

# Introduction to Spatial Analysis in ArcGIS Online

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# Topics

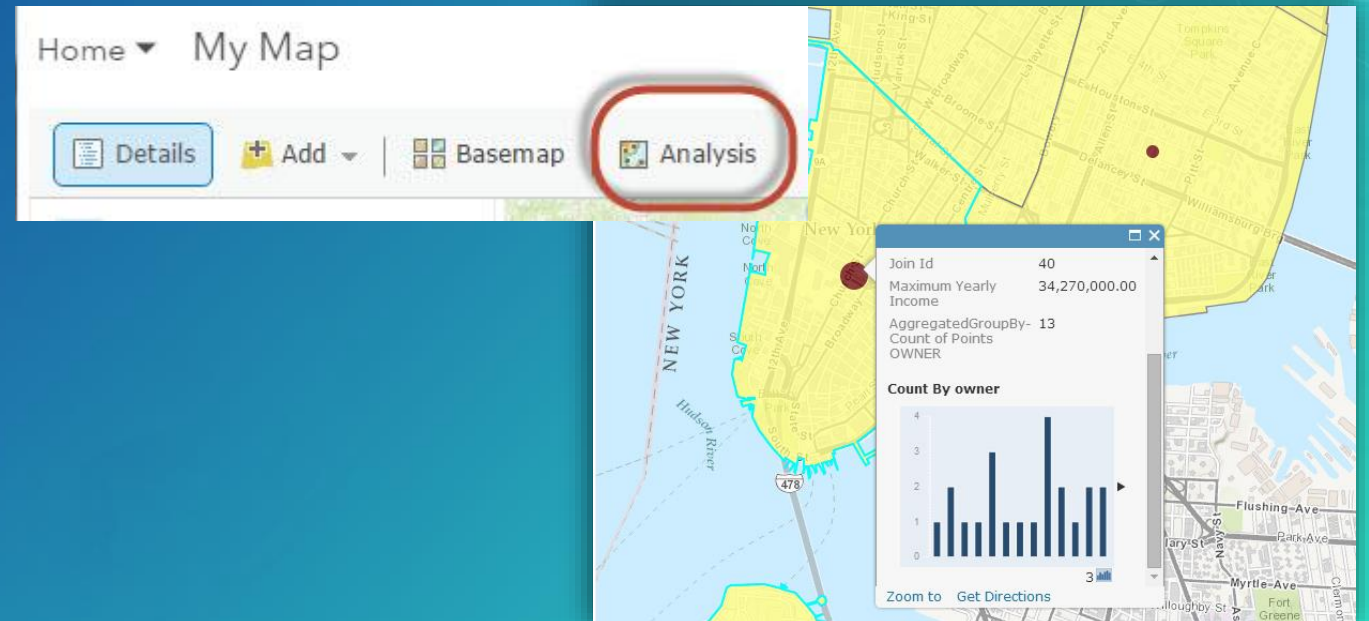
- Introducing ArcGIS Online Spatial Analysis
- ArcGIS Online Spatial Analysis Workflow
- Demos and examples
  - Using ArcGIS Online Analysis to Solve Problems
- Wrap up
- Q&A

# Introducing ArcGIS Online Spatial Analysis

# ArcGIS Online Spatial Analysis

## What is it?

- Integrate analytics into ArcGIS Online for your organization's workflows
  - Everything runs in the cloud using ArcGIS Online
  - Ready to use content
- Use analysis tools to quickly, easily, and intuitively:
  - Discover relationships, patterns, and trends in data
  - Answer questions in a meaningfull way





# ArcGIS Online Spatial Analysis

What is the value?

- Embracing Web GIS
- New and better ways to perform spatial analysis
  - Solutions based
  - Content and services
  - Easy and Intuitive

The screenshot shows the ArcGIS Online interface. On the left, the 'Perform Analysis' menu is open, listing several tools under the 'Summarize Data' category:

- Summarize Data
  - Aggregate Points
  - Join Features
  - Summarize Nearby
  - Summarize Within
- Find Locations
- Data Enrichment
- Analyze Patterns
- Use Proximity
- Manage Data

On the right, a map of Los Angeles is displayed with a hexagonal grid overlay. A pop-up window titled 'LA Median Household Income' shows the following data:

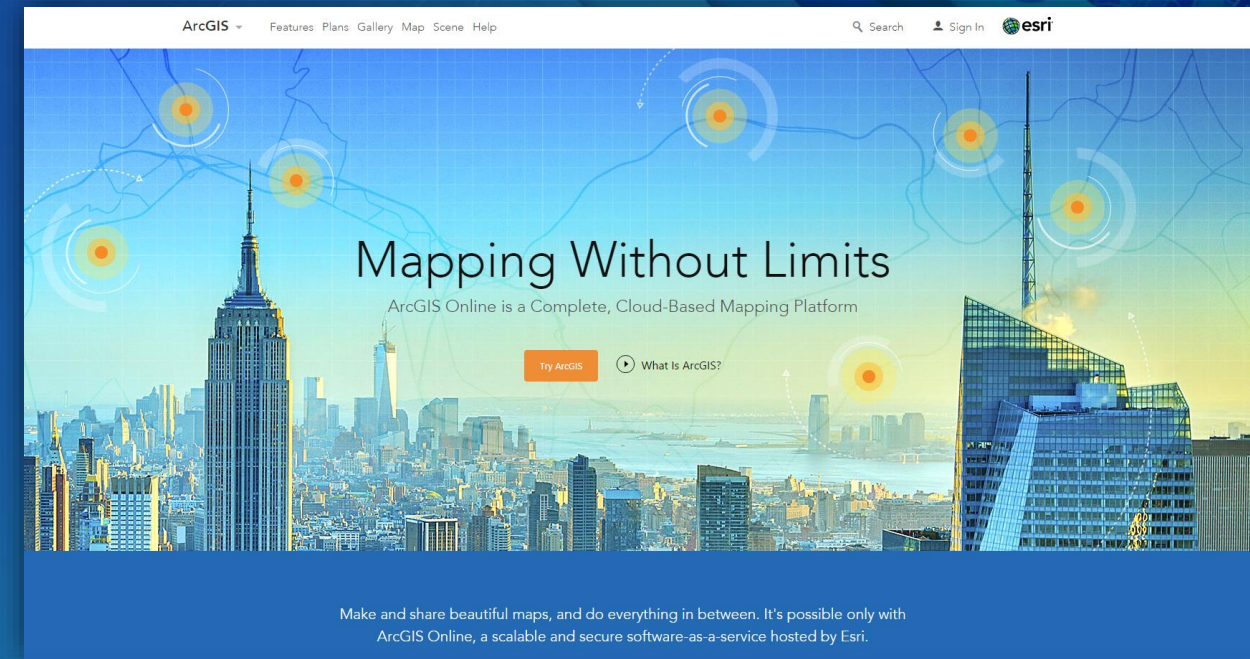
LA Median Household Income	
2015 Median Household Income	39,253.00
County Median Household Income	55,909.00

Below the table is a bar chart comparing the two income levels. The chart has two bars: one for the 2015 Median Household Income (approx. 39,253) and one for the County Median Household Income (approx. 55,909). The y-axis ranges from 0 to 50,000. The chart is titled 'LA Median Household Income' and includes a 'Zoom to' button and a 'Get Directions' button.

The map interface also includes a search bar at the top with the text 'Find address or place' and a scale bar at the bottom left showing 0, 1, and 2 miles. The Esri logo is visible in the bottom right corner.

# What do you need?

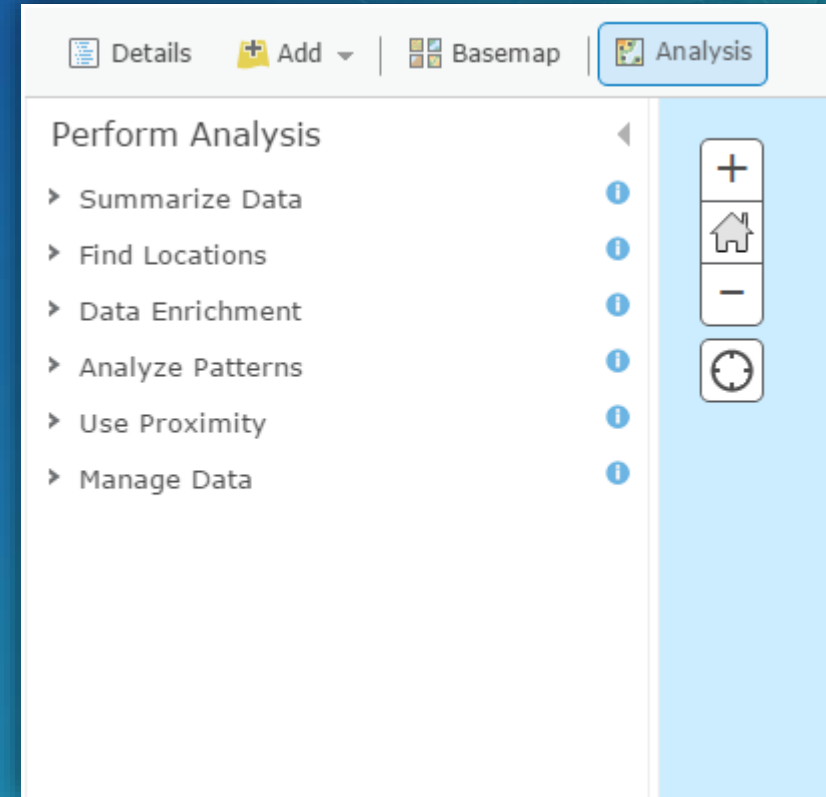
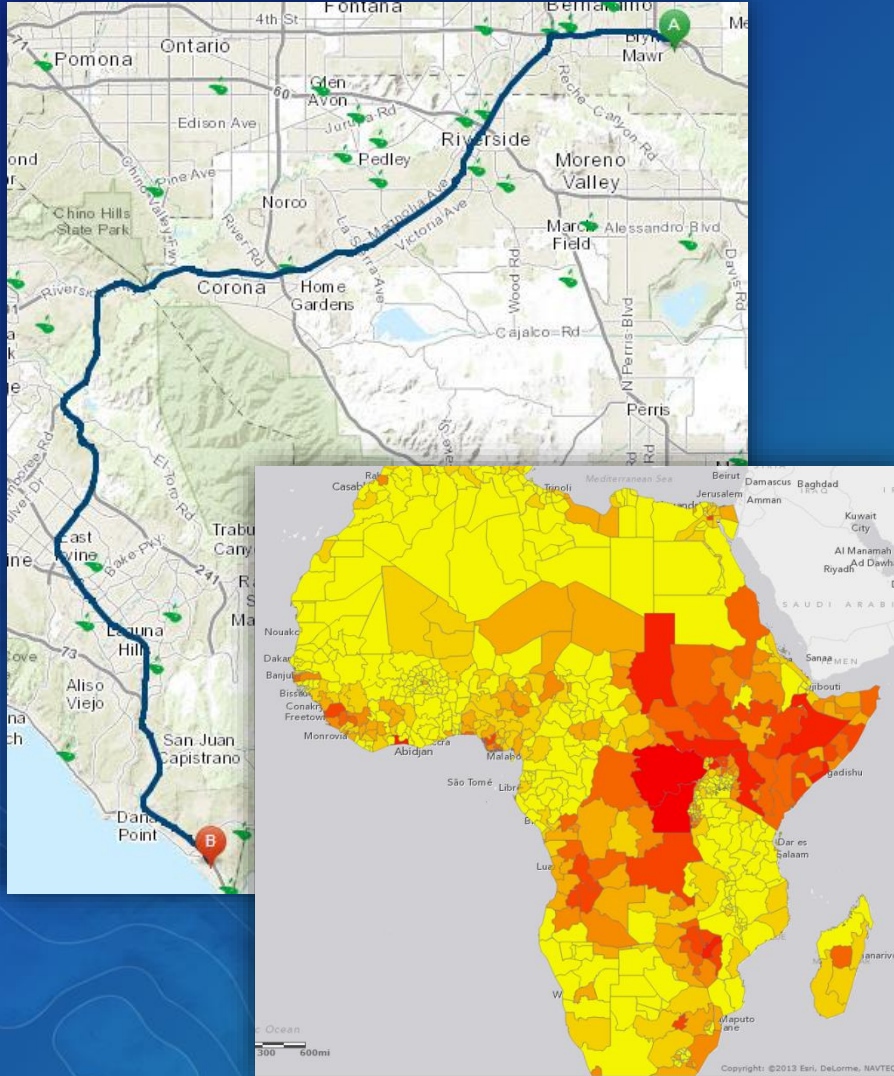
- ArcGIS Online Organizational account
- Role privileges:
  - Create items
  - Publish hosted features
  - Premium Content
  - Network Analysis
  - Spatial Analysis
  - GeoEnrichment
  - Demographics
  - Elevation Analysis
- Credits



