

# DS4SSCC Online Training - Use Cases & Priority Data Sets

WP4 - Data Space Establishment

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## Priority Data Sets: Status Quo

- As various public sector data (such as weather or air quality data) are particularly interesting for third-party creators of value-added services and applications and have important benefits for society, the environment, and the economy, **they should be made available to the public. Too often, this is still not the case**.
- With data being a cornerstone of EU's industrial competitiveness, the EC defined a catalogue of high value datasets and the Inspire Geo Data Portal, focusing on high value geo-data.
- Such specific high-value datasets are available free of charge, machine readable, provided via APIs and provided for bulk download, where relevant and become even more useful when accessible via data spaces, allowing their use for applications on a large European level. Six domains have been identified and datasets attached accordingly, including GEOSPATIAL, EARTH OBSERVATION AND ENVIRONMENT, METEOROLOGICAL, STATISTICS, COMPANIES AND COMPANY OWNERSHIP, MOBILITY





### Data sets / Use Cases - Aim

Being defined by the European Commission, we can not be sure if there are any domains or datasets missing. So in a first step the project aligned these datasets with implemented and existing use cases to identify possible gaps of datasets that have not been included while being frequently used in the wild.

- 1. Getting detailed insights into real world use cases (technology, governance, datasets)
- 1. Getting insights into what data sets are prioritized
- 1. Detecting possible gaps in relation to European high quality data sets





## 1. Desk Research:

### Main Sources:

- Lighthouse Projects
- Scalable Cities
- Eurocities
- DS4SSCC Survey

Strategic Field of Data Spaces	Use Case	Related Project	Source	Contact	geographic Scale	Data Space Sector	Dataset
Urban Planning	Driving urban planning through citizen's voice: The solution concisits of an interface that enables the use to monitor ophinons expressed by citizens on all beetback channels; including social metworks (Facebook, We eff, Daenskallake and other sources) the main dashoard presents the aggregated citizens' ophinon expressed on sourced networks, etc.) and specifying (This ophino is positive, positier, etc.) and specifying (This ophino is positive, positier) or negative. In addition, any user can dil down to actual tends and kaywords people use and create actis on specific calegories and the optios.	Data City Lab	https://www.datacitylab.com /post/d/tivino-ur/san-sioice	https://en.craft.ai/	Paris, FRA		Social networks (Facebo Twitter, DansMaRue)
Tourism	Analysing travel patterns on tourist buses: The objective of the challenge was to help RATP Dev operator of transportation systems, to understand customers' usage of its bus feets by analysing specific bus routes and ticket sales to optimise the routes of the Open Tour travelling throughout Paris.	Data City Lab	https://www.datacitylab.com /post/analysing-travel-patter ns-on-tourist-buses	https://intersec.com/	Paris, FRA		onboard Will, ticketing ar geolocation on reports
Energy	Renewable energy on a district scale	Data City Lab	https://www.datacitylab.com /post/making-more-effective- use-of-renewables	https://www.beebryte.com/	Paris, FRA		Energy data
Green Deal	GoalGreen App	Replicate	https://replicate-project.eu/ic t-florence/		Florence, IT		
Mobility	Lisbon: micro mobility, road management		https://meep.app/blog/interv/ ews/interview-vasco-mora-pr ocess-management-and-bus iness-analyst-at-emel/		Lisbon, POR		

### Variables:

- Geographic scale
- Data space sector
- Data sets in use

## Identification of 85 Use Cases / DS Strategic Field:

0	Cross			
0	Health	0		19
0	Aariculture	0		10
0	Manufacturing	C	)	3
Ŭ		c	)	1
0	Energy	С	)	9
0	Mobility	0	:	23
0	Financial	с	,	2
0	Public administration	0		12
0	Skills	Ŭ		4
0	European Open Science Cloud	C	)	1
0	meeting the Green Deal objectives	C	)	1
		С	)	1





