



2022 NEARC CONFERENCE

ArcGIS Velocity: An Introduction

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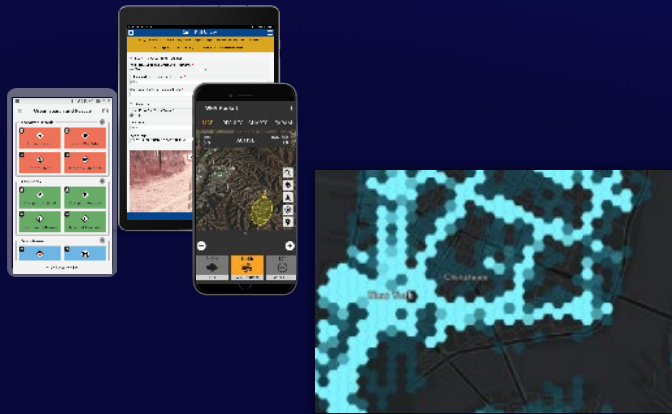
GAiken@esri.com

ArcGIS Velocity
Working with a
connected world

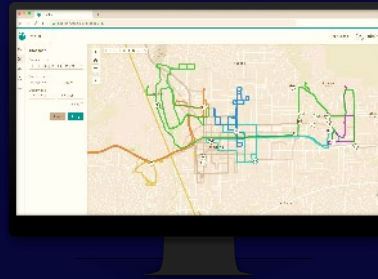


Real-time use cases

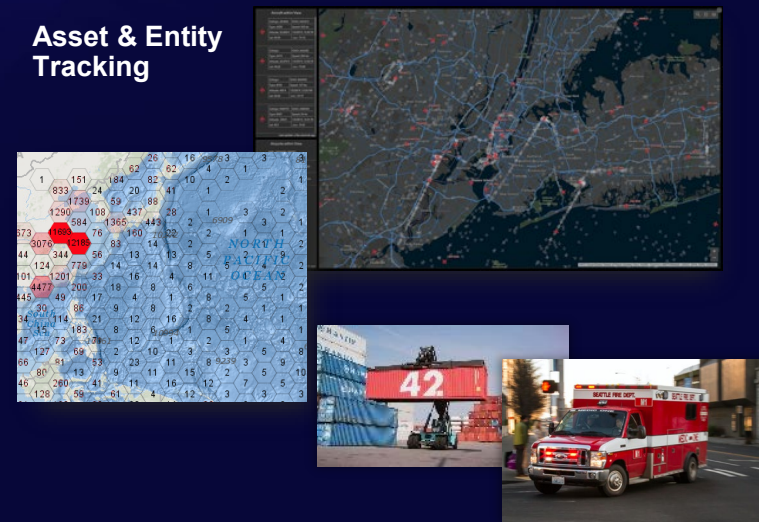
Personnel Tracking



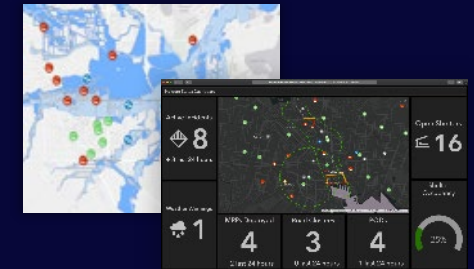
Resource Optimization



Asset & Entity Tracking



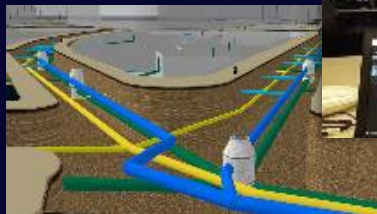
Hazard & Threat Monitoring



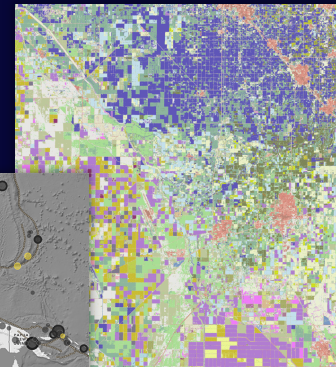
Operations Monitoring



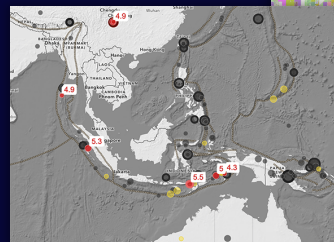
SCADA Integration



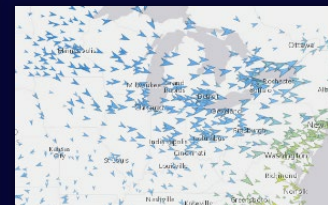
Soil & Crop Monitoring



Anomaly Detection



Air Quality Monitoring



Connected Cars

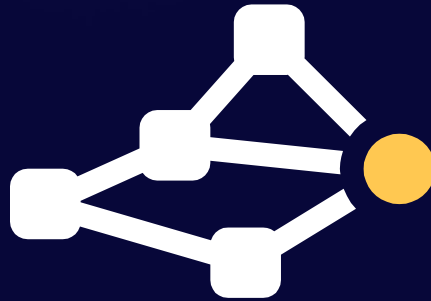


ArcGIS Velocity delivers a real-time framework

Managing and analyzing high volume and velocity data in support of mission critical applications



Ingest



Analyze



Alert

Real-Time Visualization & Analytics Integrating Sensor Networks and IoT

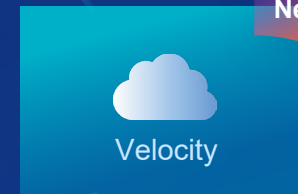
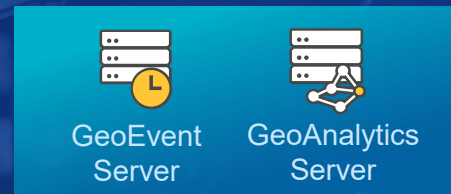
Supporting High-Velocity Data Streams
Tracking, Monitoring and Alerting



