



ArcGIS Network Analyst: Network Analysis with ArcGIS Online

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Introductions

- **Who are we?**
 - Network Analyst Product Engineers
- **Who are you?**
 - Network Analyst users?
 - ArcGIS Online users?
 - Trying to figure out what is ArcGIS Online?



Slides from this workshop

<http://esriurl.com/uc15nawago>

Topics

- **What are ArcGIS Online network analysis services**
- **How to access the online services**
- **How to use the online services in out of the box apps**
- **Support and resources**
- **Questions**

Online services

- Ready-to-use services published by Esri that are run in an Esri-administered cloud infrastructure



What you need to use online services

- ArcGIS Online subscription with service credits



- Your analysis inputs



- Mapping apps



ArcMap



ArcGIS Pro



ArcGIS
Navigator



Business
Analyst Online



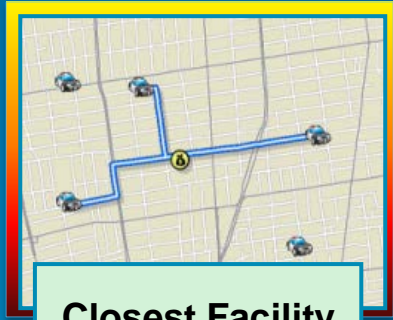
Operations
Dashboard



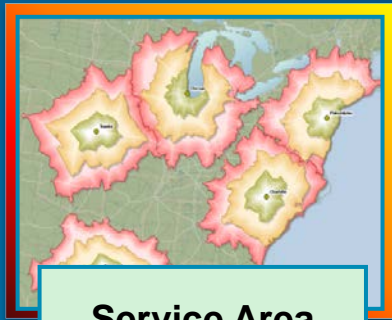
ArcGIS
Collector

What you do not need for online services

- ~~ArcGIS Network Analyst extension license~~
- ~~Your own street data modeled as a network dataset~~
- ~~Your own ArcGIS Server software~~
- ~~Hardware to host the server~~
- ~~Staff to manage the IT infrastructure~~



Closest Facility



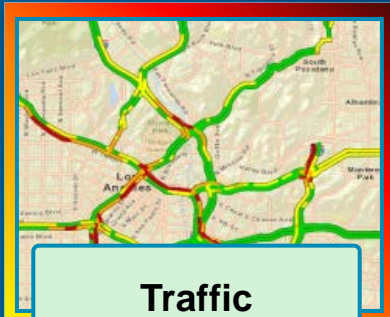
Service Area



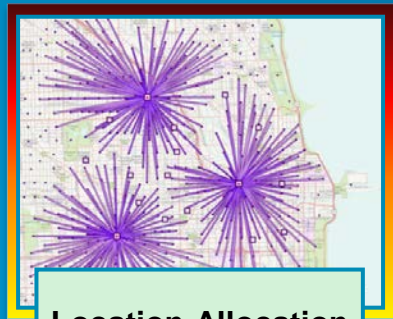
Route

Network Analysis Services

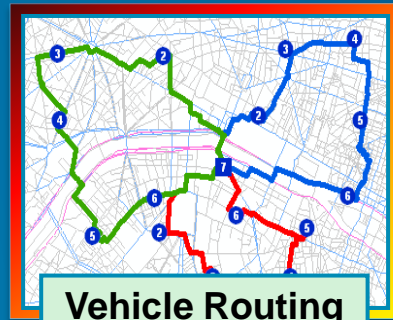
Solve transportation problems



Traffic



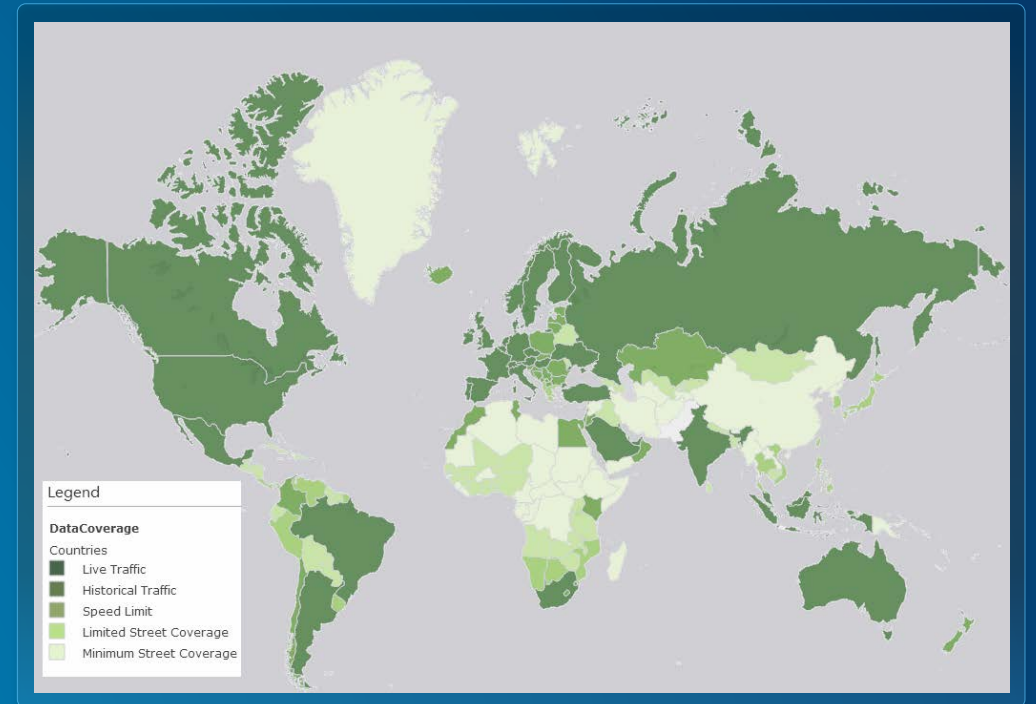
Location-Allocation



Vehicle Routing Problem

Data coverage

- Work globally
 - Currently 244 countries
- Use high quality street data
 - Real time traffic where available
 - Support for vehicle weight, width and height restrictions
 - Can use preferred truck routes or avoid toll roads
- Driving, Walking, Trucking, or **your own travel modes**



[View web map](#)

Accessing services

- All services are secured and require ArcGIS Online organization subscription with service credits
- Existing ArcGIS Desktop users get a free organization subscription
- Sign up for a 60 day free trial at www.arcgis.com



Using services

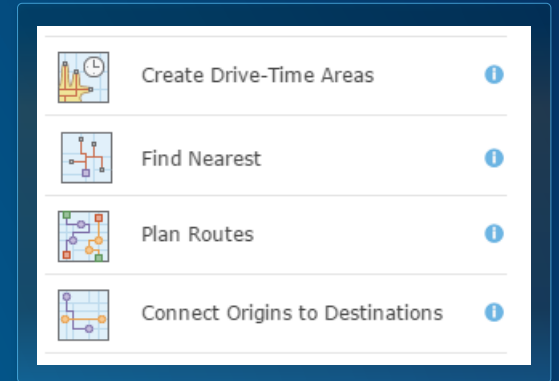
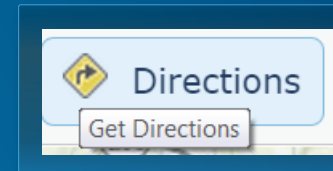
- Two main out of the box clients
 - ArcGIS for Desktop (ArcMap, ArcGIS Pro)
 - Get Directions button and Analysis tools in ArcGIS.com map viewer
- Some services supported in other ArcGIS apps
 - Navigator for ArcGIS
 - Collector for ArcGIS
 - Operations Dashboard for ArcGIS
 - Route Planner
- ArcGIS web and runtime SDKs
 - <http://developers.arcgis.com>



