Evolution of GPS Plow Tracking in the MOA

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Who we are

- Staff of 4 within the Department of Community Development
- Implement and maintain MOA's Enterprise GIS deployment
- Data design, PDF map automation, web maps/apps/dashboards, Field Maps
- Connect staff with training resources
- We try not to edit anyone's data!
- https://www.muni.org/

Mike Knapp, Geographic Information Officer
Chris Smith, Enterprise GIS Analyst
Grant Cain, Enterprise GIS Analyst
I-Shan Song, Enterprise GIS Analyst

Common Terms

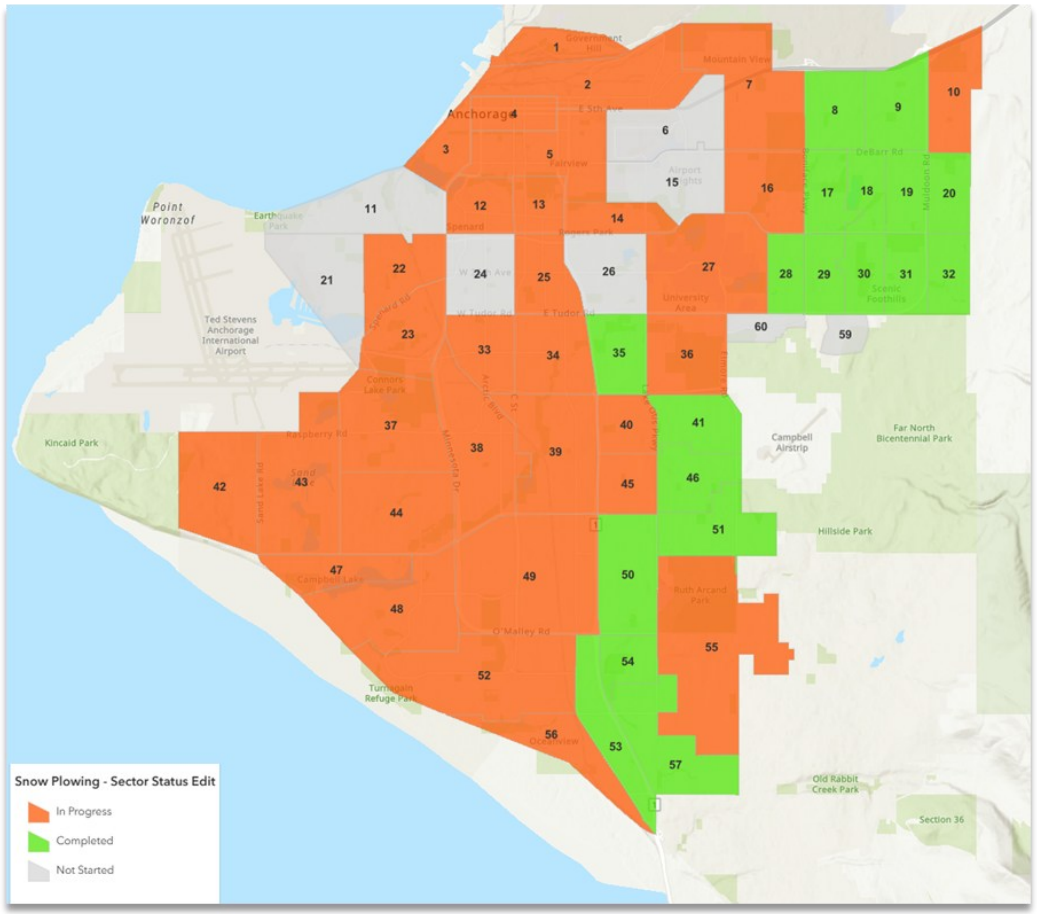
Feed-Data coming through a real time feed

Real Time Analytic-Processing and analyzing data from a feed as it's collected.

