Please send feedback before 4th of February

Can you as an operator work with the following timeline?

- End of March: all operators implement specs as described by CROW Guidance Document

- Q2 all operators implement MDS Provider API with Vehicles and Trips Endpoint

Feedback and General Tech questions - 10.2.e
10.2.e @amsterdam.nl

Hardcore Tech questions - 10.2.e (CROW)
10.2.e @transbits.nl

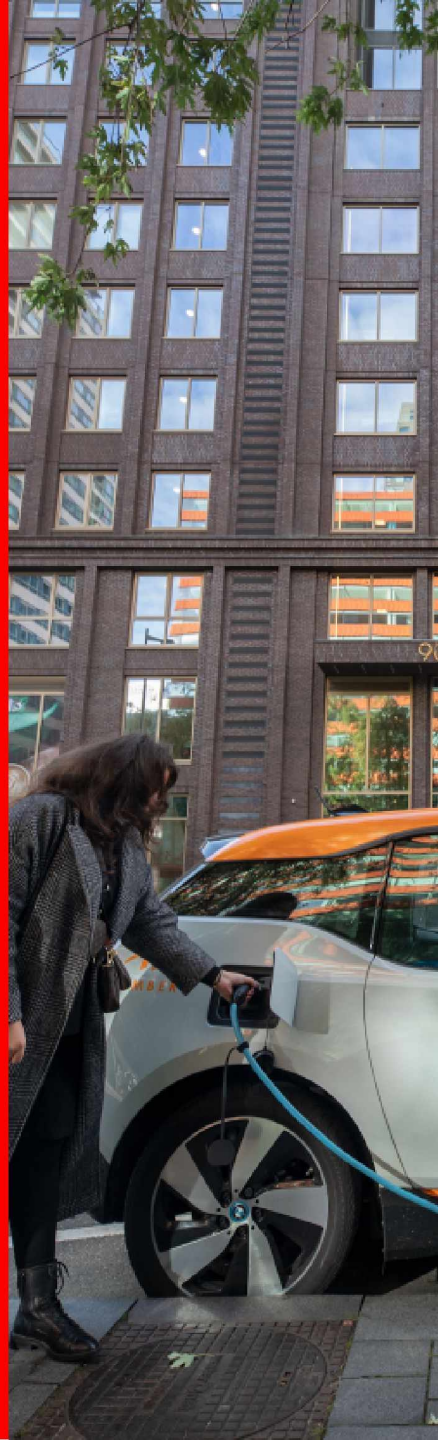
Gemeente
Amsterdam

City Data Standard – Mobility

Pilot phase Use Cases in Amsterdam, Eindhoven and Utrecht



26-1-2022



Introduction

- An open data standard for a more standardised exchange of data between operators and cities is needed to scale up shared mobility.

- Feedback from operators:
  - Nice effort, but please provide some more context on (roadmap) CDS-M
  - Initiatives of CROW and CDS-M need to be more aligned (for all parties).

- Two different but aligned tracks in CDS-M process:
  - (General) development of the standards / agreements / DPIA / EU, etc.
  - This pilot phase: testing first API's and dashboarding

- CDS-M is part of:
  - National Governance framework on MaaS standards (together with TOMP-API, etc.).
    - Strategic board, change advisory board, working teams.
  - National program on Shared Mobility ('Natuurlijk Deelmobiliteit').
  - Local / regional policies and permits in the near future.

Introduction

The purpose of this meeting:

- Provide more context on CDS-M
  - Including an update on how we are more aligning the different initiatives (CROW, CDS-M) in standardising data exchange and dashboarding.
- Start up the pilot phase for testing CDS-M (and dashboarding)
  - Make clear what's expected, needed and planned
  - To get your feedback on this!
- Answer all the questions that arise 😂

Today

- Introduction ([redacted]) – 5 min
  - why this meeting and it's purpose?
- Context, ingredients and future of CDS-M ([redacted]) - 15 min
  - recap CDS-M
  - partners Vianova & CROW
  - future of CDS-M
- Introduction pilot phase of the use cases ([redacted]) – 10 min
  - Vision, goals, questions, metrics
  - MDS vehicles and trips endpoint
  - timeline integration and evaluation pilots
- Discussion and agreements for following up (20 min)
- Final remarks and closing (5 min)

Recap on the CDS-M project: why, how, what

CDS-M our purpose

City Data Standard - Mobility

The aim is to work towards a standard European framework around data sharing supported by mobility operators and public authorities.

