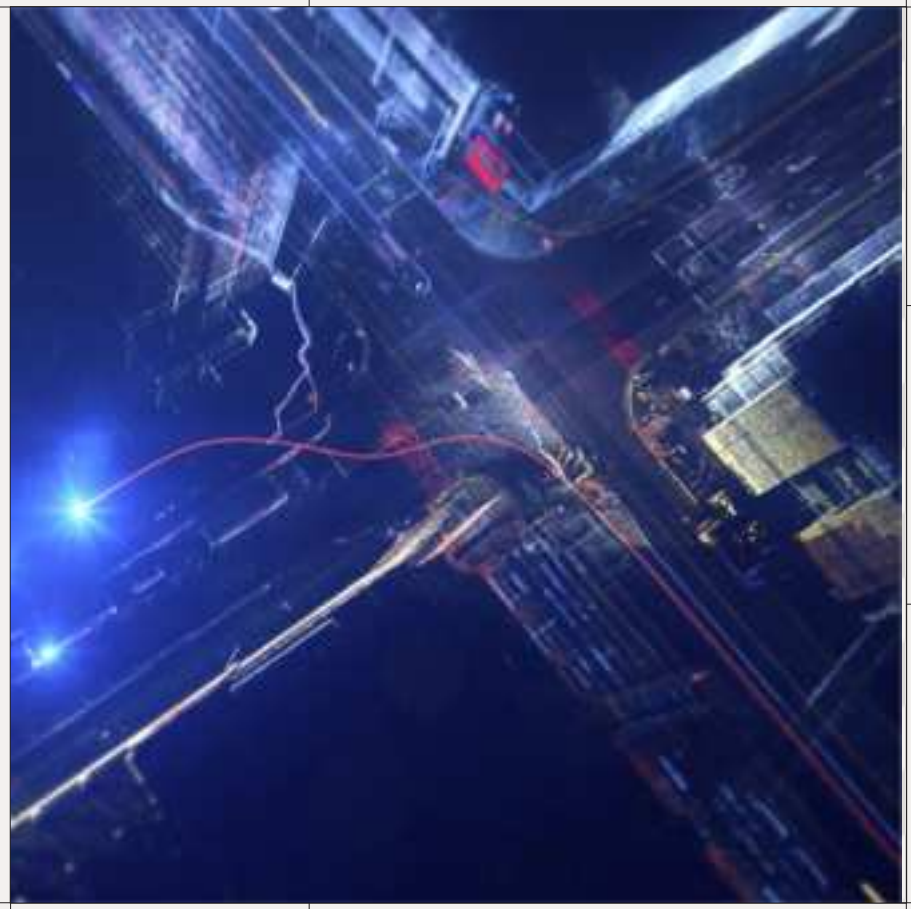
Scaling modern geospatial data capabilities

Faster, reliable delivery to power decisions that shape the world



Debbie Wilson – Head of Data

Ordnance Survey

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Ordnance Survey

We are **Great Britain's** national geospatial authority

- Established over 230 years ago
- Evolved from traditional map-makers into an innovative products and platform business
- Turns data into insights and impact, through the power of location
- Trusted advisor for geospatial to government (nationally & internationally)
- Supporting national infrastructure, public services, and innovation

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What we do

National Map provides a **360° view of the nation**, enabling powerful, joined-up insights

