

# SYNCHRONICITY



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## **Executive Summary**

*This report constitutes Deliverable 1.1 (Report on the engagement activities in the reference zones) of the SynchroniCity project and is one of the two deliverables of task 1.1, which aims to focus on providing support for the local ecosystems in each of the reference zones (i.e. cities). More specifically, Deliverable 1.1 aims to define and set up a permanent interaction process with the stakeholders of the ecosystem. The objective is to support the reference zones (with tools and instruments) to establish a community-based approach to engage with the different stakeholders and enable interaction and co-creation.*

## Abbreviations

D	Deliverable
EC	European Commission
FCC	Future Cities Catapult
RZ	Reference Zone
WP	Work Package
WT	Work Task

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# 1 Introduction

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Smart cities hold the potential to be a key driver and a catalyst in creating a global IoT market of services and hardware. However, the emerging smart city market faces specific challenges that act as barriers to growth, impeding rapid innovation and inhibiting widespread market adoption.

SynchroniCity represents the first attempt to deliver a digital single market for Europe and beyond for IoT enabled urban services by piloting its foundations at scale in Reference Zones (RZ) across eight European cities, involving also other cities globally. It addresses how to incentivise and build trust for companies and citizens to actively participate in finding common co-created IoT solutions for cities that meet citizen needs and to create an environment of evidence-based solutions that can easily be replicated in other regions.

The reference zones are based on cities which are at the forefront of smart city development covering different geographies, cultures and sizes. They include Antwerp (Belgium), Carouge (Switzerland), Eindhoven (the Netherlands), Helsinki (Finland), Manchester (the United Kingdom), Milan (Italy), Porto (Portugal) and Santander (Spain). These cities have adopted the Open & Agile Smart Cities (OASC) principles<sup>1</sup> to build IoT ecosystems and integrated services based on open standards and existing datasets.. Each of the reference zones (cities) had the responsibility to ensure that the SynchroniCity activities would be carried out in accordance with their needs, interests and regulations.

The objective of task 1.1 was to support the RZs with tools and instruments to establish a community-based approach when engaging with different stakeholders (SMEs, large industry, citizens) to enable interaction and co-creation. At the start of the project, each RZ provided an overview of their tools and co-creation mechanisms, including a list of communication channels. They were then listed and evaluated. The reference zone liaison officer was responsible for implementing these activities and making use of them to support the co-creation activities as foreseen in the other work packages.

To organise and facilitate the process across the different cities, a Reference Zone Coordinator (RZC) was appointed by the Technical Steering Committee (TSC) to chair the Reference Zone Forum (RZF). The specific objectives of the RZF, which is also called the ‘Cities Forum’, were to:

- Create a safe space for open discussions and an honest exchange of experience
- Share and work towards resolving uncertainties in the project
- Signpost the relevant information and project partners
- Be the “voice of the cities” in the Technical Steering Committee (TSC) and in the project in general.

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<sup>1</sup> Minimal Interoperability Mechanisms (MIMs) : <https://oascities.org/wp-content/uploads/2019/06/OASC-MIMs.pdf>

## **2 Cities Tour – getting to know each other and stakeholders**

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### **2.1 Initiating the discovery process of local ecosystems**

Synchronicity is an initiative that aims to deliver a digital single market for IoT enabled urban services in Europe and beyond. By piloting services at scale in eight reference zones within eight European cities, the project looked at how to build trust and create incentives for the participation of cities, companies and citizens within the marketplace. To test the marketplace, the project sought to deliver common, co-created, IoT enabled urban services that meet citizen needs, and to create a collection of evidence-based IoT solutions that can be reused and replicated with ease in other regions across Europe and the world.

Since cities and the buy-in of their citizens are a fundamental element of a functioning urban service marketplace, an in-depth understanding of the local context of each of the project's reference zones was a vital first step. This would provide the basis for coordination consistency across the reference zones throughout the project. Moreover, in this foundational process, the reference zones themselves could be provided with the correct tools to interact with their local ecosystem and beyond.

Within the context of Reference Zone coordination, several activities were performed:

- The setting up of the Cities Forum: a bi-weekly telco with all city leads
- A series of workshops to establish the cities' needs in the open call
- A tour of the cities to map infrastructure and establish rapport with the Reference Zone Coordinator

#### **2.1.1 Workshops for the Open Call**

To help define each cities' challenges to feed into the open call, a first series of workshops was organised in Helsinki, Carouge, Porto and Santander. During these workshops, the first goal was to allow the city leads to get to know each other and to establish trust between the city leads. With the goal of the Cities Forum to be a place for honest exchange, the WP1 and WP5 teams saw the necessity for these partners to get to know each other, work together, and establish a connection in the real world if they were to be honest and open during regular telcos. The workshops were a first means to establish this trust.

During the workshops, the team used the template found below for city leads and their teams to share information on their roles, as well as their general hopes and fears in relation to large scale IoT deployment.

The form is titled 'SYNCHRONICITY' and 'Your City & Organisation'. It contains a box for 'draw a picture of yourself here', a 'Name' field, and a 'My role in Synchronicity is to:' field. Below these are two large text boxes: 'I know about...' and 'I would like to know more about...'. A section titled 'What is your experience level in the following;' includes a scale from 0 (none) to 10 (expert) for five categories: Policy, Co-creation, Service delivery, Technology development, and Technology application. The URL 'http://synchronicity-iot.eu' is printed at the bottom.

Figure 1. Introduction workshop template

The outcome of this first round of questioning was mostly to create a friendly space for the city leads to interact. In that regard, it was a useful activity. The exercise that was used at the time also captured the hopes and fears that city representatives had at the beginning of the project:

## Key Takeaways

### HOPES

1. Increase in knowledge of all those involved
2. Long term sustainability of the market
3. Wider EU and worldwide uptake
4. Media reporting on the project and eventual consolidation into EU regulation
5. Data standardisation
6. Deliver something useful and valuable to citizens and stakeholders

### FEARS

1. Failure to produce something with long term sustainability
2. Inability to bring together varied cities
3. Inability to address the competing needs of cities and have local relevance
4. Data and security issues
5. Poor citizen engagement and communication
6. Theory and thought rather than action and delivery

Figure 2. Introduction workshop takeaways

Also, part of the workshops, each city was asked to contribute to a so-called 'honesty box': a place where they could leave a message without having to say it out loud in the group, without having their name attached to it. This exercise was created in an attempt to allow the city leads to bring up any concern whatsoever, without feeling judged or having to defend their position in any way. It was a first attempt to allow the city leads to be honest, without any consequences.

The question asked to them was to write down any issues or concerns they had regarding the project or the open call. Those issues were then collected and categorised into the following larger topics:

- Marketplace
- Technical
- Data and privacy
- City operations
- Desirability of solutions
- Citizen engagement

The key messages for each of these categories were the following:

#### Marketplace

- Having a marketplace for companies may be more important than a marketplace for cities - this will prevent reliance on government investment/funds in the future.
- Solutions must meet country specific regulations.
- Worry that it is difficult to find interoperability between cities if the standards are not in place. Synchronicity needs to provide standards and then they will need to implement and make it happen.
- Possible language and communication problem during deployment and collaboration with SMEs as not everyone in the municipality speaks English.
- How do we match-make SMEs to provide solutions not just parts? We need an online matchmaking service before the open call opens.

#### Technical

- The current process of having the architecture preceding the developer action/APIs presents a challenge.
- Would rather see a straightforward application and let the innovation come from the Digital Single Market which can be proved by the application.
- Would like to see a more lightweight architecture, based on APIs everywhere being wrapped into services.
- Solutions must be technically successful.

#### Data and privacy

- At the time of writing, the city had no open APIs, but the plan was to open them for SynchroniCity and long term will be open for everyone.
- Italian privacy regulation is much stricter than elsewhere → informed consent is not enough in Italy. But also, Italian privacy regulation is some of the most misunderstood in Italy.
- Data, engagement and evidence base is a very new issue in our country, and is not usually transparent or used in an open way - culture shift required.
- Concerns around jeopardising the privacy of people with new data sources and limits that privacy regulation sets, e.g. smart meter data can only be used for purposes agreed at that time.

#### City Operations

- There is a lack of collaboration between different municipal departments, and this is especially difficult for collecting and sharing data between departments.
- A mobility strategy is currently underway to replace the hold system including traffic lights, ticket readers (everything related to IT in mobility), this is a 20 year programme and may make it difficult for SMEs to deploy here.
- Contracts with service providers are not very clear on data or communications, which could be problematic for the SMEs and project.
- 2018 is election year in, so all other projects will need to be finished, which means people's time will be in short supply.
- The city wants to focus on mobility theme, not any of the others.
- The city's system is very attractive to businesses but not all contracts will be governmental in long term, so how to deal with this.
- The SynchroniCity project was initially built under their Mobility team. If now we open challenges in other areas, they will need to incorporate other people from other departments that have not been accounted for neither as resource nor in budget.
- Concerns around energy as a possible theme, due to the difficulty in arranging access to infrastructure and surrounding data, as its controlled by private companies -- potentially no way around this within the 6-month pilot period.

#### Desirability of Solutions

- Not sure about how many applications will come in the Open Call, which makes timelines difficult to understand.
- Company must have the municipality support for applications.
- Operational departments have many priorities and deploying synchronicity services won't be the priority if they are not on board, so there needs to be a project owner whose priority it is.
- Budget gap in terms of supporting deployment and installation.
- SynchroniCity needs to show and prove to inhabitants of the city what smart city services can do. If it cannot, they will not be able to get any more investment for it in the future.
- Themes are wide - there is a risk this will result in services that are not in line with what cities actually want. We need to define specific projects, but we could also have an open category that allows for surfacing unknown innovation.
- The worst case scenario is to put something in for 6 months and have to take it out. We will only deploy things in the city that we want long term and think will work.
- Concern that the solutions in place are actually useful for the cities.
- Open challenge could be a problem for 2 reasons: objectivity on deciding which is good and should be chosen, and resources: will the city make resources available to assist with the deployment.
- Services must have been through testing with people. They must work and be desirable.
- Cities must agree to support deployments before the open call.
- Following the deployments if the city wants to continue to fund the solutions they will need to tender for the services.
- The city is comfortable with solutions not working, happy to be a testbed.

#### Citizen Engagement

- Idea of citizens as a sensor could be really positive and useful for the IoT nature of civic engagement.
- If solutions are TRL6 there is little opportunity for meaningful co-creation.
- Solutions must be useful for citizens.

A full report of the process is available in Annex 1.

### 2.1.2 The Cities Tour

To understand the local context, the Synchronicity project’s Reference Zone Coordinators – Geoffrey Stevens and Michelle Warbis – undertook study visits in seven of the eight cities. These visits included formal stakeholder-focused processes of understanding policy priorities, challenge identification, and group discussions around relevant previous experiences and expected hurdles to be overcome. This was punctuated with or followed by a tour of the reference zone, led by the city’s municipal employees, showcasing recent IoT projects and programmes underway, or areas that could benefit from the solutions that emerge from the Synchronicity project.

