

A new 'Phase' of visualising transmission lines in 3D

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 **TRANSPower**



Transpower

- State owned enterprise
- Owns and operates the National Grid

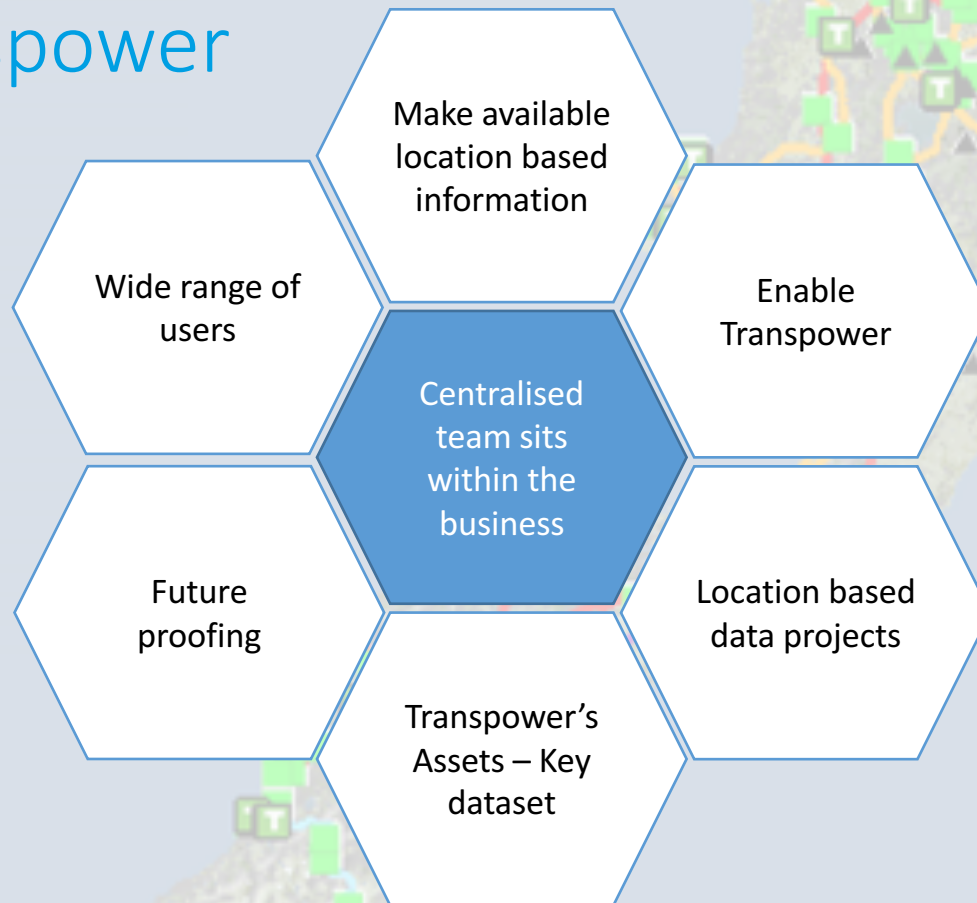


What is the National Grid?

- Over 12,000 km of transmission lines.
- Over 170 substations
- High voltage electricity – up to 220 kv



GIS at Transpower



The Lines and Circuits project



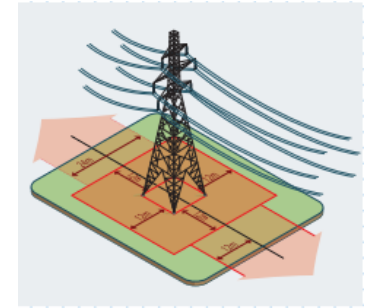
Current limitations



Only centrelines of conductors are displayed



Misinterpretation of data



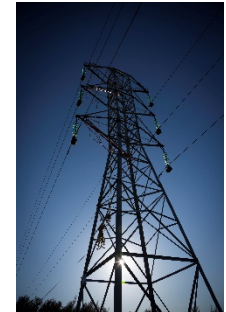
Poor representation of corridor



Limited visibility of what is underneath each conductor



Difficult to view TP assets over property boundaries



Multiple circuits on structures are not visible



What would users like to see?



