

SYNCHRONICITY



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Main author(s):	Reza Akhavan (FCC), Darren Pangbourne (FCC)
Internal reviewers:	Luis Munoz (UC), Jose Gatos (ATOS), Francesca Spagnoli (ENoLL), Martin Brynskov (AU)
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Executive Summary

This report constitutes Deliverable 1.8 (Monitoring framework template 3) of the SynchroniCity project. The Monitoring Framework (WP1, Task 1.3) of the SynchroniCity project is intended to gather information from the Reference Zones on an ongoing basis in order to support the delivery of the project. Four templates for the Monitoring Framework are planned for delivery throughout the course of the project. These templates will change based on the needs of the project. The third template is presented in this report.

Abbreviations

AAA	Authentication, Authorization and Accounting
API	Application Programming Interface
CB	Context Broker
D	Deliverable
DoA	Description of Action
EC	European Commission
FCC	Future Cities Catapult
GPRS	General Packet Radio Service
IdM	Identity Management
IoT	Internet of Things
LSP	Large-scale Pilot
OASC	Open & Agile Smart Cities
OAuth	Industry-standard protocol for authorization
RZ	Reference Zone
WP	Work Package
WT	Work Task

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1 Introduction

The Synchronicity project will transform the IoT environment within and across a number of cities and pilot areas (Reference Zones). To achieve this, it is necessary to monitor the developments in these Reference Zones systematically. The Synchronicity project proposal calls for this in Task 1.3 on the 'Monitoring and synchronization of the reference zones' (Technical Annex v2.1, Sections 1-3, page 48):

The main objective of this task is to set-up a monitoring framework that enables us to synchronize the different reference zones with each other in a periodic way. As the reference zones are constantly evolving (changing ecosystems, policies, and infrastructures) it is important to keep track of these changes. This is necessary to align the activities in WP2 on the architecture and WP3 on the development and piloting of the base applications. The monitoring will be used to provide an updated description of each of the reference zones at the launch of the open call. For the monitoring we will create a reference zone monitor in which we status and its evolutions is listed in a systematic, consistent way. We will focus on the following dimensions and assets: (IoT) hardware, (real-time) data, technology, regulatory and policy context, deployed applications, ecosystem... We will update the status biannual by means of input of the reference zone liaison officer.

This document outlines the scope of the new iteration of the Synchronicity Monitoring Framework. The Monitoring Framework (hereafter MF) is required to gather data on the Reference Zones in order to support the project. As different work packages are in progress throughout the project duration, this means that the MF will change over the course of the project. These changing needs will be reflected in changes to the MF template, which will be updated three times after the initial template.

The status of the cities presented in this document will be revisited and expanded in Month 33, contributing to D1.9 , to show the evolution of the project and, in particular, of the different RZs.

1.1 Links to other SynchroniCity deliverables

The data demonstrated in this document is derived from the following main sources:

- D2.3: Catalogue of OASC Shared Data Models for Smart City domains [1]
- D2.4: [Basic data marketplace enablers](#) [2]
- D2.5: Advanced data market place enablers [3]
- D2.8: Report on Basic Reference Zones platform deployment and operational plan [4]
- D2.10: [Reference Architecture for IoT Enabled Smart Cities, Update](#) [5]
- D3.5: Customized IoT service prototypes for lead ref. zones – basic [6]
- D3.7 [Pilot deployment plan](#) [7]
- D4.2: [Technical Validation \(Phase 1\)](#) [8]

Other sources are working shared documents in WP2 [9], WP3 [10], and WP4 [11].

1.2 Previous templates

Template 1 (D1.6) [12] of the Monitoring Framework was designed and submitted in M4. Using Template 1, from M5 to M8 all Reference Zones, except one (Milan), provided data on Basic data on the Reference Zones, Core technology review, and Ecosystem. Their completed templates can be found in [13].

Template 2 (D1.7) [14] was designed by modifying Template 1, based on monitoring requirements provided by all the Work Package leads. Main updates in the template 2 data in the following categories: Pilot area geography and current infrastructure; Impact metrics; Data ownership; Monitoring of co-creation activities; and Ecosystem for pilot applications. It is available at [15].

1.3 New template for Monitoring Framework

In the previous iterations, all Work Package Leads were asked on different stages of the project to provide feedback on the MF templates and supply their monitoring requirements. The MF was constructed around these requirements as an instrument for gathering data from the cities in a managed and coordinated way. In practice, however, it was apparent that the quantity and complexity of the information being requested became a challenge for the Reference Zones. On further investigation the following issues were identified:

- Other Work package and Task leads had developed their own custom monitoring/data collection tools which were more responsive and able to adapt to the dynamic conditions of the project than the monitoring framework being delivered in fixed intervals. This led to a perception of overlap and duplication of information requests in the MF.
- Cities highlighted that from their point of view, spreadsheet tools were not an efficient way to receive (in some cases) complex information requests. They highlighted the need to be given more direct support from the partners requesting the information.
- Given limited resources the cities had rightly prioritised support for the technical work packages as these were more directly related to readiness for the open call.

FCC, in conjunction with the WP1 lead, the project coordinator, and with input from the first interim review, agreed that a new approach was necessary to ensure the MF continued to deliver value to the project.

In modifying the approach, we paid particular attention to this feedback from the first interim review:

- “Improve the collection and dissemination of results coming from the cities, especially the anecdotal evidence and cost to make a city “SynchroniCity compliant”. You should better identify the most important results to monitor and align the KPIs to this and/or capture as testimonials and guides.”

The main changes to this iteration of the MF are:

- Improved curation and communication of the key city data being collected by the work packages: currently this information is distributed in different locations and documents, so we have consolidated this and employed data visualisation tools to communicate the status more clearly. This will largely focus on the key interoperability points of the Synchronicity framework, including:
 - o Context Information Management
 - o Shared data models
 - o Integration with Marketplace
 - o Security
- Focused questions on obtaining more ‘anecdotal’ insights from the cities. This is intended to address the issue outlined above i.e. cities were struggling to fulfil more complex, analytical information requests via this tool. We also foresee that these insights can be of more benefit to the new cities entering via the open call, which was not envisaged in earlier MF templates
- Included input from WP6 on collecting KPI results

The combined effect we hope is to make the information both more relevant and readable by all partners, but with a renewed focus on the SynchroniCity experience by the cities.

