Linking Data Management to Operational Management

Network Rail Lessons Learnt and Current Update

Providing technical leadership

Contents

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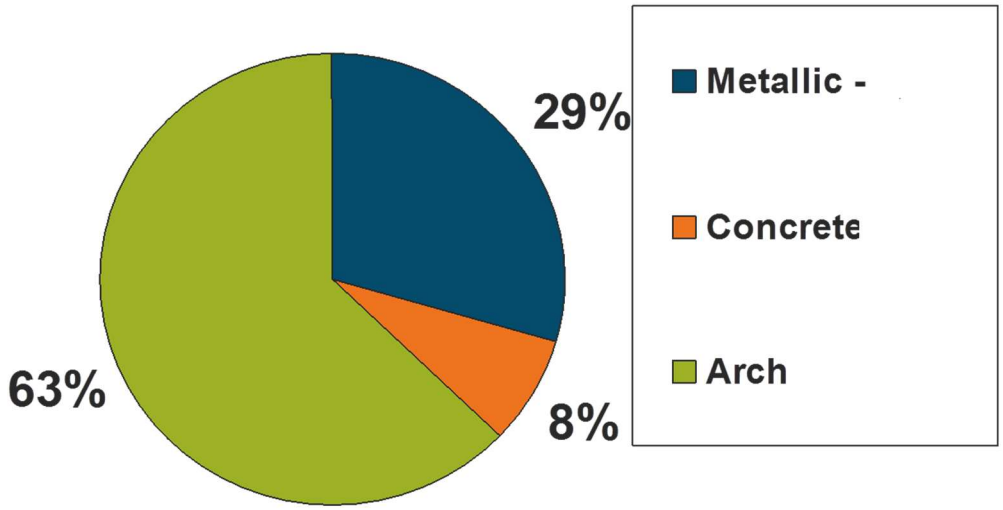
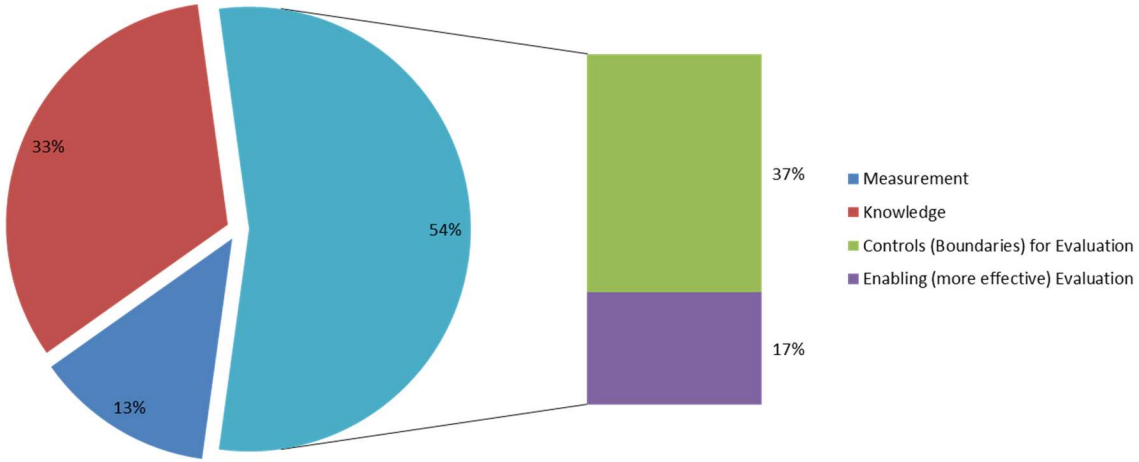
Network Rail Asset Stock

Asset Type	Number
Footbridges	1405
Overline Bridges	8693
Underline Bridges	18660
Major Structures	34
Total Bridges	28792
Bridge Spans	56319
Culverts	21401
Tunnels	624
Retaining Walls	19573
CERDS	490
Ancillaries	>200,000



2010 Tripartite Review

- *Diversity -- Judgement – 20 systems*
- *Trend of later than ideal interventions*
- *Low probability, high impact environment*
- *Inability to enable strong risk based decisions*
- *No single point of Evaluation*