How many circuits are on the tower

Where each phase is on the tower

To see where a phase is transposed

How close to the ground is the conductor

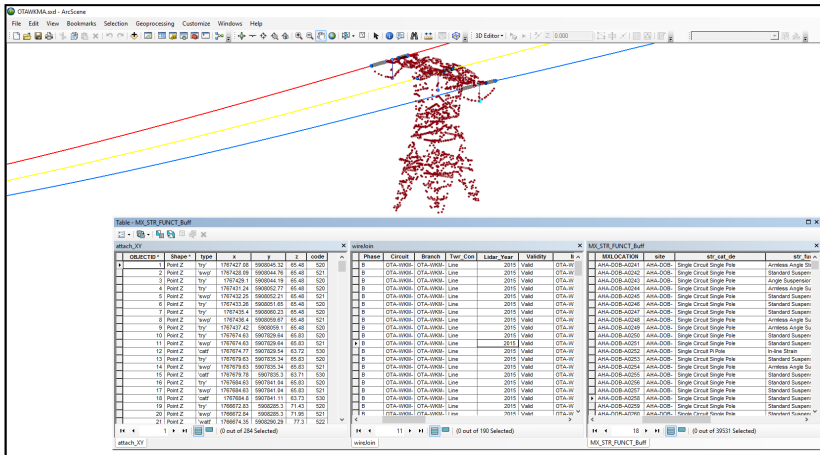
Tower width

Accurate spatial location of each conductor

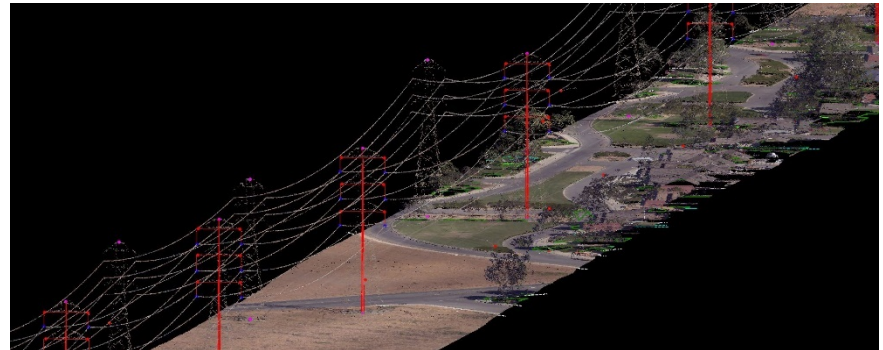
One system for both lines and circuit

What we wanted to achieve?

To provide an enhanced spatial dataset



Widely available spatial viewer in 2D & 3D



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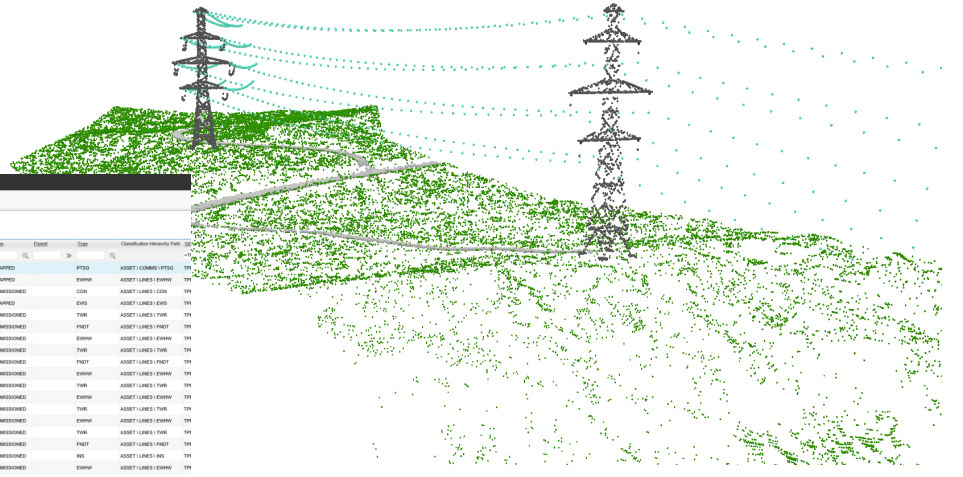
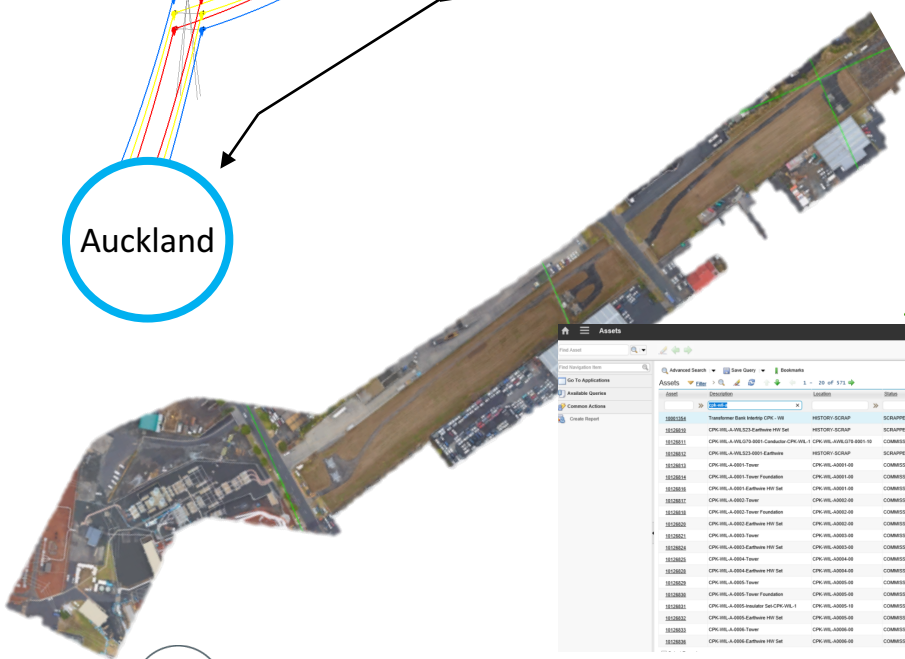
Data



