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

Network Analysis with ArcGIS Online
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
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
Network Analysis Services
Solve transportation problems

Closest Facility
Service Area
Route
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
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
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!)
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
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

![Image of ArcGIS traffic map service interface]
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
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
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
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

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<thead>
<tr>
<th>Network Analysis</th>
<th>Credits Used</th>
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<tbody>
<tr>
<td>Simple Routes</td>
<td>0.04 credits per route</td>
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<tr>
<td>Optimized Routes</td>
<td>0.5 credits per optimized route</td>
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<tr>
<td>Drive Time (Service Areas)</td>
<td>0.5 credits per drive time</td>
</tr>
<tr>
<td>Closest Facilities</td>
<td>0.5 credits per closest facility route</td>
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<tr>
<td>Multi-Vehicle Routes (VRP)</td>
<td>1 credits per route</td>
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<tr>
<td>Location-Allocation</td>
<td>0.1 credit per allocated demand point</td>
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<tr>
<td>Traffic</td>
<td>0 credits</td>
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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
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
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<tr>
<th>Time</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<tr>
<td>8:30 am</td>
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<td>Network Analyst: An Introduction</td>
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<tr>
<td>9 am</td>
<td>Routing in Buildings with 3D Networks in ArcGIS Pro</td>
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<td>Network Analyst: An Introduction</td>
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<td>10 am</td>
<td>Network Analyst: Automating Workflows with Geoprocessing</td>
<td>Network Analysis with Python</td>
<td>Network Analyst: Creating Network Datasets</td>
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<td>11 am</td>
<td>Using Navigator for ArcGIS</td>
<td>Network Analyst: Network Analysis with ArcGIS Online</td>
<td>Network Analyst: Automating Workflows with Geoprocessing</td>
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<td>Network Analyst in ArcGIS Pro</td>
<td>Network Analyst: Creating Network Datasets</td>
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<td>1 pm</td>
<td>Navigator for ArcGIS: Technical Preview</td>
<td>Network Analyst: Performing Network Analysis</td>
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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
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