

**SCALABLE SMART ANALYTIC APPLICATION BUILDER FOR SENTIENT CITIES**



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

**DINFO**  
DIPARTIMENTO DI  
INGEGNERIA  
DELL'INFORMAZIONE

**DISIT**  
DISTRIBUTED SYSTEMS  
AND INTERNET  
TECHNOLOGIES LAB



# SNAP4CITY



Powered by

<https://www.snap4City.org>





- LOCAL GOVERN
- STAKEHOLDERS
- CITY USERS
- IN-HOUSE
- ENERGY OPERATORS
- MOBILITY OPERATORS
- COMMERCIAL OPERATORS
- SECURITY OPERATORS
- INDUSTRIES
- RESEARCHERS
- START-UPS
- ASSOCIATIONS



- GDPR
- SECURITY
- PRIVACY
- ASSESSMENT
- AUDITING

- OPEN HW/SW
- IOT EDGE
- IOT BUTTONS
- IOT DEVICES

## IOT APPLICATIONS • INSTANT APPS



PERSONAL DATA • DATA DRIVEN •  
REAL TIME - ANY PROTOCOL & FORMAT

## DASHBOARDS & APPLICATIONS



CONTROL ROOM • KPI • BUSINESS INTELLIGENCE •  
DECISION SUPPORT • WHAT-IF ANALYSIS

## MOBILE & WEB APPLICATIONS



DEV KIT • SUGGESTIONS • USER ENGAGEMENT •  
COWORKING • SMART APPLICATIONS

## MICROSERVICES & ADVANCED SMART CITY API

### LIVING LAB - DEV TOOLS - COWORKING



IOT DIRECTORY • SERVICE MAP •  
RESOURCE MANAGER • DATA GATE •  
R STUDIO • ETL

### BIG DATA ANALYTICS: AI, MACHINE LEARNING



SMART SOLUTIONS • PREDICTIONS • ANOMALY DETECTION •  
TRAFFIC RECONSTRUCTION • ORIGIN-DESTINATION MATRIX •  
SOCIAL MEDIA ANALYSIS • OFFER & DEMAND ANALYSIS •  
RISK & RESILIENCE ANALYSIS

### SMART MICRO-APPLICATIONS - OPEN TO EXTERNAL SERVICES



SMART PARKING • ROUTING • PERSONAL  
ASSISTANT • INFOMOBILITY • ALERTING •  
INFO TRIAGE

## KM4CITY DATA AGGREGATOR, KNOWLEDGE BASE OF THE CITY

OPEN DATA

GIS+MAP DATA

PROPRIETARY DATA

PERSONAL DATA

IOT / IOE

INDUSTRY 4.0

SOCIAL MEDIA



# *Standards and Interoperability*

**Compliant with:** AMQP, COAP, MQTT, OneM2M, HTTP, HTTPS, Rest Call, SMTP, TCP, UDP, NGSI, LoraWan, TheThingsNetwork, SigFOX, DATEX II, SOAP, WSDL, Twitter, FaceBook, Telegram, SMS, OLAP, MySQL, Mongo, HBASE, SOLR, SPARQL, EMAIL, FTP, FTPS, WebSocket, WebSocket Secure, ModBUS, OPC, RS485, WFS, WMS, ODBC, JDBC, Elastic Search, Phoenix, JSON, XML, GeoJSON, Enfuser FMI, Android, Raspberry Pi, Local File System, etc.





## Dashboard with intelligence

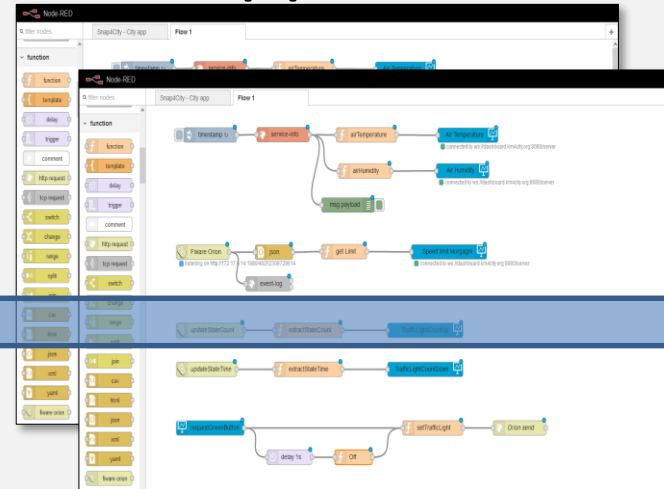


Dashboards with IOT Applications for enforcing data driven smart and intelligence into them