Line

Hamilton

Auckland



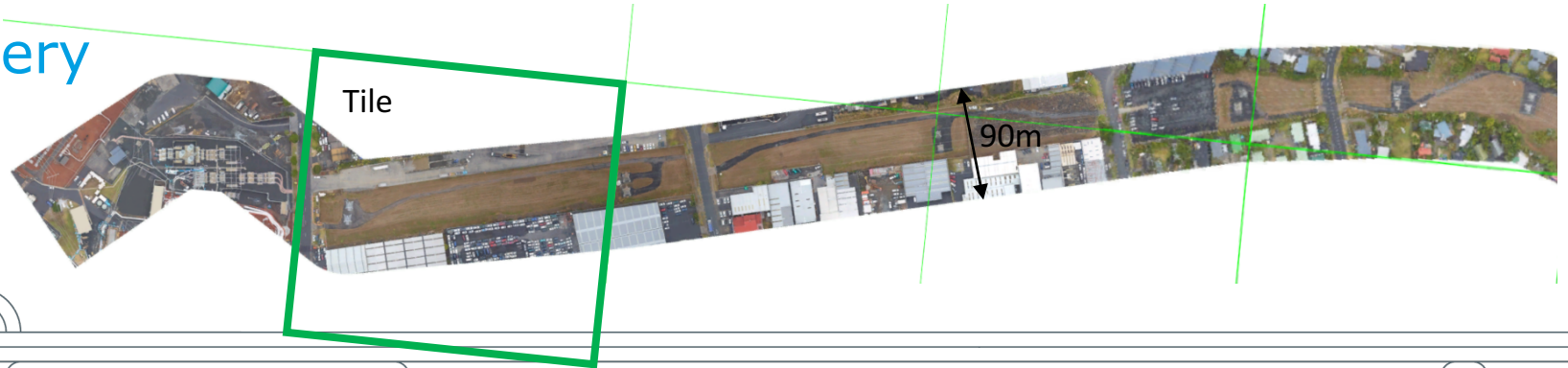
Asset ID	Name	Status	Type	Classification	Priority
1881238	Transformer Bank Mainline CPN - 18	HISTORICAL	SCRAP	PTTG	ASSET COMMS PTTG
1823812	CPN-HLA-180225-Exhaust 180 Sat	COMMISSIONED	SCRAP	EMHW	ASSET LINES EMHW
1823812	CPN-HLA-180250-001-Exhaust-CPN-VL-1	COMMISSIONED	CPN	ASSET LINES CPN	18
1823812	CPN-HLA-180250-001-Exhaust	HISTORICAL	SCRAP	EMHS	ASSET LINES EMHS
1823812	CPN-HLA-1801 Tower	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1801 Tower Foundation	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1801 Exhaust 180 Sat	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1802 Tower	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1802 Tower Foundation	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1802 Exhaust 180 Sat	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1803 Tower	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1803 Exhaust 180 Sat	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1804 Tower	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1804 Exhaust 180 Sat	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1805 Tower	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1805 Tower Foundation	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1805 Exhaust 180 Sat	COMMISSIONED	EMHW	ASSET LINES EMHW	18
1823812	CPN-HLA-1806 Tower	COMMISSIONED	TWR	ASSET LINES TWR	18
1823812	CPN-HLA-1806 Exhaust 180 Sat	COMMISSIONED	EMHW	ASSET LINES EMHW	18

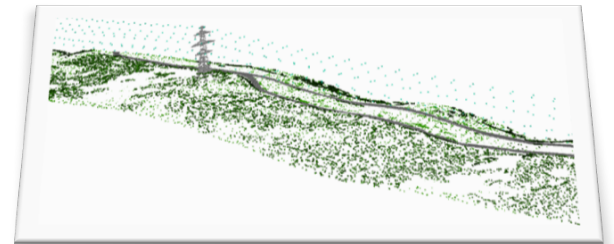
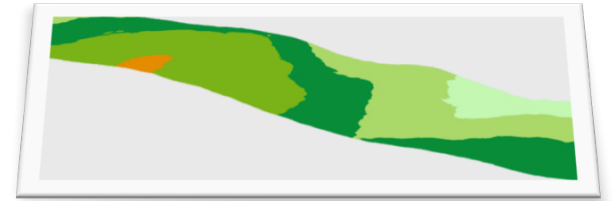
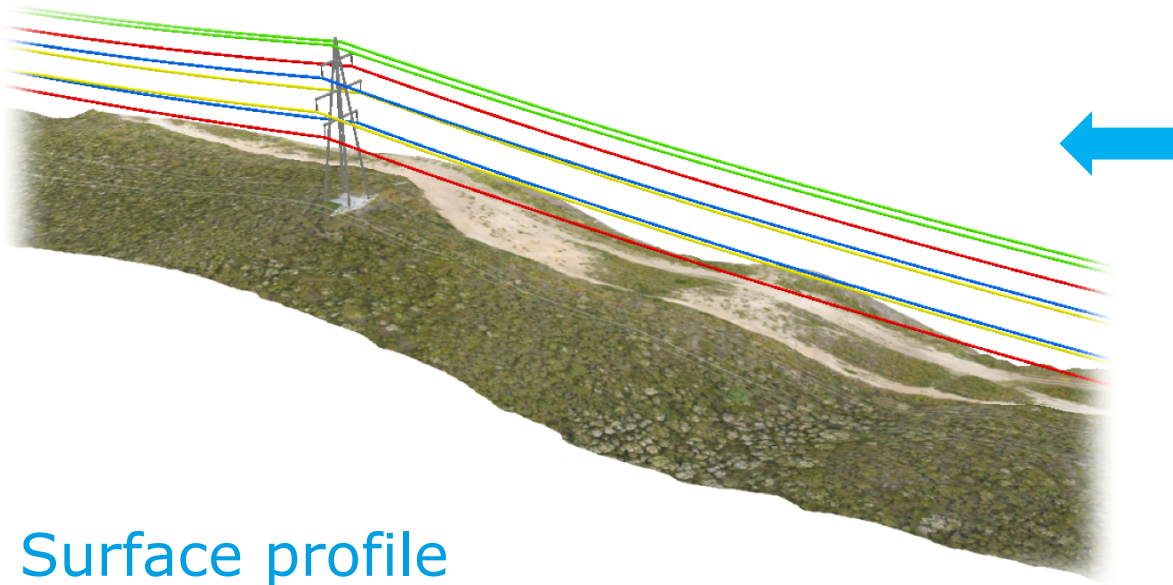
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Imagery





