



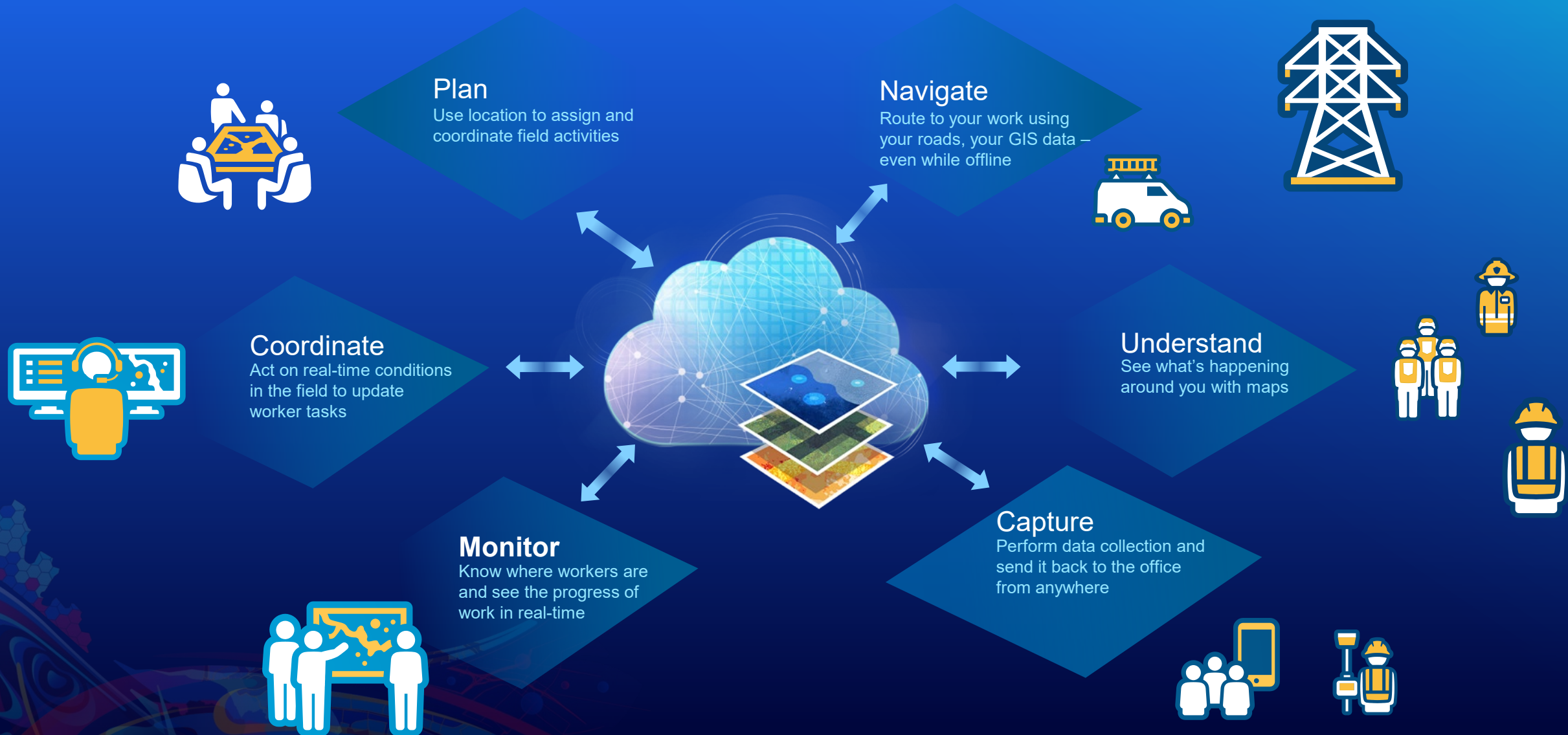
ArcGIS Field Maps: Location Tracking Basics

Aaron Pulver, Colin Lawrence, Jeff Shaner

2021 ESRI
DEVELOPER SUMMIT

Field Operations

Location-enable all phases of field work



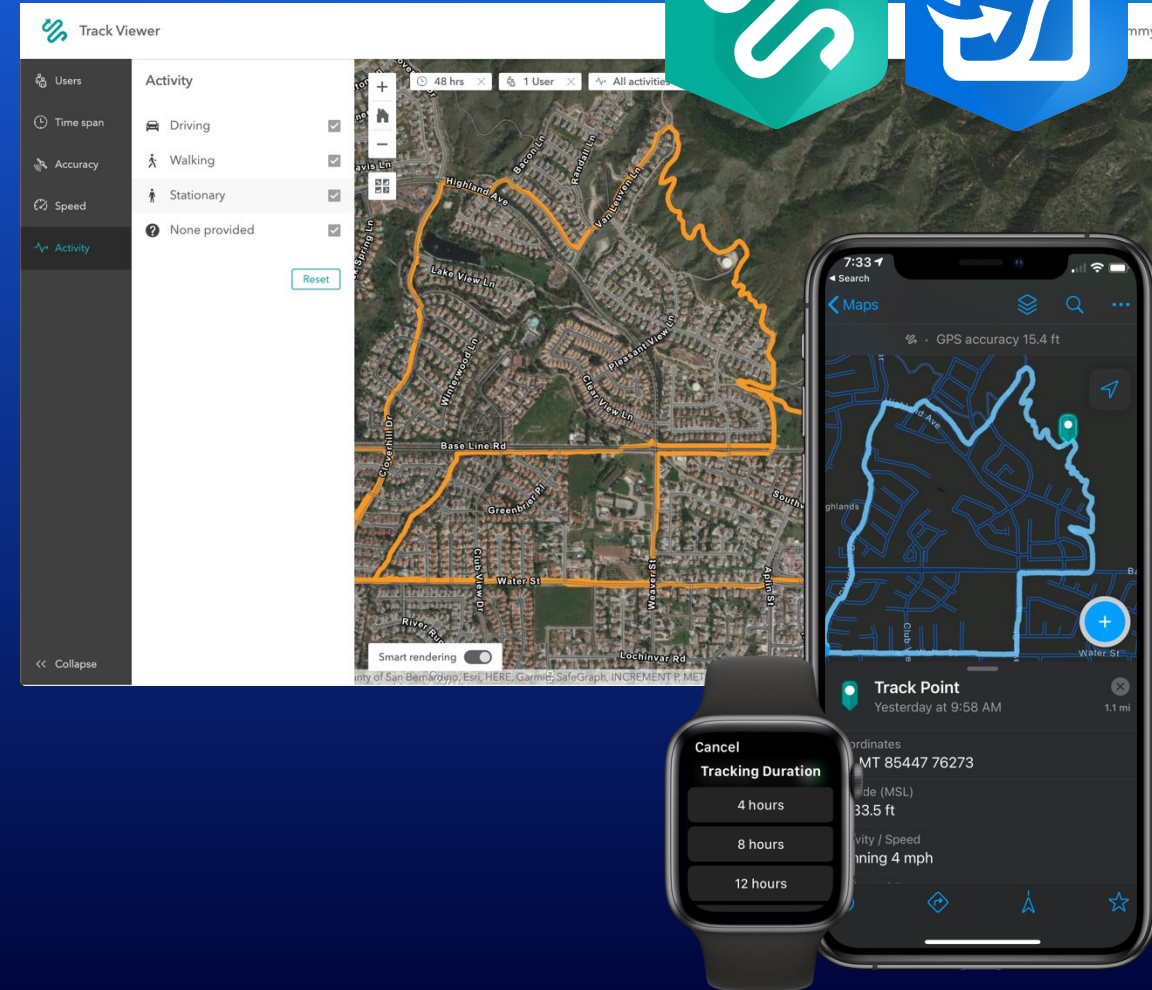
Location Tracking

Know what happens in the field

Share your location

Know where everyone is

Detect patterns



Location Tracking

How can I use it?

