Advancements in Automatic Vehicle Location (AVL) Technology

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What is AVL

- Automatic Vehicle Location (AVL)- is the means to automatically transmit data real-time via cellular connected sensors installed on a piece of equipment.
- AVL not only tracks equipment locations, but also has the capability's to provide data on
  - Fuel consumption
  - Idle time
  - Auxillary inputs
    - Plow sensors
    - Salt sensors
    - Engine diagnostics

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Benefits

- Historic comparisons
- Monitoring – allows managers and field staff to see picture of entire fleet
- Improved response time
- Better informed decisions
- Snow removal – when was a street last plowed or salted
- Billing – accurate accounting showing how long staff were at a site and what they were doing
- Accountability – hitting mail boxes, driving too fast, idle time, ect.
- Engine Diagnostics
- Sky's the limit

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Fishers Requirements for AVL

- City to own the data
- Track all DPW mobile equipment
- Flexible reporting
- Intuitive
- Real time two way information
- Monitor
  - Speed
  - Location
  - Breadcrumb trail
  - Plow/spinner status

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How AVL Works

Data:
- Position
- Speed
- Alerts

Device

Dashboard

Dashboard:
- Position
- Speed
- Alerts
- Reporting
- Geofencing
- Analysis

ArcGIS Server

GeoEvent Processor

esri - Centric

- ArgGIS On-Line
- ArcGIS
- ArcGIS Server
- Arc SDE
- GeoEvent Processor
- Operations Dashboard

ArcGIS Server and GeoEvent What?

- ArcGIS Server (core)

Takes geographic content and makes is available over the web

creates apps and views

- GeoEvent Processor (extension)

Has extra functionality to process real-time data streams (feeds from GPS devices)

Gives the server data to

useable into useable

form

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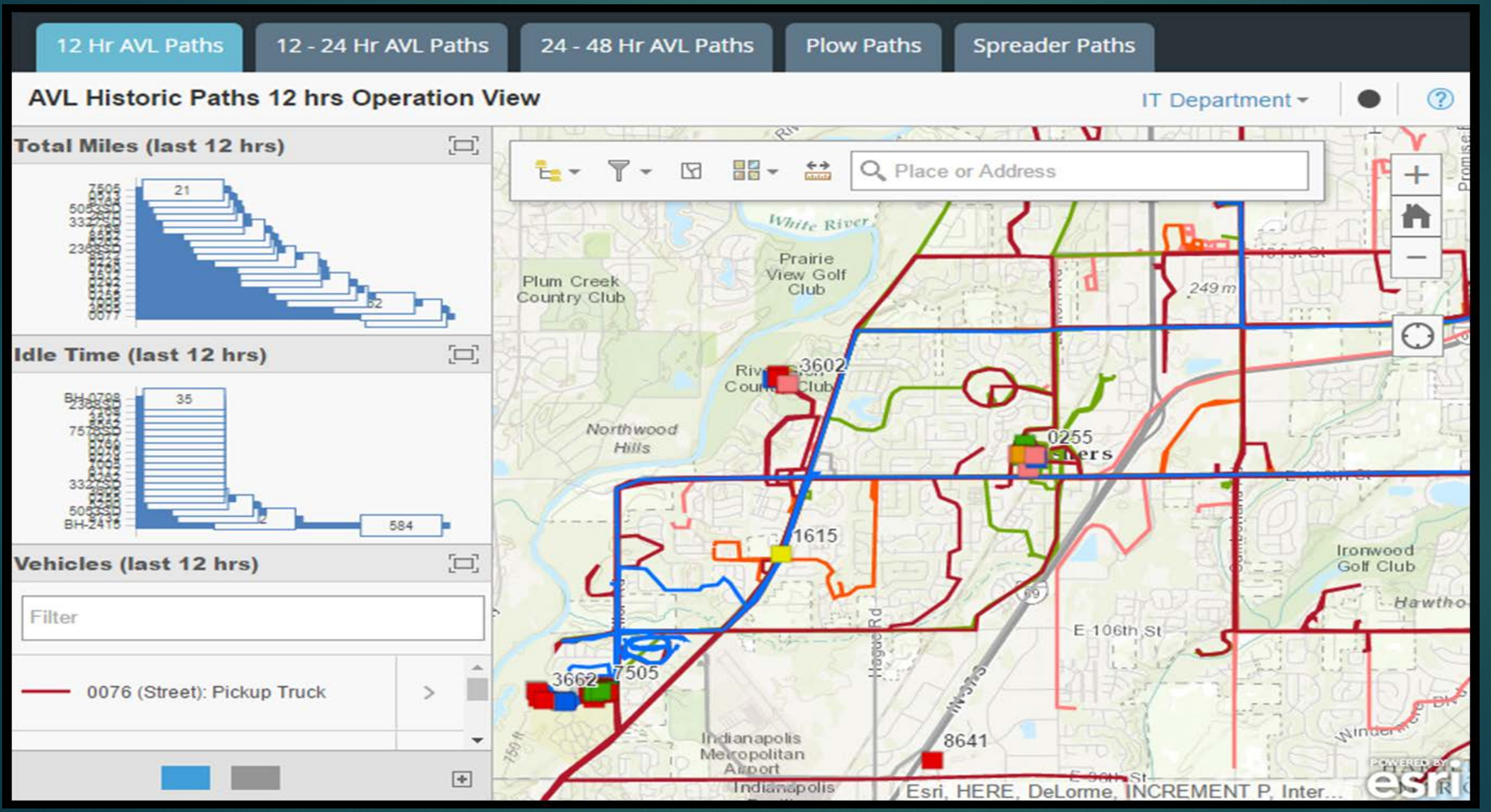
Device Type	OBD-II	Standard GPS	Advanced GPS
Vehicle Type	Passenger Vehicles/ Trucks	Any	Make/Model dependent
Speed	●	●	●
Location	●	●	●
Idle Time	●	●	●
Engine Data	●	Vehicle Dependent	Vehicle Dependent
Behavior Data	●	●	●
Additional Sensors		●	●
Wi-fi			●