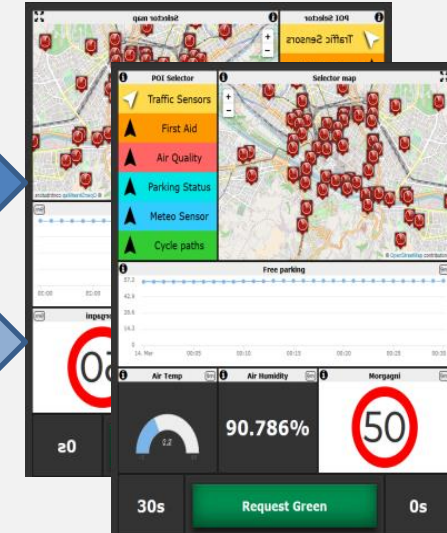
IOT and City data World



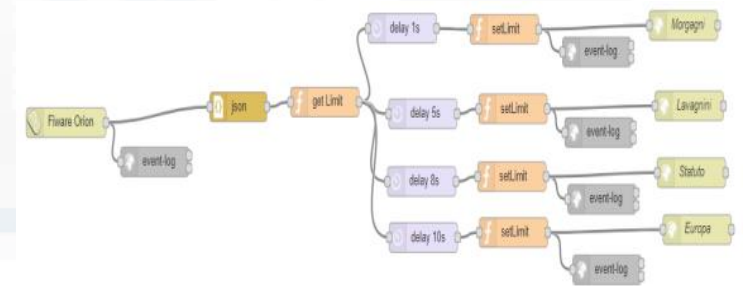