General Privileges		
<b>[ - ] <input checked="" type="checkbox"/> Members</b>	<b>[ - ] <input type="checkbox"/> Groups</b>	<b>[ - ] <input type="checkbox"/> Content</b>
<input checked="" type="checkbox"/> View	<input type="checkbox"/> Create, update, and delete	<input checked="" type="checkbox"/> Create, update, and delete
	<input checked="" type="checkbox"/> Join organizational groups	<input checked="" type="checkbox"/> Publish hosted feature layers
	<input checked="" type="checkbox"/> Join external groups	<input type="checkbox"/> Publish hosted tile layers
	<input checked="" type="checkbox"/> View groups shared with organization	<input type="checkbox"/> Publish hosted scene layers
		<input checked="" type="checkbox"/> View content shared with organization
<b>[ - ] <input type="checkbox"/> Sharing</b>	<b>[ - ] <input checked="" type="checkbox"/> Premium Content</b>	<b>[ - ] <input type="checkbox"/> Features</b>
<input checked="" type="checkbox"/> Share with groups	<input checked="" type="checkbox"/> Geocoding	<input checked="" type="checkbox"/> Edit
<input checked="" type="checkbox"/> Share with organization	<input checked="" type="checkbox"/> Network Analysis	<input type="checkbox"/> Edit with full control
<input type="checkbox"/> Share with public	<input checked="" type="checkbox"/> Spatial Analysis	
<input type="checkbox"/> Make groups visible to organization	<input checked="" type="checkbox"/> GeoEnrichment	
<input type="checkbox"/> Make groups visible to public	<input checked="" type="checkbox"/> Demographics	
<input type="checkbox"/> Make groups available to Open Data	<input checked="" type="checkbox"/> Elevation Analysis	
		<b>[ - ] <input type="checkbox"/> Open Data</b>
		<input type="checkbox"/> Manage Open Data site(s)

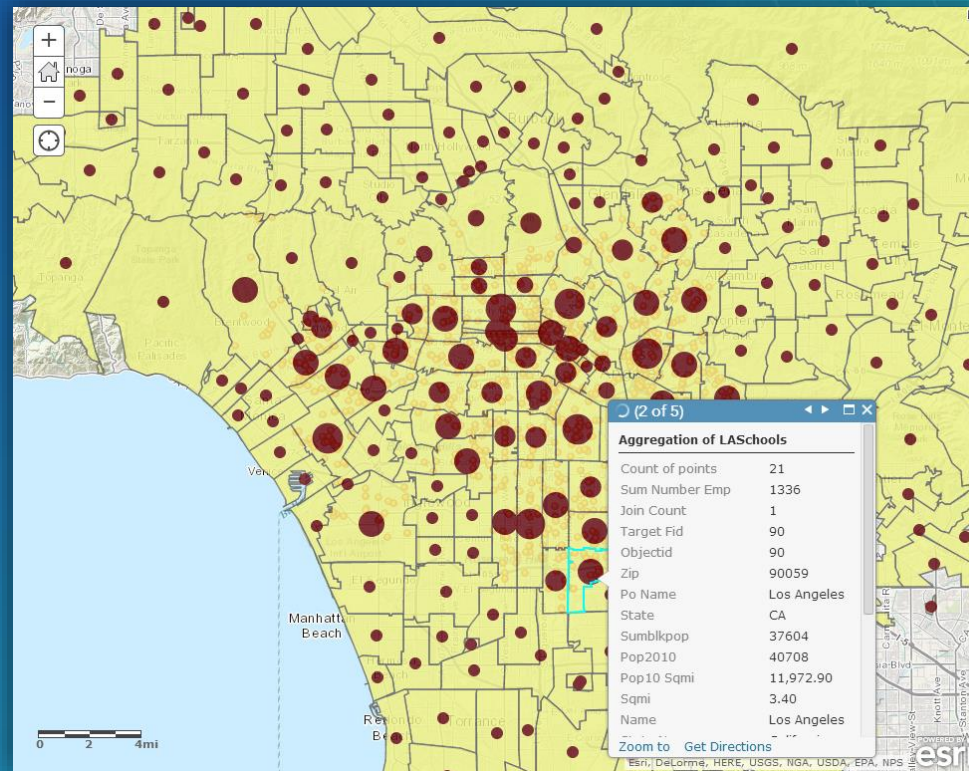
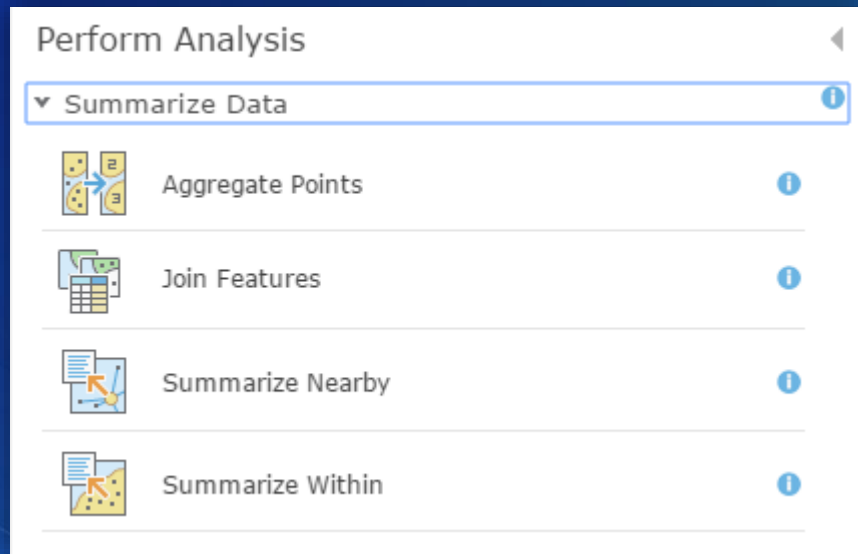


# ArcGIS Online Spatial Analysis Tools



# Summarize Data

- Calculate summary statistics for features and attributes

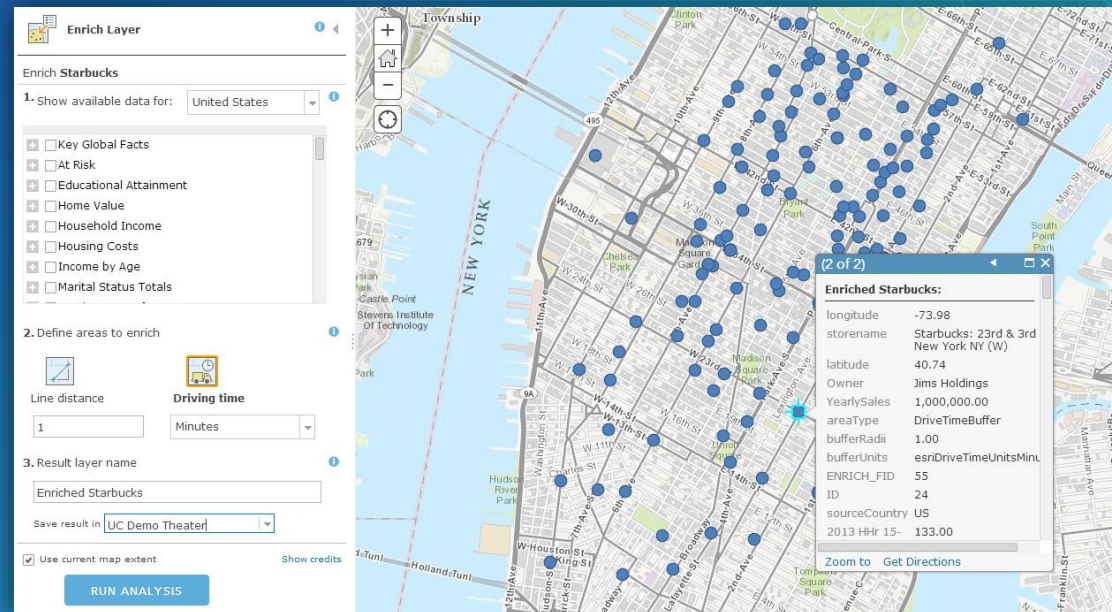
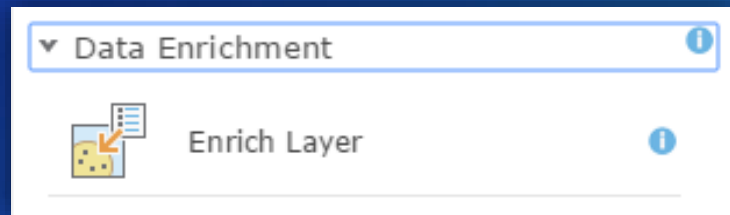


*Number of schools by zip code*



# Data Enrichment

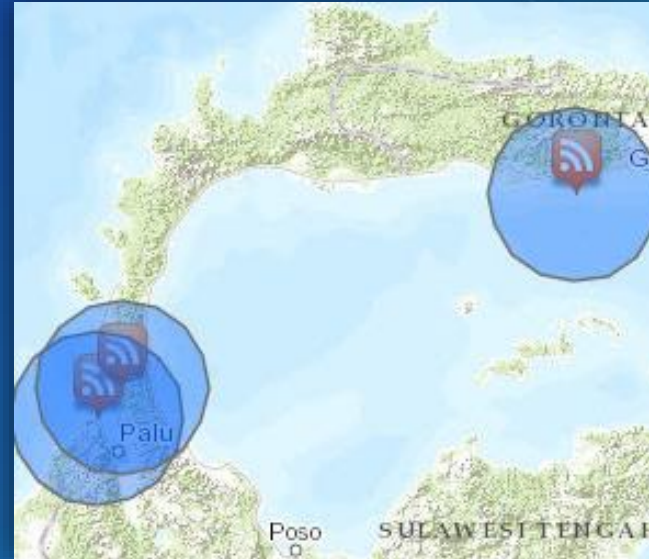
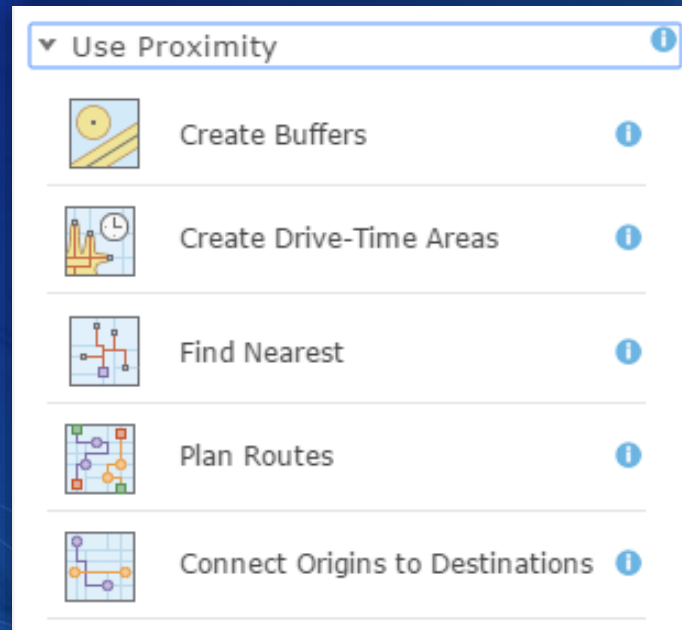
- Explore the character of areas
- Add detailed demographic data and statistics to your analysis



