# 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

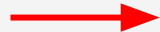1. Detecting possible gaps in relation to European high quality data sets

# 1. Desk Research:

**Main Sources:** →

- Lighthouse Projects
- Scalable Cities
- Eurocities
- DS4SSCC Survey

**Variables:** →

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

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

- Cross
- Health
- Agriculture
- Manufacturing
- Energy
- Mobility
- Financial
- Public administration
- Skills
- European Open Science Cloud
- meeting the Green Deal objectives

- 19
- 10
- 3
- 1
- 9
- 23
- 2
- 12
- 1
- 1
- 1

| 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 consists of an interface that enables the user to monitor opinions expressed by citizens on all feedback channels, including social networks (Facebook, Twi er), DansMaRue and other sources. The main dashboard presents the aggregated citizens' opinion expressed on sourced networks, classified into categories of urban management (such as security, education, public spaces, environment etc.) and specifying if this opinion is positive, neutral or negative. In addition, any user can drill down to actual trends and keywords people use and create alerts on specific categories and/or topics. | Data City Lab | https://www.datacitylab.com/post/driving-urban-planning-through-citizen-s-voice | https://en.craft.ai/ | Paris, FRA | | Social networks (Facebook, 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 fleets 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-patterns-on-tourist-buses | https://intersec.com/ | Paris, FRA | | onboard Wifi, ticketing and 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/intervi ews/interview-vasco-mora-pr ocess-management-and-bus iness-analyst-at-emel/ | | Lisbon, POR | | |

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# 2. Prioritization

**additional variables**

| | Strategic Field of Data Spaces | Use Case | Related Project | Source | No. of MIMs | MIMs | Tech | #Techs | Contact | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 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 visualize the buildings energy performance. | Ruggedised | https://ruggedised.eu/filead min/repository/Publications/ D3.7 - Web based informa tion platform for energy m anagement.pdf | 3 | OASC MIM1 – Context ; OASC MIM2 – Data Modules; OASC MIM9 – Analytics ; | 9 | 4 | | 16 |
| 3 | 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 | 2 | OASC MIM1 – Context ; OASC MIM2 – Data Modules; | 8 | 3 | | 13 |
| 4 | Health | Noise and air pollution monitoring for more efficient mobility and healthy cities | GreenMov | https://green-mov.eu/project- pilots | 3 | OASC MIM1 – Context ; OASC MIM2 – Data Modules; OASC MIM7 – Places; | 8 | 4 | | 15 |
| 5 | Urban Planning | Developing a Digital Twin to simulate urban (re-)development projects | Slim Ruimtelijk Plannen | | 4 | OASC MIM1 – Context ; OASC MIM2 – Data Modules; OASC MIM5 – Transparency ; OASC MIM7 – Places; | 7 | 2 | | 13 |
| 7 | Mobility | Intermodality between bikes and trains: bikes availability at train stations spots | GreenMov | https://green-mov.eu/project- pilots | 4 | OASC MIM1 – Context ; OASC MIM3 – Contracts; OASC MIM4 – Trust  OASC MIM7 – Places; | 9 | 3 | | 16 |
| 10 | 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 | 3 | OASC MIM2 – Data Modules; OASC MIM5 – Transparency ; OASC MIM4 – Trust ; | 7 | 3 | | 13 |
| | | Driving urban planning through citizen's voice: The | | | | | | | | |

