



# HELSINKI LOVES DEVELOPERS: IOT PLATFORMS BOOSTING THE SMART CITY DEVELOPMENT

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**FORUM  
VIRIUM  
HELSINKI**

# SELECT

for Cities



**Cities as linked and large-scale Internet of Everything (IoE) labs**



This project has received funding from the EU's H2020 Research & Innovation Programme under GA 688196.

# The Project Setup

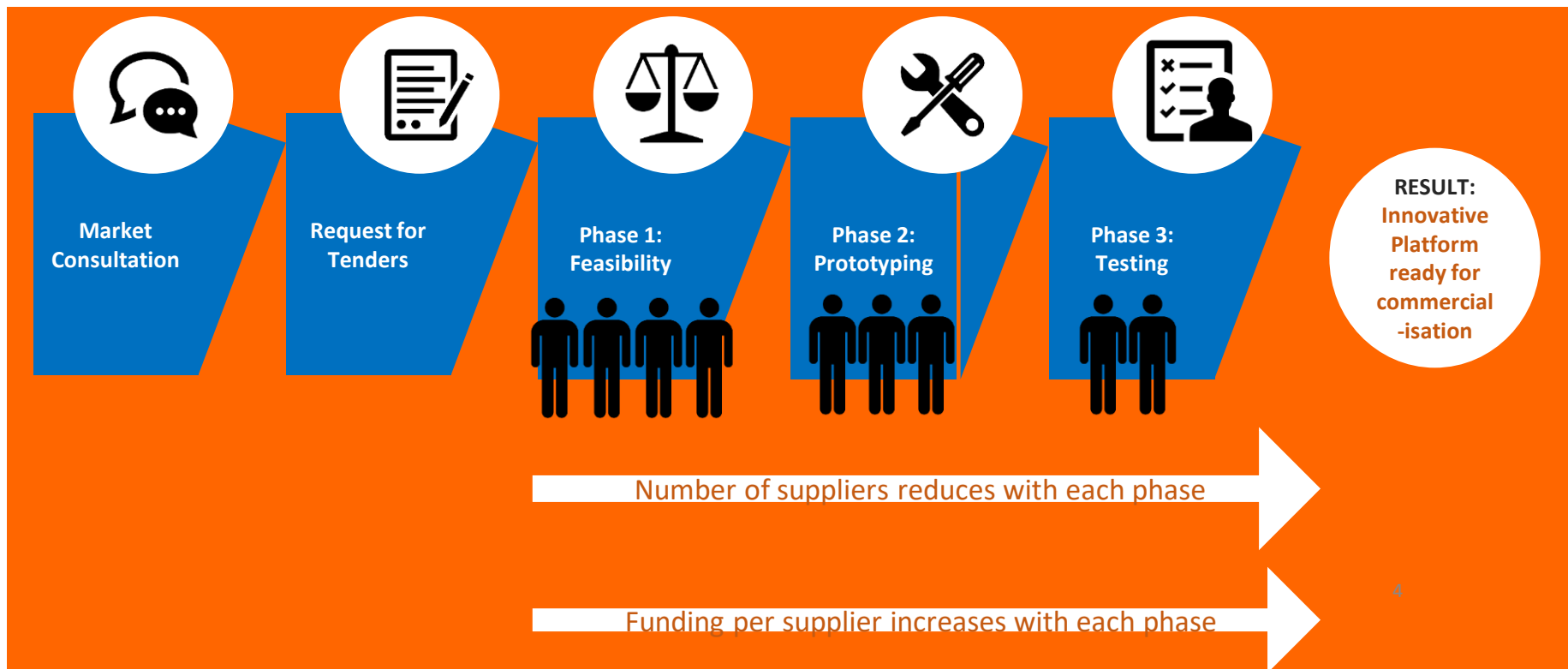
- Project coordination: Forum Virium Helsinki
- Lead Procurer: Digipolis, Antwerp, Belgium
- Buyers Group: Forum Virium Helsinki, Digipolis, City of Copenhagen
- Preferred partners:
  - City of Antwerp
  - Imec, Living Lab Expert, Belgium
  - 21C - UK