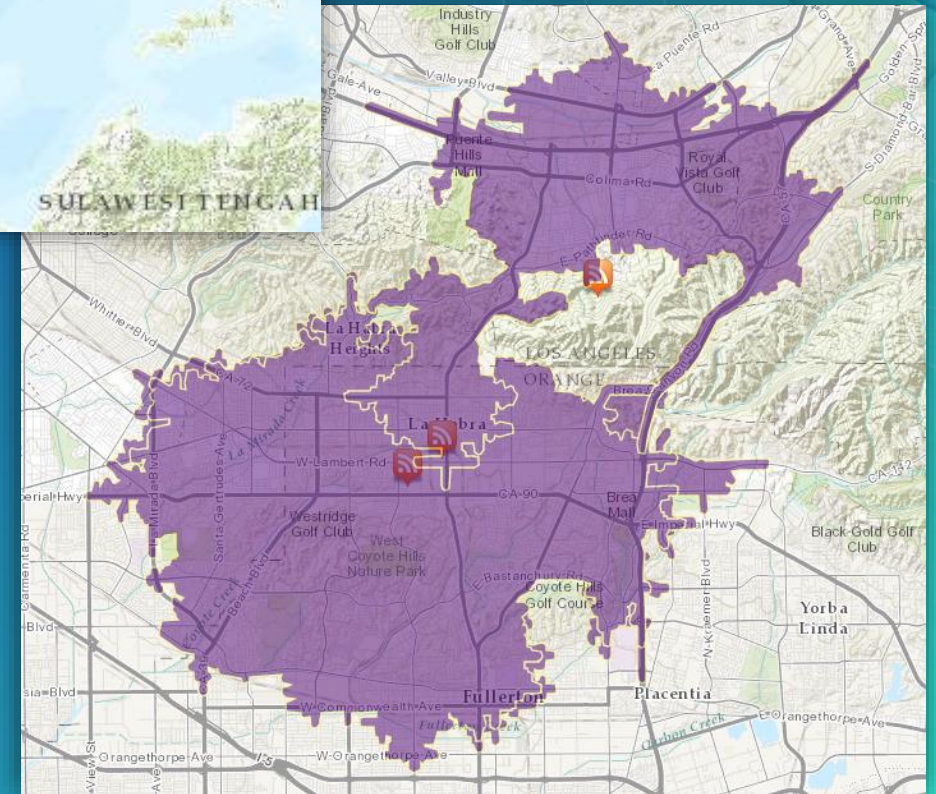
*Who lives in the neighborhood surrounding each Starbucks store?*

# Use Proximity

- "What is near what?"



*Earthquake events  
Create buffers*

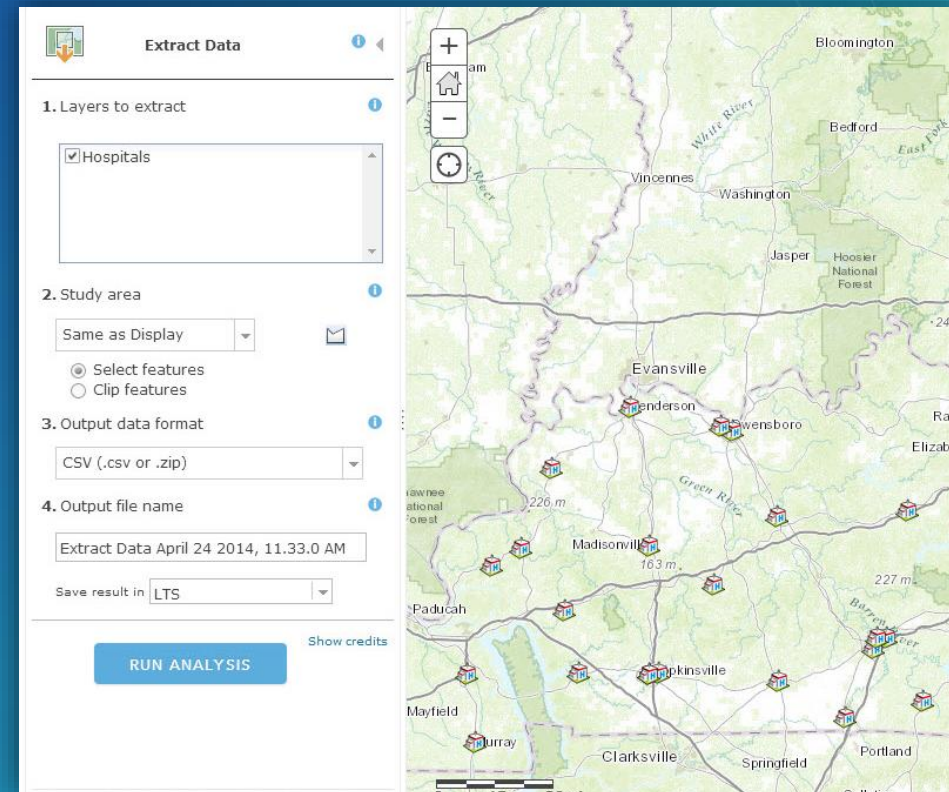
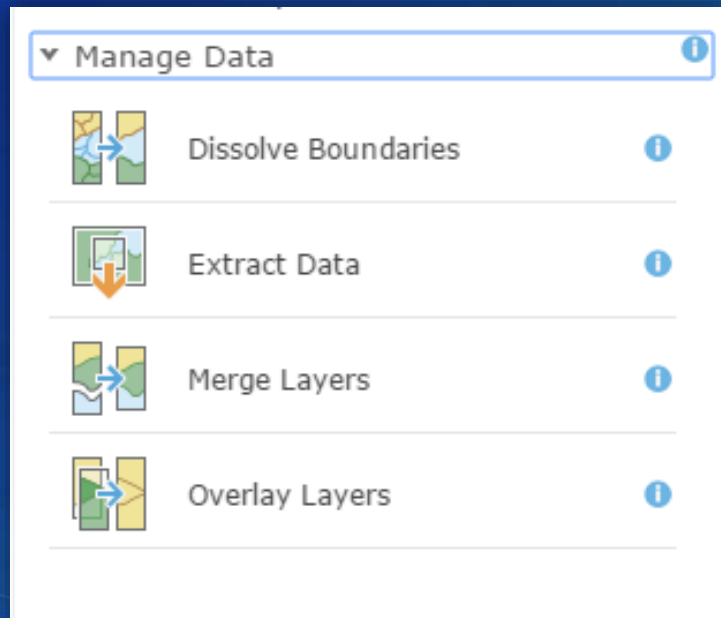


*Drive-time areas*



# Manage Data

- Manage geographic data, and combine prior to analysis



*Ohio hospitals—extract data*










# ArcGIS Online Spatial Analysis

## Release Update

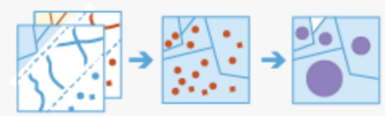
- Incremental release with each ArcGIS Online quarterly update
- New in last year:
  - Join Features
  - Find Outliers
  - Better sharing experience with network analysis results
- Latest release: June 2017
  - 26 workflows
  - Rerun analysis workflows

### Contents

- ☒ Enriched Aggregation of US airports to USStates
  -      
- ☒ Aggregation of US airports to USStates
  -  Topographic

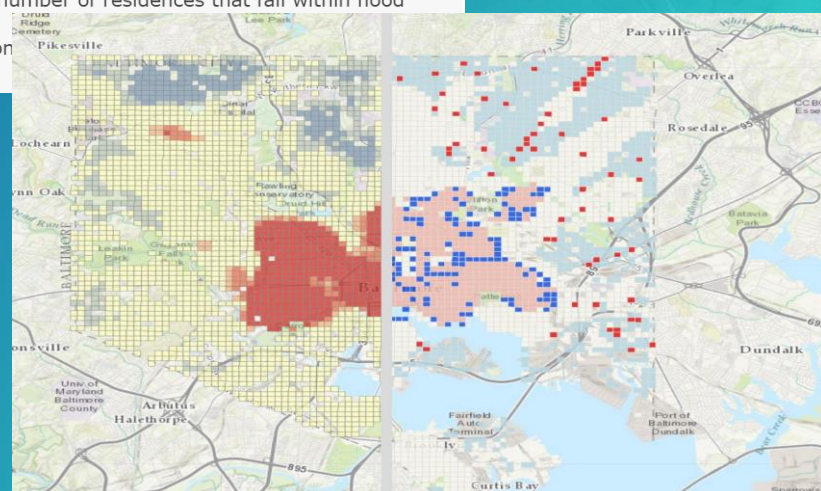
Rerun Analysis

### Join Features



Join Features will transfer attributes from one layer or table to another based on spatial and attribute relationships. For example:

- Append common boundary or demographic information to your incident data.
- Identify the closest facilities to a known location.
- Determine the number of residences that fall within flood zones.
- Identify common



# ArcGIS Online Analysis Workflow

# ArcGIS Online Analysis Workflow





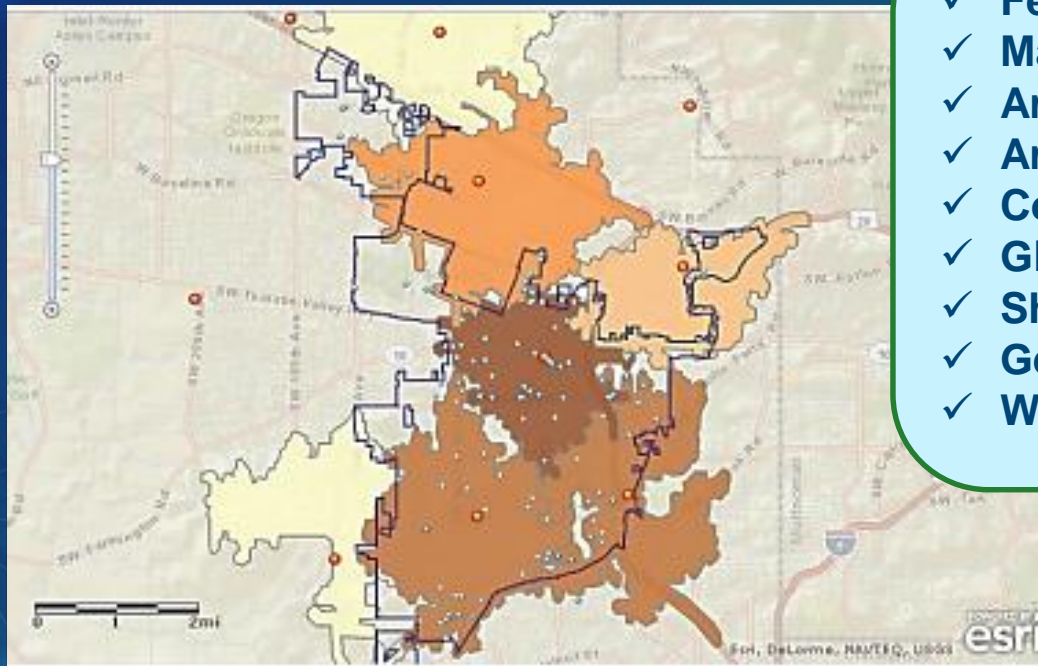
# Assemble data

Prepare  
data

- Evaluate analysis needs
- Search local and online resources
- Create, publish, and filter data

## Supported data types

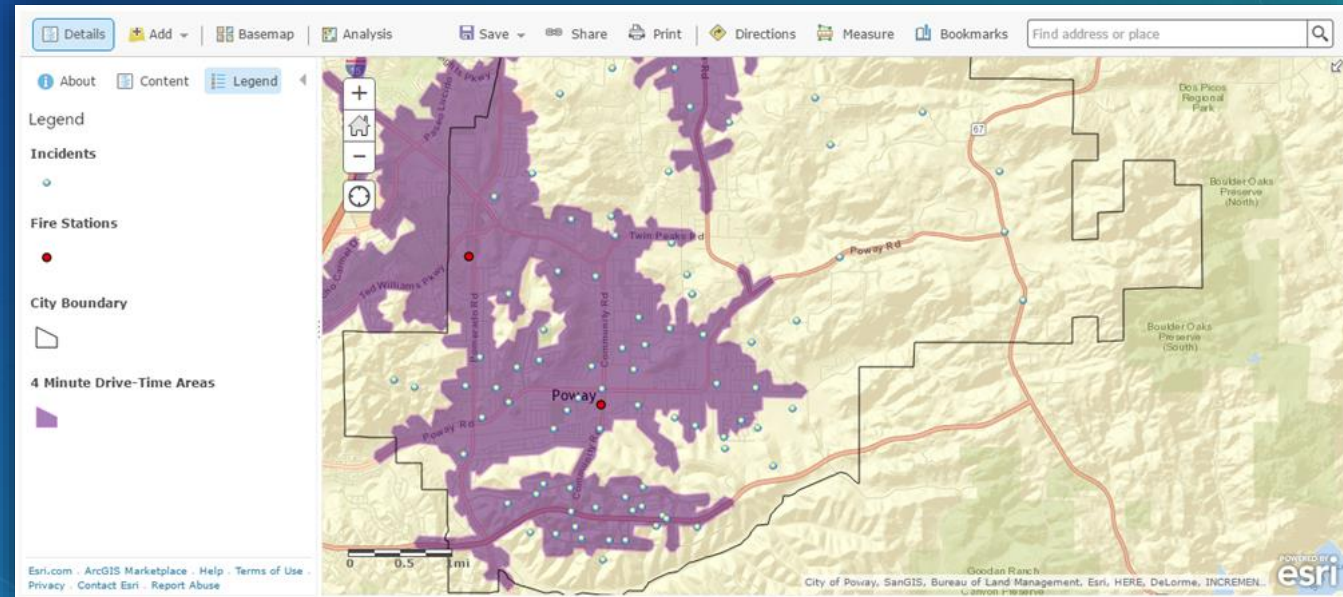
- ✓ Feature service
- ✓ Map service with feature layers
- ✓ ArcGIS Online Map Notes
- ✓ ArcGIS Online Route layers
- ✓ Comma-separated values (CSV) file (.csv)
- ✓ GPS exchange format file (.gpx)
- ✓ Shapefile (.zip)
- ✓ GeoRSS web feed
- ✓ WFS layers