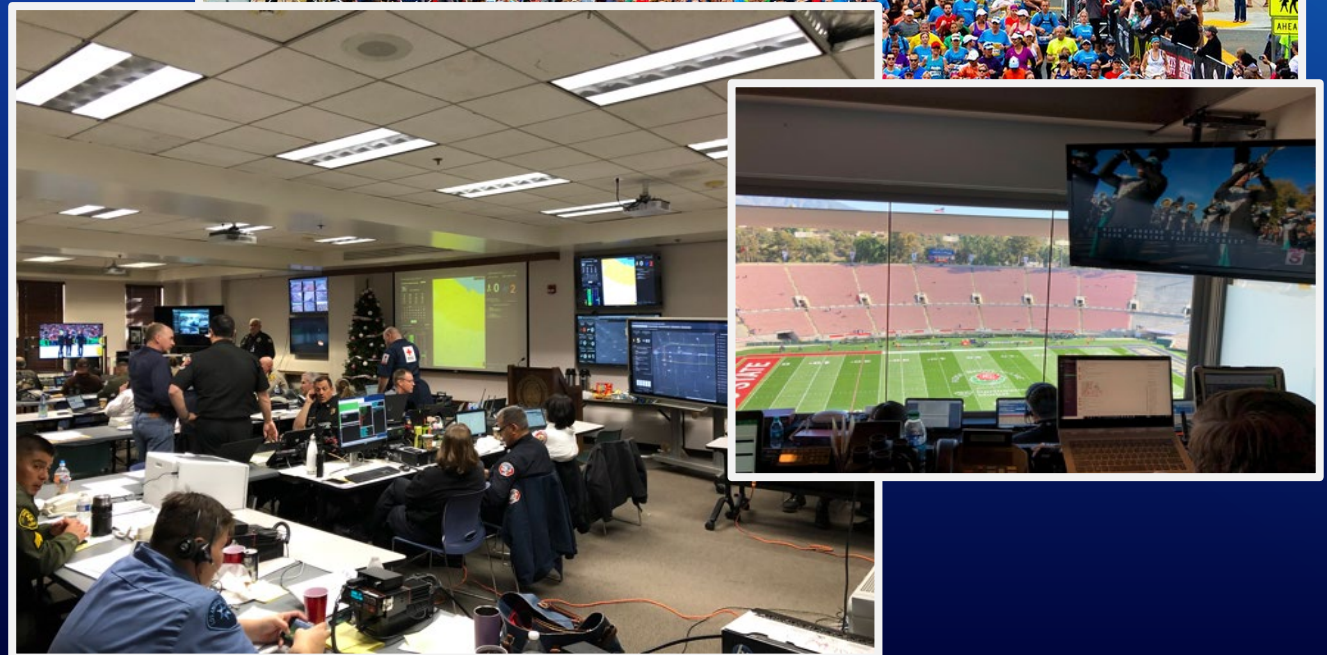
Improved Situational Awareness during events

Know where responders are when needed

- Security
- Medical
- Event Staff

Advantages

- Easy to deploy
- Frequently updates location
- Runs in the background
- Easy on battery life



Location Tracking

How can I use it?

“Near real-time” assessments

- Flooding
- Wildfire
- SAR

Advantages

- Location tracks sync when connected
- All tracks stored in a single service
- Tracks can be displayed in other apps
- No GPS device required



Location Tracking

How can I use it?

Proof of work

- Regulatory compliance
- Work efficiency

Advantages

- Track location timestamp
- Editor tracking



Location Tracking

How can I use it?

Level of service commitments

Advantages

- Smartphone/Tablet app on contractors
- Tracks stored in your organization
- Data ready for analysis
- Turn on/off when needed



Location Tracking

Key Components

Field Maps & Tracker Mobile apps (iOS, Android)

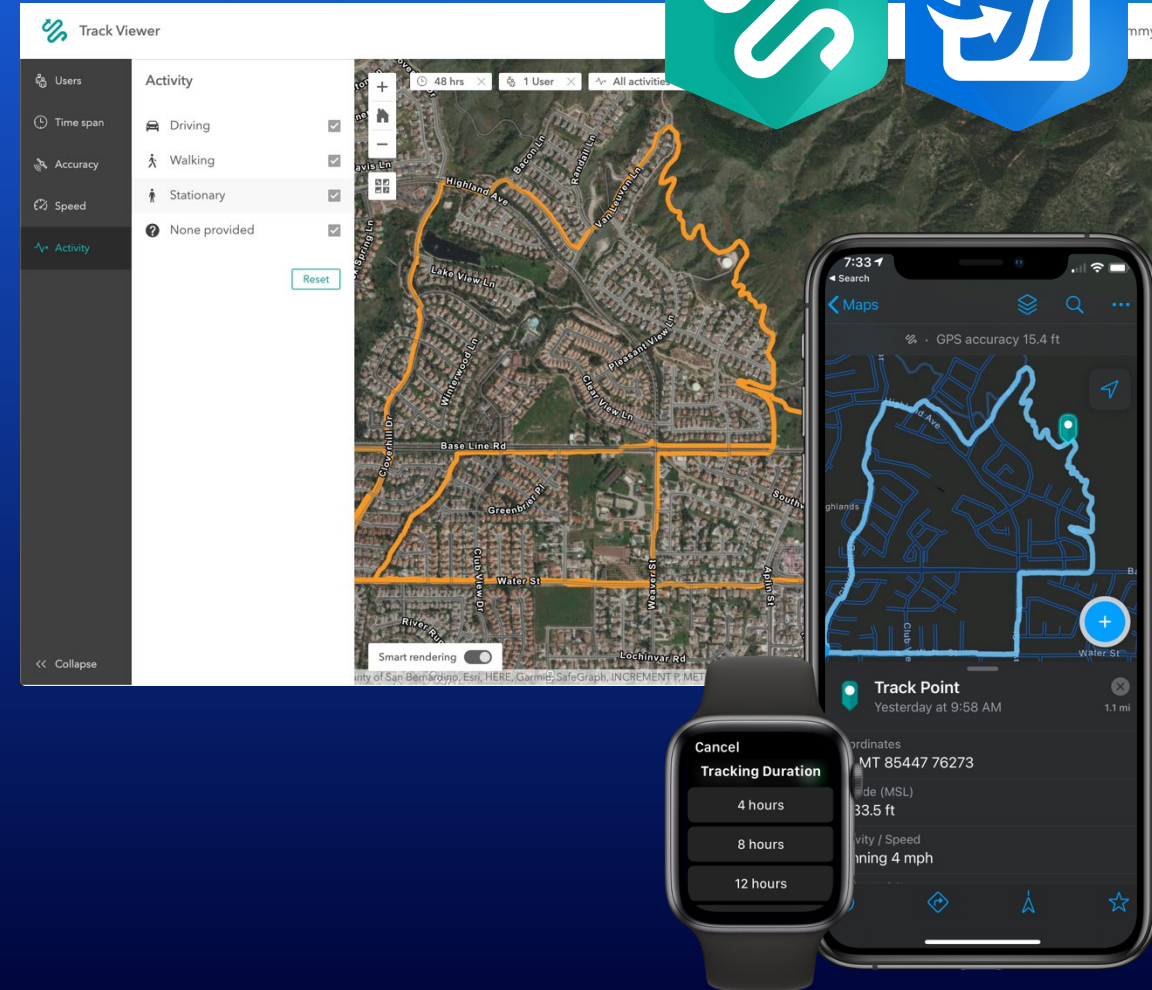
- Simple experience
- Supports offline use
- Optimized for low battery consumption
- Requires a premium add-on ArcGIS Tracker license

