



**SMARTER  
TOGETHER**

Smart and Inclusive  
Solutions for a Better  
Life in Urban Districts

# Local monitoring results

Munich local monitoring set-up and results as input in WP6

Deliverable n°4.6.1

Version 1.0



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## REVISION CHART AND HISTORY LOG

### Versions

Version number	Date	Organisation name	Comments
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V0.2	19/01/30	MUC-PLAN	After peer review
V1.0	19/02/01	ALG	Quality check
V 1.1	19/02/19	MUC-PLAN	Corrections done
V 2.0	15/03/19	SPL	Final 2 <sup>nd</sup> version ready for submission

### Deliverable quality review

Quality check	Date	Status	Comments
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Reviewer 2	19-01-23	Minor comments and remarks in the text	
Technical Manager	19-02-10	OK	
Quality Manager	19-02-01	Ok	
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## Table of contents

1. Introduction .....	7
2. Local monitoring set-up .....	8
2.1 Process of setting up a local monitoring system.....	8
2.2 Definition of the methodology for local monitoring.....	9
2.2.1 Getting the KPI data in the SDP .....	10
2.2.2 Processing and visualization of the KPI data in the SDP .....	11
2.2.3 Getting the KPI data to AIT.....	12
2.3 Results.....	12
2.4 Use cases Mobility Station and Delivery Box .....	21
3. Conclusion.....	23

## List of figures

Figure 1: Iterative approach to the local monitoring set-up .....	8
Figure 2: Munich monitoring set-up .....	10
Figure 3: Excel template for collecting data from the task leads .....	10
Figure 4: Interface for integration of KPI data in Analysis Dashboard .....	11
Figure 5: Visualization of more complex data .....	22

## List of tables

Table 1: Structure of WP4 of SMARTER TOGETHER .....	7
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## Glossary

API	Application Programming Interface
KPI	Key Process Indicator(s)
M	Month, as counted from project start (M1 = February 2016)
PLAN	City of Munich - Department of Urban Planning (Referat für Stadtplanung und Bauordnung)
RES	Renewable Energy Source
RIT	City of Munich – Department of Technology and Digitalization (Referat für Informations- und Telekommunikationstechnik)
SDP	Smart Data Platform
WP	Work Package

## 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 due Lyon	HLM	France
32	Wavestone Advisors	WAV	France

## EXECUTIVE SUMMARY

This report shares the experiences that were made during the preparation and implementation of the Munich SMARTER TOGETHER monitoring system. The monitoring itself starts in February 2019. The results will be integrated later on in WP6.

As setting up a monitoring system turned out to be a complex and challenging task, a sound communication among all involved actors from local to international level is crucial. Emphasis should be put on an efficient method for data collection in order to keep the efforts for the data providers as low as possible. Likewise, the visualisation of the indicators with the collected data is crucial to generate an added value for politicians and the administration.

The process of developing and implementing a monitoring system in Munich paved the way to even more complex data driven use cases with clear benefits for urban planning. This development is of great value for the City of Munich and will probably be extended in the future.

## 1. Introduction

This report provides the knowledge and experiences acquired during the process of installing a monitoring system within WP4 of SMARTER TOGETHER related to the Munich project area. This task was conducted by the City of Munich - Department of Urban Planning (PLAN) in partnership with all other WP4 task leaders (see Table 1).

Task number	Topic of the Task	Task leader
4.2	Citizen Engagement	MGS
4.3	Energy Refurbishment	MGS
4.4	Integrated Infrastructure	MUC-RIT
4.5	Mobility	MVG
4.6	Monitoring	MUC-PLAN
4.7	Replication	MUC-PLAN

*Table 1: Structure of WP4 of SMARTER TOGETHER*

The monitoring system is based on the Key Process Indicators (KPIs) (cf. Deliverable 6.1.1) as they are commonly shared among the three SMARTER TOGETHER lead cities Vienna, Lyon and Munich. Within this report “local monitoring set-up” refers on the one hand to the process of setting up a local monitoring system. On the other hand it refers to the methodology the local monitoring is conducted with. Both topics are explained in detail. Under results experiences are provided about the applicability and usefulness of the KPI for monitoring and measuring the project’s progress.

