Real-Time in ArcGIS

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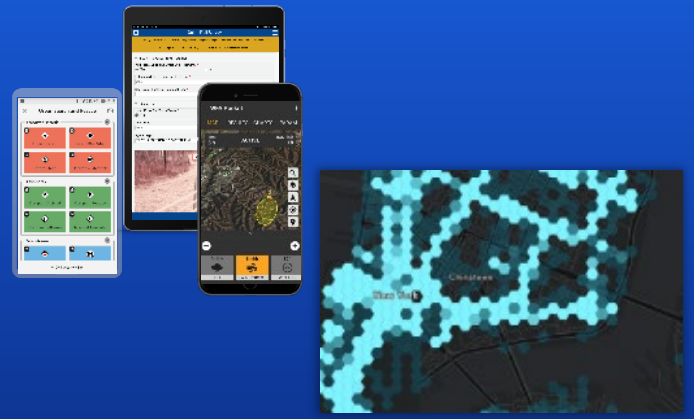
Josh Joyner

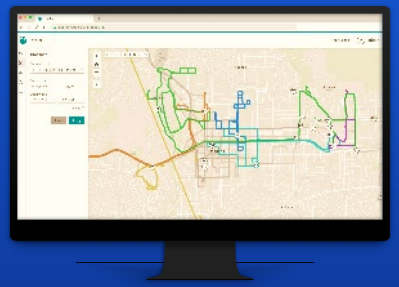
2021 ESRI
DEVELOPER SUMMIT

Use cases in real-time visualization & analytics

Personnel Tracking

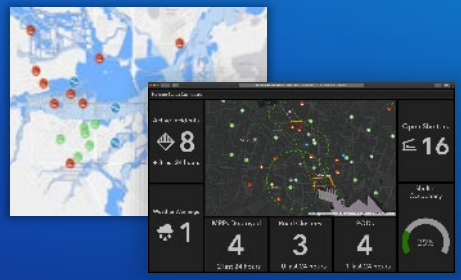


Resource Optimization



Asset & Entity Tracking

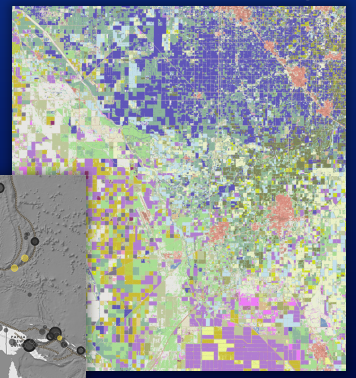
Infrastructure Protection



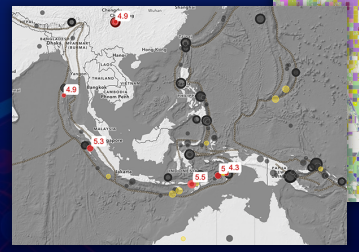
Operations Monitoring

SCADA Integration

Soil & Crop Monitoring



Anomaly Detection



Air Quality Monitoring

Connected Cars

Real-time capabilities

Real-time in ArcGIS

Tracker for ArcGIS

Know what happens in the field

Real-Time Capabilities

Ingestion

Visualization

Analytics

Alerting

Share your location

Know where everyone is

Visualize patterns

ANDROID APP ON Google play

Available on the App Store

Real-time in ArcGIS

ArcGIS Pro

Real-Time Capabilities

Ingestion

Visualization

Analytics

Alerting

Next-generation Desktop GIS

Advanced renderer controls

Intuitive analysis

Real-time in ArcGIS

Real-time in ArcGIS

Real-Time Visualization & Analytics

Supporting High-Velocity Data Streams

Tracking, Monitoring and Alerting

Enterprise

GeoEvent Server

GeoAnalytics Server

ArcGIS Online

New

Velocity

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

Sensors

Real-Time Data

IoT Platforms

Collapsing the Time from Measurement to Decision Making

GeoEvent Server

ArcGIS GeoEvent Server

Real-time capabilities for ArcGIS Enterprise

- Better decisions, the moment something happens
  - Providing real-time analysis to your observational data
    - Stationary sensors…
    - Things that move…
    - Things that just happen…
- Runs in customers' own infrastructure
  - Software that can be used in the cloud and on-premises
- Extensible via GeoEvent Gallery & bundled SDK

