



# ArcGIS Velocity: An Introduction

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DEVELOPER SUMMIT

The background features a vibrant, abstract composition. On the left side, there are several overlapping elements: a blue globe, a red and yellow DNA double helix, and a blue and yellow ribbon-like structure. The bottom left corner shows a blue and yellow grid pattern. The right side of the image is dominated by a solid blue gradient that transitions into a lighter blue at the top right. The overall aesthetic is modern and scientific.

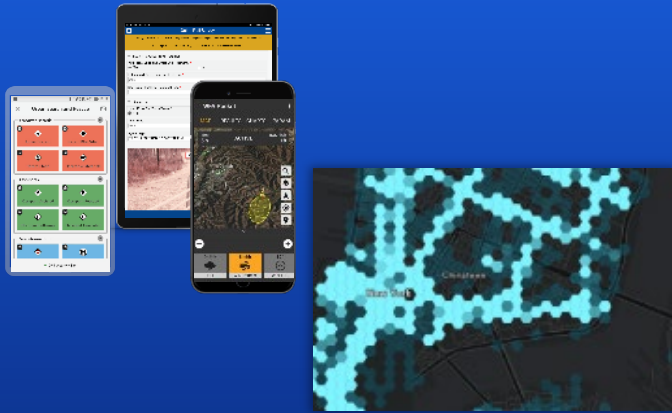
# Introduction & overview

welcome  
to the  
connected world

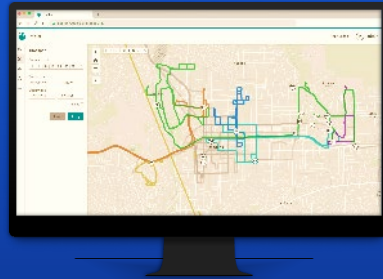


# Geospatial use cases in the Internet of Things

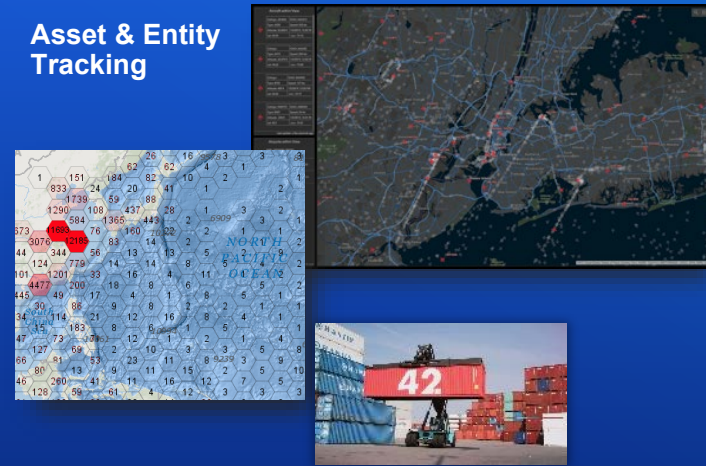
## Personnel Tracking



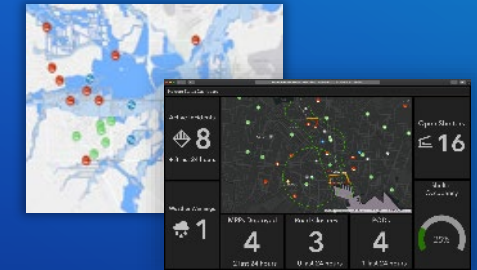
## Resource Optimization



## Asset & Entity Tracking



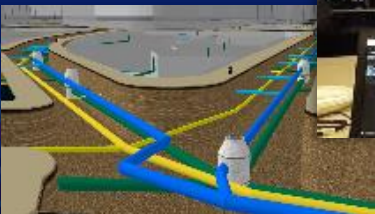
## Infrastructure Protection



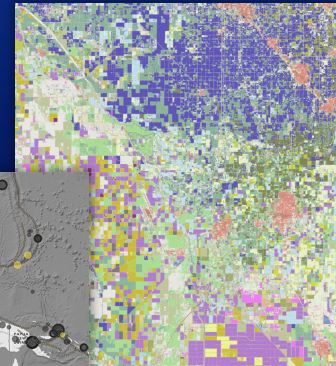
## Operations Monitoring



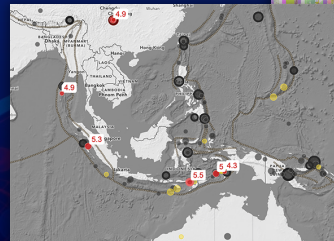
## SCADA Integration



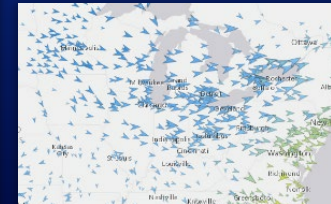
## Soil & Crop Monitoring



## Anomaly Detection



## Air Quality Monitoring



## Connected Cars



# ArcGIS Velocity

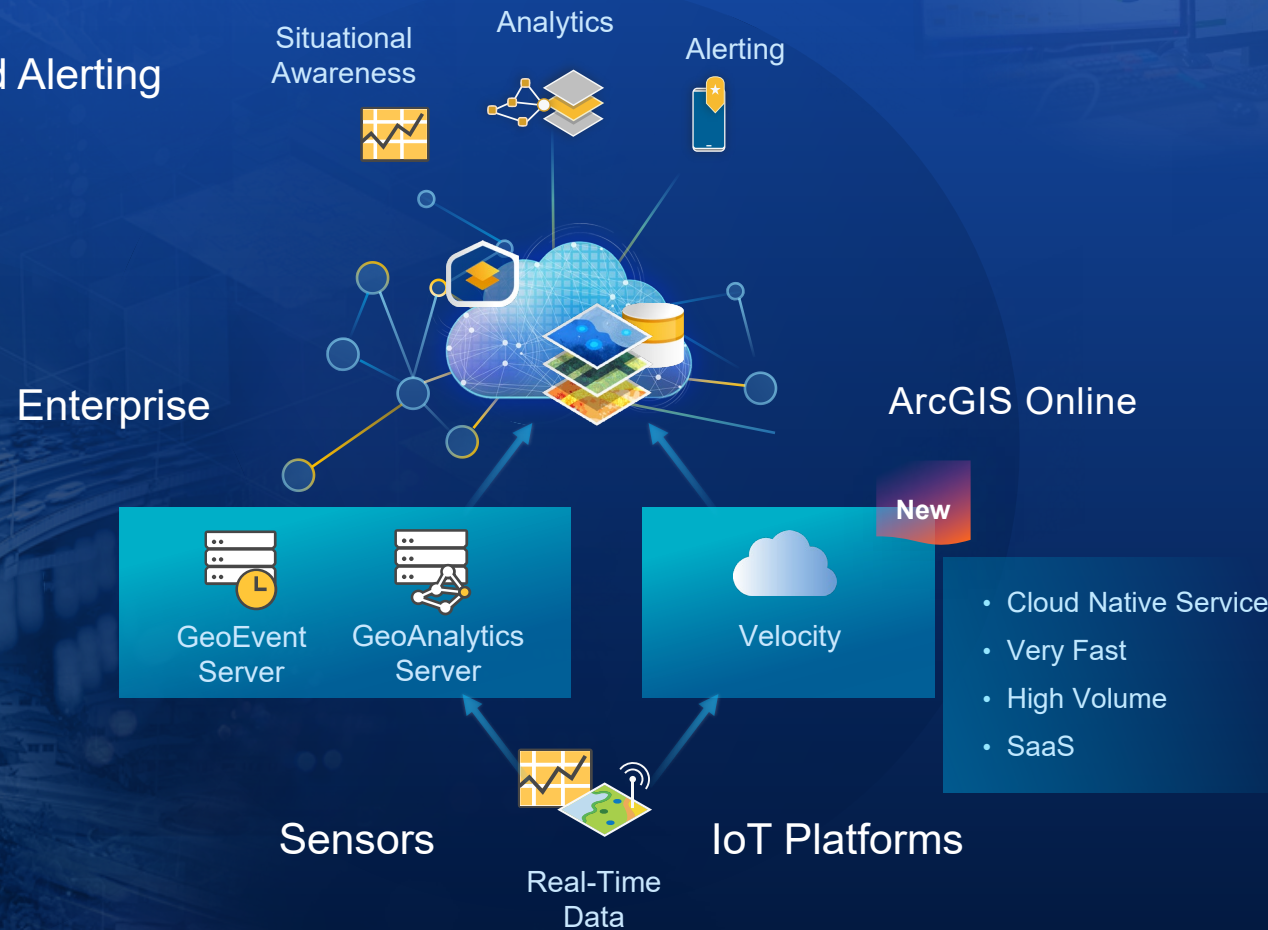
## Real-time and big data capabilities for ArcGIS Online

- Ingest real-time sensor data
- Analyze data to detect incidents
  - In real-time
  - In *near* real-time
  - Over time
- Take action



# Real-Time Visualization & Analytics

Supporting High-Velocity Data Streams  
Tracking, Monitoring and Alerting



*Collapsing the Time from Measurement to Decision Making*

# How it works

The background features a vibrant blue gradient. On the left side, there is a complex, abstract graphic design. It includes a stylized globe, various curved lines in shades of blue, red, and yellow, and patterns resembling data or molecular structures. The overall aesthetic is modern and technological.