Enterprise

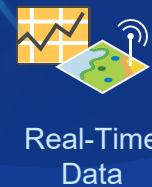


ArcGIS Online



- Cloud Native Service
- Very Fast
- High Volume
- SaaS

Sensors



IoT Platforms

Collapsing the Time from Measurement to Decision Making

ArcGIS GeoEvent Server

ArcGIS Velocity

Enterprise ready

Cloud ready

On-premises, requires ArcGIS Enterprise

Software as a service (SaaS), requires ArcGIS Online

Secure deployments in local or cloud environments

Kubernetes-based, cloud-native architecture

Real-time data ingestion, processing, and analysis

High-speed, real-time data ingestion; processing; and analysis

Extensible

Easy configuration and maintenance with built-in resiliency and failover

Advanced real-time processing

Big data analysis

ArcGIS Velocity

Real-time and big data capabilities for ArcGIS Online



Ingest

Protocols, formats, data rates



Analyze

In real-time, near real-time, over time



Alert

Alert, actuate



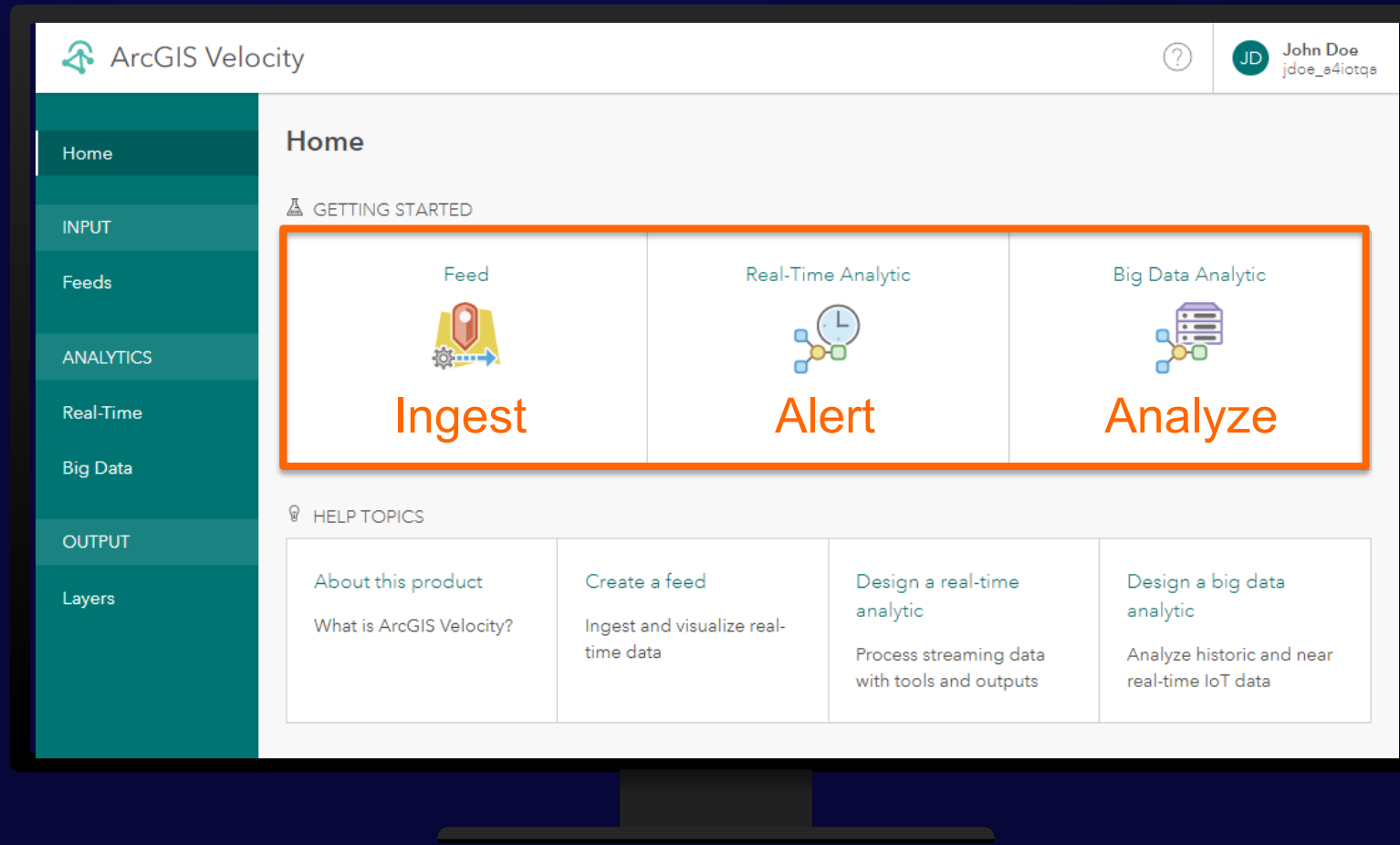
ArcGIS Velocity

Leverage sensor and IoT data for geospatial reasoning




...connects to industry leading cloud IoT platforms, data lakes, and sensor vendor APIs

ArcGIS Velocity



...ingest, process, and analyze your real-time data with ArcGIS Online

3_realtime feed Details Logs Metric




Feed by [User]

Created: 06/21/2022 Updated: 06/21/2022 Started: 06/23/2022 10:19 AM

[Edit](#) [Clone](#) [Share](#) [Delete](#) [Stop](#)

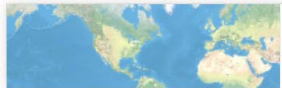
Running at 19.67 events/second



Maximum number of preview features reached. Reconnect to see latest features.

