SMARTER TOGETHER

Smart and Inclusive
Solutions for a Better
Life in Urban Districts

Replication Framework

Deliverable D8.1.1

Version 1.1

REVISION CHART AND HISTORY LOG

Versions

Version number	Date	Organisation name	Comments
V0.1	08/01/2018	ENC	First ToC
V0.2	23/01/2018	ENC	Review ToC
V0.3	31/01/2018	ENC	Chap 2-5 and 7
V0.4	01/02/2018	SPL	Chap 5
V0.5	05/02/2018	MUC;VIE	Chap 5
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V0.7	08/02/2018	AIT	Chap 4
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Deliverable quality review

Quality check	Date	Status	Comments
FHG	13/02/2018	OK	See reading form
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Technical Manager	27/02/2018	OK	
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Project Coordinator	15/03/2019	Ok	

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Glossary

BIPV	Building-integrated Photovoltaics
CHP	Combined Heat Power
CIP	City Intelligence Platform
CMS	Community Management System
CoC	SMARTER TOGETHER Club of Cities
CWA	CEN Workshop Agreement (CWA)
DHW	Domestic Hot Water
EeB	Energy-efficient Buildings
EIP-SCC	European Innovation Partnership on Smart Cities and Communities
EU	European Union
FC	Follower Cities (Santiago de Compostela, Venice, Sofia)
GDPR	General Data Protection Regulation
ICT	Information & Communication Technologies
INEA	Innovation and Networks Executive Agency
LhC	Lighthouse Cities (Munich, Vienna, Lyon)
M	Month, as counted from project start (M1 = February 2016)
PV	Photovoltaic
RES	Renewable Energy Sources
SCC-01	Horizon 2020 call "Smart Cities and Communities"
SCIS	Smart Cities Information System
SDH	Solar Distric Heating
SEAP	Sustainable Energy Action Plan
ST	SMARTER TOGETHER
WP	Workpackage

SMARTER TOGETHER BENEFICIARIES

N°	Organisation name	Short name	Country
1	Lyon Confluence	SPL	France
2	Lyon Métropole	GLY	France
3	HESPUL Association	HES	France
4	Toshiba	TSF	France
5	Enedis	END	France
6	Enertech	ETC	France
7	City of Munich	MUC	Germany
8	Bettervest	BET	Germany
9	G5-Partners	G5	Germany
10	Siemens Germany	SIDE	Germany
11	Spectrum Mobil	STA	Germany
12	Securitas	SCU	Germany
13	City of Vienna	VIE	Austria
14	BWS Gemeinnutzige	BWSG	Austria
15	Wiener Stadtwerke	WSTW	Austria
16	Kelag Wärme	KWG	Austria
17	Siemens Austria	SIAT	Austria
18	Sycube Informationstechnologie	SYC	Austria
19	Austrian Post	POST	Austria
20	Fraunhofer	FHG	Germany
21	Austrian Institute of Technology	AIT	Austria
22	Energy Cities	ENC	France
23	Gopa COM	GPC	Belgium
24	University of St Gallen	UNISG	Switzerland
25	Technical University of Munich	TUM	Germany
26	Deutsches Institut fuer Normung	DIN	Germany
27	Algoé	ALG	France
28	City of Santiago de Compostela	STC	Spain
29	City of Sofia	SOF	Bulgaria
30	City of Venice	VEN	Italy
31	Régionale d'HLM de Lyon	HLM	France
32	Wavestone Advisors	WAV	France

EXECUTIVE SUMMARY

Replication is a key activity for the success and scalability of every project. Therefore, the scope, time and budget for replication must be significantly well and logically conceived to allow a positive impact of the activities outside the project boundaries. SMARTER TOGETHER is not an exception, and scaling-up is a critical prerequisite from INEA to show a good use of H2020 grants and the achievement of the European Union (EU) energy climate and energy goals, fostering innovation and job creation.

SMARTER TOGETHER highlighted the role and importance of replication since the very beginning by dedicating two independent work-packages for this activity: one related only to the follower cities of Santiago de Compostela, Venice and Sofia; and another one with general replication work outside the demonstration areas of Vienna, Munich and Lyon. Additionally, a preparatory task in each one of the demonstration WP is also dedicated to replication.

Before the beginning of the implementation activities in each of the three demonstration sites, cities and other partners were brought together to analyse and conclude about recommendations for transposing to their own experiences and learn from best practices examples and lessons learned elsewhere. Past experiences have proven to be an added value to avoid committing similar mistakes and failures from the past. Nonetheless, cities are currently looking on how to solve a problem; and conventional turnkey solutions are hardly responding to their needs. This can be explained by the complexity of problems, which challenge the traditional vertical and non-collaborative way on how local organisations are used to work.

Recommendations from the pre-implementation can be now be complemented with the real experience from two years of execution phase and those can be tailored accordingly.

Knowing that monitoring, evaluation and standardisation are key elements on the replication, a guiding and framing overview is here given, to assess the replicability potential at this stage.

Dozens of activities are already in place or planned, within and outside boundaries, to target the replication of SMARTER TOGETHER activities, highlighting its importance and decisive role in any Smart City project.

1. Introduction

The replication framework is a product of WP8 and is destined to be used by the Lighthouse Cities and INEA. It will also present a possible framework to be validated and used by other cities and regions, when dealing with the implementation of smart cities solutions (e.g. the Club of Cities).

Quoting Ferrer et al. 2017[1], replication refers to the possibility of transporting or 'copying' results from a pilot case to other geographical areas, albeit with potentially different boundary conditions. In SMARTER TOGETHER, the implementation of the (pilot) smart city solutions is being done from WP3 to WP5 (implementation WP within the Lighthouse Cities (LhC)).

Smart Cities' projects are different from cities' traditional projects and require often a 'holistic' view, reorganisation and even a need for acquiring new competencies and skills. Cities are facing complex problems, to which innovative and co-created solutions, are not compatible with heavy and slow organisational speed at the local and regional institutions.

This document recovers the expectations, challenges and recommendations presented across the different tasks of WP1 (Innovation Action Framework), which are a result of a set of workshops and interviews made before the implementation of the measures. It will present also a small assessment made with the different local replicators, which can be of a bigger usefulness for the LhC and other readers, mainly through a discussion on enablers, barriers and solutions on the implementation of smart city solutions.

One of the activities which will be performed in the coming months will deal with the assessment made by the LhC on the recommendations given and to refine and tailor them according to the three years period of implementation phase. This activity is critical for implementing similar and futures solutions in different districts within the LhC and to transfer to other cities and regions: namely the follower cities (within the scope of WP7 – Integrated Strategies in Follower Cities); Club of Cities and in the common joint EU platforms (EIP-SCC and SCIS).

This framework will provide a glimpse on the replicability potential of the co-created measures implemented from WP3 to WP5, mainly through presenting a set of indicators that will help the Lighthouse Cities on assessing and deciding on implementing smart cities measures across their own territory.

The replication framework aims at guiding and framing the scope of the LhC between M24 and M36 by summarising the different activities expected to take place in their city, which will target the development of an internal implementation guideline for each one of the LhC (Milestone M8.2.1- Implementation Guidelines in the LhC).

Finally, this document summarises the main activities being done outside the project, mainly with the collaboration of other SCC1 projects, through the Replication Taskforce Group.
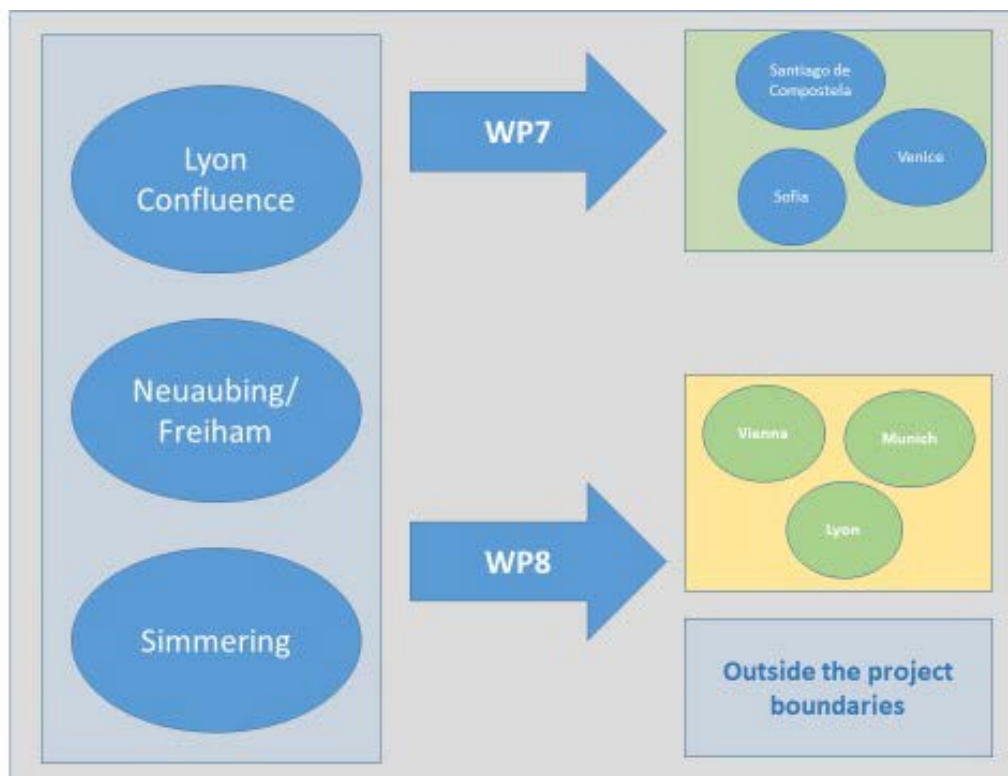
Figure 1: Replication scope

Note: The replication strategy covering all three-follower cities is presented in a different and dedicated WP (WP7 – Integrated Strategies in Follower Cities). Therefore, all activities related to them will not be addressed here.

2.   Innovation Action Framework

Before the start of the execution and implementation phases, all six cities involved in the project, together with different participating research institutes (AIT, Fraunhofer IAO and UniSG) came together to bring up the project requirements and draw up main recommendations, based on experiences presented by given best practices. WP1 – Innovation Action Framework – findings covered the expectations, challenges and recommendations across different thematic fields, which were considered critical for the implementation of smart city solutions. These results were the output of a set of workshops and interviews made.

