Transport data hub

West of England Mayoral Combined Authority

MHA and AECOM lunch and learn

25th September 2025

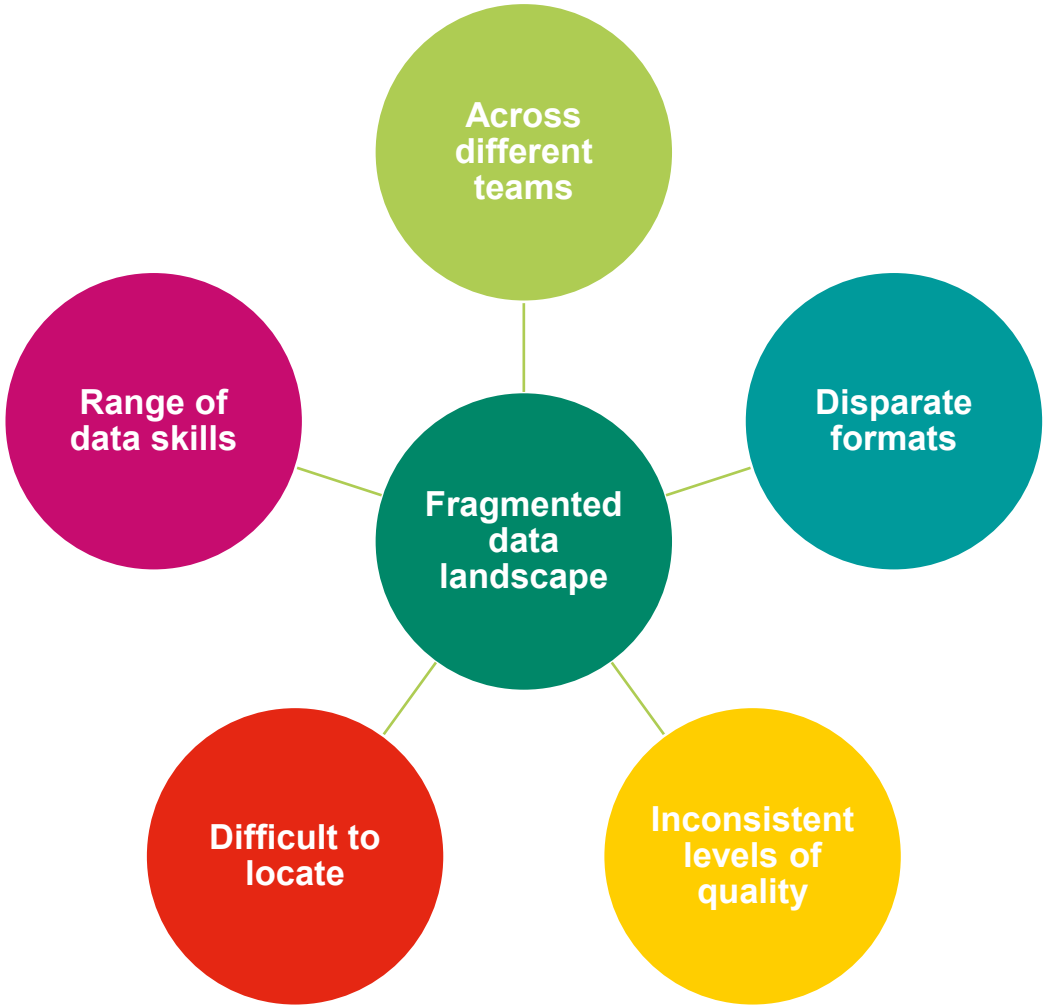
Tom D Allen

Contents

01

Background

The problem - significant barriers accessing & sharing transport data in the region



Limiting organisations to…

Collaborate effectively

Respond efficiently to data requests

Generate insights from data they already hold

Funding source: DfT's Future transport zone programme

Transport data hub

Unifying multiple sources of data, enabling access analysis and insight

Mobility as a Service

Plan, book and pay all from one app - West

Mobility hubs

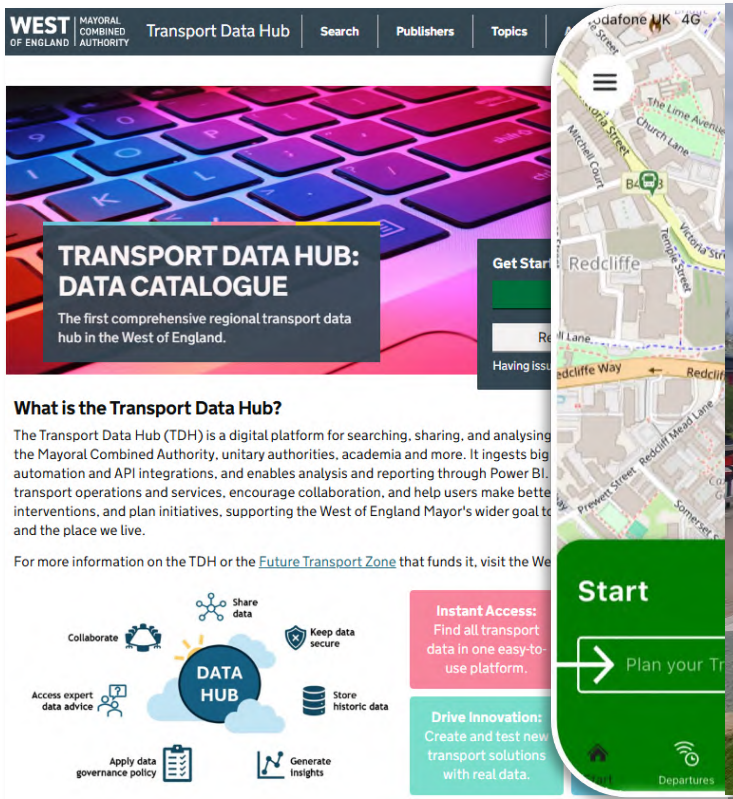
Promoting multi-modal journeys by enhancing facilities at interchange locations

