

Aerial Line Survey Data *Developments and Applications*

August 2017

TRANSPower



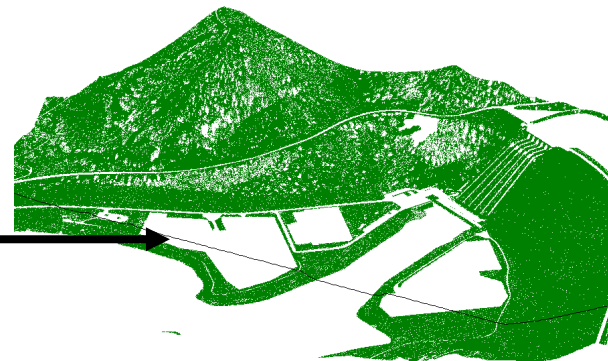
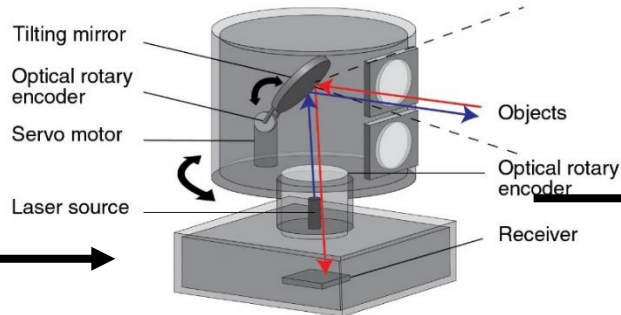
Contents

- What does Transpower's Aerial Line Survey data look like?
- How has the data improved over time?
- What is the value of the data set to Transpower?

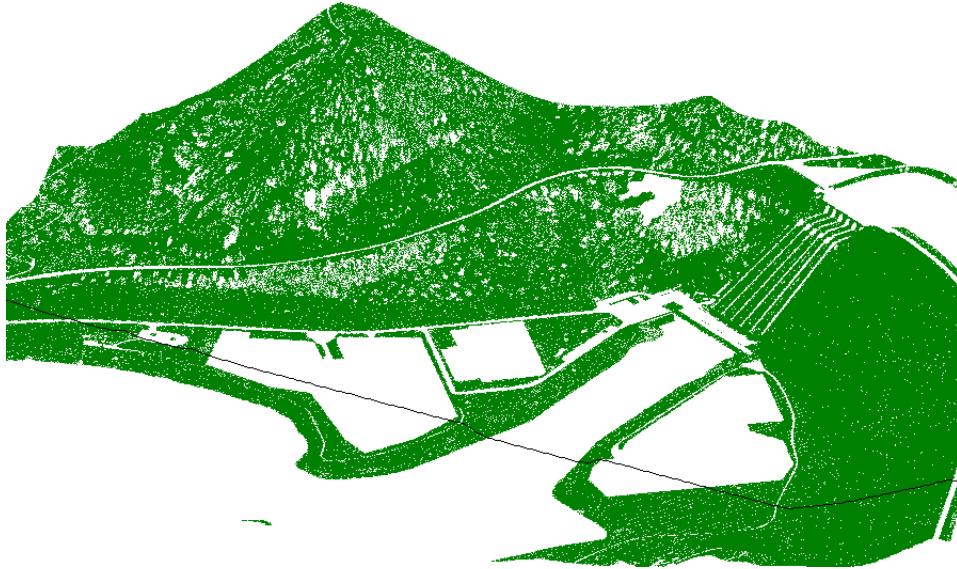


Aerial Line Survey Overview

- Aerial Line Surveying is a way to collect highly accurate topographical and asset data
- Transpower uses LiDAR – *Light Imaging Detection and Ranging* from a helicopter