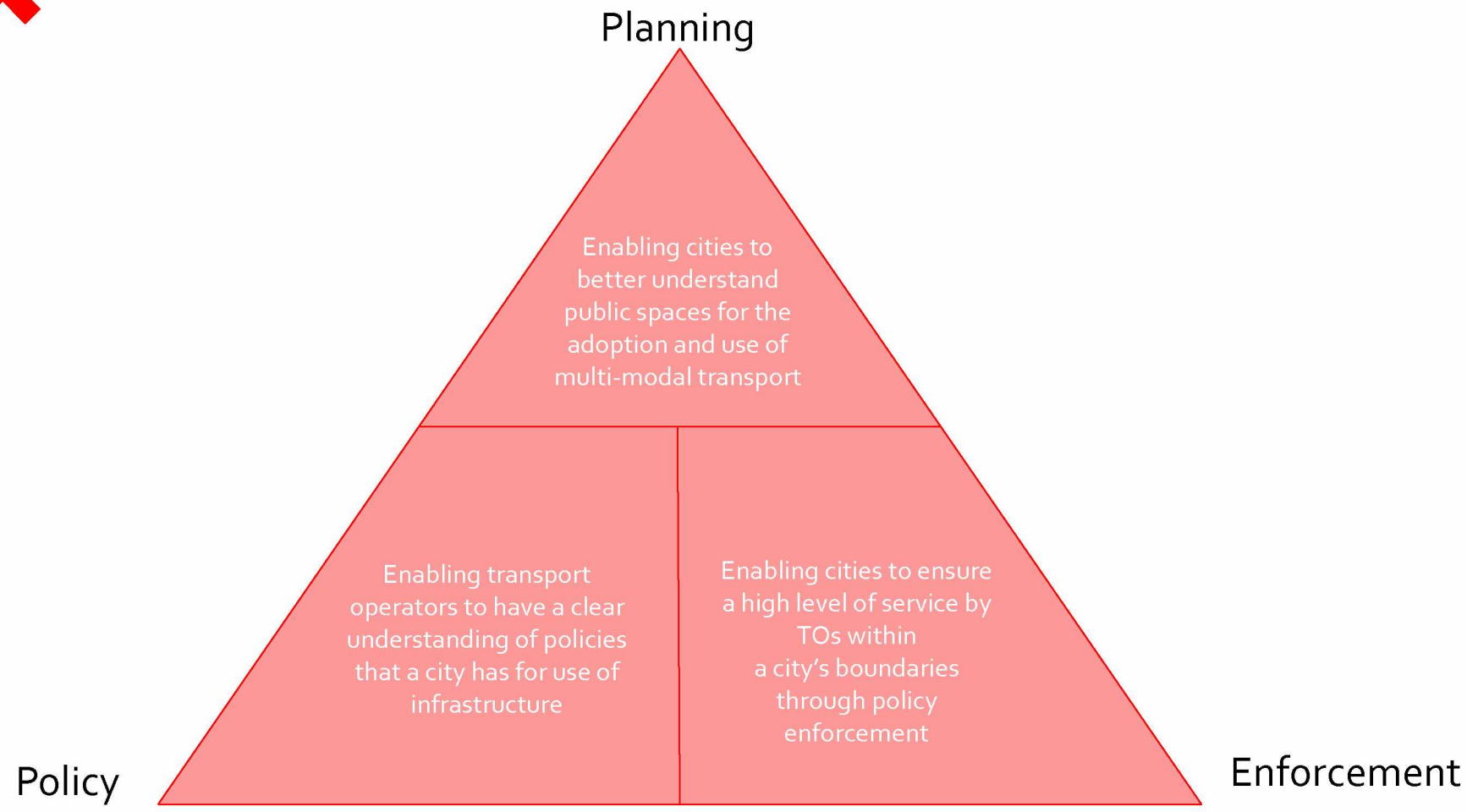
A framework that strengthens cooperation among actors and enables scale up of new mobility solutions in a sustainable way.

CDS-M
City Data Standard - Mobility

Why?

- A single CDS-M will clarify which data may be processed for which purpose/use case in terms of privacy;
- and how data should be processed, stored and exchanged safely.
- The CDS-M framework is a standard way of handling data, resulting in delineated data requirements per use case. It also clarifies which data can be used for which policy purpose.
- By linking the data requirements to the use cases, it is possible to compare data from different cities with the same use cases and learn from each other.
- Because the CDS-M framework requires policy-makers to think about which metrics achieve which use cases and policy goals (purpose reasoning), research into the effect of shared mobility on the city is done in a focused way.

Why data sharing?



Why data sharing?

- **Policy**
  - Clustering – sidewalk management
  - Dynamic vehicle caps/ distribution requirements
  - Car reduction analysis and transit impact analysis (modal split)
  - 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
  - Parking space performance

- **Enforcement and contract management**
  - Vehicle caps and permit area compliance

Gemeente
Amsterdam

Enforcement of what?

Monitoring the **operator's** performance and compliance,

not the behaviour of citizens

CDS-M is a requirement for the next permit round.

A marriage of convenience



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

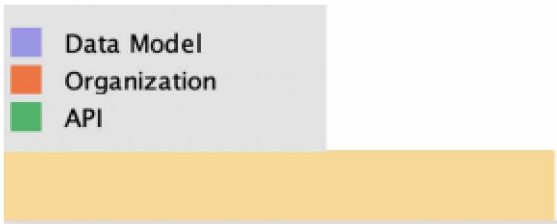
- Provides city infrastructure
- Requires data
- Requires mobility services
- Creates insights

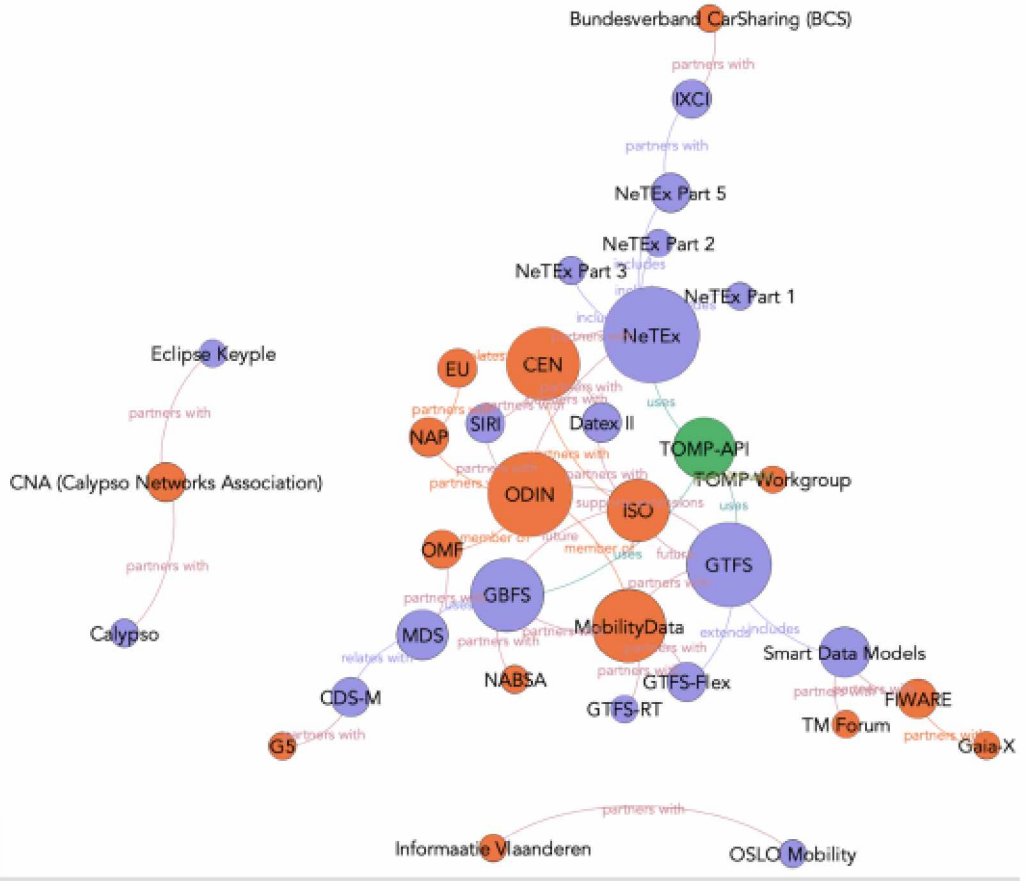
- Share data and insights
- Create better infrastructure
- Ensure high level services
- Improve policy

