GSHi Workflows Explained: GNSS, Inspections & Public Reporting

GNSS, Inspections & Public Reporting

SCAUG 2024 Frisco, Texas

GSU

Building Connections for Life
Établir des liens pour la vie

THE WORKSHOP

NEILA

GIS Analyst
Certified GISP New

LINDSEY

GIS Technician

JAYRAJ

Data, Integration & Platform Specialist

PAUL

Innovation Officer

MSc(GIS) GISP

ORCHESTRATE THE GLUE

The **Geo** game is a **data** game.

Same as you!

Here's some of our glue on AGO

GEO STACK

"Upgraded" to 10.9.1 / 10.8.2

2 Small Utility Agreements

2 Federated Enterprise Servers

All those blue pawns = people. Yup!
A jillion manual interventions.

aka engineering's "data-mining"
process

CHALLENGES

Organizational constraints / technical debt

Awareness / engagement short lived

False starts / klunky ops / no CMMS or EAM !!

Process maps? We don't need no stinking …

The Esri "Unified Workflow" myth

HA DATA

High accuracy
data collection
Field Maps & EOS Gold GNSS

BUSINESS NEED

Better location of assets, particularly for underground!

Um, you ever try to find a handhole under 3 feet of snow?

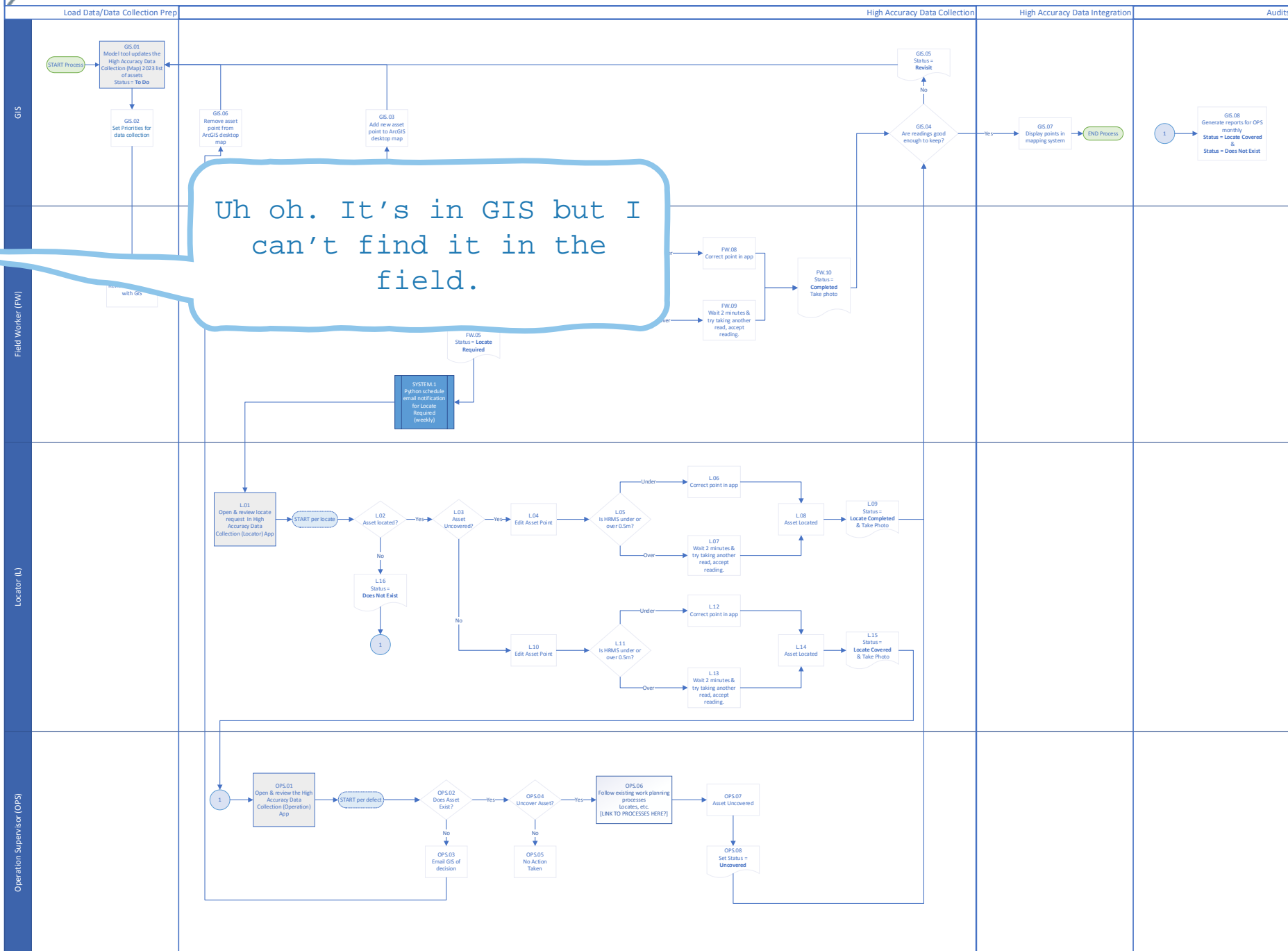# STEP 1: PROCESS

With all projects, we've started with a process map.

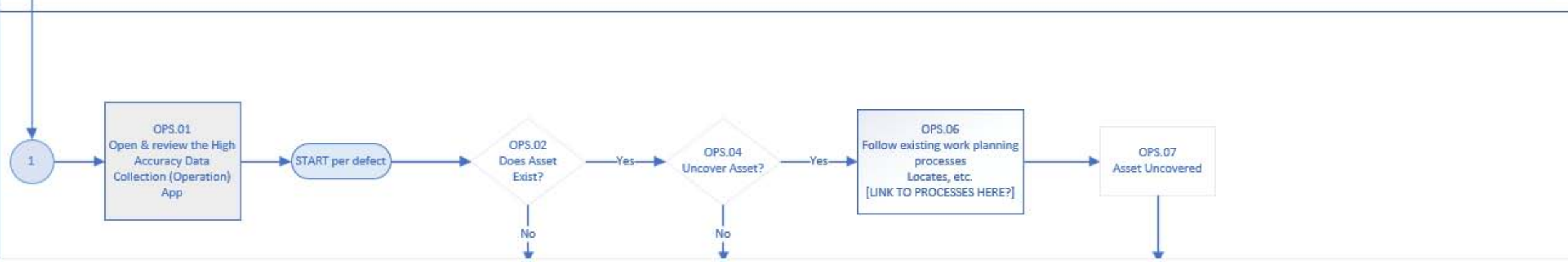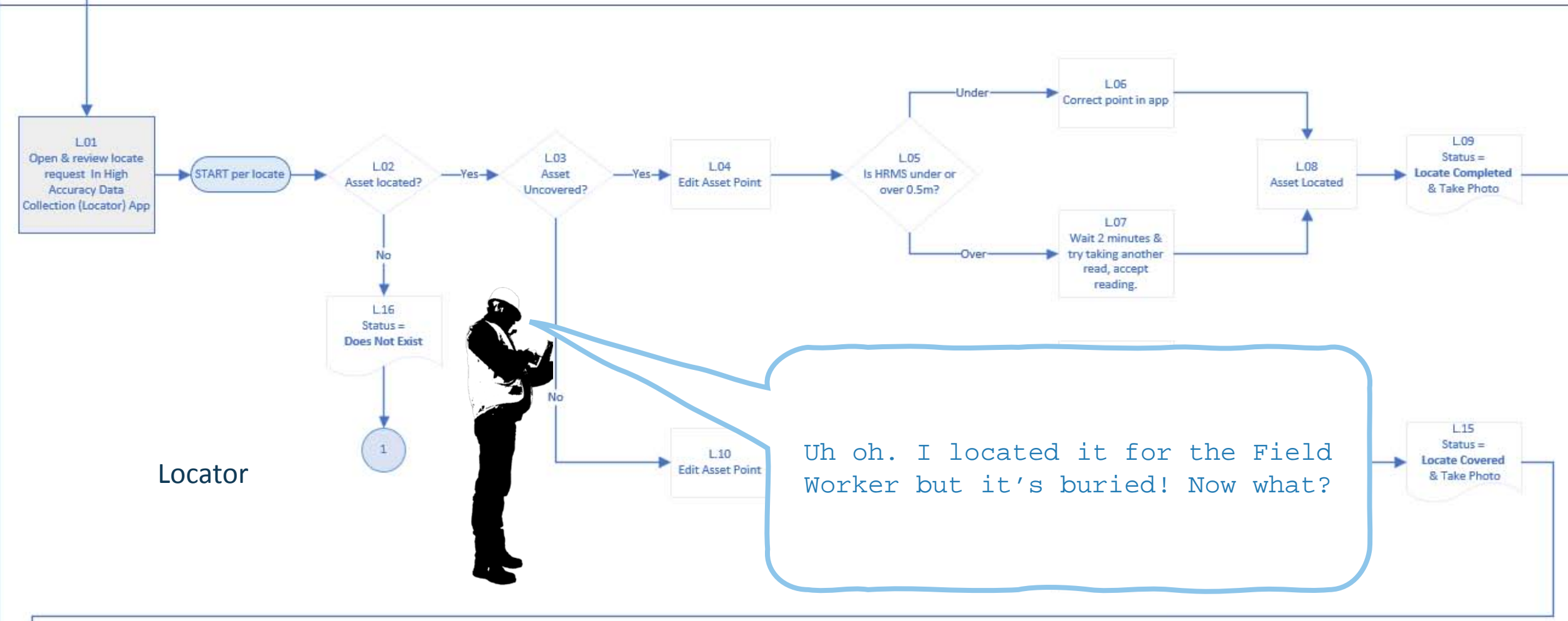Um, you ever try to build solutions around an undocumented process? **Fail!**

| Load Data/Data Collection Prep | High Accuracy Data Collection | High Accuracy Data Integration | Audits |

Field worker

GIS

START Process

GIS.01
Model tool updates the High Accuracy Data Collection (Map) 2023 list of assets
Status = **To Do**

GIS.02
Set Priorities for data collection

GIS.06
Remove asset point from ArcGIS desktop map

GIS.03
Add new asset point to ArcGIS desktop map

GIS.05
Status = **Revisit**

No

GIS.04
Are readings good enough to keep?

