Traffic Count Group Data Collection

Collector User Group
February 21st, 2019

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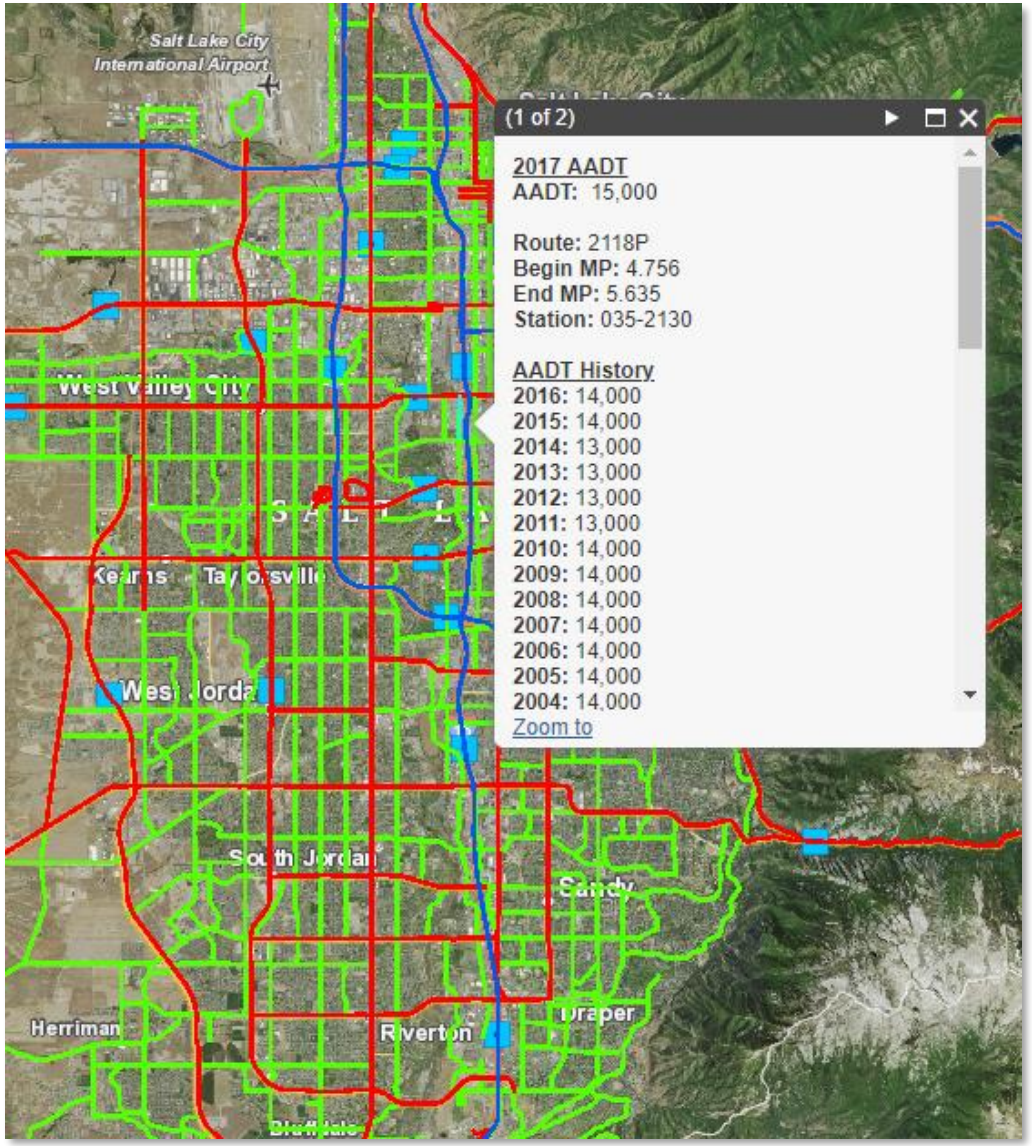
UDOT Keeping Utah Moving

GEOGRAPHIC INFORMATION SCIENCE

Background

- 144 Continuous Count Stations across the state (164 soon)
- Radar, Loops, WIM
- Collect traffic volume to aggregate Annual Average Daily Traffic (AADT)
- Widely distributed public GIS Product

The traffic count group is responsible for deploying the count stations, maintaining them, collecting the data, and creating the AADT.



Use Case

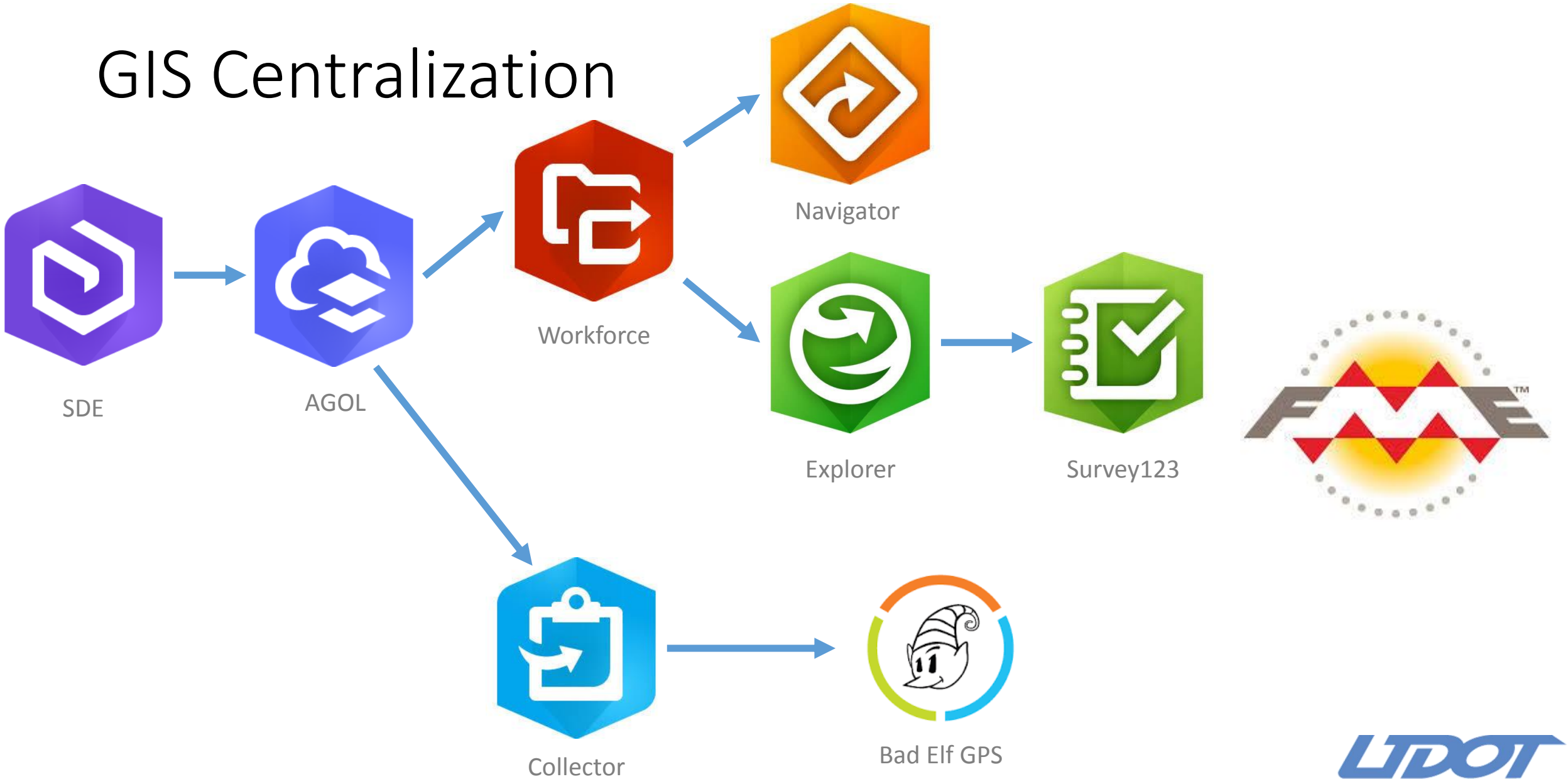
The previous process involved multiple data sources in different data types