Track Viewer Web app

- Display and manage users and their location history
- See only the users that you have access to (Feature Service views, OBAC)

Organizational Capability

- Enable location tracking in their organization
- Single service for storing and managing location tracks
- Privacy and security controls enforced



Deprecation of Tracker

Key Takeaways

- Tracker will be deprecated at the end of 2021
- Collector, Explorer, and Tracker functionality has been brought into Field Maps
- Migration considerations
 - Supports Enterprise 10.6.1 or higher
 - Has parity with Tracker with some minor exclusions
 - Uses the same Track Viewer web app as Tracker does to view track
- New Features in Field Maps
 - Start tracking for a duration
 - View tracks on other maps






Tracking in the ArcGIS Field Maps Mobile App

Tracking in the ArcGIS Field Maps App

Requirements

- The organization must be enabled for tracking
 - Settings > Organization extension
- The user must have access to the Field Maps mobile app
 - Be a member of your organization
 - View content shared with their organization
- The user must have an ArcGIS Tracker* add on license

**ArcGIS Tracker**
248 assigned 2 available | 250 total

Compatible user types 9 Manage

General
Home page
Gallery
Map
Items
Groups
Utility services
Member roles
New member defaults
Marketplace
Collaborations
Credits
Security
Open Data
Organization extensions

Organization extensions

Location tracking

Location tracking is an organization-wide extension, providing the ability to record where users are and where they have been. When you enable location tracking, licensed users in your organization can use the Tracker mobile app to upload their locations to the location tracking layer. [Learn more](#)

[Open Track Viewer](#)

✓ Enabled

Started: Dec 10, 2019 by Nitro Admin

Retain tracks for: 30 days

Roles that can view tracks:
Administrator ⓘ Viewer + Track Viewer ⓘ Publisher + Track Viewer + ... ⓘ

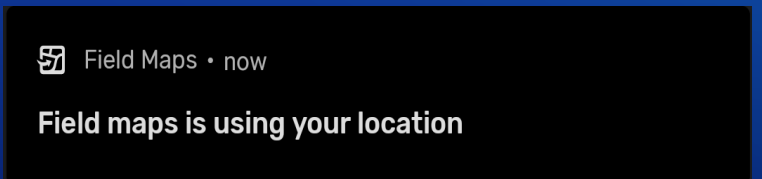
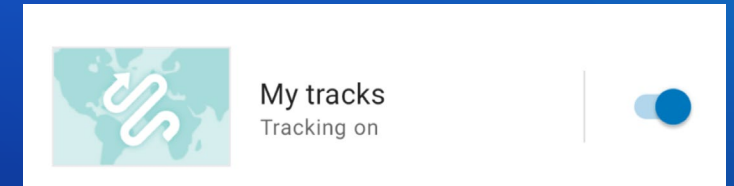
ⓘ Allow additional roles to view location tracks by visiting the [Member roles](#) tab, and enabling the "view location tracks" privilege for any custom member role.

Tracking in the ArcGIS Field Maps App

How it works

- Track anywhere – with or without a connection – as tracks are stored locally on the device*
- Tracking works in the background so the app does not need to be open
- Start tracking at the users convenience and set a timer to turn off tracking
- With tracking on, a breadcrumb of tracks follows your location and can be displayed in the maps
- Tracks are automatically uploaded to your organizations Location Tracking Service when the device is connected

**The tracks database is cleared on sign out*





Demo

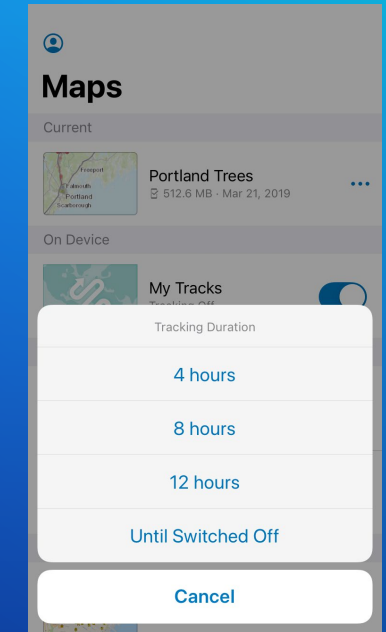
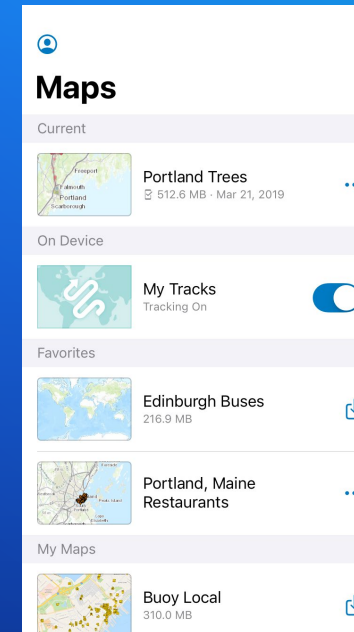
Tracking in ArcGIS Field Maps

