Urban Data Collective

Urban Data Exchange

Implementation of OASC MIMs

Alex Gluhak, CEO
Urban Data Collective

A bit of history

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More than a decade of smart city experimentation

2010-2013

2011-2013

2015-2018

SYNCHRONICITY

2017-2020

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SYNCHRONICITY

Project goals

- Enable a step change from smart city islands towards an interoperable urban data ecosystem
- Create a single digital market for IoT and AI enabled service and solutions to scale, allow better sharing of solutions, benchmarking and best practices across cities
- Synchronicity laid the foundations for some of the OASC Minimum Interoperability Mechanisms (MIMs)

OPEN & AGILE SMART CITIES

- MIM1 defines how city data can be accessed
- MIM2 defines how city data is represented
- MIM3 defines how city data can be discovered and exchanged

IoT data marketplace

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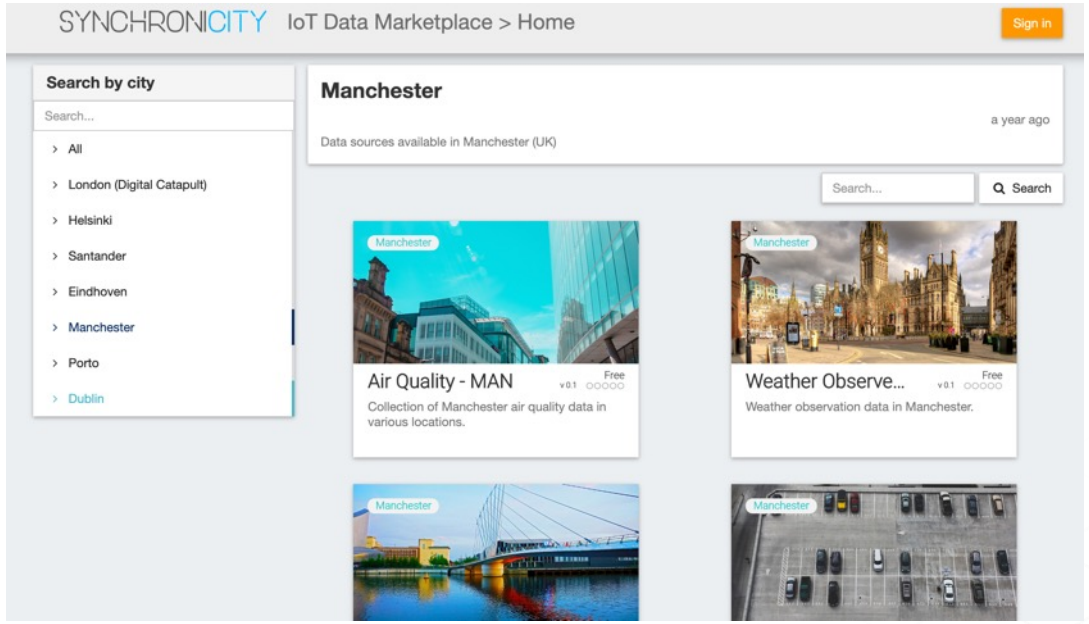
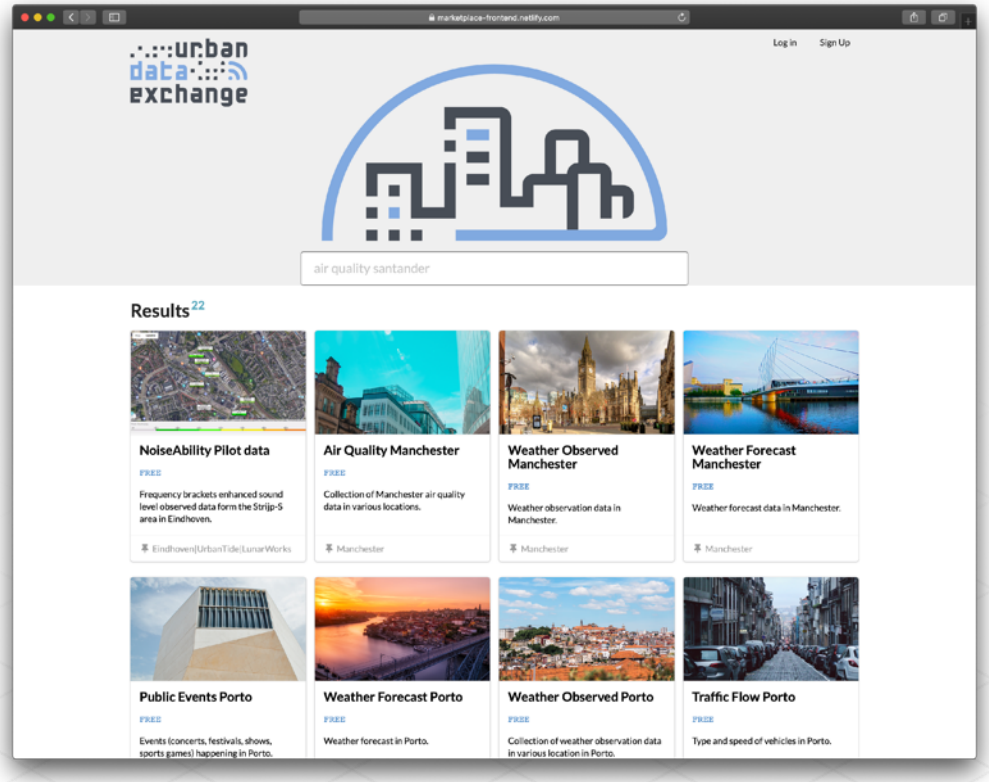
Initial prototypes developed during SynchroniCity project