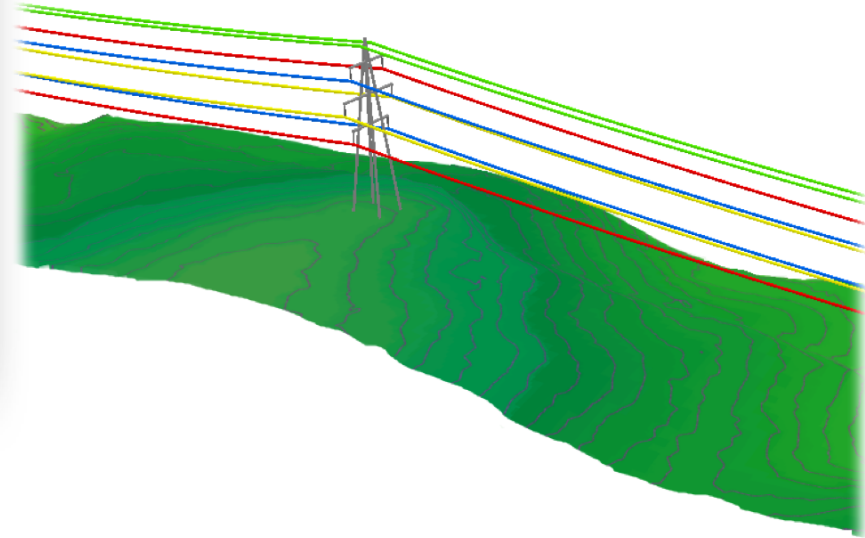
Surface profile

- DEM created from LiDAR to use as a base for the imagery
- LiDAR - TIN – Raster – 3D imagery



