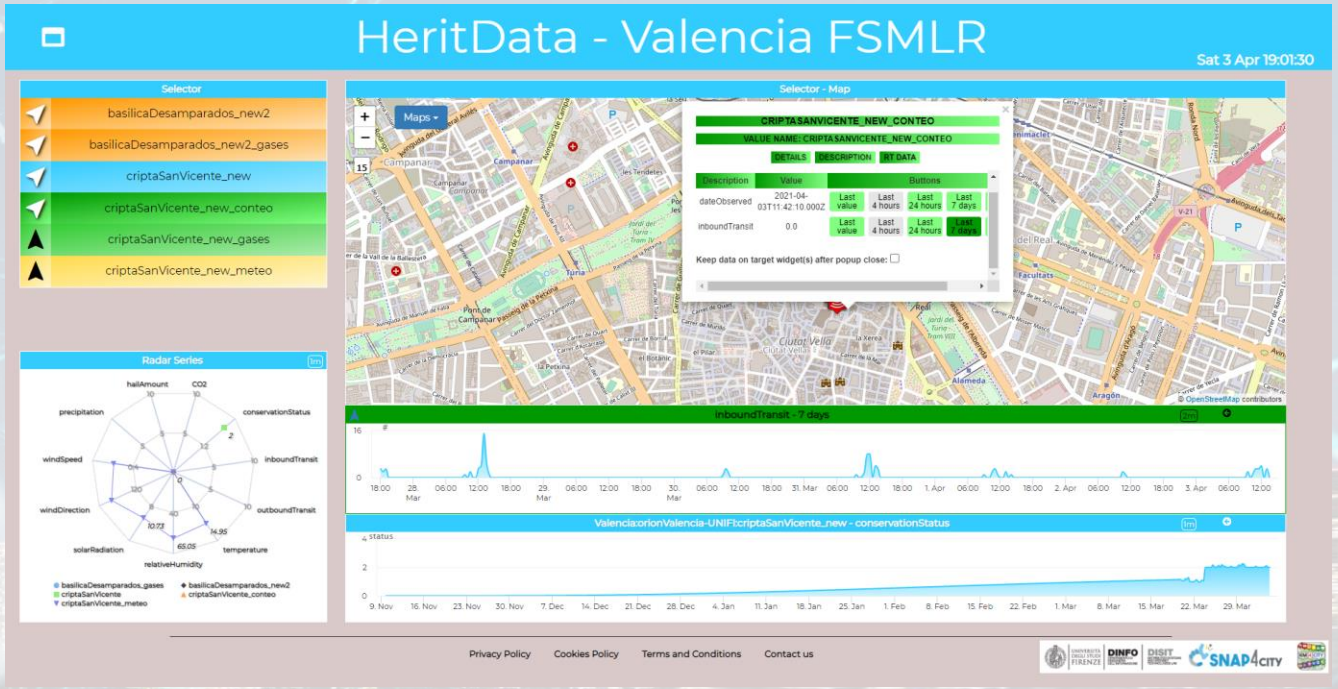





Interreg
Mediterranean
HERIT-DATA
Valencia

Valencia, FSMLR

- **Tourism Domain**
  - Counting People
  - Environmental data
- **Dashboards**
  - Map coverage
  - Monitoring and real time control
- **Tech:**
  - Snap4City
  - Twitter Vigilance
  - Historical and Real Time data
- **Since 2020**

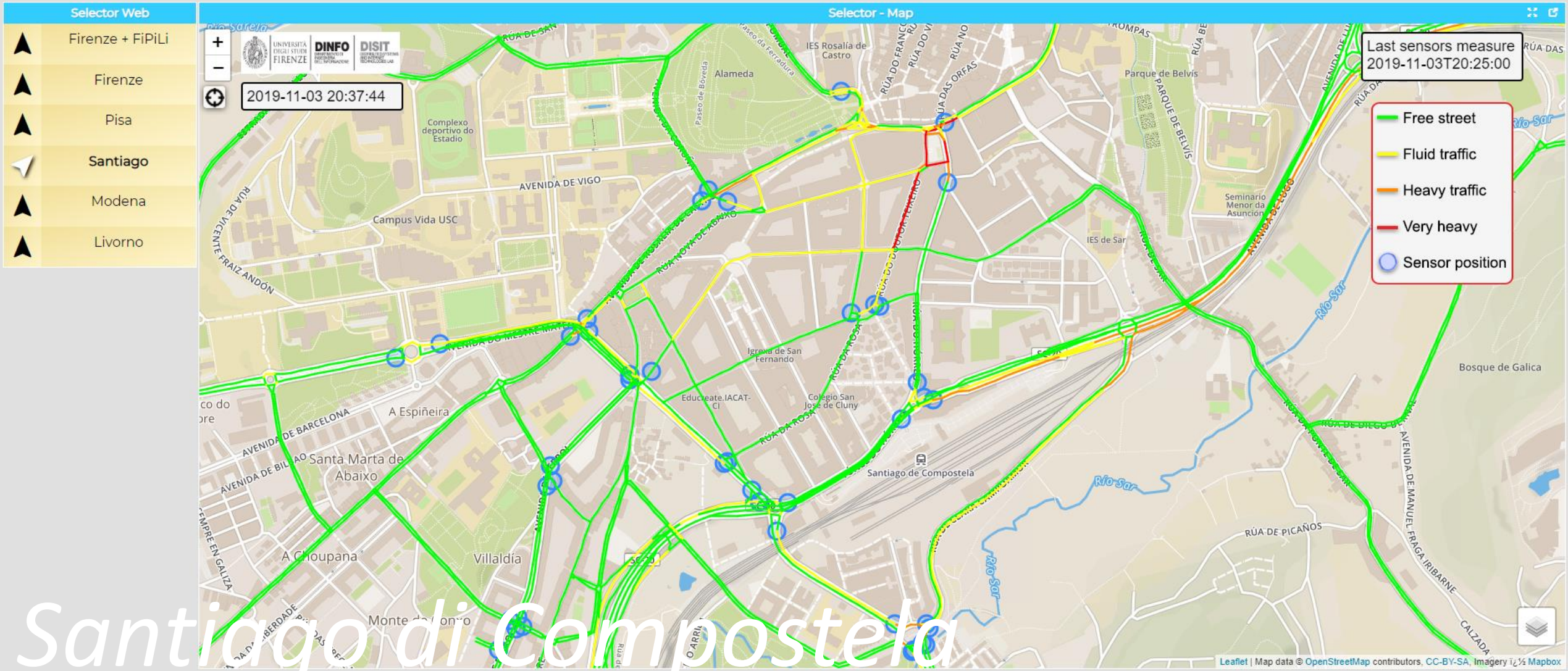




Santiago di Compostela

Traffic Flow Reconstruction for the cities

Sun 3 Nov 20:37:43



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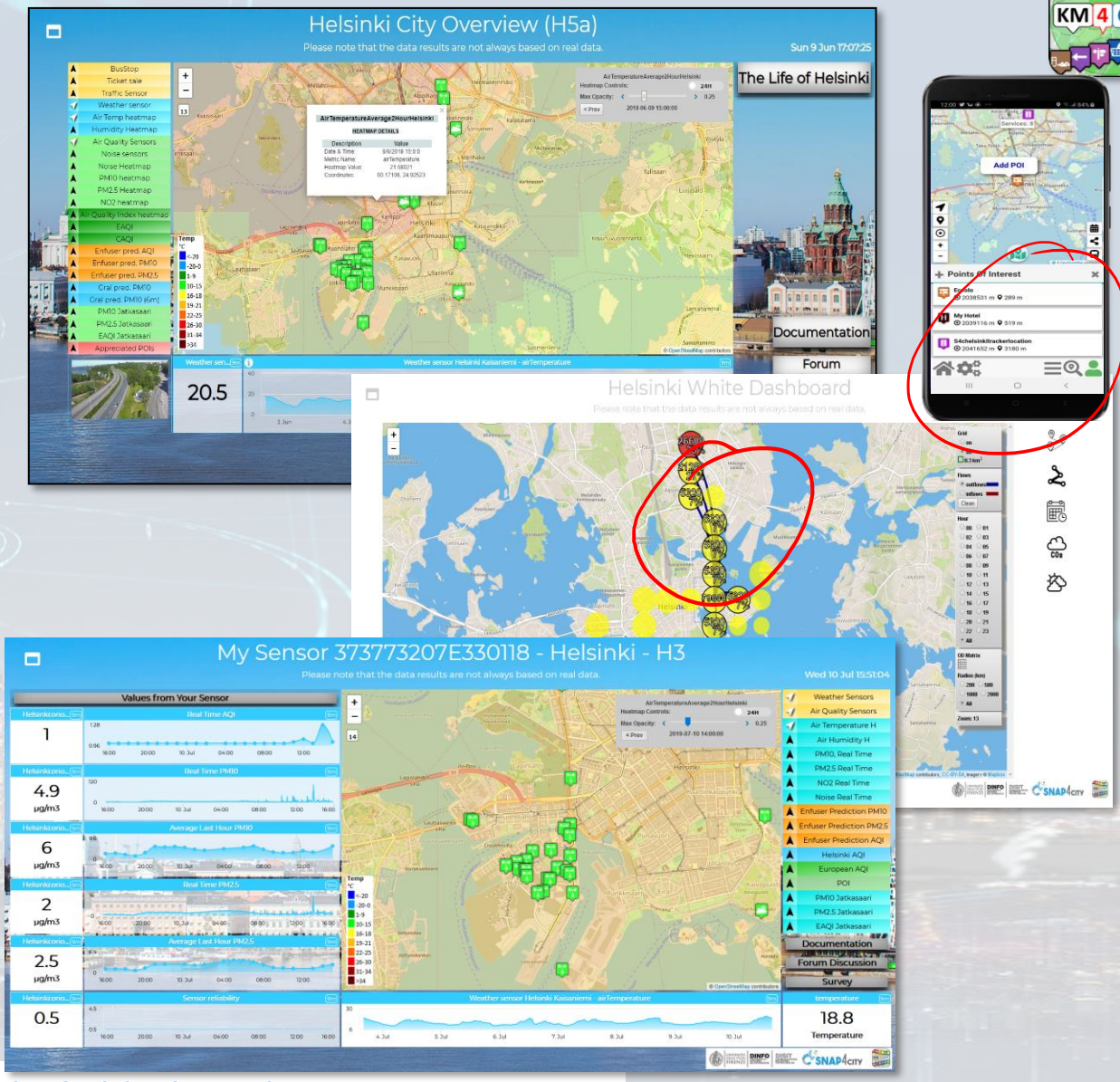
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Helsinki



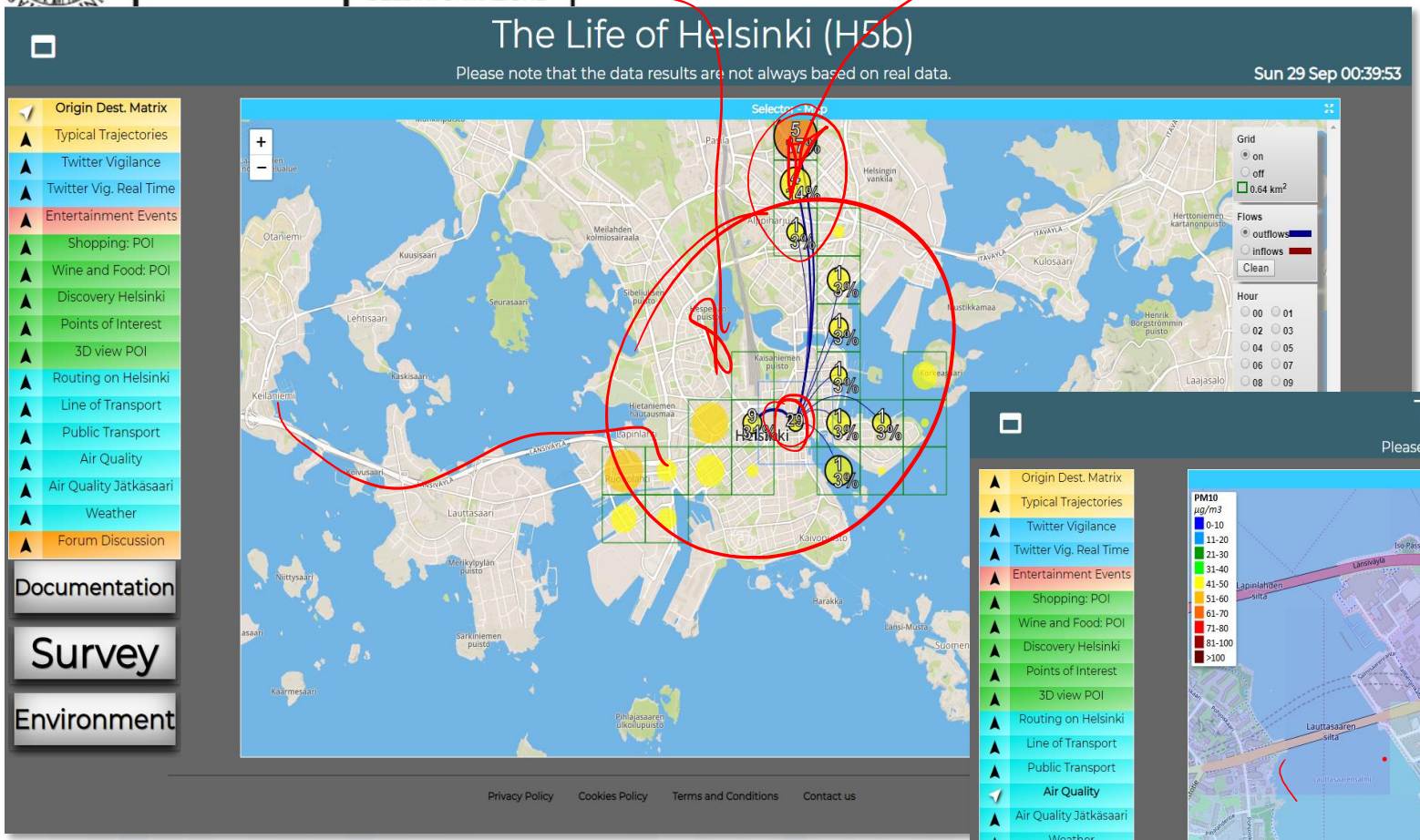
Helsinki Case

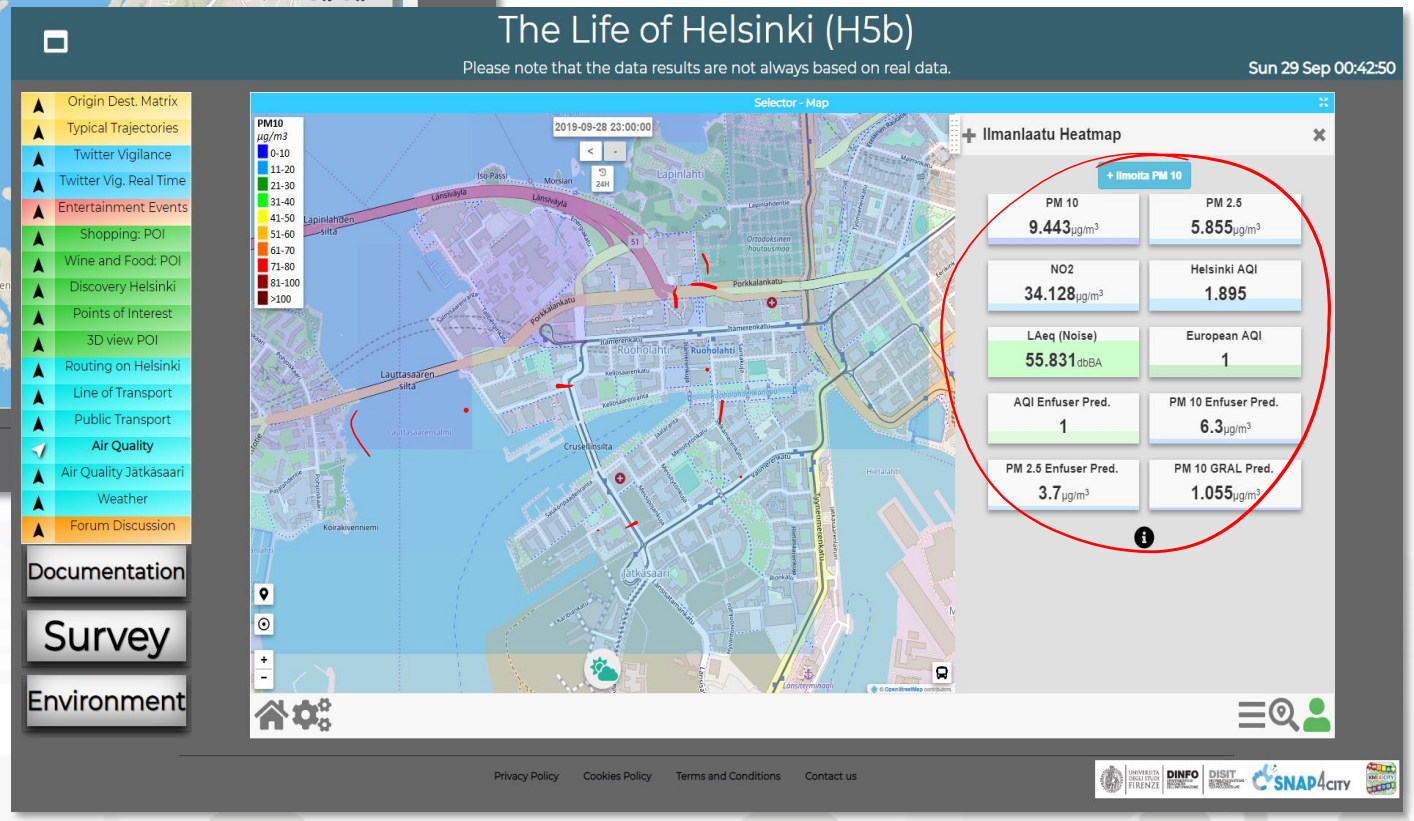
- **Dashboards & Services**:
  - **Environment** & **Weather**, PM10, PM2.5,NO, SO2, CO, noise, etc.
    - Sensors values, Heatmap & **Alerts** on critical
    - FMI Enfuser prediction: PM10, PM2.5, ..
    - GRAL predictions PM10, validations
    - Private sensors in Jätkäsaari area (personal dashboards)
  - **Mobility**: Traffic Sensors, Operators, routing, multimodal routing, whatif
  - **Social**: Twitter Vigilance, early warning
  - **Life in Helsinki**: OD matrix people flow, Twitter Vigilance SA, hot places, etc.
  - **Tourism and Culture**
- **Mobile App and MicroApplications:**
  - Helsinki in a Snap (all stores)