## 2. Prioritization



### additional variables

Strategic Field			1.0000			1000		0200000	120100
of Data Spaces	Use Case	Related Project	Source	No. of MIMs	MIMS	Tech	#Techs	Contact	Total
Energy	Web based information platform for energy management. The platform is a cloud-based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to svaulize the buildings energy performance.	Ruggedised	https://ruogedised.eu/filead min/repository/Publications/ D3.7 - Web based informa tion platform for energy m anagement.odf		OASC MIM1 – Context ; OASC MIM2 – Data Modules; OASC MIM9 – 3 Analytics ;	9	4		16
Public administration	Sensors to measure filling of waste containers implemented	Ruggedised	https://ruggedised.eu/filead min/repository/Publications/ D2.5 - Sensors to measur e filling of waste container s implemented.pdf		OASC MIM1 – Context ; OASC MIM2 – Data 2 Modules;	8	3		13
Health	Noise and air pollution monitoring for more efficient mobility and healthy cities	GreenMov	https://green-mov.eu/project- pilots		OASC MIM1 – Context ; OASC MIM2 – Data Modules; OASC MIM7 – 3 Places;	8	4		15
Urban Planning	Developing a Digital Twin to simulate urban (re-)development projects	Slim Ruimtelijk Plannen			OASC MIM1 – Context ; OASC MIM2 – Data Modules; OASC MIM5 – Transparency ; OASC MIM7 4 – Places;	7	2		13
Mobility	Intermodality between bikes and trains: bikes availability at train stations spots	GreenMov	https://green-mov.eu/project- pilots		OASC MIM1 – Context ; OASC MIM3 – Contracts; OASC MIM4 – Trust OASC 4 MIM7 – Places;	9	3		16
Public administration	Keep sidewalks bin-free: The objective of the challenge was to predict waste collection time thanks to AI, and alert building caretakers via text messaging of exact collection times in order to reduce the occupation of public areas.	Data City Lab	https://www.datacitylab.com /post/better-informing-about- waste-collection-times		OASC MIM2 – Data Modules; OASC MIM5 – Transparency ; OASC MIM4 3 – Trust ;	7	3		13
	Strategic Field of Data Spaces Energy Public administration Health Urban Planning Mobility Public administration	Strategic Field         Case           of Data Spaces         Use Case           Web based information platform for energy         Web based information platform for energy           which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.           Public administration         Sensors to measure filling of waste containers implemented           Health         Noise and air pollution monitoring for more efficient mobility and healthy cities           Urban Planning         Developing a Digital Twin to simulate urban (re-/development projects           Mobility         Intermodality between bikes and trains: bikes availability at train stations spots           Keep sidewalks bin-free: The objective of the challenge was to predict waste collection time thanks to Al, and aiert building caretakers via text messaging of exact collection time than indust no index to reduce the occupation of public areas.	Strategic Field         Related Project           of Data Spaces         Use Case         Related Project           Web based information platform for energy management: The platform is a cloud-based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.         Ruggedised           Public administration         Sensors to measure filling of waste containers implemented         Ruggedised           Health         Noise and air pollution monitoring for more efficient mobility and healthy cities         GreenMov           Urban Planning         Developing a Digital Twin to simulate urban (re-/development projects         Slim Ruimtelijk Plannen           Mobility         Intermodality between bikes and trains: bikes availability at train stations spots to Al, and alert building caretakers via text messaging of exact collection times in order to reduce the collection of public areas.         GreenMov	Stategic Field         Source           of Data Spaces         Use Case         Related Project         Source           Web based information platform for energy management. The platform is a cloud-based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.         Ruggedised         https://ruggedised.up/leading// D3.7 - Web based information interprocession/Publications// D3.7 - Web based information substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.         Ruggedised         https://ruggedised.up/leading// D3.7 - Web based information anagement.dd/           Public administration         Sensors to measure filling of waste containers implemented         Ruggedised         https://ruggedised.up/leading/ D2.5 - Sensors to measure e. Limic of vasete_containers           Health         Noise and air pollution monitoring for more efficient mobility and healthy cities         GreenMov         https://green-mox.eu/project- plicis           Mobility         Intermodality between bikes and trains: bikes availability at train stations spots to Al, and alert building caretakers val text messaging of exact collection times in order to reduce the coccupation of public areas.         