Tracking in the ArcGIS Field Maps App

Toggle Tracking on and off

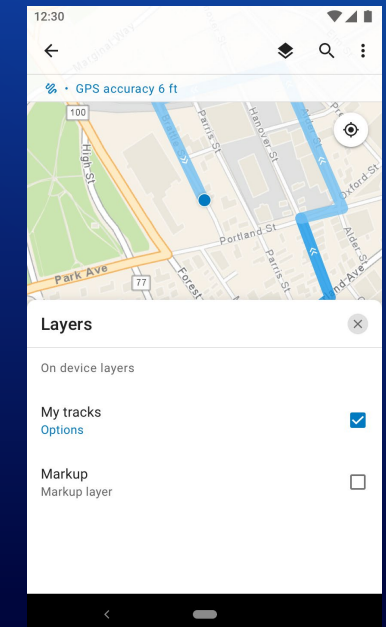
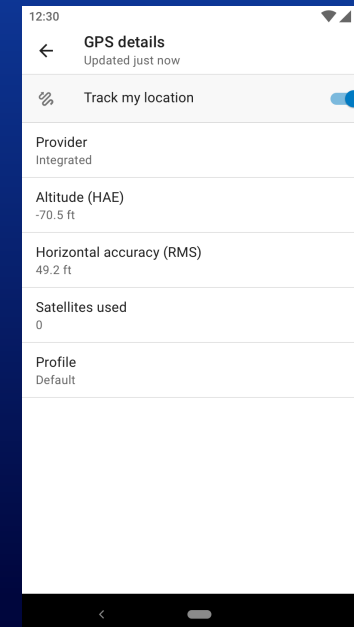
From the My Tracks card in the Maps list

- My Tracks map card listed in the On Device section*
- View and toggle the state of tracking and optionally set a duration to track
- Use the My Tracks map for quick and easy viewing of your tracks



From the GPS details within any map

- Tracking toggle in GPS details panel
- Tracker icon indicates when tracking has been toggled on
- View tracks in any map by Toggling on My Tracks layer



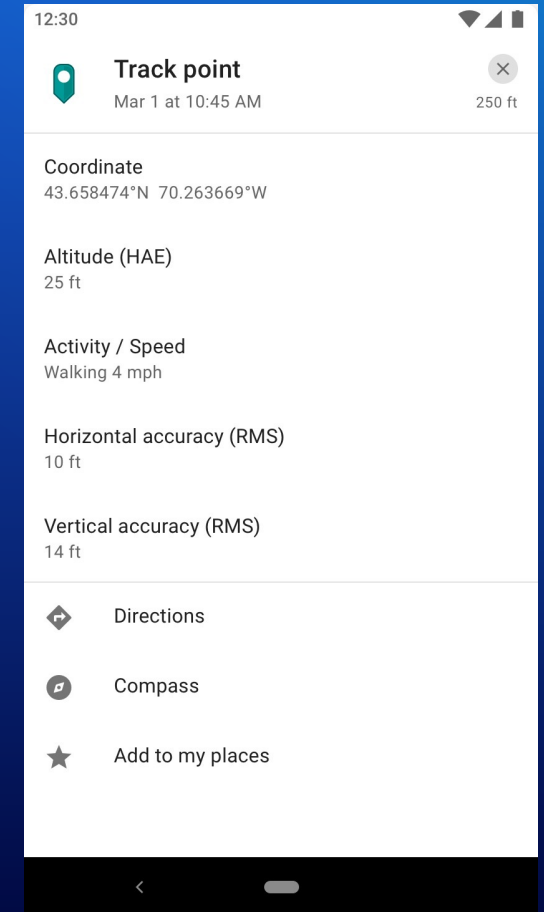
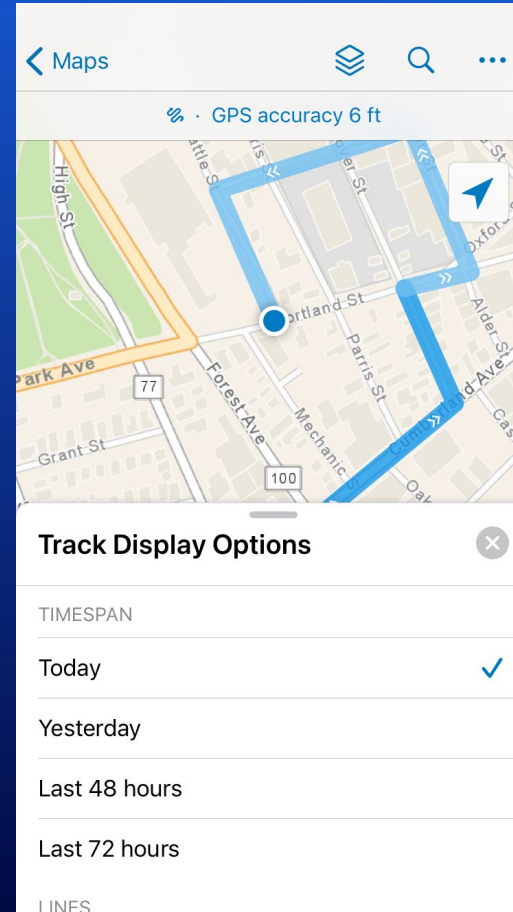
**the My Tracks card and tracking toggle are only visible if the user is properly licensed*

Tracking in the ArcGIS Field Maps App

Track display and info

Viewing and interacting with tracks

- Track lines can be displayed in any map
- Activity determines the color of the track line
- Chevron arrows indicate direction of travel
- Filter relevant tracks by timespan
- Tap a track line to reveal metadata for the nearest track point

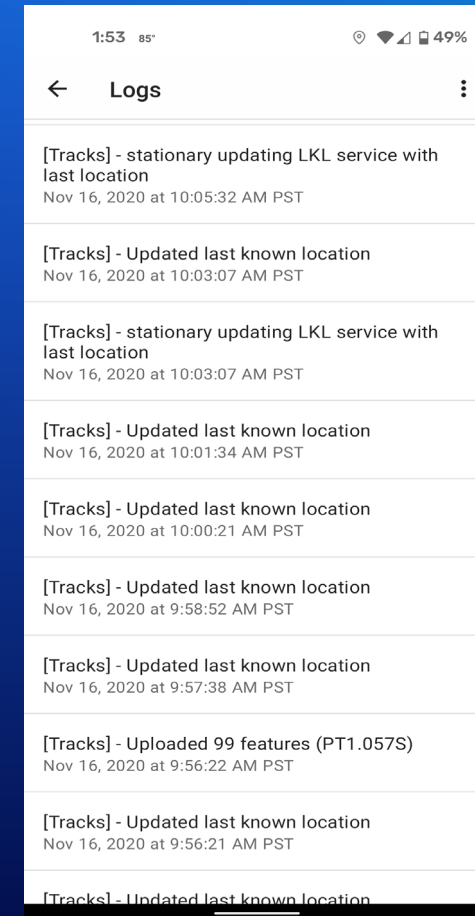


Tracking in the ArcGIS Field Maps App

Logging

In-app logging shows tracking events for:

- Tracking toggled on/off
- Last Known Location (LKL) updates
 - Stationary or moving
- Track uploads
 - Success and failures
- Clearing of uploaded tracks
- URL scheme parameter details





