CityVerve: Manchester's Smart City Initiative

Platforms for Supporting IoT Smart City Ecosystems

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CityVerve
Smart. Innovative. Manchester.

£15M collaborative R&D project

Smart Cities: doing more with less in a time of financial constraints

CityVerve will provide Smart City demonstrators, networks, platforms and infrastructure to enable open innovation

Central to this will be **BT's IoT data hub**, interoperating via **Hypercat** with a range of other platforms

Replicable, sustainable and scalable

CityVerve's Use Cases:
What is being built?

Transport and Travel

Energy and the environment

Health and Social Care

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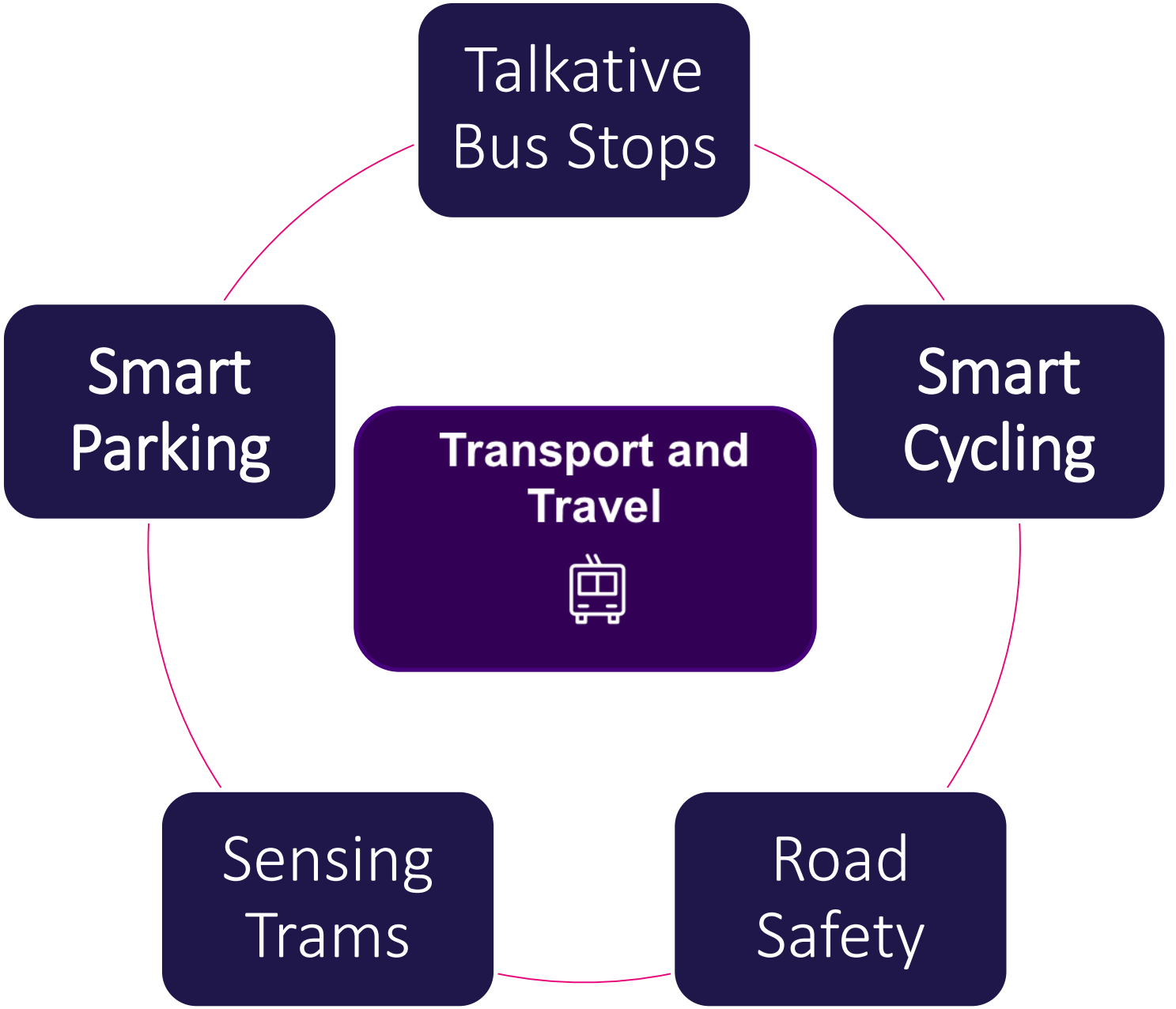