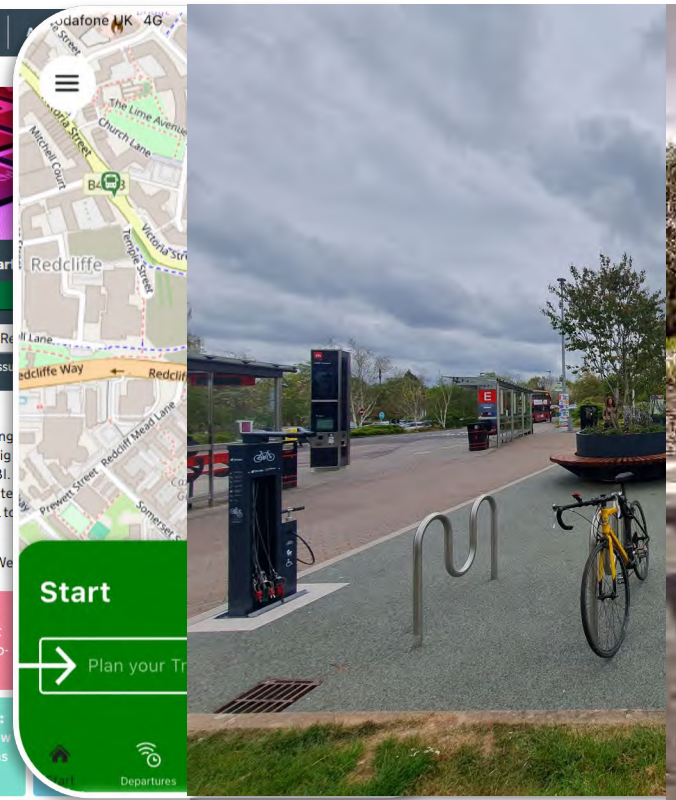
Dynamic demand responsive transport

Offering an alternative public transport mode in areas where traditional modes do not currently present as a viable option