Tabs Focused on Needs



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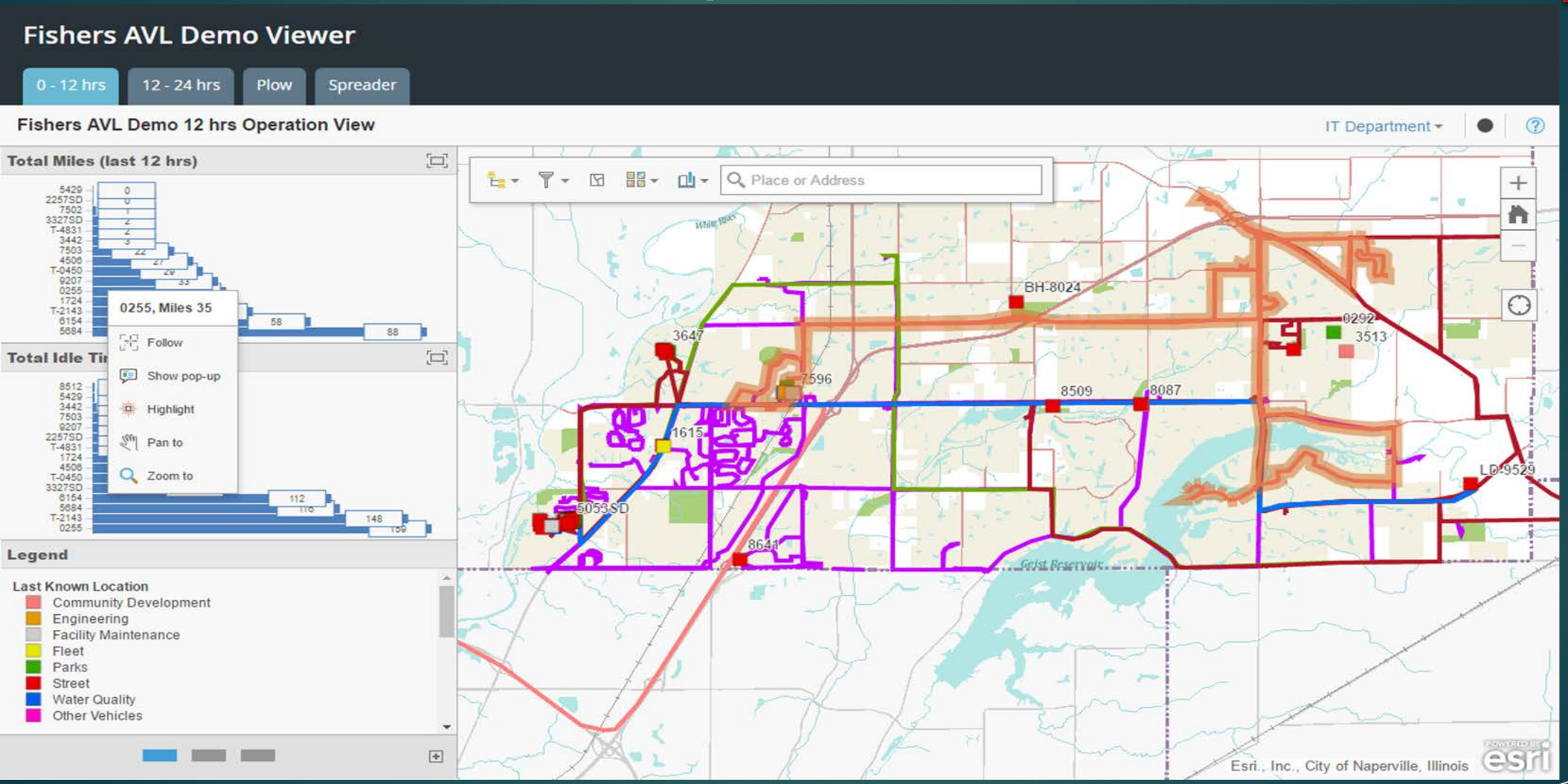
Interactive Graphs