- GIS Location Layer
- Machine Attribute Access database
- Paper Location Inspection and Trouble Ticket forms
- Paper forms transferred to google sheets

Other Concerns

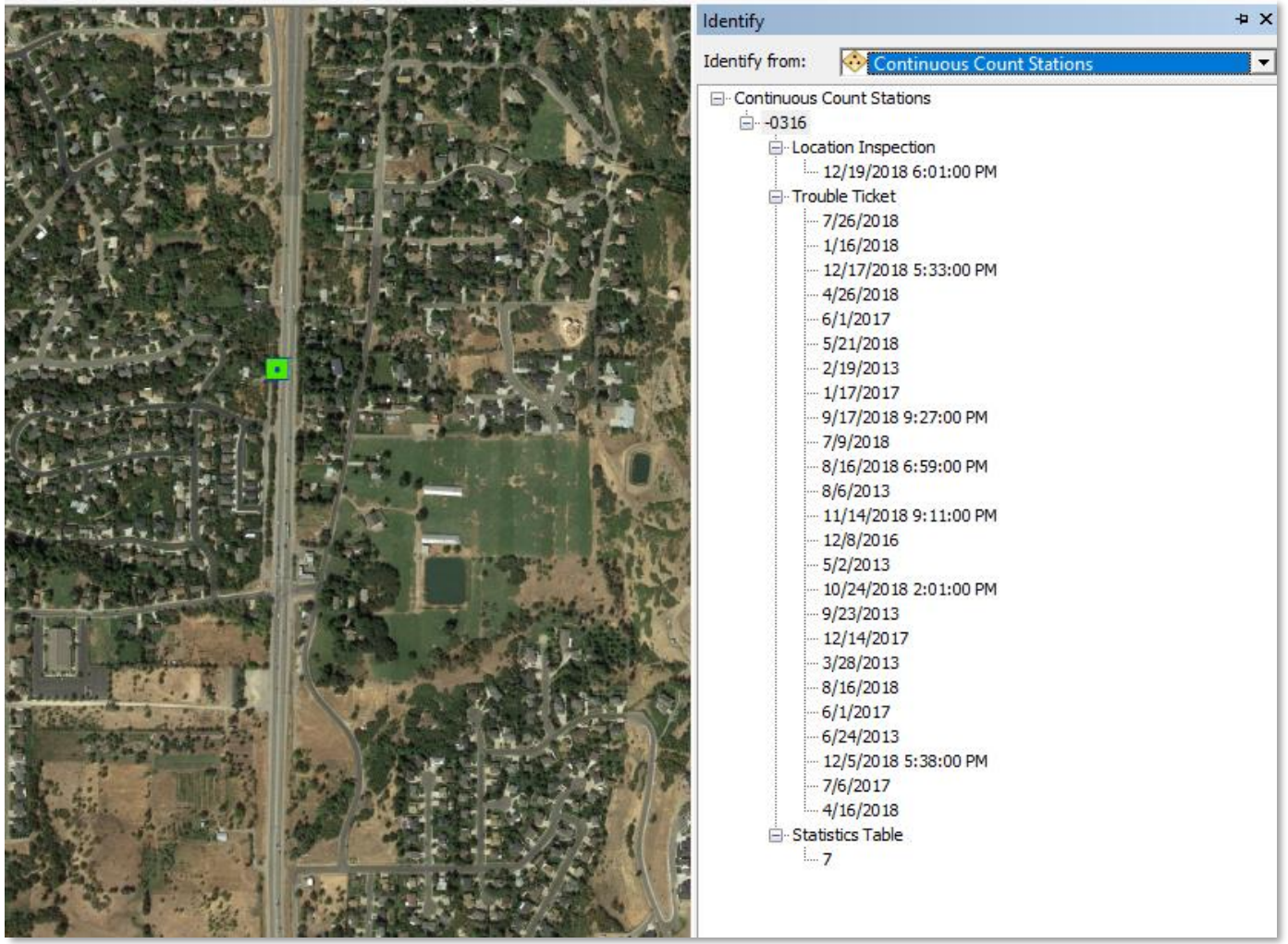
- Sites can be in remote locations of the state
  - New employees can have trouble locating the correct site
- Adding new sites/updating locations
  - This was done using a handheld GPS and recording the coordinates