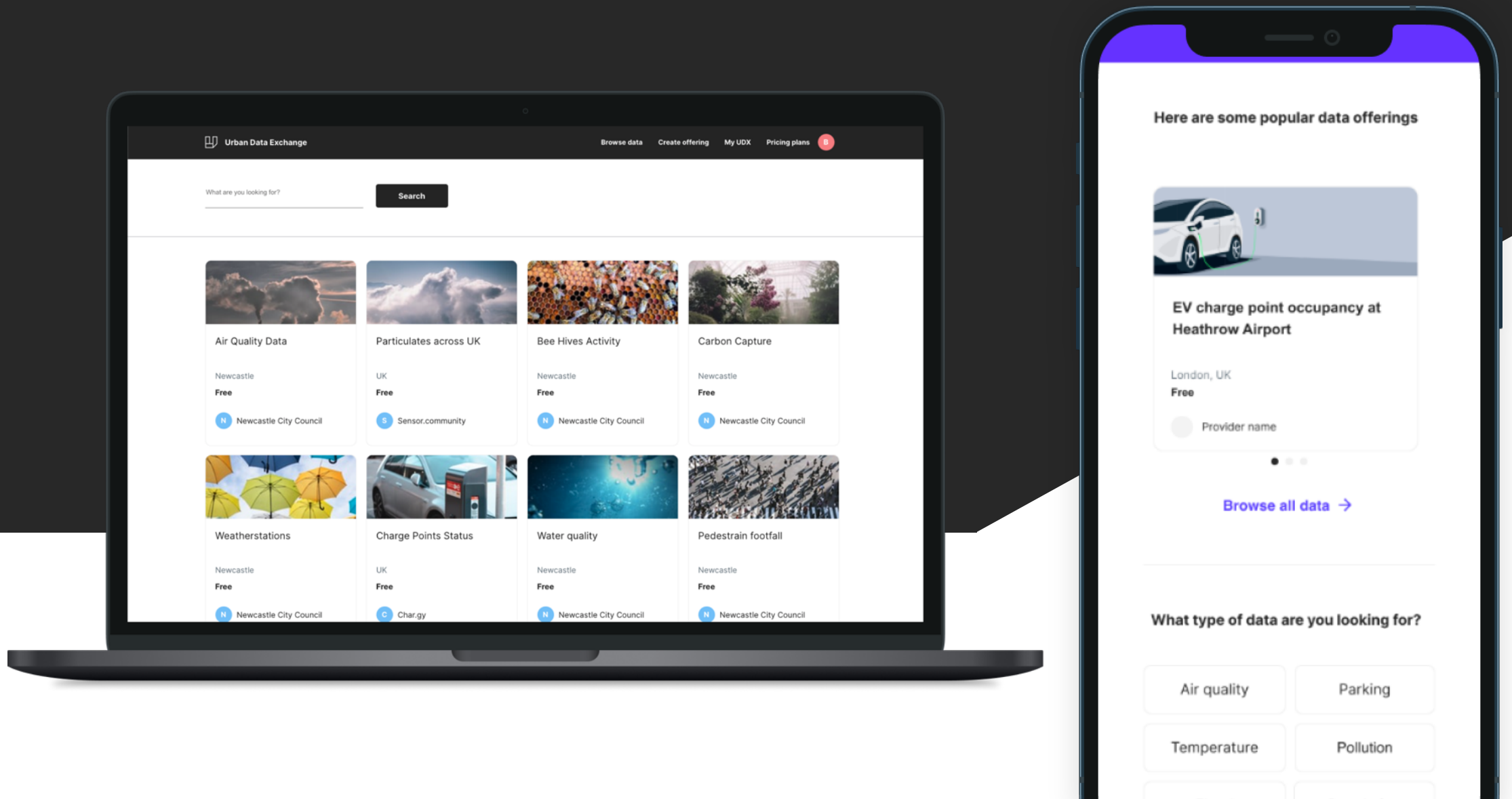


V0.1



V0.2

Urban Data Exchange (UDX)



What is UDX?

UDX is a SaaS platform that simplifies management, use and sharing of live urban data streams

DATA PROVIDERS

Organisations share their data streams by plugging them into the UDX platform, making them available to others

Example:
An EV charge point operator wants to make its infrastructure more widely available and shares charge point location and availability data

DATA USERS

Users can browse UDX to discover live data streams they need and subscribe to them

Example:
A navigation service provider that uses this data can now show its customers available charging points on their journey

UDX benefits

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- UDX unlocks data across different systems in an organisation and makes it accessible and sharable in one single place
- Save time and money running urban data related projects
- Benefit from innovation others create with your data
- Access data from other organisations
- Monetise high value data streams

Real time data space

A data sharing layer to enable real time data collaborations

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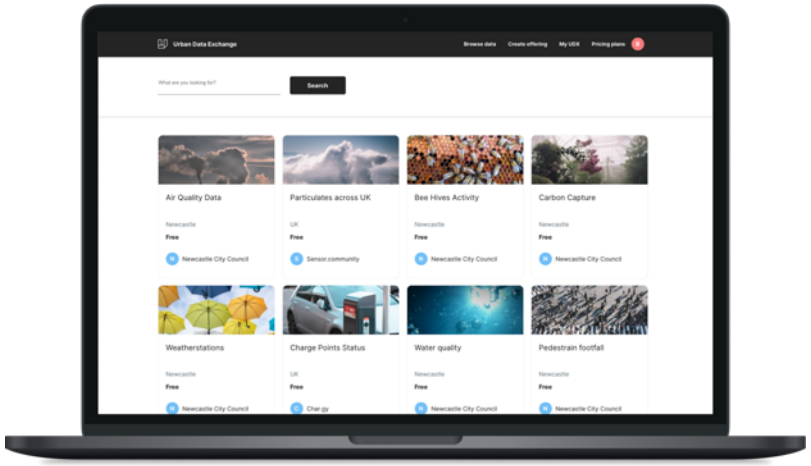