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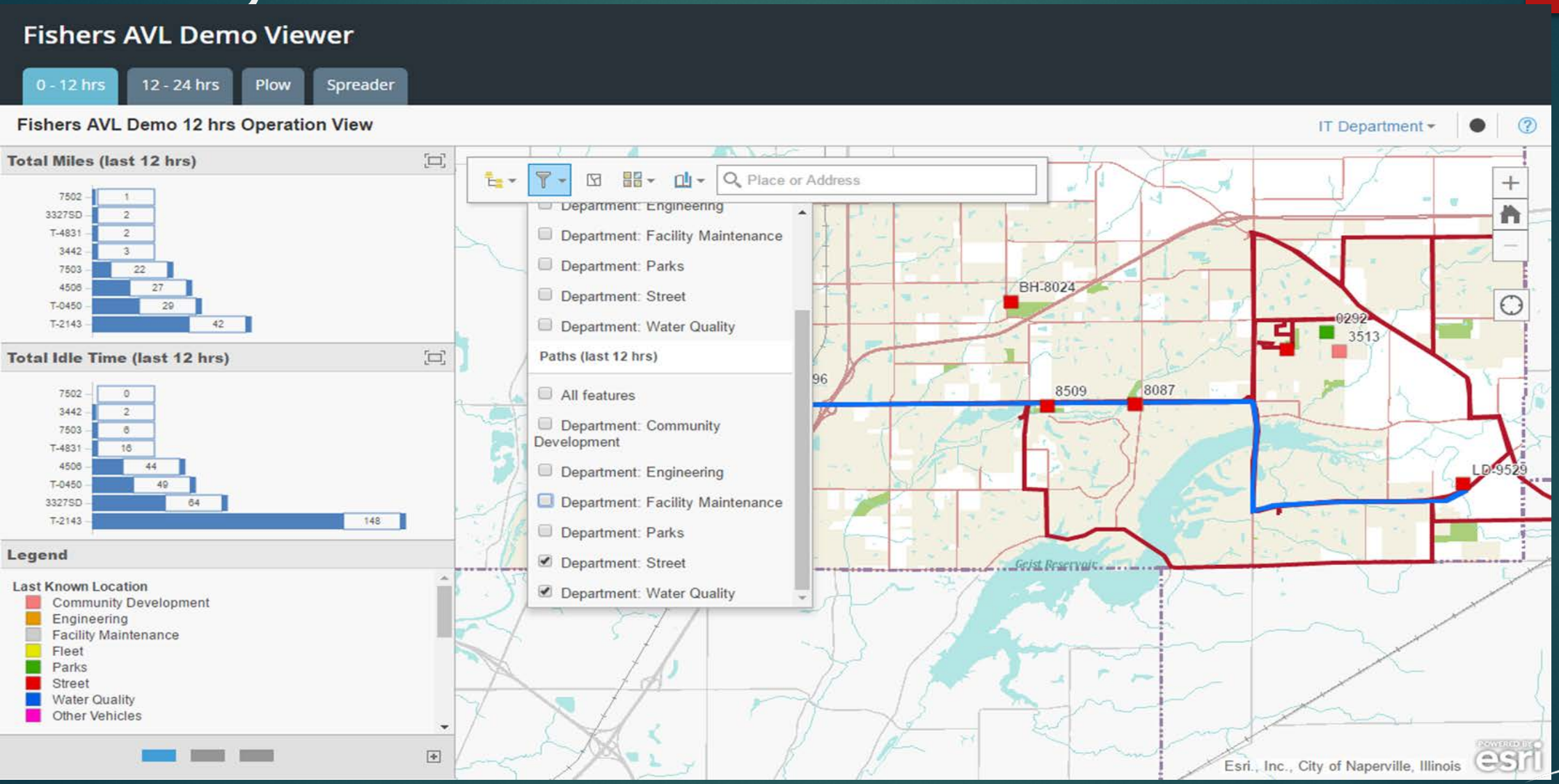
Ways to Filter



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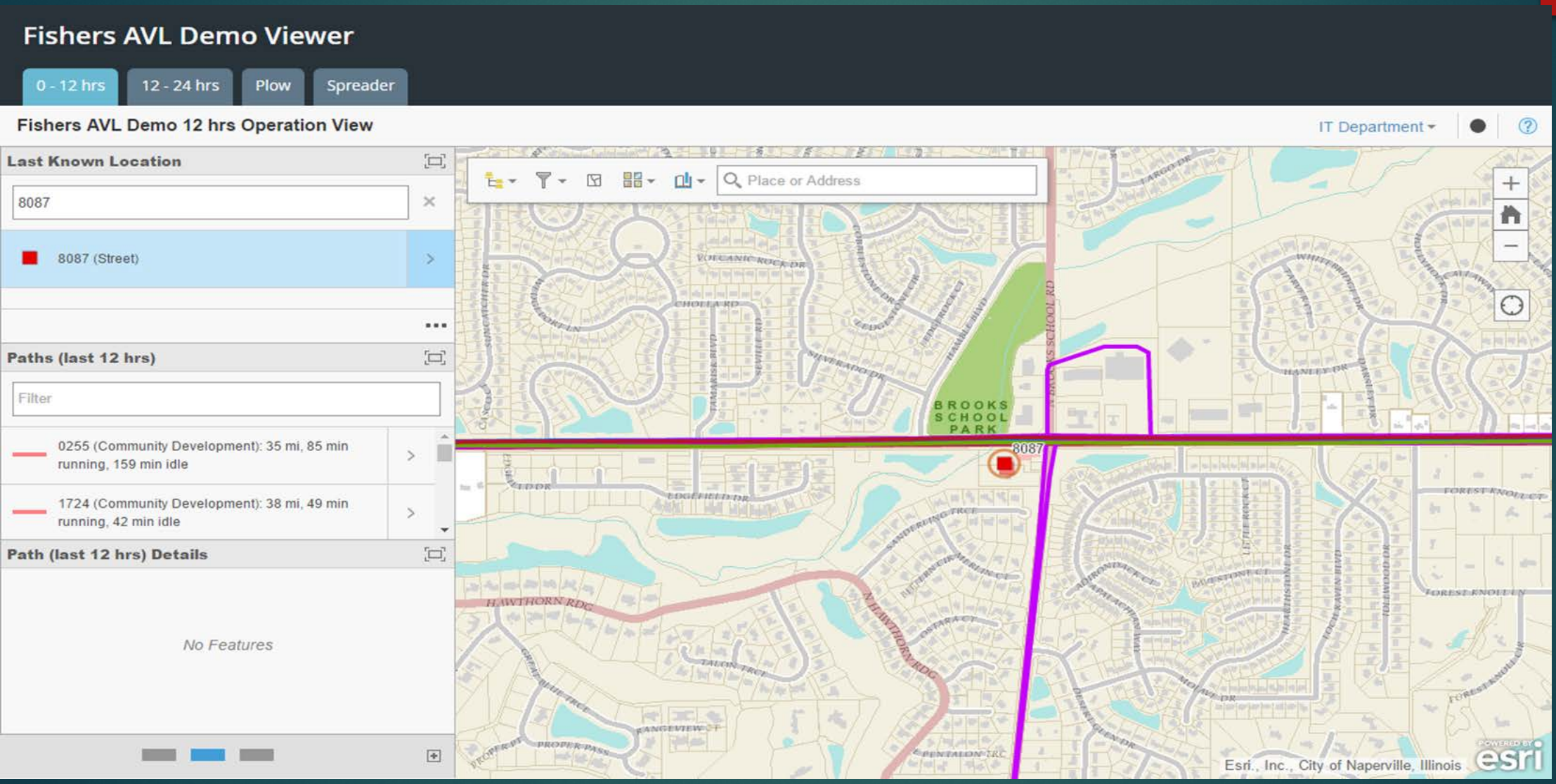
Last Know Location/Path