[Add to new analytic](#) [Item details](#) [Open in Map Viewer](#)

Associated feature layer



V3_realtime_feed

V3_realtime_feed

Jun 21, 2022

Feed details

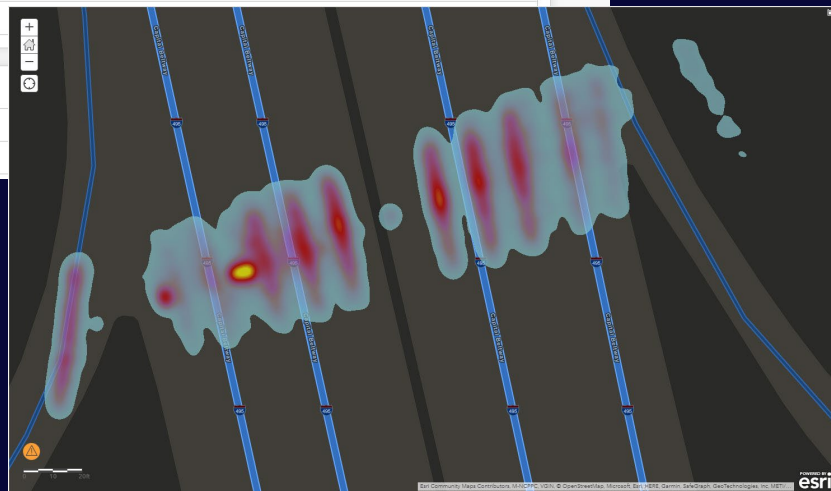
Type: HTTP Receiver

HTTP endpoint path	[Redacted]
Authentication type	None

Format details

Format	Delimited
Build geometry from fields	True

Feeds



Feeds

Ingest and visualize real-time data streams

- **Connect to data sources**
 - ArcGIS (Feature & Stream Layers)
 - Cloud IoTs (Amazon, Azure, Cisco)
 - Web & Messaging (HTTP, Kafka, RSS...)
- **Schema auto-discovery**
- **Is a type of stream layer**
 - Immediate display of new data

The screenshot displays the ArcGIS Velocity interface for a specific feed. At the top, the feed name 'ais_ship_positions' is shown. Below it, there is a summary card for a feed by 'jdoe_e4iotqa' titled 'Simulated AIS ship positions from the Marine Cadastre Automatic Identification System'. The card indicates it is 'Running at 5.33 events/second' and includes a 'Stop' button. Metadata shows it was created on 09/23/2020, updated on 09/23/2020, and started on 09/23/2020 at 9:51 AM. Action buttons for 'Edit', 'Clone', 'Share', and 'Delete' are present. A map on the right shows the Pacific Northwest coast with blue dots representing ship positions near Vancouver and Portland. Below the summary card are buttons for 'Add to new analytic', 'Item details', and 'Open in Map Viewer'. A 'Feed details' section follows, listing configuration parameters for an HTTP Simulator.

Field separator	.
Features per execution	30
Repeat simulation	true
Interval for sending events (milliseconds)	1000
Time field index	1
URL	https://e4iot-public-s3-us-west-2.amazonaws.com/...
Convert to current time	true

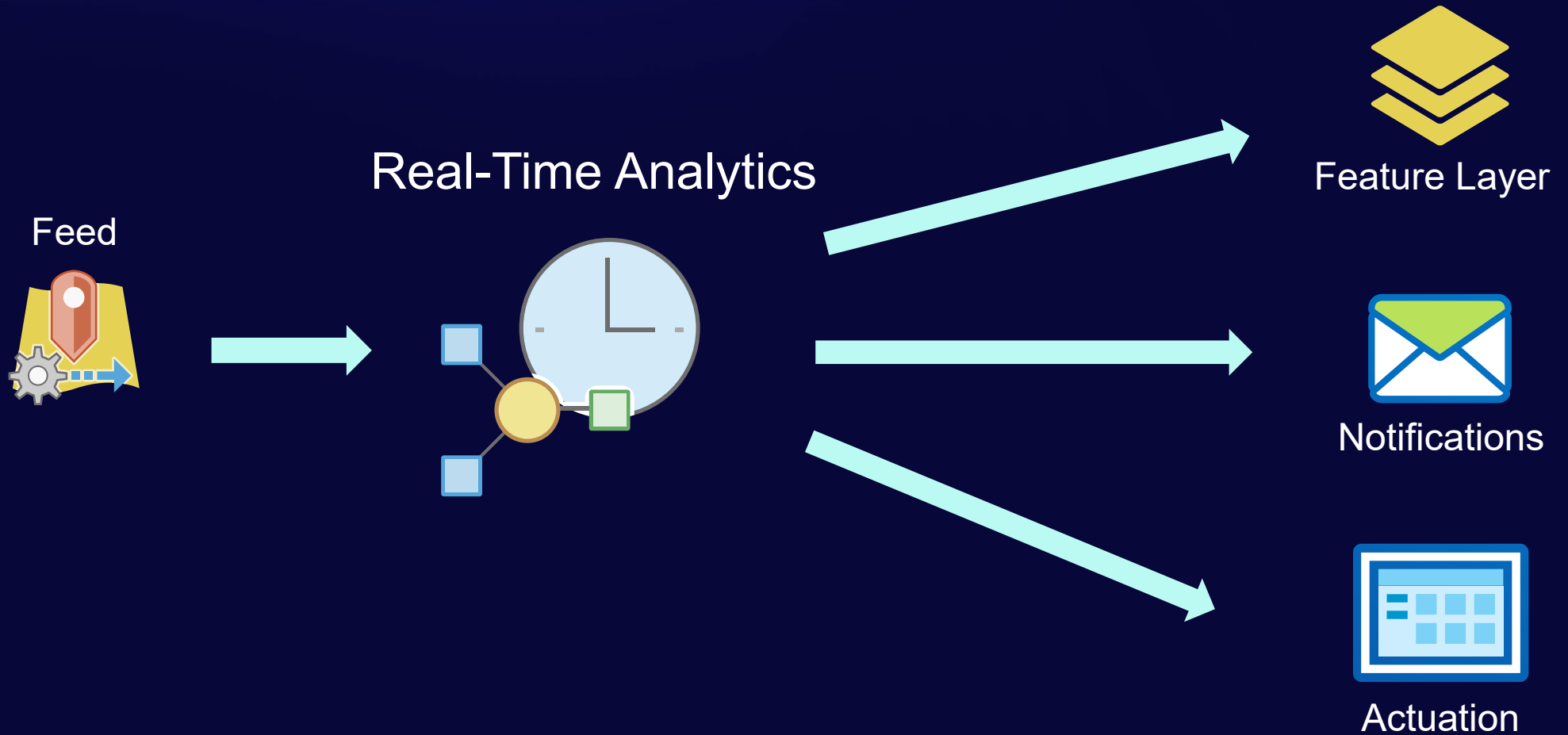
This screenshot shows the 'Feeds' management page in ArcGIS Velocity. The left sidebar contains navigation options: Home, INPUT, Feeds, ANALYTICS, Real-Time, Big Data, OUTPUT, and Layers. The main content area shows a table of feeds with columns for Title, Executable, Status, and Input rate (events/sec). A 'Filter by name' search bar is at the top right. The table lists two feeds: 'ais_ship_positions' (Executable: Yes, Status: Started, Input rate: 30) and 'satellite_locations' (Executable: Yes, Status: Stopped, Input rate: n/a). A '+ Create feed' button is located at the top left of the table.