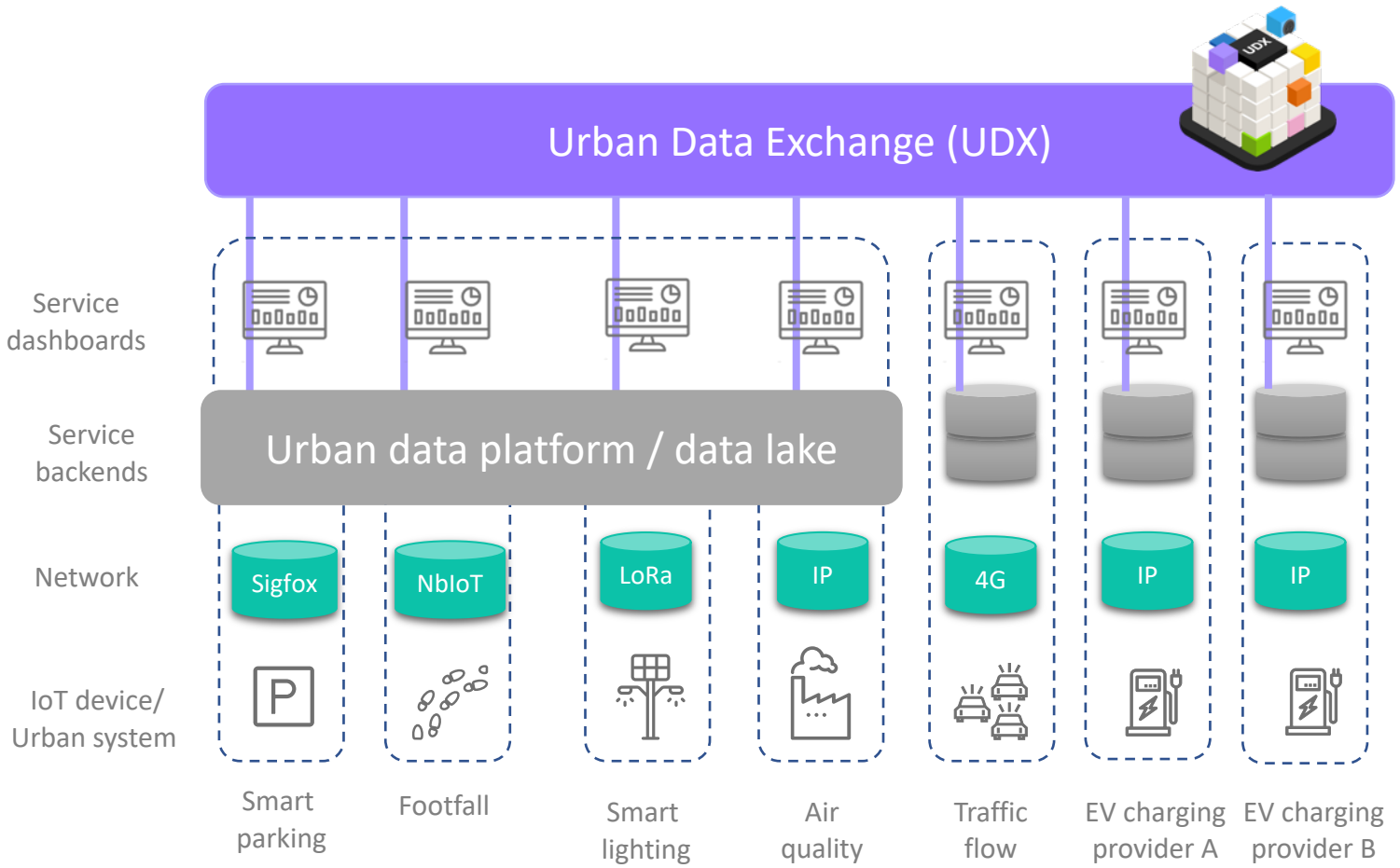

OPEN & AGILE SMART CITIES

Compliant to OASC Minimum Interoperability Mechanisms

UDX features

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Simplified data onboarding

Create suitable metadata descriptions for your data streams and make your data available to others in a matter of minutes

Discovery

Search a rich catalogue of curated urban data streams from trusted providers and find quickly what you are looking for

License assistant

Easily define data licenses & custom sharing agreements, so you can decide how your data can be used by whom

SLA tracking

Understand the reliability of urban data streams and verify that SLAs of sharing agreements are met

Standardisation

Harmonise access to your urban data streams, remove complexities of wrangling with different data formats and APIs

Agreement negotiation

Negotiate access to urban data streams via a few clicks, saving time needed for legal agreements and approval processes

Reputation management

Understand quickly the reliability of data providers and users, be part of a trusted user community and provide feedback

Monetisation

Set commercial terms for your urban data streams and gain reoccurring revenues from your subscribers for data access

UDX features

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MIM1 + 2

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MIM3

MIM1 + MIM2

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External systems

MIM1/2 compliant

Other

Integrators

Rest

MQTT

....

Ingress Service

Mapping object library

Normalise Service

Smart Data Models

UDX public API

NGSI-LD

MIM1 + MIM2

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What's in the stream? −

Payload structure

```
{
  "id": "urn:ngsi-ld:EVChargingStation:GB*CGY*E*00159",
  "type": "EVChargingStation",
  "status": {
    "type": "Property",
    "value": "CHARGING"
  },
  "address": {
    "type": "Property",
    "value": {
      "type": "PostalAddress",
      "postalCode": "N15 6BZ",
      "streetAddress": "Grovelands Road",
      "addressCountry": "GBR",
      "addressLocality": "Haringey "
    }
  },
  "partyId": {
```

Payload format	EVChargingStation
Update rate	Every 10 minutes

UDX API 1.0.0 OAS3

This is the UDX API. For this public API, use the data stream token `API access key` to query endpoints.

Authorize

default Check the API status

- GET `/health` Health check

ingress For data providers: Post data into a stream

- POST `/{uuid}/batch` Push new records into a stream using batched writes
- POST `/{uuid}/ngsild` Push new ngsild records into a stream
- POST `/{uuid}` Push new record into a stream

egress For data providers & subscribers: Access data inside a stream

- GET `/{uuid}` Get all records for a stream within a time interval
- GET `/{uuid}/latest` Get the latest record from a stream
- GET `/{uuid}/entities` Get the latest record for each unique entity of a stream

