



Gemeente
Amsterdam

City Data Standard - Mobility



December 2021



Introduction

Smart Cities Strategy

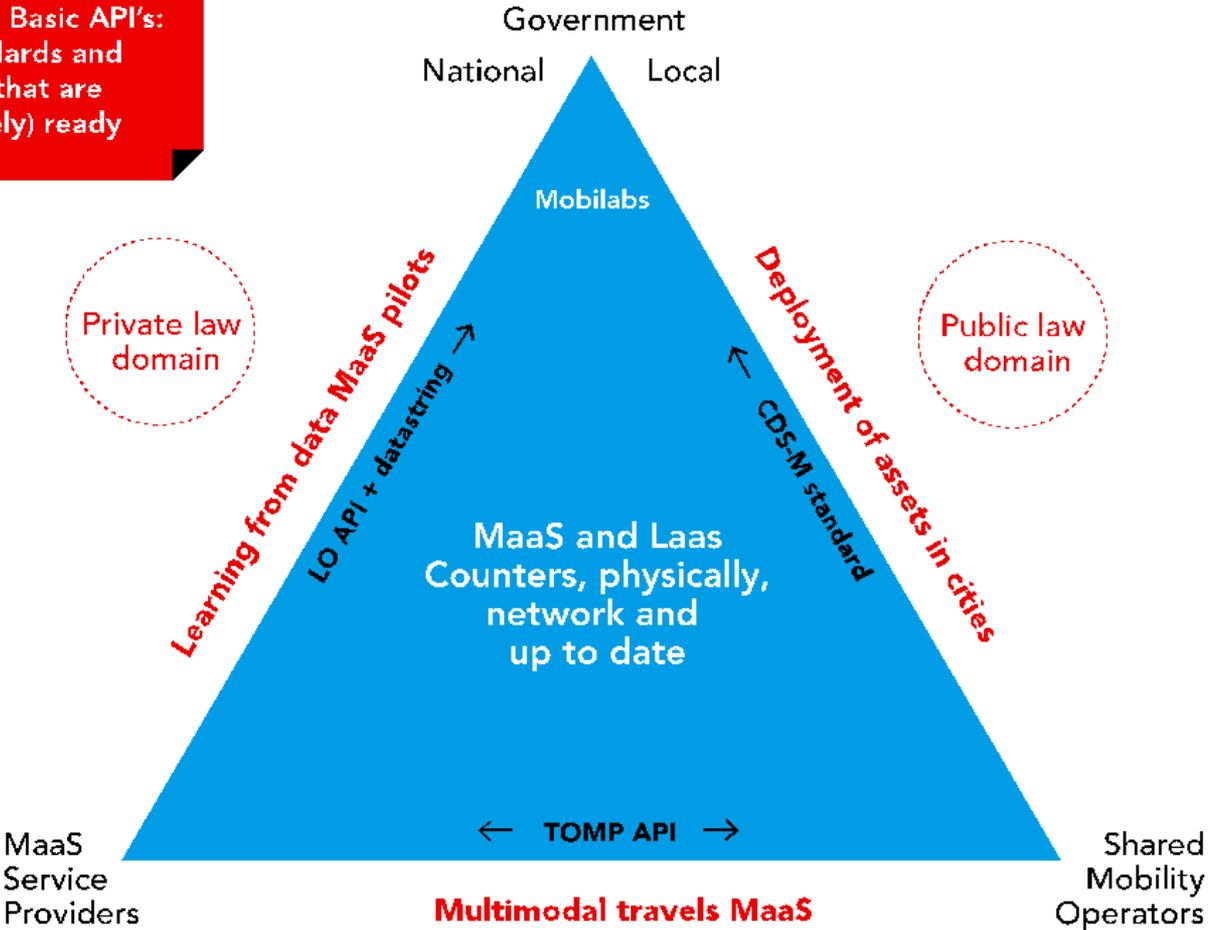
- In 2017, 130 representatives of Dutch cities, companies, and scientists delivered the Smart Cities Strategy to parliament. The strategy detailed an approach to deal with the issues that arise from this increase of populations.
- Within the report, smart mobility was highlighted as one of the five main considerations for an improved future within the urban landscape.