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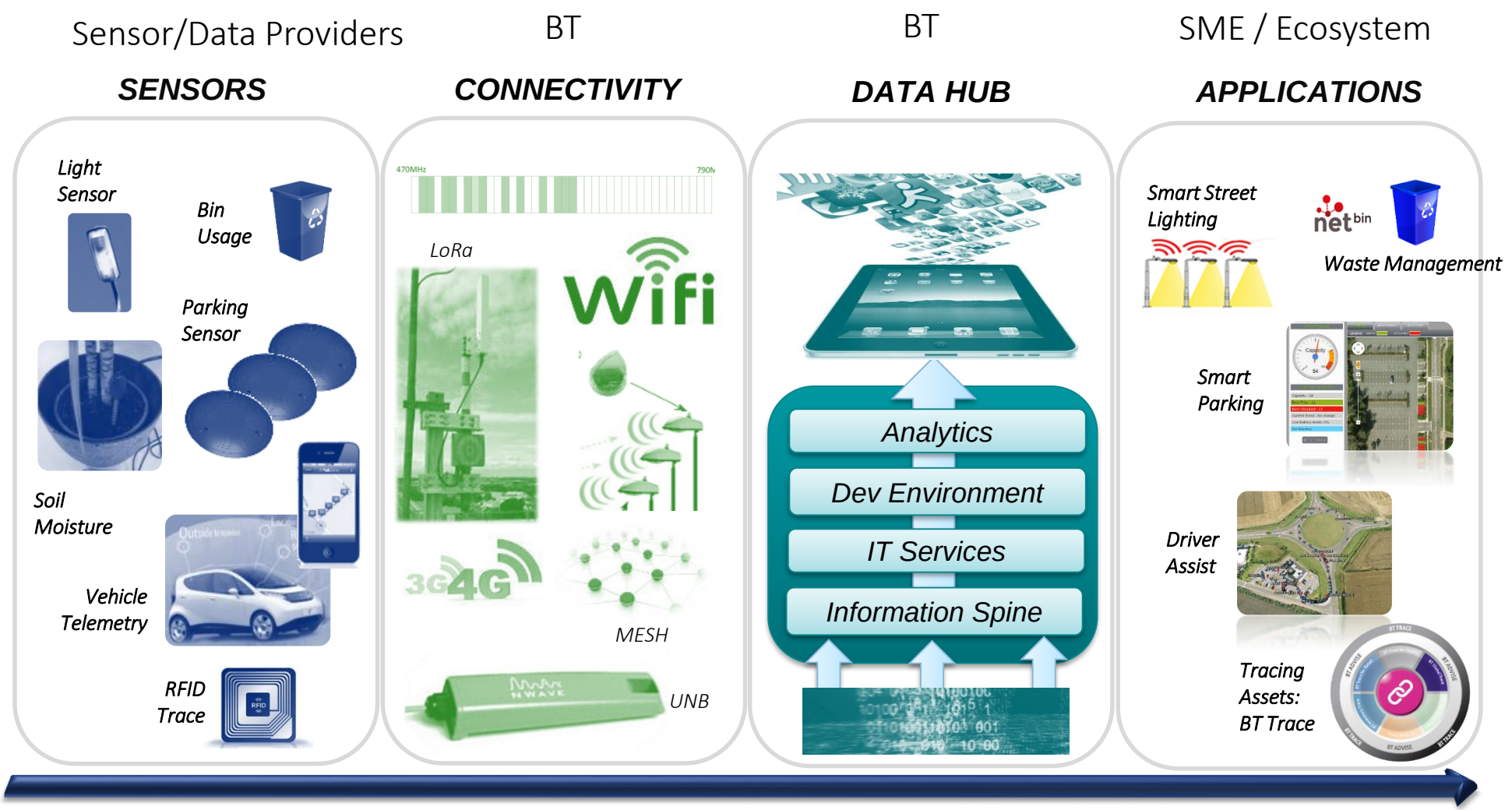