heartbeat

- POST `/{uuid}/heartbeat` Push a heartbeat signal into the UDX API

MIM3

Data search and discovery

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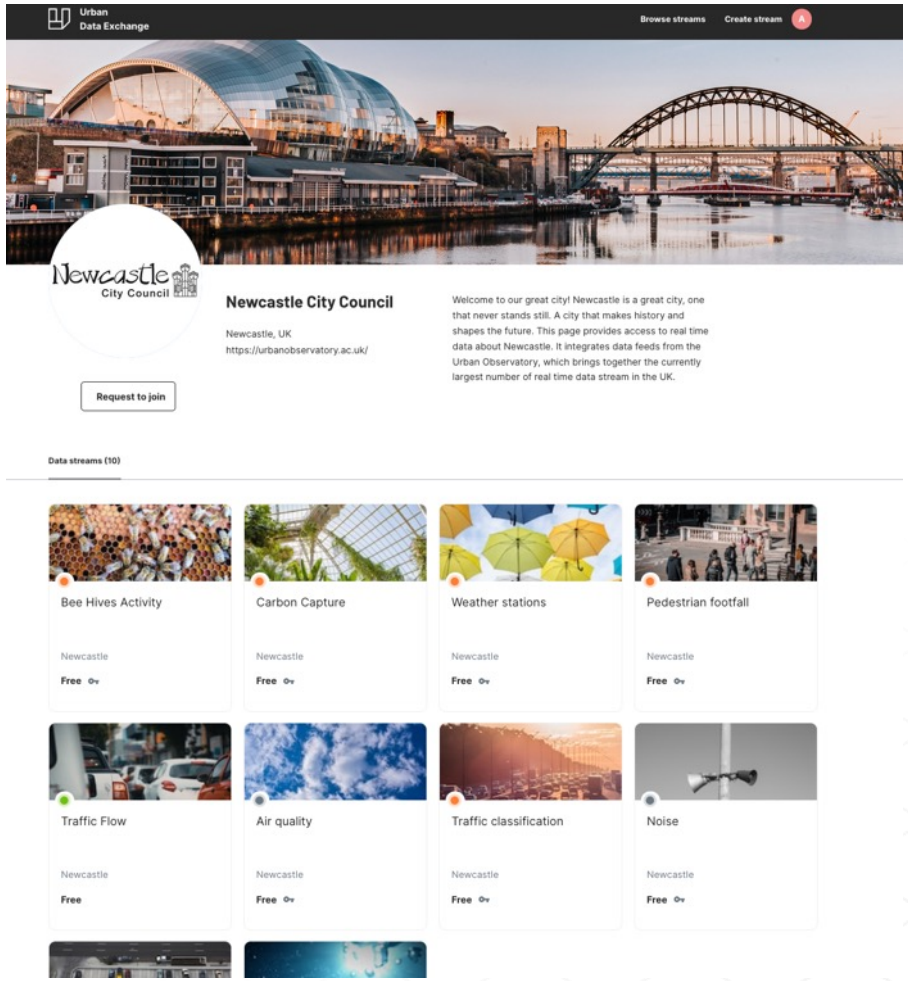
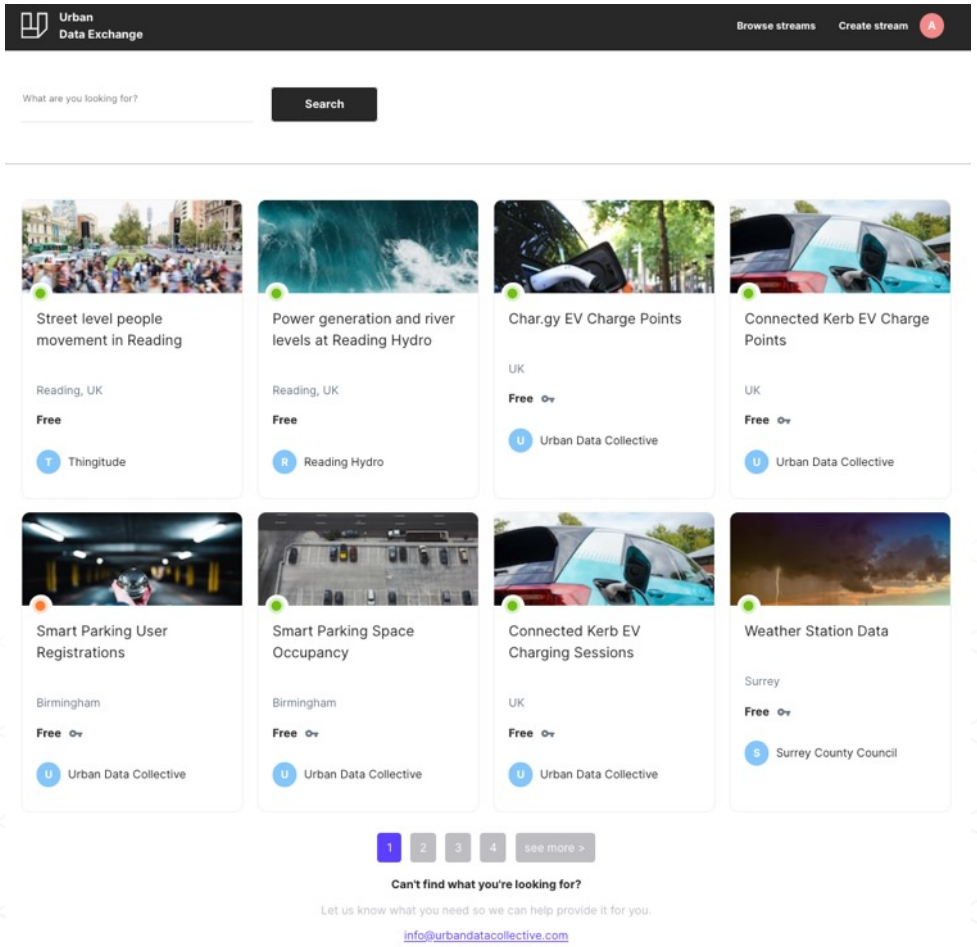


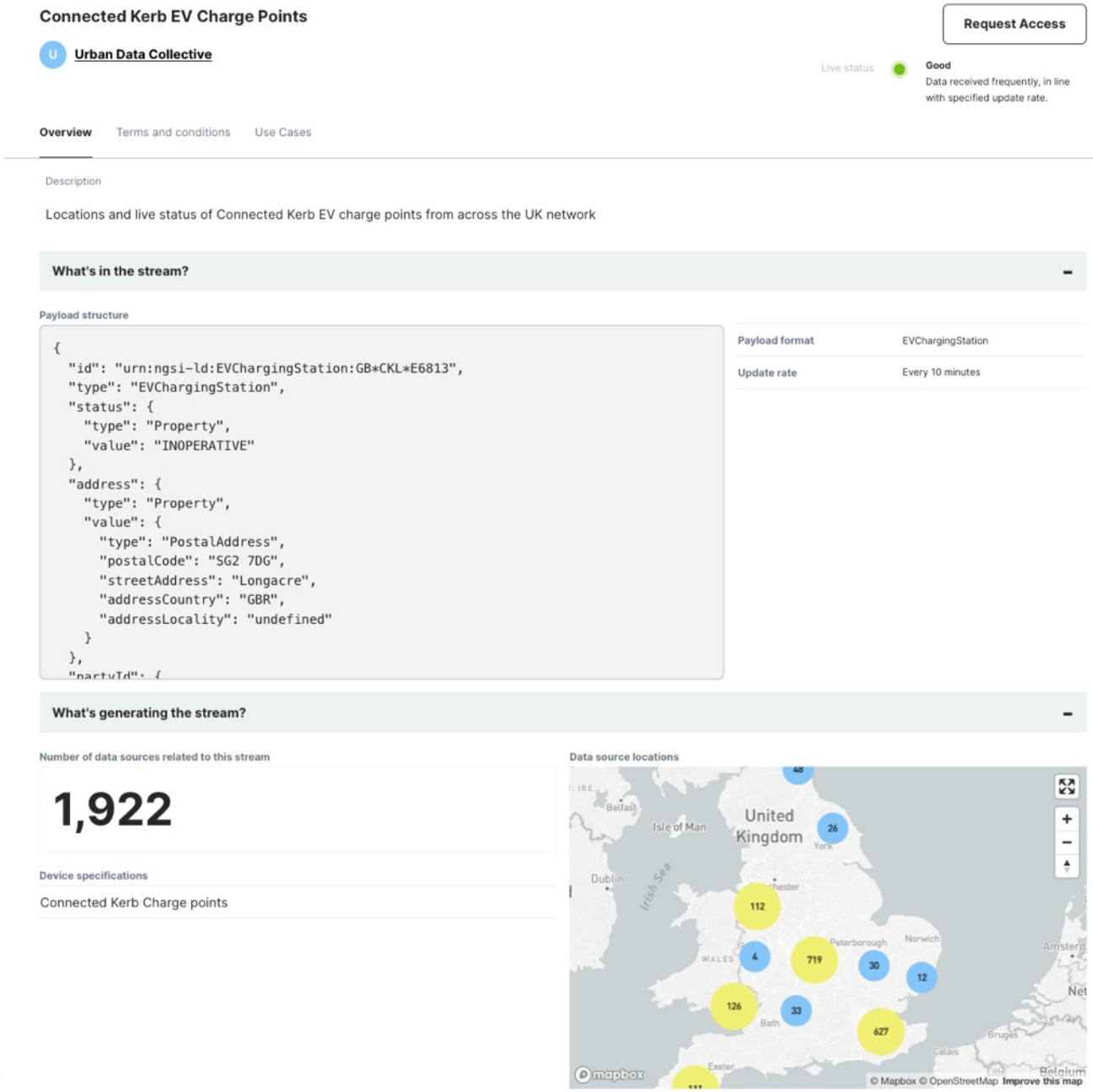
Org portal



UDX marketplace

MIM3

Data stream metadata



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Explore

- Stream meta-data
- Terms and conditions
- Use cases

MIM3

Data sharing agreement and custom license editor

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Overview | **Terms and conditions** | Use Cases