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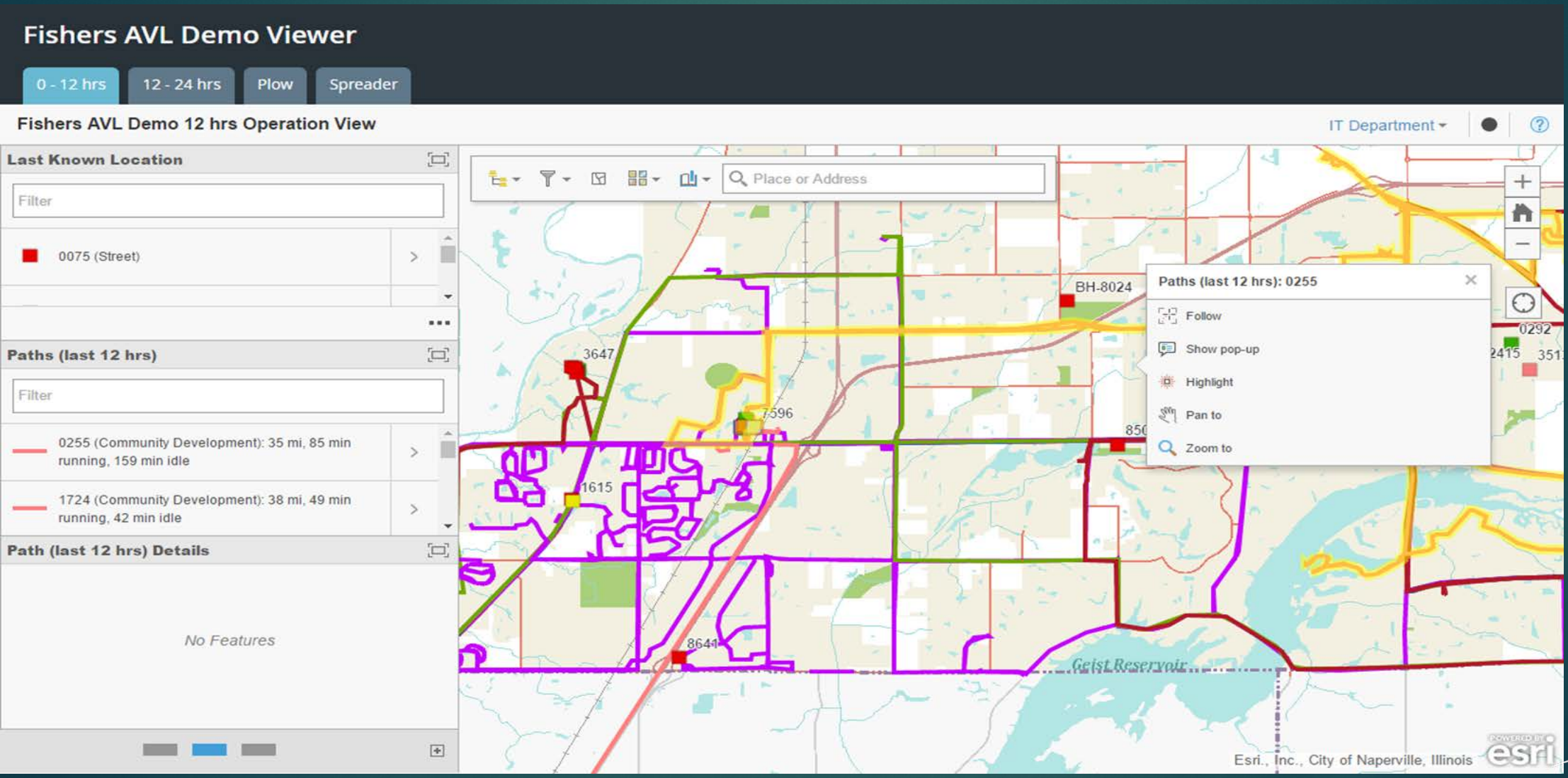
Zoom and Click



