

ACEP + Kartorium: Digital Twinning Galena's Power Distribution System



Kartorium

Overview

- Overview of Kartorium
- Collaboration in Kotzebue + lessons learned
- Methodologies
 - Asset inventory
 - Drone capture
- Results
- Sharing and reusability

So Much Data



Asset Management

O&M, CMMS (work orders, service histories)



Building Automation & SCADA

Live data feeds, meters/sensors, trending



Process Documentation

Training, procedures, manuals



CAD Models

Design documentation, scan-to-BIM



Geospatial Data & Imagery

GIS layers, inspection drone imagery



Human Expertise

Experienced subject matter experts

So Little Transparency



Lack of collaboration and awareness

Costly, ineffective, dangerous operations



Workforce turnover

They take it with them



Remote, harsh conditions

Travel, rework



Too technical

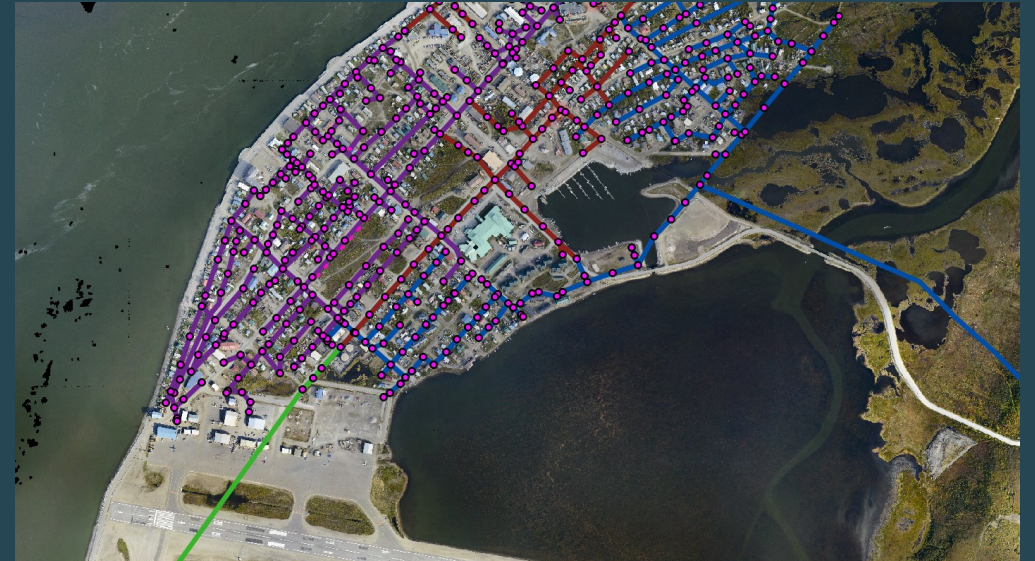
Not designed for normal people

Kartorium



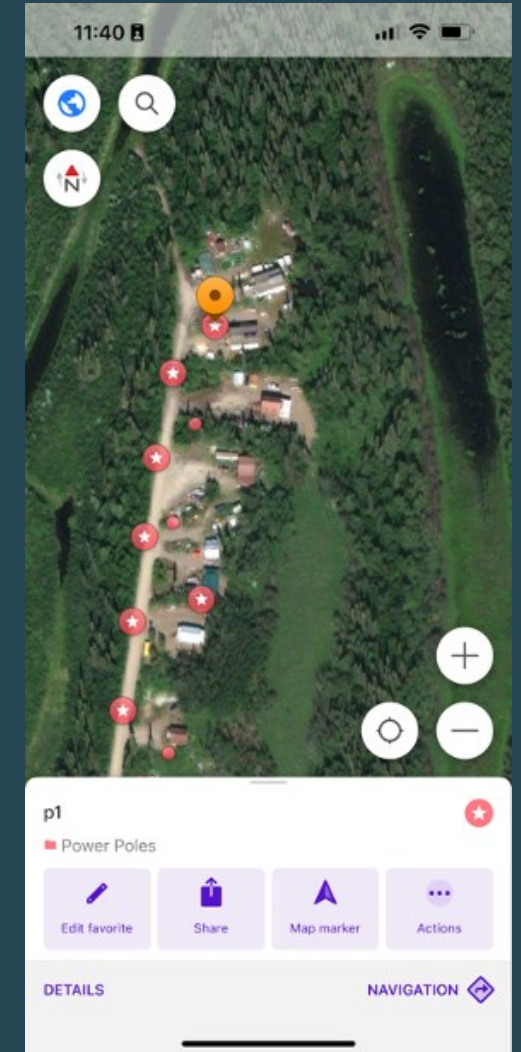
Collaboration in Kotzebue

- Working simultaneously with KEA, for different purposes
- Utilized ACEP intern to improve KEA digital twin
- Lessons learned pulled forward



Methodologies – Asset Inventory

- Open-source tools: OSMand & QGIS
- Help from interns, combined multiple datasets

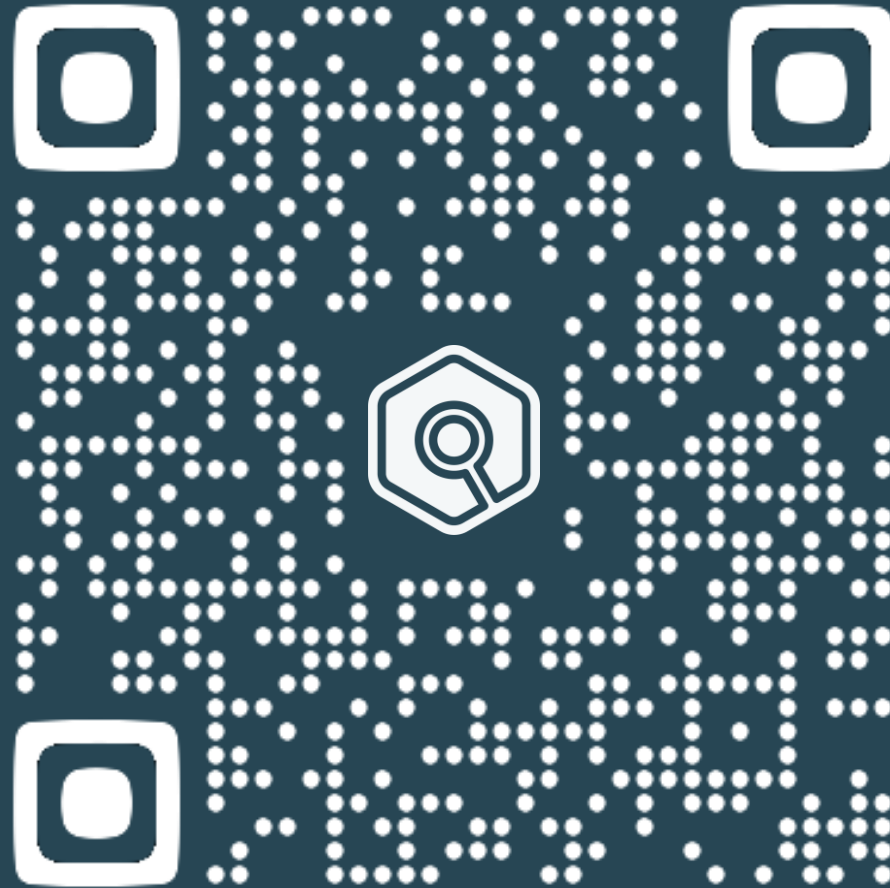


Methodologies – Drone Capture

- Approval from FAA to fly at max 400ft, excluding above the airport
- Captured entire community twice: 400ft and 100ft
- Split community into ~20-acre flights, line of sight required
- Consumer-grade drone technology: Skydio 2