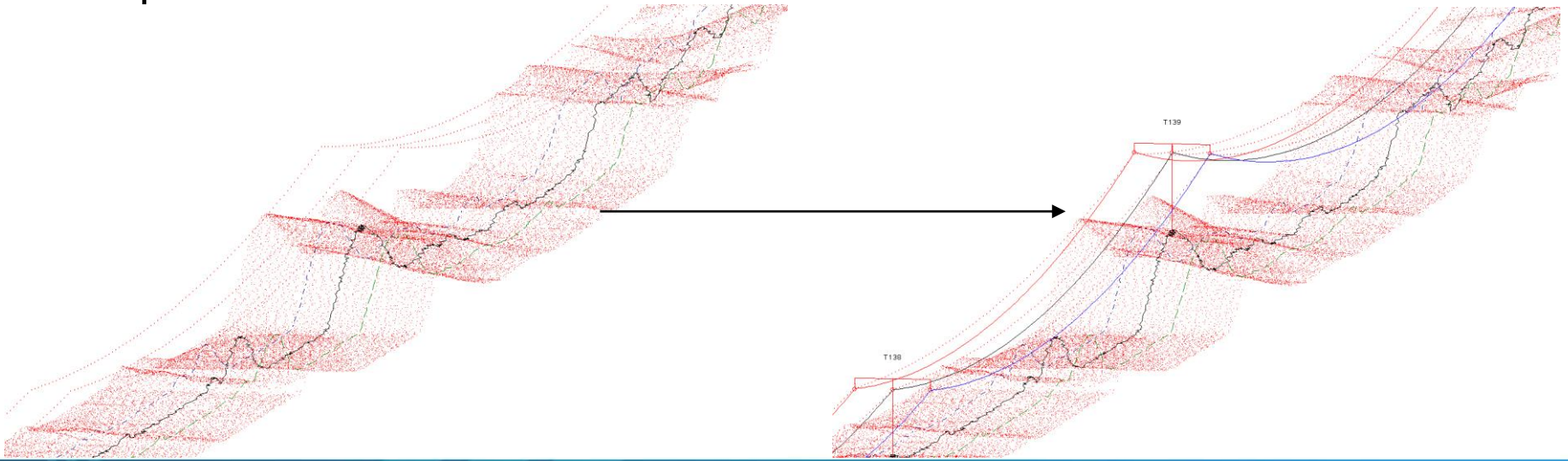


Benmore



What the final product looks like

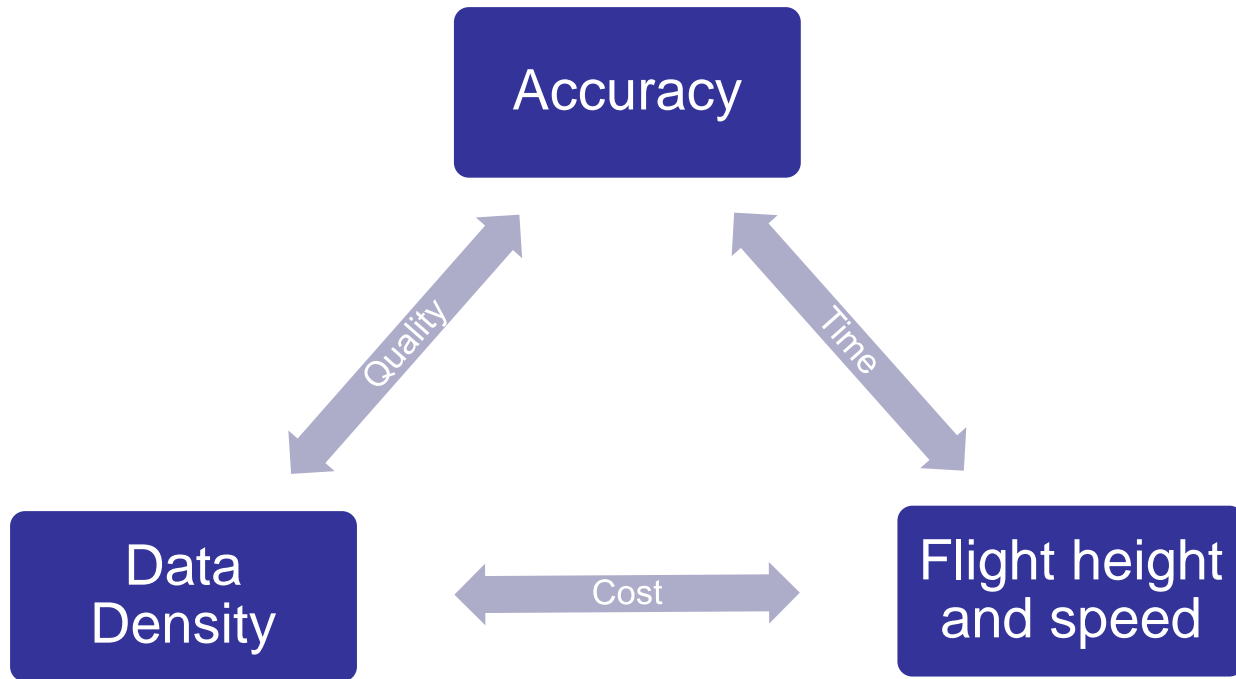
- A point cloud is good for measuring between points
- Transmission line assets are dynamic so a working model is required