Current Situation

maintain asset register

structural assessment

vehicle incursion risk assessment

bridge strike assessment

change in use

examination

managing risk of adverse / extreme weather

outside party interfaces

manage abnormal load requests

scour assessment

maintenance

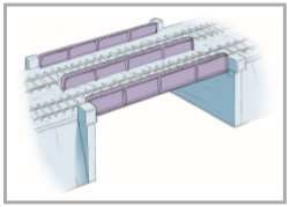
Renewals / deferrals

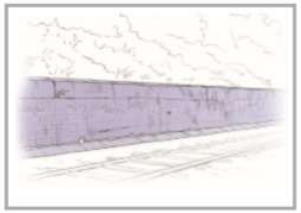
manage interfaces with works carried out by other disciplines

manage ad hoc reports (control, community relations, close call)

The Challenge

70,000 assets





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100,000 deliverables/ year

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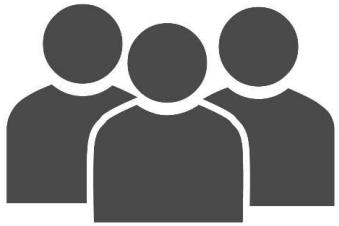
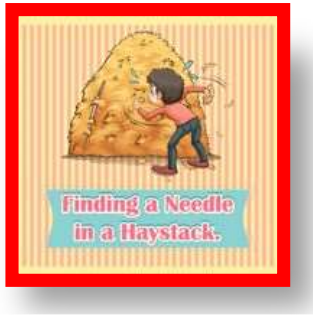
250 people



It's just like…



We've been here before

Headline lessons learnt from CSAMS:

1. Data requirements driven by the system capability.
2. Too many requirements and local variants on requirements, made a solution undeliverable;
3. Data migration was too onerous, with expectation of a 1:1 match;
4. 'Big Bang' approach is too challenging to cater for in 1 increment;
5. IT is a comparatively immature industry;
6. Too much focus on mobile data capture;

Data

Network Rail has an abundance of data in structured and unstructured forms.

They key to effective decision making :

1. Enough data, not too much or too little;
2. Right quality data;
3. Only having beneficial data;
4. Recognising data is an aid/tool, not the decision maker;
5. Qualitative data is as equally powerful as quantitative.