# 2. Prioritization / Short Listing

| ID | Type | Location | Description | Project name | Link | points total | selection |
|---|---|---|---|---|---|---|---|
| 1 | 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 visualize the buildings energy performance. | Ruggedised | https://ruggedised.eu/fileadmin/repository/Publications/D3.7_-_Web_based_information_platform_for_energy_management.pdf | 16 | X |
| 7 | Mobility | | Intermodality between bikes and trains: bikes availability at train stations spots | GreenMov | https://green-mov.eu/project-pilots | 16 | X |
| 11 | Urban Planning | Paris | Driving urban planning through citizen's voice: The solution consists of an interface that enables the user to monitor opinions expressed by citizens on all feedback channels, including social networks (Facebook, Twi er), DansMaRue and other sources. The main dashboard presents the aggregated citizens' opinion expressed on sourced networks, classified into categories of urban management (such as security, education, public spaces, environment etc.) and specifying if this opinion is positive, neutral or negative. In addition, any user can drill down to actual trends and keywords people use and create alerts on specific categories and/or topics. | Data City Lab | https://www.datacitylab.com/post/driving-urban-planning-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.app/blog/interviews/interview-vasco-mora-process-management-and-business-analyst-at-emel/ | 17 | X |
| 19 | Mobility | Madrid | MaaS Madrid | | https://www.intelligenttransport.com/transport-articles/92375/city-snapshot-mobility-as-a-service-in-madrid/ | 16 | X |
| 23 | Mobility | Ghent | Ghent | TMaaS | TMaaS - Traffic Management as a Service (Closed) | UIA - Urban Innovative Actions (uia-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/onze-oplossingen/open-data/dcat-ap-vlaanderen-profiel-en-validator | 17 | X |
| 39 | Mobility | | myAthensPass - parking app | | https://play.google.com/store/apps/details?id=gr.citizen.pass&hl=en&gl=US | 16 | X |
| 45 | Energy | Helsinki | Energy and Climate Atlas | | https://kartta.hel.fi/3d/heating/Apps/Helsinki/view.html , https://kartta.hel.fi/3d/atlas/#/ | 16 | x |
| 59 | Urban Planning | Eindhoven | Smart Urban Planning, with tools like Digital Twinning & VR and also an Integrated Impact Assessment Model (IAM) in cooperation with the UDI (Urban Development Initiative) | | https://brainporteindhoven.com/udi/en/digital-city | 17 | x |
| 77 | Health | Barcelona, Göteborg, Amersfoort | SCOREwater develops and tests three large-scale demonstrations cases for collecting, computing and presenting various data tailored to needs of our stakeholders. In Barcelona we initiate a new domain "sewage sociology" mining biomarkers of community-wide lifestyle habits from sewage. In Amersfoort we develop new water monitoring techniques and data-adaptive storm water treatment and apply to water resource protection and legal compliance for construction projects within the Göteborg-case. We enhance resilience against flooding by sensing and hydrological modelling coupled to urban water engineering. We will identify best practices 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 |
| 85 | Mobility | | Schwung: predictive traffic management mobile app data collection linked to traffic light operation Partners: Vialis (commercial solution) and civilian participants | | https://schwung.nu/ | 16 | x |
| 88 | Mobility | Amsterdam | IDEA predictive mobility based on floating car 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 | Type | Location | Description | Project name | Link | Points Total |
|---|---|---|---|---|---|---|
| 14 | Green Deal | Florence | GoalGreen App | Replicate | https://replicate-project.eu/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/onze-oplossingen/open-data/dcat-ap-vlaanderen-profiel-en-validator | 17 |
| 45 | Energy | Helsinki | Energy and Climate Atlas | | https://kartta.hel.fi/3d/heating/Apps/Helsinki/view.html , https://kartta.hel.fi/3d/atlas/#/ | 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://brainporteindhoven.com/udi/en/digital-city | 17 |
| 77 | Health | Barcelona, Göteborg, Amersfoort | SCOREwater develops and tests three large-scale demonstrations cases for collecting, computing and presenting various data tailored to needs of our stakeholders. In Barcelona we initiate 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 legal compliance for construction projects within the Göteborg-case. We enhance resilience against flooding by sensing and hydrological modelling coupled to urban water engineering. We will identify best practices 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 |
| 88 | Mobility | Amsterdam | IDEA predictive mobility based on floating car data | IDEA project | | 17 |
| 90 | Green Deal | Slovenia | Farm2Fork | Farm2Fork | | 18 |

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

# 4. Stakeholder Forum Workshop: Domain distribution
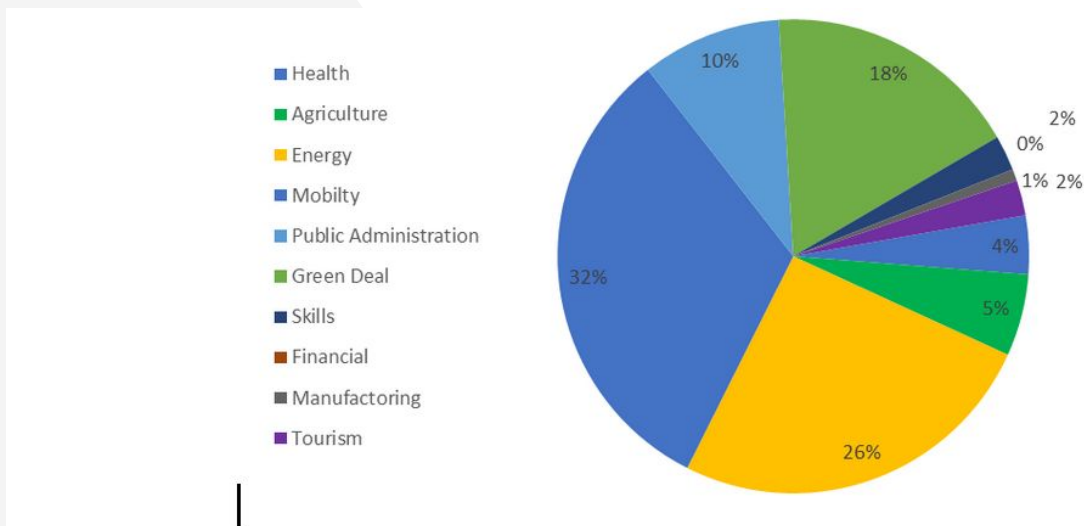
Top 3:

1. Health
1. Energy
1. Green Deal



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

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# 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 |

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# 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<br>MIM2: Data Models |
| Climate Atlas (Helsinki) | MIM2: Data Models<br>MIM7: Places<br>MIM8: Indicators<br>MIM9: Analytics |
| Intelligent Data Exchange Alliance (Amsterdam) | MIM1: Context<br>MIM2: Data Models<br>MIM7: Places<br>MIM8: Indicators |
| Urban Development Initiative (Eindhoven and Helmond) | MIM1: Context<br>MIM2: Data Models<br>MIM7: Places<br>MIM8: Indicators |
| Score Water (Barcelona, Amersfoort, Göteborg) | MIM1: Context<br>MIM2: Data Models |
| Farm2Fork (Kranj) | MIM3: Contracts<br>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** | |
| **Supply Side** | **Demand Side** |
| <ul><li>Analyse state of the art in terms of semantics (LOV, Smart Data Models, …)</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> | <ul><li>Define scalability requirements</li><li>Define durability requirements</li></ul> *For cloud-based infrastructures:* <ul><li>Define data transferability requirements</li><li>Check GDPR compatibility</li><li>Check pricing structure</li></ul> |