Finally, insights are provided about creating more complex use cases for monitoring.

## 2. Local monitoring set-up

### 2.1 Process of setting up a local monitoring system

The first challenge of the process of setting up a local monitoring system was to establish a common understanding about the task on international as well as on local level. Therefore, an iterative process was chosen (cf Figure 1).

The base of the SMARTER TOGETHER monitoring are the KPI. Nevertheless, among Lyon, Vienna, Munich and the Monitoring and Evaluation WP (WP6) lead AIT each KPI had to be discussed separately in order:

- To obtain a clear and commonly shared idea about what each KPI is supposed to measure,
- To discuss and exchange about methods for collecting the data for the KPI,
- To clarify common as well as individual barriers for collecting the data and
- To agree on the format the KPI are delivered to the WP6 lead AIT for further processing.

Munich accomplished this task by actively participating in WP6 meetings with the other lead cities. Furthermore, several bilateral meetings and telephone conferences were conducted during the last three years to get a clear picture about monitoring within WP6 of SMARTER TOGETHER.

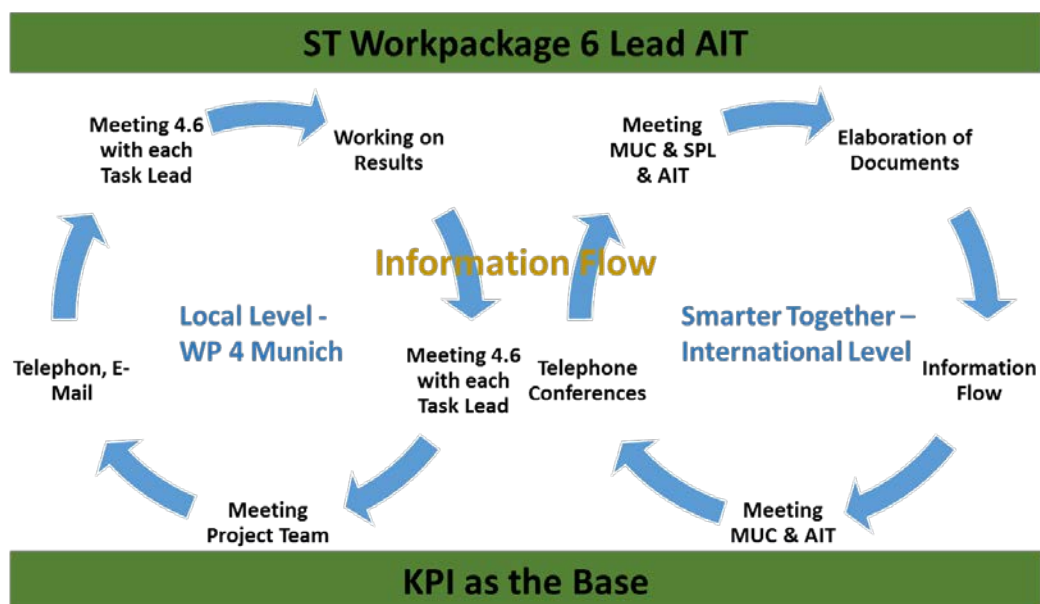


Figure 1: Iterative approach to the local monitoring set-up



The knowledge and agreements generated by the mutual exchange on international level had to be transferred on local level, i.e. to the task leads of SMARTER TOGETHER WP4 – the Munich project team. Therefore, several group sessions as well as bilateral meetings with each of the task leads, i.e. from 4.2 – 4.7 were held.

At the beginning of this process each KPI was assigned to a task leads' responsibility according to its thematic focus, e.g. all mobility related topics were assigned to the Mobility task (Task4.5). The next step was to discuss with each task lead in detail the challenges and potential obstacles to obtain valid data for each KPI. Basically, for the majority of the KPI no problems occurred. However, some KPI turned out to be problematic mainly as no valid data source exists and/or the aspired methodology for data collection is not applicable (cf. Results 2.3).