Positioning data

Highly accurate satellite positioning data using OS Net

Maps and imagery

Mapping designed to provide visual context and simple analysis

Land and terrain

Land cover, land use and elevation data

Water

Water bodies, tidelines and river networks

Buildings and infrastructure

Information about the built environment

Areas and zones

Areas used for administration and analysis

Addresses and names

Information relating to addresses, named features and places

Transport

Network data for roads, paths, trams, ferries and railways

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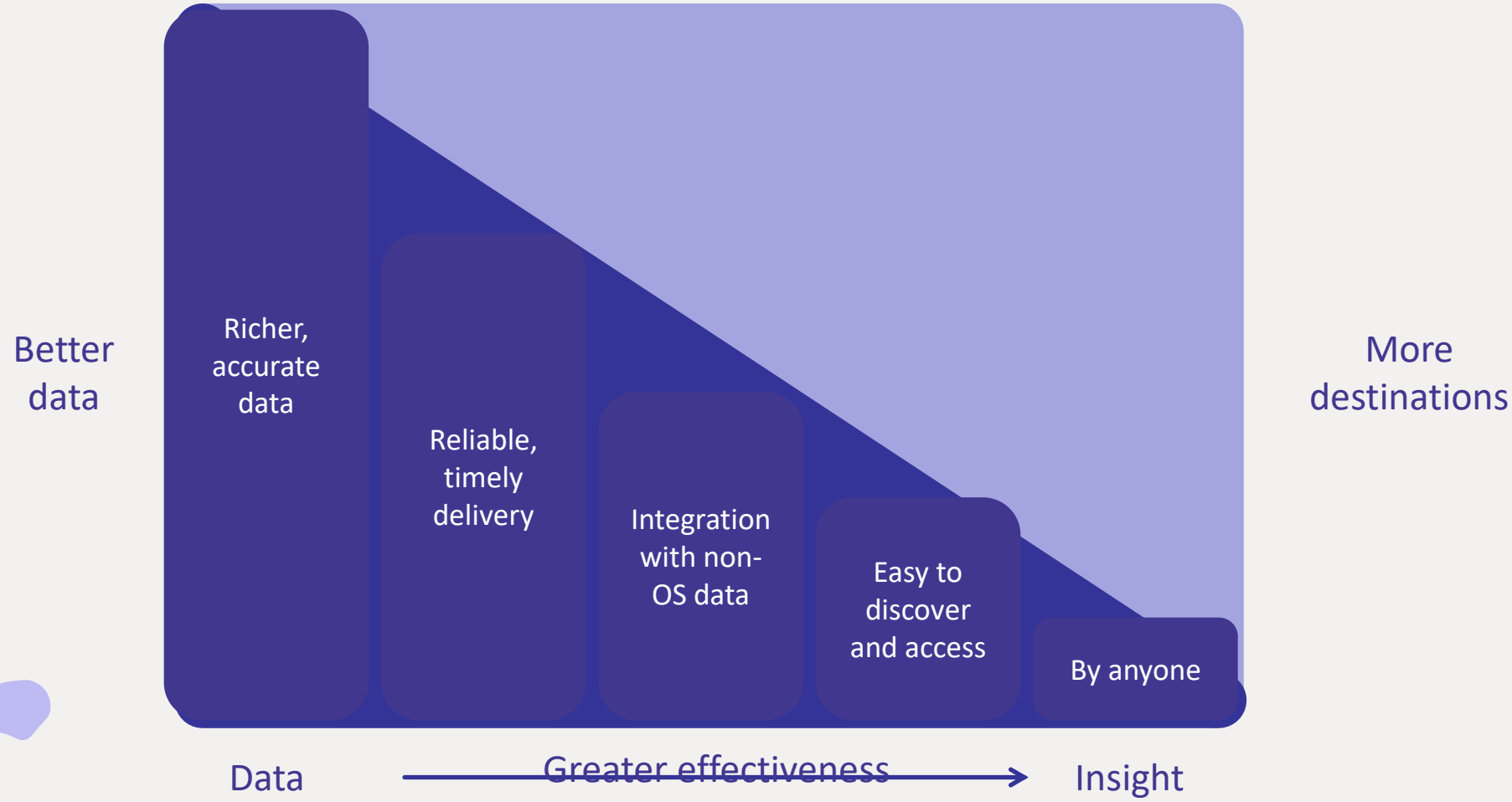
How we do it

Maintaining and providing access to the *National Map* must evolve to meet the needs of current and emerging customers



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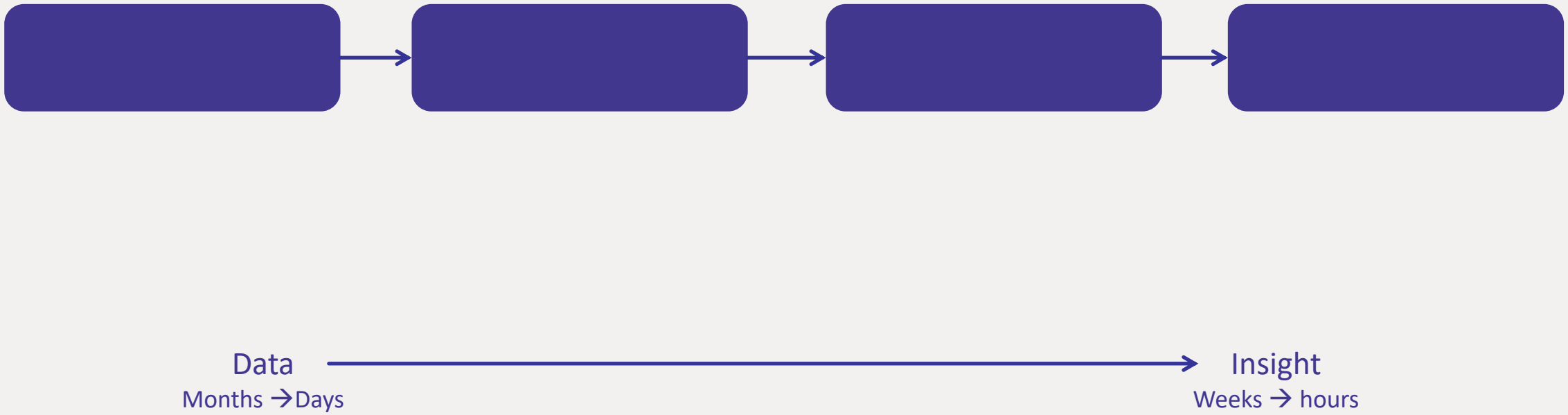
Geospatial value chain



Data
Months → Days

Insight
Weeks → hours

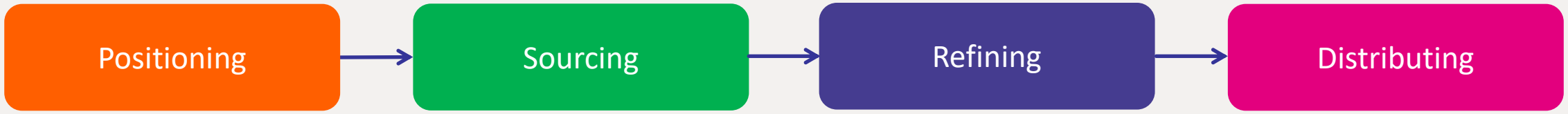

Data
Months → Days
Insight
Weeks → hours

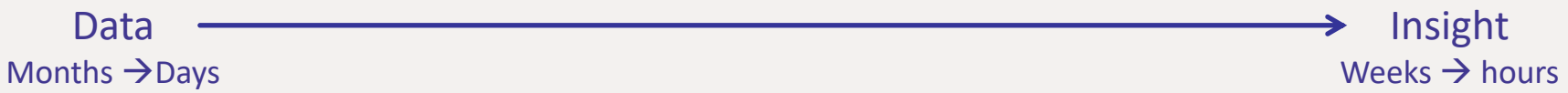
Foundational capability:
GPS/GNSS ground network (OS Net – Rinex - GINA)
Coordinate Reference System (British National Grid)