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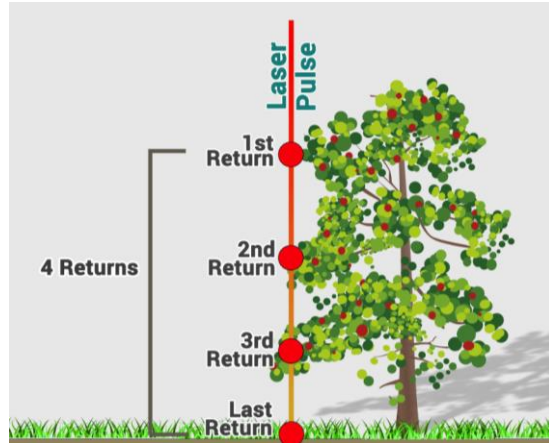
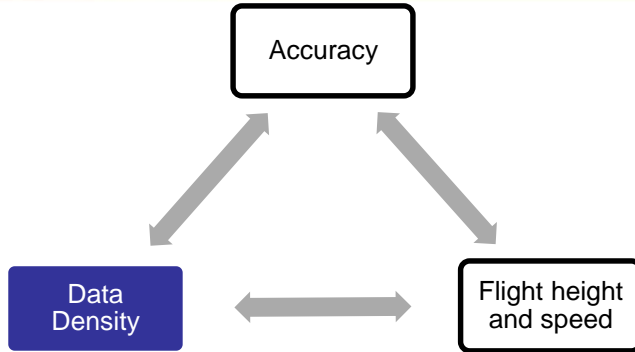
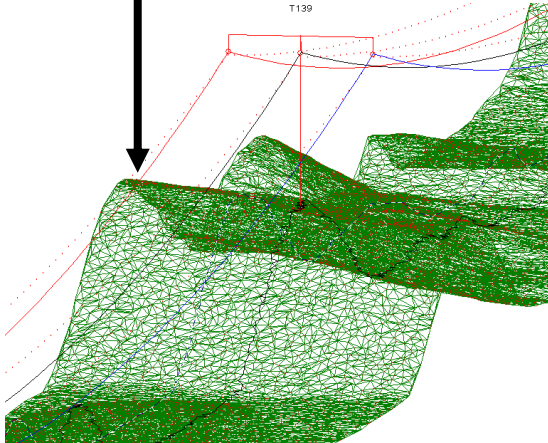


Transpower requirements:

- 14 points / m² minimum
- Approximately 1.5GB per TIN
- Approximately 2.5GB per model

Technology improvements:

- Greater power
- Multiple pulse tracking
- Multiple receivers

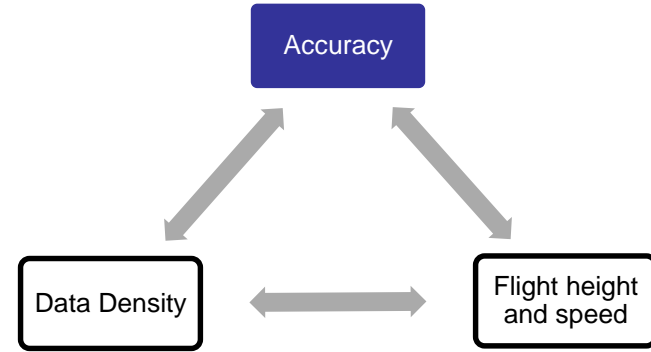


Transpower requirements:

- +/-75mm relative accuracy of 2 points within 1km

Direct technology improvements:

- Internal Measurement Unit – military grade
- Direct conductor temperature measurement
- Post processing

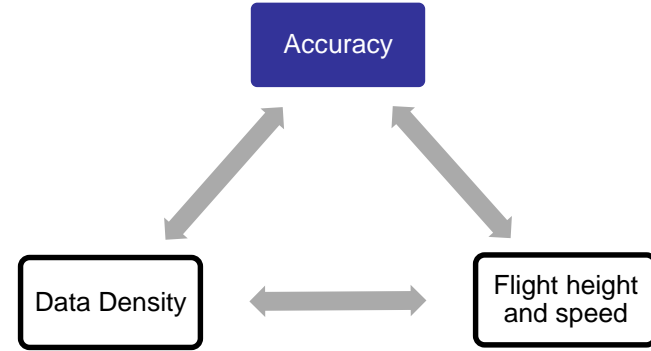
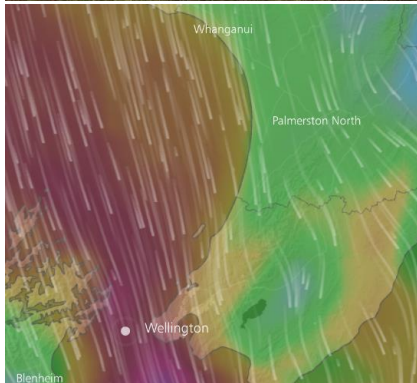
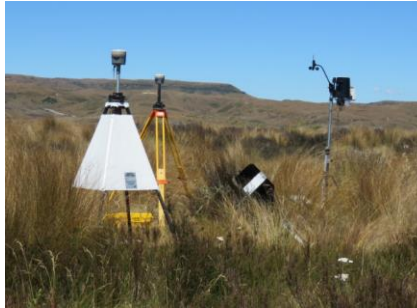


Indirect technology improvements:

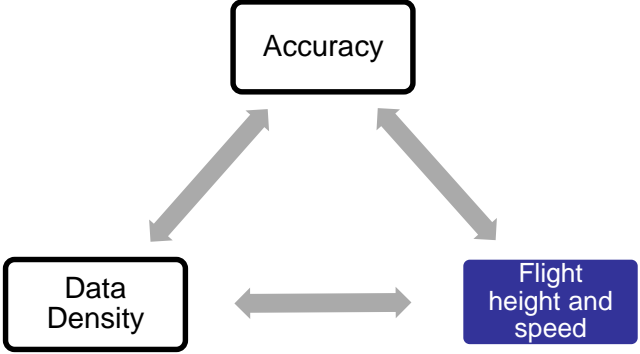
- NIWA weather models
- Global Navigational Satellite System
 - GPS
 - GLONASS

Other considerations:

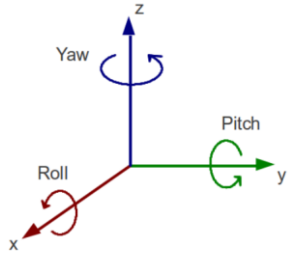
- Wind effects
 - Direct **increase** in accuracy with increased wind



- Wind effects
 - Direct **decrease** in accuracy with increased wind
 - Indirect **increase** in accuracy with increased wind due to advanced IMU



- Pilot skill with sub-optimal aeronautics
 - 50km/h +
 - No banked turns
 - Re-calibration of IMU
 - No relative yaw