This package of activities supplied the needed activities to provide an overall structure to SMARTER TOGETHER, defined key components and external conditions, gathered examples of successful implementation of innovative smart solutions elsewhere and identified main objectives and challenges, producing recommendations to the LhC, to support them through the implementation phase (WP3, WP4 and WP5).

To accomplish its goals, this WP focused on the following activities:

- Capacity building;
- Creating a common understanding of major terms;
- Providing a comprehensive knowledge base for all following WP.

All the activities were divided in the different tasks presented below:

- Technologies for co-created city solutions;
- Processes and methods for co-created city solutions;
- Data and standards for co-created city solutions;
- Business models for co-created city solutions;
- Governance/ Participation for co-created city solutions.

Lighthouse Cities, while discussing the contents and outputs from this deliverable, found relevant to recover the main outputs from WP1 and expressed the need to assess and validate the main recommendations after the implementation and monitoring of smart city solutions. The final deliverable from this WP8, D8.3.2 - Smart City Toolbox - will present this analysis, and provide final recommendations for the replication and scalability of the solutions.

2.1 Technologies for co-created city solutions

Under this task, technologies for successful co-created city solutions from three different thematic fields were considered, namely:

a) Nearly zero or low-energy districts,

b) Integrated infrastructure

c) Sustainable urban mobility.

Furthermore, key demands per technology field, which are seen as highly challenging and relevant for the technical transformation of the existing districts of SMARTER TOGETHER, were determined. This task looked for technical solutions that would enable the economic and ecologic transformation into a modern, climate-resilient, low carbon and energy efficient district with respect to the existing heterogeneous urban infrastructure and ownership structure in districts.

The tables below summarise the main recommendations for nearly zero or low-energy districts, based on D 1.2.2.

2.1.1 Recommendations for new buildings	
Consider the Life Cycle of building materials	Demand the use of recyclable materials with low inherent primary energy consumption and a low carbon footprint.
Energy provision contract	Electricity from a 100% renewable energy mix.
Onsite renewable energy production	Roofs and partly the facades have to be utilised for energy production from RES
Energy Efficiency	Aim for the highest performance levels for the technologies to be implemented, including lights and appliances.
	Implement / require building certifications which highly rate energy efficiency aspects
Combine e-mobility	Provide charging stations for e-bikes and e-cars at a percentage of the occupancy.

Table 1: Recommendations for new buildings

2.1.2 Recommendations for Energy efficiency refurbishment of buildings	
Refurbishment assessment	Due to a large number of buildings to be intervened, perform a building cluster, characterised by certain aspects, such as: Building period; Heritage-protection; Type of ownership; Precondition of the heating systems; Location (will the neighbouring buildings also be refurbished? Availability and potential of renewable energy sources / energy infrastructure); Potential of different (renewable) energy sources / energy supply possibilities
Refurbishment extension	Assess the extent of the required refurbishment measures for each of the building clusters. Start and focus refurbishment actions on buildings with a high heating energy demand which are supplied by CO_2-intensive energy supply units

Promote holistic approaches	Achieving highly energy efficient or even net zero energy renovation requires a holistic solution that (i) minimises the heat loss and energy consumption requirements of the building, (ii) produces and distributes the required energy in the most efficient manner, and (iii) generates renewable energy to meet the remaining (small) demand (in this order).

Table 2: Recommendations for Energy efficiency refurbishment of buildings

2.1.3 Innovative technical refurbishment solutions for building energy systems	
Prefabrication stage	Shifting most of the installation work to the prefabrication stage can greatly increase the quality of the execution.
Integration of solar energy	For building refurbishment, it might make more sense to install PV systems instead of solar thermal collectors as the piping and water storage could lead to more difficulties and requires more space. But such considerations should also depend on the actual circumstances and the depth of the refurbishment actions.

Table 3: Recommendations for innovative technical refurbishment solutions for building energy systems

2.1.4 Recommendations for Urban renewable energy generation (mostly PV)	
Planning for urban integrated photovoltaic systems	Energy concepts with predominantly use of locally generated heat and electricity from solar technologies (solar thermal, photovoltaic) are a key element for technology solutions of the city transformation. Especially for urban development, areas without an existing infrastructure of district heating are good candidates for solar energy.
RES Planning for new urban areas	Assessment based on local renewable energy production, whether decentralised or centralised systems are more useful, has to be explored and developed from the very beginning. 100% supply by renewable energy sources (solar, wind, biomass and geothermal energy) can be achieved, if economically reasonable.

Go beyond buildings	Assess other urban areas for solar power generation. Attractive urban areas are: transport infrastructure: a) Noise barriers, b) Stations, c) Railway line, d) Parking canopies, e) Canopies of traffic areas; Former military training areas; Landfills; Open space solar systems.
Follow Legislation	According to the EU Energy Efficiency Directive, the refurbishment rate of 3% public buildings per year is mandatory. For implementing flagship projects with great visibility, it is recommended to integrate an effective BIPV design in public architectural competitions...

Table 4: Recommendations for urban renewable energy generation (mostly PV)

2.1.5 Recommendations for integrated infrastructures for district heating

Transformation of the existing district heating to DH4.0 and other systems	Low-temperature space heating system Low-temperature domestic hot water (DHW) supply system The transformation of the current district heating system towards the 4th generation is essential to lower both the supply and return temperature of the system. This also enables and facilitates the integration of low temperature waste heat (which is by far the majority of waste heat). Solar district heating (SDH) with seasonal storage Biomass CHP plants for district heating Deep geothermal power plants Renewable energy supply without district heating - individual heat pumps (powered by electricity from renewable energy sources such as PV, wind, biomass CHP, etc.) could/should supply the majority of the heat demand in such areas

Table 5: Recommendations integrated infrastructures for district heating

2.1.6 Recommendations for sustainable urban mobility

Mobility Station (interface)	Enhancing accessibility of an interface (mobility point or station) should cover a range of different aspects of planning and design activities such as land use planning and interface design.
	Enhancing urban and mobility integration of mobility interfaces is recommended to be properly addressed during planning, design, (re-)design as well as construction of an urban transport interfaces.
	Transport interface is recommended to be located in a strategic urban environment and conveniently integrated for the functional and aesthetic viewpoint.
	The impact of this infrastructure on straightness centrality (directness of journeys along the public transport network, average minimum number of transfers between the interface and any other node) of the other transport nodes should be assessed.
	Use an approach enabling to quantify relevant key indicators describing the urban complexity around the interface to enhance accessibility and integration during the interface planning process.
	Bus / tram stops and underground / railway station entrances must be in direct visual connection to one another.
	The most direct path between each stops / entrances must be analysed; when it is not possible to walk following the straightest line (the visual connection), it must be checked that the shortest itinerary: not deviating from a straight line of more than 10 meters, not implying more than 3 turns, not including any discouraging elements being disincentive to transfer.
	The shortest itinerary must satisfy the requirements of proximity, safety, comfort, but also attractiveness, assuring a high-quality design and locating liveable elements in the path.
	Waiting time is one of the most discouraging factors, according to most travellers; thus, it is important to locate waiting areas in positions where users may keep themselves entertained at least by interacting with people (e.g. people staying in urban spaces, shopping, etc.).

Table 6: Recommendations for sustainable urban mobility

2.2 Processes and methods for co-created city solutions

Within smart city projects, a structured management approach is needed. City administration and urban planning departments, that are often responsible for the coordination and implementation of smart city projects, are often less structured and innovative than in the commercial sphere or business projects. WP1 showed that the development of specific innovative technological applications and other solutions requires that different actors with different disciplinary backgrounds from the public, private and civic sector work together and new partnerships are spurred. Thus, the management and planning of smart city projects needs to rely on methods and techniques, often facilitated by ICT, that take multiple actors interests or utilities into account.

The analysis of the process and project management requirements of SMARTER TOGETHER Lighthouse and Follower Cities revealed that there is a concurrent need for appropriate process management models:

Recommendations	
Smart city management processes in the city administration	Raise awareness for requirements as well as the potential scope of smart city management processes in the city administration, the project teams as well as relevant stakeholder groups.
Governance mechanisms	Adapt and improve collaborative governance mechanisms dedicated to the planning and management of integrated smart city solutions.
Co-creative spaces	Create a safe / neutral space (e.g. neutral locations) for the implementation of the (co-creative) methods that support the city process transformation towards the requirements of smart city projects.
Common understanding	Take the time to get to know each other and develop a common understanding of the project goals as different phases of the smart city process management are related to specific requirements and activities, especially with regards to more co-creative forms of working together. Make explicit a shared understanding and perception of the challenges and aims of the smart city project in coordination with the municipal government.
Define your baseline	Express the key priorities and baseline conditions for the smart city project and its area.
Involve stakeholders	Specify the rules for following the process; indicate which recommended best practices should be followed, which stakeholders should be involved and which required tasks they need to complete in accordance with expected standards. Use visualisation and peer-to-peer methods to involve a broad variety of stakeholders more openly and intuitively in the smart city project process.

Key performance indicators	Discuss and identify process key performance indicators. Verify which critical success factors should be met. Describe what measurements (financial, operational, and organisational) need to be established.
Monitoring and evaluation	Monitor and evaluate the progress of the smart city project. An effective evaluation is important to prove the value of the smart city project and to communicate the benefits of the smart city projects for the city authorities and other city stakeholders.
Lessons learnt	Define lessons learnt and operationalise them in the current or following smart city projects. The smart city projects processes must integrate defined procedures for knowledge sharing activities and replicability taking into account the need to allocate resources for that purpose.

Table 7: Recommendations for Processes and methods for co-created city solutions

2.3 Data and standards for co-created city solutions

The strategic needs of Lighthouse- and Follower Cities are presented in terms of ICT requirements in WP1.

Based on the status quo analysis and best practices, main recommendations for the approach with regard to the establishment of Urban Data Platforms are presented. These recommendations consider essential organisational frameworks, technical concepts and cutting-edge technologies that should be taken into account for future implementations of similar projects.

Different recommendations were presented for data governance and application purpose, data gathering and processing, urban (data) platforms and Interoperability.

Recommendations for data and standards	
Data governance and application	Follow up an agile approach and identify functionalities with high business value (according to city strategies, SEAP). Implementation of data management to serve as key enabler for information and knowledge management. Go for low-hanging fruits with high impact and low effort to come to quick presentable solutions and show therefore the benefit and stimulate new ideas at stakeholder side. Installation of (virtual) organisation – data competence centre –represented by city stakeholders (institutions) coping with data and information provision and stimulating cross-domain activities (co-creation).
Data gathering and processing	Develop a data map showing institutions, identifying relevant data, ownership as well as

legal and technical constraints (privacy, possible interfaces)

Develop the concept of a data integration/linking pipeline covering the overall landscape from source, intermediate system and endpoint (urban data platform) incorporating failure/fault management and notification mechanisms.