Data acquisition and maintenance:
Aerial & UAS imagery
Field surveying and editing
Core large scale data
Intelligence-led planning
Non-OS data

Real-time pipelines: Raw to product
Ingest & prepare
Derive & enrich
Generalise
Data products

Data Hub:
Beta, Open, Premium data (OS & Non-OS)
APIs: download, OGC
Data Platforms
Documentation & guides





Enablement

GIS + data analysis tools
Developer tools
Data science enablers
Customer support
Consultancy / Innovation
Partner network



Data
Months → Days

Insight
Weeks → hours

Scaling modern geospatial data capabilities

#1 Operating model, culture and mindset

 # 2 Automation & AI

#3 Cloud-native data infrastructure

#4 Make data easy to use

#5 AI-ready data

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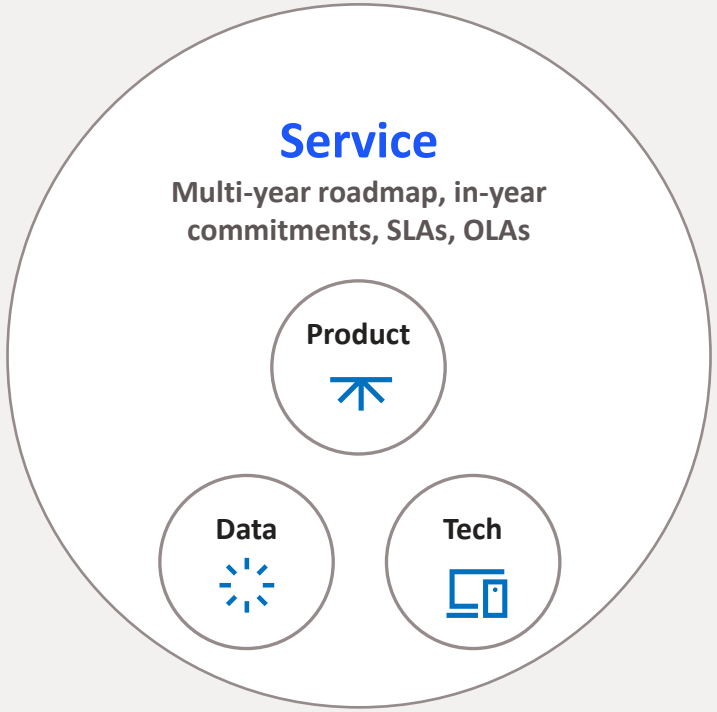
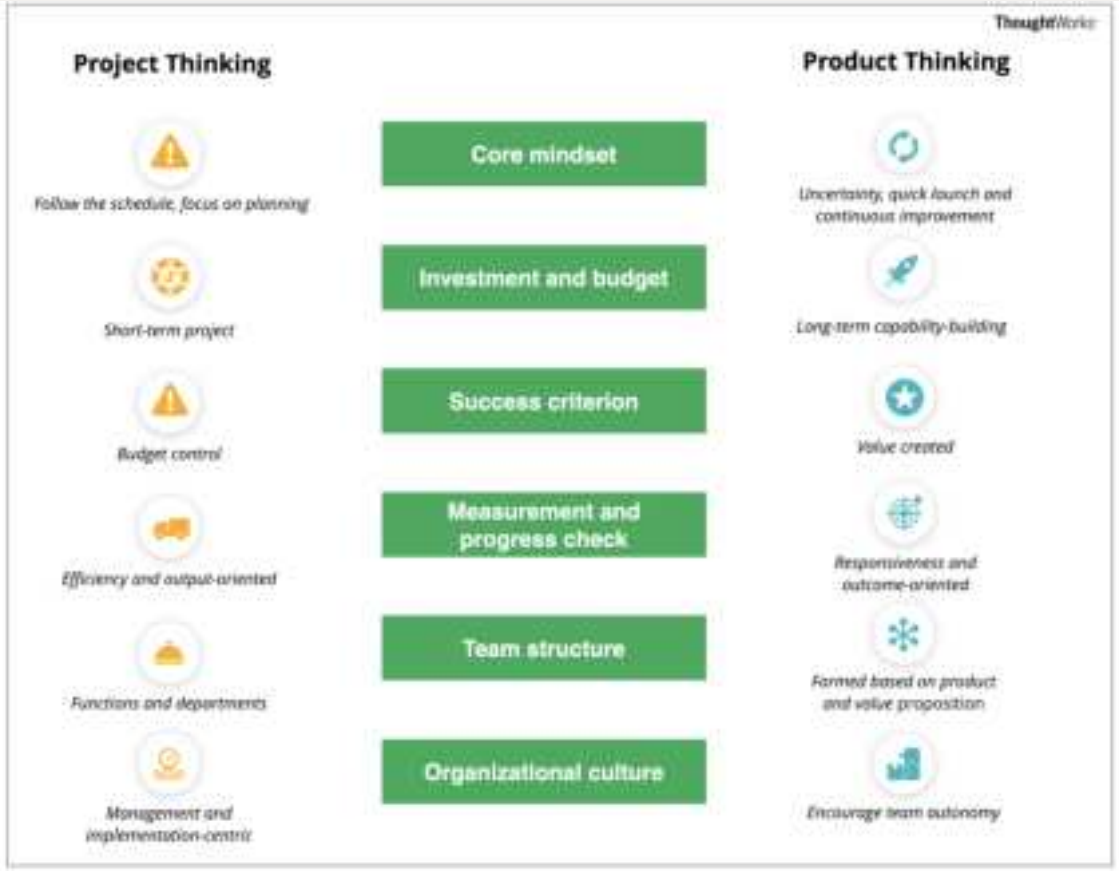
Scaling #1: Services - moving from project to product