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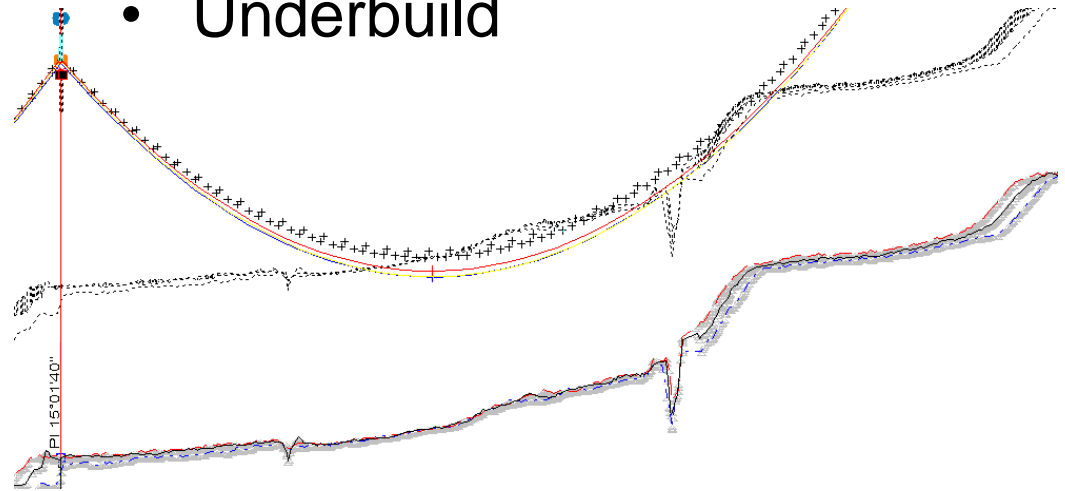
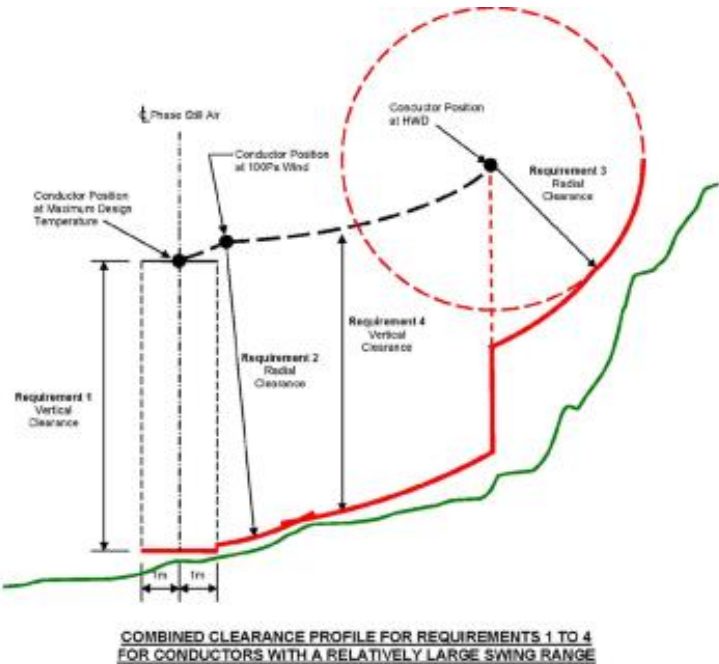
ALS data uses

- Line and substation design
- Line and substation constructability assessments
- Clearance checks to ECP 34 Statutory clearance requirements
- 3rd party requests
- Corridor management
- Line resilience investigation
- Vegetation management