GreenMov         https://www.datacitylab.com toost/bester-informing-about- waste-collection.times	Strategic Field         Case         Related Project         Source         No. of MiMs           of Data Spaces         Use Case         Web based information platform for energy management. The platform is a cloud-based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.         Ruggedised         https://ruggedised.gu/lied/ min/rugges/tory/Public/attors/ D2.7 - V4b Dased informa tory Dased informa ion platform for energy m anagement.off           Public administration         Sensors to measure filling of waste containers implemented         Ruggedised         https://ruggedised.gu/lied/ min/rugges/tory/Public/attors/ D2.5 - Sensors to measure simplemented         etime_d         waste_container s	Strategic Field of Data Spaces         Sec Case         Related Project         Source         No. of MiMs         MMs           Web based information platform for energy management: The platform is a cloud-based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.         https://unopedised.eu/liead mini/repositor//Publications/ D37 - Web based information platform for energy management. The platform for energy management Log difference output to visualize the buildings energy performance.         Nose of MiMs         OASC MIM1 - Context ; OASC MIM2 - Data Modules; OASC MIM2 - Data Modules; OASC MIM2 - Data Modules; OASC MIM1 - Context ; OASC MIM1 - Context	Strategic Field of Data Spaces         Use Case         No. of MMs         MMs         Tech           of Data Spaces         We based information platform for energy management. The platform is a cloud-based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way, and to visualize the buildings energy performance.         No. of MMs         OASC MM1 - Context ; OASC MM2 - Data Module; OASC MM9 - anagement.off         OASC MM1 - Context ; OASC MM2 - Data Module; OASC MM9 - anagement.off         Second Strategic Field Module; OASC MM9 - Second Strategic Field Module; OASC MM1 - Context ; OASC MM1 - Context ;	Strategic Field of Data Space     Use Case     Related Project     Source     No. of MMs     Miles     Tech     Places       Image: Space halfs     best could-based service which collects data from the buildings and the District Heating (Dr) substations. The data is then used for governing the space halfs (from a more efficient)     space halfs     oASC MM1 - Context ; D3.7. Web based information provide best different pace halfs     gad     oASC MM1 - Context ; D3.7. Web based information (DASC MM2 - Data Modules; OASC MM9 - anagement Log Amage distance)     gad     gad       Emergy     and to sualize the buildings energy performance.     Ragedised     minimized contraining anagement Log //Log codesided dullade minimized contraining anagement Log //Log codesided dullade minimized contraining administration     gad     OASC MM1 - Context ; OASC MM2 - Data     g     d       Public     Sensors to measure filling of waste containers administration     Ruggedised     minimized containers a minimized containers administration     gad     gad     gad       Heath     Noise and air polition monitoring for more efficient mobility and healtry cities     GreenMov     plots     gad     gad     gad       Urban Planning     Developing a Digital Twin to simulate urban recyclerely and train station spits     Sim Ruimetijk, Plannen     gad     gad     gad       Mobility     Intercontext train station spits     GreenMov     plots     gad     gad     gad       Mobility	Strategic Field of Data Space     Use Case     Related Project     Source     Nu. of MMS     Nu. of MMS     Inch     Fields     Contact       Web based information platform for energy management: Looilects data from the buildings and the District Heating (PM) substations. The data is include for governing the space heating demands-upply in anose efficient way, space heating demands-upply in anose efficient way, and to visualize the buildings energy performance.     Rugedised     https://unpediased.au/liead min/repositor/Publications/ Distribution     0ASC MM1 - Context ; 0ASC MM2 - Data     9     4       Public     Sensors to measure filling of waste containers administration     Rugedised     https://unpediased/upplications/ min/repositor/Publications/ Distribution     0ASC MM1 - Context ; 0ASC MM2 - Data     9     4       Public     Sensors to measure filling of waste containers administration     Rugedised     https://unpediased/upplications/ min/repositor/Publications/ Distribution     0ASC MM1 - Context ; 0ASC MM2 - Data     8     3       Public     Noice and air policition monitoring for more efficient modeling and healthy roties     Rugedised     affine duraset containers administration     8     4       Urban Planning     Developing a Digital Twin to simulate uban modeling and builts in the insteament cod dista     https://unpediaset.au/linead min/repositorie     A     A       Urban Planning     Developing a Digital Twin to sim