Problems we are solving:

- **Commissioning:** slow, time-consuming, outcome over output, experimentation and *"failure"* inherent part of product development, balanced portfolio
- **Whole-life approach:** prioritise quality, reliability and maintenance not just new features
- **Accountability & decision-making:** within and between services not senior leadership, deliver what matters and re-prioritise as change happens

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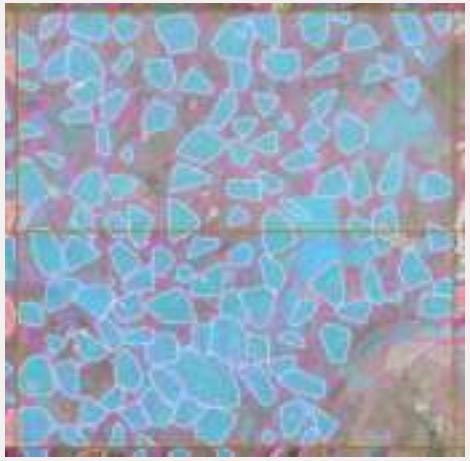
Scaling #2: Automation & AI

Phase 1: Intelligence-led planning & change detection



- **In production** since 2020
- **Outcome:** identify real-world change providing change intelligence to plan and direct editing
- **Benefit:** Reduce time to complete job - editor driven directly to change and knows what it is
- **ML enhancement - 2025:** transitioned from eCognition to Azure ML model improving performance and quality

Phase 2: Automatic feature extraction







New features & attribution: Field boundaries, land cover & roof attributes

- **In production** since 2023
- **Outcome:** identify features and derive attribution not captured as part of our core specification to deliver NGD product enhancements
- **Customer use cases unlocked:** Rural Payments Agency: calculation of environmental subsidies, MHCLG – land cover change and green energy policies
- **ML enhancements 2025+:** transition of field boundaries from eCognition to new ML model improved **performance** (+400%) , **quality** (10% from 40% failure rate) and **timeliness** to < 2 mths post edit update from > 6 mths

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Scaling #2: Automation & AI

Phase 3: Total Revision (TR) and Tidal Automation

- **In production:** 2026
- **Outcome:** automatically produce candidate features for new developments and tidal areas from UAS imagery
- **Benefit:** Reduce time to edit. Editors require less time to update entire area, quality control is built into the job removing downstream process, editors focus on the more complex elements (e,g, carriageways)

Phase 4: GeoFoundational Models

- **Applied Research & Development**
- **Outcome:** develop advanced geofoundational models that can be applied to a range of sensors & platforms – multi-spectral, hyperspectral, LiDAR – aerial, UAS, mobile, satellite
- **Benefits:** Increased currency and timeliness, improved accuracy and quality, greater production productivity

Phase 5: Automation National Cyclic Revision (NCR)



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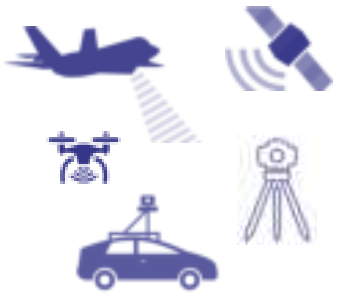
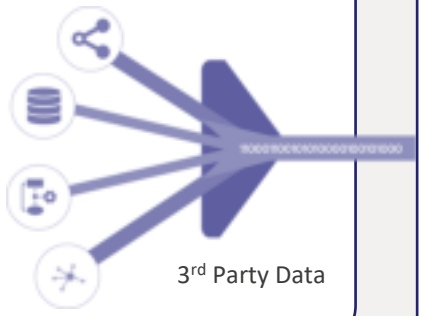
Scaling #3: Cloud-native data infrastructure