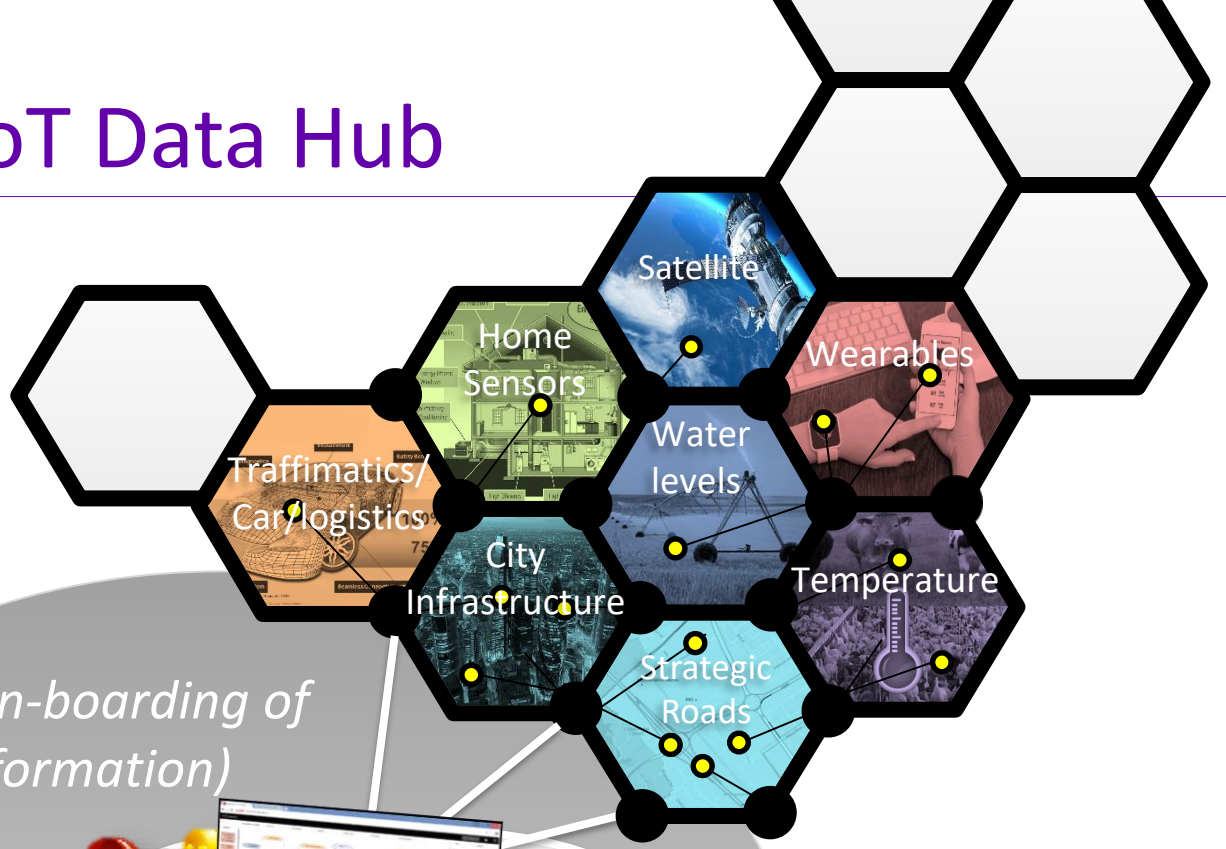
IoT Technology layers