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

Helsinki





https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MTc1Mg==

Helsinki

Environmental Data Predictions: GRAL

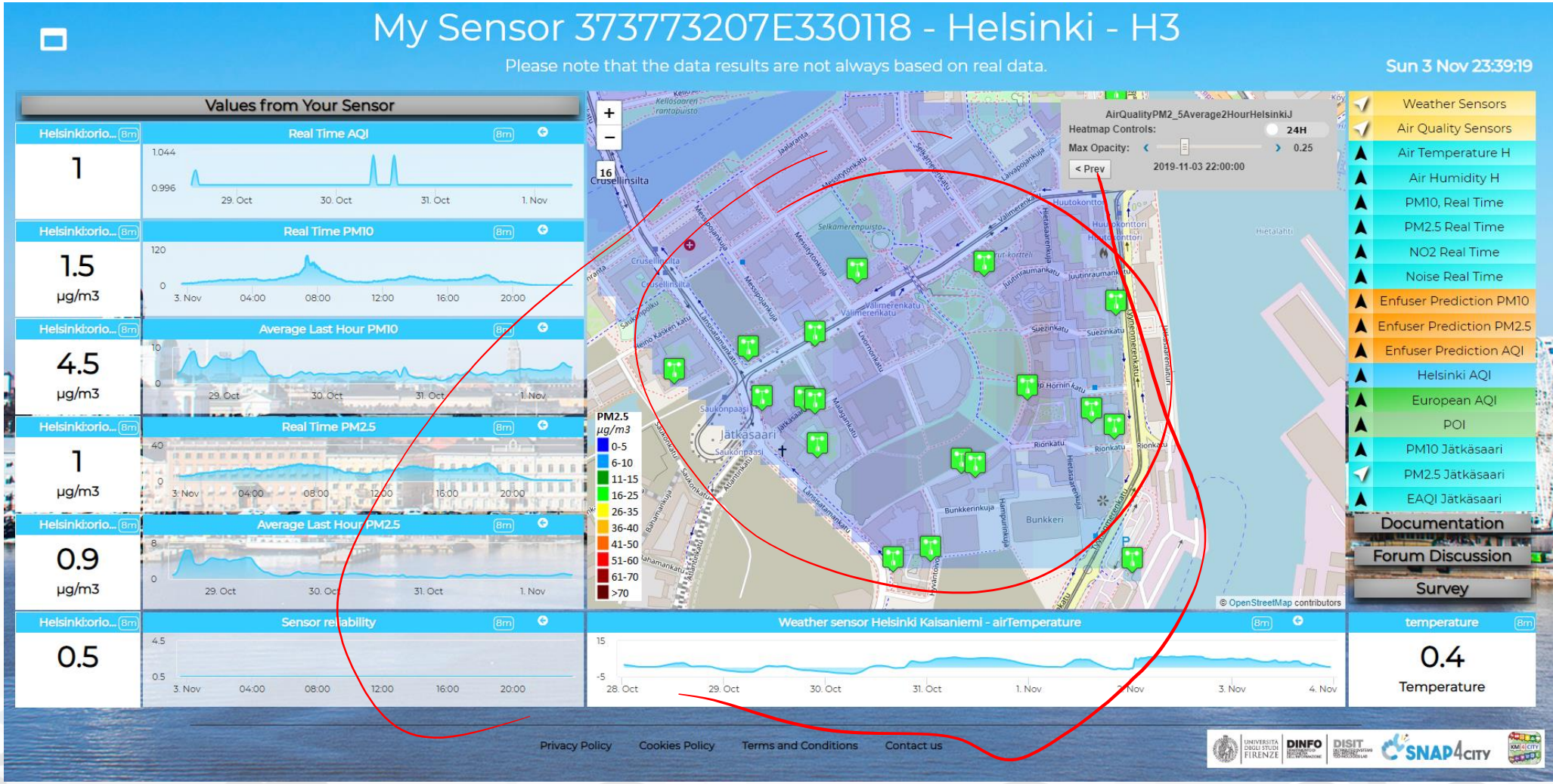
- **GRAL predictions: PM10, NOX, ….**
  - **Comparison wrt real time values in actual value of Sensors**
  - Graz Lagrangian Model.
- GRAL model takes into account:
  - pollution sources (for example the vehicles, their distribution on the streets, the about of pollution they produce according to their distribution over time and space, etc.),
  - structure of the city (streets and shape 3D of the buildings),
  - weather forecast (wind intensity and direction), etc.
- GRAL can be applied on NOX, PM10, PM2.5, … or any other particles



Environmental Devices hosted by Citizens









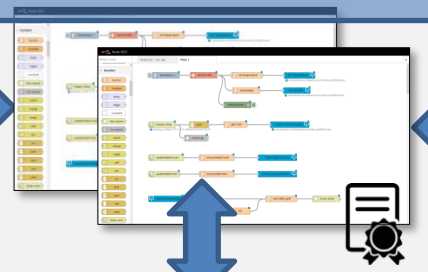
Prato
Smart City vs Industry 4.0

GIDA set up

Smart City data from many sources



IOT Applications

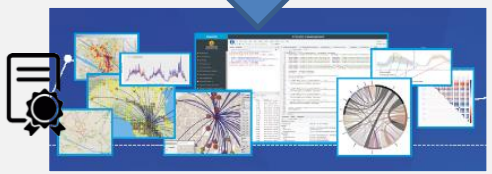


Dashboards and Apps





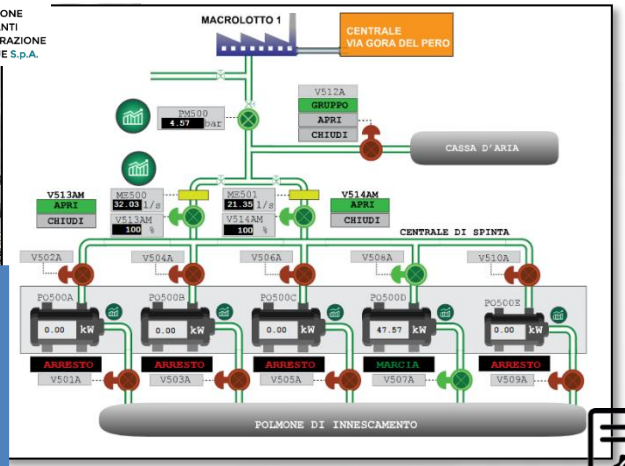




IOT Data Shadow Snap4City

Big Data Analytics, Artificial Intelligence





Modbus

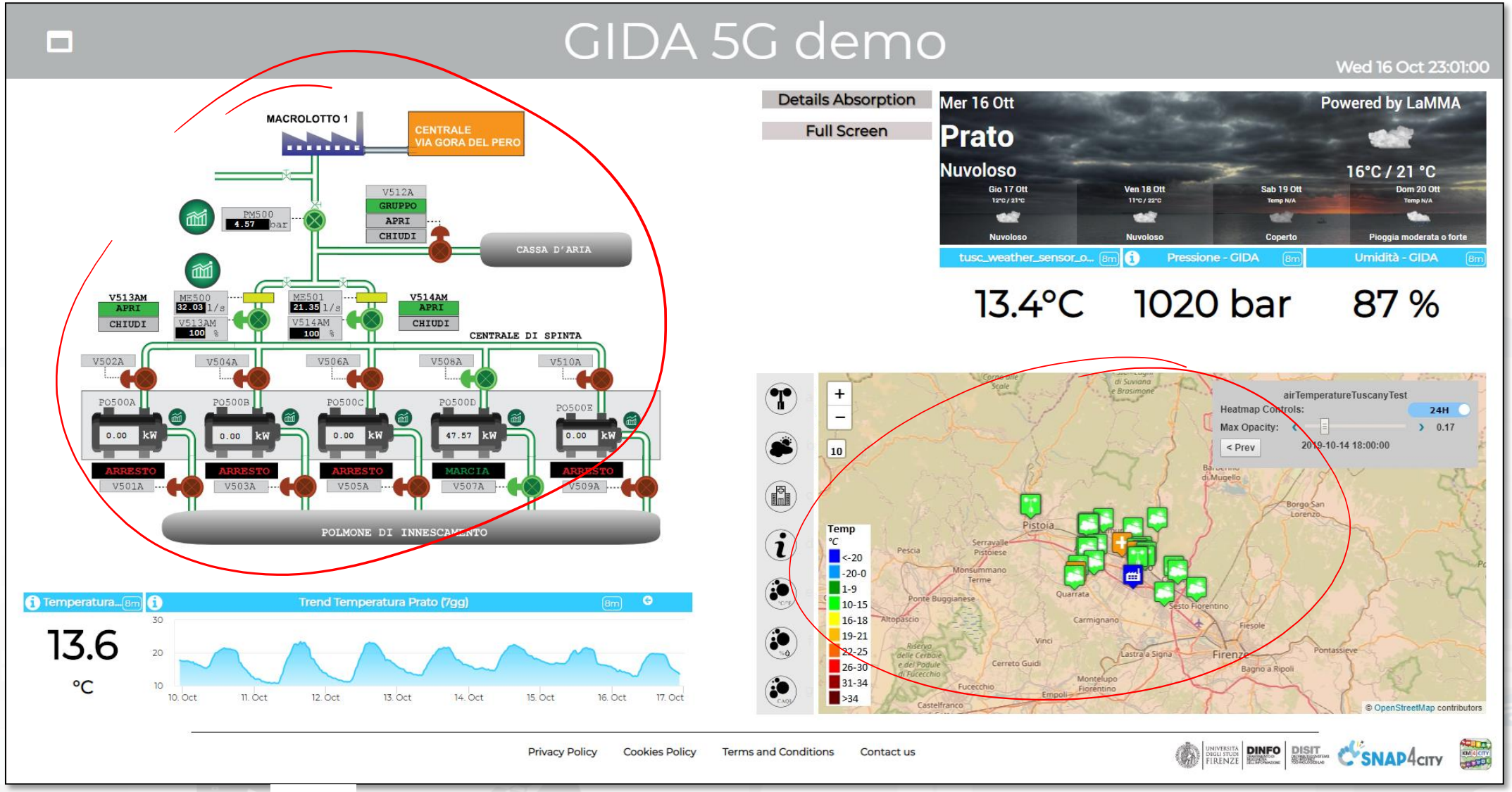
ModBus to Snap4City Gateway Edge

5G network devices

ZTE

Telemonitoring Telecontrol

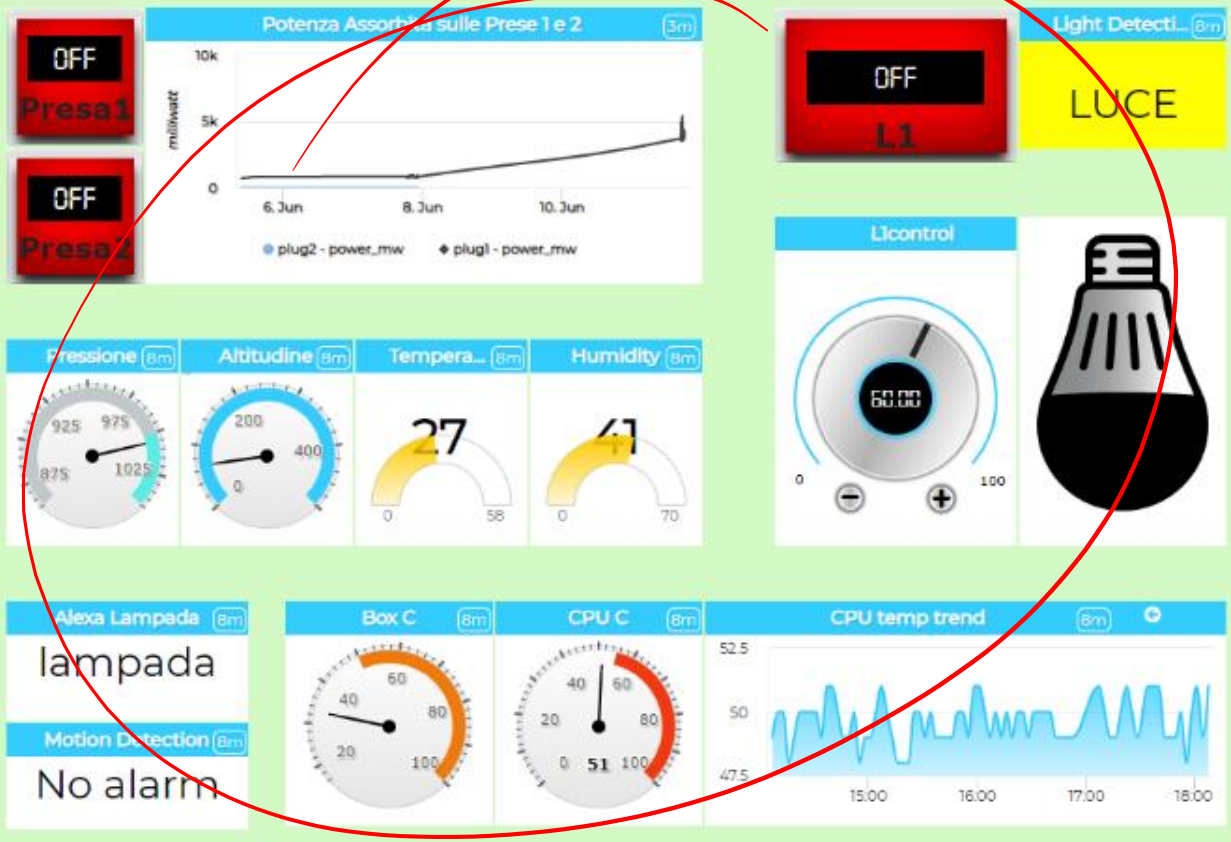
Dashboards & Services:

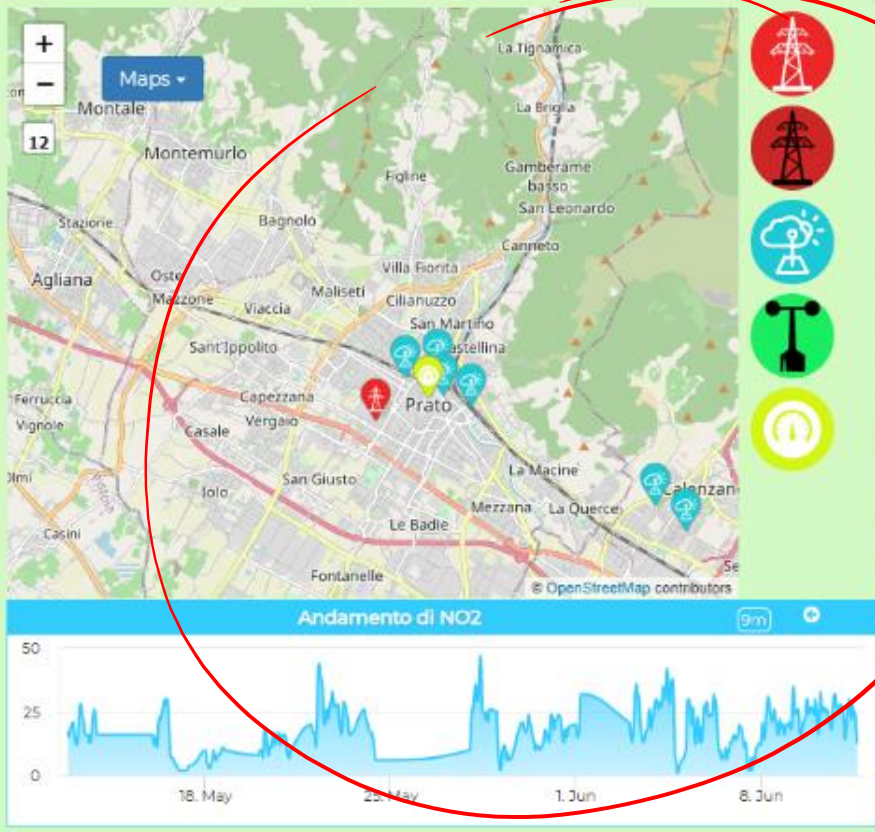


https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjIyNg==

Snap4Home 5G Demo

Thu 11 Jun 18:07:32



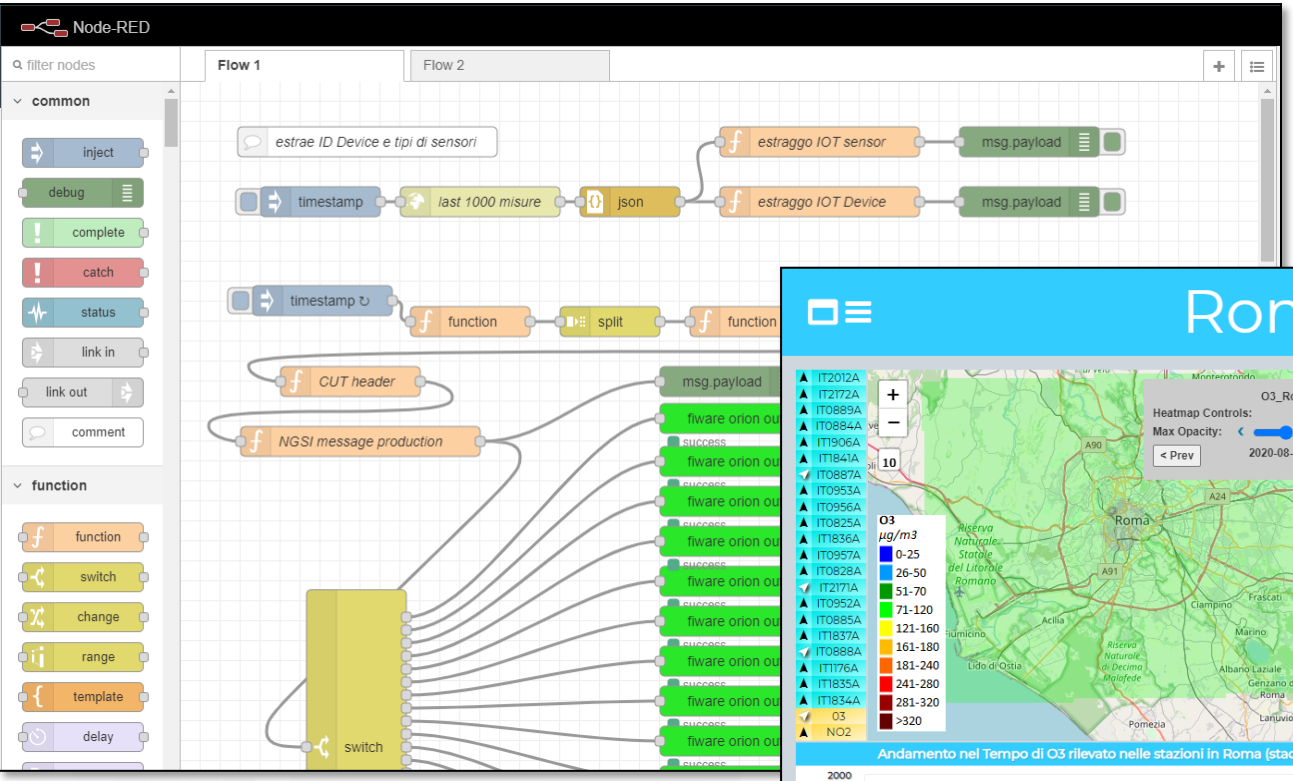


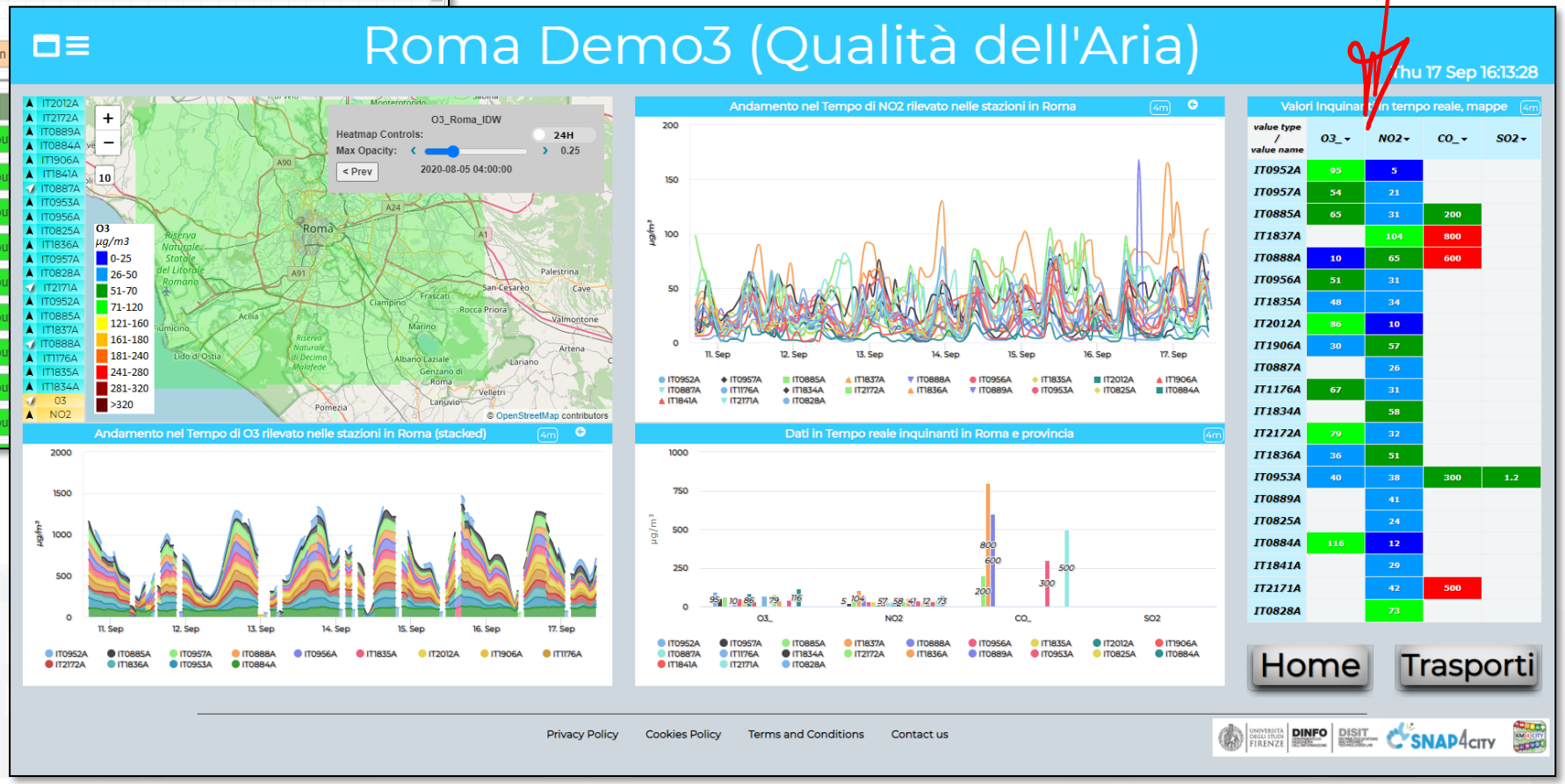


open fiber WIND 3 ZTE estra



Roma (I)

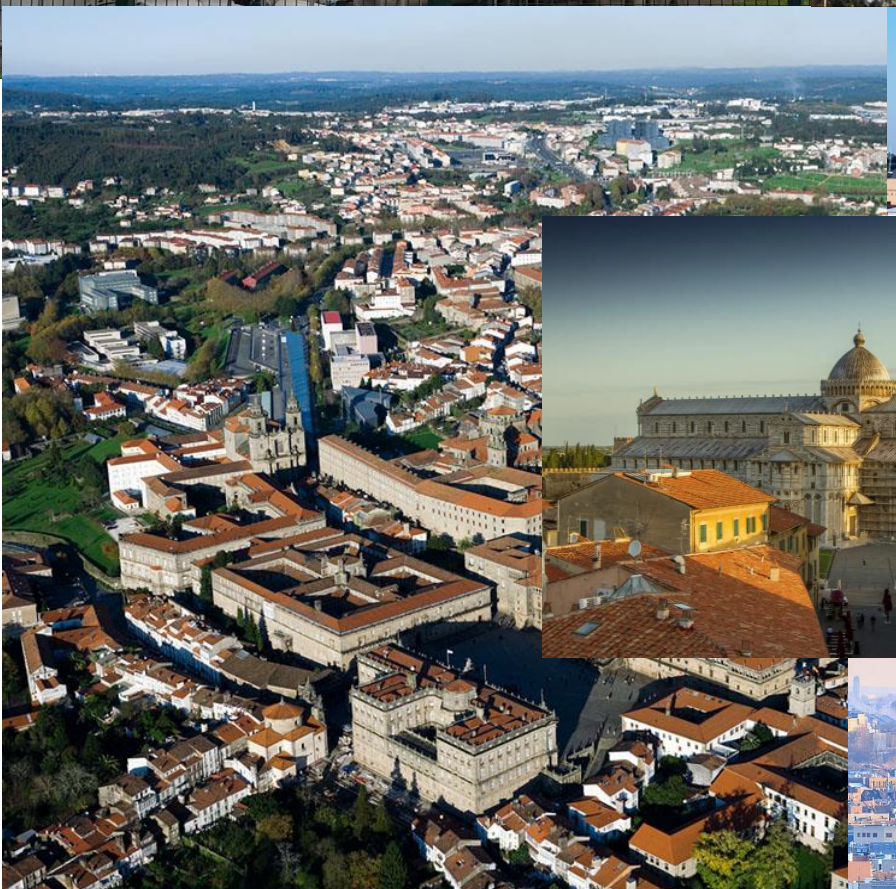




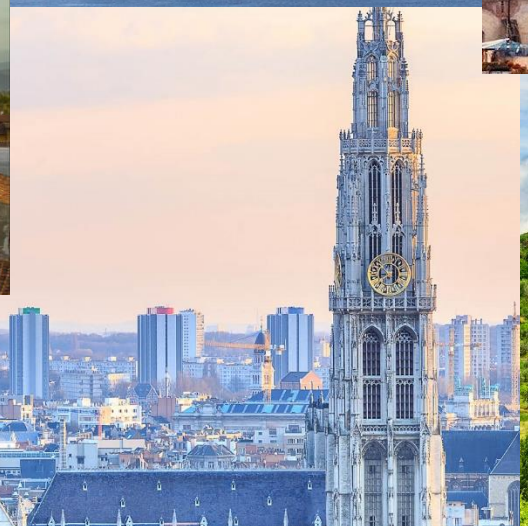
Roma (I)

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







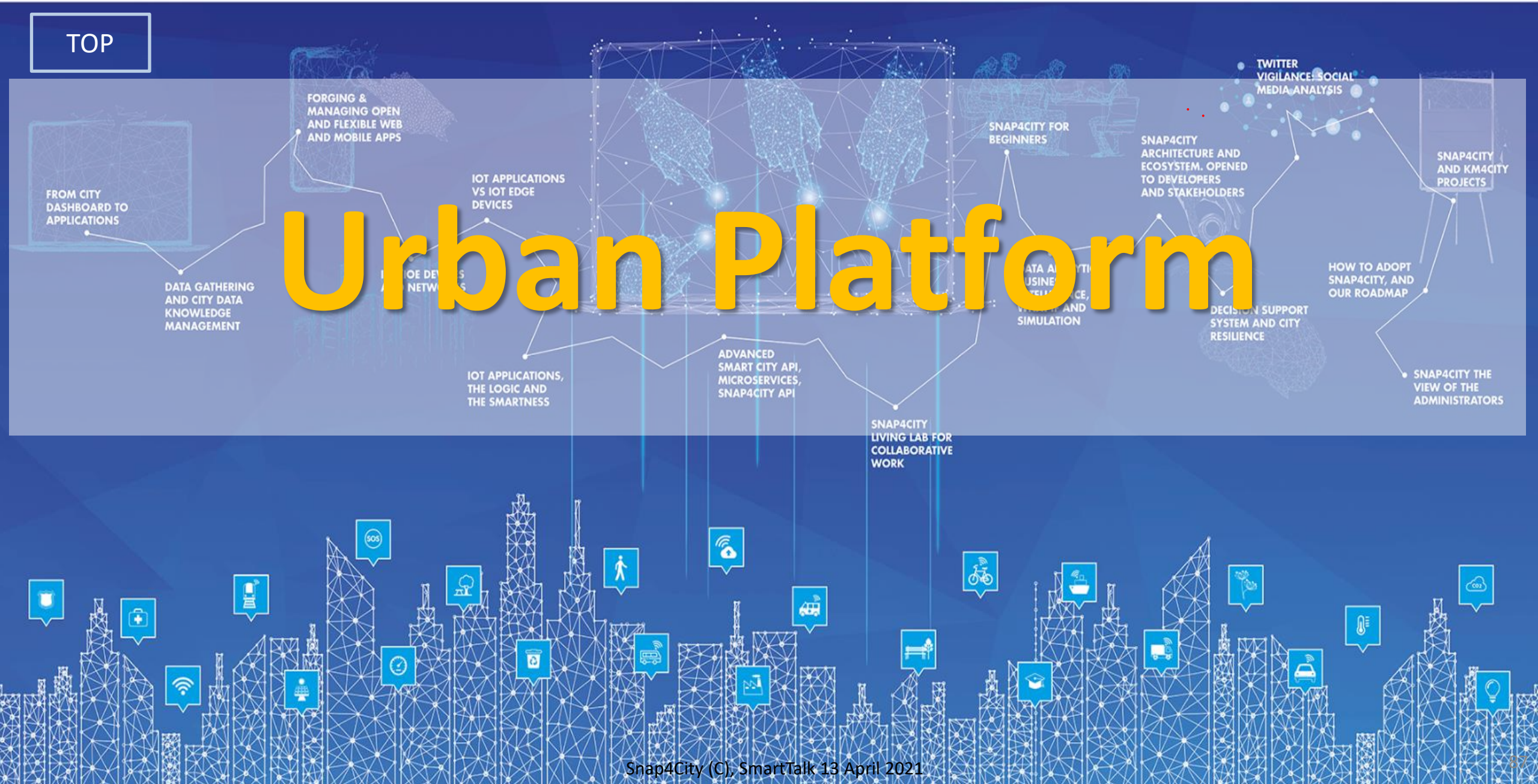


https://www.snap4city.org/4



Scenarious

- 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
- 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



Urban Platform

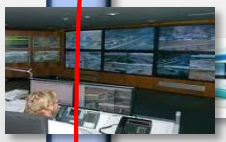
Challenges: Requests and Deductions

Public Admin.



Pub. Admin: detection of critical conditions, improving services

Mobility Operators





Tune the service, reselling data and services , prediction





Commercial: customers prediction and profiles, promotions via ads



Tourism Museums



Tune the service, prediction

API for SME

Services & Suggestions
Transport, Mobility, Commercial (retail), Tourism, Cultural

Smart City Engine

User profiling
Collective profiles
User segmentation

Personal Time Assistant
dynamic ticketing, whispers to save time and money, geoloc information, offers, etc.