Likewise, all issues that were discussed with each task lead were also discussed in the bigger circle, i.e. with all members of the Munich project team. Thus, a sound information flow among all involved parties was guaranteed setting the floor for the agreement on the methodology for data collection on local level.

## 2.2 Definition of the methodology for local monitoring

As regards the definition of the methodology for data collection on local level the mainly involved parties were City of Munich – Department of Urban Planning (PLAN), City of Munich – Department of Technology and Digitalization (RIT) as well as VMZ. The two latter ones were particularly involved as they are running the Munich SMARTER TOGETHER Smart Data Platform (SDP), i.e. the central place to collect, store and process urban data in Munich. In a first step these three parties developed a methodical blueprint for the data collection on local level. This blueprint was then discussed, tested and adapted together with the whole Munich SMARTER TOGETHER project team and thus consequently evolved to the Munich monitoring concept.

The goal of designing the Munich monitoring concept was to have a methodology that is efficient and easily understood by the KPI responsables, i.e. the task leads 4.2 – 4.7. For the analysis of urban data and the provision of additional services (e.g. the Munich Smart City App) the Munich SDP is the project's central processing unit. Hence, it was clear from the beginning that the SDP is also the central platform for storing and processing the data of the KPI (cf. Figure 2).

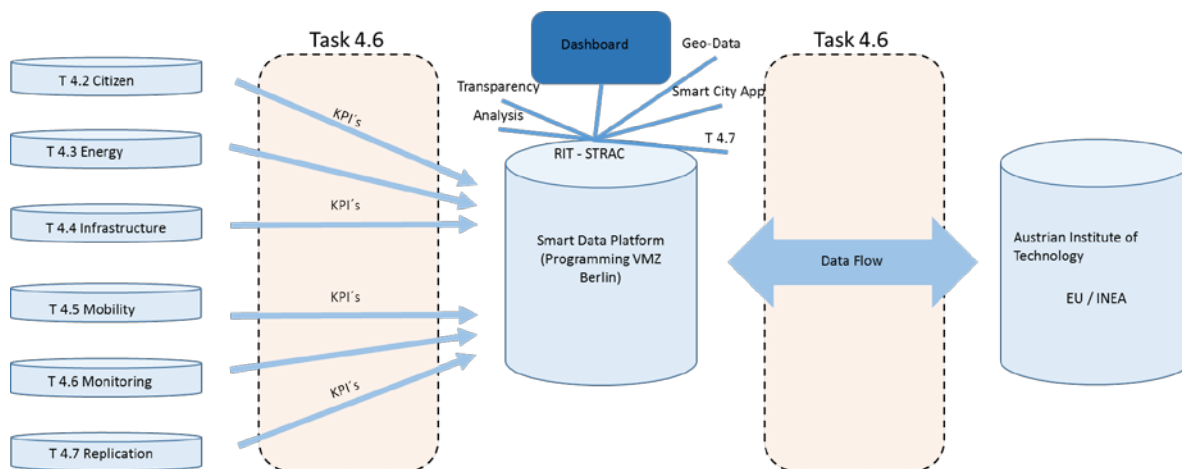


Figure 2: Munich monitoring set-up

Below the three sections of the Munich monitoring set-up are described in detail.

## 2.2.1 Getting the KPI data in the SDP

The source of all KPI data are the implementation activities of the Munich tasks 4.2 – 4.7. As mentioned above each task lead has the responsibility for a certain number of KPI that describe the progress of its respective activities over the project's course. The produced data is static (e.g. number of mobility stations), i.e. no constant flow of frequently changing data had to be managed. Therefore, an excel template was developed meeting the requirements of data management (cf. Figure 3).

