



ArcGIS Enterprise: Publishing Your Own Network Analysis Services

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Slides for this demo theater on Publishing Your Own Network Analysis Services

<http://esriurl.com/ds19nas>

An abstract geometric pattern consisting of various colored lines and shapes, including shades of blue, green, yellow, and purple, arranged in a dynamic, overlapping manner in the bottom right corner of the slide.

Agenda

- Network Analyst concepts
 - ArcGIS Enterprise publishing workflow
 - Geoprocessing services
 - Network Analysis services
 - Using network analysis services
- 



Network Analyst Concepts

ArcGIS Network Analyst

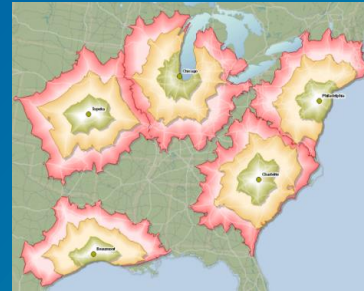
Solve Transportation Problems



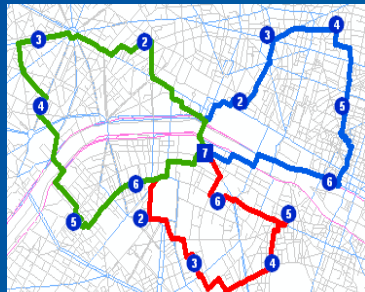
Route



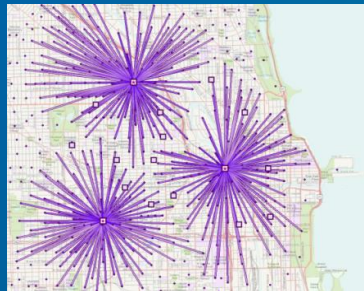
Closest Facility



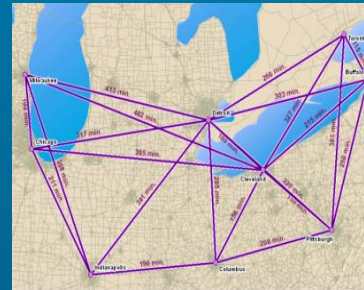
Service Area



Vehicle Routing Problem

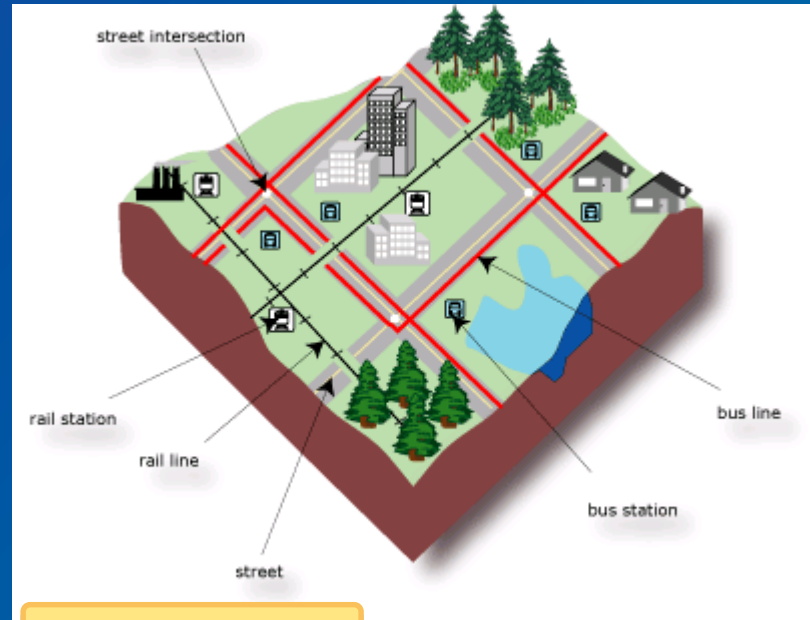


Location-Allocation



Origin-Destination Cost Matrix

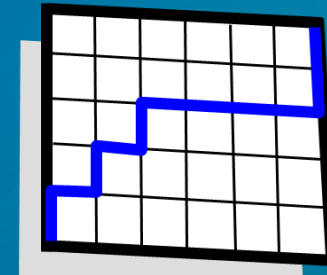
Analysis is performed on a network dataset



Transportation
Network

Data Model

Network Dataset



Geodatabase



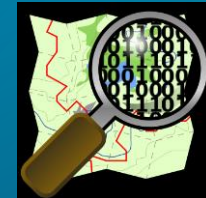
Where do I get a network dataset?