ArcMap



ArcGIS Pro



ArcGIS Navigator



ArcGIS Collector



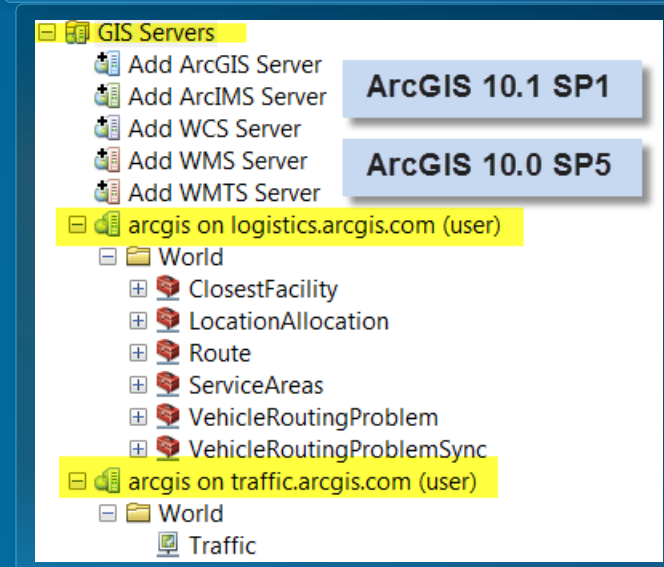
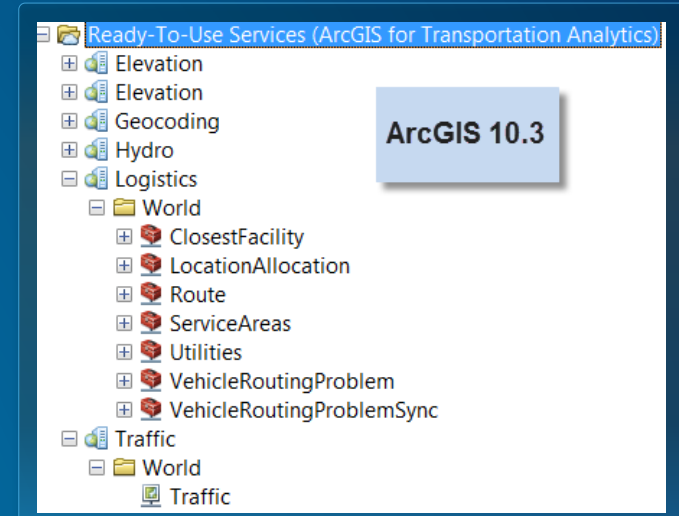
Operations Dashboard



Route Planner

Using services with ArcGIS for Desktop (ArcMap)

- Supported with ArcGIS for Desktop version
 - 10.0 SP5
 - 10.1 SP1 (**10.1 final is not supported**)
 - 10.2 and later
- Single sign-on support with 10.2 and later
- Need to create ArcGIS server connections with 10.1 SP1 and 10.0 SP5



Using services with ArcGIS for Desktop (ArcGIS Pro)

- Add ArcGIS Server connection to your project
- No ready-to-use services node (coming soon!)

The image displays two side-by-side screenshots of the ArcGIS Pro interface, illustrating the steps to add an ArcGIS Server connection to a project.

Left Screenshot: The 'Project' pane is open, showing a tree view with folders for Maps, Toolboxes, Databases, Styles, Folders, and Locators. A context menu is open over the 'Project' folder, listing options such as 'New Map', 'New Scene', 'New Basemap', 'Add Folder Connection', 'Add Database', 'New Database Connection', and 'New ArcGIS Server Connection'. The 'New ArcGIS Server Connection' option is highlighted. A tooltip for this option is visible, stating: 'Add ArcGIS Server Connection. Connect to ArcGIS Server as a user. Add the connection to the project. A new server connection file is created in the project's home folder and is referenced by the project.'

Right Screenshot: The 'Project' pane is open, showing the same tree view. The 'Servers' folder is now expanded, showing a connection to 'arcgis on logistics.arcgis.com (user) (1)'. Under this connection, a 'World' folder is expanded, listing several service areas: 'World/ClosestFacility', 'World/LocationAllocation', 'World/Route', 'World/ServiceAreas', 'World/Utilities', 'World/VehicleRoutingProblem', and 'World/VehicleRoutingProblemSync'.

Using services with ArcGIS.com map viewer

- Need to add your inputs to ArcGIS Online
- Layers and data you can analyze
 - Feature service
 - Map service
 - Comma-separated values (CSV) file (.csv)
 - GPS exchange format file (.gpx)
 - Shapefile (.zip)
 - File Geodatabase (.zip)
 - GeoRSS
 - KML
 - Map notes
 - Route layers

Basemap

Search for Layers

Browse Esri Map Layers

Add Layer from Web

Add Layer from File

Add Map Notes

Add CSV Layer

Locate features using: Latitude/Longitude Address

Select geocoder: Esri World Geocoder

Country: United States

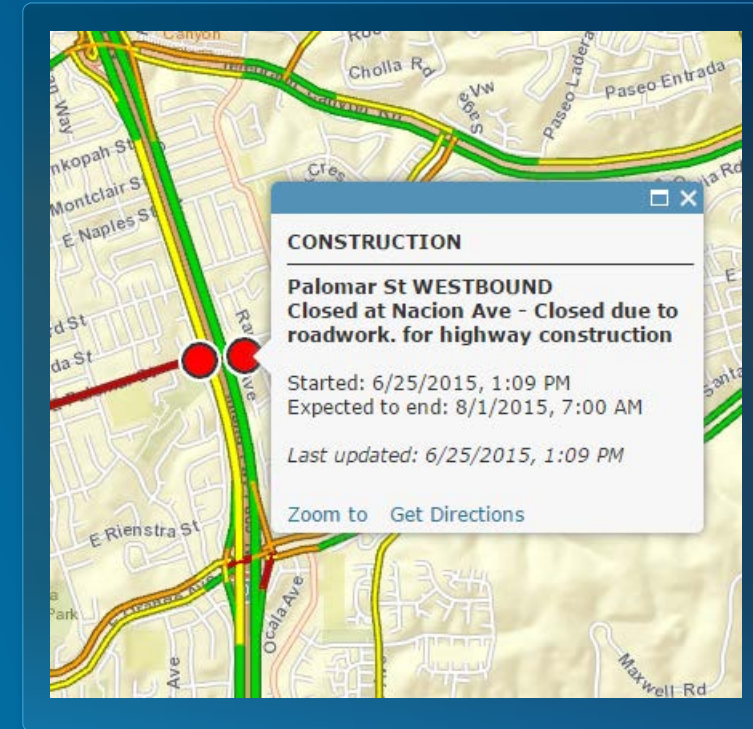
Review the location fields. Click on a cell to change it.