Enabling the IoT Ecosystem
SECURITY / RESILIENCE / SCALE

BT IoT Data Hub



The IoT Data Hub

- *Information Aggregation*
- *Economies of scale*
- *Uniform Access*
- *Maximise Value of Data*
- *Lower barrier to participation*

(On-boarding of Information)

Developers

Data Hub

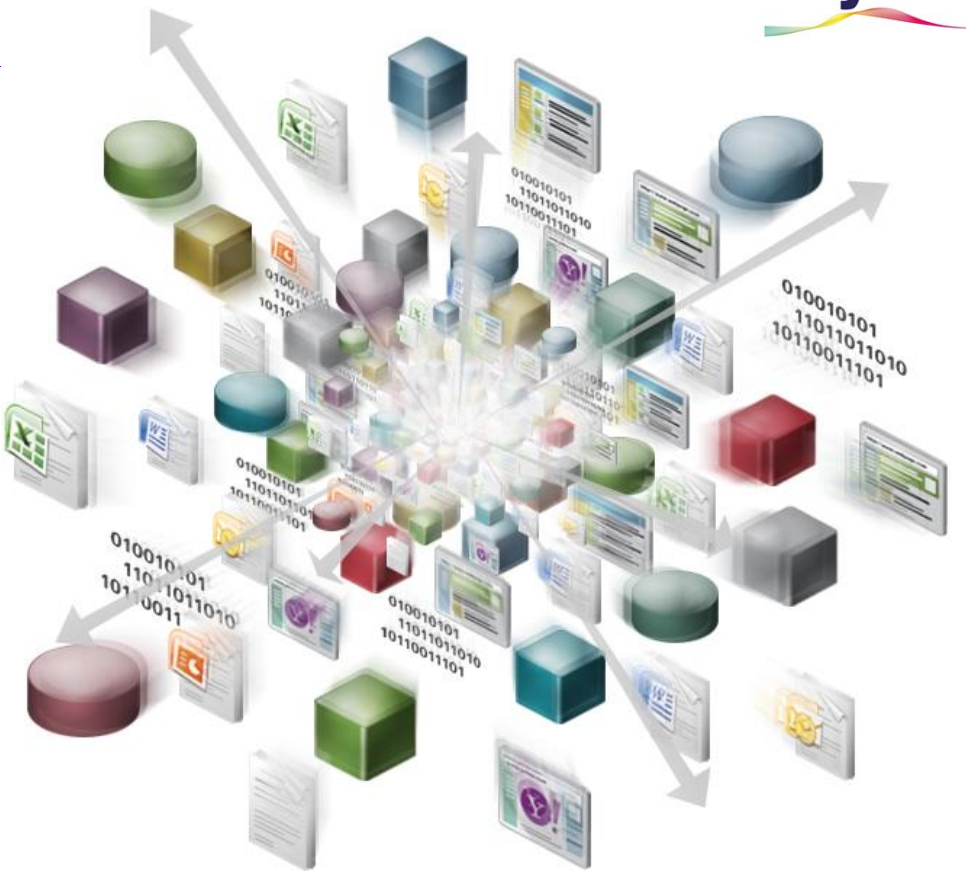
(Connecting applications to information)

Applications

Current BT Manchester data

~200 data feeds

Parking Data
Automatic Traffic Counts
Air Quality data
River Levels
Smart Buildings data
Live and scheduled train
Live and scheduled bus
Cycling usage patterns
NAPTAN (bus stop locations)
Met Office Weather Observations
Highways England – trunk route traffic speed and density



Other partners also have hubs for other application themes

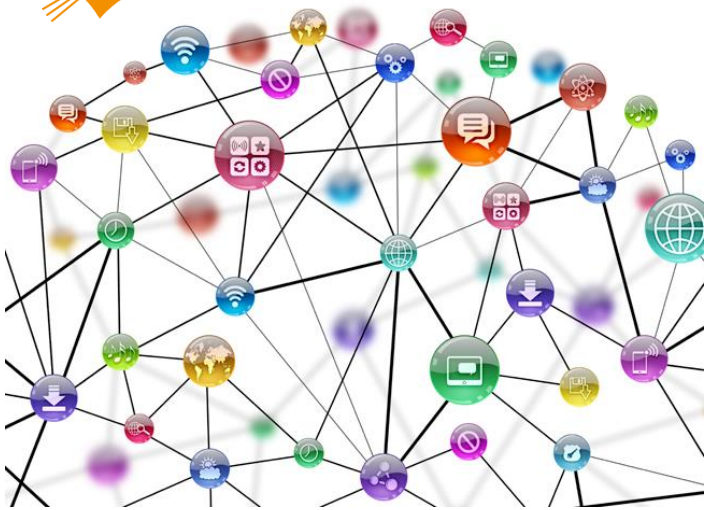
⇨ Data hub interoperability

IoT & Interoperability

***"Interoperability* is essential to unlock 40% of the $11 trillion potential value of the IoT"**
(McKinsey)

RISK:

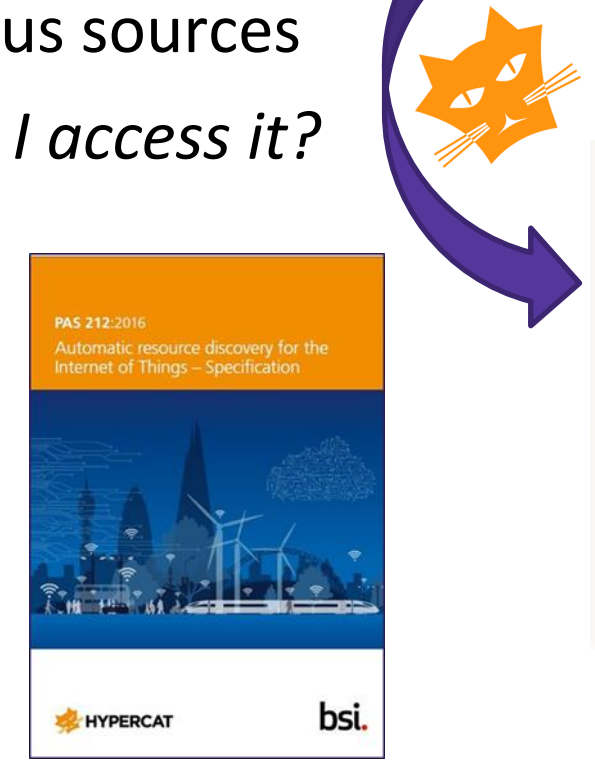
without Interoperability Data Hubs will become Data Silos