# Update map

Add to  
map

- Bring data into ArcGIS Online map viewer
- Optionally
  - Set symbology, map display extent, and bookmarks
  - Save map

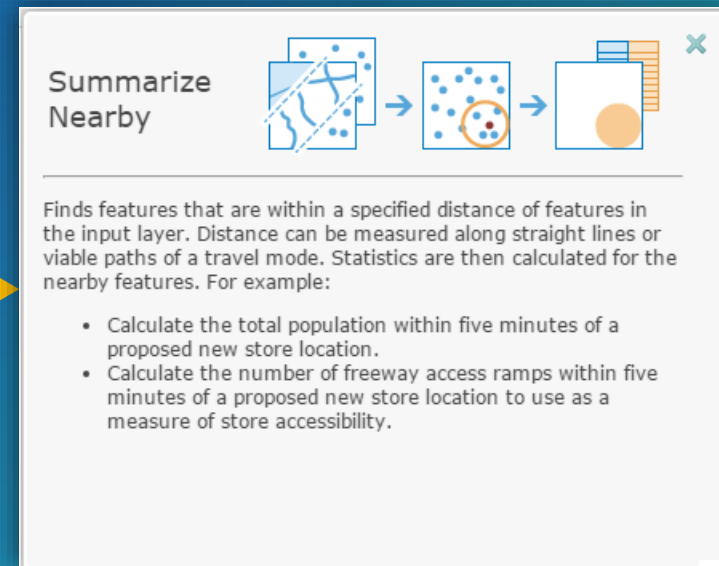
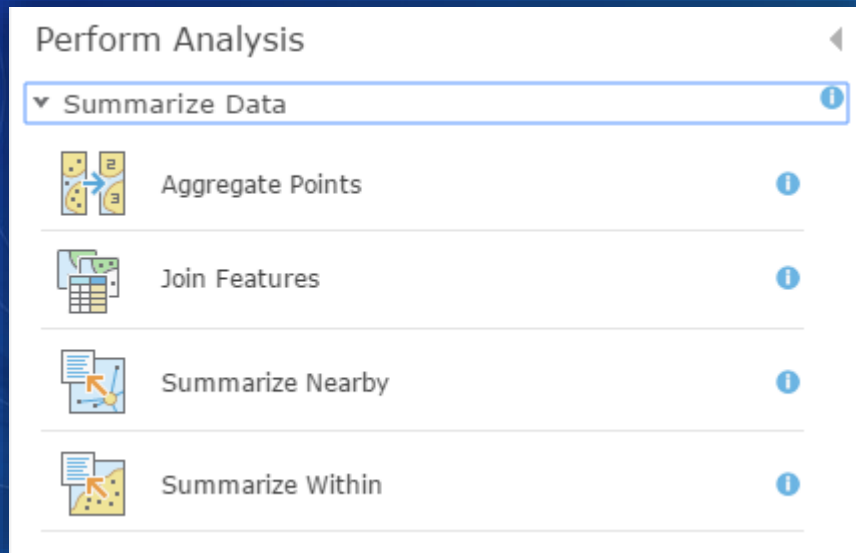
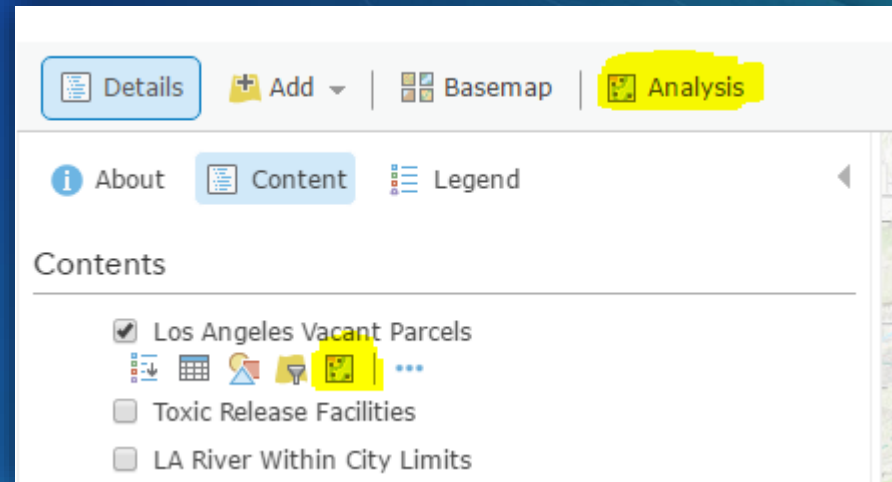


Living Atlas Analysis Layers and custom analysis layers do not need to be added to map

# Analyze data

- Open Analysis tools
- Determine appropriate tool(s)

Perform analysis

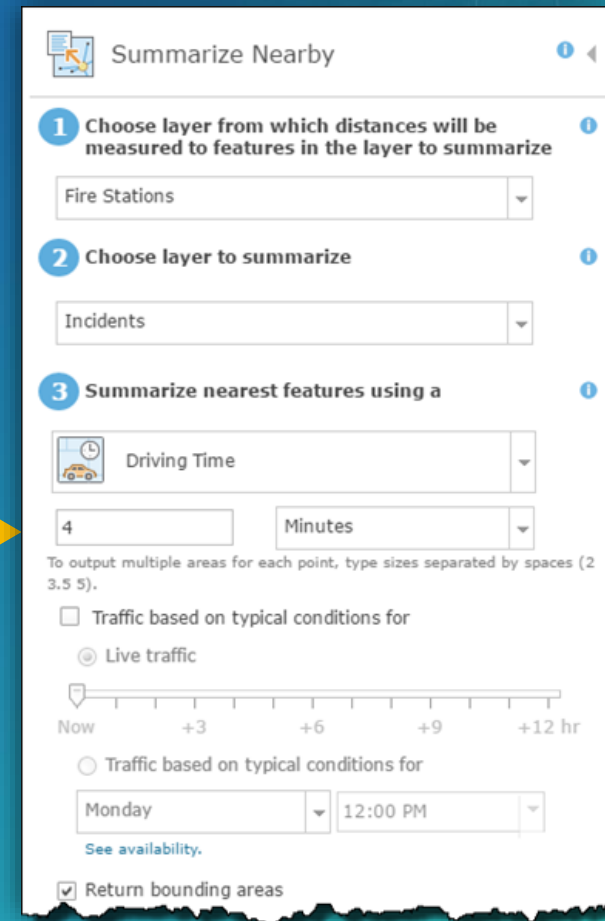
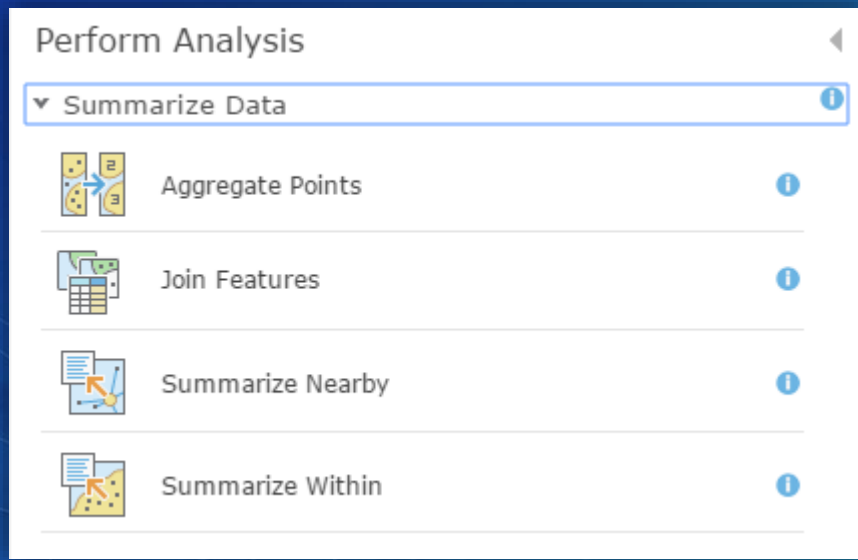




# Analyze data

- Determine appropriate tool(s)
- Apply parameters

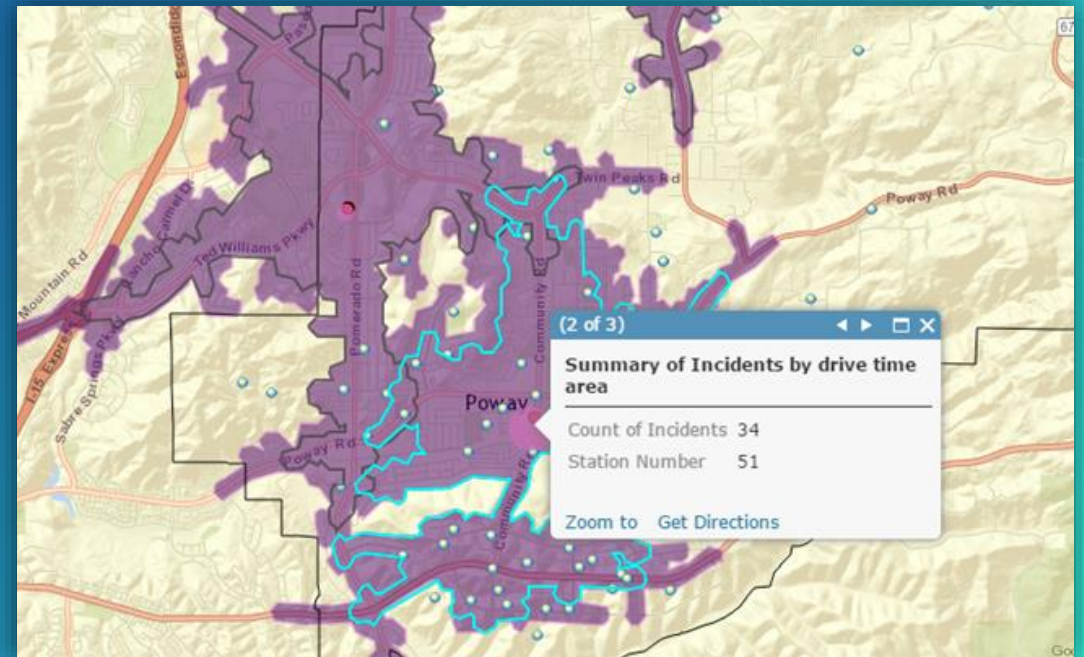
Perform analysis



# Use and review results


Review  
results


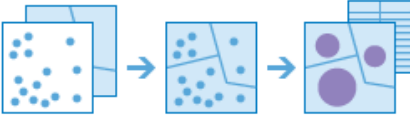



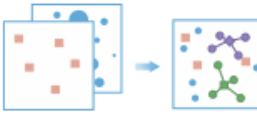
- Added to web map
- Published as hosted feature services within the organization
- Configure results layer – pop-ups, symbology
- Share the results



# Adding Analysis to Web Apps using Web AppBuilder for ArcGIS

Review  
results


  
Analysis

Name	Settings	Usage
<input checked="" type="checkbox"/> Aggregate Points		 Aggregate points into polygons where the points are located.
<p>The tool display name : <input type="text" value="Aggregate Points"/></p> <p><input checked="" type="checkbox"/> Show help links in the widget</p> <p><input checked="" type="checkbox"/> Show option to use the current map extent</p> <p><input checked="" type="checkbox"/> Display <b>Show credits</b> option</p> <p><input checked="" type="checkbox"/> Save the result in user's account</p> <p><input checked="" type="checkbox"/> Show ready to use layers from ArcGIS Online Living Atlas of the world</p> <p><input type="checkbox"/> Allow to export results</p>		
<input type="checkbox"/> Calculate Density		 Create a density map from point or line features by spreading known quantities of some phenomenon(represented as attributes of the points or lines) across the map.
<input type="checkbox"/> Choose Best Facilities		 Choose Best Facilities



# Adding Analysis to Web Apps using Web AppBuilder for ArcGIS


Review  
results


 Create Buffers ?