Yes

GIS.07
Display points in mapping system

END Process

GIS.08
Generate reports for OPS monthly
Status = Locate Covered
&
Status = Does Not Exist

1

Field Worker (FW)

...with GIS

Uh oh. It's in GIS but I can't find it in the field.

FW.08
Correct point in app

FW.09
Wait 2 minutes & try taking another read, accept reading.

FW.10
Status = **Completed**
Take photo

FW.05
Status = **Locate Required**

SYSTEM.1
Python schedule email notification for Locate Required (weekly)

Locator (L)

L.01
Open & review locate request In High Accuracy Data Collection (Locator) App

START per locate

L.02
Asset located?

Yes

L.03
Asset Uncovered?

Yes

L.04
Edit Asset Point

L.05
Is HRMS under or over 0.5m?

Under

L.06
Correct point in app

Over

L.07
Wait 2 minutes & try taking another read, accept reading.

L.08
Asset Located

L.09
Status = **Locate Completed**
& Take Photo

No

L16
Status = **Does Not Exist**

1

No

L.10
Edit Asset Point

L.11
Is HRMS under or over 0.5m?

Under

L.12
Correct point in app

Over

L.13
Wait 2 minutes & try taking another read, accept reading.

L14
Asset Located

L15
Status = **Locate Covered** & Take Photo

Operation Supervisor (OPS)

1

OPS.01
Open & review the High Accuracy Data Collection (Operation) App

START per defect

OPS.02
Does Asset Exist?

Yes

OPS.04
Uncover Asset?

Yes

OPS.06
Follow existing work planning processes Locates, etc.
[LINK TO PROCESSES HERE?]

OPS.07
Asset Uncovered

No

OPS.03
Email GIS of decision

No

OPS.05
No Action Taken

OPS.08
Set Status = **Uncovered**
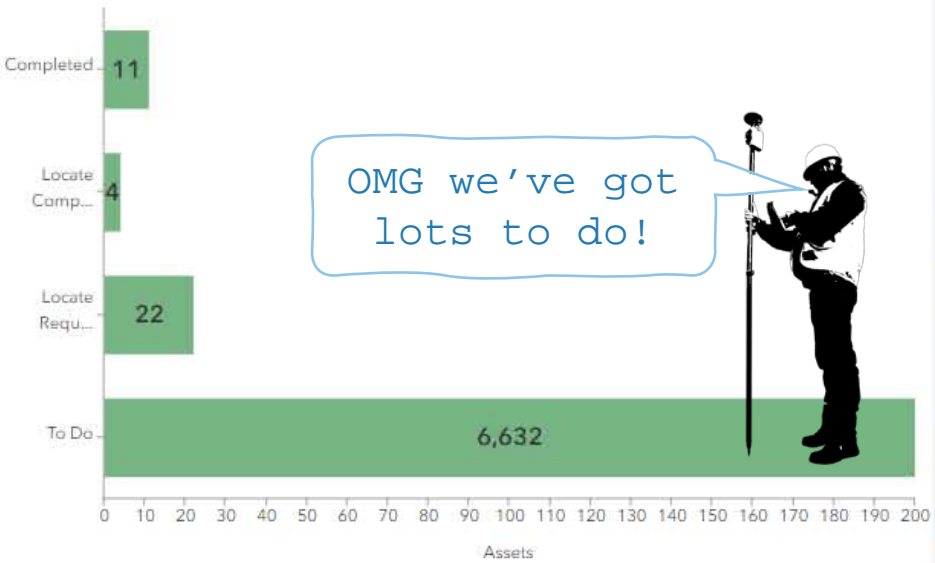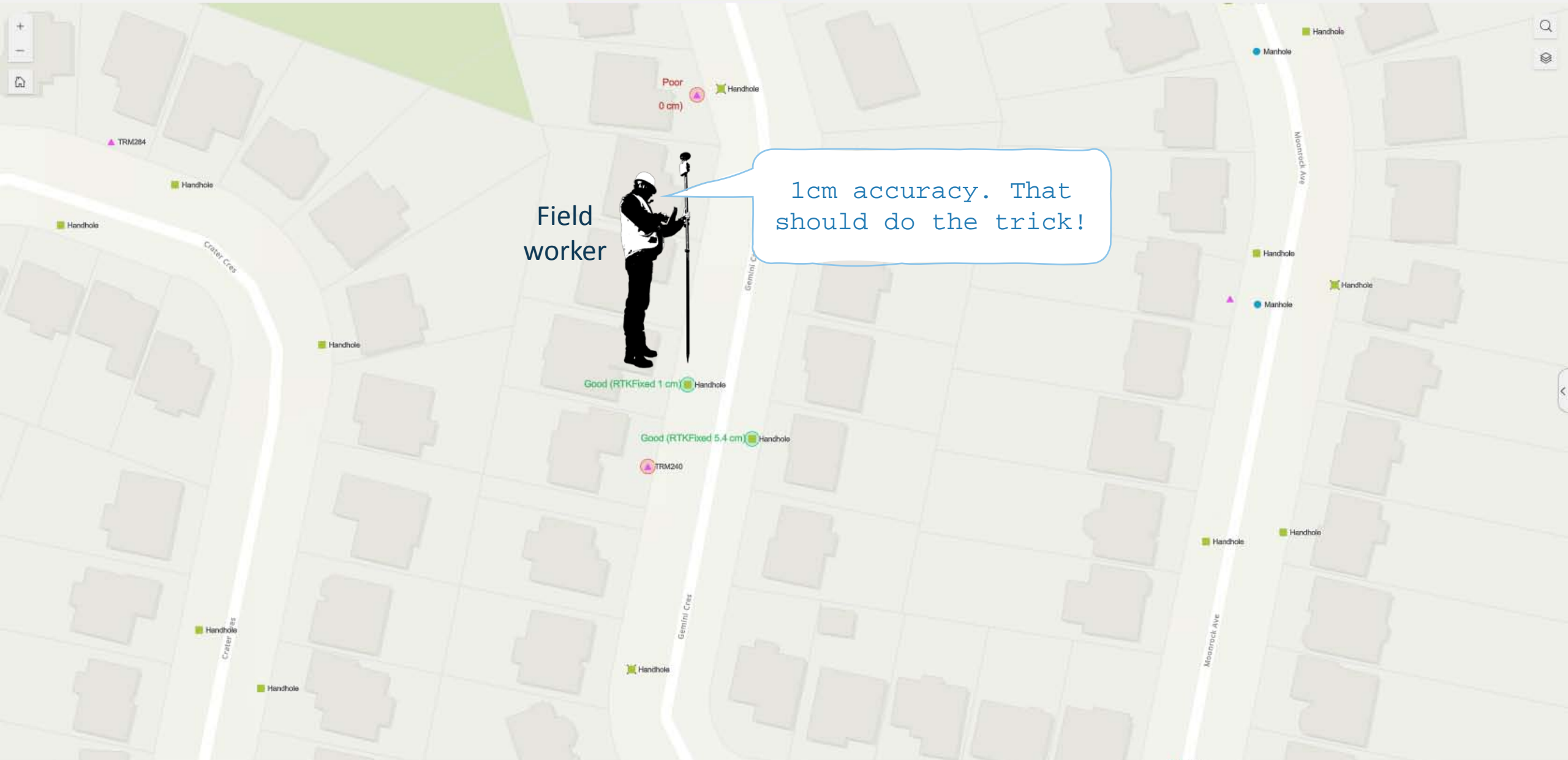
INSPECTIONS

Annual Inspections

AGO as our system of record

All plant + infrared inspections

BUSINESS NEED

No CMMS or Enterprise Asset Management System. Paper process.