GIS Centralization



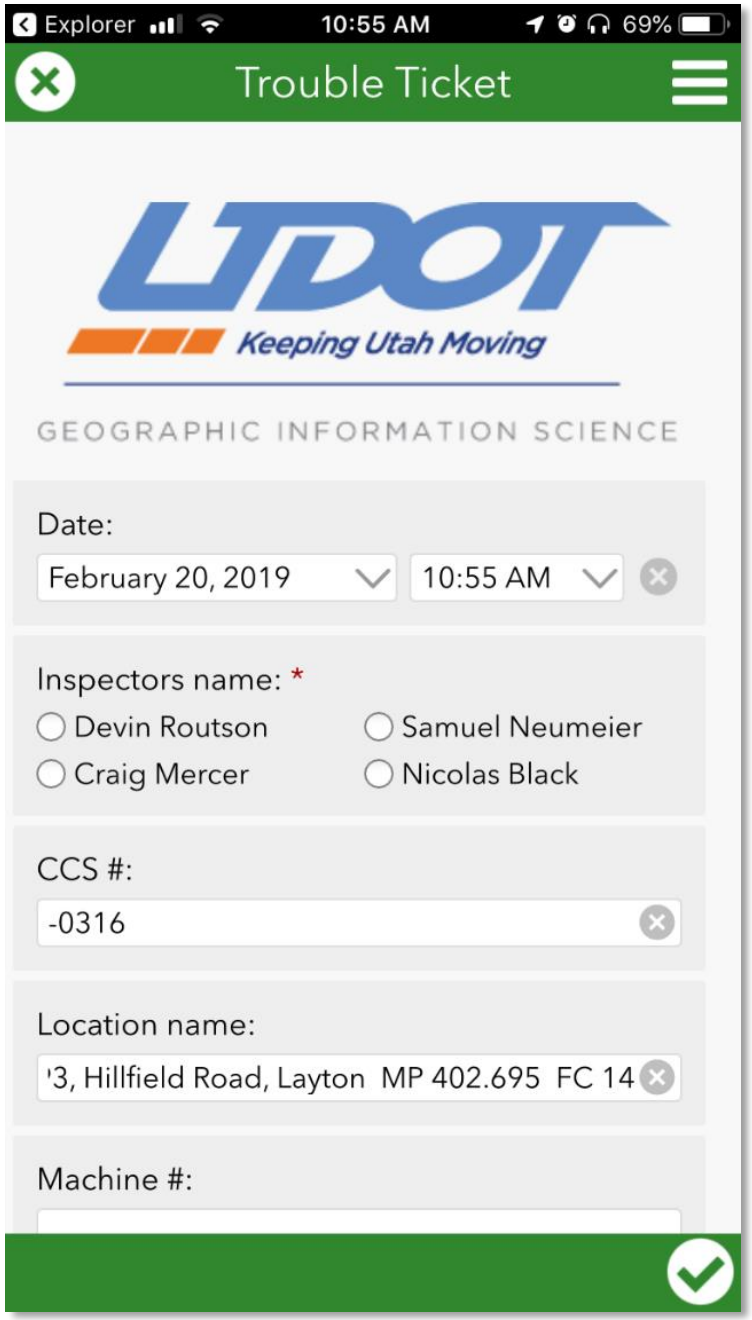
Data Processing

- Machine attributes added GIS Location Layer
- Related tables set up for Trouble Tickets and Location Inspections
- Historical entries added to related tables
- Published as an editable feature service from ArcGIS Enterprise



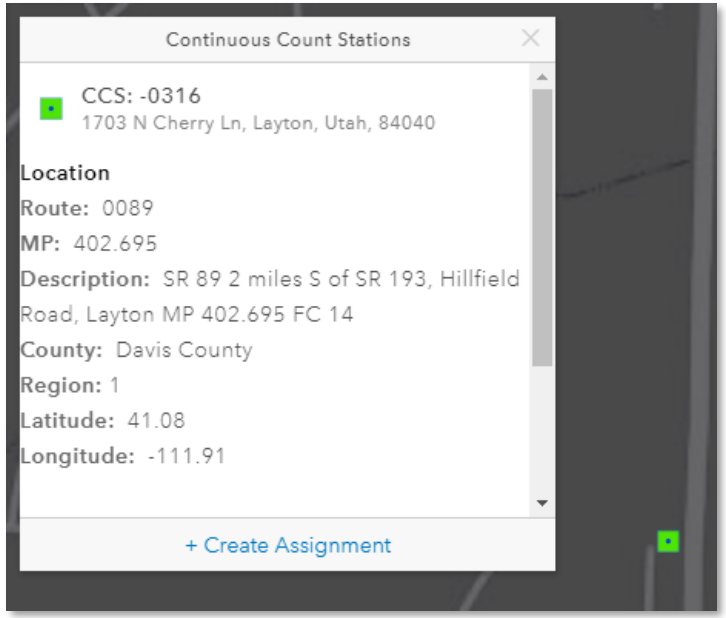
Survey123 (Replacing Paper Forms)

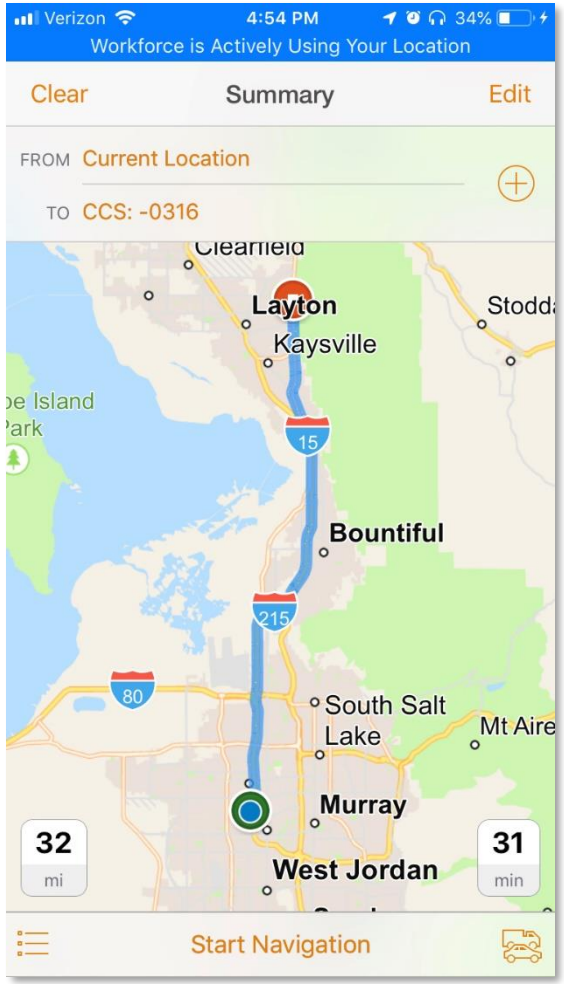
- Create two surveys
  - Location Inspection
  - Trouble Ticket
- No point location necessary
  - Related to the CCS Location by CCS Number (-0322)
- Create as many coded domains as possible to increase productivity in the field