IOT Hubs & interoperability

Data hubs lower the barrier to participation:

- Data published on clear terms to a wide audience
- Access to data from multiple heterogeneous sources
- *What data does this hub have and how do I access it?*
- *Interoperation between hubs*

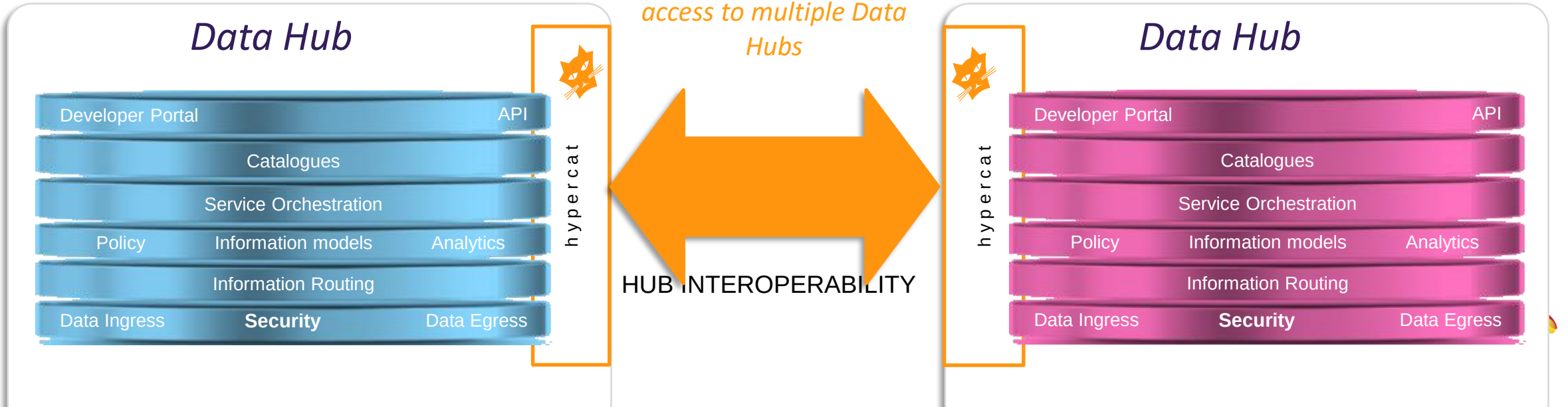