Existing standards

MaaS ALLIANCE

MaaS Data Model Ecosystem

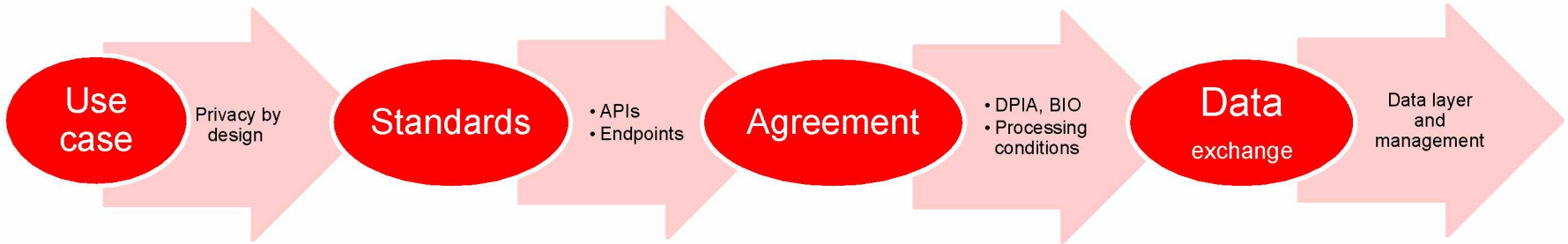




Existing standards

No single specification fits all use cases

Proces flow CDS-M



Design CDS-M

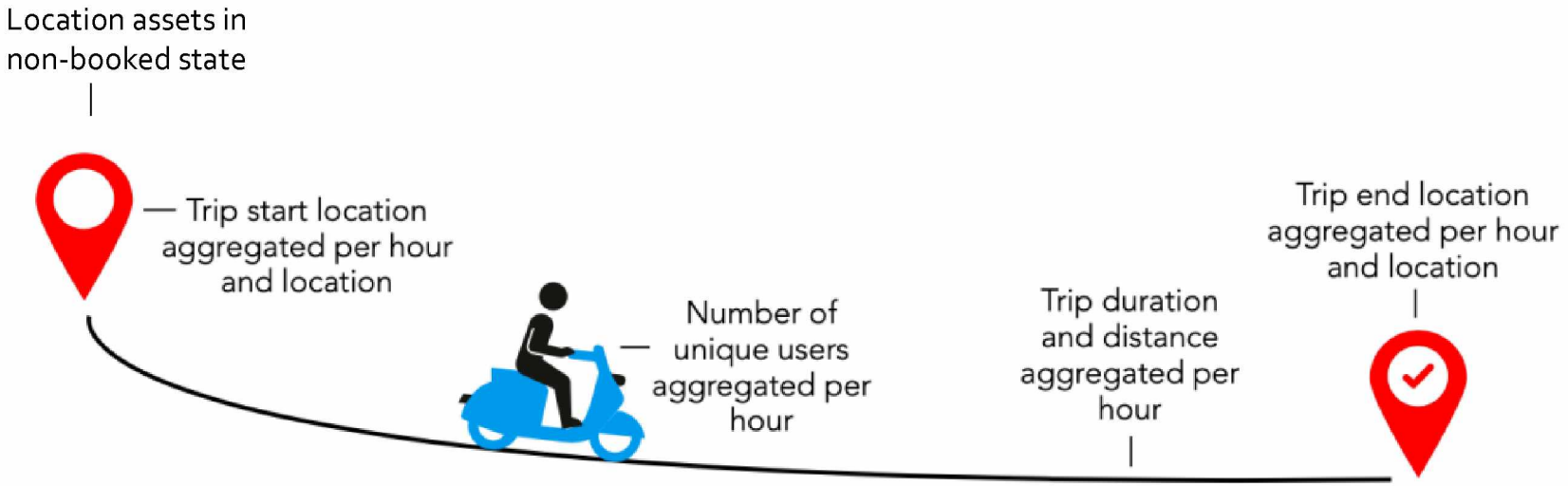
The Standards

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. The standards are linked to suitable use cases.

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.