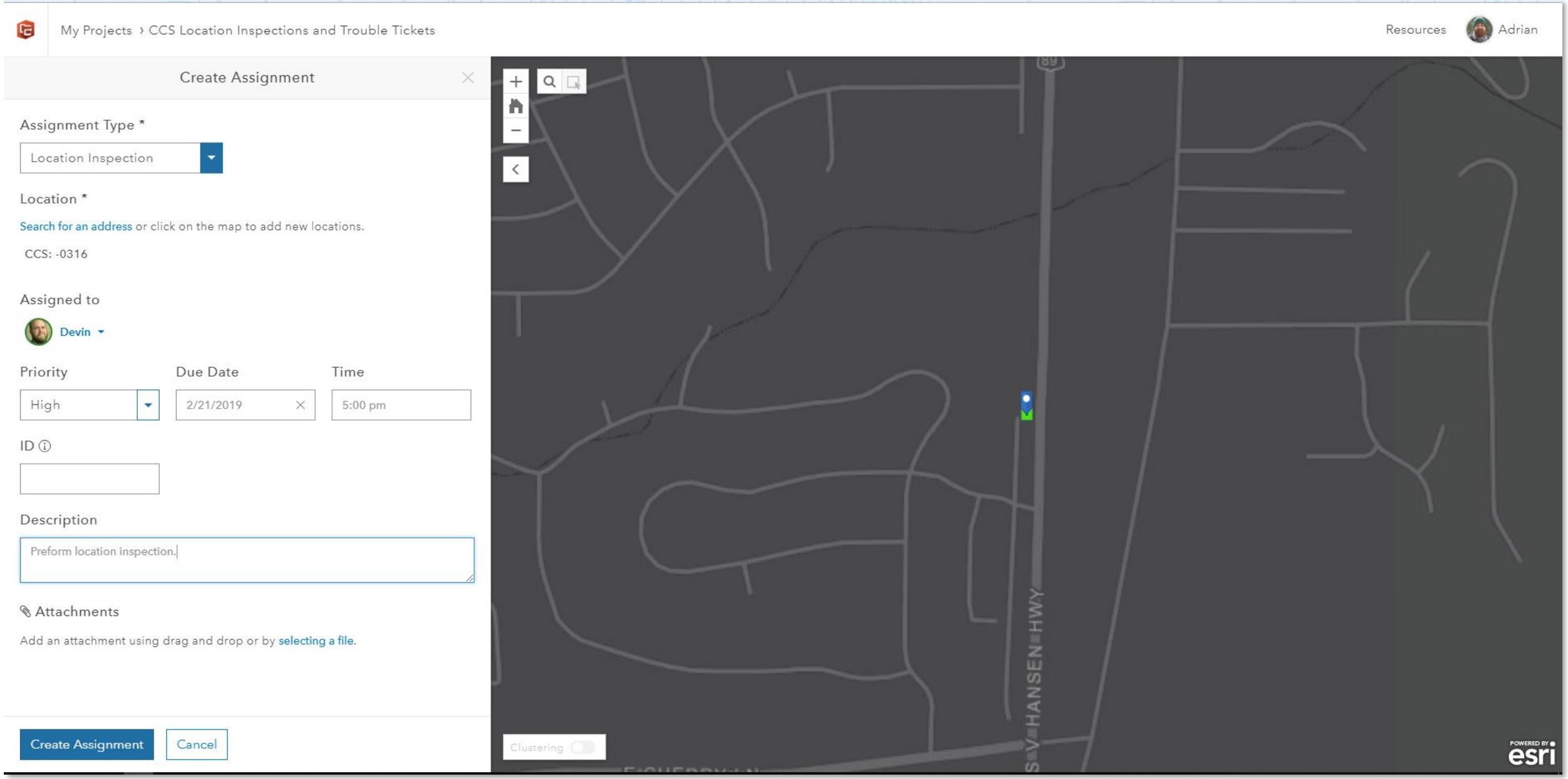


Workforce

- Created a workforce project to dispatch mobile workers for either two classes of tickets
- Ability to click on a CCS location and generate a ticket at the site
- Integrated with Navigator to locate stations where assignments have been created
- Integrated with Explorer to access surveys







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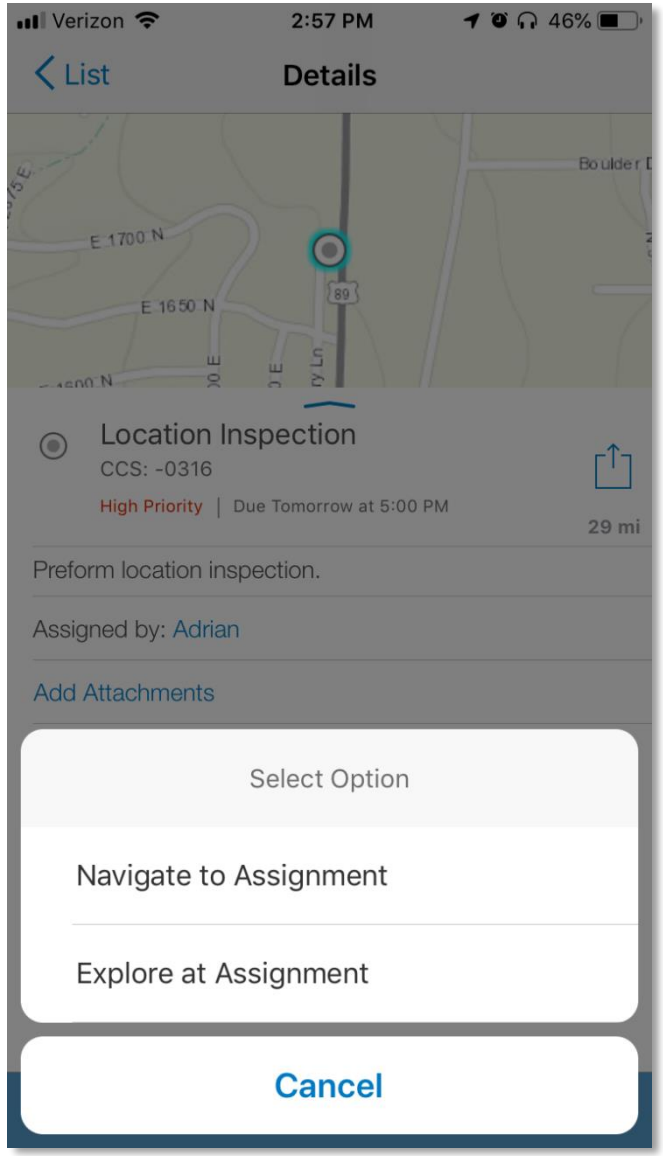
Workforce