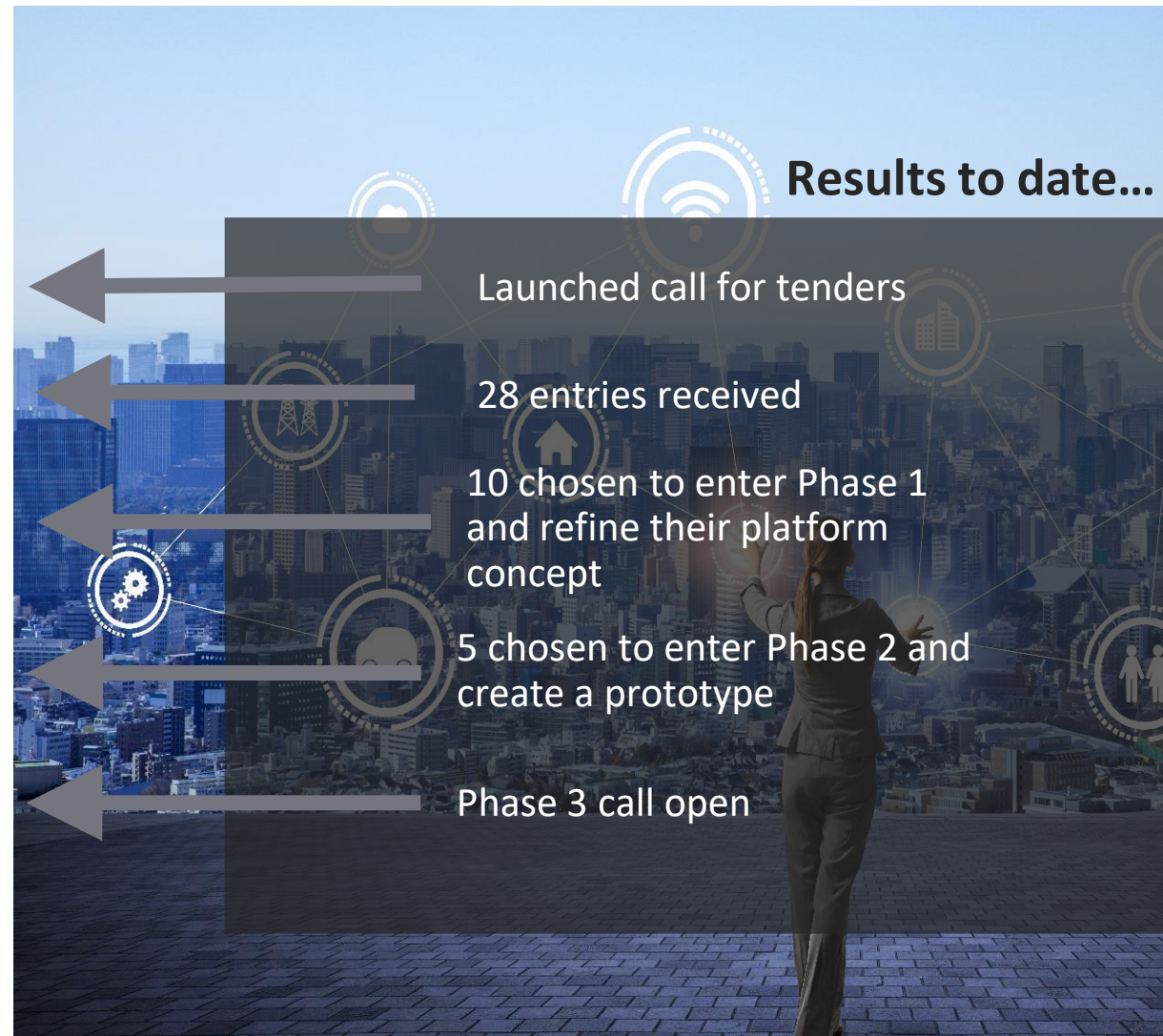
Duration: 48  
months  
Budget: 5.6 million EUR

[www.select4cities.eu](http://www.select4cities.eu)