This deliverable is not for public dissemination, but consortium members provided in particular, reference zones, Open Call winners and new cities joining the SynchroniCity project can benefit from

the information provided in this document. The aim is to provide a demonstrate the latest status of each reference zone among other cities in various domains such as hardware, data, technology, regulatory and policy, deployed application and ecosystem and keeping track of the cities during the project. This document is also relevant to anyone who is participating on the design and implementation of the SynchroniCity platform and its components. Other audiences who provide design services and applications using relevant standards and the recommendations of standards bodies.

2 Status of the Reference Zones:

The SynchroniCity project has eight Reference Zone cities (core pilot cities) across Europe: Antwerp in Belgium, Carouge in Switzerland, Eindhoven in Netherlands, Helsinki in Finland, Manchester in the UK, Milan in Italy, Porto in Portugal and Santander in Spain. These cities are adopting OASC principles to build IoT ecosystems based on open standards and existing datasets to build integrated services. In this section, we present the current SynchroniCity framework components deployed on each Reference Zone, as well as the status of the validation.

The validation process is explained in detail in D4.2 [8]. In the next sections “Passing validation” indicates that the component/Interface satisfactory passed the corresponding validation process, with very minor remarks (if any). The “Partial validation” indicated the component/Interface is present/reachable but failed the corresponding validation process because of required mismatched functionalities and/or not SynchroniCity compliant. In any case, these reported issues are feasible to be rectified [8].

2.1 Current status of SynchroniCity Framework in RZs

Figure 1 primarily visualises¹ the readiness of the SynchroniCity framework in each reference zone, along with the thematic priorities and where there is convergence in the thematic use cases across this emergent sector, and how themes map to specific applications. Data have been extracted from the “Services and applications tracking sheet” at [10] This may be of particular value to the new companies and cities entering the project as the deployments unfold. (We have included for completeness an outline of the three broad themes below.)

This visualisation in Figure 1 highlights that seven out of the eight reference zones have successfully implemented the framework (i.e. the required Synchronicity components in each RZ such as Context Data Management, IoT Management, Data Storage Management, etc. are implemented, deployed and running), while work in Helsinki is ongoing. In sections below we have asked the cities to comment on the experience and challenges of implementing the framework.

Reference zone themes:

- **Human-Centric traffic management:** The initial application data-driven bicycle mobility aims to improve bicycle mobility in cities by leveraging and combining data from different IoT systems. Also, it aims to improve the overall cycling experience, safety, infrastructure planning and policy making for the future.
- **Multi-modal transportation:** A multimodal assistant application that will inform citizens about their mobility options and will facilitate their use in a multimodal way. Citizens will be able to plan and use public transport, bike, and other sharing services and transport modes.
- **Community policy suite:** The objective is to enable local authorities implement an approach to develop innovative IoT-based solutions that leverage more agile in their management and policy making processes.

¹ The figures in this document are not colour coded and colours have been used for better visualisation only.

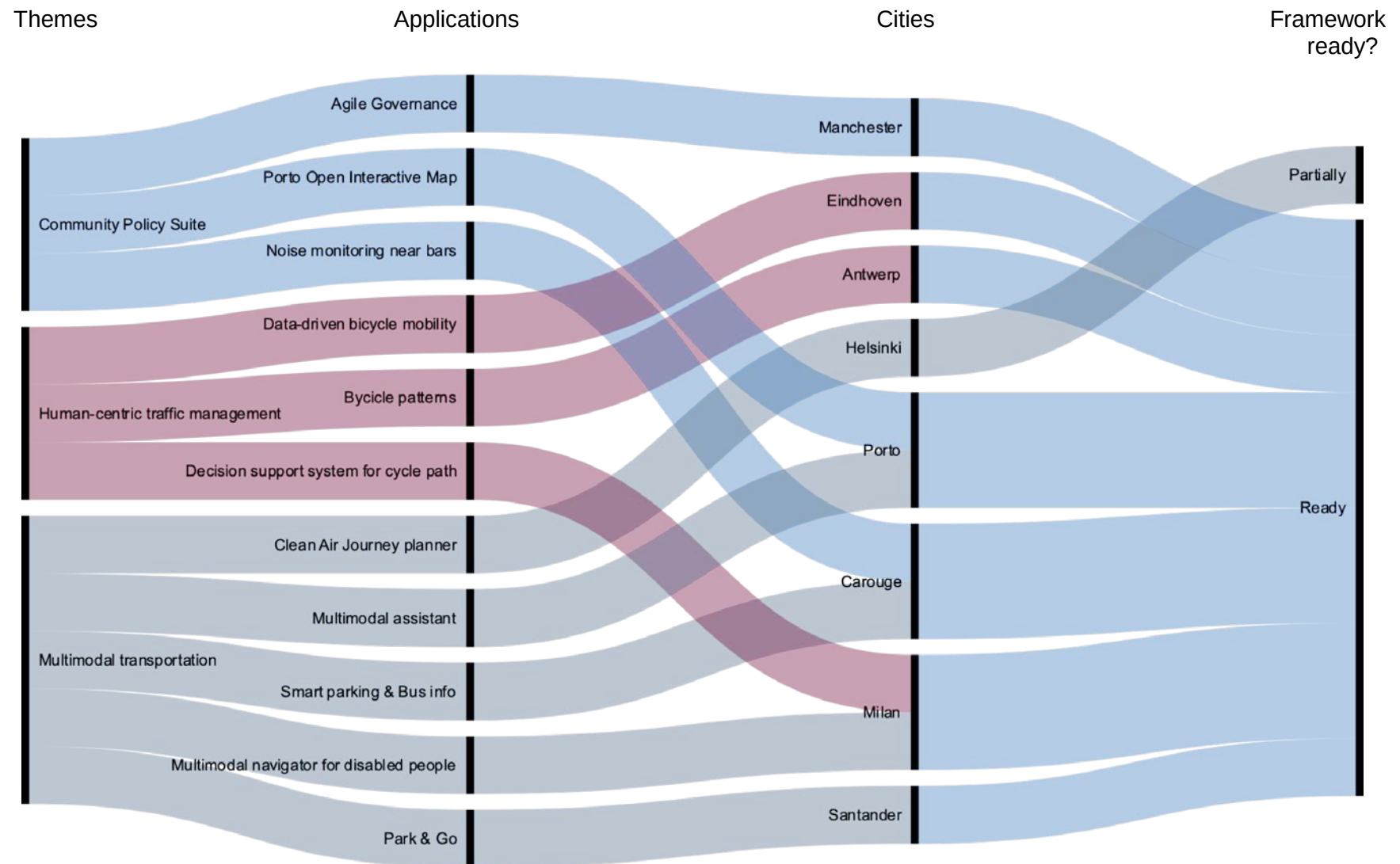


Figure 1: Themes, applications and readiness of SynchroniCity Framework in RZs

2.2 Current status of Atomic Services and Applications in RZs

Figure 2 shows the status of connectivity of data sources and progress in implementation and integration of different applications in the reference zones in Jan 2019 derived from [10]. The visualisation highlights the range of results has a wide spread (0% to 100%) though with a distribution mostly above 50%. From this we can make some inference that the reference zones faced challenges in implementation of the services.