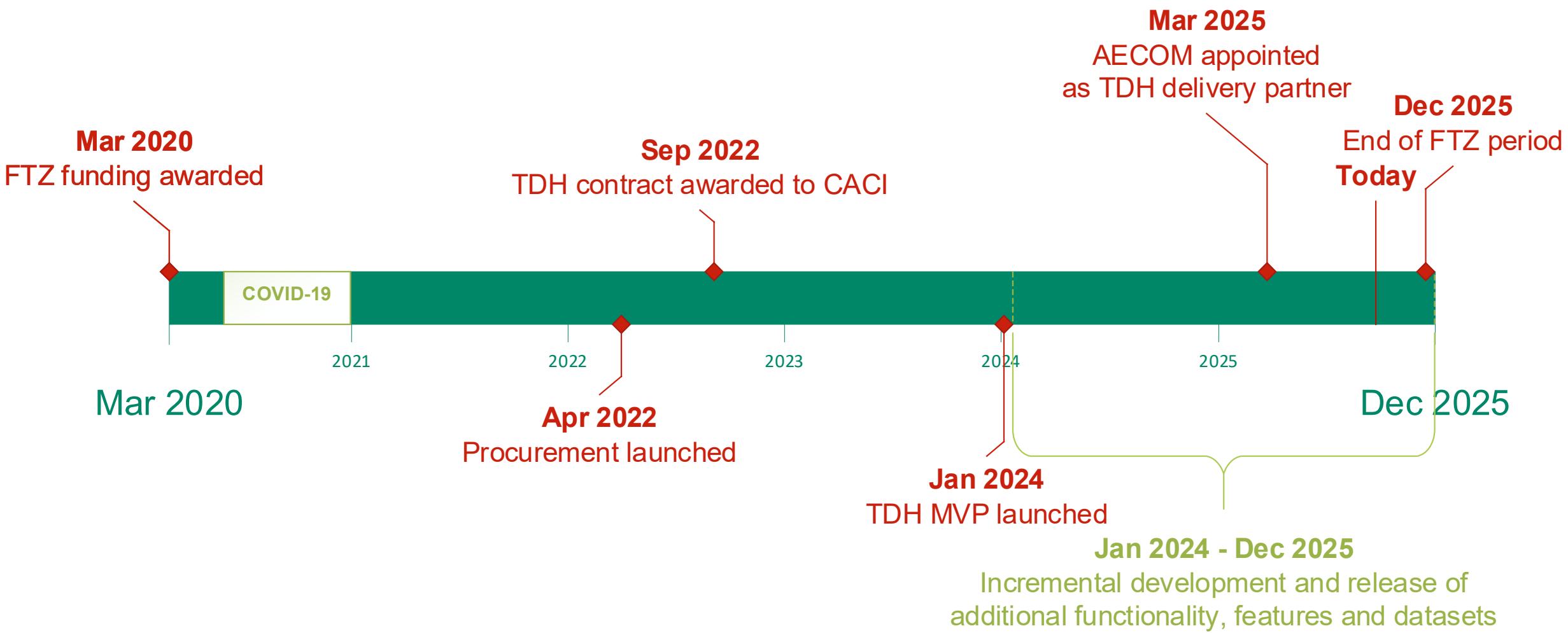
Integrated micromobility service

Providing e-scooter, e-bikes and e-cargo bikes across the region

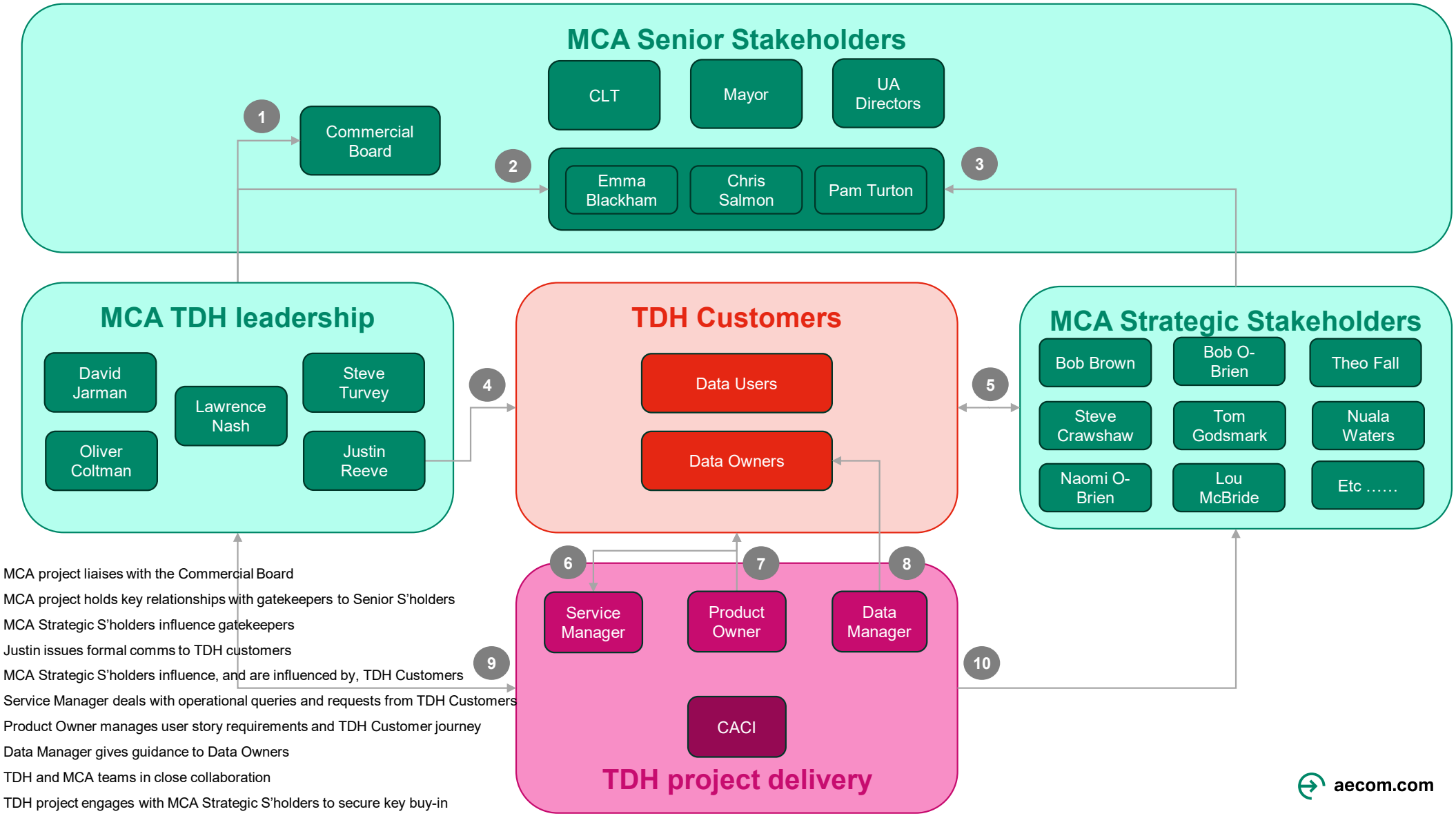




TDH timeline



TDH stakeholders



1 MCA project liaises with the Commercial Board
2 MCA project holds key relationships with gatekeepers to Senior S'holders
3 MCA Strategic S'holders influence gatekeepers
4 Justin issues formal comms to TDH customers
5 MCA Strategic S'holders influence, and are influenced by, TDH Customers
6 Service Manager deals with operational queries and requests from TDH Customers
7 Product Owner manages user story requirements and TDH Customer journey
8 Data Manager gives guidance to Data Owners
9 TDH and MCA teams in close collaboration
10 TDH project engages with MCA Strategic S'holders to secure key buy-in

02

Aims and objectives

TDH objectives

Embed data-driven decision-making

- enabling data driven decision-making in a range of areas, from small-scale and short-term, to regional strategic decisions, through enabling datasets to be used together more effectively and by providing more sophisticated analytics and modelling capabilities

Maximise the value realised from data

- releasing value from new and existing data assets

Work with data more efficiently

- increasing efficiency of access to data and reducing the time it takes data-dependent users to discover and use the right data

Make our customers more knowledgeable

- improving customer experience by removing barriers to accessing information, empowering customers to make smarter mobility decisions

Support innovation in the region

- facilitating innovation and better-quality research within the MCA and beyond

A sustainable and viable transport data hub

TDH – mapping resources to output, outcomes and impact

Transport Data Hub – logic map

Objectives	Input	Output	Outcome (by end of FTZ period)		Impact
Main objective: A sustainable and viable TDH	**IP1:** FTZ funds – capital and revenue	**OP1:** A cloud based data platform developed using industry best practice that can securely process, store, serve and make its data available to its customers. In addition, the TDH is flexible to allow scalability in terms of future applications and integration with different platforms	**O1:** A single source of truth, where all data is in an intuitive format, reliably accessible from one location enabling better data sharing	OB1, OB2, OB3, OB4	**I1: Data discovery, analysis and innovation:** Enabling data customers to explore data, build reports and generate data driven evidence and insight that can be used to assess impacts of interventions
OB1: Embed data-driven decision-making	**IP2:** List of prioritised user stories from engagement with other FTZ projects, data customers and UAs	**OP2:** Data pipelines enabling reliable, low effort ingestion, storage and processing of data in support of the MCA's business requirements	**O2:** A centralised place for data discovery that eliminates bottlenecks by making data available from across the MCA's business	OB1, OB2, OB3, OB4	**I2: Systemised data governance:** The TDH will enable the MCA to take a leading role in setting standards for suppliers and partners by aligning data governance, ethics, regulation, and operational practice
OB2: Maximise the value realised from data	**IP3:** Open data sets	**OP3:** A searchable data catalogue, populated with metadata and data quality indicators enabling data customers and data managers to query and maintain/govern its data	**O3:** Improves access to data by reducing time taken to find data and then process it	OB3, OB4	**I3: Dynamic, demand based operations:** Enabling the observation of patterns of performance, travel behaviour and usage across the network to allow transport operations teams to optimse their services to deliver more efficient transport network utilisation, improved user experiences and better infrastructure planning
OB3: Work with data more efficiently	**IP4:** Operational requirements	**OP4:** Self service reporting and analytics capabilities enabling service managers and data customers to analyse data with different skill levels	**O4:** Making data available to customers from data sharing agreements	OB3, OB4	**I4: Intelligent transport planning and investment:** Accurate data of sufficient resolution to inform business cases, strategic planning, external funding applications, future policies and strategies
OB4: Make our customers more knowledgeable	**IP5:** FTZ data policies	**OP5:** Data sharing agreements with suppliers and consumers	**O5:** Trusted data, that is accurate and reliable and of sufficient granularity to enable evidence based decision making and inform future policies and strategies	OB1, OB2	
OB5: Support innovation in the region	**IP6:** Lessons learned	**OP6:** Guidance and established processes in place to support compliance with data standards, security procedures and general usage	**O6:** Facilitates innovation and better quality research within MCA, UAs and third parties	OB5	
		OP7: Enriched metadata to provide users with essential information (e.g. temporal/geographic coverage, update frequency, granularity, quality statements) to enable earlier assessment of data usefulness	**O7:** Established, streamlined and intuitive data ingestion pipeline processes	OB3	
		OP8: Data Explorer tool that enables interactive searching for the end-user, providing them with a rich summary and coverage of the TDH datasets	**O8:** Enables early identification of data gaps and processes to incorporate additional data	OB3	
		OP9: KPIs for monitoring the TDH usage and user's behavioural change	**O9:** Reduces the technical challenges and security risks associated with consuming data by applying a standard set of processes (e.g. assessment of data quality) that increase efficiency of data discovery, consumption & utilisation	OB2	
			O10: Facilitates regulatory compliance by: • Systemic management of data privacy and protection requirements • Enabling data protection officers to categorise data and apply approriate access restrictions in line with GDPR	OB2	
			O11: Trusted and reliable data increases confidence in data catalogue and reuse of data, saving costs, driving efficiencies and improving quality and consistence of deliverables e.g. assessments	OB2, OB3	
			O12: Future proofed system architecture enabling support of real-time data assets, IoT applications and integrated network operations	OB5	
			O13: Better understanding of customers' needs improving user guidance for activities and hence enabling interventions to be targeted to meet their requirements	OB4	