Field Name	Location Fields
Address	Address
City	City
State	State
Zip	ZIP Code

ADD LAYER CANCEL

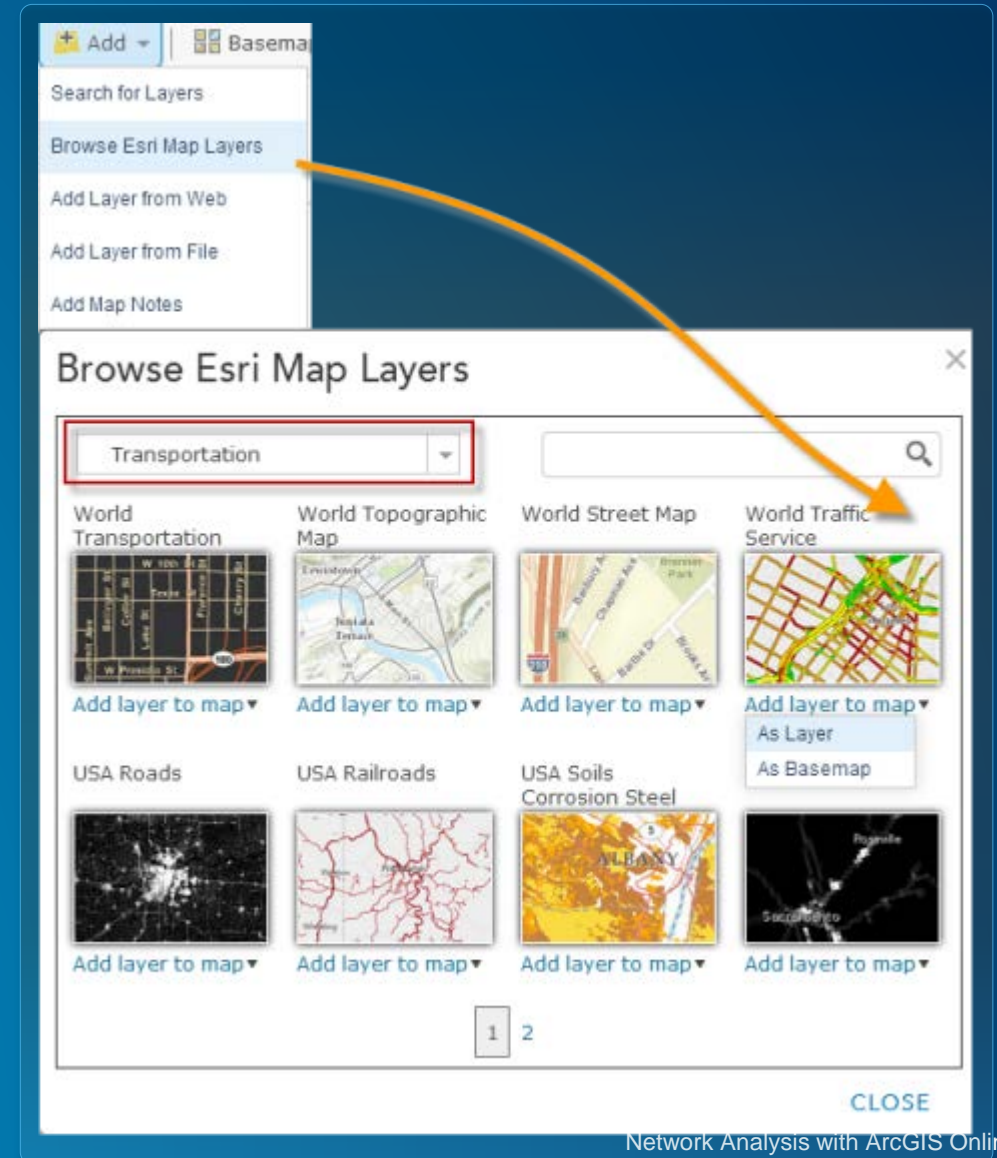
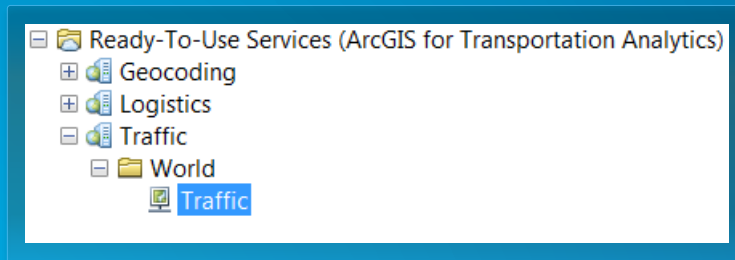
Traffic service

- Visualize traffic speeds
 - Support for live, historical and predictive traffic conditions
- Traffic Incidents
- Background layer to display results from network analysis services
- Data updated every five minutes



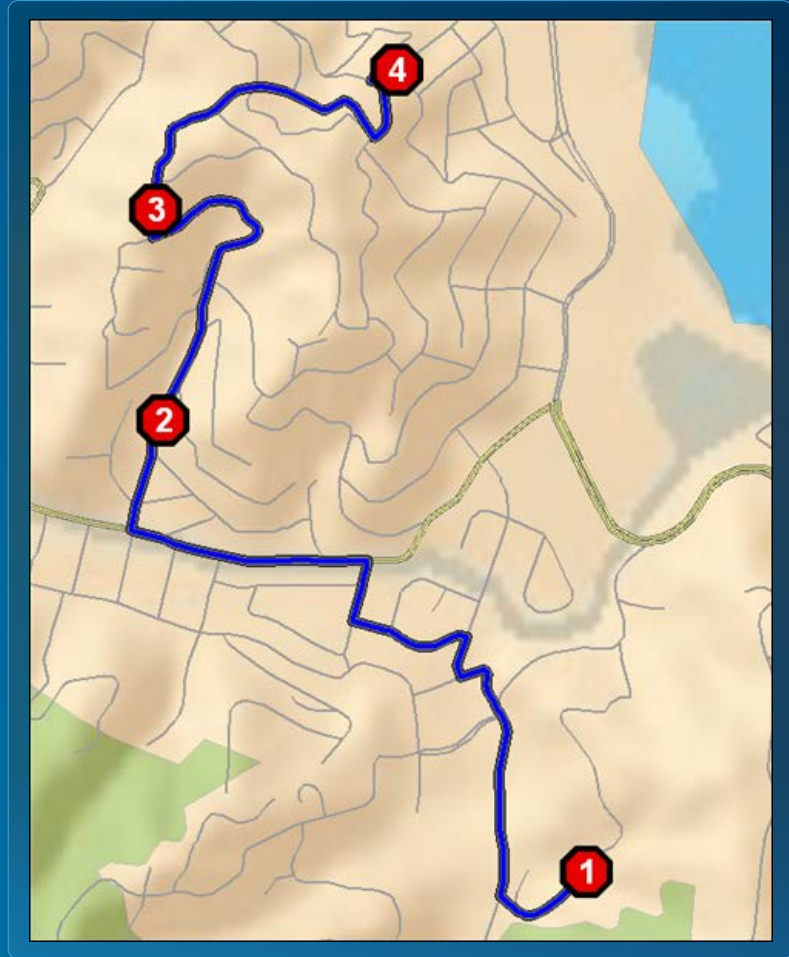
Using Traffic service

- Use the World Traffic web map or add Traffic layer to your own web map
- Use traffic map service in ArcGIS for Desktop



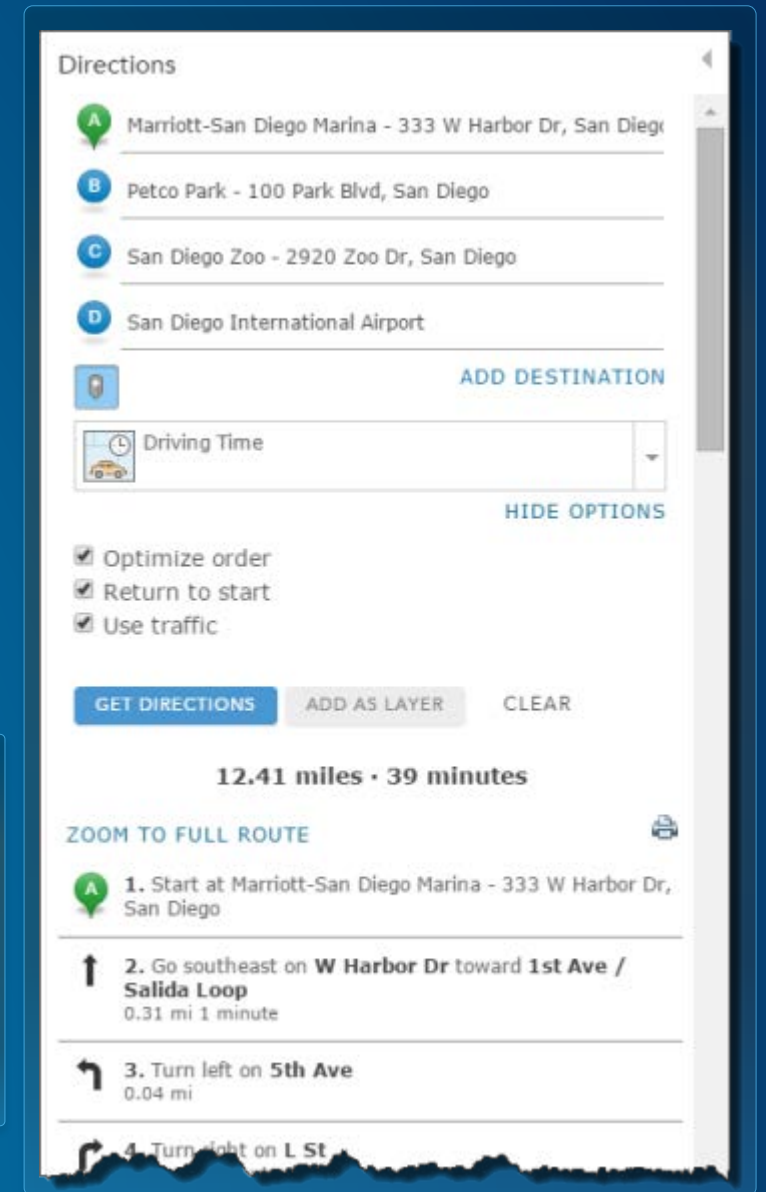
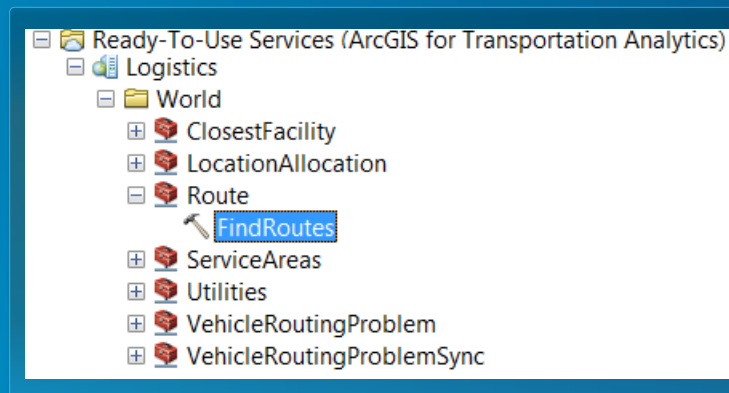
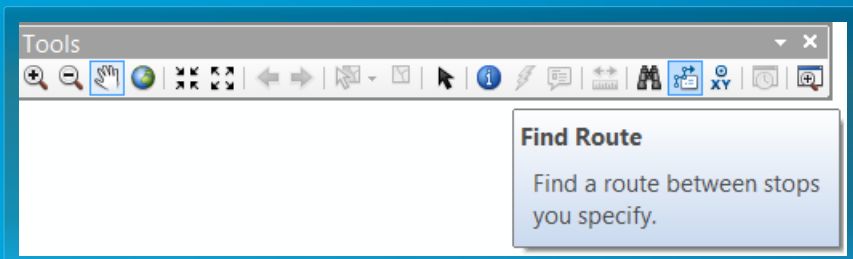
Directions (Route) Service