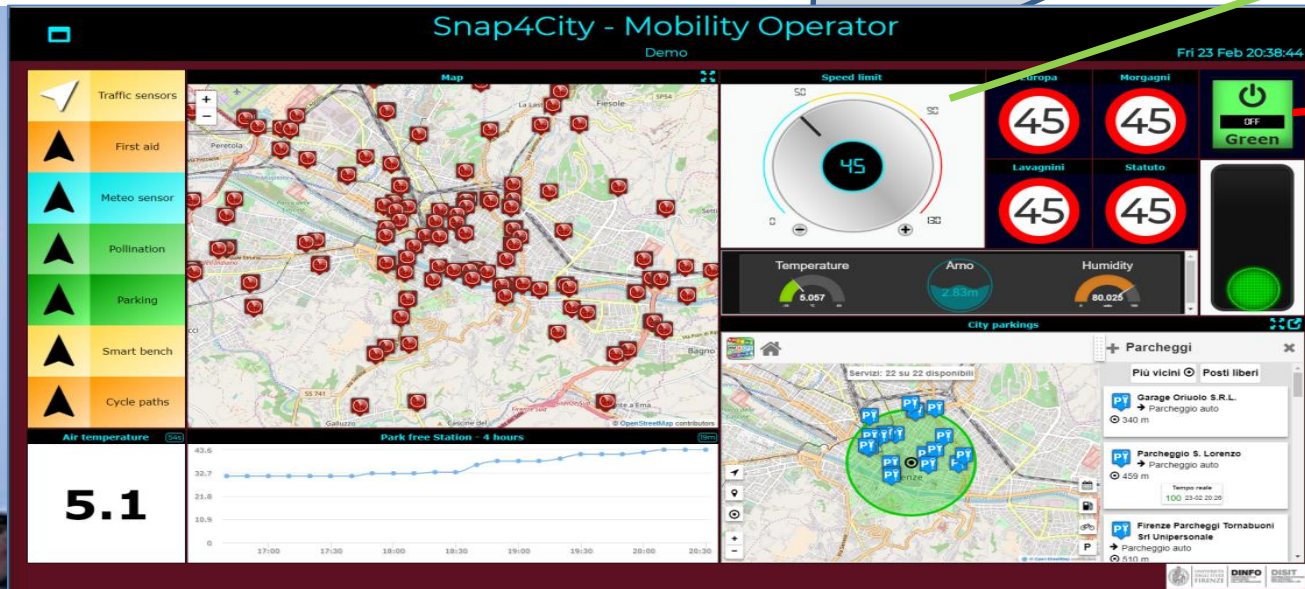
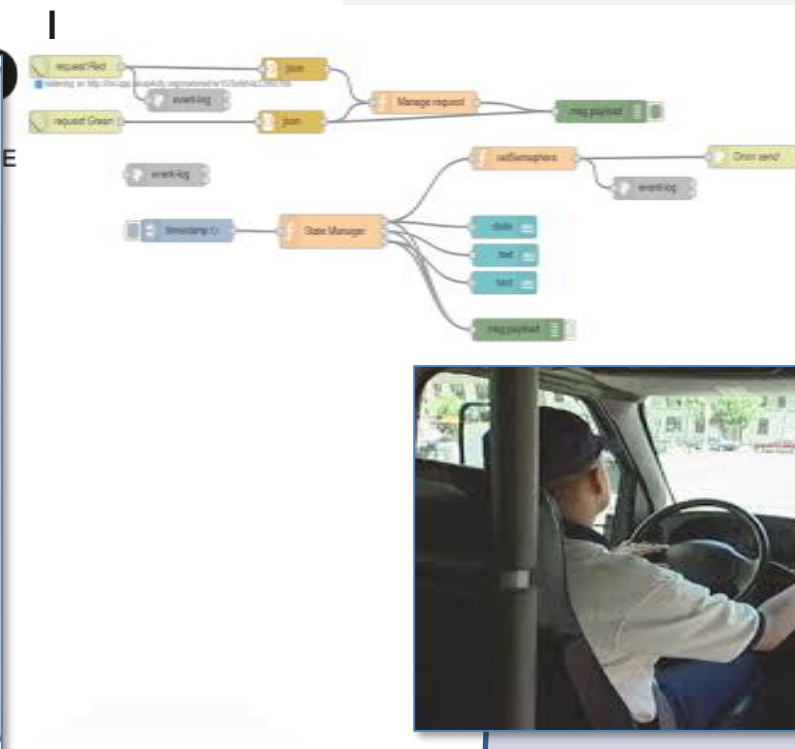
IOT Applications