03

The solution

What is it?
What data is there and how is it organised?
Case studies

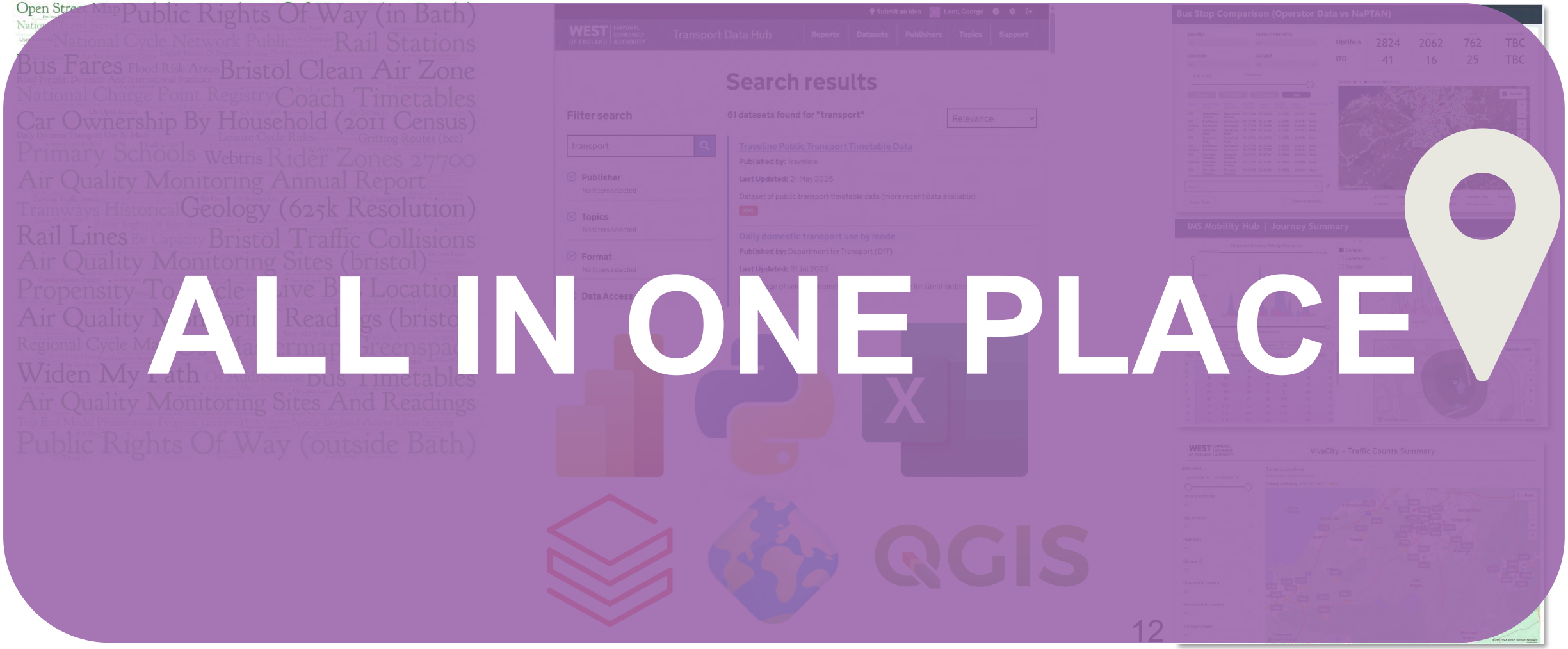
What is it?