Article: old but good

We're CMMS/EAM-less so we had to build our own inspection solution.
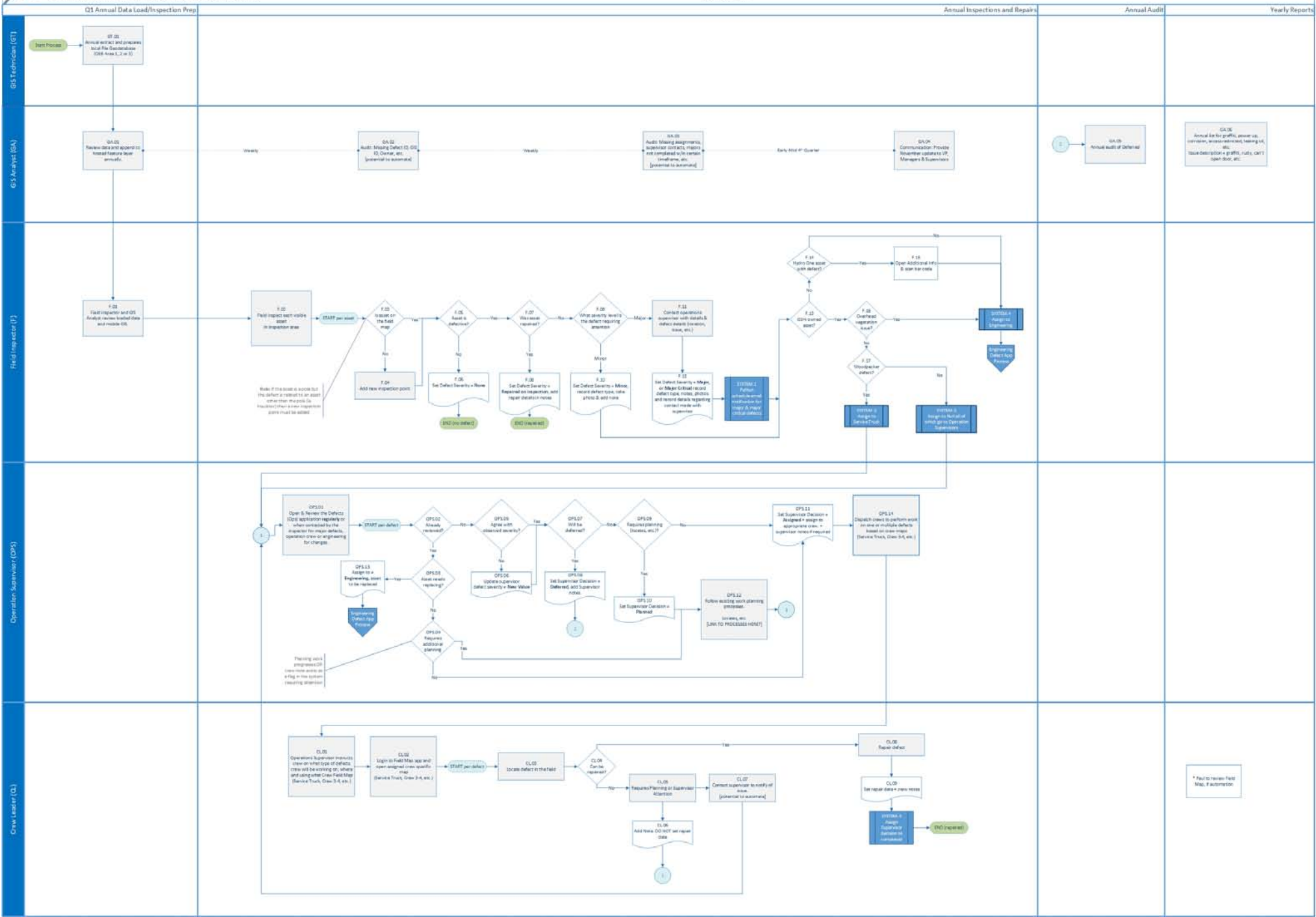
STEP 1: PROCESS

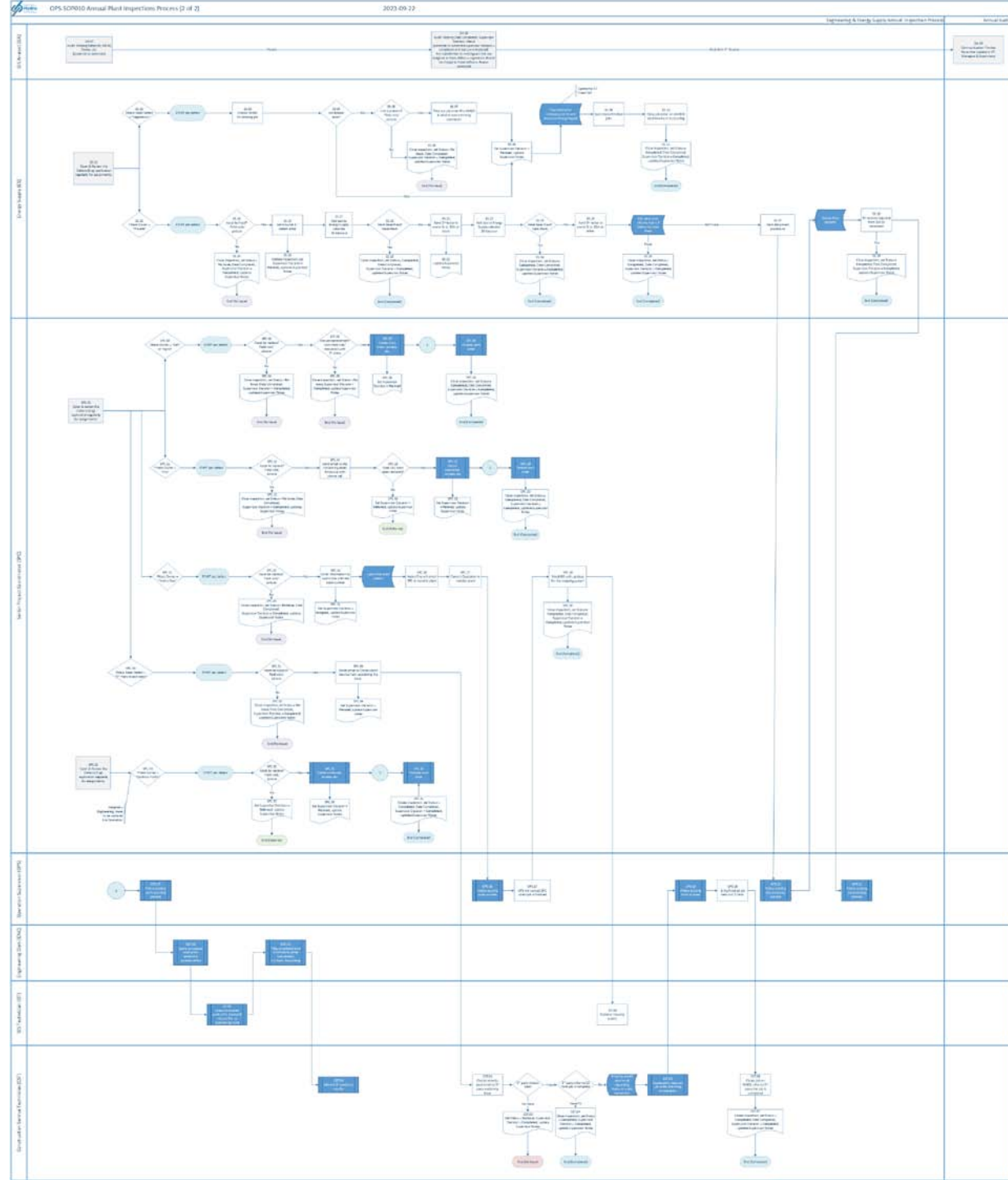With all projects, we've started with a process map.

Overview: 3 year

Version 1 solution was built without a process map.
Fail + Chaos

Hydro

Column headers: Q1 Annual Data Load/Inspection Prep | Annual Inspections and Repairs | Annual Audit | Yearly Reports

Swimlanes (rows): GIS Technician (GT) | GIS Analyst (GA) | Field Inspector (F) | Operation Supervisor (OPS) | Crew Leader (CL)

GIS Technician (GT)

- Start Process
- GT.01 Annual extract and prepares local file Geodatabase (GDB-Area 1, 2 or 3)

GIS Analyst (GA)

- GA.01 Review data and append to Hosted Feature layer annually.
- Weekly
- GA.02 Audit: Missing Defect ID, OIS ID, Owner, etc. [potential to automate]
- Weekly
- GA.03 Audit: Missing assignments, supervisor contacts, majors not completed w/in certain timeframe, etc. [potential to automate]
- Early-Mid 4th Quarter
- GA.04 Communication: Provide November updates to VP, Managers & Supervisors
- GA.05 Annual audit of Deferred
- GA.06 Annual list for graffiti, power up, corrosion, access restricted, leaking oil, etc. Issue description + graffiti, rusty, can't open door, etc.

