



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

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Summary

The document presents the iCity methodology for the assessment of city ICT infrastructures, services and their associated data models in support of open, internet-enabled public services and services of public interest.

The main objective of the assessment is to identify technical and non-technical requirements for the integration of the iCity Platform with the cities' infrastructure. It involves the analysis of each city's infrastructure, relevant policies and processes and identifying the services to be integrated with the iCity Platform.

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Abbreviations and Acronyms

| Acronym | Description |
|---------|--|
| ICT | Information and Communication Technologies |
| SME | Small medium enterprise |
| WP | Work Package |
| API | Application programming interface |
| GDP | Gross domestic product |
| GVA | Gross value added |
| IAAS | Infrastructure as a service |
| D | Deliverable |
| PPP | Private Public Partnership |

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 third parties** (developers, SMEs...) that are pushing for their space as services provisioners in Smart Cities 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 with 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.

This deliverable is the first deliverable from WP3 and the result of the Task T3.1. “Assessment of existing telecommunications and services infrastructures and requirements consolidation”. The deliverable describes the methodology used for the assessment of existing infrastructures, services and resources in the project, pilot cities taking into account the requirements and needs of the stakeholders.

The main objective of the assessment is to identify technical and non-technical requirements for the integration of the iCity Platform with the cities infrastructure. It involves the analysis of each city’s infrastructure, relevant policies and processes and identifying the services to be integrated with the iCity Platform. This has an impact to the architecture that will be defined in WP3 which will describe different maturity levels of implementation depending on the current city infrastructure and the needs of the city administrations and the citizens.

The identified requirements, including the trust and security model, will be used to define the overall architecture of the integration platform (including the APIs).

The results of the applying the presented in this document methodology will be documented in the deliverable D3.2 Report on iCities digital footprint and gap analysis.

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1. Introduction

The “proposed methodology for iCities digital assessment” deliverable is designed to support the analysis of existing ICT infrastructure, policies and processes in the participating cities and to help describing the requirements for the conception of the blue print architecture for the iCity Platform.

The document is structured as the following: Section 2 presents the overview of the proposed methodology, Section 3 identifies the key elements associated with the assessment and defines the questionnaire for collecting the initial data, which have to be supplemented by face-to-face meetings to complete the missing details.

The questionnaire addresses technical and non-technical aspects. One part of it is dedicated to gathering details of the infrastructure and the services. Another part is focusing on the non-technical aspects like business processes, legal issues (data protection and privacy) and local administrative policies.

Regarding the technical aspects (infrastructure and services), the methodology applied is to collect the same information from the participating cities (Barcelona, Bologna, Genoa and London) regarding the overall ICT infrastructure and specifically the infrastructure that will be made available for the iCity Platform, in terms of sensors, cameras, middleware and other software for the databases, business management processes, etc. Other important details needed for the assessment include information about the applications and services (and the associated software), the security (authentication, authorisation, ...) and whether any Open Data platform already exists. If such a platform does already exist, then the cities are being asked to provide details of the data content and the APIs.

Section 4 explains the methodology for defining the iCity pilot scenarios and use cases to identify specific characteristics and requirements of the iCity for its deployment and usage in the cities involved in the project.

In section 5, the conclusions from the document are summarised. Finally, Annex 2 presents the resulting questionnaire.

2. Methodology for iCities digital assessment

The assessment of the cities involved in the project is part of an iterative process depicted in Figure 1, through which the iCity Platform architecture will be gradually refined and described in a series of deliverables.

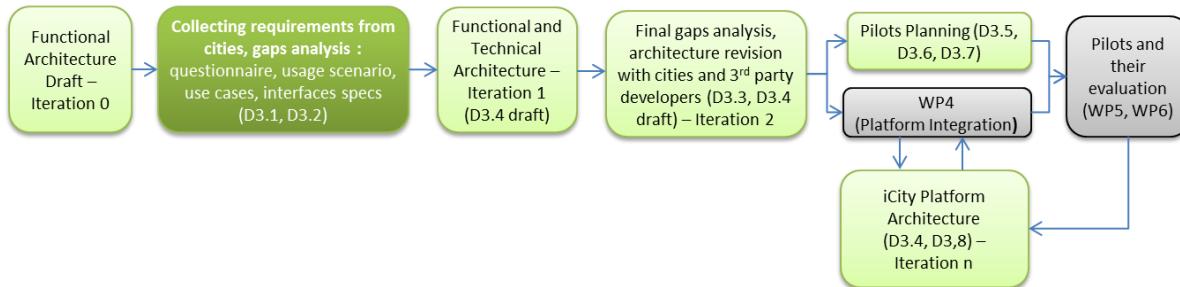


Figure 1: iCity Platform Architecture design process

The first inputs to the iCity design process were the stakeholders expectations collected by WP2 and the understanding in the consortium regarding the functionalities to be provided by the iCity Platform. This information enabled the WP3 team to identify the questions to be addressed to the cities in order to (i) assess the aspects of their ICT infrastructure that are relevant for iCity and (ii) collect their detailed requirements to the iCity Platform. This section of the document presents an overview of the assessment methodology, which is explained in more detail in the next sections.

The assessment focuses on analysis of the available ICT infrastructures, services and relevant legal and administrative policies in the cities in support of open, internet-enabled public services and services of public interest, which can be provided through the iCity Platform. The goal of the assessment is to collect functional and non-functional requirements to the platform for its integration with the cities' infrastructure and for successful execution of pilots in the cities.

In the first step, information about the available ICT infrastructures, services, their data models, relevant legal and administrative policies was collected with the help of a specially created questionnaire. This is enabling the project team members to have a good overview of the current ICT status in the cities and assess the gaps.

In the next step, the representatives of the cities with help from the WP3 team will define the iCity pilot scenarios to be implemented in their cities on the basis of the iCity Platform. That will enable to identify aspects to be assessed in more detail. The focus will be on the platform use cases.

The information collected through the questionnaire is insufficient for a detailed assessment. Therefore, dedicated meetings between the WP3 team and the cities stakeholders (technical, legal and administrative experts) will be organized to discuss the draft version of the iCity Platform, collect detailed information about cities infrastructure and services to be integrated with - or provided through - the iCity Platform, identify gaps, administrative and legal policies to be respected.