The Reference Zones visited were Helsinki, Carouge, Porto, Santander, Eindhoven, Antwerp, and Milan. They all happened between September and November 2017, with visits lasting between 1 and 3 days. Unfortunately, Manchester could only be visited at a much later stage of the project. Each visit was led by one or both of the Reference Zone Coordinators (RZC), with support from other FCC staff of the project.

More informally, the time spent in each reference zone, within municipality buildings and on the city streets, provided an unrivalled opportunity to experience the realities of the city and the way the opportunities or challenges posed by the cities’ infrastructure – both physical and digital – to their publics. Easily taken for granted observations, like the speed of 3/4G, or the cost of public transport were noted, and though these field notes are not included explicitly below, they helped to shape the information presented, and documentation that followed for other tasks and deliverables.

Immediately after each visit, the RZCs consolidated and formalised the notes they had made. These notes were then combined with other data sources by colleagues from Work Package 5 (Open Call) to create city fact files for each reference zone, holding all the key information that could be useful for SMEs applying to the Synchronicity Open Call.

To better understand the city priorities and challenges, the data collected during those interviews was aggregated and structured into a table similar as the one below:

CHALLENGE/TOPIC					
Specific challenges	Existing assets/ infrastructure	Projects/SMEs in the area	Stakeholders responsible	Stakeholders affected	Potential IoT solutions

Table 1. Cities tour interview template

In addition to the questions asked to the city representatives, the Work Package 5 (Open Call) Lead felt it was important to get answers to some key questions, the answers to which would affect the open call management and delivery. For example:

- What is the role of Synchronicity’s international cities?
- What type of SMEs should be Synchronicity’s target audience?
- What is your expectation of SMEs and what they will deliver?
- How do you plan to engage with SMEs?
- How will you be able to support SMEs during deployment and installation?
- Do you have experience in Open Calls/Competition based funding?

Below you will find the key lessons from the Cities Tour.

**Key learnings:**

- Allow people to ask ‘silly’ questions really to speed up the convergence around the goals and the approach of the project.
- Stay close to city representatives over the course of the project to create a safe space to share real learnings (and stay away from the need to reporting).
- Maintain continuous dialogue with the partners to gradually build trust and achieve your goals.
- Coordinate the many requests from work packages to cities and reduce duplication.
- Creating a request tracker but it did not really work. Not all the WP fed into it and not all the cities used it. Administrative overhead to keep track was too high.

A full report of the cities fact-finding tour is available in Annex 1.

### 3 Transitioning to a regular telco

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The fortnightly Cities Forum meeting provided a 90-minute session for city leads to discuss recent progress, and share challenges they were facing. In this space, the Reference Zone Coordinator (RZC) was able to monitor progress on different tasks and take stock of difficulties, feeding back to relevant work package Leads.

Through holding these regular sessions, the RZC facilitates the exchange of experience in the reference zones, providing a bridge between the consortium partners and the cities to ensure proper coordination and management of requests.

The Cities Forum meeting was also pivotal in building good relationships between the cities. Minutes and action points from these meetings were circulated with all city leads and other relevant consortium members.

By combining face-to-face meetings with regular telcos we relationships were formed and useful information was shared beyond the usual project updates leading to useful knowledge sharing of honest feedback.

### 4 Final steps

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In October 2019, city representatives and project partners met in Milan to discuss and share experience on the way pilots had been implemented and reflect on the benefits of those experiments in their territory. The attendees were split into smaller groups to work around prepared posters, and were asked to report on their experiences throughout the SynchroniCity project. They were to focus for 5 to 10 minutes each on the following topics:

- the main challenges they faced
- what they had learned
- what recommendations they had for similar projects in the future

Below you will find a list of the main challenges, learnings and recommendations gathered from all the groups:

**Main challenges:**

- Failing sensors
- Issues with access to data
- Dealing with non-mature platforms
- Access to federation of data
- Wrong format of data model
- 6 months is short /summer period difficult
- Cities need to conform to NGSII-Standards
- Lack of communication
- End-to-end integrations
- GDPR
- Installation
- Third party provider issues
- City agility
- Expectations management
- Technical standards still evolving
- Installs on infrastructure
- Ramp-up phase with cities

### **Learnings:**

- Local partner needed
- Different steps of administration process required
- Single point of contact in the Council needs to be someone with overarching view of stakeholders
- Co-creation takes time
- Face-to-face meetings are crucial
- Engagement of stakeholders
- Timeline too short

### **Recommendations:**

- Involve interested stakeholders
- Provide hardware support (i.e. on sensors)
- Adhere to/implement standards
- Specification to be arranged pre-pilot period
- Ramp up time needed with city partners
- Intelligent procurement in cities
- Lower-expectations of co-dependency on city side
- Create plan with enough agility
- Improve development documents with examples

Additional to the information gathered through the workshop setting, the following recommendations were topics of discussion at the end of the session, and are communalities between the groups:

- More technology experts required particularly for a hardware test service for the framework
- More guidance for new cities allowing them to increase their agility to facilitate a smoother deployment
- Develop a better understanding of city strategic objectives and how the solution is able to respond to this earlier in the pilot period
- Make the pilot period 9 months or move the period out of the Summer Holiday season

With this session taking place late afternoon on the last day of the event, many partners were leaving at this stage and the discussion was cut short.

## 5 Conclusions

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SynchroniCity started and ended with cities and their citizens. The Cities Forum was praised by the reference zones as it provided them with a platform where they could openly discuss the challenges linked to IoT deployment in their territory. It was a way for cities to work together to resolve, and where possible, prevent problems. This way, the SynchroniCity project made sure that technology development was not disconnected from the city needs.

Face-time between the cities and the RZC helped develop strong relationships, for the project, and built a sense of shared experience that would have been extremely difficult to achieve remotely or via email. Moreover, meetings with other city stakeholders helped the Reference Zone Coordinator (RZC) better understand each local ecosystem and generate greater buy-in from city stakeholders and decision makers beyond the project. Ultimately, the cities tour played and continued to play a pivotal role in the success of the Synchronicity project.

The Cities Forum was also used by Work Package 5 (Open Call) to identify the challenges each city was facing that could be addressed by open call respondents (i.e. the pilot projects). The information gathered was used to inform the themes and challenges when designing and delivering the Synchronicity open call (WP5) in 2018. Many of the things collected at the early stage of the project helped guide SMEs implementation and delivery, and answered questions regarding working relationships with cities, as well expectations and desires of the cities.

## 6 Annex

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### 6.1 Annex 1: Cities tour report

## 1.0 Introduction and Background

Synchronicity is an initiative to deliver a digital single market for IoT enabled urban services in Europe and beyond. By piloting services at scale in eight reference zones within eight European cities, the project looks at how to build trust and create incentives for the participation of cities, companies and citizens within the market place. To test the marketplace, the project seeks to deliver common, co-created, IoT enabled urban services that meet citizen needs, and to create a collection of evidence-based IoT solutions that can be reused and replicated with ease in other regions across Europe and the world.

Since cities and the buy-in of their citizens is a fundamental element of a functioning urban service marketplace, an in depth understanding of the local context of each of the project's reference zones was a vital first step. This would provide the basis for coordination consistency across the reference zones throughout the project. Moreover, in this foundational process, the reference zones themselves can be provided with the correct tools to interact with their local ecosystem and beyond.

To understand local context, the Synchronicity project's Reference Zone Coordinators – Geoffrey Stevens and Michelle Warbis - undertook study visits in seven of the eight cities. These visits have included formal stakeholder-focused processes of understanding policy priorities, challenge identification, and group discussions around relevant previous experiences and expected hurdles to be overcome. This was punctuated with or followed by a tour of the reference zone, led by the city's municipal employees, showcasing recent IoT projects and programmes underway, or areas that could benefit from the solutions that emerge from the Synchronicity project.

More informally, the time spent in each reference zone, within municipality buildings and on the city streets provided an unrivalled opportunity to experience the realities of the city and the way the opportunities or challenges posed by the cities' infrastructure – both physical and digital – to their publics. Easily taken for granted observations, like the speed of 3/4G, or the cost of public transport were noted, and though these field notes aren't included explicitly below, they have helped to shape the information presented, and documentation that has followed for other tasks and deliverables.

The Reference Zones visited were Helsinki, Carouge, Porto, Santander, Eindhoven, Antwerp, and Milan, and these all occurred between September and November 2017, with visits lasting between 1 and 3 days. Unfortunately, we were unable to visit Manchester until later in the project so the results presented here were provided remotely. Each visit was led by one or both of the Reference Zone Coordinators, with support from other FCC staff of the project.

### September

6 - 8 Helsinki Visit

27 - 28 Carouge Visit

### October

11 - 13 Porto Visit

25 - 27 Santander Visit

## November

6 - 7 Eindhoven Visit

7 - 8 Antwerp Visit

13 - 14 Milan Visit

Immediately after each visit, the RZCs consolidated and formalised the notes they had made. These notes were then combined with other data sources by colleagues on WP5 to create city fact files for each RZ, holding all the key information that could be useful for SMEs applying to the Synchronicity Open Call.

The following is the consolidation of all of the original notes made by the RZC into one reader-friendly document. It was created one month after the end of the final visit. However, it has been organised to follow a standardised structure throughout, the exact content of the visits varied to some degree, and this explains the differences in quantity and detail of information presented herein.

## 2.0 City Fact Files

### 2.1 Helsinki

**Date of visit:** September 6th-8th

**Number of participants:** 5 (plus RZCs)

**Other meetings and engagements:** Additional meetings with Helsinki's Director of IT, the city's technical architect, visit to the city's smart district, visit to Smart Helsinki exhibition.

#### 2.1.1 City Priorities and Challenges

The city has five areas of strategic priority:

1. **Social care and welfare** - This has IoT demand but the sector are already doing well at taking care of it
2. **Lifetime education** - The physical city as a platform for learning
3. **City environment** - Capacity and usefulness in monitoring the whole city from environmental and social perspectives; there are many new things to learn if we can implement the right sensor and measurement tools. Opportunity in showing where and how to act around specific environmental challenges (Such as reducing air pollution; water pollution; energy use; move towards carbon neutrality etc.)
4. **Logistics processes** - Smart logistics processes already exist but there is a focus on adapting the commercial model into the city context. Better logistics assist with improved quality of life - sensors in dummy devices, follow life cycle of plant and equipment - need to be able to uniquely identify equipment. Cost reduction from last mile
5. **Mobility as a service** - Transport modal integration; traffic management; real-time understanding of flows; smart contracting. Keen to have real time understanding how people move and understanding what is going on will enable optimisation of transport systems.