Avoid the use of privacy relevant or personal related data if it does not generate real additional value, e.g. if data is anyway aggregated afterwards (reduce effort for legal contracts, data usage policies, etc.)

Follow-up the agile approach again, when it comes to the implementation of the application, try to come up with quick presentable results, avoid long development times until the first results will be shown, these might stimulate new ideas at stakeholder side and shows the potential benefits of the solution quickly.

Clarify if there will be information needed on near- or real-time basis and take that into account for creating the appropriate technical infrastructure.

Implement user-interfaces for management of infrequently human-generated content (structured and unstructured)
Implement a meta-data management concept being able to complement measurement data by suitable description data.
Implement historicising mechanisms for all kind of data making it possible to analyse the data from several points/time frames and different historical and present description (meta-data) structures.

An extension by nowadays more popular concepts like Big Data mechanisms (e.g. NoSQL, NewSQL) should be taken into account. The concept of Data Lake should be assessed with regard to feasibility especially in the case, where data to be processed is not fully clear at the beginning and where various different data sources by means of the 3V paradigm have to be incorporated.

Urban (data) platforms	Follow-up a multi-layered approach when designing systems with the goal to incorporate various domain specific data sources addressing the 3V paradigm (volume, variety, velocity) and different characteristics by means of timing and importance with regard to decision making. Separation of concerns should be especially taken into account in system design although this is a meanwhile well-known principle in software

	engineering.
Interoperability	Comparable information between cities is a crucial issue. One of the prerequisites is to offer easy to use interfaces on the platform side to access the data and information stored for further analysis. Open APIs are one approach to handle this requirement.

Table 8: Recommendations for data and standards for co-created city solutions

2.4 Business models for co-created city solutions

Throughout the whole process of creating and designing a business model SMARTER TOGETHER participants will be guided and supported by the University of St. Gallen. To have an effective and efficient process, different workshops were designed in order to directly work together with each city.

There are several steps each city needs to undertake in order to reach a (new) business model.

One of the biggest hurdles to overcome in the whole business model innovation process is resistance. Doing so is essential in order to have successfully implemented a business model in the smart city.

Changing user behaviour

- Complexify problems
- Simplify solutions

Leading multiple individuals to take a consequential single decision

- Circumvent decision-making
- Multiply decision-making

Change management is key within a business-model perspective. The following points summarize the relevant steps to be given in this process, according to Deliverable D1.5.1 - Business models for co-created city solutions.

- Definition of a Plan of Action (develop a vision, quick wins, definition of structures and goals).
- Build Capabilities by selecting the right team and building missing capacities (develop the capabilities internally, build new partnerships; buy capabilities or businesses; establish a culture of innovation).

Business models are subject of a specific task within WP8 with more details on main findings and framework.

2.5 Governance/ Participation for co-created city solutions

This task aimed to give recommendations for cities on how to collaborate with publics (participation) and across governmental entities and levels (governance) in order to realise the promise of co-creation. The main challenge involves widespread ideas and expectations regarding the roles to be played by users and citizens that constitute obstacles to co-creation.

Recommendations for governance and participation	
Ensuring cooperation of stakeholders	Develop a Top-Down Bottom-Up strategy
Learning about citizen needs and ideas	Learn to be surprised Learn to be taught
Achieving public understanding of project goals	Provide skills, not just information Situate knowledge-making in material environments
Overcoming silo structures of city administration	Institutionalise topic-specific coordination and decision-making Introduce project-specific reporting lines
Coordinating multiple administrative and governmental scales	Empower district-level coordination and decision making Plan not to plan

Table 9: Recommendations for governance and participation

3. Replication framework: challenges, enablers and solutions

Energy Cities organised a workshop in December 2017 in order to gather staff from lighthouse cities involved in a transversal way into the smart city strategy of the pilot cities. This workshop was dedicated to discuss underlying challenges, enablers and solutions to different smart city aspects

1. Enablers will help potential replicating local authorities to assess their situation and check, whether or not, conditions for advancing a smart city strategy are there, and if not, to make sure that this is taken into consideration and addressed.

2. Key challenges will allow potential replicating local authorities to make sure that the managing teams are well aware of the obstacles and that those will be taking care of.
3. Solutions presented will allow potential replicating local authorities to get inspired and have access to a series of successful practices to choose from when putting together their own smart city strategy.

The following pages summarise and highlight the major findings of the workshop. The tables below show and describe the enablers, key problems and solutions that were identified by the participants.

3.1 Enablers

	Link to Recommendations from WP1
3.1.1 Organisational, structural and governance aspects	
Relying on **existing strategies** and infrastructure **Leadership and ownership:** - **Municipal owned companies / Urban renewal offices** (100% owned by the city) or **urban agencies / core groups** existing in different areas and focusing on different topics including social or economic	Ensuring Cooperation of Stakeholders (1.6) Overcoming Silo Structures of City Administration (1.6)
The **political will / will of decision makers** (high level) is part of the guarantee that the process will work – it is easier when it works top down. Good relation between political representatives is also important (Good information flow between elected officials) / Good coordination between departments - **Local heroes** willing to do it Buy-in from technical department and to "sell" the solution to the higher level **Allies / friendly departments within the municipality / mentors (breaking the silos) / taskforces / Building the right crowd** **Transversal cooperation within the local authority**	Ensuring Cooperation of Stakeholders (1.6)
The **EU project** is an enabler as without it the decision level would not have committed. **Existing strategy and vision**, especially on the urban development - **Common goals, targets and vision**	Achieving Public Understanding of Project Goals (1.6) Common understanding (1.3)

Acceptance and Satisfaction	Ensuring Cooperation of Stakeholders (1.6)
	Learning about Citizen Needs and Ideas (1.6)
Inspiration – somewhere else – sometimes it is important to visit examples from other countries / regions / cities Publications – see that others deal with similar problems	General best practices presented in WP1
Right to fail as it is a pioneer project / a lab / a demonstration Assessment which measures are generally more accepted than others	Co-creative spaces (1.3)

3.1.2   Legal aspects

Right to experiment Evolution of regulations at local but also national level (ex. renewables, retrofitting)	Co-creative spaces (1.3)
Evolution of the regulation / governance – pilot project –anticipation	

3.1.3   Economic aspects

European funds (as seed money) **National funds** (e.g. national funding for refurbishment, used in Vienna) **Attractive area** In the case of Lyon, the territory is very attractive; it is a place of innovation, where one can take risks. The area of Lyon is already attractive; it is the place to be, as the pilot area is in the city centre. The demand in this area is high, it is a positive market. **Financial benefit** – for department that implements project Clear **business models and financing schemes**	Generally related with T1.5 and T8.4

3.1.4   Communication, co-creation and engagement aspects

Image - the positive effect of being awarded by the EU Commission means that you are among the best cities – it is not only a matter of money, but also a matter of image!	Change management from T1.5

Raise awareness among the people in the city **on the importance of refurbishment**. They need to be aware of the benefits, not only economic, but focus on the quality of life (thermal comfort)

Find buy-ins (technical and political)
Good communication – storytelling skills / Quick-story – to know the right question
The **integration of tenants and renters** is important, as there is strong legislation on this topic. If the building is renovated the company is allowed to increase the rent with a small amount of money. When the company comes with a top down approach mentioning that they will do refurbishment the tenants will be against it. However, when they are involving the tenants in a participatory way, asking what improvement this would bring, they would discuss and agree easier. **More cooperative focus.**

	Learning about Citizen Needs and Ideas (1.6)

Engagement of local stakeholders
People being proud of what they do, start with success factors.

Ensuring Cooperation of Stakeholders (1.6)

Transparency / information/ communication
"Showing off" successful pilot / demonstration which should be made visible

Fact sheets on quick wins: Sharing a quick win – showing quick-ins on the top level (gives credibility). Don't communicate a quick-win as a big victory (it's dangerous) / Be positive and say good things **/ Piloting** can open new doors, too
Communicate more in the media on positive aspects
Organise site visits (touch + feel)
Co-creation processes and understanding the needs and opposition to change
Defining the right problem

3.1.5 Other

Sharing best practices between cities – access existing knowledge How easy the technology is? How available it is?	General best practices presented in WP1

Table 10 : Enablers for replicating smart cities' solutions

3.2 Key Problems and Challenges

KEY PROBLEMS AND CHALLENGES	Link to Recommendations from WP1
3.2.1 Organisational, structural and governance aspects	
Internal governance with no transparency	Ensuring Cooperation of Stakeholders (1.6)
Missing internal processes and how do you get **from pilot to standard**.	Smart city management processes in the city administration (1.3)
Informal governance structure – blocking the decision and implementation	Ensuring Cooperation of Stakeholders (1.6)

Inexistent integrated strategies Timeframe: "not in the right time" **(administrations are slow!)** Municipalities are not flexible **(not a risk culture)**	Ensuring Cooperation of Stakeholders
On a process level, this is a pilot project and there is **no standard procedure / solution** yet – related to procurement for innovation	Ensuring Cooperation of Stakeholders (1.6)
Experiment status (allowing accepting some conditions)!	Co-creative spaces (1.3)
Silos in the organisation and no strategy - This can cause lack of motivation in the departments – people are not allowed to work outside their department. **Lack of confidence within the organisation and between different departments**	Overcoming Silo Structures of City Administration (1.6)
Complicated processes **Bad examples from the past**	Ensuring Cooperation of Stakeholders (1.6) General best practices presented in WP1

3.2.2 Legal aspects

Legal and policy framework for data protection and privacy is missing.	Data gathering and processing (1.4) Data governance and application (1.4)

Changing national legal framework and new standards.
 	
National framework impeding local willingness
 	
There is no minimum standard from the national level.
 	
National regulatory framework (e.g. in France the minimum standard for building retrofit is to paint the façade, so the regulation is too weak).
 	
Confusing legal standards and regulation (General Data Protection Regulation - GDPR) – different levels
  - Big energy companies are not willing to share the data with the public authorities, even though in some cases they are city owned (e.g. adding additional sensors by the municipality to obtain the same data).
  - No clear legal framework to allow operators / municipal owned companies to share data.
 	
In the refurbishment process (private housing), **the decision-making** is complicated as one needs a high percentage (75% and even 100%) of homeowners to agree.
	Coordinating Multiple Administrative and Governmental Scales (1.6)
	
	Ensuring Cooperation of Stakeholders (1.6)

Difficulty to replicate pilots - legal constraints.