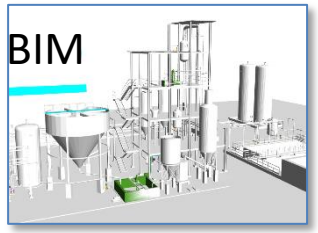
User Behavior
Crowd Sources

Data: Public and Private, Static and Real Time

Private: user movements, social media, crowd sources, commercial (retail)
Public: infomobility, traffic flow, TV cameras, flows, ambient, weather, statistic, accesses to LTZ, services, museums, point of interests, …

Concept

BIM

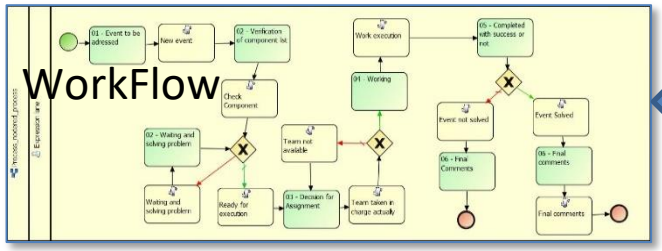


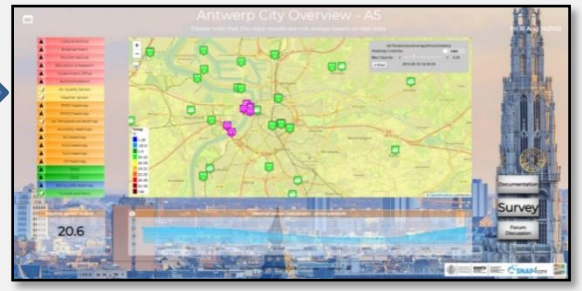
KPI, POI, MyKPI, …

API, External Services

Web Scraping

WorkFlow

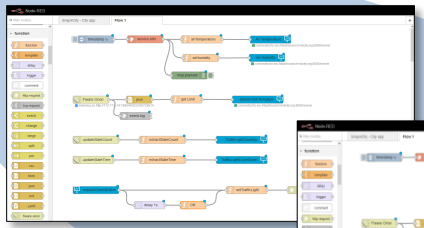


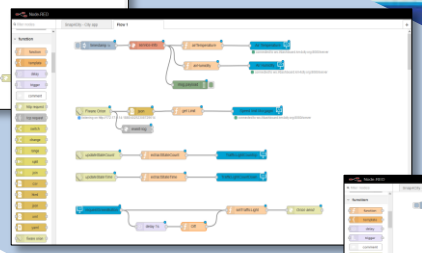


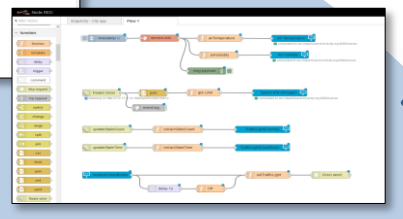












Data Analytics,
Artificial Intelligence

IOT Apps

IOT Broker



FIWARE

ckan

LD, LOD



GIS

Big Data

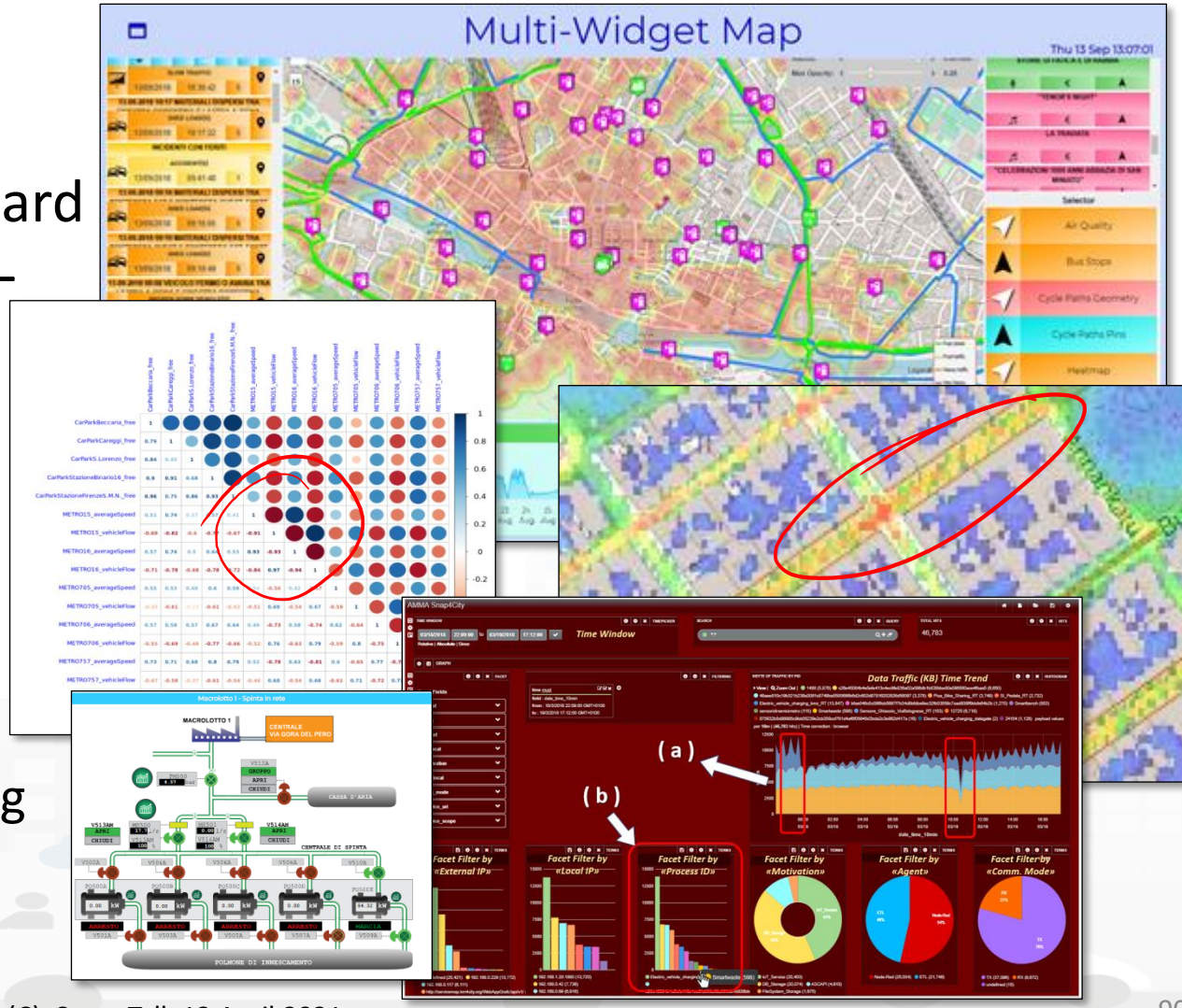
KB



Dashboards and Apps

Data Rendering vs Control Room Dashboards

- **GIS** rendering by layers
- **Business intelligence** mainly focused on making statistics from tabular: no layer, hard relationships, ... Exploit Data Analytic, ETL
- **Visual Analytics**, data understanding
  - Rendering and drill down
  - Faceting/grouping (Elastic Search/SOLR)
  - Cross filtering (Kibana, Grafana, Banana)
  - Interactive, Cross Widgeting
- **Control Room Dashboards:**
  - Need: Visual Analytics, Data Analytic, geospatial reasoning, data driven processing
  - H24, alerting, Flexible rendering, custom widgets, interactive dashboards

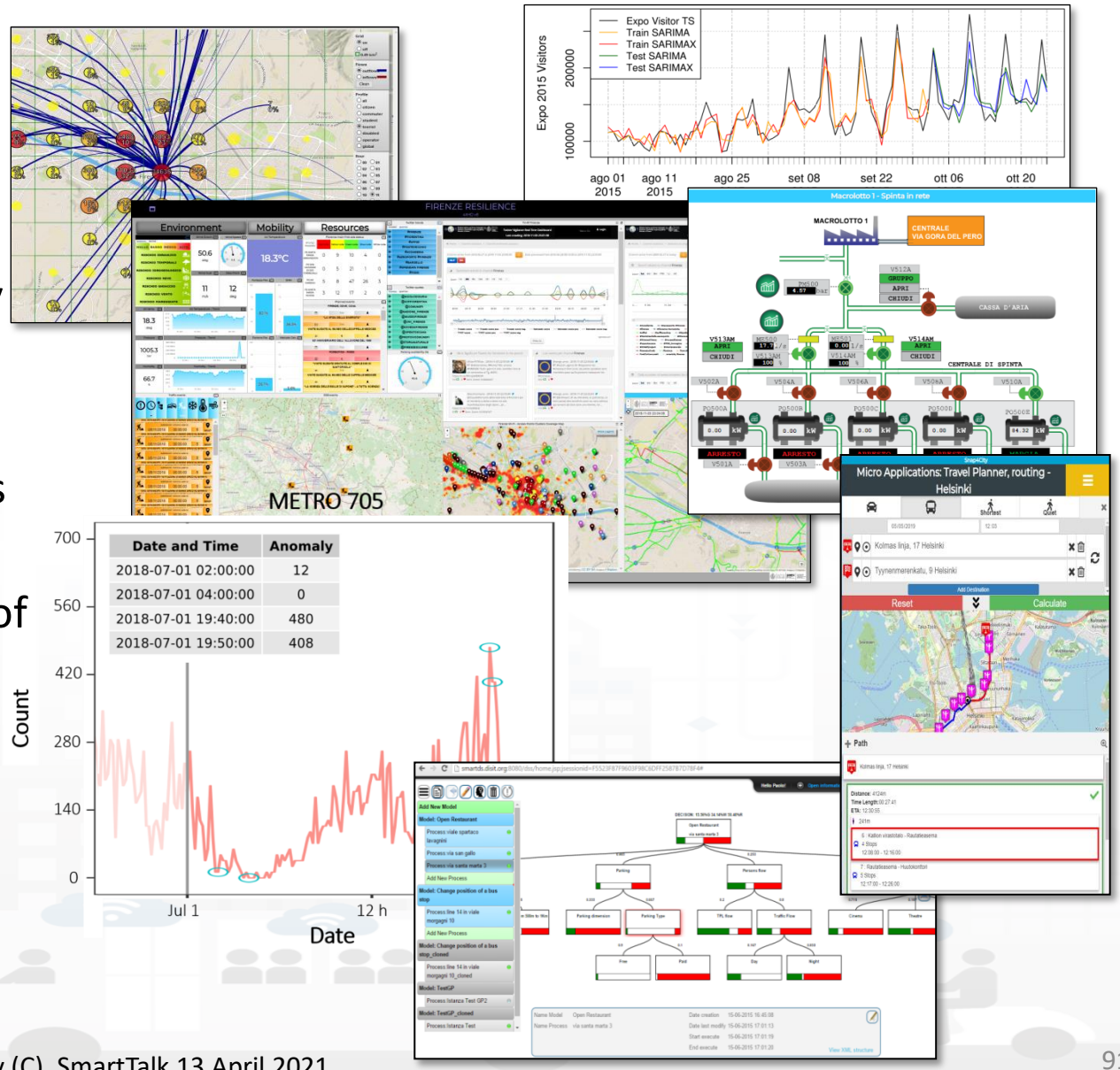


Decision Support, Act!

Smart City Control Room, SCCR, SCR

- Not only a collection of verticals

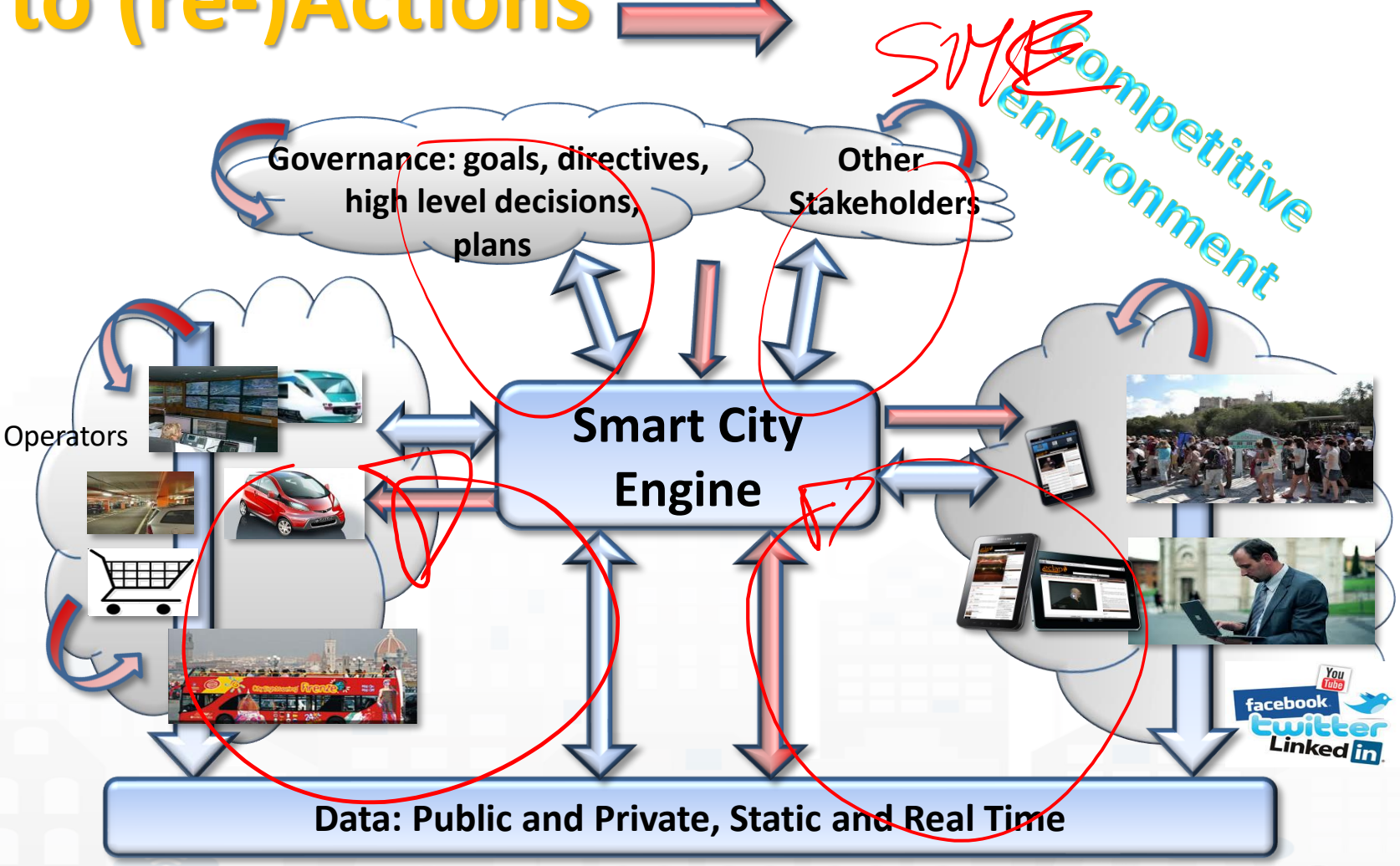
- **Exploiting analytics**: prediction, simulations, anomaly detection. ..
  - Big data approach to Data Analytics
- **Connecting Heterogeneous data** to defined strategies and alerting
- **Connected interactive dashboards** for different kind of decision makers: operators and majors
- **What-if Analysis taking into account multiple data sources**



From strategies to Actions

From Strategies to (re-)Actions

- Informing
- Suggesting
- Engaging
- Alerting, Early Warning
- Making Decision active
- New Plan



Snap4City tools and Living lab Solution have been Created to satisfy requirements of international organizations as:

- **ENOLL**: https://www.openlivinglabs.eu/
  - European Network **of Living Labs**
- **EIP-SCC**: European Innovation Partnership on Smart Cities and Communities
  - https://eu-smartcities.eu/
- **Select4Cities**: Pre-Commercial Procurement Project to develop a data-driven, Internet-of-Everything (IoE) platform for large-scale urban co-creation
  - https://www.select4cities.eu/

Living Lab Flexibility

Snap4City Satisfies all Requirements of ENOLL Select4Cities and EIP-SCC

- **Multiple modalities to perform the same activities**
- **Tuned for Beginners and Skilled people**
- **Visual interface and programming tools**
- **Resources and artefacts sharing for learn acceleration and co-working**
- **Open Living and co-working Portal**: https://www.Snap4City.org