1 Choose layer containing features to buffer ?

State park ▼

2 Enter buffer size ?

 Distance

 Field

Enter buffer size

3

Miles ▼

To create multiple buffers, enter distances separated by spaces (2 3 5).

+ Options ?

3 Result layer name ?

State ParkBuffer


Save result in 

UC2017 ▼

☒ Use current map extent [Show credits](#)

Back

Run Analysis

 Create Buffers ?

Messages


Create Buffers submitted.

Executing

Succeeded.

Outputs

[State ParkBuffer](#)

[State ParkBuffer](#) 

Note: Feature and table outputs are added in the map as operational layers.

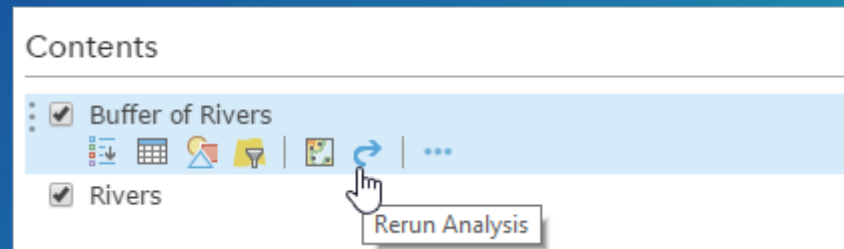
Back

Home

## Re-run analysis

Rerun  
analysis

- Analysis can be re-run from a result layer
- All the previous parameters will be honored
- The tool can be rerun with the same parameters, or the parameters can be updated



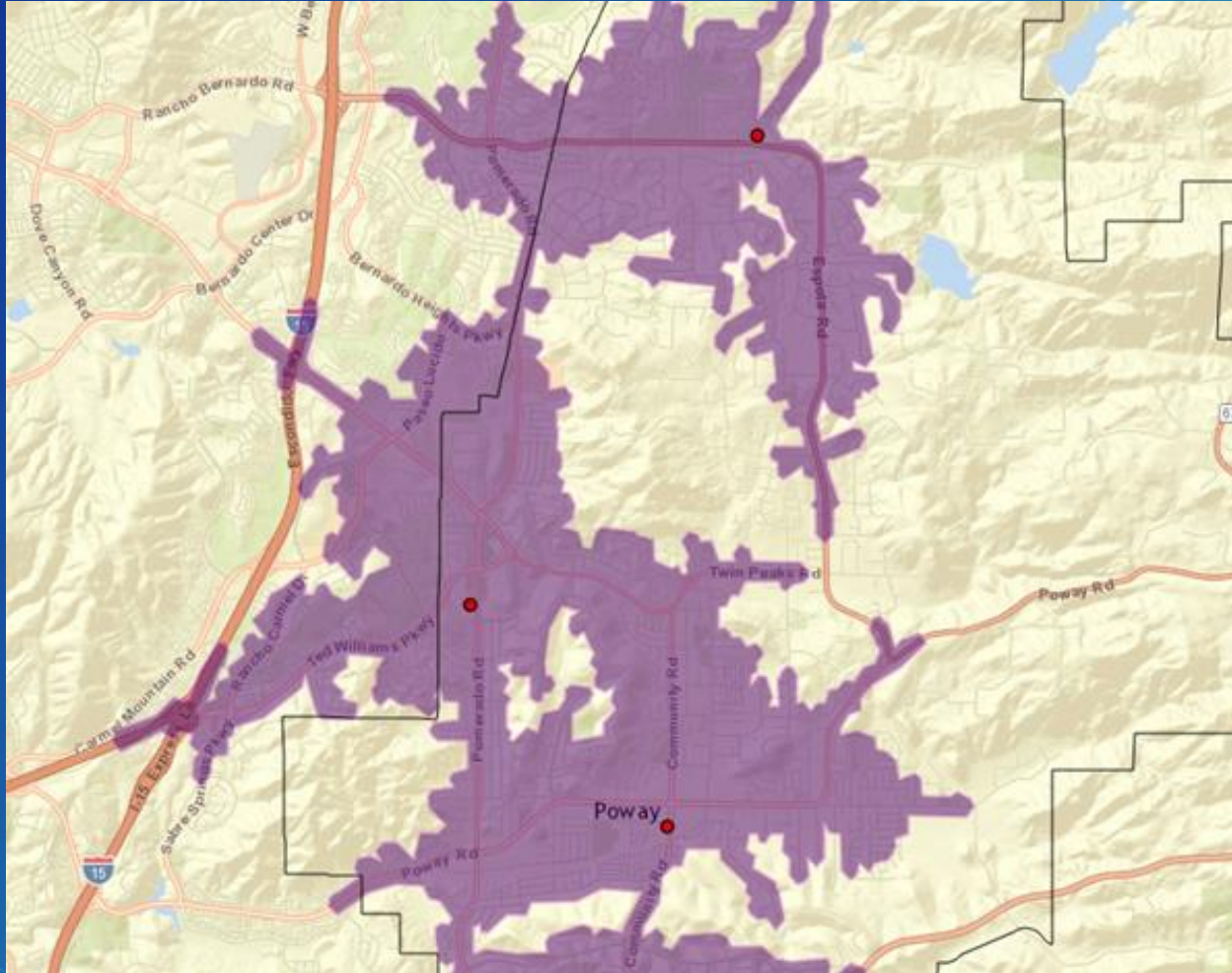
# **Demos – Using ArcGIS Online Analysis to Solve Problems**