The outcomes of this multi-step analysis will be presented in the deliverable D3.2. They will be used as requirements to the design of the iCity platform. On this basis the WP3 team will define the functional and technical architectures of the platform (first architecture iteration), which will be discussed and revised with the stakeholders of the cities and 3rd-party developers. The discussion will contribute to the final gap analysis of the cities' ICT infrastructures for the deployment of the platform, which will be presented in deliverable D3.3. The revised version of the iCity architecture will be used for the platform integration (by

WP4) and for planning the pilots (deliverables D3.5, D3.6, D3.7). The WP3 team will continue to update the architecture of the iCity Platform if such need will be identified during the platform integration (WP4) or pilot preparation, execution and analysis (WP5, WP6). The intermediate version of the architecture obtained from this process will be presented in the deliverable D3.4. The final version of the architecture will be documented in deliverable D3.8.

3. Questionnaire for collecting information about cities' ICT and services

This section presents the questionnaire and corresponding guidelines to drive the process of collecting information about cities that intend to offer open, internet-enabled public services and services of public interest in-line with the overall iCity objectives. These principles stem from the processes and lessons learnt by the iCity partners in collecting information in the four cities involved in the project, i.e., Barcelona, Genoa, Bologna and London.

It is expected that the principles and concepts outlined hereby relating to the overall iCity methodology presented in this deliverable, might evolve and be refined later on at project run-time according to further work and future findings within the project.

3.1 “Background” information about cities

The first part of the questionnaire is dedicated to the collection of “background” information about cities. It includes demographic, economic, organisational, logistic, environmental aspects, etc., about the cities. This is crucial in the process of enabling them to offer open services to the citizens in a flexible and effective way. As reported in [1], *“many cities around the globe have realised that their performance does not depend just on the city’s size of population, production facilities and physical infrastructure, but even more on the availability and communication of knowledge and their social and intellectual capital”*. The following sub-sections present different aspects of the “background” information about cities addressed in the questionnaire.

3.1.1 Demography

The first core step to characterise the urban context of a city where “smart services” can be effectively offered to its citizens is **to collect demographic information and create a snapshot of the size, distribution, characteristics, growth and structure of population**. Within the iCity project, as reported in Deliverable D2.1, the core demographic factors that have been considered are **the age, the gender, and the nationality of the citizens**, first on a “local” perspective, i.e., within the city, and then in a broader “regional” perspective.

To characterise the population in terms of “age”, it is crucial to understand their familiarity with a range of technologies, services and applications and therefore the likelihood for a newly offered service/application to be adopted and by whom. The 4 categories that have been defined are: children (up to 14 years old), young people (15 to 34 years old), adults (35 to 64 years old) and seniors (65 years old and over).

Similarly, **the “gender” and the “nationality” factors**, meaning the spoken languages, the cultural background and also the specific needs within a city, can play an important role in determining how and if a given service/application is more likely to be adopted, understood and promoted in specific portions of the population.

Finally, the **density of the population** (i.e., from the local to the regional perspective) plays a very important role in understanding the reach, the scalability and the sustainability of specific services/applications (and overall projects like iCity) to be run and offered as their diffusion and uptake can be highly influenced by the way people communicate with each other. This ultimately depends on “how many and how close” people are.

3.1.2 Economy

To effectively “digitalise” a city and provide open, internet-enabled public services and services of public interest, another essential step is to understand and characterise its **economic background and context**. For this purpose **macroeconomic and microeconomic information need to be collected and analysed**.

Depending on the **economic profile of a city**, broadly defined as (i) the set of available resources overall in the municipality and its region and how diversified these resources are, and (ii) the general wealth distribution in the population, including the level of unemployment, **it is possible to more precisely identify and engage key players in the overall service/application offering and consumption**.

As reported in [1], macroeconomic data which has been collected within iCity is the total Gross Domestic Product (GDP) and the Gross Value Added (GVA) distribution by economic sectors at regional level. Knowing whether economies are more or less diversified and the degree of sectorial specialisation of each city can determine priorities for the choice of services and applications. Furthermore, the average household income at regional level can provide valuable data about a family's purchasing power in order to determine the potential number of platform users.

An interesting aspect, which relates to both the demographic and economic data collected within the four cities involved in the iCity project, is the **number of visitors per year per city**. The number of tourists has a direct impact on the overall population habits and also on the city/region economy. In this respect, specific services offered within the cities might be defined to specifically target this portion of the non-fixed population.

3.1.3 Local facilities and city organisational structure

The likelihood that a given service might be readily offered and deployed within a city, as well as the rapidity of its diffusion, is directly related to the infrastructure each city has already in place both in terms of (i) **urban infrastructure** and (ii) **organisational structures** within the cities (and among the citizens) to promote the service. “**Urban infrastructure**” defined as the total length of roads which are in each city, its type (streets, roads, sidewalks, etc.), the surface area of parks, the number of trees, what proportion of these trees are located on streets, etc., and “**organisational infrastructure**” defined as internal organisational pattern of the cities: the number of districts and neighbourhoods in which the city is subdivided, the cities’ public buildings stock (occupied by both administrative and, also, educational, cultural, sport facilities, etc.) and the amount of municipal employees who work in the public sphere.

This kind of information is of utmost importance to understand **how to enable a digital public space, as well as the informational infrastructure for the real city, in which the virtual city will be connected with the physical city**, to integrate with each other and create the proper place to build an open and linked applications ecosystem.

In this perspective, to **collect background information about infrastructures and facilities within the city** is another essential methodological step for the creation of services of public interest to be generated and provided in smart cities.

3.2 Available technical infrastructure

The core idea is to start from the analysis of the technologies, interfaces, components and frameworks already in place, and combine these with the identified requirements and needs from the key stakeholders to create an appealing and feasible service delivery ecosystem.

Directly related to what has been discussed above, **any type of data characterising “what is already in place” in a city**, whether at the level of physical resources or at the level of intangible assets and already offered/available services, constitutes a prerequisite information building block in the process of empowering cities and citizens with smart digital services.

This data is essential to understand and facilitate within each of the involved cities what are the data sets/infrastructure and locations to be **the ‘target’ of initial actions for co-creation of public service functions**, but also crucial **to identify potential services to develop through the iCity Platform**.

Note that in this document, we do not focus on analysing the results of the questionnaires as this is the main focus of deliverable D3.2. In the following, we rather provide an overview of the “categories” of data that have been identified as key in order to ground the development and deployment of the iCity Platform. The aim is to present and propose these categories from a methodological point of view as specific classes of information to be identified and characterised for iCities digital assessment possibly also in other smart cities projects.