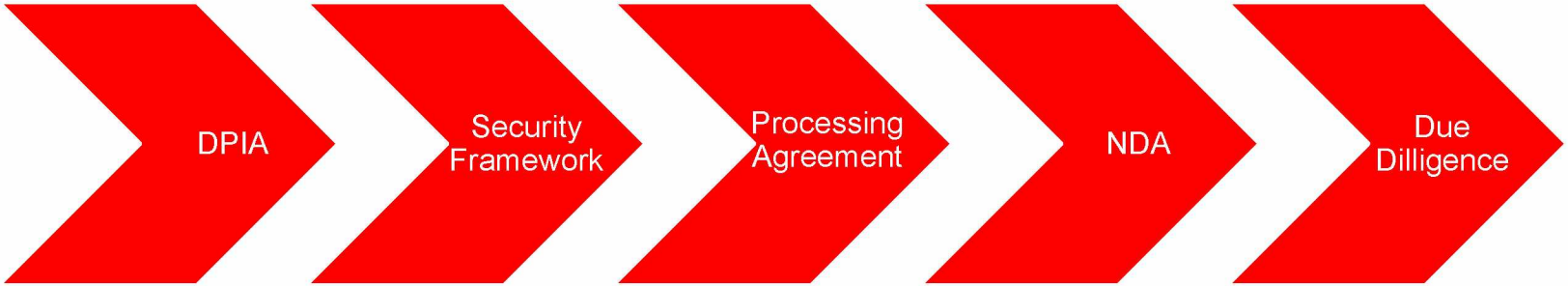
The Standards



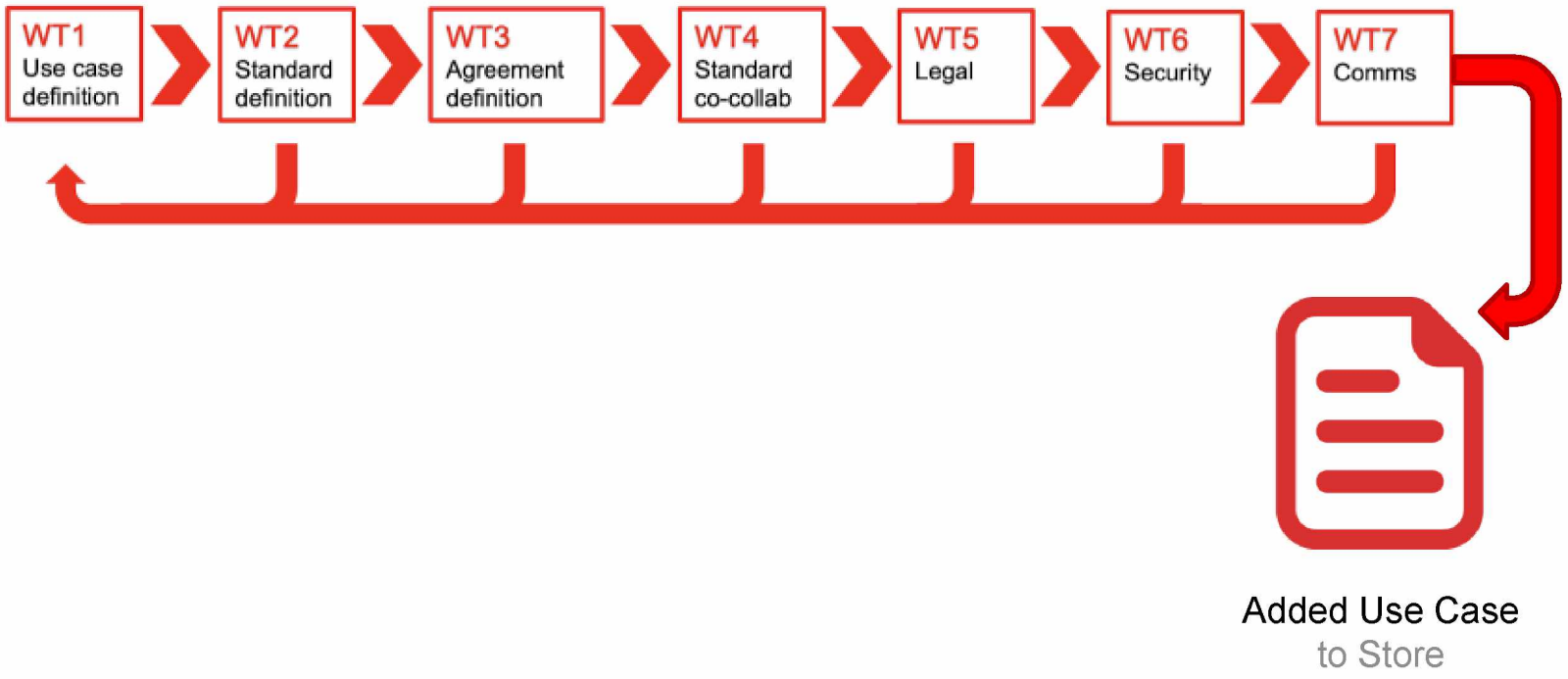
- TOMP-API
- GBFS
- MDS provider – trips and vehicles endpoint
- MDS metrics
- SIRI (NeTEx)
- GTFS
- DATEX II

The Agreement

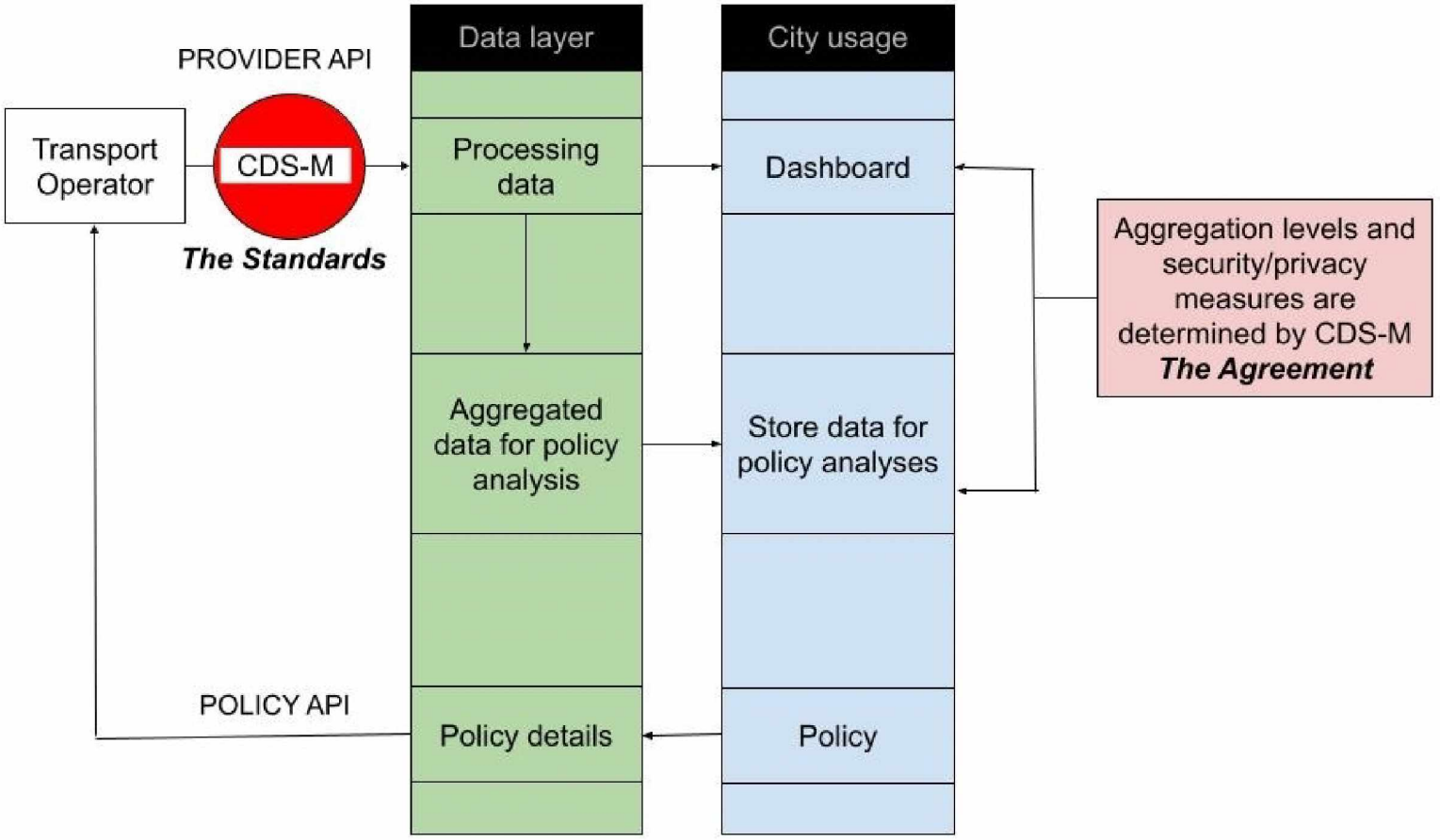
- The Agreement arose from European requirements and legislation.
- It describes documenting steps that must be undergone in order to achieve a **high quality and secure exchange of data**
- The Agreement consists of a DPIA template, a Security Framework consisting of a Baseline Information Security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