ArcGIS GeoEvent Server

Essential capabilities for a complete solution

- Ingestion
- Analytics
- Visualization
- Alerting
- Storage

ArcGIS GeoEvent Server

Essential capabilities for a complete solution

- Ingestion
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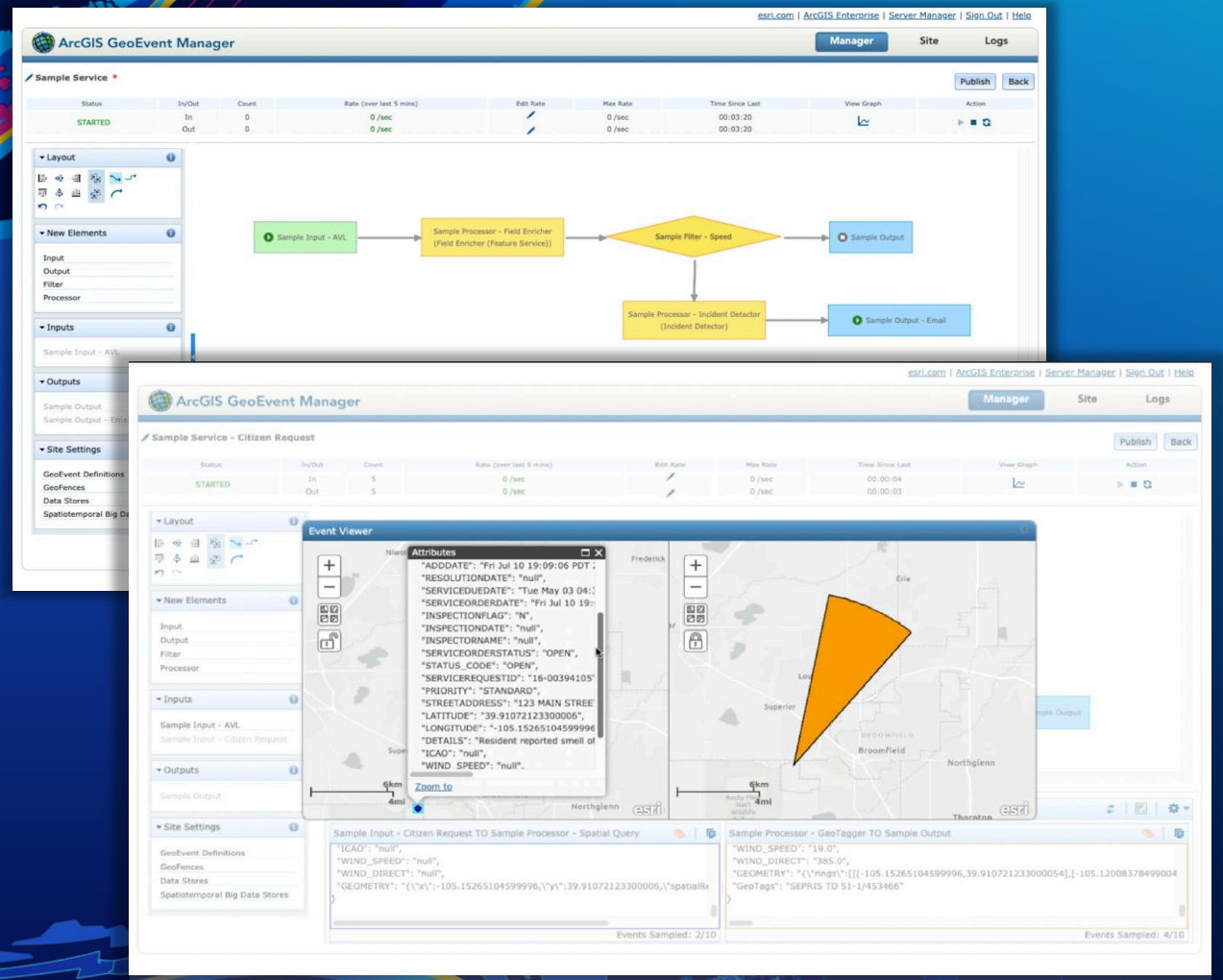
- Storage