Public Domain Dedication and License (PDDL)

You are free to:

Share

Adapt

Create

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Read the full license agreement

Create custom license

1 Terms — 2 Ownership — 3 IP — 4 Permissions — 5 General

Business terms

Will the access to this data offering be free or charged for use?*

- (•) Free
- ( ) Charged monthly
- ( ) Charged annually

What length of time can users access the data offering?*

- (•) Indefinitely
- ( ) A defined period of time

Specify end date

15 / 01 / 2023

What is the cancellation notice period for this data offering?*

0 | Select unit...

MIM3

Data access negotiation (data provider)

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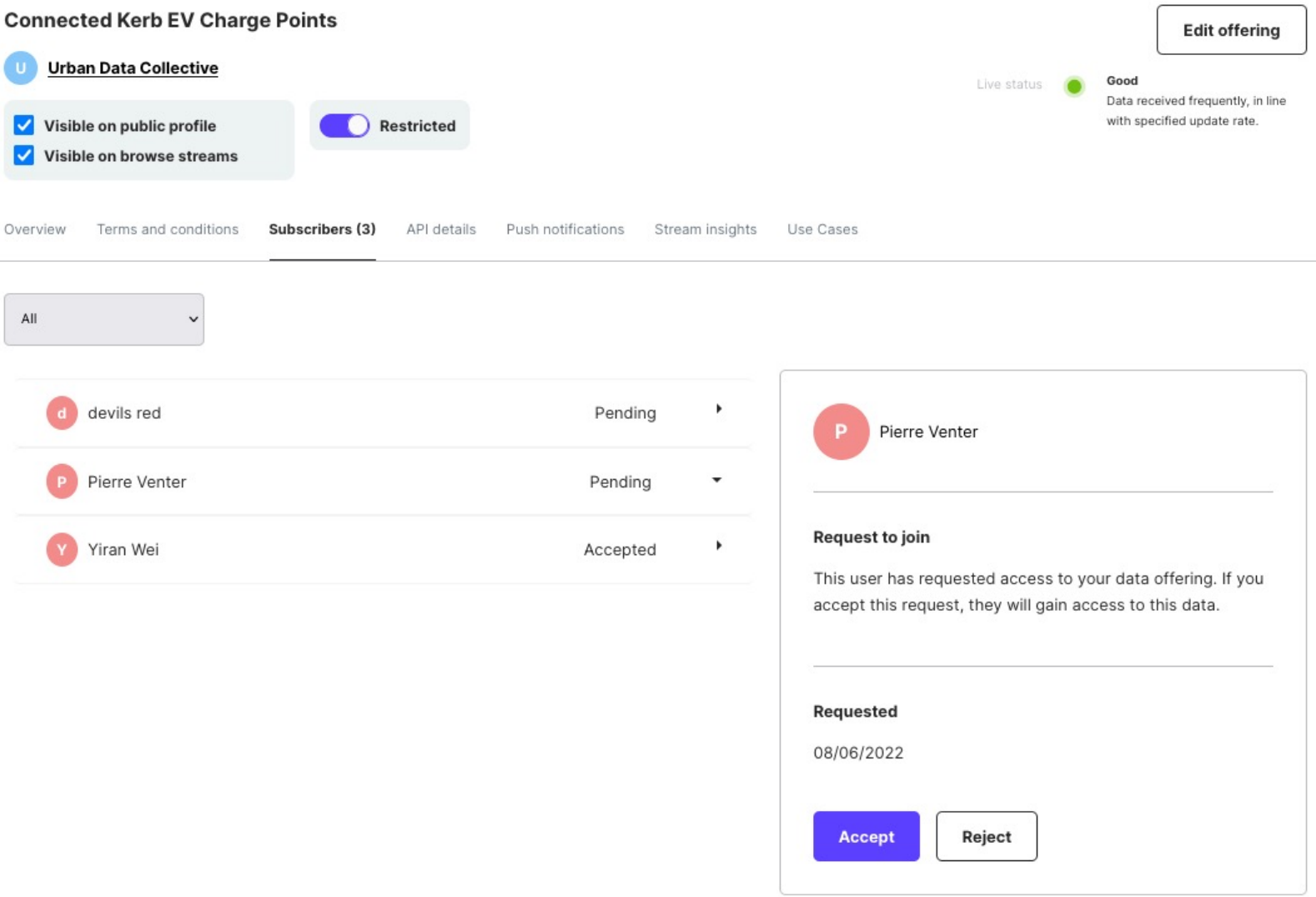

MIM3

Data access negotiation (data user)

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Traffic Flow

N Newcastle Urban Observatory

Subscribe

Live status Good
Data received frequently, in line with specified update rate.

Overview | Terms and conditions | Use Cases

Description

ANPR Vehicle counts in Newcastle upon Tyne

Connected Kerb EV Charge Points

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Request Access

Live status Good
Data received frequently, in line with specified update rate.

Overview | Terms and conditions | Use Cases

Description

Locations and live status of Connected Kerb EV charge points from across the UK network

Traffic Flow

Newcastle upon Tyne

Data subscriber

Who is subscribing to this data offering?

Alex Gluhak

Please read and agree to the license agreement

Public Domain Dedication and License (PDDL)

You are free to:

Share

Adapt

Create

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Read the full license agreement

