Mobility Data Space on Traffic Counts

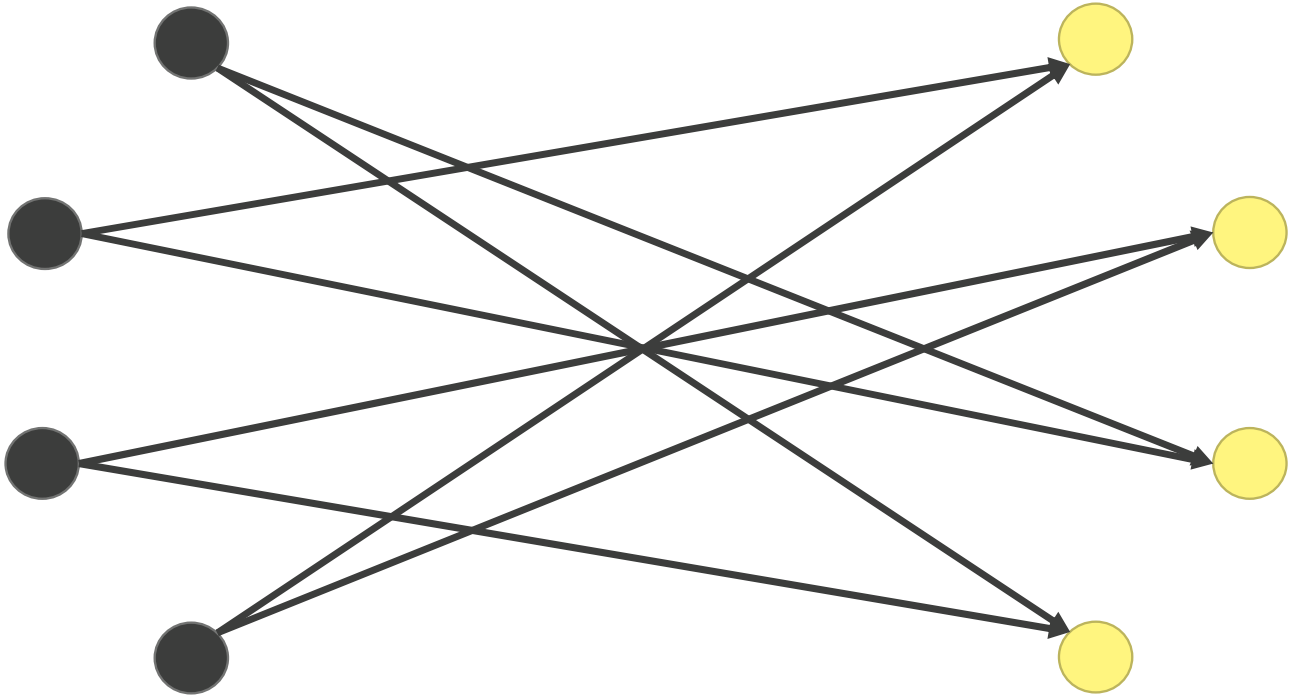
Flanders Demo

Steven Logghe

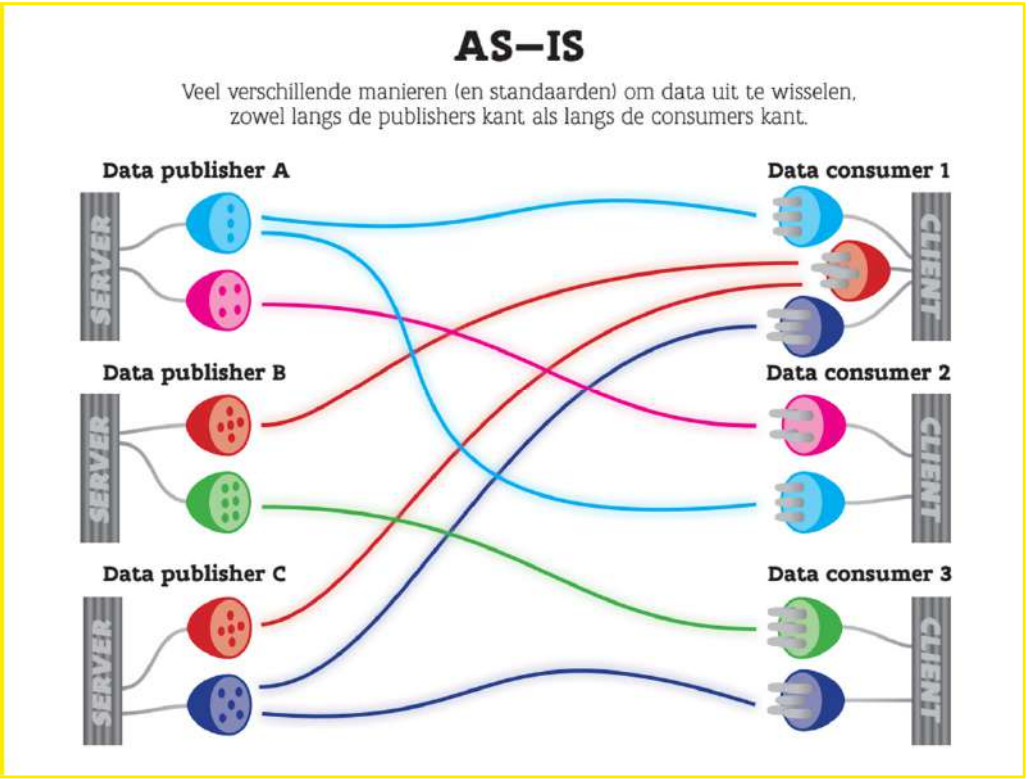
DIGITAAL VLAANDEREN | Vlaamse overheid

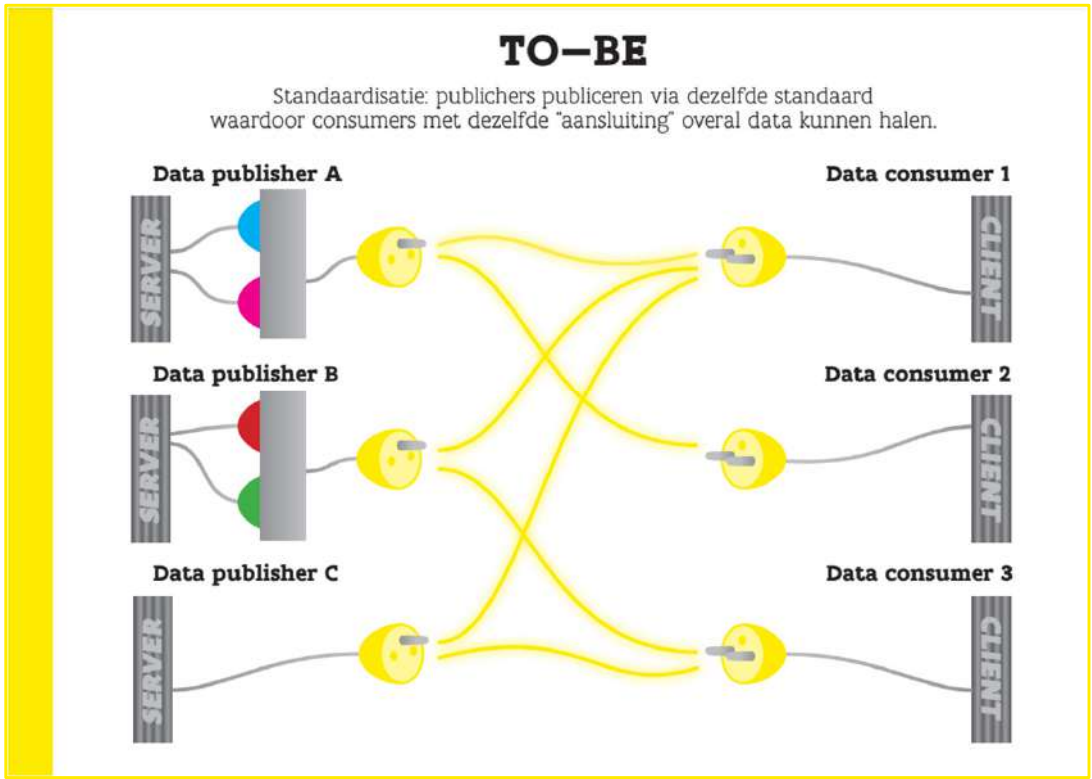
Data exchange with a Data Space

Decentral approach within an ecosytem to share data => Vlaamse Smart Data Space – Digital Flanders