3.2.3 Economic aspects	
Low energy price. **Risk taking** (transition from pilot/lighthouse to daily life/usual projects), making it economically viable. **No interesting financing schemes for banks**. **Procurement procedures**: difficult to procure innovation (lack of standards); procurement is made to purchase solutions (goods/services), not to solve problems.	General business models from T1.5 and T8.4

3.2.4 Communication, co-creation and engagement aspects	
Lack of trust between the municipality and the municipal owned companies. **Mistrust between different departments within the same municipality** **Lack of ownership** by the citizens, passive citizens - high expectations of citizens towards city Lack of concrete results to share and show Lack of definition of smart city	Achieving Public Understanding of Project Goals (1.6) Overcoming Silo Structures of City Administration (1.6)

3.2.5 Other	
No baseline data for mobility issues nor for energy consumptions and patterns; Communication is difficult on energy efficiency issues: How to make the invisible visible? Indicators **Technical standards – changing too fast compared to slow administrative processes**.	Achieving Public Understanding of Project Goals (1.6) Key performance indicators (1.3) Monitoring and evaluation (1.3)
Lack of urgency, motivation, citizen push as current situation is already quite comfortable (e.g. Munich) as the city is demographically growing and attracting investors. Lack of motivated people / people are not flexible / no resources / no time / not interested **Long time frame**	Ensuring Cooperation of Stakeholders (1.6) Learning about Citizen Needs and Ideas (1.6)
Resistance to change. Change is perceived as a big barrier	Achieving Public Understanding of Project Goals (1.6)

Table 11: Challenges and barriers for implementing smart city solutions

3.3 Solutions

	Linked recommendations from WP1
3.3.1 Organisational, structural and governance aspects	

Set up a dedicated company or task force/core group

Set up a small company like SPL (Lyon) to develop a specific territory and tackle different aspects on one territory. This company is highly skilled and decisions can be taken in short time. However, the problem is to replicate this outside of the pilot area.

In the case of Lyon, there are 10 000 employees in the municipal organisation and the decision-making process is complicated. Municipalities have the right to set up companies for specific purposes, so the SPL has 25 employees and the mayor is the president of the company, having thus a direct link. However, this makes sometimes the dialogue with the civil servants complicated as they are seen as a problem and not as a solution (rivalry).

Ensuring Cooperation of Stakeholders (1.6)

2 such companies exist in Lyon. These companies have the right to experiment and might have derogations from the regulation. (e.g. you need to build 2 car parks / apartment, but in an experiment area / urban lab this regulation is not compulsory). The benefits of such small and flexible organisation are: many decisions can be taken for the project running for a limited period of time (short-term) and geographical area. Nonetheless, it can create mistrust in the municipality or metropole, once other people are doing tasks which they would be able to perform.

Overcoming Silo Structures of City Administration (1.6)

In the area of Aspen in Vienna and in the former harbour of Hamburg, the solutions found are similar.

It is also mentioned that in Munich the urban renewal offices were more independent 30 years ago, but now they are losing their special status, becoming too administrative.

Core group (Munich): Multidisciplinary group without steering capacity, composed by different departments of the municipality and other organisations. It is more open and innovative than it used to be in the past as it is open to external parties to the municipality. In the past, it was just internal. The city staff represented are heads of division. Benefits: composed by people who wish to work, are transparent and address different topics. Negative: Lack of steering power. With time, heads of division are assigning people with less power to the group and losing interest.

Setting up a replication platform locally, involving the key stakeholders who are potential replicators – create exchange of experience among the different persons having similar roles in different districts, also involving public and private actors; but also have decision making power and have access to the political level. **Form a core group** that is transparent and multi-domain and also open to other external actors and have more steering power / capacity in the group, could be a next step.

Ensuring Cooperation of Stakeholders (1.6)

Overcoming Silo Structures of City Administration (1.6)

Having the existing company from the pilot area operating in other districts in the same city: The new company having the know-how and the experience from the pilot district could operate also on the development and refurbishment of other areas in the city (like UBA Hamburg).

Economic development department (Lyon): For very big and complex organisations, fostering transversal departments, which do not depend on a specific project, for discussing crosscutting topics can trigger trust between different departments. Each vertical department has an innovation person, which meet every 2 months. Discuss cross-sectoral topics (solid waste, mobility, etc.).
Set up LABs – to try things beyond regulation.

Replicators should be involved in the implementation phase
In the SCC projects, **monitoring and replication are part from the beginning**

Achieving Public Understanding of Project Goals (1.6)

Ensuring Cooperation of Stakeholders (1.6)

Open calls for innovation and new ideas:
- **citizen oriented** (crowdfunding platform for instance)
- **city employees oriented**

Co-creative spaces (1.3)

3.3.2 Legal aspects

Related to data platforms – one solution is the **data gatekeeper** ("sort of "data concierge") managing the access to data and set standards and processes, a basic standardised procedure. This is also a solution to the **lack of national legal framework** (Munich and replicated to Vienna). Another idea is the development of a **foundation or advisory board**: a multi-level participation platform, which assesses the access to data. Reflects the power of civil society to deal with information.

The lawmakers are not so fast and have a different language than technicians and politicians, sometimes legal frameworks are inexistent and **law makers need to be involved in the project from the beginning, even in the piloting phase**, they should be called to the discussion and regular meetings (like in Milano).

Set up labs to try things beyond regulation
In France, the state allows to go beyond the national regulatory framework to experiment

Ensuring Cooperation of Stakeholders (1.6)

Updating the prototype and once this is done and it works, the replication should take place in all neighbourhoods.

Apply norms from other EU countries: When, in a country, there is no standard, it is possible to apply norms from other EU countries (a specific topic is to connect the PV systems to the grid, which is a German norm / standard and is used in France as there were no similar standard). This helped to develop systems in France in general and not only in Lyon. **Lobby for stronger standards based on the experiment level.**

3.3.3 Economic aspects

Use of crowdfunding – especially as a marketing instrument and to commit citizens (e.g. renewable energy systems)

Setting up a municipal crowdfunding platform
Voucher system
Reduced property tax for people who carry out refurbishment works
Tax credit for refurbishment, instead of only tax reduction: In Italy people can even resell their tax benefit (to a company for instance)

Bring other indicators to the equation: monitoring of results focused on the use of different indicators in order to show not only the financial benefits (on which decision-making is mainly based), but also the costs that could be avoided in the future and social, health benefits; e.g. being ready to invest in solutions that do not necessarily save money, but they could avoid costs in the future - not visible, but indirect financial benefits (e.g. in the field of sustainable mobility and public transport, people save money as they do not use their individual cars). These are indirect support / funding that on the longer term reduces the costs and the environmental impact.

Develop solutions and indicators to make investments visible in a different way as, currently, the criteria is only profit and return on investment. Take into consideration social and environmental benefits as well as avoided future costs instead of only profit.

General business models from T1.5 and T8.4

Cash advance by financial institution – a tool that is popular in Lyon as a financial institution gives money for the first year of the project and will allow the organisations to start the work without waiting for subsidies.

A **national fund** in Germany (KfW) giving funding according to the standards. It covers up to 15% of the overall budget. The beneficiary has to assure 20% as guarantee.

Change current business models in the sense that they should not be only based on profit but also on avoiding future costs and on other indicators: social, health etc.

Allow cascade funding to reach a certain impact (within SMARTER TOGETHER, cascade funding is not allowed by the EU).

3.3.4 Communication, co-creation and engagement aspects

Local renewal offices as communication hubs in the districts. In Munich, these are working for a 5 years' concession and any kind of company can apply. Many communication and information works is done by these companies that act as participation and consulting offices.

Quality of communication
- Listening / bottom up
- Continuity
- Involvement
- Avoid dealing only with "list of complaints"

Going beyond communication, towards participatory processes by listening to the people, discussing and getting to the source of the problems, which is the solution also for the acceptance of the different projects. **More bottom-up communication and co-creation** with local authorities listening more to people's needs. They should not only listen to people's complaints, but be proactive on the solutions proposed and co-create with them, truly understanding their needs
Change of the mindsets is necessary via the ownership from the beginning by involving everyone concerned.

Continuity of communication: Communicate periodically the state of the project so that the results can be adapted regularly to the needs and realities in the field, rather than just deliver a final product that is not corresponding to the current needs (Managing expectations).

Ensuring Cooperation of Stakeholders (1.6)

Overcoming Silo Structures of City Administration (1.6)

More resources invested in communication / participation to accompany on the long term and increase the quality and move towards more participatory processes since the very beginning of the project.

Make the decision-making process more transparent (this solution might not necessarily be in line with political will).

Identify reliable stakeholders that would be more trusted by citizens and would act as ambassadors (e.g. pioneers becoming ambassadors / pilot families trained and training other families). **Identify trusted contact partners and involve them in the process** / build trust.

Positive testimonies and feedback from pilots: e.g. Invite residents from refurbished buildings to the other owner meetings in buildings that are to be refurbished to make testimonies of their experience and positive feedback.

Create an informal environment and create conviviality
e.g. In Milano intervention of a team with different representatives to speak to the people in an informal environment (bring food etc); **Setting up working groups with citizens**

3.3.5 Other

Develop other types of indicators/variables (not only related to energy savings, which in some cases are related with long payback periods) e.g. in the field of building retrofit, other indicators should be introduced than energy savings, showing very long-term payback periods (25 years). So, the economic aspect of investment is not attractive in this case. Other variables such as health issues, comfort, and quality of life should be introduced.	Define your baseline (1.3) Monitoring and evaluation (1.3)
Making the invisible visible - Financial aspects - Comfort/lifestyle - Testimony/feedback	Achieving Public Understanding of Project Goals (1.6)

Table 12 : Possible solutions to take into account when replicating smart cities' solutions

4. Replication of the measures deployed in the Lighthouse Cities

4.1 Selection of measures for replication: Focus measures

From the total amount of measures being implemented from WP3 to WP5, nine have been selected for replication (focus projects sourced from the relevant project books from WP2 – co-creation for smart city solutions).

Focus measure name	Description
Eco-refurbishment of Cité Perrache (Lyon)	Refurbishment of a Social Housing Estate with 281 flats built in the 1930ies
Refurbishment of Hauffgasse 37-43 (Vienne)	Refurbishment of a Social Housing Estate, 486 flats, community centre;
Zero Energy Gym - Secondary School Enkplatz 7 (Vienna)	Reconstruction of a Public Building,
Consulting for Refurbishment (Munich)	Providing feasibility studies as information and for convincing the owners.
Community Management System connected to the city data platform (Lyon)	Use the Community Management System (CMS) formerly developed by Toshiba to display energy data collected by the Grand-Lyon Data Platform to gain a global understanding of the energy flows of the area in order to improve the urban planning process and the planning, design and operation of public infrastructures.