This section presents the methodology for identifying the infrastructures that cities can potentially open up.

3.2.1 Physical layer infrastructure

Physical layer infrastructure is the pervasive physical infrastructure that is available in the cities, such as networking gear and the broadband coverage, down to traffic lights, street lights etc.

This layer will drive the requirements for the **IAAS layer in the platform**.

Making Wifi available is seen in almost every city as a key requirement; with the consequent legal implications that need to be looked at for the iCity Platform design (see sub-section 3.4). Where there is - or it is planned to introduce - a **public WiFi service** then cities were asked to provide information about the geographical coverage (ideally a map).

Making part of their network infrastructure available **other than Wifi** is also considered as a source of potential revenue creation for cities (such as fibre cables that could be rented to companies). Where there is - or it is planned to introduce - a service based on the existing optical fibre network then cities were asked to provide information about the geographical coverage (ideally a map).

While some of the cities own most of the assets, others do not. This makes the process of opening up those infrastructures much more challenging.

The questionnaire was designed to obtain information about existing infrastructures in the fields of (mainly) **transport and environment**, in order to assess what infrastructure could potentially be utilised for pilot scenarios, what existing systems might need to be integrated into an iCity Platform and their level of complexity.

3.2.1.1 Transport

In the area of public transport, the questionnaire asked for information about the number of buses, metro trains and railway trains, and the number of routes and stops/stations.

The possibility to develop - and the modality to launch - innovative application and services in the so-called area of “smart urbanism”, such as for instance dynamic road-route planning based on traffic, traffic-light management, indoor and outdoor parking management, integrated smart card for public transport, traceability of hazardous substances, etc., requires a good understanding of what infrastructural elements are already in place or not (e.g., traffic cameras, traffic information panels, dedicated parking slots, waste removal, etc.).

Given that road traffic management systems are becoming increasingly prevalent and sophisticated, the cities were asked to report if any **intelligent transport sensor systems** were installed for traffic sensing¹, situation awareness², positional sensing³, etc.

The outputs of the following **Sensing Infrastructures** are considered in many cities to be open for 3rd-party developers:

- On-line traffic control systems.
- Traffic light control systems.
- Inductive loop-based traffic control sensing infrastructures.
- Accident detection systems.
- Metropolitan video surveillance systems.

3.2.1.2 Environment

Another key area on which iCity is focusing is the so-called **smart energy/environment domain** which spans applications like intelligent management of electricity and gas network, intelligent management of waste, , sensors to capture data of pollution and noise, etc.

Environmental Control sensors embrace a broad category of devices for measuring temperature, air quality, illumination, humidity, noise, level of CO2, allergic (pollen) level container sensor, earthquake, fire, flooding, etc. Questions to each of the involved cities focus on sensors that measure the water-table level, the sea-level and coastal-erosion, water quality, the weather, flood detection and water management, soil conditions, and earthquake and tsunami warnings.

Collecting information via these kinds of sensors is intended to facilitate the development and uptake of smart energy/environment kinds of applications, encompassing the reduction of CO2 emissions, increasing efficiency, quality and sustainability of gas, water and electricity networks and awareness of citizens and businesses about their actual consumption so they can act accordingly and contribute to better preserve the environment.

3.2.2 Platforms, applications and services

The cities were asked questions about the **currently available services**, to understand in which way these services have been (if already existing) offered to the citizens. This has a direct influence on the technical, operational and social changes to be accounted for when planning new applications and services to be accessed by a broad audience in an open service ecosystem.

Questions asked related to:

- The number of subscribers to digital services (mobile phones, Smartphones, Internet)
- Public Wifi deployment

¹ These kinds of systems enable the control and management of traffic whether land, sea, or air to be controlled. These are large and complex systems which assist controllers to optimise traffic flow and usually require an extensive sensor network to detect and manage the extended system.

² This kind of system enables to monitor the external environment from within a vehicle. For example, Bologna's parking sensors within their disabled bays identify if a car has the right to be parked in a bay and alerts nearby traffic wardens if not.

³ The most common of these systems presently available are the GPS-based systems and they can be used, for example, to track specific categories of vehicles, like waste removal vehicles.

- Digital presence of government, i.e., the number of e-government services
- Which services are provided in the city (for example, Bus-control information, mobility information, authentication management, municipal e-payment services, municipal hosting servers, .city domain, etc.)
- What technologies/applications/services are made available within the city government itself:.... and are the services offered to public employees from different departments or municipal agencies? and are they managed internally or is the management outsourced?

3.2.3 Open Data

Questions regarding Open Data developments in the cities were included in the questionnaire in order to discover if cities are already operating (or intending to operate) in an Open Data environment and determine the associated technical and non-technical requirements for the iCity Platform. One particular non-technical factor could be the need to comply with the legal requirements of storing and sharing personal data.

All types of public authority departments (construction, energy, health, police, finance, education, ...) were listed and the cities were asked to indicate their plans for integrating outputs from these areas into an Open Data framework.

They were also asked to give their reasons for pursuing the Open Data concept, since this information will also impact on the features to be supported by the iCity Platform. For example, if the purpose is to solicit feedback from the citizens, then a capability for receiving and processing the comments has to be incorporated. Similarly, the need to support crowd-sourcing features brings further challenges.

Finally, in the “technical infrastructure” part of the questionnaire, the cities were asked if they expected to need help in facilitating the availability of Open Data in their city, since there are experts in the project consortium who can provide this support.

3.3 ICT organisational aspects

The iCity project aims to respond 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 project encompasses the concept of Open Data with a novel approach of Open Infrastructures where the **available municipal ICT networks already deployed in urban spaces** will be made available and accessible to open innovation ecosystems (specially SMEs) with the objective of maximising the number of deployed services of public interest.

In this respect, it is essential to capture the information considered relevant to understand the level of ICT technology and services usage in a given city (i.e., basic services, internal administration, online services, public broadband infrastructures and ICT Environment). A set of questions has envisaged **identifying the level of involvement in smart cities initiatives or related ICT projects** in order to check which partnerships have been established and the level of relationships within the government itself.