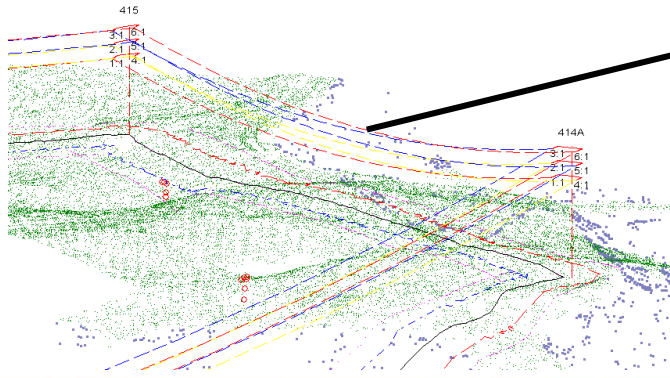
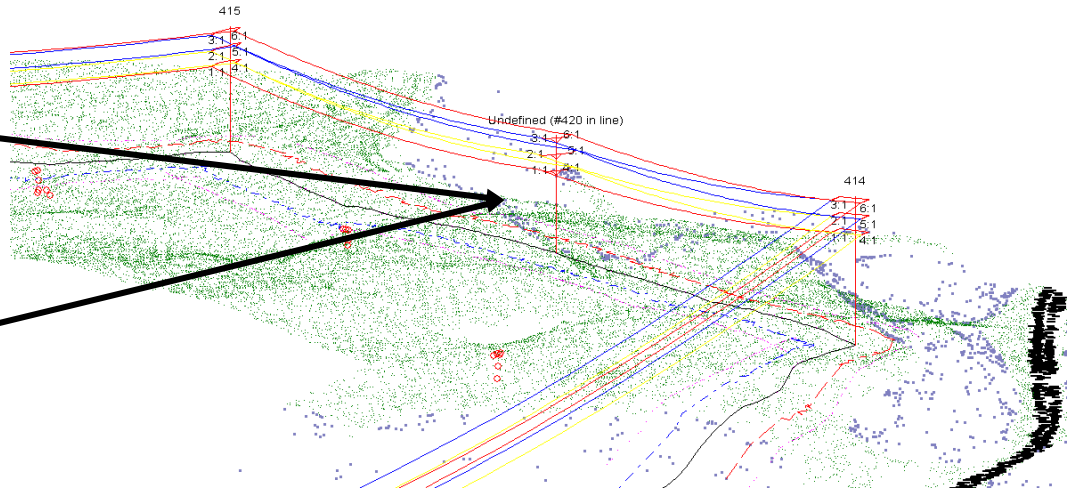