KPI Number	Title	Description	Unit	Target Value	Baseline M1	M1 - M6	M7 - M12	M13 - M18
					01.02.2016	31.07.2016	31.01.2017	31.07.2017
1.9	Investment in mobility solutions	Total investment in mobility solutions in EUR.	l	1,43 million				
3.1	Number of e-vehicles deployed	Number of electric vehicles that were acquired within Smarter Together and allocated at the project's mobility stations.	#	30				
3.2	Number of charging stations	Number of charging stations that were acquired within Smarter Together and set up in the project area.	#	8				
3.4	Km of electrical vehicles	Amount of km covered with electric vehicles that were acquired within Smarter Together	Km	174.000				
		Number of intermodal mobility points set up as						

Figure 3: Excel template for collecting data from the task leads

The template implies all KPI and is sorted after task responsibilities. Furthermore, it contains the baseline and the time periods of the monitoring as well as the time stamps for collecting the data.

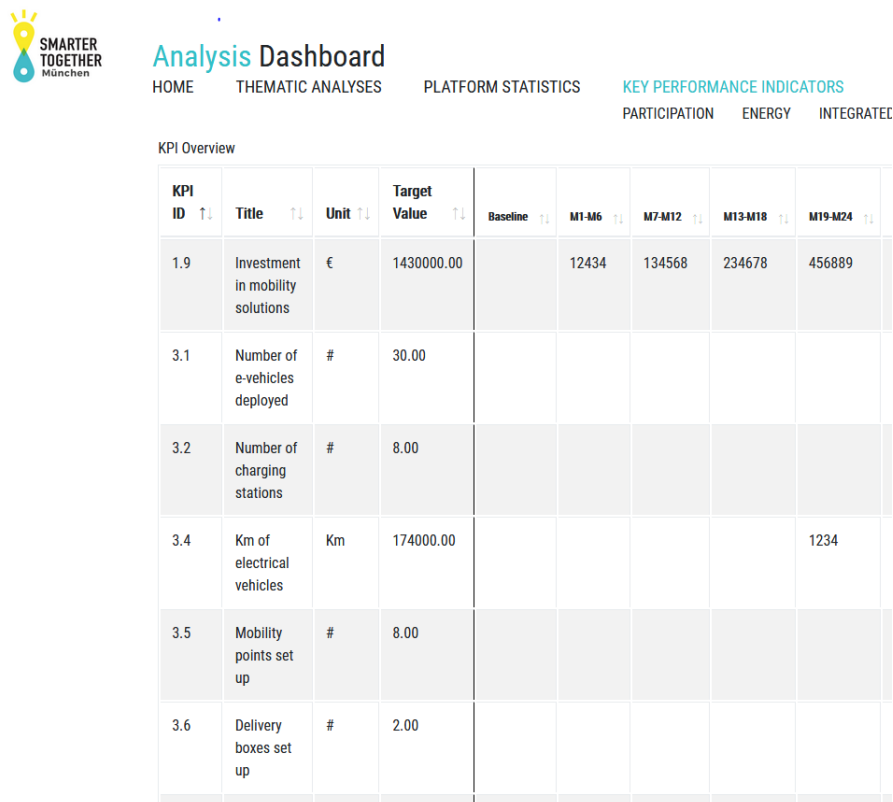
With anticipation to each time stamp, the task leads are requested to enter the data of their KPI. As the monitoring system starts running by the beginning of the SMARTER TOGETHER M36 all data produced previously in the M1 – M35 is collected retroactively. From M36 on every six month new data will be gathered. The integration of the data into the SDP is done via an automatic upload routine of the latest excel file.

## 2.2.2 Processing and visualization of the KPI data in the SDP

The Munich SDP fulfils various functions regarding the handling of urban data.

First, the analysis dashboard provides users access to all data stored in the platform according to a user concept. Certain users have admin rights, i.e. they have access to all contents of the SDP whereas others only have access to their specific thematic topics. This concept is applied with the perspective of a future extension of the SDP implying more roles and different access rights.

The data is presented in a visualized way, i.e. graphs, diagrams etc. translate the statistics of urban data (e.g. the KPI) into understandable and valuable information (cf. Figure 4). Furthermore, the SDP provides the possibility to connect different data sets and to create thus more complex queries. Both topics are relevant for urban planners in order to generate a benefit out of urban data.