Big Data Analytic-Batch processing and analysis of data that summarizes data, enriches data and recognizes data patterns

Previous Tracking

- Manual! (Updates are limited)
- Public could see:
  - Sectors (residential plowing status)
  - Status of sidewalks
    - Updated manually



Advantages of Tracking Plows with GPS

- Little user input needed
- Updated in real time
- Allows the public to see where plowing action is occurring
- Allows drivers to focus on driving

Installing Gateways and Getting Data Feed

- Worked with Samsara
- We track speed and location
  - Not tracking blade up/down
- Installed gateways on 47 vehicles
  - 4 Trackless (Parks and Rec)
  - 13 Trackless (Street Maintenance)
  - 30 CAT Graders (Street Maintenance)

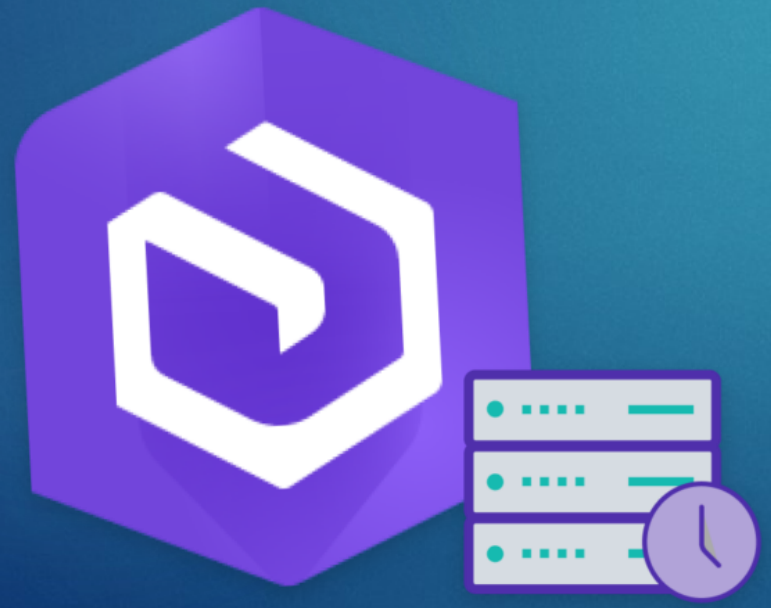
Esri's Winter Weather Solution

- Used to help us start the process
- Contains premade:
  - Maps
  - Apps
  - Dashboards
  - Analytics
- Needed to customize products to fit organizational needs

Velocity VS. GeoEvent Server

ArcGIS GeoEvent Server

- Installed on-prem
- Maintenance/updates done by us



ArcGIS Velocity

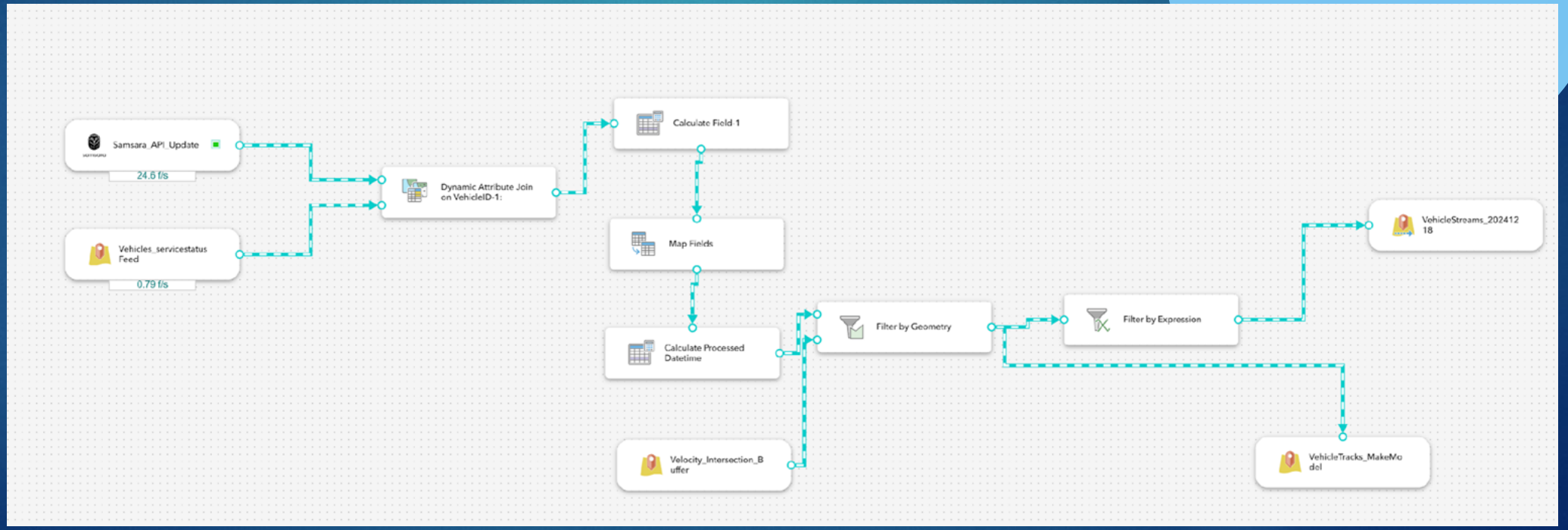
- In AGOL environment (AWS)
- Maintenance done by Esri
- Big Data Analytic capabilities