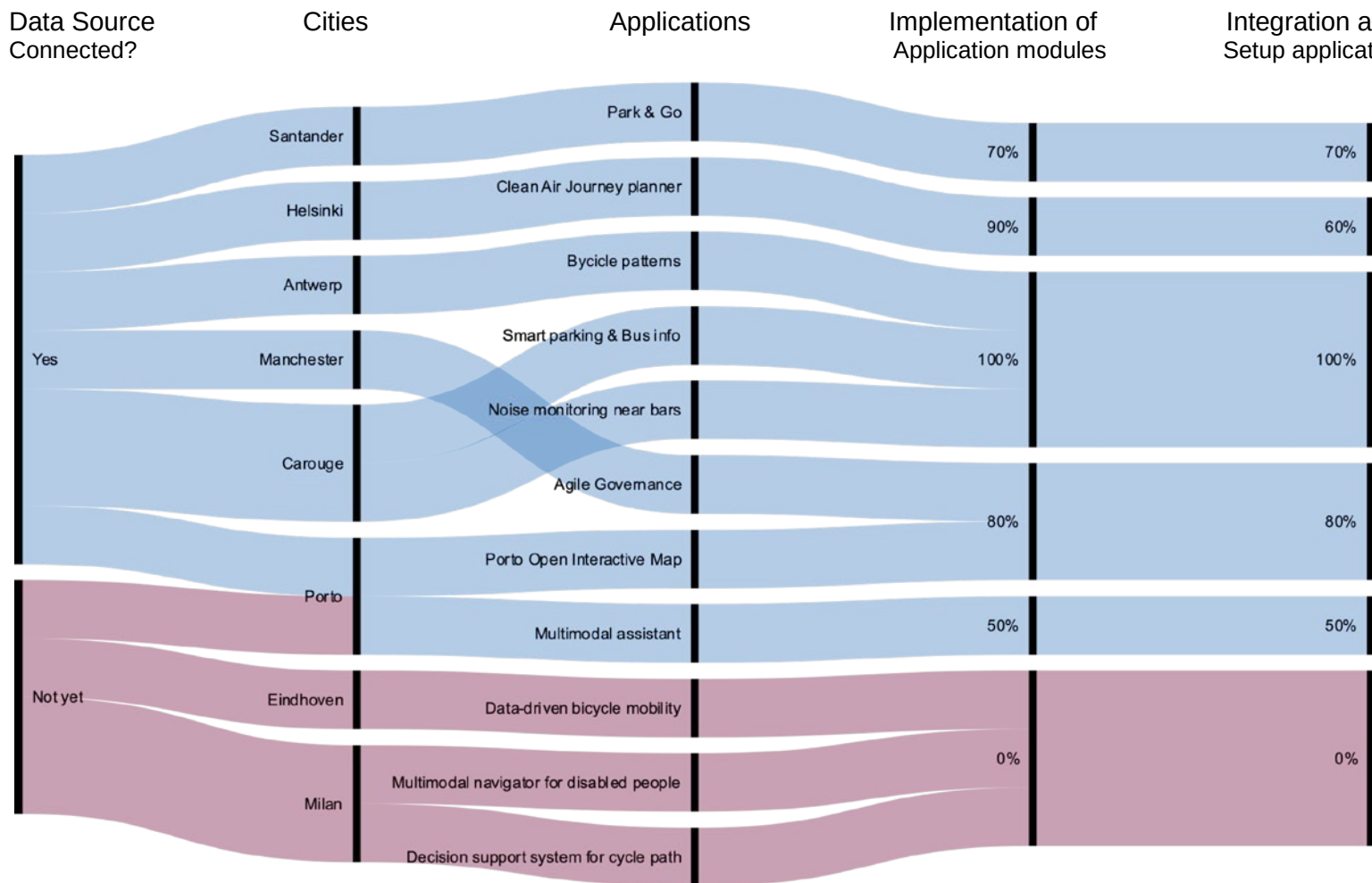


Figure 2: Status of implementation of applications in RZs

2.3 Status of Context Information Management

Context Management is responsible for managing the context information received from IoT devices compliant with the data models and data formats accepted by the SynchroniCity Architecture. Figure 3 shows 7 RZs have successfully passed the validation process. The validation results derive from the NGSI interface interoperability point implementation achieved on all 8 Reference Zones through the FIWARE Orion Context Broker (D4.2) [8]. This ensures a common approach to context information management, based on the NGSIv2 protocol.