The screenshot shows the 'Analysis Dashboard' interface. At the top left is the 'SMARTER TOGETHER München' logo. The main navigation bar includes 'HOME', 'THEMATIC ANALYSES', 'PLATFORM STATISTICS', and 'KEY PERFORMANCE INDICATORS'. Under 'KEY PERFORMANCE INDICATORS', there are sub-links for 'PARTICIPATION', 'ENERGY', and 'INTEGRATED'. The main content area is titled 'KPI Overview' and contains a table with the following data:

KPI ID	Title	Unit	Target Value	Baseline	M1-M6	M7-M12	M13-M18	M19-M24
1.9	Investment in mobility solutions	€	1430000.00		12434	134568	234678	456889
3.1	Number of e-vehicles deployed	#	30.00					
3.2	Number of charging stations	#	8.00					
3.4	Km of electrical vehicles	Km	174000.00					1234
3.5	Mobility points set up	#	8.00					
3.6	Delivery boxes set up	#	2.00					

Figure 4: Interface for integration of KPI data in Analysis Dashboard

Besides, the SDP offers an Application Programming Interface (API) for other applications giving thus third parties the possibility to develop additional services. In the case of Munich, this is so far the Munich Smart City App and the Geo Data Pool.

### 2.2.3 Getting the KPI data to AIT

Finally, the data of the KPI is an essential part of the WP6 conducted by AIT. Therefore, a download function for the KPI was implemented in the SDP guaranteeing a smooth data flow between Munich and AIT.

## 2.3 Results

In the following all KPI are listed in tables. For each Munich SMARTER TOGETHER task exists one table displaying the tasks' KPI. Besides the number of the KPI (cf. Deliverable 6.1.1) the titles and units are listed. The last column provides experiences about applicability and usefulness of the indicators for monitoring the project's progress.

The last table is called "Further Indicators" as those indicators go beyond the KPI. They are collected as the Munich project team is interested in this specific data.

Task 4.2 Citizen Engagement (MGS - Münchner Gesellschaft für Stadterneuerung mbH)

KPI Number	Title	Unit	Applicability & Usefulness
5.1	Number of Urban Living Labs	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
5.2	Visitors/Participants in ULL activities	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
5.3	Co-created solutions involving residents	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
5.4	Number of people involved in co-creation processes	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
5.5	Satisfaction with results of co-creation processes	Likert-scale from 1 (unsatisfied) to 5 (completely satisfied)	<ul style="list-style-type: none"> <li>• Not applicable</li> <li>• The co-creation processes were conducted at the beginning of the SMARTER TOGETHER project</li> <li>• The outcomes of these processes were implemented during the project</li> <li>• Results are visible/tangible at the end of the implementation phase or afterwards</li> </ul>

			<ul style="list-style-type: none"> <li>An evaluation of the satisfaction with results of the participants of the co-creation processes is not possible</li> </ul>
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#### Task 4.3 Energy Refurbishment (MGS - Münchner Gesellschaft für Stadterneuerung mbH)

KPI Number	Title	Unit	Applicability & Usefulness
1.2	Tenants directly involved	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
1.3	Refurbished floor area – refurbished total floor area	m <sup>2</sup>	<ul style="list-style-type: none"> <li>Applicable</li> <li>The method of calculation of floor space differs from country to country as legal frameworks are different</li> <li>Thus, the international comparability of data based on the floor space (e.g. specific investment) is difficult</li> </ul>
1.4	Installation of Smart Home Solutions	#	<ul style="list-style-type: none"> <li>By the end of the implementation phase approximately 20 Smart Home Solutions were installed</li> <li>Despite great efforts during local events, advertisement in newspapers etc. and door-to-door retailing the interest of the local population remained rather low</li> <li>Further efforts to promote the Smart Home Solutions will be carried out during the last two years of the project</li> </ul>
1.5	Total investment in construction solutions	€	<ul style="list-style-type: none"> <li>Applicable</li> <li>Calculation is based on the Munich city councils resolutions for the</li> </ul>