# ArcGIS Velocity

Leverage sensor and IoT data for geospatial reasoning

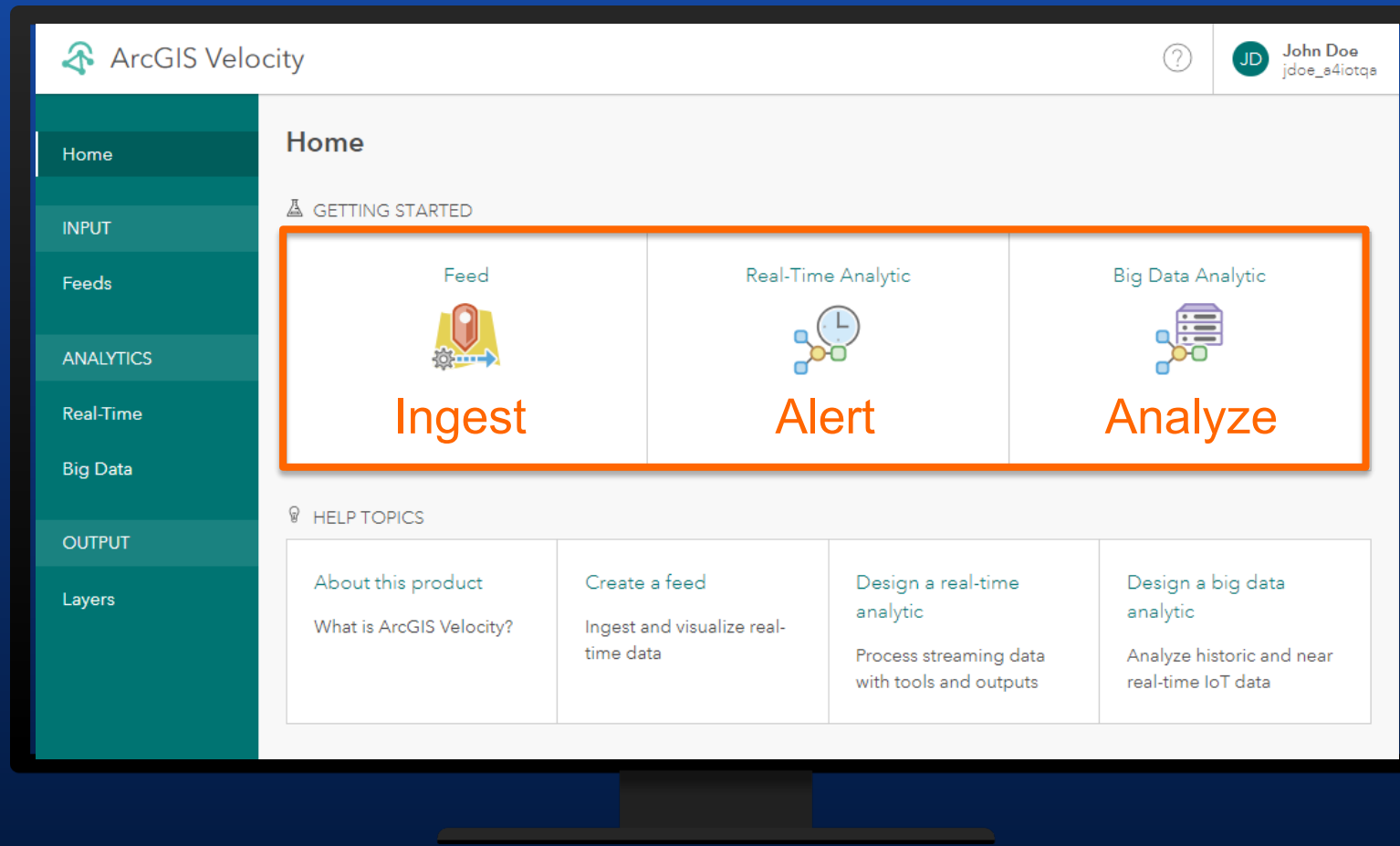


...connects to industry leading cloud IoT platforms, data lakes, and sensor vendor APIs

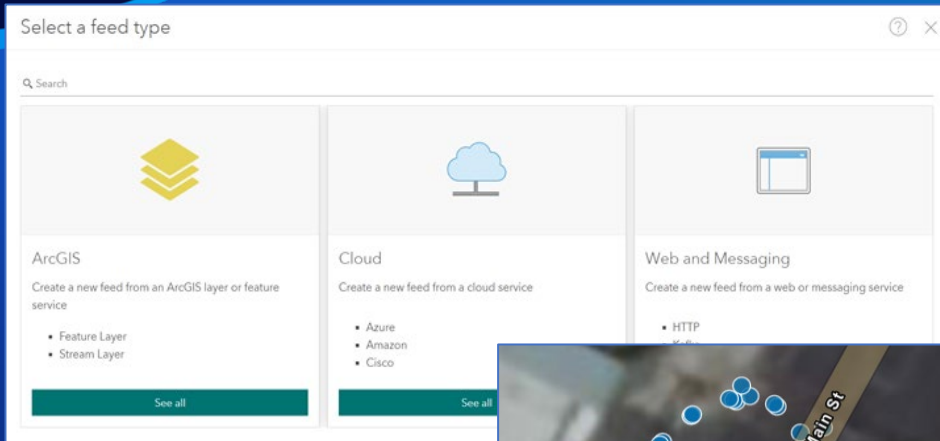


# New application

Authoring experience for hosted real-time & big data tasks



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



# Feeds

Greg Christakos

# Feeds

## Ingest & visualize real-time data streams

- Connect to data streams
  - ArcGIS (feature layers, stream layers)
  - Cloud IoTs (Azure, AWS, Cisco)
  - Web & Messaging (HTTP, Kafka, MQTT)