This set of questions has therefore envisaged **characterising and describing the specific ICT planning, strategy and decision-making players for the involved cities** in order to understand:

- Who is responsible within the municipality for ICT strategy, planning, budgeting, project approval, solutions implementations and operations, and, in particular, how ICT budgeting is allocated and managed.
- Whether there is a dedicated and centralised ICT department serving the various other city departments or if ICT strategy and planning is run horizontally across several offices and departments.
- How decisions about specific ICT projects to be implemented are taken within the city and, very interesting, who are the stronger influencers over identifying government's ICT priorities (among citizens, businesses, city departments, central IT organisation, etc.).

From a methodological perspective to collect this kind of information can be challenging, as depending on different countries and cities organisations, the possibility to directly interact with people in charge of ICT deployment and development might require intermediate interaction steps with public authorities and agencies not always familiar with the kind of vision promoted by smart cities projects like iCity. However, this is changing also to the increasing adoption of services and applications via the open Internet technologies and social communities that help creating awareness among citizens, but also among decision-makers at various levels in the municipalities.

3.4 Legal aspects related to ICT

Deployment and adoption of ICT-based applications and services in an open environment which involve e-government and other kind of public services or services of public interest involving municipalities can potentially **have implications regarding regulatory and legal aspects**.

Therefore, for the four involved cities within iCity a dedicated set of questions about **the regulatory framework for specific aspects related to ICT** was asked in order to assess:

- Whether the current legislation allows PPP⁴ models for ICT.
- If renting or leasing is allowed for ICT related procurement.
- If renting or leasing is a common practice for ICT related procurements.
- If the legislation allows the city to rent its excess of capacity of existing infrastructure to the private sector.

Moreover, in the perspective of increasingly adopting the **Open Data approach** for an increasing range of data classes (e.g., construction, demographics, business, environment, urban transport, etc.) and publicly offered services, a dedicated set of questions has been defined to understand the importance, impact and possible uptake of related open data initiatives.

⁴ PPP stands for Private Public Partnership.

4. Defining the iCity pilot scenarios and use cases

The purpose of defining iCity Platform usage scenarios and use cases is to identify specific characteristics and requirements of the iCity for its deployment and usage in the cities involved in the project. After they are identified, the technical details have to be specified.

4.1 Provide an overview of services or data to be accessed through the iCity Platform

First of all, the representatives of cities involved in the project should define which available services or data in their cities they want to make accessible through the iCity Platform. Each of the cities has to provide a textual description of the scenario addressing at least the following aspects:

- Short description of the service functionality or description the data kind to be opened.
- Information about the available utility services, which has to be integrated with the iCity Platform (for example, authentication/authorisation service, billing service, reporting service, etc.) for the service provision.
- Information about potential users of the service/data.
- Information about planned number of users.
- Expected data traffic size.
- Required user authentication/authorisation mechanisms.
- Information on how the infrastructure service/data can be accessed by the iCity Platform.
- Description of how users should access the service/data through the iCity Platform.

4.2. Define the iCity Platform usage scenarios for the pilots

At the second step the scenario should be described in more detail as an iCity Platform usage scenario and underlying use cases. By a “usage scenario” we mean a concrete deployment and usage of the iCity Platform in the cities participating in the project. A “use case” describes the activities of the actors (or components) of the iCity Platform while using it in a particular way. A usage scenario therefore serves as a concrete “story” with the purpose to demonstrate the usage of the iCity Platform in a particular pilot. Usage scenarios and use cases will be defined by the WP3 team together with the representatives of the cities.

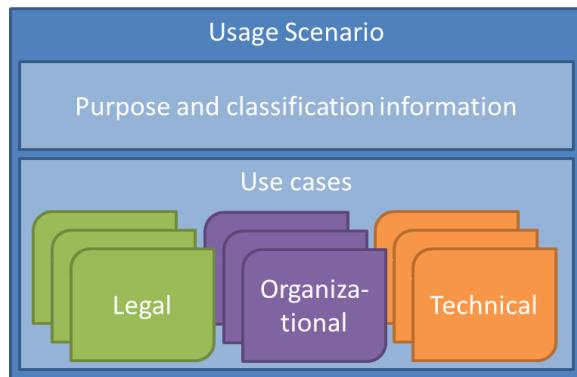


Figure 2: Usage scenarios and use cases

Figure 2 illustrates the relation between usage scenarios and use cases. A usage scenario consists of a description of its purpose (combined with an outline of the concrete system or service), and a number of use cases.

Defining usage scenarios and use cases is a traditional approach in software engineering for capturing the functional requirements to a system to be implemented [13, 14]. In case of the iCity platform all requirements related to the platform design, deployment and usage have to be captured. Therefore the traditional methodology was extended to introduce three relevant for iCity categories of use cases: legal, organizational, and technical⁵.

A usage scenario has to be described by the following items placed in a table based template presented below:

- Description: A general description of the iCity Platform usage scenario, e.g., by means of a little story illustrating its main points and purposes.
- Category: The main focus of the usage scenario: technical, organizational, legal, business, etc. (not exclusive). That correlates with the categories of the related to the scenario use cases.
- Domain: The application domain of the usage scenario, e.g., Public sector services, Environment, Transport, Open Data, Telecommunications, etc.
- Goals and purposes: A description of the main concepts and ideas to be illustrated by the usage scenario. What are the main points to be conveyed? What is the rationale behind the usage scenario
- Actors and Roles: Actors playing specific roles in the usage scenario. This may include domain specific entries (e.g., additional service providers).
- Components and services: Some architectural description of the system described in the usage scenario.
- Existing specifications to rely on: Are there already standards or specs available?
- New specifications required: What is not yet available?
- Related use cases: List of use cases related to the usage scenario.

⁵ This and the following in the chapter templates are defined on the basis of the Fraunhofer FOKUS use case templates used in numerous projects and in particular recommended in the white paper P. H. Deussen, K.-P. Eckert „Cloud Concepts for the Public Sector in Germany – Use Cases.“