Smart Data Platform based on Siemens City Intelligence Platform (CIP) with municipal Data Gatekeeper Concept (Munich)	Deployment of an open, secure and citywide Smart Data Platform. It acts as a virtual data-backbone for collecting city-data in the domains of mobility, energy, urban living and crowd data as a basis for a holistic view of city-data and operated under the (trustworthy) control of the public authority to offer security and quality of data. This Smart Data Platform will receive data e.g. from the sensor infrastructure installed with the open-urban-labs, and from sensors used within the smart home solution for refurbished flats etc. and can be used for developing smart services. To address the necessary regulations a so-called *Data Gatekeeper* concept is developed in cooperation with Task 1.5. It defines common usage, legal aspects (data privacy and security), operations and management of such a Smart Data platform. The concept defines a framework for a trustworthy and open solution and is used as a blueprint to support replication and the development of an ecosystem of Smart- Services with full respect of local requirements related to data management. Consumers/providers of the data will be allowed to gain trusted access to urban and public data smart services in the district.
Implementation of an autonomous electric shuttle (Lyon)	Testing of 2 autonomous e-shuttles (Navly), data generation
Design and installation report of a mobility point including the introduction Vienna Mobility Card (Vienna)	Conceptional design of 2 mobility points and building 1or 2 mobility points (along with Vienna Mobility Card introduction) to strengthen multimodal services, develop an attractive design and reduce pressure on on-street parking (possible rollout in city)
Local Lab – Smart Neighbourhood Lab (Munich)	Smart neighbourhood lab (Stadtteillabor) – home of the citizen engagement process (event location, exhibition hall) and citizen centre

Table 13 : Focus measures description.

For more detailed information, please see the appendix of this document

The potential for replication is made within the scope of WP6 – Monitoring and will be evaluated using six criteria, which are described below.

4.2 Criteria for measuring the replication potential

4.2.1 CO2 saving potential and cost efficiency

The first criterion is essential with regards to the 2020 Energy Strategy of the European Union[2].

It should be evaluated if the planned replication of smart city measure is even smart (does it bring an improvement to the Status Quo). It is therefore important to scrutinise monitoring data and ensure that the measure itself is cost efficient, saves a relevant amount of CO2 and is therefore even worth replicating. The lower the costs of the CO2 saving measure the higher the replication potential.

4.2.2 Data standardisation potential and data quality

The important point when it comes to the data standardisation potential is the establishment of a standard that can be the further taken up and used by other cities. An established standard will be necessary when trying to mainstream certain standards and processes.

Besides the question of how to establish a standard, the second question arising is the comparability of data. Especially for ICT driven projects, for which the data quality is the key to a successful replication of certain measures. In detail, it means that the same type and quality of data should be available to make realistic estimations how a measure works in a different context. If this is not the case, it should at least be put attention on the data transparency as well as the data path. In other words, where does the data come from, who provides it and has it been modified?

4.2.3 Scalability

Transferring one measure from one context to another means that the contexts themselves need to be comparable to certain degrees (to later on be scalable). It is therefore important that the built urban fabric, in both contexts, shows similarities in terms of age, design and planning logic. The more similarities there are the higher the transferability will be. This criterion rather applies for measures in the built environment (refurbishments) than for the transfer of technologies (mobility concepts).

4.2.4 Governance context

Beside the built environment, another (equally important) issue is the organisational environment. Again, the highest replicability potential can be ensured when similar departments of a municipality are involved in the development and conduction of a measure.

Further, local governance practices should be taken into consideration, i.e. city specific processes and development plans should be scrutinised.

4.2.5 Viable Business models

To financially understand a measure and its potential to be transferred in another urban context it is important to understand the financial underlying background. Has a suitable business model been developed? Are its results promising i.e. the value proposition is fulfilled? Can a similar approach be applied to a new context?

Setting up a clear business model before starting to conduct the measure is key, for thus a feasible model in one city does not mean that it is feasible in another.

4.2.6   Legal framework

National as well as international guidelines and market regulations are a key factor when it comes to the replication potential of measures. The more international agreed upon legal frameworks and market regulations for cities exist the higher the replication potential of such measures. When rigid national laws exist, the potentials to transfer a measure from one city to another is decreasing.

4.3 Replication potential through standardisation

4.3.1   Standardisation in the past

When the lighthouse projects were announced in the Horizon2020 programme, the three key words attached to these projects were: innovate, emulate, replicate. Here, we are focusing on the replication process of successful pilot projects.

In order to replicate pilot activities, proper documentation is of paramount importance: documentation in terms of technical details, but also organisational, structural and financial details. For most of this documentation, standards or technical guidelines are essential. Standards have existed since the beginning of recorded history, especially in tangible items related to residential infrastructure; most famously perhaps, the Roman Empire which standardised the gauge (1435 mm) of rutted roads marked by chariot wheels, which most countries still adhere to today. Another significant beacon in standardisation was triggered by a devastating fire in the United States in 1904, known as the "great fire of Baltimore", devastating the city due to various different fire hoses that would not allow the regional fire departments to help fighting the quickly spreading fire. By 1906, fire hydrants and fire hoses across the United States were standardised. With the foundation of ISO and CEN (1947 and 1961, respectively) more and more infrastructure features were introduced to the world of standardisation and thereby – on the long run – allowing more product compatibility and more economic competitiveness on a global level.

4.3.2   Standardisation in Smart Cities and SMARTER TOGETHER

Historically speaking, most efforts in the world of standardisation are industry-driven; standardisation organisations are eager to help industry battle the technical challenges of getting into the market. However, the most important angle from which the integration of innovative products, services, business models, has to be viewed when discussing the topic smart cities has not been addressed in the past. Now, with the introduction of Smart Cities and Internet of Things, city/community representatives have to take part in the standardisation process. With the help of these lighthouse projects, municipality representatives will actually be enabled to influence the content of standards. Until recently, cities/communities have not had an opportunity to participate in the development of standards. Partly because they could not effort the time and resources

these processes take, but partly also, because there has not been any effort to reach out to municipalities and most of them as we have learned were not even aware of the standardisation activities that will eventually impact their work and their citizens' lives.

However, affecting citizens' lives is the primary goal of SMARTER TOGETHER and the lighthouse projects at large; not only in the lighthouse city, but also in the follower cities. Prior to launching replication activities and simultaneously starting standardisation activities, the consortium had to analyse existing standards and get an understanding of the standardisation potential of the project.

The result of the standardisation analysis will be found in milestone M.8.5.1 'Overview of existing standards and ongoing standardisation activities' that is due to M30.

This comprehensive analysis will then be compared to ongoing standardisation activities and identified needs of the pilot activities. The resulting gap analysis will lead us to identify various standardisation proposals.

A first initiation of a standard is currently ongoing. The development of a so-called **CEN Workshop Agreement (CWA)** on the 'Description and Assessment of Good Practices for Smart City Solutions' is a first step for the standardisation task to support the replication efforts of the project.

4.3.3   Replication action

Urbanisation trends are not independent phenomena. These trends have environmental and societal consequences: many organisations, networks, infrastructure projects, conferences and discussion groups have been established and started to dedicate their work on tackling challenges related to urbanisation, both globally and nationally.

Both national and international workshops have generated ideas for smart city projects, citizen focused use cases, business models for improving the urban space. These conversations also resulted in a list of challenges both common to certain cities and unique to individual communities.

In order to come up with solutions, so-called "good practices" have proved to be an effective means of orientation in initial project stages. There have been in a number of collections of "good practice" in the last couple of years aiming at demonstrating how cities/communities may overcome specific challenges in various sectors. Additionally, there have been efforts to benchmark cities in relation to others, which enable statements about implementation but also about effectiveness.

Within the European Smart Cities and Communities (EIP-SSC) Initiative, the European Commission has carried out several lighthouse projects, developing and sometimes replicated smart city solutions. In our case (Vienna, Munich, Lyon with their follower cities Santiago de Compostela, Venice and Sofia), one of the first steps in the project was the

collection of good practise solutions from other cities in the sectors of (e-mobility, refurbishment, district heating, data and data standards, processes and methods, business models, as well as governance and citizen participation. The results have been available to all project members and recovered in this deliverable.

The quality of good practice collections varies greatly while their structures are rarely consistent or comparable. Even within the SMARTER TOGETHER consortium, it was a challenge to come up with a general structure that fits all. Due to the broad topic of the pilot projects this may not come as a great surprise, however, there was no standardised quality check allowing generic criteria for a *good practice*.

- Criteria that may help describing *Best Practices* could be the following:
- Category (e.g. technology, service);
- Addressed sectors (e.g. energy, mobility, security);
- Background (who has developed the solution and to what aim);
- Value (how does the solution contribute to a certain aim or certain change);
- Negative side effects when indicated (including costs and stakeholders affected);
- Implementation context (where is the solution already implemented, local context);
- Feasibility of replication (under which circumstances is the solution transferable to other (local, national, international content) contexts?

Today, technological solutions are emerging with ever-shorter lifecycles. Additionally, a growing number of companies offer a variety of smart city products and solutions, not necessarily with the pain points of their customers in mind. This makes it difficult for customers such as other vendors, municipalities, investors, research institutions, associations, domestic and foreign initiatives to evaluate the benefits of new technologies, products or services. Nonetheless, understanding the impact of new technologies and other kinds of inventions influence the development of cities is essential for decision-making processes.

The main obstacle in finding the best possible solution for a municipality (in terms of being sustainable, adapted to the individual needs, cost-effective, agile, etc.) is the fact that local authorities usually do not have a comprehensive knowledge of what is available on the market. To make matters worse, individual departments within individual municipalities are usually not interconnected in a way that would allow for a regular and thorough exchange of information, challenges, and collaborative efforts, making it even harder for communities to paint technology providers the bigger picture and thereby making it almost impossible for said technology providers to pitch their solutions to cities/communities.

This in turn, has a major impact on procurement processes of most municipalities, as these processes rely on clear requirements regarding national and European tenders

and relevant technologies. Cost intensive yet innovative acquisitions can only be justified and acquired through appropriate argumentation and comprehensive market knowledge. This is where *best practices* come into play.

The role of CWA on the 'Description and Assessment of Good Practices for Smart City Solutions' is to evaluate best practices.