- Schema auto-discovery
- Immediate real-time visualization
  - Behaves like stream layer in a map

The screenshot shows the 'ais\_ship\_positions' feed details page in ArcGIS Velocity. The page includes a map of the Pacific Northwest with ship locations, a 'Stop' button, and a 'Feed details' table. The table contains the following information:

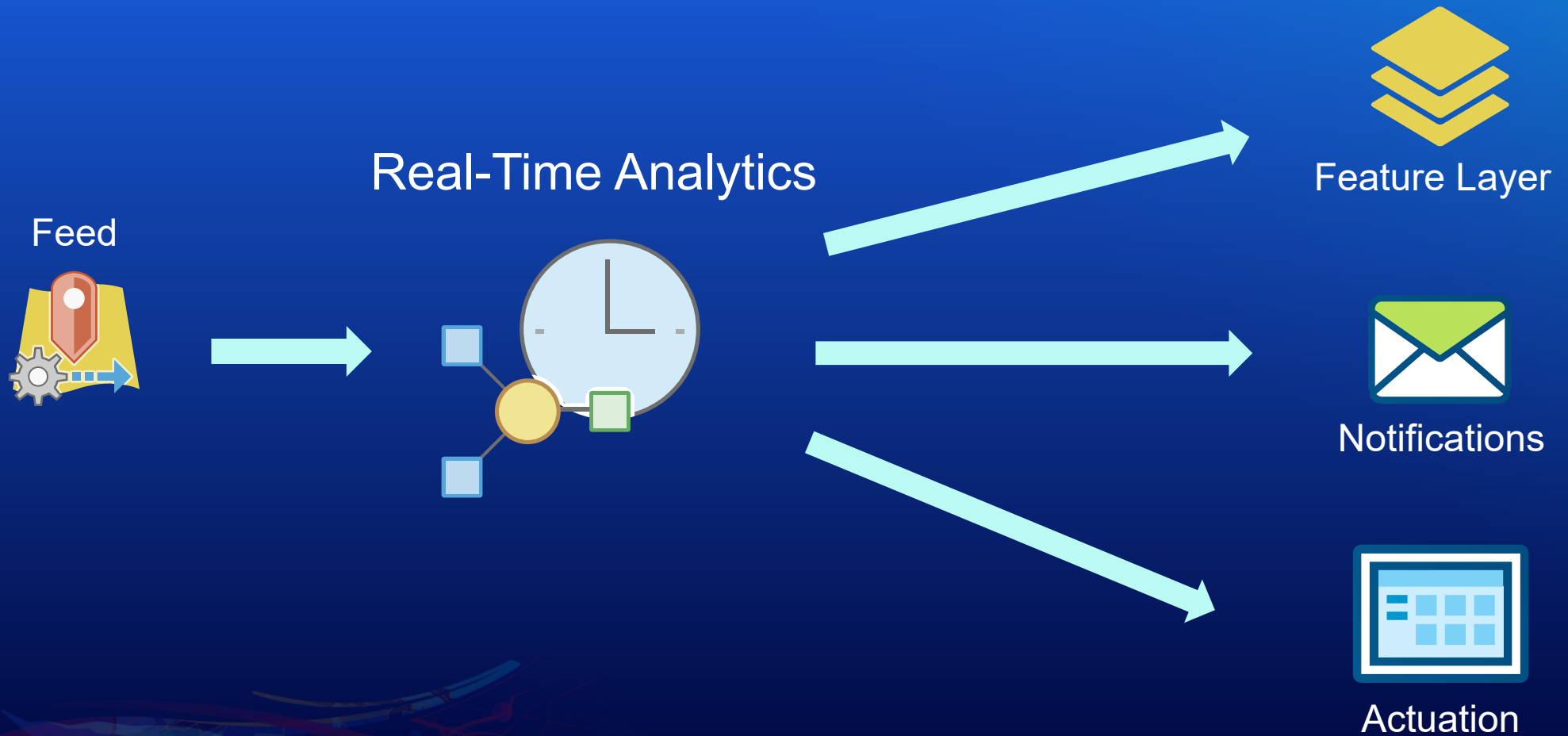
Field separator	.
Features per execution	30
Repeat simulation	true
Interval for sending events (milliseconds)	1000
Time field index	1
URL	https://a4iot-public-s3-us-west-2.sma...
Convert to current time	true