Data sources within MaaS

MaaS Basic API's:
Standards and
APIs that are
(largely) ready



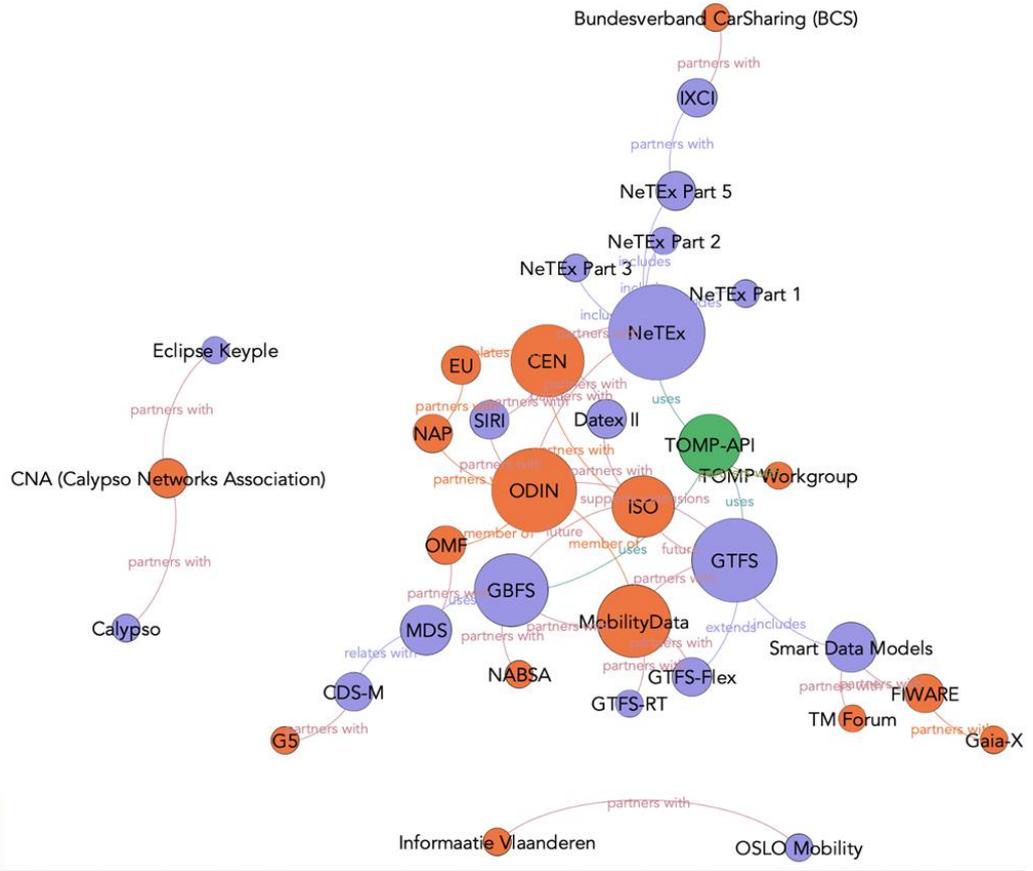


Existing standards



MaaS Data Model Ecosystem

- Data Model
- Organization
- API





Existing standards

**No single standard fits
all use cases**



Design CDS-M

Therefore CDS-M exists of:

1) The Standards

There are a range of APIs on the market, all of which can send different types of data. The selection of standards consist of a selection of APIs and Endpoints that are relevant to mobility and comply with European requirements.

1) The Agreement

The agreement' consists of the principles and arrangements governing cooperation and measures between parties. Part of this process consists of privacy and security tests. Hereby CDS-M supports the secure processing of data from mobility users.



The aim is to work towards a single European data standard for mobility and strengthen cooperation among mobility operators and public authorities.

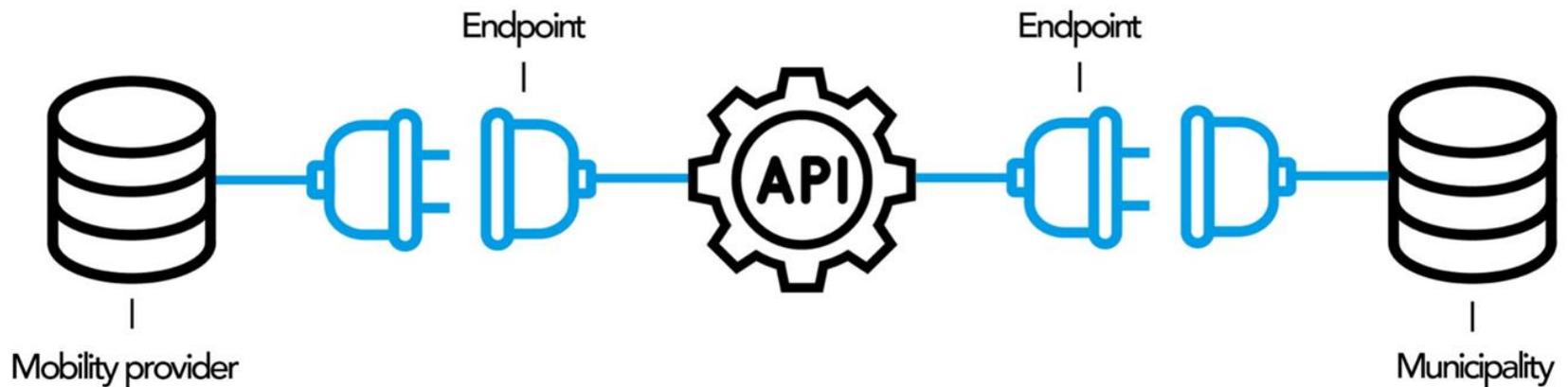
- A single CDS-M will clarify how data should be processed with a view to GDPR compliance and what type of information should be supplied for what use cases;
- This will make it easier for mobility providers to roll out their services in different areas;
- CDS-M enables municipalities and provinces to combine data and learn from each other;
- CDS-M provides a better understanding of the use and effects of shared mobility (e.g., accessibility and quality of life). CDS-M is a resource for improving and innovating policy;



How do The Standards work?