- Purchase StreetMap Premium for ArcGIS
 - High quality ready-to-use network dataset
 - Can add your own street data as well



OR

- Build your own network dataset from:
 - Your organization's data
 - TIGER
 - OpenStreetMap (try ArcGIS Editor for OpenStreetMap)

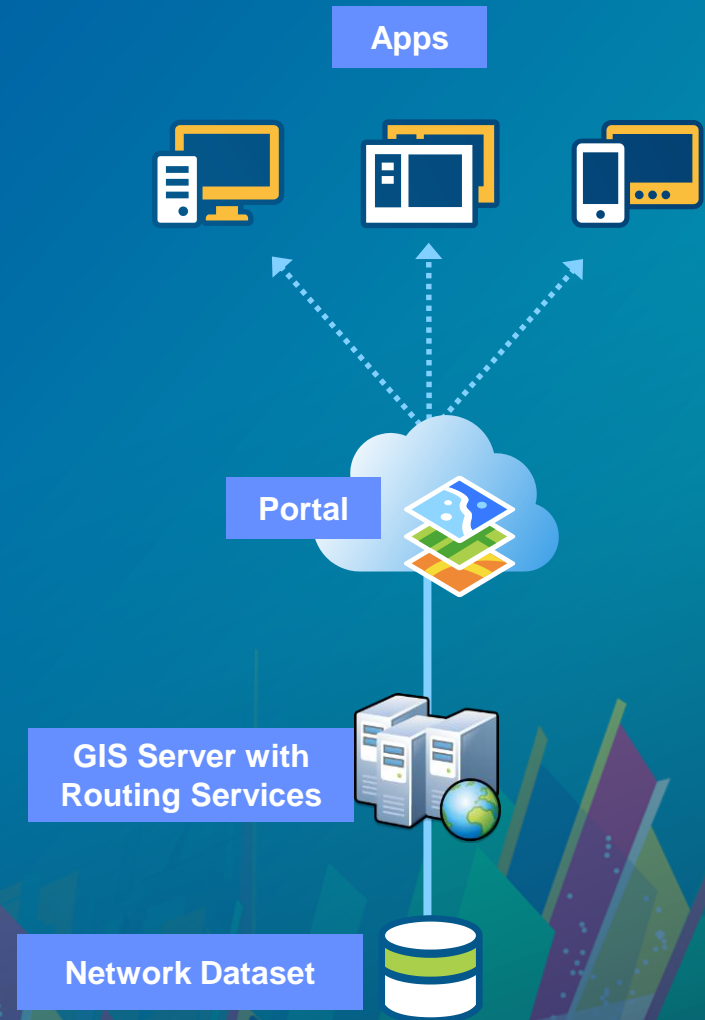




ArcGIS Enterprise

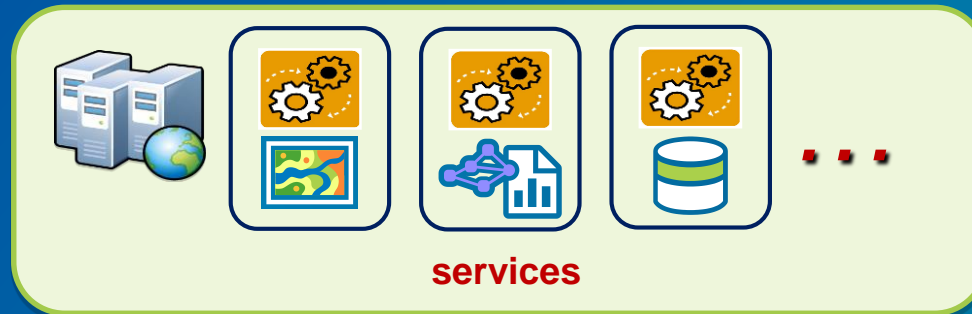
What is ArcGIS Enterprise?

- Enables “Web GIS” in your infrastructure
 - On-premises or in your own cloud
- Formerly known as ArcGIS for Server



What are GIS services?

- **GIS service** → GIS resource running on a server
 - vs. GIS application on your local computer