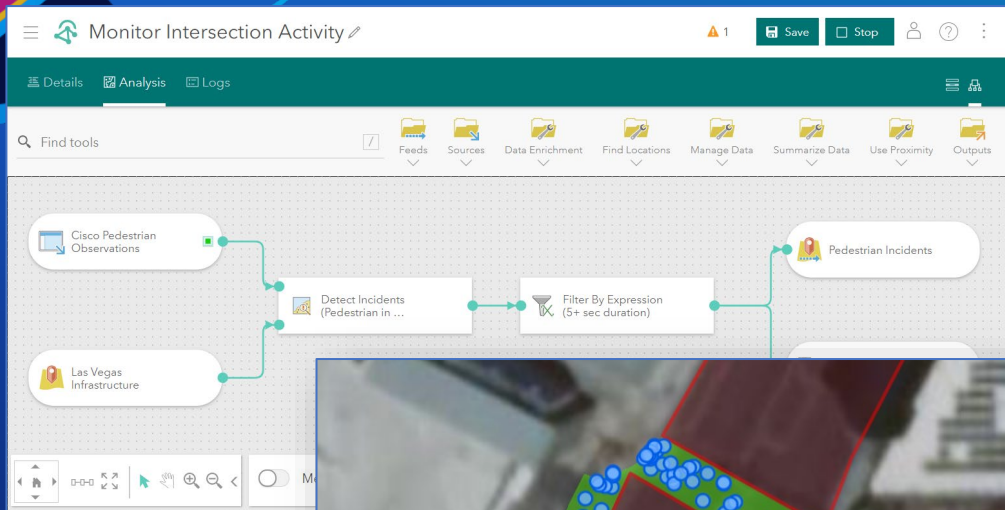
The screenshot shows the 'Feeds' management page in ArcGIS Velocity. The page includes a table with the following information:

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

# Real-time analysis

*Process and analyze real-time data streams*





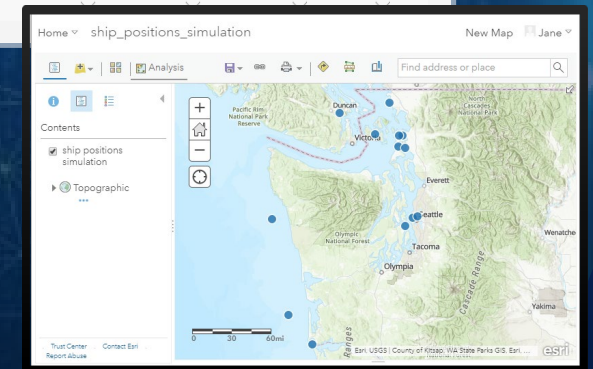
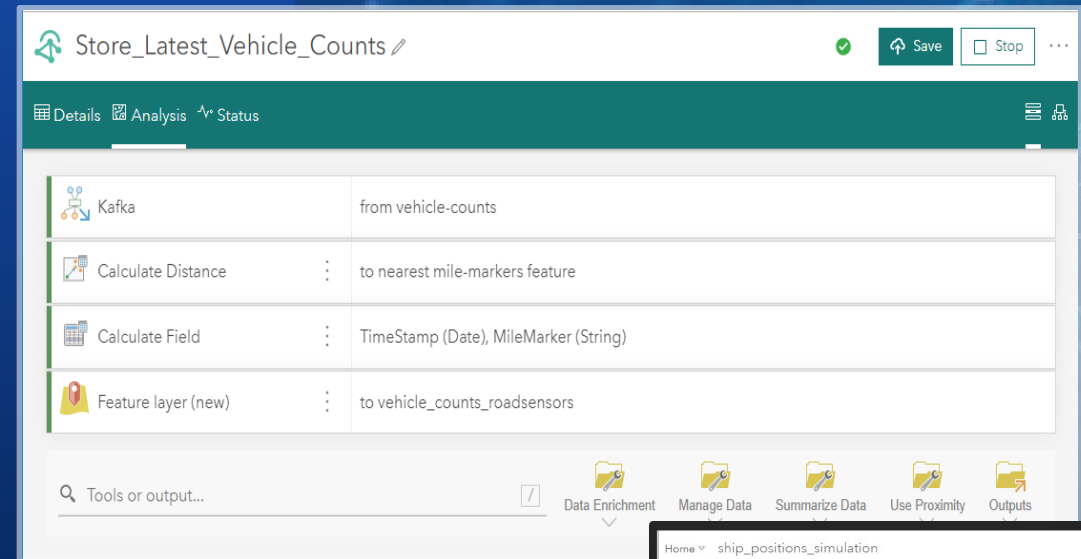
# Real-time analytics

Greg Christakos

# Real-time analytics

Analyze and process real-time data streams

- Input data sources
  - Feeds
  - Static datasets (geofencing, enrichment)
- Analytic tools
- Outputs
  - ArcGIS layers (feature, stream, map image)
  - Alerts & notifications (email, text message)



# Inputs & outputs

Supported systems, protocols, and data formats

## Feeds and data sources

Feature Layer  
Stream Layer  
AWS IoT  
RabbitMQ  
Azure Blob Store  
Simulator  
AWS S3

