# Instructions for using N-CAST

The N-CAST shapefiles can be used to map and analyze the data contained within the N-CAST database. N-CAST provides shapefiles for download in a file geodatabase format (.gdb) which allows multiple shapefiles to be downloaded at once. Currently, data is aggregated and reported monthly. Users can download each month individually, or they can download all available months at once. As stated on the N-CAST webpage, by downloading any N-CAST files, the user is accepting the Terms of Use Agreement.

After determining the desired files to download, the user should click on the download link for whatever files they wish to download. Clicking on the link will prompt a download of a compressed file geodatabase (.zip) that contains one or more shapefiles. Agree to the download and store the file geodatabase on your local computer.

The N-CAST functionality can be accessed through GIS software already installed on your computer, ESRI's ArcMap will be used as an example.

*GIS Mapping Steps* (ArcMap required)

**1)** Download the file geodatabase located at http://atri-online.org/n-cast/ to your computer.

**2)** Unzip the compressed file (.zip) and store the uncompressed file (.gdb) on your computer.

**3)** Open the ArcMap software and start with a new blank map project.

**4)** Add data to the map by choosing "Add Data" from the standard toolbar (Figure 1):

Figure 1 – Adding Data
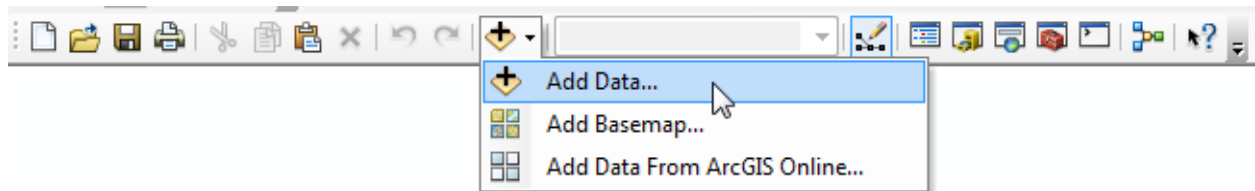


Navigate to the location where you saved the uncompressed N-CAST files and double-click on the file geodatabase. Within the geodatabase will be one or more shapefiles, each corresponding to a specific month of data. Click on the name of the shapefile(s) you wish to add (use CTRL key to select more than one) and then click "Add". The example in Figure 2 shows three available shapefiles that have all been selected for addition.

Figure 2 – Selecting Shapefiles to Add
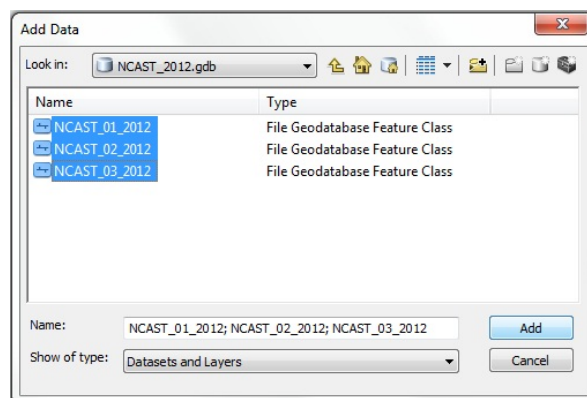
**5)** In the Table of Contents, right click on one of the layers that was just added and choose "Open Attribute Table" (Figure 3).

Figure 3 – Opening Attribute Table
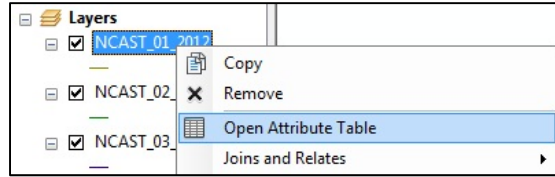


This will allow you to see the contents of each shapefile in tabular form, as shown in the Figure 4 example.

Figure 4 – Viewing Attribute Table



**6)** To map the average speed data, you will need to adjust the layer symbology. In the Table of Contents, right click on one of the layers and select Properties (Figure 5).