- Data Space -


AS–IS
Veel verschillende manieren (en standaarden) om data uit te wisselen,
zowel langs de publishers kant als langs de consumers kant.
Data publisher A
Data publisher B
Data publisher C
Data consumer 1
Data consumer 2
Data consumer 3
SERVER
CLIENT


TO–BE
Standaardisatie: publichers publiceren via dezelfde standaard
waardoor consumers met dezelfde "aansluiting" overal data kunnen halen.
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Traffic Measurements

Measuring the number and speed of vehicles, bikes and pedestrians in a certain location.

Different measuring techniques and sensors, each with their own strong points.

A number of different data protocols

Over 500 different organisations in Flanders

Used for a wide range of use cases

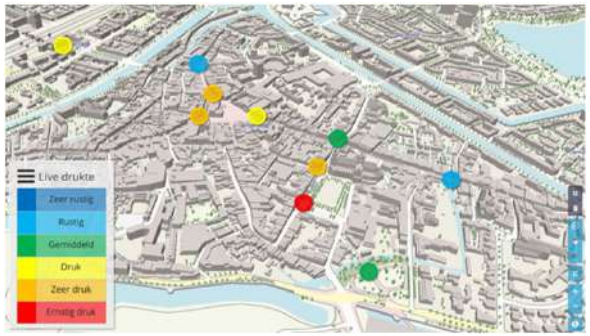
Use Cases

Within mobility:

- **Control systems:** such as traffic lights, lane signaling, parking guidance…
- **Monitoring and evaluation:** statistics, policy KPI's, evolutions, impact measurements
- **Visualisation:** overview of current traffic situation, dashboards and mapping applications
- **Simulations:** traffic models, digital twins, scenario analysis

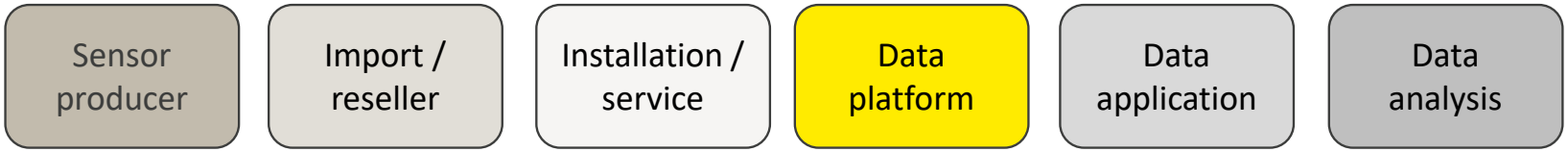
Outside mobility:

- **Environment:** emission modeling and calculation
- **Spatial planning:** impact during permit processes (fc MOBER)
- **Retail and economic policy:** monitoring of locations, modeling retail flows
- **Tourisme:** monitoring and analysis
- **Advertising:** audience measuring (viewer ratings) of out-of-home advertising



Value chain traffic measurements

If you need traffic measurements, you have to buy them

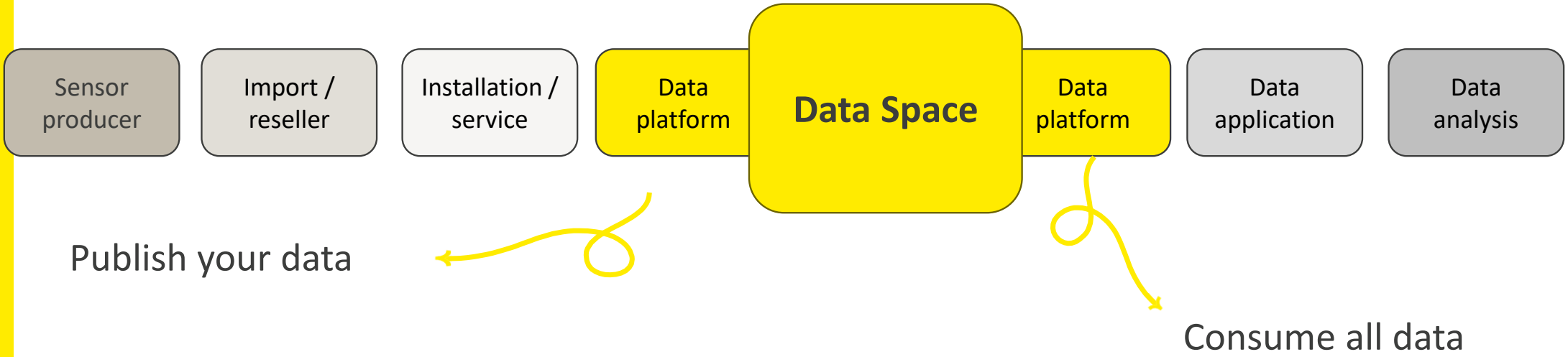


Linear value chain

Can we change this and re-use traffic measurements?