Demo

Advanced Tracking Methods

Tracking in the ArcGIS Field Maps App

Advanced tracking methods

MDM configurations

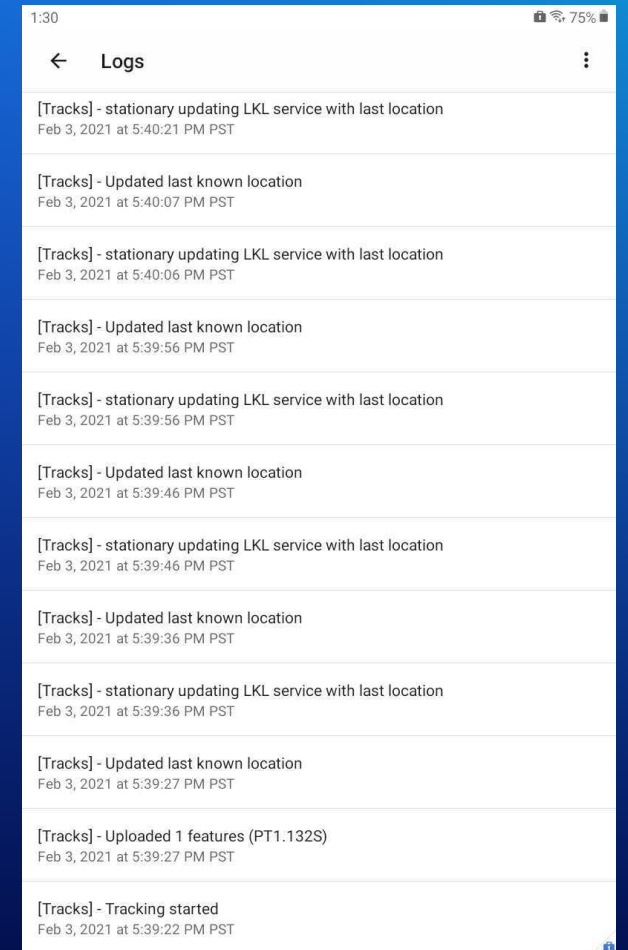
- Define custom values for tracking specific parameters:
 - *trackingUploadTracksFrequency*
 - *trackingUploadLKLFrequency*
- Overrides the defaults used in app
- Units defined in seconds

URL scheme

- New reference context added for tracking:
 - `referenceContext=track`
- New parameters for passing tracking values:
 - `trackingOn` (set to *true* or *false*)
 - `trackingDuration` (in hours)



<https://fieldmaps.arcgis.app/?referenceContext=track&trackingOn=true&trackingDuration=120>



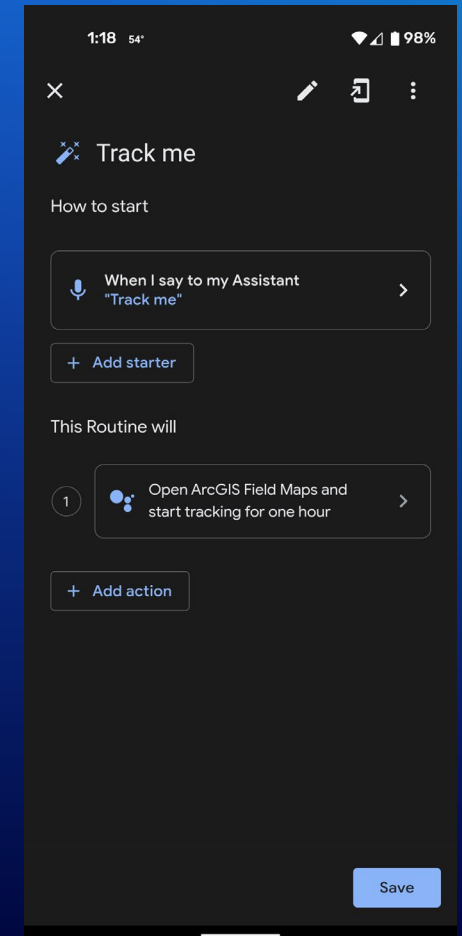
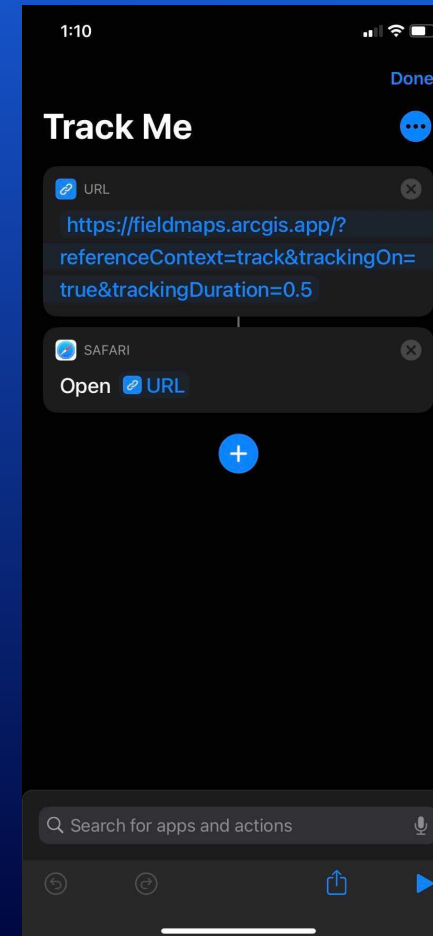
Tracking in the ArcGIS Field Maps App

Advanced tracking methods

More options to start tracking

- Start and stop tracking using built in custom intents
 - *“Okay Google, Open ArcGIS Field Maps and start tracking”*
- Set durations for tracking not included in the UI
 - *“Okay Google...start tracking for 1 hour”*
- Set custom commands using Routines with Google Assistant or iOS Shortcuts