Usage scenario template

| ID | Title | | | | | | |
|---|--|-------|-------|---------|---|---------|---|
| Description | Main “storyline” for the use case | | | | | | |
| Category | Technical, organizational, legal, ... | | | | | | |
| Domain | E.g., public sector services | | | | | | |
| Goals and purpose | What is demonstrated by the usage scenario? | | | | | | |
| Actors and Roles | Actors and their roles participating in the scenario, e.g., described using a table as follows: | | | | | | |
| | <table border="1"> <thead> <tr> <th>Actor</th><th>Roles</th></tr> </thead> <tbody> <tr> <td>Actor 1</td><td>Role 1 for actor 1 Role 2 for actor 1 ...</td></tr> <tr> <td>Actor 2</td><td>Role 1 for actor 2 Role 2 for actor 2 ...</td></tr> </tbody> </table> | Actor | Roles | Actor 1 | Role 1 for actor 1 Role 2 for actor 1 ... | Actor 2 | Role 1 for actor 2 Role 2 for actor 2 ... |
| Actor | Roles | | | | | | |
| Actor 1 | Role 1 for actor 1 Role 2 for actor 1 ... | | | | | | |
| Actor 2 | Role 1 for actor 2 Role 2 for actor 2 ... | | | | | | |
| Components and services required for execution, and proposed architecture | Relate of a reference model and deployment model, provide some architectural description | | | | | | |
| New specifications required between the actors | Identification of specification (and standardization) requirements (derived from the corresponding entry in the use case descriptions) | | | | | | |
| Related use cases | List of use cases related to this scenario | | | | | | |

4.3 Define use cases for the pilots

Use cases describe certain aspects related to a usage scenario, for instance a detailed interaction between user and the iCity Platform. We distinguish between technical, organizational, and legal use cases, organized into the following hierarchy:



Figure 3: Hierarchy of use cases

Hence, depending on the level of granularity, a legal use case may determine several organizational use cases illustrating how the legal requirements are implemented, which in turn are related to several technical use cases. For instance, the legal requirement of some European countries that security events need to be reported to the responsible data privacy authority implies that there are procedures in place to do so. Which parts of the hierarchy need to be present depends on the purpose of the corresponding usage scenario. If the objective is to understand some technical issues, then use cases on the technical level are

sufficient. On the other hand, if the objective is to analyse how a specific legal regulation is implemented by organizational and technical means, then use cases from all three categories have to be present.

The following sub-sections present the templates for all mentioned types of use cases. The use cases will be defined by the WP3 team together with the representatives of the cities.

4.3.1 Legal use cases template

Legal use cases may relate to a certain area, e.g., Europe, Italy, London, etc. Since iCity Platform will be deployed in several European cities, different legal frameworks need to be considered.

Legal use case template

| ID | Title | | | | | | |
|--|---|-------|-------|---------|---|---------|---|
| Description | Short summary of the use case | | | | | | |
| Actors and Roles | <p>Actors and their roles participating in the scenario, e.g., described using a table as follows:</p> <table border="1"> <thead> <tr> <th>Actor</th><th>Roles</th></tr> </thead> <tbody> <tr> <td>Actor 1</td><td>Role 1 for actor 1 Role 2 for actor 1 ...</td></tr> <tr> <td>Actor 2</td><td>Role 1 for actor 2 Role 2 for actor 2 ...</td></tr> </tbody> </table> | Actor | Roles | Actor 1 | Role 1 for actor 1 Role 2 for actor 1 ... | Actor 2 | Role 1 for actor 2 Role 2 for actor 2 ... |
| Actor | Roles | | | | | | |
| Actor 1 | Role 1 for actor 1 Role 2 for actor 1 ... | | | | | | |
| Actor 2 | Role 1 for actor 2 Role 2 for actor 2 ... | | | | | | |
| Goals and aspirations for the UC | Background and main message of the use case | | | | | | |
| Legal domain | Data privacy regulations, licensing, contracting, etc. | | | | | | |
| Area | E.g., EU, Italy, Barcelona . . . | | | | | | |
| Legal frameworks, laws, etc., to be taken into account | Laws, policies, etc. which are of relevance | | | | | | |
| Required preconditions | Any preconditions necessary to understand the use case | | | | | | |
| Compliance criteria | Explanation why the use case is an illustration on how legal requirement can be implemented | | | | | | |
| Description of procedures to ensure legal compliance | Explanation how the use case shows the implementation of legal requirements | | | | | | |
| Existing specifications to rely on | Specifications and standards already dealing with aspects related to the use case | | | | | | |

New specifications Specifications and standards needed to establish the goals of the use case required between the actors

4.3.2 Organisational use cases template

Organisational use cases describe organisational measures, e.g., service management procedures to be implemented, permissions, obligations, etc.

Organizational use case template

| ID | Title | |
|--|--|---|
| Description | Short summary of the use case | |
| Actors and Roles | Actors and their roles participating in the scenario, e.g., described using a table as follows: | |
| | Actor | Roles |
| | Actor 1 | Role 1 for actor 1 Role 2 for actor 1 ... |
| | Actor 2 | Role 1 for actor 2 Role 2 for actor 2 ... |
| Goals and aspirations for the UC | Background and main message of the use case | |
| Organization domain | E.g., security procedures, data privacy procedures, etc. | |
| Regulations and policies to be taken into account | Policies, standards, best practices to be taken into account | |
| Description organization procedures | The “workflow” (or procedures) on organizational level used to achieve the goal of the use case | |
| Components and services involved | What components and services of the system in question (described in the usage scenario) are needed/used to realize these procedures | |
| Required preconditions | Any preconditions necessary to understand/implement the use case | |
| Criteria for success | The expected output and the side effects | |
| Failure conditions | What can go wrong | |
| Failure handling | what to do about it | |

| | |
|---|---|
| Related use cases and those that are pre-requisite | May refer to technical UC describing the technical means to implement this UC. |
| Existing specifications to rely on | Specifications and standards already dealing with aspects related to the use case |
| New specifications required between the actors | Specifications and standards needed to establish the goals of the use case |

4.3.3 Technical use cases template

Technical use cases describe technical processes to be implemented

Technical use case template

| ID | Title |
|---|---|
| Description | Short summary of the use case |
| Actors and roles | Actors and their roles participating in the scenario, e.g., described using a table as follows: |
| Actor | Roles |
| Actor 1 | Role 1 for actor 1 Role 2 for actor 1 ... |
| Actor 2 | Role 1 for actor 2 Role 2 for actor 2 ... |
| Primary Actor | The actor who initiates the technical use case |
| Goals and aspirations for the UC | Background and main message of the use case |
| Platform, tools and the environment needed for execution of the UC | Technical requirements concerning the execution environment |
| Description of file formats, wire protocols, in-memory objects, and other artifacts needed for execution | “Artifacts” used in the use case |
| Components and services required for execution | What components and services of the system in question (described in the usage scenario) are needed/used to realize these procedures. |
| Available components | What components from the required are already available in the city |

| | |
|---|---|
| | infrastructure and have to be re-used/integrated |
| Input parameters needed for initialization | Initial input values for the execution of the use case |
| Criteria for success | Expected process, outcome, side effect. Described by sequence charts or BPMN diagrams, etc. |
| Failure conditions | what can go wrong |
| Failure handling | what to do about it |
| Related use cases and those that are pre-requisite | Relevant use cases for the associated usage scenario. |
| Existing specifications to rely on | Specifications and standards already dealing with aspects related to the use case |
| New specifications required between the actors | Specifications and standards needed to establish the goals of the use case |

4.4 Provide technical specification of interfaces

At this stage the technical specifications referenced in the technical use cases have to be provided. In particular, the following aspects should be covered:

- Specification of interfaces and underlying protocols.
- Specification of the data formats and structures.
- Specification of security mechanisms for accessing the infrastructure services or data.