Building a pipelining system with streaming analysis and full data control



GeoEvent Server

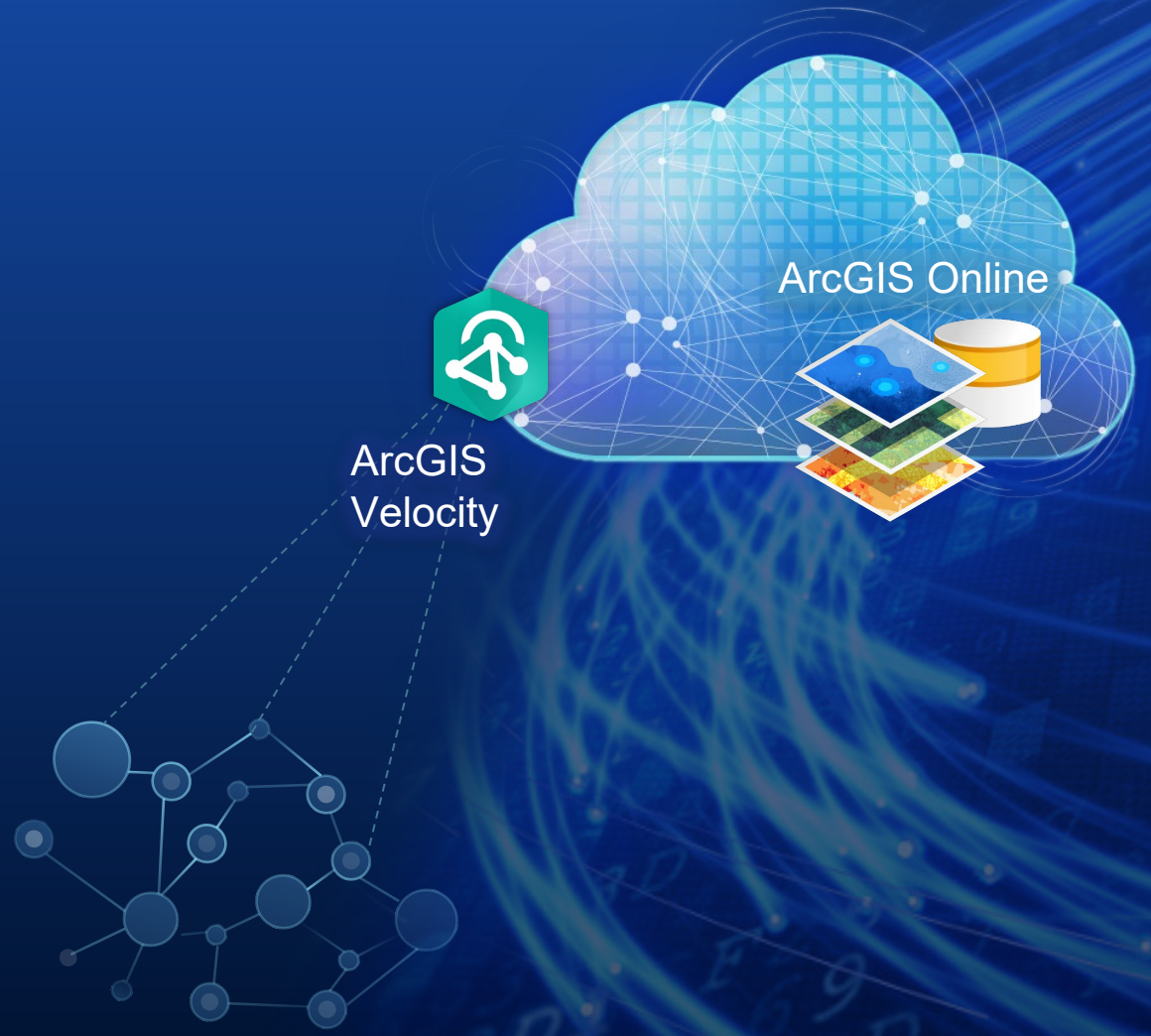
Demonstration

ArcGIS Velocity

ArcGIS Velocity

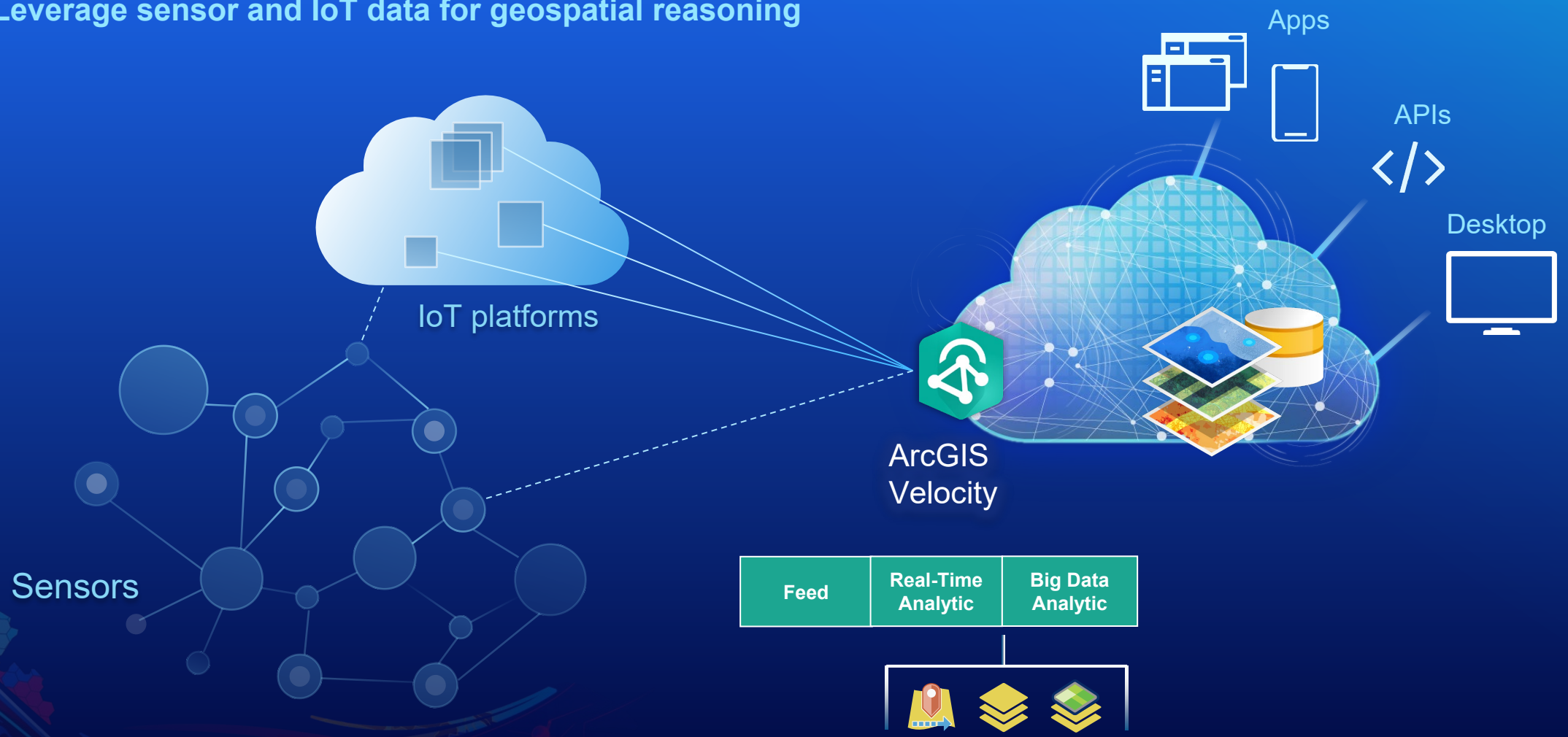
Real-time and big data capabilities for ArcGIS Online