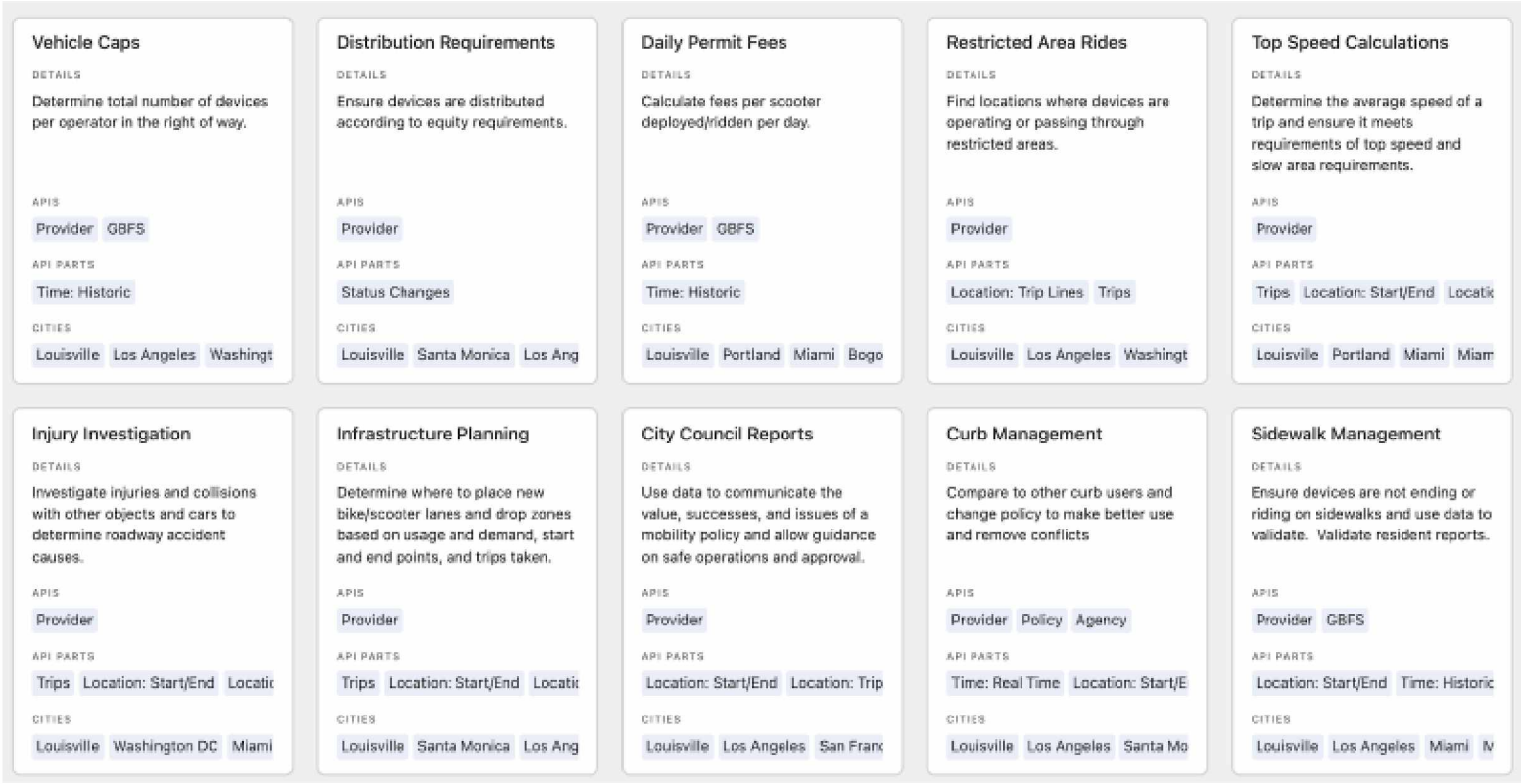
Use case store



Dataflow

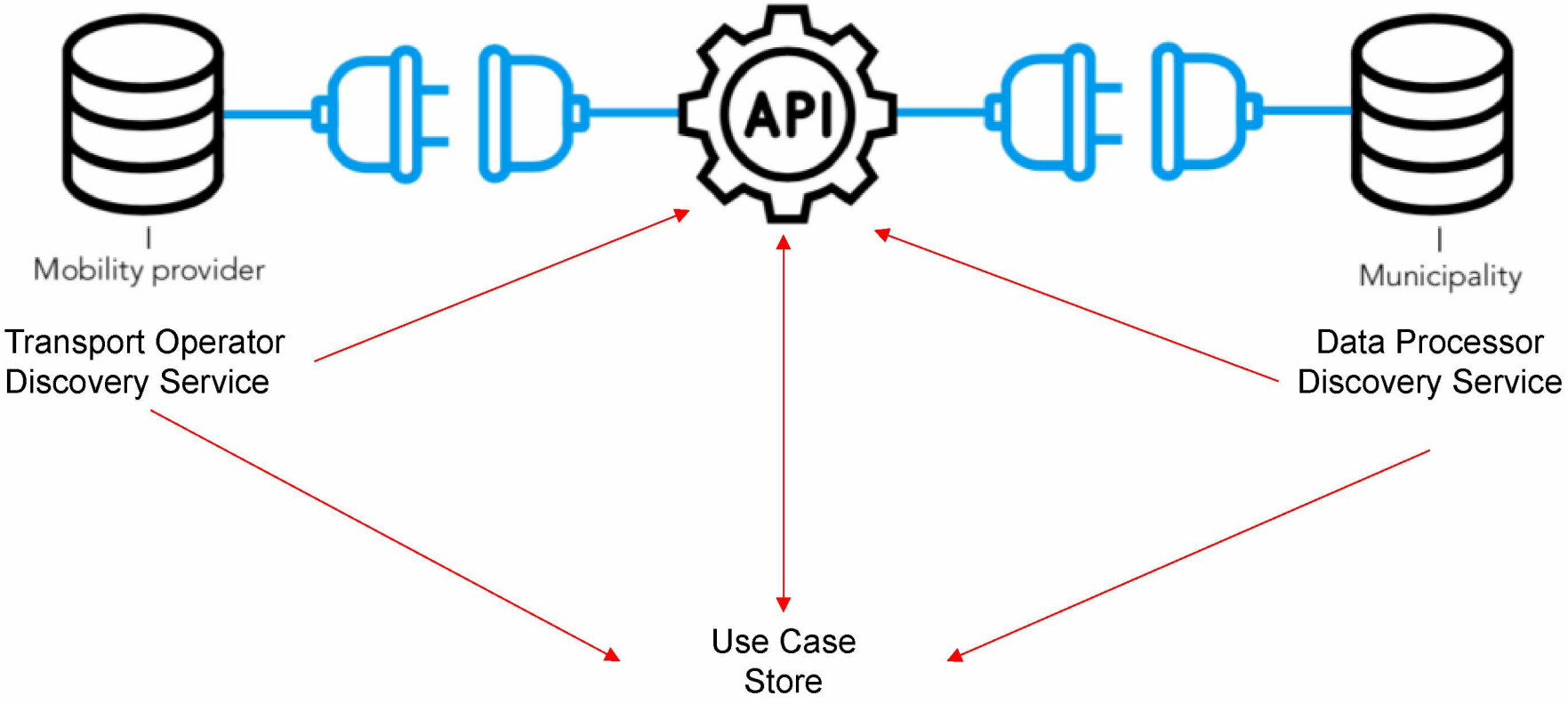

PROVIDER API
Transport Operator
CDS-M
The Standards
Data layer
Processing data
Aggregated data for policy analysis
Policy details
POLICY API
City usage
Dashboard
Store data for policy analyses
Policy
Aggregation levels and security/privacy measures are determined by CDS-M
The Agreement
Data layer can be hosted by a 3rd Party or the City

Use case store