- Share GIS resources to the web as following service types



Map



Feature



Network
Analysis



Geodata



Geoprocessing



Image



Locator



Schematics



Publishing Services

Publishing workflow for GIS services

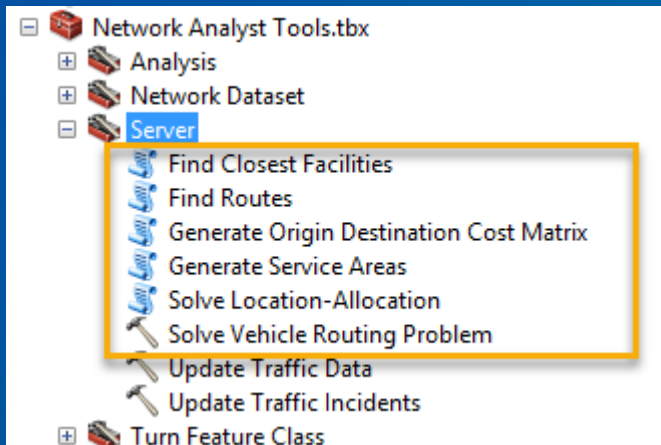


Publishing network analysis services

Can be published as two different service types

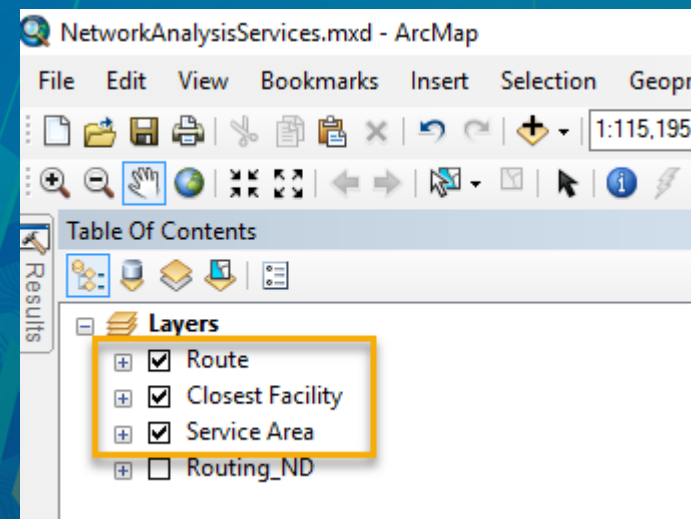
Geoprocessing Service

- 1 Author using geoprocessing tools from the Server toolset
- 2 Run the tools and publish the result as a service
- 3 Use from Map Viewer, ArcGIS Pro and ArcMap



Network Analysis Service

- 1 Author using a map document with network analysis layers
- 2 Publish the map document as a service
- 3 Use from Map Viewer and ArcMap (Route solver only)



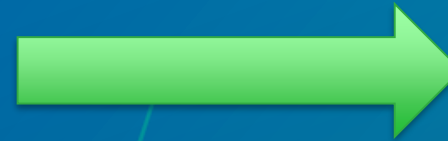
Publishing network analysis services should be



Publish Routing Services utility

```
Command Prompt
C:\>C:\Python27\ArcGISx6410.6\python.exe "C:\Program Files\ArcGIS\Server\tools\PublishRoutingServices\publishrouting services.py"
-s gisserver.domain.com -P gisportal.domain.com -u admin -p site.admin -o D:\RoutingServices\ServiceDefinitions -n D:\data\Streets.gdb\Routing\Routing_ND
```

I have a network dataset and want to publish all network analysis services. Is there a single tool that can perform the authoring and publishing of these services?



YES

Publish Routing Services tool

- ArcGIS Server command line utility included with ArcGIS Enterprise 10.6 or later
- If publishing to a federated GIS Server, the tool registers the network analysis services as portal utility services
- Requires Network Analyst extension for ArcGIS Server
- For previous versions of ArcGIS Enterprise, download a similar tool from GitHub

Publish Routing Services utility

ArcGIS 10.6 (Windows) | [Other versions](#) ▾

The Publish Routing Services utility allows you to publish directions, routing, and logistics services based on a network dataset to your ArcGIS Server. These services can be used to perform route, closest facility, service area, location-allocation, origin destination cost matrix, or vehicle routing problem analyses on transportation networks. If your ArcGIS Server is federated with a portal, the services are configured as utility services with your portal. Once published, the services can be used with ArcGIS Desktop applications such as ArcGIS Pro and ArcMap, or in the Map Viewer application available with ArcGIS Enterprise portal to [get directions](#) and [perform analysis](#). The services are similar to directions and routing services available with ArcGIS Online, but are based on your own network dataset and running in your ArcGIS Enterprise.

🔑 License:

To use this utility, your ArcGIS Server site needs to have an ArcGIS Network Analyst extension license.

Data requirements

You can use this utility with a network dataset that is available as part of StreetMap Premium for ArcGIS or with your own network dataset. Before running the utility, the network dataset should be copied (in the same directory path) to all the machines participating in your GIS Server site.