The CWA provides requirements to describe and evaluate good practices of Smart City Solutions and addresses key decision-makers of various stakeholder groups and covers the following scope:

- Finding an adequate terminology: "Good Practices" / "Best Practice";
- Identifying good practice description criteria;
- Classifying description criteria;
- Creating a template based on this set of criteria.

The initiation of the CWA is currently ongoing and the related project plan can be found online[3].

5. Planning the replication within the Lighthouse cities

5.1 List and description of activities in the Lighthouse Cities in developing an internal replication strategy

5.1.1 Lyon

In Lyon, SPL, responsible for undertaking all the implementation work under WP3, works together with Lyon Metropole to coordinate an integrated strategy to do-design and implement Smart City measures outside the demonstration area of Lyon Confluence. The table below summarises and frames the actions planned to take place for spurring replication at local and regional levels:

What activity	Responsible (who's responsible for the activity)	Description of the activity	Target group (who's the activity targeting)	When did the activity took place (before M24) or is planned to take place (M24-M36)
European standards on energy DATA + Data collection on Lyon Urban data platform	SPL + Lyon Métropole	Workshop: • Lessons learnt • Good practices	4 major urban projects in Lyon Métropole: • Gerland • Carré de soie • Campus de la DOUA • Part -Dieu	M24-M36

User interface for energy management	SPL + Lyon Métropole	Workshop: • Lessons learnt • Good practices	4 major urban projects in Lyon Métropole: • Gerland • Carré de soie • Campus de la DOUA • Part -Dieu	M24-M36
PV energy: self-consummation / crowdfunding	SPL + HESPUL	Workshop: • Lessons learnt • Good practices	4 major urban projects in Lyon Métropole: • Gerland • Carré de soie • Campus de la DOUA • Part -Dieu	M24-M36
Business model and data collection, data visualisation and data management	SPL	Workshop: • Lessons learnt • Good practices	4 major urban projects in Lyon Métropole: • Gerland • Carré de soie • Campus de la DOUA • Part -Dieu	M24-M36

Table 14: List and description of activities in Lyon area in developing an internal replication strategy

5.1.2   Munich

SMARTER TOGETHER is part of Munich's larger effort to foster future oriented sustainable urban development, to contribute to climate goals and to reduce CO_2 emissions. Projects are designed to improve energy efficiency, infrastructure and supply and to offer easy access to green mobility solutions and to promote solutions for the digital and organisational innovation.

Phase 1 (M1 – M24):

During the first two years of the implementation, the City of Munich focused on preparing material evaluation and dissemination for the Munich projects.

▪ **Knowledge Carrier[4]**

The *Knowledge Carrier* brings together detailed information on the projects including information on process, based on continuous process evaluation. Combined with a geo-referenced 3D-model of the development area, it has the potential of being linked to the smart data platform and to be used as a tool for integrated planning. The knowledge carrier will serve as a key tool for dissemination in the replication phase.

▪ **Impact Workshops**

Two "impact workshops" were set up to clarify vision and goals of the project until 2021and beyond. An initial workshop on the overall vision took place on 19 April

2017, a second workshop, in which more detailed project visions were developed, was held on 12.-13. December 2017.

- ▪ **Business Model workshops**

  Two workshops on business models were held with together with UniSG on selected high-potential projects (Smart Data Platform, District Sharing Box, Consulting for Refurbishment)

  Targeted cooperations (notably on monitoring and procurement) were established between ST and other smart mobility projects led by the city administration (notably City2Share and the EU funded project Civitas Eccentric).

What activity	Responsible	Description of the activity	Target group	When did the activity take place
Smart City Interest Group	City of Munich	The SCIG seeks the exchange with industry and institutions on smart city topics. (twice a year)	Industry, Start-ups, SMEs	M1 – M60
Impact workshops	City of Munich	Development of overall vision for replication projects	All ST Taskleads	M15 / M22
Networking with other SC Projects in Munich (notably Civitas and City2Share)	City of Munich	Targeted Networking events for city colleagues with the aim of sharing experiences and identifying cross-departmental opportunities for developing and promoting smart city topics (11.11.2016)	Colleagues from within administration	M10
Kick-Off Knowledge Carrier in Munich	City of Munich	Presentation of the knowledge carrier to partners within the administration at a social event in the City Hall (18.01.2018)	ST colleagues and Colleagues from within administration	M24

Table 15: List and description of activities in Munich area in developing an internal replication strategy (phase 1)

Phase 2 (M24 - M36):

During the last year of implementation Munich will focus on the targeted planning for replication after M36.

▪ **Replication Workshops**

The series of "replication workshops" is designed to support the Project- / Task-leads in the identification of their replication projects – to be developed after M36. Following-up from the "Impact workshops", the focus is on identifying replication potentials of and for the Munich projects. The workshop series aims to lead to prioritised list of replication projects with clear replication plans for the task leads up to M60.

The series also identifies areas, in which the replication process might help to improve the planning process for the integrated development of future smart city projects.

Workshop topics include:

▫ Analysis of Replication Potential
▫ Stakeholder Mapping
▫ Drafting of Structured Replication Plans
▫ Tools for Replication

▪ **Knowledge Carrier Roadshow (M 26-30):**

The Knowledge Carrier provides detailed information on all Munich projects for both experts and the broader public. With the "Roadshow", we hope to disseminate project results and findings and to enter into detailed discussions about replication potentials with colleagues and stakeholders internal to the administration. There will be presentation of projects and Q&A sessions with task leads on pre-selected topics of interest to stakeholders

▪ **Standardisation**

Together with DIN, we are intending to work on standardising aspects of the Munich projects – where of interest. Amongst other, DIN will cross-check selected Munich projects on compliance with existing standards and make recommendation for potential adaptations. (M24 - M34)

▪ **Project Factsheets**

The Munich projects will be documented in factsheets including possibly confidential information on their costs / benefits and other process related issues. (M 34-36)

What activity	Responsible	Description of the activity	Target group	When will the activity take place

Replication Workshops	City of Munich	Support the identification of replication projects Workshop topics include: • Analysis of Replication Potential • Stakeholder Mapping • Drafting of Structured Replication Plans • Tools for Replication	All ST Task leads	M24-M36
Roadshow Knowledge Carrier	City of Munich	Dissemination of project findings and identification of potentials for replication	Other city departments	
Business Model Workshops (Part II)	UniSG	Finalising workshops on Business Models	Selected ST Task leads	M24-M36
Standardisation	DIN	Inputs to standardisation	Selected ST Task leads	M24-M36
Project Factsheets	City of Munich		Task leads and Colleagues from within administration	M24-M36

Table 16 : List and description of activities in the Munich in developing an internal replication strategy

(Phase 2)

Success for local replication will be measured by observing indicators such as:

- directly replicated projects
- new projects developed
- partners for replication
- optimised processes implemented
- new standards / specifications
- potential investment in new projects
- potential new jobs
- Impact (e.g. CO_2-savings) through replication
- (list will continue to evolve)

5.1.3   Vienna

In Vienna, the replication activities are pursued with a multi-level approach:

- Peer-to-peer exchanges take place between organisations or departments of the same or similar function, letting the organisations involved in SMARTER TOGETHER motivate and convince their peers;

- Interface activities target different organisations or departments, which are to be involved for a specific topic. Activities of this type will take place to adapt and improve a process respectively that the integration and input of the stakeholders is necessary for removing barriers;

- Supporting activities are to assist the launch or roll-out of SMARTER TOGETHER projects or solutions inside the city, for example they can support the definition of a standard process;

- Include systematically all relevant governance and civil society structures in order to develop common understanding, share values and ensure a process-oriented learning - governance learning and inclusive / participatory policy development with all actors.

All activities build on in-depth "harvesting" workshops which take place within Task 5.7 "Preparing for replication" during 2018/19. In these workshops, all involved stakeholders of a pilot project are gathered to recap the project and to exchange on the experiences made in order to foster the common learning. Ideas for improvements in view of replication will be the one of the outcomes of these workshops and the interface to WP8, task 8.2.

Table of activities (in chronological order):

What activity	Responsible (who's responsible for the activity)	Description of the activity	Target group (who's the activity targeting)	When did the activity take place or is planned to take place[1]
Supporting activity	City of Vienna	The conceptual and planning proceedings of SMARTER TOGETHER were transferred to a new guideline for mobility points in Vienna, in the context of new mobility services in other project areas.	• Urban Planning, Mobility Agency of Vienna • Real Estate Developer, companies offering mobility services or vehicles	M12-20
Interface handling	City of Vienna	New methods and instruments for integrated urban and energy planning from SMARTER TOGETHER, with a special focus on energy data, were integrated in another refurbishment area in Vienna (Floridsdorf)	• Energy Planning + other Municipal Departments • District Authorities • Local Stakeholders	M12-23
Interface handling	URBAN INNOVATION CENTRE VIENNA	Excursion to Salzburg (AUT); site visit of energy efficient buildings with a high share of RES; moderated discussions on experiences and solutions during the journey	• Municipal departments responsible for development and operation of educational buildings • Specialist planners and technology experts	M24

[1] It is planned to prolong the replication activities beyond M36. In this way it will be ensured that the whole potential of the findings and lessons learned can be harnessed. After the finalisation of the realisation projects a period of at least 6 months is reasonable for collecting the final outcomes (WP 5) and transfer them into the city.

Interface handling	URBAN INNOVATION CENTRE VIENNA	Excursion to St. Pölten (AUT); site visit of refurbished school with efficient measurement and control technology; follow up on previously identified barriers and drivers	• Different municipal departments involved in the development and operation of educational buildings	M28
Peer-to-peer	URBAN INNOVATION CENTRE VIENNA	Workshop; exchange of experiences and lessons learned during the work with inhabitants, SimMobil, engagement activities and how to transfer to other districts of Vienna	• Local renewal offices (GB*)	M32
Peer-to-peer	URBAN INNOVATION CENTRE VIENNA	Workshop: exchange of experiences and lessons learned on the process of tenants' information and participation	• Social housing developers	M34
Peer-to-peer	URBAN INNOVATION CENTRE VIENNA	Workshop; sharing of experiences and lessons learned on how to implement e-car sharing in social housing	• Social housing developers	M36
Supporting activity	URBAN INNOVATION CENTRE VIENNA	Support of the roll-out of mobility points; support of process guideline development on mobility strategy	• Wiener Stadtwerke • MA 18	M28-36
Supporting activity	URBAN INNOVATION CENTRE VIENNA	Support of the roll-out of area screening	• MA 20	M28-36
Supporting activity	URBAN INNOVATION CENTRE VIENNA	Support of the cost-benefit comparison of social housing monitoring	• Social housing developers • AIT	M30-36
Supporting activities	URBAN INNOVATION CENTRE VIENNA	Support of the replication based on the outcomes resulting from the harvesting workshops; (Methods to be defined)	• To be defined	M26-36

Table 17: List and description of activities in the Vienna in developing an internal replication strategy

6. Supporting the replication processes of solutions developed in other cities

Extrapolating the boundaries of a Smart City is a challenge and critical factor for success. SMARTER TOGETHER recognised its importance and dedicated two parallel ways for doing so. On one side, promoting activities, which allow knowledge transfer replication at city level, and on the other side, ensuring replication at commercial and industrial level. These two approaches differentiate on their finality.