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

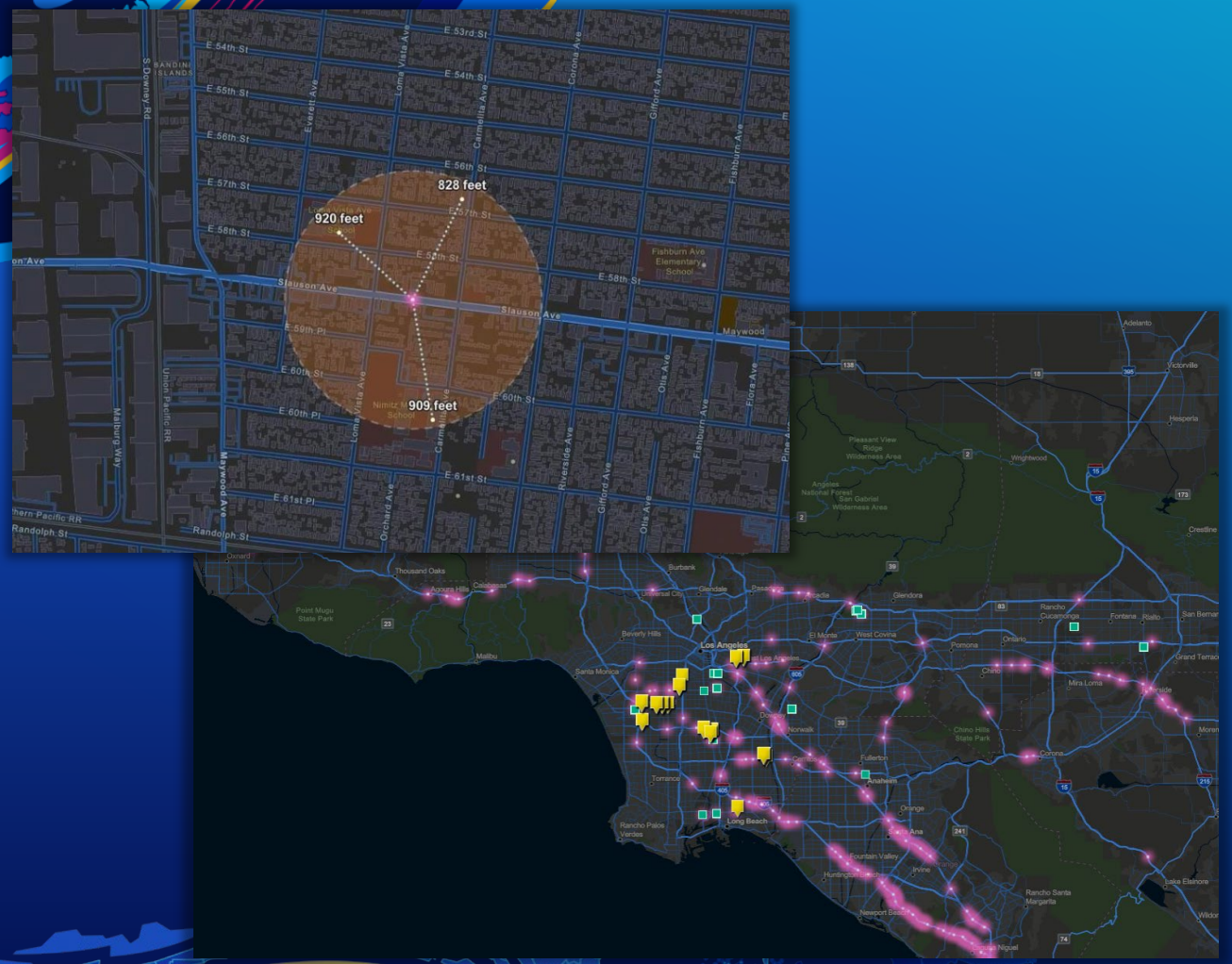


ArcGIS Velocity

Leverage sensor and IoT data for geospatial reasoning



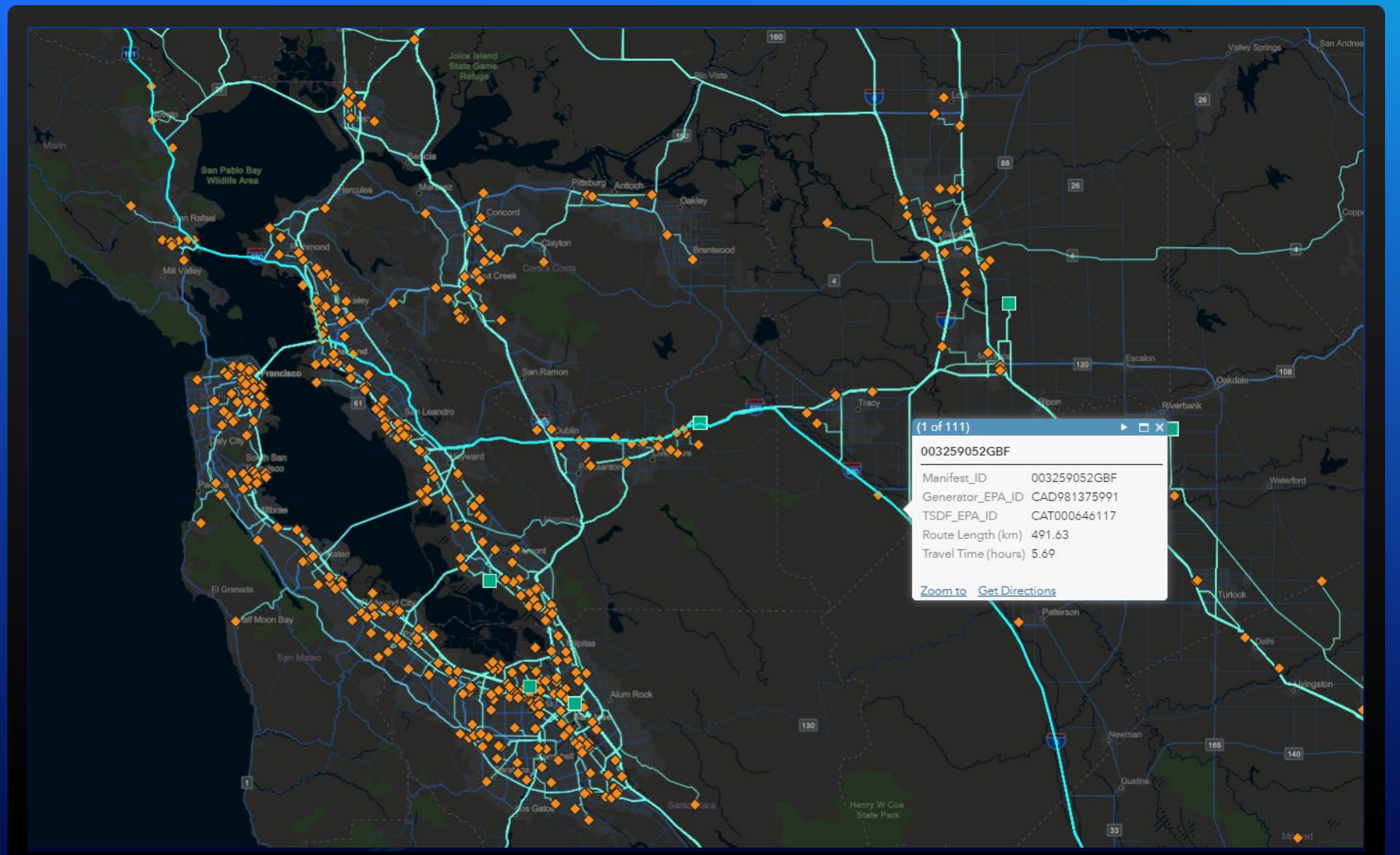
…connects to industry leading cloud IoT platforms, data lakes, and sensor vendor APIs



