UMS Group Inc.
Transmission Line Span Asset Register Development

OVERVIEW

Many utilities have structures in their GIS, with long lengths of conductors (wire from splice to splice), but are missing assets called a “Span” (parts of conductors). This is an important gap because much of the risk of these assets lies in the interface between a span and the ROW (vegetation) below it.

METHODOLOGY

- We created a new asset class consisting of more than 180,000 transmission line spans
- The initial “span” was derived using a database of transmission structures. Once the structures were sequenced, the span length was calculated as a span attribute.
- Other attributes we brought in this new span data set, e.g. conductor attributes, # of splices on a span, and # of aviation marker balls on a span. Note: Any attribute could be joined to this span table for analysis.
- This work was completed by utilizing a custom BI application which aided in quick calculations using large data sets (i.e. 148k structures), mapping visualizations, and geospatial analysis to utilize geolocation / lat-long data.

DATA UTILIZED

Structure database, sequence number dataset, OH Line shape files, OH conductor attributes (type, size, age, etc.), child asset data sets (e.g. geolocations of splices, spacers, and marker balls)

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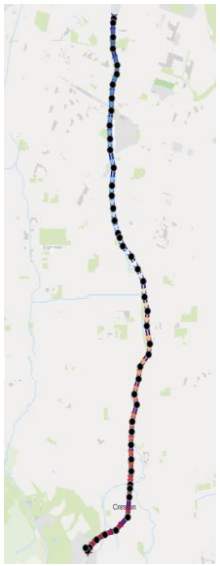
Case Study: Transmission Line Span Asset Register Development

CHALLENGES

- Data quality: duplicate data, missing data, incorrect sequence numbers, incorrect/outdated structure IDs, incorrect Lat/Long coordinates
- Data availability: the table of structures existed all along, but the sequence numbers associated with each structure did not. Data also didn't exist to indicate which "branch" of a multi-directional/split Tx line the structure existed on – a methodology to deal with this had to be developed.

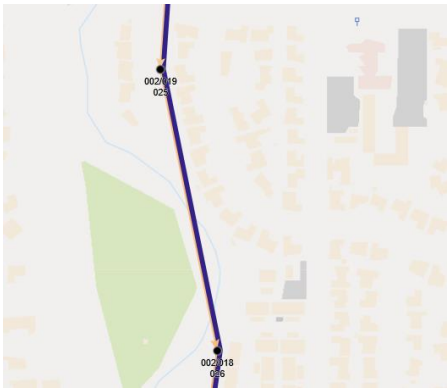
SUCCESS

- Establishment of this asset class was a significant step forward for this utility, allowing more effective asset risk management, as well as development of condition assessments, lifecycle strategies and risk profiles for each transmission span.
- Document conductor asset condition on each span
- Assign ROW Clearance attributes to measure Veg Management risk
- Link asset condition and veg exposure to consequence (river and highway crossings, schools, etc.)
- The client realized that they could not adopt a risk-based approach without data on this critical missing asset class.
- We built a comprehensive database of 148,000 transmission line spans in less than 3 weeks and delivered it to the client for upload as a new layer in GIS.



Spans (46)

SEQNO	SAP_FUNC_L...	From Struc	To Struc	Distance (ft)
0	ETL.1010	0/TERM1	006/043	226.74
1	ETL.1010	006/043	005/042	787.42
2	ETL.1010	005/042	005/041	624.76
3	ETL.1010	005/041	005/040	937.79
4	ETL.1010	005/040	005/039	487.24
5	ETL.1010	005/039	005/038	621.16
6	ETL.1010	005/038	005/037	747.84
7	ETL.1010	005/037	005/036	669.43
8	ETL.1010	005/036	004/035	815.73
9	ETL.1010	004/035	004/034	726.49
10	ETL.1010	004/034	004/033	603.63
11	ETL.1010	004/033	004/032	996.96
12	ETL.1010	004/032	004/031	977.33
13	ETL.1010	004/031	004/030	546.07
14	ETL.1010	004/030	004/029	691.37
15	ETL.1010	004/029	003/028	675.64



Example visualization of a client transmission line – showing each structure and its sequenced path, overlaid with an OH line shape file. This was primarily used for checking for data quality issues. Sample data with span length shown as well.

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