## 2.1.2 Project Polygon Findings

For the project polygon exercise, Helsinki chose to focus on mobility; participation and democracy; and city environment, as it was felt that these were important to the city, tied in with wider Synchronicity objectives, and could be impacted by IoT.

### Mobility

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders	How can IoT help
Travel chains	HSL APIs	EIT Digital	Helsinki Region Transit Authority	Traffic light control
Congestion	HAQT - Air quality monitoring	Empower (EU project)	City planning dept	Methodologies and tools to measure and model
Emissions	Underground tunnel to move transport underground	Caroom; Whim app (uber banned); Drive Now	Data accelerators	Data gathering - traffic flows,, air qual, noise, people counting, availability of wheelchair space
Parking	Transit cards; share bikes; drive now; smart parking; EV charging	TUUP	Maas operators	Special environments for cars
Real time navigation	Noise monitoring - my smart life	iScape (EU Project)	Transport companies (VR etc)	People as sensors
Walking/active transport	Helsinki region infoshare	Maas global	Cyclists, walkers, transport users	Build trust - not spying helping city function better
Extra hour to the day	Pylons/Totems		People with health issues	
Inclusiveness and accessibility	Ambition to be smart mobility test bed		Tourists	

			Elderly/disabled people	
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### Participation and Democracy

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders
Enabling people to produce or see self as actors in data collection	My Helsinki app	Visualisation for budgets	Politicians
Empowering people to participate in city decision making	Open decision making API	Participatory budgeting	City officials
Consensus building	Issue reporting API	Finnish net solutions	Citizens
Strengthening transparency	MyData	D-Cent (EU project)	Businesses eGov providers
	Events API	Mapita - maptioneers	

### City Environment

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders	How can IOT help?
Recycling	My data	iScape	City environment department; city transport authority	Utilise smart grid
Waste management/ disposal	Smart grid	LUODE - Antifreeze in river monitoring	Public energy company	Behaviour change apps
Air pollution	Smart waste pipes - Kalasatama	Apartment buildings as energy providers	District heating and cooling schemes	Personal monitoring; smart metering

River pollution	Helsinki region infoshare	Home carbon	Condominium / apartment cooperatives	Benchmarking
Natural environment preservation	HAQT	Koteihilli	Utility companies / construction companies	Provide evidence
Individual environmental behaviour	Real time energy monitoring		Tourists	Citizen science tools
Baltic sea pollution	Carbon neutral 2035 target		Residents	

### 2.1.3 WP5 Questions and Answers

The WP5 Lead felt it was important to get the answers to some key questions, the answers to which would affect the open call management and delivery. These questions were brainstormed with city leads and their colleagues, and their answers are below.

#### What’s the role of the international cities? How could they affect you?

- Helsinki is working with multiple other cities: Talinn, Hamburg, Copenhagen, and there’s a six city strategy in Finland, so Helsinki is used to working collaboratively
- The Open Call should act as a showcase with studies for scaling up and business expansion, then global cities can come in for monitoring
- There should be theme based workshops for all cities (including global) interested in themes
- The current guidelines around the international cities are too generic - we need to document and communicate better around what involvement actually means

#### What type of SMEs should be the target audience?

- TRL6 isn’t critical, but maybe the money isn’t enough to enter at a lower level, though TRL5 may be possible as product exists but hasn’t been demonstrated
- Scaled solutions are lacking - maybe money should be for scalability rather than innovation
- Commercial viability is key for Helsinki

#### How will you be able to support SMEs during deployment and installation?

- Provide APIs and other assets e.g. living lab bus
- Collaborative workshops and co-creation
- Relationship building with clients and partners
- Technical support (money from Synchronicity to enable this)
- Open data and business training
- Hackathon with IBM - advertise call as part of this to be carried on
- Role of departmental managers/leads to help with deployment

**What's your expectation of SMEs and what they will deliver?**

- Mainly interested in Southbound solutions rather than apps
- Keen for SMEs to use existing assets

**How do you plan to engage with SMEs?**

- Leading through line managers and delivery/operational people in Helsinki city gov with expertise and understanding of area
- Hackathon with IBM
- Events in IOT programme
- Data business networks for relationship development
- Smart City Expo

**What's your experience of Open Calls? What works? What doesn't?**

- If you can define something good, they work well
- Companies can learn about cities and their processes through open calls
- Local reach is very important for EU wide calls
- Technical expertise is required to help applicants with technical issues
- Process needs to be clear from the outset and not change after announcement
- Open calls can lack long term sustainability
- Big open calls can get lost between partners and have a lot of misunderstandings

**3.1.4 Other findings and workshop outputs**

Harmonisation is the key, the innovation comes from demonstrating the digital single market, a solution working in multiple cities is a big achievement even if it isn't the most innovative application.

- City challenge doesn't necessarily have to be new and rad but could be. If the solution is also effective and interesting it will act as a better "promotion" for the DSM concept.
- Helsinki perspective is that validation and scaling is more important than innovation in solutions
- Need to encourage use of existing infrastructure (e.g. network of air qual apps, would SME like to use them)

Things only work when there is demand - when people use it, it gets better, if standards are too far away (as in made too far in advance of knowing how they will be used and are too idealistic they will never get used)

**Meeting with the Director of IT and Reference Architect**

Will discuss further with FV how the city will engage with SMEs deploying solution but seemed keen to get operational staff "line managers" involved in this process and to be drivers of change

- Sees the benefits of the open call funding to try new services.
- Many cities think they can control the market but they can't; cities need to develop services that can be self sustaining
- Don't believe in whole city platforms, but interested in platforms as they are required by applications
- When city gov contracts companies they specify that data is made available to city and is open

Need to start small to manage risk, than if it works invest more from the cities

- Need to try to understand the impact (need baseline monitoring), hard to prove that it's the only reason for the outcome
- You don't necessarily get something real by testbed, but you learn and can build on top of competencies. Products in the marketplace is not the only outcome
- Cities are able to provide new environments so that companies can send best people to get excited

## 2.2 Carouge

Date of visit: September 27th-28th

Number of participants: 5 (including RZCs and Carouge's Mayor)

### 2.2.1 City priorities and challenges

- Improving public safety and security (problem with anti-social behaviour, graffiti and vandalism)
- Improving sustainability through more conscious energy and water consumption
- Improving the environment through better waste management systems and street cleaning
- Improving mobility and reducing reliance on cars (big traffic problem due to number of people who come into the city for work, and who travel through to get to Geneva)
- Improving public participation and engagement with the city (very few people engage, low voter turnout, and lack of diversity in participation both demographically and by geography)
  
- Carouge has a human resources problem due to the city's size - financing beyond the 6 month project may also be a problem, but it's vital to ensure that things chosen can demonstrate success of Smart Cities/ IoT so they can have long term viability
- Communicating with the public on a 6 month deployment basis is going to be a real problem - there needs to be some level of certainty around projects, not just a trial
- Carouge/Geneva has long had a problem with lack of public trust around smart/IoT which means public funds haven't been able to help in this areas, which makes the European money all the more important

### 2.2.2 Project polygon findings

For the project polygon exercise, Carouge chose to focus on mobility; participation; waste management; and energy, as it was felt that these were important to the city, tied in with wider Synchronicity objectives, and could be impacted by IoT.

#### **Sustainable Mobility**

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders responsible	Stakeholders affected	How could IoT help?
Electric vehicles	Open data on transport	IEM Group - smart parking	Transport dept	Visitors	Signpost to parking places
Reduce transit traffic	Free bikes coming in 2018	ABB - EV charging	Chinese company with dockless bikes	Municipality - dept of transport; dept of urbanism	Routing - stay on main road
Reduce logistics traffic	Smart parking system	Orgiwise - LoRa	Carouge municipality	Workplaces - commuting employees	Cameras on rubbish trucks or other logistics vehicle to make issues visible
Small streets are blocked by traffic (need to ease congestion)	Dockless bikes by Chinese company (Geneva)	Telecabin - proposed cable car	Canton de Geneva	City inhabitants	Drone taxis
Maintaining bike lanes			TPG - Public transport	Freight and logistics companies	Navigation with public transport app
Accessibility for elderly			Taxi companies	Pedestrians/cyclists	Changing traffic light change speed to help accessibility

Reduce private vehicle use (at the minute cars seem to be fastest and cheapest option)			Mobility - Shared cars company	Drivers (50% of people in Carouge don't own a car, up from 20% in 2000)	
Control/prioritise parking			Transport associations (lobbyists)	Transport associations (lobbyists)	

**Waste management/cleaning the city**

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders responsible	Stakeholders affected	How could IoT help?
Reduce/no cost of collection	400 street bins	Ecowaste	Private companies collect communal waste bins	Contractors	Humidity sensors
Reduce residual waste	Bin sensors in all bins	Orbwise	Department voirie, espaces vecto et nateriel	Tourists	Sensors to show smell problem
Pest prevention (birds, foxes)	Some underground communal bins		City responsible for collection, Canton for disposal	Municipality	Reduce administrative/planning burden for city
Smell problems - how to clear organic waste quickly	LoRa and wifi			Inhabitants	Fill sensors on street bins
Street cleaning - sweeping,				Businesses	Route/job planning

graffiti, litter					
Reduce staff time spent collecting waste					Apps to help reduce waste

**Public engagement/participation**

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders responsible	Stakeholders affected	How could IoT help?
Involve inhabitants	70% of inhabitants have smartphone	MMOS	municipality	All city Inhabitants (not just citizens) -workers - commuters - holiday homes - epats	VR tours and futures to increase engagement
Increase voter turnout - and methods of engagement beyond voting	1500 new inhabitants per year	City making Game	canton	Refugees and asylum seekers	Online voting
Awareness and motivation of decision making in the city	Community action groups		Central govt	Young people School children	Realtime app to let people know about what's happening
Demonstrating the impact of engagement	city induction tours for new residents				App for involvement in decisions

How to overcome multiple language barriers					Interaction at point of interest (totems!?)
How to reach the digitally isolated/excluded					predictive/evidence based policy making
Increasing political transparency					Development and roadwork information gathering
Increase the diversity of people engaging - move away from usual suspects -					Open data to enable AI for routine questions
How to effectively hand over responsibility from council to citizen					

**Energy consumption**

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders responsible	Stakeholders affected	How could IoT help?
Reduce electricity, oil, gas consumption	City owns lights	Robin Hood Energy	Citizens as energy producers	Municipality and canton	Something with blockchain
Aim for 17000 KW per person per year	public spaces for alternative energy	PV Panels	Citizens as energy users	Utility providers	Smart meters

Move to heat network	Owns some solar panels		Urbanism department	Business	Behaviour change applications
Engaging citizens to reduce energy			Developers/ construction companies	Citizens	Demand management smart grid
Energy sharing/mini grid			SIG - Services Industrial Geneva	Schools and other public bodies/buildings	
Energy autonomy of citizens			Energy companies (obligation)	Municipal fleet	
Move to sustainable energy for public buildings			Municipality budget line in many areas		

### 2.2.3 WP5 Questions and answers

The WP5 Lead felt it was important to get the answers to some key questions, the answers to which would affect the open call management and delivery. These questions were brainstormed with city leads and their colleagues, and their answers are below.