			project SMARTER TOGETHER
1.6	Specific investment in construction solutions	€/m <sup>2</sup>	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
1.7	Total investment in energy solutions	€	<ul style="list-style-type: none"> <li>• Applicable</li> <li>• Calculation is based on the Munich city councils resolutions for the project SMARTER TOGETHER</li> </ul>
1.8	Specific investment in energy solutions	€/kWp	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.1	Final energy savings achieved by the implemented building efficiency measures	MWh/year	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.2	Increase in energy efficiency of building's envelope	%	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.3	CO <sub>2</sub> reduction achieved by the implemented building efficiency measures	t/year	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.4.1	Installed RES capacity Heating /Electricity	MW	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.4.2	Installed RES capacity Heating /Electricity	MW	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.5	Floor space to be connected to district heating	m <sup>2</sup>	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
2.6	Share of RES (excl excess heat) in	%	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>

	district heating		
2.7	Electricity generated by RES	MWh/year	• Applicable
2.8	CO2 reduction achieved by energy supply measures, total	t/period	• Applicable
2.9	Total CO2 reduction	t/year	• Applicable
2.10	Reduction of Final Energy Consumption	%	• Applicable
2.11	Innovative heat substations installed	#	• Applicable
7.1	Average reduction of energy bill per household in refurbished buildings	€/year	• Applicable
7.2	Average reduction in maintenance costs per household in refurbished buildings	€/year	• Applicable
7.3	Average reduction in total housing costs per household in refurbished buildings	€/year	• Applicable
7.4	Individual cost for living (focus on energy/housing and transportation) for citizens	€/year	• Applicable

Task 4.4 Integrated Infrastructure (RIT - Referat für Informations- und Telekommunikationstechnik)

KPI Number	Title	Unit	Applicability & Usefulness
1.10	Investment in ICT solutions	€	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
4.1	Qualitative acceptance for smart services of citizens in daily life		<ul style="list-style-type: none"> <li>Not applicable</li> <li>The foreseen calculation method is not suitable to make statements about the citizens' acceptance of smart services in their daily life</li> <li>Please cf. to Further Indicators</li> </ul>
4.2	Data security within the city	Written description	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
4.3	Demand and usage of smart services	#	<ul style="list-style-type: none"> <li>Not applicable</li> <li>A single number does not provide any information about the intensity of usage of the Smart City App</li> <li>Please cf. to Further Indicators as more specific data is provided</li> </ul>

Task 4.5 Mobility (MVG – Münchner Verkehrsgesellschaft)

KPI Number	Title	Unit	Applicability & Usefulness
1.9	Investment in mobility solutions	€	<ul style="list-style-type: none"> <li>Applicable Calculation is based on the Munich city councils resolutions for the project SMARTER TOGETHER</li> </ul>
3.1	Number of e-vehicles deployed	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
3.2	Number of charging stations	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>



3.4	Km of electrical vehicles	Km/year	<ul style="list-style-type: none"> <li>• Applicable</li> <li>• Mileage data is provided for e-cars only</li> <li>• For e-bikes and e-trikes no mileage is available as it is not registered due to data privacy reasons</li> </ul>
3.5	Mobility points set up	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
3.6	Delivery boxes set up	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>
3.7	CO2 savings achieved by mobility measures	t/year	<ul style="list-style-type: none"> <li>• Not applicable</li> <li>• The foreseen calculation method is not suitable to make statements about the CO2 savings achieved by mobility measures as there are too many unknown quantities</li> <li>• The complete elimination of these unknown quantities is not possible</li> <li>• Please cf. to Further Indicators and the more detailed use cases (cf. 2.4) where more detailed information about the use of the mobility stations is provided</li> </ul>
3.8	Energy savings by mobility measures, total	kWh/year	<ul style="list-style-type: none"> <li>• Not relevant for Munich (cf. D 6.1.1)</li> </ul>
3.9	Number of electrical vehicles split up into vehicle types	#	<ul style="list-style-type: none"> <li>• Applicable</li> </ul>