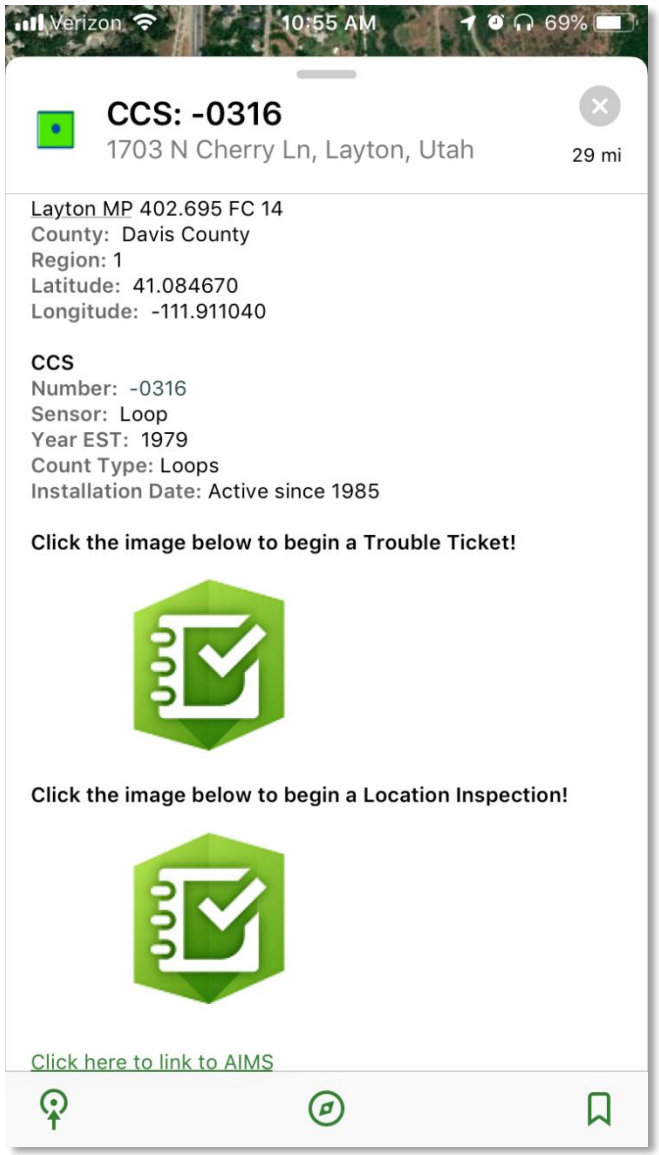
Connecting to Survey123 via Explorer

- Field worker selects “Explore at Assignment”
- Explorer opens at location with pop up loaded
- Auto populate as many fields as possible using the *Custom URL Scheme*

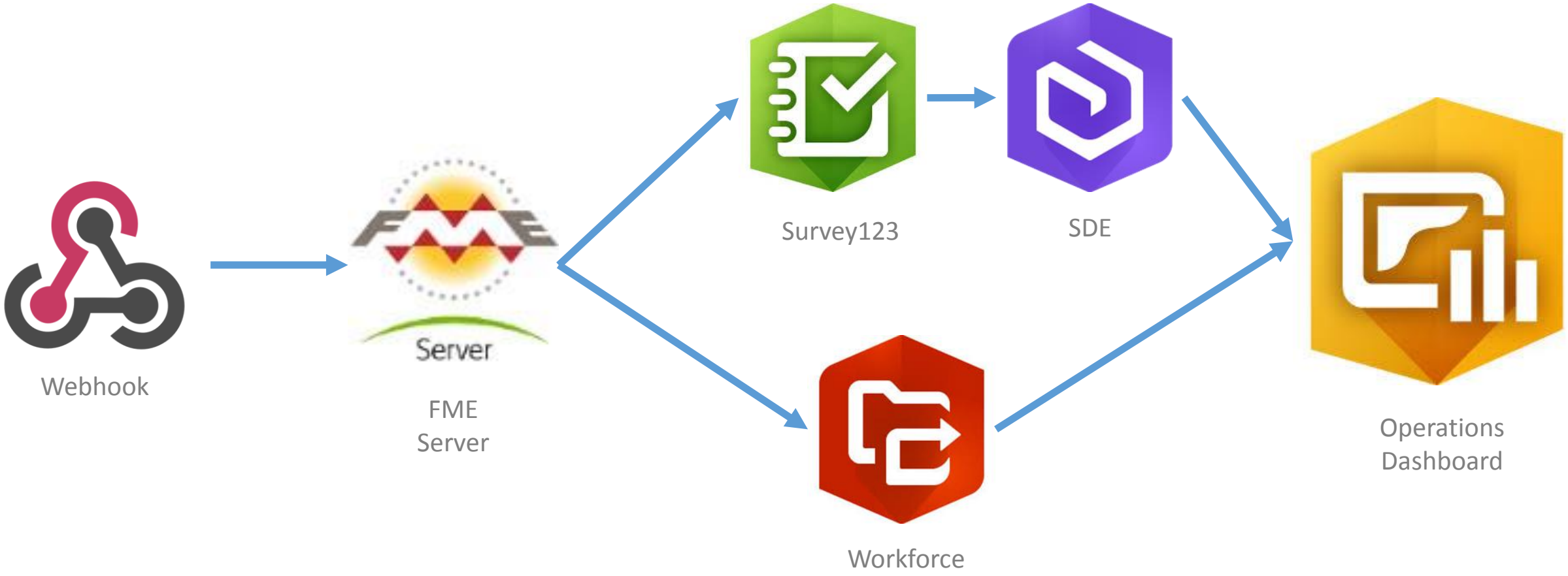
Why the extra step at Explorer?