ArcGIS Velocity

Demonstration

California Dept of Toxic Substances Control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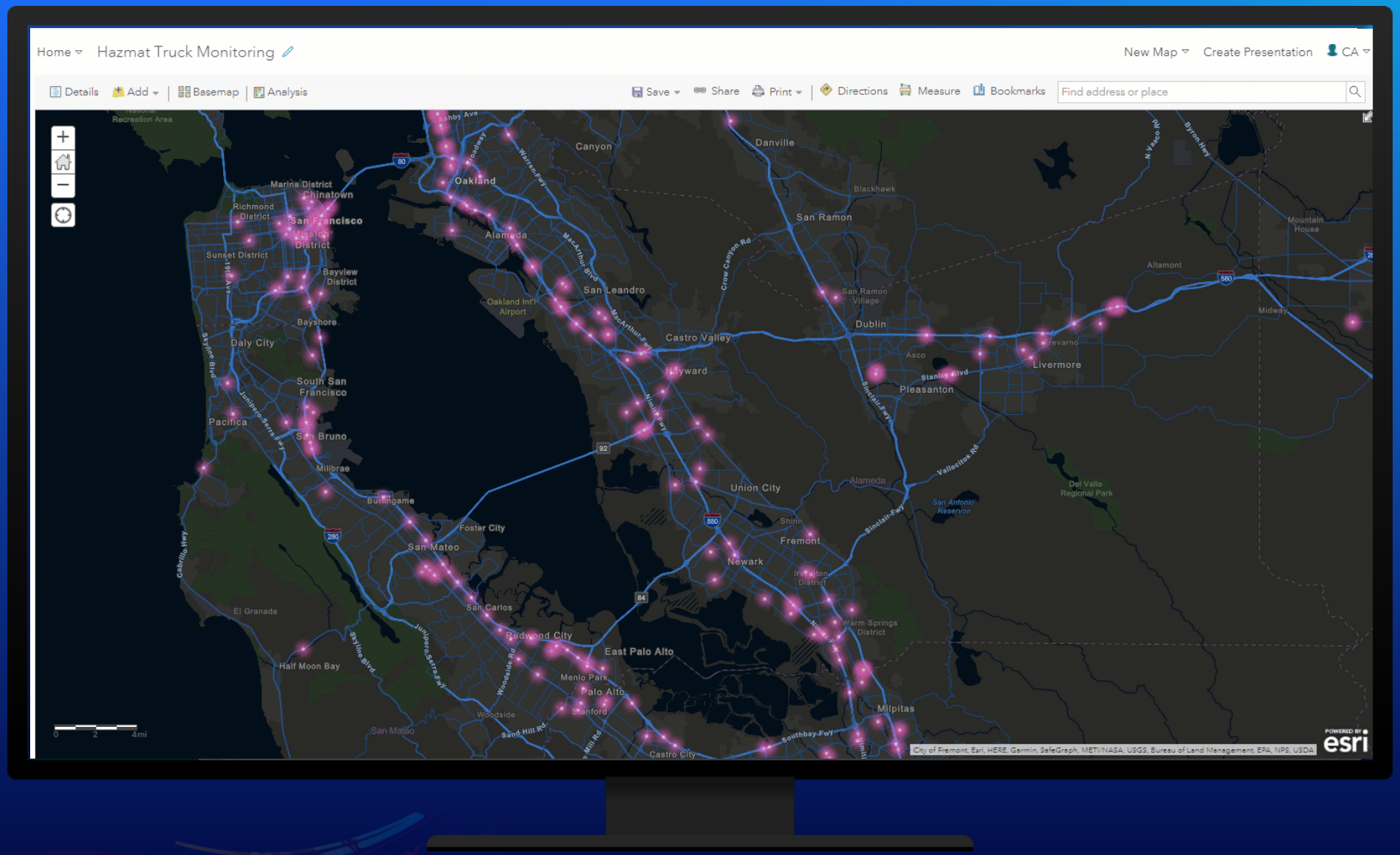
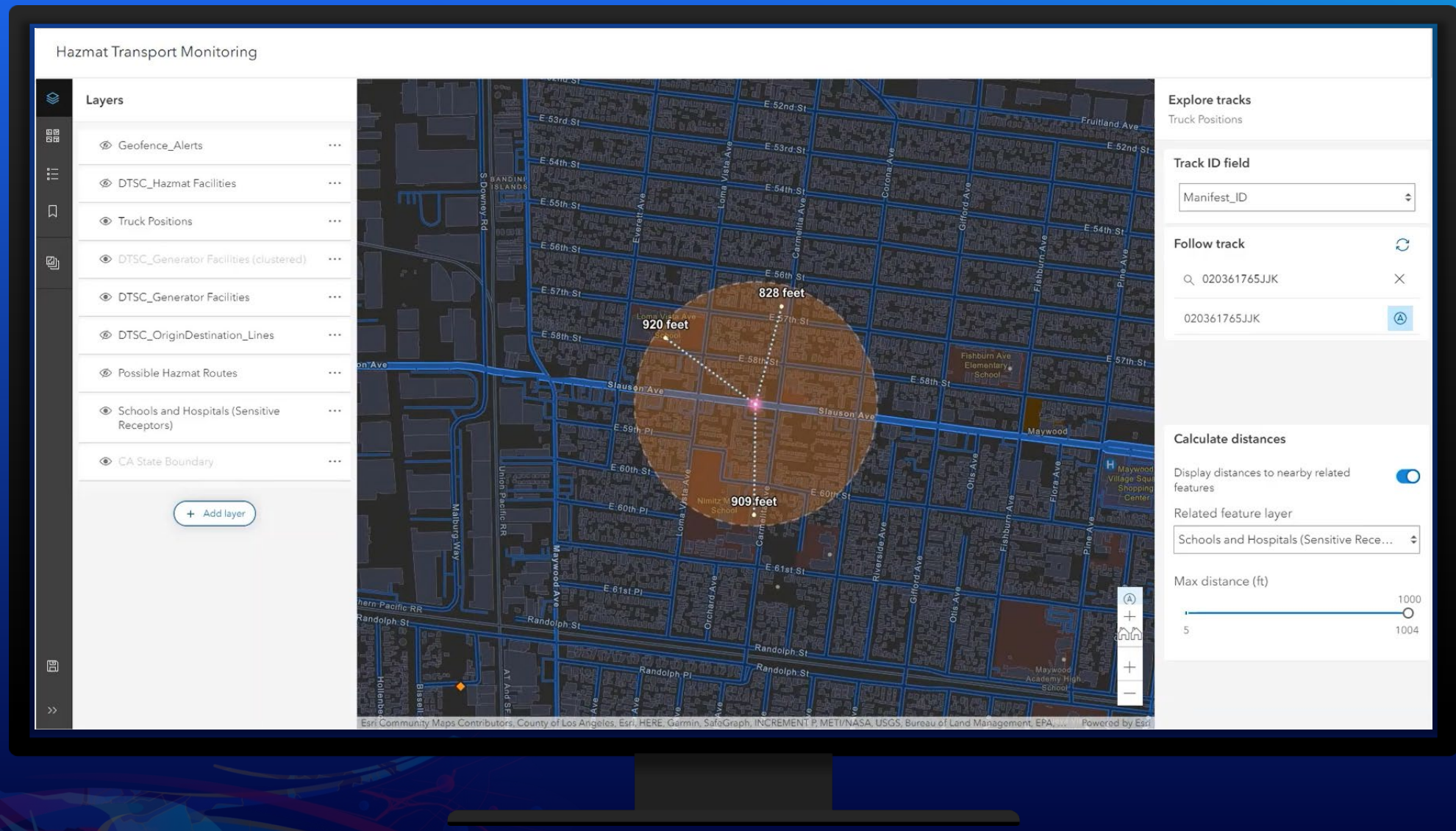
Manifest_ID 003259052GBF
Generator_EPA_ID CAD981375991
TSDF_EPA_ID CAT000646117
Route Length (km) 491.63
Travel Time (hours) 5.69
Zoom to
Get Directions
San Pablo Bay Wildlife Area
Joice Island State Game Refuge
Alum Rock
Henry W Coe State Park