Within this chapter, an overview of SMARTER TOGETHER's scope outside the project will be given and the planning of the different activities will be framed. Commercial and industrial topics have a dedicated task, under which all deliverables will be produced. Therefore, this document will not cover those.

Outside the project, SMARTER TOGETHER is committed in developing activities, which aim to bring other cities together and to facilitate knowledge transfer from the participating partners to the outside. By participating in a joint taskforce, promoted by the Innovation and Networks Executive Agency (INEA), the objective is the collaboration between the projects and cities.

6.1 The Club of Cities (CoC)

Scope

The Club of Cities is one of the main activities within the replication work package. This club aims to bring together cities, which are willing to learn and possibly replicate the Smart City solutions developed during the SMARTER TOGETHER project, with the objective of improving their capacity to implement solutions through networking, study visits and online tools. The partner cities in the SMARTER TOGETHER project will share their experience in five areas of co-created and replicable integrated smart solutions: citizen engagement, district heating & renewable energy, holistic refurbishment, smart data and e-mobility. Cities with a determined focus and interest on Smart City Solutions are welcome to join the Club of Cities, especially those focusing on the following themes: political governance in a Smart City, business models and citizen engagement. There is no limitation in terms of city size, administrative structure or location.

The SMARTER TOGETHER Club of Cities aims to benefit its members in multiple ways:

- First hand shared successful solutions from the SMARTER TOGETHER project;
- Access to excellent Smart City know-how, notably to the SMARTER TOGETHER Wiki;

- Participation in study visits in the Lighthouse Cities of Vienna, Munich and Lyon, where innovative Smart City solutions on demonstration sites will be showcased;

- Direct access to city staff in the Lighthouse, Follower and Observer Cities of SMARTER TOGETHER, enabling sharing of experience and know-how;

- Regular meetings of the Club of Cities, with the participation of city staff from the Lighthouse and Follower Cities;

- Possibility to disseminate and highlight own actions and good practices via the SMARTER TOGETHER communication channels.

6.1.1 Activities previewed to be performed with the Club of Cities:

Activity	Location	Date	Invitation mode/Communication channel
Energy Cities annual conference and creation of a Club of Cities membership	Stuttgart, Germany	18th April 2017	Energy Cities members Energy Cities mailing list SMARTER TOGETHER website
Survey on cities' needs	online	May-August 2017	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website
NEDO/SMARTER TOGETHER/Smart Buildings joint event	Lyon, France	19th October 2017	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Replication workshop	Brussels, Belgium	5th December 2017	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Peer-to-peer workshop	Munich, Germany	17th - 19th January 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
General Assembly	Vienna, Austria	4th – 6th March 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group

Webinar on PV collective self-consumption	online	21st March 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Webinar on consultancy activities for private housing retrofit (as an essential tool for a successful project)	online	10th April 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Energy Cities annual conference – citizen empowerment	Rennes, France	20th April 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Webinar on Smart lampposts and e-governance	online	16th May 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Webinar on urban living labs	online	23rd May 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Webinar on knowledge carrier platform	online	tbd	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Intensive Lab Session	Santiago de Compostela, Spain	May 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Peer-to-peer workshop	Vienna, Austria	July 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group

Intensive Lab Session	Venice, Italy	September 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Intensive Lab Session	Sofia, Bulgaria	October 2018	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group
Replication toolkit	Brussels, Belgium (tbd)	tbd	CoC mailing Energy Cities members Energy Cities mailing list SMARTER TOGETHER website SCC Replication Taskforce Group

Table 18 : List and description of activities in the frame of the Club of Cities

6.2 The European Innovation Partnership on Smart Cities and Communities (EIP-SCC)

One of the most relevant platforms for scaling and replicating is The European Innovation Partnership on Smart Cities and Communities (EIP-SCC). This group aims to create an open, collaborative market place for smart city solutions at the intersection of transport, energy and ICT and to drive market transformation through development and replication of solutions at large scale.

By now, nearly 5,200 partners representing cities, companies, research organisations and other interest organisations and partners organised their interest to collaborate through approximately 400 commitments. Out of these, 370 were retained. Coming from 31 countries, they constitute the core part of the Market Place of the EIP-SCC.

There are different topics covered in 6 Action Clusters that have been established:
1. Sustainable Districts and Built Environment
2. Sustainable Urban Mobility
3. Integrated Infrastructures & Processes
4. Business Models
5. Citizen Focus
6. Integrated Planning/Policy & Regulation

The Action Clusters organise the Market Place (MP) of the EIP-SCC. They work on specific issues related to smart cities. Participants discuss potential ideas and synergies to help efficient implementation and replication of commitments/solutions and explore new fields of activities and business models.

Replication is organised through Action Cluster roll-out initiatives. These initiatives are a key implementation tool of the EIP-SCC and its market place. They bring those public and private partners together which are interested and committed to join up efforts to develop bankable solutions for replicating specific innovations at scale.

6.3 The Smart Cities Information System (SCIS)

The Smart Cities Information System (SCIS) brings together project developers, cities, institutions, industry and experts from across Europe to exchange data, experience and know-how and to collaborate on the creation of smart cities and an energy-efficient urban environment.

The SCIS **monitors and analyses EU-co-financed projects** in the fields of smart cities and communities (SCC), sustainable energy districts and energy-efficient buildings (EeB) with respect to European Union energy and climate change policy, **as well as other projects** including the projects developed in the frame of the EIP SCC.

7. Conclusion and next steps

This document pretended to frame the scope of activities that are going to be done (or are already being done) under the Replication WP. As referred in the beginning of this deliverable, replication refers to the possibility of transporting or 'copying' results from a pilot case to other geographical areas, although with potentially different boundary conditions. The activities are divided into two groups according to the place they will take place: within the Lighthouse Cities (1) and external to the project boundaries (2). As stated before, there is a dedicated WP covering all activities regarding the Follower Cities (WP7). This document recovered the main recommendation from the best practices collection, prior to the implementation (from WP1), presented the main enablers, challenges and solutions in implementing smart cities' measures and listed the main activities planned for internal and external replication. The key success factors for measuring the replication potential were also presented (CO_2 saving potential and cost efficiency, data standardisation potential and data quality, scalability, governance context, viable Business models, legal framework), highlighting the importance of having a proper and robust monitoring scheme in place.

Within the replication activities, Lighthouse Cities will from now validate the recommendations collected during WP1 and will link them to the enablers, challenges and solutions resulted from this framework. This valuable information and experience will be organized and framed in order to produce a Replication Toolbox (D8.3.2), which will report the major lessons learned and review the recommendations for the implementation of Smart Cities' solutions. Moreover, Lighthouse Cities will produce Internal Replication Guidelines (M8.2.1) and a Handbook on business models (D8.4.1) and a strategy of standardisation (D8.5.1) will be delivered by the end of the replication work package.

Appendix

Description of the focus measures

Eco-refurbishment of Cité Perrache	
Description & main goal	Refurbishment of a Social Housing Estate with 281 flats built in the 1930ies
Development area	Lyon Confluence Area
Involved actors and their role	- SPL Lyon Confluence (urban developer) - Grand Lyon Habitat (Social housing operator, woner of the building)
Key contacts	- Etienne Vignali (SPL) - Cécile Aubert (Grand Lyon Habitat)
Category	Refurbishment of a Rental Social Housing
Inhabitants	ap. 500 Persons
Refurbished Flats	275 flats (256 flats after refurbishment)
Refurbished surface	12.541 m² (useable surface)
New constructed surface	0 m²
Current energy performance	ap. 425 kWh/m²yr (primary energy consumption)
Energy performance after refurbishment	72 kWh/m²yr (primary energy consumption)
Energy supply	Connected to district heating
Integration of renewables	District heating (cogeneration heating-electricity by gasification from wood)

Eco-refurbishment of Hauffgasse 37-43	
Description & main goal	Refurbishment of a Social Housing Estate, 486 flats, community centre;
Development area	Simmering
Involved actors and their role	- BWSG (owner) - KWG (heat energy provider) - wohnbund:consult (Consultant)
Key contacts	Markus Raimann
Category	Refurbishment of a Rental Social Housing
Inhabitants	1.051 Persons
Refurbished Flats	486 flats

Refurbished surface	53.532 m²
New constructed surface	7.205 m²
Current energy performance	112,00 kWh/m²a (HEP)
Energy performance after refurbishment	23,00 kWh/m²a (HEP)
Energy supply	local district heating grid (gas fired)
Integration of renewables	175-250 MWh/a

Zero Energy Gym (Secondary School Enkplatz 7)	
Description & main goal	Reconstruction of a Public Building,
Deployment	Simmering
Involved actors	VIE (owner)
Key contacts	Katharina Rücker-Primas Andreas Tschismasia
Category	Reconstruction of a public gym
Inhabitants	1.000 persons
Refurbished surface	00 m²
Number of new constructed classrooms	15 classrooms / 4 gyms
New constructed surface	6.500 m² (gross floor area)
Current Energy performance	104 kWh/m²a (total)
Energy performance after refurbishment	0 kWh/m²a (total)
Energy supply	district heating, natural gas
Integration of renewable Energy	heat pump, solar thermal and PV System

Consulting for Refurbishment	
Description & main goal	Providing feasibility studies as information and for convincing the owners.
Deployment area	Neuaubing / Westkreuz
Involved actors and their role	City of Munich (Financing) MGS (Sanierungsträger)
Key contacts	Hana Riemer