- Point-to-point routing – Simple Route
- Find the best route for visiting a series of stops that minimizes travel time or travel distance – Optimized route
- Use live traffic conditions
- Driving directions in many languages



Using Directions service

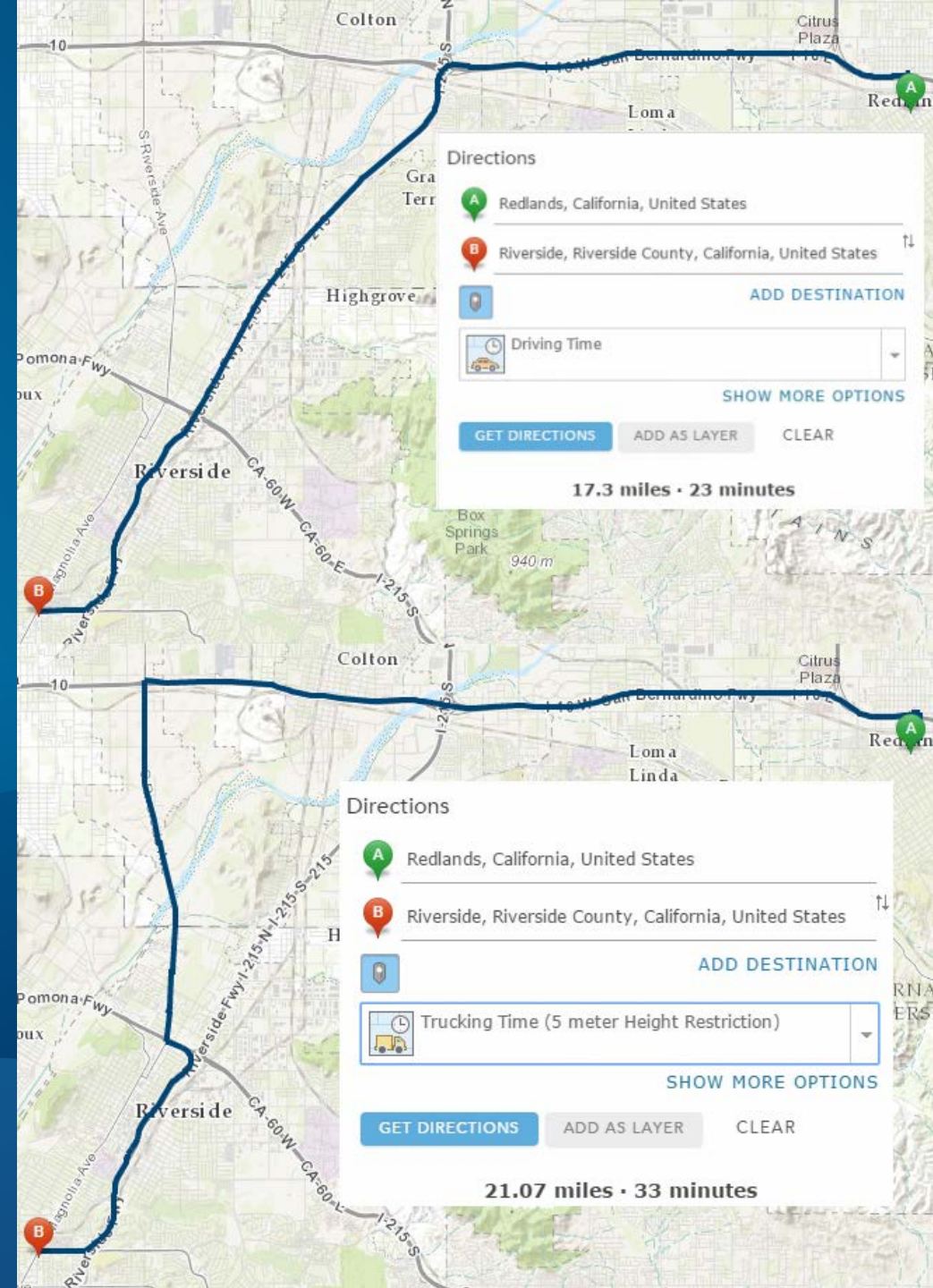
- Directions tool in ArcGIS.com map viewer
 - Can save results as a web map layer for further analysis
- FindRoutes geoprocessing tool from Ready-to-Use Services
- Find Route button in ArcMap



Demo

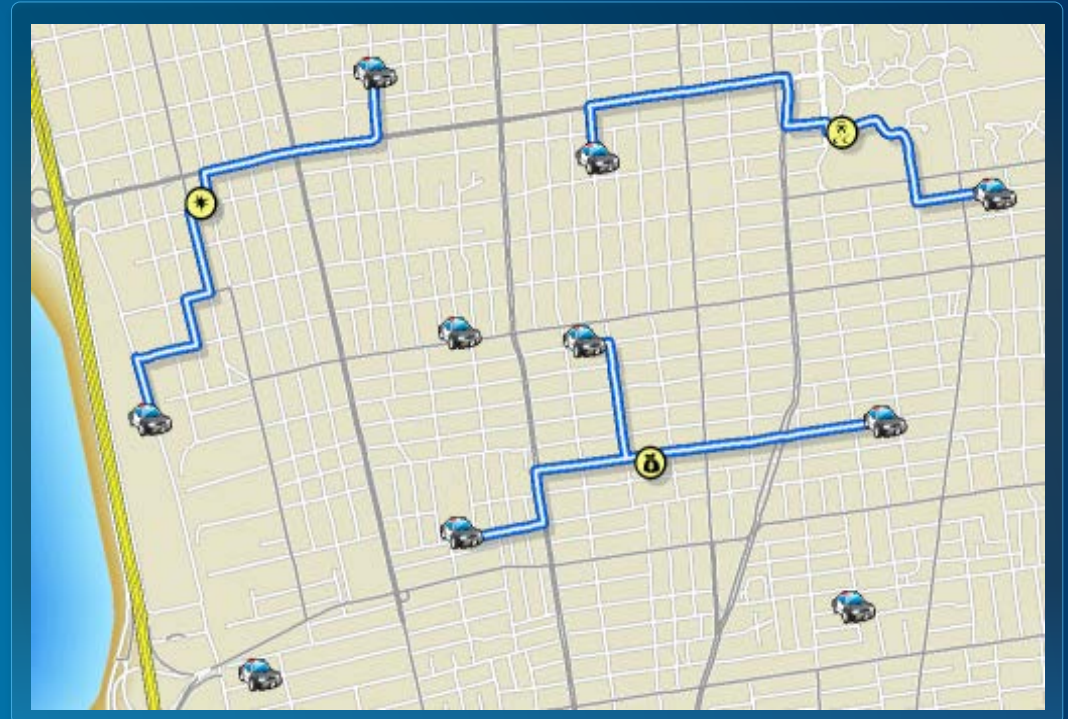
Directions tool with custom travel modes