☐ I agree to the terms and conditions of the license agreement*

Price: **Free**

By subscribing to this offering you will have **94** subscription(s) remaining

Subscribe

MIM3

Service level tracking

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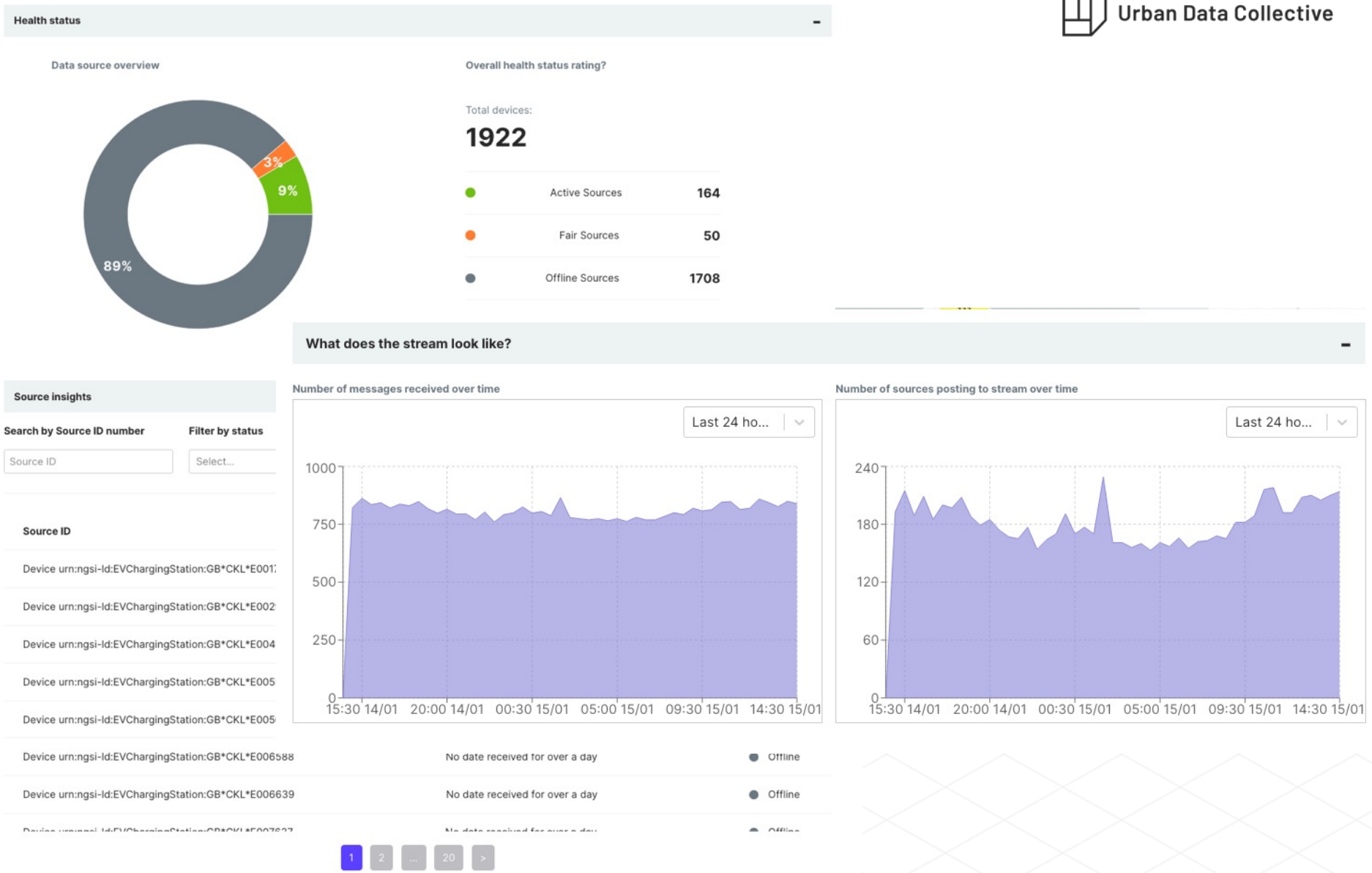

Data Spaces

UDX

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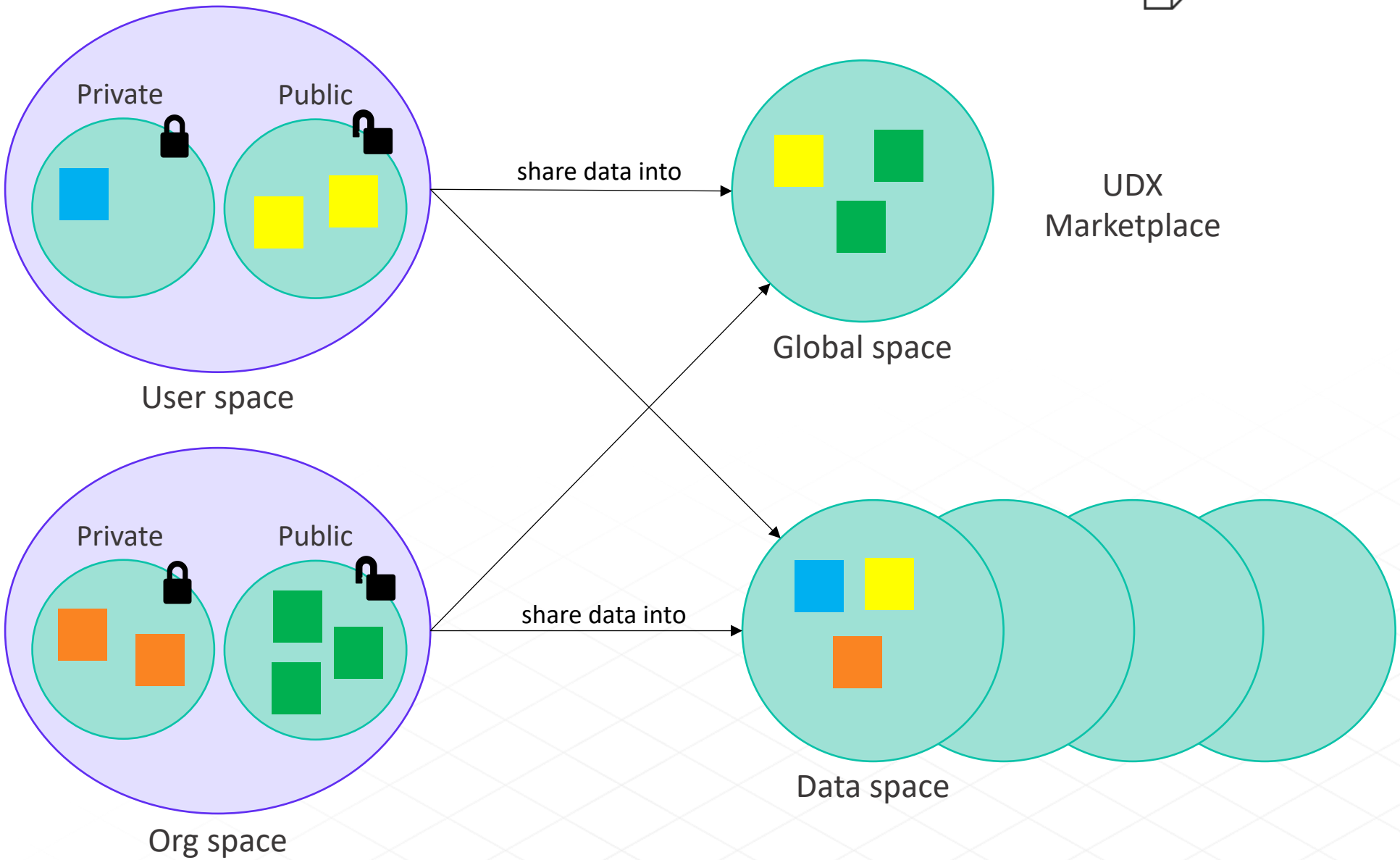