Community Management System connected to the city data platform	
Description & main goal	Use the CMS formerly developed by Toshiba to display energy data collected by the Grand-Lyon Data Platform to gain a global understanding of the energy flows of the area in order to improve the urban planning process and the planning, design and operation of public infrastructures.
Category	Application
Deployment area	Lyon-Confluence
Involved actors and their role	- SPL Lyon-Confluence (Urban developer - Definition of use-cases) - Toshiba (Developer of the 1st version of the CMS) - Grand Lyon (Operator of the data platform - Will set-up the API to send data to the CMS)
Key contacts	Name: Etienne Vignali (SPL Lyon Confluence) Emmanuel Gastaud (Lyon data platform)
Main challenges and risks	- Any important events, conditions or decisions that may negatively affect the achievement of this activity - Unavailability of data sources and/or sensors necessary to collect data - Unavailability of data sets necessary to perform defined scenarios - Data received is of poor quality - Lack of usage of the CMS
Overall technology stack	Set of web-based technologies (mostly of them JavaScript library based, see also details in peer-to-peer section at the end of the document)
Input dataset interfaces	This application will use dynamic data sets sent to the Grand-Lyon data platform by data providers involved in SMARTER TOGETHER. The data transfer will use the standard web service APIs of the Grand-Lyon data platform that complies with OGC requirements (SOS HTTP GET).
Output dataset interfaces	Not defined yet
Analysing capabilities	This application may have analysing capabilities for some use cases but this will be defined later.
Visualisation capabilities	This application will provide one or two comprehensive graphs per use-case. These graphs have been designed with future users of the CMS during several workshops.
Operation and maintenance (by whom)	Will be done by the IT department of the Métropole of Lyon.
Stakeholder	Métropole of Lyon
Privacy related concerns (short description)	Data collected will be aggregated by building in order to respect life privacy. In case of individual data collection, as defined in use-case n°3, explicit consent will have to be obtained.
Data (operation) security	Application is operated by IT department of Métropole of Lyon and is therefore embedded the local IT strategy and operation guidelines.
Number of data (information) sources involved	The CMS will use data sent to the Grand-Lyon data platform by more than 10 suppliers.

Smart Data Platform based on Siemens City Intelligence Platform (CIP) with municipal Data Gatekeeper Concept	
Description	Deployment of an open, secure and city-wide Smart Data Platform: it acts as a virtual data-backbone for collecting city-data in the domains of mobility, energy, urban living and crowd data as a basis for a holistic view of city-data and operated under the (trustworthy) control of the public authority to offer security and quality of data. This Smart Data Platform will receive data e.g. from the sensor infrastructure installed with the open-urban-labs, and from sensors used within the smart home solution for refurbished flats etc. and can be used for developing smart services. To address the necessary regulations a so-called *Data Gatekeeper* concept is developed in cooperation with Task 1.5. It defines common usage, legal aspects (data privacy and security), operations and management of such a Smart Data platform. The concept defines a framework for a trustworthy and open solution and is used as a blueprint to support replication and the development of an ecosystem of Smart- Services with full respect of local requirements related to data management. Consumers/providers of the data will be allowed to gain trusted access to urban and public data smart services in the district.
Category	Platform
Deployment area	Munich
Involved actors and their role	Christian Schwingenschlögl (SIDE), Johannes Sauter (FHG-IAO), Jan Kätker (VMZ), Jonas Kahlert (UNISG)
Key contacts	Uwe Montag (Uwe.Montag@muenchen.de)
Main challenges and risks	Get access to interesting, quantitative and qualitative data to accompany the proper implementation of the demo project and to ensure that smart solutions are developed. Properly address and implement (into the Smart Data Platform Architecture) the requirements resulting from the Data Gatekeeper. Involvement of third parties, start-ups or developers to address the requirement of the people and business in the district and build corresponding, robust business models.
Overall technology stack	
Input dataset interfaces	Ongoing definition, depending on use case. E.g. REST API, Sensor data input etc.
Output dataset interfaces	TBD, ongoing
Analysing capabilities	Ongoing definition, depending on use case
Visualization capabilities	Ongoing definition, depending on use case
Operation and maintenance (by whom)	VMZ
Stakeholder	VMZ, LHM, FHG (for Data Gatekeeper)

Implementation of an autonomous electric shuttle (Navly) in the Lyon-Confluence area	
Description & main goal	Testing of 2 autonomous e-shuttles, data generation
Development area	Lyon Confluence Area, 1 car-free route
Involved actors and their role	GLY: Responsibility for transportation, decides on public transport operator Navly =Navya + Keolis - Navya: shuttle manufacturer - Keolis: public transport operator Lyon - SPL + Hespul: coordination, data use cases
Key contacts	Etienne Vignali (SPL Lyon Confluence)
Main challenges and risks	- Unavailability of good quality data - Regulatory framework (driverless vehicles) - Move from demonstration to post demonstration - Prove economic model
Type of vehicle (e.g. taxi, bus)	Autonomous mini bus (<= 15 passengers)
Fleet strength in project/beyond (#)	2 shuttles / Navya projects in other cities (Sion Switzerland, Perth Australia)
Type(s) of EV	BEV
Business area beyond project (yes/no)	Not yet, 2nd test route with car circulation planned in 2018 in Confluence area.
Share of electric vehicles in public transport (city)	
Share of public transport in modal split project area/city	Very small
Type & number of recharging points	
Level of automation	5 (2-3 in testing, accompanied by driver)
Pre-defined schedules and routes / on demand	Pre-defined. Route length 1.5 km (5 stops) on public road, where car circulation is forbidden.
Registration options (e.g. online)	See below
Access options (e.g. app, card)	Free during demonstration period (until Dec 2017)
Payment options (e.g. ticket, card)	See above
Costs for users (e.g. € cost/ticket)	See above
Combination with other incentives (yes/no)	Connected to tram, bus, bike and EV sharing.
Combination with app / electronic devices (e.g. routing) (yes/no)	no

Design and installation report of a mobility point (incl. introduction Vienna Mobility Card)	
Description & main goal	Conceptional design of 2 mobility points and building 1or 2 mobility points (along with Vienna Mobility Card introduction) to strengthen multimodal services, develop an attractive design and reduce pressure on on-street parking (possible rollout in city)
Development	Simmering
Involved actors and their role	- WSTW: project coordination, research, mobility survey, implementation - Gebietsbetreuung, AIT: design, survey - Wohnbund: mobility survey - Department of City Administration: legal aspects
Key contacts	Bertram LUDWIG
Main challenges and risks	- Lack of integration process of mobility providers (e.g. car sharing) - Lack of acceptance by local residents/visitors/policy (co creation) - Approval process by local authorities - No appropriate business model for the maintenance of mobility point
Location on public / private ground	Public
Type of area (e.g. former car park, urban green)	On-street-parking
Stations (#)	1 or 2 will be implemented
Distribution in project area/beyond	Not so far (possible rollout results of successful testing in Simmering)
Space provided for stations (m²)	Approx. 50-100 m2
Type & number of available mobility options (e.g. 2 pedelecs)	mobility station with e-car sharing, pedelecs
Connection to other mobility options (e.g. public transport / recharging stations)	Recharging station for e-car sharing, stations close to public transport stop
Easy / barrier-free access (yes/no)	Access for residents and visitors
Amenity value (e.g. weather protection, lighting, visibility)	W-LAN, bench
Utilisation rate (e.g. number of users)	
Combination with app / electronic devices (e.g. routing)	set-up of booking systems and software integration
Combination with other services (e.g. kiosk, ATM) (yes/no)	Yes, delivery boxes and W-LAN

Munich: Local Lab – Smart Neighbourhood Lab	
Description	Smart neighbourhood lab (Stadtteillabor) – home of the citizen engagement process (event location, exhibition hall) and citizen centre
Category	Urban living lab
Deployment area	Neuaubing-Westkreuz / Freiham
Involved actors and their role	MGS – plans and operates the lab
Key- contact person	Silke Strehle (MGS), s.strehle@mgs-muenchen.de, Phone: + 49-89-23333957
SWOT Analysis	**Strengths** - Well-established communication structures - Well-established local institutions - Well-established NGO networks - Highly developed infrastructure - Strong business partners **Weaknesses** - Lack of awareness in general public and target groups - Lack of knowledge in regard to smart city goals **Opportunities** - Smart city framework strategy is being worked out - Established communication structures, media eco-system - Participating institutions see ST as an opportunity - Financial support of the City of Munich - Competencies, skills and knowledge about governance structures are already there **Threats** - Disinterest of economically weak population, that has other issues - Societal disinterest of population groups, that do not feel integrated in the society and live mostly in their community - Critical media coverage about the project - Local press is not interested in ST - The Lab might fail to attract the necessary attention - The operator might not have the human resources capacity to open the lab often enough
Objectives	- Raise both awareness for the ST process and acceptance for the ST solutions in the neighbourhood - Activate citizens and stakeholders to proactively take responsibility for change in their district - Acquire multipliers, new neighbourhood communities and stakeholders
Target groups	The smart neighbourhood lab is directed at the following target groups: - Residents of the project area and other interested citizens - Local businesspeople, social and cultural communities / initiatives

	and representatives of institutions in the project area - Owners of real estate in the project area (mostly owner communities [WEGs]) - Local policy makers - Local opinion leaders
Location	The lab is located in an interim used building next to a centrally located square, the building and square will be refurbished in the course of the district development programme.
Urban Lab Strategy and Measures	A stationary approach was chosen for the smart neighbourhood lab. The lab should host most citizen and stakeholder engagement workshops, exhibitions and other related events. To generate an additional benefit for the district and increase awareness, the lab should also be opened to the residents for social and cultural activities, because there is no meeting point or citizen centre up to now. 1. Scouting of a suitable building 2. Contact building's owner and negotiate contract 3. Develop a utilisation concept matching the intended citizen & stakeholder engagement activities 4. Visual branding of the lab 5. Operation of the lab a. Room for citizen and stakeholder engagement (Co-Creation workshops / Design Thinking

List of cities of the Club of Cities (M24)

- o Aberdeen
- o Águeda
- o Almada
- o Aradippou
- o Association
- o Besançon
- o Brussels
- o Bursa
- o Čačak
- o Heidelberg
- o Igoumenitsa
- o Illkirch
- o Ivanic-Grad
- o Izmir
- o Kremnica
- o Leicester
- o Leuven
- o Lisbon
- o Litomerice
- o Ljungby
- o Lorient
- o Metz
- o Milton Keynes
- o Minsk
- o Mouscron
- o Munich
- o Nantes
- o Pamplona
- o Paris
- o Porto
- o Riga
- o Rijeka
- o Schwetzingen
- o Strasbourg
- o Stuttgart
- o Tampere
- o Tours
- o Trnava
- o Valley
- o Växjö
- o Venice
- o Vienna
- o Zadar

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