Figure 5 – Selecting Layer Properties
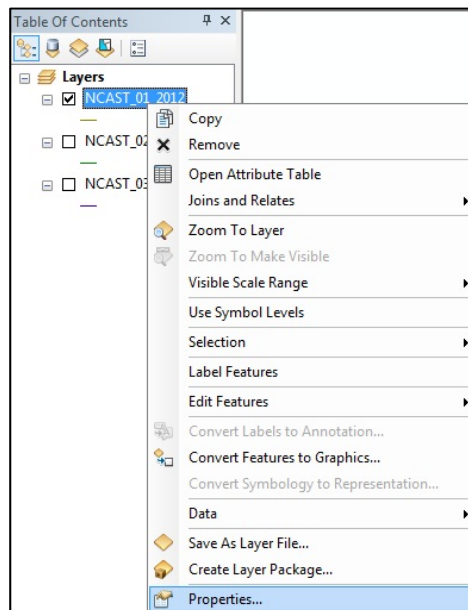
Select the "Symbology" tab, and then select "Quantities – Graduated colors" from the list on the left (Figure 6).  In the Layer Properties pop-up window select the time bin you would like to view in the "Value" drop down list.  The AM Peak is shown as an example (please refer to the data dictionary at the conclusion of this document for an explanation of each field).  The number of classes and class ranges can be modified on this screen as well.

Figure 6 – Modifying Layer Symbology
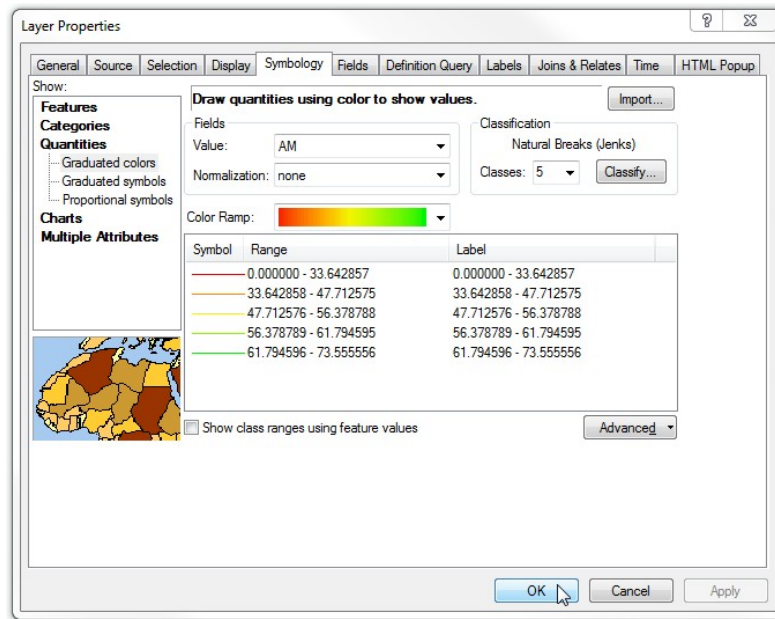


**7)** Use the "Zoom" tool on the standard tool bar to zoom-in to an area of interest.

**8)** Use the "Identify" tool to view attribute information for a particular segment.  The attribute information will appear in the "Identify" pop-up window, as shown in Figure 7.

Figure 7 – Example Segment Attributes
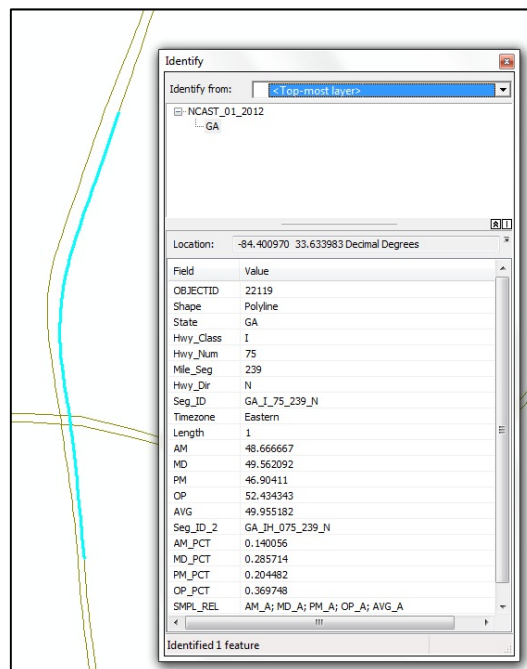
**9)** Additional layers can be added to create maps for reports and presentations.

# N-CAST Shapefile Data Dictionary

Background:
The various shapefiles within the file geodatabase were created using ATRI FPM data from the year 2012. Please refer to the N-CAST Background document for more detail on the ATRI FPM database.

