



This map demonstrates the use of ArcGIS for Desktop 10.6's Network Analyst tools for **OD Cost Matrix Analysis**. In this study, least-cost routes were identified between specified points using a portion of Annapolis County, Nova Scotia, as a study area.

To perform the analysis, a new OD Cost Matrix analysis layer was created within ArcGIS using the Network Analyst tools. Analysis parameters such as U-turn permissions, cutoff distance value, and output geometry type were then defined within the layer's properties.

OD Cost Matrix analysis is similar to Closest Facility analysis. Like Closest Facility analysis, it computes the most efficient path between multiple origins and destinations. OD Cost Matrix analysis is computationally faster, so it is more suitable for large datasets. However, it is not able to provide a geometry output showing the routes or driving instructions.

N

0 25 50 100 Kilometres

The source for the network model was Nova Scotia Civic Address (NSCAF) road data in vector shapefile format. This data had to be modified to ensure proper connectivity, preparing it for inclusion in a functioning network model. To do this, the roads data was first imported into an ArcGIS file geodatabase as a feature class, allowing it to be accessed by Network Analyst functionality. Next, values representing speed limits and traffic flow direction (one-way or two-way) were manually input into the feature class's attribute table.

GNSS field collection and knowledge of municipal standards were used to obtain accurate figures. **Attribute domains** were used to ensure **data integrity** during this process. Length and travel time figures were generated using the ArcGIS Field Calculator.

Using the modified road layer, a new **Network Dataset** was created with **minutes** and **length** specified as impedance values. From here, constraints were added to accurately model turns using a **Turn Feature Class** created for this purpose and ArcGIS' editing tools.

Finally, the layers were symbolized, legend and surround information was added, and the final product suitable for print was created.

- Point Features**
- Church
 - School
 - Lighthouse
 - Orchard
 - Sewage Settling Pond
 - Local Road
 - Unpaved
 - Seasonal Dry Weather Road
 - Swamp
 - Tank
 - Tower
 - Windmill
 - Abandoned Railroad
- Roads**
- Arterial Highway (100 Series)
 - Collector Highway (200-300 Series)
 - Trunk Highway (1-99 Series)
 - Local Road
 - Unpaved
 - Seasonal Dry Weather Road
 - Swamp
 - Tank
 - Tower
 - Windmill
 - Abandoned Railroad

- Area Features**
- Commercial Area
 - Building or Structure
 - Campground
 - Cemetery
 - Cut or Fill
 - Dump
 - Recreation Area
 - Hydrography
 - Pipeline Underground
 - Gravel Pit
 - Sewage Treatment Plant
 - Swamp
 - Vegetation
- Line Features**
- Cliff
 - River, Stream, Coastline
 - Contour
 - Contour Approximate
 - Tree Area, Line, Row or Orchard
 - Depression Contour
 - Index Contour
 - Pipeline
 - Underground
 - Power Transmission Line
 - River, Stream, Coastline

OD Cost Matrix Analysis

Bridgetown, Lawrencetown, Middleton

&
Surrounding Areas

Annapolis County
Nova Scotia

Scale: 1:50,000
0 0.5 1 2 3 4 Kilometres

Projection: Universal Transverse Mercator, Zone 20 North
Datum: North American Datum 1983 (NAD83)
Correction: Canadian Spatial Reference System 1998 (CSRS98)

Magnetic North
November 2018
Calculated magnetic
declination: 17° 2' 19" W
Latitude: 44° 55' 13" N
Longitude: 65° 10' 07" W

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at the Centre of Geographic Sciences, NSC, Lawrencetown, Nova Scotia.
The product is unedited, unverified and intended
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