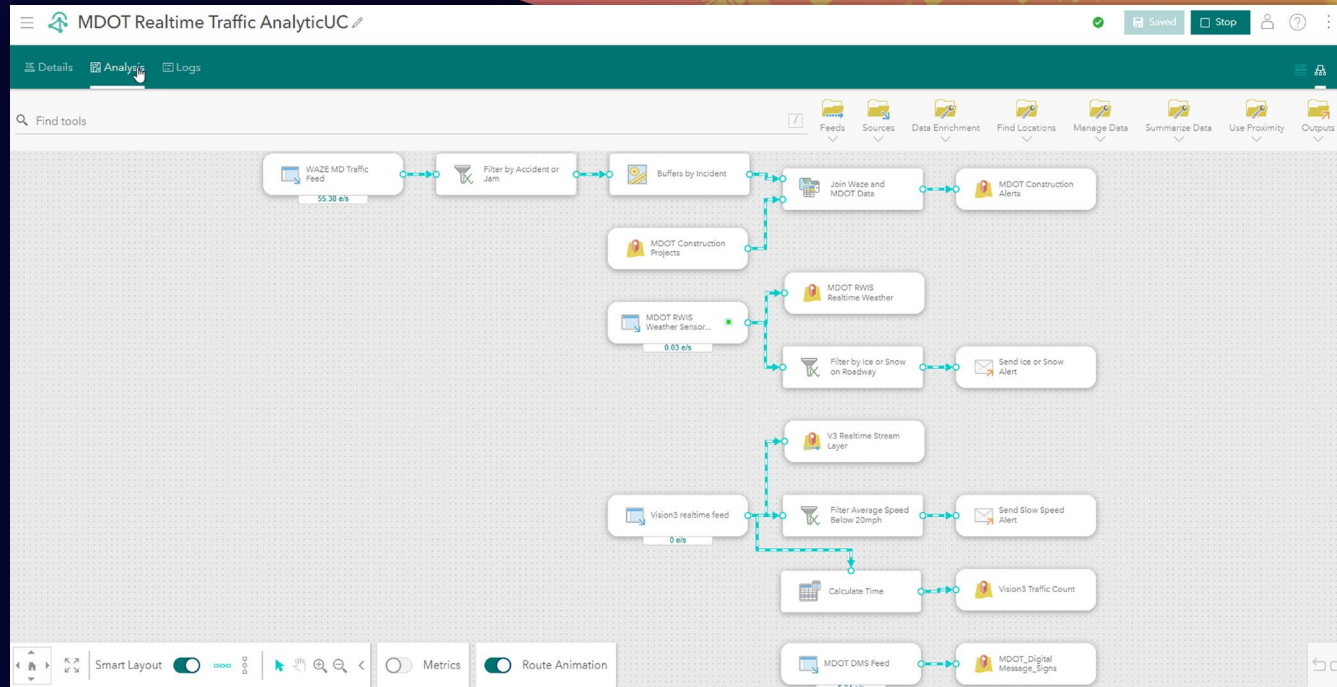
Title	Executable	Status	Input rate (events/sec)
ais_ship_positions	Yes	Started	30
satellite_locations	Yes	Stopped	n/a