Data Space as a solution

Introducing a data space leads to re-use of data from traffic measurements

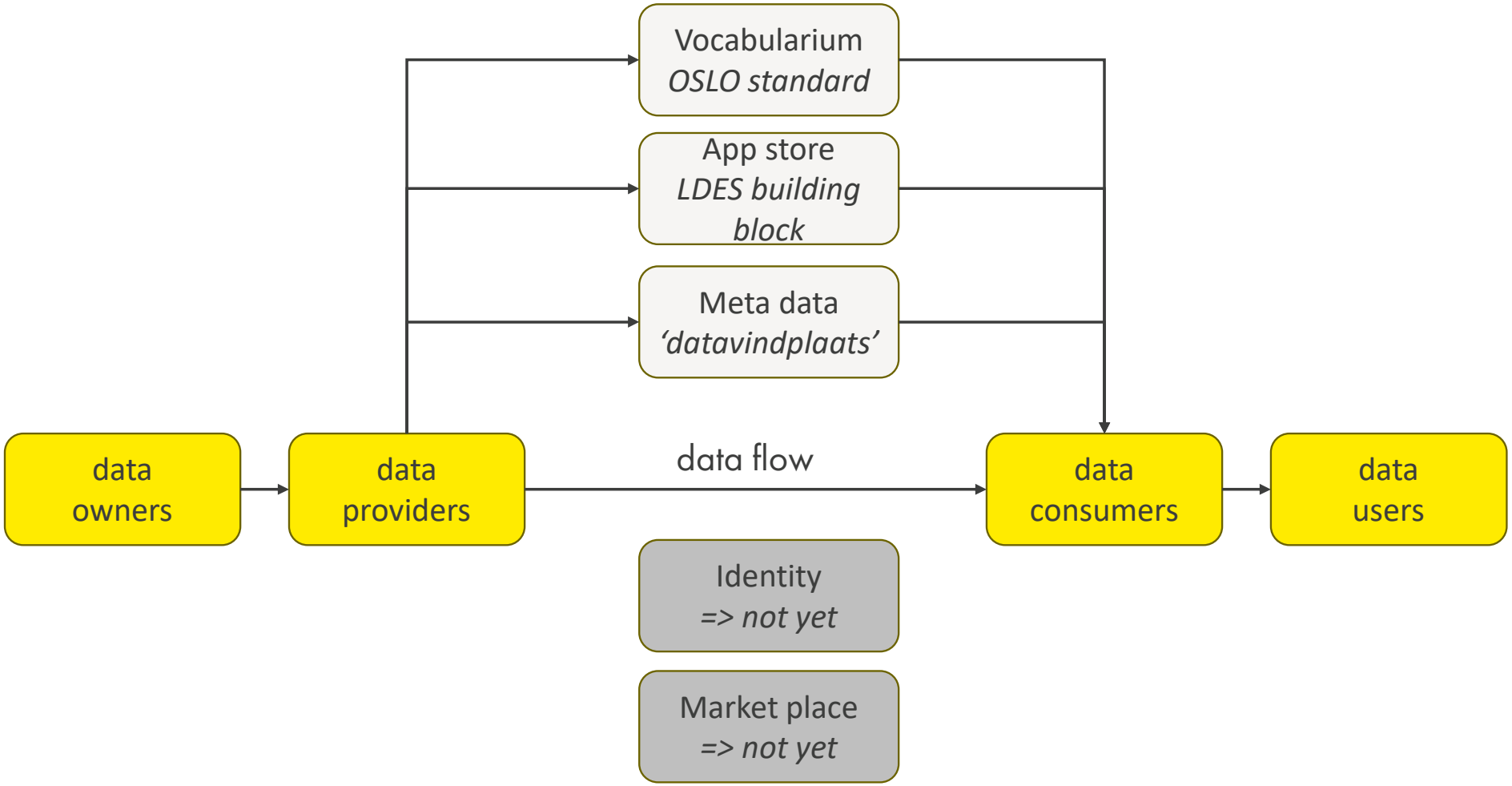


Data Space Traffic Measurements

What do we need?

Easy to understand	STANDARD	1
Exchangeable	TECHNOLOGY	2
Reusable	ECO-SYSTEEM	3
Future Proof	GOVERNANCE	4

