Aerial Survey – Overview, Area of Interest and Feature Extraction

National Aerial Survey Overview

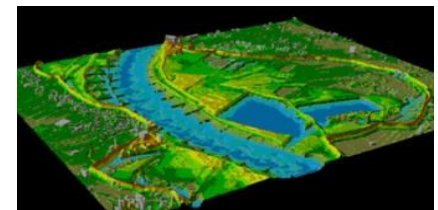Aerial survey data captured over the full UK rail network. (16000km)

Data captured includes

- High resolution downward facing imagery
- High resolution forward and rear facing oblique imagery
- Infra-red data capture
- 3D LIDAR imagery
- Extracted features such as asset mapping, vegetation analysis and level Crossing analysis
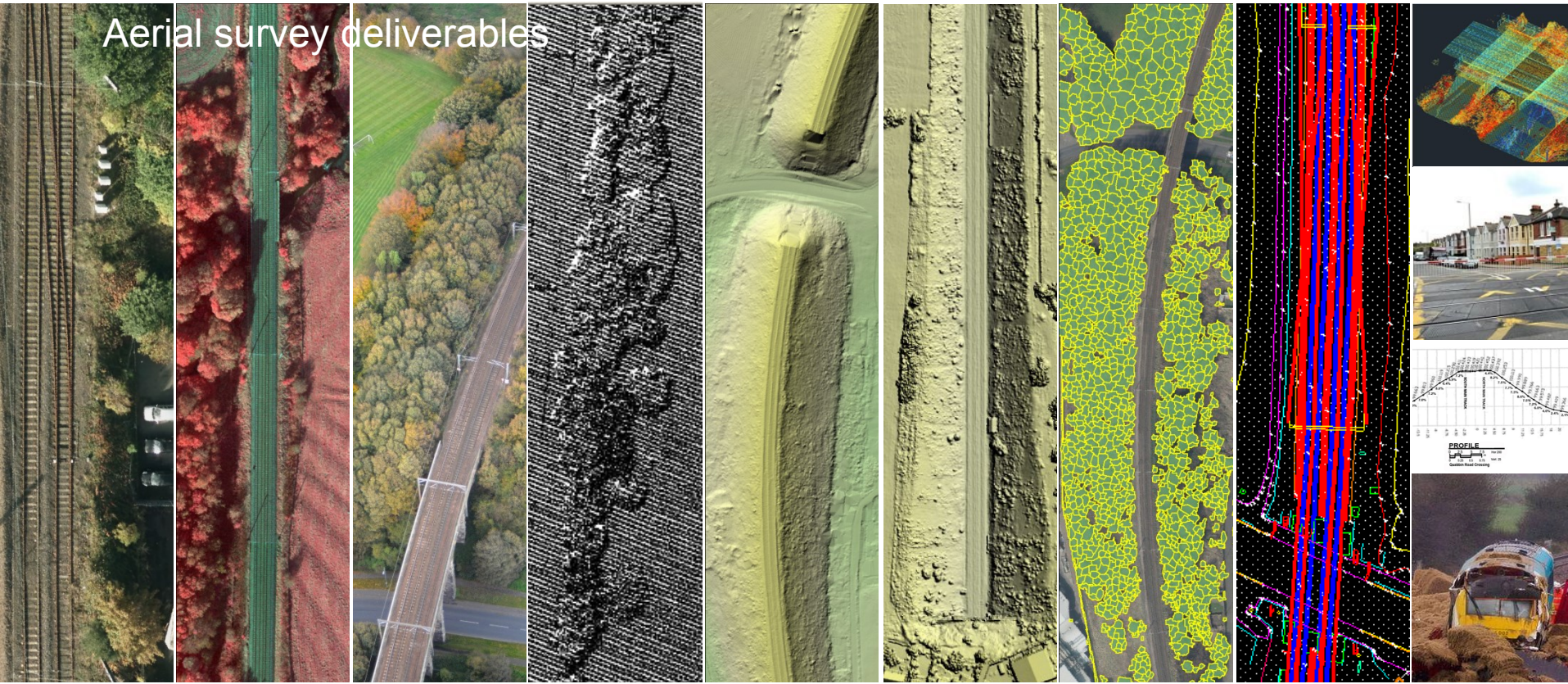
Benefits include