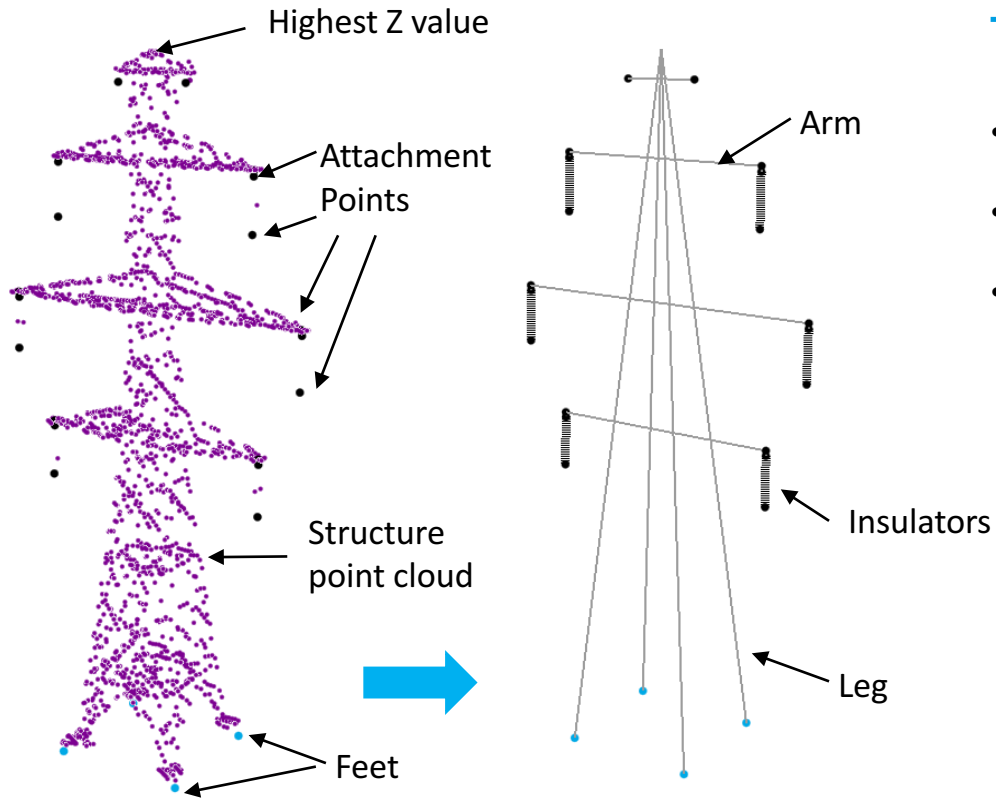


Contours



- 1m contour to highlight elevation
- Created using the Raster elevation model



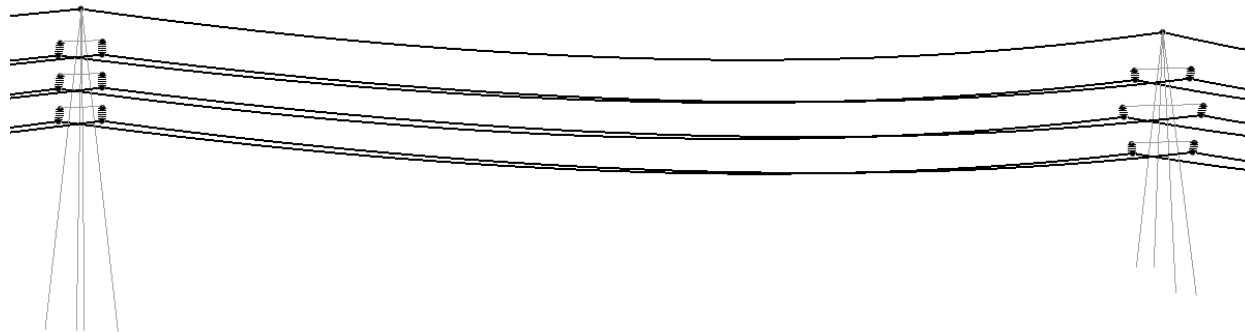
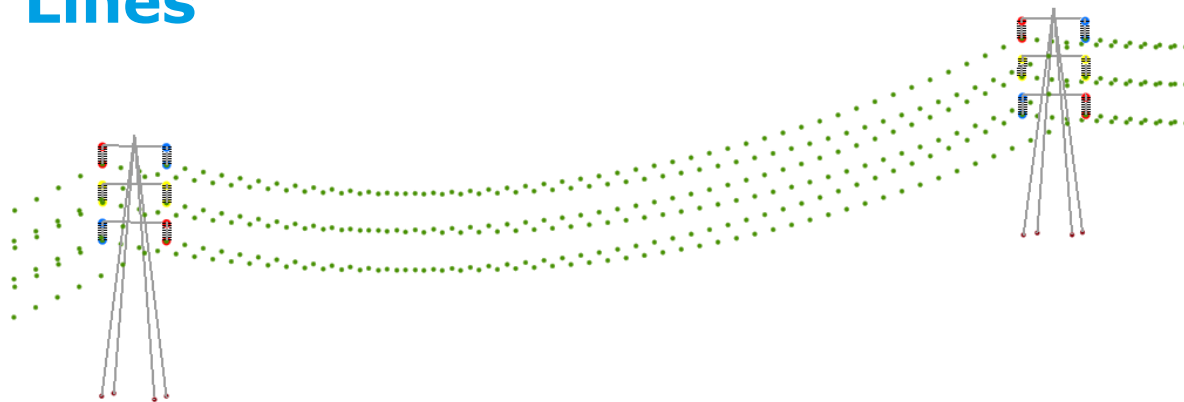


Towers

- Basic representation of each tower
- Built with Python script
- The towers are spatially attributed with information unique to each tower