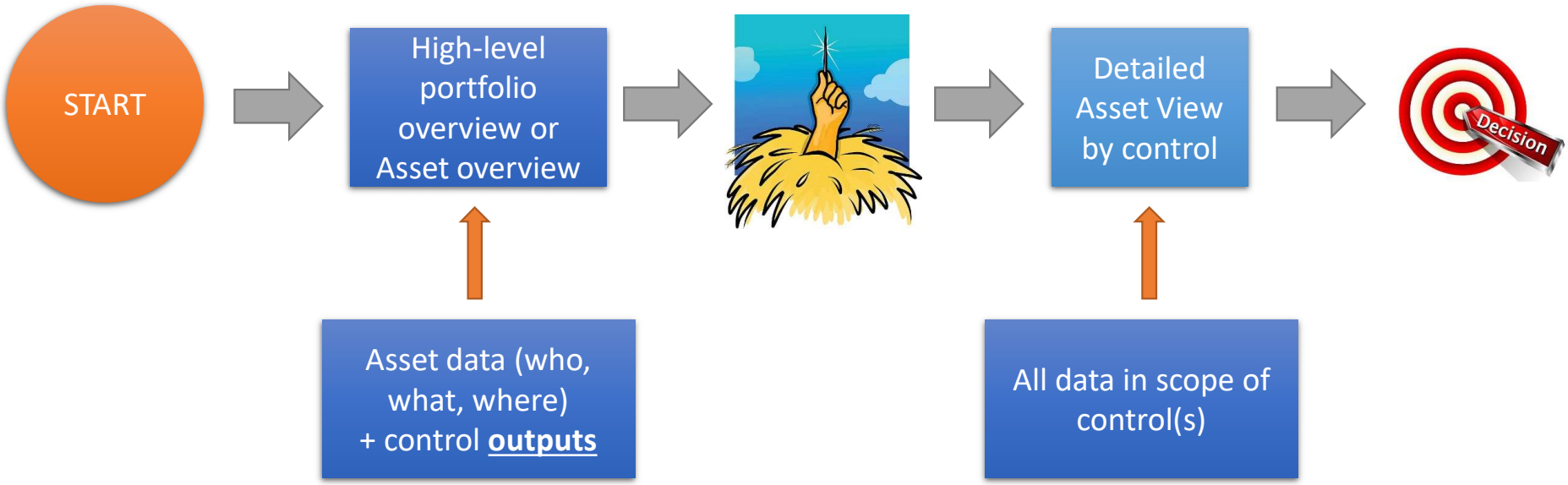
Data migration principles

1. Each project should derive ‘what’ data is required first (establish the ‘to-be’ position);
2. Establish rules / review previous information to migrate data;
3. Accept some existing data cannot be migrated automatically and will need manual intervention.

A publication from BI-Survey shows us that 58% of the companies they surveyed said that they base at least half of their regular business decisions on gut feel or experience, instead of being data and information-driven. On average, they realized that the companies would use only 50% of the information available when it came to decision making.

Proposed Approach to Data

We can't make a decision based on lots of data, so use a high-level overview approach with capacity to drill down into detail.



Bringing all our asset information together

NetworkRail

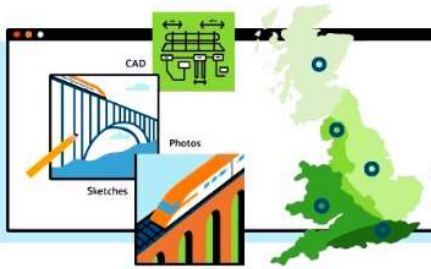
STRUCTURES AND TUNNELS

Network Enterprise Structures & Tunnels system

NEST

Inventory and content manager

A one-stop-shop for managing data for structures including 3D models, structure hierarchy, sketches and documents.



Assessment

Using data intelligence to streamline and standardise asset assessment.

Scour

Use the tool to assess, determine and record scour inspections and to reduce asset risks.

Examination

Capability for Network Rail and suppliers to plan and capture examinations, with facility to upload reports, recommendations and defect information.

Evaluation

Pulls together assessment and examination information to determine what actions are needed to maintain acceptable levels of safety and performance.