Re-usable data & pipelines, cloud-native platforms, right tool for right job

Sourcing



Increased currency & smarter, targeted capture & maintenance



3rd Party Data

CDSP Labs

Research

GeoAI

Product Development

CDSP Refinery

Incremental Change Processing

Identify & Lifecycle Management

Data Linkage

Data Integration

Metadata & provenance

Automated Feature Extraction & Classification

Data Derivation

Master Data Mgmt

Machine Learning

Internal Data Access

Serve to OS Data Hub

databricks

STAC

Unity Catalog

Landing

Raw

Base

Derive & Enrich

Curate

Products

Common Data Store

Data Observability, Security & Governance



National Geographic Database



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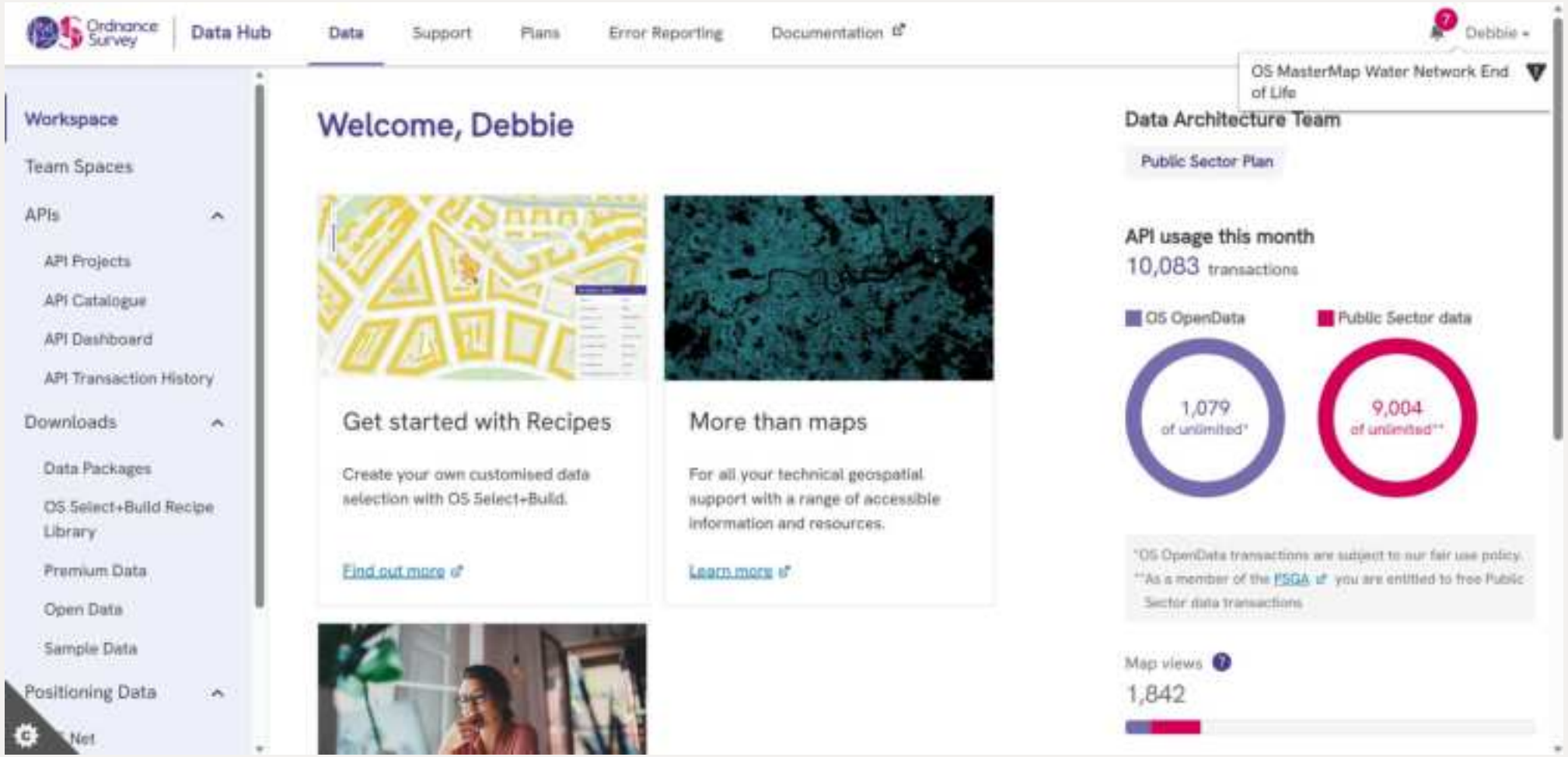
Scaling #4: More Destinations – making data easy to use

Data Hub, Data Platforms and insight enablers



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Scaling #4: More Destinations – making data easy to use