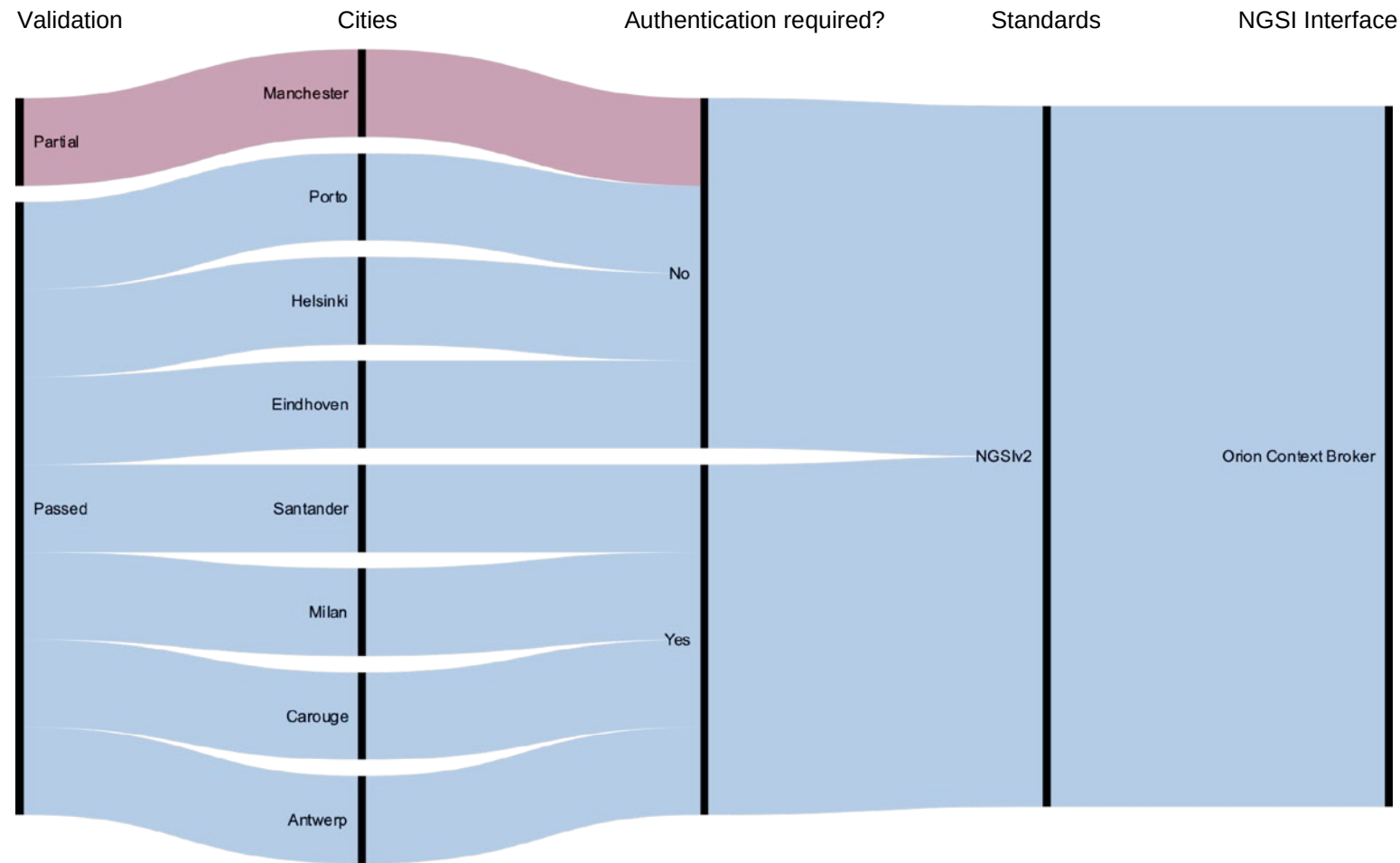


Figure 3: Status of Context Information Management in RZs

2.4 Status of Historical Data Access

The SynchroniCity Historical Data API allows access to historical data related to an attribute of an entity [16]. As illustrated in Figure 4, the majority of cities (five out of eight) have already adopted SynchroniCity proposed Historical API to retrieve historical data from context entities.

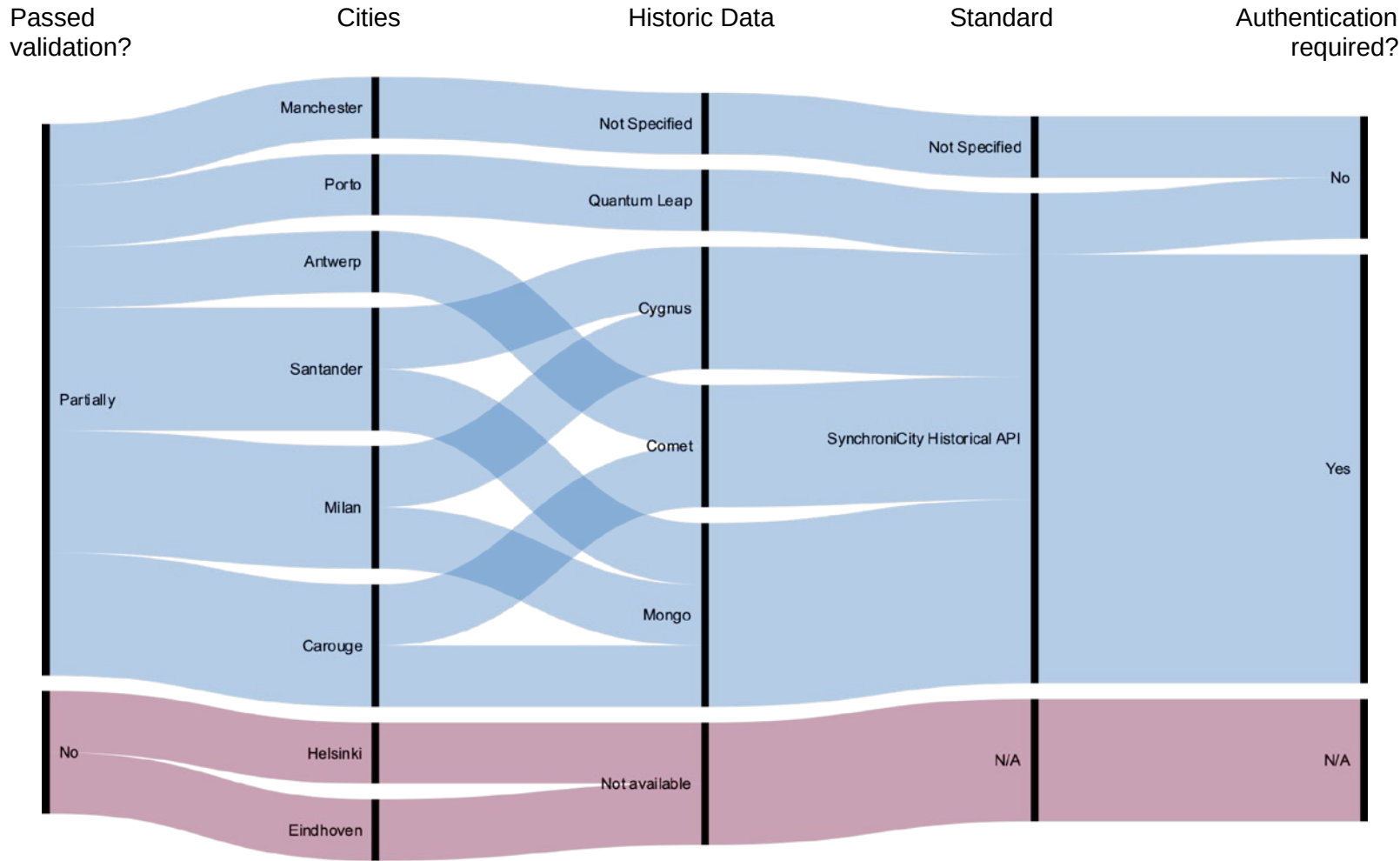


Figure 4: Status of Historic Data Access

2.5 Status of Data Sets

Figure 5 shows the number of valid entities reported according to SynchroniCity Data Models in different RZs in Dec 2018 and Feb 2019. The new data sets have been added and majority of the RZs in Feb 2019 have been increased.