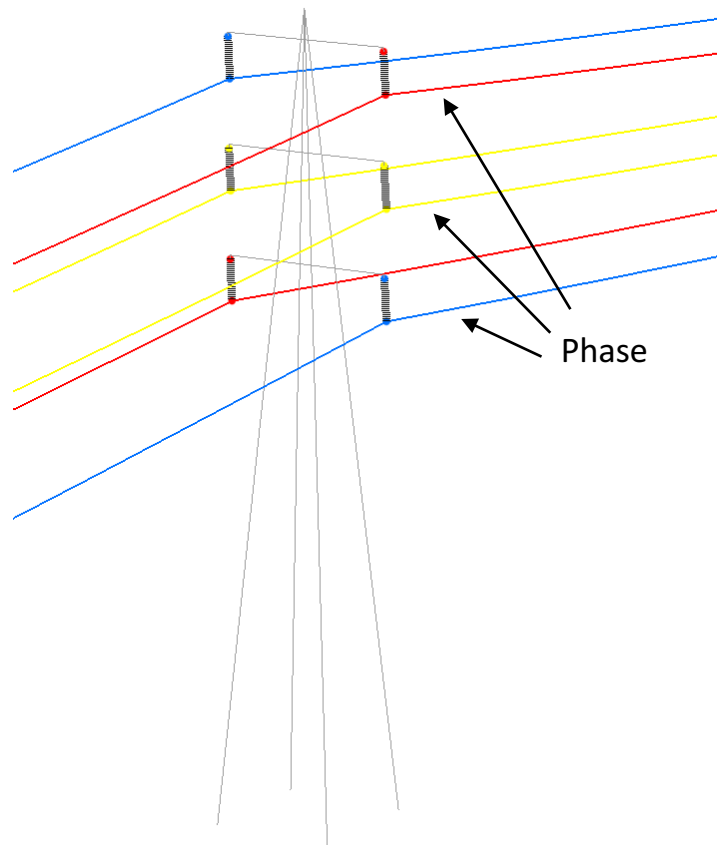
Lines



- Tools used
 - Points to Line
 - Split at Point
 - Spatial join



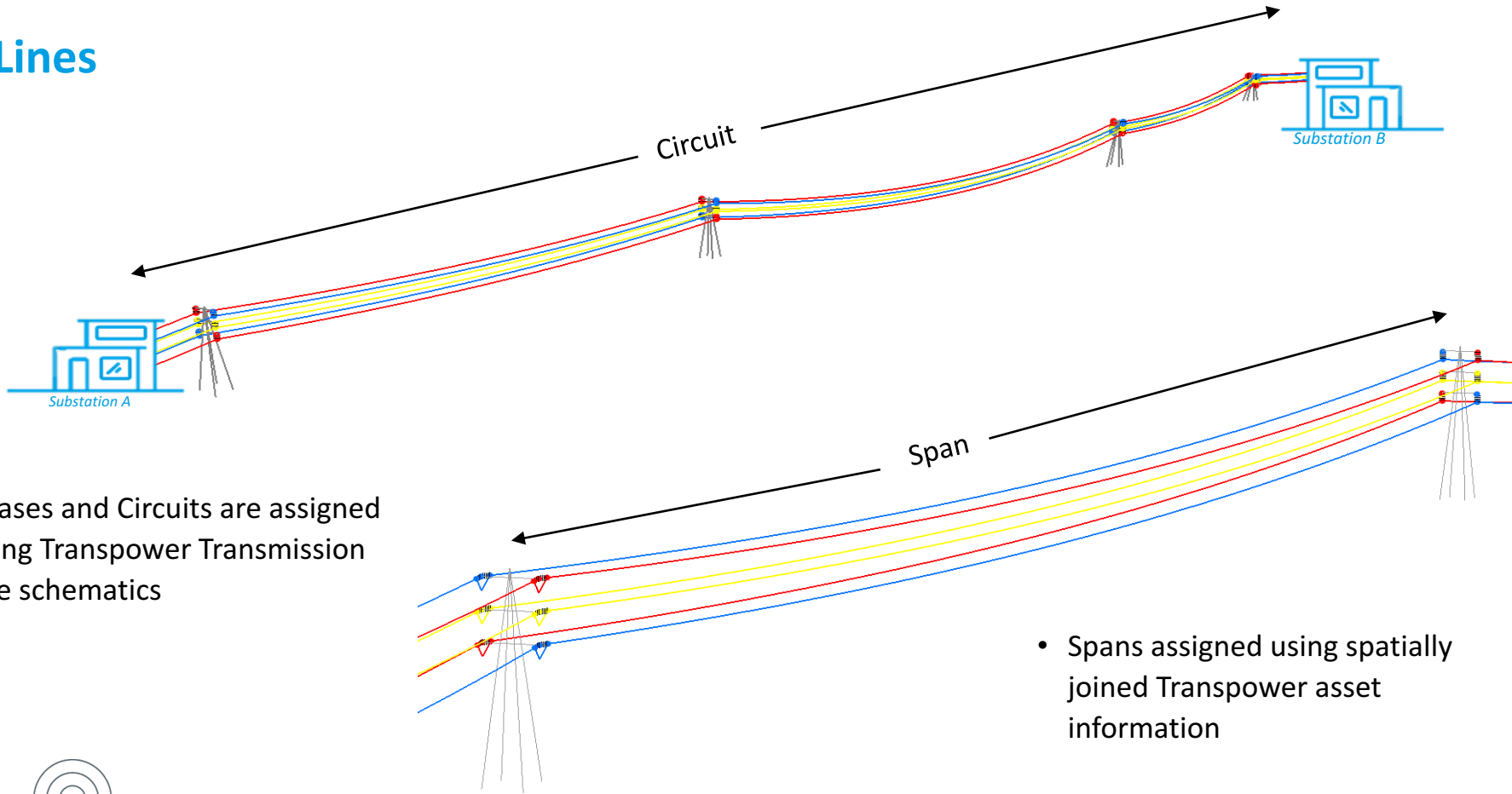
Lines



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 - Points to Line
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 - Spatial join
- Phases and Circuits are assigned using Transpower Transmission line schematics



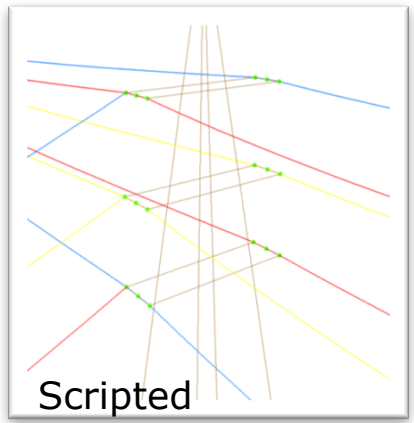
Lines



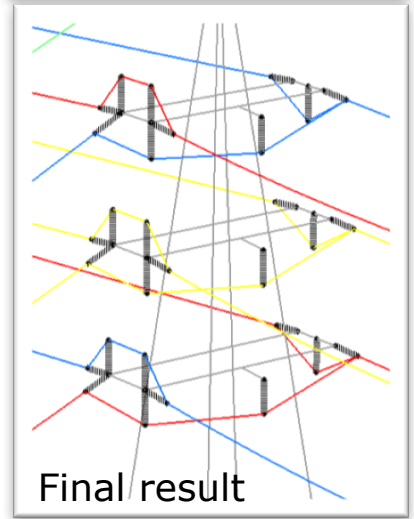
- Phases and Circuits are assigned using Transpower Transmission line schematics