#### What type of SMEs should be Synchronicity’s target audience?

- SMEs should only be registered within the EU
- SMEs should have 5+ employees to ensure sustainability and adequate support
- Ideally SMEs will have financial stability to exist beyond synchronicity for at least 24 months
- No institutionalised SMEs - those that have received funding before and want more should not apply)

#### What is the role of Synchronicity’s international cities?

- EU SMEs should be able to deploy outside EU
- Closer relationship with city officials could help build a problem solving network like OASC
- Cities get in touch to help each other need to be beyond technical people to politicians and senior officers

**Experience of Open Calls**

<b>Good</b>	<b>Bad</b>
Need the dream team - expertise from different companies that are complementary not overlapping	Partners need to meet face to face
Consortia not individual SMEs are required	Too many institutionalised SMEs
Clear definition of project - not flexible	If not specific enough can be twisted to serve bid not city
Can help cities see what is possible	

**How will you support SMEs during deployment?**

- Project management
- Signposting and getting the right stakeholders on board
- Advice and permissions from public bodies
- Carouge will hire someone to manager/own/deliver the deployment and installation phase. Synchronicity provides funding for this

**What is your expectation of the SMEs and what they will deliver?**

- Speak French or English
- Listen and adapt product to Carouge
- Store data in Switzerland
- Respect licensing
- Work collaboratively
- Long term viability not just 6 month experiment

**How do you plan to engage SMEs?**

- Have a list of 104 SMEs that the municipality is already in touch with, and a large proportion of Swiss SMEs are working on smart cities. The municipality have met all of them and will contact them once the challenges are known.

**2.3 Porto**

Date of visit: October 11-13

Number of participants: 10 (plus RZCs)

Other meetings and engagements: Presentation by Porto Digital on relevant projects; visit to social housing development site

## 2.2.1 City priorities and challenges

### **Open data**

Apps based on open data

Urban platform

Policy (information based decision making validation)

City OS

*(Note are these challenges, or are they solutions)*

### **Monitoring policy impact**

Results monitoring

### **Scale up**

Implementation of innovation project in the city

Entrepreneurship support

### **Environment**

Public lighting

Smart lighting

Environmental noise

Reducing CO2

Environment (air, green space, noise)

Climate change

### **Mobility**

Traffic lighting

Mobility

Smart traffic management

MAAS

### **Waste management**

Recycling

reuse

### **Energy**

Energy communities

Reduce energy demand  
 Building energy efficiency  
 Local renewables  
 Smart grid

**Civic engagement**

Ecosystem engagement

**Tourism** - Helping get tourists out of the centre of the city

2.2.2 Project polygon findings

For the project polygon exercise, Porto chose to focus on environment; waste management; and energy as it was felt that these were important to the city, tied in with wider Synchronicity objectives, and could be impacted by IoT.

ENVIRONMENTAL ISSUES (General)					
Specific challenges	Existing infrastr	Projects/ SMEs in the area	Stakeholders responsible	Stakeholders affected	Potential IOT solutions
Public health	Environmental sensing units	Environmental sensing units	Porto digital	Population of nearby cities	Energy production system
Environmental conditions (e.g. heat, temp, UV)	Smart energy meters	EV network	Transport operators	Porto inhabitants	Real time data
Street lighting	Smart water meters	UBIWHERE and monitor	Aguas do Porto	Children and older people (weaker respiratory systems)	Meters and sensors for monitoring
Waste management	Good recycling	Exercise programme	Universities and R&D centres		Smart energy lighting systems

	system (collection)	based on air quality			
Maintaining biodiversity	Public wifi networks	Civic education schemes/lessons	Purchasing/procurement division		Wildlife monitoring (sonar?)
Local energy production		Nature based solutions projects	APA (national level)		Apps that provide education/awareness
Construction and refurbishment		Smart-lighting	LIPOR (waste company)		Waste weight sensors
Street cleaning			Municipal environment department		Algorithms to cross ref data
Water / air quality					

WASTE MANAGEMENT					
Specific challenges	Existing infrastr	Projects/SMEs in the area	Stakeholders responsible	Stakeholders affected	Potential IOT solutions
Plastic on beaches	Recycling is free but waste collection is expensive	Waste communications campaigns	Land owners	City inhabitants	Waste exchange
Dog waste	Social housing under municipal control	Small pilots on monitoring bin full-ness levels	SUMA	Retail and restaurants	Reporting

Smells	Municipal buildings		Recalte	Tourists	Share info platform
Waste collection timetable knowledge	Waste staff can report issues		Waste management company (City council)	Schools and universities	Sensors to weigh waste
Public understanding on what waste is and recycling	'Fix my street' – can report waste issues online or by phone				Coordination
Cost of collection contractors					Reporting
Public bins are always too full					Waste to energy
Vandalism					

MOBILITY					
Specific challenges	Existing infrastructure	Projects/SMEs in the area	Stakeholders responsible	Stakeholders affected	Potential IOT solutions
Accessibility of the transport system	Park and ride system	Existing mobility apps e.g Moveme.amp	AMP transport authority	Tourists	Smart traffic lights
Easy access to the public transport timetable required	Free wifi in buses	OPT - The company that developed Moveme	Car sharing/PHV schemes e.g. Uber, cabify and lyft	Public	Parking sensors for outdoor lots and data from

					existing indoor lots
Need to quickly resolved road traffic accidents	Some intelligence on traffic light systems	All data is on a centralised point – city working on improving this amongst the data providers	Vila nova de gaia	Drivers/ car users	Activators
Better management of transport during peak hours	Existing mobility apps e.g Moveme.amp	City working on integrating x-sharing companies into multi modal transport	Cities from the Metropolitan area of Porto	Commuters	Provide real time traffic data
Traffic lights all work independently and this causes congestion	Tourism APIs which can be used commercially	Smart traffic light system – 8 million euro investment over 5 years – with fibre connection	STCP – Metro porto	Drivers of public transport	Image processing video cameras
Need better pedestrianisation	Weather data		CP – private buses	Low income citizens	Mobility apps
Incentives for people to use public transport	Public wifi in town centre		TIP – Andata tickets	Students	
Not enough places to park in the city centre	Traffic constrains info (open data map but not yet API)		Parking lot owners	People with limited mobility	
			Taxi associations		

NB 1: A company owns all the data and it is not open – there’s a need for real time data

NB2: Opt – moveme is now being developed and deployed in Lisbon

ENERGY					
Specific challenges	Existing infrastr	Projects/SM Es in the area	Stakeholders responsible	Stakeholders affected	Potential IOT solutions
Homes and public services generate a lot of CO2	LED lighting ready to control in 5 years	Traffic lighting	Public	Everyone	Observatory to monitor and control
Aim to reduce CO2 to 3.5 tons per capita	20% of homes are social housing	3D mapping of buildings	Mobility department		Citizen feedback loops for understanding
Fossil fuel transport system	Smart meter trials	OMNIFLOW	Ade Porto		Citizen sensing
Municipality has a direct cost for transport, buildings, lighting etc.	Optic fibre	Municipal building observatory – manual but soon smart	Purchasing/procurement division		Air quality
	Refurb of large buildings – market/theatre/old factories	EVs	CGI – integrated management		Car commuting and classification
	Energy management system	Solar PV in schools	Porto digital		Local energy communities

		Tax relief for energy efficiency	Domas Social		Car counting and classification
		LED lighting project	Environment Department		EMS
			EV companies		
			GOP – public construction company		
			Step – bus company		

### 2.2.3 WP5 Questions and answers

The WP5 Lead felt it was important to get the answers to some key questions, the answers to which would affect the open call management and delivery. These questions were brainstormed with city leads and their colleagues, and their answers are below.

#### Experience with open calls

- No one in Porto has been part of large open call process before, as such Porto would like a public FAQ forum during the open call process

#### How will you be able to support SMEs during deployment?

- Porto Digital can provide technical competence
  - Tech team
  - Multidisciplinary
  - Service design
  - Liaison
  - Informatics
  - Platform development
- Comfortable with providing project owners and liaison people
- In Porto there are several companies delivering services owned by Porto (like porto digital) so can be complex to find correct people
- Cities need to give written commitment to deployment support, but there is already high level management and political buy in in Porto

#### What is the role of the international cities?

- To prove the concept of global digital single market
  - Even if we can deploy just 1 solution internationally it becomes a beacon project
  - However it's not important for an international company to deploy in the EU

- Interested to learn from other cities and important to know about differences

### **What type of SMEs should Synchronicity target?**

- Type, age doesn't matter all about their solutions
- TRL6 is important, must be tested
- Very open to new technology and services as long as they have been tested in situ before
- Companies must comply with regulations
- Must have willingness to work with municipalities to adapt
- Open to customisation and favour a building block approach

### **Expectations of what SMEs will deliver?**

- Good solutions to challenges and problems
- Some collaboration and adoption of specific proto needs even if base tech the same
- Happy to try short term solutions but if it brings value to the city they will be interested in maintaining
- Porto will need support in maintaining the system, some startups have poor documentation and this could be problematic long term
  - Don't necessarily need final product but expect god guidelines and information on how to operate

### **How will you engage with SMEs?**

- Porto Digital have a team ready but need to understand the details before they make their plan

## 2.2.4 Other findings and meeting outputs

### **Scale up Porto Open Cal Presentation**

Scale-up Porto open call for activities not technology, understanding that municipality doesn't need to be working in the startup sector anymore; there are lots of organisations working on this. The scaling up process was lacking support, so scale-up was created 2 years ago with the goal to create the main conditions for scaling up business and innovations.

Porto Digital Created a scale-up manifesto and a book that demonstrates the scale up companies and their potential. Also adapted the scale up concept to fit the Porto reality

Activities were invited through a competition, and involved people from all departments and legal. Many proposals and activities selected to last throughout the rest of the year

### **Desafios Open Call Presentation**

Porto tries to have citizens' participation in identifying challenges then ask SMEs to address these challenges through an open call. SMEs are selected based on the following evaluation criteria:

- Impact on the city
- Innovation
- Replicability
- Promotion of the innovation ecosystem

- Feasibility

Originally it was hoped that there would be an open call once a year, but the process was a lot more work than they realised, so will drop to once every 2 years, because they want it to be as good as possible, and they feel unable to if too regular.