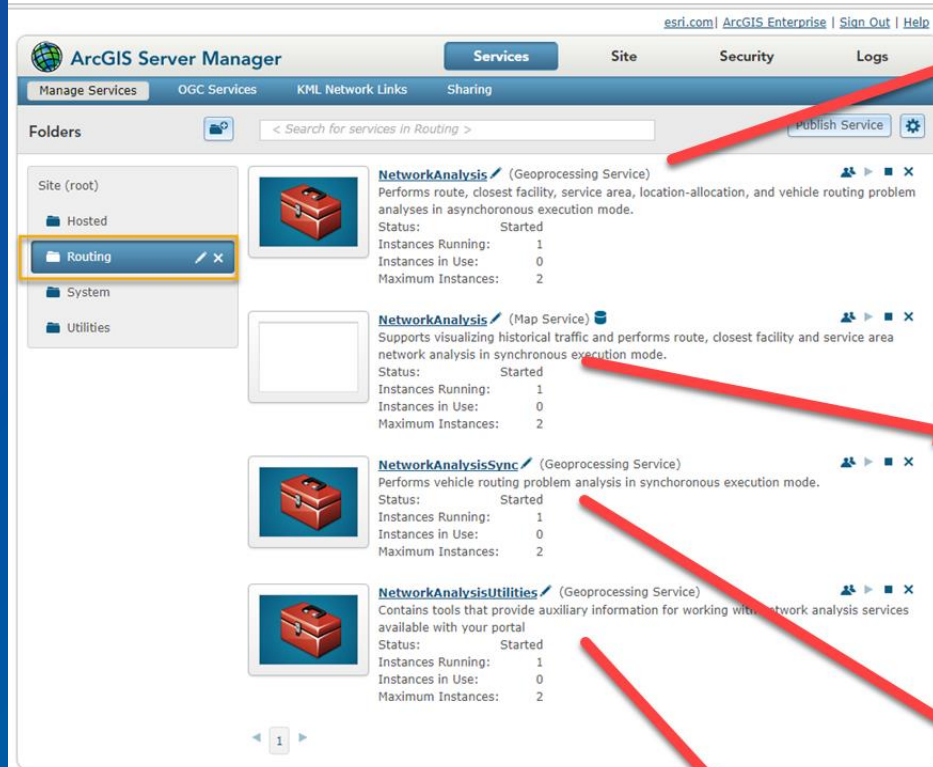
In this topic

[Data requirements](#)

[Parameters](#)

[Examples](#)

Services created by Publish Routing Services tool



ArcGIS REST Services Directory
Home > services > Routing > NetworkAnalysis (GPService)
JSON | SOAP

Routing/NetworkAnalysis (GPService)

Service Description: Performs route, closest facility, service area, location-allocation,

Tasks:

- FindRoutes
- FindClosestFacilities
- GenerateServiceAreas
- SolveLocationAllocation
- SolveVehicleRoutingProblem
- GenerateOriginDestinationCostMatrix

Execution Type: esriExecutionTypeAsynchronous

Result Map Server Name:

MaximumRecords: 1000

Child Resources: [Info](#)

Asynchronous
geoprocessing
service

ArcGIS REST Services Directory
Home > services > Routing > NetworkAnalysis (NAServer)
JSON | SOAP

Routing/NetworkAnalysis (NAServer)

Service Description :

Route Layers:

- Route

Closest Facility Layers:

- ClosestFacility

Service Area Layers:

- ServiceArea

Child Resources: [Info](#)

Network analysis
service

ArcGIS REST Services Directory
Home > services > Routing > NetworkAnalysisSync (GPService)
JSON | SOAP

Routing/NetworkAnalysisSync (GPService)

Service Description: Performs vehicle routing problem analysis in synchronous

Tasks:

- FindVehicleRoutingProblem

Execution Type: esriExecutionTypeSynchronous

Result Map Server Name:

MaximumRecords: 1000

Child Resources: [Info](#)

Synchronous
geoprocessing
service

ArcGIS REST Services Directory
Home > services > Routing > NetworkAnalysisUtilities (GPService)
JSON | SOAP

Routing/NetworkAnalysisUtilities (GPService)

Service Description: Contains tools that provide auxiliary information for

Tasks:

- GetToolInfo
- GetTravelModes

Execution Type: esriExecutionTypeSynchronous

Result Map Server Name:

MaximumRecords: 1000

Child Resources: [Info](#)

Service to get
travel modes

Registering services with your portal

- Configure as Directions and Routing utility services in your portal
- Allows all apps to discover the network analysis services
- Required by many apps in order to use the services
- Configured by Publish Routing Services tool if publishing services to a federated GIS Server

Home Gallery Map Scene Groups My Content My Organization UC2017

UC User Conference Portal

SAVE **CANCEL**

General
Home Page
Gallery
Map
Item Details
Groups
Utility Services
ArcGIS Online
Servers
Roles
Collaborations
Security

Utility Services

Configure the utility services for your portal. To configure your portal to use utility services from ArcGIS Online, open the ArcGIS Online tab.