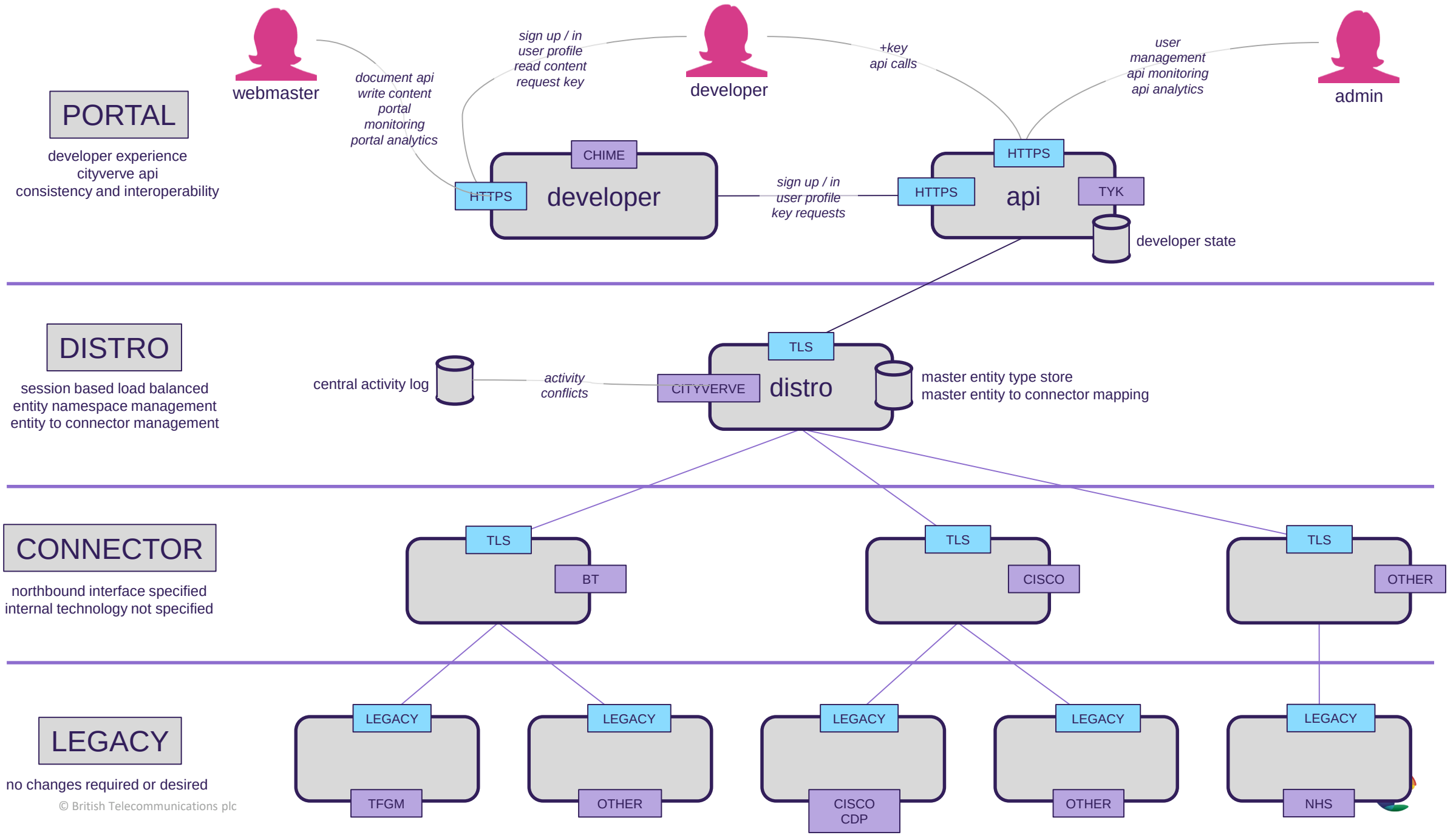
CityVerve's *platform of platforms*

Driving data hub interoperability

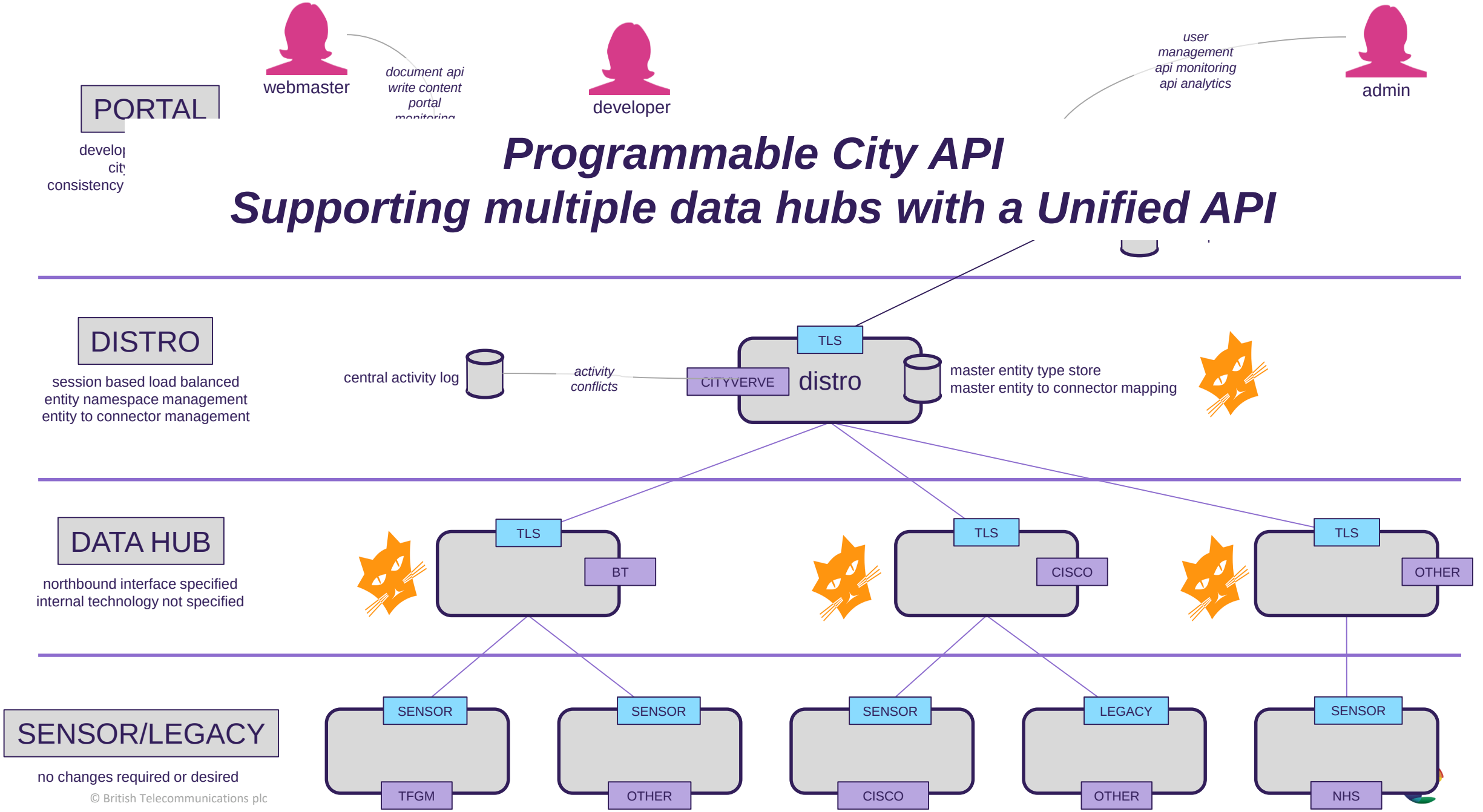
- **Hypercat specification (BSI)**
- A machine-readable (JSON) data catalogue + API
- Breaking down silos
- Fostering innovation
- Maximising the value of data