## 2. Prioritization / Short Listing

	ID	Туре	Location	Describtion	Project name	Link	points total	selection
	1	Eperav		Web based information platform for energy management: The platform is a cloud -based service which collects data from the buildings and the District Heating (DH) substations. The data is then used for governing the space heating demand-supply in a more efficient way.	Runnedised	https://ruggedised.eu/fileadmin/repository/Publicat lons/D3.7 - Web_based_information_platform_for every_measurement.pdf	16	×
		Mability		and to visualize the buildings energy performance.	Casaabtau	_chergy_management.pdi	10	~
	11	Urban Planning	Paris	Internovating devices these and catality dates advanced by user standards splot During utana parameter to be so that the source of the source on source of the theter that each in the source of the source of the source of the source of the sources. The analysis advanced the source of the source of the sources of the source of the sources. The source of the sources. The source of the source of the source of the sources of the source of the sources. The source of the sources. The source of the source of the source of	Data City Lab	https://www.datacitylab.com/post/dfi/log-urban-pla https://www.datacitylab.com/post/dfi/log-urban-pla nning-through-citizen-s-voice	16	x
	14	Green Deal	Florence	GoalGreen App	Replicate	https://replicate-project.eu/ict-florence/	16	x
	15	Mobility		Lisbon: micro mobility, road management		https://meep.ap/blog/interviews/interview-vesco- mora-process-management-and-business-analyst- at-emei/	17	x
	19	Mobility	Madrid	MaaS Madrid		https://www.intelligenttransport.com/transport-artic les/92375/city-snapshot-mobility-as-a-service-in-m adrid/	16	x
	23	Mobility	Ghent	Ghent	TMaaS	TMaaS - Traffic Management as a Service (Closed)   UIA - Urban Innovative Actions (ula-initiative.eu)	16	x
	25	Mobility	Flanders	Flanders Smart Data Space Data Integration for Smart Mobility Flanders Water Dataspace	DCAT AP-VL	https://www.vlaanderen.be/digitaal-vlaanderen/onz e-oplossingen/open-data/dcat-ap-vlaanderen-profie I-en-validator	17	x
	39	Mobility		myAthensPass - parking app		https://play.google.com/store/apps/details?id=gr.c itizen.pass&hl=en≷=US	16	x
	45	Energy	Helsinki	Energy and Climate Atlas		https://kartta.hel.fl/3d/heating/Apps/Helsinki/view. html., https://kartta.hel.fl/3d/atlas/#/	16	x
	59	Urban Planning	Eindhoven	Smart Urban Planning, with tools like Digital Twinning & VR and also an Integrated Impact Assessment Model (IIAM) in cooperation with the UDI (Urban Development Initiative)		https://brainporteindhoven.com/udi/en/digital-city	17	x
	77	Health	Barcelona, Göleberg, Amersfoort	SCOREvular ovelops and tests three large-scale demonstrations cases for collecting, computing and presenting values data latilised to needs of our stakeholders, in Barcelona we initiate a new domain "sewage sociology" mining biomarkers of community-wide lifestyle habits from sewage. In Ameristori we develop new water monitoring techniques and data-adaptive storm water treatment and gapty to water inscore protections and legal compliance for construction sensing and hydrological modelling coupled to utan water engineering. We will lentity be protectes for developing and using the digital services, thus addressing water stakeholders beyond the project partners. The project will also develop technologies to increase public engagement in water management.		https://www.scorewater.eu/	18	x
<b>N</b>				Schwung: predictive traffic management mobile app data collection linked to traffic		had a star and a star and	10	
	85	Mobility	A marken dama	light operation Partners: Vialis (commercial solution) and civilian participants	IDE 4 seclast	https://scnwung.nu/	16	x
	88	MODIIILY	Amstergam	IDEA predictive mobility based on libating call data	IDEA project			