- The standards are a selection of application Programming Interfaces (APIs) specified for mobility use cases.
- An API is a tool written in a coding language that any database can understand.
- An API functions as a 'plug' connecting two systems, enabling standardised data exchange.

XXX CDS-M as plug



When two parties implement an API, it functions as a plug between two systems. The API-plug only works if the right 'power' (data) is supplied. Therefore, the API provides portability and standardization. APIs work with requests and responses. Governments can send a pull request through the API to the mobility provider's database. The Endpoint on the mobility provider's side responds to this request by granting access. Subsequently, the municipality can transfer the relevant data onto its system. In this respect, the Endpoint can be seen as the socket of the API-plug. Data transfer can be done vice versa in both directions.



What data does CDS-M communicate?

Location assets in non-booked state



— Trip start location aggregated per hour and location



— Number of unique users aggregated per hour

— Trip duration and distance aggregated per hour

— Trip end location aggregated per hour and location



One example of CDS-M data items.

Part of the selection of standards are (1) the General Bikesharing Feed Specification (GBFS) and (2) the MDS Metrics. Via GBFS, the location of non-booked assets can be communicated near real-time. Via the MDS metrics, the number of rides per hour, the average length, the average duration and an origin-destination matrix on neighborhood level can be displayed.



What does the The Agreement consist of?

- The Agreement arose from European requirements and legislation.
- It describes the process steps that must be undergone in order to achieve a high quality and secure exchange of data.
- The Agreement consists of a **DPIA** template, a **Security Framework** consisting of a Baseline Information Security (BIO) test template and minimum security measures, a **Non-Disclosure Agreement** and a **Due Dilligence** (comparative test) with respect to internal operations of mobility providers.



A marriage of convenience



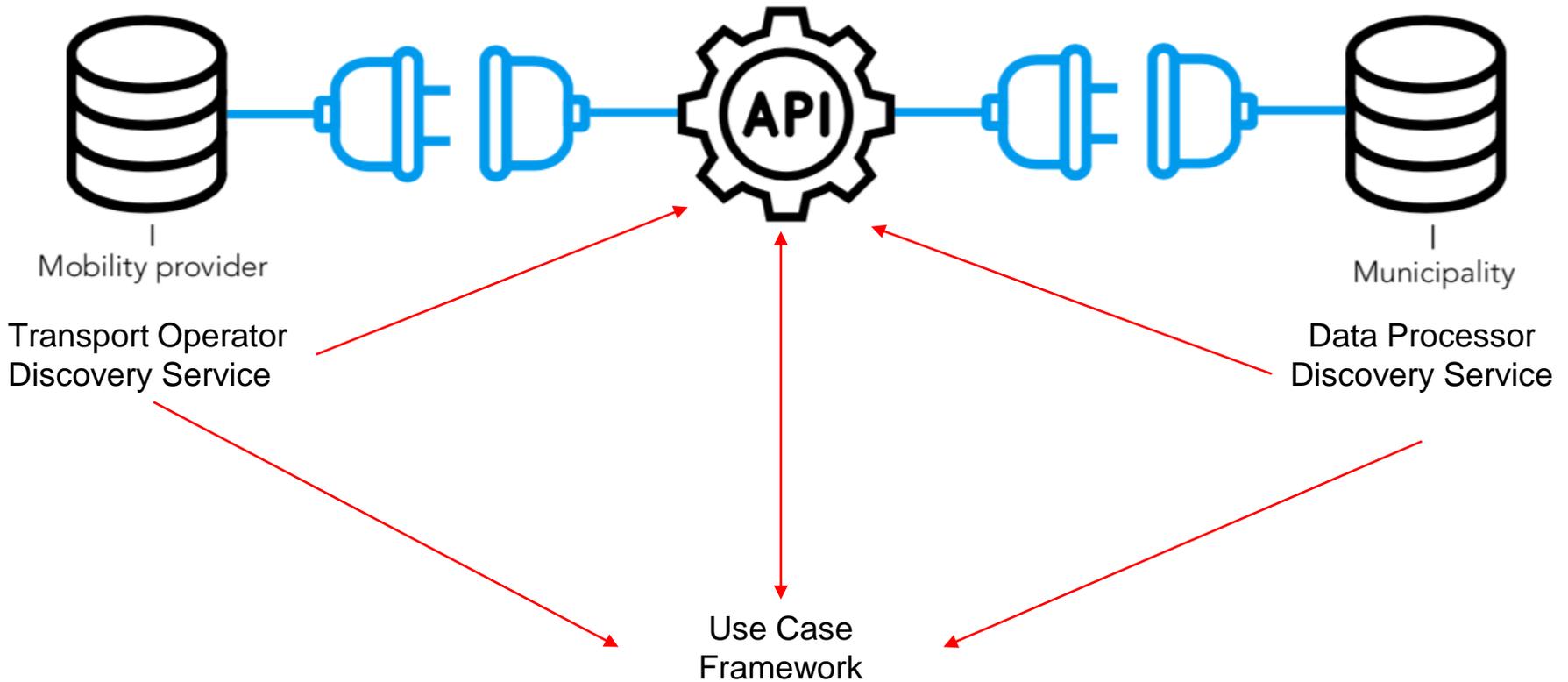
- Requires city infrastructure
- Collects data
- Provides mobility services
- Requires insights