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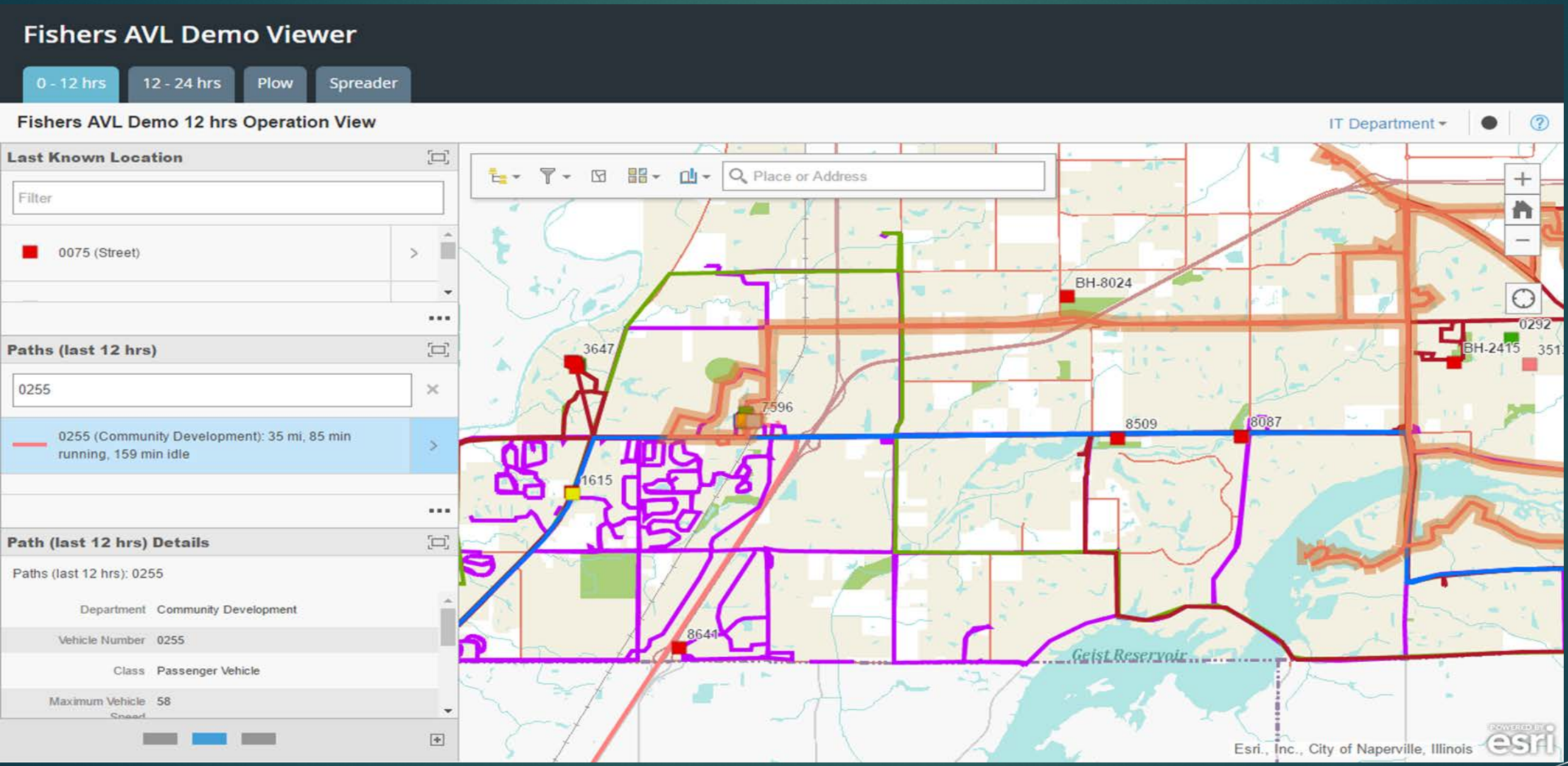
Highlight/Filter Paths



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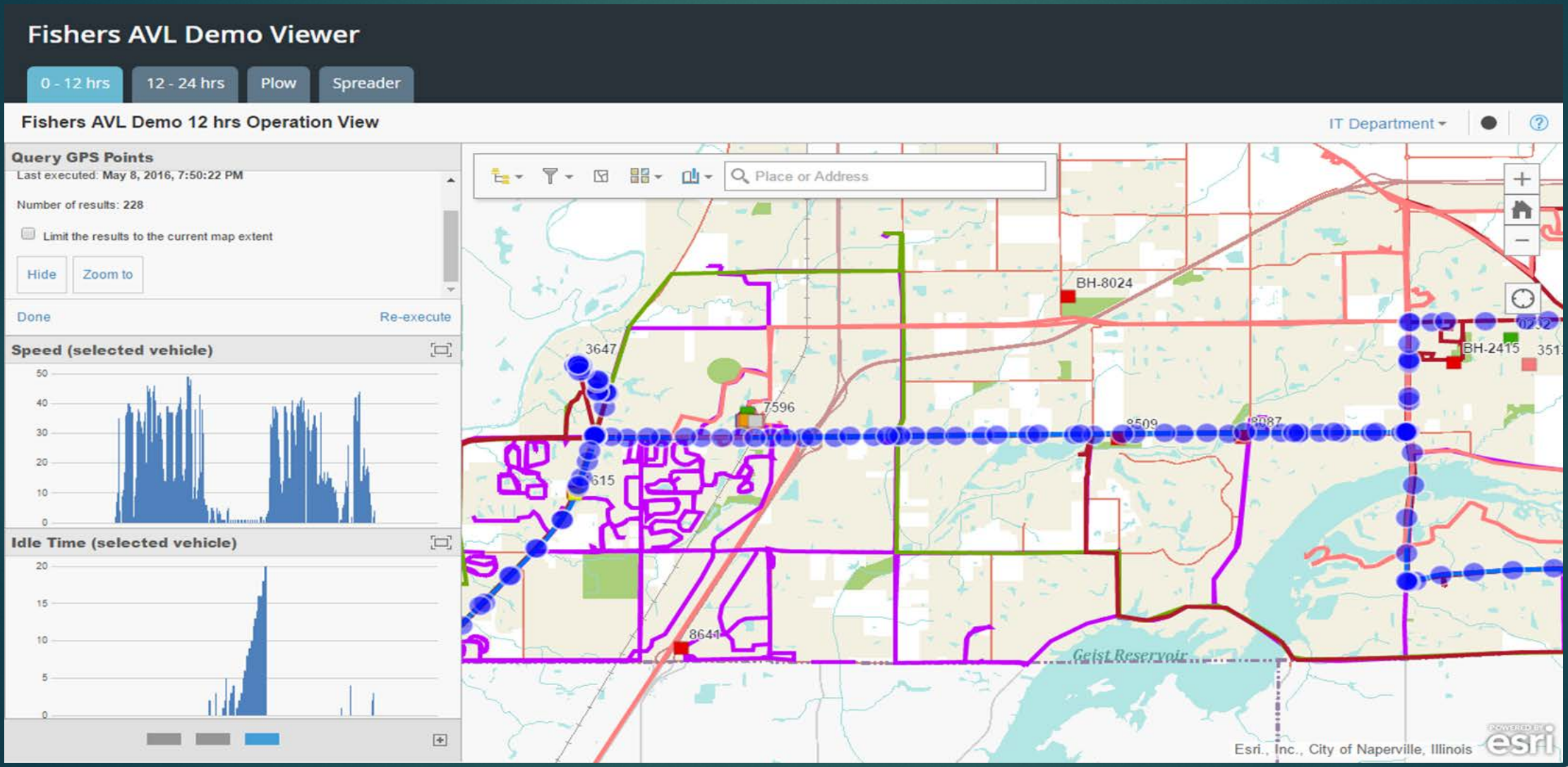
Vehicle Inquiry