**Support for automations using iOS Shortcuts is on the roadmap*

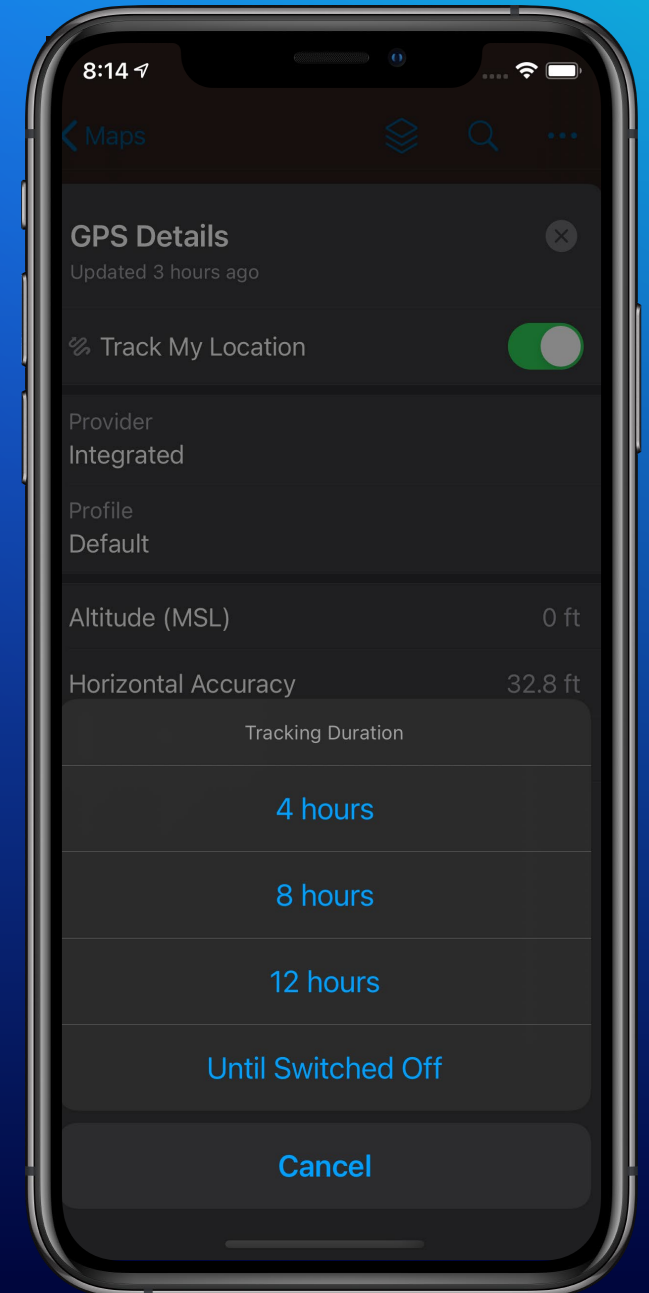


Tracking in the ArcGIS Field Maps App

Advanced tracking methods

Apple Watch companion app

- Toggle tracking on and off from an Apple Watch
- Can set tracking duration from the watch
- Tracking state syncs between watch and phone
- Supports complications on the watch face for viewing current tracking status





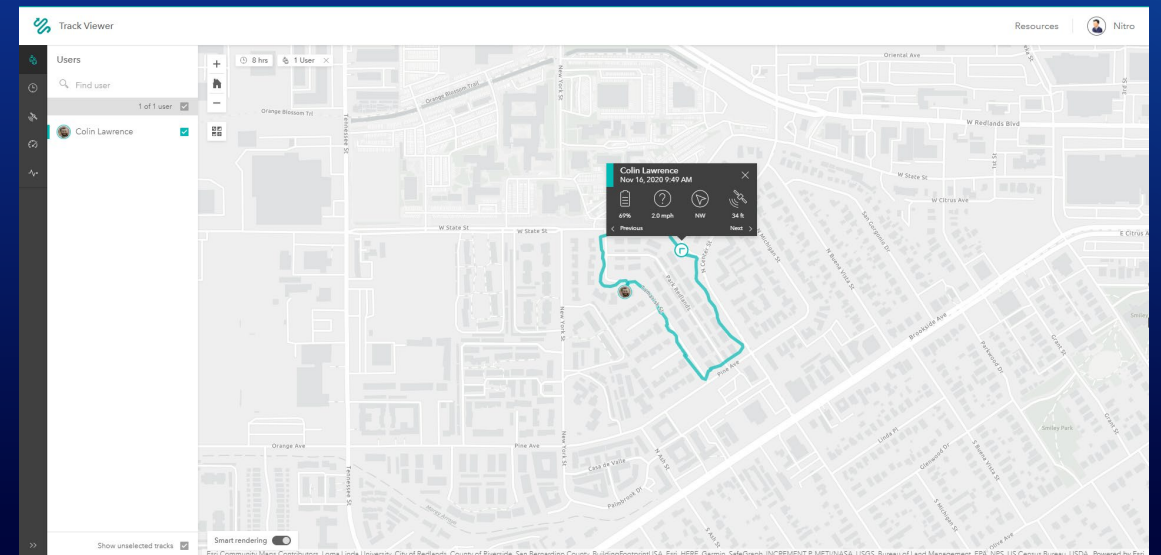
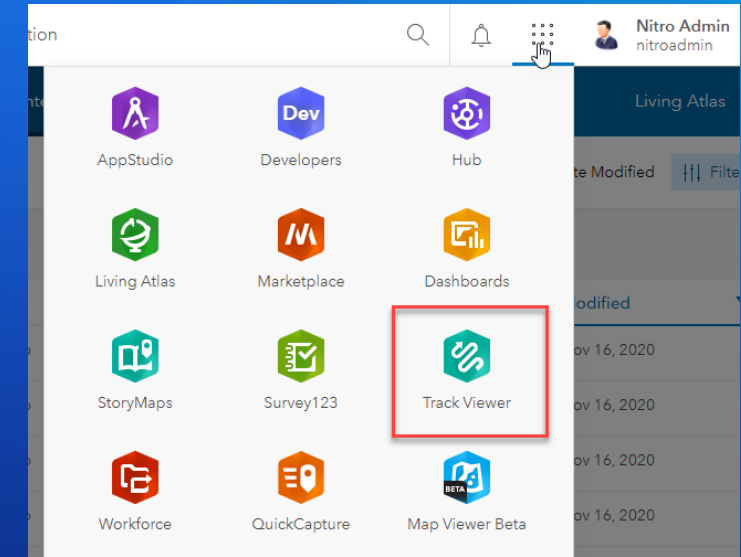
Demo

Track Viewer Web App

Track Viewer Web App

View organizations tracks

- The same Web App used by Tracker is used by Field Maps for tracks
- Allows administrators to create track views, defining which user's tracks are included in the view and who can view those tracks.
- Mobile workers can only view their own tracks without further permissions
 - *view location tracks* privilege
 - *join organization groups* privilege
 - The track view must be shared with them



Analyzing Tracks

The background of the slide is a solid blue gradient. On the left side, there is a complex, abstract graphic design. It features several overlapping, wavy, ribbon-like shapes in shades of blue, red, and yellow. Some of these shapes contain internal patterns, such as a grid of small white squares. The overall aesthetic is modern and technical, suggesting a theme related to data analysis or digital technology.

Location Tracking

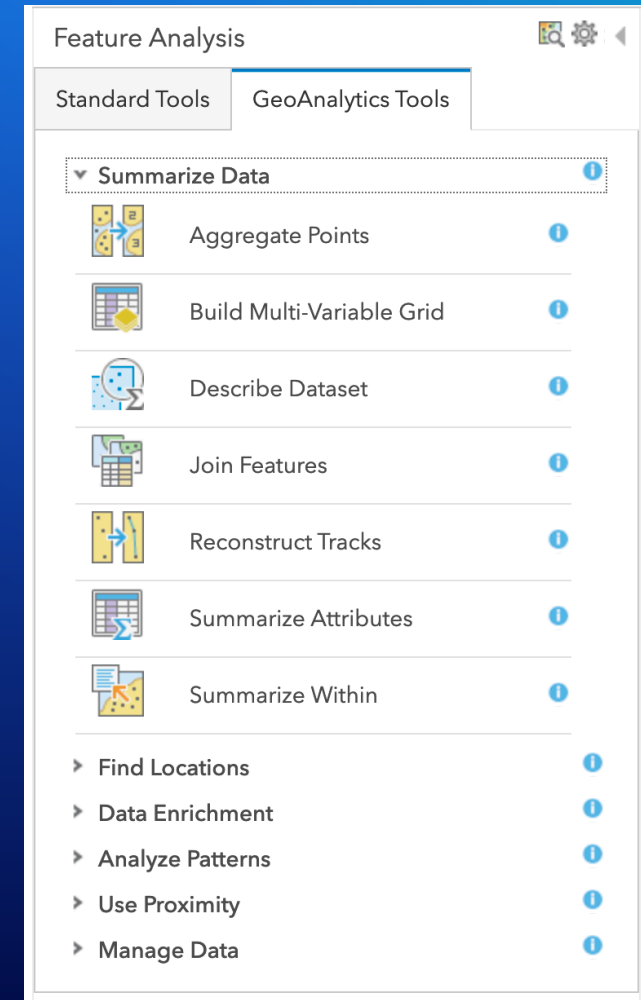
Analysis

- Three main ways to analyze tracks
 - Using ArcGIS GeoAnalytics Server
 - Exporting & use ArcGIS Pro
 - Developing custom notebooks or scripts using the ArcGIS API for Python