Field Inspector (F)

- F.01 Field Inspector and GIS Analyst review loaded data and mobile GIS
- F.02 Field Inspect each visible asset in inspection area
- START per asset
- F.03 Is asset on the field map?
  - No → F.04 Add new inspection point
  - Yes → F.05 Asset is defective?
    - No → F.06 Set Defect Severity = None → END (no defect)
    - Yes → F.07 Was asset repaired?
      - Yes → F.08 Set Defect Severity = Repaired on Inspection, add repair details in notes → END (repaired)
      - No → F.09 What severity level is the defect requiring attention
        - Minor → F.10 Set Defect Severity = Minor, record defect type, take photo & add note
        - Major → F.11 Contact operations supervisor with details & defect details (location, issue, etc.)
- Note: If the asset is a pole but the defect is related to an asset other than the pole (ie insulator) then a new inspection point must be added
- F.12 Set Defect Severity = Major, or Major Critical record defect type, notes, photos and record details regarding contact media with supervisor
- SYSTEM.1 Python schedule email notification for major & major critical defects
- F.13 (OPS owned asset?)
  - Yes → F.16 Hydro One asset (joint defect)?
    - No → (loop)
    - Yes → F.19 Open additional info & scan bar code
  - F.18 Overhead vegetation issue?
    - Yes → SYSTEM.4 Assign to Engineering → Engineering Defect App Process
    - No → F.17 Woodpecker defect?
      - Yes → SYSTEM.2 Assign to Service Truck
      - No → SYSTEM.3 Assign to Null all of which go to Operation Supervisors

Operation Supervisor (OPS)

- OPS.01 Open & Review the Defects (Ops) application regularly or when contacted by the inspector for major defects, operation crew or engineering for changes.
- START per defect
- OPS.02 Already reviewed?
  - Yes → OPS.03 Asset needs replacing?
    - Yes → OPS.13 Assign to a Engineering, asset to be replaced → Engineering Defect App Process
    - No → OPS.04 Requires additional planning
      - Yes → (loop back)
      - No → (continue)
  - No → OPS.05 Agree with observed severity?
    - No → OPS.06 Update supervisor defect severity = New Value
    - Yes → OPS.07 Will be deferred?
      - Yes → OPS.08 Set Supervisor Decision = Deferred, add Supervisor notes
      - No → OPS.09 Requires planning (locates, etc.)?
        - Yes → OPS.10 Set Supervisor Decision = Planned → OPS.12 Follow existing work planning processes (Locates, etc) [LINK TO PROCESSES HERE?]
        - No → OPS.11 Set Supervisor Decision = Assigned + assign to appropriate crew, supervisor notes if required → OPS.14 Dispatch crews to perform work on one or multiple defects based on crew maps (Service Truck, Crew 3-4, etc.)
- Planning work progresses OR crew note exists as a flag in the system requiring attention

Crew Leader (CL)

- CL.01 Operations Supervisor instructs crew on what type of defects crew will be working on, where and using what Crew Field Map (Service Truck, Crew 3-4, etc.)
- CL.02 Login to Field Map app and open assigned crew specific map (Service Truck, Crew 3-4, etc.)
- START per defect
- CL.03 Locate defect in the field
- CL.04 Can be repaired?
  - Yes → CL.08 Repair defect → CL.09 Set repair date + new notes → SYSTEM.6 Assign Supervisor Decision to completed → END (repaired)
  - No → CL.05 Requires Planning or Supervisor Attention
    - CL.07 Contact supervisor to notify of issue [potential to automate]
    - CL.06 Add Note. DO NOT set repair date
- * Paul to review Field Map, if automation

OPS-S0P010 Annual Plant Inspections Process

Operation & Engineering Procedures

Supervisor contacted ⌃

Person contacted

[   ]

Contact method

[⌄]

Date supervisor contacted

[📅 YYYY-MM-DD   ⌄]

[🕐   ⌄]

F.12 Set Defect Severity to Major or Major Critical.

Set Defect Severity = **Major** or **Major Critical**, record defect type, add notes, photos and record details regarding contact made with supervisor. SYSTEM.1 is implemented.

F.13 Is Defect a GSHi owned Asset?

Is defect a GSHi owned asset? Answer: Yes → go to F.16, if no → go to F.14.

F.14 Is Defect a Hydro One Asset?

Is defect a Hydro One asset? Answer: Yes → go to F.15, if no → it will automatically be assigned to Engineering. SYSTEM.4 is implemented.

F.15 Open Additional Info & Scan Hydro One Bar Code.

Open additional info & scan Hydro One bar code.

F.16 Is it an Overhead Vegetation Issue?

Is it an overhead vegetation issue? Answer: No → go to F.17, if yes → SYSTEM.4 will be implemented, and the defect will be assigned to Engineering.

F.17 Is it a Woodpecker hole?

Is it a woodpecker hole? Answer: No → SYSTEM.3 will be implemented, and defect will go to Operation Supervisor, if yes → SYSTEM.2 will be implemented, and defect will be assigned to Service Truck.

Supervisors (OPS)

OPS.01 Opens & Reviews Defect (Ops) Application.

Open & review the Defects (Ops) application regularly or when contacted by the inspector for major defects, receives automated or manually sent major or major critical emails, operation crew or engineering notification regarding changes.

OPS.02 Already Reviewed?

Already reviewed? Answer: Yes → go to OPS.03, if no → go to OPS.05.

OPS.03 Asset Needs Replacing?

Does asset require replacing? Answer: No → go to OPS.04, if yes → go to OPS.13. Once the task is assigned to Engineering, the defect will be removed from the Operation Defect App.

OPS.04 Job Requires Additional Planning?

Does the job require additional planning? Answer: No → go to OPS.11, if yes → go to OPS.12

Note: Planning work progresses OR crew note exists as a flag in the system requiring attention.

OPS.05 Agree with Observed Severity?

Does the Operation Supervisor agree with observed severity by the Field Inspector? Answer: No → go to OPS.06, if yes → go to OPS.07.

OPS.06 Update Supervisor Defect Severity to New Value.

Operation Supervisor will update supervisor defect severity = **New Value** if they don't agree with Field Inspector's opinion.

OPS.07 Will Defect be Deferred?

Will defect be deferred? Answer: No → go to OPS.09, if yes → go to OPS.08.

OPS.08 Set Supervisor Decision to Deferred.

If Supervisor decides to wait and fix defect later, they will Set Supervisor Decision = **Deferred**, add Supervisor notes. The GIS Analyst will generate a list of deferred assignments for the Supervisor annually GA.05.

OPS.09 Requires Planning (locates, etc.)?

Requires planning (locates, etc.)? Answer: No → go to OPS.11, if yes → go to OPS.10.

Featured Content

GSU featured apps, maps, stories and analytics.
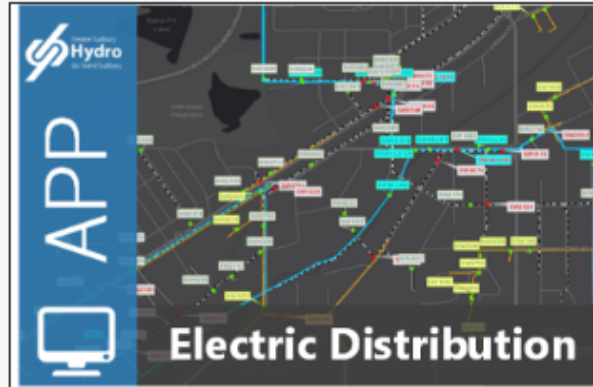
GSU General Electric Viewer (...

Control Room Electric Viewer (...

