Ontario Regional
ORCGA
Common Ground Alliance

Utility Data Collection to Deliver Broadband to Rural Municipalities - Renfrew/Arnprior Case Study

Lawrence Arcand, P.Eng, PE

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Presentation Overview

- Accelerated High-Speed Internet Program (AHSIP) Background
- Considerations for Data Collection
- Data Collection Techniques
- IKE GPS Solution
- Arnprior/Renfrew Case Study
- Summary
- Questions

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AHSIP Overview

Bringing high-speed internet access to every community in Ontario

The Government of Ontario has committed almost $4B to provide access in every region of Ontario to reliable, high-speed internet by the end of 2025.

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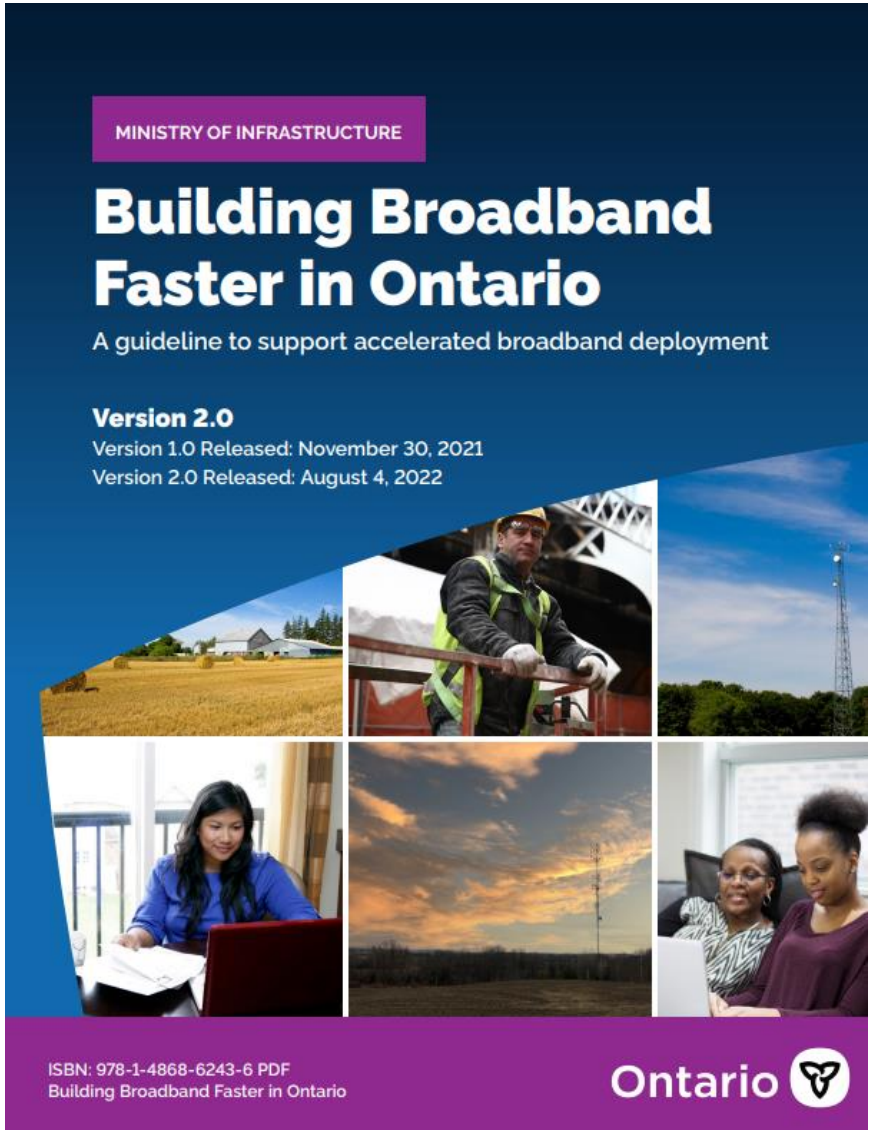
AHSIP Overview



- Program is assisted by the Building Broadband Faster Act, 2021 (amended April 14, 2022)
  - https://www.ontario.ca/laws/statute/21b02/v1
- Bill 257 – Supporting Broadband and Infrastructure Expansion Act 2021
  - https://www.ola.org/en/legislative-business/bills/parliament-42/session-1/bill-257
- BBFA Guideline 2.0 Aug 4 2022
  - https://files.ontario.ca/moi-building-broadband-faster-in-ontario-guideline-v2-en-2022-08-17.pdf

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Data Collection - Applicable Standards

Planning

Identify Corridor
- Subsurface Utility Engineering Investigation
- Pole Inventories,

Design

Complete Design
- Capital Project
- Utility Conflict Matrix
- Utility Relocation
- Identify Make Readies

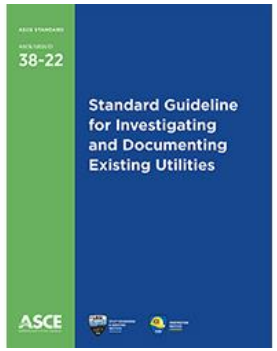
Construction

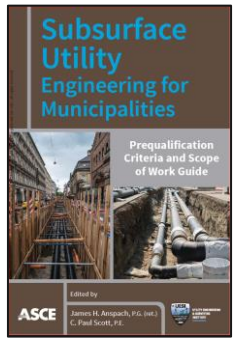
Relocate Utilities
- Make Ready
- Early works
- During construction

Post Construction

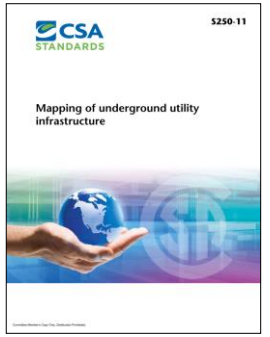
Utility Close Out
- Invoicing/Payment
- Claim Resolution
- As Built Drawings,

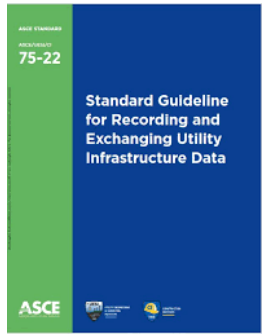
ASCE 38





CSA S250 / new ASCE





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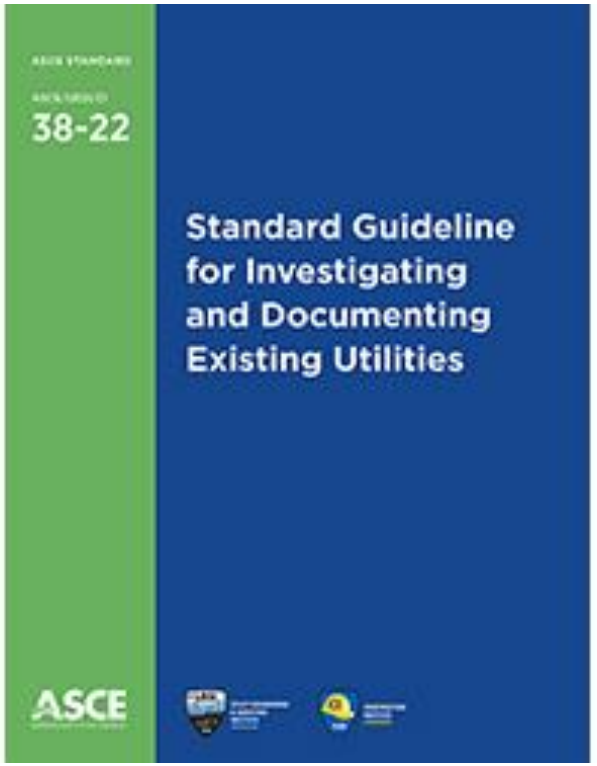
Key Standards – ASCE 38-02 and -22

Quality Levels

QL-D QL-C QL-B QL-A

Increasing Certainty



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Key Requirements for Data Collection

Key Questions:

1. Building methods which determine what do I need to find. U/G, Aerial?
2. What are the Permit and Engineering Requirements?
3. What Quality Level do you need/want for the data?
4. How much detail do you need for Poles?
5. What techniques are available?