Location Tracking

Analysis

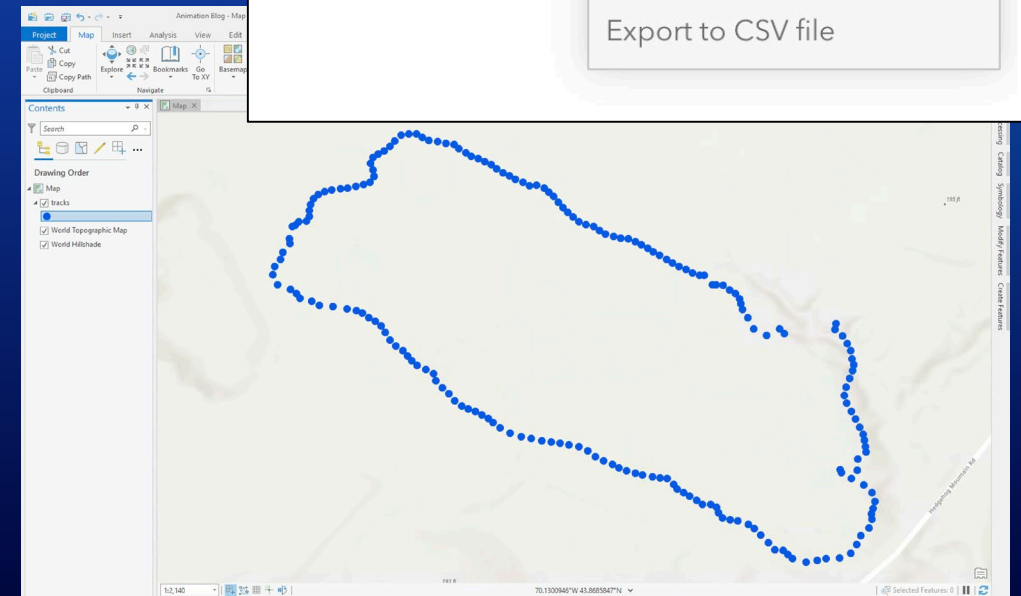
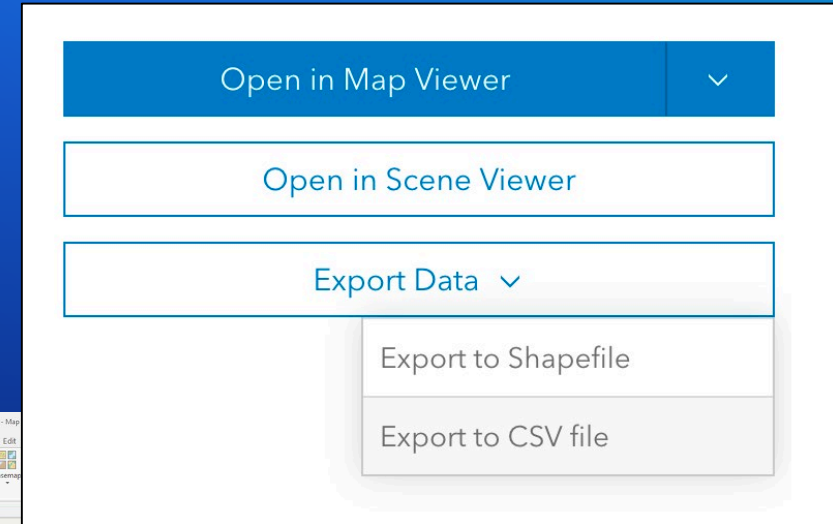
- GeoAnalytics Server
 - Enterprise only
 - Designed for high volumes of data
 - Distributed computation
 - Requires additional server(s)
 - Many out of the box tools (Reconstruct tracks, Find dwell locations, etc.)



Location Tracking

Analysis

- Exporting & analyze
 - Can use tools in ArcGIS Pro
 - May not be as performant as GeoAnalytics Server
 - Supports more customized workflows

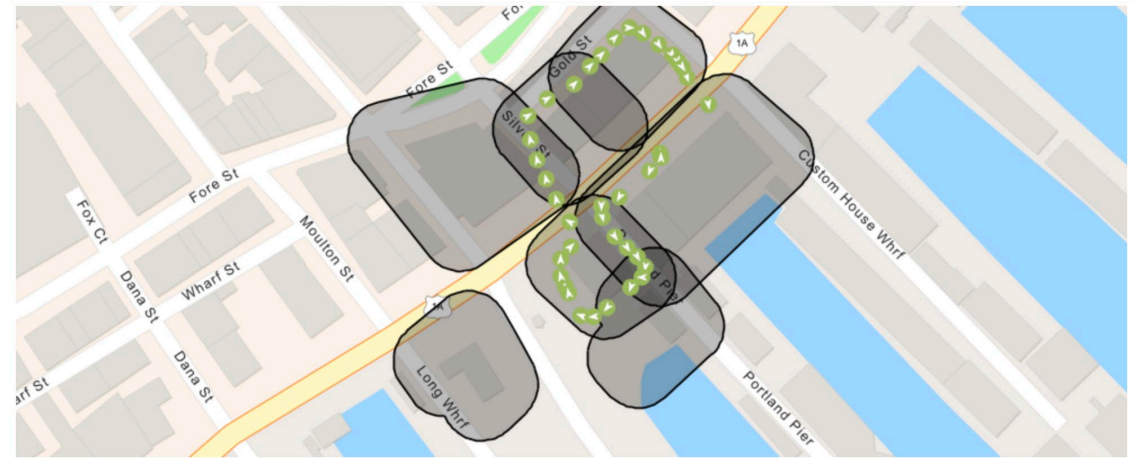


Location Tracking

Analysis

- ArcGIS API for Python
 - There is a Tracker module in the ArcGIS API for Python
 - Manage location tracking
 - Create track views
 - Query tracks
 - Useful for specific repeatable tasks
 - Identify inspected assets
 - Exporting tracks on a schedule
 - Custom track-line creation
 - Examples provided on GitHub

```
In [5]: buildings_df["BUFFERED"] = buildings_df["SHAPE"].geom.buffer(15)  
# Set the new column as the geometry so it will be used when rendering the map  
buildings_df.spatial.set_geometry("BUFFERED")  
buildings_df.spatial.sr = sr  
m = create_webmap(tracks_layer, buildings_df)  
m
```