Dashboards



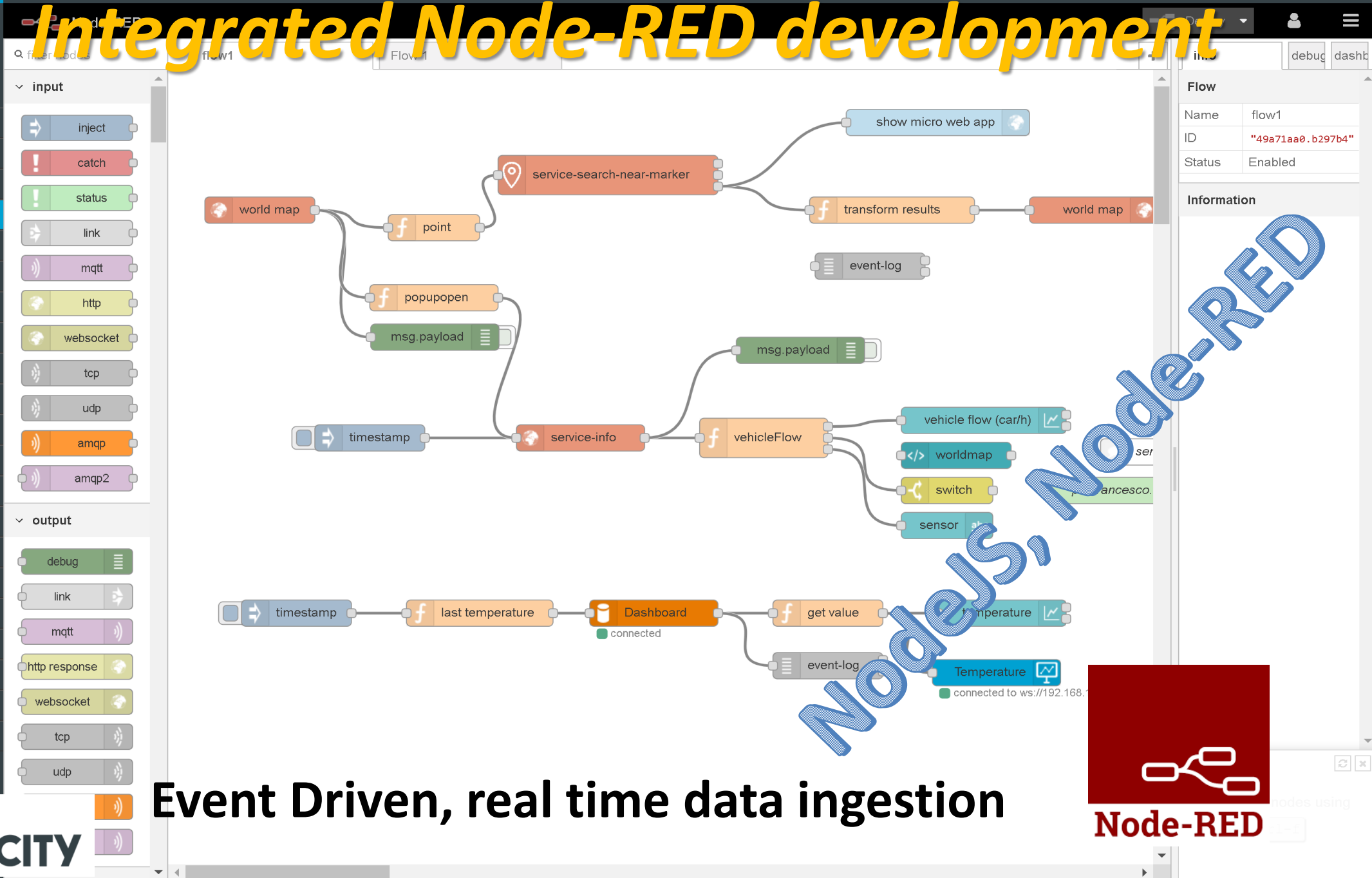
Applications



# Integrated Node-RED development

roottooladmin1  
RootAdmin | Idap

- Dashboards
- My Dashboards
- Notifier
- IOT Applications
- My Personal Data
- IOT Directory and Devices
- Knowledge and Maps
- Micro Applications
- External Services
- Data Set Manager: Data Gate
- Resource Manager: Process Loader
- Development Tools
- Management
- Settings
- User Management and Auditing
- Help and Contacts
- Documentation and Articles
- My Profile
- Snap4City portal
- Km4City portal
- DISIT Lab portal