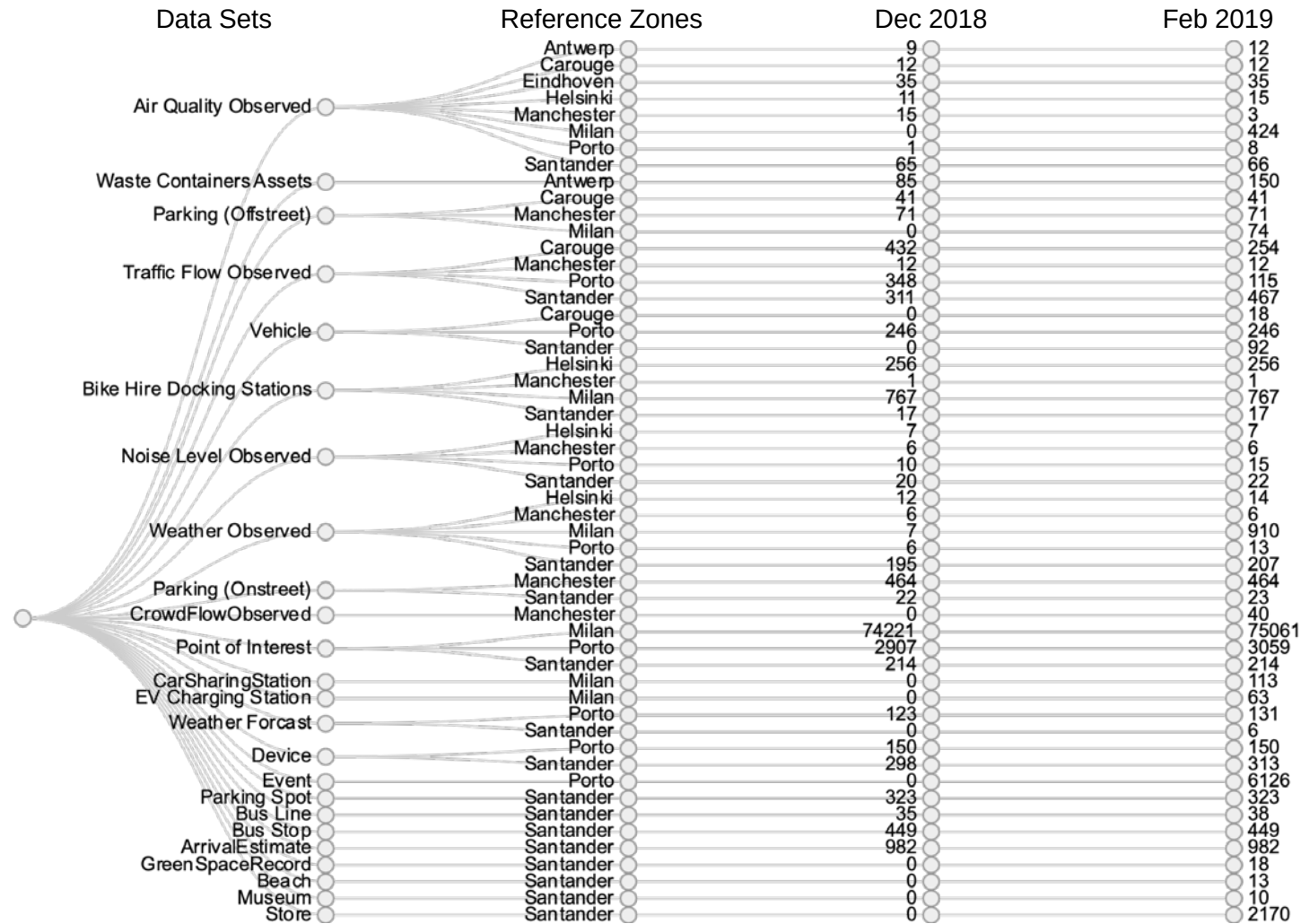


Figure 5: Status of Data Sets in RZs in Dec 2018 and Feb 2019

2.6 Status of Security framework

Security includes three sub-components (D4.2) [8]: 1) Identity management system to store and organize the identities of users; 2) Authentication component that regulates access to the platform; 3) Authorization component that grants access to the functionalities and digital assets. SynchroniCity Security API proposes an OAuth 2.0 interface to grant access mainly to context and historical information, either to read it or to provide it. Figure 6 visualises the status of each RZ in terms of different Identity management and result of the validation.