Azure Event Hub  
HTTP Receive  
Cisco Kinetic EFM  
Web Socket  
Azure Cosmos DB

HTTP Poll  
Azure Service Bus  
Kafka  
MQTT



## Outputs

Azure IoT Hub  
Kafka  
Email  
Azure Blob Store

Feature Layer  
Stream Layer  
AWS S3  
Text Message  
RabbitMQ

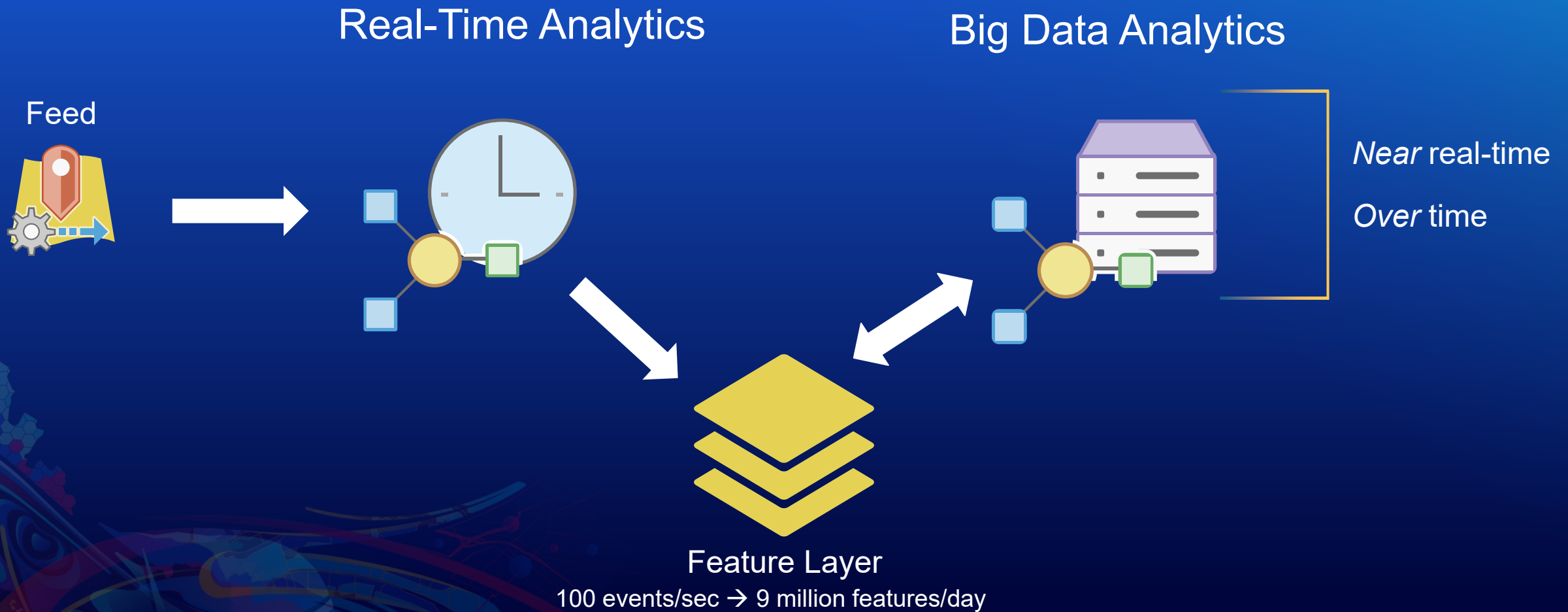
HTTP Post

## Formats

Delimited  
JSON  
Parquet  
GeoJSON  
XML  
Shapefile  
Feature JSON  
RSS

# End-to-end analysis

*Evaluate incidents, trends, and patterns against any decision timeline*





Waze Traffic Jam Trends

Details Analysis Logs

Find tools Sources Analyze Patterns Data Enrichment Find Locations Manage Data Summarize Data Use Proximity Outputs

Las Vegas Waze Jam Observations

Las Vegas Street Centerlines

Calculate Distance (Jams to Streets)

Join Features (Jams to Streets)

Map Fields (Rename ObjectID)

Traffic Jams per Road Segment

```
graph LR; S1[Las Vegas Waze Jam Observations] --> P1[Calculate Distance (Jams to Streets)]; S2[Las Vegas Street Centerlines] --> P1; P1 --> P2[Join Features (Jams to Streets)]; P2 --> P3[Map Fields (Rename ObjectID)]; P3 --> P4[Traffic Jams per Road Segment];
```



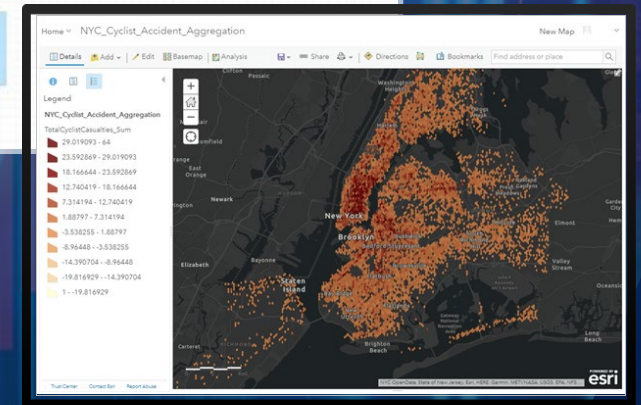
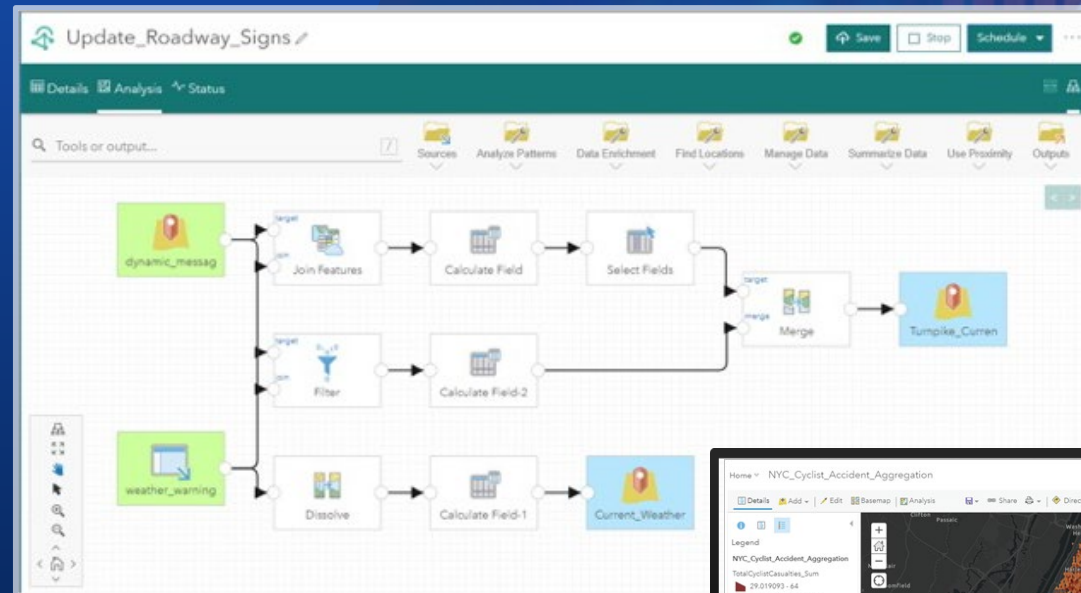
# Big data analytics