- Spans assigned using spatially joined Transpower asset information





Scripted



Final result

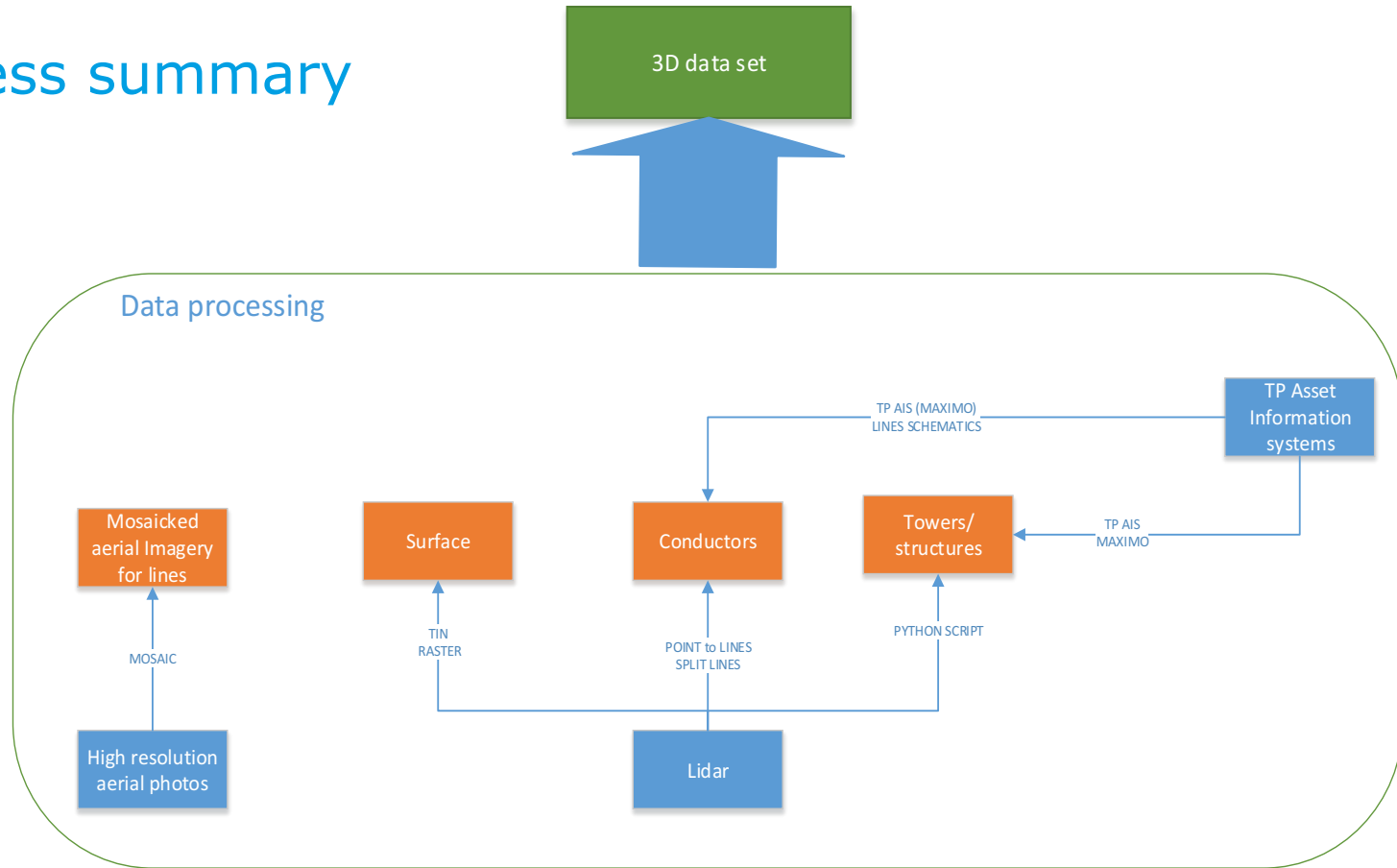


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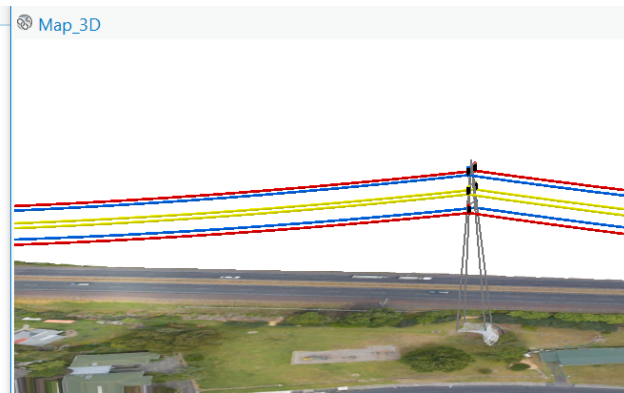
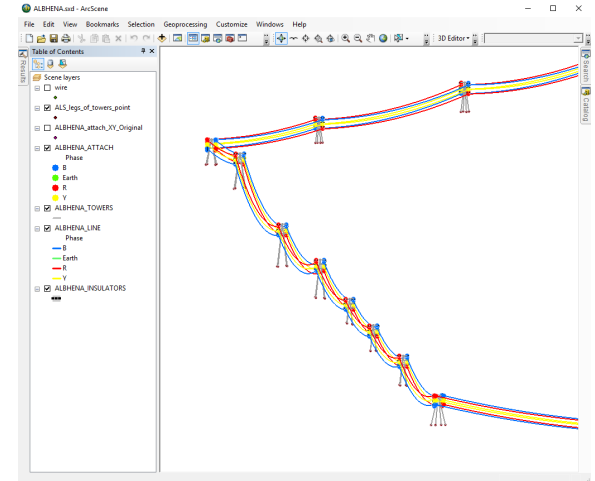
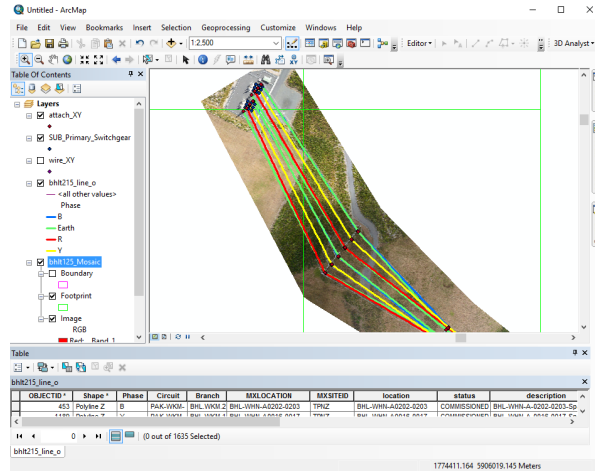
TRANSPOWER

Process summary



Software

- ArcMap
- ArcScene
- And now ArcPro!