UDX deployment models

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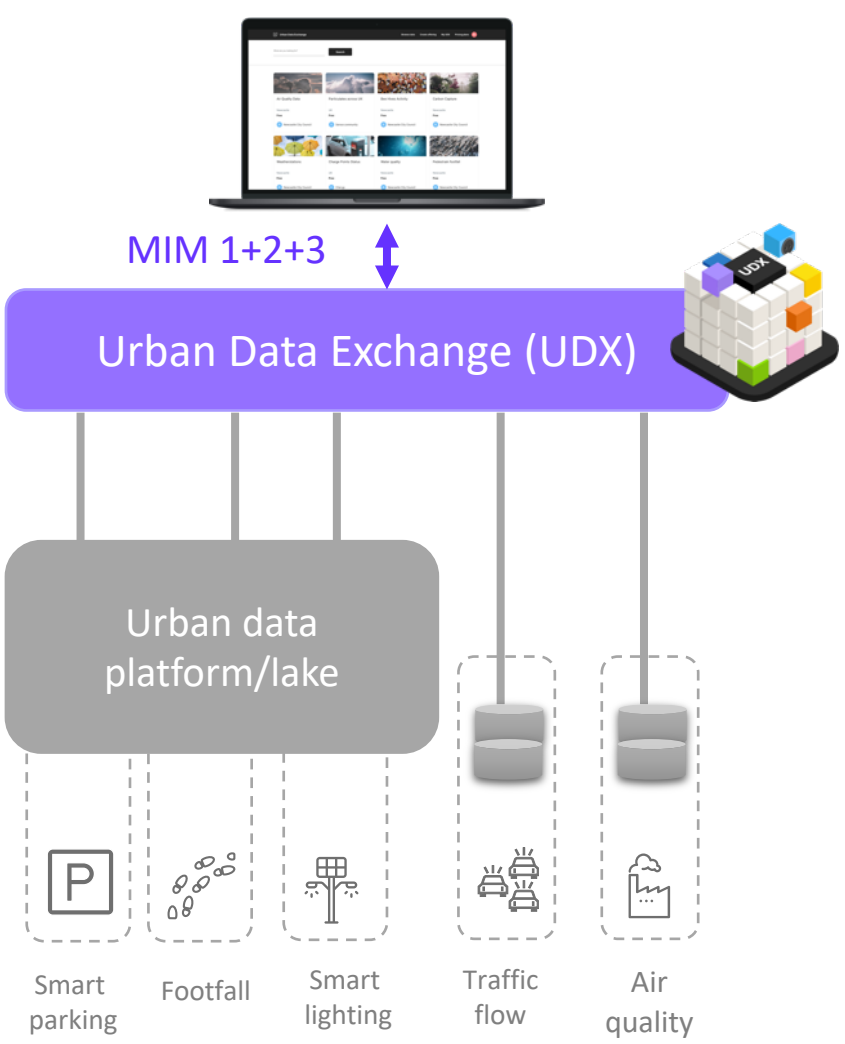
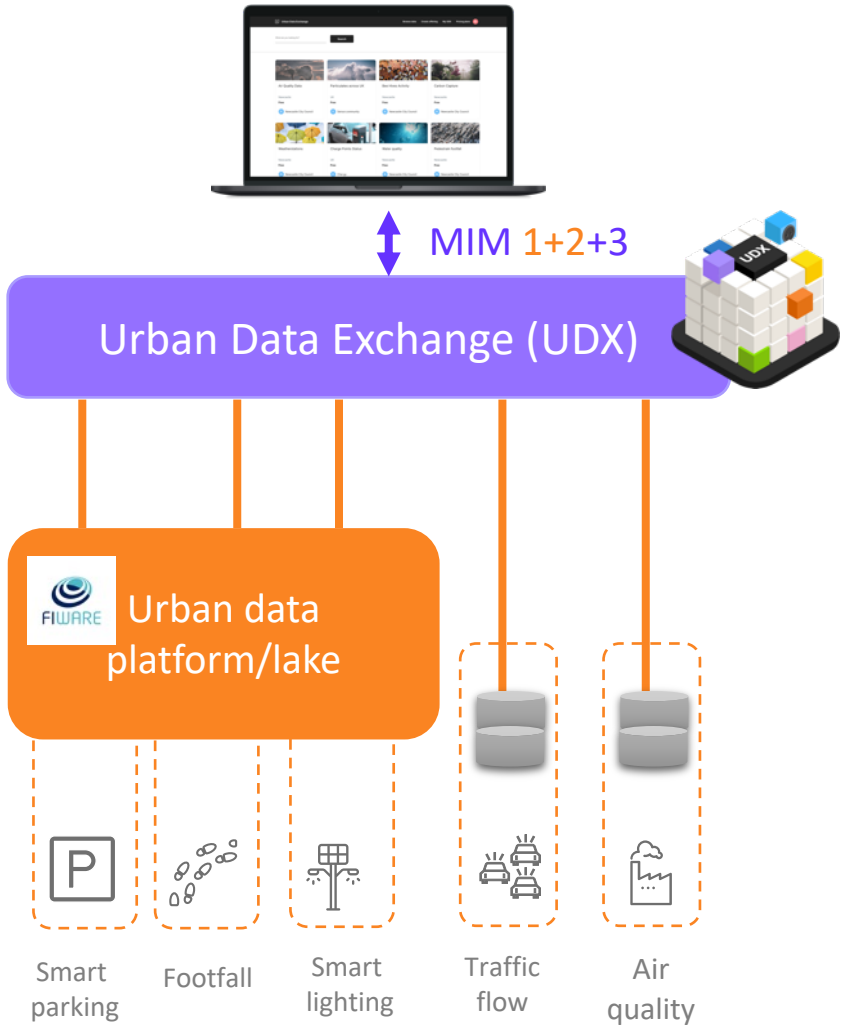