- One goal of the project was to auto populate as much as possible to avoid time spent using manual entry
- *Custom URL Scheme* handles this perfectly adding information that is not readily available in the work ticket to the survey

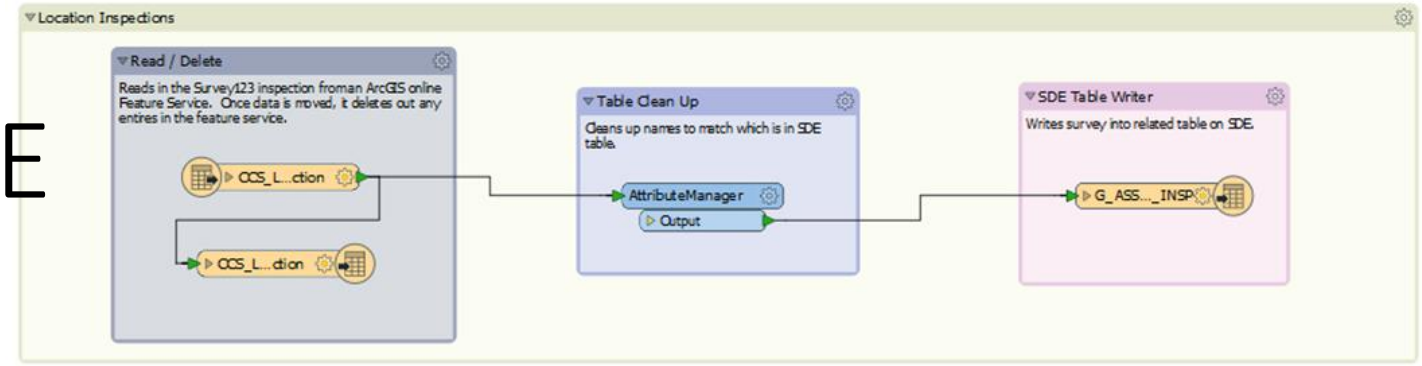


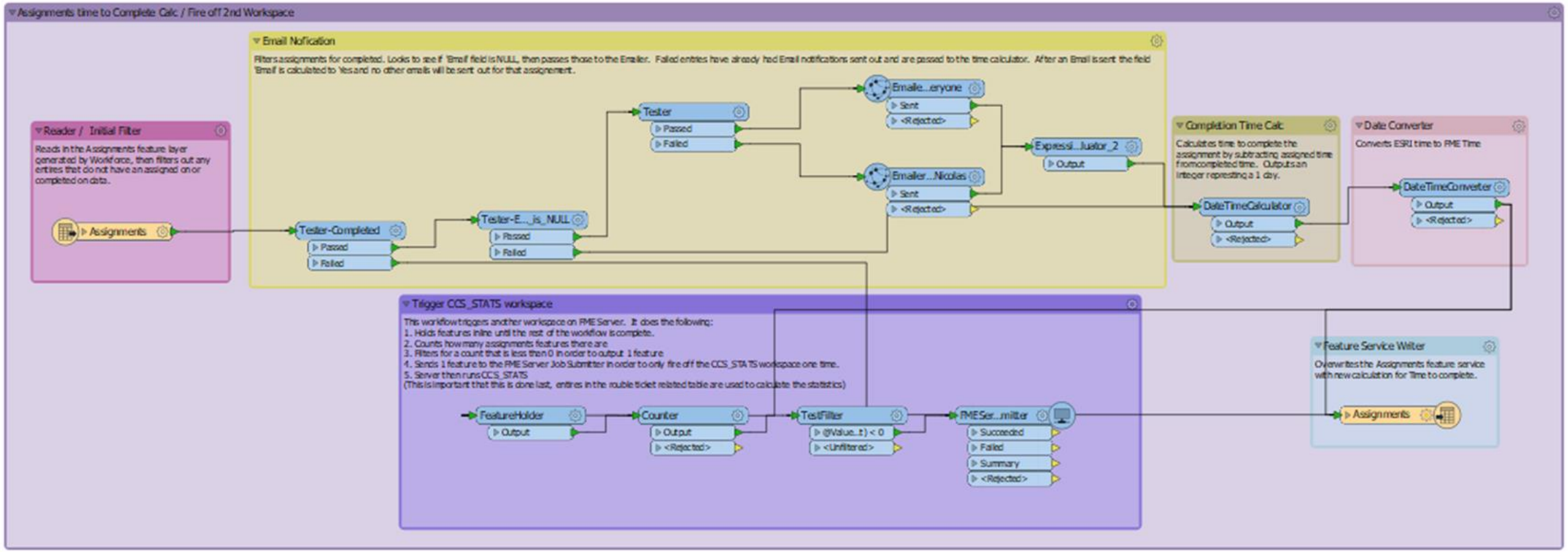


Data ETL

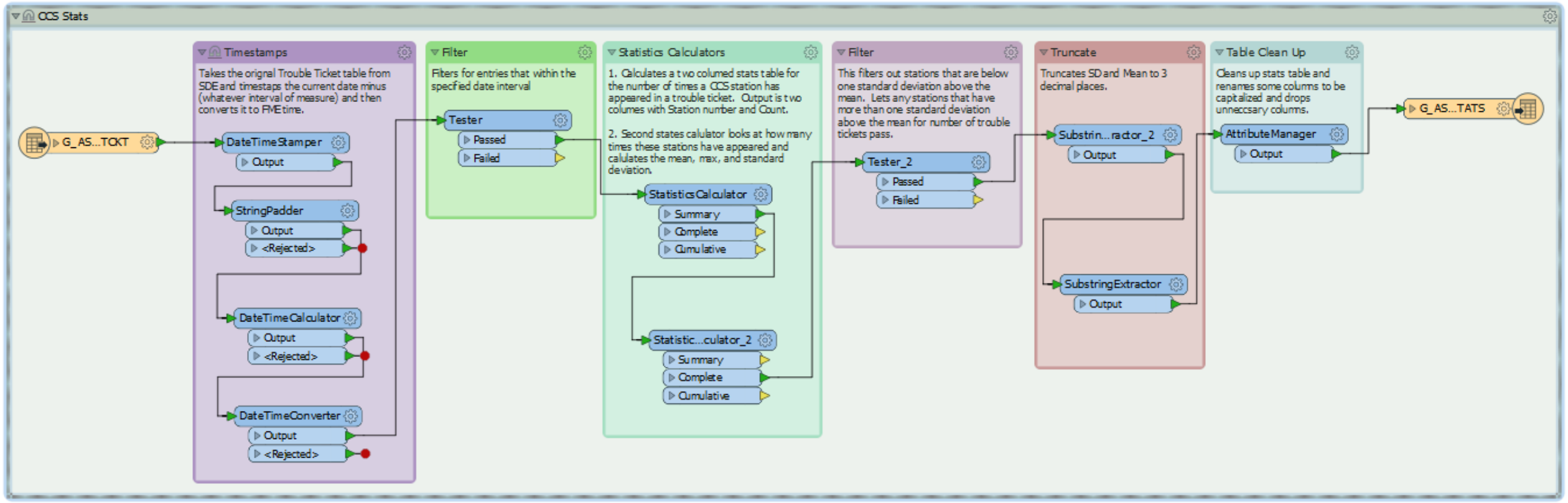

Webhook
FME
Server
Survey123
SDE
Workforce
Operations
Dashboard

Data ETL - FME

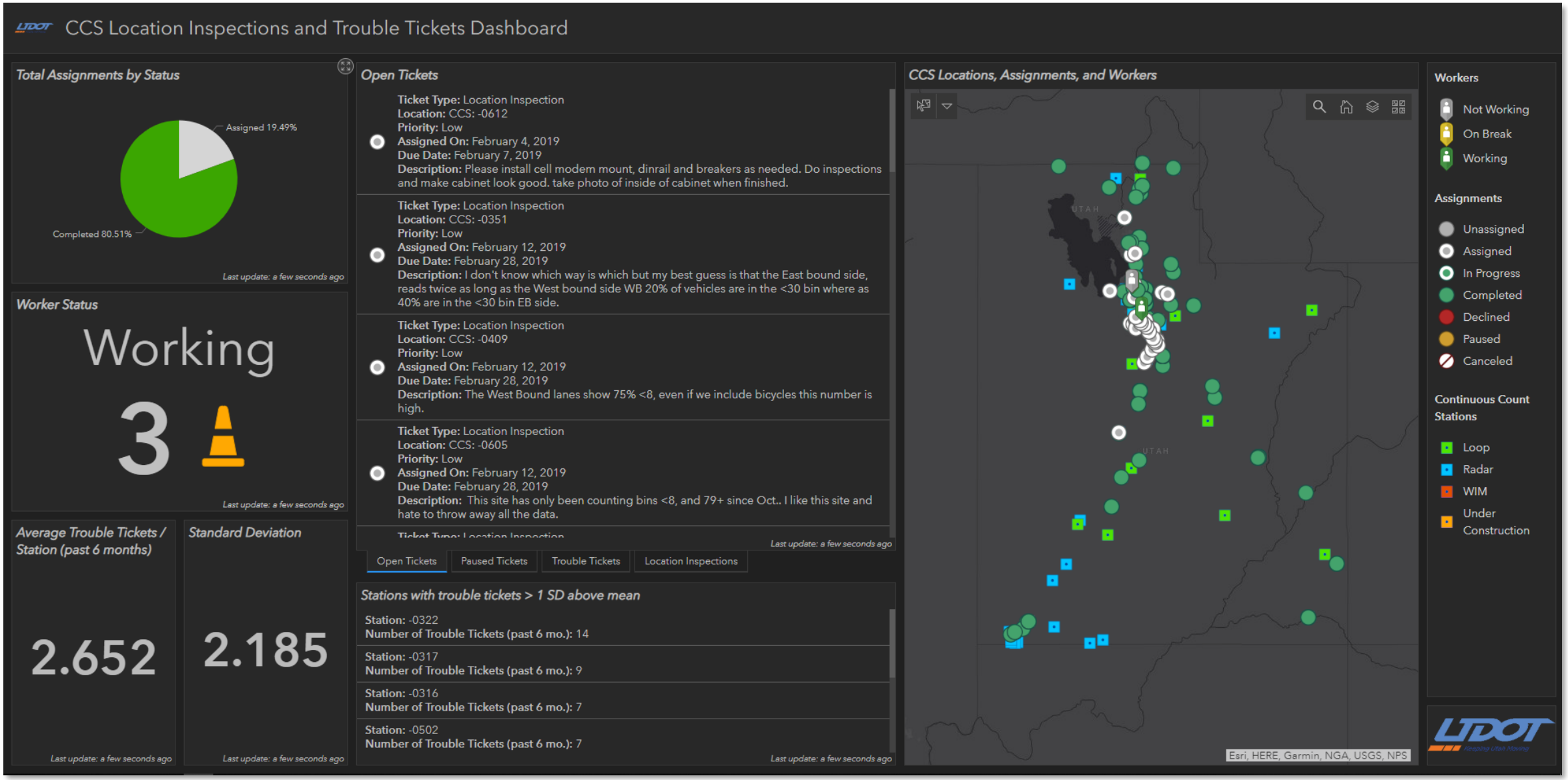

Location Inspections
Read / Delete
Reads in the Survey123 inspection froman ArcGIS online Feature Service. Once data is moved, it deletes out any entires in the feature service.
CCS_L...ction
CCS_L...ction
Table Clean Up
Cleans up names to match which is in SDE table.
AttributeManager
Output
SDE Table Writer
Writes survey into related table on SDE.
G_ASS..._INSP


Assignments time to Complete Calc / Fire off 2nd Workspace
Email Notfication
Filters assignments for completed. Looks to see if 'Emailf field is NULL, then passes those to the Emailer. Failed entries have already had Email notifications sent out and are passed to the time calculator. After an Email is sent the field 'Emailf is calculated to Yes and no other emails will be sent out for that assignement.
Reader / Initial Filter