- Provides city infrastructure
- Requires data
- Requires mobility services
- Creates insights

- Share data and insights
- Create better infrastructure
- Ensure high level services
- Improve policy



A marriage of convenience





Applications of data

- **Policy**
 - Parking space performance
 - Car reduction analysis and transit impact analysis
 - Distribution analysis (Inclusion)
 - Parking pressure analysis
 - Event management (dynamic policy)
- **Planning**
 - Urban planning on basis of Demand/Usage
 - Modality specific route development
 - Dedicated pick-up/drop-off/charging/parking zones
- **Enforcement and contract management**
 - Vehicle caps
 - Clustering – sidewalk management
 - Permit area compliance



Data needs

Planning

Enabling cities to better understand public spaces for the adoption and use of multi-modal transport

Enabling transport operators to have a clear understanding of policies that a city has for use of infrastructure

Enabling cities to ensure a high level of service by TOs within a city's boundaries through policy enforcement

Policy

Enforcement



CDS-M and the Smart City

CDS-M is a Smart City application

The AP defines a smart city application as the collection and processing of (personal) data on or in public space through the use of sensors, technology or other applications in order to gain insight into or analysis possibilities for public space, or to make it possible to manage public space. There is a wide range of smart city applications that may fall under this definition. One example is the use of sensors that collect data on traffic. Traffic movements are highly suitable for identifying people. Improper use of such data therefore entails risks for the protection of personal data. The AP uses the term smart city to refer to all public spaces in the Netherlands, including villages, nature and agricultural areas.



Privacy & data protection

Data Protection Impact Assessments under the GDPR

[Article 35 of the GDPR](#) covers Data Protection Impact Assessments. The DPIA is a new requirement under the GDPR as part of the “protection by design” principle. According to the law:

Where a type of processing in particular using new technologies, and taking into account the nature, scope, context and purposes of the processing, is likely to result in a high risk to the rights and freedoms of natural persons, the controller shall, prior to the processing, carry out an assessment of the impact of the envisaged processing operations on the protection of personal data.

Trip data is personal data, pseudonymous data are personal data

Using the Data Protection Impact Assessment as a process



GDPR - Principles of processing personal data

Personal data shall be:

- a) **collected for specified, explicit and legitimate purposes** and not further processed in a manner that is incompatible with those purposes; further processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes shall, in accordance with Article 89(1), not be considered to be incompatible with the initial purposes ('purpose limitation');
- a) **adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed** ('data minimisation');
- a) **kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed**; personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1) subject to implementation of the appropriate technical and organisational measures required by this Regulation in order to safeguard the rights and freedoms of the data subject ('storage limitation');

<https://gdpr.eu/article-5-how-to-process-personal-data/> (Art. 5.1 b, c, e)



Additional data sharing concerns

- Ownership & IP rights
- Trade secrets
- Competition
- Liability
- Stricter rules for certain use cases
- New regulations changing compliance
- Power of authority



Privacy Law

Dutch DPA fines municipality for Wi-Fi tracking

News message / 29 April 2021

The Dutch Data Protection Authority (DPA) has fined the municipality of Enschede €600,000 for using Wi-Fi tracking in the city centre in a way that is prohibited. The Wi-Fi tracking made it possible to track shoppers and people who live or work in the city centre.

In 2017 the municipality of Enschede decided to measure how crowded the city centre was, using sensors. It contracted a company that specialises in conducting people counts.

Sensor equipment was placed in the shopping streets that detected the Wi-Fi signals from the mobile phones of passers-by. Each phone was registered separately and given a unique code.