Find best route for a truck that requires 5 meter clearance



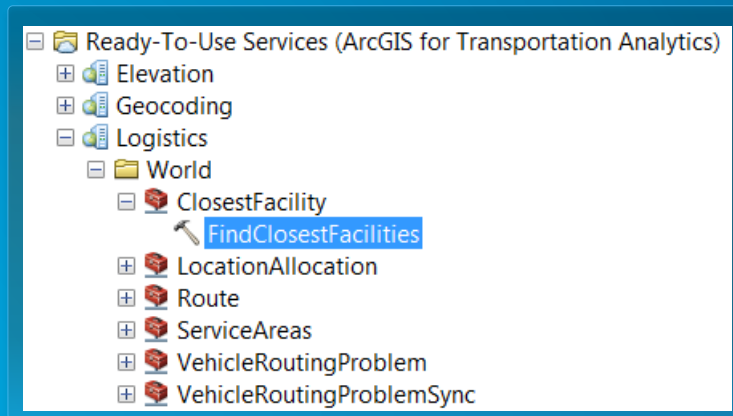
Closest Facility service

- Find the closest facilities from each incident
- Generate routes and driving directions
- You can also...
 - Use live traffic conditions
 - Limit the search distance
 - Limit the number of facilities to find
 - Travel from the facility to the incident



Using Closest Facility service

- Use Find Nearest analysis tool in ArcGIS.com map viewer
- Use FindClosestFacilities geoprocessing tool from Ready-to-Use Services



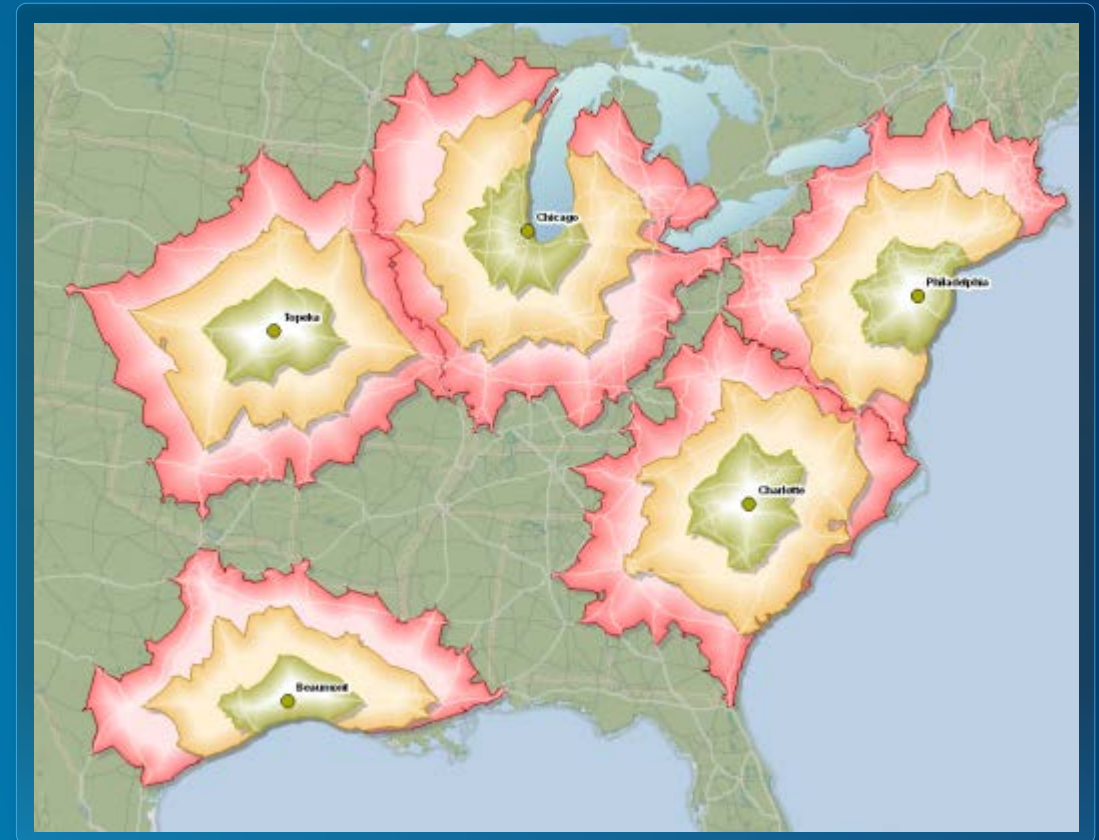
A screenshot of the 'Find Nearest' analysis tool interface in ArcGIS.com. The interface is titled 'Find Nearest' and contains the following steps and options:

- 1 Choose point layer from which the nearest locations are found:** A dropdown menu is set to 'customers'.
- 2 Find the nearest locations in:** A dropdown menu is set to 'Stores_Points'.
- 3 Measure:** A dropdown menu is set to 'Walking Time'.
- 4 For each location in the input layer:**
 - Limit the number of nearest locations to: A spinner box is set to '2'.
 - Limit the search range to: A text box is set to '10' and a dropdown menu is set to 'Minutes'.
- 5 Result layer name:** A text box contains 'Nearest Stores to Customers'. Below it, 'Save result in' is set to 'dmandloi'.

At the bottom, there is a checkbox for 'Use current map extent' and a 'Show credits' link. A large blue button labeled 'RUN ANALYSIS' is at the bottom center.

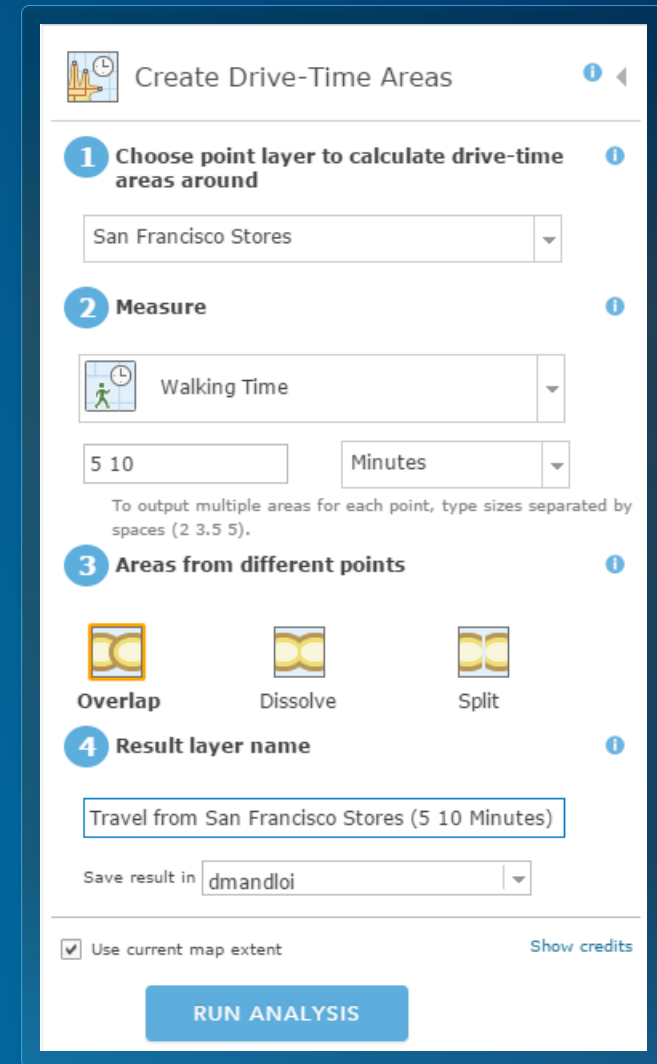
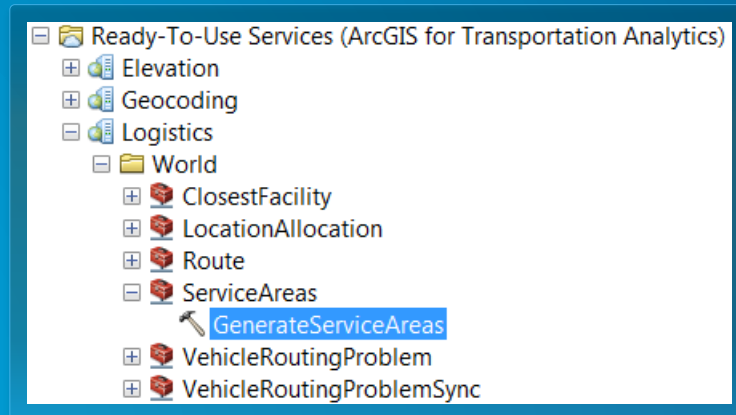
Service Areas (Drive Times) service