Non MIMs compliant solution



MIM1+2 compliant solutions

Example 1: Surrey County Council

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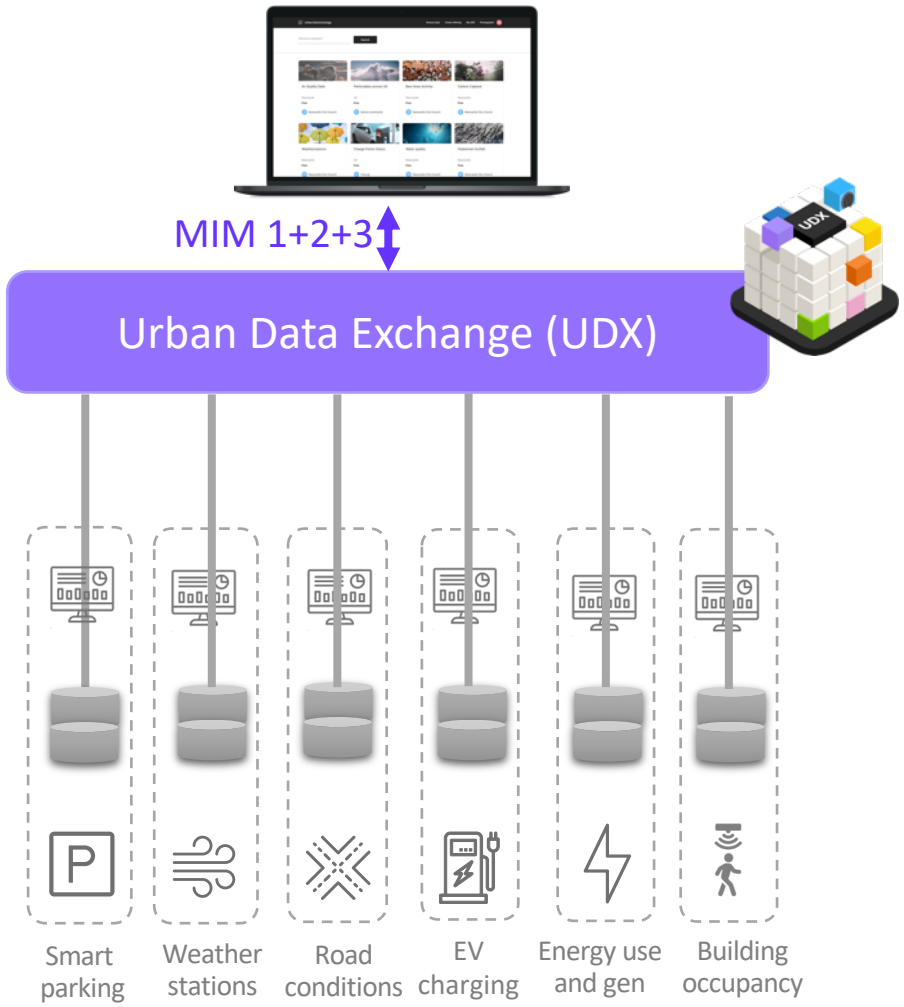
SURREY COUNTY COUNCIL

- Local authority with 23k+ employees
- Deployed a wide range of IoT and Smart Building solutions for netzero transition and improvement of public services
- Uses UDX to
  - Make data easier accessible to internal data teams
  - Automate net-zero reporting
  - Improve utilisation of public EV charging network
  - Share data with neighbouring local authorities



Example 2: Urban Observatories

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urban observatory

- Urban observatory are network of UK universities who manage real time data on behalf of their cities
- Work with the Department of Transport (DfT) to access real-time data on traffic and air pollution on regional scale
- Use UDX as a common platform to create a regional real-time space

Newcastle University

MANCHESTER 1824 The University of Manchester

UNIVERSITY OF BIRMINGHAM

The University Of Sheffield.

Hull City Council

Example 2: Urban observatory

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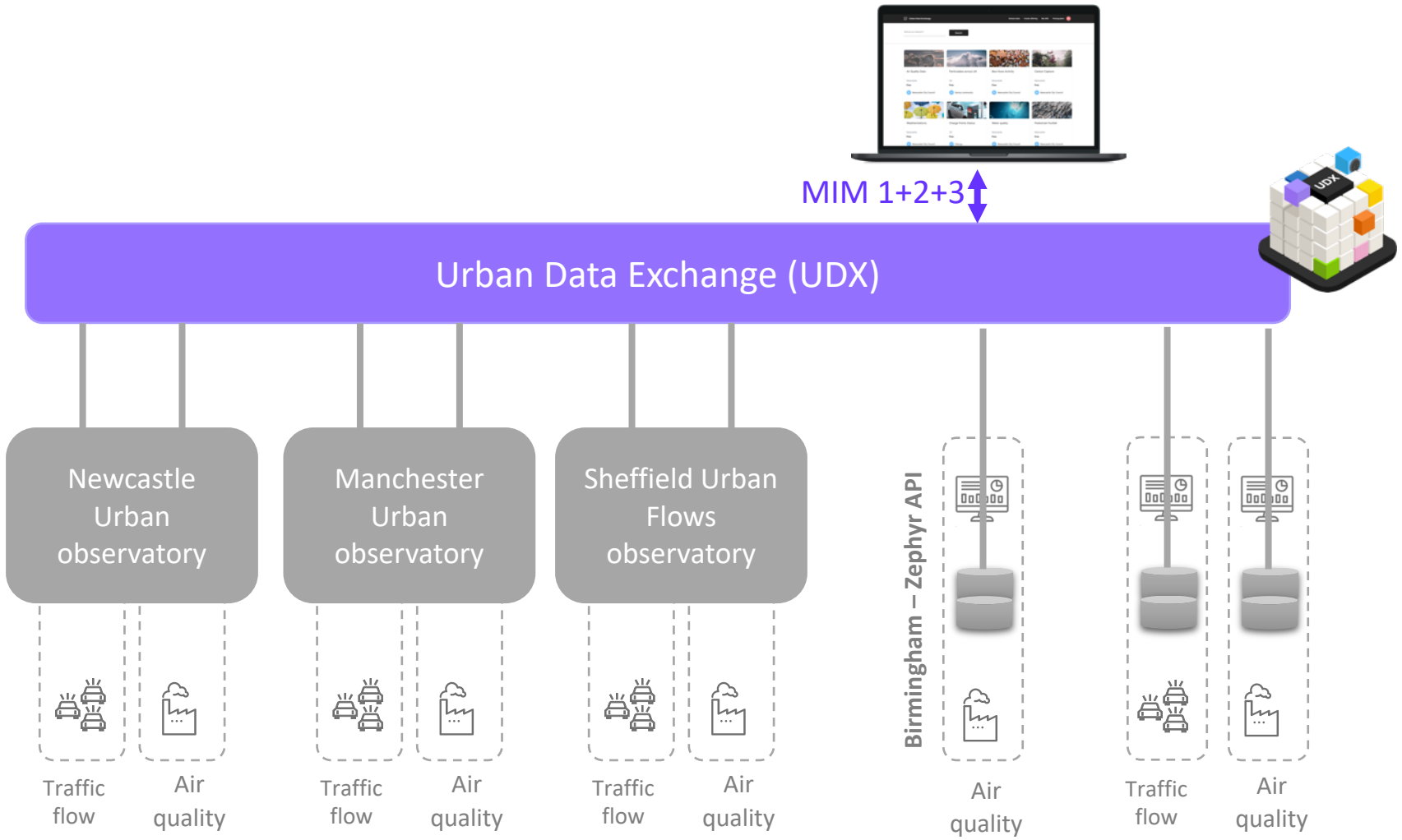

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Thank you!

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Alex Gluhak, CEO, Urban Data Collective