CDS-M in the EU

■ Opportunities

- Clear use case mapping
- Cooperation among all stakeholders on the 'standard' and 'agreement'
- Strong legal framework
- Reduction of standard specific dialects
- Enhanced harmonization of data
- Works towards the EU Digital Single Market

■ Bottlenecks

- Privacy and purpose discussion
- Trusted third partner for data processing or city based model



CDS-M Use Cases

```
1 {
2   "id": "POL-UC-001-1", // unique identifier of use case definition (WT1)
3   "story": { // WT 1
4     "asA": "string",
5     "iWouldLikeTo": "string",
6     "inOrderTo": "string"
7   },
8   "benefits": [ // WT 1
9     { "to": "cities",
10      "items": [
11        "string",
12        "string",
13        "string"
14      ]
15    },
16   "problemsSolved": [ // WT 1
17     { "to": "cities",
18      "items": [
19        "string",
20        "string",
21        "string"
22      ]
23    },
24   "deliveryStandards": [ // WT 2 & 4 => deliveryStandards renamed to requestedStandards
25     {
26       "standard": "GBFS",
27       "minVersion": "2.0",
28       "maxVersion": "2.2",
29       "endpointModifications" : [{}], // TO D0, look at https://github.com/openmobilityfoundation/mobility-data-specification/issues/608#issuecomment-889167578
30     }
31   ]
32 }
```

Use Case Template

Use case identifier (Gemeente and ID #)		
Item	Description	Notes
As a...		
I would like...		
In order to...		
The definition of done is...		
The benefits to a City are...	1. Benefit 1 2. Benefit 2 3. Benefit 3	
The benefits to a TO are...	1. Benefit 1 2. Benefit 2 3. Benefit 3	

- A product of the CDS-M selection of Standards and Agreement is the **Use Cases Library**. It documents the use cases that have been through all process steps of the CDS-M with appropriate privacy and security measures.
- The Use Case Library is available in JSON and PDF.