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Vehicle Detail Log

Last Known Location: 0075

Timestamp	3/3/2017, 1:35 PM
Department	Street
Vehicle Number	0075
Year	2009
Make	Ford
Model	F350 4WD
Class	Pickup Truck
Heading	193
GPS Speed	0
Engine Ignition Sense	0
Plow UpDown	0
Spreader OnOff	0
Device Motion Sensor	0
Device Power State	0
Device Low Battery	0
Device High Temperature	0
Vehicle OBD JBUS Speed	0
RPMs	0
Throttle Position	14
OBD Odometer	104,724
Fuel Level Percentage	40
Engine Coolant	152
Fuel Rate	1
Battery Voltage	14
Turn Signal Status	0
Calculated Trip Odometer	14,301
Mileage From Install	9,114
Current Idle Time	0
Current Trip Mileage	0
Trip Stop Time Minutes	256
Trip Idle Time Minutes	0
Trip Run Time Minutes	0
Total Trip Time Minutes	0
DTC Count	0
DTCs	
Year	2017
Month	3
Week	9
Day	3
Day of Week	6
Current Engine State	3

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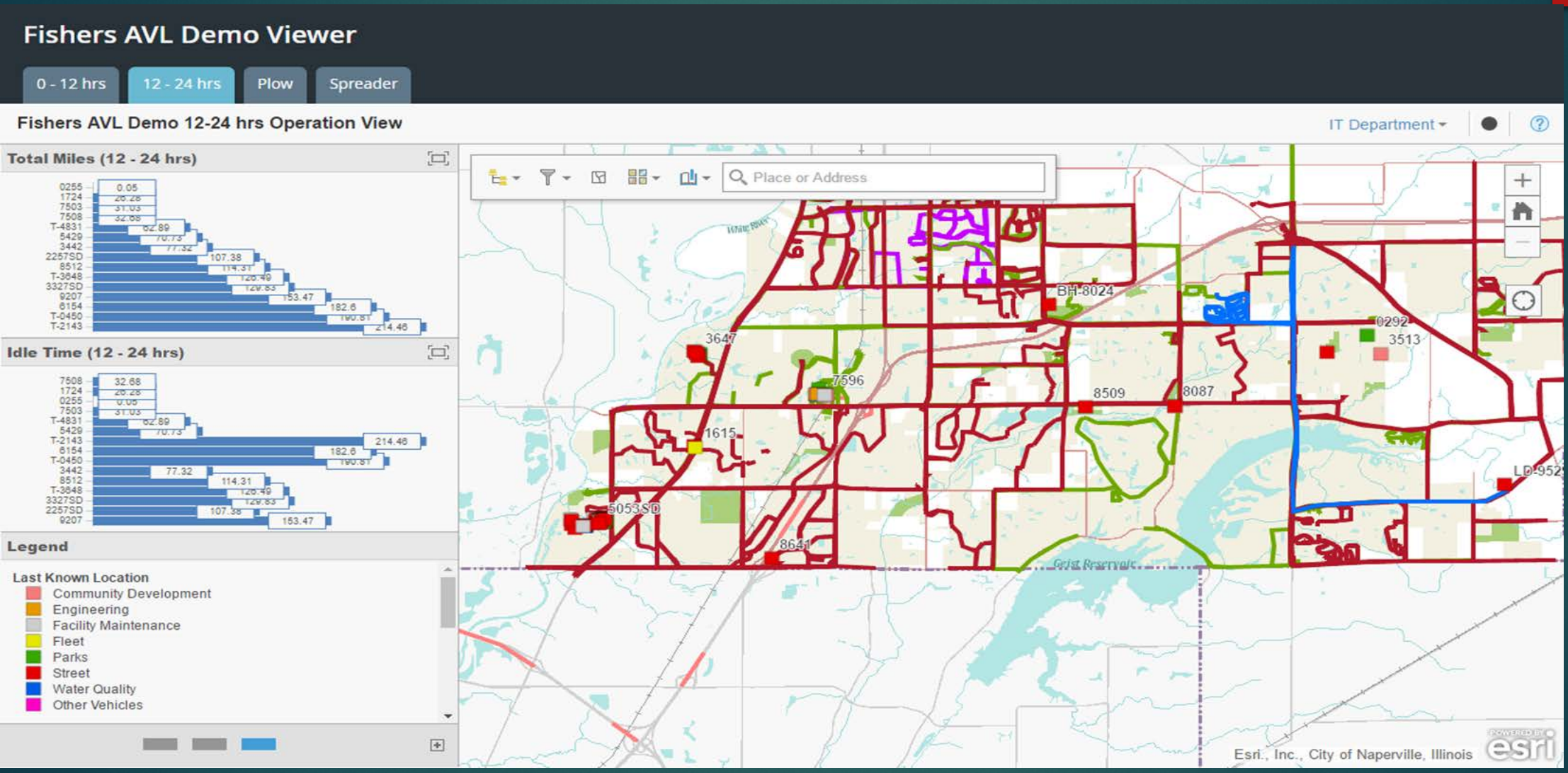
Historic Views