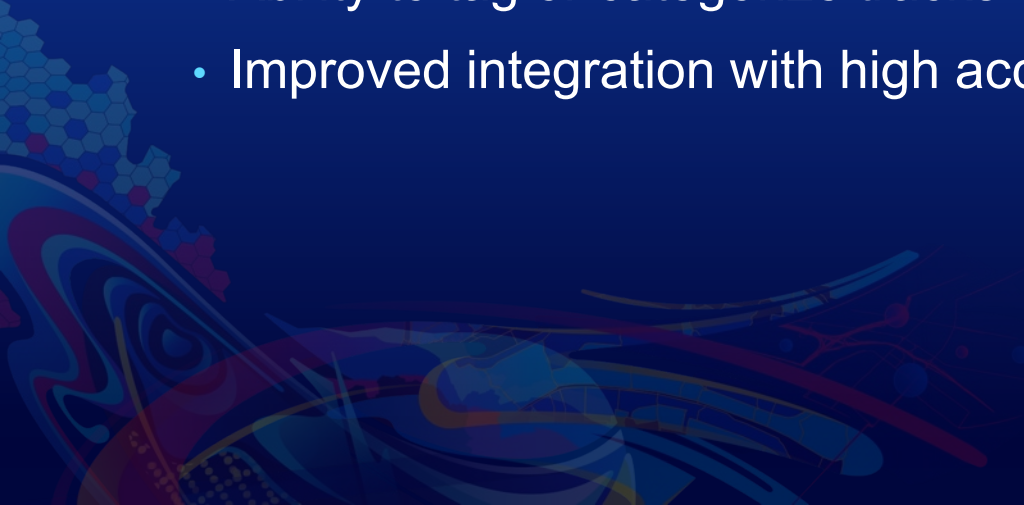


Analyzing Tracks Demo

The background of the slide is a deep blue gradient. On the left side, there is a complex, abstract graphic. It features several thick, flowing lines in shades of blue, red, and yellow. Some of these lines form loops or swirls. There are also smaller elements, including a grid of small white squares on a blue background, and some red dots or nodes connected by thin lines. The overall impression is one of dynamic movement and data visualization.

Location Tracking

What's Next

- Improved visualization in other web applications (Map Viewer, Dashboards, etc)
 - Analysis in ArcGIS Online
 - More ways to start/stop tracking
 - Defined as part of a map
 - When entering/existing an area
 - Ability to tag or categorize tracks
 - Improved integration with high accuracy receivers
- 

Field Maps | Thank You

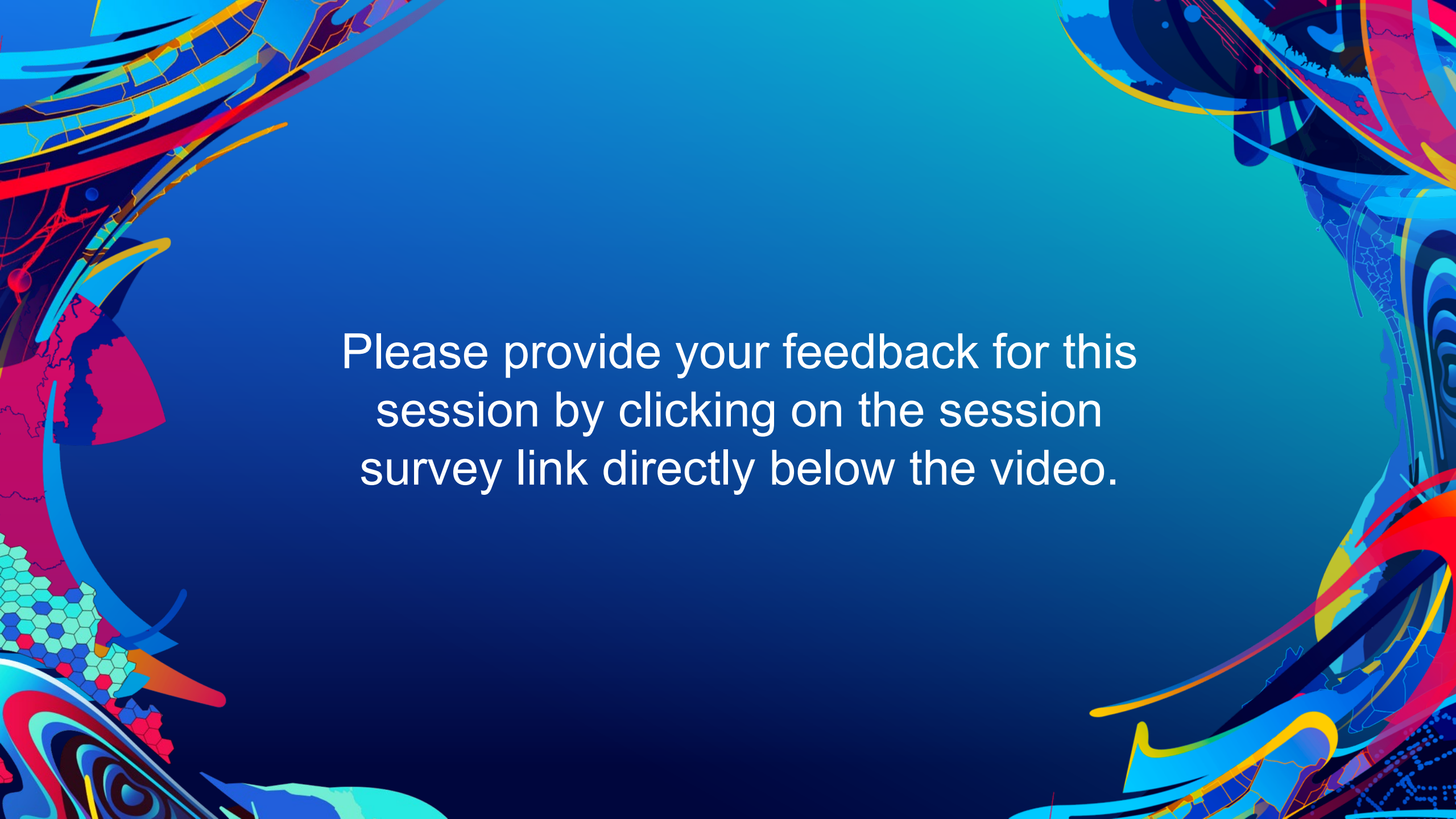
Resources:

- Product Page - <https://www.esri.com/en-us/arcgis/products/arcgis-field-maps/overview>
- Documentation Website - <https://www.esri.com/en-us/arcgis/products/arcgis-field-maps/resources>
- GeoNet Community Group - <https://community.esri.com/t5/arcgis-field-maps/ct-p/arcgis-field-maps>
- GitHub Repository - <https://github.com/Esri/tracker-scripts>
- ArcGIS Ideas website - <https://community.esri.com/community/arcgis-ideas/>



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The background is a vibrant, abstract composition. It features a central area of solid blue and teal. The left and right sides are framed by complex, colorful patterns. On the left, there are swirling shapes in red, yellow, and blue, along with a section of a hexagonal grid in shades of green and blue. On the right, there are more swirling patterns in blue, red, and yellow, with some darker, more intricate designs. The overall effect is dynamic and modern.

Please provide your feedback for this session by clicking on the session survey link directly below the video.