Directions and Routing

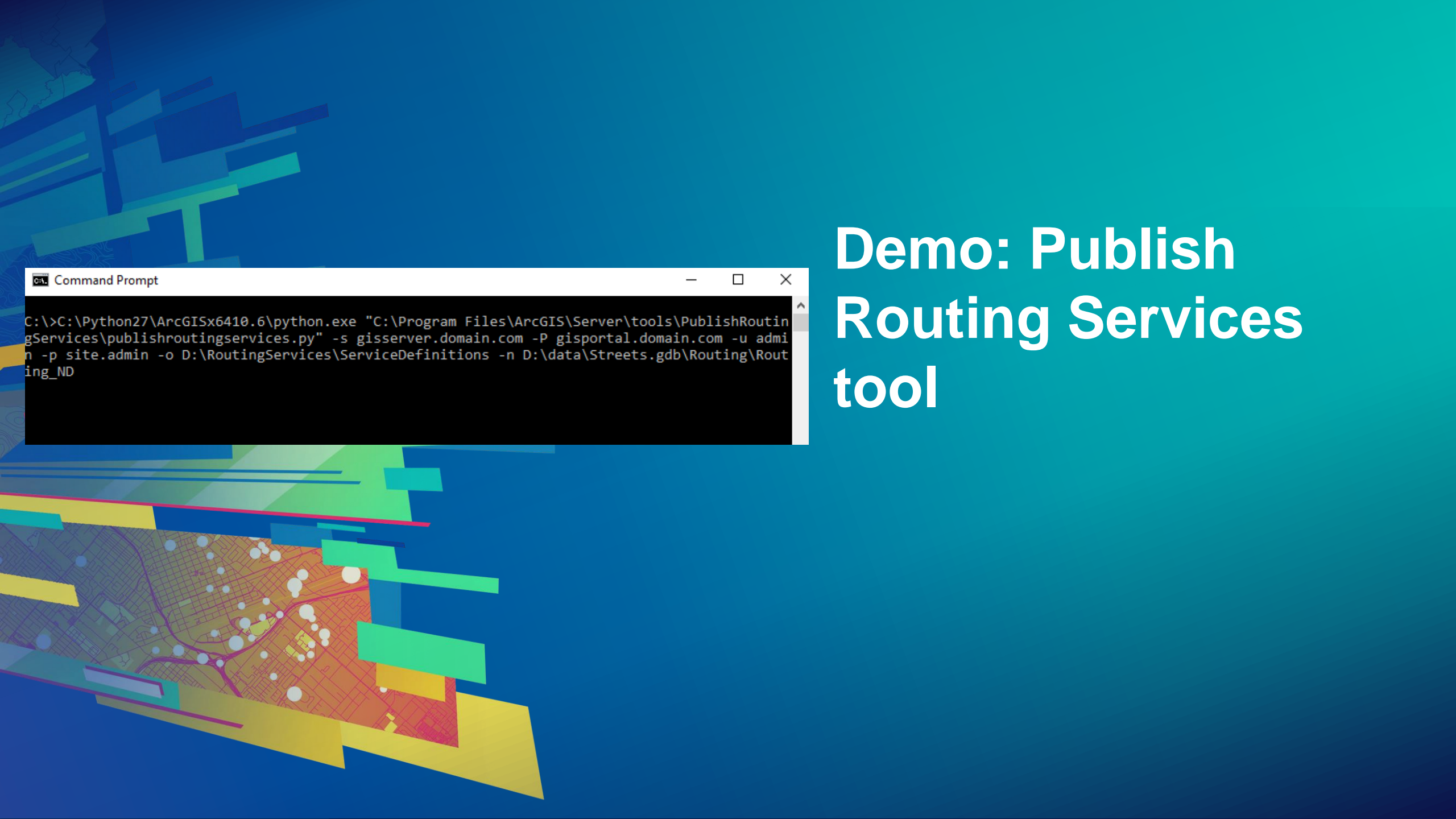
Configure your routing services. Choose the routing service type, and enter the URL of your service.

Route
Route
Route (Asynchronous)
Closest Facility
Closest Facility (Asynchronous)
Service Area
Service Area (Asynchronous)
Vehicle Routing Problem
Vehicle Routing Problem (Asynchronous)
Location Allocation (Asynchronous)
Routing Utilities
Traffic
Origin Destination Cost Matrix (Asynchronous)

services/Routing/NetworkAnalysis/NAserver/Route
s/rest/services/folder/serviceName/NAserver/layerName

CONFIGURE TRAVEL MODES

Demo: Publish Routing Services tool



```
Command Prompt

C:\>C:\Python27\ArcGISx6410.6\python.exe "C:\Program Files\ArcGIS\Server\tools\PublishRoutingServices\publish routingservices.py" -s gisserver.domain.com -P gisportal.domain.com -u admin -p site.admin -o D:\RoutingServices\ServiceDefinitions -n D:\data\Streets.gdb\Routing\Routing_ND
```