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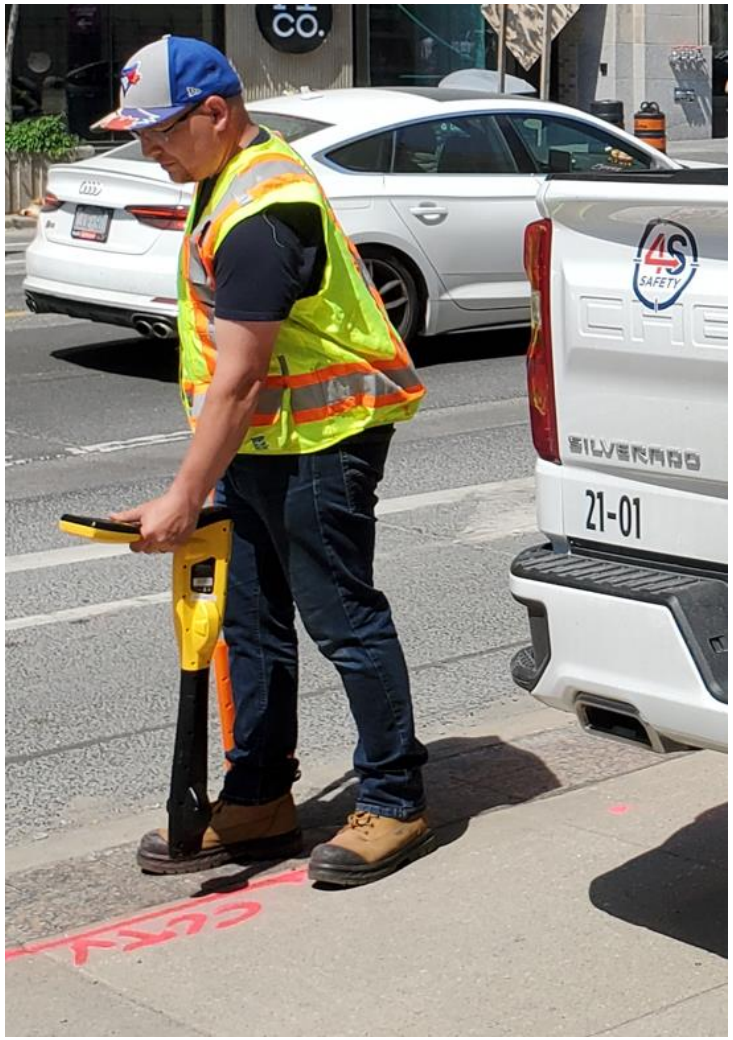

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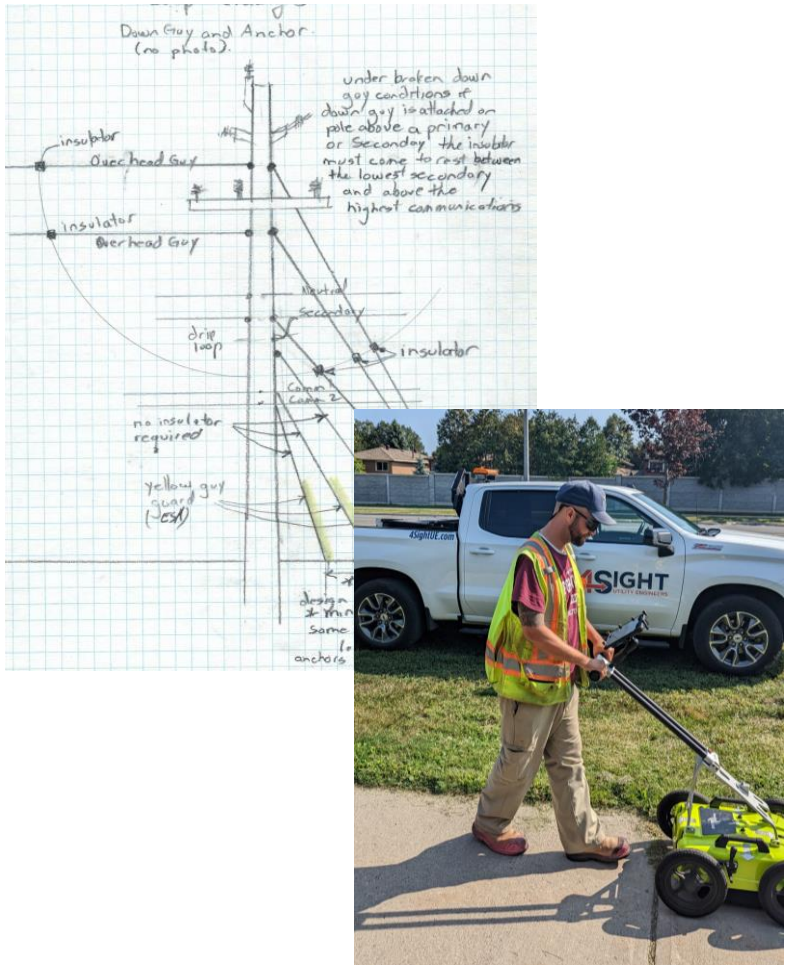

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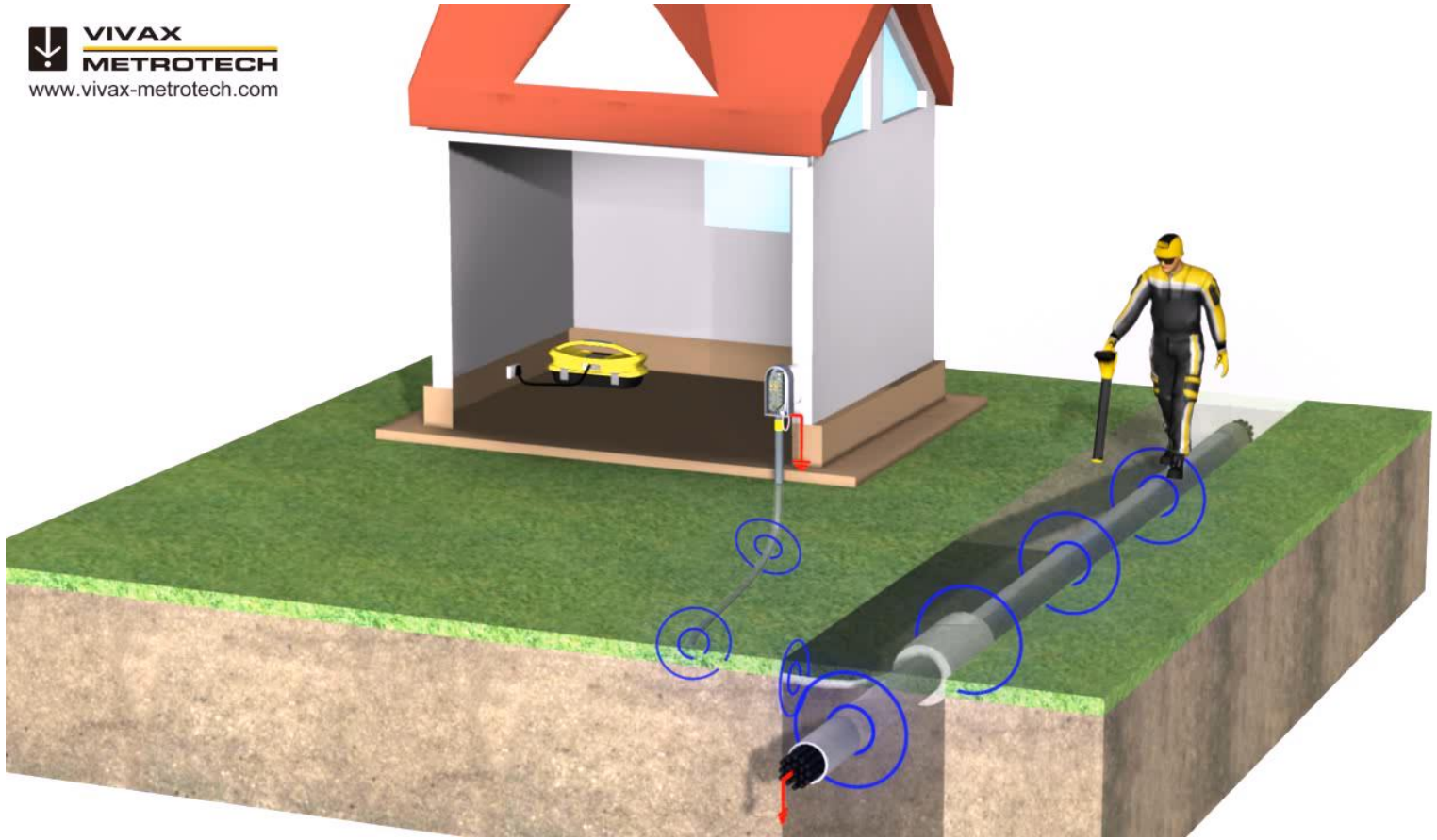
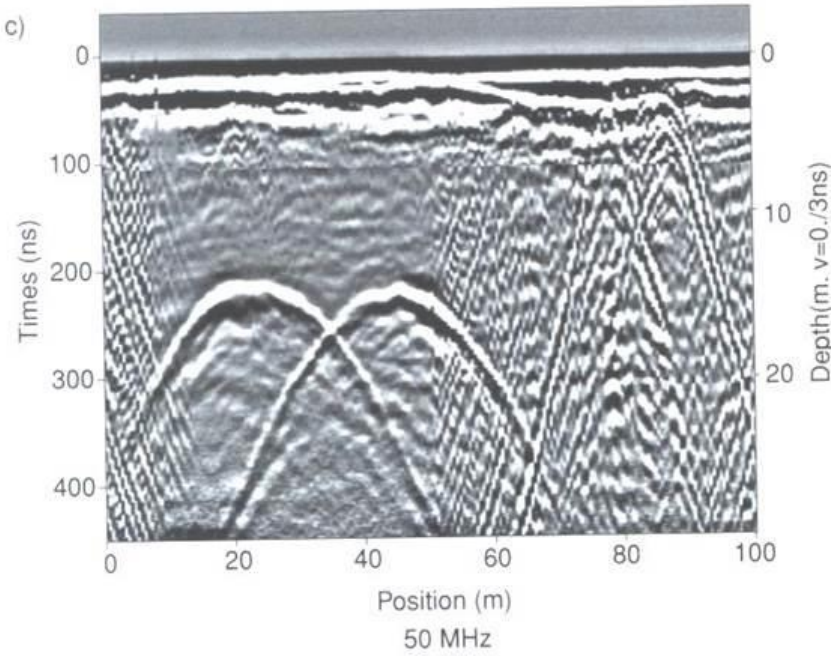
Techniques – Pipe and Cable Locators