Greater Sudbury Hydro Field Vi...
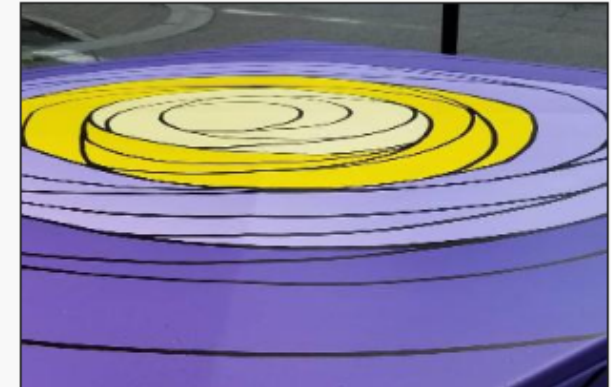
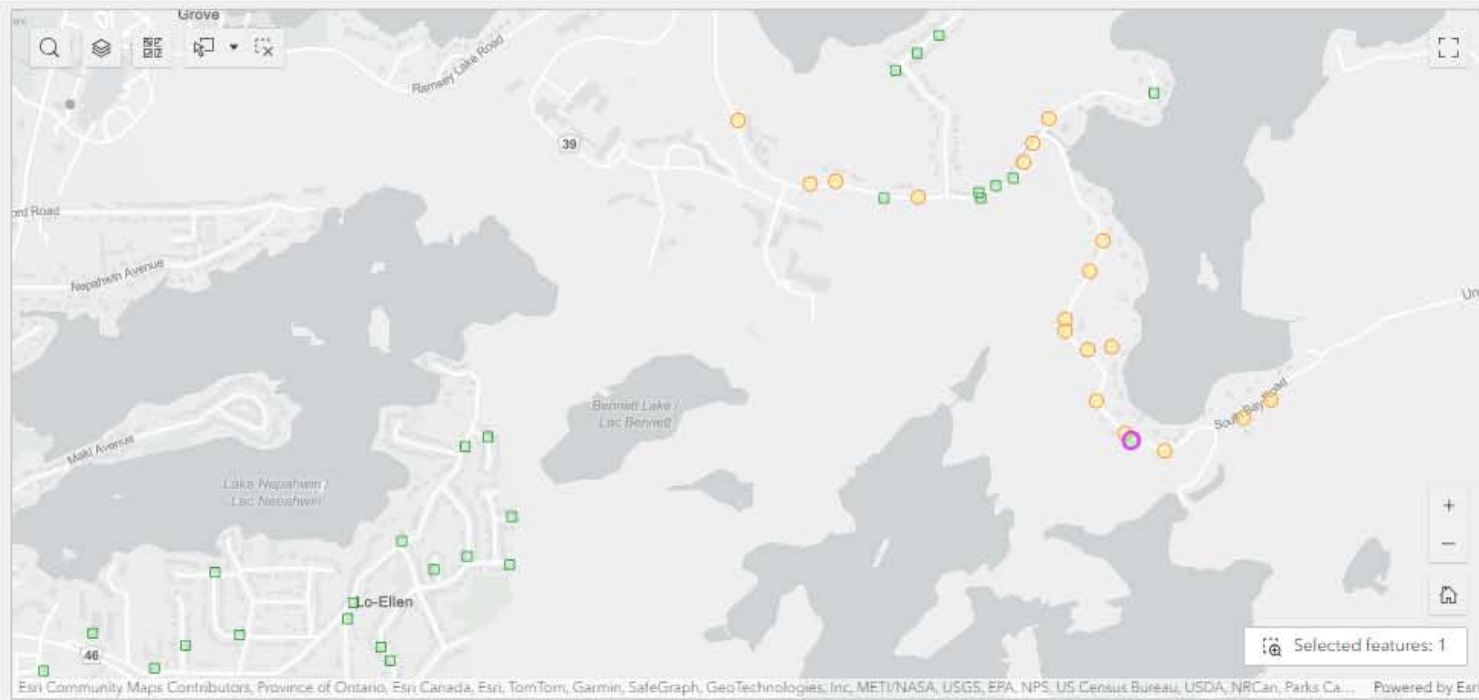Power Up Greater Sudbury

Streetlight Billing Report (ODB)

Supervisor Inspections Viewer ...

Switch Maintenance Review (O...

Engineering Inspections Viewe...

< undefined

1 Woodpecker

Defect Details

Defect ID

4525

Inspection severity

Minor

Operations severity

Minor

Asset defect

Woodpecker

Inspection Details

Inspection date

📅 2/26/2024

🕐 02:17:48 PM

Issue description

One pecker hole 4' below secondary

About the asset

GSU GIS ID

33657

Asset type

Pole

Location notes

2182 SOUTH BAY rd

Owner

[Update] [Delete]

Defects

Search

er	Location notes	Defect ID	Operations seve...	Inspection severity	Repair date
ry Hydro	1832 ARMSTRONG st	4160	Major	Major	8/10/2022, 10:39 AM
ry Hydro	33 FERGUSON ave	4334	Major	Major	4/27/2023, 11:29 AM
ry Hydro	31 FERGUSON ave	4333	Major	Major	4/27/2023, 11:29 AM
ry Hydro	2081 SUNNYSIDE rd	4200	Major	Major	8/8/2022, 9:41 AM
ry Hydro	0 CLEARWATER LAKE rd	4152	Major	Major	6/7/2022, 9:14 AM
ry Hydro	6017 CLEARWATER LAKE rd	4153	Major	Major	6/7/2022, 2:24 PM
ry Hydro	4977 CROATIA rd	4159	Minor	Minor	7/5/2022, 1:22 PM
ry Hydro	4977 CROATIA rd	4167	Minor	Minor	7/5/2022, 1:23 PM
ry Hydro	1485 HANNAH LAKE rd	4209	Minor	Minor	8/30/2022, 11:23 AM
ry Hydro	1947 LATIMER cres	4244	Major	Major	8/4/2022, 10:36 AM

Last update: a few seconds ago

Crew Alert! Needs attention

Operations severity is

- All -

Asset defect is

- All -

Decision (Supervisor) is

- All -

Assign to is

- All -

Not assigned

Not completed

< 276 of 301 >

Selected features: 1

Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Ca... Powered by Esri

All Inspections & Defects (2022 / 2023 / 2024)

≡

Inspection cycle (year)
2024 (OEB 3)

Inspection date
All

Defect severity ∧
All

Assigned to ∧
No category selected

Decision status ∧
All

Asset type ∧
All

Last modified (edited)
All

⊘ **Not repaired! See crew note** ∨
No crew alert

• No crew alert

Alert: Pole 18246 Woodpecker
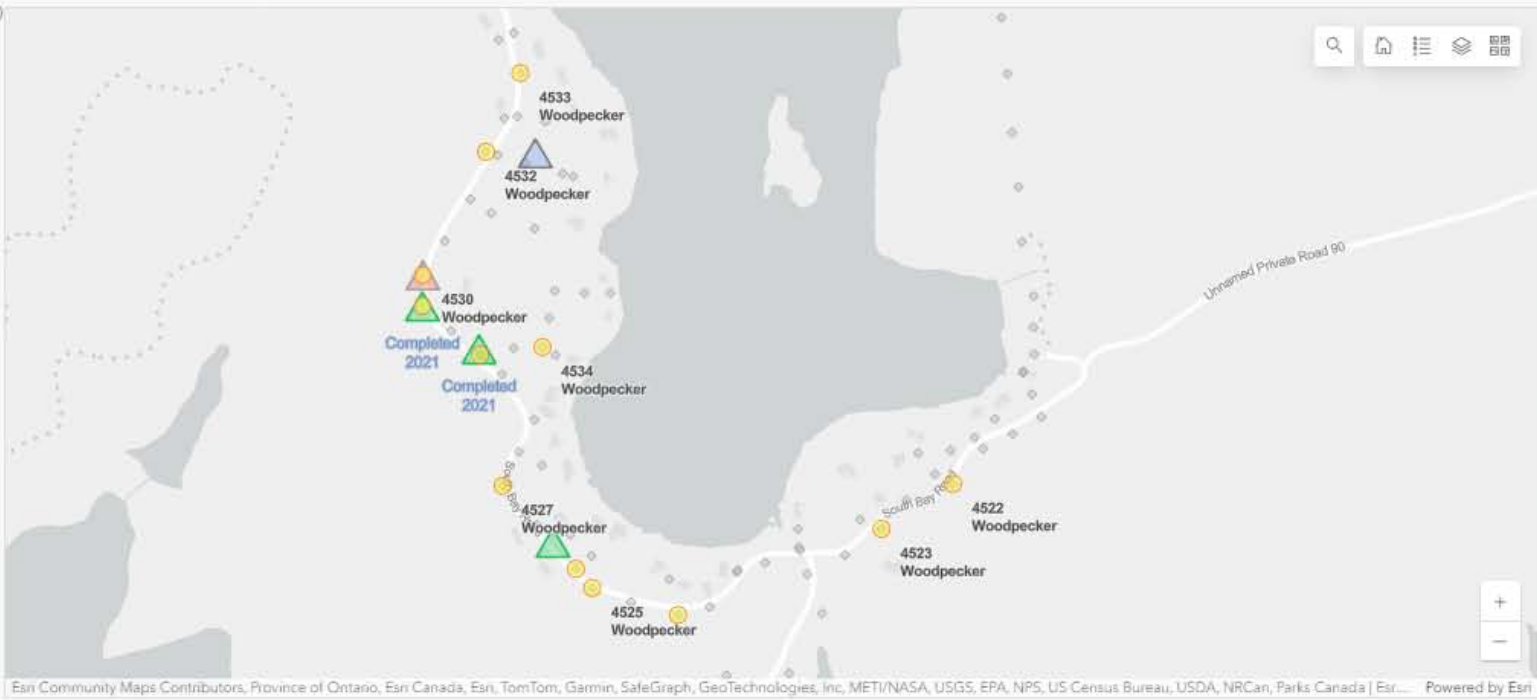
Alert: Pole 04504 Woodpecker

Reset

10,160
Inspections

43
Defects

14
Unassigned

2
Crew alerts

🔍 🏠 ☰ ⬡ ▦

Wahnapitae
Marten River
Capreol
Val Therese
Levack
144
Chelmsford
Azilda
Garson
River Valley
144
Coniston
Field
Sudbury
Markstay
Lively
Warren
Naughton
537
Verner
Whitefish
St. Charles
Lavigne
289m
88
urgeon Falls
Lake Nipissing
Lac Nipissing
88
Noëlville
Dokis
88
Alban

Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, NRCan, Parks Canada | Esri Canada
Powered by Esri

○ Pole 31443 (Woodpecker)
Inspection date: 3/22/2024, 1:53 PM
Assigned to **Engineering** & completed on:
Crew notes:

○ Pole 07310 (Deteriorated)
Inspection date: 3/22/2024, 1:42 PM
Assigned to **Engineering** & completed on:
Crew notes:

○ Pole 06895 (Woodpecker)
Inspection date: 3/22/2024, 1:38 PM
Assigned to **Engineering** & completed on:
Crew notes:

○ Pole 06507 (Woodpecker)
Inspection date: 3/12/2024, 1:23 PM
Assigned to **Engineering** & completed on:
Crew notes:

○ Pole 07127 (Woodpecker)
Inspection date: 3/2/2024, 2:30 PM
Assigned to **Engineering** & completed on:
Crew notes:

○ Pole 07027 (Deteriorated)
Inspection date: 3/2/2024, 1:47 PM
Assigned to & completed on:
Crew notes:

○ Pole 35349 (Woodpecker)
Inspection date: 3/2/2024, 1:27 PM
Assigned to **Service truck 79** & completed on:
Crew notes:

○ Pole 07038 (Woodpecker)
Inspection date: 3/2/2024, 1:21 PM
Assigned to **Service truck 79** & completed on:
Crew notes:

□ Pole 07042 (Woodpecker)
Inspection date: 3/2/2024, 1:14 PM
Assigned to **Service truck 79** & completed on: 3/19/2024, 1:12 PM
Crew notes: Complete

○ Pole 33282 (Woodpecker)
Inspection date: 3/2/2024, 1:06 PM
Assigned to **Service truck 79** & completed on:
Crew notes:

□ Pole 07307 (Deteriorated)
Inspection date: 2/29/2024, 3:26 PM
Assigned to & completed on: 3/19/2024, 8:58 AM

+
−

All Inspections & Defects (2022 / 2023 / 2024)

Inspection cycle (year)
2024 (OEB 3)

Inspection date
All

Defect severity
All

Assigned to
No category selected

Decision status
All

Asset type
All

Last modified (edited)
All

Not repaired! See crew note
No crew alert

- No crew alert
- Alert: Pole 18246 Woodpecker
- Alert: Pole 04504 Woodpecker

Reset

10,160 Inspections

28 Defects

0 Unassigned

2 Crew alerts

4533 Woodpecker
4532 Woodpecker
4530 Woodpecker
Completed 2021
Completed 2021
4534 Woodpecker
4527 Woodpecker
4522 Woodpecker
4523 Woodpecker
4525 Woodpecker

Unnamed Private Road 90
South Bay

Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada | Esr.... Powered by Esri

Assigned to **Engineering** & completed on:
Crew notes:

Pole 06507 (Woodpecker)
Inspection date: 3/12/2024, 1:23 PM
Assigned to **Engineering** & completed on:
Crew notes:

Pole 07127 (Woodpecker)
Inspection date: 3/2/2024, 2:30 PM
Assigned to **Engineering** & completed on:
Crew notes:

Pole 35349 (Woodpecker)
Inspection date: 3/2/2024, 1:27 PM
Assigned to **Service truck 79** & completed on:
Crew notes:

Pole 07038 (Woodpecker)
Inspection date: 3/2/2024, 1:21 PM
Assigned to **Service truck 79** & completed on:
Crew notes:

Pole 07042 (Woodpecker)
Inspection date: 3/2/2024, 1:14 PM
Assigned to **Service truck 79** & completed on: 3/19/2024, 1:12 PM
Crew notes: Complete

Pole 33282 (Woodpecker)
Inspection date: 3/2/2024, 1:06 PM
Assigned to **Service truck 79** & completed on:
Crew notes:

Pole 07049 (Woodpecker)

Chart 1 (Defect severity):
Minor — 22 (null), 6 (Completed)
Legend: null, Completed

Chart 2 (Assigned to):
Engineering — 4 (null)
Service truck 79 — 18 (null), 6 (Completed)
Legend: null, Completed

Chart 3 (Asset / defect type):
Deteriorated — 5
Other (see notes) — 2, 8
Woodpecker — 28
Legend: Pole, Switch
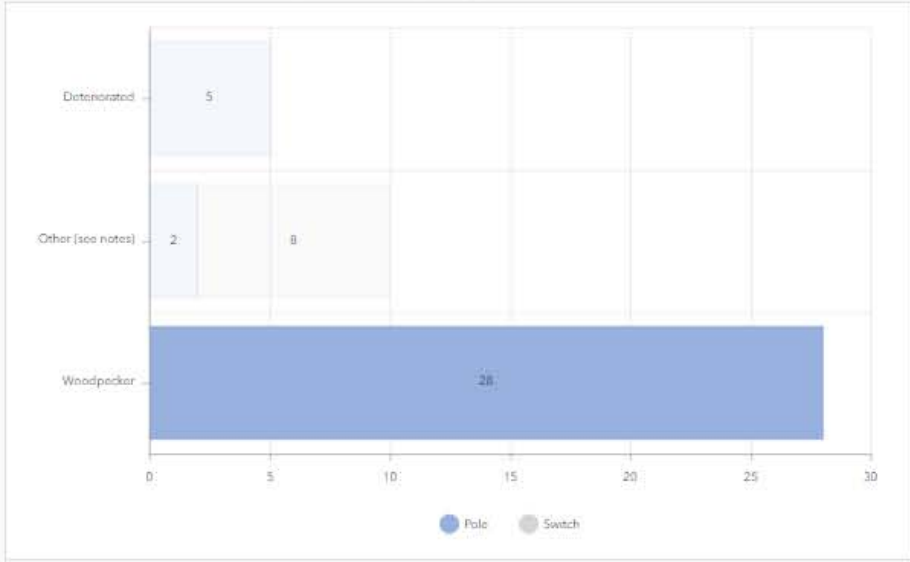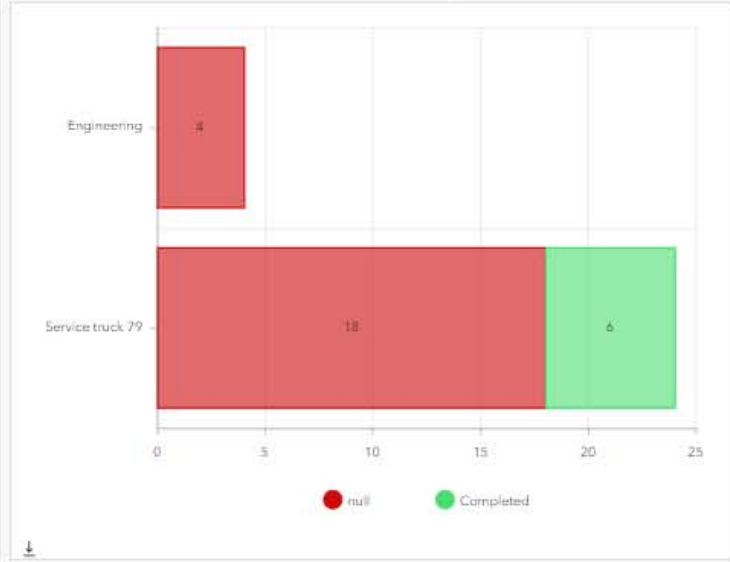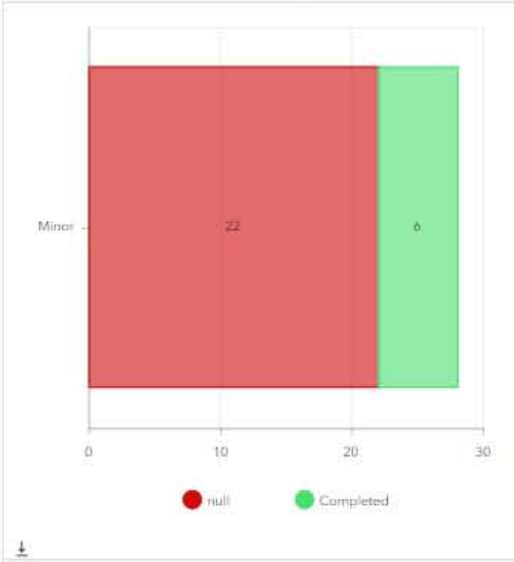
STREETLIGHTS

The No Code Anti-Pattern

A Practical Approach for GSHi
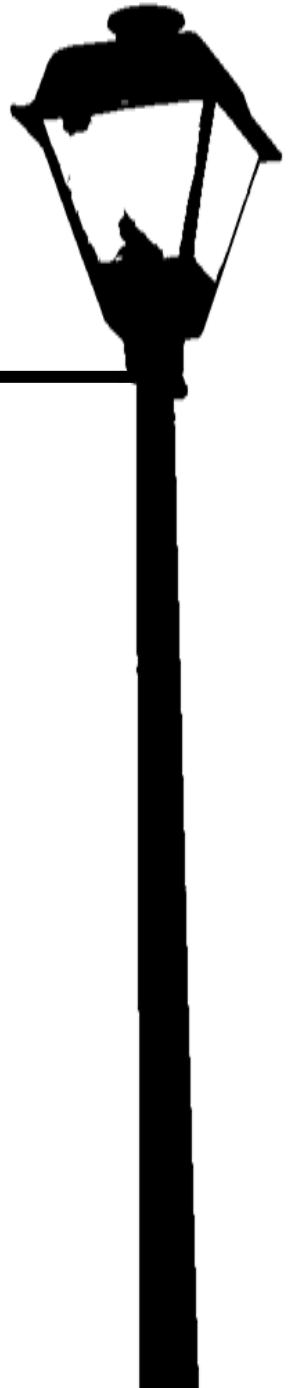
STEP 1: PROCESS

With all projects, we're mapping the process and documenting it in SOP/IMS

Hi: I'm a streetlight & I belong to "The City".