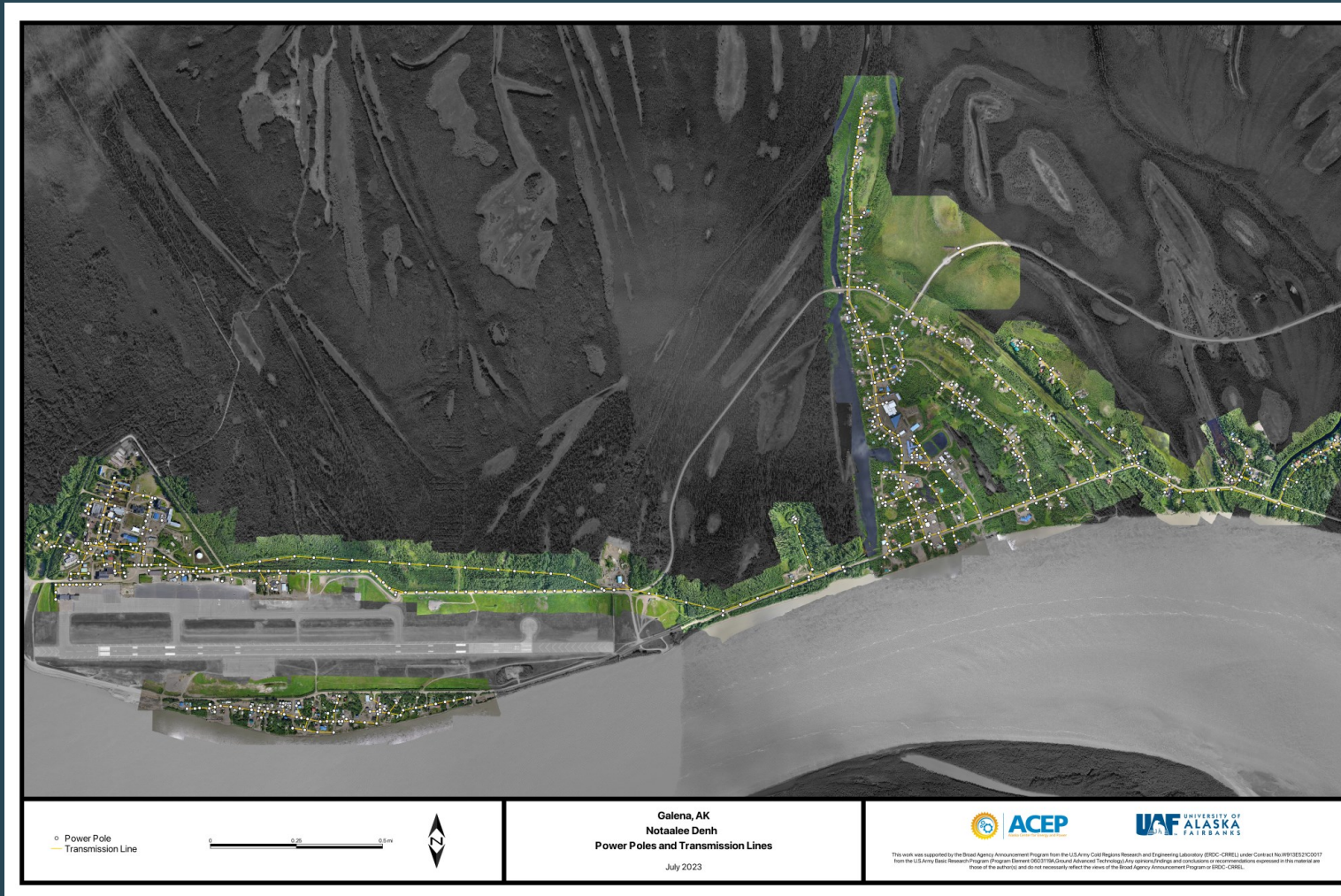


Results - Kartorium





Results – Imagery



Sharing and Reusability

- Public link!
- Large print-out was giving to City of Galena by ACEP
- Processed imagery was shared with ANTHC for use in their projects
- Grid modeling done by other teams at ACEP
- Vulnerabilities were shared with Alaska Energy Authority

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