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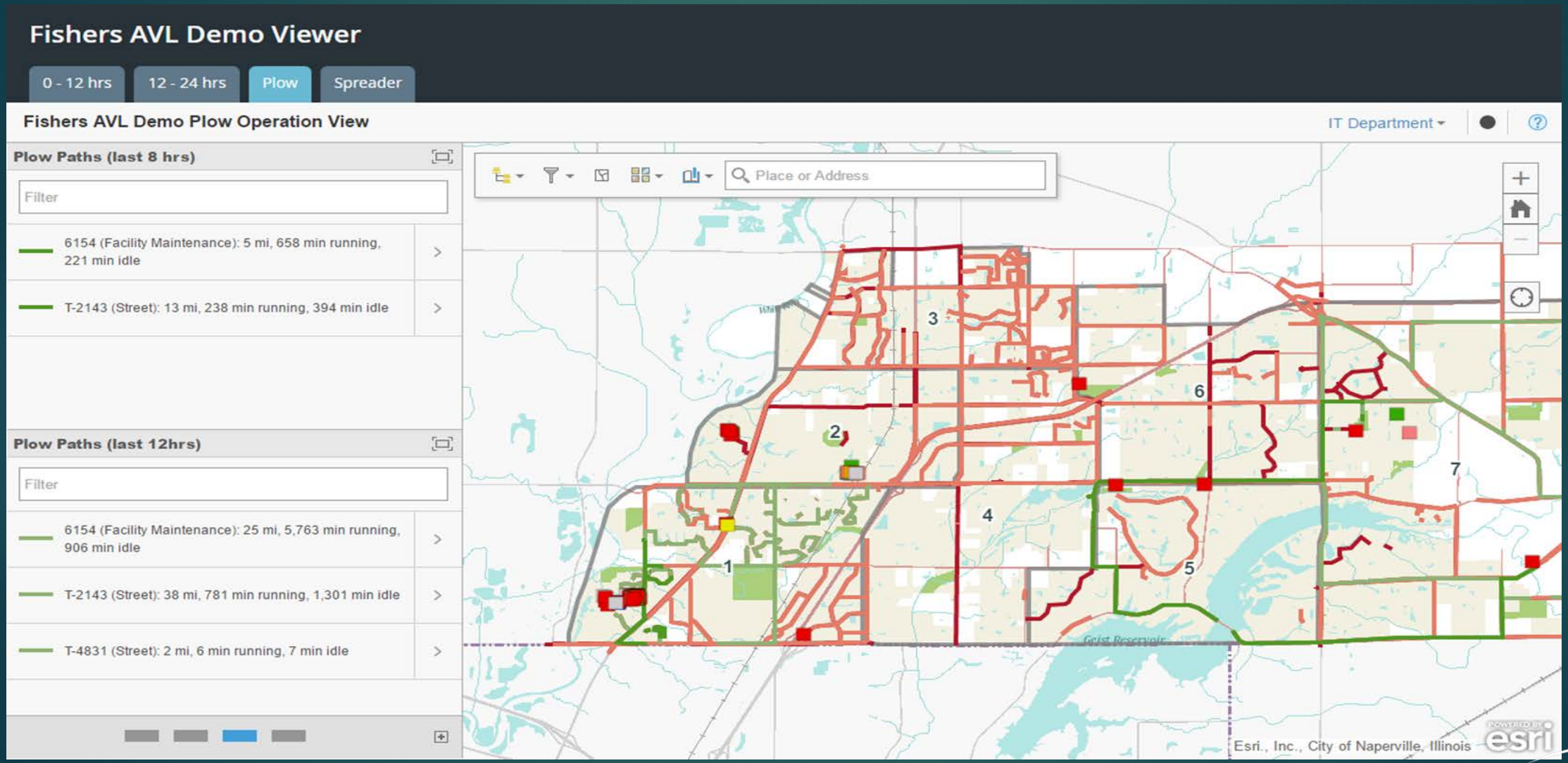
Plow Status



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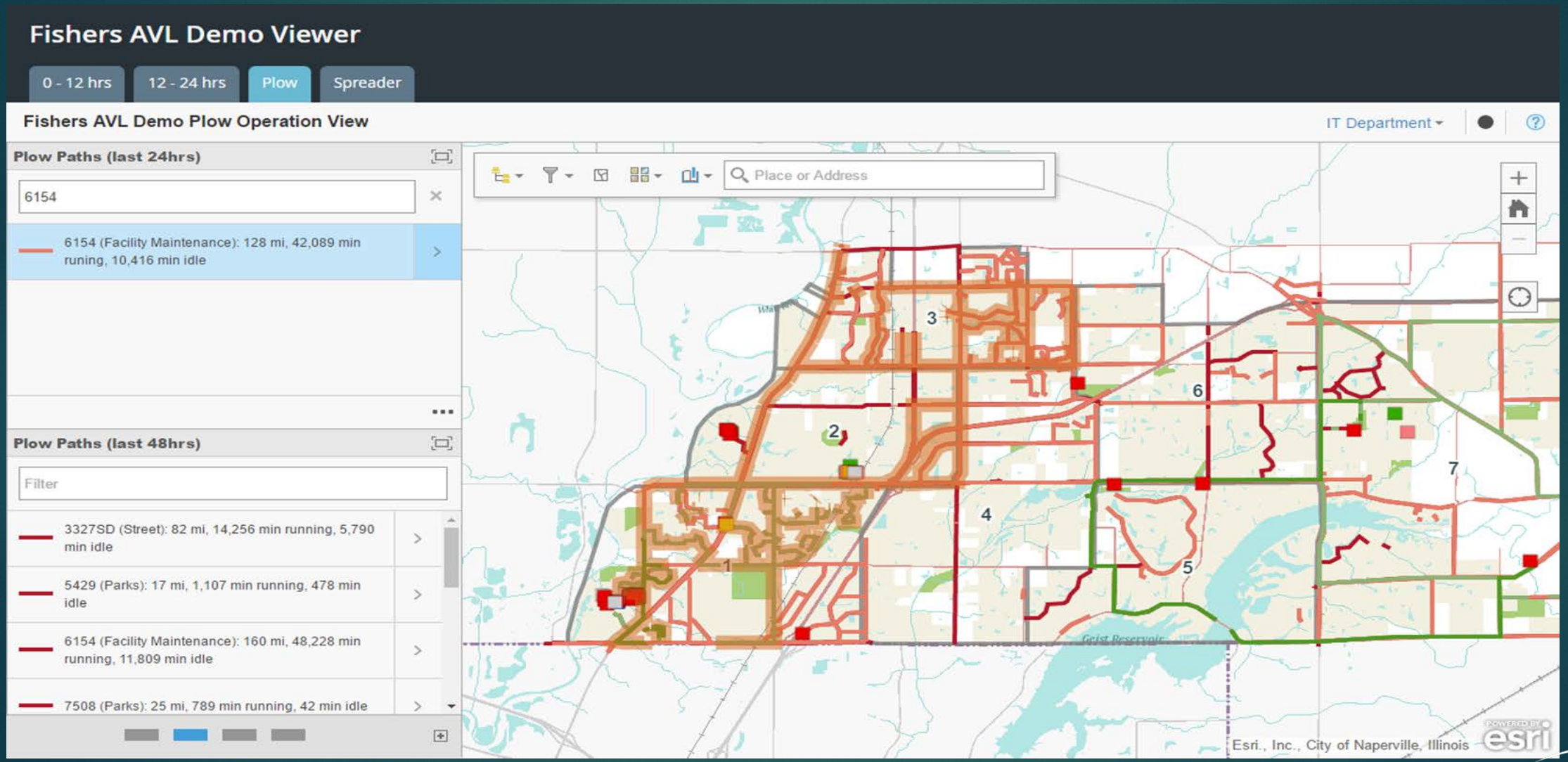
Filter Plow Data