SELECT

for Cities

CERTIFICATE OF ACHIEVEMENT

1° place award to

UNIVERSITY OF FLORENCE - DEPARTMENT OF INFORMATION ENGINEERING

for SNAP4CITY

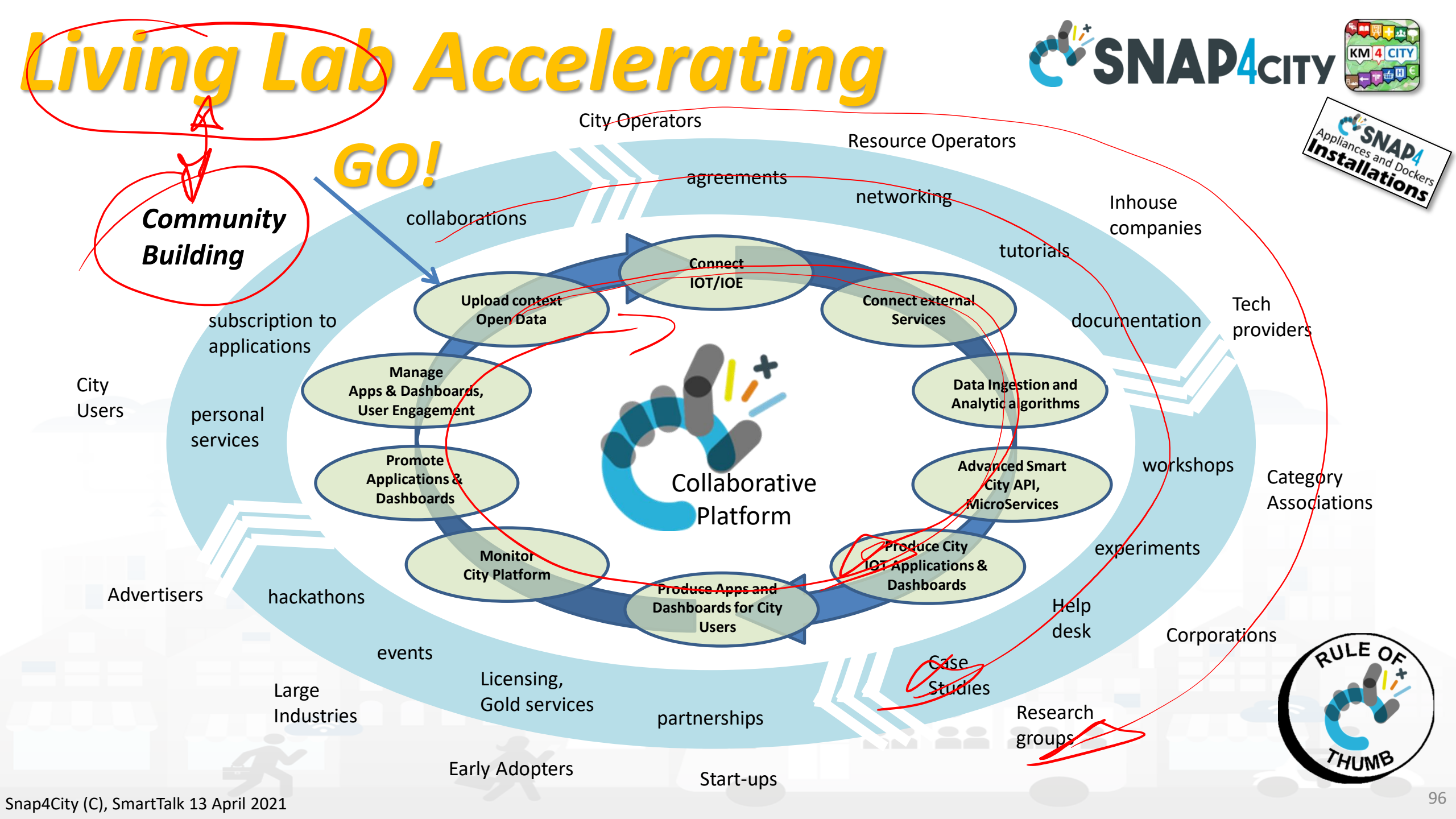
https://www.snap4city.org/558

for successfully completing the
SELECT for Cities PCP competition
19.11.2019

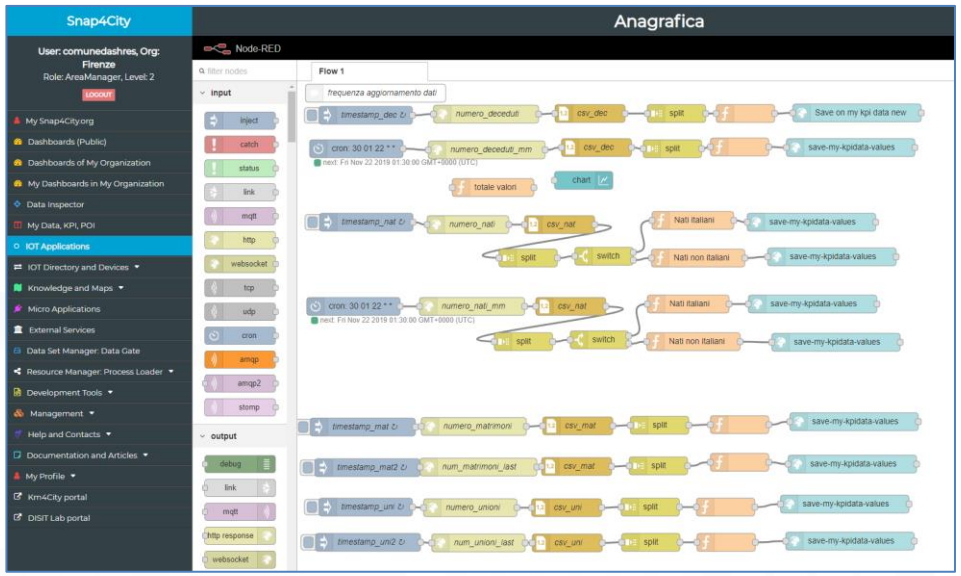
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688196

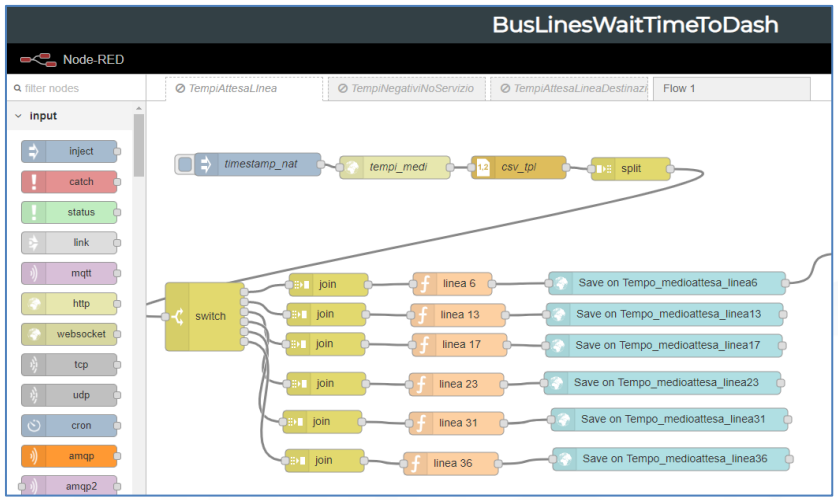
DIGIPOLIS
FORUM VIRIUM HELSINKI
CITY OF COPENHAGEN
Buyers Group

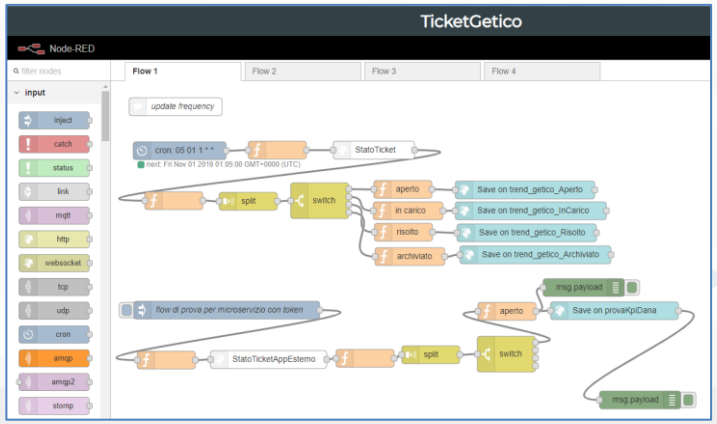
Living Lab Accelerating

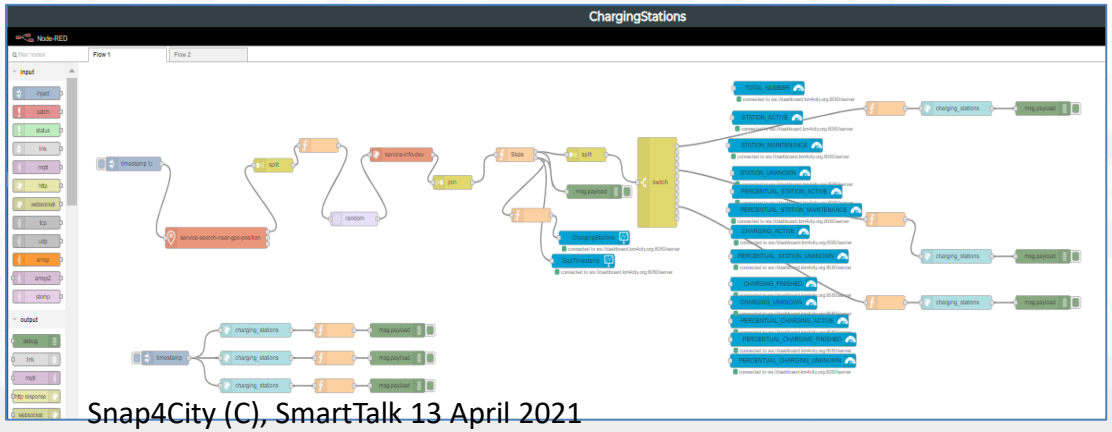


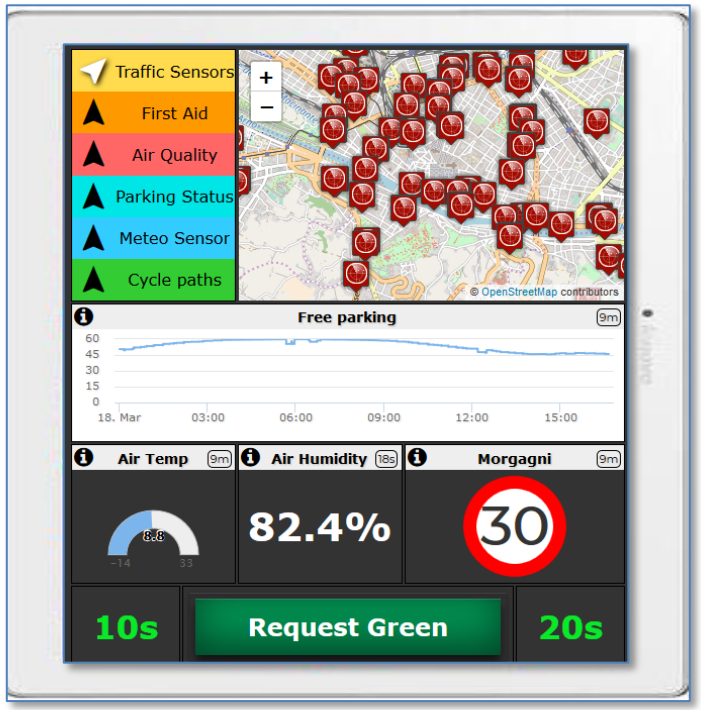
The Back-Office Data Flows (selection) Exploiting *the Snap4City Node-RED MicroServices*

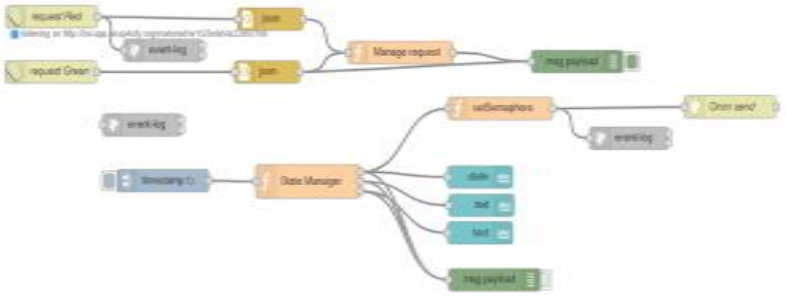









Traffic Sensors
First Aid
Air Quality
Parking Status
Meteo Sensor
Cycle paths
© OpenStreetMap contributors
Free parking
9m
60
45
30
15
0
18. Mar
03:00
06:00
09:00
12:00
15:00
Air Temp
9m
Air Humidity
18s
Morgagni
9m
82.4%
30
10s
Request Green
20s







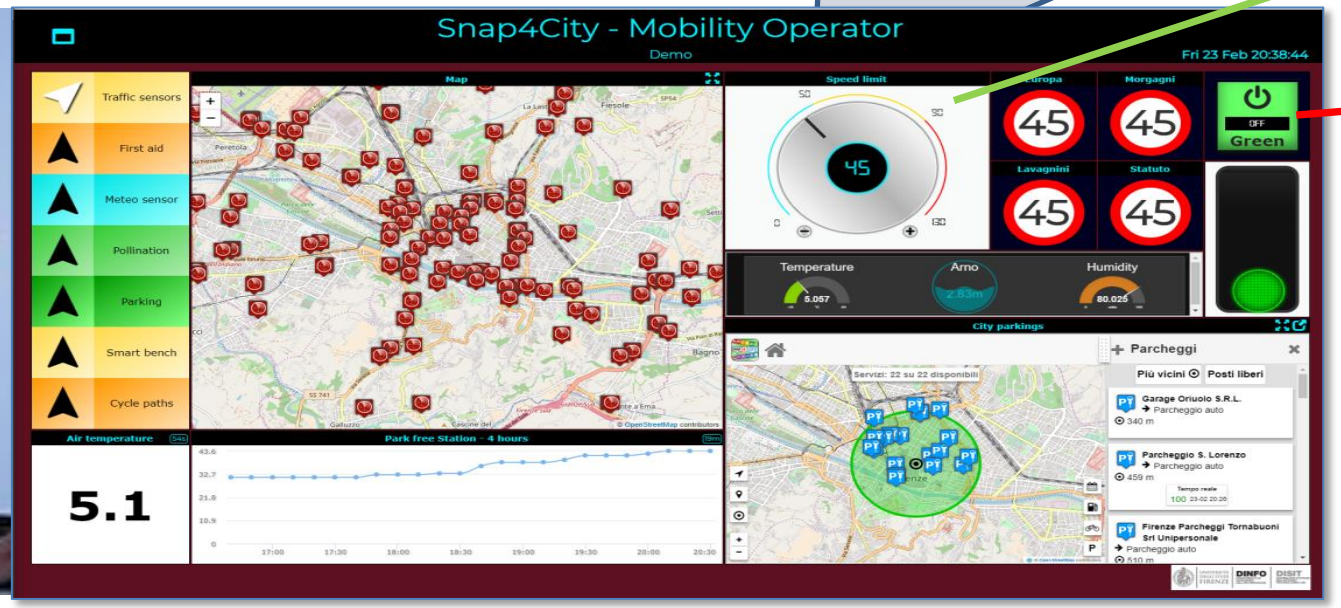

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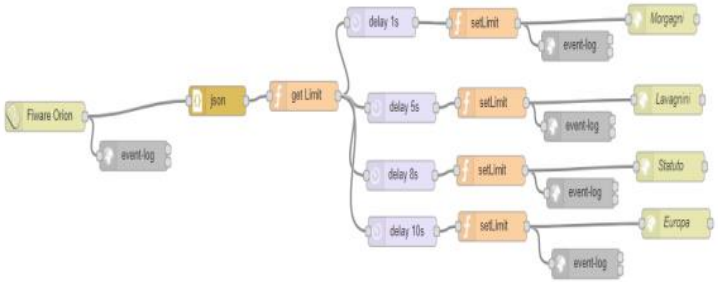

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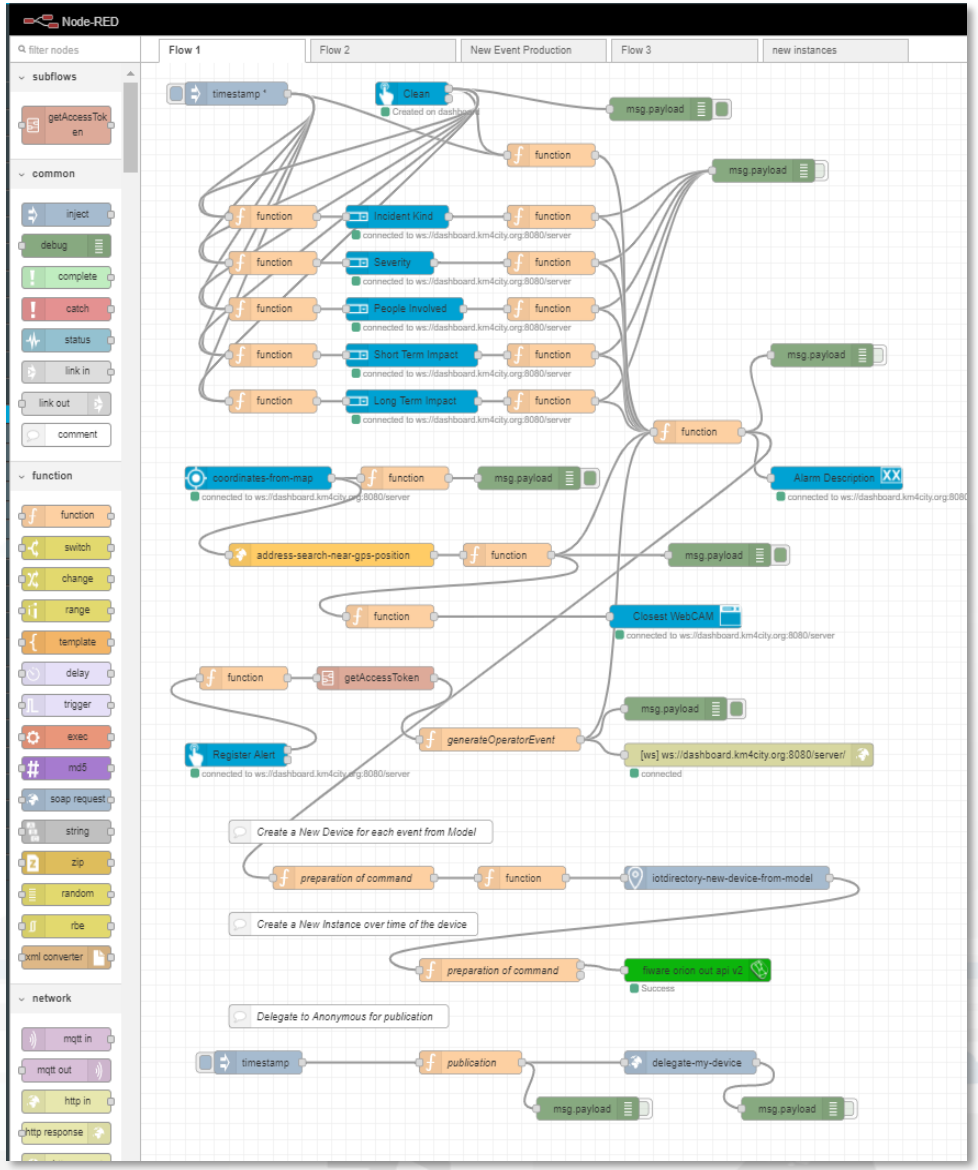

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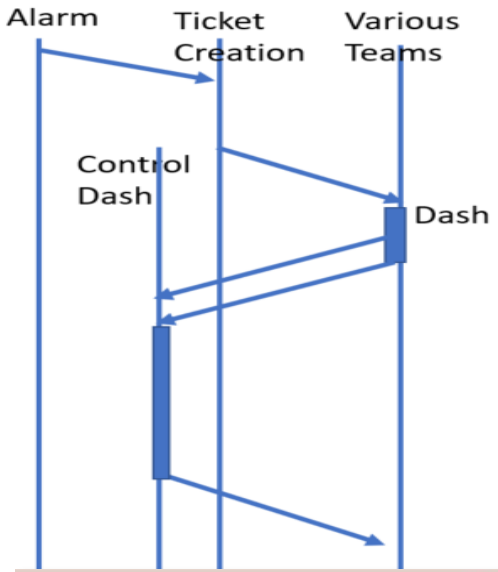