Care for me please and keep my owner's up to date.

THE PLATFORM PROMISE

"ArcGIS suite of field apps transforms disparate field activities and processes into a **unified workflow.**"

Unified… um, for who?

Public Report

Public
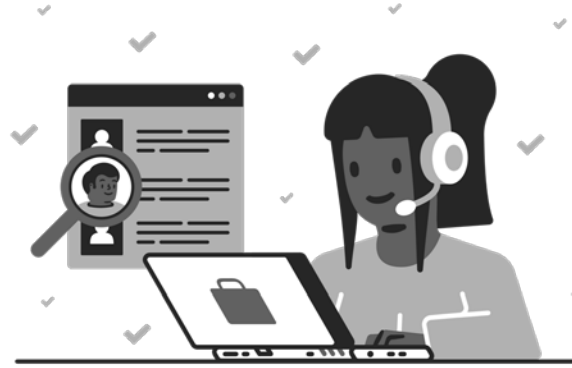
Review & Assign

Office

Field Work

Field
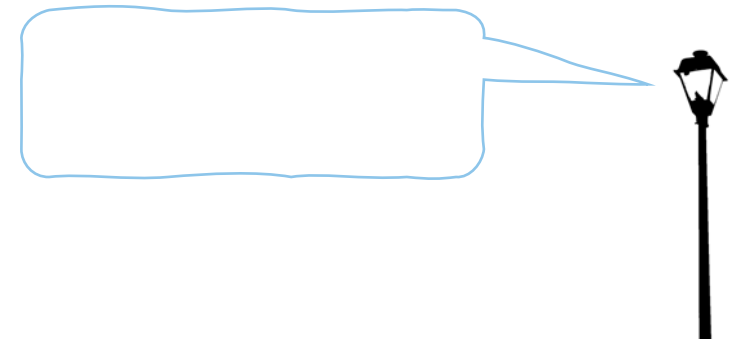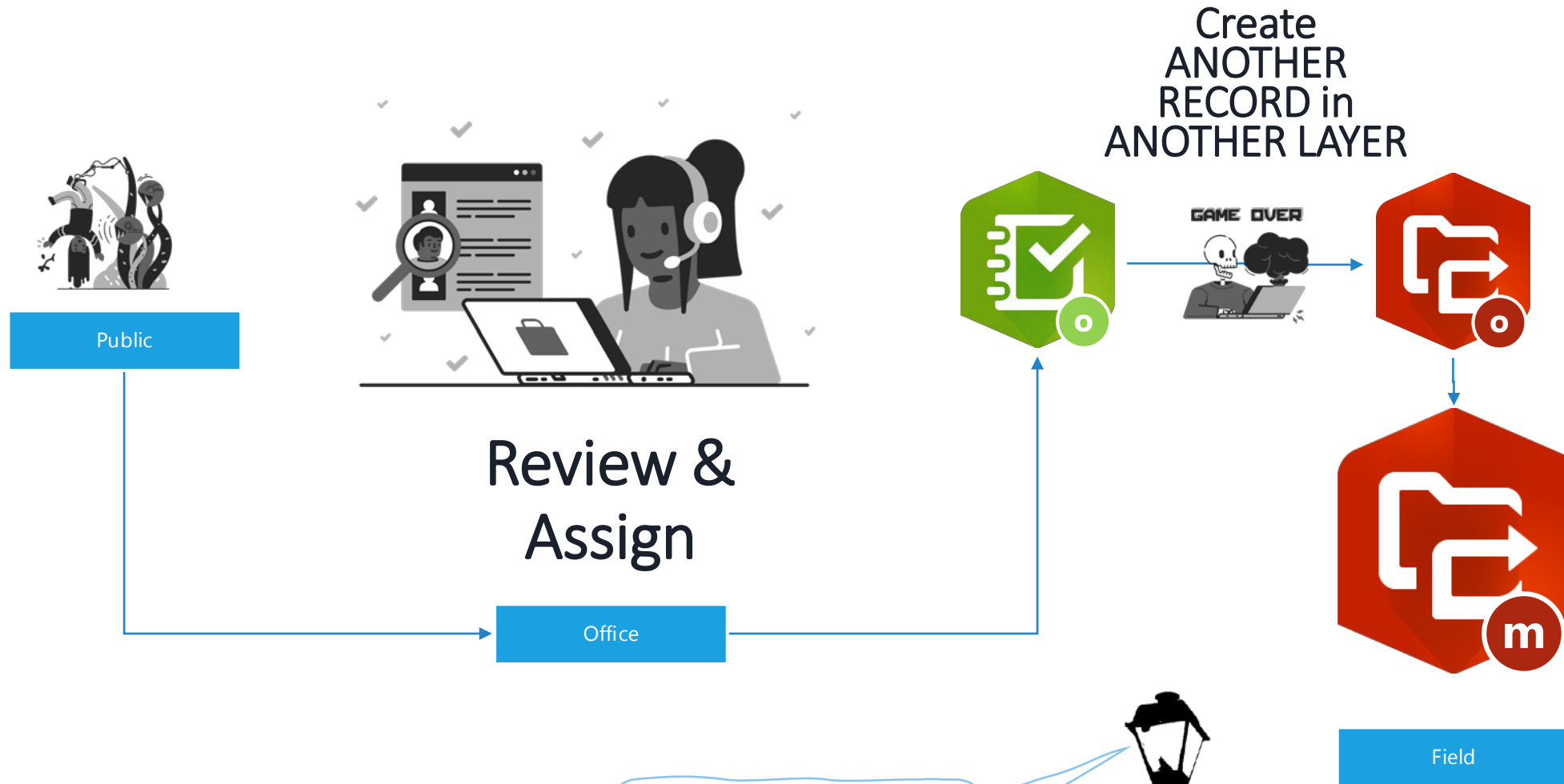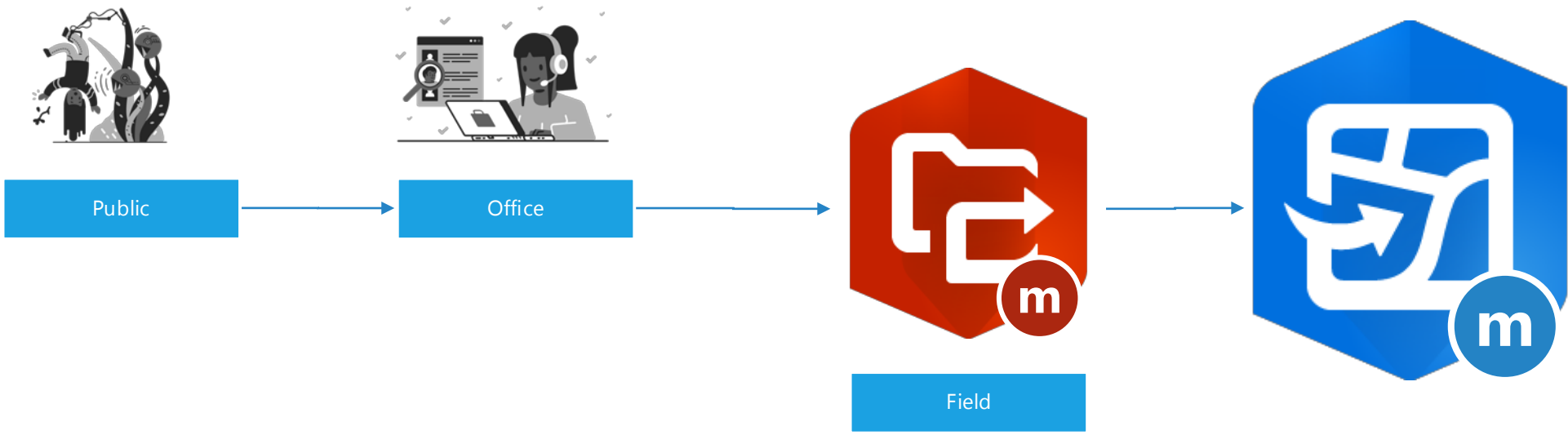
Office

New Project

Step 1.
New **Workforce**
Project

Public
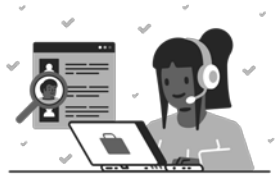
Connect   Online

Step 2.
Public Form in **Connect**
then publish web

Field

Assignment   Maintain

Step 3.
Build **Field Map** from
Assignments (view)
then app link

This slide is
busy. Shrug.