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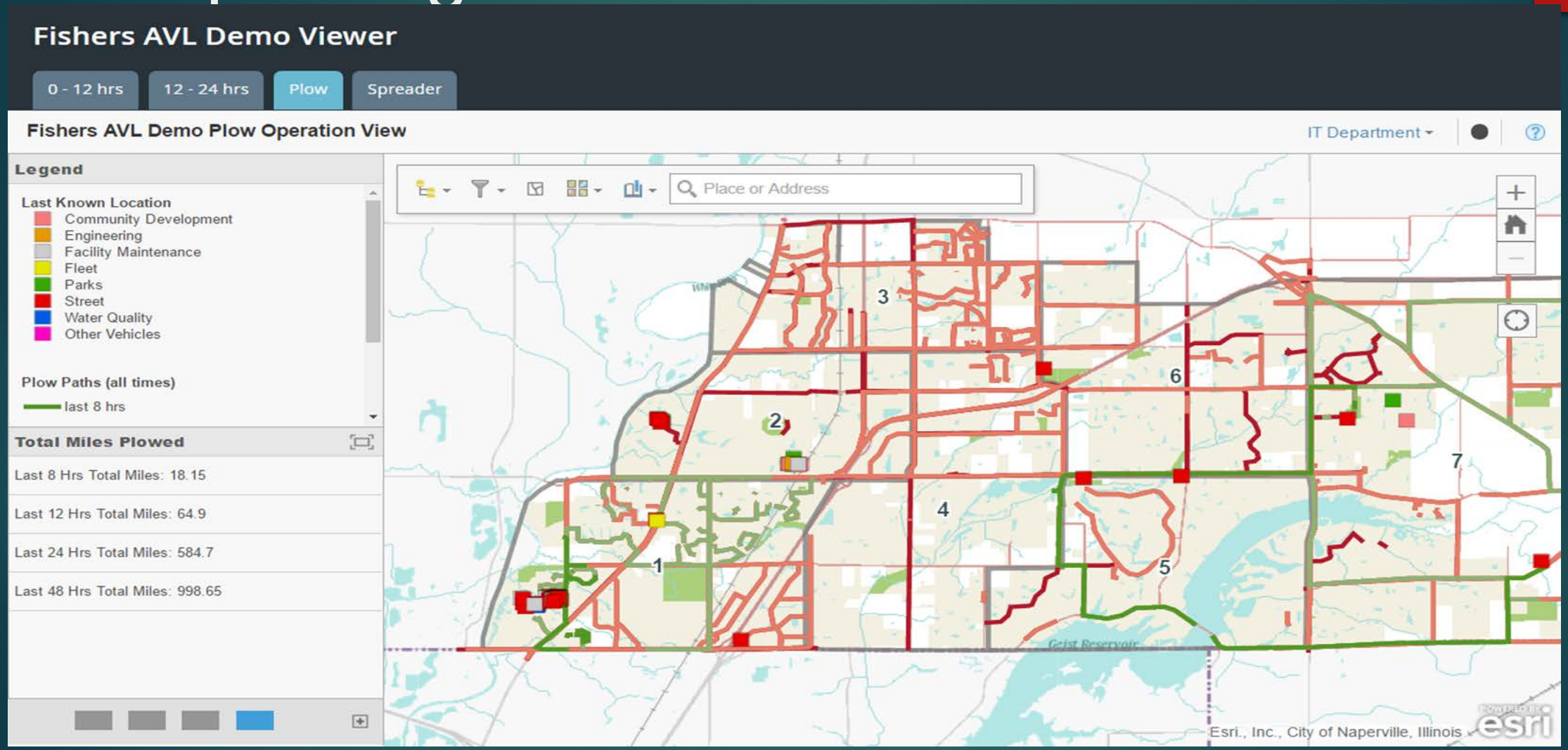
Reporting



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Pitfalls

- Multiple Stakeholders – to be successful, communications between departments and contractors outlining responsibilities is essential.
- Know your equipment and try to standardize vehicles and controls
- Not having an end goal
- Not giving your contractor remote access to the server that houses all the AVL data or vise versa
- Not being a mobile friendly work place
- Not getting staff buy-in

Future Goals

- Geofence areas (School property) to improve accuracy of invoicing
- Create plow/deicing routes – turn by turn directions
- Integrate sensor conditions and warnings into list of alerts
- Reporting - day-to-day, month-to-month, year-to-year
- Live mapping to share with public
- We don't know what we don't know…….

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Questions?

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