...discover and share real-time data streams as items in ArcGIS

Real-time analysis

Process and analyze real-time data streams





Real-Time Analytics

Real-Time Analytics

Process and analyze real-time data streams

- Input Sources

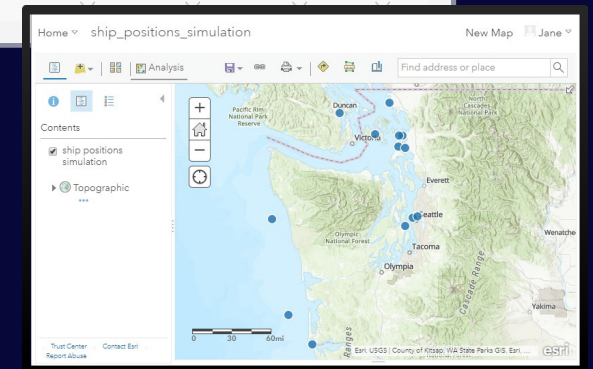
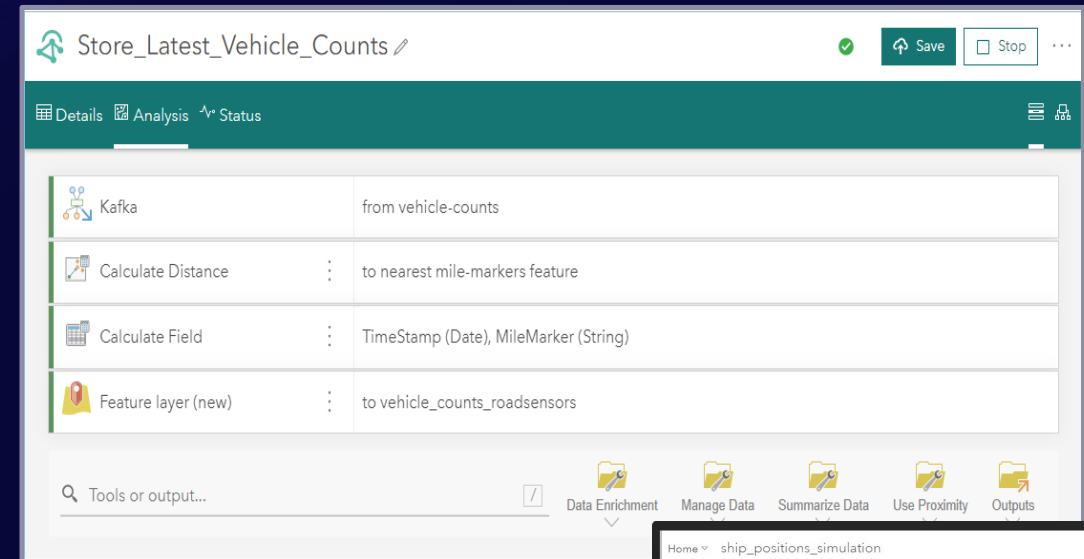
- Feeds (one or more)
- Static data sources (enrichment, joins)

- Analytic Tools

- Build a pipeline of zero to many....
- Analyze individual observations

- Outputs

- ArcGIS Layers (Map & Feature)
- Alerts & Notifications (Email, Actuators)