WEST OF ENGLAND | MAYORAL COMBINED AUTHORITY

PLENTIFUL DATA

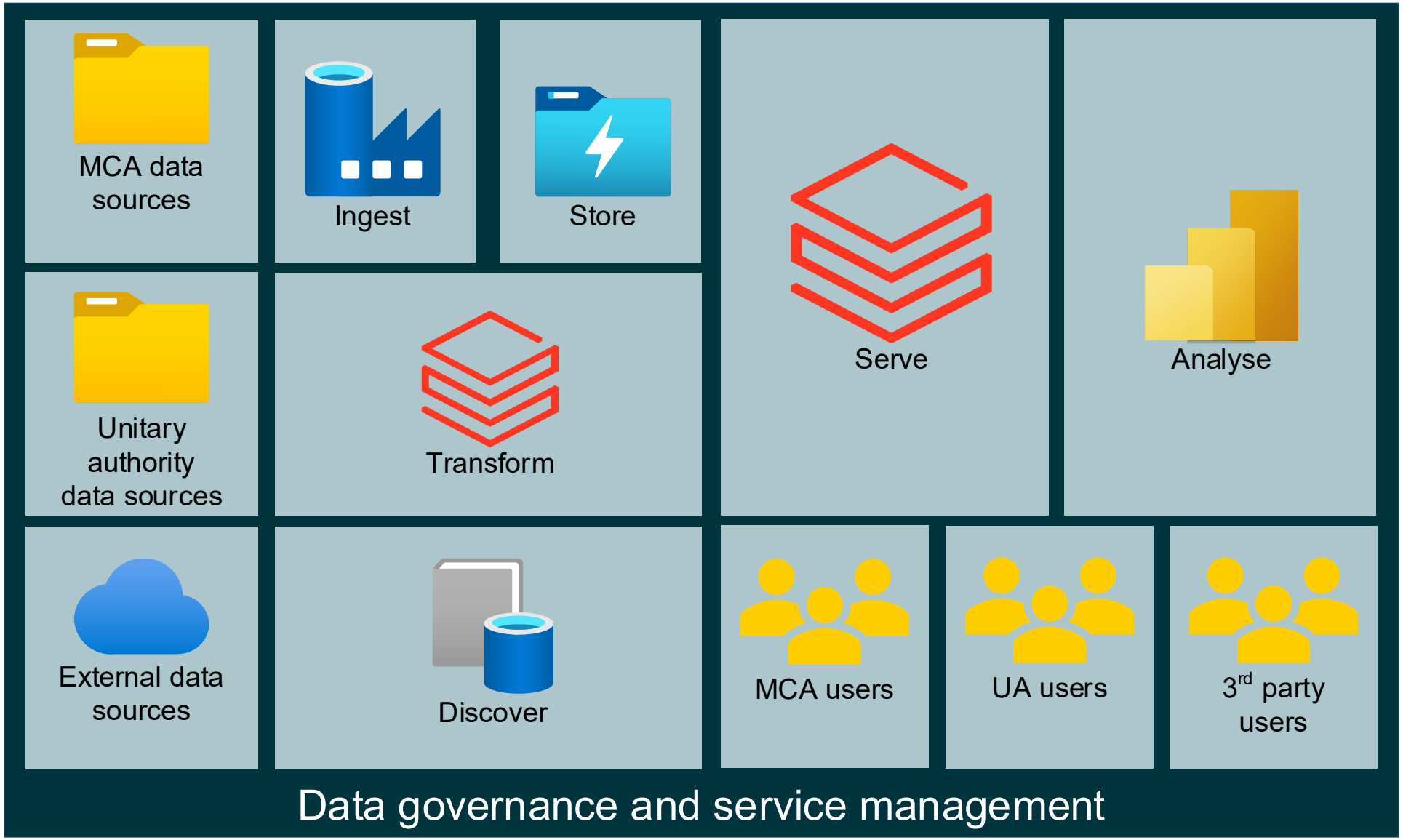
EASILY ACCESSIBLE

UNIQUE INSIGHT



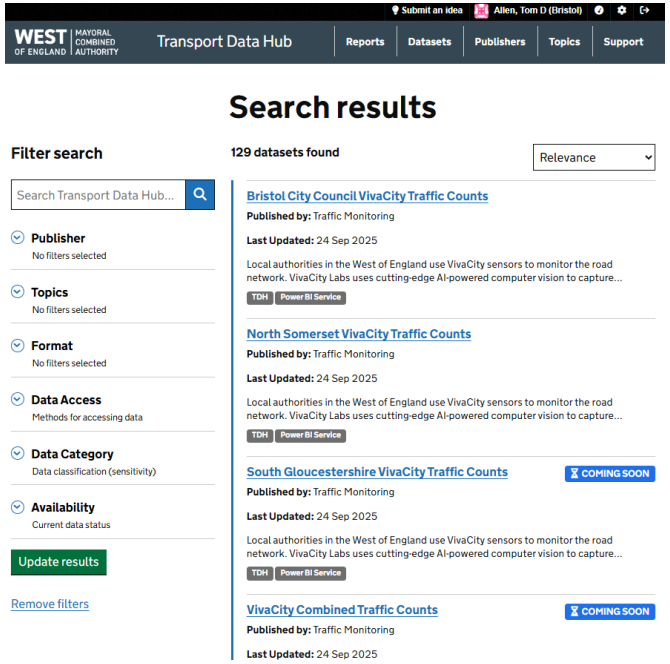
ALL IN ONE PLACE

High level system components



What data is there already and how is it organised?

- 129 data sets searchable by
  - Topic
  - Publisher
  - Format
  - Data access
    (method for accessing data)
  - Data category
    (sensitivity)
  - Availability



Medallion data architecture (modified)

Signposted data (wood)

Raw data (bronze)

Cleansed or transformed data (silver)

New data created from joining, merging etc (gold)

Example: Bus Concessionary Travel Pass Use

Medallion data architecture (modified)

Not applicable in this case

~~**Signposted data** (wood)~~

Data is in the same state as provided by data owner

Year	Month	Service	BANES_ITSO	BANES_Manual	Bristol_City_ITSO	Bristol_City_Manual	Total_ITSO	Total_Manual
2023	11	3X	0	0	31	9	55	13

Raw data (bronze)

Data is pre-processed for analysis according to design principles & best practices

Year	Month	Unitary_Authority	Bus_Service	Total_Manual_Transactions	Total_Scanned_Transactions	Grand_Total
2023	11	BANES	3X	0	0	0
2023	11	BCC	3X	9	31	40
2023	11	NSG	3X	0	0	0
2023	11	SCC	3X	4	24	28