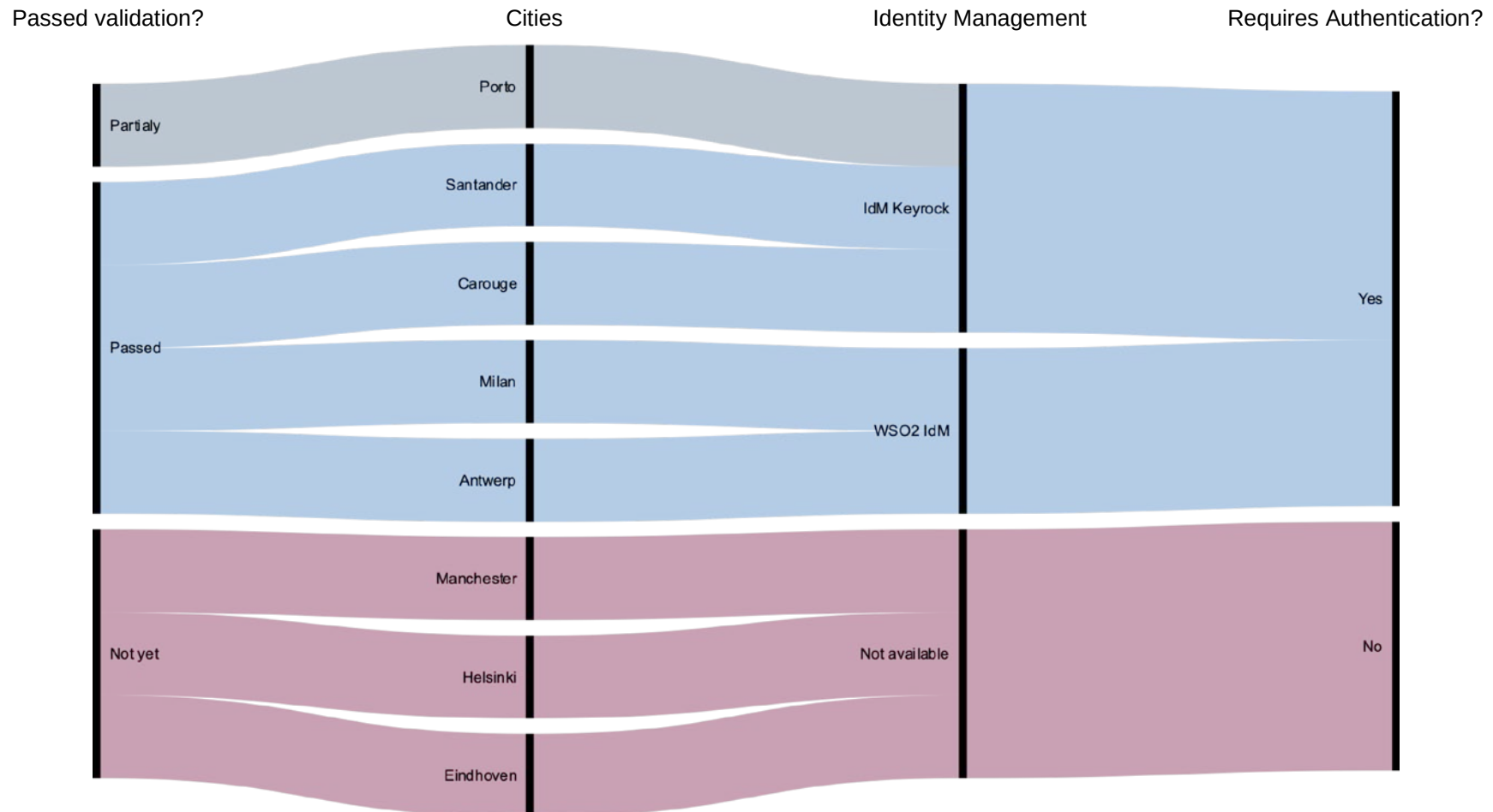


Figure 6: Status of Security Framework in RZs

2.7 Status of Data Models

Figure 7 represents the status of different Data Models in the Reference Zones. It is an extract from a working document (Jan. 2019) in WP2. “Ready” indicates that the RZ has already implemented the Data Model in their SynchroniCity instance:

- “Planning” indicates that the RZ intends to use the Data Model for data publication
- “Studying” indicates that the Reference Zone is considering the inclusion of instances of the Data Model

(For more details please see to D2.3 [1])