Home
Hazmat Truck Monitoring
New Map
Create Presentation
CA
Details
Add
Basemap
Analysis
Save
Share
Print
Directions
Measure
Bookmarks
Find address or place
Oakland
Alameda
San Leandro
Castro Valley
Hayward
Danville
San Ramon
Dublin
Pleasanton
Livermore
Union City
Fremont
Newark
Milpitas
Foster City
San Mateo
San Carlos
Redwood City
East Palo Alto
Menlo Park
Palo Alto
Stanford
Castro City
Daly City
Pacifica
San Bruno
Millbrae
Burlingame
Bayshore
Bayview District
Sunset District
Richmond District
Marina District
Chinatown
San Francisco
Mission District
Oakland Int'l Airport
Del Valle Regional Park
San Antonio Reservoir
Warm Springs District
Irvington District
Shinn
Alameda
Altamont
Midway
Mountain House
Trevarno
Asco
Blackhawk
San Ramon Village
Canyon
Woodside
El Granada
Half Moon Bay
Sand Hill Rd
Southbay Fwy
Sinclair Fwy
Vallecitos Rd
Stanley Blvd
Crow Canyon Rd
MacArthur Blvd
MacArthur Fwy
Nimitz Fwy
Warren Fwy
Junipero Serra Fwy
Skyline Blvd
Cabrillo Hwy
Woodside Rd
Ashby Ave
Broadway
Byron Hwy
N Vasco Rd
0
2
4mi
City of Fremont, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA
POWERED BY esri