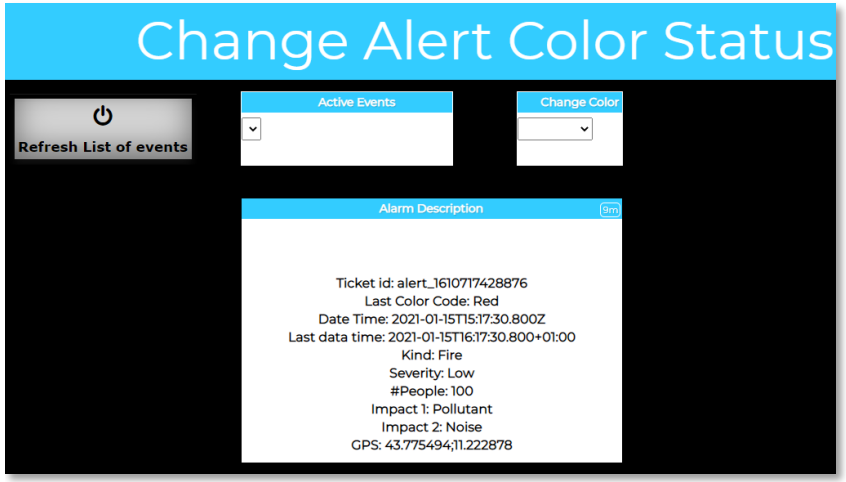

Snap4City - Mobility Operator
Demo
Fri 23 Feb 20:38:44
Traffic sensors
First aid
Meteo sensor
Pollination
Parking
Smart bench
Cycle paths
Map
Speed limit
45
Europa
45
Morgagni
45
Lavagnini
45
Statuto
45
OFF
Green
Temperature
Arno
Humidity
City parkings
Parcheggi
Più vicini
Posti liberi
Garage Oriuolo S.R.L.
Parcheggio S. Lorenzo
Firenze Parcheggi Tornabuoni Srl Unipersonale
Air temperature
5.1
Park free Station - 4 hours

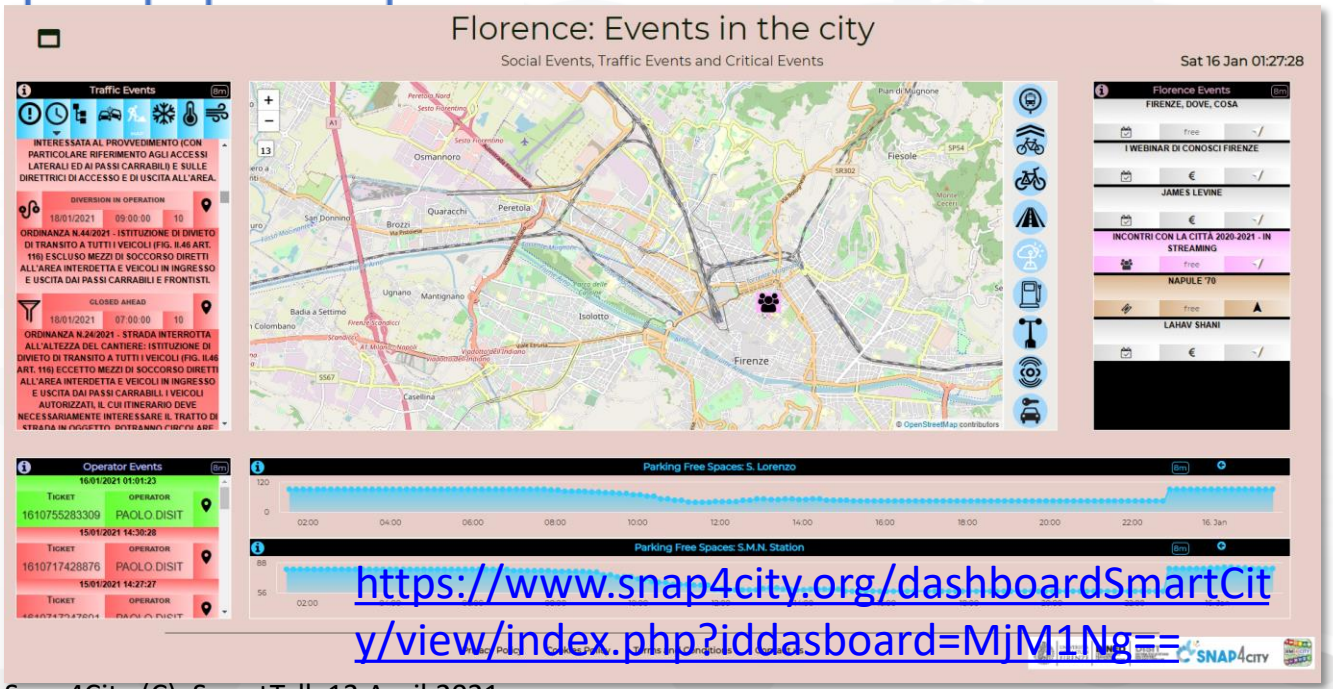

Fiware Orion
event-log
json
get Limit
delay 1s
setLimit
event-log
Morgagni
delay 5s
setLimit
event-log
Lavagnini
delay 8s
setLimit
event-log
Statuto
delay 10s
setLimit
event-log
Europa

Flow Mng





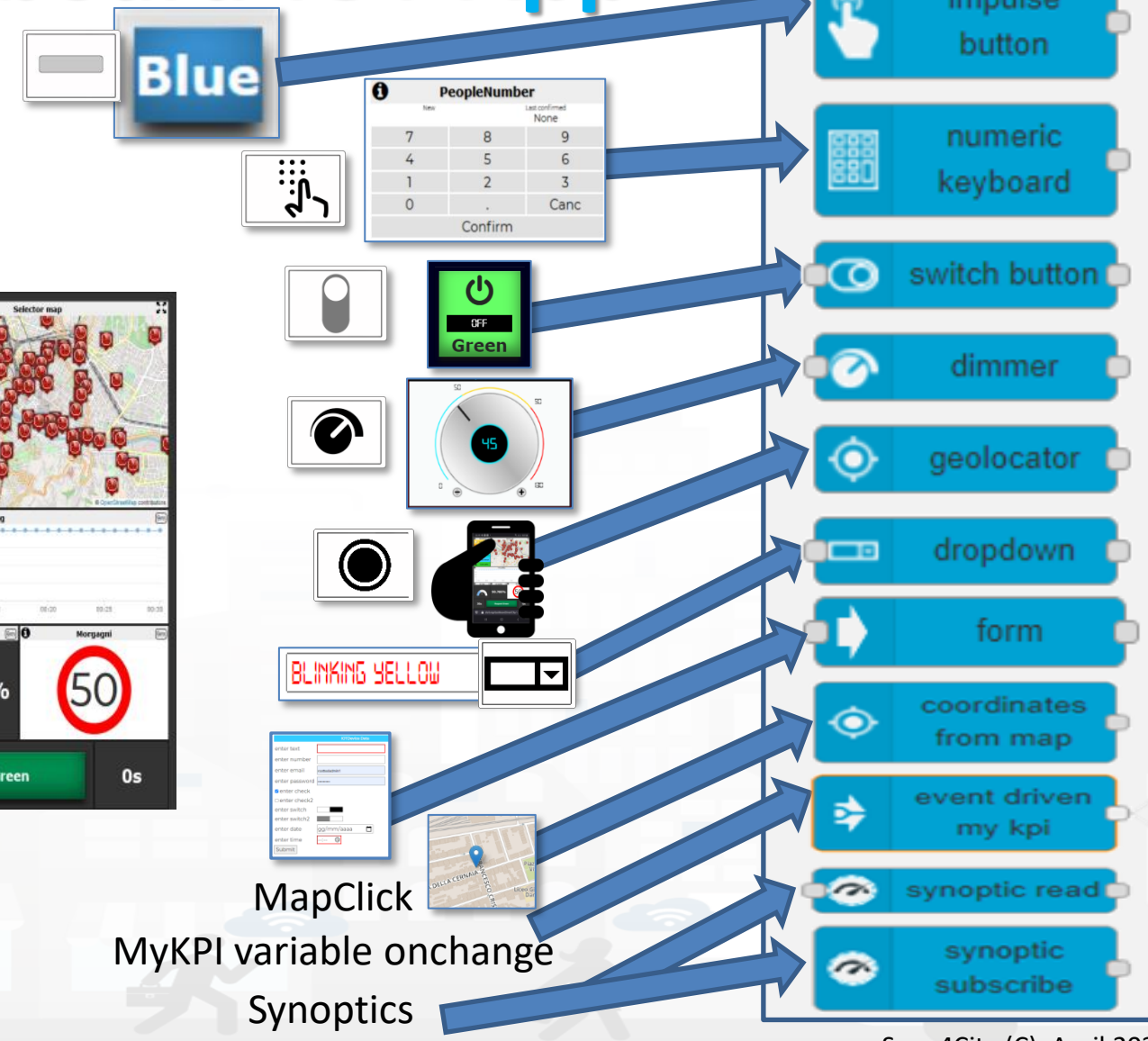




https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=MjM1Ng==

Dashboard-IOT App



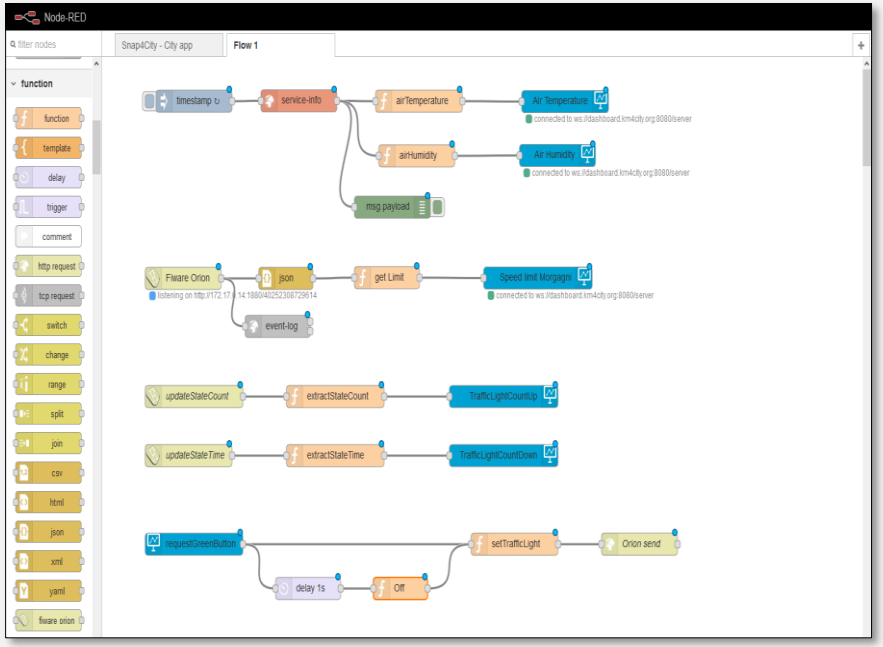


MapClick

MyKPI variable onchange

Synoptics

From Dashboard to IOT App

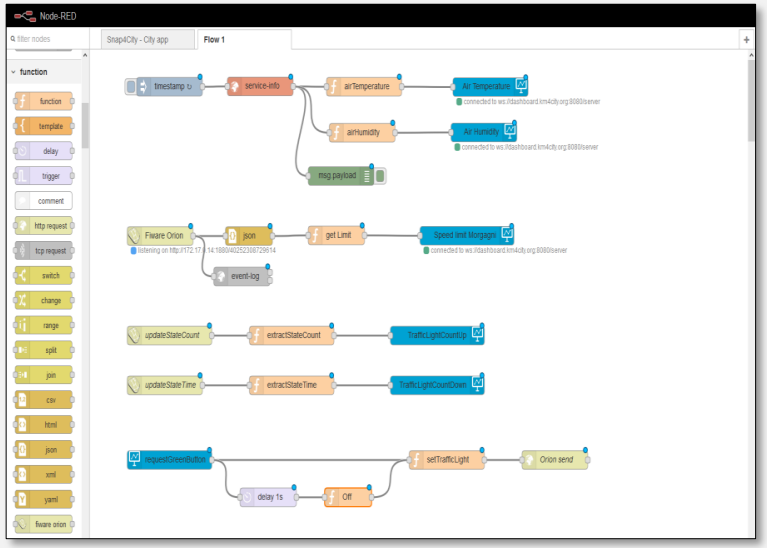


IOT Application

Nature

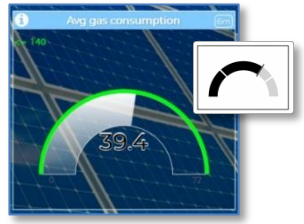
Dashboard-IOT App

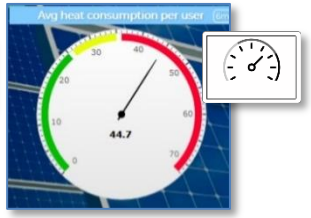
From IOT App to Dashboard

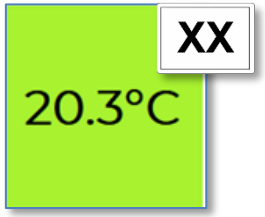


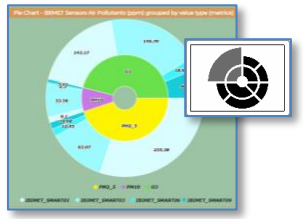
IOT Application

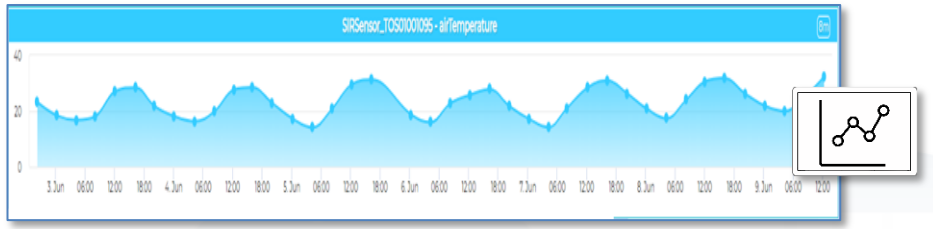
- gauge chart
- single content
- speedometer
- horizontal single bar
- vertical single bar
- web content
- time trend
- bar series
- radar series
- pie chart
- curved line series
- table content
- synoptic write
- calendar