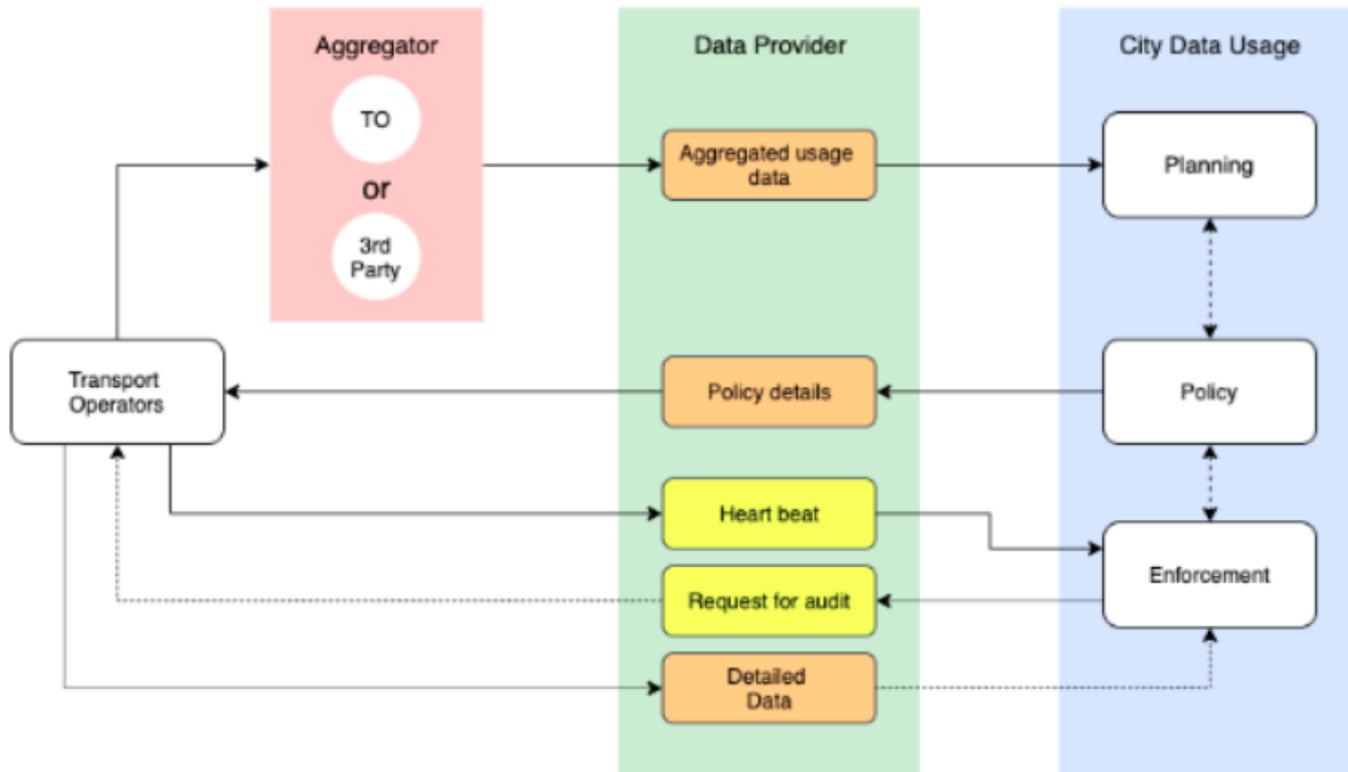
CDS-M benefits

- Provide a framework to fulfill the desire for a network of nodes to provide an interconnect single data market for transport related data
- Offers a build once, deploy often solution by identifying common practices and awareness
- Ensure data is handled in a proportionally necessary way with checks on privacy and security
- Creates trust and openness in a clearly defined framework



Dataflow

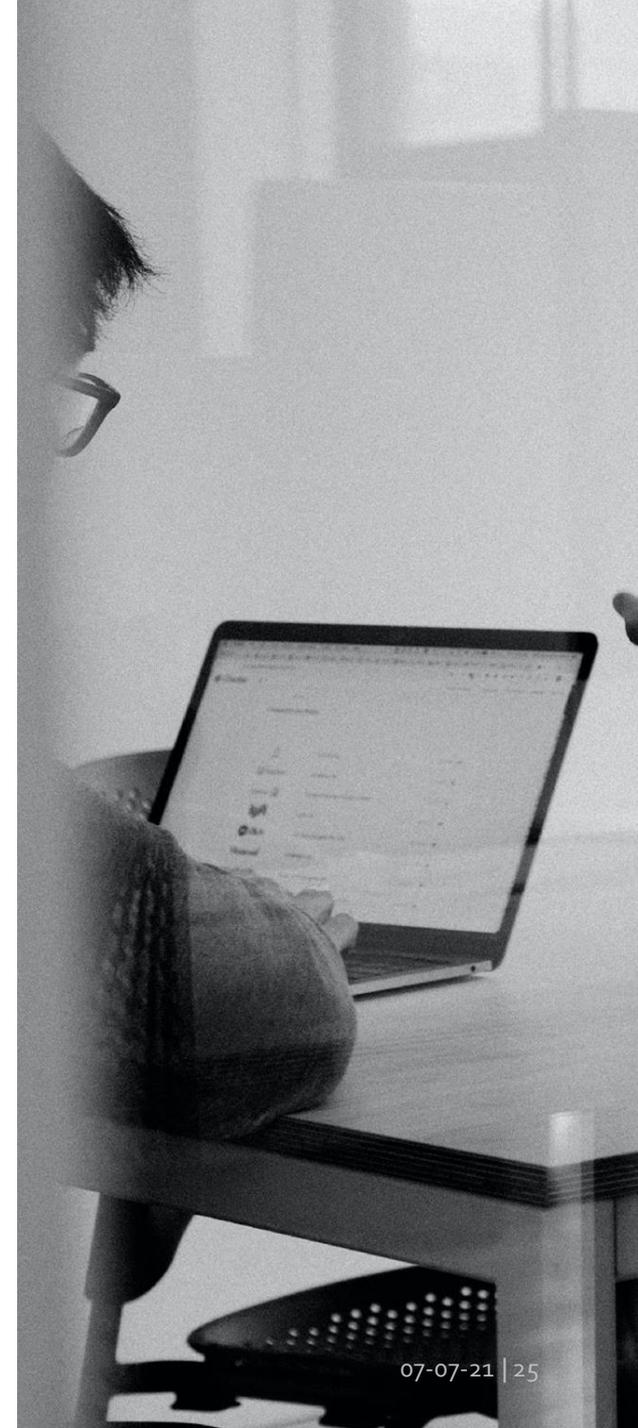
CDS-M Dataflow Diagram



Working Group

Mix of market parties (TOs, data brokers, shared mobility operators), policy makers and experts