Greg Christakos

# Big data analytics

Perform batch analysis on large volumes of data

- Input data sources
  - ArcGIS (feature layers)
  - Cloud IoTs (Azure Blob, AWS S3)
  - Web & Messaging (HTTP, RSS)
- Analytic tools
  - Analyze patterns
  - Find locations of interest
  - Manage, summarize, & enrich data
- Outputs
  - Store results (feature layers)
  - Alerts & notifications (email, text message)
  - Export data to cloud stores (Azure Blob, AWS S3)



# Spatiotemporal analysis

## Tools for transforming, enriching, & analyzing geospatial data

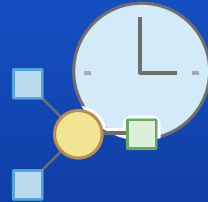
- Summarize Data
  - Aggregate Points
  - Join Features
  - Reconstruct Tracks
  - Summarize Attributes
  - Summarize Within
- Find Locations
  - Detect Incidents
  - Find Dwell Locations
  - Find Similar Locations
- Enrich Data
  - Calculate Motion Statistics
- Use Proximity
  - Create Buffers
  - Calculate 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



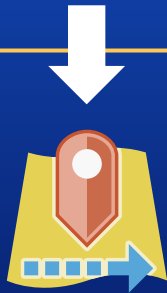
# Visualization

*Live or historic observations*

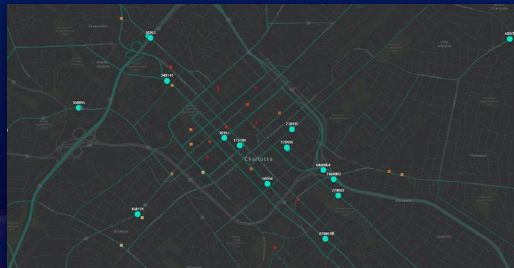
Real-Time Analytics



Big Data Analytics



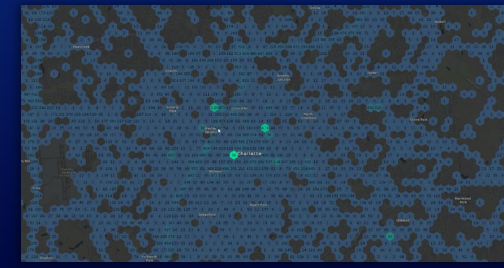
Stream Layer



Feature Layer



Map Image Layer



The background features a vibrant, abstract composition. On the left side, there are several overlapping elements: a stylized globe with a grid pattern, a blue and yellow curved shape, and a red and yellow curved shape. The bottom left corner is filled with a complex pattern of red, yellow, and blue lines and shapes, resembling a molecular structure or a data visualization. The right side of the image is a solid, light blue gradient.

Wrap up

# Licensing

Annual subscription on top of ArcGIS Online

The image shows two overlapping screenshots of Esri's web interfaces. The background screenshot is the ArcGIS Online homepage, featuring a navigation menu (ArcGIS, Pricing, Map, Scene, Help), a search bar, and a 'Sign In' button. The main content area includes a 'Welcome to ArcGIS Online!' message, a 'Learn by doing' section with three cards, and a 'Try ArcGIS Online' button. The foreground screenshot is the ArcGIS Velocity dashboard, which has a dark green sidebar menu with options: Home, INPUT, Feeds, ANALYTICS, Real-Time, Big Data, OUTPUT, and Layers. The main dashboard area is titled 'Home' and contains two sections: 'GETTING STARTED' with three large buttons for 'Feed', 'Real-Time Analytic', and 'Big Data Analytic'; and 'HELP TOPICS' with four smaller cards providing detailed information and links for each feature.