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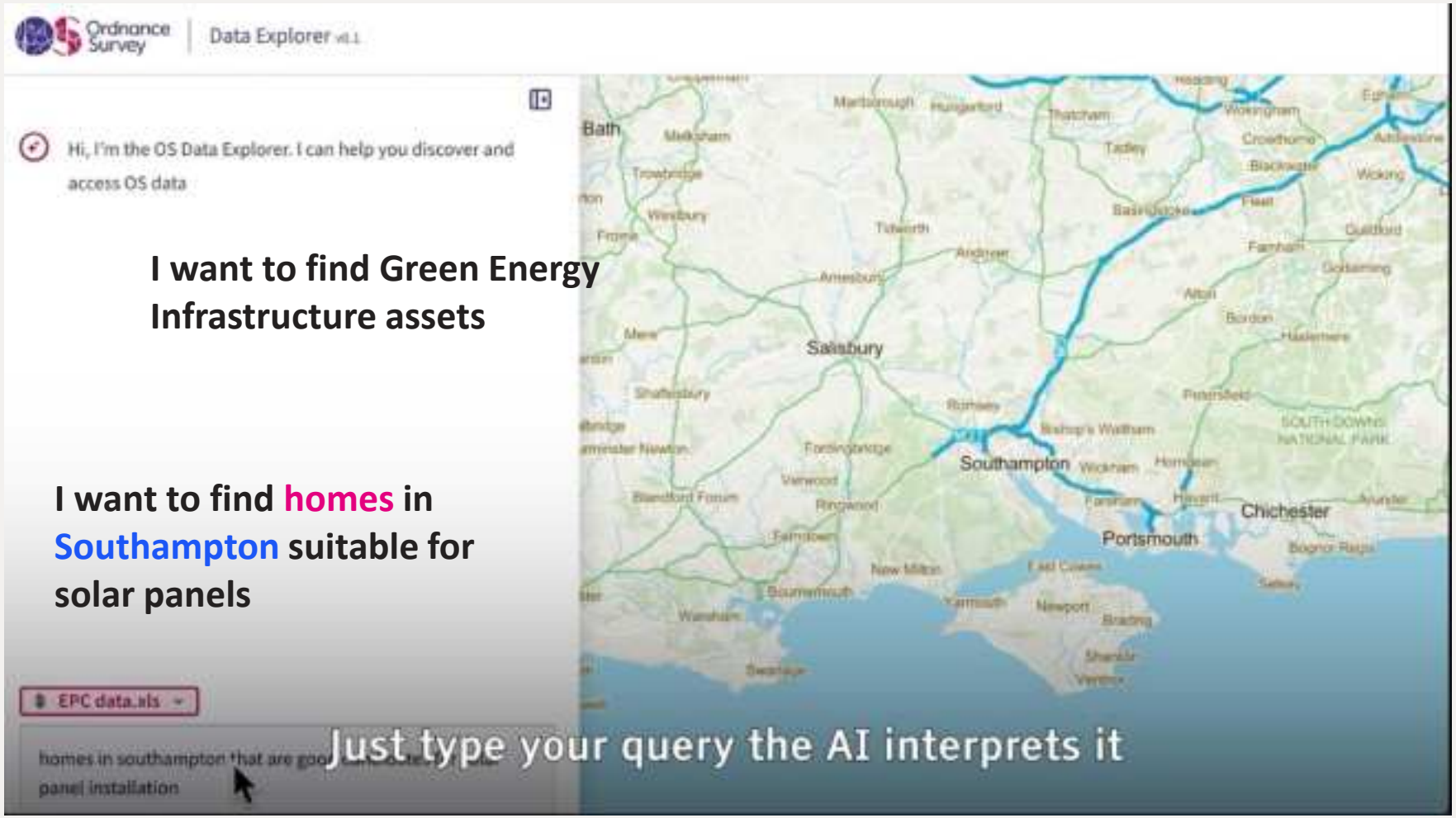
Easy to discover and access – Data explorer



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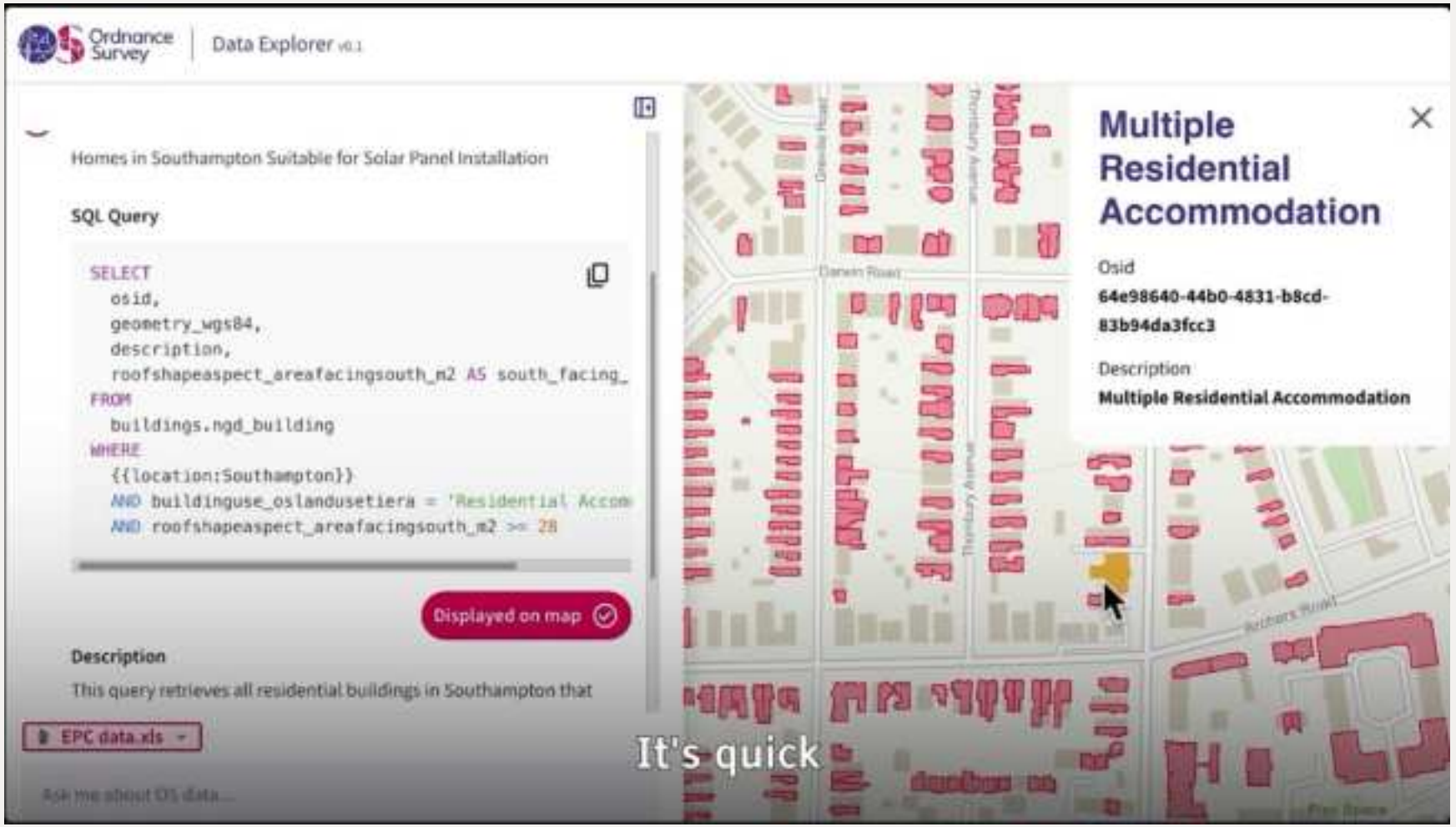