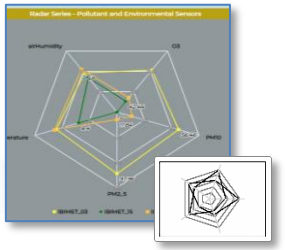


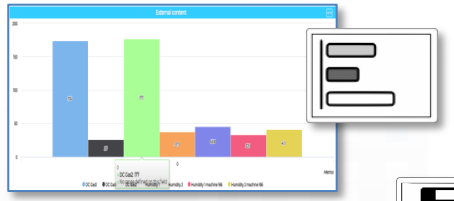


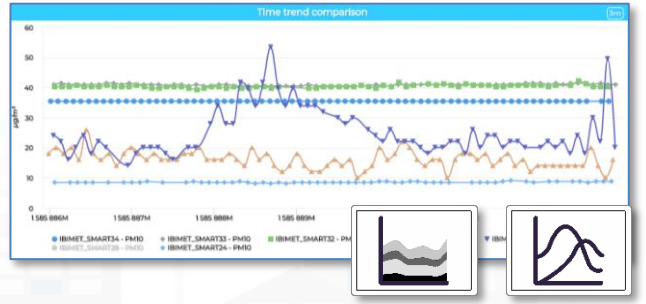


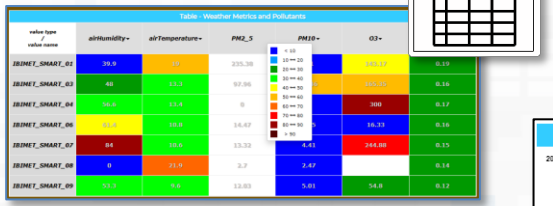


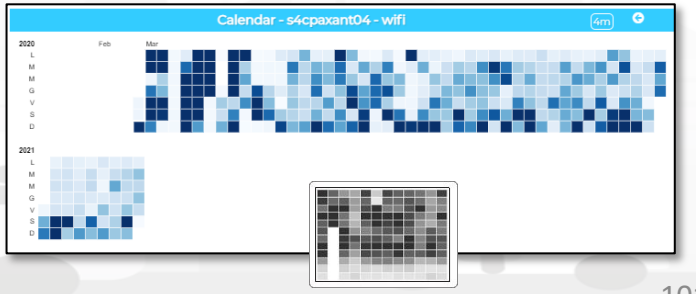












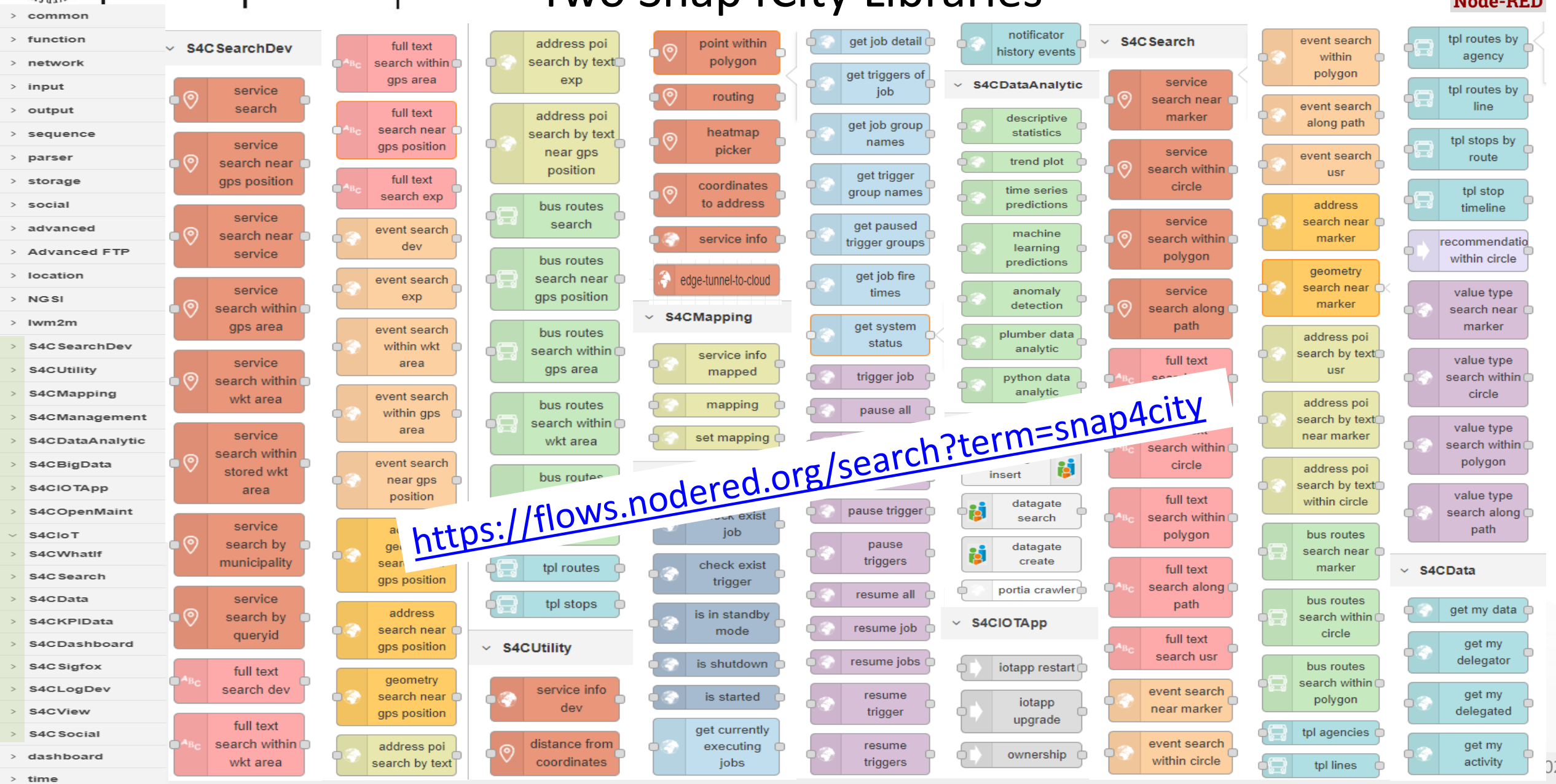
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April 2021 collection

Two Snap4City Libraries

SNAP4CITY Node-RED

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



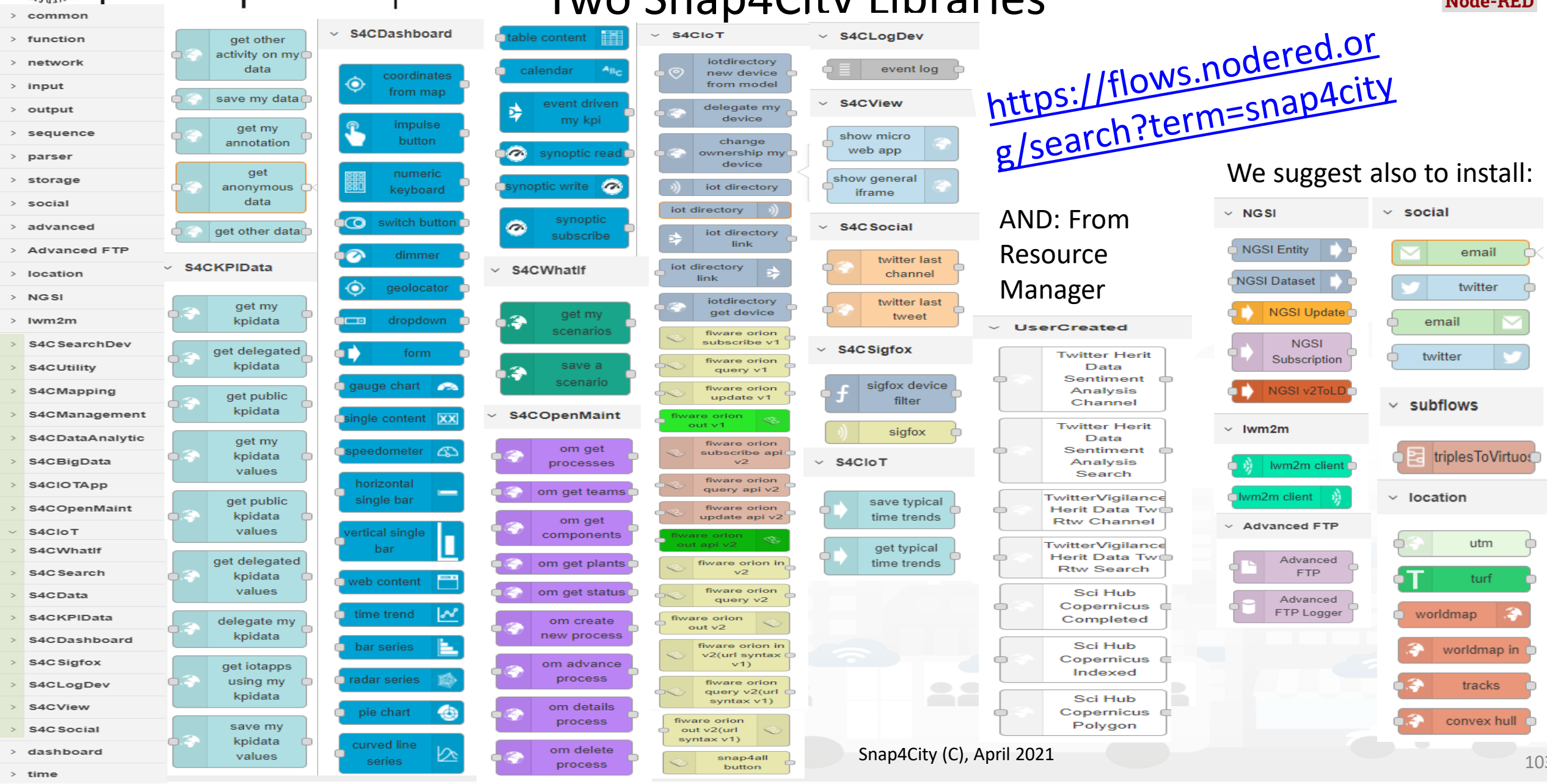
April 2021 collection

Two Snap4City Libraries

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

We suggest also to install:

AND: From Resource Manager

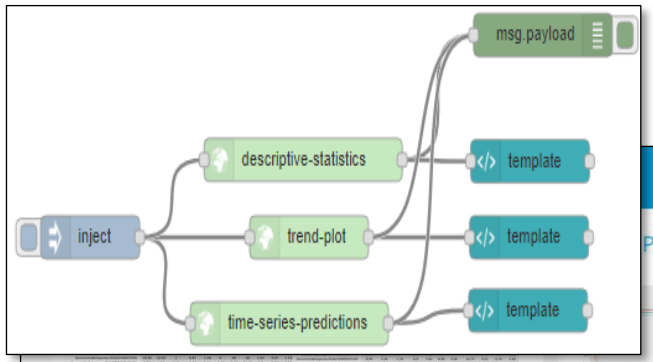


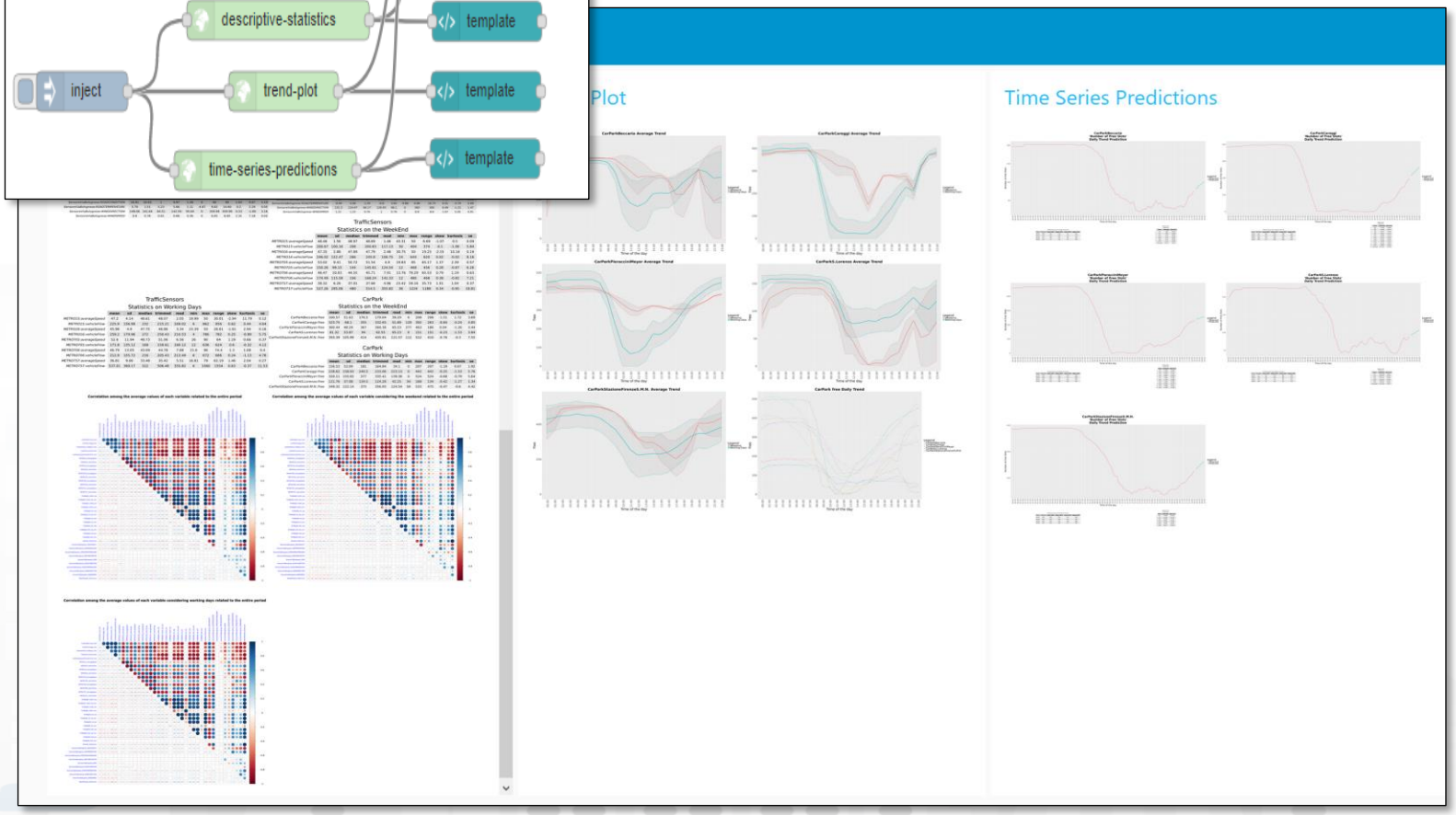
Data Analytics to MicroServices

S4CDataAnalytic

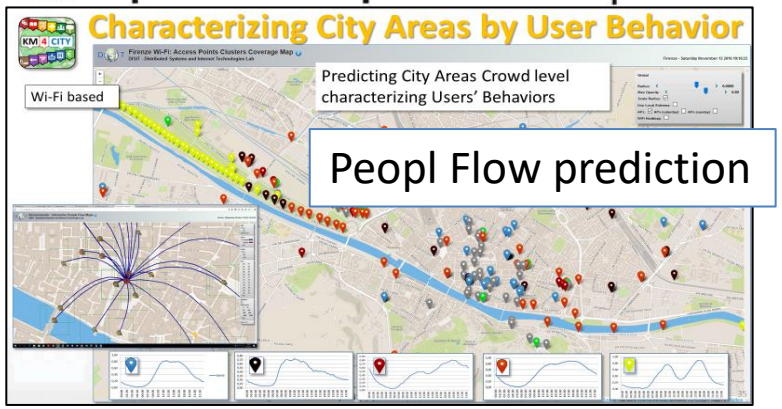
- descriptive statistics
- trend plot
- time series predictions
- machine learning predictions
- anomaly detection
- plumber data analytic
- python data analytic

R Studio and Python algorithms are **automatically** transformed into **MicroServices** for your IOT Applications