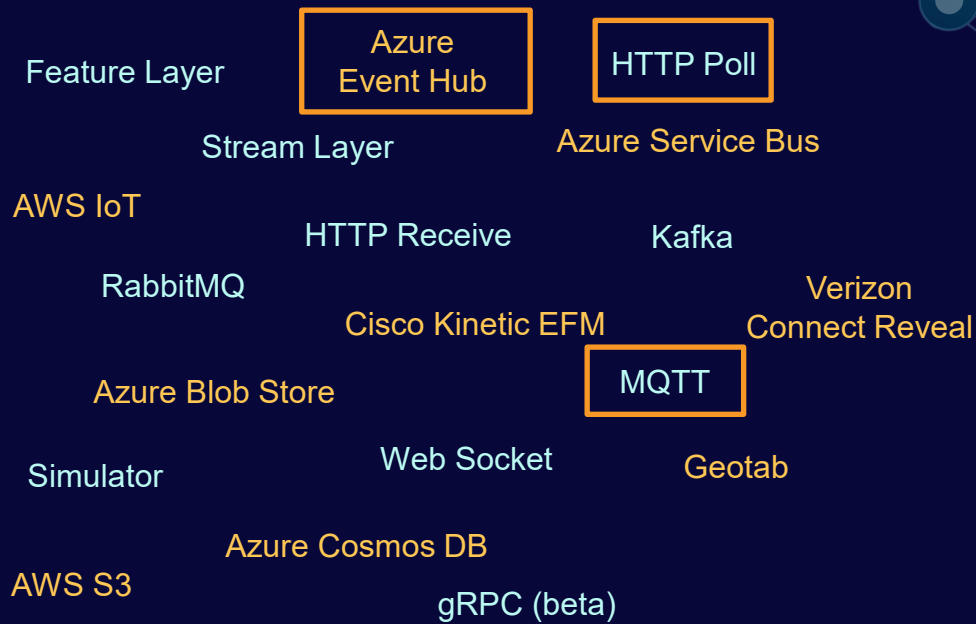


...generating alerts from and triggering actions to IoT devices in real-time

Input & output types

Supported types and formats

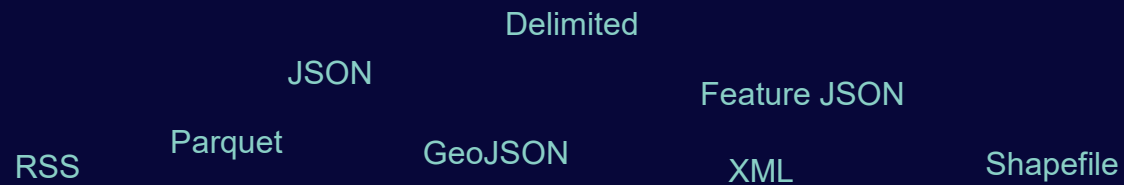
Feeds and data sources



Outputs

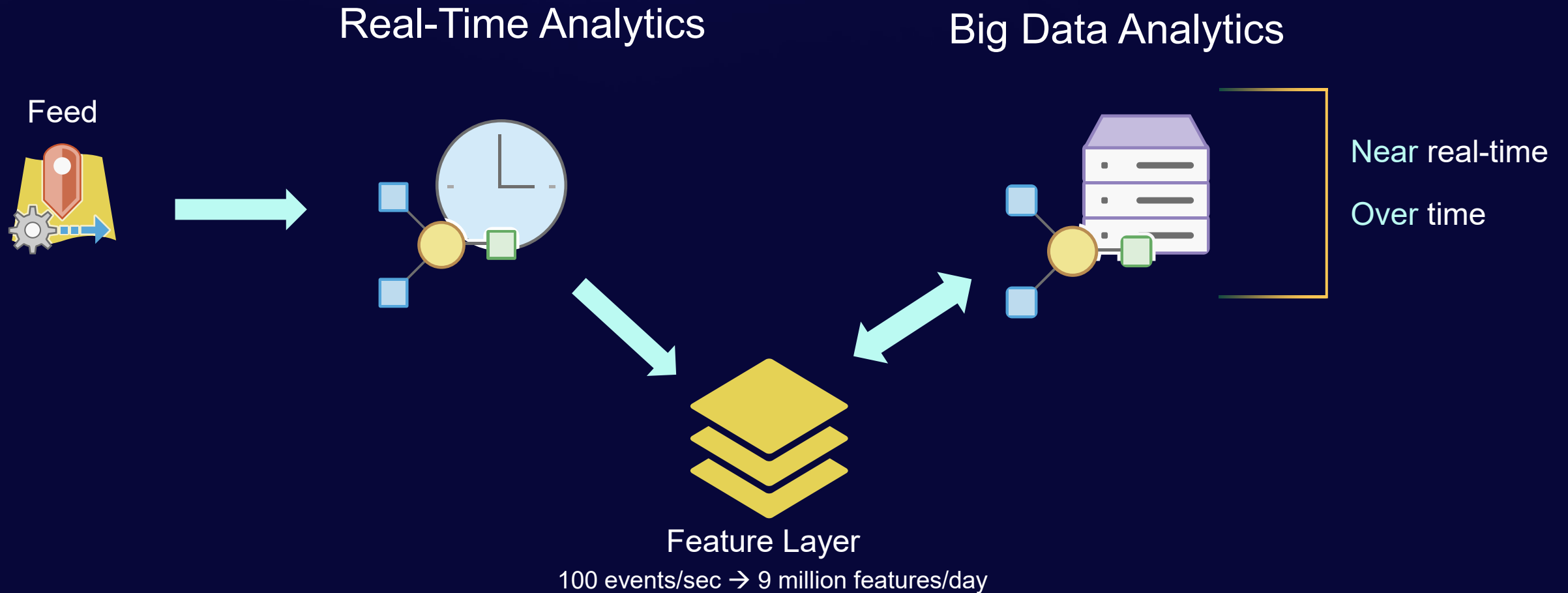


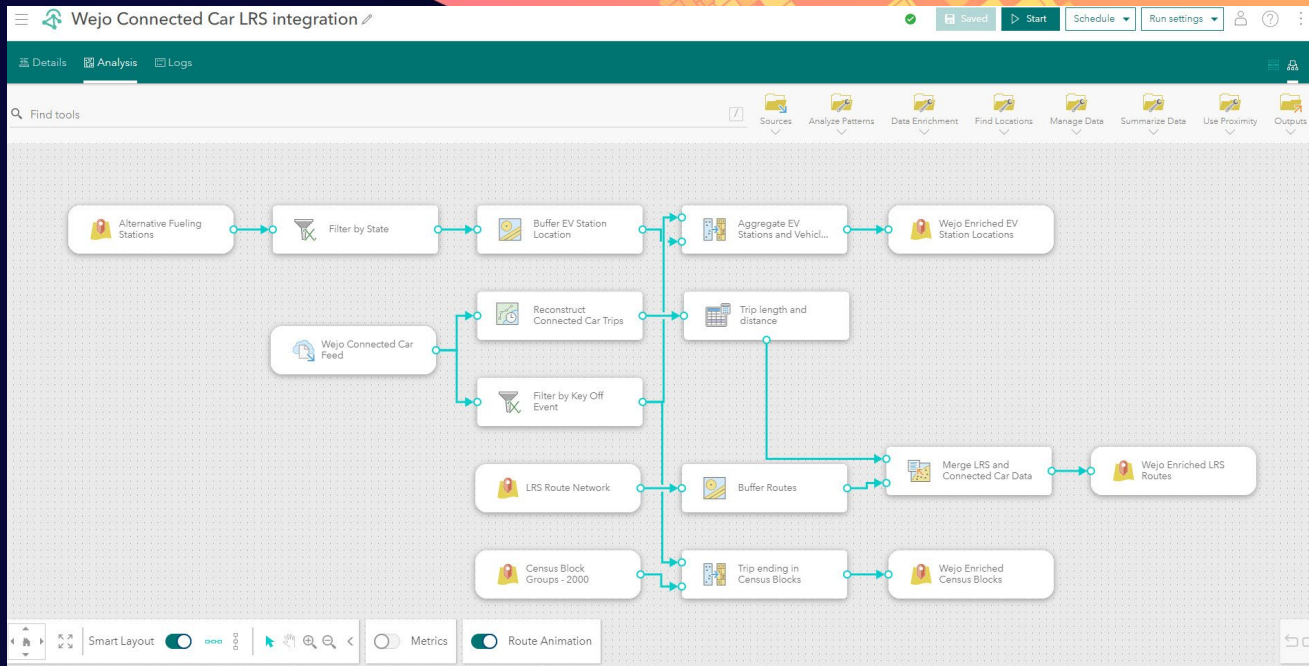
Formats



End-to-end analysis

Evaluate incidents, trends, and patterns against any decision timeline





Big Data Analytics

Big Data Analytics

Perform batch analysis on stored big data

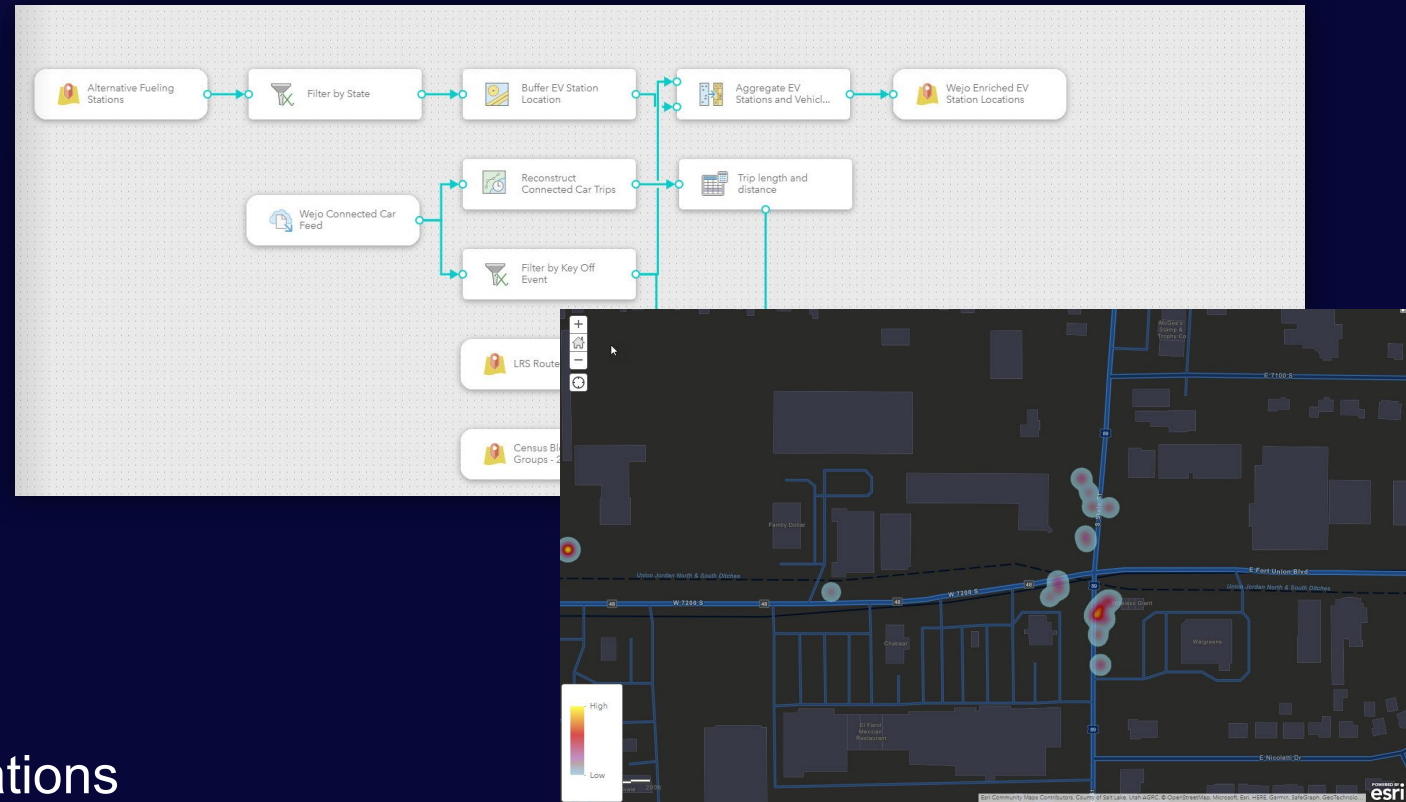
- Input Sources

- ArcGIS (Feature Layers)
- Cloud (Amazon S3, Azure Blob)
- Web & Messaging (HTTP, RSS...)

- Analytic Tools

- Analyze Patterns
- Find Locations
- Manage, Summarize, Enrich Data

- Output results to one or more destinations



...big data analysis pipelines on-demand or scheduled for recurring execution

Spatiotemporal analysis

Tools for transforming, enriching, and analyzing geospatial data

- **Summarize Data**

- Aggregate Points
- Join Features
- Reconstruct Tracks
- Summarize Attributes
- Summarize Within

- **Find Locations**

- Detect Incidents
- Find Dwell Locations
- Find Similar Locations

- **Enrich Data**

- Calculate Motion Statistics

- **Use Proximity**

- Create Buffers
- Calculate Distance
- Snap to Network

- **Analyze Patterns**

- Calculate Density
- Calculate Journeys
- Find Hot Spots
- Find Point Clusters

- **Manage Data**

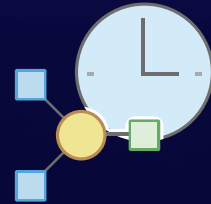
- Filter
- Calculate Fields
- Dissolve Boundaries
- Overlay Layers
- Select Fields
- Map Fields
- Project
- Merge