# Pre-Commercial Procurement (PCP) Enables **Competitive Research and Development** of the Innovation Platform







# Smart City IoE Platform



Cloud Enabled



User Centric



Co-Created



Data-Driven

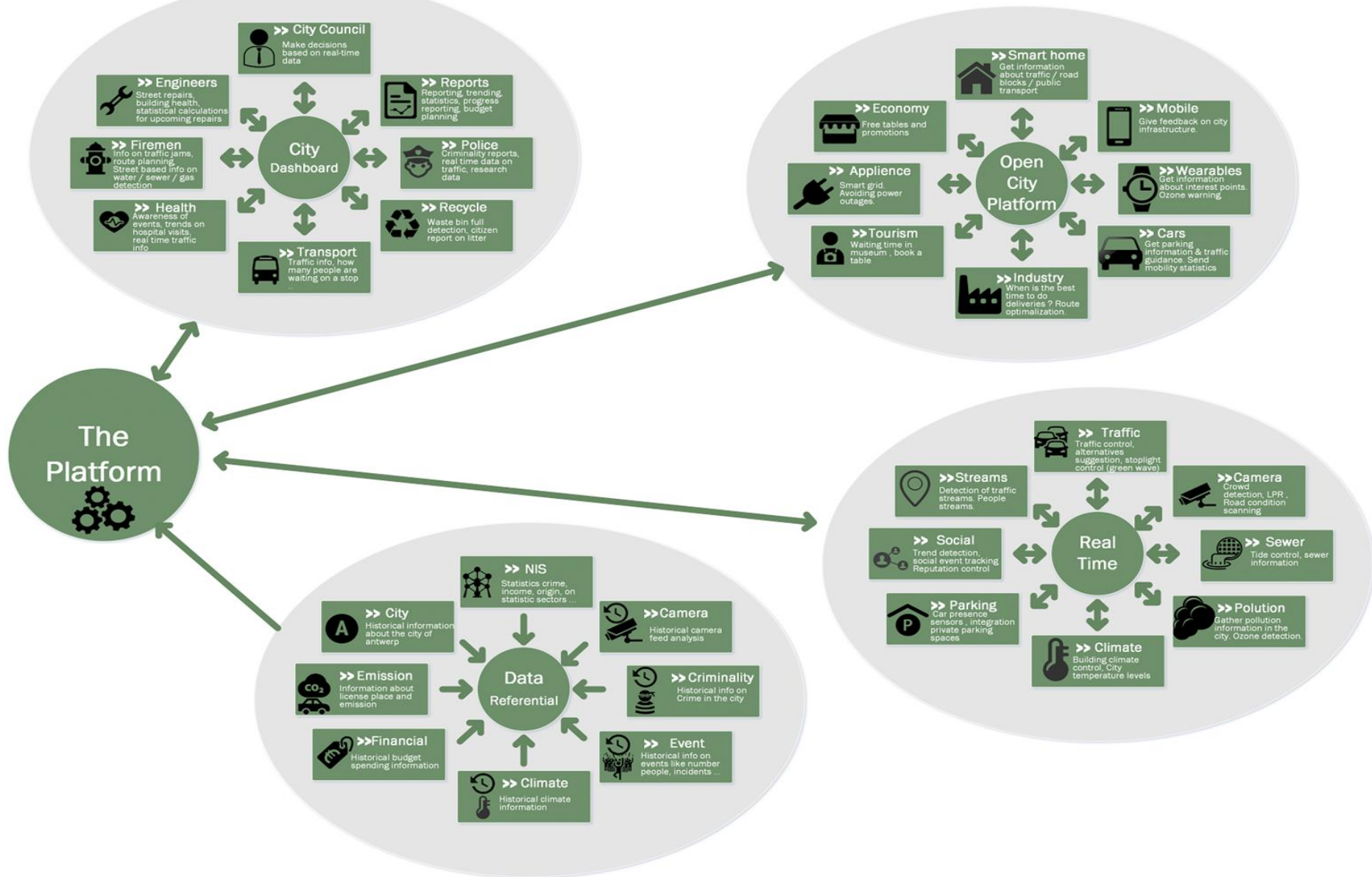


Open Source

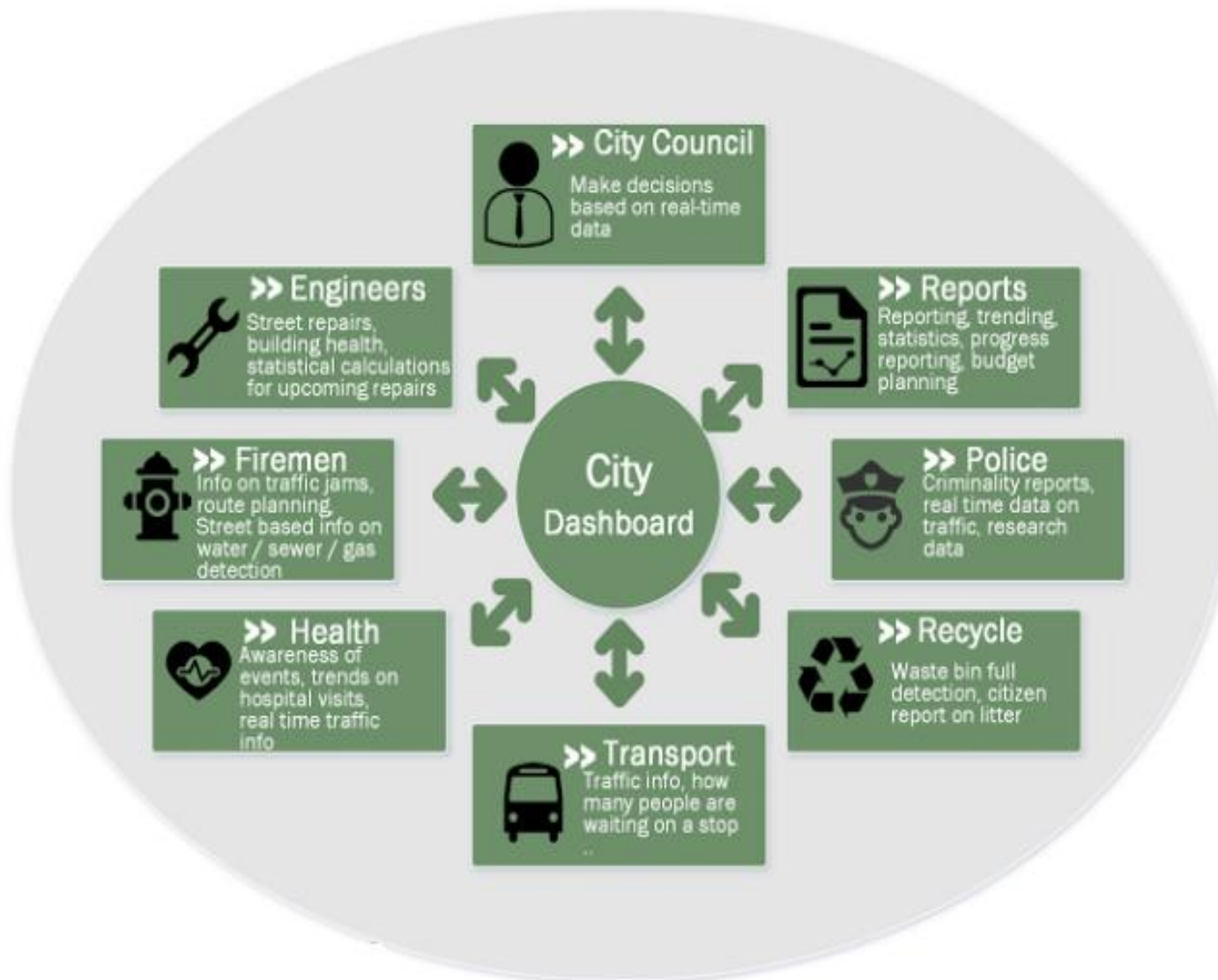


Service Oriented

# Select4City

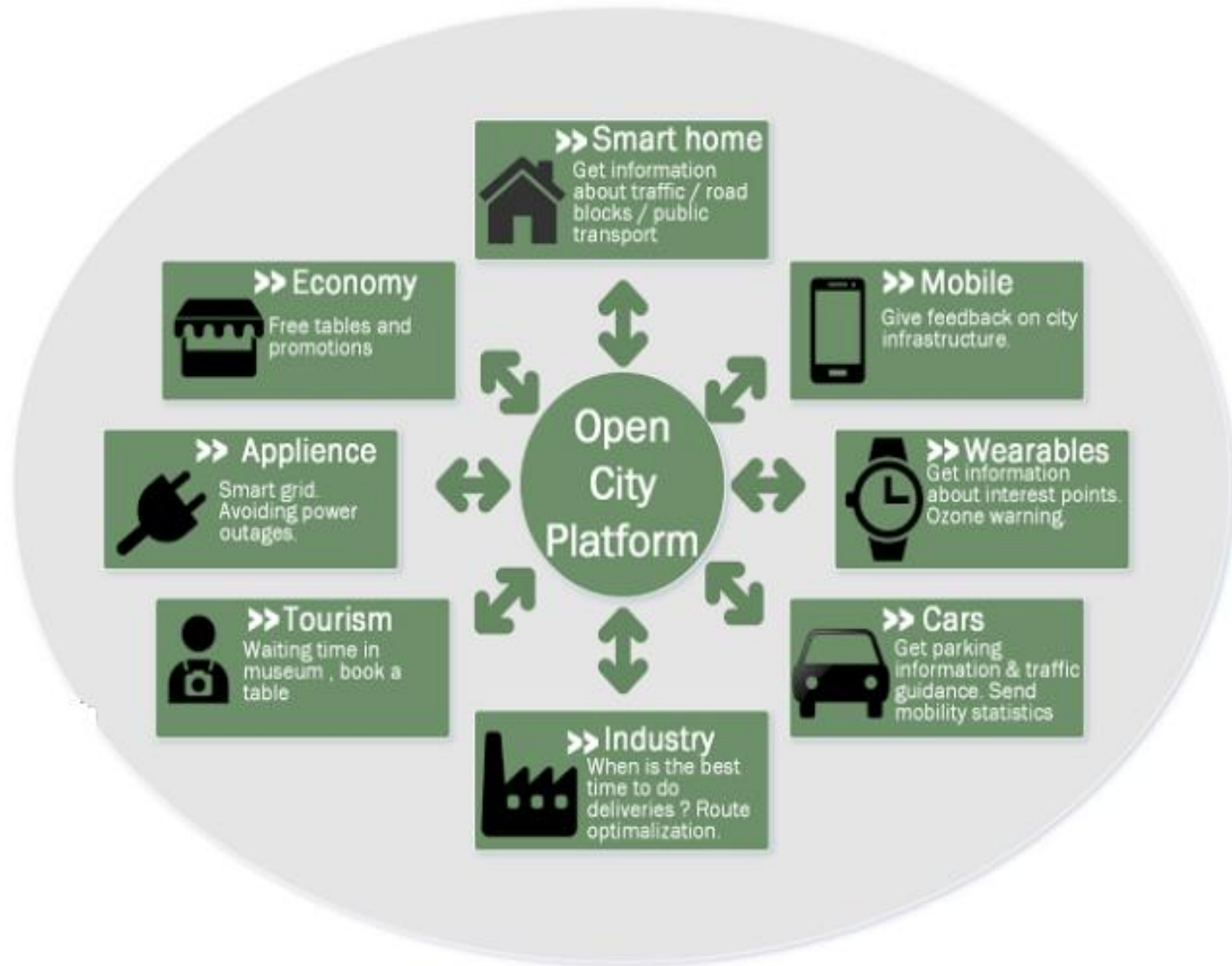


# City Dashboard

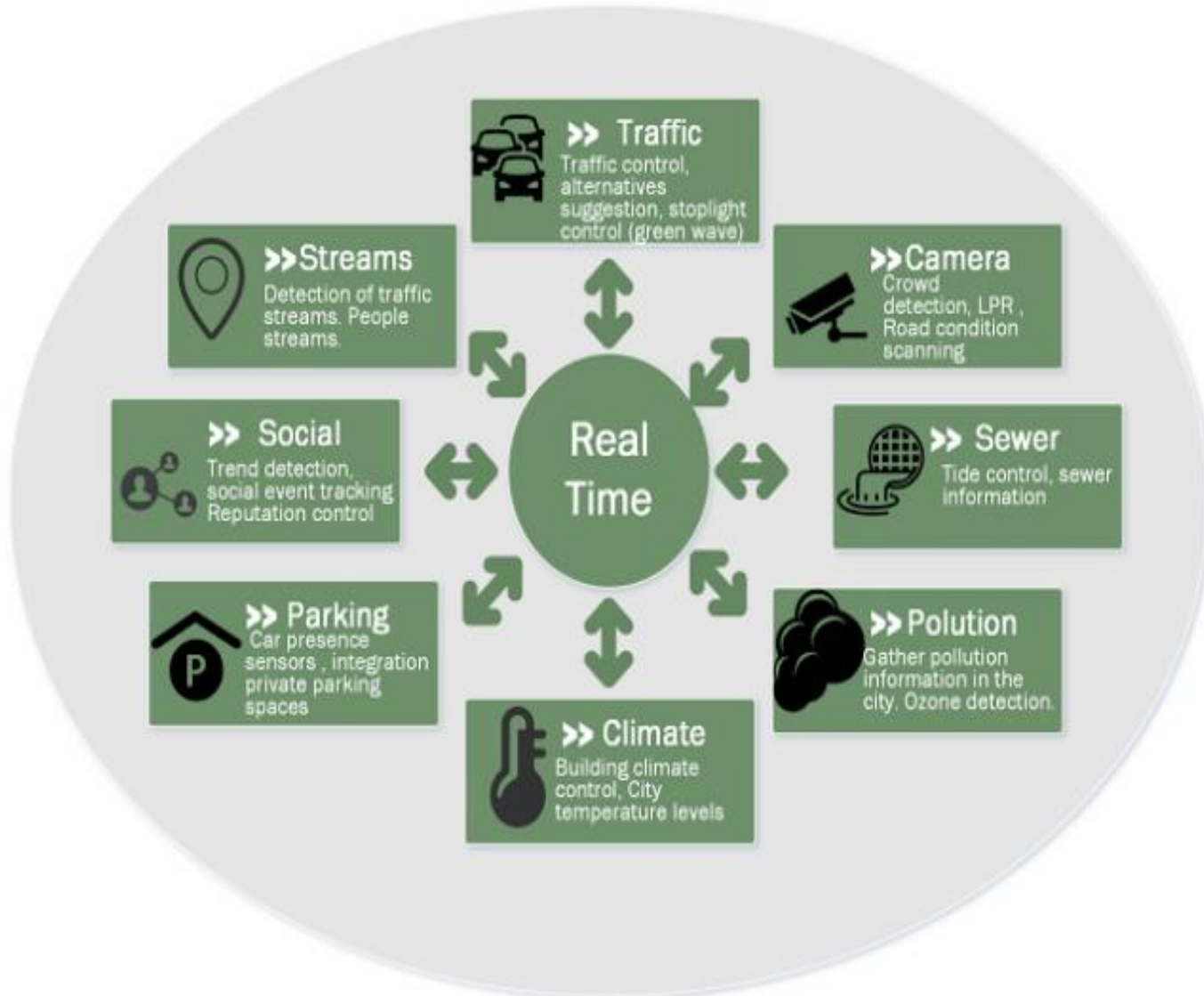




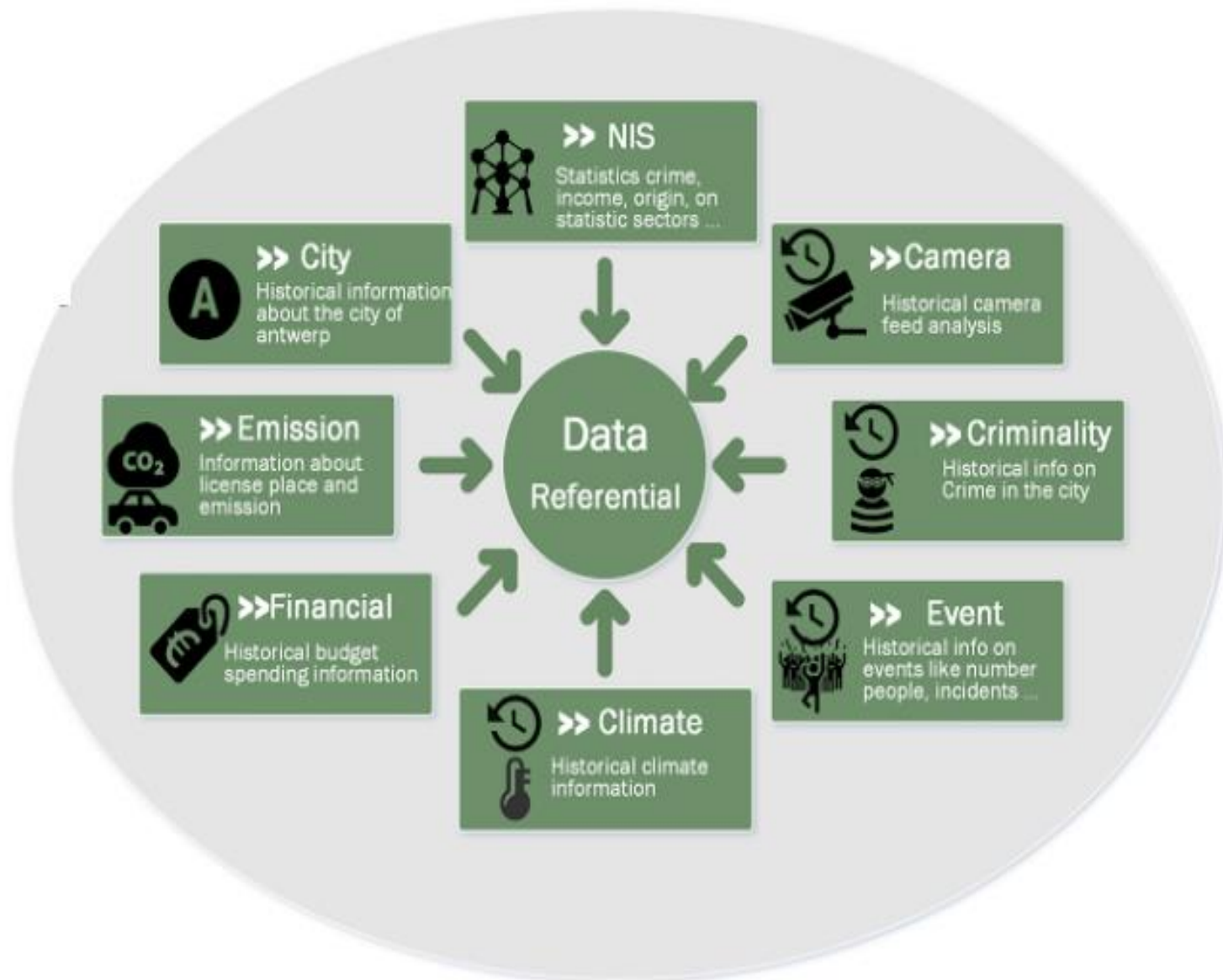
# Open City Platform



# Real Time Communication



# Data Referential



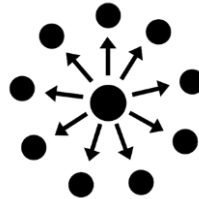
# Quality Requirements



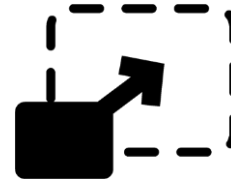
Distributed  
