



"Linked Open Apps Ecosystem to open up innovation in smart cities"

Project Number: 297363

Deliverable:	D3.5 Required Public space infrastructures to meet Cities priorities and use cases scenarios
Version:	1.1
Delivery date:	25/01/2013
Dissemination level:	PU
Authors:	CISCO, FRAUNHOFER, RETEVISION

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise.

Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Summary

This document presents the required public space infrastructure requirements to be able to execute the iCity 'open infrastructure' use cases.

The infrastructure requirements are related to the infrastructures that the cities **decided** to open up *until now*; it does not cover all potential infrastructures that the cities *might* open up. The cities prioritization of use cases still needs to happen based on the developer feedback.

Document Contributors

Partner	Contributor
CISCO	Frank Van Steenwinkel
FRAUNHOFER	Yuri Glickmann
RETEVISION	Elena Villa

Executive Summary

Linked Open Apps Ecosystem to open innovation in smart cities – iCity – aims at making a step forward in fostering the co-creation of services of public interest by 3rd parties (developers, SMEs, ...) that are pushing for their space as service providers in Smart City urban spaces.

The project responds to the growing demand from social stakeholders to provide services of public interest based upon the exploitation of available public information, digital assets and infrastructure. In doing so, the concept of Open Data is encompassed within a novel approach of Open Infrastructures where the municipal ICT networks already deployed in urban spaces will be made available and accessible to open innovation ecosystems (especially SMEs) with the objective of maximizing the number of deployed services of public interest. The project is targeted towards the seamless integration of sensing, control and command functionalities available over public space, where apps will be developed to interact with a broad number of wired and wireless sensors and control devices, therefore supporting a new dimension of “city sensing and acting” enablement.

The document presents the required public space infrastructures to meet the city requirements.

A description of the cities current infrastructure can be found in D3.3 Report on iCities digital footprint and gap analysis-final.

TABLE OF CONTENTS

- 1. LONDON 5**
 - 1.1 WIFI..... 5
 - 1.2 SENSOR NETWORKS 5
 - 1.3 PUBLIC SPACE INFRASTRUCTURE REQUIREMENTS 5
 - 1.3.1 *Wifi at Tfl network*..... 5
 - 1.3.2 *Air sensors in London*..... 5
- 2. BARCELONA 6**
 - 2.1 WIFI OUTDOOR NETWORK. 6
 - 2.2 BARCELONA SENSORS PLATFORM (BSP): 6
 - 2.3 OTHER INFRASTRUCTURES 6
 - 2.4 PUBLIC SPACE INFRASTRUCTURE REQUIREMENTS. 7
 - 2.4.1 *Wifi*..... 7
- 3. GENOA..... 10**
 - 3.1 INFOMOBILITY DATA 10
 - 3.2 WEATHER STATION 10
 - 3.3 WIFI..... 10
 - 3.4 CITIZENS DESK 10
 - 3.5 PUBLIC SPACE INFRASTRUCTURE REQUIREMENTS. 10
- 4. BOLOGNA..... 11**
 - 4.1 TRANSPORTATION – MOBILITY 11
 - 4.2 PUBLIC SPACE INFRASTRUCTURE REQUIREMENTS. 11
- 5. CONCLUSIONS 12**

1. London

In London, the infrastructures are:

1.1 Wifi

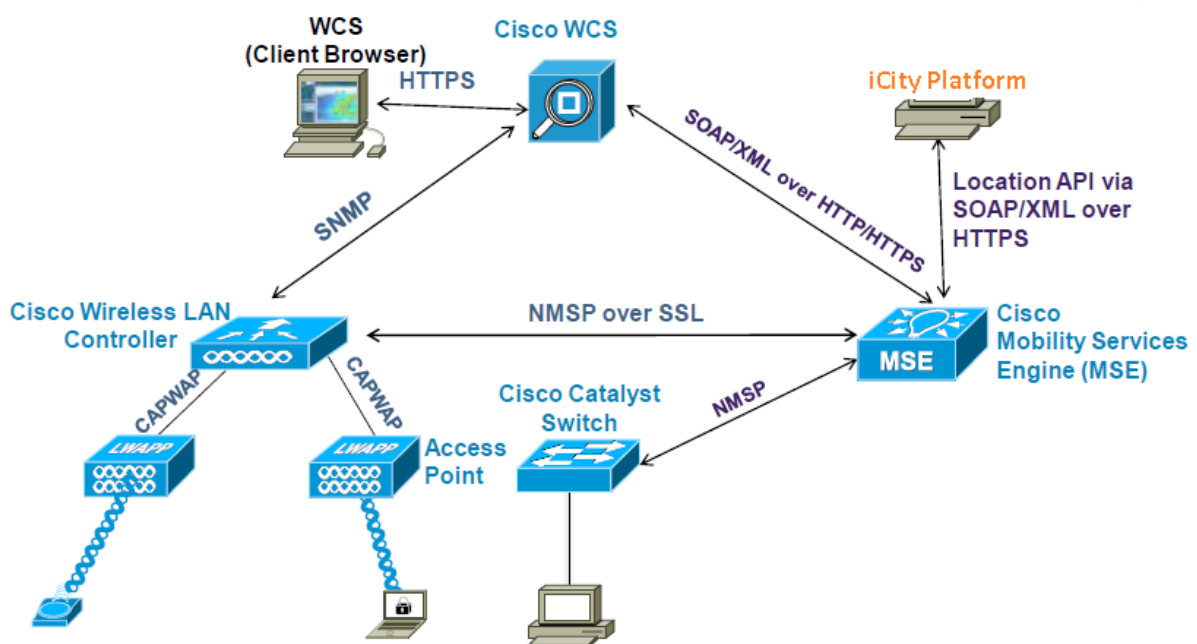
1.2 Sensor Networks

(The infrastructure details can be found in D3.3 Report on iCities digital footprint and gap analysis-final)

1.3 Public Space infrastructure requirements

1.3.1 Wifi at Tfl network

The required public space infrastructure for the wifi location based services is already in place at the Tfl network. The only missing part is the network connection towards the iCity Platform.



1.3.2 Air sensors in London

The APIs are already reachable via the internet. For best performance, we recommend to make a direct network connection between the iCity Platform and the server that hosts the APIs for the sensors.

2. Barcelona

In Barcelona we have identified following infrastructure that could be opened:

(All hardware is currently installed in the public space, except the wifi access points for the location based services use case, that is selected as the first infrastructure that will be opened.)

(The infrastructure details can be found in D3.3 Report on iCities digital footprint and gap analysis-final)

2.1 Wifi Outdoor Network.

- Barcelona Wi-Fi Service Captive Portal.

2.2 Barcelona Sensors Platform (BSP):

- Air quality sensors.
- Allergy sensors.
- Acoustic sensors.
- Temperature sensors.
- Fire sensors.
- Humidity sensors.
- Flooding sensors.
- Wind sensors.
- Wave sensors.
- Luminosity sensors.
- Seismometer sensors.
- People counter.
- Street parking sensors.
- Traffic sensors.
- Mobile Phones as sensors.

2.3 Other infrastructures

(All of these sensors can be public or private ownerships).

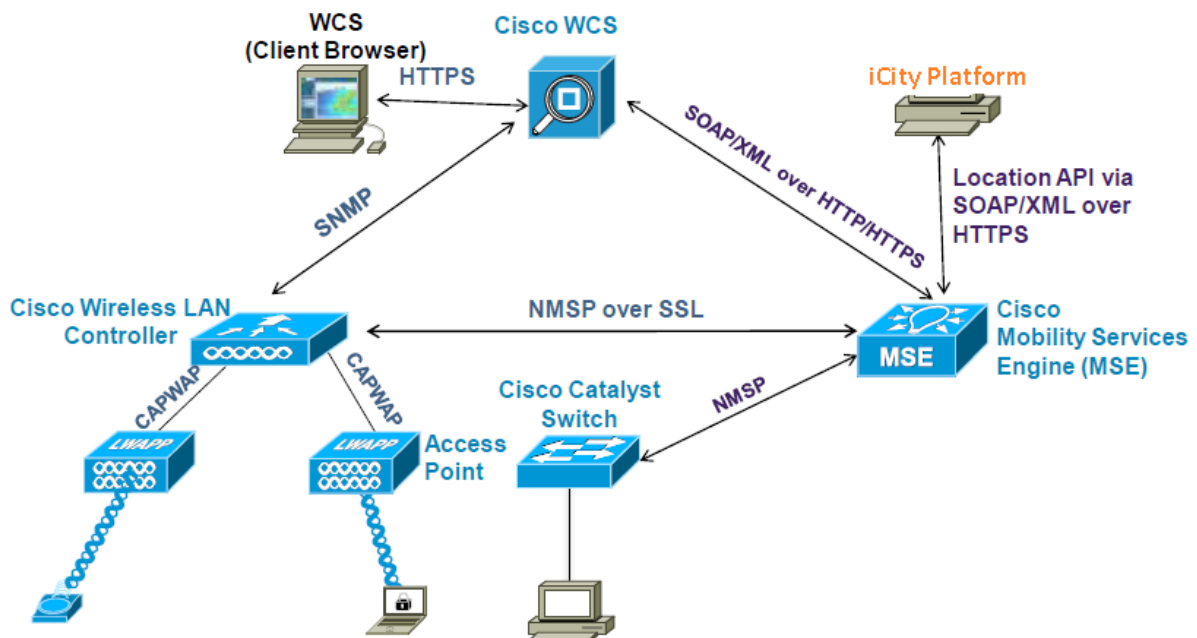
- Street Cameras.
- eGovernment Kiosks.
- Barcelona Optical Fiber Network.
- Barcelona Official Website (<http://www.bcn.cat/>).
- Barcelona Official Open Data Portal (<http://www.bcn.cat/opendata/>)
- Backend public applications and Dbs.
- Hosting of external applications.
- Displays (in urban space):
 - In buses/metros/trains/tramways stops/stations.