- Find the area you can reach from a location in a given time period
- You can also...
 - Solve for many locations
 - Use multiple drive time values
 - Analyze for different times of the day
 - Specify the direction of travel



Using Service Areas service

- Use Create Drive Time Areas, Summarize Nearby or Enrich Layer analysis tool in ArcGIS.com map viewer
- Use GenerateServiceAreas geoprocessing tool from Ready-to-Use Services



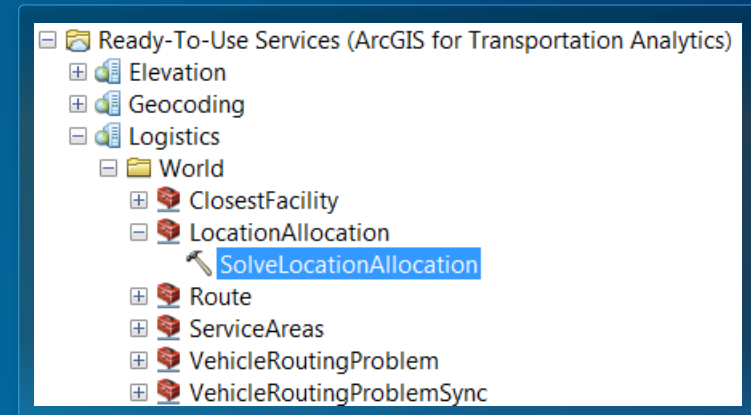
Location-Allocation service

- **Determine the best location for a facility, based on demand conditions**
 - Choose from many different analysis types
 - Limit the capacity of facilities
 - Analyze for different times of day



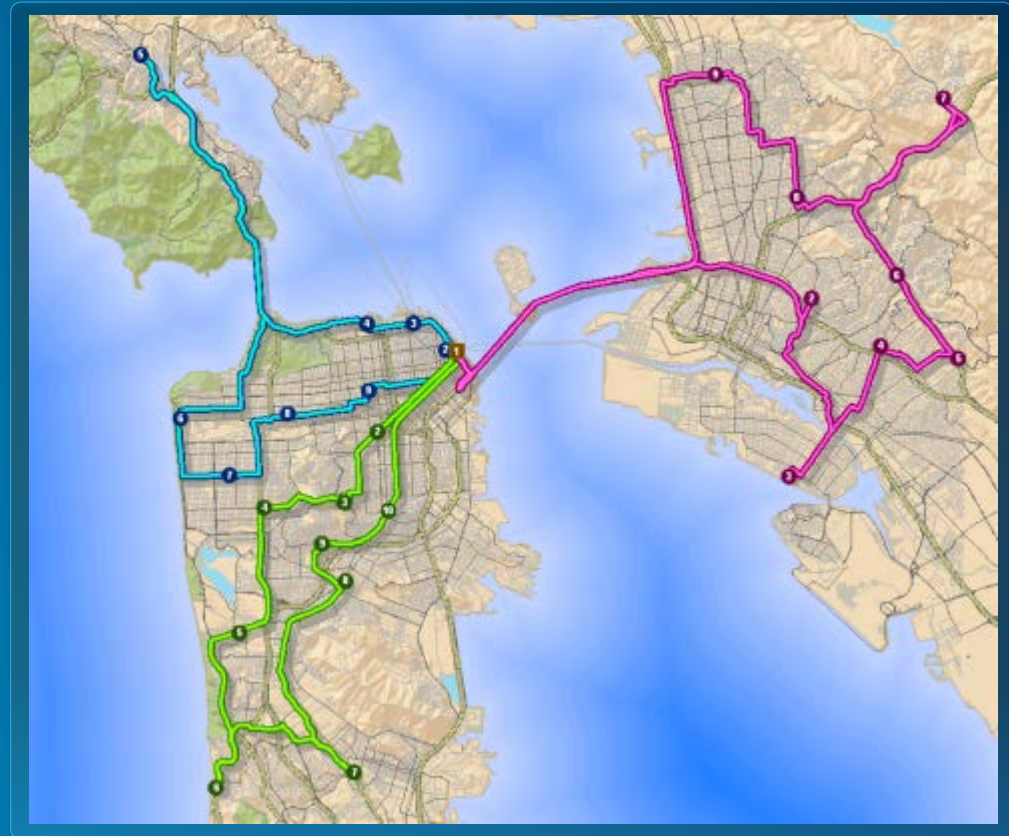
Using Location-Allocation service

- Currently not available as an analysis tool in ArcGIS.com map viewer (coming soon!)
- Use `SolveLocationAllocation` geoprocessing tool from Ready-to-Use Services



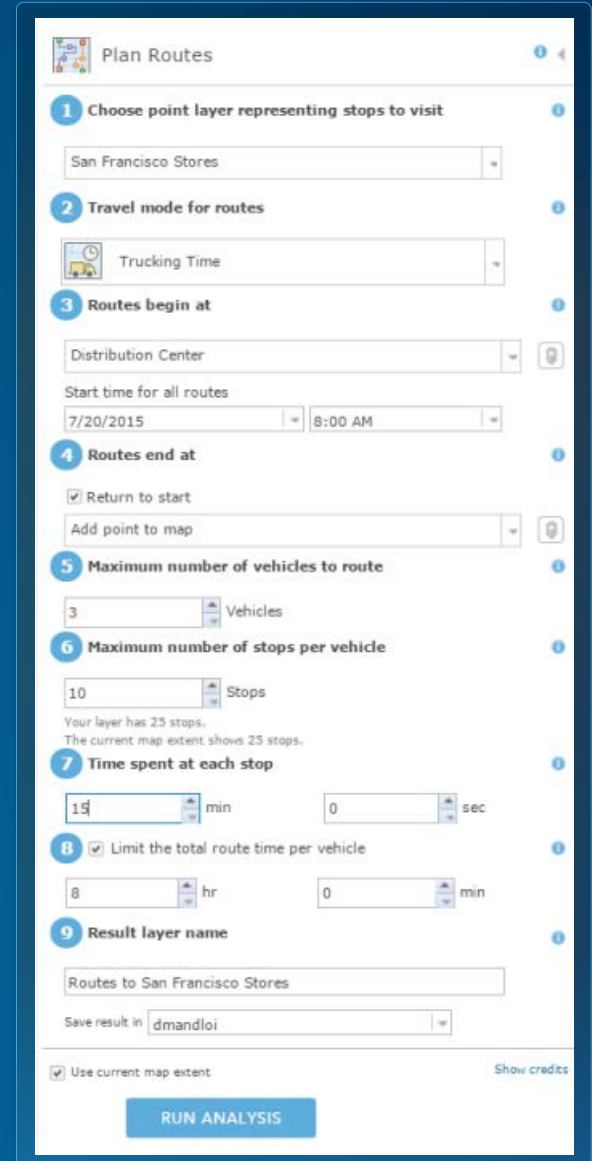
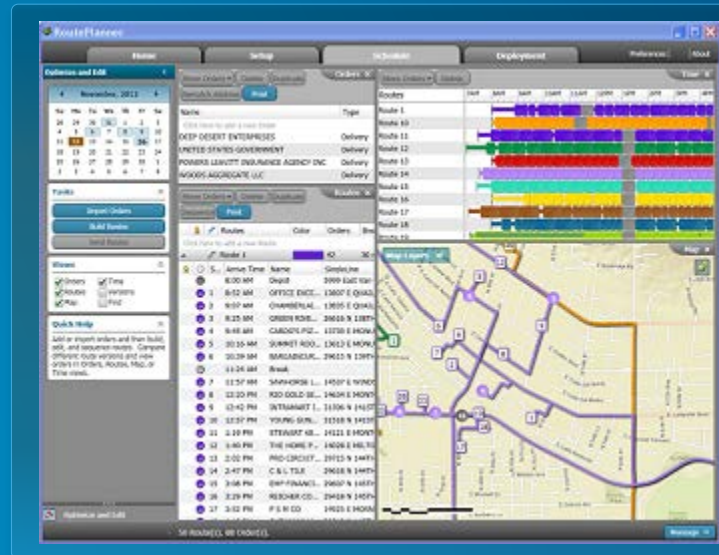
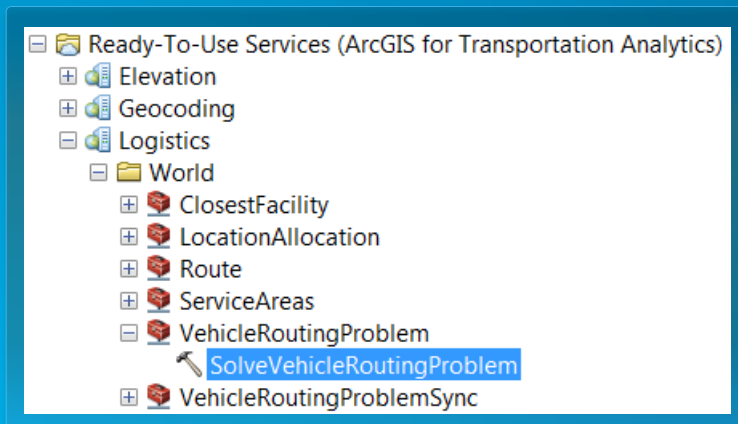
Vehicle Routing Problem (Fleet Routing) service