& Decoupled



Interoperability



Scalability



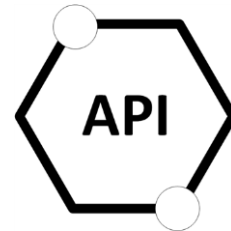
Pluggable



Legacy &  
heterogeneous



Robustness



Openness



# Phase 3 - Living Labs inside Cities

Improve proposed solutions  
by actively involving users  
through real-life intervention

- Beyond prototype, **real-life** validation: a mature proof of concept that can run in a semi-commercial setting
- Demonstrate these solutions' capacity to allow a **user-centered management of personal data**
- Simultaneous and **iterative** testing in two cities
- Validated with **stakeholders** for different use cases in each city

## Living Lab Stage



Iteration 1: Living Lab  
preparation stage  
(01/11/2018 -  
18/01/2019)

- technical integration
- co-creation and preparation

Iteration 2: Living Lab  
Developer Stage  
(21/01/2019 -  
12/04/2019 )

- co-design by developers

Iteration 3: Living  
Lab End user stage  
(30/04/2019 -  
02/09/2019)

- testing and validating by end users
- lessons learned and final reporting

## Multi-method:

- Innovatrix co-creation workshops
- Surveys
- Focus-groups
- Interviews
- “hard-data” collection/analytics (usage, number of users, time spent on platform, pages consulted, ...)



# Helsinki large scale pilot

- Focus is on air quality in the actively developing areas
- Context: The Jätkäsaari area, due to its current and future development (former logistic port turning into new area) has and will face many environmental challenges.
- Multiple data sources, e.g. ENFUSER, HSY, crowdsourced (sensors at citizens' balconies)
- Cooperate with other projects and installations, (e.g. Crusell Bridge, movable pylons, HSY, plenty of them will be launched 2019) and smart mobility lab
- Aim: create platform that integrates many data, provides tools for analytics and new services to:
  - get easy and quick access to information about air quality
  - reveal dependencies between activities and air quality (e.g. construction work)
  - make short and long term predictions of impact from human activities on environmental change