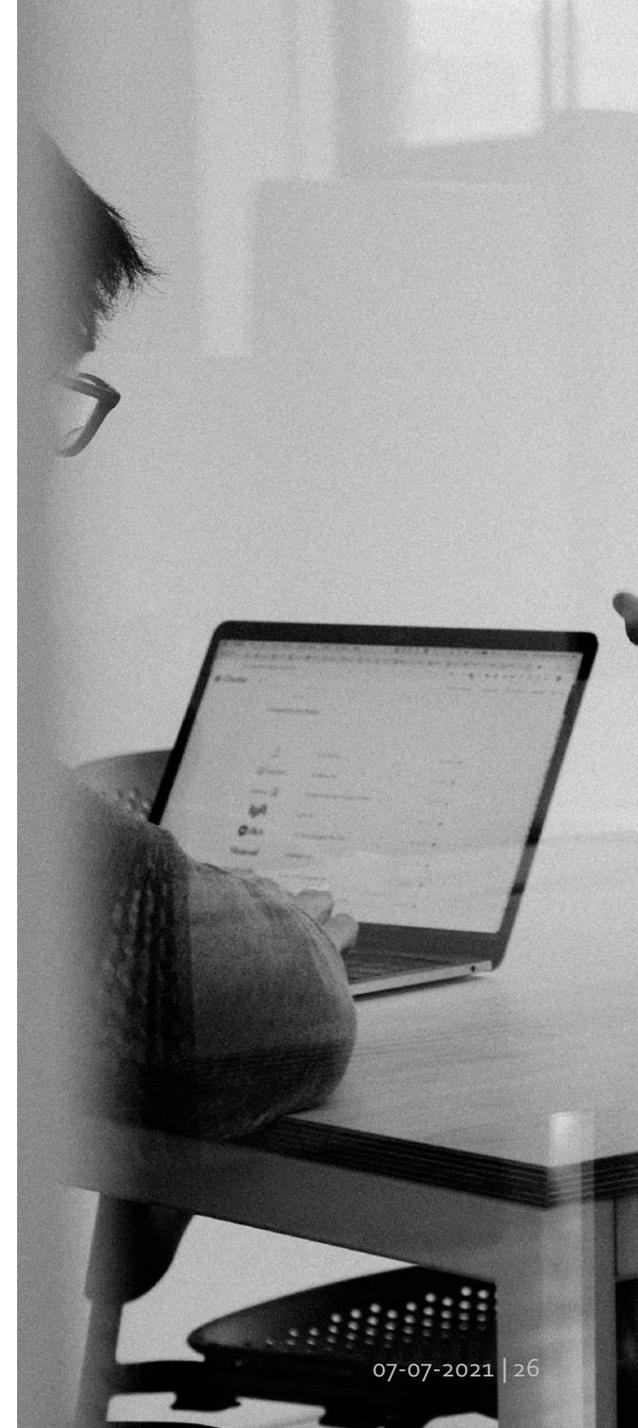
- Legal team
- Technical team: computer scientists
- Governance team
- Analysis team: urban planners and data scientists
- Security team
- Dissemination and communication team
- Standards working team
- monitoring standards; cooperation with CEN, OMF, Mobility Data



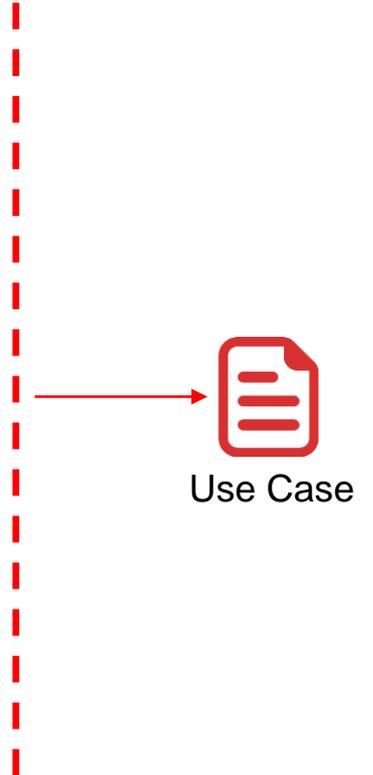
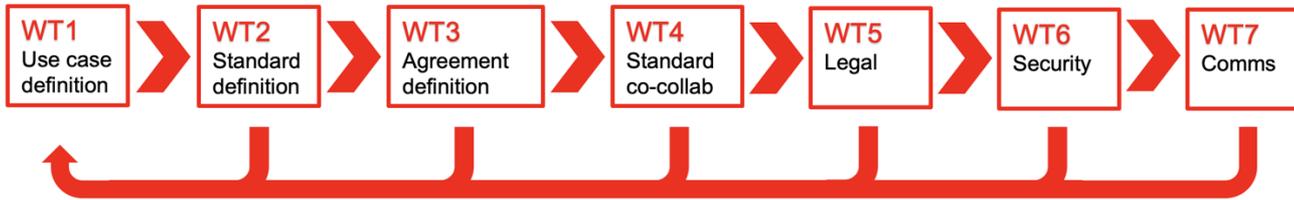
Working Group

Objectives and Outcomes

- The Use Cases (Ucs) drive the objectives of the working group
- Working Teams develop the Standard and the Agreement in their areas of specialism in relation to the UCs
- Create an alignment together to form the UC definition templates with security and legal considerations
- By proxy the outcome is a Use Case using the Use Case Framework
- Delivered via GitHub & Blueprint
- Don't reinvent but adopt and help adapt!