Reads in the Assignments feature layer generated by Workforce, then filters out any entires that do not have an assigned on or completed on data.
Assignments
Tester-Completed
Passed
Failed
Tester-E..._is_NULL
Passed
Failed
Tester
Passed
Failed
Emaile...eryone
Sent
<Rejected>
Emailer...Nicolas
Sent
<Rejected>
Expressi...luator_2
Output
Completion Time Calc
Calculates time to complete the assignment by subtracting assigned time fromcompleted time. Outputs an integer represting a 1 day.
DateTimeCalculator
Output
<Rejected>
Date Converter
Converts ESRI time to FME Time
DateTimeConverter
Output
<Rejected>
Trigger CCS_STATS workspace
This workflow triggers another workspace on FME Server. It does the following:
1. Holds features inline until the rest of the workflow is complete.
2. Counts how many assignments features there are
3. Filters for a count that is less than 0 in order to output 1 feature
4. Sends 1 feature to the FME Server Job Submitter in order to only fire off the CCS_STATS workspace one time.
5. Server then runs CCS_STATS
(This is important that this is done last, entires in the rouble ticket related table are used to calculate the statistics)
FeatureHolder
Output
Counter
Output
<Rejected>
TestFilter
@Value...t) < 0
<Unfiltered>
FMESer...mitter
Succeeded
Failed
Summary
<Rejected>
Feature Service Writer
Overwrites the Assignments feature service with new calculation for Time to complete.
Assignments