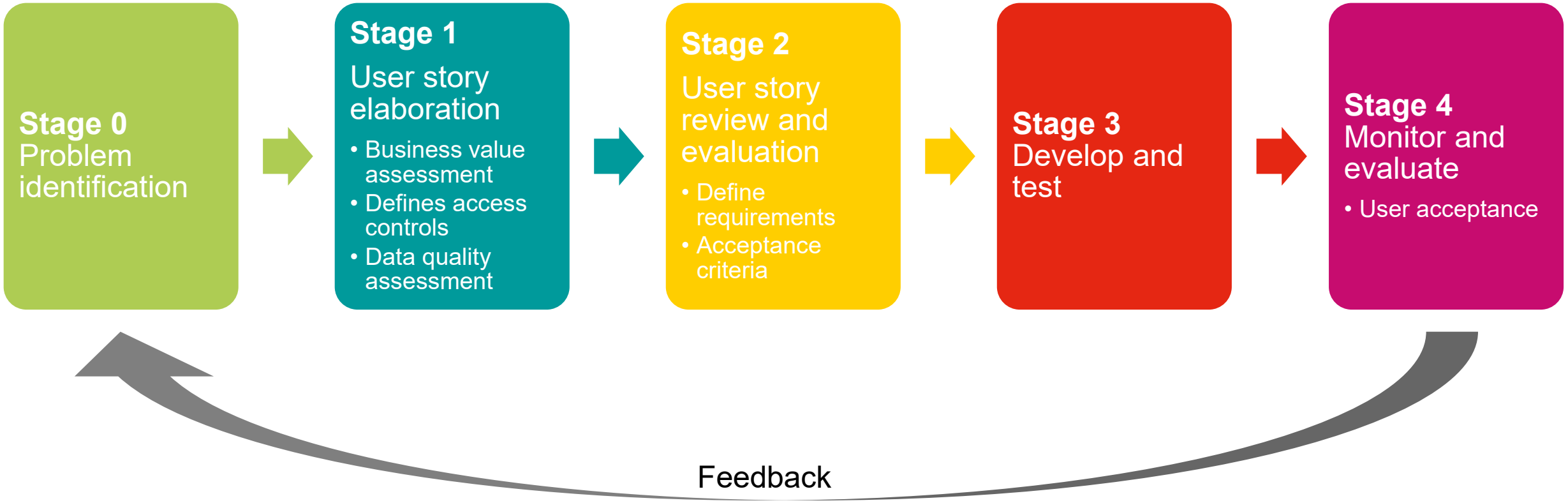
Cleansed or transformed data (silver)

Data is joined and consolidated to bring out business value/insight across the board

Year	Month	Unitary_Authority	Bus_Operator	Bus_Service	Total_Manual_Transactions	Total_Scanned_Transactions	Grand_Total
2023	11	BCC	FirstGroup SOP	3	364	9837	10201
2023	11	SGC	FirstGroup SOP	3	33	1178	1211
2023	11	BCC	FirstGroup SOP	36	125	3240	3365
2023	11	BANES	Stagecoach Bus	3X	0	0	0
2023	11	BCC	Stagecoach Bus	3X	9	31	40
2023	11	NSG	Stagecoach Bus	3X	0	0	0
2023	11	SCC	Stagecoach Bus	3X	4	24	28
2023	11	BCC	FirstGroup SOP	4	255	10779	11034

New data created from joining, merging etc (gold)

Submitting your data



A business value assessment is used to prioritise when data is ingested

– BVA = (reach x impact x strategic alignment) / effort + business change)

Summary	Priority ...	Reach	Impact	Strategy	Technical_...	Business_C...	Labels	Status
MDP-81 UA/MCA Boundaries (Silver)	25						Business_US	STAGE 2 REFINEMENT
MDP-79 Summarisation Dashboard Support	20						Functional_US	STAGE 3 DEVELOPMENT
MDP-11 GIS Data Sharing - MCA writes to TDH	17.9						Business_US Functional_US	STAGE 2 REFINEMENT
MDP-67 Add in preview funtionality for all TDH held datasets	12						Functional_US	STAGE 3 DEVELOPMENT
MDP-23 Travel to work survey (Bronze)	10						Business_US	STAGE 3 DEVELOPMENT
MDP-80 Mobility Hubs (Locations & Facilities)	10						Business_US	STAGE 3 DEVELOPMENT
MDP-30 Incorporate the data library into the TDH data catalogue	10						Business_US	STAGE 3 DEVELOPMENT
MDP-24 NPTI Bus Journey Times (Bronze)	10						Business_US	STAGE 2 REFINEMENT
MDP-73 Ingest Ticket information from Stagecoach from their data warehouse	9.6						Business_US	STAGE 2 REFINEMENT
MDP-29 Ingest Vivacity traffic count data for BCC and BANES into the TDH	9.1						Business_US	STAGE 3 DEVELOPMENT
MDP-95 Ingest Vivacity traffic count data for South Glos into the TDH	9.1						Business_US	STAGE 2 REFINEMENT
MDP-97 Ingest Vivacity traffic count data for North Somerset into the TDH	9.1						Business_US	STAGE 2 REFINEMENT
MDP-77 Supported Services Ticketer Data Transformations (Silver)	9						Business_US	STAGE 2 REFINEMENT

Reach

- The number of people or users that can benefit from this user story or can benefit from using the data that is ingested as part of the story.

Impact

- The user value – this could be measured by time saved, improved data insights (or data quality) for better reporting.
- The business value - can it provide benefits to the region such as improvements to safety, reduced emissions etc? or can it be commercialised?

Strategic alignment

- To what extent does the user story enable or support any existing MCA or UA initiatives (i.e. wider data / digital strategy)?
- Does it explicitly deliver on the objectives of the TDH by being implemented?

Technical effort

- This is the level of technical effort required to deliver the project in single person time.