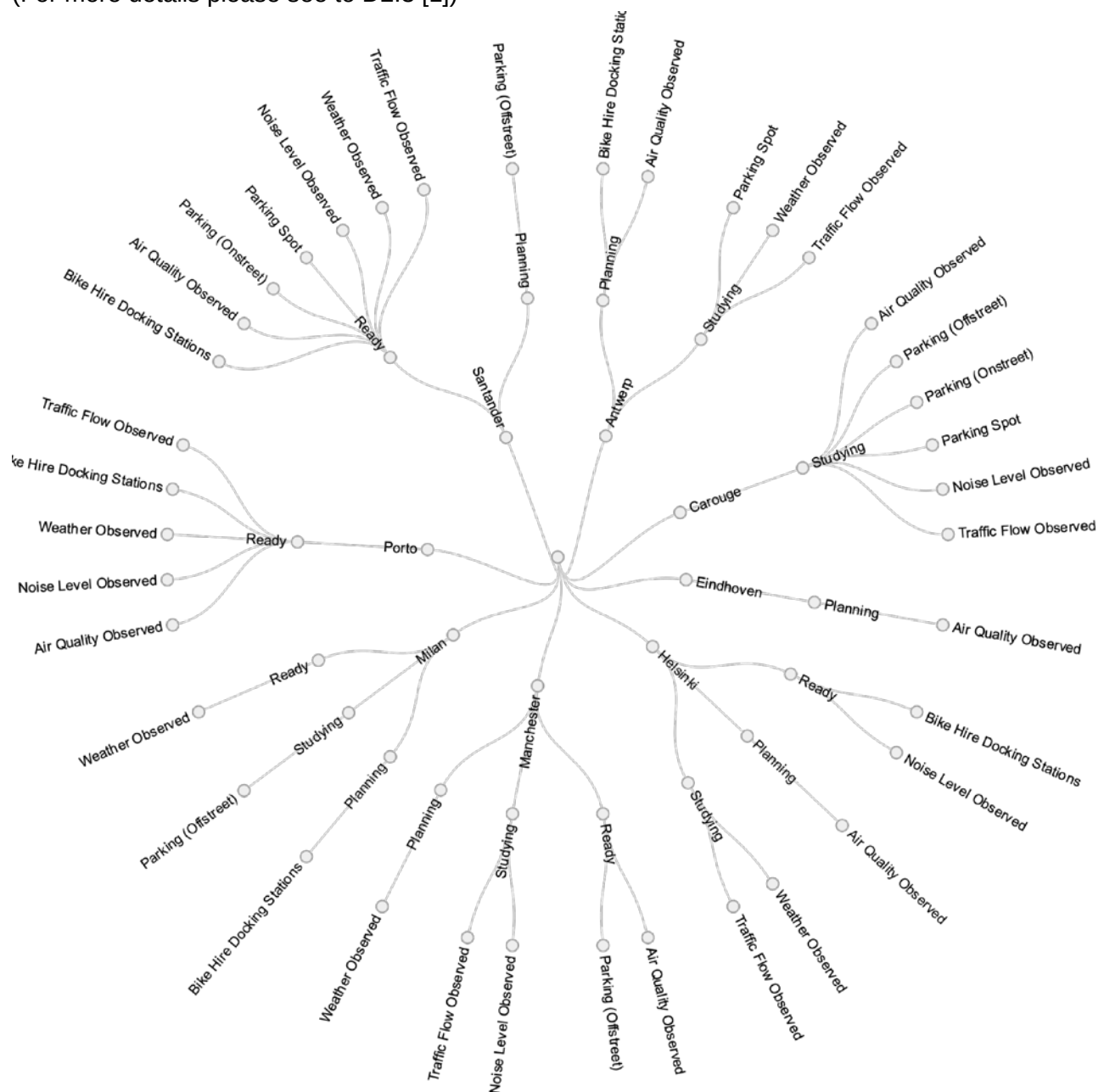


Figure 7: Status of Data Models in RZs

2.8 Status of Ecosystem Transaction Management (Marketplace)

IoT Data Marketplace exposes functionalities such as catalogue management, ordering management, revenue management, SLA, licence management etc. Synchronicity IoT Data Marketplace (which is accessible at [17]) provides a harmonised access to data sources in the cities. Figure 8 shows the which data sets in which reference zones are available in the Synchronicity IoT Data Marketplace [17]. Some cities such as Milan have developed their own data platform and the rest of the cities intend to deploy the Synchronicity marketplace.