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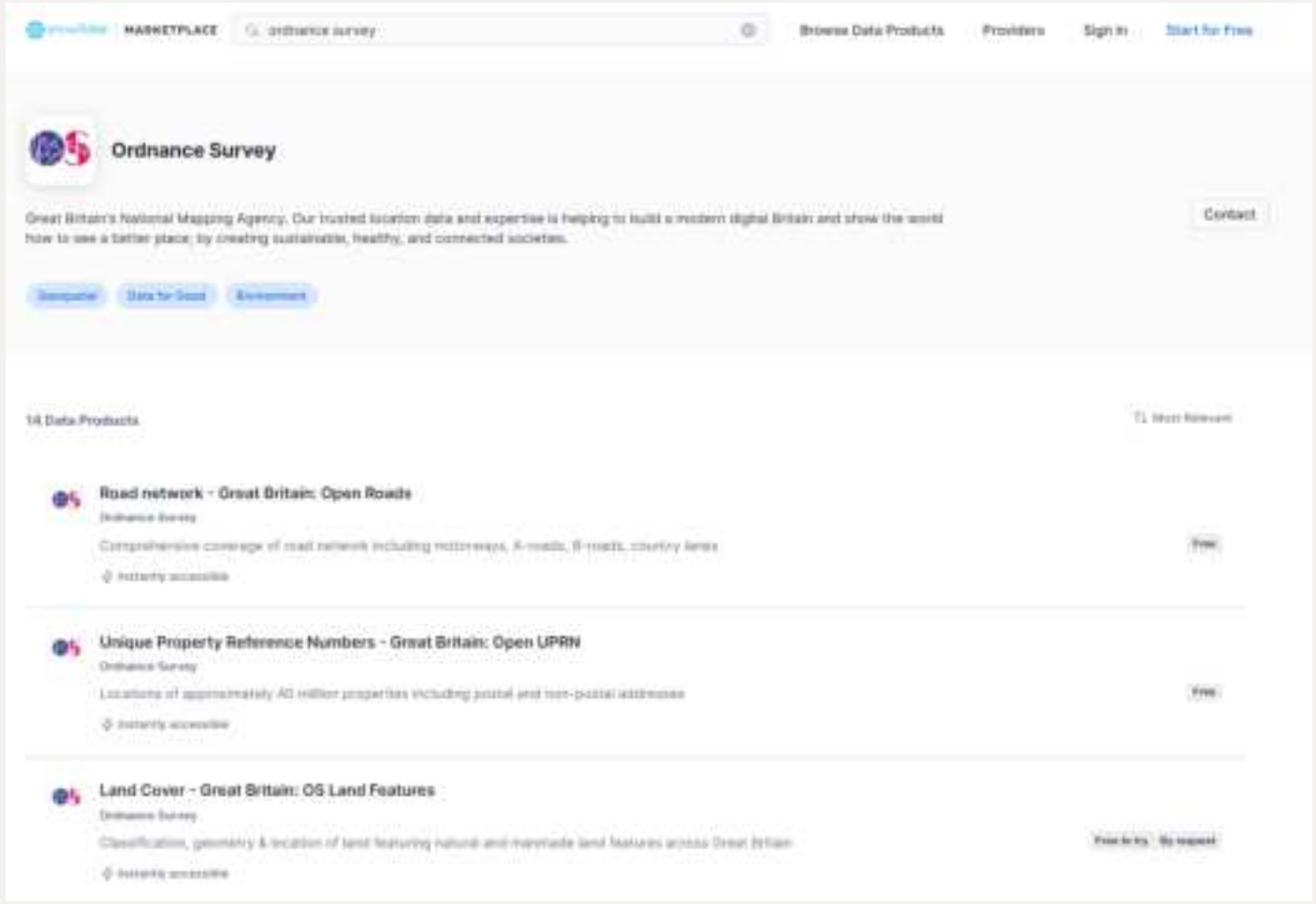
Making data easy to use

Accessing OS data directly in your data platform. Time to insight – hours!