- Route a fleet of vehicles to service a set of orders
- You can also specify...
 - Vehicle capacities
 - Driver specialties
 - Work breaks
 - Time windows on orders



Using Vehicle Routing Problem service

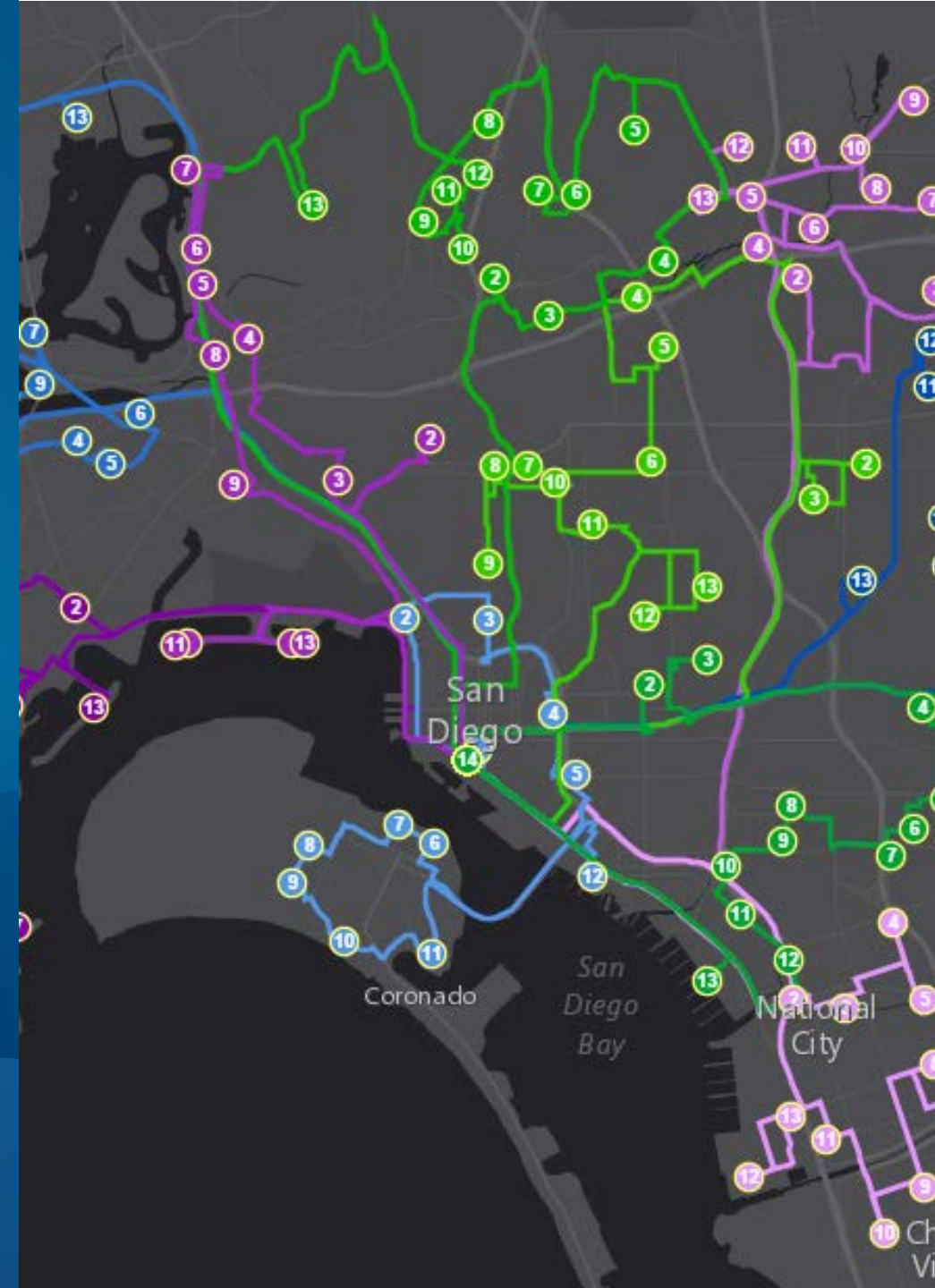
- Use Plan Routes analysis tool in ArcGIS.com map viewer
- Download the free [Route Planner application](#)
- Use [SolveVehicleRoutingProblem](#) geoprocessing tool from Ready-to-Use Services



Demo

Schedule Inspections

Use Plan Routes to schedule inspections and send routes to inspectors in the field



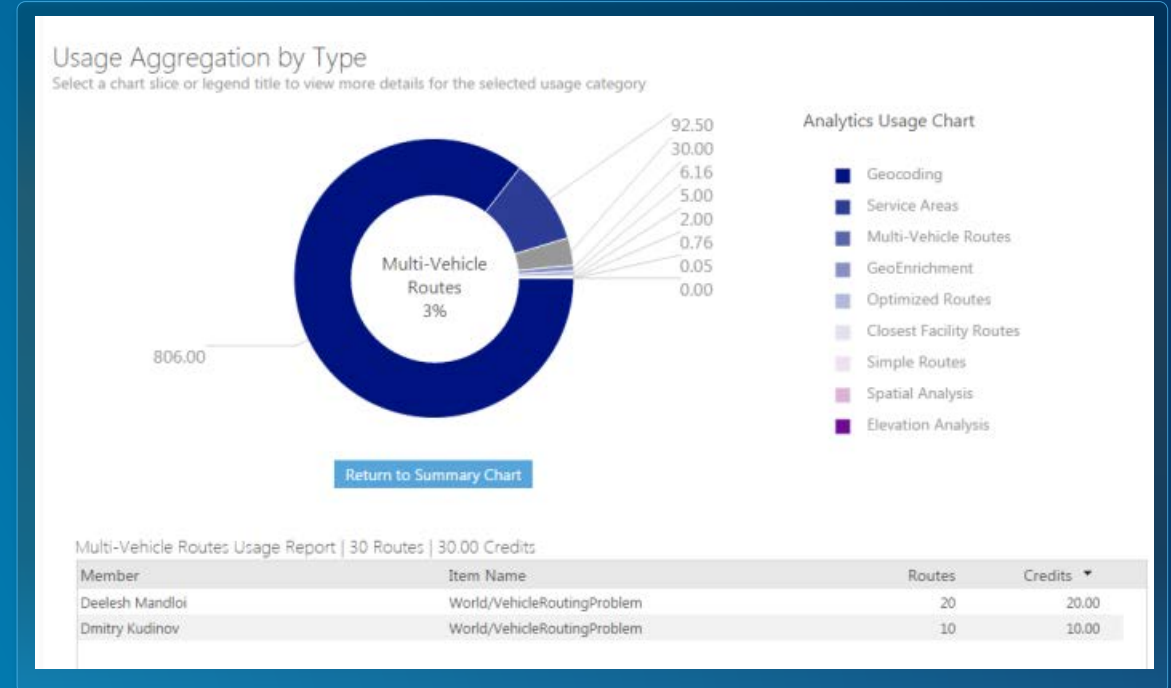
Understanding Your Bill – Service Credits

- **Every successful request deducts credits from your organization**
- **How many service credits does network analysis services use?**
- **Credits explained**

Network Analysis	Credits Used
Simple Routes	0.04 credits per route
Optimized Routes	0.5 credits per optimized route
Drive Time (Service Areas)	0.5 credits per drive time
Closest Facilities	0.5 credits per closest facility route
Multi-Vehicle Routes(VRP)	1 credits per route
Location-Allocation	0.1 credit per allocated demand point
Traffic	0 credits

Monitor service credits used by your organization

- Reports can be accessed by the administrators in your ArcGIS Online organization
- Monitor usage by individual users



Network Analysis privilege

- Control which users can run network analysis services using custom roles and the network analysis privilege

SAVE CANCEL

General
Home Page
Gallery
Map
Item Details
Groups
Utility Services
Roles
Security
Open Data

Roles ?