- Extended with other modalities, specifications (APIs and Endpoints), agreements and privacy – and security considerations.

Use case store



Example use case store

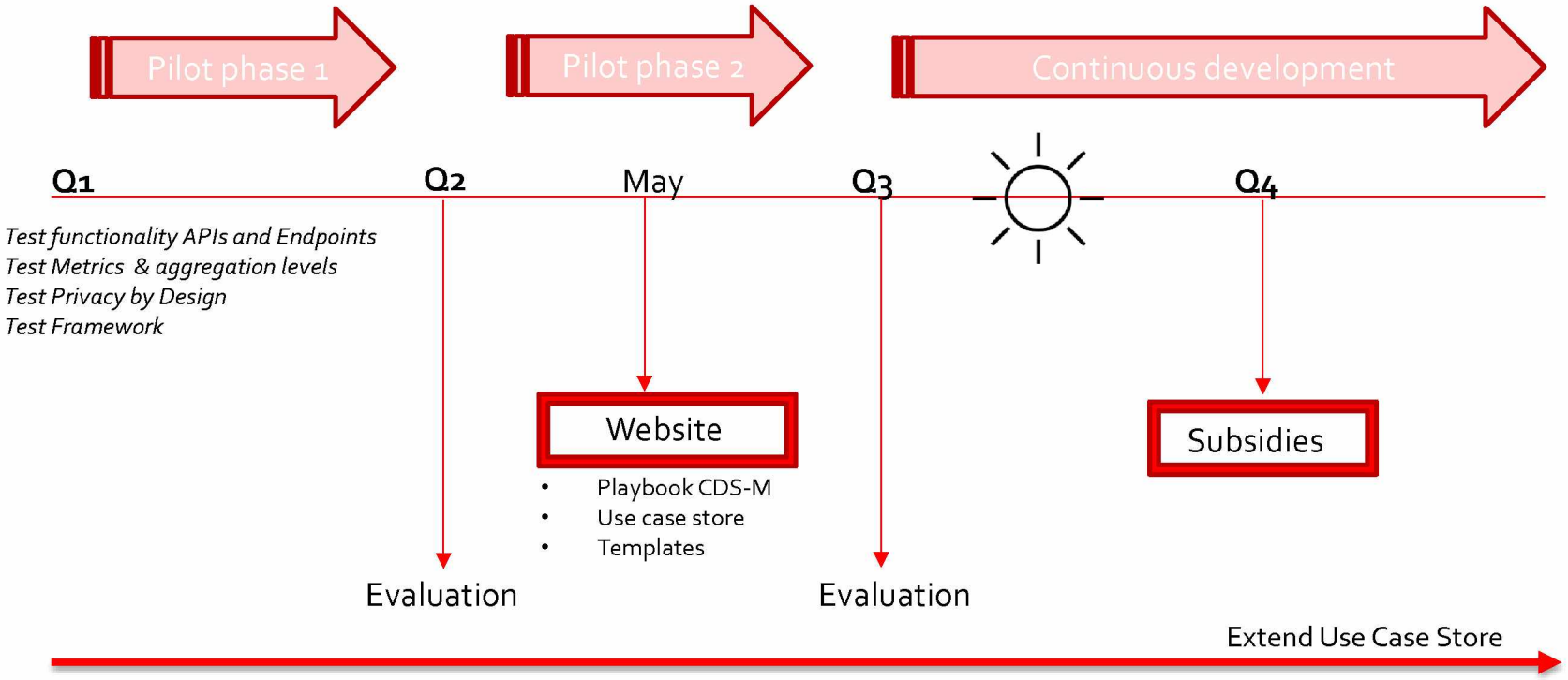
Use Case Template

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*	

- AirTable
- Discovery API

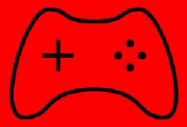


Roadmap CDS-M



Outlook CDS-M

Website with process flow, playbook CDS-M, and use case store

Click and play 

We start small, focused on:
Shared mobility
Pilots in the G-5
Dashboarding Vianova & CROW