Techniques – Ground Penetrating Radar



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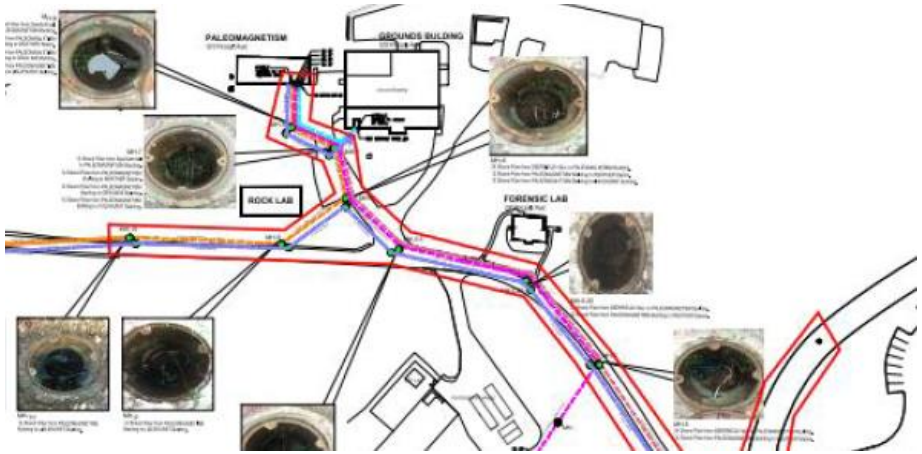
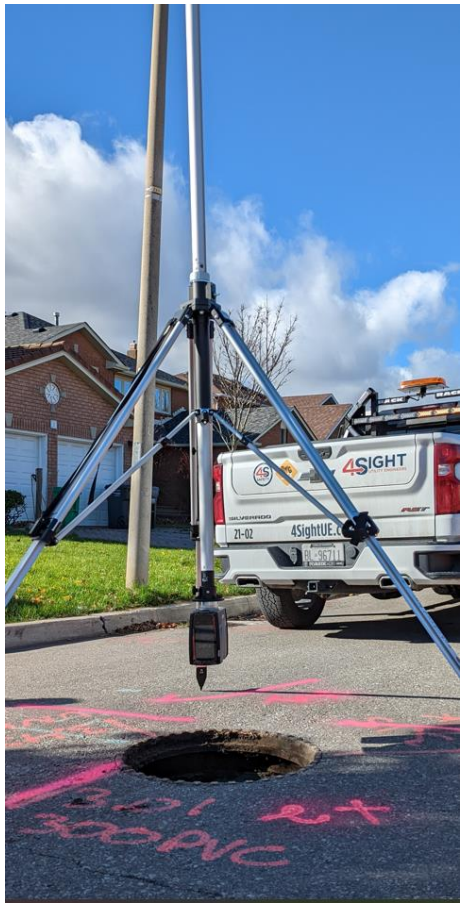
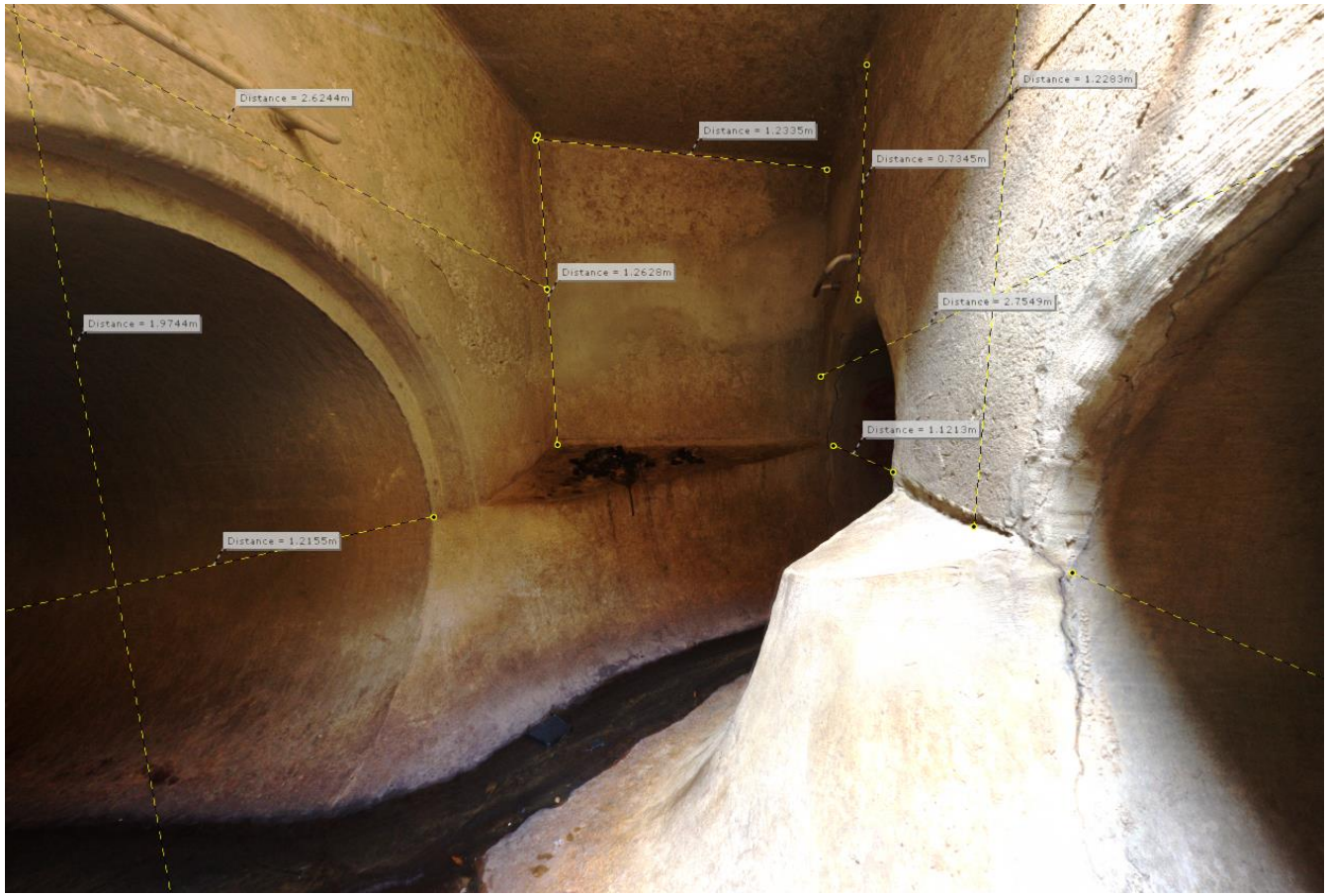
Techniques – CCTV / Sondes



Techniques – LIDAR





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Techniques – Vacuum Excavation

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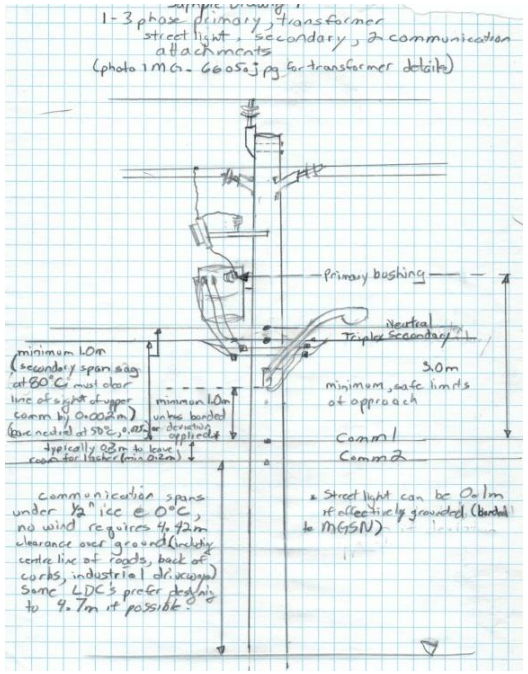
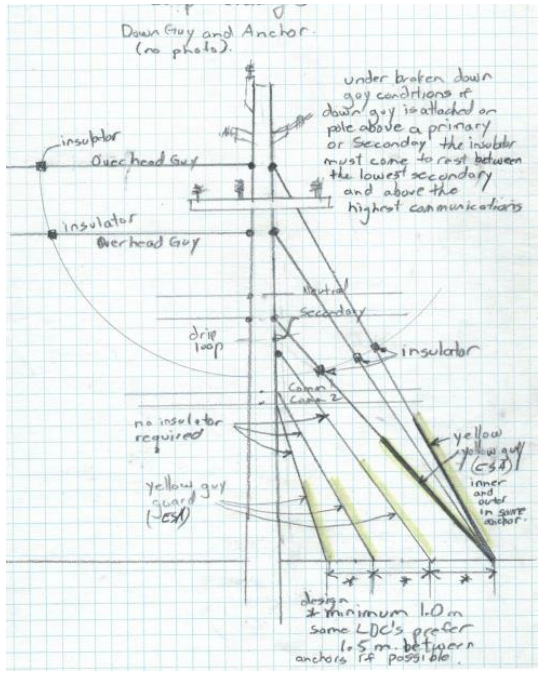
Techniques – Measurements and Photos