# Investigating response time

Create drive-time areas using traffic conditions

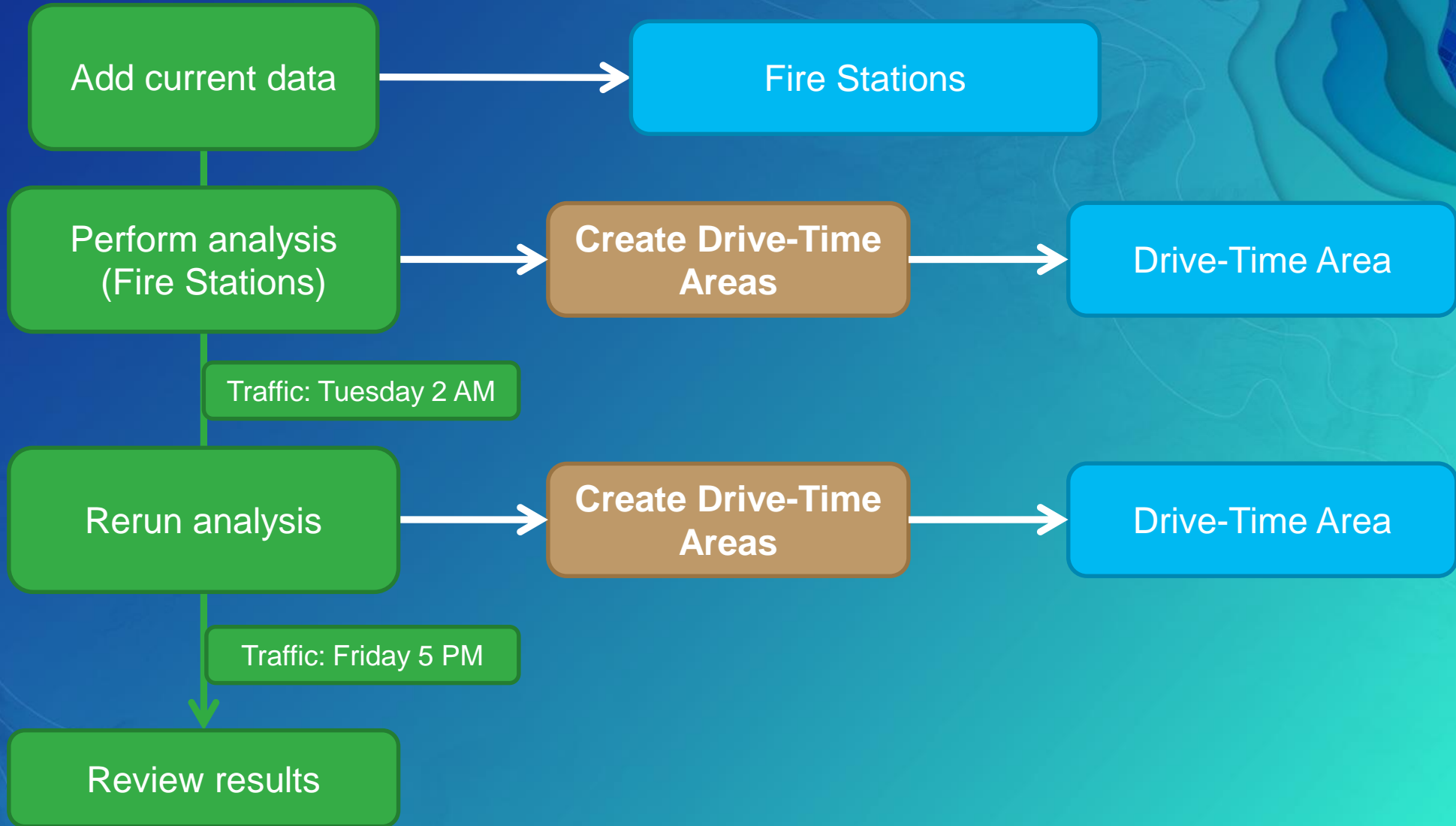
# Demo Scenario



Find the areas of the city within a four-minute drive time



## Demonstration review

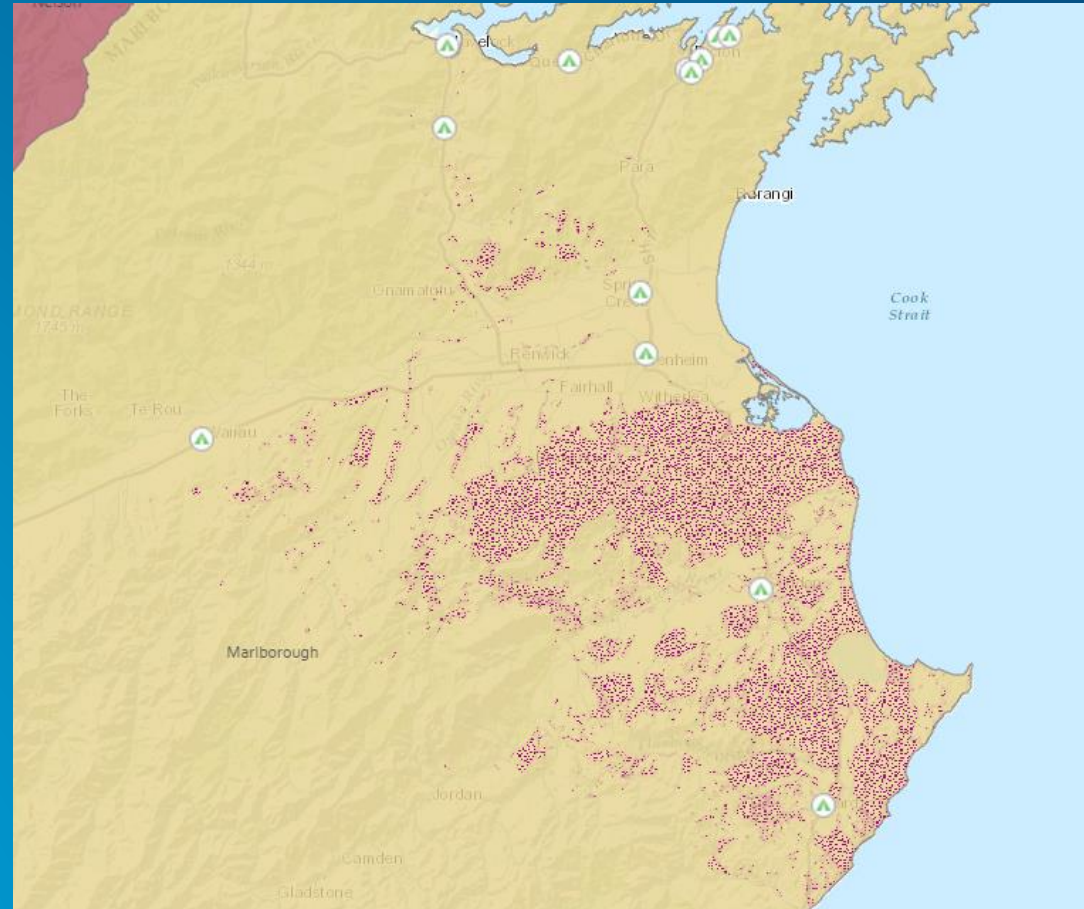




# Analyzing invasive species

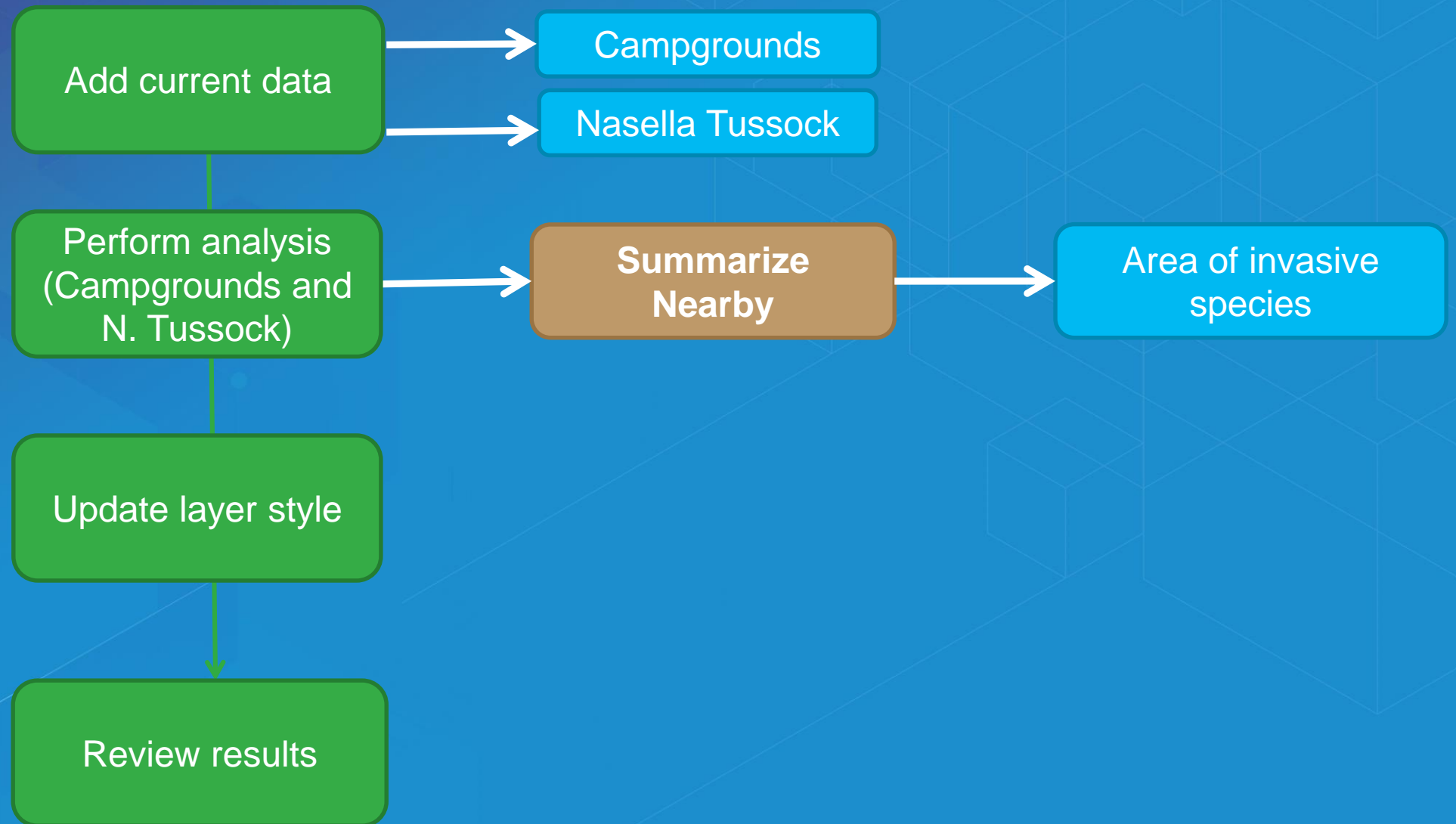
Summarize affected areas near campgrounds

# Demo Scenario



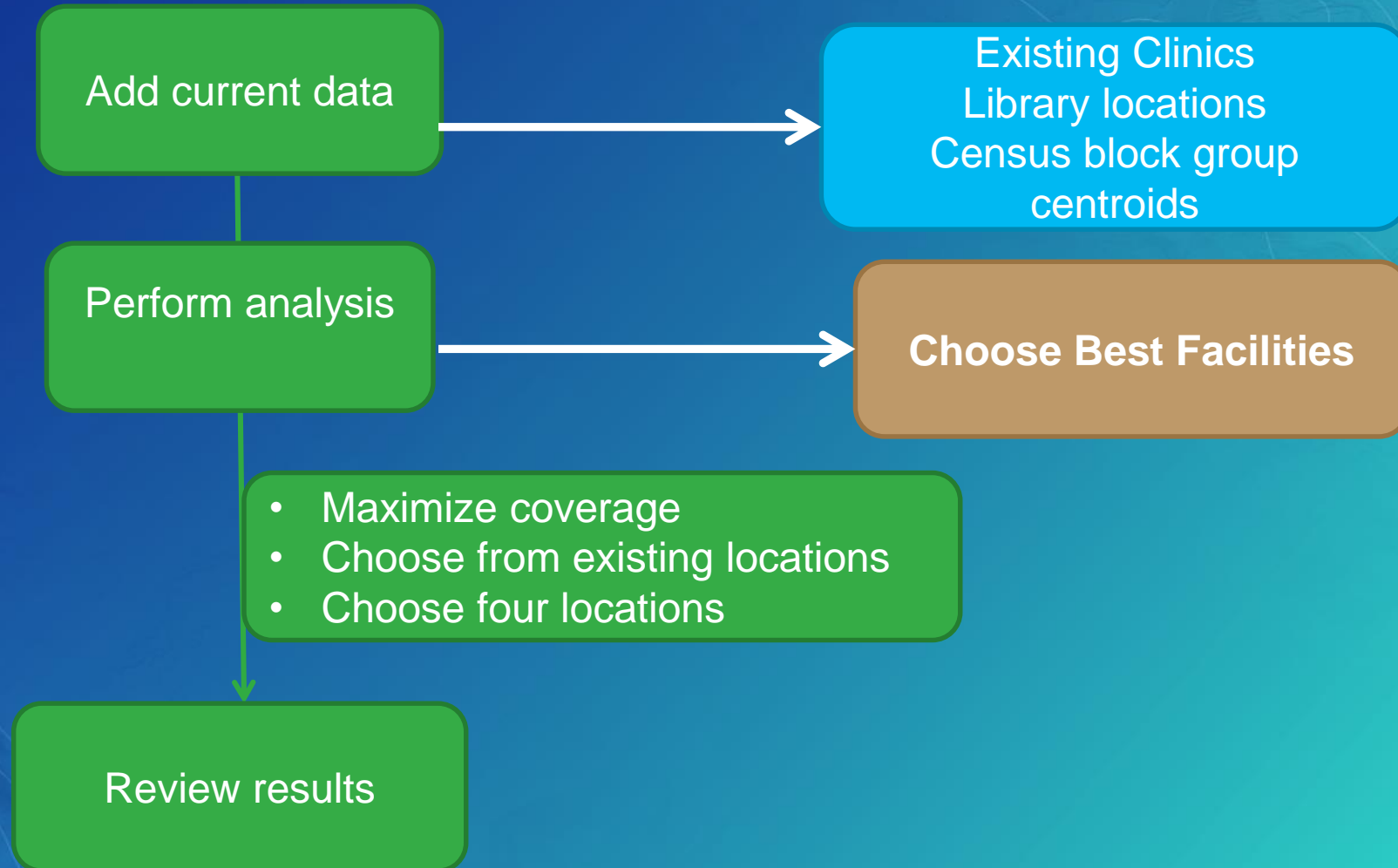
Determine which campgrounds are near areas affected by an invasive weed