Event Driven, real time data ingestion



input

output

function

social

storage

analysis

advanced

lwm2m

S4C SearchDev

S4C Mapping

S4C Management

S4C DataAnalytic

S4C BigData

S4C Search

S4C Data

S4C Dashboard

S4C Sigfox

S4C IoT

S4C LogDev

S4C View

S4C Social

location

dashboard

S4C SearchDev

service search

service search near gps position

service search near service

service search within gps area

service search within wkt area

service search within stored wkt area

service search by municipality

service search by queryid

service info dev

full text search dev

full text search within wkt area

full text search within gps area

full text search near gps position

full text search exp

event search dev

event search exp

event search within wkt area

event search within gps area

event search near gps position

address geometry search near gps position

address geometry search near gps position

geometry search near gps position

address poi search by text

address poi search by text exp

address poi search by text near gps position

bus routes search

bus routes search near gps position

bus routes search within gps area

bus routes search within wkt area

bus routes search within stored wkt area

tpl routes

tpl stops

S4C DataAnalytic

descriptive statistics

trend plot

time series predictions

machine learning predictions

anomaly detection

S4C BigData

datagate insert

datagate search

datagate create

S4C Mapping

service info mapped

mapping

set mapping

S4C LogDev

event log

S4C Management

check exist job

check exist trigger

is in standby mode

is shutdown

is started

get currently executing jobs

get job detail

get triggers of job

get job group names

get trigger group names

get paused trigger groups

get job fire times

get system status

pause job

pause jobs

pause trigger

pause triggers

resume all

resume job

resume jobs

resume trigger

resume triggers

notificator last events

notificator history events

S4C Search

service search near marker

service search within circle

service search within polygon

service search along path

service info

full text search near marker

full text search within circle

full text search within polygon

full text search along path

full text search u

event search within polygon

event search along path

event search usr

address search near marker

geometry search near marker

address poi search by text usr

address poi search by text near marker

address poi search by text within circle

bus routes search near marker

bus routes search within circle

bus routes search within polygon

tpl agencies

tpl lines

tpl routes by agency

tpl routes by line

tpl stops by route

tpl stop timeline

recommendatio within circle

value type search near marker

value type search within circle

value type search within polygon

value type search along path

S4C Data

get my data

get my delegator

get my delegated

get my activity

get other activity on my data

save my data

get my annotation

get anonymous data

get other data

S4C Sigfox

sigfox device filter

sigfox

S4C Dashboard

impulse button

numeric keyboard

switch button

dimmer

city dashboard

gauge chart

single content

speedometer

time trend

geolocator

bar content

column content

S4C IoT

iot directory

iot directory

iot directory link

iot directory link

fiware orion

fiware orion

orion test

fiware orion

Snap4all Button

S4C View

show micro web app

show general iframe

S4C Social

twitter last channel

twitter last tweet

S4CKPIData

get my kpdata

get my kpdata values

get public kpdata values

get delegated kpdata values

save my kpdata values

BASIC

ADV

<https://flows.nodered.org/?term=snap4city>



User: adifino, Org: DISIT  
Role: Manager, Level: 4

Your Level

Home / Tutorials and Videos / Welcome: how to start using Snap4City for beginners

## Welcome: how to start using Snap4City for beginners

## Snap4City developers suggest you reading:

You have already created a **Dashboard**. Now, you may decide to make it public (visible and accessible) to all on WEB, or to provide access in view to other specific users that you know by nickname. In addition, you can pass the **Ownership** of a **Dashboard** to some other user of the system, and you can clone the **Dashboard** as well. So that you can create **Dashboard** for other users as well. We suggest to test these functionalities since you can:

- access to Data Set **Manager** to upload/download, share data sets as files in CSV: [https://datagate.snap4city.org/ssologin\\_handler](https://datagate.snap4city.org/ssologin_handler)
- upload data for the **knowledge base** and **dashboards** via Data Set **Manager**,
- access and share of resources as: **dashboards**, **IOT Applications**, blocks, etc.; <https://processloader.snap4city.org/processloader/ssologin.php?redirect=page.php%3FshowFrame=false>
- access to help and contacts, FAQ, documentation and articles
- manage personal data: profile, IOT Sensors, **Annotations**, Personal Data, **Dashboards**.; <https://www.snap4city.org/drupal/myprofiledata>
- Auditing Access to My Data according to GDPR.

See this link to learn more about the possibilities:

[TC110: Dashboard delegation to access and passage of ownership, and/or cloning](#)

Exercises

SLIDES

If you are not registered please apply for a **free registration** from <https://www.snap4city.org> and then pass to ACCESS AT THE TOOLS and full Snap4City environment.

Snap4City puts in the hands of City Users a flexible environment to quickly create a large range of smart city applications/views exploiting heterogeneous data and services of stakeholders by IOT/IOE and big data technologies. For Snap4City, City Users can be citizens, students, operators, researchers, decision makers, developers, etc. see [Users' Roles on Snap4City](#).

- **Manager**: is a **final user**, has the capability of: accessing and creating Dashboards with a large set of data (high level types as: POI, sensors, KPI, micro applications, external services, etc.), attaching alerts and notifications; registering IOT Devices; creating IOT Applications exploiting MicroServices; loading and sharing data sets; managing personal data and annotations; full access to documentation, help desk, FAQ, coworking; managing personal profile and data according to GDPR; **NOTE**: accessible features are mainly visual and simple to understand and to use, and provide a limited number of parameters on each dialog and for each action. Default values of created elements can be changed editing elements.
- **AreaManager**: is a **Developer/researcher, students, city operator**, with additional capabilities with respect to the Manager to: register IOT Brokers; creating advanced IOT applications; create massive data transformation processes; create data analytics in multiple languages, testing and load them, create microservices; adding external services; sharing results, loading shapes; analyzing performance of the back office; **NOTE**: technical views and details are fully accessible