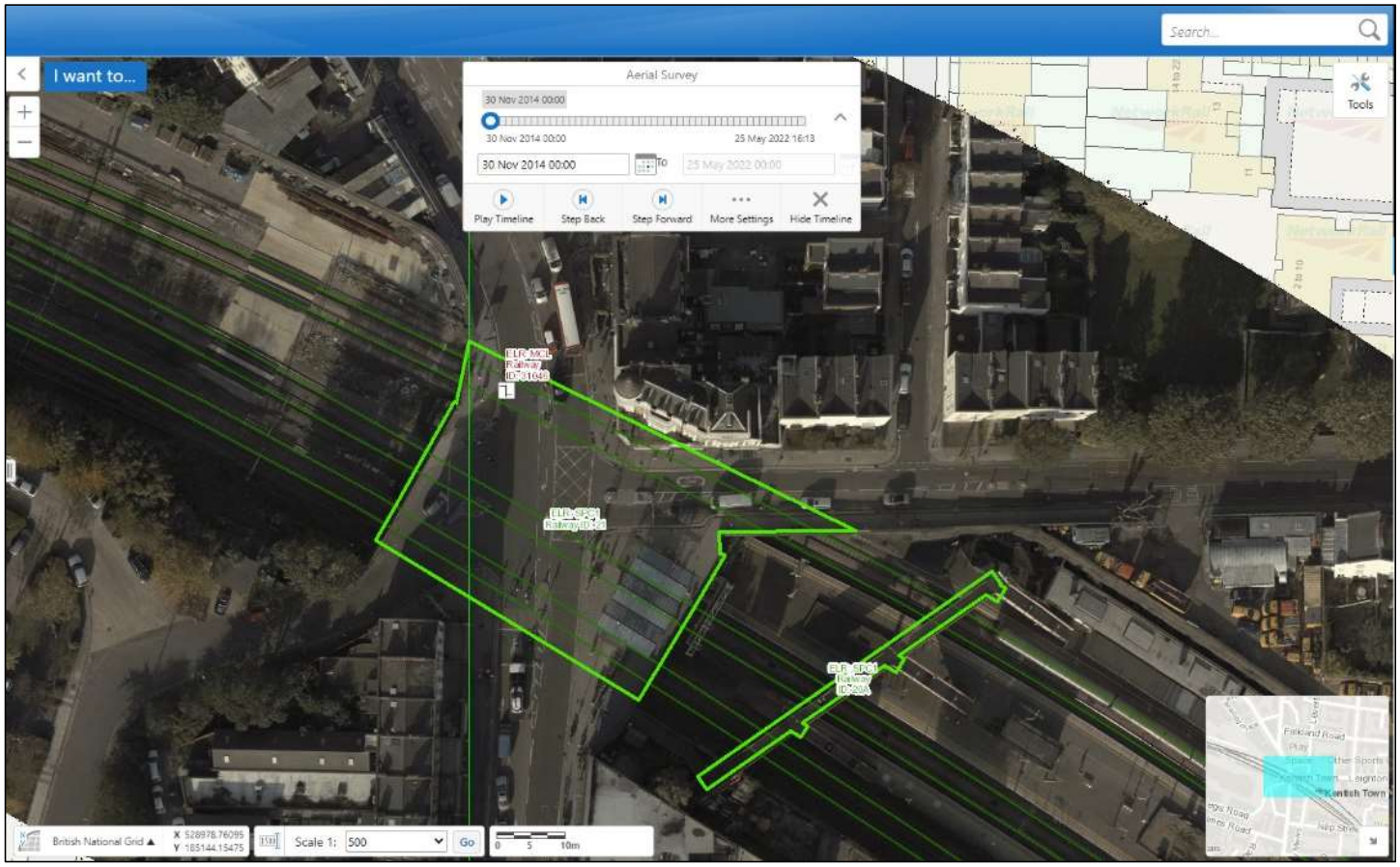
Intervention management

Provides a view of management work (mitigation, intervention and restrictions) against asset types in response to identified threats or enhancement triggers.