This task will be performed together by the technical specialists from the cities and from WP3.

5. Conclusions

This document has presented the iCity methodology for assessing the ICT infrastructures, services and their associated data models in support of open, internet-enabled public services and services of public interest in the selected cities of Barcelona, Genoa, Bologna and London. The methodology has been designed to assess the cities, based on the requirements identified in deliverable D2.1: "Stakeholder Requirements", using data collected through a specifically developed questionnaire. This questionnaire addresses both technical and non-technical topics.

The overall methodology for defining the iCity pilot scenarios and assessing the technical and non-technical aspects has been described.

The key technical elements considered are: the ICT infrastructure and specifically the infrastructure that will be made available for the iCity Platform, in terms of sensors, cameras, middleware and other software for the databases, business management processes, etc.). Other important details needed for the assessment include information about the applications and services (and the associated software), the security (authentication, authorisation...) and whether any Open Data platform already exists. If such a platform does already exist, then the cities are to be asked to provide details of the data content and the APIs.

The key non-technical elements are compliance with the legal requirements for data protection and privacy, as laid down in EU Directives.

Annex 1: References

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Annex 2: Questionnaires

A. Background information

The first part of the questionnaire is dedicated to collecting city background information.

Q1.1. City Name

Please, provide the name of your city

Q1.2. Which of the following best represents the city office or municipal agency in which you work? (Please select only one response.)

- Mayor's office
- Central ICT Office
- Central Administrative Office
- Branch Administrative office
- Municipal Agency (EMS, Police, Transport, Other, etc), Please specify.

Q1.3. Which of the following best represents your job title? (Please select only one response.)

- Mayor
- CIO/CTO
- City Manager
- City Department Leader
- Municipal Service Agency Leader
- Municipal Service Agency Technology Leader (Head of MIS/IT)
- Other (Please specify)

Q1.4. Demography of the City

Total population

Kids (0-15)

Youngsters (15-35)

Adult (35-65)

Senior (+65)

Q1.5. Economy of the City

Gross Domestic Product (GDP)

GDP by sector

City's ICT annual budget

Employment rate

Unemployment rate

Q1.6. Other City Indicators

| | |
|----------------------------|----------------------|
| Number of Annual Visitors | <input type="text"/> |
| Total Surface (HA) | <input type="text"/> |
| Surface of Parks (HA) | <input type="text"/> |
| Human density (people/HA) | <input type="text"/> |
| Kms. of Roads | <input type="text"/> |
| Kms. of Sidewalks | <input type="text"/> |
| Kms. of Streets | <input type="text"/> |
| Number of Streets | <input type="text"/> |
| Total Number of Trees | <input type="text"/> |
| Number of Trees in Streets | <input type="text"/> |

Q1.7. City Structure

| | |
|--|----------------------|
| Number of Districts | <input type="text"/> |
| Number of Neighborhoods | <input type="text"/> |
| Number of Administrative Municipal Buildings | <input type="text"/> |
| Number of Other Municipally owned buildings (schools, libraries,sport centers, etc.) | <input type="text"/> |
| Total number of municipal employees | <input type="text"/> |
| Total number of municipal MOBILE ONLY employees | <input type="text"/> |

B. Physical layer infrastructure

To collect information on physical layer infrastructures of the cities was defined the following questionnaire:

Q2.1. City Infrastructures. (*Please indicate Yes or No and the amount where appropriate*)

| | |
|-------------------------------------|----------------------|
| Tetra Communication System | <input type="text"/> |
| Location / Positioning Service | <input type="text"/> |
| Location / Positioning Service Type | <input type="text"/> |
| Internet for Bus Users | <input type="text"/> |
| Internet for Metro Users | <input type="text"/> |
| Internet for Train Users | <input type="text"/> |
| Global Call Center | <input type="text"/> |
| If NO Global call center, How Many? | <input type="text"/> |

| | |
|--|--------------------------|
| Information Kiosks | <input type="checkbox"/> |
| Garbage Containers in City | <input type="checkbox"/> |
| Public Lighting (Type and Amount) | <input type="checkbox"/> |
| Traffic Lights (Amount) | <input type="checkbox"/> |
| License Plate Recognition at Parking' Entrance | <input type="checkbox"/> |
| Traffic Info Panels for Parking Spaces | <input type="checkbox"/> |
| Traffic Info Panels for Reversible Lanes | <input type="checkbox"/> |
| Traffic Info Panels for Traffic Information | <input type="checkbox"/> |
| Traffic Cameras | <input type="checkbox"/> |
| Non Traffic Cameras | <input type="checkbox"/> |
| Magnetic Loops for Traffic Counting | <input type="checkbox"/> |
| Public Fountains (Amount) | <input type="checkbox"/> |
| Surface Parking | <input type="checkbox"/> |
| Underground Parking | <input type="checkbox"/> |
| Motorbikes Parking | <input type="checkbox"/> |
| Bikes Parking | <input type="checkbox"/> |
| Biking Stations (Public Bikes for Residents) | <input type="checkbox"/> |
| Buses (Amount) | <input type="checkbox"/> |
| Bus Lines (Amount) | <input type="checkbox"/> |
| Bus Stops (Amount) | <input type="checkbox"/> |
| Metro Trains (Amount) | <input type="checkbox"/> |
| Metro Lines (Amount) | <input type="checkbox"/> |
| Railway Trains (Amount) | <input type="checkbox"/> |
| Railway Stations (Amount) | <input type="checkbox"/> |
| Taxis (Amount) | <input type="checkbox"/> |
| Taxi Waiting Areas | <input type="checkbox"/> |
| Energy Metering in Public Buildings | <input type="checkbox"/> |
| Green Corridor Service (Green Traffic lights path for Fire Brigades) | <input type="checkbox"/> |
| Automatic Accident Detection (ej.. in Tunnels) | <input type="checkbox"/> |

Q2.2. Intelligent Transport Sensoring Systems - Traffic Sensing, Signalling and Management.