Data Space Architecture



Data Space Traffic Measurements

data owner

data provider

BRUGGE

GEO MOBILITY IDASO

Telraam

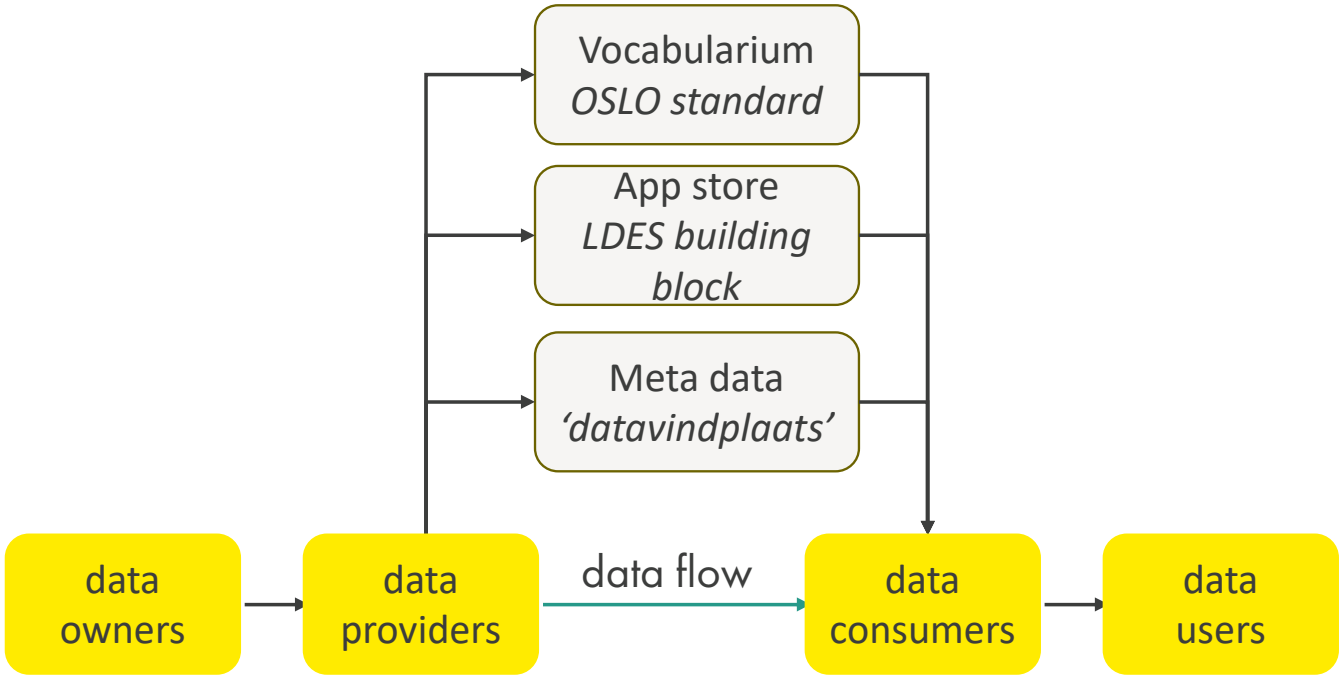
AGENTSCHAP WEGEN & VERKEER

Vlaams Verkeerscentrum

sign co

TERNAT

KRYCER



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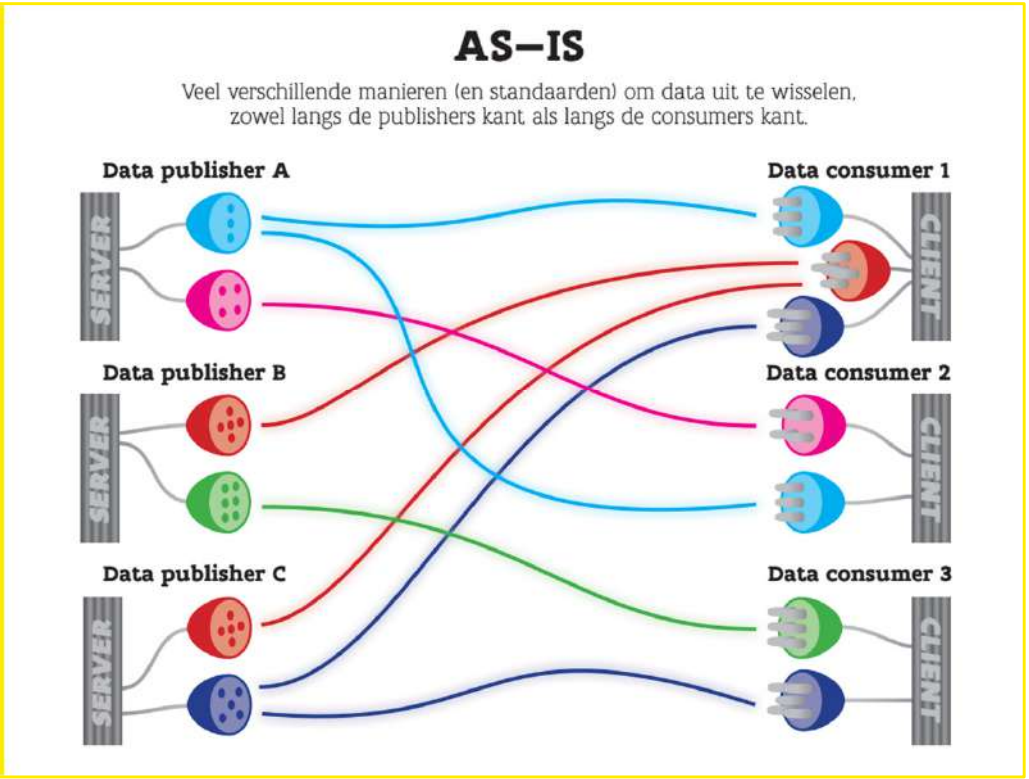
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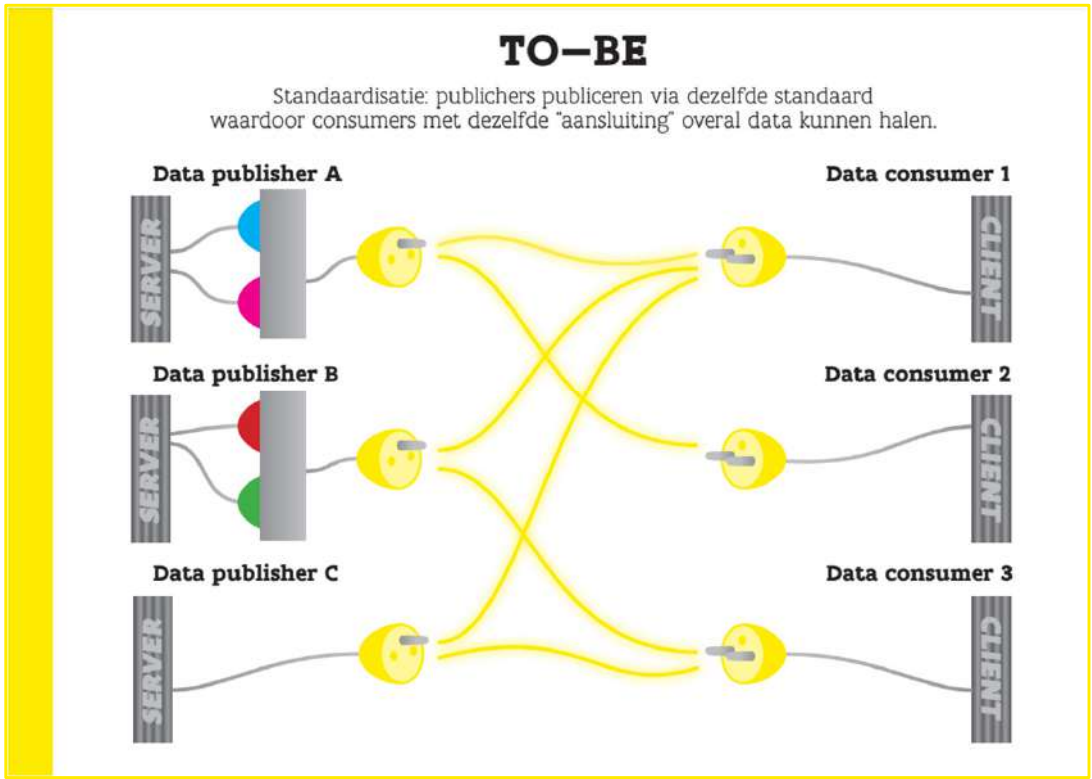
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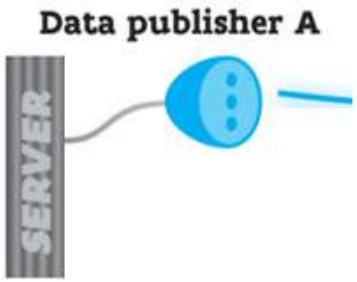
Current workflow for a data user

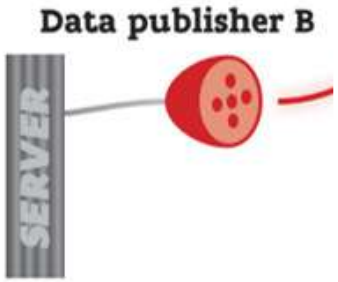
I want to make a mobility analyses based on two data sets of traffic measurements



Traffic measurements of Geomobility:
a traffic measurement data provider that works for the city of Bruges

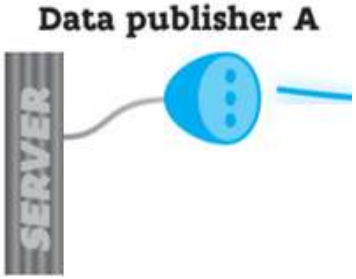
B R U
G G E

GEO MOBILITY
data driving mobility



Traffic measurements of Telraam:
a citizen science project where citizens installs traffic measurement devices

Telraam



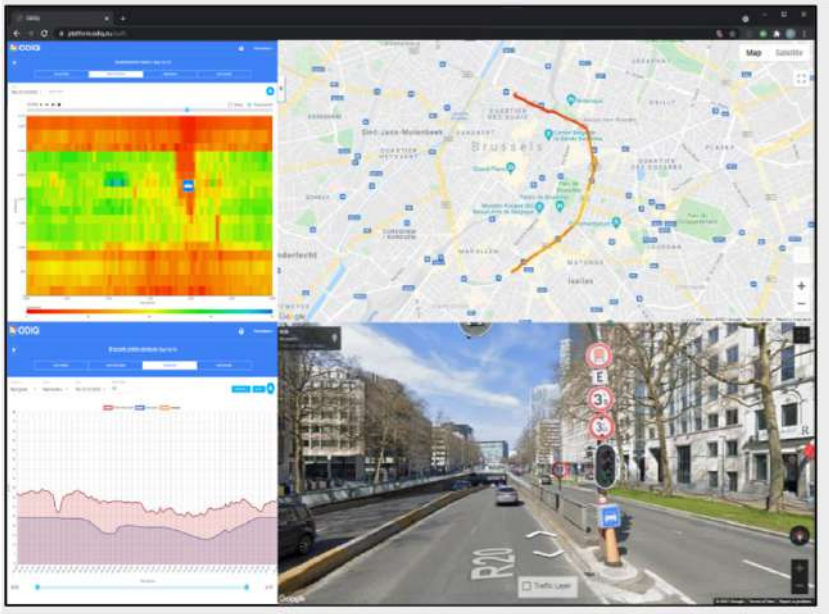
Current Workflow - Geomobility

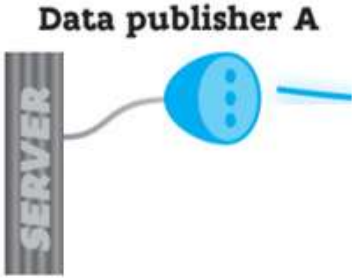
Traffic data from the city of Bruges is on the Geomobility platform.

Only after subscription, you can see the data availability

You can consult, query and download it.