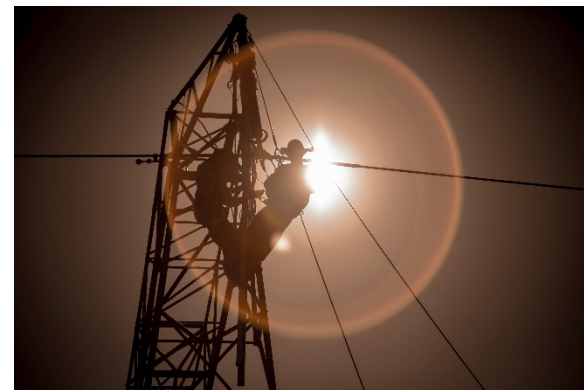
Constraints

- Source data

Multiple data sources

High resolution imagery

Lidar capture



Challenges

- Data maintenance



Customer benefits

Timely decision
making

Faster and more
accurate
response

Improve asset
data quality

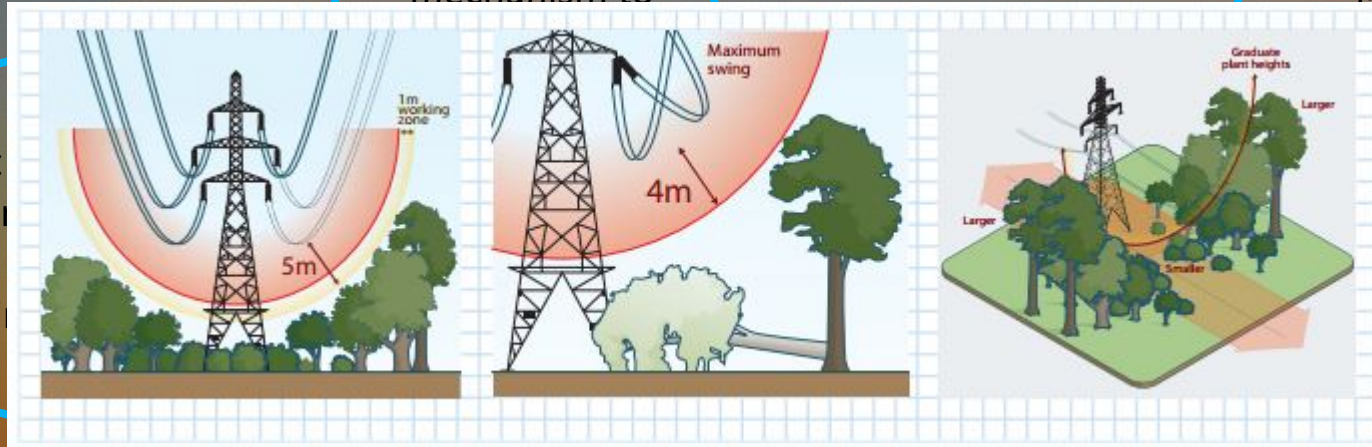


Future vision

3D Delivery mechanism to

Augmented reality view for clearance

Most information
main



QUESTIONS