## Suggested Activities to be performed to learn HOW to use Snap4City:

This page would guide you along few steps to see how the solution allows you to incrementally pass from **Level 0** to 5, from a **Manager** to an **Area Manager**:

- **Level 0 user**: access at data/services views of the city by using public Dashboards; (Public User) [\(overview on dashboards\)](#)
- **Level 1 user**: create personal/professional views/dashboards on data: (Manager) [\(see what a Manager can do\)](#) [\(see how Dashboards can be created\)](#)

Full Search

Search

Search

## Organization Groups

DISIT

- Operative

## Recent comments

- 1 month 6 days ago

## Recent content

Ti Suggestiamo come realizzare la tua prima Dashboard (Step 1) [new](#)  
roottooladmin1

Benvenuto al nostro Sindaco ed al suo Team [new](#)  
roottooladmin1

We suggest to Antwerp Developers: How to manage my Dashboards

Your Org

Last Art.

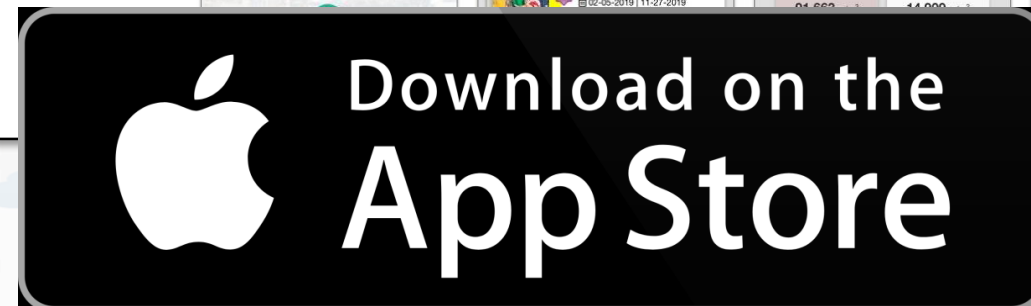
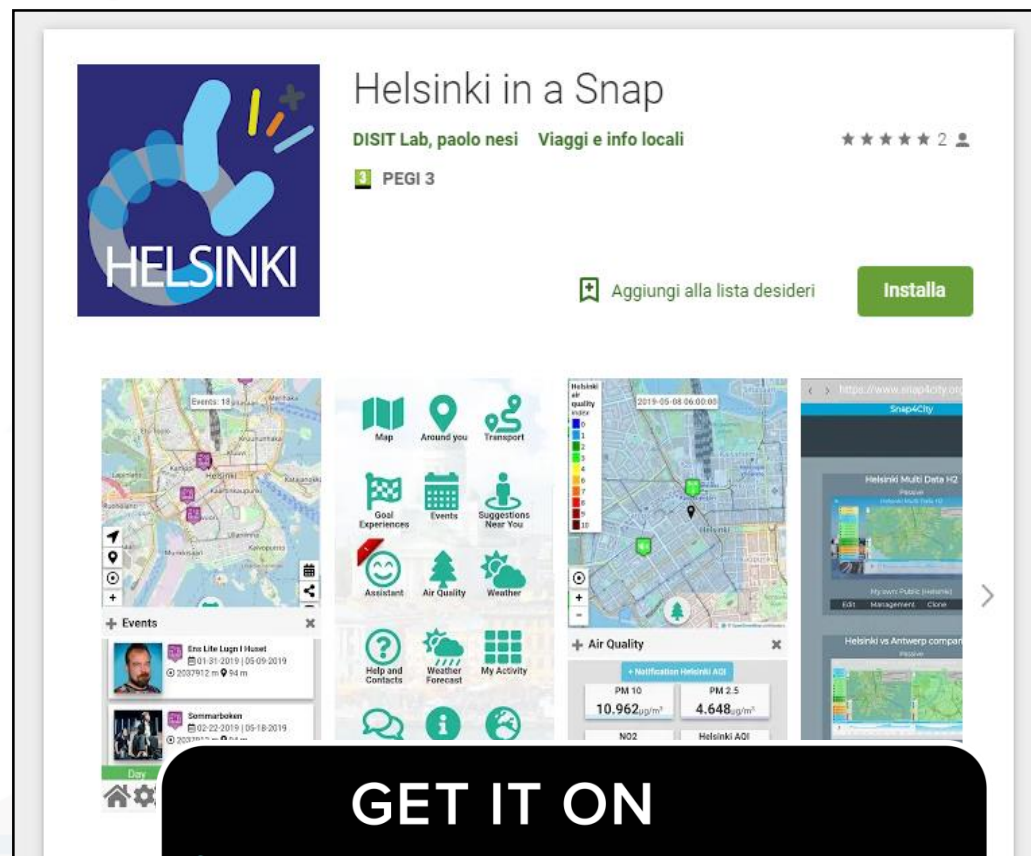
News