You need an API to query and consult different measurement locations





Current workflow – Geomobility

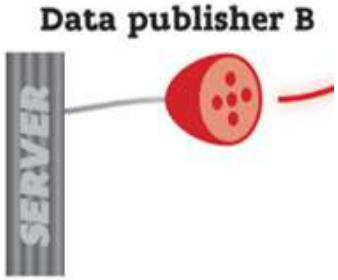
Geomobility API:

Dataset as JSON file

Data has own classification (P/C = personal vehicle,…), it is not standardized

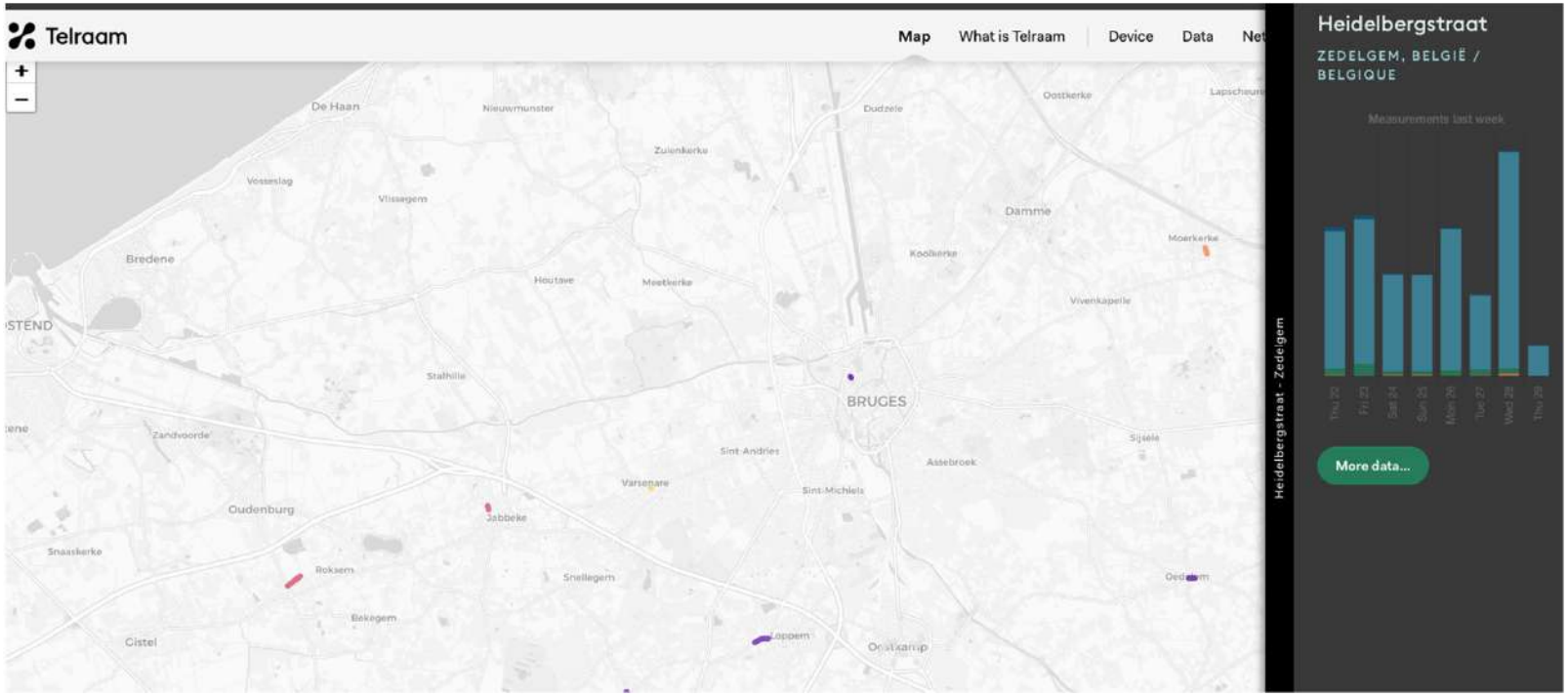
The data has no semantic, it is not understandable without manual of Geomobility.

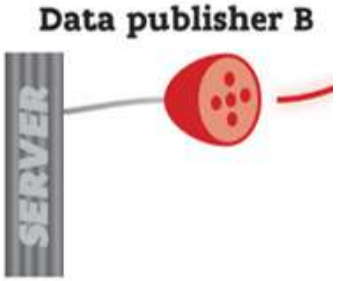
"data": [{ "_id": "64c3e03da4d94b14206ebca9", "type": "standart", "origin": "A", "destination": "B", "classification": "P/C", "timestamp": "2023-05-07T22:30:00.000Z", "count": 1, "poiId": "5ed752d5-a754-415c-97a1-0ca27cff1a81", "surveyId": "903e2e28-919e-4fcf-8a68-8a46bc3c9b94" }, { "_id": "64c3e03da4d94b14206ebcaa", "type": "standart", "origin": "B", "destination": "A", "classification": "P/C", "timestamp": "2023-05-07T22:30:00.000Z", "count": 1, "poiId": "5ed752d5-a754-415c-97a1-0ca27cff1a81", "surveyId": "903e2e28-919e-4fcf-8a68-8a46bc3c9b94" }



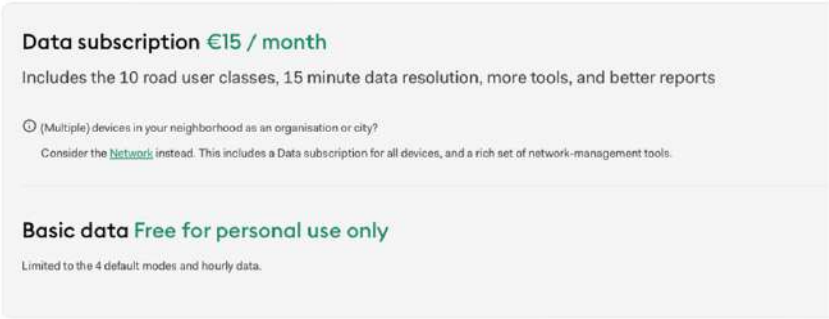
Current workflow: Telraam

TeIraam data is on the telraam platform, you can query it there:





Current Workflow – Telraam



Without paying account, you can only consult the data, not download the data.

You can only query data for individual locations.

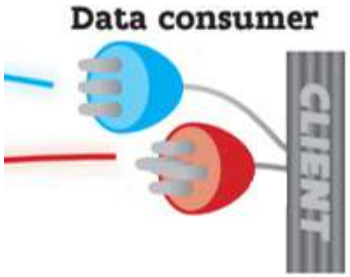
You can take a subscription to the API:

Also here, own data protocol, no standardization

Also semantic is missing, no integration without the Telraam manual.

"properties": { "segment_id": 24948, "last_data_package": "2023-09-14 08:31:32.782600+00:00", "timezone": "Europe/Brussels", "date": "2023-09-14 07:00:00+00:00", "period": "hourly", "uptime": 0.774166666666667, "heavy": 0.0, "car": 0.0, "bike": 0.0, "pedestrian": 0.0, "v85": "" } }, { "type": "Feature", "geometry": { "type": "MultiLineString", "coordinates": [[[4.48769540323306, 51.2992002546036], [4.48770315069313, 51.2992892351387], [4.48771466796467, 51.2994215239229], [4.48763698906074, 51.2996019870262], [4.48719986341616, 51.3006174845592]]] },

Current workflow: data integration



To make an analysis, you need to integrate both data sets

"data": [{ "_id": "64c3e03da4d94b14206ebca9", "type": "standart", "origin": "A", "destination": "B", "classification": "P/C", "timestamp": "2023-05-07T22:30:00.000Z", "count": 1, "poiId": "5ed752d5-a754-415c-97a1-0ca27cff1a81", "surveyId": "903e2e28-919e-4fcf-8a68-8a46bc3c9b94" }, { "_id": "64c3e03da4d94b14206ebcaa", "type": "standart", "origin": "B", "destination": "A", "classification": "P/C", "timestamp": "2023-05-07T22:30:00.000Z", "count": 1, "poiId": "5ed752d5-a754-415c-97a1-0ca27cff1a81", "surveyId": "903e2e28-919e-4fcf-8a68-8a46bc3c9b94" }