### **Learnings from the mini Open Calls:**

1. Need to engage the citizens to get people on board
  2. Need more workshops next time - either with citizens/people applying so they know what challenges there are
  3. Timing: Too positive and optimistic about timing - it took a lot longer than we thought it would
  4. Criteria etc. was clear so there was no problem, and good existing engagement with the ecosystem made it simple too
- a. So important to engage as many people as possible as early as possible

Porto felt it would be good to use the competition process as the city as a living lab - experimentation. Also good as a type of smart procurement, as it overcomes the barriers that are felt in usual procurement procedures.

## **2.4 Santander**

Date of visit: October 17

Number of participants: University of Cantabria 2, Santander Municipality 7, Telefonica 1

Other meetings and engagements: meeting with telefonica digital transformation program manager, Review of new smart city strategy session with Juan, Meetings and visits with Local Technology SMEs in technology park

### **2.4.1 City priorities and challenges**

#### **Mobility**

- Reducing traffic in the city centre
- Parking in the city centre (Park and Ride service)
- Efficient and adaptable route planning system for combined transport modes - walking, buses, cycling, street elevator, private cars
- Last mile parking logistics
- Data collection for decision making and strategic planning (e.g. understanding the current use of different routes and transport)
- Improve sustainable mobility

#### **Other interests**

- Parking
- Busses - new metro busses with lanes and the council is reorg the bus routes to provide better service
- Hilly city - provide adapted routes including bus (tus), escalators, bikes (bictus)

OTHER CHALLENGES – not a priority:

**Citizen centred service**

- Accessibility
- Including young people
- Social services - elderly in 2025 will have 25% of retired people (+65yrs). They demand different services, but not homogenous.
- Monitoring elderly, monitoring falls
- Citizen card (There is a project currently in call for procurement document definition phase in which will implement a citizen card, a municipality wallet, a citizenship CRM among others)

**Sustainable development and infrastructure**

- Intelligent management of urban infrastructure
- Maintenance of streets and pavements
- Improve information about mobility in the city
- Collect more data for future projects ( Collecting data of all municipality services and also from any context information that affect the city in an automated form)

2.4.2 Project polygon findings

**Mobility**

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders	How can IoT help?
Searching for available parking places	Smart Parking sensors (~300 sensors)	Indoor private parking (in 3 months)	City Council	Sensors on the bus too see if buses a full, information could be displayed on the
Parking spaces for the camper vans (only 25 parking space currently, would require two sensors per van)	No deployment yet	NAC (big enterprise) - providing crowd detectors, University of Cantabria	Residents	Collecting data, conveying data to citizens
How many people are on the bus	GPS location	Use case by U. of Cantabria - system shows you how long and through what means you	Tourists/people living outside of the city	People counting to identify the potential locations

		can get to the city centre		
Available spaces for wheelchairs, prawns (so far only two are available) - collect data and convey data to citizens	Have a route planning app, but people say it's not accurate and bad interface/use experience	Professional School is continue developing the app.	Local businesses	Provide info about available places and timetable
Traffic around school during picking up times	There are people counting devices available at the Uni, based on counting mac addresses - mobile phones		Mobility operations companies	Parking status, flow of cars - rotation index, predictive analytics
Route planning for different modes of mobility	App for the bus transportation Information about bicycle docks and available bikes		Community groups, schools etc.	IoT platform, recognising the events, User interface to upload and to read info
Where to build escalators	Santander Open Data		Maintenance companies	Data analysis
Local transport information	Sociotal App with routes within the city for disabled people, narrow street, broken roads fed in by user			Capture the info, analyse, Provide info to user
Last mile parking for logistics	Information Boards (6-7) Panels for Private parking			Calculate the model distribution of transport use - for decision making and planning

Promoting public transport	Parking Machines Mobile Phone payment			Monitoring street escalators and informing citizens about the real time status of the escalators, cable cars
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### 2.4.3 WP5 Questions and answers

From interview with the synchronicity team in Santander

#### Role of international cities

Based of learnings from OrganiCity, if we need to introduce new cities in the call, it is essential that we have specific resources (a specific person) dedicated to that. We then should have specific channels of communication with this new city, for example in a similar way to the Cities Forum. The type of city we need to engage needs to be clear. For example, it is different to involve cities that have deployed IoT solutions to those that haven't but would like to get ready for it. The views of Santander for the case of SynchroniCity is to involve the less-ready cities and involve them in the project through sharing knowledge (participation in meetings, workshops, cities forum, technical meetings) activities and by upscaling their Smart City

related skills. While having them involved in these activities it is a way also to select them according to their appetite to participate in the Synchronicity DSM. A note for the International cities is that they would not travel far unless there is a budget associated to it. We need a good strategy and analysis on how the cities will engage within Synchronicity (there is one in OrganiCity)

#### Target audience

The target audience needs to be realistic with the amount of funding given. For Santander the main audience should be small and medium businesses (SMEs) that have already some knowledge on the IoT domain and are not that early stage so that they take time to adopt the solutions in the cities. On the other hand, it would be good to also have those SMEs that, even if they do not have the technical knowledge, they have the domain knowledge and can bring in ideas (e.g. developing an engagement platform – a technical partner would benefit from another who really understand engagement) For bigger corporates (e.g. utility company), we could contact them from an early stage to understand exactly what are the real needs and who are their providers. This requires also resources.

We could add new cities in the Consortia but this need to be minimally ready for Synchronicity. OASC could be a good starting point. The problem with many of the cities is that they do not have a single internal contract point person that understands very well the technical part. You need this to make the link between what you have and what you need to adopt to make your city ready. This could be relatively easy if that person was in place, but generally, this is not the case. Therefore, a F2F to understand this link with the new cities is very important.

If cities form consortia with the SMEs, then the SME could dedicate some of the money to sub-contract the city resource (1 PM, for example) to ensure the city becomes ready for the integration of its solution – if the city do not have money they will have it very difficult to participate within the timeframe given. ATOS is doing some work now on understanding what is the real technical reality of the cities. Worthwhile updating the table for the cities profile once this is completed.

### **How do you plan to engage with SMEs?**

It is very important to continuously handhold them through the entire journey. Therefore, workshops, clinics, etc. are very welcome. However, it is very important to have many of these activities that are personalised (1-2-1 clinics), almost like a mentoring or tutoring. This is time consuming for partners and especially cities. However, cities will benefit from talking to SMEs and understanding the technical part of Smart City platforms which could serve them as a coaching or can give them an idea of what is out there in the market and be able to make informed decisions for future projects.

### **What mechanisms are in place to enable monetisation of data and solutions?**

We have strategies but are not in place. This is associated with the confidence of the veracity of the data and the subsequent compromise with the business.

### **Experience with open calls**

OrganiCity – experiments in cities

Fiesta IoT – data platforms with 2 targets: research groups (scientific excellence) +

SMEs - open call are funded

Fertival – open call is not financed

## 2.4.4 Other findings and meeting outputs

Coming from different projects and IoT initiatives, Santander RZ currently has a wide and heterogeneous set of IoT devices supported by diverse IoT communication technologies: a DigiMesh (IEEE 802.15.4) network connects SmartSantander legacy IoT sensors to gateways, while WiFi and Ethernet access points connect these IoT gateways to the backbone. Also Mobile networks assist, either, IoT nodes or gateways to reach the backbone where this broadband connectivity is not available or not supported by specific nodes (e.g. nodes installed on vehicles).

- Real time information of available parking spots.
- Traffic cameras in the city providing real time images about the status of the traffic.
- Traffic intensity sensors and inductive loops (traffic congestion)
- Indoor parking.
- Environmental nodes and noise meters. Both fixed and mobile nodes measuring environmental parameters.
- Irrigation sensors (Parks & Gardens).
- In addition, the diverse Municipality info systems enrich available information providing:
- Bus lines, routes and stops, with info about the existing buses lines in the city, the routes of a particular line or related to next buses reaching the bus stop, including the distance to reach the bus stop as well as the estimated time of arrival for the first and second bus coming.
- Taxi stops that provide real time information about taxi availability in each particular

- stop.
- Bike stops, providing information about the number of available public-hire bikes and also the number of places to return such bikes.
- Bike lanes. A set of assets, including polylines that represent the lanes for bikes in the city of Santander.
- Pace of the city events (reported incidents happening in the city).
- Shopping information.
- Information of the beaches in the city.
- A new LoRa network deployment, managed by the University of Cantabria, will also provide support for new LoRa devices integration.

As a FIWARE compliant architecture, Santander's northbound is based on NGSI interfaces to provide access to IoT data and device management. This access can potentially be used to design and develop specific access points to IoT deployments. Currently, Santander RZ provides three open accesses to its IoT and info sources catalogue:

- OrganiCity RESTful APIs 6 with the catalogue (among other cities) of current IoT deployments and context information of Santander city. Intended for experimentation and co-creation processes.
- SmartSantander RESTful APIs 7 including access to SmartSantander IoT data to deploy any application based on SmartSantander Service Experimentation layer.
- Santander Open Data Catalogue, a public access, using different protocols and formats, to get all public information available about the city, including IoT data sources, administrative and cultural information.

## 2.5 Eindhoven

**Date of visit:** November 6th

**Number of participants:** 10 (including RZC and WP5 lead)

**Other meetings and engagements:** Walking tour of Brainport; meeting with living lab team and technology demo

### 2.5.1 City priorities and challenges

The City of Eindhoven's main strategic objective is to reduce the city's CO2 emissions. This broad priority spans the work of the city's energy, environment, planning, mobility and citizen engagement teams and related partners and providers. A number of key programmes are working towards this goal.

**Mobility:** Eindhoven's city transport is emission free, and there is hope to expand this beyond the municipality's fleet of cars to other transport. To do this, there is work being undertaken at multiple layers of governance and in many departments across the municipality which can be a challenge. To go emission free, Eindhoven is focused on improving mobility as a service; using data to improve services and wayfinding; and improved traffic management systems.

**Towards the end of gas heating:** Most of Eindhoven’s emissions come from the building stock, and heating the stock specifically. In fact, Eindhoven’s buildings are responsible for twice as many emissions as the city’s transport, so this is a major challenge to overcome. Electrical heating is perceived to have many benefits, as well as being cleaner it has a lot of potential for IoT, and initiatives are ongoing to address energy storage issues, which can help with redistribution.

**Street of the future:** Eindhoven wants to deal with environmental challenges y focusing on the street, at the human level. Key challenges include heat stress, poor climate adaptation and lack of sustainable urban drainage solutions. To deal with these, a street based programme of work including urban greening, sustainable building and nature based solutions are being implemented

As well as these areas of focus, Eindhoven is committed to Open Data principles, set out by the city in 2015, and a central tenet of this is working collaboratively with private companies and the public to deliver a city data platform for the city.