Systems which enable the control and management of traffic whether land, sea, or air to be controlled. These are large and complex systems which assist controllers to optimize traffic flow and usually require an extensive sensor network to detect and manage the extended system. If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.3. Intelligent Transport Sensing Systems - Situation Aware Systems

The ability to monitor the external environment from within the vehicle. For example, Bologna's parking sensors within their disabled bays which identify if a car has the right to be parked in a bay and alerts nearby traffic wardens if not.

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.4. Intelligent Transport Sensing Systems - Positional Sensing

The most common of these systems presently available is the GPS system. For example, this may be where waste removal vehicles are tracked.

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.5. Intelligent Transport Sensing Systems - Other Transport Systems

(Use this area if your City uses other type of sensors related to Transport)
If these Type of Sensor are present in your City

Describe what they are and what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.6. Environmental Sensing Systems – Control

Environmental Control (temperature, Air Quality, illumination, humidity, noise, CO₂, allergic (pollen) level container sensor, earthquake, fire..flooding)

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.7. Environmental Sensing Systems - Water Table

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.8. Environmental Sensing Systems - Sea Level and Coastal Erosion

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.9. Environmental Sensing Systems - Water Quality

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.10. Environmental Sensing Systems – Weather

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.11. Environmental Sensing Systems - Flood Detection and Water Management

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.12. Environmental Sensing Systems - Soil Conditions

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.13. Environmental Sensing Systems - Earthquake and Tsunami Warnings

If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.14. Environmental Sensing Systems - Other Environmental Monitoring Systems
(Use this area if your City uses other type of sensors related to Environmental Systems)
If these Type of Sensor are present in your City

Describe what you use them for

List the Stakeholders, Including the Application development Co.

Technical contacts for further details (E-mail)

Q2.15. Subscribers of Digital Services

Mobile Phones %

Smartphones %

Internet Access %

Q2.16. Coverage of Infrastructures

Broadband Coverage

High Speed Internet %

Q2.17. Fiber Optic Networks

Most cities have already deployed extensive optical fibre networks in the city. Some of these can be made available for public use. Please provide some information on the current status and future plans and projects.

Please provide some information on the current status and future plans.

Q2.18. If your city has introduced or plans to introduce a service based on the existing optical fibre network then please

Provide Geographical Coverage

Name the Company who provides the optical Network (if known)

Give a Contact for further Technical Discussions (E-mail)

Please provide any map or graph that can help to better understand the existing infrastructure

Q2.19. Publicly Available WiFi

Most cities have already deployed extensive WiFi-networks in the city. Some of these can be made available for public use.

Please provide some information on the current status and future plans and projects.

Q2.20. If your city has introduced or plans to introduce a free WiFi service then please

Provide Geographical Coverage

Name the Company who provides the WiFi Service (if known)

Give a Contact for further Technical Discussions (E-mail)

Q2.21. Digital Presence of Government (Please provide links)

Web Sites Open Data

Web Sites e-Government

Facebook

Twitter

YouTube

Other

Q2.22. Assessment of City Infrastructure Platforms to be Open for use beyond the city departments

Traffic Sensors

Environmental Sensors

In / Out Parking Sensors

Garbage Bins (in some cities)

WiFi Hot Spots

Fiber Optic Networks

Public Screens

Public Business Information (e-Government. Ej. <http://www.bcn.cat/en/ihome.htm>)

C. ICT organisational aspects

A set of questions was defined to collect information on organizational aspects of ICT in the cities.

Q3.1. Who within the city is primarily involved in the decisions for planning, budgeting, approving, implementing and the operations of information & communication technologies (ICT)? (Please select all that apply per column.)

| ICT Strategy & Planning | ICT Budgeting | ICT Project approval | ICT Solutions implementations | ICT Solutions operations |
|-------------------------|---------------|----------------------|-------------------------------|--------------------------|
|-------------------------|---------------|----------------------|-------------------------------|--------------------------|

| | ICT Strategy & Planning | ICT Budgeting | ICT Project approval | ICT Solutions implementations | ICT Solutions operations |
|----------------------------------|-------------------------------|-----------------------|----------------------------------|----------------------------------|--------------------------------|
| Mayor | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| CIO / CTO | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| CFO | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| City Manager | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other city department Leader | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Municipal agency leader | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Outside contractor / consultants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| None of the above | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q3.2. Which of the following best represents the city's approach to strategy and planning for ICT across all city departments and municipal agencies? (Please select only one response).

- Each city department and municipal agency develops its' own ICT strategy/plan, **with no input** from the city's central IT organization
- Each city department or municipal agency develops its' own ICT strategy/plan, **with input** from the city's central IT organization
- There is **collaboration** between the city department or municipal agency and the city's central IT organization to develop ICT strategy/planning
- The city's central IT organization develops the ICT strategy/plan, **with support** from the city department or municipal agency
- The city's central IT organization develops the ICT strategy/plan **for all city departments and municipal agencies**

Q3.3. Which of the following best represents how budget for ICT is allocated throughout the city government? (Please select only one response.)

- Each city department and municipal agency has their own ICT budget
- A few city departments and municipal agencies combine their ICT budget with the city's central IT organization
- Most city departments and municipal agencies combine their ICT budget with the city's central IT organization
- All city departments and municipal agencies share a centralized ICT budget with the city's central IT organization

Q3.4. Which of the following best represents how the city government determines which ICT projects to implement? (Please select only one response.)

- Each city department and municipal agency determines which ICT projects to implement, with no input from the city's central IT organization
- The city department or municipal agency determines which ICT projects to implement, with input from the city's central IT organization
- There is collaboration between the city department or municipal agency and the city's central IT organization to determine which ICT projects to implement

- The city's central IT organization determines which ICT projects to implement, with input from the city department or municipal agency
- The city's central IT organization determines which ICT projects to implement for all city departments and municipal agencies

Q3.5. Which of the following best represents how ICT is implemented throughout the city government? (Please select only one response.)