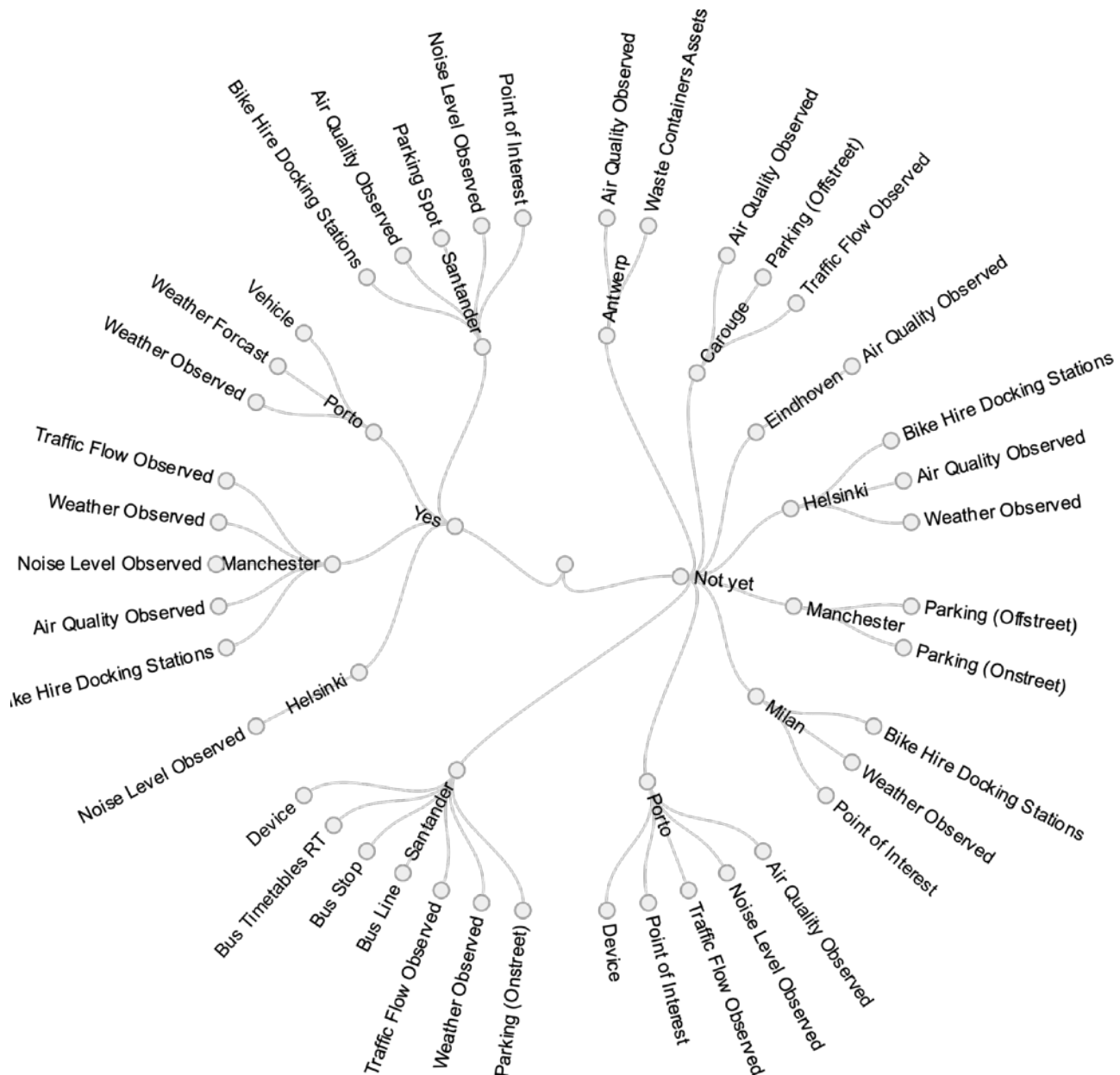


Figure 8: Status of Synchronicity IoT Data Marketplace, *updated on 21 Jan 2019*

3 The view from WP2/3/4 leaders and the Reference Zones

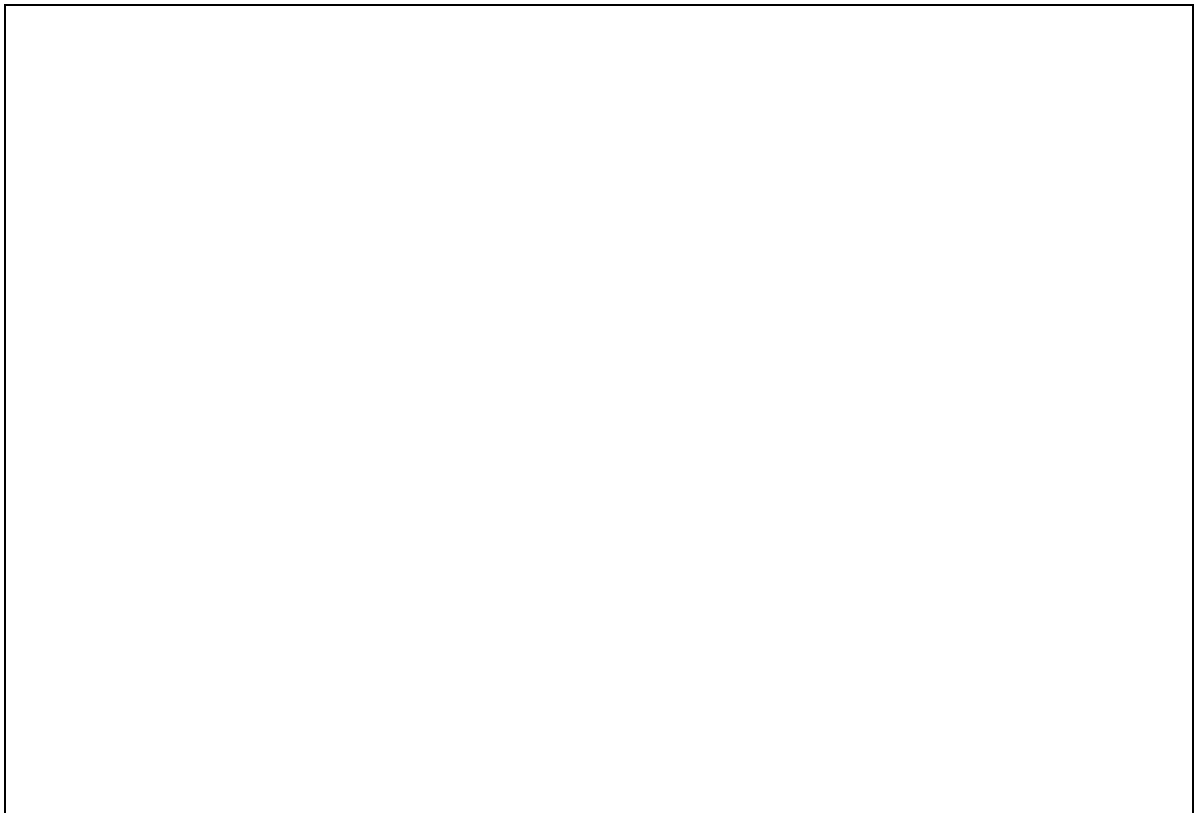
The main message from the project coordinator at the recent CSCC19 conference was that smart cities and communities is not a 'sector', "it's all of us." We want to reflect that holistic perspective in this section by asking each of the core cities to provide their insights and experience both on the practical implementation of the SynchroniCity framework, but also reflecting on the bigger question: How do we ready ourselves for a global market of IoT- and AI-enabled services for cities and communities?

On subjects from trust to tech, green to financing, or the standards-based approach to innovation in general, the aim of this section is to capture the insights and experiences on the ground in the cities and in dialogue with the global movers and shakers in this emergent market.

As mentioned above, in requesting the information in this section we are mindful of the comments from the interim review report which asked the consortium to "Improve the collection and dissemination of results coming from the cities, especially the anecdotal evidence, to make a city "SynchroniCity compliant".

3.1 Feedback from WP2 leader

Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from your perspective? What works well in the RZs? What worked less well? and suggestions for improvements? etc.

A large empty rectangular box with a thin black border, intended for providing feedback on the implementation of the Synchronicity Framework and related components across different reference zones.

3.2 Feedback from WP3 leader

Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from your perspective? What works well in the RZs? What worked less well? and suggestions for improvements? etc.

3.3 Feedback from WP4 leader

Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from your perspective? What works well in the RZs? What worked less well? and suggestions for improvements? etc.

3.5 Feedback from Antwerp

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for the local government and decision makers in your RZ?*

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.7 Feedback from Eindhoven

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for*

the local government and decision makers in your RZ?

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.9 Feedback from Carouge

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for*

the local government and decision makers in your RZ?

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.11 Feedback from Helsinki

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

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On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for the local government and decision makers in your RZ?*

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.13 Feedback from Manchester

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for the local government and decision makers in your RZ?*

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.15 Feedback from Milan

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for the local government and decision makers in your RZ?*

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.17 Feedback from Porto

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for the local government and decision makers in your RZ?*

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

3.19 Feedback from Santander

- *As we conclude the initial phase of the project before the open call deployments, what are your overall thoughts and observations about Synchronicity, and becoming a SynchroniCity-compliant city? What has worked well and less well? How do you see the impact of the work in the future (economically? Socially? Environmentally?)*

- *What are the main challenges you have faced on the project to date in your city, from different perspectives:*

E.g. technology/technical user experience:

E.g. legal and policy frameworks; financing; engagement; stakeholder; experimentation; providing relevant services; other?

What would you do differently next time?

- *How has Synchronicity helped tackle barriers to growth, innovation and market adoption in your city? (You might consider in particular the main challenges identified at the outset of the project: vendor lock-in; city lock-in; citizens' needs and buy-in; siloed business models and achieving return on investment; quantifying the socio-economic and environmental impact; the availability of high value data sets beyond open data; enabling agile policy-making in cities; procurement models and innovation culture in city departments.)*

- *What experiences or learnings would you share with new companies and cities joining the project through the open call?*

- *With current APIs and platforms varying greatly between cities, SynchroniCity seeks to find the balance between the heterogeneity of these legacy systems and a minimum interoperability to allow for a single market to develop. How do you think this has worked in practice?*

- *Please use this space to provide any other comments, insights, or learnings from the project:*

General questions / observations from the cities:

- *Figures 1 to 9 (above) represent the implementation of Synchronicity Framework, Application Services, Context Information Management, Historical Data Access API, Data Sets, Data Models, Security API, and Marketplace respectively. We can infer from the visualisations that different aspects of the framework represented different levels of challenge in each reference zone. Do you have any comments on these from the perspective of your city?*

Key Performance Indicators (KPIs)

On behalf of the KPI task in WP6, please can you provide information on the following questions?

- *With a scale of 1 (low) to 5 (high), how would you evaluate the value of SynchroniCity for the local government and decision makers in your RZ?*

- *What is the number of SMEs involved to date?*

- *Which ecosystem partners have been involved during the project in your RZ? (In listing the partners involved, the Smart City Growth Map, see Fig 5 in D6.3 can be used for assistance) Select three most important partners for the success of the project.*

- *What is your evaluation of the number of jobs created by the project?*

- *Did you implement the PIA in your RZ? (If not, describe why)*

- *Which new cities (not partners in SynchroniCity consortium) would you name as interested in SynchroniCity? Please list the cities and describe what kind of interaction have you had with the cities?*

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