INTELLIGENT INFRASTRUCTURE

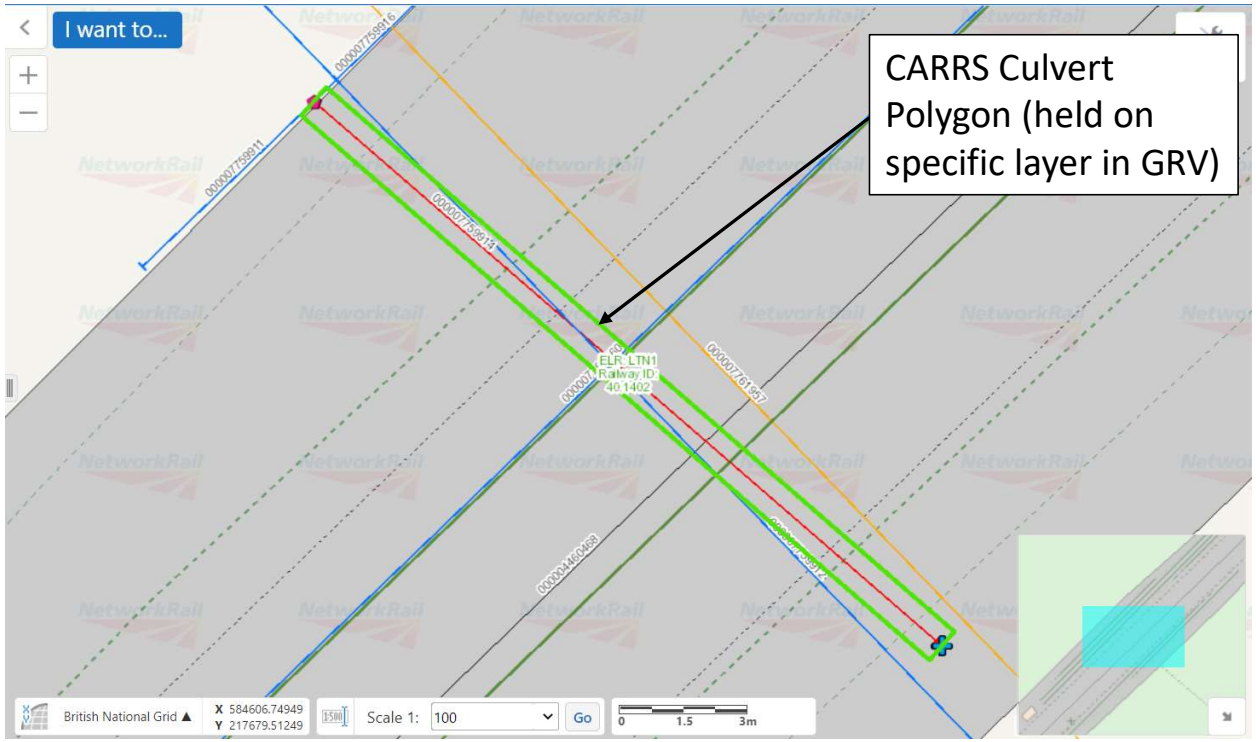
Scan for more information

Bridge polygons



Culvert geospatial location initiative

View from GRV showing output:

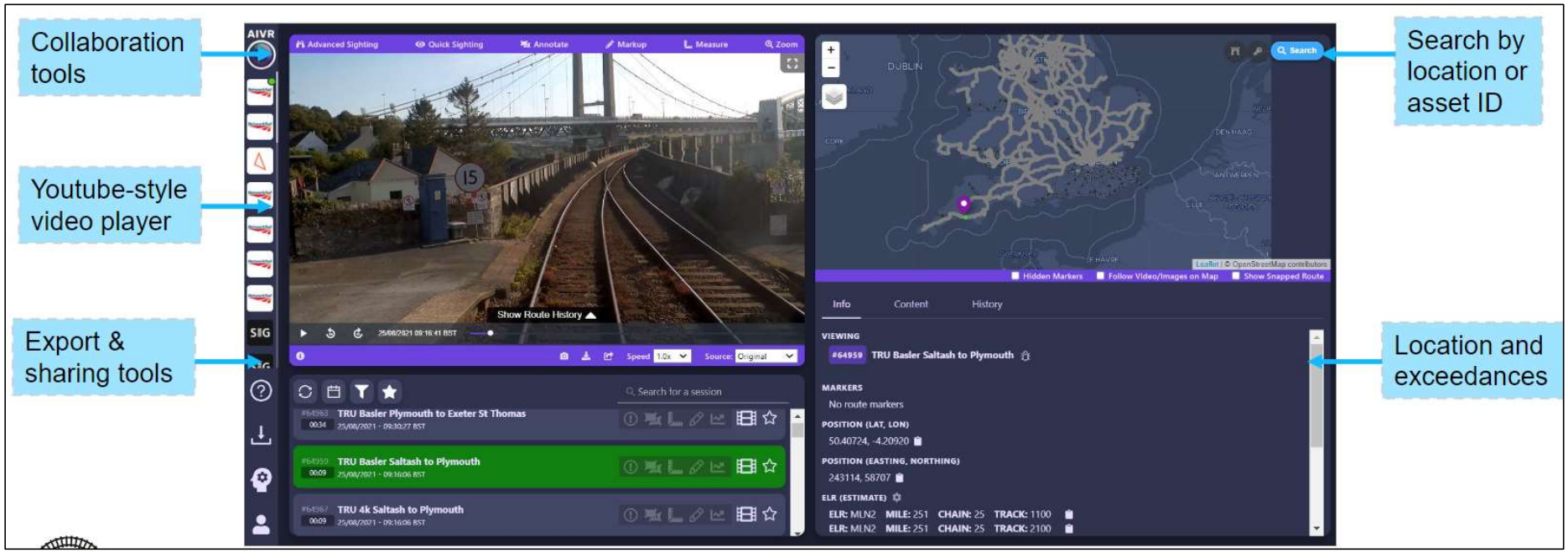


The vertices of the polygon will be stored in a data table in the form of latitude and longitude.

Bore diameter will be recorded and coupled with length areas/volumes can be extracted at a national, Region, Route or ELR level.

This data can be exported for use with other datasets.

AIVR – train borne data capture



Overview

Things to discuss / highlight:

1. All assets geospatially located using Lat/Long;
2. NEST – External Provision;
3. Enable different ways of working
4. How to future proof

   Digital examination techniques (scan to BIM, drone and TLS data capture, AI for defect detection)
5. Part of larger system

NetworkRail

everyone
home safe
every day

Technical Authority

Providing technical leadership