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Techniques – LiDAR

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Techniques – IKE GPS

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Arnprior Renfrew – Case Study

Arnprior Renfrew – Case Study

1. Project Overview
2. Why Did they Choose the IKE?
3. Managing the Project
4. Data Collection Methodology
    1. Data Collector
    2. Data Input Field
    3. Field Process
5. Sample GIS Data
6. Post Processing of Data
7. Lessons Learned
    1. Weather Issues
    2. Tripod / GPS Accuracy
    3. Getting all poles required for Calculations
    4. File Size
    5. Obstructions

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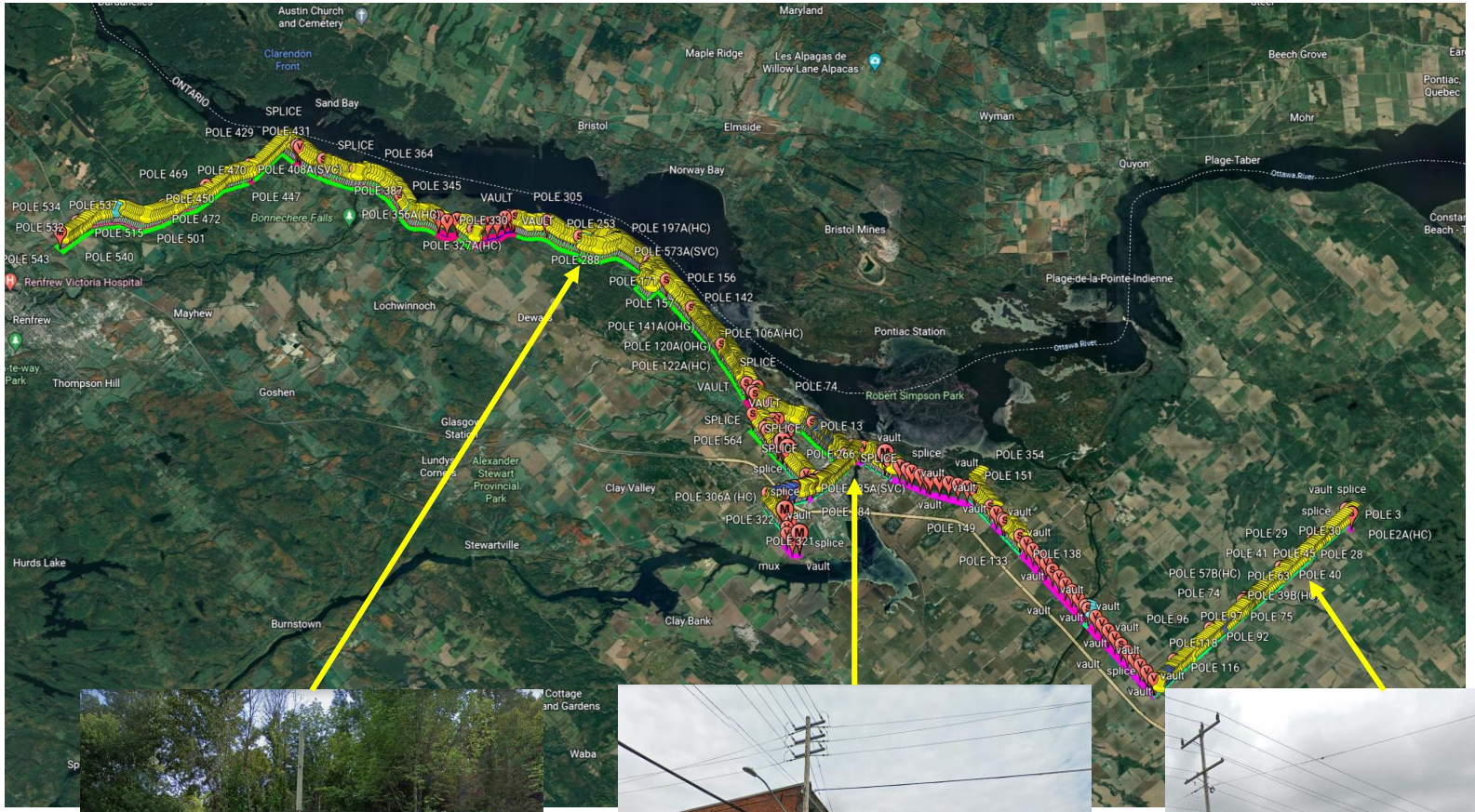
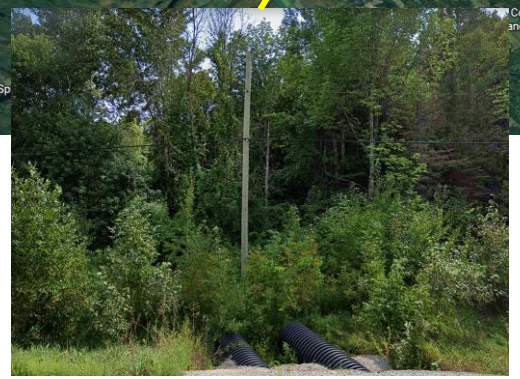
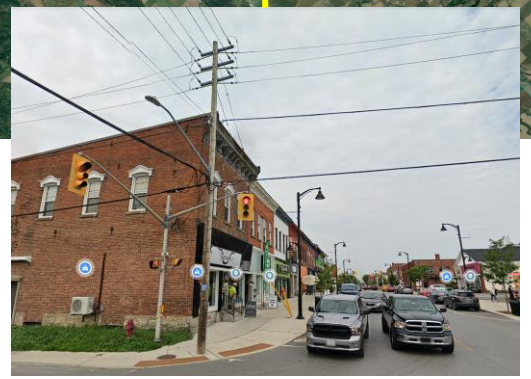
Project Overview







- Approx. 1400 Poles
- Farm fields / Residential / Forested / City Center
- Varying traffic and road conditions

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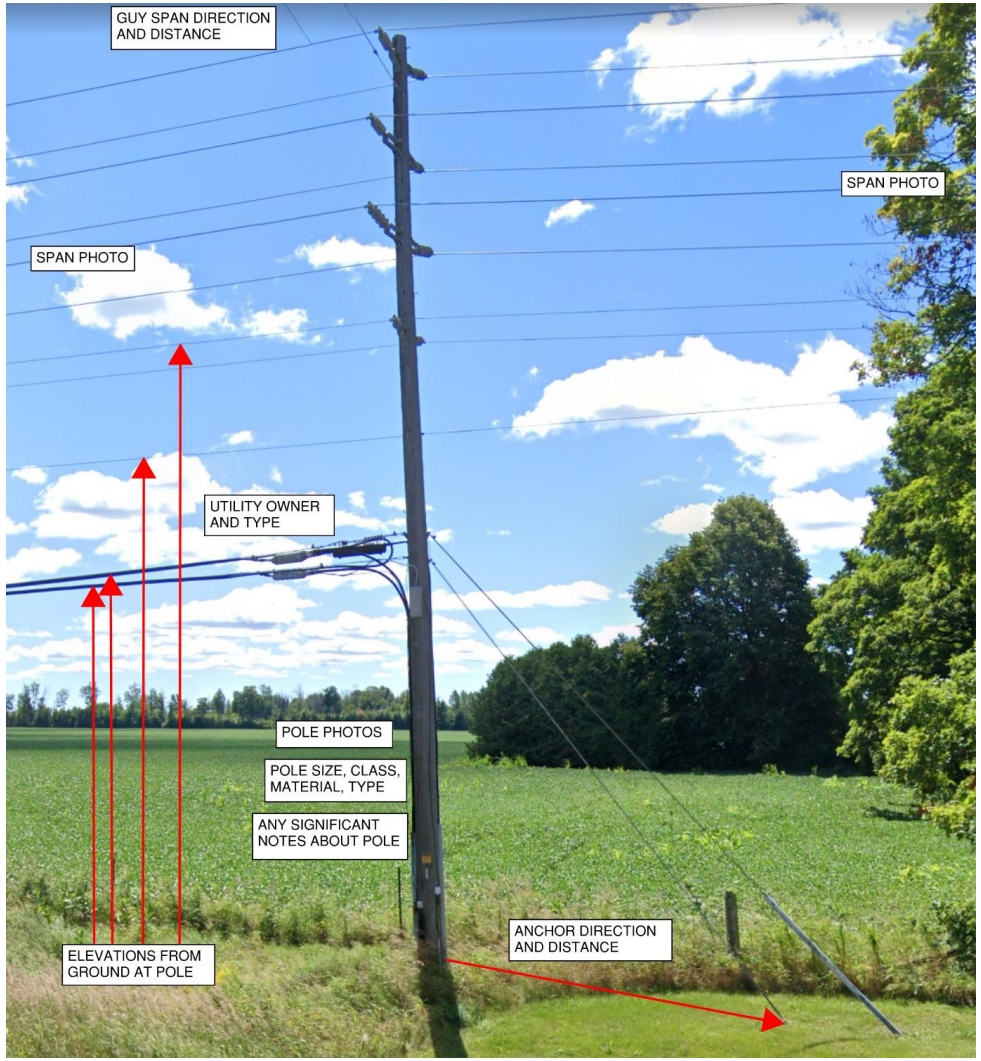
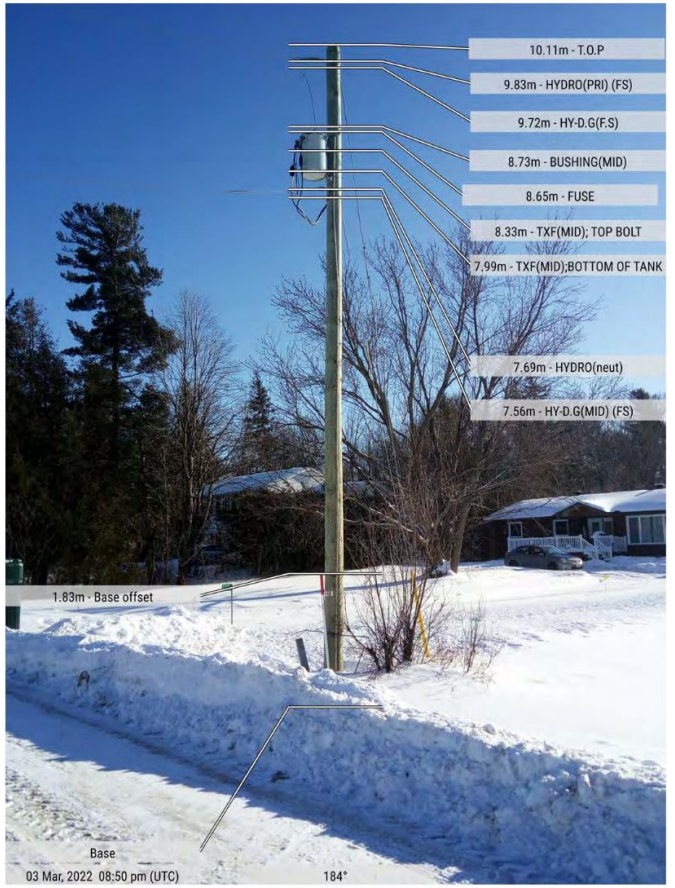
Project Overview