FME - Statistics



Dashboard for Decision Making

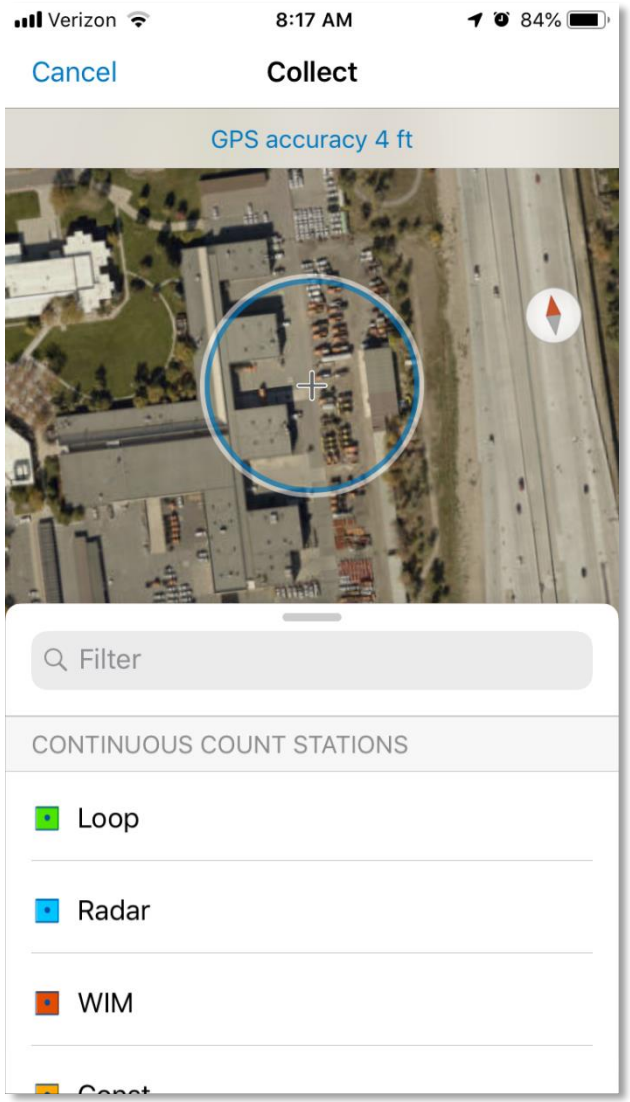


Dashboard for Decision Making

- Dashboard displayed in Traffic Count shop
- Used for morning meetings
- Track employee progress throughout the day

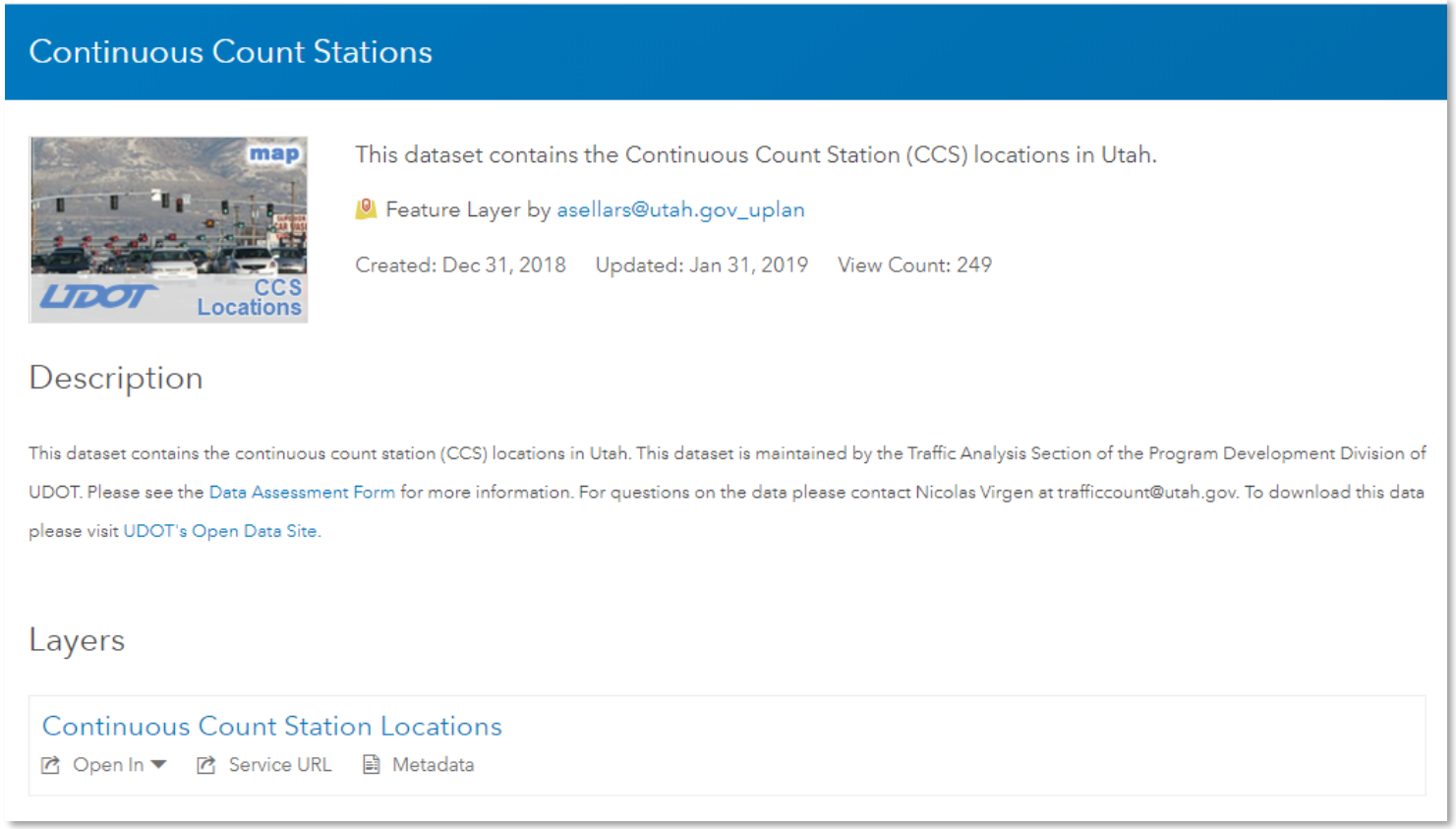
Updating & Adding Station Locations

- Access CCS Location Feature Service from AGOL via Collector
- Connect to Bad Elf GNSS Surveyor
- Add new sites
- Update old site locations
  - Historic CCS Locations have been found to not be representative of actual sensor location



Production Layer

- Nightly FME workflow
  - Transfers locations that are not under construction
  - Only transfers relevant attributes
  - Public view in AGOL



Questions?

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