## Tiered Licensing

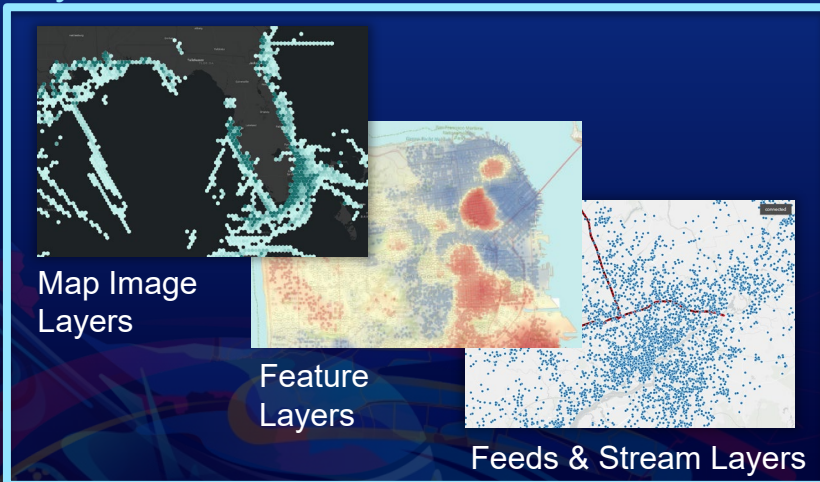
- Data velocity
- Storage capacity

# Licensing

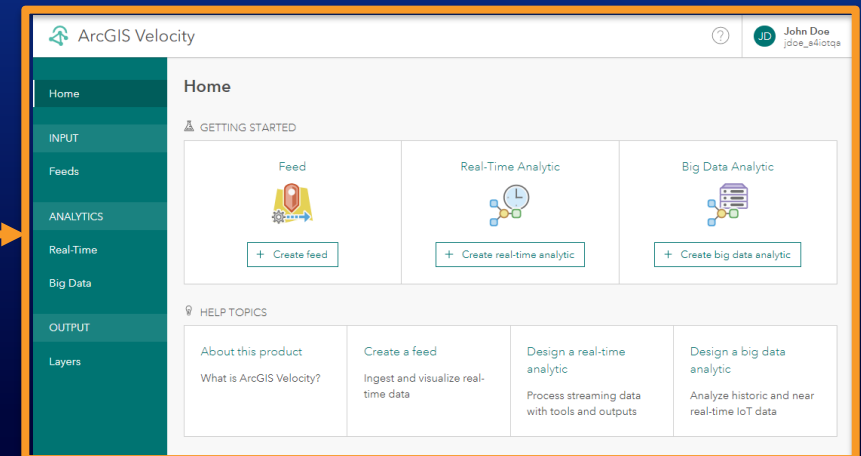
## User types and access



## Layers & Feeds - all users



## App - Creators and GIS Pros

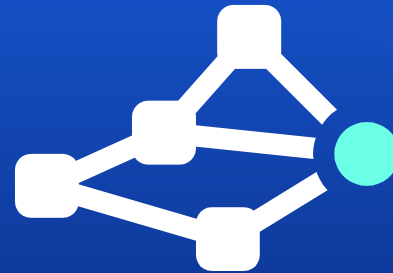


# ArcGIS Velocity

Real-time and big data capabilities for ArcGIS Online



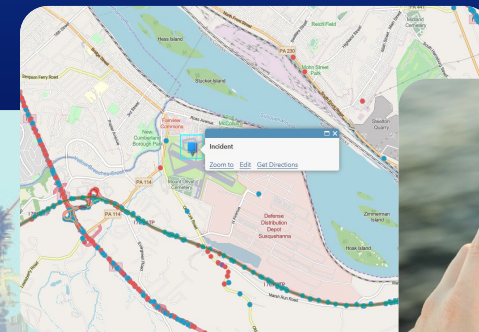
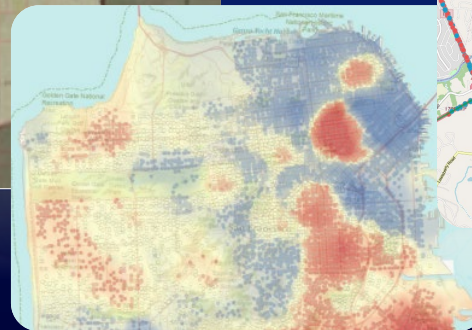
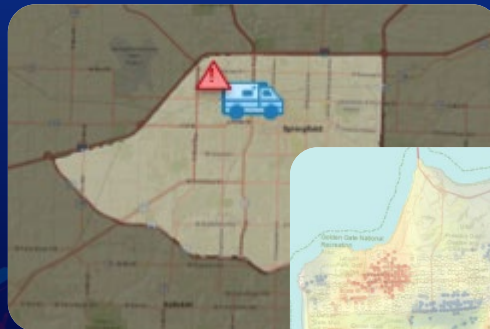
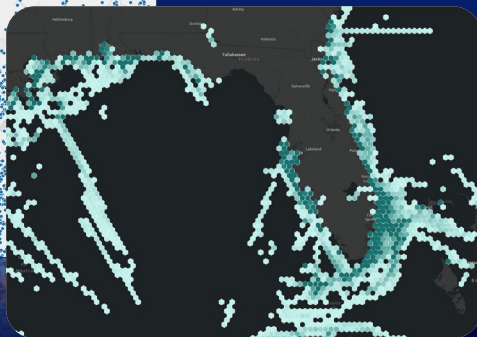
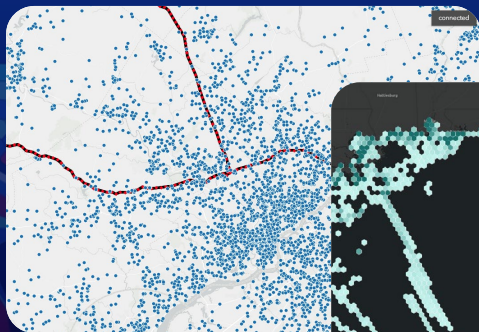
Ingest