To Collect:

- Pole Location & Number
- Pole type / class / material
- Utility types and owners
- Pole features
- Relative elevations
- Significant notes
- Photos



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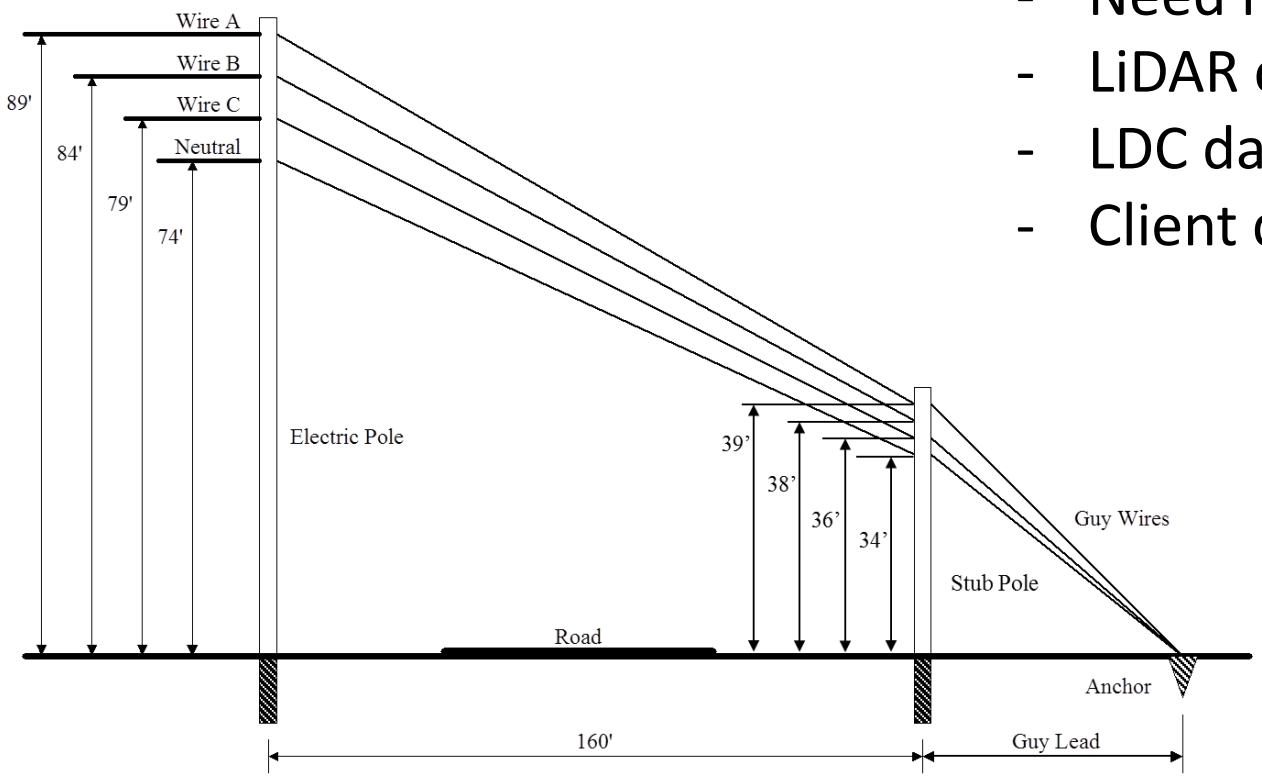
Why Ike?



- Need more data than photos provide
- LiDAR considered
- LDC data requirements for pole calculations
- Client dictated IKE be used

ike GPS

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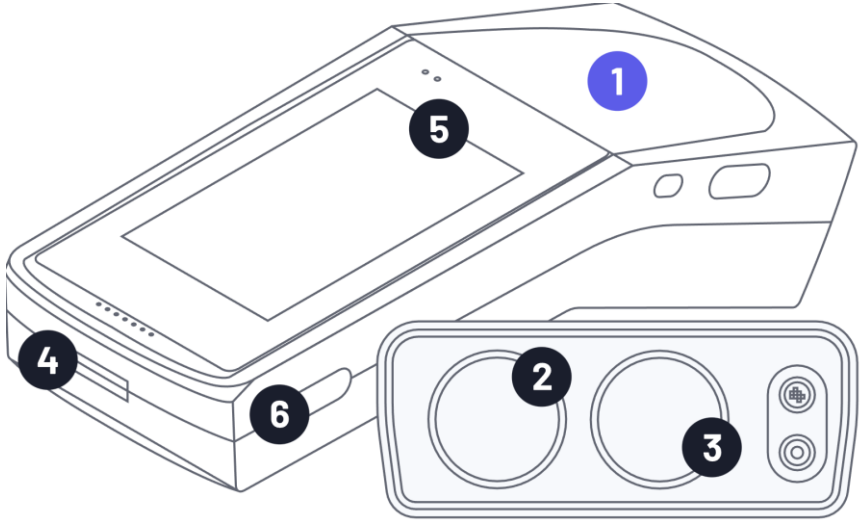
Data Collection Methodology – Data Collector

- GPS
- Laser rangefinder
- Calibrated image capability
- Ike Office App
- Adjustable tripod



ike GPS

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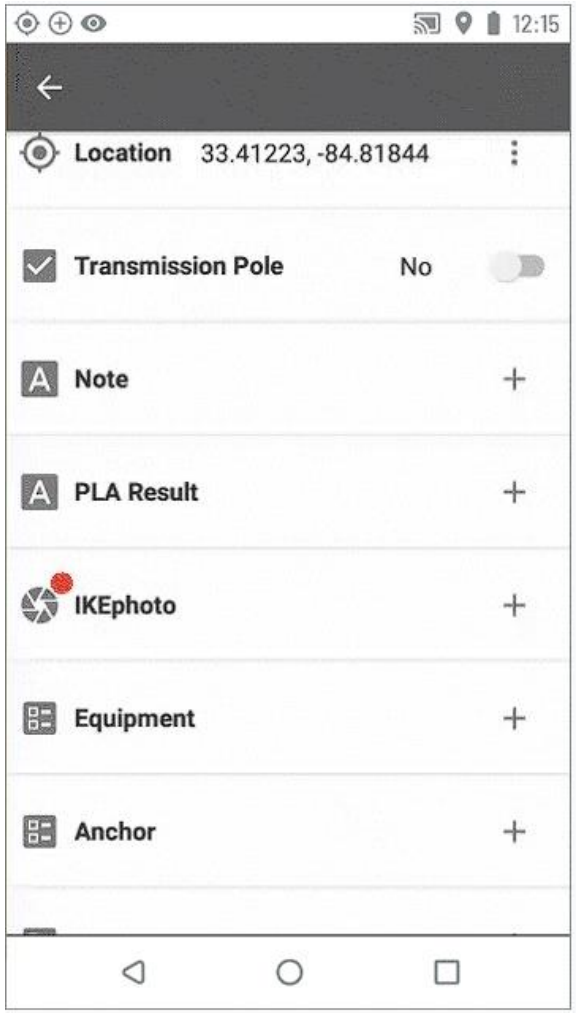
Data Collection Methodology – Data Input Field