Business change

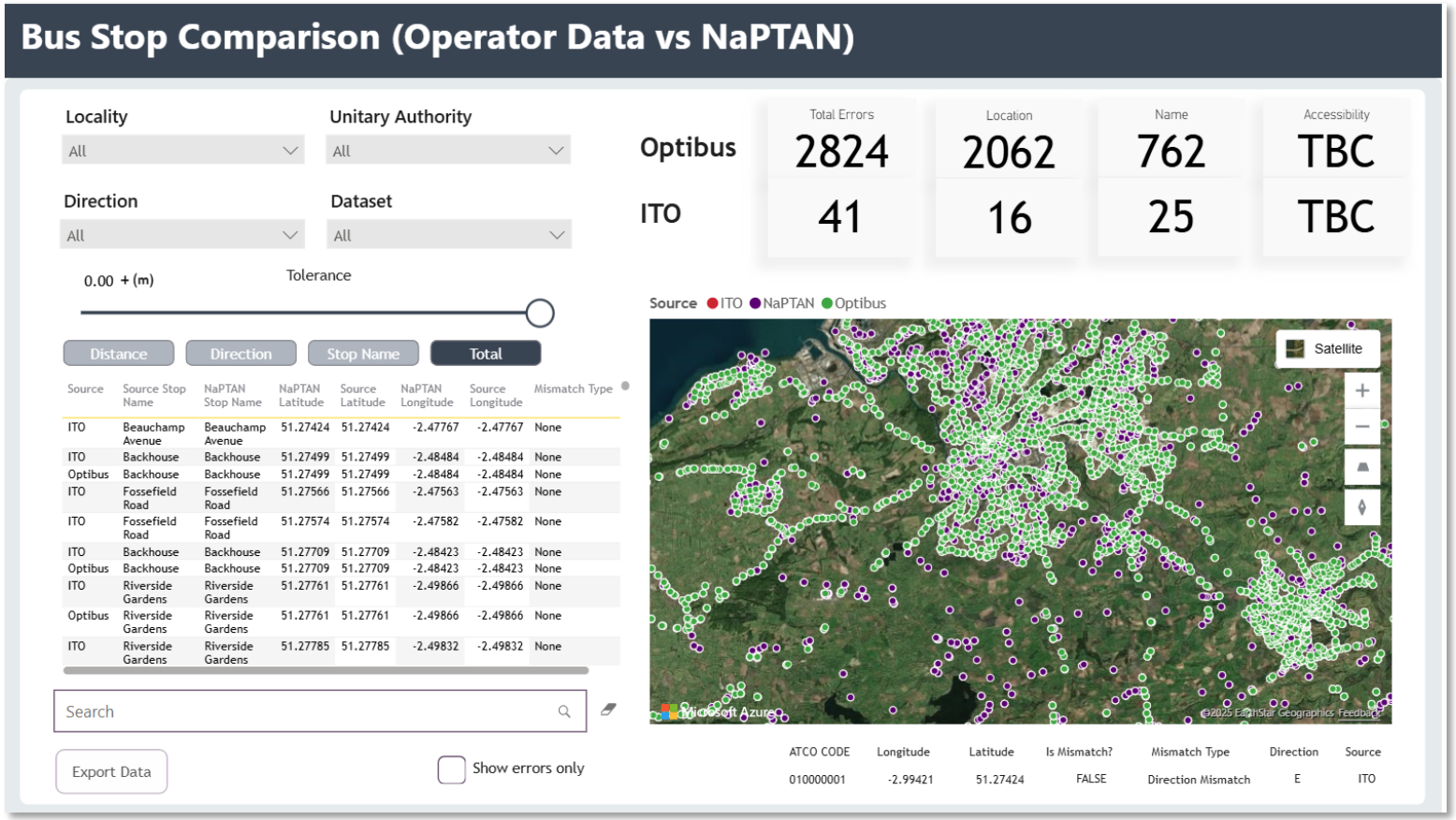
- This is the level of business change required to deliver the user story end to end, e.g. process transformation, organisational transformation, increase in digital maturity

Case study – evaluating scheme impact

- TDH used to understand patterns of e-bike and e-scooter use at the UWE campus mobility hub

Case studies – improving operations

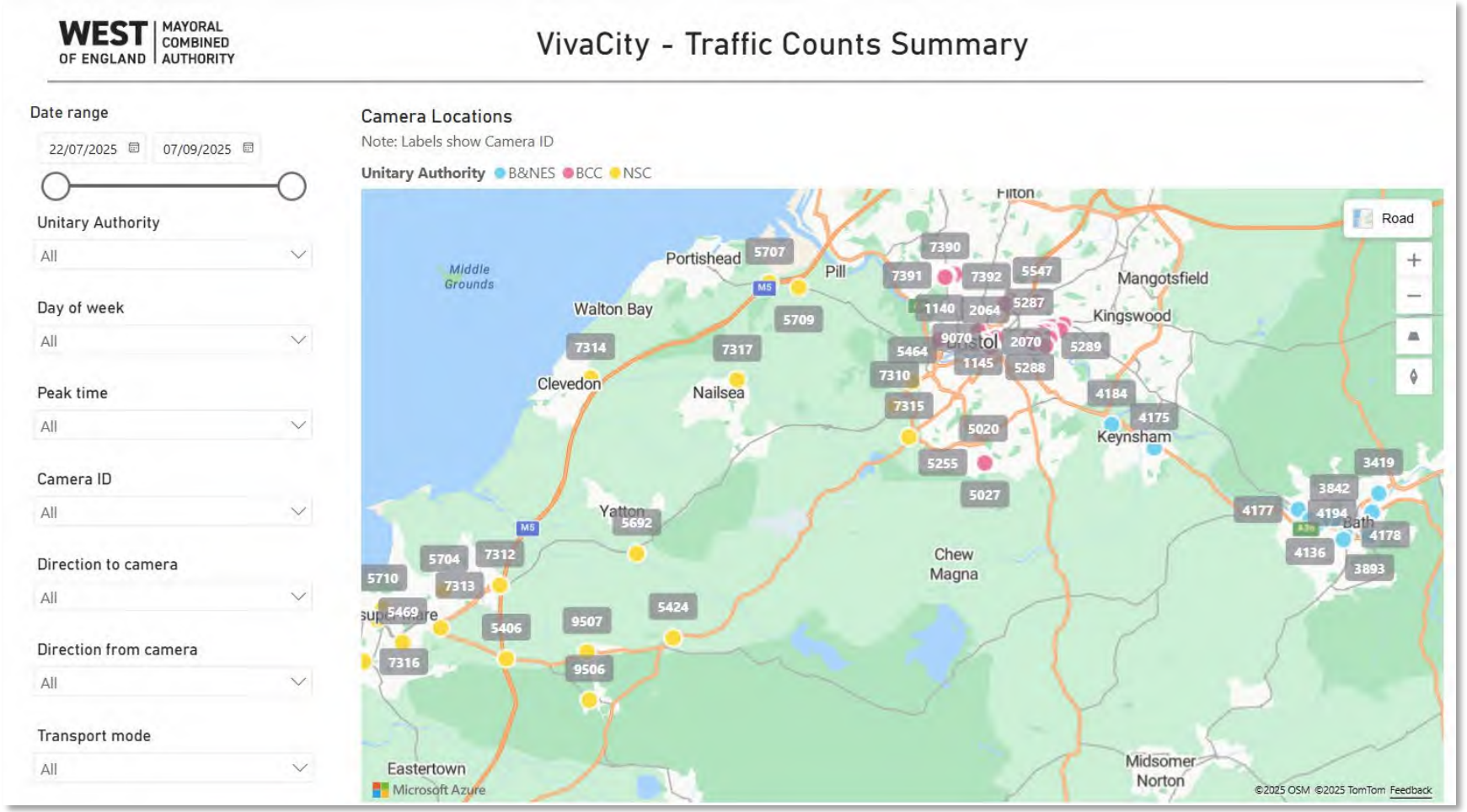
- Mismatch in bus stop coordinates across databases impacts customer satisfaction e.g. ghost buses
- TDH ingested data from:
  - Bus operators
  - NaPTAN (DfT's database)
  - ITO (where Google gets its data)
- TDH automated analysis to identify errors
- MCA bus operations team notified others to rationalise data and improve data quality