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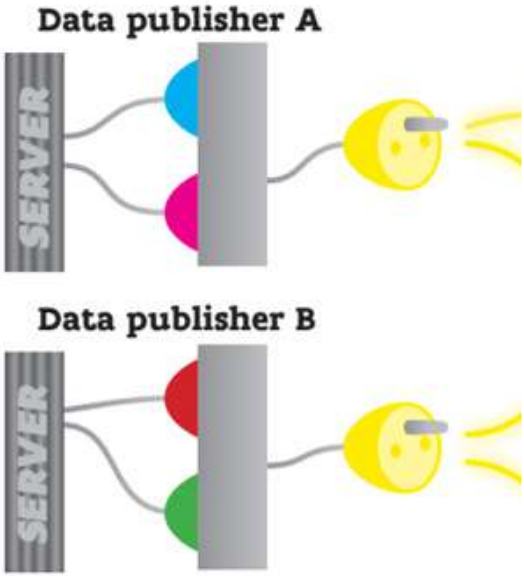
=

You first have an expensive IT integration job:

- Set-up a database with a new data base layout
- Technical integration of API’s
- Convert the data feeds to your data base layout
- Give an interface on your data base to the traffic analyst

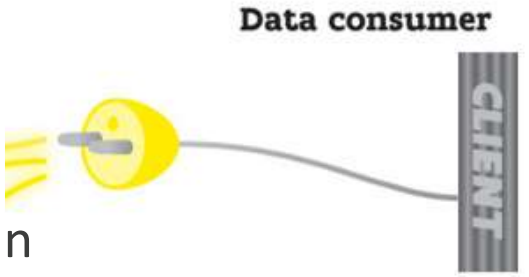
After this, you can finally start your mobility analysis

Data Space Traffic Measurements



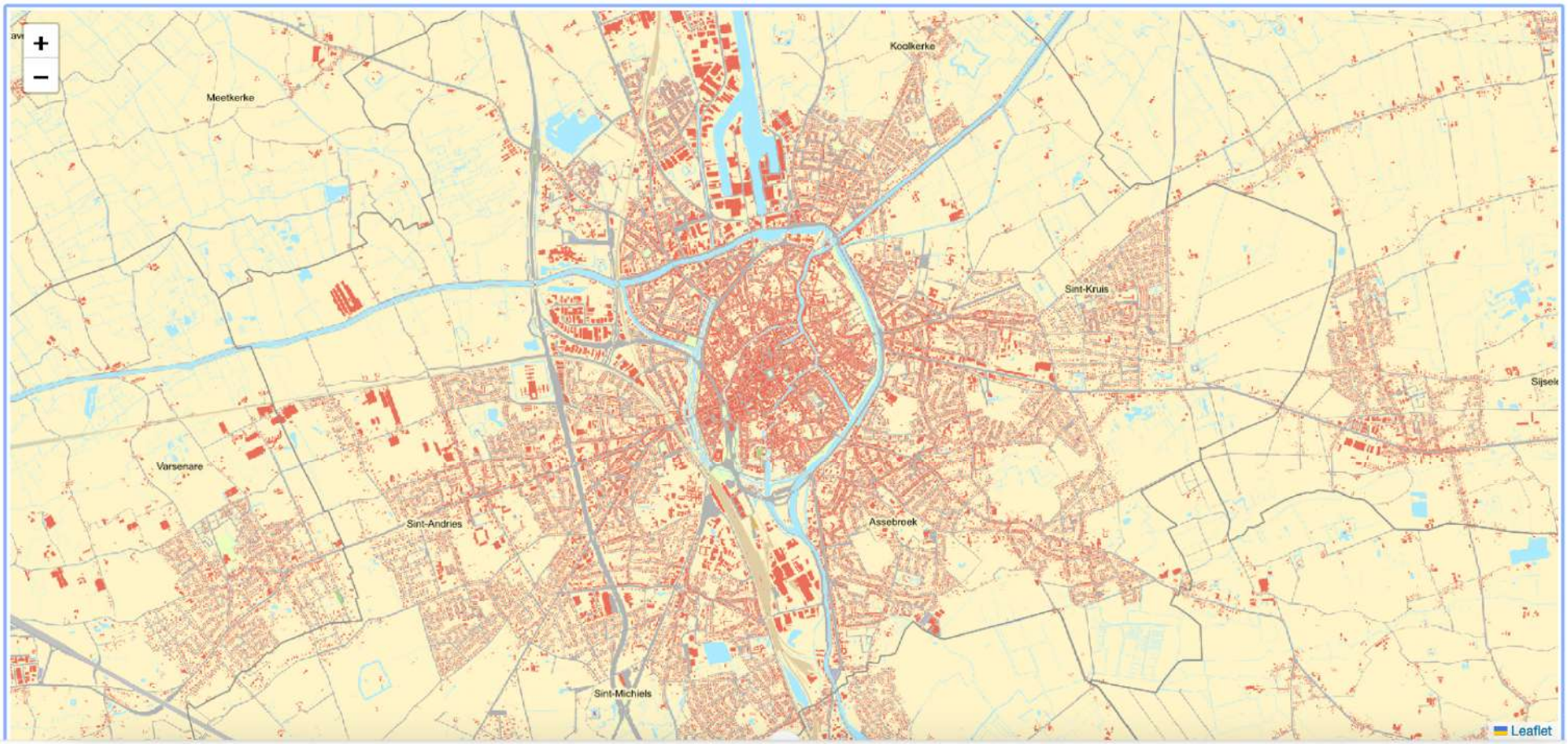
- We developed a common standard OSLO Traffic measurements
- We have building blocks with a standardized LDES interface
- Both GeoMobility and Telraam onboarded on the data space and have now OSLO / LDES Traffic measurements:
  - https://brugge-ldes.geomobility.eu
  - https://telraam-api.net/ldes/observations
- The data space has a working community to further expand it

- There are building blocks to easily consume the data
- You can easily plug and play with linked data databases
- We build a demonstrator to exploit the linked data: chatgpt can understand it!



Demonstrator

The application runs in a browser.