Publishing tips and tricks

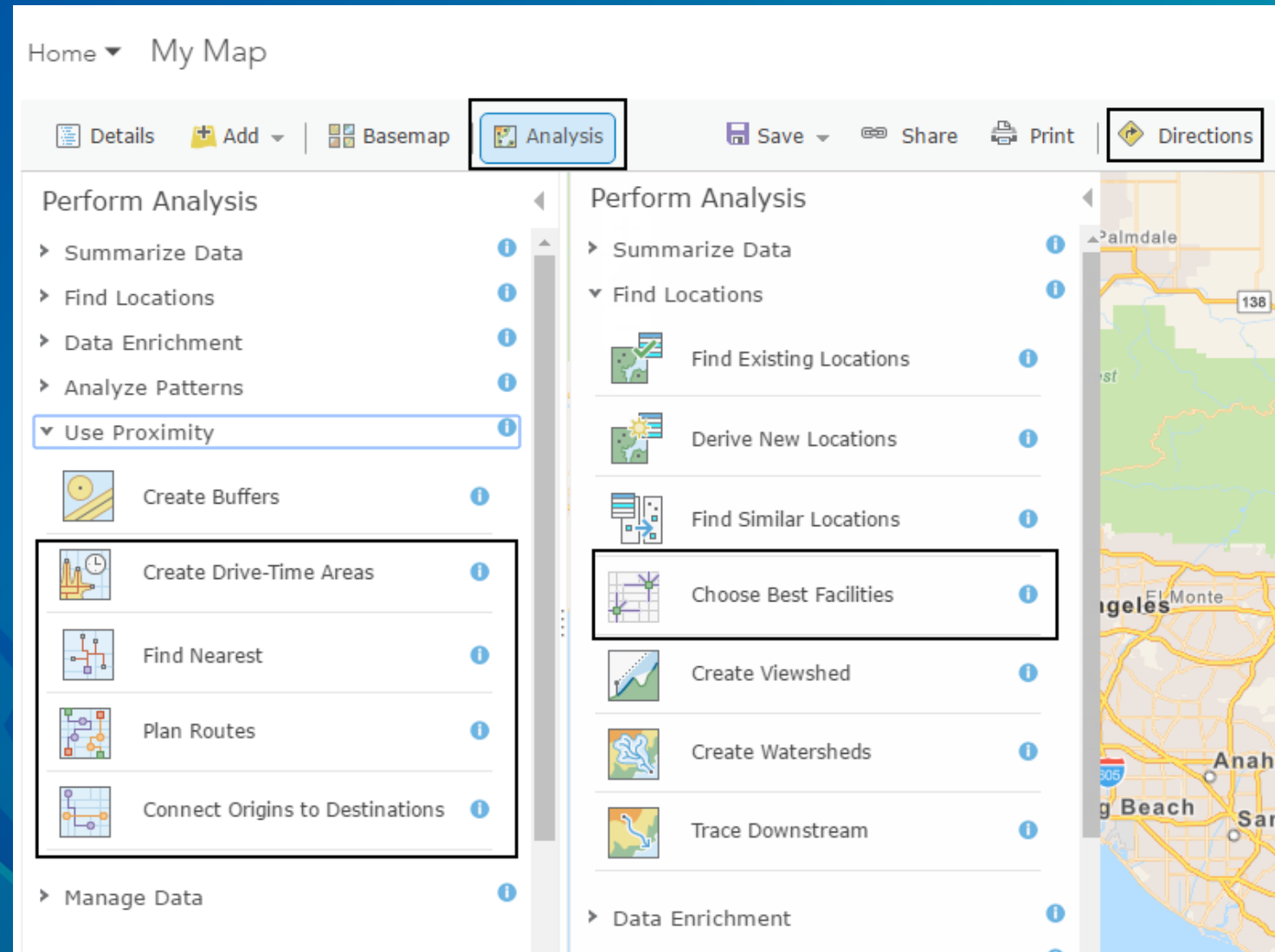
- Do not try to publish network analysis services using standard publishing workflows
 - It is difficult to get all the services published correctly
 - Some apps might not work if some services are missing or not configured correctly
- Manually delete existing network analysis services then recreate new ones using the publish routing services tool when
 - Upgrading to newer versions of ArcGIS Enterprise
 - Upgrading street data (for example, using newer version of StreetMap Premium)

Using Services



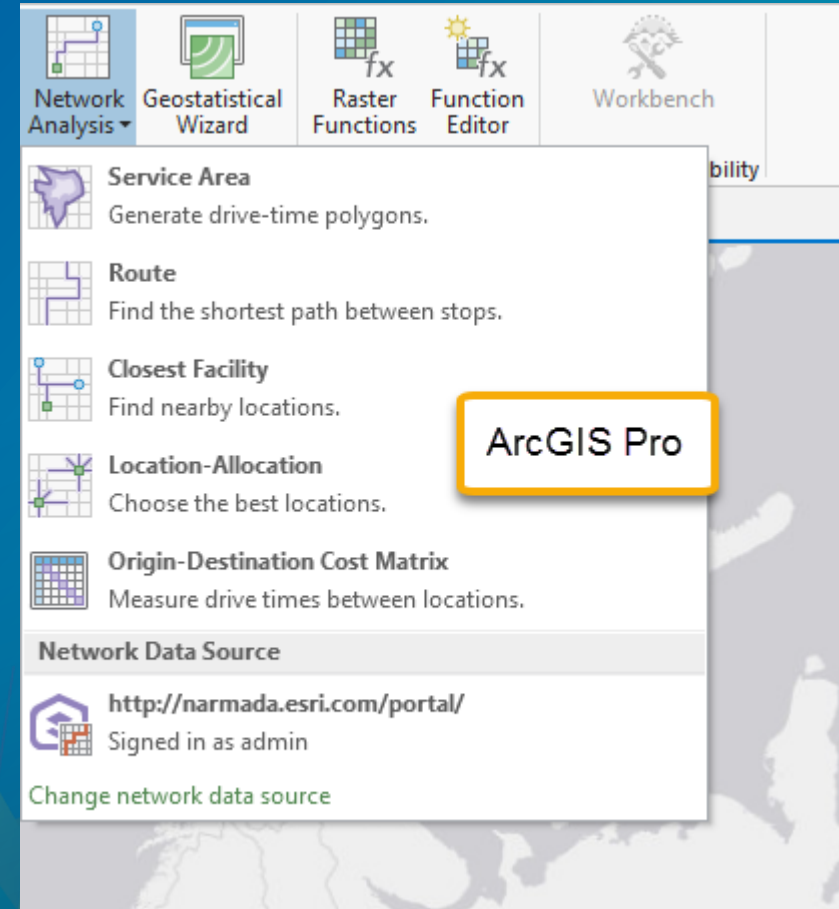
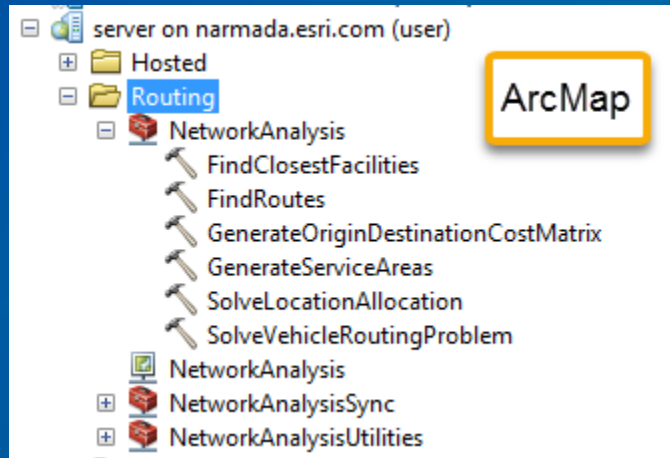
Using services in Map Viewer