### 2.5.2 Project polygon findings

For the project polygon exercise, Eindhoven chose to focus on mobility; civic engagement; energy and environment, as it was felt that these were important to the city, tied in with wider Synchronicity objectives, and could be impacted by IoT.

#### MOBILITY

Specific challenges	Existing infrastructure	Ongoing projects or active SMEs	Stakeholders responsible	Stakeholders affected	How could IoT solve the challenge
Going emission free	Bike sharing	Autopilot (H2020)	Emergency services	The public	Influencing people’s routes
MaaS	Spatial policy	My bike routes app	Bravo (public transport)	Entrepreneurs	Capturing non-motorised traffic flow data
Freeing space	EV Charging stations	C-mobile	Technolation (system for traffic light management)	Pedestrians, drivers etc	
No more congestion	E-buses	MeBeSafe	TomTom	Event organisers	

Capturing info from non-motor traffic flow		Mobility Move	Google		
		Hopper	Municipality transport department		
		Sorama			

**CIVIC ENGAGEMENT**

Specific challenges	Existing infrastructure	Ongoing projects or active SMEs	Stakeholders responsible	Stakeholders affected	How could IoT solve the challenge
Getting enough people involved	Digital panel of 1000 citizens	Trillion project	Public information and research department in City of Eindhoven	Public sector	Feedback, validation of interventions
Getting a diversity of people involved	Private sector design community	OP O40	Tech suppliers	Public	Data collection
Overcoming silos	District organisations/community groups	Open remote	IoT community	Academia	Real time feedback
Tackling divides within communities	Smart society programme	Yucat SME	Het Nieuwe Instituut		Increase diversity
Enabling co-ownership - deeper level of		Data studio			Close gap, enhance interactivity between city and citizens

engagement					
					Citizen as sensors

**ENVIRONMENT**

Specific challenges	Existing infrastructure	Ongoing projects or active SMEs	Stakeholders responsible	Stakeholders affected	How could IoT solve the challenge
External water patterns	Open data portal	Unalab H2020	Eindhoven municipality -Environment dept -Planning dept	Eindhoven citizens	Nosie measurements
Air quality	Sewer data	Profituim o40 urban amring	Teefpunt GROE M (NGO clustering)	Visitors	Biodiversity cameras
Flooding	Sewage pumps (internet connection)	Water quality - Kalinto		Health department and care providers	Sensors for soil quality
Heat islands	Air quality sensors	Noise pollution airport project			Sewage water sensors that help understand public health
Poor earth/ground quality	Environmental conditions sensors	Open remote geo-triggered service			Humidity
Quality of public space and green areas	Sewage plan	Impads - green space improvements			
Biodiversity	Road map for urban space				

Sewage management	Roadmap for energy				
Water quality					

**ENERGY**

<b>Specific challenges</b>	<b>Existing infrastructure</b>	<b>Ongoing projects or active SMEs</b>	<b>Stakeholders responsible</b>	<b>Stakeholders affected</b>	<b>How could IoT solve the challenge</b>
Reduction of natural gas	Solar panels	City roadmap	Renting corporations	Home owners	Awareness
Technical innovation for electrical system	Smart meters	Nudges	Condominiums	Home renters	Information on adaptive energy consumption
CO2 reduction	Energy label for efficiency of properties or products		Enexis - grid operator	Building owners (businesses)	Home automation systems
Efficient energy management	Smart thermostats		Energy company	Energy companies	Local data for renewable energy production
Grid storage	Electric grid		Municipality		
Increase use of renewable energy					
Behaviour change for more sustainability					

Management of load on the energy grid					
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### 2.5.3 WP5 questions and answers

The WP5 Lead felt it was important to get the answers to some key questions, the answers to which would affect the open call management and delivery. These questions were brainstormed with city leads and their colleagues, and their answers are below.

**What do you want Synchronicity to achieve?**

- Help build and develop the local ecosystem in Eindhoven around SMEs
- Provide incentives for IoT companies

**What’s the role of international cities? How could they affect you?**

- Cities as observers should be able to describe how the scale up could happen
- International cities could act as evaluators
- Global cities also provide worldwide dissemination channels

**What type of SMEs should be Synchronicity’s target audience?**

- SMEs should be TRL6, but cities need to be at a certain level of readiness too
- Any EU country is fine, but not so keen on going beyond the EU
- Profit or not for profit fine, but ability to be long term sustainable is key

**How do you plan to engage with SMEs?**

- Beyond data event - 29th March
- Co creation sessions of JLO O40
- Hackathons
- Brainport development linkage
- Via the Stryp-S community

**What’s your expectation of SMEs and what they will deliver?**

- Solutions should positively impact the public
- Solutions should contribute to improved quality of life
- Should follow IoT and data policy principles of Eindhoven
- Adhere to open data commitment
- All should be specific, measurable, achievable, relevant, timely

**How will you be able to support SMEs during deployment and installation?**

- Will host a kick off meeting with all relevant stakeholders in Eindhoven
- Technical support is available from technical partner, Atos, but a lot of decisions on support depends on how many hours are left in the work package

- Will describe roles and responsibilities of different organisations/partners in Synchronicity for different types and levels of support
- Will indicate what CAN'T be provided, and be upfront and open about this e.g. we will not provide advice on data and privacy, but there will be a Webinar with Mandaat international etc.

## 2.5.4 Other findings and meeting outputs

### **Stratumseind Living Lab**

Stratumseind is a pub street 300m long, with a busy night time economy. It attracts 20,000 young visitors on weekends, and has a history of aggression related incidents.

A project turned the street into a living lab to try to control the atmosphere and research the effect of light on behaviours. The street has a number of LED lighting systems that can be programmed to turn different colours at different times to influence behaviour, and this is measured by detecting walking patterns and sound analytics. Sound was also monitored: specifically the volume and direction of sound, and machine learning has been used to distinguish the difference between fights and people having a good time loudly

Cisco are currently working on ways in which phone data and bluetooth can be used without knowing who individuals are (removing personal identifiers), to build a simple profile of street visitors, and ViNotiom movement sensors are also being used. These overcome privacy issues by not storing data, but storing movement paths.

For Stratumseind to have a research future and have impact, more people need to want to use the data being collected to develop projects.

### **Brainport Smart Society**

Brainport is a district that underwent huge economic regeneration. After Phillips factories closed down, thousands of people lost their jobs and the area became unused and dilapidated. The regeneration process led by the Brainport Development Corporation reversed this trend, and it is now one of the Netherlands 3 key economic districts. Along with the economic regeneration, the area has been considering ways in which it can become a smart 'society' rather than a smart city, and its primary focus has been on embracing technology in situ within the city, and giving over the area to living labs and test beds, where people can become part of the innovation process.

## 2.6 Antwerp

**Date of visit:** November 7-8th

**Number of participants:** 9 (including RZC and WP5 lead)

**Other meetings and engagements:** Walking tour of the city's smart district; demo of loading sensors

## 2.6.1 City priorities and challenges

**Smart government:** Commitment to offering services digitally, and providing people with smartphones that enables people to offer support in situ, and gets city services into the public openly. Pilots using blockchain technology is currently underway regarding people’s life cycles; movement patterns; educational achievements and energy storage.

**Energy and materials management:** Blockchain technology being harnessed for energy sharing systems. Waste management also high on the agenda, with a new weight cost system in underground containers. This is a long term project for the whole city

**Mobility:** Lots of mobility initiatives currently underway in Antwerp. Loading and unloading sensors are in place with a goal to ensure that loading and unloading zones are free to use and not used as parking sensors. A wayfinding app is being developed to deal with infrastructure planning. This is not yet multimodal, but hopefully it will be soon. Antwerp also calculates footfall through wifi and smartphone MAC codes.

**Additional insights from Antwerp transport planning policy officer:**

- There’s a growing number of bicycles in the city, and Antwerp needs to know how they move, how they interact with other traffic types, and how they can smooth the flow of cycle traffic.
- Motorised traffic congestion is also a problem, and this causes health and safety issues. A key cause of this is suburbanites driving into the centre. This is well known, and causes conflicts between central urban dwellers and suburbanites.
- By 2050, the city is hoping to have a 50:50 modal split, with a focus on bike rather than public transport.

**Safety:** Public safety and security, night time economy, and road safety

## 2.6.2 Project polygon findings

For the project polygon exercise, Antwerp chose to focus on mobility and environment and energy, as it was felt that these were important to the city, tied in with wider Synchronicity objectives, and could be impacted by IoT. Moreover, Antwerp was mindful of the fact that their resources for the Synchronicity project were primarily based within their transport department.

**MOBILITY**

Specific challenges	Existing infrastructures	Ongoing projects or SMEs	Stakeholders responsible	Stakeholders affected	How could IoT help
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Safety for non-motorised vehicles	Loading/Unloading sensors for vehicles	Track&Trace of shared bikes (VELO)	Public Transport operators	4Bs (Business, brains, citizens, visitors)	Safety alert
Data capture and flow management	City platform-IoT Platform (technical infra)	Citizen Bike (IMEC) – Track&Trace of non-shared bikes	The City (Mobility Department + MPA)	Pedestrian and cyclists	Infrastructure(sensor) + IoT on top
Encouraging non-motorised transport	Cameras (not sure how best to use them yet)	Smart Ways to Antwerp travel planner	Companies collecting data (floating cars)	All the ones mentioned under “stakeholders responsible”)	Real time data + visualisation
Sustainable transport	Floating car data	Privacy	Local police (cameras)		Wayfinding and display for transport data
Monitor behavioural change	Footfall measurement with Wi-Fi counting and mobile data		Bike sharing companies – Velo and others		
Measure impact of changes	Map – Park+Ride (maybe with real time data?)		Car sharing companies (Cambio, etc.)		
	Docking information for share bikes		Flemish Government (roads/traffic)		
			Private Parking companies		

**LOGISTICS**

<b>Specific challenges</b>	<b>Existing infrastructures</b>	<b>Ongoing projects or SMEs</b>	<b>Stakeholders responsible</b>	<b>Stakeholders affected</b>	<b>How could IoT help</b>
Reduction of Carbon	Loading/Unloading sensors	T-Mining (SME)	The City	Home delivery consumers	Traffic monitoring
Last Mile Logistics	Cameras	Avantida – empty containers (SME)	The Port	All companies mentioned in “Stakeholders Responsible”	Smart delivery (
50:50 modal shift	ACPaaS (Antwerp City Platform)	Slickss (SME)	Warehouse managers		Granting access to loading zones – small and micro-warehouses
End-to-end optimised flow of goods (know where your product is when, reducing waiting times, etc.)		IntelloCity (Last mile logistics projects)	Delivery companies		Predictions
		University of Antwerp traffic cameras	Newport – data platform (big private company)		Real time data

			Business improvement district organisations (UNIZO)		
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## ENVIRONMENT and ENERGY

Specific challenges	Existing infrastru	Ongoing projects or SMEs	Stakhldrs responsible	Stkhldrs affected	How could IoT help
Carbon neutral by 2020	Smart meters	Smart underground waste disposal roll out	Municipality of Antwerp	As before	Real time data
Climate adaptation	10 air quality monitoring stations	Bel Air (aq sensors with imec)	Unicore	Citizens	Predictive analytics
Improve air and noise quality	ACPaas - Antwerp city platform	Curieuze Neuze – Co-creation project	Vito/Catalisti (research orgs)		Circular economy/sharing app
Grow the circular economy	Waste sensors	Fifth play – small buildings sustainability	Water link – Smart meters for water		Modelling of air quality in different streets
Improve waste management	Blockchain technology	Restore – Smart metering	Rio link - Sewers		Emergency response cityà citizen and citizenà city
	Rainfall meters	SME: Energy ID	Flemish government		Faster communications
		Bluechem	Antwerp University		Monitor energy use of old buildings and help them reduce use

## 2.6.3 WP5 questions and answers

The WP5 Lead felt it was important to get the answers to some key questions, the answers to which would affect the open call management and delivery. These questions were brainstormed with city leads and their colleagues, and their answers are below.