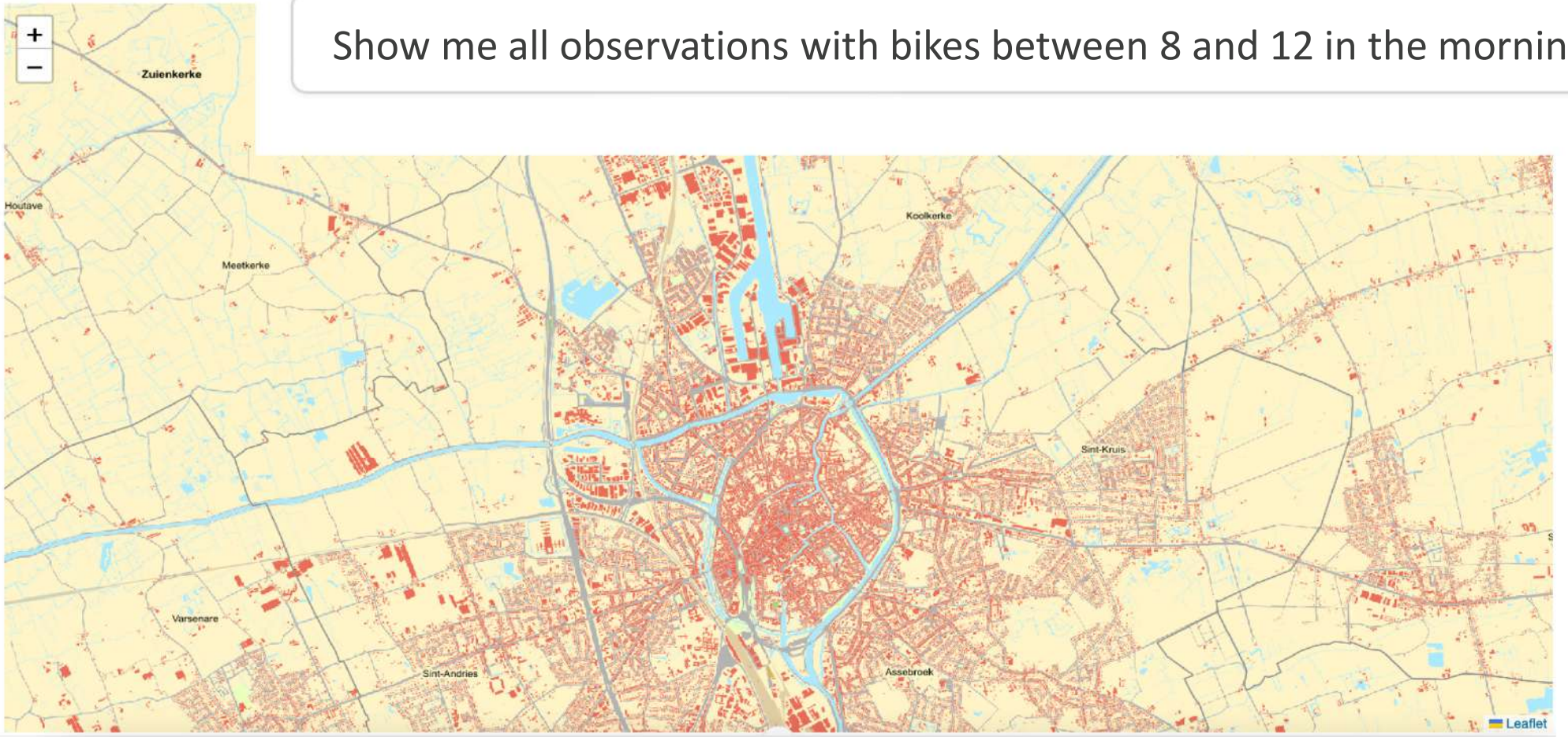
Demonstrator

You can consult the data in human language

Show me all observations with bikes between 8 and 12 in the morning

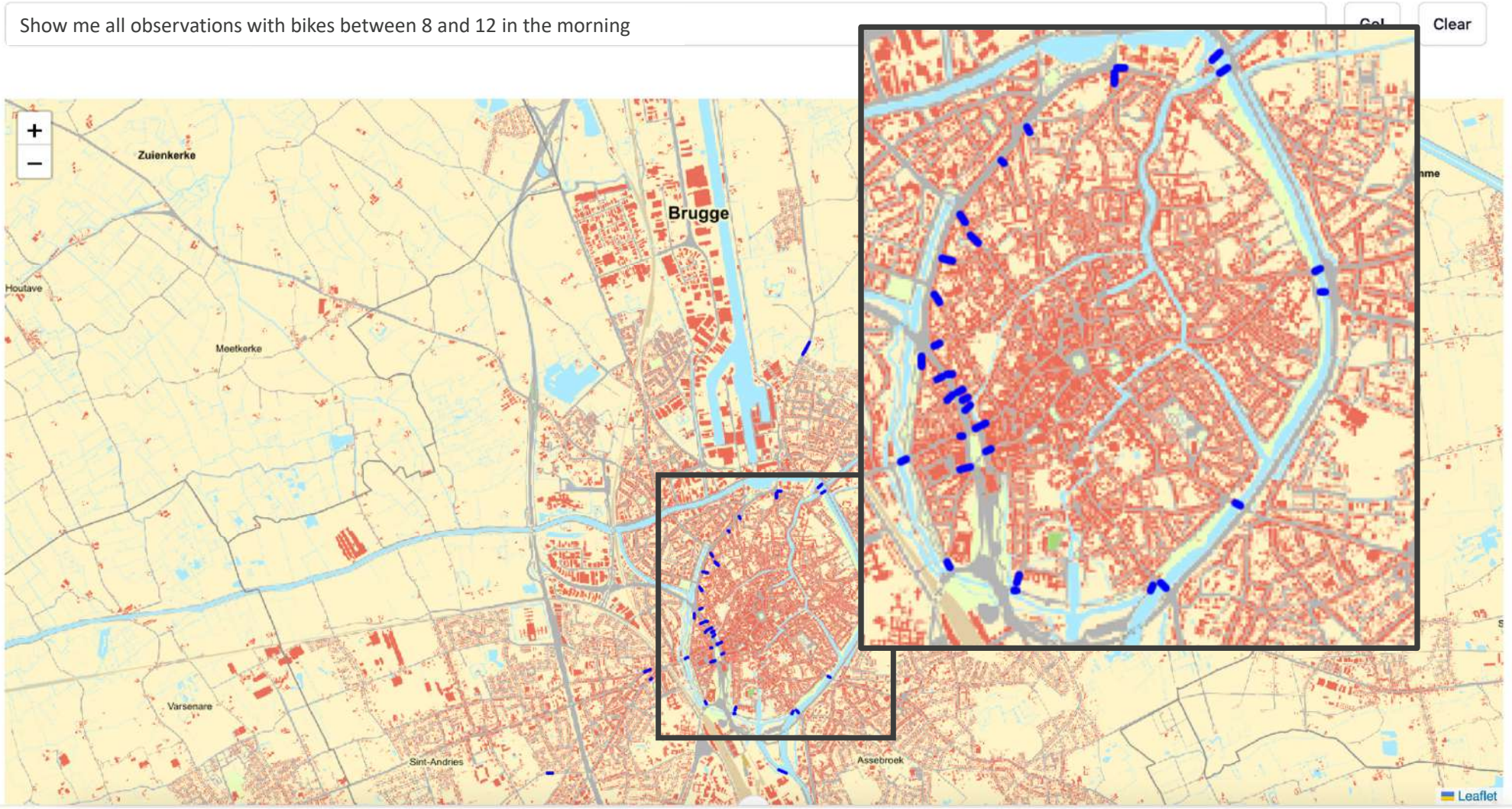
Go! Clear

Show me all observations with bikes between 8 and 12 in the morning



Demonstrator

The visualisation is updated automaticly



Demonstrator

By clicking, the requested data is visualised

Show me all observations with bikes between 8 and 12 in the morning

Go!