Data Prep

- Connecting Samsara feed with Esri Velocity
- Preparing layer of sidewalks, streets and trails
  - Unique ID
  - Ownership
  - Type
  - Maintained by
  - Sector
- Tools in velocity helped but manual touch ups were still needed

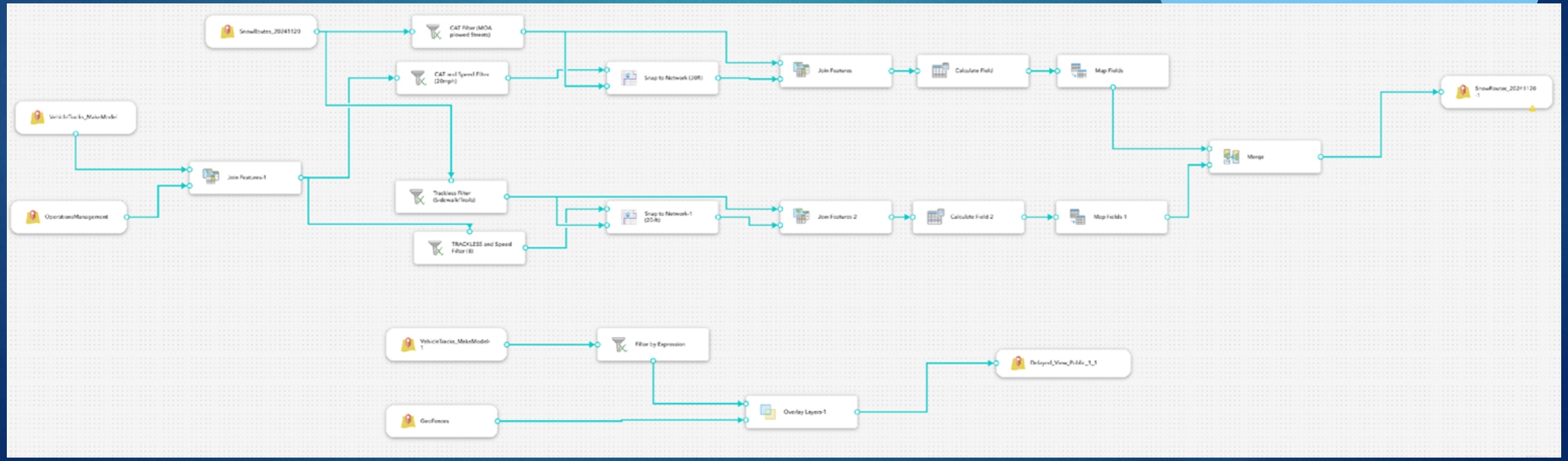
ArcGIS Velocity Real Time Analytic

- Determines if vehicles are active
- Filters out vehicle locations when in intersections
- Creates tracks of vehicle locations (i.e. breadcrumbs)