Source: (https://ikegps.com/ike-office/ike-field-tools/)

- Step-by-step list
- Integrated photos in required fields
- Distances calculated via rangefinder

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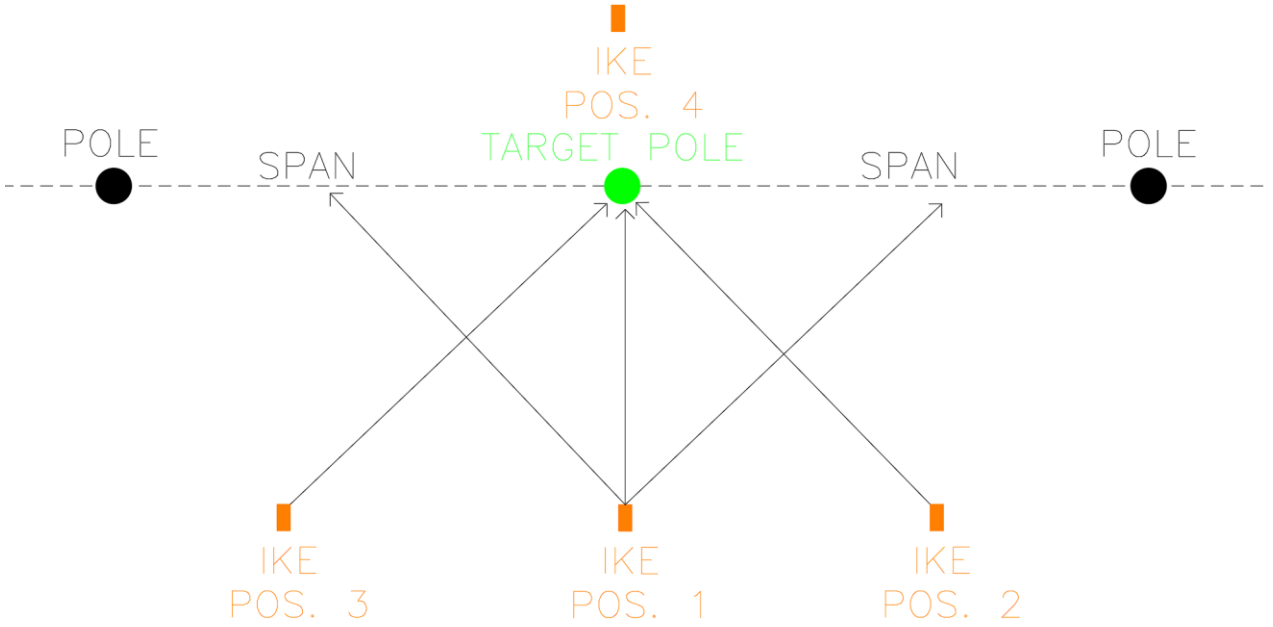
Data Collection Methodology – Field Process



- Three angles of pole, photos of any tags or markings on pole, and one photo of each span
- Stake with known height used to mark offset from base of pole in cases of snow buildup

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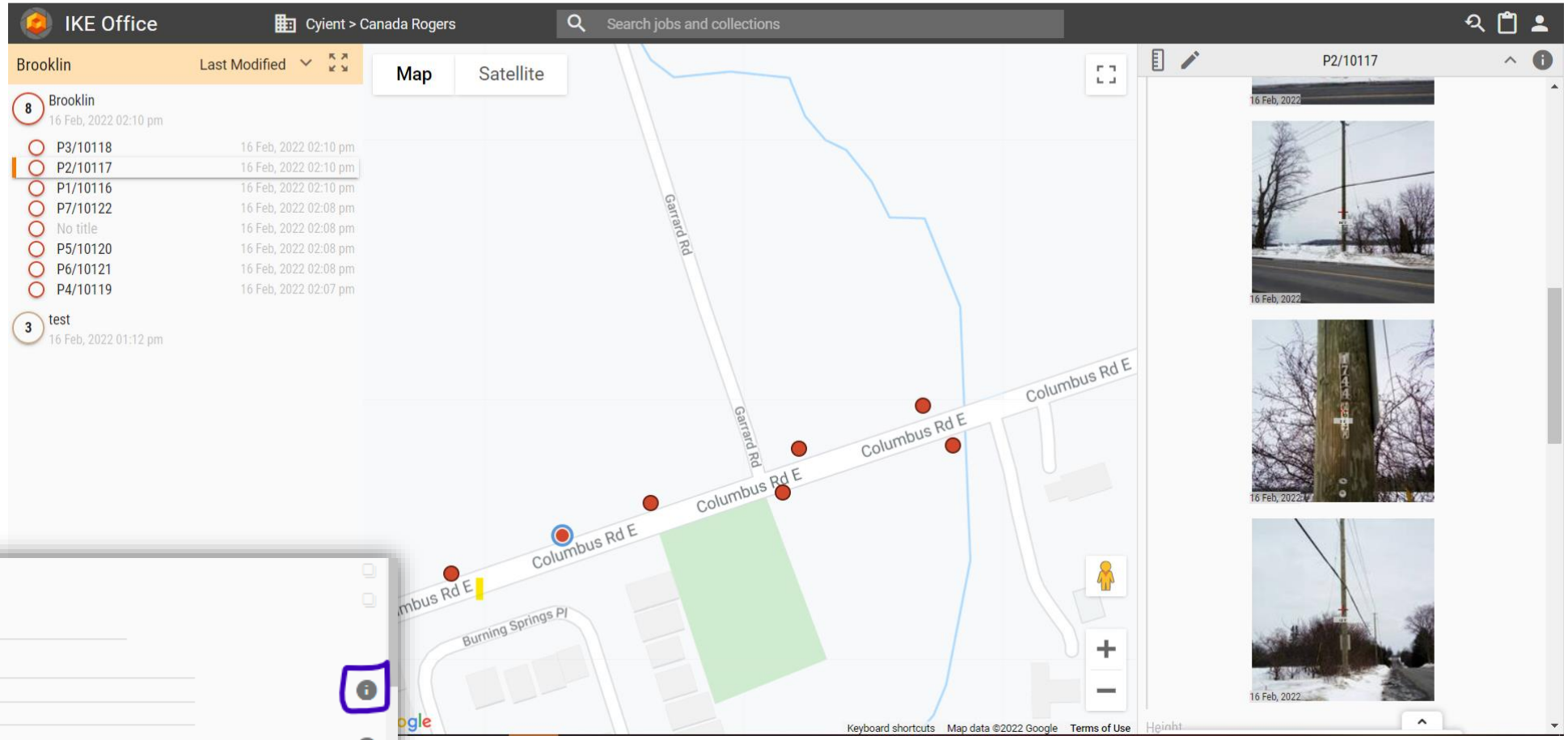
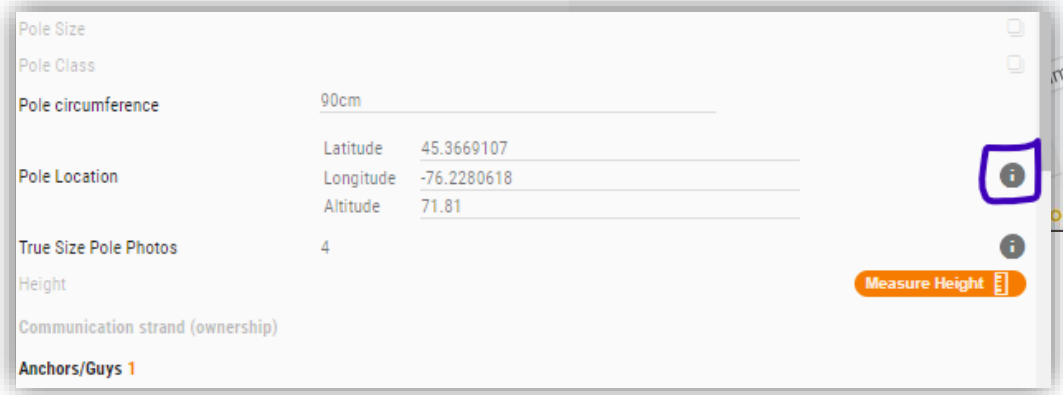
Sample GIS data