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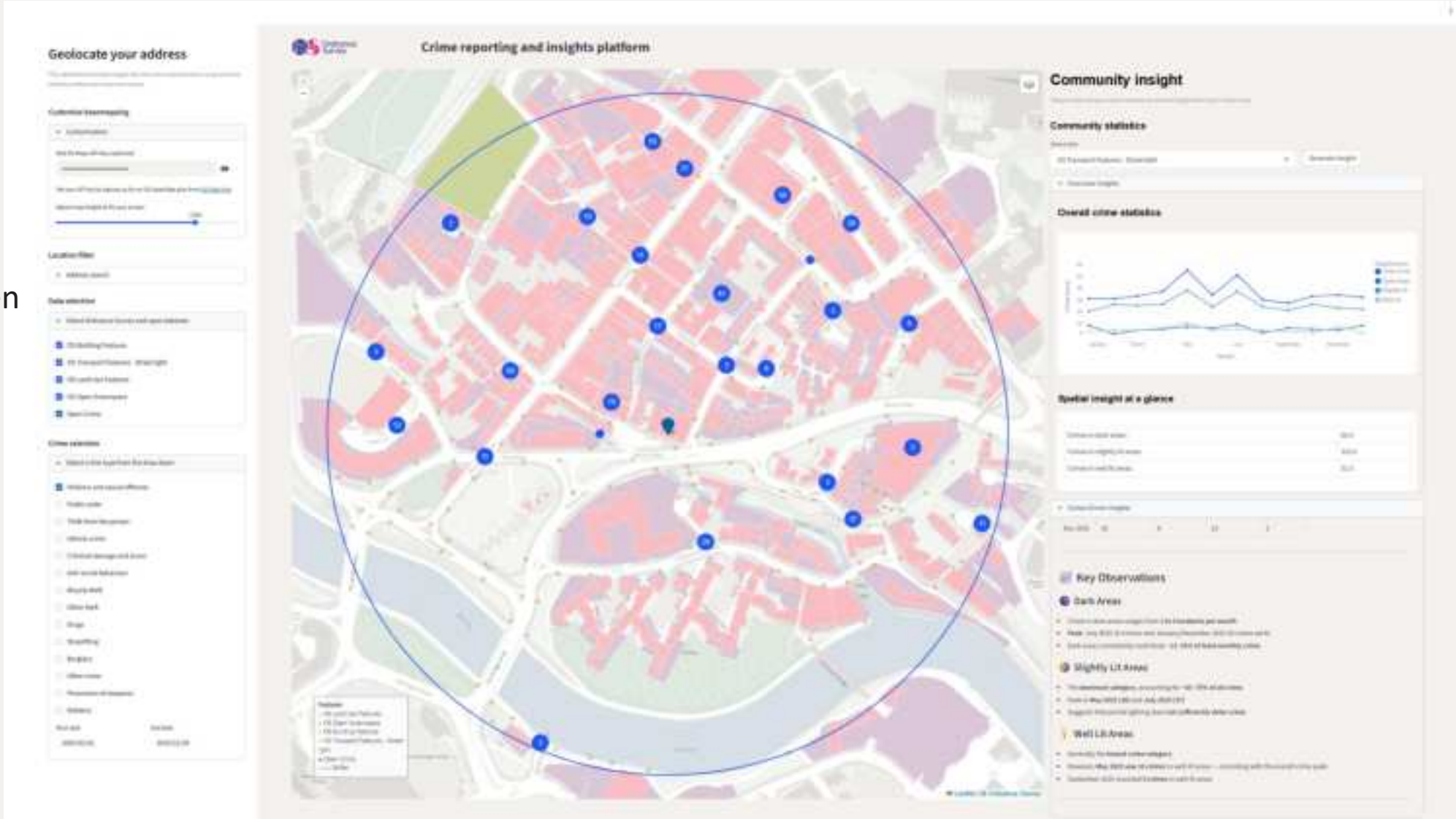
Making data easy to use

Accessing OS data directly in your data platform. Time to insight – hours!

Violence Against Women & Girls



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Scaling #5: From analytic-ready to AI-ready data

Context, governance, interoperability and suitability for specific AI use cases

4 Pillars	From	To	What is required?
Technical optimisation	Structured, formatted and interoperable for use by man and machines CSV, GeoPackage, OGC APIs	For use by machines learning and AI tools	Parquet/GeoParquet, Zero-copy, MCP access; Unity Catalog/Delta, Iceberg, STAC, tiered storage, new security controls & subscription models for AI
Data & Metadata quality	Coherent data design, standards (schemas, codelists), discovery metadata and user documentation	+ enable AI and humans easily understand and assess data and fitness for use through context and rich metadata	Sovereign data assets, Semantic Layer - ontologies & business logic GeoCrossiant – standardised metadata for ML ready data
Organisation & Infrastructure context	Skills, processes & guidelines; data accountabilities & governance	Providing transparent information about how data is produced for use by AI	Data linkage & spatial context, lineage, uncertainty, data contracts incl. SLAs, Data observability and dashboards
Legal, security & ethical compliance	Lawful use, privacy, data access and use policies and licencing	+ documented assessment of ethical and responsible practices	Integration of AI governance into technical (data/arch) and legal/procurement frameworks

Takeaways

Scaling is not just a technology challenge

ways of working, processes and people (skills and talent)

GeoAI has arrived and is here to stay

From computer vision to agentic AI, It is transforming the way we work – smarter and harder

Making data easy to use for man, machine and AI

Need to continue to design and make data accessible well but provide richer metadata and context (semantic layer) to determine suitability and maximise use within AI applications

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