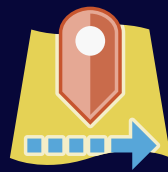
Visualization

Live or historic observations

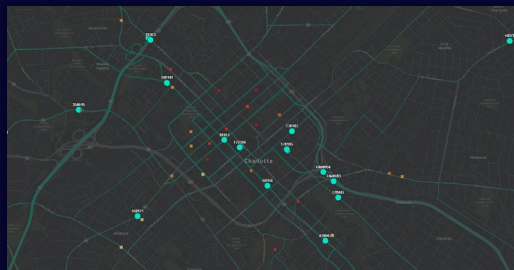
Real-Time Analytics



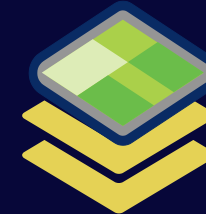
Big Data Analytics



Stream Layer



Feature Layer



Map Image Layer

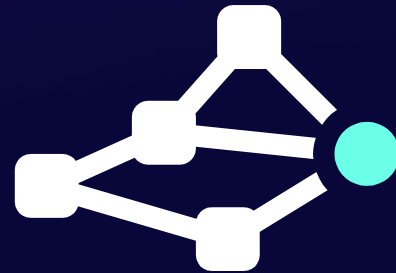


ArcGIS Velocity

Real-time and big data capability for ArcGIS Online



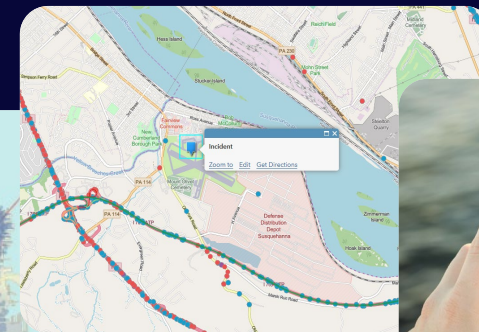
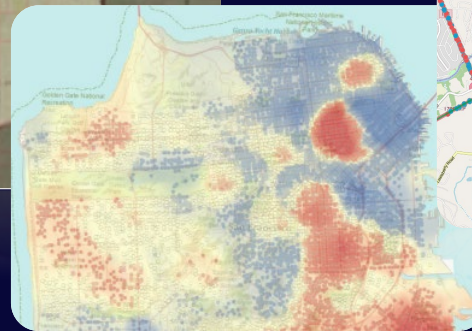
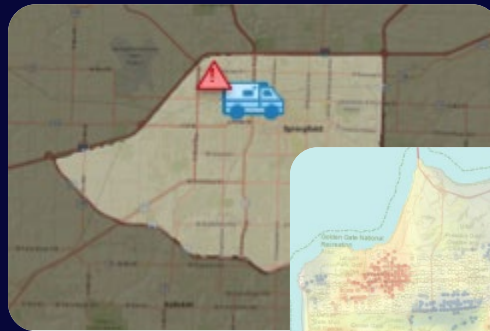
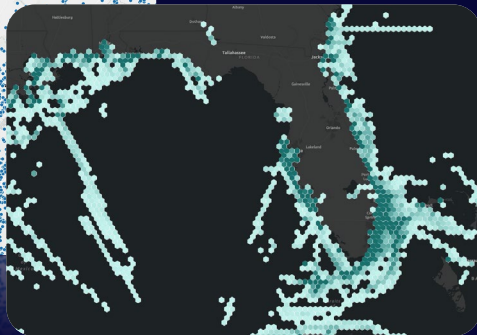
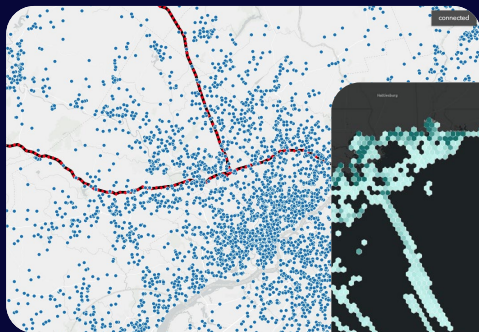
Ingest



Analyze

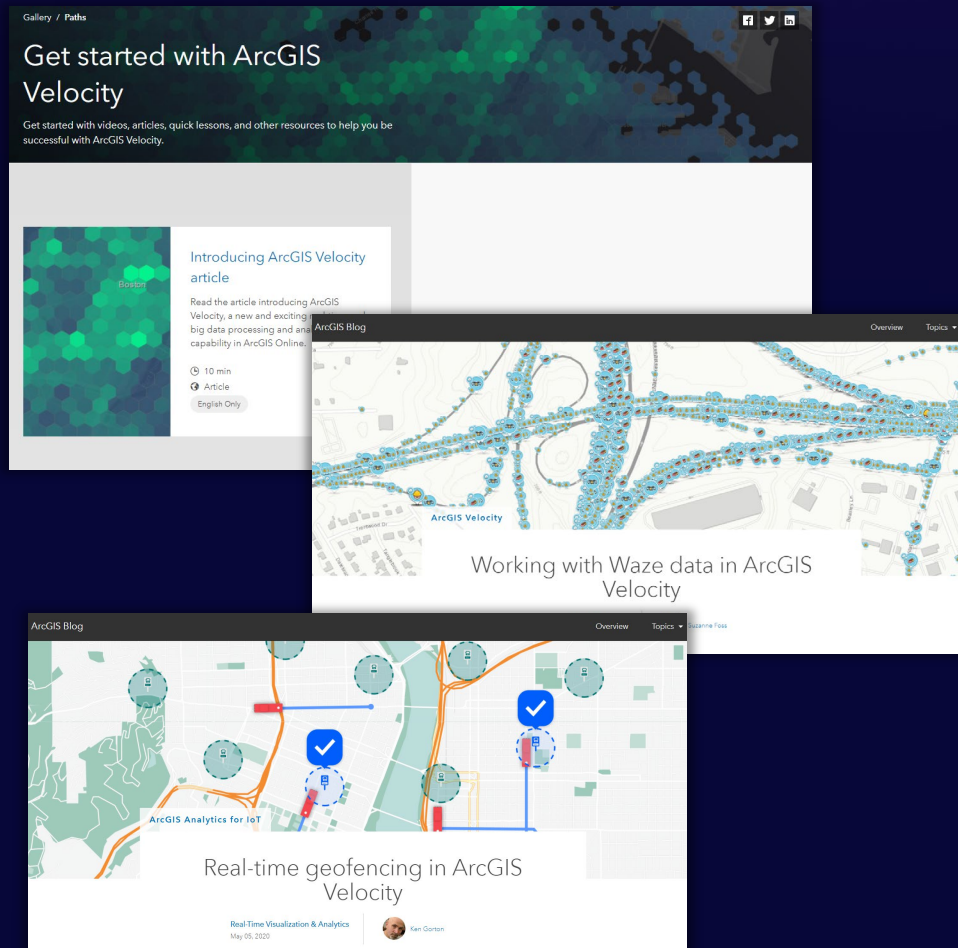


Alert



Resources

Information and documentation



Documentation:

<https://doc.arcgis.com/en/iot>

Learn Path:

<https://learn.arcgis.com/en/paths/get-started-with-arcgis-velocity/>

Blogs:

<https://www.esri.com/arcgis-blog/?s=#&products=arcgis-velocity>

Community:

<https://community.esri.com/t5/arcgis-velocity/ct-p/arcgis-velocity>

Q&A

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