Dashboarding

Our objective is to make data sharing easier

First steps towards making dashboarding easier:

- Unify data requirements for research, cities and 3rd party processors
- Unify metrics and aggregation levels
- Unify data sharing contract agreements

First in the Netherlands, end of 2022 focused on Europe



Cities and the CROW shared mobility dashboard unify data requirements on the basis of use cases

- Preferred MDS Provider API with Vehicles and Trips Endpoint
- Optional TOMP/GBFS with static ID

https://docs.crow.nl/deelfietsdashboard/hr-dataspec/

Now: the pilot phase of Use Cases in Amsterdam, Eindhoven and Utrecht

Vision

- Cities with a high quality of life and an accessible, sustainable mobility system ↓

Goals

- Give shared mobility the right place and role in the mobility system ↓

Questions

- How do we organise shared mobility so that it fits in with our vision? ↓
  - Vehicle Cap
  - Service area, parking zones, hubs
  - Usage / Modal split

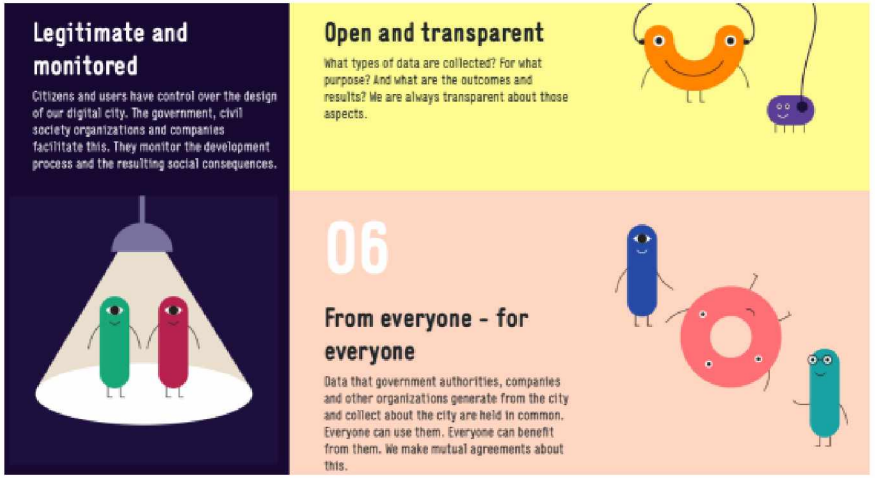
Metrics

- Device rotation, clustering, origin-destination matrix, duration and distance trips, number of assets, infringements ←

Learning objectives

- Learn how to work with data driven policy analysis and development
- Learn how to bring shared mobility to its highest potential
- Learn how to work with the CDS-M framework
- Learn what value we can give back to the operators
- Learn how to communicate findings and publish shared mobility data as open data

'data from everybody for everybody' – Manifest TADA



https://tada.city/en/home-en/

Goals pilot phase with Use Cases

- Experimenting with the use of CDS-M in terms of:
  - (parts of) the existing API's (GBFS v1, MDS Provider)
  - The agreements (DPIA, NDA, etc.)

- Experimenting with mobility platform (Vianova) to determine
  - How shared mobility moves through the city;
  - What the service area should be;
  - What the vehicle cap should be (dynamic/static);
  - Where to create parking zones;
  - And where to create hubs;
  - **Modal shift.**

- Gain insight in the impact of data sharing for all involved parties
  - Get to know the benefits and risks of standardizing shared mobility data.
  - Get feedback on the approach.

Use Cases Overview

The uses cases as provided by the three cities are as follow:

Policy

- *Vehicle distribution analysis (Inclusivity and impact on public transport)*
- *Analysis on use of public space*

Planning

- *Urban (mobility hub) planning on basis of Demand/Usage*
- *Modality specific route development*

Enforcement and contract management

- *Vehicle caps*
- *Clustering – sidewalk management*
- *Permit area compliance*

What is in it for you?

- Learn how to work with the designated APIs and CDS-M, both requirements of upcoming permit tenders
- Learn how to cooperate with cities to bring shared mobility to its highest potential
- Show aldermen and policy makers the value of shared mobility through data
- Communicate what information/cooperation from cities are of value to **you**

Collaborating in this pilot phase

- Ministry of Infrastructure and Waterways
- Three different cities: Amsterdam, Eindhoven and Utrecht.
- Rotterdam starts Pilot Proces 27-01-2022
- Eight different operators: Check, Felyx, TIER, Cargoroo, Mywheels, Greenwheels, Go Sharing and Amber.
- Vianova, as a mobility platform provider for the cities
- CROW as knowledge platform

Cooperation CROW

2. Data specifications

The operator *MUST* provide data conforming to one of the below described specifications.

Customized feeds *MAY* be implemented as an alternative to MDS.

Standard	Note
MDS	Preferred.
GBFS	Requires a customized feed for CROW deelfietsdashboard.
TOMP	Requires a customized feed for CROW deelfietsdashboard.

{.data}

MDS Provider API

Vehicles Endpoint

§ 2.2 MDS

Based on endpoint specification: `/vehicles`.

Below fields *MUST* be supplied for the Deelfietsdashboard. Other field *MAY* be filled and indeed are required by the MDS specification.

Value	Note
`current_location`	always *REQUIRED*
`device_id`	always *REQUIRED*
`last_event_location`	always *REQUIRED*
`last_event_types`	always *REQUIRED*
`last_vehicle_state`	always *REQUIRED*
`propulsion_types`	always *REQUIRED*
`vehicle_type`	always *REQUIRED*

MDS Provider API

Trips Endpoint

Trips

A trip represents a journey taken by a *mobility as a service* customer with a geo-tagged start and stop point.

The trips endpoint allows a user to query historical trip data.

Unless stated otherwise by the municipality, the trips endpoint must return all trips with a `route` which intersects with the municipality boundary.

Endpoint: `/trips`
Method: `GET`
Beta feature: No
Schema: `trips` schema
`data` **Payload:** `{ "trips": [] }`, an array of objects with the following structure

https://github.com/openmobilityfoundation/mobility-data-specification/blob/main/provider/README.md

Why MDS Provider API?