Source	Source Stop Name	NaPTAN Stop Name	NaPTAN Latitude	Source Latitude	NaPTAN Longitude	Source Longitude	Mismatch Type
ITO	Beauchamp Avenue	Beauchamp Avenue	51.27424	51.27424	-2.47767	-2.47767	None
ITO	Backhouse	Backhouse	51.27499	51.27499	-2.48484	-2.48484	None
Optibus	Backhouse	Backhouse	51.27499	51.27499	-2.48484	-2.48484	None
ITO	Fossefield Road	Fossefield Road	51.27566	51.27566	-2.47563	-2.47563	None
ITO	Fossefield Road	Fossefield Road	51.27574	51.27574	-2.47582	-2.47582	None
ITO	Backhouse	Backhouse	51.27709	51.27709	-2.48423	-2.48423	None
Optibus	Backhouse	Backhouse	51.27709	51.27709	-2.48423	-2.48423	None
ITO	Riverside Gardens	Riverside Gardens	51.27761	51.27761	-2.49866	-2.49866	None
Optibus	Riverside Gardens	Riverside Gardens	51.27761	51.27761	-2.49866	-2.49866	None
ITO	Riverside Gardens	Riverside Gardens	51.27785	51.27785	-2.49832	-2.49832	None

Case study – sharing data

- Results from VivaCity camera surveys shared within the region
- Multi modal demand presented in various user configurable formats
- Supports collaboration and cost reductions



04

Current focus and future plans

Our current focus

WEST OF ENGLAND MAYORAL COMBINED AUTHORITY

Data

- Accelerating data ingestion
- Prioritising FTZ datasets
- Combining datasets to add value

Applications

- Improving the catalogue e.g. to quickly visualise and sample datasets
- Enabling/ enhancing access points
  - Power BI
  - Python
  - QGIS

User experience

- Identifying and resolving UX issues
- 1st phase of usability testing completed and measures implemented
- 2nd phase in Oct
- Publicising the tool

Architecture and quality

- Embedding data quality assessment tool into BAU
- Efficient transition between IT service providers

Project governance

- Preparing a business case to support on-going maintenance & development
- Development of target operating model – transitioning to BAU

TDH – product road map

WEST OF ENGLAND MAYORAL COMBINED AUTHORITY

Transport data hub – product road map v2

			July 2025	August 2025	September 2025	October 2025	November 2025	December 2025	2026 and beyond
Data*	Future Transport Zone (FTZ) data	IMS data	IMS Voi ☑	IMS Tier ☑	IMS Dott IMS combined	IMS dashboard migration	IMS dashboard enhancements		Further IMS dashboard enhancements
		Other FTZ data	Mobility hubs (locations & facilities) ☑		Travel surveys Micromobility dashboard (Mobility Hubs M&E)		MaaS OpenSearch MaaS combined portal analysis		MaaS multimodal journeys
	Bus data		Passenger Focus ☑ ITSO smartcard data ☑ Ticketer patronage data ☑	ITO World ☑ NAPTAN improvements	NPTI TransXChange Concessionary bus analysis	Stagecoach ticketing	NPTI bus delay Multi-operator patronage NPTI journey times		Passsenger delay dashboards
	Rail data					GWR parking			Rail patronage and delay
	Other key datasets		Data library (wood*) ☑			Travel to work surveys	Data library		Connectivity tool
	Contextual data						Weather	Contextual GIS	
	Highways data			Vivacity Bristol & BANES ☑	Drakewell BANES	STATS19 BCC collision data EV charging	Manual traffic surveys	Traffic counts	INRIX/TomTom data UA collision data
Applications	Enriched visualisation		Catalogue summarisation PoC ☑	PBI visualiser of summarised data		Bespoke visualisation		Real-time demonstrator	
	Access points		Python enabled ☑	Enhanced tailored P BI connect file ☑ Serverless databricks warehouse ☑		QGIS and ArcGIS enabled			
	Enhanced data catalogue			Implement UX recommendations from ph1			Implement UX recommendations from ph2		Continuous UX improvement
User experience	Identifying UX improvements		Accessibility testing ☑ User experience testing – ph1 ☑			User experience testing incl. self-serve – ph2			Further UX testing
	User support		TDH Champions identified in MCA ☑		TDH Champions trained	User guide in TDH			Chat TDH
	Service manager		In post ☑				TDH hackathon		
	Customer introduction		MCA priority data owners onboard ☑	TDH team engagement with UAs ☑	Phased introduction to customers at UAs, North Somerset and Universities as new data sets are released				TDH open to public
Architecture and quality assurance	Quality assurance		Enhancement of data quality assessment tool ☑		Promote use of data quality assessment tool				
	Databricks		Restructuring assessment ☑			Delt start	3rd party security audit		
Project governance	Business case		Guidance on approach from senior stakeholders ☑	Methodology developed to monetise benefits ☑	Prepare business case	Business case submitted	Business case approved		New funding in place for TDH
	Monitoring and evaluation		TDH usage metrics in place ☑						
	Business As Usual				Development of target operating model				Implementation of TOGAF and ITIL

*** notes on data:** key to colour coding: wood (brown) refers to signposted data, bronze – raw data, silver – transformed data and gold – combined data

☑ **Task completed**

Thank you

tom.d.allen@aecom.com

Don’t miss October’s lunch and learn on…

Monitoring and evaluation
– updates to local authority guidance

AECOM

Delivering a
better world