### 3. Interviews

#### 3. In-depth Interviews:

- The interviews took place online from March to • May 2023, and lasted a maximum of 45 minutes.
- Interviews revealed the priority data sets and • technologies that have been used and limitations that were experienced.

**Interviews**, refining selected use cases and gain deeper insights:

- **Technical details**
- Priority data sets Missing data

ID	Туре	Location	Description	Project name	Link	Points Total
14	Green Deal	Florence	GoalGreen App	Replicate	https://replicate-project.e u/ict-florence/	16
25	Mobility	Flanders	Flanders Smart Data Space Data Integration for Smart Mobility Flanders Water Dataspace	DCAT AP-VL	https://www.vlaanderen .be/digitaal-vlaanderen/o nze-oplossingen/open-d ata/dcat-ap-vlaanderen- profiel-en-validator	17
45	Energy	Helsinki	Energy and Climate Atlas		https://kartta.hel.fi/3d/hea ting/Apps/Helsinki/view.h tml., https://kartta.hel.fi/3d/atla s/#/	16
59	Urban Planning	Eindhoven	Smart Urban Planning, with tools like Digital Twinning & VR and also an Integrated Impact Assessment Model (IIAM) in cooperation with the UDI (Urban Development Initiative)		https://brainporteindhove n.com/udi/en/digital-city	17
77	Health	Barcelona, Göteberg, Amersfoort	SCOREw ater develops and tests three large-scale depromstrations cases for collecting, computing and presenting various data tailored to needs of our stakeholders. In Barcelona we eiptigte a new domain 'sew age sociology' mining biomarkers of community- wide lifestyle habits from sew age. In Amersfoort we develop new water monitoring techniques and data-adaptive storm water treatment and apply to water resource protection and lagal compliance for construction projects within the Göteborg-case. We enhance resilience against flooding by sensing and hyrological modeling coupled to urban w ater angineering. We il identify best practices for developing and using the digital services, thus addressing w ater stakeholders beyond the project suthins with extenders public develop technologies to increase public engagement in water management.		https://www.scorew.ate	18
88	Mobility	Amsterdam	IDEA predictive mobility based on floating car data	IDEA project		17
90	Green Deal	Slovenia	Farm2Fork	Earm2Fork		18

Table 3: Shortlist of final use cases, selected for interviews





## 4. Stakeholder Forum Workshop: Domain distribution



### Тор 3:

- 1. Health
- 1. Energy
- 1. Green Deal



Figure 2. Dataset domain distribution, as identified at the Stakeholder Forum Workshop (April 2023)







## **Key Findings**







# Key finding 1: Detected priority data sets

Detected priority data sets	Related Dataset (as defined by EC)	Domain
Floating car data		Mobility
Planning data (road closure)		Planning
Energy data	Energy resources	Earth Observation and Environment
Building registry	Buildings	Geospatial
3D City Model	Buildings	Geospatial
Weather data	Weather alerts	Meteorological
Water Quality	Water quality	Water
Soil Humidity	Soil	Soil
Vehicle / pedestrian count		Mobility
Water levels	Water levels	Water
Opening hours		Individual / Commercial
Housing Quality		Planning
Land Use	Land Use	Land Use
Product Descriptions		Individual / Commercial