### **What is your expectations of SMEs and what they will deliver?**

- Be more creative than a big company would
- No preference regarding business model, but needs to be clear, and sustainable to extend after 6 months
- Not just selling into the city, but to other audiences e.g. Nexport
- Deliver services/solutions in an agile way
- Scalable solutions
- The data collected should be shared on the open platform
- Antwerp is particularly interested in hardware: Getting sensor data is the main bottleneck for the city

### **What's the role of Synchronicity's international cities?**

- Testing the single market
- If extending globally, too hard and costly for the SMEs
- Important opportunity to learn from each other. Could we make project deliverables open to international cities?

### **What type of SMEs should be Synchronicities target audience?**

- How can SMEs only be called upon and exclude big companies given EU procurement rules?
- Does the solution have to be tested in a city? What is a relevant environment? How should we define this?

### **How will you be able to support SMEs during deployment and installation?**

- This will come down to budget allocation and person months

## 2.6.4 Other findings and meeting outputs

**Loading/unloading parking sensors:** This initiative enables parking enforcement to see when a car has parked in a spot used for loading/unloading accurately – they can use this info to ticket and fine offenders. The sensor data goes into specially created devices that all the inspectors have, which enable them to create the ticket there and then. It is designed to ease congestion and make it fair for all the businesses in the area who need the space for loading and unloading or deliveries. Drivers don't know that there are sensors in the ground, but do know that the area is only for loading/unloading as there are many bright signs

**Smart district:** The smart district not far from the centre of town is/will be the pilot area for a lot of IoT interventions and smart initiatives. It is an area of mixed facilities – lots of independent fashion, furniture and design shops, restaurants, bars, and a lot of housing – some high end, and some social housing.

Currently the area has a couple of sites of underground waste sorting. This is a series of bins on one street, for different types of waste, which residents open with a pass and put in their rubbish, this is then weighed, and residents are charged in accordance to how much waste they put into the bins. Waste is then compressed and stored underground. This means that the waste trucks don't need to come so regularly, and people are conscious about how much they throw away

There is a school within the smart district which is a specialist music school. Since it's in the district the idea is that it will take ownership of some smart/tech based initiatives, and it struggled with this idea at first. They now seem to be coming round to it and thinking about how education, music and technology can come together.

Antwerp City Council and IMEC have created an app which gathers opinion research data from people in the smart zone, if they choose to download the app. Through beacons in the district, questions will pop up on people's phones, asking their opinion on design, development and ideas for the area. People's responses are then fed into the municipality. To help close the digital divide, there will soon also be electronic pylons with touch screens which will have the same questions, so a smart phone isn't a pre-requisite to participation.

## 2.7 Milan

Date of visit: November 13th-14th

Number of participants: 11 (including RZCs)

Other meetings and engagements: Tour of Milan's smart district Brainport

### 2.7.1 City priorities and challenges

Milan has a Smart City strategy, and is involved in a number of projects and programmes that forward that agenda. Beyond that, there are other key areas that the city is focusing on in general, and on improving through innovation and technology.

**Sharing economy:** spaces for co-working and sharing - lots of examples in different sectors where Milan is trying to share and optimise sharing

**Public involvement:** Last 5 or 6 years Milan has been working on public involvement, and there is a new wave of public involvement at neighbourhood level - potentially through digital means to be part of municipality decision process

**Regeneration/renewal in neighbourhoods** outside of the city centre: Increasing focus on dealing with social problems for the city, as well as improving the city's attractiveness for cities and businesses

**Security and safety:** There are a lot of new body cams and video cams (1000 around the city) being implemented for police officers. Have been increasing at a rate of 100 per year, and new cams attached on the new network (fibre and NPLS Campus) - Crime is increasing

**Accessibility:** Physical - all citizens have the right to access services; Digital - access of digital services (digital inclusion/digital transformation), might include public wifi networks

**Energy management:** This ties in with a number of other European projects taking place - Also new position of energy manager in technical department of the municipality

**Mobility:** Difficult to reach different points in the city, and mobility can make city more efficient and environmental sustainability

### 3.7.2 Project polygon findings

For the project polygon exercise, Milan chose to focus on mobility; civic engagement; and the sharing economy, as it was felt that these were important to the city, tied in with wider Synchronicity objectives, and could be impacted by IoT. Milan were also mindful of the choices cities had made when completing this task before them, and did not want to vere off too far in an alternative direction.

#### Mobility

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders	How can IoT help
Mobility services are not integrated in one user facing App	PLUMS - Urban planning for Urban Mobility - online consultation platform (should be in place in 2018)	ZEHUS - hybrid bike sharing	Municipality, but depends on the regional level decisions - could also be regional or central gov	One App for all transport services
Too many cars	Service providers Apps, i.e. bike sharing - municipal and private (Mobike, Ofo - from foreign providers)	Mobike	Local Policia - enforcing compliance with rules, issuing fines	Smarter traffic lights sensors
Encouraging people to use sustainable transport/	. E-cars sharing - Go Go Cars.	Ofo	TRENORD - Milan railway system	Journey planner showing all available transport options. Accurate

Using cars even for short distance journeys				information about service, e.g. if e-bike/car is fully charged at the docking station
Citizens do not view surface transport (buses) as efficient	Passante Ferroviario (Sistema Integrato) - single ticketing system public transport,	E car sharing	Taxi drivers (taxi union)	
Air Quality		Go Go cars	Mobility department (ATM transport department)	
Vandalism towards the shared bikes		Sharing cities	car/bike share operators	
			ARPA Environmental Agency,	
			AMAT (Agency for Mobility - Transport, Environment in the municipality)	

**Sharing Economy**

Specific challenge areas	Existing assets	Projects/ SMEs in this area	Stakeholders	How can IoT help
Awareness + Communication of sharing options. "Normalisation" of sharing economy	Car/Bike sharing,	Sharing Cities, GreenApes	Municipality Procurement + governance team. Communication by municipality. Municipality -	Mobility Apps see all available options

			mobility department	
Lack of Integration of services	co-working spaces, co-housing. Shared services - laundry, kitchens	GAS - community buying everything	Communities - Condominiums	Room/Space optimisation, check utilisation
Barriers in participation, e.g. digital divide, age, etc.	Municipality programmes - 'Adopting a grandpa'. 'Host an immigrant' policy (for a financial reward)	Electric city movers project	Businesses (co-working, retail, etc.)	Sharing services integration + integration with conventional services,
No quantitative evidence of sharing economy benefits		Zehus	Public organisations, e.g. schools, hospitals, etc	
			Private providers, e.g. Uber	
			Utility providers	

Specific challenge areas	Existing assets	Projects/SMEs in this area	Stakeholders responsible	Stakeholders affected	How can IoT help
Need to use new and different methods to engage	Lots of online consultation tools developed internally by municipality	Sharing cities: co-design process and digital social market	Milan Polytechnique	ATM (transport)	Sensors to monitor the environment and motivate the public to participate
How can we balance public involvement with expectations	E015 Digital Ecosystem	Hackathons being set up by public utilities to improve service	Associations of public engagement experts	Condominiums and community groups	Beacons for push notification consultation

Need to get more people participating	Civic crowdfunding programme	E015 Digital Ecosystem	A2A (energy)	Digitally excluded public	Engagement app
Need to make engagement more diverse across different groups	Social media use is very active by the municipality - multiple accounts across the organisation	Lots of online consultation tools developed internally by municipality	ATM (transport)	General public	Public interactive screens
Engagement needs to be more fair and open	Participative municipality programme		Legambiente (environmental association)	Local businesses	
Engagement for the digitally excluded	PUMS: Urban Sustainability Mobility Planning		Milan municipality: mobility dept and planning dept	Municipality and politicians	
How to involve other stakeholders, like businesses etc.	Public wifi network				
	Interoperability platform of the municipality				

### 2.7.3 WP5 questions and answers

The WP5 Lead felt it was important to get the answers to some key questions, the answers to which would affect the open call management and delivery. These questions were brainstormed with city leads and their colleagues, and their answers are below.

#### What’s your expectation of SMEs and what they will deliver?

- If deploying apps, must be in Italian language
- More keen to have applications for city users that help citizens, and there should be customisation and co-creation with users

- Looking for interesting and creative ways to correlate and bridge together different data sets
- Ideally data collected by SMEs (northbound or southbound) should be returned to the municipality for free
- Awareness and knowledge of the Italian privacy authority regulations, and its impact

#### **How do you plan to engage with SMEs?**

- Involve association of SMEs and chamber of commerce (ASAP)
- Communications will be clear on demonstrating how the project can help SMEs make business with the municipality

#### **How will you support SMEs during deployment and installation?**

- Will set up a kick-off meeting for the SMEs that deploy in Milan with all the relevant municipality officers and service providers
- Will be able to direct SMEs to the right people for assistance and implementation, and will encourage direct communication, but if this doesn't work well, the city lead will be supportive in helping to get a response
- Will get a councillor interested and actively involved as this will get more municipal departments bought in
- Will open data and APIs for the SMEs

#### **What's the role of Synchronicity's international cities and how will they affect you?**

- Will be interesting to learn from global cities, and especially to compare processes in less developed countries to more developed countries

#### **Experience of Open Calls/Competition based funding?**

- No experience of Open Calls or competition based funding, at least in the department running Synchronicity, only traditional procurement experience

## 2.8 Manchester

Unfortunately, it was not possible to visit Manchester during 2017 so the project polygons and questions were answered remotely. A separate visit to Manchester was organised in February 2018 bringing together all the Manchester partners Manchester city council, Manchester Metropolitan University, Bronze Labs, the Digital Catapult and key stakeholder the CityVerve project.