Hypercat enables uniform access to multiple Data Hubs





Programmable City API
Supporting multiple data hubs with a Unified API



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Thanks for listening

BT

BT/See.Sense CityVerve smart light trial

200 See.Sense sensor-enabled cycle lights to Manchester cyclists

– ICON gathers broad range of anonymised sensor data

– flashes brighter and faster in high risk situations

– feed back location and speed data

Data aggregated on BT's IoT Data Hub, combine with other data

Rich picture on how Manchester's cyclists use their city

Optimise cycle infrastructure investment

SEE.SENSE

cityverve BT

For more information please visit www.seesense.cc/manchester

Thank you for your participation in the project.

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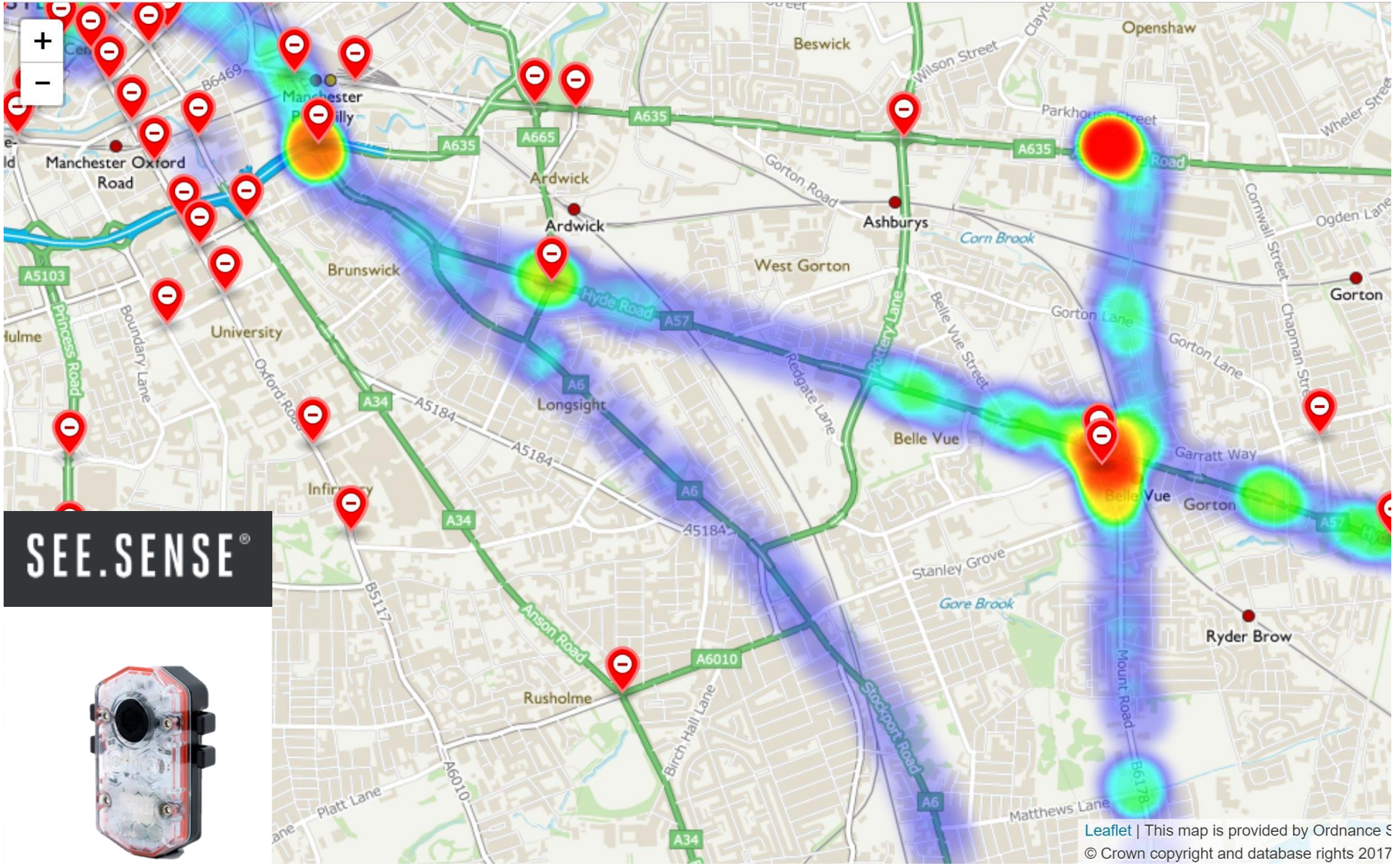