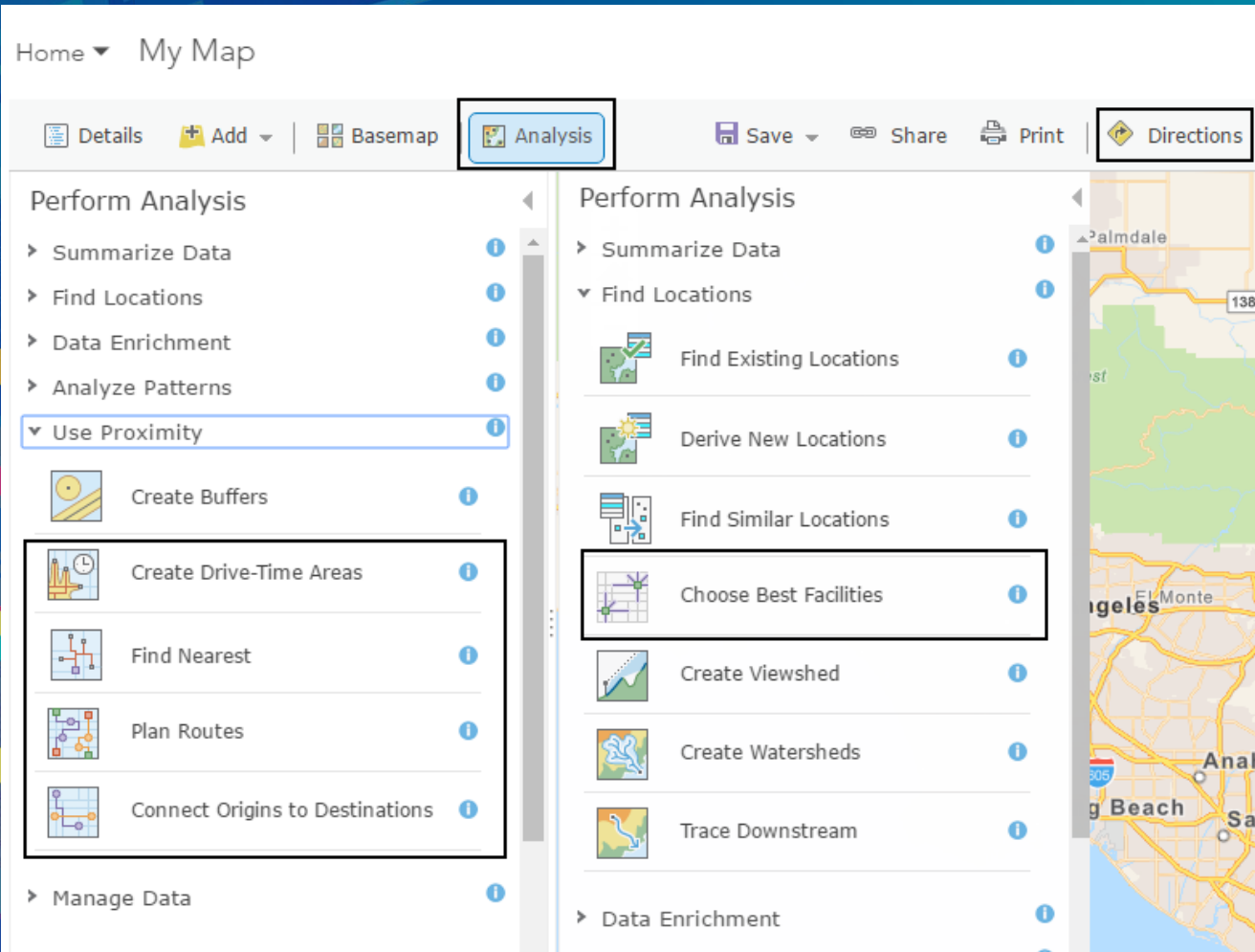
- Directions button
- Analysis tools
 - Most tools in the Use Proximity toolset
 - Choose Best Facilities tool in Find Locations toolset
 - Summarize Nearby tool in Summarize Data toolset