Hazmat Transport Monitoring
Layers
Geofence_Alerts
DTSC_Hazmat Facilities
Truck Positions
DTSC_Generator Facilities (clustered)
DTSC_Generator Facilities
DTSC_OriginDestination_Lines
Possible Hazmat Routes
Schools and Hospitals (Sensitive Receptors)
CA State Boundary
Add layer
828 feet
920 feet
909 feet
Explore tracks
Truck Positions
Track ID field
Manifest_ID
Follow track
020361765JJK
020361765JJK
Calculate distances
Display distances to nearby related features
Related feature layer
Schools and Hospitals (Sensitive Rece…
Max distance (ft)
1000
5
1004
Esri Community Maps Contributors, County of Los Angeles, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, …
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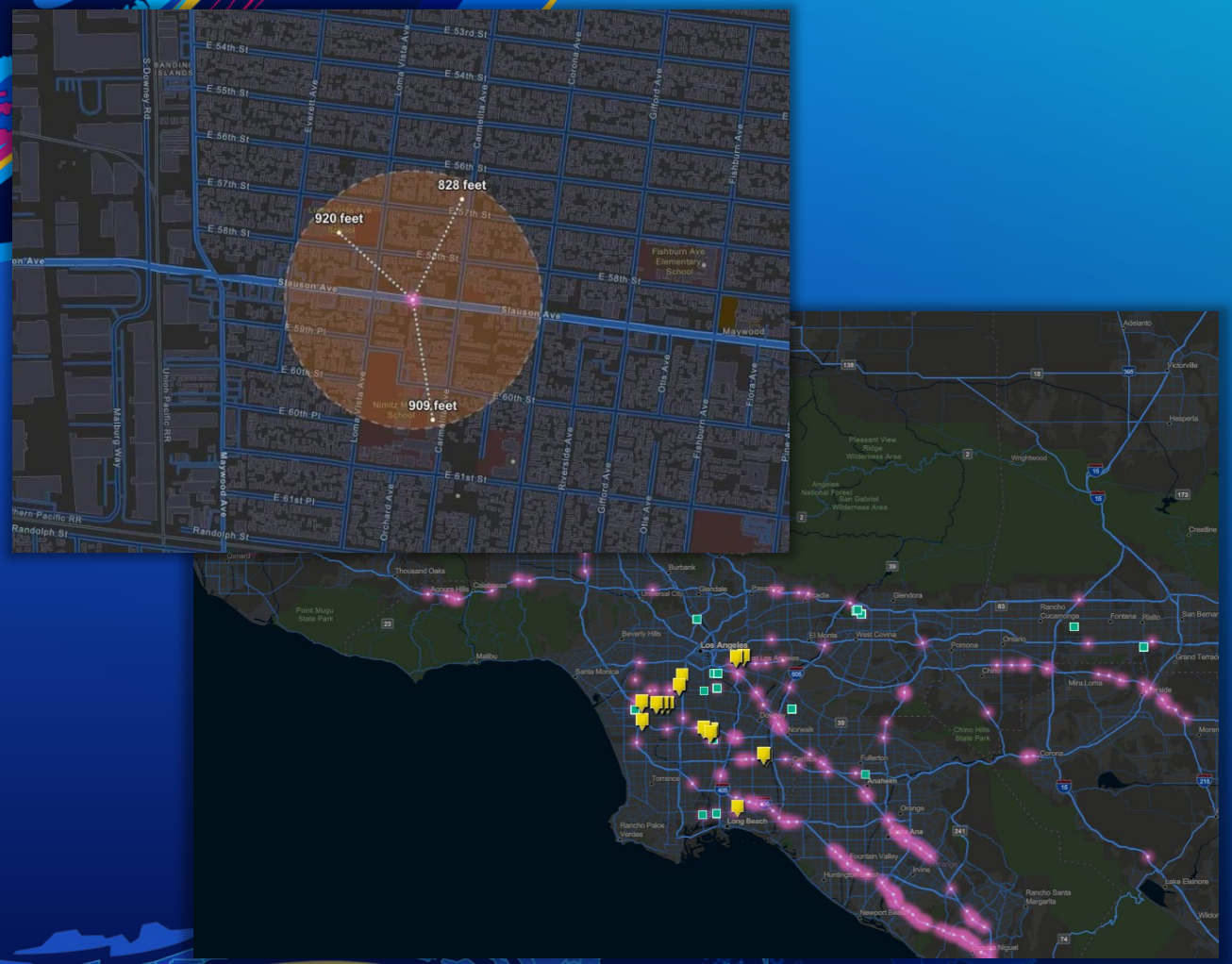