## Task 4.6 Monitoring (PLAN- Referat für Stadtplanung und Bauordnung)

KPI Number	Title	Unit	Applicability & Usefulness
1.1	Residents in Light House Demonstration Area	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
1.11	Total Investment	€	<ul style="list-style-type: none"> <li>Applicable</li> <li>Sum of investments of task 4.3 – 4.5</li> </ul>
1.12	Leverage effect of EC funding	%	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
7.6	Jobs created (directly)	#	<ul style="list-style-type: none"> <li>Not applicable</li> <li>No official statistics available that allow any correlation with the investments of task 4.3</li> </ul>
7.7	Jobs created (indirectly)	#	<ul style="list-style-type: none"> <li>Not applicable</li> <li>No official statistics available that allow any correlation with the investments of task 4.3</li> <li>No valid figures for proper calculations available (except investments)</li> </ul>
7.8	Disposable personal income in lighthouse districts	€/month	<ul style="list-style-type: none"> <li>Not applicable</li> <li>No official statistics available</li> </ul>
7.9	Discretionary personal income in lighthouse districts	€/month	<ul style="list-style-type: none"> <li>Not applicable</li> <li>No official statistics available</li> </ul>

## Task 4.7 Replication (PLAN – Referat für Stadtplanung und Bauordnung)

KPI Number	Title	Unit	Applicability & Usefulness
6.1	Governance 1	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
6.2	Governance 2	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
6.3	Number of key actors involved from different departments and organisations	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
7.5	New business models developed and validated	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>

## Further Indicators (all Munich SMARTER TOGETHER Task Leads)

KPI Number	Title	Unit	Applicability & Usefulness
8.1	Total downloads of Munich Smart City App	#	<ul style="list-style-type: none"> <li>Applicable</li> <li>KPI 8.1 – 8.11: more detailed information about use and acceptance of smart services by the citizens</li> </ul>
8.2	iOS downloads of Munich Smart City App	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
8.3	Android downloads of Munich Smart City App	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>
8.4	Number of Munich Smart City App starts (iOS)	#	<ul style="list-style-type: none"> <li>Applicable</li> </ul>

8.5	Number of Munich Smart City App starts (Android)	#	• Applicable
8.6	Number of jumps from Munich Smart City App to MVG More	#	• Applicable
8.7	Number of jumps from Munich Smart City App to MVG Fahrinfo	#	• Applicable
8.8	Number of jumps from Munich Smart City App to MVG eTrike App	#	• Applicable
8.9	Number of jumps from Munich Smart City App to Neighbourhood Sharing Boxes Process	#	• Applicable
8.10	Number of jumps from Munich Smart City App to Transparency Dashboard	#	• Applicable
8.11	Transparency Dashboard website visits	#	• Applicable
8.12	Number of Intelligent Lampposts	#	• Applicable
8.13	Number of Sensors on Intelligent Lampposts	#	• Applicable

8.14	Scope of household survey	#	• Applicable
8.15	Return of household survey	#	• Applicable
8.16	Installed RES capacity district heating	MW	• Applicable
8.17	Number of battery storage	#	• Applicable
8.18	Capacity of battery storages	MW	• Applicable
8.19	Share of RES in district heating	%	• Applicable

## 2.4 Use cases Mobility Station and Delivery Box

The Munich SMARTER TOGETHER project team, i.e. in this case mainly PLAN, RIT, MVG and Statauto invested additional resources in the development of two extra use cases. The use cases are about the eight mobility stations and the two delivery boxes that were set-up during the project's implementation phase.

The challenge of these two use cases was to bring together the complex information of the rental records with other relevant information (e.g. weather conditions) and to create some queries that are of interest for urban planning. Similar to the approach to the KPI this challenge was mastered by close and continuous cooperation among all involved parties. The focus was on finding answers to the question who uses the mobility stations and delivery boxes when (time) and how (intensity, kind of service). Additionally, a GIS based reachability analysis was carried out in order to find out how many people live within a walking distance of 3, 5 and 10 minutes of the stations.