# Helsinki use case actors

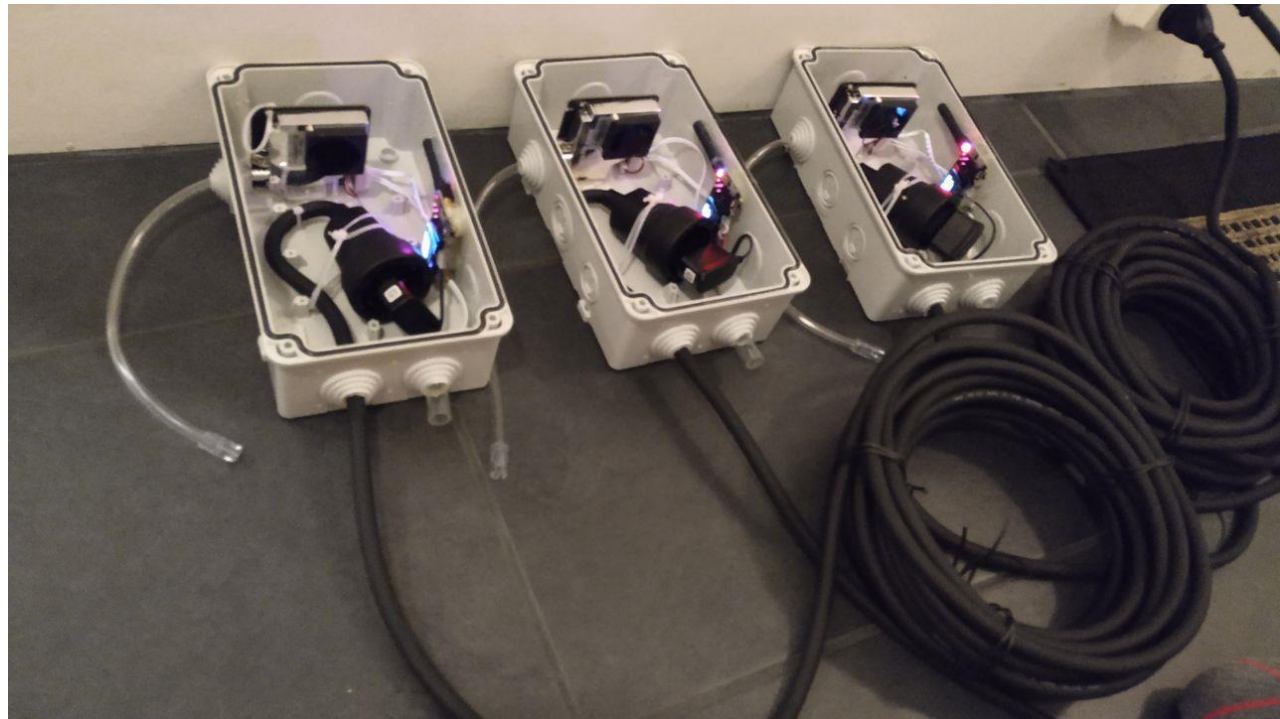
- City officials :
  - dashboard to control and steer the city
    - *snapshot*: current state air quality
    - *historical state*: knowledge on history of air quality
    - *analysis*: visual information about correlation air quality with main influencers
    - *forecast*: forecast air quality in certain area's
    - *impact*: knowledge on how different actions impacts air quality
- Domain experts: work on specific projects
  - *specific impact*: specific ontologies for their project
  - *analysis of specific impact*: specific analytics in relation to their project
- Developers: create apps based on data via the platform and builds services on top of the platform
- Citizens, visitors, tourists
- Business owners

# Helsinki use case in a nutshell

- Increase sources of air quality data
- Increase quality of data
- Validate and benchmark existing systems, ENFUSER
- Create really useful apps, services that are using air quality data
- Create precedents and work flow for crowdsourcing of air quality data
- Involve different user groups: City officials, domain experts, citizens, people with respiratory problems, tourists, business owners, visitors, Smart lab experimentators

# Real time data

- Sensors in info pylons
- Sensors on citizens' balconies
- Sensors nearby construction sites
- Sensors from other projects/installations



# Expected outcomes

Pollution models

Improved ENFUSER  
model

What-if: impact of  
construction

Mobile app:  
monitoring, routing,  
around...

Sensor network  
planner

Ecological watch



# Platform Concept - Engineering



## City Enabler (CE)

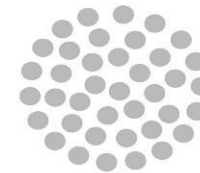
- ✓ Builds on previously developed competences and assets e.g. FIWARE Generic Enablers and Knowage Suite
- ✓ Innovates in the areas of geospatial data visualization dashboards, and data analytics with batch and real-time processing supporting decision making by adopting a container and microservice-based architecture.
- ✓ CE will be enhanced with ground-breaking components for supporting the EU GDPR.



# Platform Concept - Indra

## IoE Platform

- ✓ Provides an API manager where vertical solutions can publish their interfaces as well as explore and discover other vertical solutions APIs
- ✓ Fault tolerant – e.g. the failure of a module will not affect others. Failures will be detected in advance
- ✓ Supports several storage engines simultaneously. A data abstraction layer allows to query in a parallel way across all databases with a single request and obtain a single merged response



**indra**

# Platform Concept University of Florence



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

**DINFO**  
DIPARTIMENTO DI  
INGEGNERIA  
DELL'INFORMAZIONE

**DISIT**  
DISTRIBUTED SYSTEMS  
AND INTERNET  
TECHNOLOGIES LAB

## Snap4City

- ✓ Quickly creates a large range of smart city applications exploiting heterogeneous data and stakeholder services enabled by IOE tech and big data analytics
- ✓ Mixes data driven, stream and batch processing; fully based on microservices using easily replaceable tools
- ✓ Innovative aspects relate to semantic computing and search information, resources management, parallel and distributed entities for discovering data based on microservices and external services, plus dashboard and development tool kits



Effective  
Knowledge s.r.l.