- MDS is tailored towards policy making
- Future development MDS in right direction
- Close collaboration CDS-M and Open Mobility Foundation
- Vehicles endpoint shows more states and events + is suitable for research due to static ID
- Trips endpoint shows true amount and duration of trips → enhanced data quality and data validation

Comparing MDS *Vehicles* to GBFS *free bike status*

Both MDS *Provider Vehicles* and GBFS *free bike status* offer real-time information about vehicles deployed on public streets. The chart below shows key differences between the MDS *Vehicles* endpoint and GBFS *free bike status*.

	MDS - Provider vehicles (*v1.0.0*)	GBFS - free_bike_status (*v2.1rc*)
Identifier	Unchanging vehicle ID	Randomized vehicle IDs
Vehicle State	5 states including removed, on trip, outside jurisdiction, or unknown.	4 combinations via available and disabled states
Vehicle Event	26 events including rebalancing, maintenance, off hours, reserved, cancelled trips, comms lost, and low or charged battery	*Not applicable*
Visibility	Private: for internal city management and policy enforcement	Public: visible to all

Evaluatie pilot

- Have the learning questions been answered? What did we find?
- Are data sharing requirements and technical standards S.M.A.R.T?
- How did the collaboration go? What could be better?
- Are the operators comfortable with the requested data? Do they see the value?
- What can cities give back to operators in terms of information/cooperation?
- How will we evaluate in the future? How often and in what way?
- Technical integration questions? → CROW

Timeline roadmap and expected results

Total pilot phase is due for Q2 2022 and layed out in two:

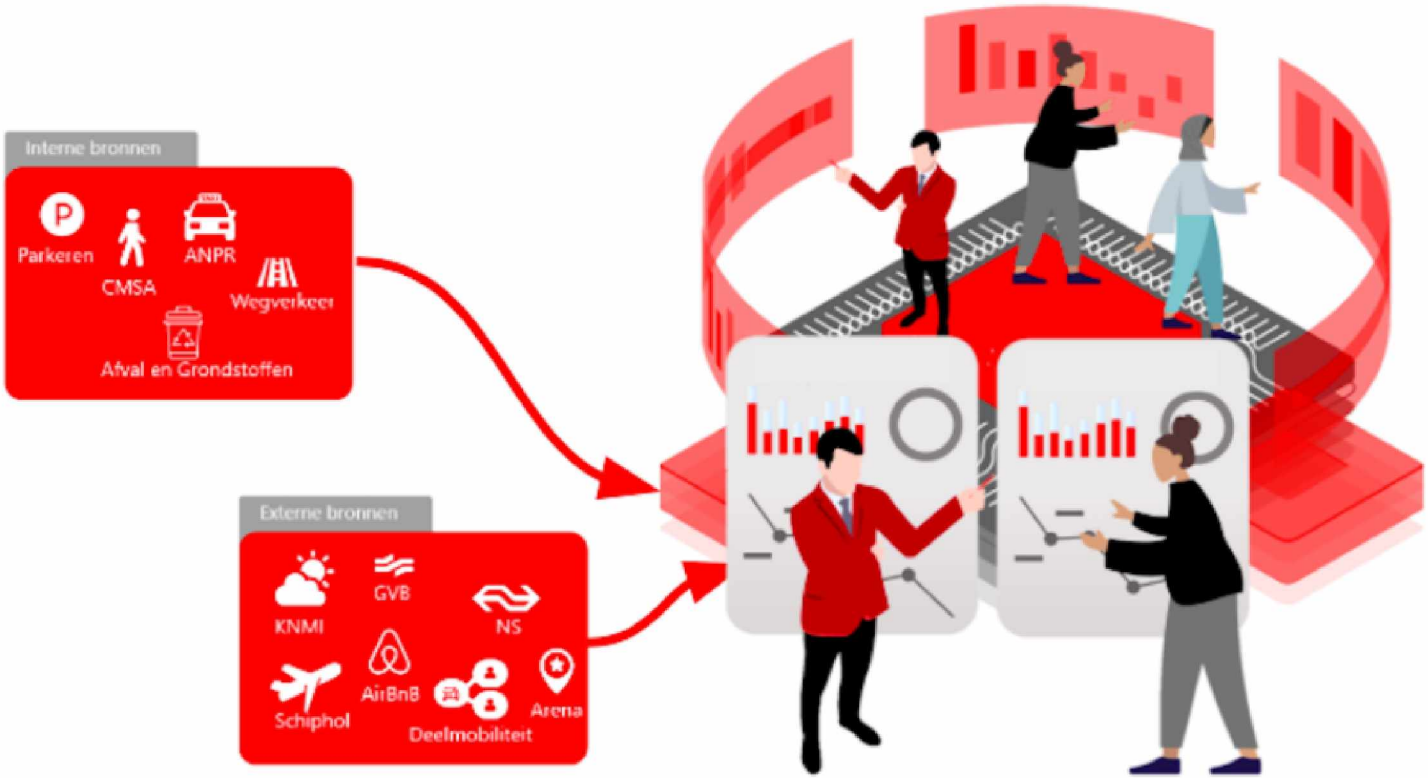
Pilot Phase 1: until 31 March 2022

- GBFS v1 integration operators shared e-bikes and e-mopeds with Vianova
- MDS Provider API for carsharing operators
- Evaluation beginning of April

Pilot phase 2: April until 30 june 2022:

- MDS tutorial by CROW for operators start of April
- MDS integration for all the operators (cars, bikes, mopeds, etc.).
- Evaluation in July

Questions / Discussion



CDS-M

City Data Standard - Mobility

Thank you!

National Governance on MaaS Standards

- **CDS-M as part of DEMS** - Datagedreven Ecosysteem Mobiliteit en Smart City
- **Strategic committee Min I&W on MaaS standards Vervoerregio Amsterdam**
  - **Donkey Republic**
  - **Municipality of Utrecht**
  - **9292OV**
  - **TCA**
  - **Arriva**

- **Change Advisory Board Min I&W**
  - 10.2.e
  - 10.2.e
  - 10.2.e
  - 10.2.e

- **Working Groups** (definition, improvement, alignment and dissemination)
  - **TOMP**
  - **CDS-M** (opens May 2022)

WG is open for all stakeholders!