Using services in ArcGIS Desktop

- Use from Network Analysis gallery in the Analysis tab within ArcGIS Pro
- Use from a ArcGIS Server connection in ArcMap





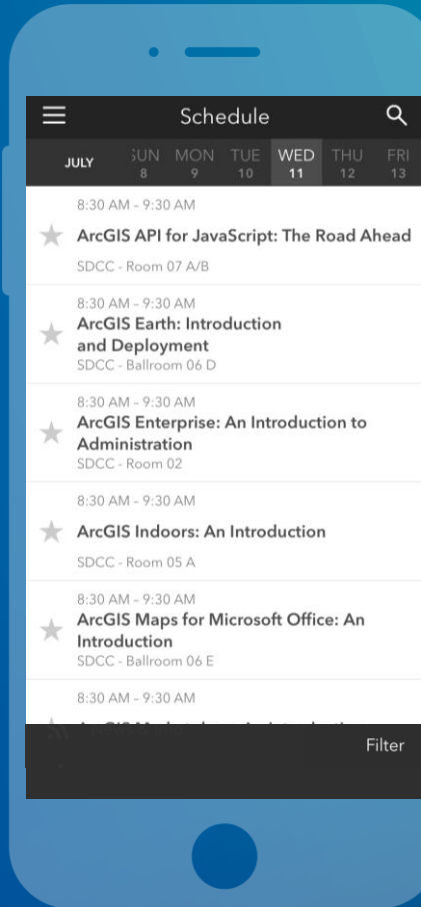
Demo: Using Network Analysis Services

Please Take Our Survey on the App

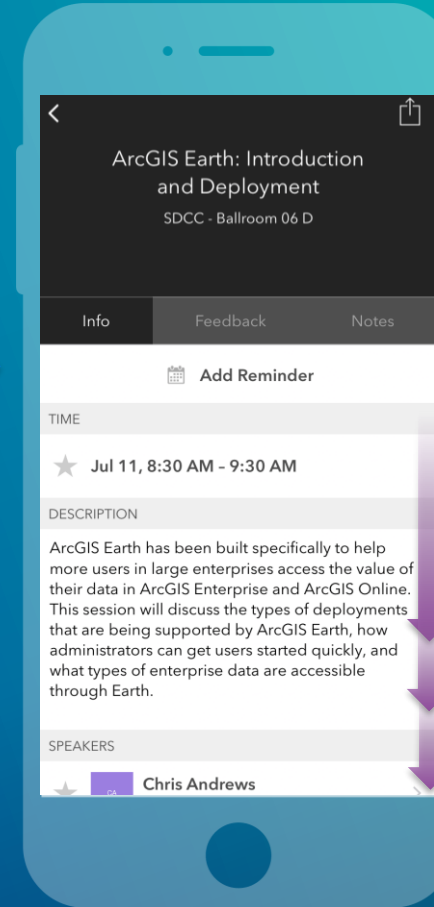
Download the Esri Events app and find your event



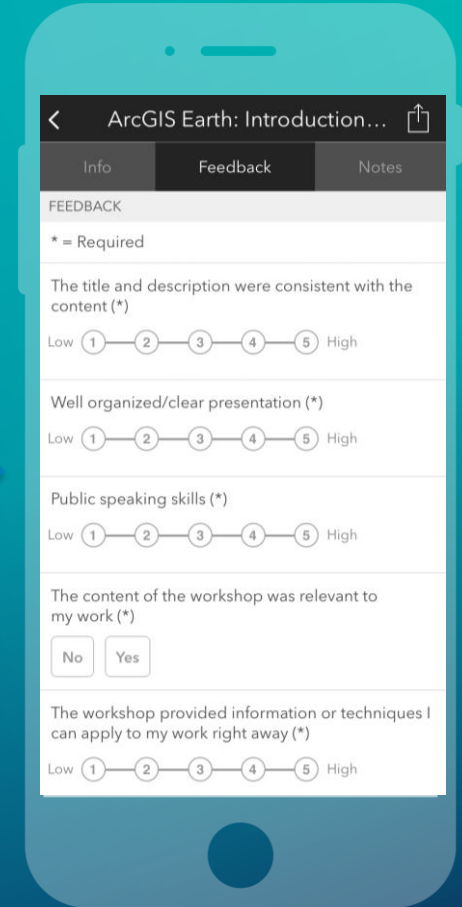
Select the session you attended



Scroll down to find the feedback section



Complete answers and select "Submit"



Questions?

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<http://esriurl.com/ds19nas>



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THE
SCIENCE
OF
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