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FIRENZE  
APRI-OFF APPROVATO



UNIVERSITÀ DEGLI STUDI DI MILANO

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for Cities

## Events

Engineering	Indra	UoF
<p><b>City:</b> Helsinki</p> <p><b>Date:</b> 14th March 2019</p> <p><b>Event:</b> <a href="#">Hackathon</a></p> <p><b>Organizer:</b> <a href="#">Aalto University/CKIR</a></p> <p><b>Contact info:</b> <a href="mailto:ckir-biz@aalto.fi">ckir-biz@aalto.fi</a></p>	<p><b>City:</b> <a href="#">Helsinki</a></p> <p><b>Date:</b> 27th February - 13th March, registration closes 13th March <i>21st March - 29th March</i> - Create your solution onto Helsinki platform environment <i>2nd April</i> Developers present their solutions and winners will be announced</p> <p><b>Organizer:</b> MINSAIT and Indra</p> <p><b>Contact info:</b> <a href="mailto:support.helsinki4cities@onesaitplatform.com">support.helsinki4cities@onesaitplatform.com</a></p>	<p><b>City:</b> Online (<a href="http://www.snap4city.org">www.snap4city.org</a>)</p> <p><b>Date:</b> 21st January 2019 to 15th March 2019</p> <p><b>Event:</b> Hackathon</p> <p><b>Organizer:</b> University of Florence</p> <p><b>Contact info:</b> <a href="https://www.snap4city.org">https://www.snap4city.org</a></p>





# Hackathon for City Enabler

- Organised by Aalto University [Center for Knowledge and Innovation Research \(CKIR\)](#) together with [Forum Virium Helsinki](#)
- One-day hackathon on 14th of March in Otaniemi campus
- To develop applications for innovative urban IoE-based (Internet of Everything) services for Helsinki
- For individuals or with a team (max 5 people).
- Working on two real-life use cases from Helsinki, using the [City Enabler](#) platform as a starting point.
- Prizes:
  - 1st prize: 1000€
  - 2nd prize: 500€
  - 3rd prize: 300€
  - The prizes will be given as Amazon gift cards.
- Location: Väre building, class room L208, Otaniementie 14, Espoo
- Event page: <https://www.aalto.fi/events/hackathon-for-select-for-cities-internet-of-everything-ioe-city-enabler>
- The demo video that shows the City Enabler platform: <https://www.youtube.com/watch?v=WPC5JkS0aIM>
- For further information, send your contact details (name and email) to [ckir-biz@aalto.fi](mailto:ckir-biz@aalto.fi), also to receive link to registration.



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## Hackathon for Minsait – An Indra Company

- Participants will compete by developing a prototype using Onesait platform capabilities to improve Helsinki's Jätkäsaari area.
- Information event: 7. March, 14:00 at VTT Micronova, Tietotie 3, Espoo, Small Meeting Room.

Remote participation: <https://global.gotomeeting.com/join/165075445>

- Registration by: 13. March
- Selection of best ideas for challenge: 20. March
- Challenge: 21-29. March
- Presentation of awards: 2. April
- Prizes: 500€ (3<sup>rd</sup>), 1500€ (2<sup>nd</sup>) and 3000€ (1<sup>st</sup>)
- Contact: [support.helsinki4cities@onesaitplatform.com](mailto:support.helsinki4cities@onesaitplatform.com)
- More information: <https://challenge4cities.onesaitplatform.com>
- Information on the platform: <https://onesaitplatform.atlassian.net>
- Access to the Helsinki platform: <http://helsinki4cities.onesaitplatform.com/>
- Demo: <https://youtu.be/4YhrjGJI2mM>



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# Hackathon for University of Florence

Constantly looking for **innovative ways** to live more responsibly and we think that a project on sustainability, sharing, collaboration, could concretely improve people's lives and help build the planet in which we would like to live.

- The hackathon is taking place from January 21 to March 15. All the projects will be hosted by Snap4City.org.
- Registration opens on January 21 Registration closes on March 13 for final hackathon submission.
- Three challenges / prizes on Sentient Smart Cities and IOT 29,000 euros of awards
- Participants individuals, teams, companies (only small businesses). Three winning teams will be identified
- On March 15 the jury will communicate the finalists, while the final classification and thus the winners will be communicated on Antwerp and Helsinki, respectively, where the finalists will be requested to present their projects to the audience.
- The final **winning teams** will be awarded a **prize of 7,000 euro each**, the seconds prize is 3,500 euro, the thirds is 1,500 euro.
- The the fast rabbit submission has been awarded with a **prize of 5,000 euro**.
- **Demo:** [https://youtu.be/\\_juJhr-H-Ds](https://youtu.be/_juJhr-H-Ds)



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## In Sum: for Developers

- Free space for experiment - 3 data-driven, Internet-of-Everything (IoE) platform for large-scale urban co-creation
- Fully functional, well equipped Living Lab
- Access to data, working with real data from sensors, support for data sources
- Well defined use cases
- Full support from our Contractors while developing
- Be the first to use our Real-time data sources
- APIs to access/connect devices
- APIs to add/manage data sources
- Tools to create and add their own APIs
- Tools, instruments: widgets, security, ontologies, dashboards
- The opportunity to test IoE platforms before they are on the market
- Open source



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