- Improved safety (less site visits)
- Enhanced asset management
- Reduced site survey costs
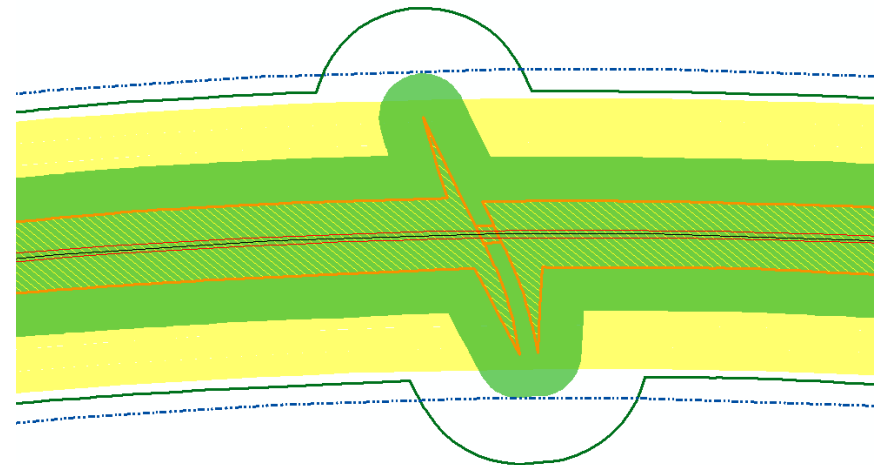
Aerial survey deliverables

Ortophoto RGB	Ortophoto CIR	Oblique Images	LiDAR	DTM	DSM	Tree database	Vector Mapping	NAIRN's Profile
Raster Resolution: 4cm Format: .ECW, .TIFF	Raster Resolution: 4cm Format: .ECW, .TIFF	Both Forward and Rear Facing Format: jpg Resolution:	Point Cloud Resolution 25ppm Format: .LAS	Raster Resolution: 20cm grid Format: XYZ, ASCII Grid, Binary Grid	Raster Resolution: 20cm grid Format: XYZ, ASCII Grid, Binary Grid	ArcGIS Filegeotabase	Vector Format: .DGN, .DXF, ArcGIS Filegeotabase	Format: Hump Calculator, 2d/3d PDF, .AVI

National Aerial Survey Area of Interest

Area of interest

- NR Ownership boundary **AND** track centreline
- Swath of 150m as a general rule
  - 60m either side of track centreline **or**
  - 20m either side of ownership boundary **(which ever is greatest)**

Not in scope

- Track on land not owned by NR (other than HS1 lease)
- Land owned by NR with no track

Legend

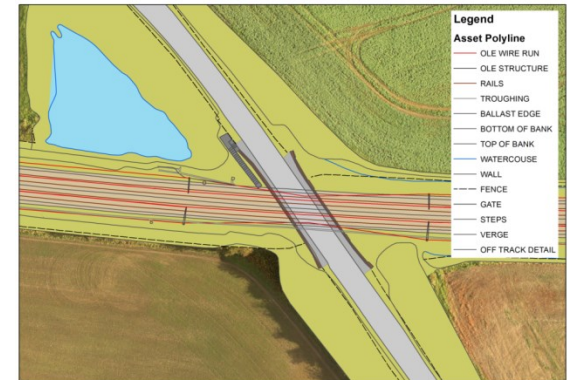|	
——	Route Centreline
——	Track Centreline
┄┄	150mt swath width
▨	Track Centreline + 60mt each side
▨	Ownership Boundary
☐	Ownership Boundary + 50mt each side
▮	Ownership Boundary + 20mt each side

Feature Extraction - Asset Mapping

Aerial Survey Data is processed to enable key asset features to be extracted and analysed

Asset Mapping

3D vectors defining key assets visible from the air including:

- Track centreline
- Drainage
- Earthworks
- Electrical power
- Level crossings
- Operational property
- S&C
- Signalling
- Structures
- Telecoms
- Track

Legend
Asset Polyline
OLE WIRE RUN
OLE STRUCTURE
RAILS
TROUGHING
BALLAST EDGE
BOTTOM OF BANK
TOP OF BANK
WATERCOUSE
WALL
FENCE
GATE
STEPS
VERGE
OFF TRACK DETAIL

Feature Extraction – Vegetation Assessment

Aerial Survey Data is processed to enable high risk vegetation to be identified

Vegetation Classification

Trees and other vegetation are identified and classified with valuable attributes including:

- Height
- Trees within falling distance of OLE
- Tress within falling distance from track
- Slope
- Health

Risk Assessment

A graphical representation of high risk vegetation is produced enabling proactive vegetation management.

Feature Extraction – Level Crossing Analysis

Aerial Survey Data is processed to assess level crossing compliance

Profile data

Profile data is analysed and provided at regular intervals for each vehicular level crossing.

Nairn's Pofiles

- Hump calculation carried out for each vehicular level crossing.
- Summary sheet (RAG) provided to indicate level crossing compliance with NR standards.

Ref:	NR/L3/TRK/4041
Issue:	1
Date:	02/06/2012
Compliance date:	01/09/2012