< Assignments   Details

Streetlight on 24 hours

Edit   ...

2126 Muriel Crescent

High Priority
Due: November 20, 2023, 2:36 PM

Unassigned   Assign ▾

Created: November 17, 2023, 2:37 PM by null
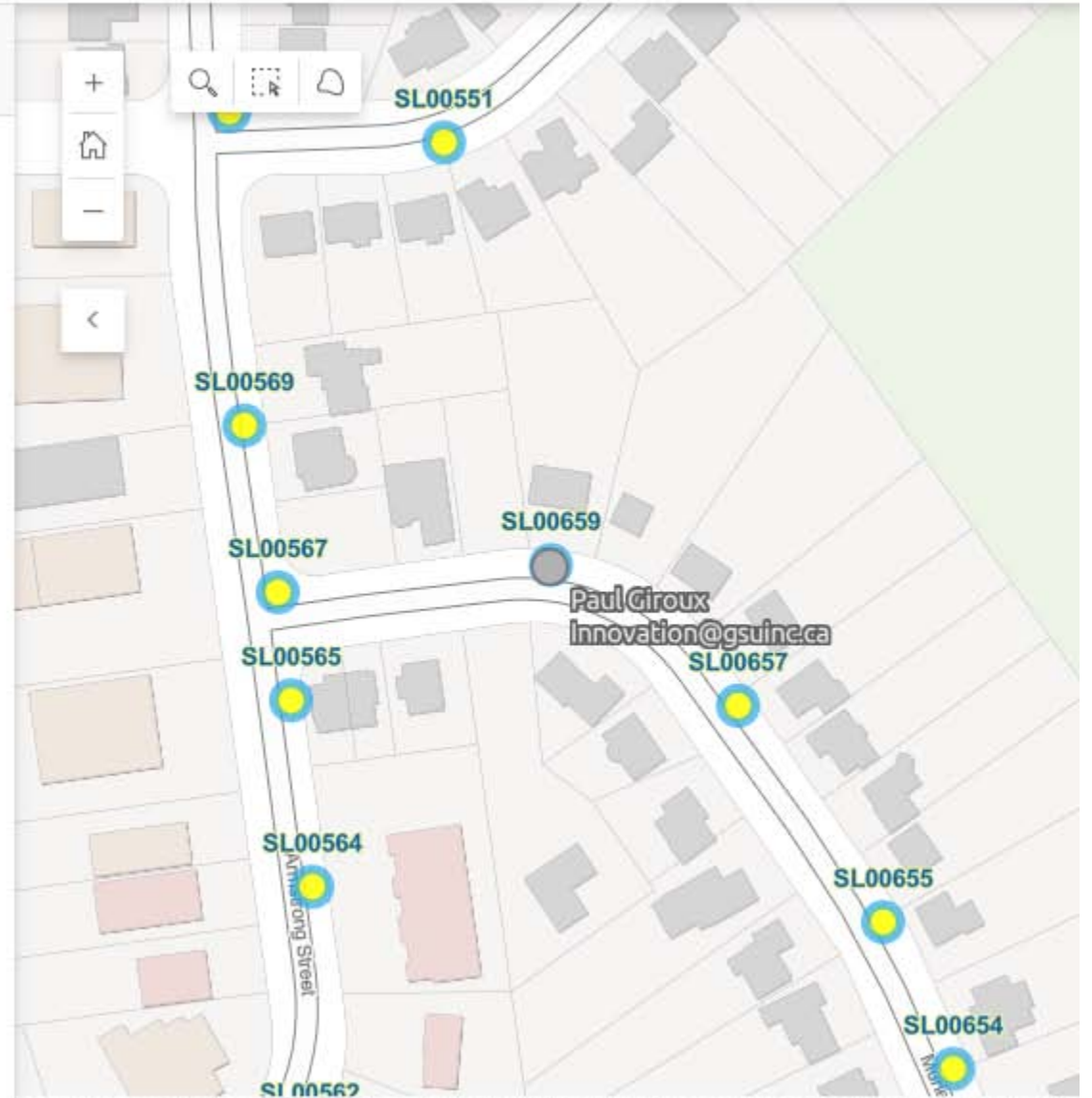Unassigned: November 24, 2023, 12:51 PM

ID: SL00659

Notes

Contact name: Paul Giroux | Email: Innovation@gsuinc.ca | Phone:

Attachments

Add an attachment using drag and drop or by selecting a file.

Happy dispatcher = happy life.

SL00551

SL00569

SL00659

SL00567

Paul Giroux
Innovation@gsuinc.ca

SL00565

SL00657

SL00564

SL00655

SL00562

SL00654

SA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada | Esri Canada Powered by Esri
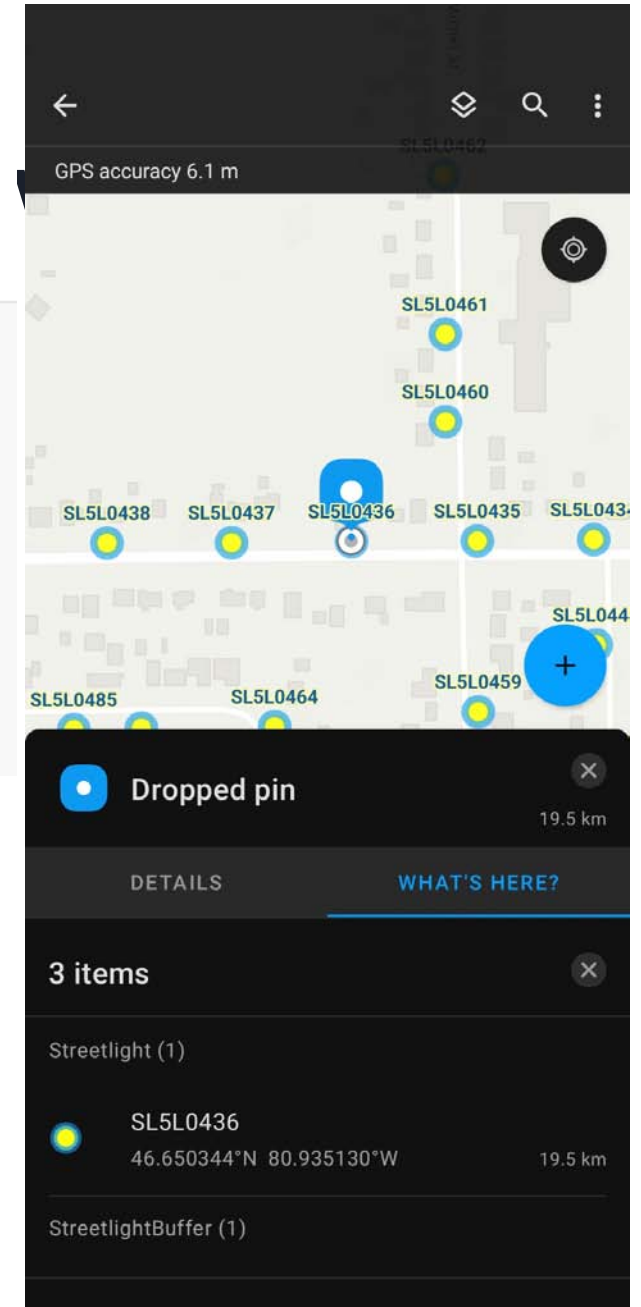
Streetlight Reporting & Maintenance

OVERVIEW   ASSIGNMENT TYPES   USERS   ADVANCED
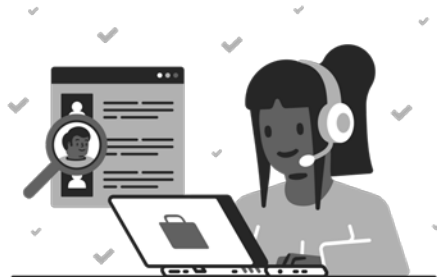
App Integration ✓

App integrations maximize the efficiency of your mobile workers by providing directions and the maps and forms needed to complete their work. **More info**

📋 ArcGIS Collector		Add
🟢 ArcGIS Explorer		Add
📱 ArcGIS Field Maps ✓		
All project assignment types are integrated to the **Streetlight Maintenance Field (Map)** map	Edit	Remove
🔶 ArcGIS Navigator ✓		Remove
☑️ ArcGIS Survey123		Add

Happy crew leader = happy life.

← GPS accuracy 6.1 m

SL5L0461
SL5L0460
SL5L0438 SL5L0437 SL5L0436 SL5L0435 SL5L043...
SL5L0485 SL5L0464 SL5L0459

Dropped pin   19.5 km

DETAILS   **WHAT'S HERE?**

3 items

Streetlight (1)

SL5L0436
46.650344°N 80.935130°W   19.5 km

StreetlightBuffer (1)

NO CODE + WORKFLOW

We can build a unified workflow
with the ArcGIS suite of apps that transforms activities and processes

Just a splash of sorcery was used in building this no code solution. Meet with me to learn more!

THANK YOU

1 Get to **know me**

2 **Geek out** with us

3 Email us: **gis@gsuinc.ca**