- IKE Office
- Project Overview
- Individual Pole Data with photos





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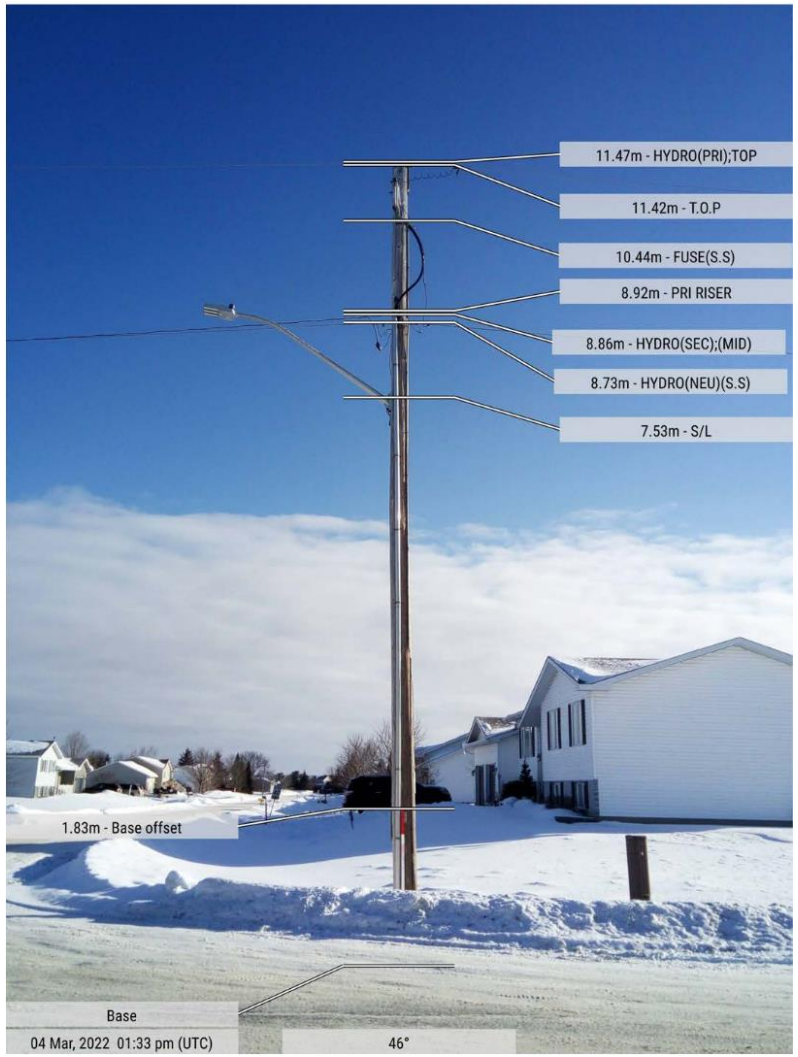
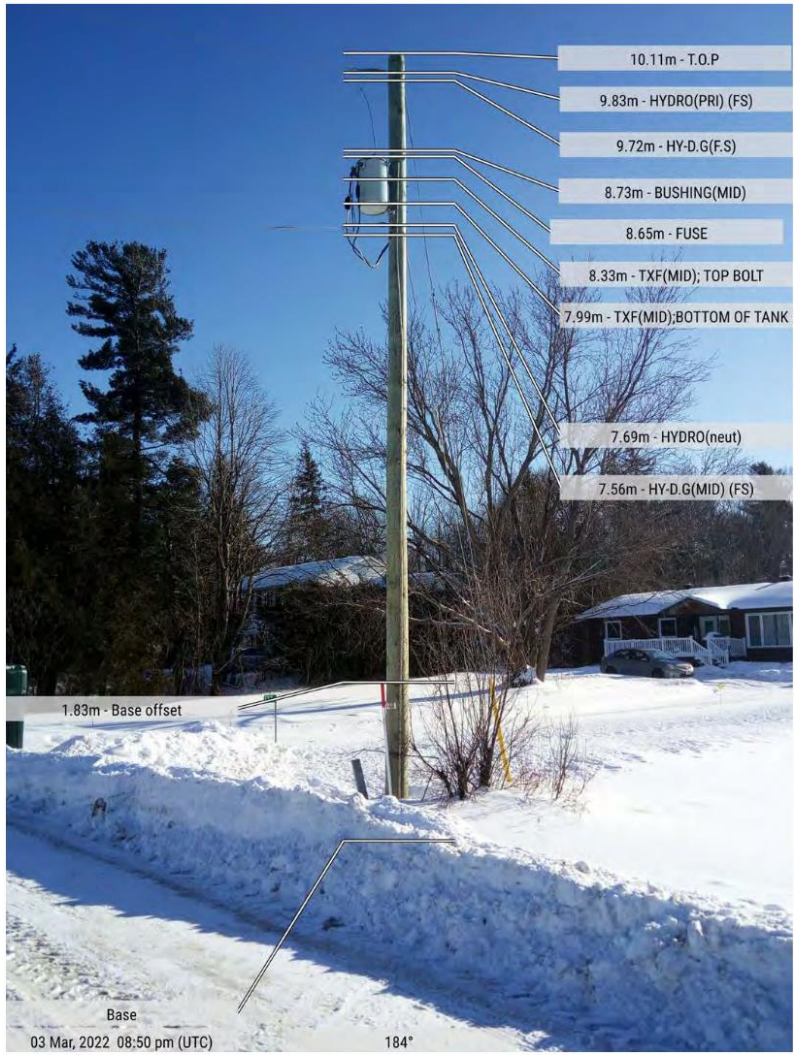
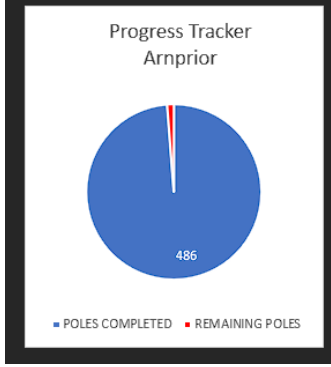
Post – Processing of Data

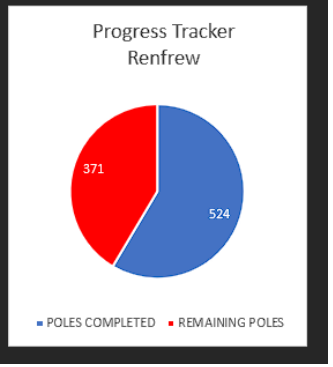




- Completed by client at their request
- Could be done by any party
- Progress tracking

	Arnprior	Renfrew	Total
Total Poles	492	895	1387
Total Completed	486	524	1010
Total Remaining	6	371	377
Percent Complete	99%	59%	73%





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Lessons Learned?

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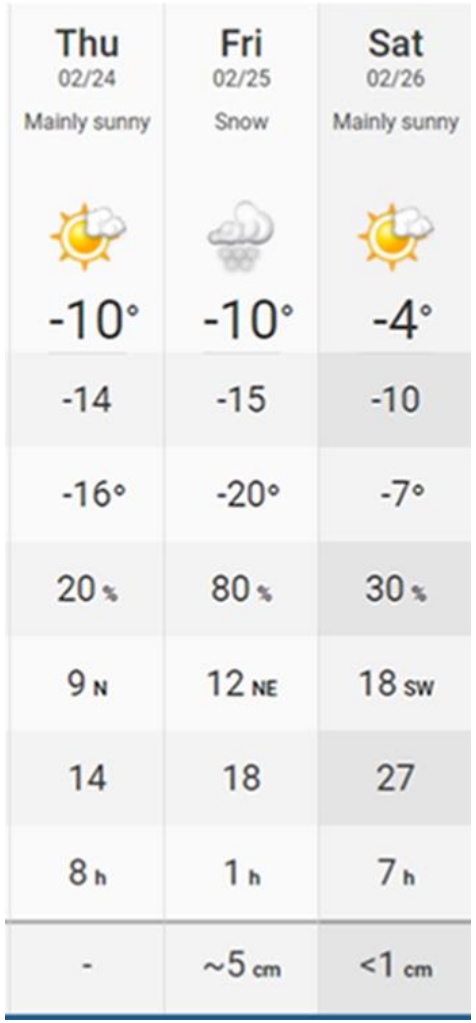
Lessons Learned - Weather



Thu 02/24	Fri 02/25	Sat 02/26
Mainly sunny	Snow	Mainly sunny
-10°	-10°	-4°
-14	-15	-10
-16°	-20°	-7°
20 %	80 %	30 %
9 N	12 NE	18 SW
14	18	27
8 h	1 h	7 h
-	~5 cm	<1 cm

- Freezing rain / snow buildup on screen
- Touchscreen unusable when wet / frozen
- Blurry photos
- Laser inaccuracy

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Lessons Learned – Tripod / GPS accuracy

- Need sturdy GPS placement
- Horizontal GPS accuracy could be improved
- Z-component relativity (Need to measure from same location to determine elevation differences)