Analyze



Alert

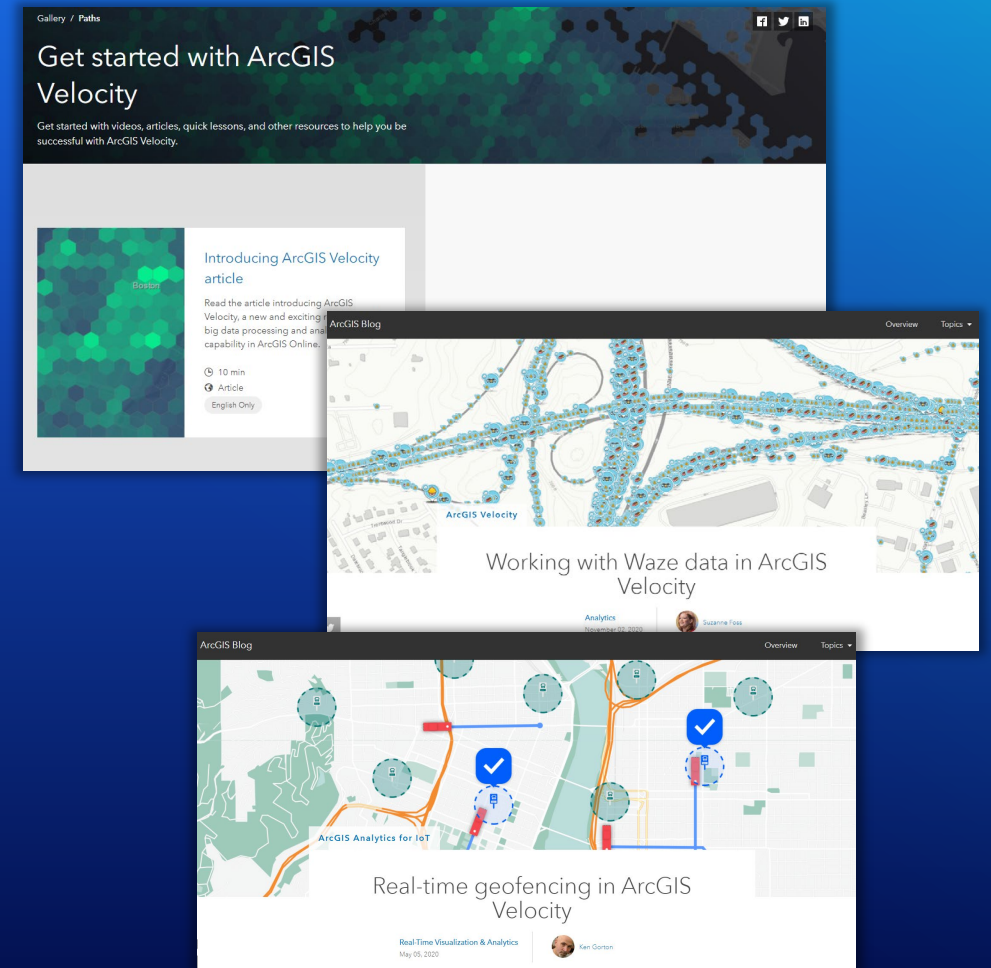




# Resources

## Tutorials, videos, 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>
- GeoNet **Updated !**  
<https://community.esri.com/t5/arcgis-velocity/ct-p/arcgis-velocity>





**esri**<sup>®</sup>

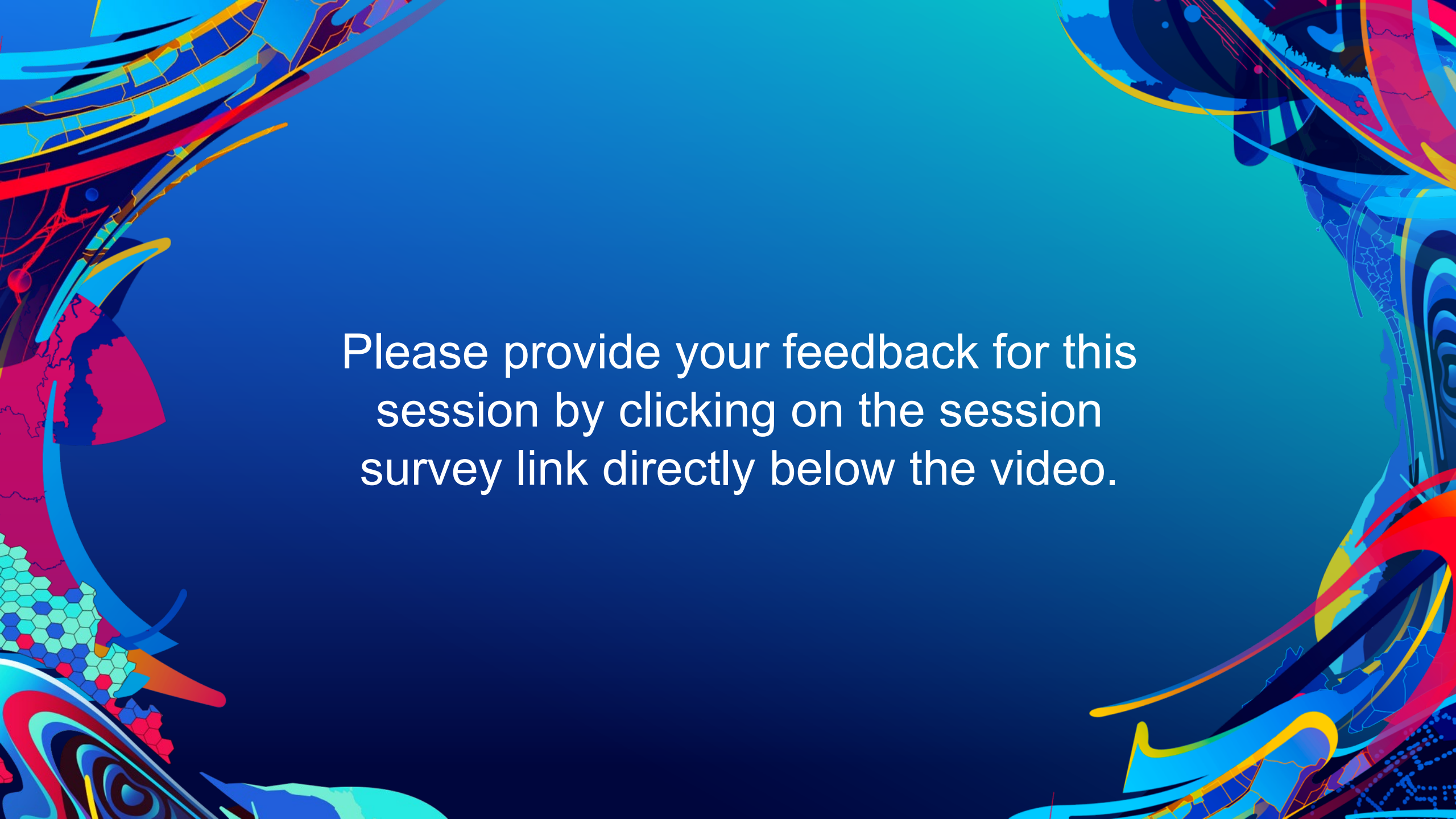
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WHERE**<sup>®</sup>



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