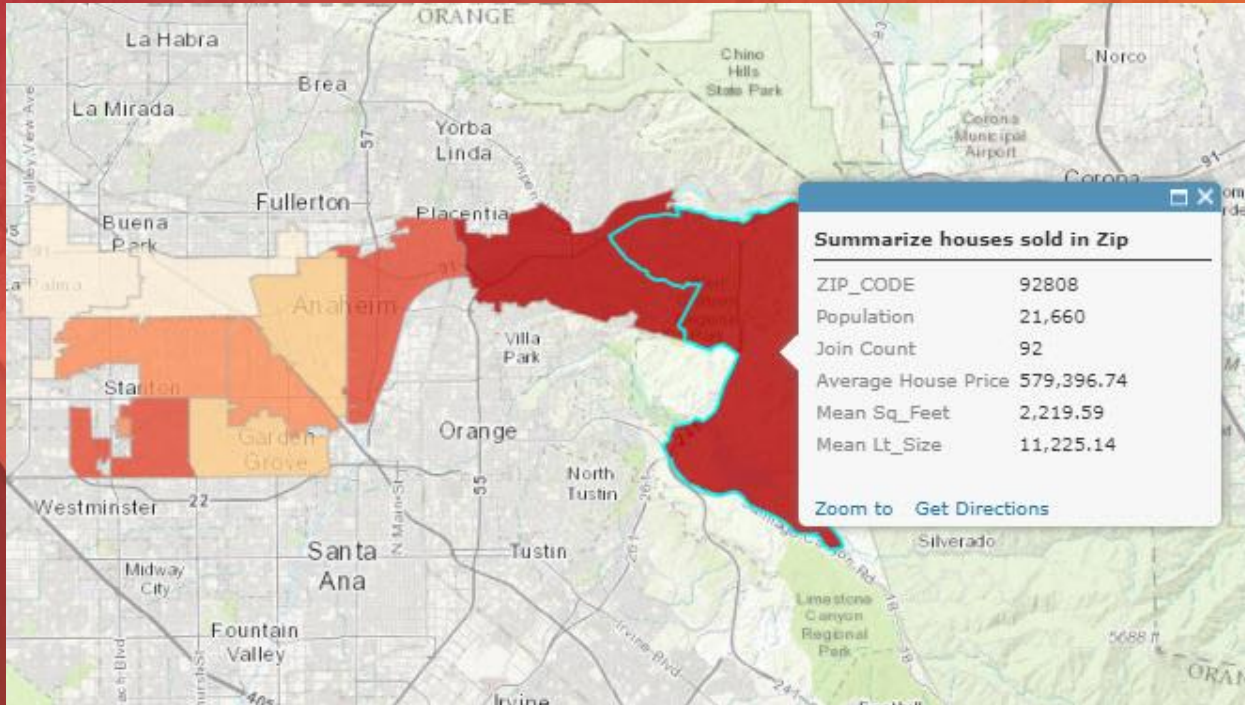
## Demonstration review





## Demonstration review





# Demo

Summarize house sales per zip code

# Demo Scenario

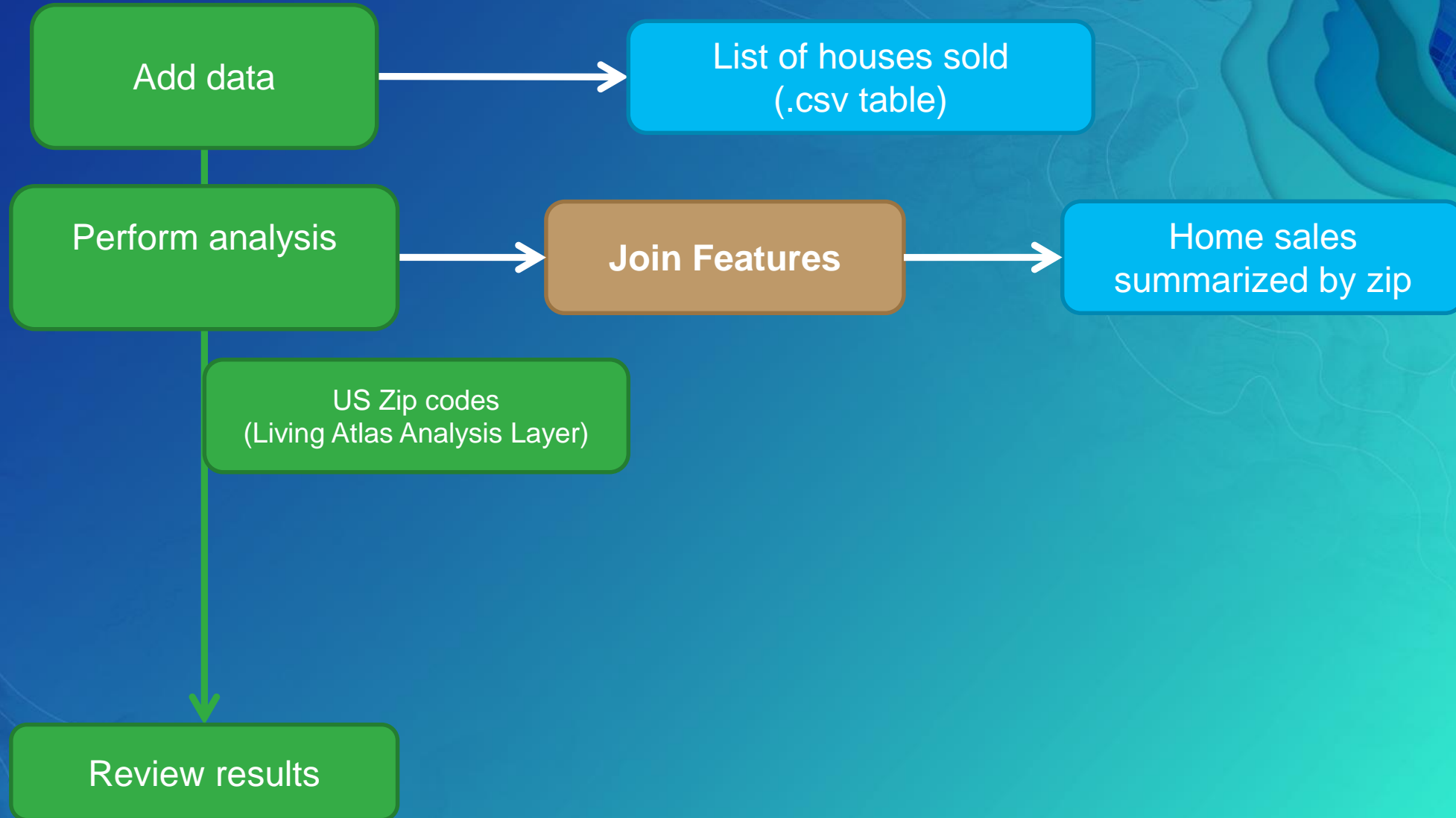
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Sq.Feet	BR	BA	Date	Amount	Yr.Built	Lt Size	Acres	Pool	APN	APN-TR	City	ZIP_CODE	STATE
2	1240	3	2	1/12/2010 0:00	55300	1975	5450	0.13	0	351-061-4	35	Anaheim	92807	CA
3	1125	3	1	1/12/2010 0:00	80000	1955	7992	0.18	0	128-531-3	12	Anaheim	92804	CA
4	966	2	2	1/22/2010 0:00	101000	1964	5942	0	0	897-090-0	89	Anaheim	92804	CA
5	966	2	2	1/27/2010 0:00	117000	1964	4781	0	0	897-091-8	89	Anaheim	92804	CA
6	1272	2	2	1/25/2010 0:00	165000	1964	5193	0	0	897-090-6	89	Anaheim	92804	CA
7	1072	2	1	1/11/2010 0:00	223000	1972	1120	0.03	0	127-012-0	12	Anaheim	92804	CA
8	1120	3	1	1/13/2010 0:00	230000	1953	6061	0.14	0	083-335-1	8	Anaheim	92806	CA
9	944	1	1	1/14/2010 0:00	240000	1953	6480	0.15	0	037-201-3	3	Anaheim	92805	CA
10	1149	3	1	1/29/2010 0:00	245000	1954	6018	0.14	0	083-342-1	8	Anaheim	92806	CA
11	880	3	1	1/29/2010 0:00	245000	1949	7200	0.17	0	071-162-1	7	Anaheim	92801	CA
12	1536	4	2	1/22/2010 0:00	250000	1956	8505	0.2	0	128-313-2	12	Anaheim	92804	CA
13	1930	4	2	1/25/2010 0:00	250000	1957	6183	0.14	0	070-522-0	7	Anaheim	92801	CA
14	1012	2	1	1/27/2010 0:00	260000	1972	1390	0.03	0	363-061-2	36	Anaheim	92807	CA
15	1578	4	2	1/12/2010 0:00	265000	1955	6161	0.14	0	071-242-0	7	Anaheim	92801	CA
16	944	3	1	1/15/2010 0:00	265000	1955	7200	0.17	0	131-182-1	13	Anaheim	92804	CA
17	943	2	1	1/28/2010 0:00	270000	1974	2105	0.05	0	268-191-0	26	Anaheim	92806	CA

Listofhousesold

Determine what is the average sales price per zip code in the area?