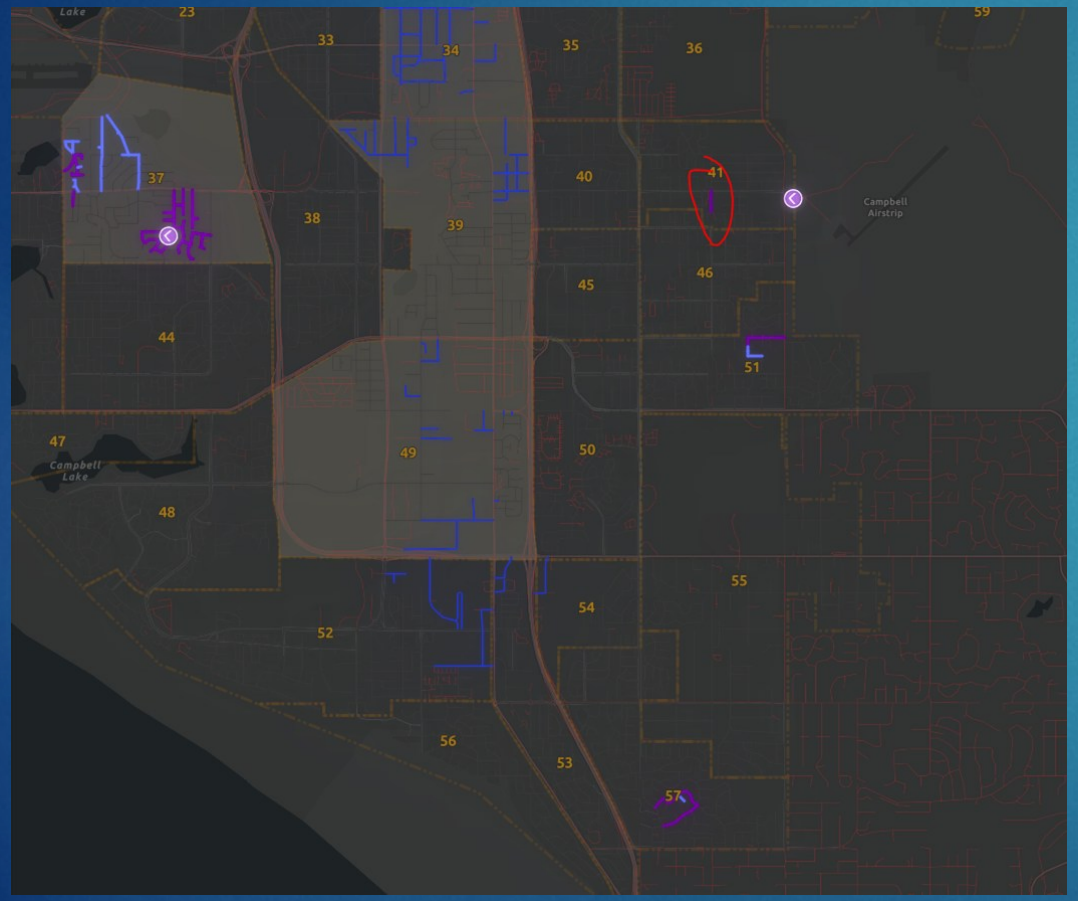


ArcGIS Velocity
Big Data Analytic

- Changes plow status of roads automatically
- Makes sure logic is being met
  - Comparing event type, vehicle location, vehicle type, segment type, ownership