The aim was to understand Manchester's ecosystem readiness and explore the support available, understanding of the project in the city, relationship with City Verve, Uni of Manchester and Bronze Labs activities and Digital Catapults role in integrating the synchronicity system.

### 2.81 City priorities and challenges

The "Our Manchester" strategy puts people's needs at the heart of how we deliver services.

Collaboration, connectivity and creativity are at the heart of all that we do.

Culture & Public Realm

Energy & Environment

Health & Social Care

Travel & Transport

2.8.2 Project polygon findings

<b>City priority – Urban Mobility</b>					
<b>Specific challenges within this area</b>	<b>Projects or SMEs already working in this area</b>	<b>Existing relevant infrastructure or resources</b>	<b>Stakeholders affected</b>	<b>Stakeholders responsible</b>	<b>How can IoT help solve these challenges?</b>
E.g. Water pollution		E.g. Water quality project run by university	E.g. People living close to river	E.g. Thames Water	E.g. Pollution sensors
MaaS (Mobility as a Service)	CityVerve	Get Me There card. CityVerve Green Travel Planner	Commuters, visitors Transport professionals	MCC (inc. Highways)	Integrated data. Real time travel and traffic information
Low Carbon Travel	CityVerve Triangulum, MoBike,	MoBike private sector dockless bikes Metro minibuses Trams Low Carbon buses Guided bus way	Commuters Visitors Transport Professionals Citizens with respiratory diseases	MCC (inc Highways) NHS	Journey planning

Last Mile Logistics	Triangulum	Electric Cargo Bikes	Businesses, Public sector organisations (e.g. universities, hospitals) on the Corridor	TBC	Providing accessible cargo bikes New business models E.g. Deliveroo. Replacing existing fleet e.g. libraries
Vehicle to Grid	TBC	Electric Vehicles	MCC Private Sector Commuters	MCC	More dynamic use of public charging points.

<b>City priority – Energy Usage and Management</b>					
<b>Specific challenges within this area</b>	<b>Projects or SMEs already working in this area</b>	<b>Existing relevant infrastructure or resources</b>	<b>Stakeholders affected</b>	<b>Stakeholders responsible</b>	<b>How can IoT help solve these challenges?</b>
E.g. Water pollution		E.g. Water quality project run by university	E.g. People living close to river	E.g. Thames Water	E.g. Pollution sensors
Energy efficient buildings	Triangulum & CityVerve	LORA network. Access to various BMS systems. Sensors in buildings.	FM Workers Citizens Energy managers	FM Energy Managers	Data enabled facility management Battery storage Renewables
Demand Aggregation	Triangulum	Some PV, energy pumps etc.	RSLs FM Managers Businesses Residetns	GMCA MCC	Providing a standard method of aggregating diverse energy assets

Fuel Poverty	CityVerve, City Policy initiatives	Developing home sensor network	RSLs Residents Health service	RSLs Health service MCC	Improved home monitoring to lead to more efficient energy in homes
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<b>City priority – A Cleaner, Greener City</b>					
<b>Specific challenges within this area</b>	<b>Projects or SMEs already working in this area</b>	<b>Existing relevant infrastructure or resources</b>	<b>Stakeholders affected</b>	<b>Stakeholders responsible</b>	<b>How can IoT help solve these challenges?</b>
E.g. Water pollution		E.g. Water quality project run by university	E.g. People living close to river	E.g. Thames Water	E.g. Pollution sensors
Commercial Waste in City Centre	TBC		MCC Businesses CityCo (City Centre Management company) 3 <sup>rd</sup> party contractors	MCC Businesses CityCo	Smarter collections through data and sensors
Resilient Urban Planning/Nature Based Solutions	Grow Green	TBC	MCC Manchester Climate Change Agency Residents	MCC Property Developers	Mapping Sensors to check for flooding, water retention, Air Quality sensing

Citizen Responsibility for a greener city	Grow Green Manchester Climate Change Action Plan	Manchester Climate Change Agency Carbon Literacy Training Recycling facilities	MCC Manchester Climate Change Agency Residents Visitors	MCC	Apps for sharing good practice or through “circular economy”
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<b>City priority – Data Driven City</b>					
<b>Specific challenges within this area</b>	<b>Projects or SMEs already working in this area</b>	<b>Existing relevant infrastructure or resources</b>	<b>Stakeholders affected</b>	<b>Stakeholders responsible</b>	<b>How can IoT help solve these challenges?</b>
E.g. Water pollution		E.g. Water quality project run by university	E.g. People living close to river	E.g. Thames Water	E.g. Pollution sensors
Understanding how the city is working (particularly across domains)	CityVerve	TBC – proximity sensors, people counting.	City Centre managers, Citizens	MCC	Sensors Data
Real Time Response to City Problems	CityVerve City Centre Review	CCTV TBC – sensors Data sharing applications	City Centre Managers Citizens	MCC Software developers	Machine learning Video analytics
Agile City Governance	Synchronicity SmartImpact	CityVerve API	MCC TfGM	MCC TfGM	3D Mapping Open data
Community Engagement	CityVerve Triangulum Synchronicity	TBC	Citizens Councillors	MCC Civic Society	Social Media Visualisation

	SmartImpact				
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### 2.8.3 Other projects in Manchester

CityVerve is the UK's Internet of Things Demonstrator. Receiving £10 million of funding from Innovate UK, across 20 partners, we are delivering a unique platform for new services across the themes of transport, energy and environment, health and social care, and culture and public realm.

Working with Cisco, BT, and a wide range of SMEs, alongside our transport executive, hospitals, science park and universities, we are developing a “smart city district” on the Oxford Road corridor. CityVerve will show the potential for sharing data through combining a range of platforms into a single API. [www.cityverve.org.uk](http://www.cityverve.org.uk)

## 3.0 Honesty Box

As part of the workshops each city was asked to contribute to the “honesty box”. This was to give honest open feedback on any issues of concerns. Below is a grouped list of the feedback received from all the cities.

### Marketplace

- Having a marketplace for companies may be more important than a marketplace for cities - this will prevent reliance on government investment/funds in the future
- Solutions must meet country specific regulations
- Worry that it is difficult to find interoperability between cities if the standards are not in place. Synchronicity needs to provide standards and then they will need to implement and make it happen.
- Possible language and communication problem during deployment and collaboration with SMEs as not everyone in the municipality speaks English
- How do we matchmake SMEs to provide solutions not just parts? We need an online matchmaking service before the open call opens.

### Technical

- The current process of having the architecture preceding the developer action/APIs presents a challenge.
- Would rather see a straightforward application and let the innovation come from the Digital Single Market which can be proved by the application.
- Would like to see a more lightweight architecture, based on APIs everywhere being wrapped into services.
- Solutions must be technically successful.

### Data and privacy

- At the time of writing, the city had no open APIs, but the plan was to open them for Synchronicity and long term will be open for everyone.

- Italian privacy regulation is much stricter than elsewhere → informed consent is not enough in Italy. But also, Italian privacy regulation is some of the most misunderstood in Italy.
- Data, engagement and evidence base is a very new issue in our country, and is not usually transparent or used in an open way - culture shift required.
- Concerns around jeopardising the privacy of people with new data sources and limits that privacy regulation sets, e.g. smart meter data can only be used for purposes agreed at that time.

## City Operations

- There's a lack of collaboration between different municipal departments, and this is especially difficult for collecting and sharing data between departments.
- A mobility strategy is currently underway to replace the hold system including traffic lights, ticket readers (everything related to IT in mobility), this is a 20 year programme and may make it difficult for SMEs to deploy here.
- Contracts with service providers are not very clear on data or communications, which could be problematic for the SMEs and project.
- 2018 is election year in, so all other projects will need to be finished, which means people's time will be in short supply.
- The city want to focus on mobility theme, not any of the others.
- The city's system is very attractive to businesses but not all contracts will be governmental in long term, so how to deal with this.
- The Synchronicity project was initially built under their Mobility team. If now we open challenges in other areas they will need to incorporate other people from other departments that have not been accounted for neither as resource nor in budget.
- Concerns around energy as a possible theme, due to the difficulty in arranging access to infrastructure and surrounding data, as its controlled by private companies -- potentially no way around this within the 6 month pilot period.

## Desirability of Solutions

- Not sure about how many applications will come in the Open Call, which makes timelines difficult to understand.
- Company must have the municipality support for applications.
- Operational departments have many priorities and deploying synchronicity services won't be the priority if they are not on board, so there needs to be a project owner whose priority it is.
- Budget gap in terms of supporting deployment and installation.
- Synchronicity needs to show and prove to inhabitants of the city what smart city services can do. If it cannot, they will not be able to get any more investment for it in the future.
- Themes are wide - there is a risk this will result in services that are not in line with what cities actually want. We need to define specific projects, but we could also have an open category that allows for surfacing unknown innovation.
- The worst case scenario is to put something in for 6 months and have to take it out. We will only deploy things in the city that we want long term and think will work.
- Concern that the solutions in place are actually useful for the cities.
- Open challenge could be a problem for 2 reasons: objectivity on deciding which is good and should be chosen, and resources: will the city make resources available to assist with the deployment.
- Services must have been through testing with people. They must work and be desirable
- Cities must agree to support deployments before the open call.
- Following the deployments if the city wants to continue to fund the solutions they will need to tender for the services.
- The city is comfortable with solutions not working, happy to be a testbed.

## Citizen Engagement

- Idea of citizens as a sensor could be really positive and useful for the IoT nature of civic engagement.
- If solutions are TRL6 there is little opportunity for meaningful co-creation.
- Solutions must be useful for citizens.

## 4.0 Next steps

The information in this report and other written documents that have come from it will be used in designing and delivering the Synchronicity open call (WP5) in 2018. Already, the information has been used to inform the themes and challenges that will make up the call, which at present look set to include mobility, environment and well-being, and public engagement. Hopeful SMEs will have access to some of the details contained in this report to help them make deployment decisions in the open call process. Many things within this report will also help guide SMEs implementation and delivery, and answers questions regarding working relationships with cities, as well expectations and desires of the cities.

The information in this useful has also proved useful for the delivery of work package 3, housing realistic assessments and concerns of progress. Moreover, it has given an unrivalled insight into the readiness of each city, the specific challenges they face beyond the technical, and their key concerns moving forward. Throughout the tour process the emerging challenges and concerns were built into the Cities Forum meeting programme, under the assumption that many cities would face the same difficulties, this meant that cities could work together to resolve, and where possible, prevent problems.

Facetime between the cities and the RZC has helped develop strong relationships, for the project, and built a sense of shared experience that is difficult to achieve remotely or via email. Moreover, meetings with other city stakeholders helped the RZC better understand each local ecosystem and generate greater buy-in from city stakeholders and decision makers beyond the project.

Ultimately, the cities tour has played and will continue to play a pivotal role in the success of the Synchronicity project.