## Demonstration review

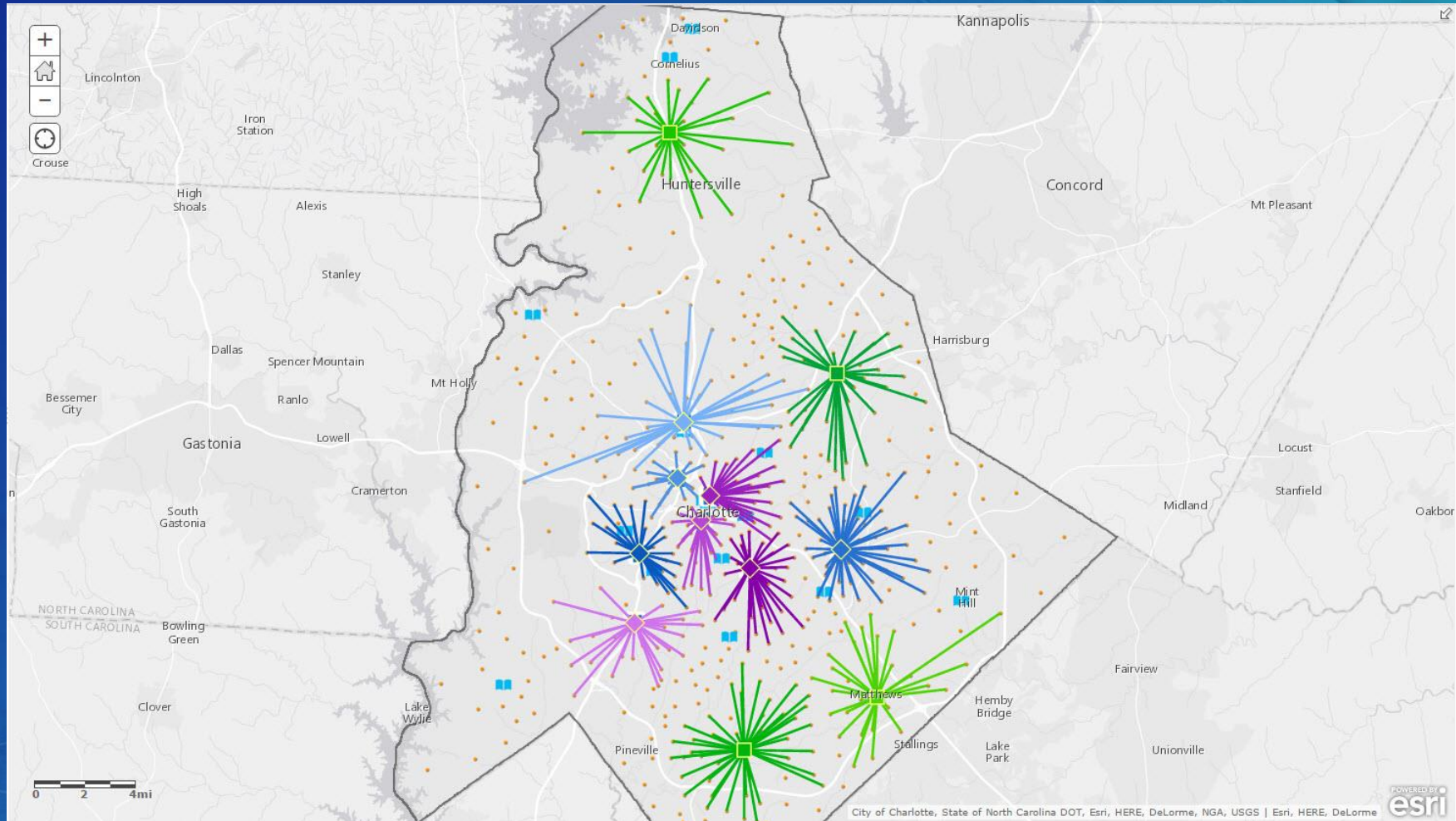


# Choose best facilities

Minimize travel cost & Maximize Demand Served

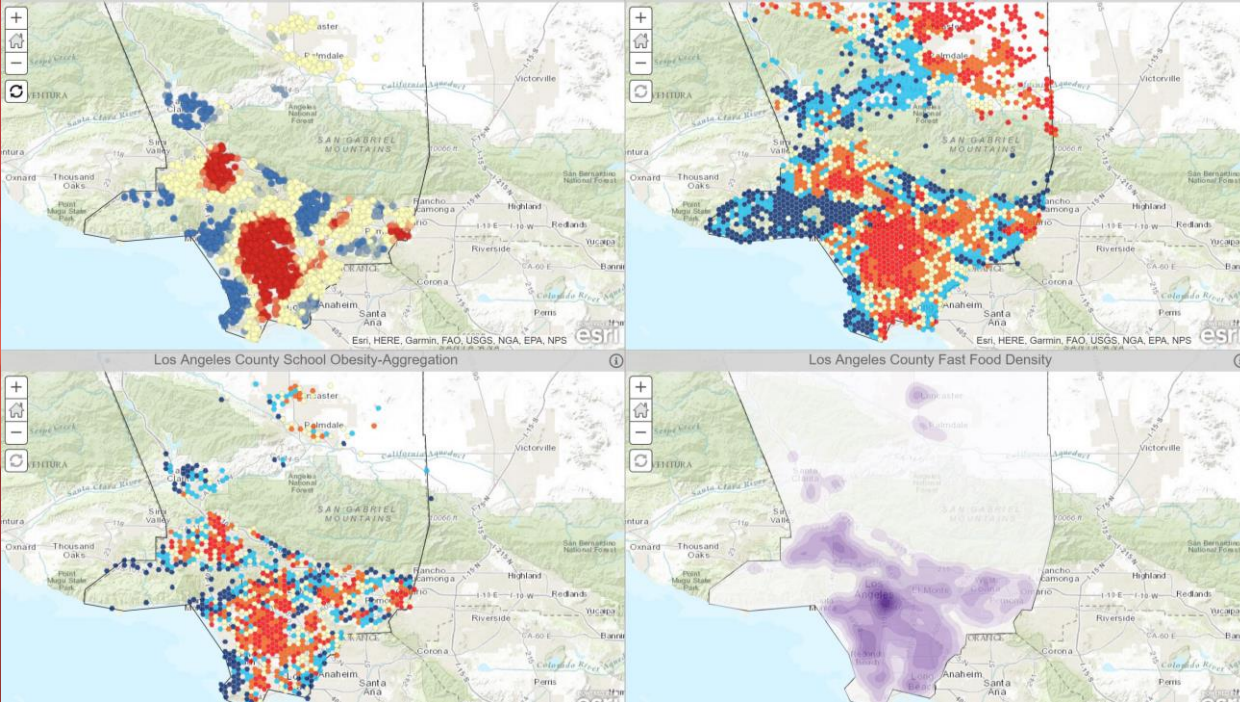


# Demo Scenario



**Find the best locations for additional clinics**

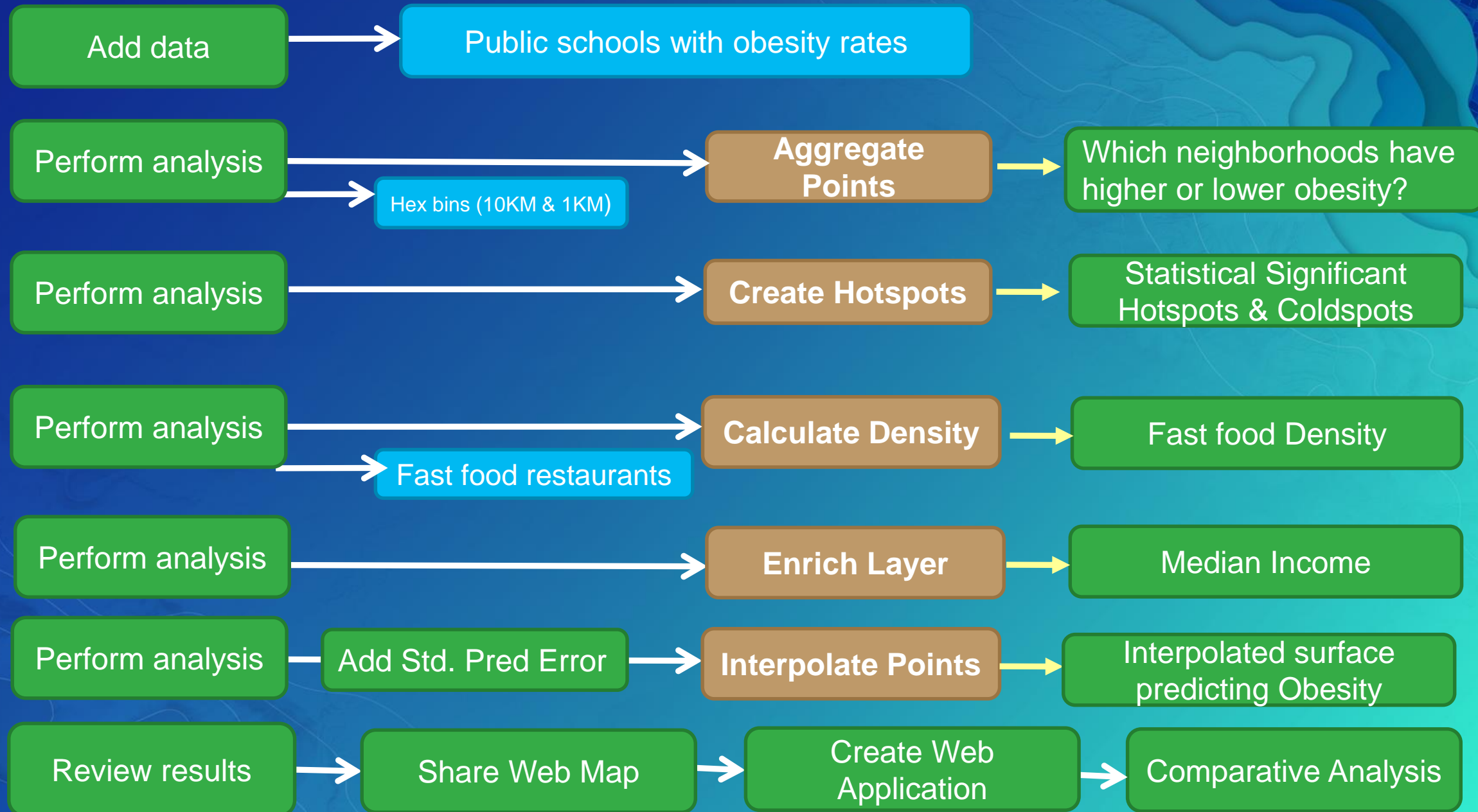




# Demo

## School Obesity Analysis

# Demonstration review



**Wrap up**



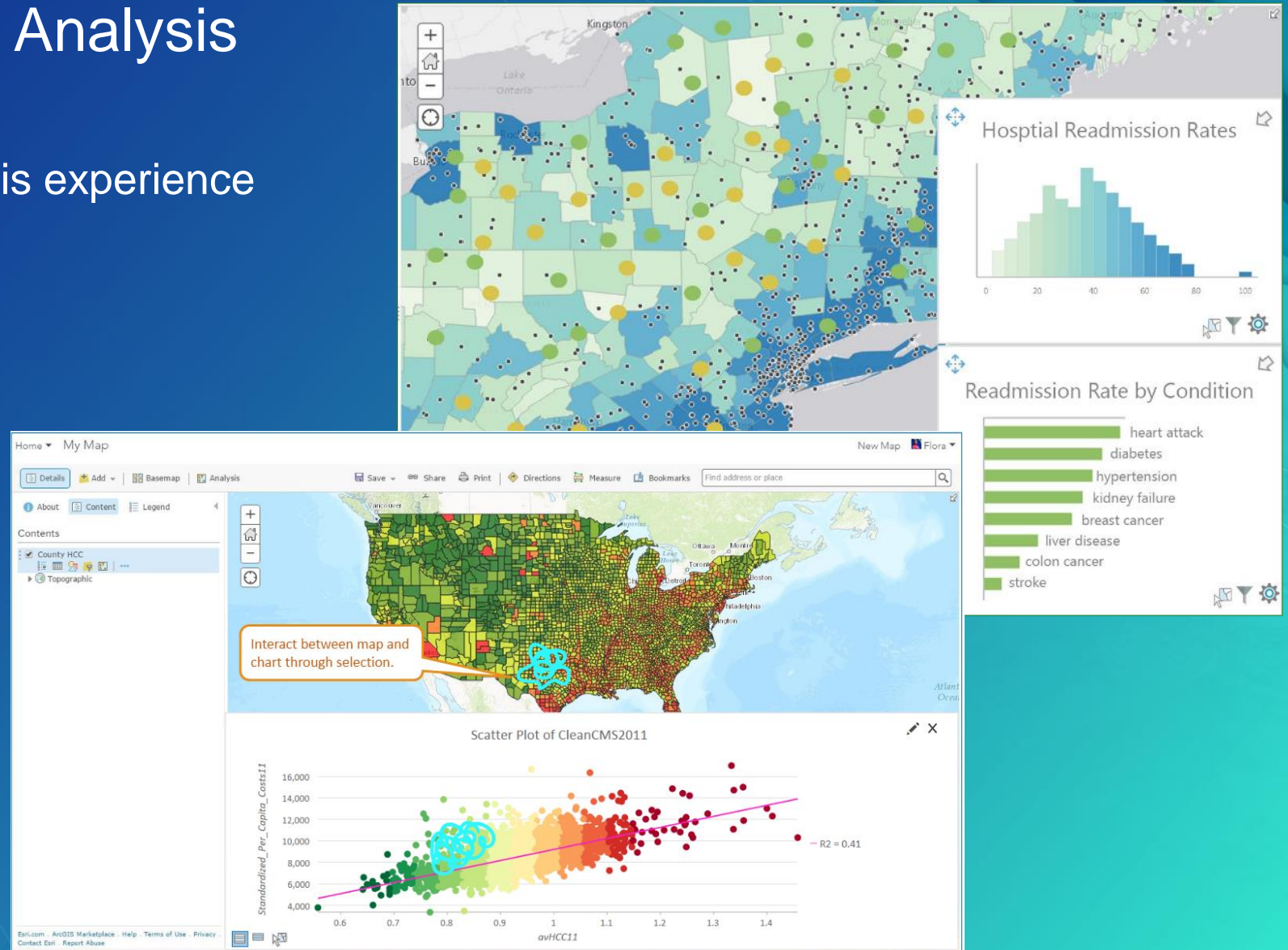
# Summary

- **Spatial analysis adds valuable insight by providing hosted tools that work with your data in your ArcGIS Online organization**
- **Performing spatial analysis online is easy and intuitive**
- **Use ArcGIS Online spatial analysis to discover geographic relationships, patterns, and trends**

# ArcGIS Online Spatial Analysis

What's next?

- Continue to improve rerun analysis experience
- Charts
- New Analysis tools
- Chaining analysis functions

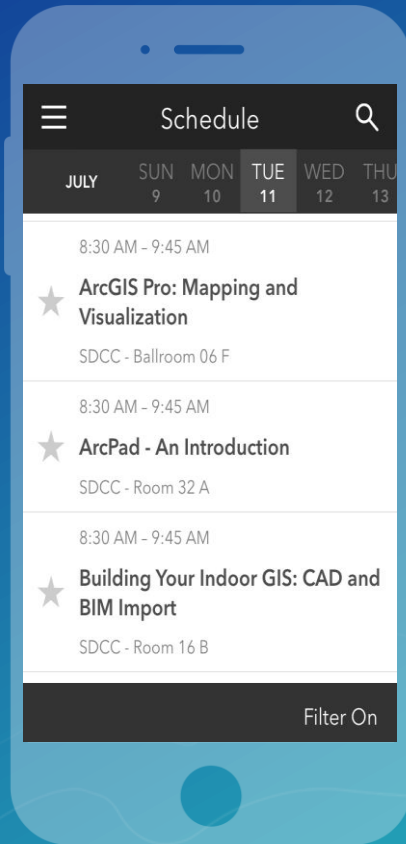


# Please Take Our Survey on the Esri Events App!

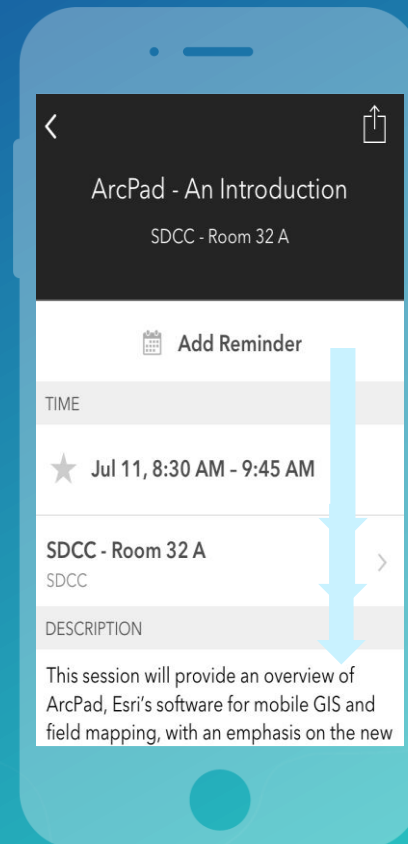
**Download the Esri Events app and find your event**



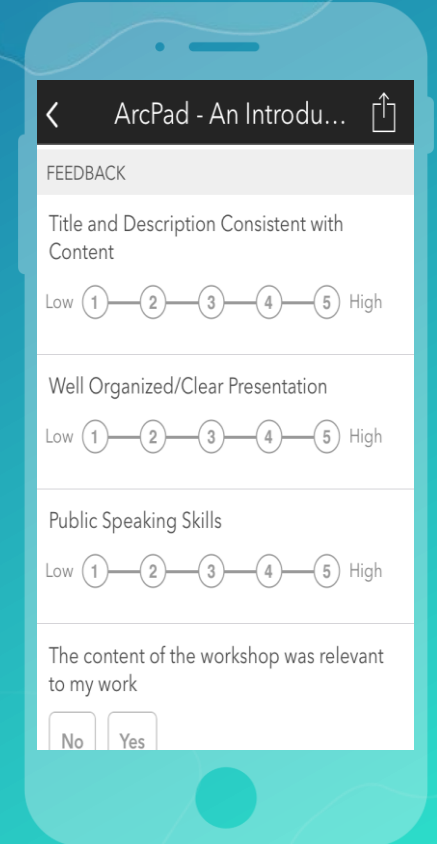
**Select the session you attended**



**Scroll down to find the survey**



**Complete Answers and Select "Submit"**







esri

THE  
SCIENCE  
OF  
WHERE