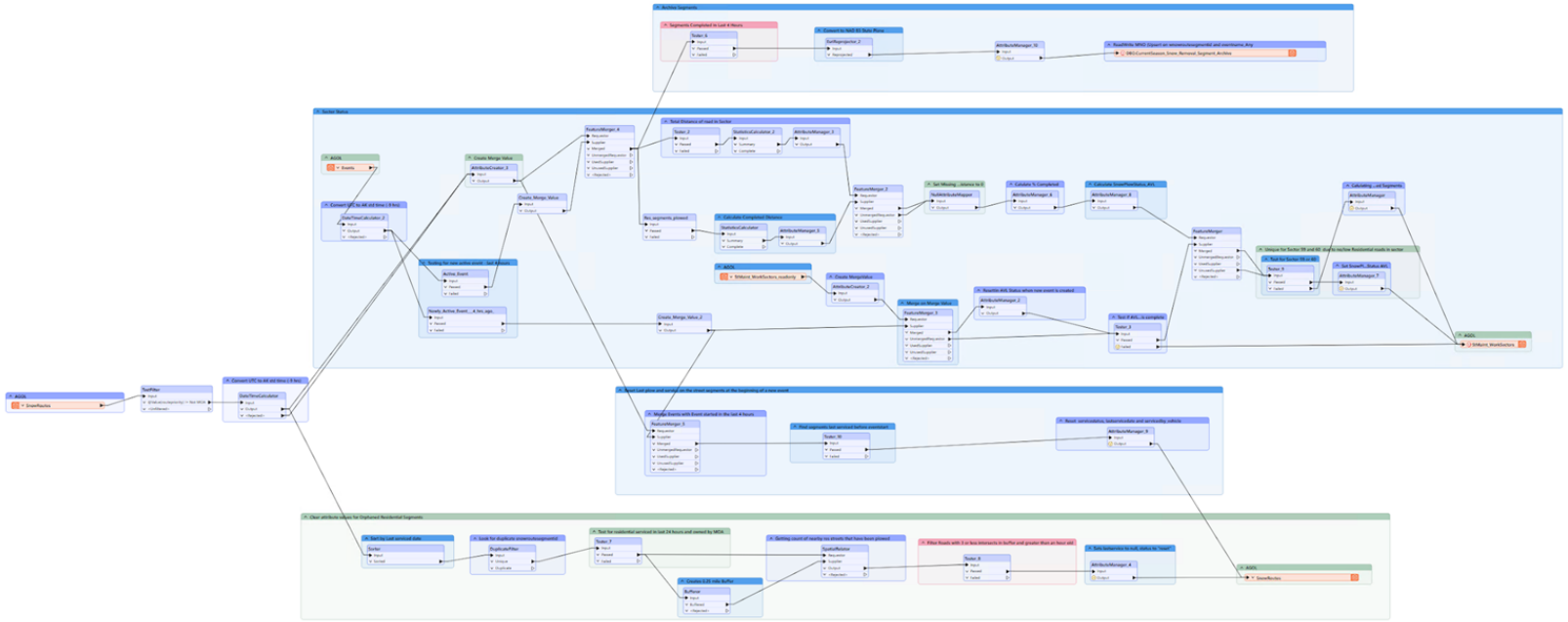
FME



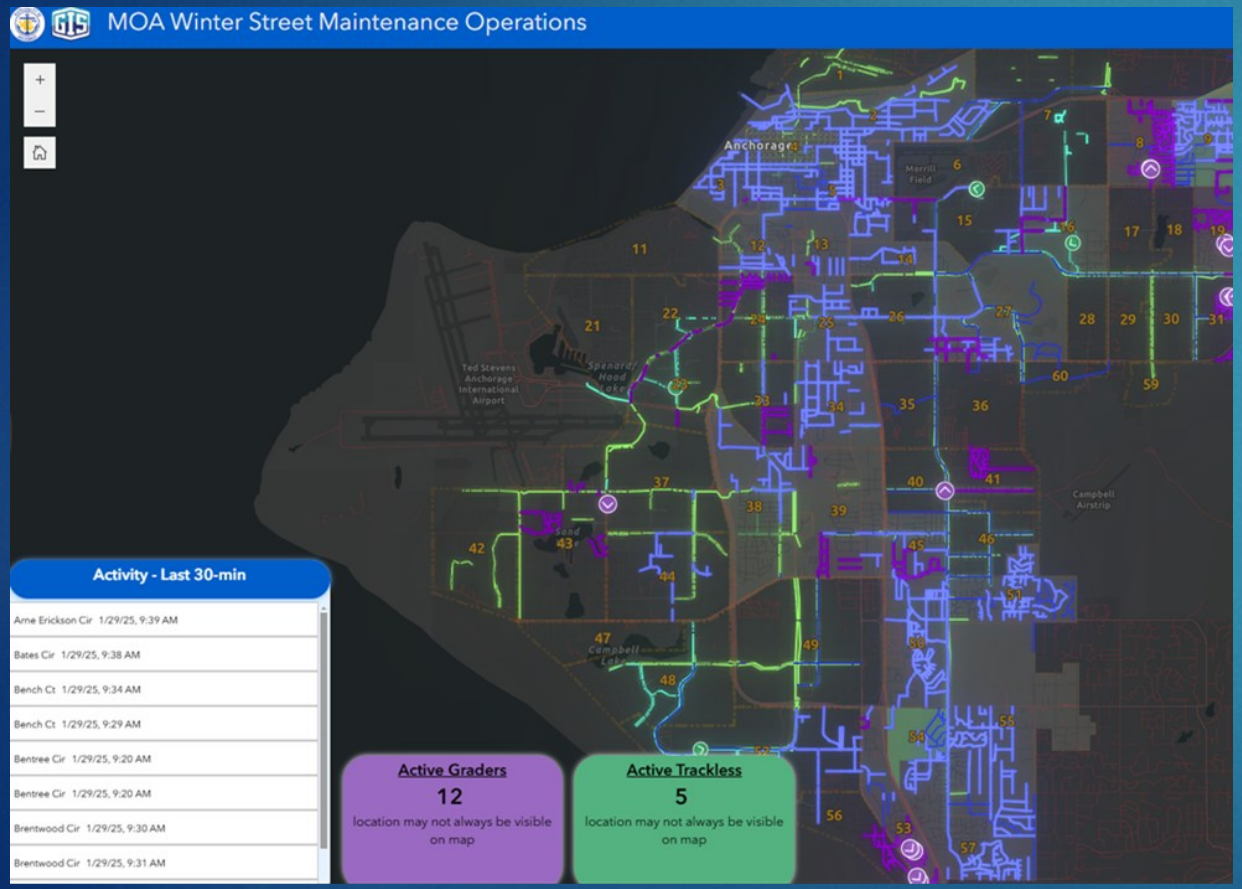
- Can access AGOL data
- Runs on a schedule
- Fixes potential mistags
  - Heading error
  - Speed parameter
  - Fly-by error

FME

- Resets plow status when new event is started
- Calculate sector's residential plow status
- Create an archive of completed segments
- Calculate event stats
  - Duration of event
  - Distance plowed during event