- TVs inside buses/metros/trains/tramways.
- Displays in the streets.
- Displays in shopping malls.
- Displays in facades.
- Mobile surface charging points.
- Bicycle Stations (rent-a-bike public service).
- Automatic Bollards.
- Traffic barriers.
- Traffic Lights (in particular those traffic lights already adapted for blind people).
- Lane control lights (reversible lanes, parking to traffic shift)
- Street Lights.
- Street Parking Registers.
- Public Transport Vending Machines.
- Loudspeakers.
- Irrigation Network

2.4 Public Space infrastructure requirements.

2.4.1 Wifi

One of the infrastructures that Barcelona wants to open up is the wifi network; offering location based information via the iCity API.



The only hardware devices that should be installed in the streets are:

Outdoor access points (AIR-CAP1552I-E-K9)

(The Wireless Lan controller and MSE will be a software component)



Outdoor access point

We have to connect the access point to the Barcelona city network. This can be done via wifi or fiber connection. The following deployment guidelines are important:

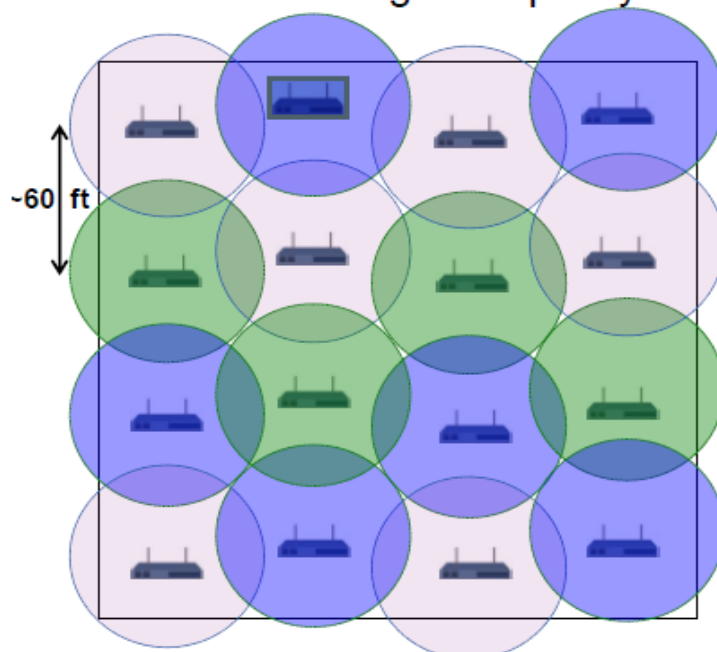
Access Point Density

- Use smaller, overlapping cells
- For wireless data only deployments: 10% AP cell overlap
- For wireless data + voice deployments: 20% AP cell overlap
- For good location fidelity, access points should be located 15-20 meter apart.
- Typically about one access point every 230 - 460 sqm

Further deployment information can be found at:

http://www.cisco.com/en/US/docs/wireless/access_point/1550/quick/guide/ap1552Sgsg.html

Location coverage & capacity



All other activities required for the wifi use case execution are related to configuration and software deployment.

3. Genoa

In Genoa all systems are currently operational.

Most APIs still need to be developed.

The infrastructures selected are:

3.1 Infomobility Data

3.2 Weather Station

3.3 Wifi

3.4 Citizens Desk

(The infrastructure details can be found in D3.3 Report on iCities digital footprint and gap analysis-final.)

3.5 Public Space infrastructure requirements.

No new hardware needs to be installed. New APIs will be developed for our iCity use cases.

The recommendation is to have a direct network connection between the iCity Platform and the server who is hosting the APIs.

4. Bologna

The infrastructures selected are:

4.1 Transportation – Mobility

Bologna will focus on APIs related to transportation – mobility.

4.2 Public Space infrastructure requirements.

No new hardware to be installed.

APIs will be made available.

The recommendation is to have a direct network connection between the iCity Platform and the server who is hosting the APIs.

5. Conclusions

The iCity Platform enables 3rd party developers to create value for citizens and the city.

We can learn from this deliverable, that to implement the use cases, **the impact related to the infrastructure requirements are minimal**. This could be coincidence, but even then it proves that the enablement of the 3rd party developers can be initiated **without huge public infrastructure works while still enabling value creation**.

Most infrastructures considered to be made 'open' are already available in the public space.

The costs to develop the APIs will be far less than installing additional hardware infrastructures in the public space.

Based on the information we have received from the cities, we can conclude that the value creation is mainly driven by software development and has little impact on the public space infrastructure requirements for this project.