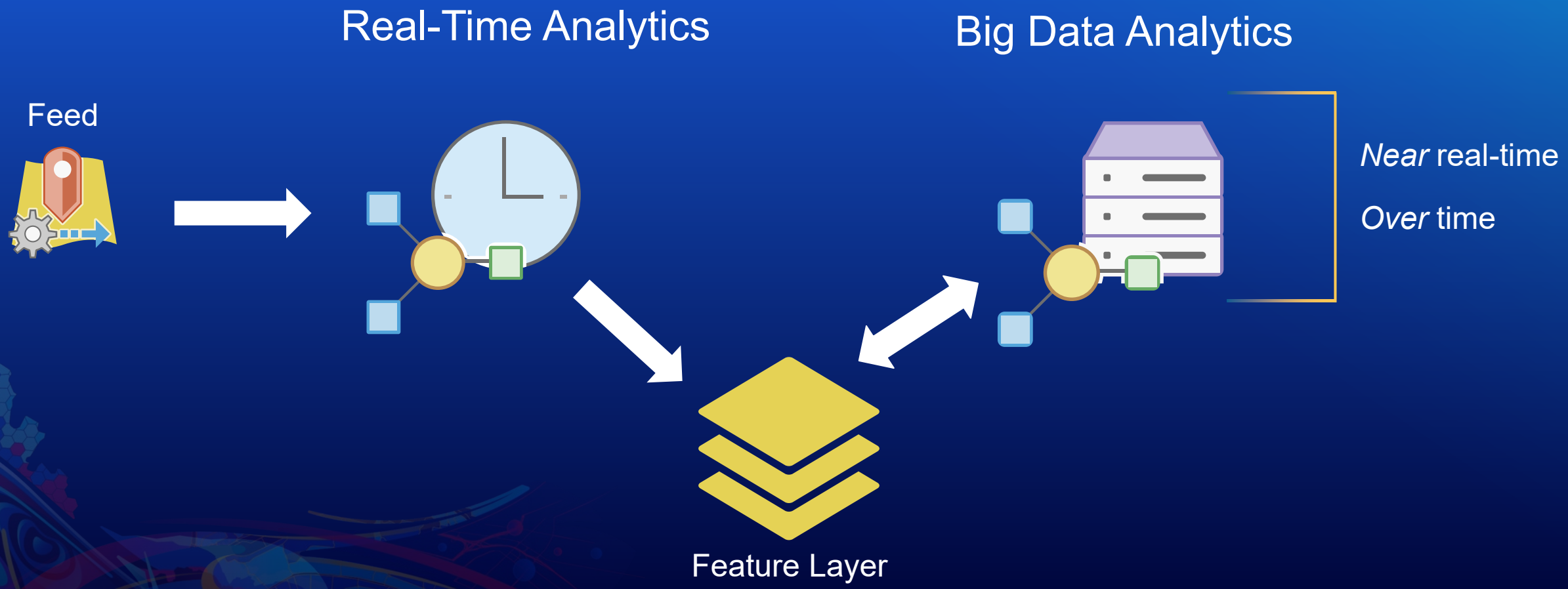
ArcGIS Velocity

Demonstration

California Dept of Toxic Substances Control

End-to-end analysis

Evaluate incidents, trends, and patterns against any decision timeline



Visualization

Live or historic observations

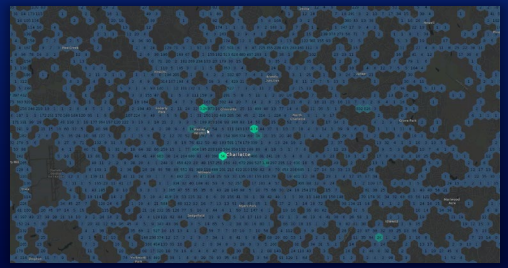
Real-Time Analytics

Big Data Analytics

Stream Layer

Feature Layer

Map Image Layer



Real-time & big data concepts…

How Analytics for IoT relates to GeoEvent and GeoAnalytics Server

	GeoEvent Server	Velocity	
Ingestion	Input	Feed	**Ingestion (& Visualization)**
Analysis & Alerting	GeoEvent Service	Real-Time Analytic	**Analysis & Alerting**

	GeoAnalytics Server	Velocity	
Ingestion & Analysis	Tool or Script	Big Data Analytic	**Ingestion & Analysis**

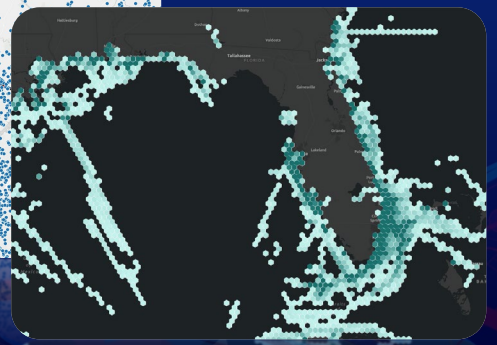
ArcGIS Velocity

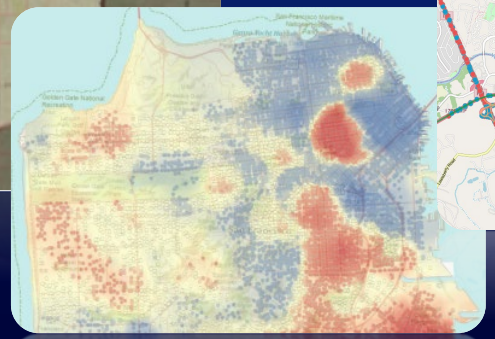
Real-time and big data capabilities for ArcGIS Online

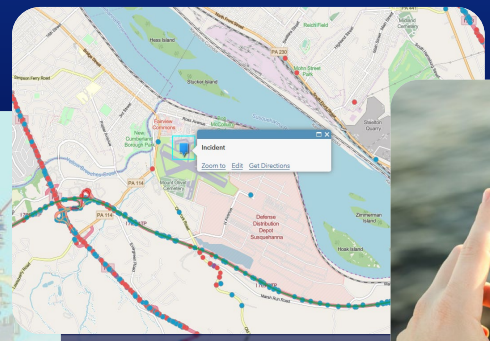
Ingest

Analyze

Alert







Wrap Up

Real-Time Visualization & Analytics

ArcGIS GeoEvent Server

Real-time mapping and analytics

Software:

ArcGIS Enterprise + GeoEvent Server (+ GeoAnalytics Server)

Target:

Savvy IT / GIS Staff
On premises or single tenant cloud
Closed environments / networks
Extensible

ArcGIS Velocity

Harness the full potential of IoT

Capability:

ArcGIS Online + Velocity

Target:

No GIS admin needed
Public cloud
Feeds with internet access
Scalable and resilient
High velocity and volume

Real-time in ArcGIS

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