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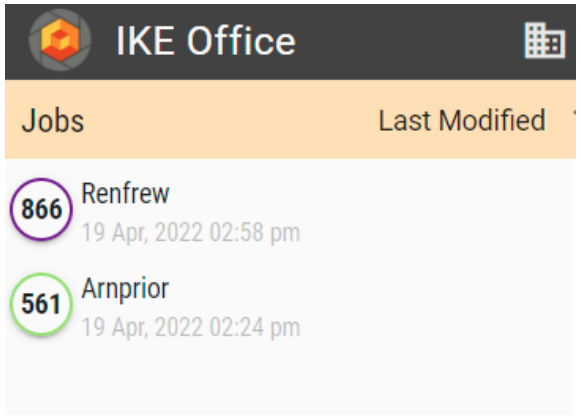
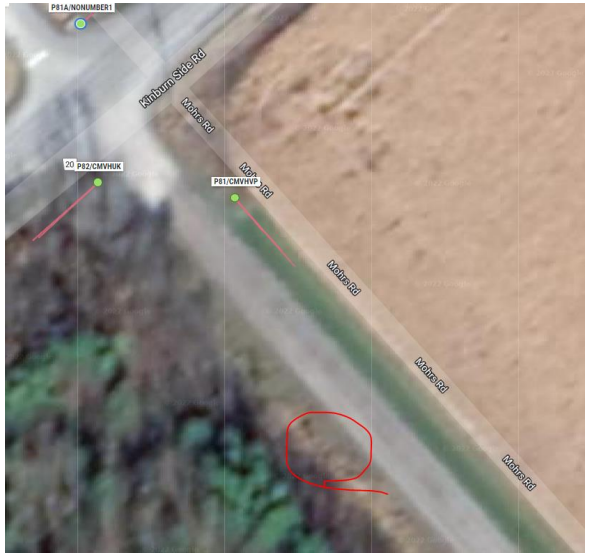
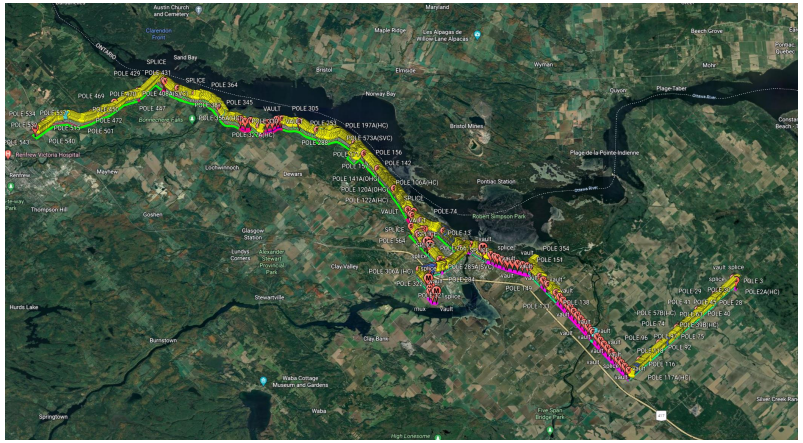
Lessons Learned – Additional poles / Calculations



- Thorough examination of all required poles required beforehand by someone with understanding of loading
- Connected poles
- Additional poles down adjacent roads





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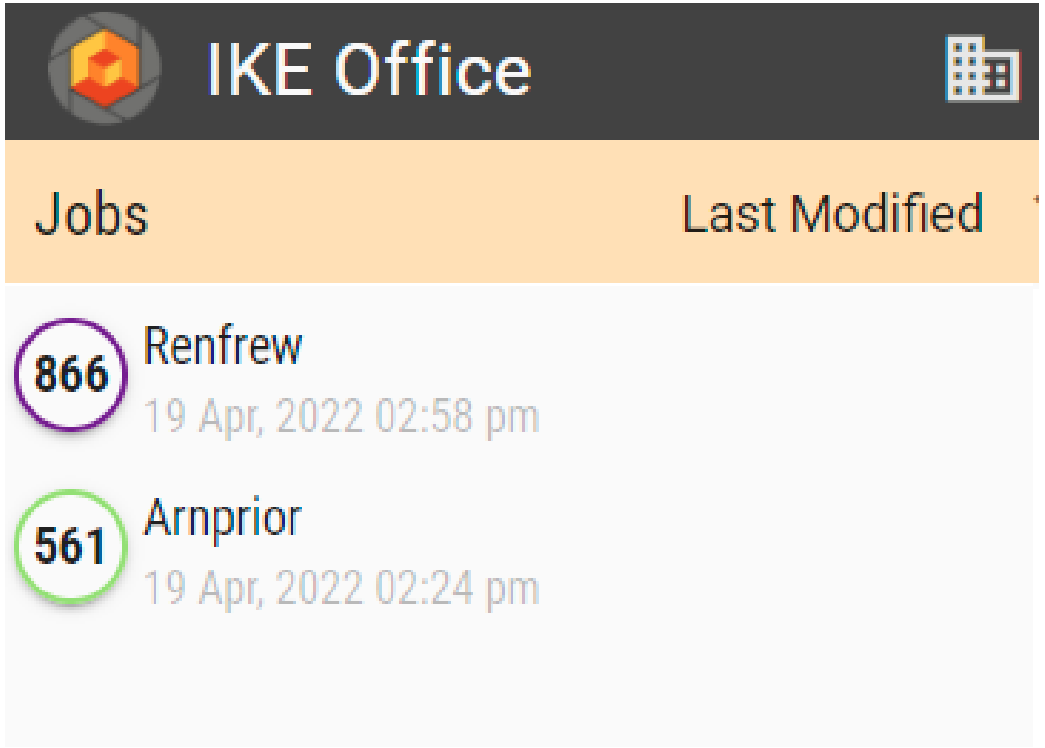
Lessons Learned – File Size



- Break Project into smaller chunks for smaller file sizes
- Unit had very slow download speed in rural area when attempting to sync
- Larger file sizes caused instability in the application, and it would take much longer to load, sometimes crashing

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Lessons Learned – Obstructions

- Vegetation / objects blocking sightlines
- Laser requires direct placement on center of pole
- Hand measurements sometimes required

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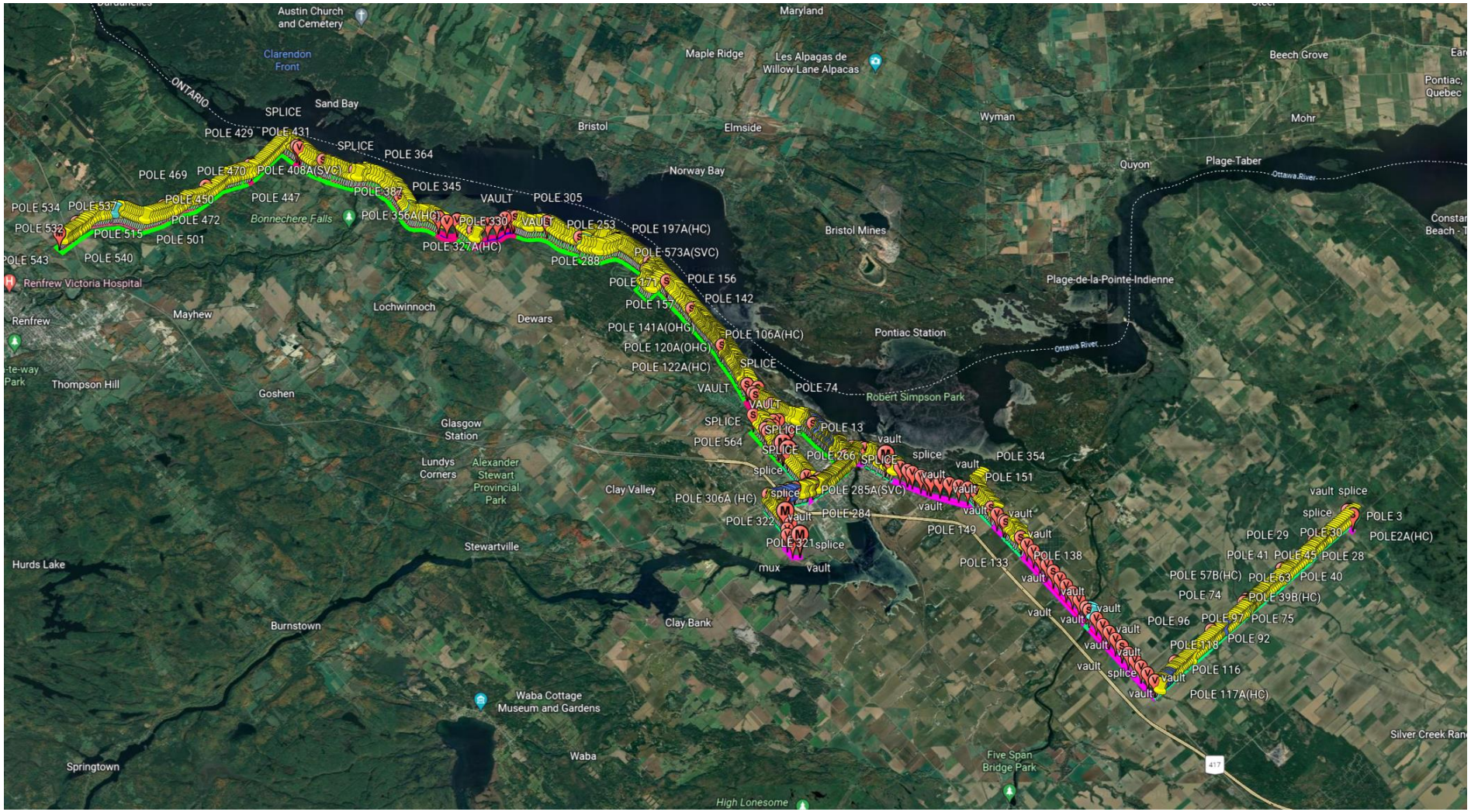
Project Completion



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Summary

1. Understand your project and what information needs to be collected.
2. Follow appropriate Standards and Guidelines.
3. The IKE is a valuable tool for collection of detailed Pole Inventories suitable for engineering pole calculations.

Questions?

Lawrence Arcand, P.Eng, PE
President - 4Sight Inc.
Lawrence.Arcand@4SightUE.com
C:905-424-1959

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