The programming and the visualisation of the use cases was done by VMZ according to the specifications of PLAN and RIT (cf. Figure 5).

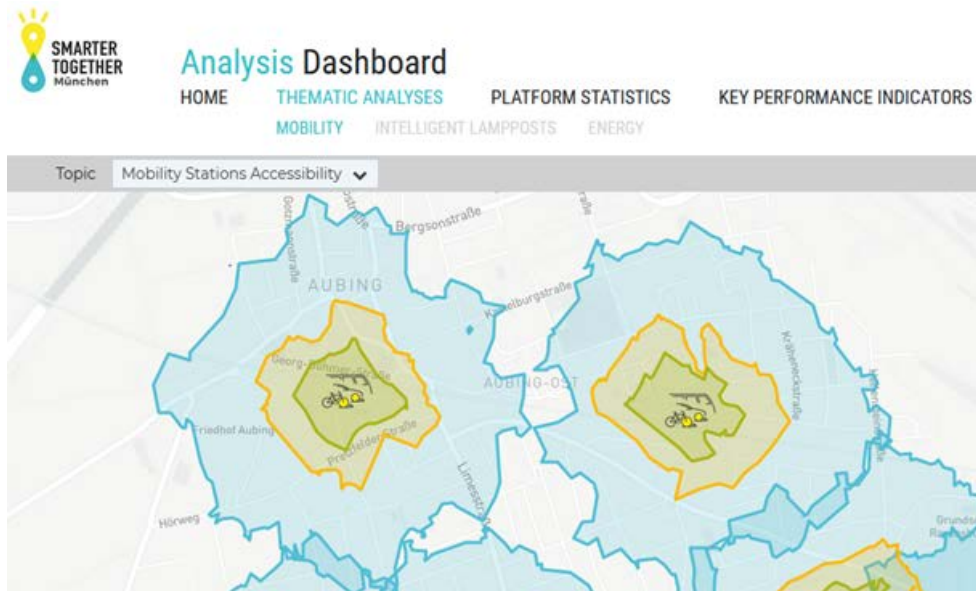


Figure 5: Visualization of more complex data

Summing it up, the experiences gathered with the set-up of the KPI monitoring system were a clear benefit for the development of the more complex use cases. The overall goal for the upcoming two years (replication phase) is to identify parameters for the best location of mobility stations and delivery boxes in the city. The visualization makes it easier to involve political decision makers and to convince them that expanding the sharing economy is a good idea.

### 3. Conclusion

First, it turned out that setting up a monitoring system, even with rather simple indicators, is a complex task. In the case of SMARTER TOGETHER not only different partners on local level had to be coordinated but also on international level. A continuous and well-structured communication among all involved partners about the contents of the indicators is crucial for the success. Likewise, a timely start of this process before the implementation of the monitoring system is also crucial.

Besides, some indicators that seemed to be promising at the beginning of the SMARTER TOGETHER monitoring set-up process turned out to be useless and inapplicable. Testing the indicators with regard to practicability before the final implementation of the monitoring system is a good thing to do. This gives the possibility to adapt them to the real needs of the actors interested in the monitoring.

In the context of cities setting up a monitoring system cannot be done by one single actor. It always involves many different urban actors with different roles and thus fosters the collaboration across sectors and administrative units. This is a great value itself with further benefits besides the monitoring system.

Furthermore, when thinking about a monitoring system a great emphasis should be put on the aspect of visualising the data. This makes (big) data more tangible for politicians and other representatives (e.g. administration, business) of the city. In consequence, decision making (e.g. for the localisation of new mobility stations and delivery boxes) is eased by this visual input.

Finally, it can be said for the case of Munich that the process of setting up a monitoring system in the frame of SMARTER TOGETHER triggered other process within the city of Munich. Namely, process about interchanging data of different institutions (administration with administration, administration with public companies) going well beyond the monitoring system started and are likely to be extended within the next years.

## REFERENCES

No external sources etc. were used for the elaboration of the Deliverable 4.6.1