Underclearance Violations

- Fleet can be checked quickly
- Dynamic system
- Underbuild



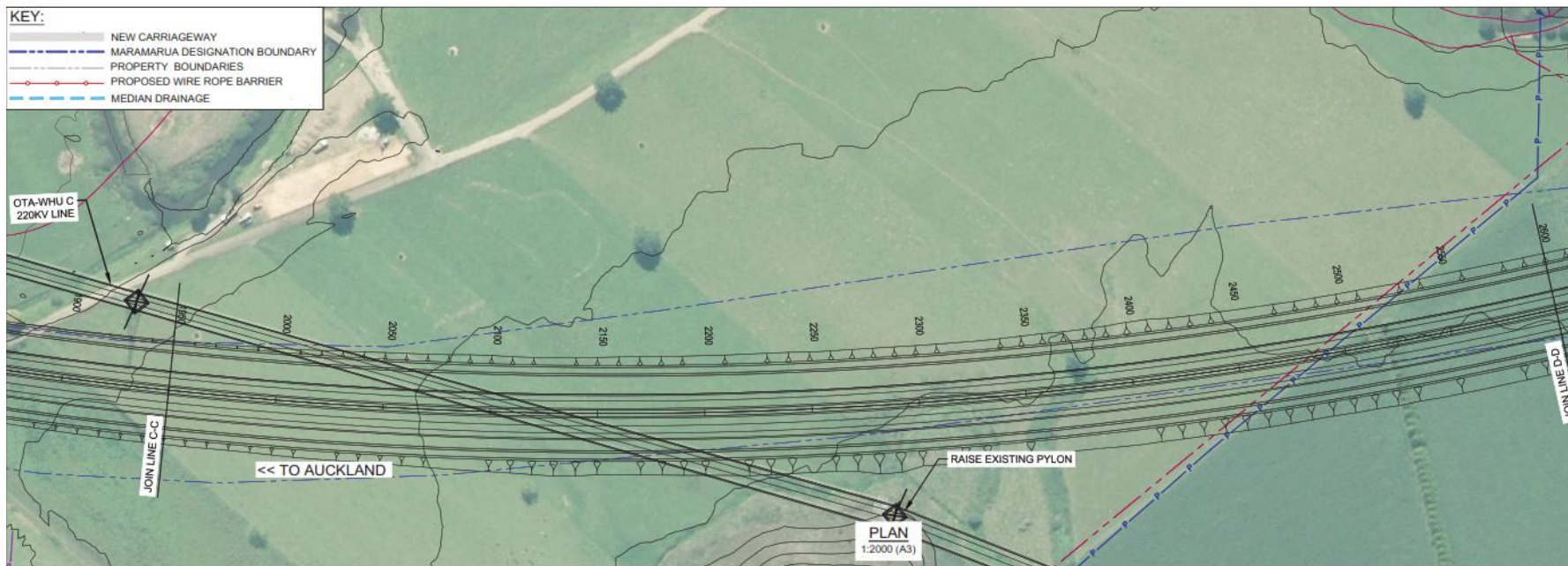
Underclearance violation design



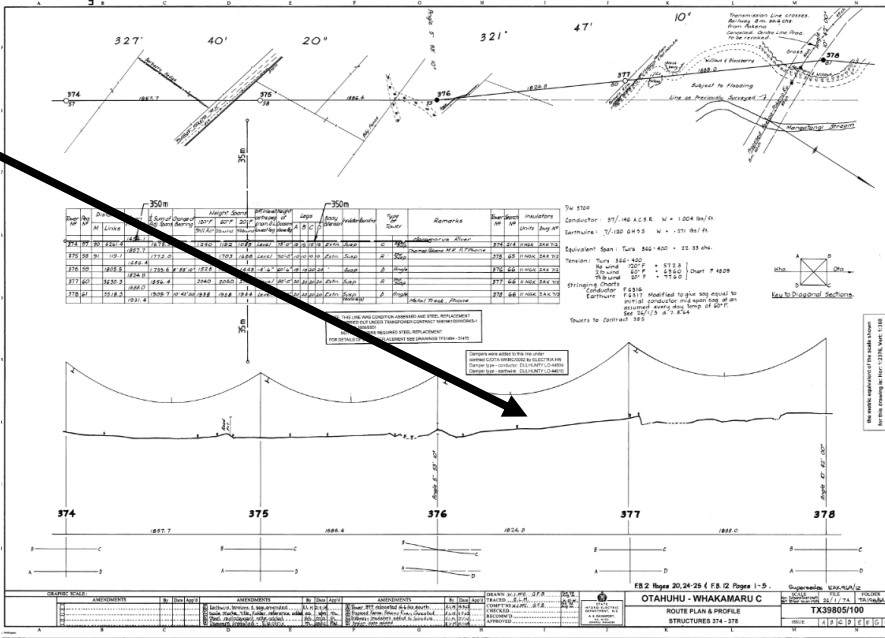
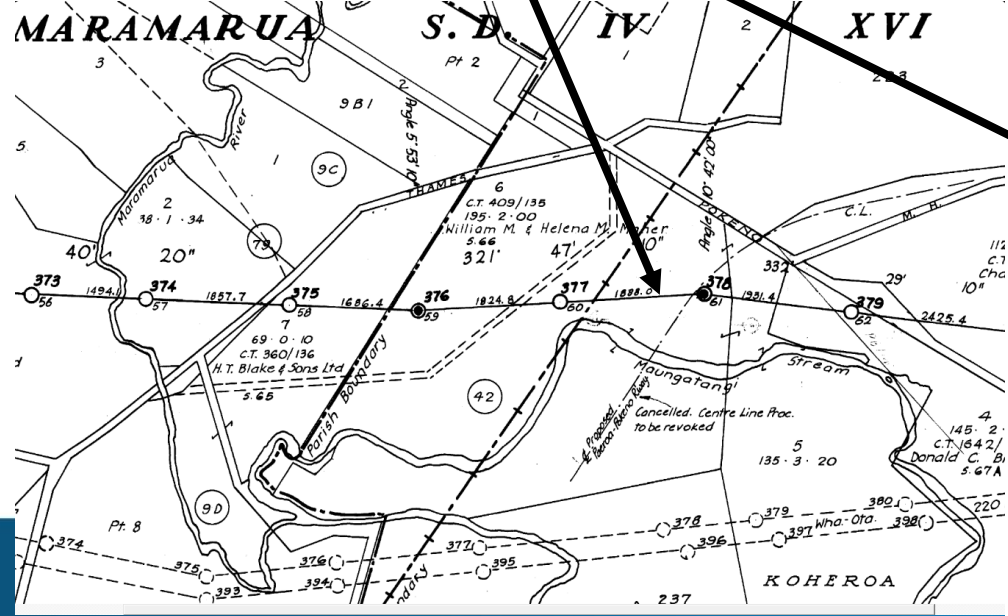
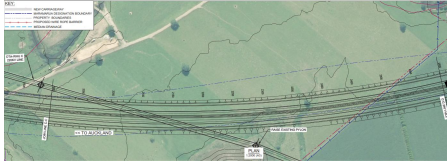
Proposed design