Clear

This is a counting point of Geomobility

Demonstrator

Show me all observations with bikes between 8 and 12 in the morning

Go! Clear

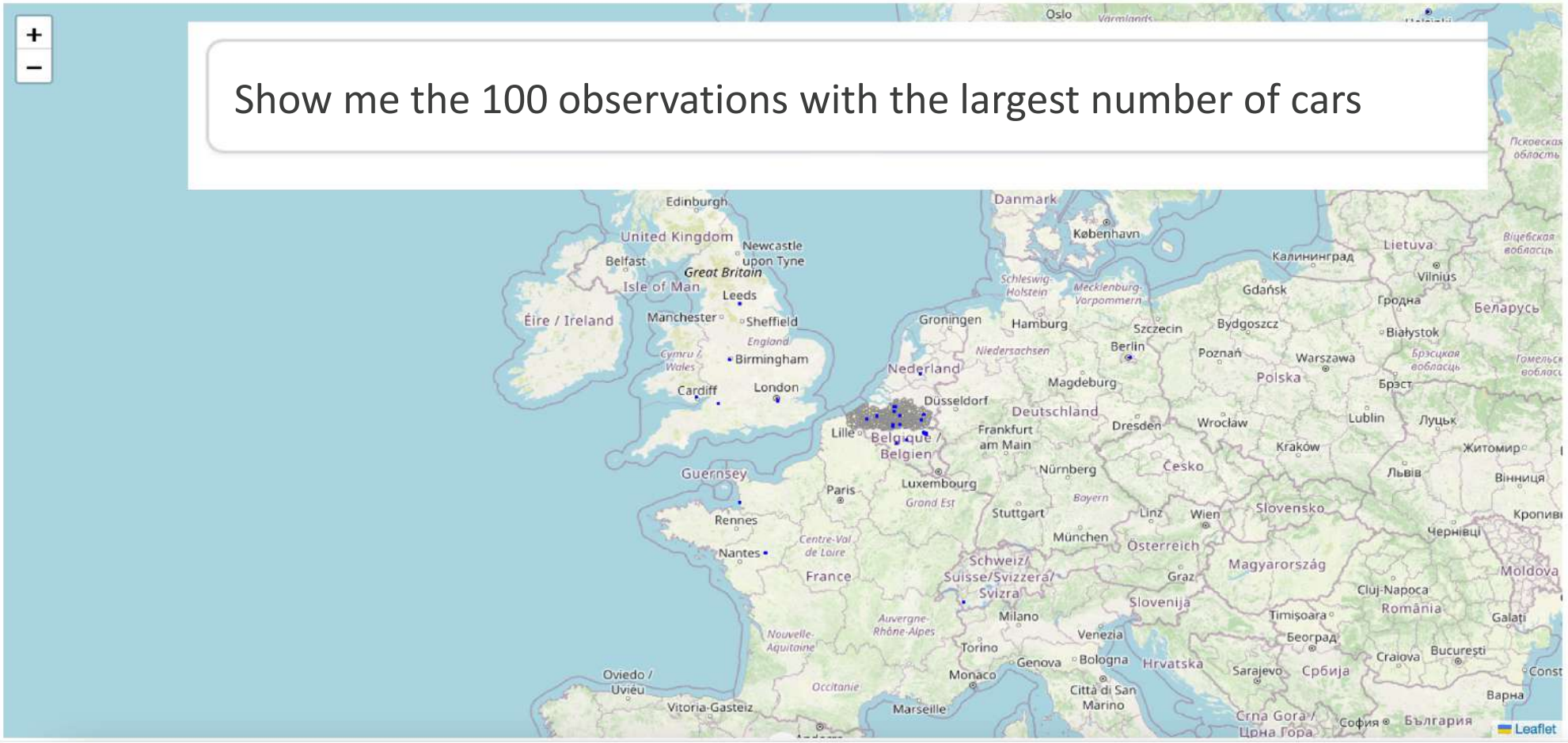
This is a counting point of Telraam

Demonstrator

You can query over data sets, in a creative manner.
Telraam contains worldwide data

Show me the 100 observations with the largest number of cars

Go! Clear

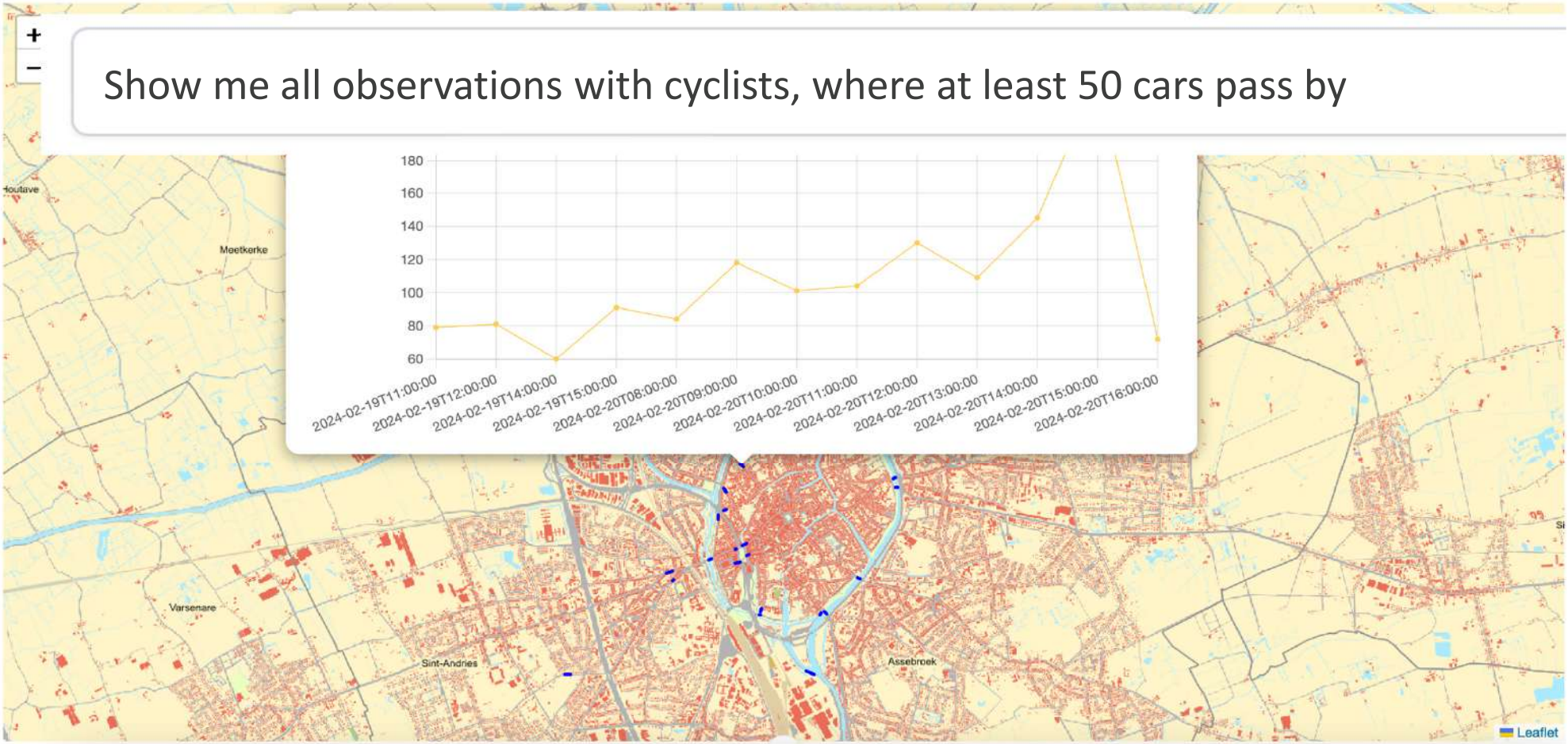


Demonstrator

Different properties can be combined in one query.

Show me all observations with cyclists, where at least 50 cars pass by

Go! Clear



The impact for a user of a Data Space

How is this enabled?

- A meta data catalogue makes the different datasources findable
- LDES as standard gives a clear interface
- Building blocks leads to easy set-up
- OSLO model gives understandable data, for humans and for large language AI
- Data interoperability lowers the integration costs for new data streams to zero.
- Chances to easily expand to new data sources

Data Spaces are the final step within “data interoperability”

$\Rightarrow$ **No more burden for the end users on technical data aspects!**

Contact us:
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https://www.vlaanderen.be/vlaamse-smart-data-space-portaal