- Each city department and municipal agency handles their own ICT implementations with no support from the city's central IT organization
- The city department or municipal agency leads the ICT implementation, with support from the city's central IT organization
- There is collaboration between the city department or municipal agency and the city's central IT organization for ICT implementations
- The city's central IT organization leads the ICT implementation, with support from the city department or municipal agencies
- The city's central IT organization handles ICT implementations for all city departments and municipal agencies

Q3.6. Of the following groups, which one has the greatest influence over identifying the city government's ICT priorities? (Please select only one response.)

- Citizen & business input or task force
- City department or municipal agency needs
- Central IT organization's needs
- A balance of all groups' needs (citizens, businesses, city departments, municipal agencies and the central IT organization)

Q3.7. Please Provide the ICT Contact person and Contact Details



Q3.8. Please Provide the Operational Contact person and Contact Details



D. Legal aspects related to ICT

For collecting information on Legal aspects related to ICT the following questions were defined.

Q4.1. What is the regulatory framework for the following aspects related to ICT? (please briefly describe in the space provided)

Is current legislation allowing PPP models for ICT?



Is renting or leasing allowed for ICT related procurements?



Is renting or leasing a common practice for ICT related procurements?

Is legislation allowing the city to rent its excess of capacity of existing infrastructures (dark fibre, outdoor wireless, etc.) to the private sector?

Q4.2. How and who is managing the security and legal aspects of your city infrastructure and especially e-govmnt. and Platform and/or Open Data aspects of it.



Q4.3. Please provide the legal contact person name and contact details of people involved in the legal/operational aspects



Q4.4. Who is managing the intellectual property rights in the city such as license fees for software, use of applications etc...



D. Applications/Services

The presented below questions are defined to identify how the cities are currently delivering their services and also find out if there is any outsourcing used. The legal aspects of outsourcing and data storage are explained in detail in the section 6. The collaboration tools such as video conferencing, web conferencing are important as the iCity Platform is demanding a good level of collaboration.

Q5.2. Can you describe your deployment process for services (from development to testing to deployment – to user acceptance)



Q5.3. Please indicate to which extent each of the following technologies are made available within the city government? (Please select one response per row.)

| | Central admin. office, a few branch offices & municip al agencies | Central admin. office, some branch offices & municip al agencies | Central admin. office, most branch offices & municip al agencies | Central admin. office, all branch offices & municip al agencies | Do not offer this technology | I'm not sure |
|--|---|--|--|---|------------------------------|-----------------------|
| Broadband connectivity to the city network | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Enterprise email (e.g., Outlook, Lotus Notes, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| IP or digital phone service (e.g., VOIP) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Unified communications | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Video conferencing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Web conferencing (e.g. WebEx, GoToMeeting) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| VPN for remote network access | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Document sharing (e.g., SharePoint, Lotus Notes, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shared online workspace (e.g., Wiki) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q5.4. Are some or all of the above services being offered in mobility to public employees from the different departments or municipal agencies?

Yes

No

Please, elaborate your response

Q5.5. Please indicate which of the following services are managed internally or outsourced? (Please select one response per row.)

| | Managed Internally | Outsourced to a Service Provider | Do not offer this technology | I'm not sure |
|---|-----------------------|----------------------------------|------------------------------|-----------------------|
| Broadband connectivity to the city network | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Enterprise email (e.g., Outlook, Lotus Notes, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| IP or digital phone service (e.g., VOIP) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Unified communications | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Video conferencing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Web conferencing (e.g. WebEx, GoToMeeting) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| VPN for remote network access | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shared Data Centers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

E. Open Data

Open Data portal is an important part of the iCity Platform, therefore it is important to understand the status of open data related development in the cities. Below is presented a part of the online questionnaire addressing this issue.

Q6.1. Please name the Open Data Officer, who is the primary point-of-contact for city data (with contact details), if applicable.

Q6.2. Please name Open Data Evangelists, if any, in your city (with contact details).

Q6.3. Please indicate any existing city-sponsored open data offerings, including, but not limited to websites.

The web address of the offering

The department, division, and/or agency providing the offering

Is this open data offering should be integrated in the iCity Platform for pilot use-case?

Q6.4. If the Open Data (OD) offering is provided on a basis of dedicated Open Data platform:

Which software is used for realization of the OD platform (CKAN, Virtuoso, relational database, etc)?

Does the OD platform provide an API to other applications? How this API looks like?

OD documents are published with meta-data. What is the structure of the meta-data?

Which document formats are supported by the platform (rdf, csv, xls, pdf, etc)

Please provide contact details of the person to provide further information about this OD offering

Q6.5. Please specify planned or ongoing open data activities, if any, in your city. Do you have a roadmap (timetable) for open data activities? If so, please provide a brief statement regarding the roadmap.

Q6.6. Which of the planned or ongoing Open Data activities you would like to integrate in the iCity Platform

Q6.7. Please indicate the planned classes of data to be rolled out for the iCity project (Please select all those apply)

- Arts and Recreation (such as sewer systems, street lights, signs, potholes, and sanitation services)
- City Budget: Revenue & Expenditures
- Construction, Housing and Public Works (such as Parks and Playgrounds)
- Demographics (including *births, deaths, divorces, expenditures, income, marriages, population, poverty, and wealth*)
- Elections
- Energy and Utilities
- Health, Disability and Elderly Care
- Law Enforcement, Courts and Prisons
- Tourism
- Business Enterprise, Economics and Trade (includes Foreign Investments)
- City Portal Web Statistics
- Crime and Community Safety
- Education and Public Libraries
- Emergency Services
- Environment, Geography and Meteorological (including *mapping and geospatial data, marina management and beaches*)
- Labor Force and Employment Market
- Political
- Urban Transport
- Other, Please Specify

Q6.8. Please indicate your reasons for pursuing Open Data. (Please select all those apply)

- Transparency
- Innovation
- Public Feedback
- Local Budgetary Earmarks
- Legal Purposes
- Longitudinal Studies
- Enable Data Discoverability
- Efficiency
- Trust
- Crowdsourcing
- Reuse / Free Data Access
- Verifiability
- Planning
- Data Exploration
- Quality
- Media Feedback
- Participation / Outreach
- Economic Stimulus
- Cross Disciplinary Studies
- Return on Investment (ROI)
- Improve Data Fusion Efforts

Other, Please Specify

Q6.9. What possible advantages does the city see in terms of international / EU collaboration in the field of Open Data?**Q6.10. What kind of help would the cities need, in terms of platforms, technologies, consultancy or otherwise that would facilitate the availability of open data in the city?**