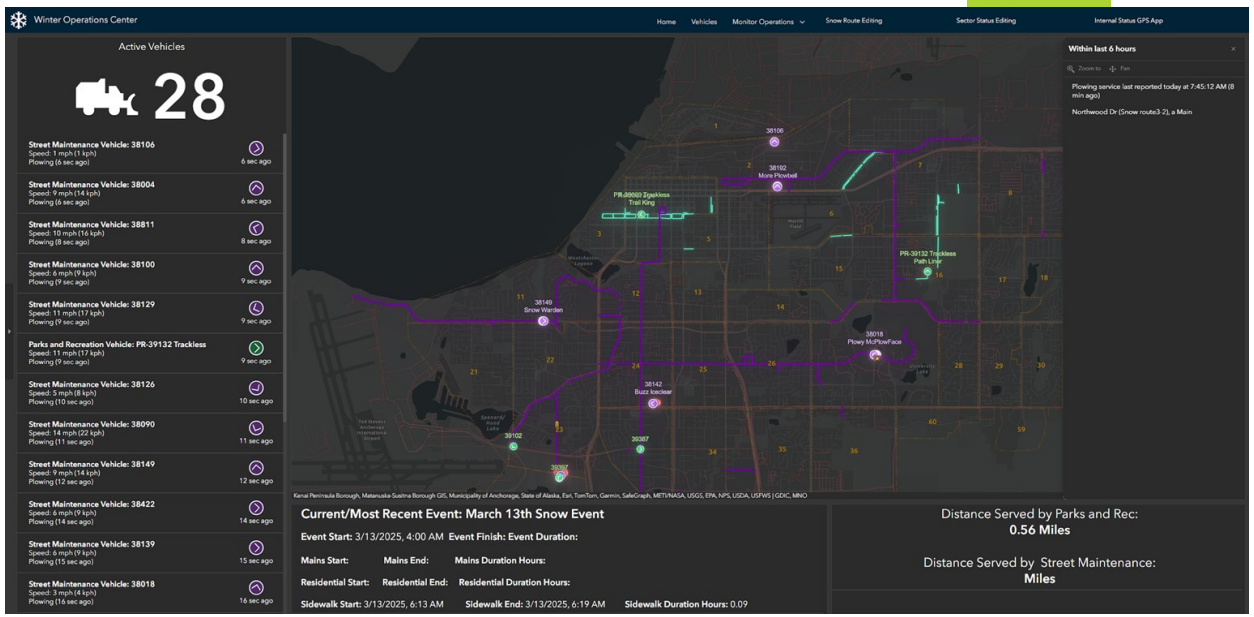
Public apps

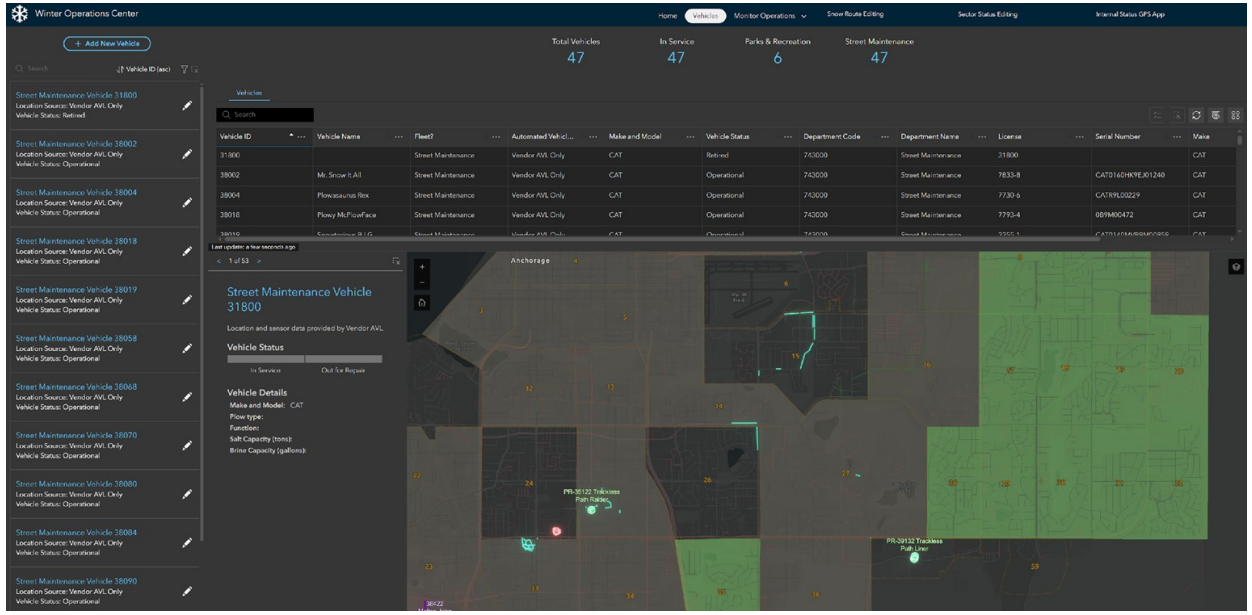


- Delayed by 15 minutes
- Shows when segments were last serviced
- Shows plow status of sectors
- Shows delayed location of active plows

Internal Apps

- Track plowing operations in real time
- Create/change a plow event
- Mark vehicles as out of service
- Mark sectors as delayed
- Change street plowing segment's status manually if needed





Thank You!