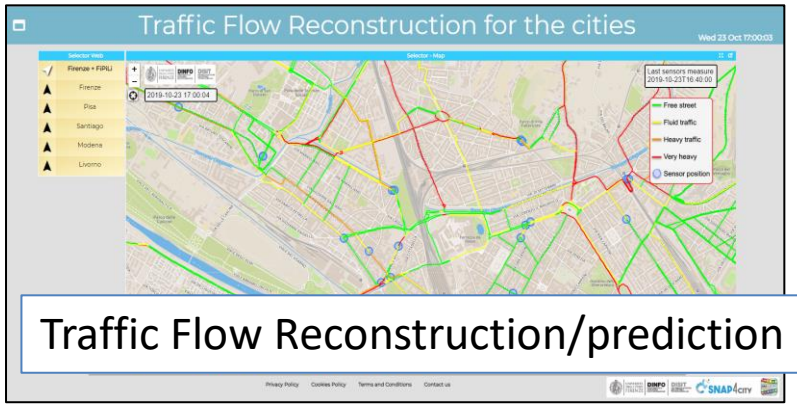




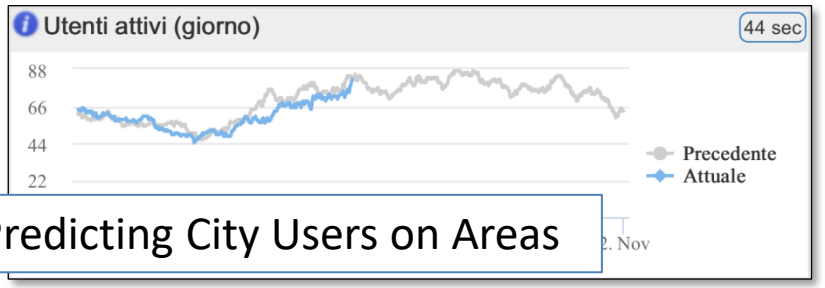
Data Analytics



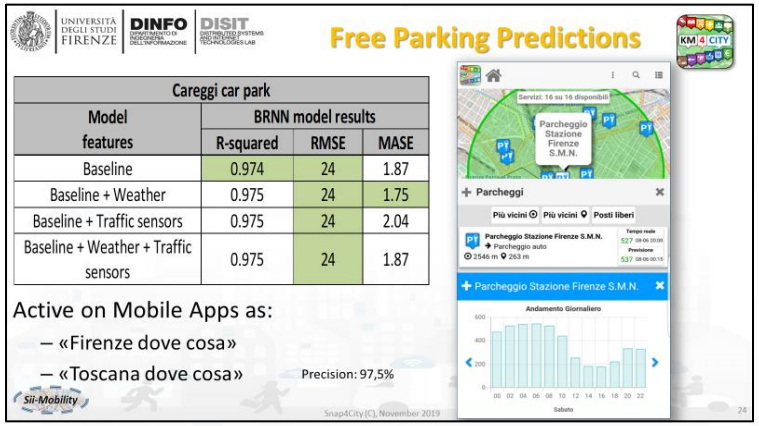
Peopl Flow prediction

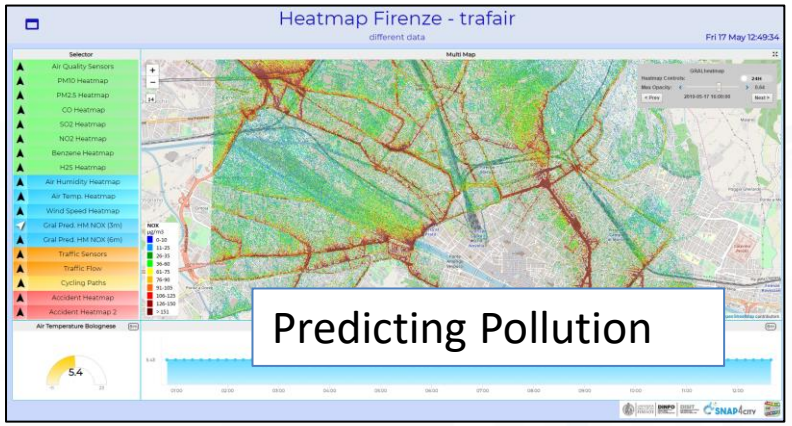


Traffic Flow Reconstruction/prediction

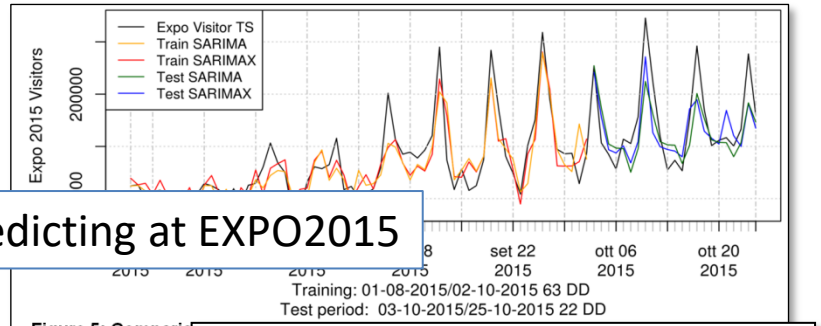


Predicting City Users on Areas

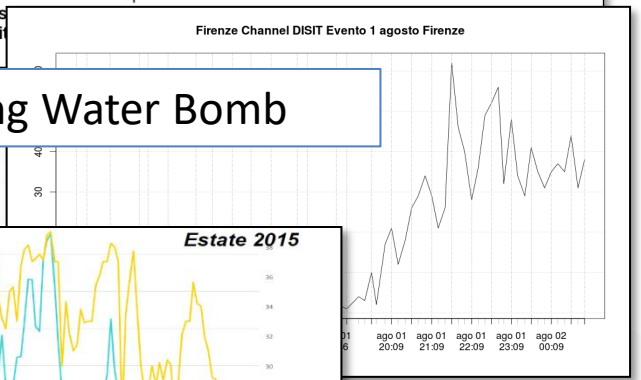




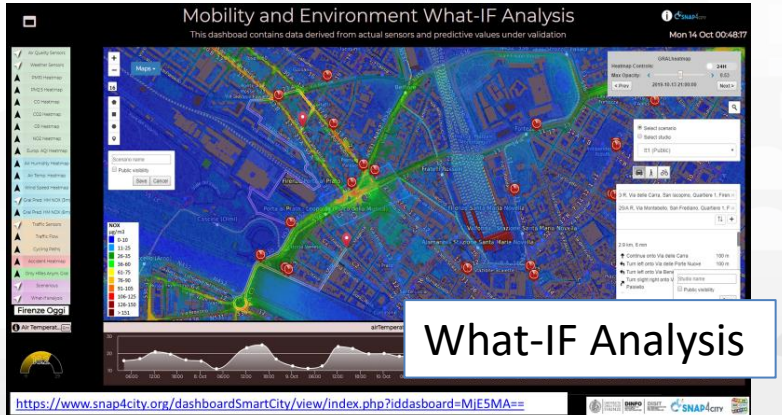
Predicting Pollution



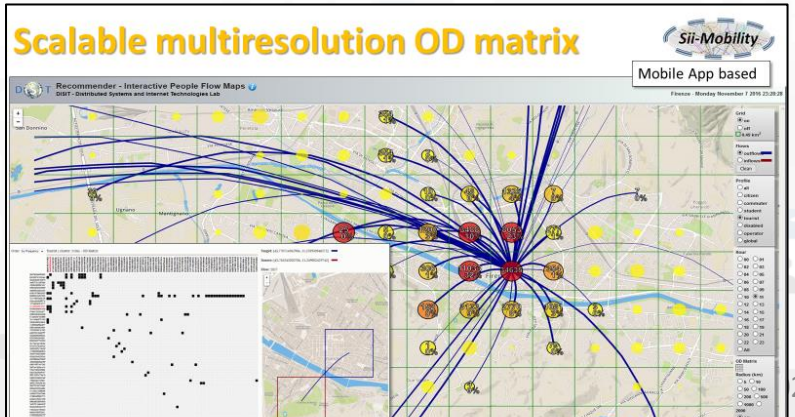
Predicting at EXPO2015

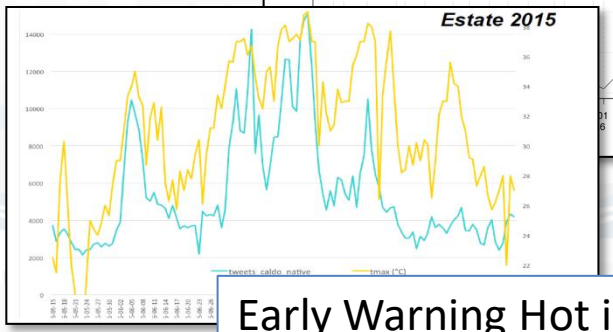


Early Warning Water Bomb



What-IF Analysis





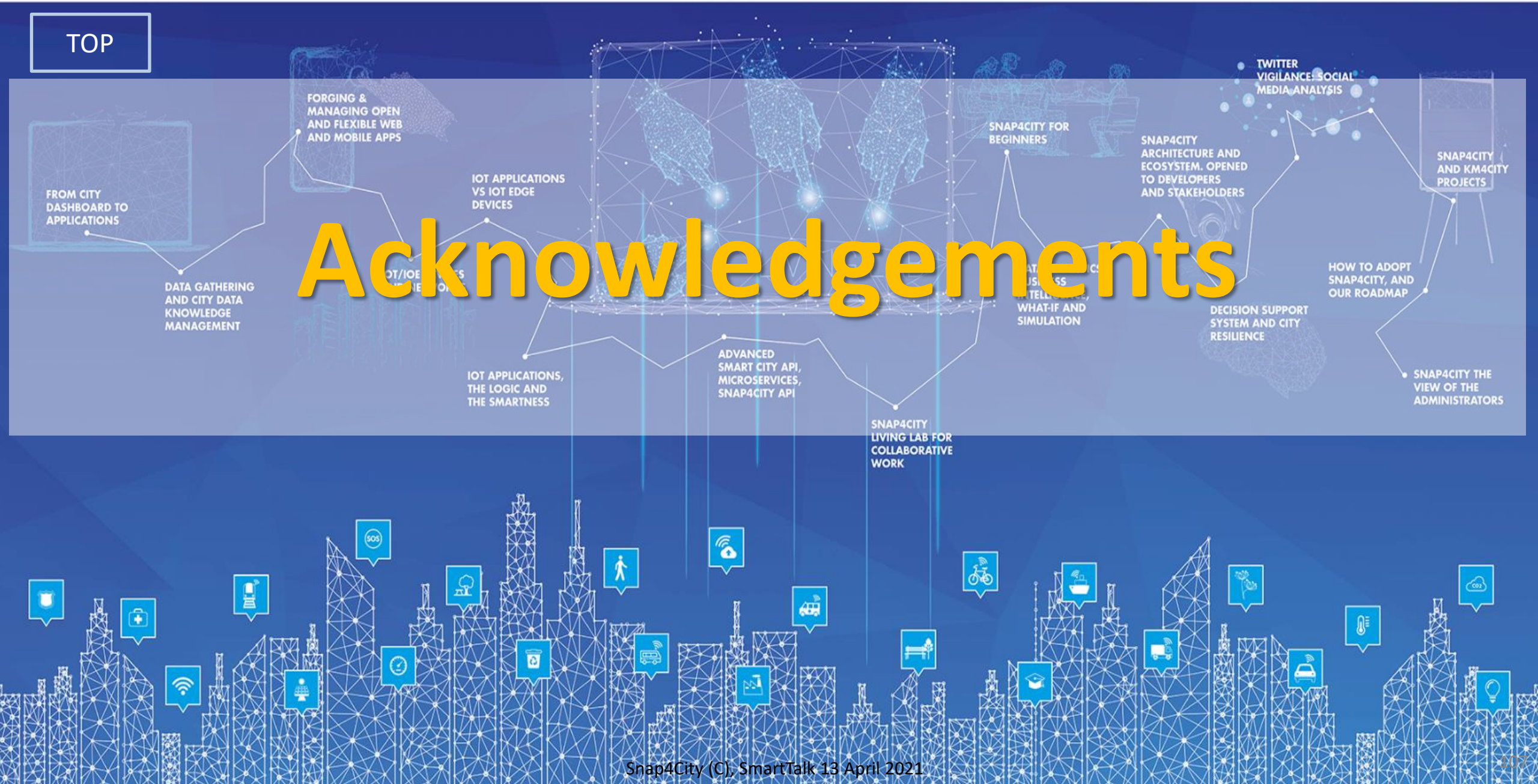
Early Warning Hot in Tuscany

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Disappearing Data Analytics

SNAP4CITY | KM 4 CITY

SNAP4CITY	Antwerp					Helsinki								Where				RULE OF THUMB
	City official	ICT official	Developer	Citizen, tourist, visitor	Business owner	City officials	City officials Domain experts	City officials City developers	Third party developers	Citizen	Citizens with respiratory problems	Tourists	Business owners	Mobile	MicroApplication	Tool, via Portal (ICT Developers)	Dashboards	Main Data Sources
Discovery near to me	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			POI, OSM
Discovery along a path	x	x	x	x		x		x	x	x	x	x		x	x			POI, OSM
Discovery in an area, shape	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		POI, OSM
browsing Public Transport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			OSM, GTFS
Full Text search	x	x	x	x	x	x		x	x	x	x	x	x	x		x		POI, OSM
Routing: pedestrian				x	x			x	x	x	x	x	x	x	x			OSM
Routing: pedestrian quite				x	x			x	x	x	x	x	x	x	x			OSM
Routing: private vehicles	x		x	x		x		x	x	x	x	x		x	x			OSM
Routing: Multimodal Public Transport				x					x	x	x	x		x	x	x		OSM, GTFS
heatmaps: weather (Temp, Humidity)	x	x		x	x	x	x		x	x	x	x	x	x			x	Sensors data, OSM
heatmaps: environmental variables, PM10, PM2.5, NO2, EAQI	x	x		x	x	x	x		x	x	x	x	x	x			x	Sensors data, OSM
heatmaps: environmental variables, Noise						x	x		x	x	x	x	x	x			x	Sensors data, OSM
heatmaps: safe on bike (Antwerp)	x	x		x	x									x			x	Spec. Portal
heatmaps: Enfuser prediction, PM10, PM2.5, AQI						x	x		x	x	x	x	x	x			x	Enfuser data
heatmaps piking values any place	x	x			x	x	x	x	x				x				x	Computed Heatmps
heatmaps: GRAL prediction, PM10						x	x		x	x	x	x	x	x			x	OSM, Traffic, Weather
Comparsison: Enfuser, Gral, Real Time						x	x										x	Enfuser, Sensors, GRAL
Sensors Data Time Trends, & drill down	x	x	x		x	x	x	x					x			x	x	Sensors data, OSM
Weather Forecast	x	x		x	x	x	x		x	x	x	x	x	x			x	Forecast Service
Origin Destination Matrices	x	x	x		x	x	x	x	x				x				x	Snap4City Mobile App
Typical trajectories	x	x	x	x	x	x	x	x	x				x			x	x	Snap4City Mobile App
Hot Area in the city	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	Snap4City Mobile App
Hot Places in Smart Zone	x	x	x	x	x									x		x	x	Snap4City PAXcounters
Services Suggestions on mobiles				x						x	x	x		x	x			Snap4City Mobile App
Alerts on critical cases: several variables	x			x	x	x	x			x	x		x	x				Sensors data, OSM
The most used services		x		x	x		x			x	x	x	x				x	Snap4City Mobile App
Twitter Trends Daily	x	x	x		x	x	x	x	x				x			x	x	Twitter Vigilance
The auditing of user and living lab		x				x		x								x		Snap4City Portal
Self assessment	x	x	x	x	x	x	x	x	x	x	x	x	x			x		Snap4City Portal
Trajectories reg from mobile PAX Counters	x	x	x			x	x	x							x		x	PAX Counters
Engagement real time assessment	x	x	x			x	x	x									x	Snap4City Mobile App



Acknowledgements

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

Km4City 1.6.4

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

E Ø 15 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

2017
- 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)

SIRIUS

5G (2018-21)
- 5G tech
- Energy
- Industry 4.0
- Synoptics

TRAFAIR CEF (2018-21)
- Traffic and Mobility Impact on Pollution
- NOX predictions

2019
EUROPEAN OPEN SCIENCE CLOUD

LAID Smart Bed (POR CreO, Regione Toscana)
- Smart Health

GREEN FIELD PEAS Soda4.0 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



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

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 Pilots
- Data Analytics
- Extended platform

JRC EUROPEAN COMMISSION



Winner of Select4Cities PCP

Winner of Open Data Challenge of enel X

PC4City (2020-21)
Monitoring Terrain

2021

JRC EUROPEAN COMMISSION

Smart Ambulance
(2021-22)

Enterprise
(2021-22)
Industry 4.0

Almafluida
(2021-22)

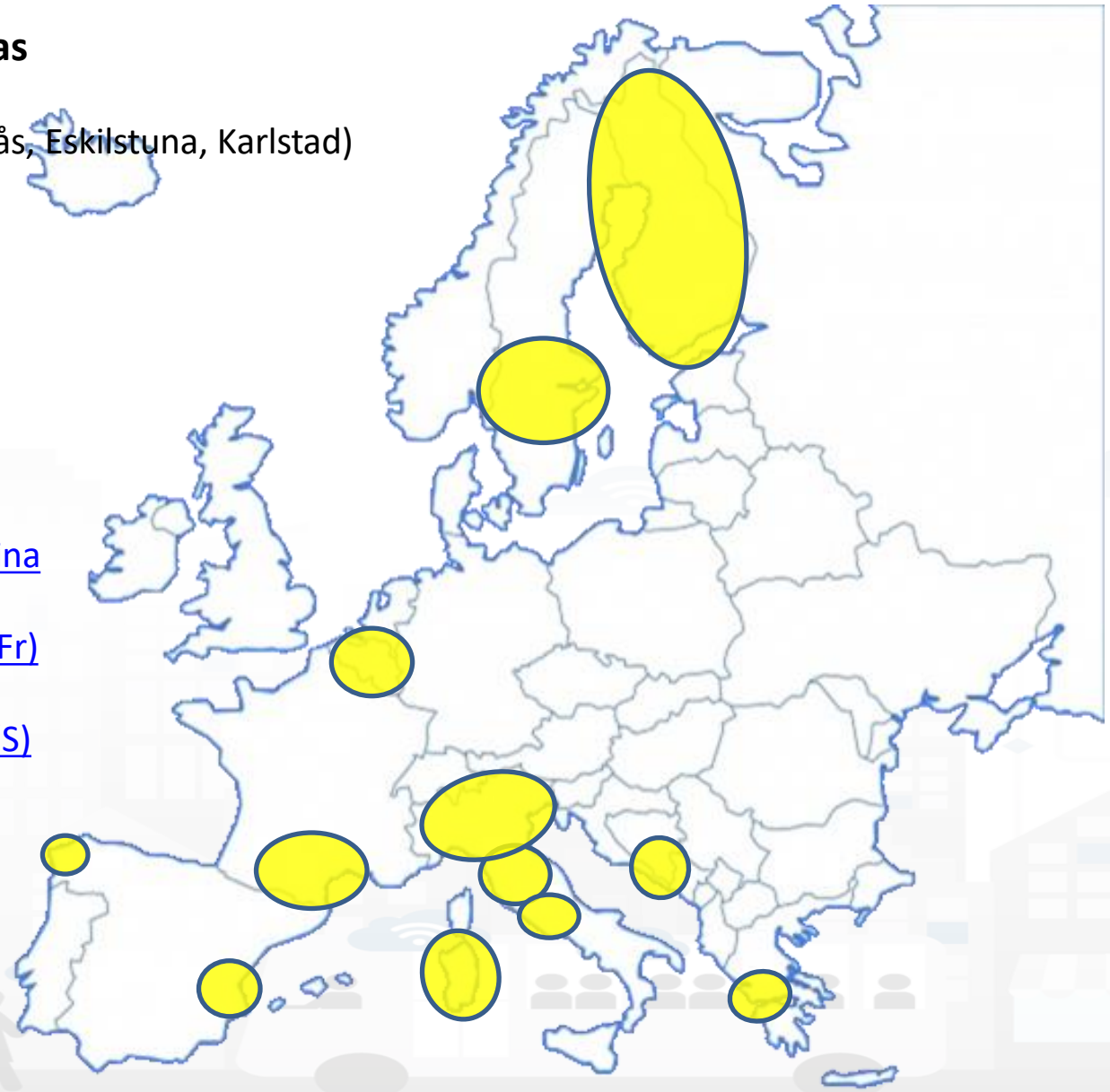
2022

AMPERE (2021-22)
Industry 4.0

Coverage 2020

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)



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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

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- **Km4City** *is an open technology and research line of DISIT Lab exploited by a number of projects. Some of the innovative solutions and research issues developed into projects are also compliant and contributing to the Km4City approach and thus are released as open sources and are interoperable, scalable, modular, standard compliant, etc.*

TOP

SNAP4CITY

KM 4 CITY

Be smart in a SNAP!



SNAP4
Appliances and Dockers
Installations

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