3rd party project clearance checks

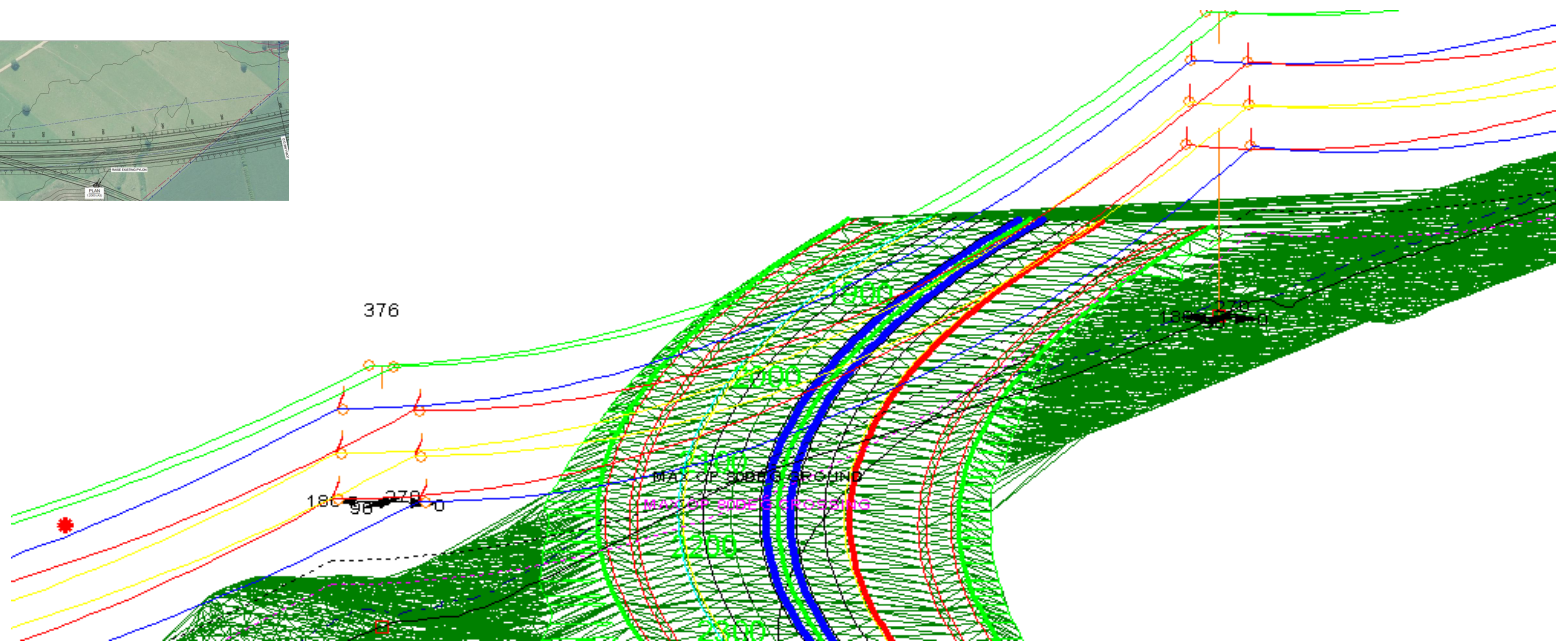
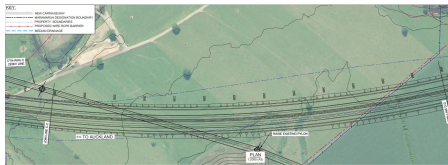


Transpower information



NOT TO SCALE
 SEE TO BE ADDED SECTIONS

ALS information



Questions?