# Key Finding 2: Existing gaps!

Detected priority data sets	Related Dataset (as defined by EC)	Domain
Floating car data		Mobility
Planning data (road closure)		Planning
Energy data	Energy resources	Earth Observation and Environment
Building registry	Buildings	Geospatial
3D City Model	Buildings	Geospatial
Weather data	Weather alerts	Meteorological
Water Quality	Water quality	Water
Soil Humidity	Soil	Soil
Vehicle / pedestrian count		Mobility
Water levels	Water levels	Water
Opening hours		Individual / Commercial
Housing Quality		Planning
Land Use	Land Use	Land Use
Product Descriptions		Individual / Commercial









# Key Findings 3: Techn. Overlaps

### Geographic Tools:

- Esri, ArcGIS
- Open source GIS
- Web-based GIS
- Remote sensing
- GPS & GNSS

### 3D Modelling tools:

- CityGML
- gITF
- 3D Modelling Software
- Visual Engines
- VR
- Web-based platform
- Point cloud data

#### Sensor data management:

- LDES
- NGSI-LD
- MQTT
- Apache Kafka
- AMQP
- CoAP
- RESTful







# Key Findings 4: Common Challenges

- Procurement
- Data Quality
- Level of Granularity
- Challenges in Data Sharing
- GDPR & Legal based challenges







# Key Findings 5: MIMs in use cases

Flemish Smart Data Space (Flanders)	MIM1: Context MIM2: Data Models
Climate Atlas (Helsinki)	MIM2: Data Models MIM7: Places MIM8: Indicators MIM9: Analytics
Intelligent Data Exchange Alliance (Amsterdam)	MIM1: Context MIM2: Data Models MIM7: Places MIM8: Indicators
Urban Development Initiative (Eindhoven and Helmond)	MIM1: Context MIM2: Data Models MIM7: Places MIM8: Indicators
Score Water (Barcelona, Amersfoort, Göteborg)	MIM1: Context MIM2: Data Models
Farm2Fork (Kranj)	MIM3: Contracts MIM4: Trust







# Key Findings 6: Data cooperation Canvas

Data & Data Sources						
Supply Side	Demand Side					
<ul> <li>Provide metadata</li> <li>Document access type (API)</li> <li>Detail data quality attributes</li> <li>Detail SLA levels</li> <li>Provide contact details</li> </ul>	<ul> <li>Find potential data source</li> <li>Access third party API</li> <li>Assess data quality attributes</li> <li>Decide required SLA specs</li> <li>Negotiate or define smart contracts</li> </ul>					
Interoperability						
	Demand Side					
<ul> <li>Analyse state of the art in terms of semantics (<u>LOV</u>, <u>Smart Data Models</u>,)</li> <li>Apply the most common ontologies for the data domain</li> <li>Decide on applicable / feasible level of verbosity</li> <li>Provide links to other relevant ontologies</li> </ul>	<ul> <li>Assess if the semantics of the data are properly understood</li> <li>Assess if the provided data models and ontologies can sufficiently be mapped to the (internal) target system</li> <li>Where necessary, identify the required MIM2 PPI's (Pivotal Points of Interoperability, for instance, GeoJSON) and interoperability mechanisms (wrappers, mappers, convertors)</li> </ul>					
Technical Concepts / Models	Technical Infrastructure					
<ul> <li>Decide on trust levels and set up Trusted Exchange / Marketplace model accordingly</li> <li>Decide on necessary Usage Control systems</li> <li>Select an Identity Provider</li> <li>Set up metering</li> </ul>	Define scalability requirements     Define durability requirements      For cloud-based infrastructures:     Define data transferability requirements     Check GDPR compatibility     Check pricing structure					