SEE.SENSE®

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Insight

Infrastructure use

Future investment

Road quality

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Smart Parking

Smart Parking

Milton Keynes example

£1.1m new multi-storey car park put on hold

Re-focus on driving up usage of existing capacity

Air Quality

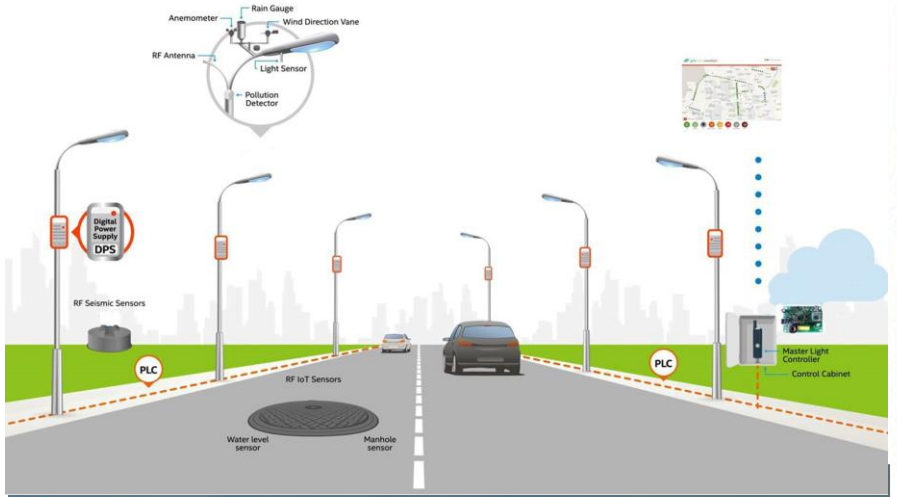
Understanding correlations between traffic and AQ

Addressing health challenges

Smart Lighting

Sensors used to control dimming of lights based on real time traffic volumes

30% energy savings delivered



GREAT EXPECTATIONS

A stretch of the A143 through the Suffolk village of Great Barton is hosting a pilot connected lighting scheme that, it is being argued, has the potential to transform the economics of smart city applications. *Lighting Journal* took a look

But the savings come from selectively reducing light output when it is not needed. Lighting empty roads in the early hours on full power is, of course, in no-one's interests, not least the tax-paying public. Based on these savings, a connected street lighting system, including the wireless network, pays for itself in just a few years.

One of the benefits of connected street lighting that isn't in a typical business case is the ability to remotely adapt lighting levels. This is used today to brighten lighting to assist emergency services or for special events. But it is also useful to fine-tune LED lighting in residential areas.

The public reaction to LED street lights is notoriously difficult to predict, and typically varies street by street, with some residents complaining about glare and others about gloom. Without central control the only response is to manually visit and reset each light, wiping out much of the initial LED energy savings. Connected street lights