Role Name:

Description:

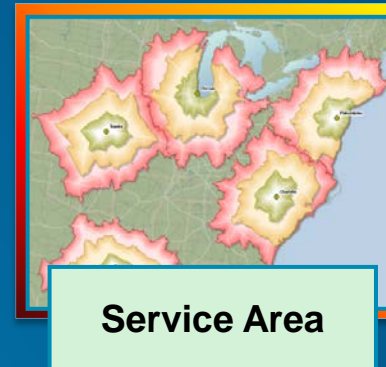
TOGGLE ALL ON COLLAPSE ALL

General Privileges

<input checked="" type="checkbox"/> Groups	<input checked="" type="checkbox"/> Content
<input checked="" 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 checked="" type="checkbox"/> Publish hosted tile layers

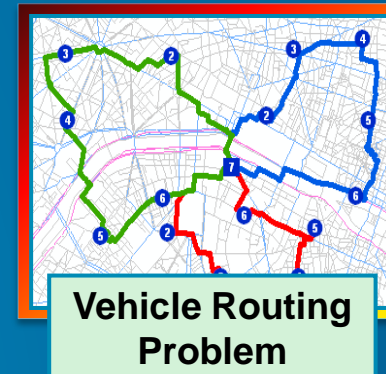
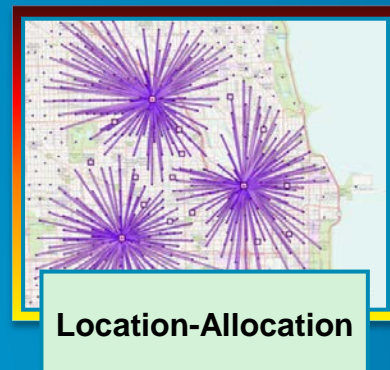
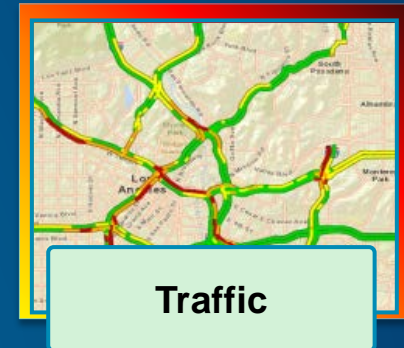
<input type="checkbox"/> Premium Content	<input type="checkbox"/> Features
<input type="checkbox"/> Geocoding	<input checked="" type="checkbox"/> Edit
<input checked="" type="checkbox"/> Network Analysis	<input type="checkbox"/> Edit with full control
<input type="checkbox"/> Spatial Analysis	
<input type="checkbox"/> GeoEnrichment	
<input type="checkbox"/> Demographics	
<input checked="" type="checkbox"/> Elevation Analysis	

Summary



- **Network Analysis services**

- Ready-to-use services for solving transportation problems
- Requires ArcGIS Online subscription and service credits



Support and Resources

- <http://logistics.arcgis.com>
- <http://route.arcgis.com>
- <http://traffic.arcgis.com>
- [Sample applications](#)
- [ArcGIS Online services in the Network Analyst help](#)

Network Analyst presentations

Tuesday

Wednesday

Thursday

Time	Tuesday	Wednesday	Thursday
8:30 am		Network Analyst: An Introduction	
9 am			
10 am	Routing in Buildings with 3D Networks in ArcGIS Pro		
11 am		Network Analyst: Automating Workflows with Geoprocessing	Network Analyst: An Introduction
		Network Analysis with Python	
12 pm	Using Navigator for ArcGIS		Using GTFS Public Transit Data in ArcGIS
		Network Analyst: Network Analysis with ArcGIS Online	
1 pm			
2 pm	Navigator for ArcGIS: Technical Preview	Network Analyst: Creating Network Datasets	Network Analyst: Automating Workflows with Geoprocessing
			Network Analyst in ArcGIS Pro
3 pm	Performing Network Analysis	Network Analyst: Performing Network Analysis	Network Analyst: Creating Network Datasets
4 pm	Network Analysis with ArcGIS Online		

Room 15 A

Room 16 B

Demo Theater 10 Apps

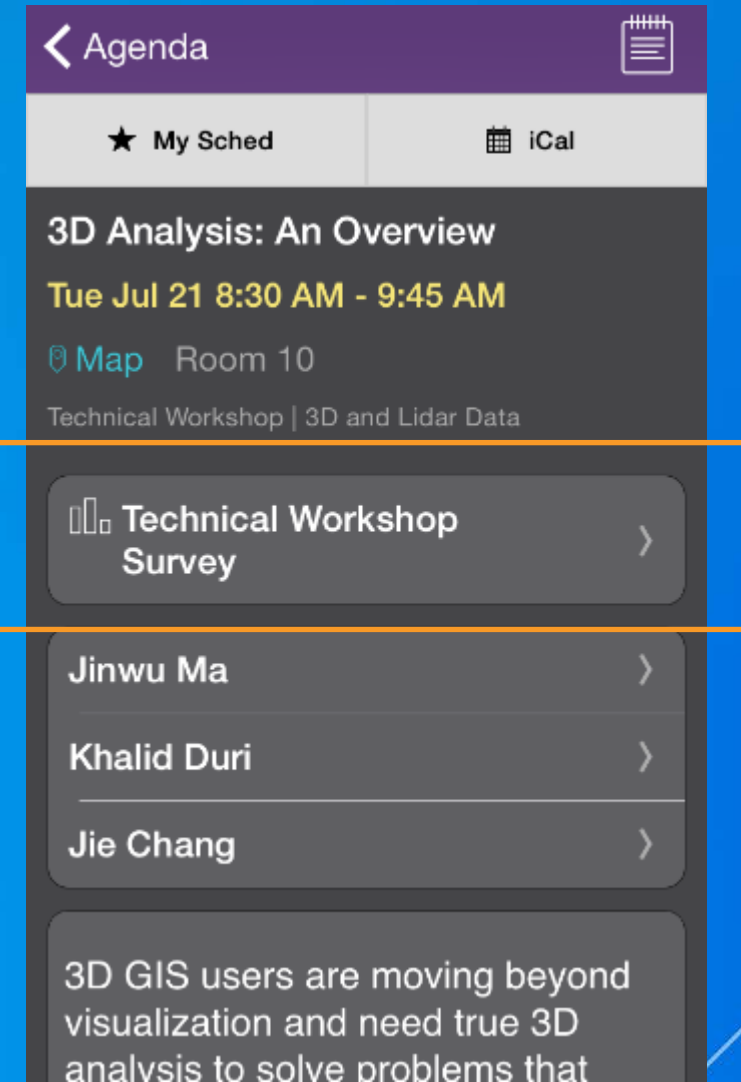
Demo Theater 13 Spatial Analysis

Tech Theater 15 Exhibit Hall A

Tech Theater 17 Exhibit Hall A

Thank you...

- Please fill out the session survey in your mobile app
- Select [enter session title here] in the Mobile App
 - Use the Search Feature to quickly find this title
- Click “Technical Workshop Survey”
- Answer a few short questions and enter any comments





Understanding our world.