Flyer

VIDEOS

All Tools

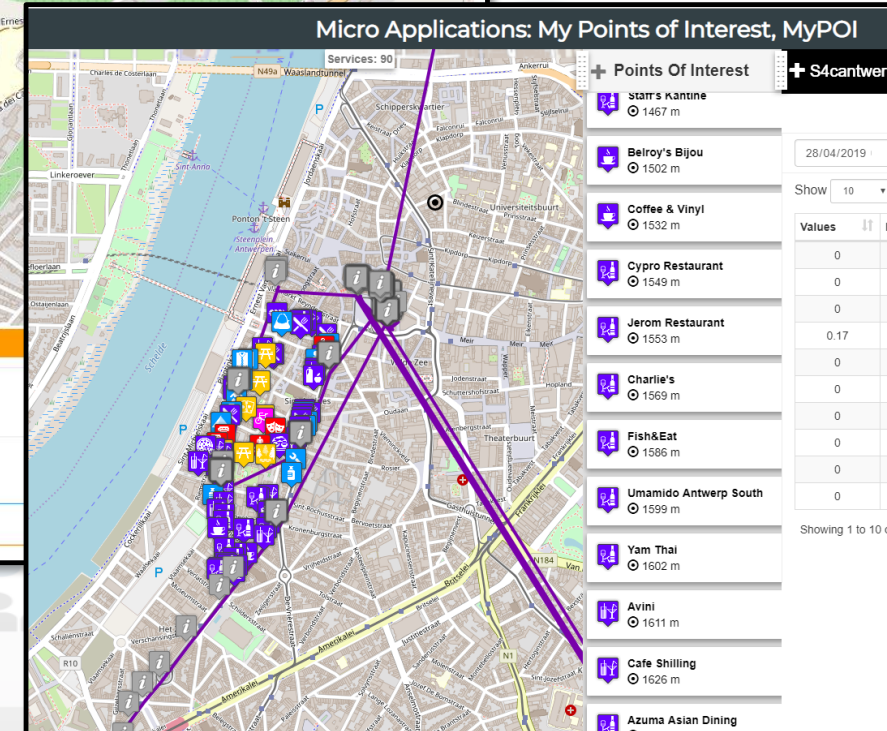
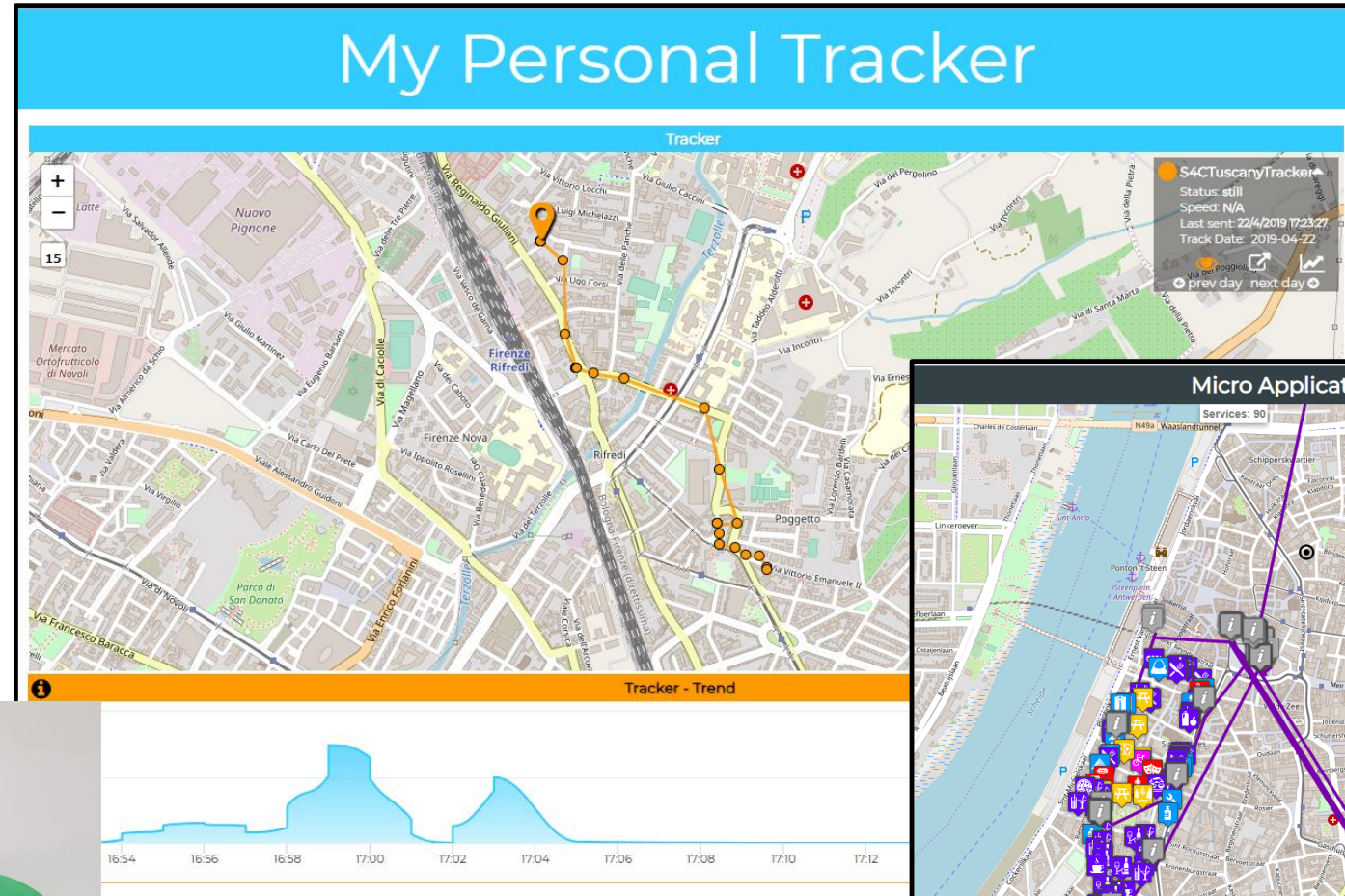
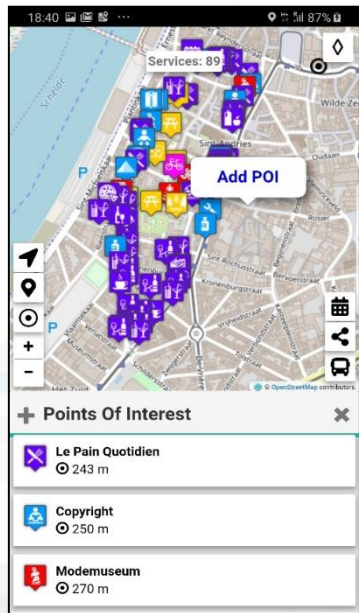
# 2 professional Mobile Apps on 2 platforms:





# Tracking of Devices and Mobiles

- Real Time Trajectories for Mobile and Moving IOT Devices
  - Multiple tracks
  - Day by day
- Micro Application





# Main Projects/Pilots

## Projects

**SELECT**  
for Cities



**Green Impact**

- Sii-Mobility → DISIT (mobility and transport)
- REPLICATE → DISIT (ICT, Energy, IOT)
- RESOLUTE → DISIT (Resilience, ICT, Big Data)
- GHOST → UNICA (strategies, smart city)
- TRAFair → UNIMORE, DISIT (environment & transport)
- MOSAIC → DISIT (mobility and transport)
- WEEE Life → DISIT (waste, environment)
- Smart Garda Lake → Castelnovo del Garda
- 5G → DISIT (Industry 4.0 vs SmartCity)
- Green Impact → DISIT (Industry 4.0)
- PISA Agreement → data aggregation