Process flow





Data sharing benefits

- Standardised practice around mobility data collection
- Ability to cross pollinate data in a meaningful and efficient way
- Identification of best standards for specified use cases to bring clarity to policy makers
- Clear understanding of compliance requirements relating to GDPR and security
- Clear understanding of Agreements for data sharing beyond the original scope
- Discovery services enable plug and play for smaller organisations with minimal to no budget for smart city mobility regulations



Planned infrastructure

- Invite is open to all parties who have a relevancy to the Working Team (WT) in which they
- Each WT will focus on their specialism and report back to the Working Group (WG) at the bi-weekly meeting
- Bi-weekly meeting will assess and address activities for each WT
- WG will co-ordinate all activities of the WTs to further extend the specification framework via GitHub and The Blueprint
- GitHub and The Blueprint are the core documents to be produced and maintained by the WG

Pilots

- **Amsterdam**
 - Shared e-scooters (mopeds)
- **Utrecht**
 - Shared cargo bikes
- **Eindhoven**
 - eHubs & shared scooters





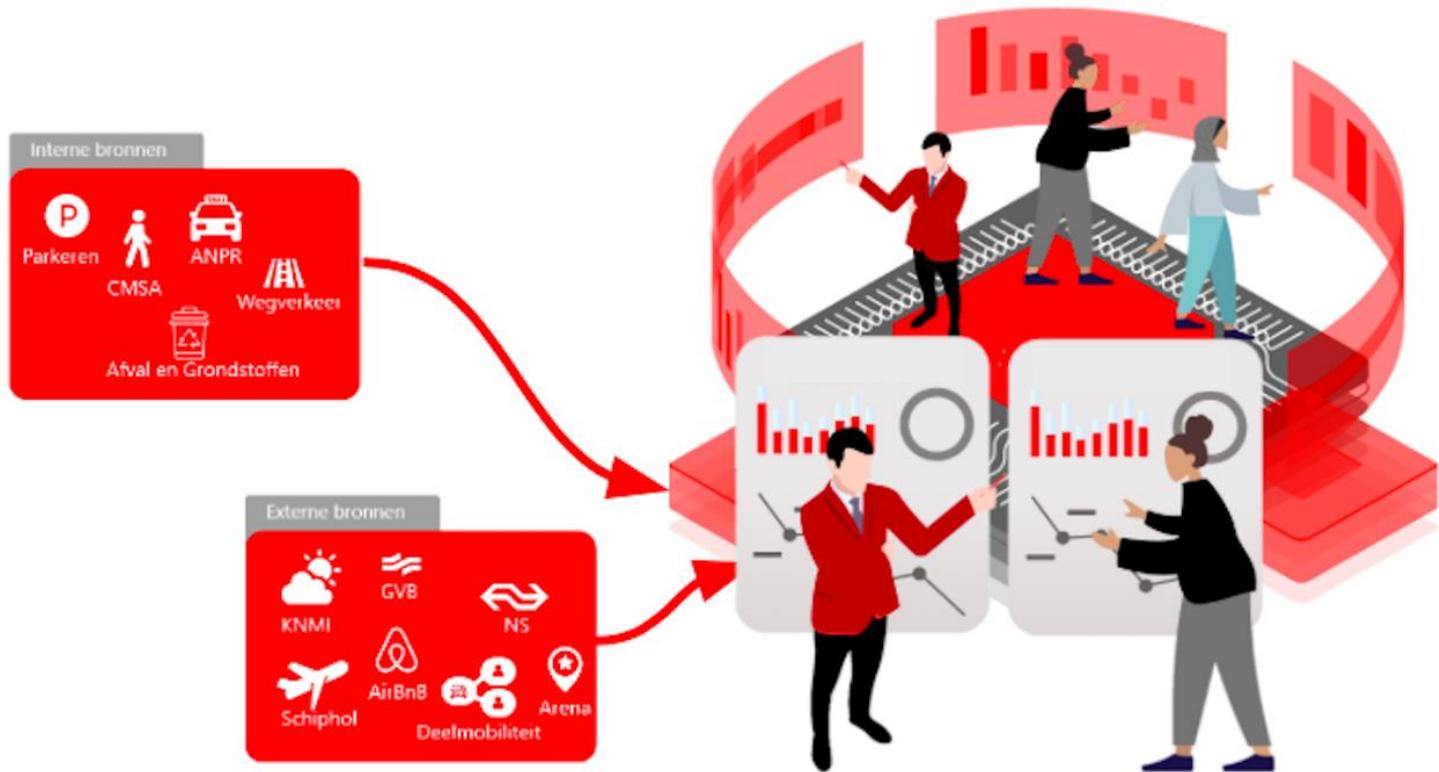
Resources

Swagger Defintion - <https://app.swaggerhub.com/home#/CDS-M/>

GitHub Repository - <https://github.com/CDSM-WG/CDS-M>



Questions / Discussion





CDS-M

City Data Standard - Mobility

Thank you!