Each N-CAST shapefile has a vector spatial representation and the geographic coordinate reference GCS_WGS_1984. Please note that any "<NULL>" values that appear in the database indicate locations and/or times when there was insufficient data to conduct an analysis. Less than 0.05% of segments have insufficient data for all five time bins.

Shapefile Contents:

Field: FID
- * Field description : Internal feature number.
- * Description of values: Sequential unique whole numbers that are automatically generated.

Field: Shape
- * Field description: Feature geometry.
- * Description of values: Indicates file is a line shapefile.

Field: State
- * Field description: State Assignment.
- * Description of values: State boundary in which the roadway segment falls within.

Field: Hwy_Class
- * Field description: Highway Classification.
- * Description of values:
  o "I"- Interstate

Field: Hwy_Num
- * Field description: Highway Number.
- * Description of values: Numerical values of roadway name (i.e. 10 for I-10).
  o NOTE: For I-35W, the highway number is reported as 351

Field: Mile_Seg
- * Field description: Mile Segment.
- * Description of values: Sequential unique whole numbers that are automatically generated to uniquely name corresponding 1 mile segments on each roadway.

Field: Hwy_Dir

- * Field description: Highway Direction.
- * Description of values:
  - "N"- North
  - "S"- South
  - "E"- East
  - "W"- West
  - "B"- Both
  - "I"- Inner Loop
  - "O"- Outer Loop

Field:   Seg_ID

- * Field description: Unique Segment Identifier.
- * Description of values:   Combination of all naming categories to create one unique ID.

Field:   Timezone
- * Field description: Time Zone.
- *Description of values:   Eastern, Central, Mountain, Arizona, Pacific.

Field:   Length
- * Field description: Length of segment.
- *Description of values:   Numerical value with units of miles.

Field:   AM
- * Field description: Average spot speed during morning peak weekday hours (6:00:00 AM to 9:59:59 AM).
- *Description of values:   Numerical value with units of miles per hour.

Field:   MD
- * Field description: Average spot speed during midday weekday hours (10:00:00 AM to 2:59:59 PM).
- *Description of values:   Numerical value with units of miles per hour.

Field:   PM
- * Field description: Average spot speed during evening peak weekday hours (3:00:00 PM to 6:59:59 PM).
- *Description of values:   Numerical value with units of miles per hour.

Field:   OP
- * Field description: Average spot speed during offpeak weekday hours (7:00:00 PM to 5:59:59 AM).
- *Description of values:   Numerical value with units of miles per hour.

Field:   AVG
- * Field description: Average spot speed during all weekday hours.
- *Description of values:   Numerical value with units of miles per hour.

Field:   AM_PCT
- * Field description: Share of total position reads for that particular segment that fell within the morning peak weekday hours (6:00:00 AM to 9:59:59 AM).
- *Description of values:    Numerical value ranging from 0 to 1.

Field:   MD_PCT
- * Field description: Share of total position reads for that particular segment that fell within the midday weekday hours (10:00:00 AM to 2:59:59 PM).
- *Description of values:    Numerical value ranging from 0 to 1.

Field:   PM_PCT
- * Field description: Share of total position reads for that particular segment that fell within the evening peak weekday hours (3:00:00 PM to 6:59:59 PM).
- *Description of values:    Numerical value ranging from 0 to 1.

Field:   OP_PCT
- * Field description: Share of total position reads for that particular segment that fell within the offpeak weekday hours (7:00:00 PM to 5:59:59 AM).
- *Description of values:    Numerical value ranging from 0 to 1.

Field:   SMPL_REL
- * Field description: Reliability of sample used to calculate average spot speeds for each time bin within a segment.
- *Description of values:    Each of the five time bins (AM Peak, Midday, PM Peak, Offpeak, and Average) are assigned a reliability grade of A, B, or C.  Time bins with a grade of A are the most reliable, indicating a sample with a relative standard error (RSE) of less than 30 and a sample size (N) of greater than 30. Bins with a grade of B are less reliable, having a RSE of less than 30 but an N that is less than or equal to 30.  Time bins with a grade of C are the least reliable and have a RSE of 30 or more and an N of 30 or less.

Field:   Shape Length
- * Field description: Automatically generated field by software that cannot be deleted.
- *Description of values:    This value is automatically generated by the GIS software and should not be used as the shape length.  Please refer to the field "Length" for the segment length in miles.  To hide this field, right click on the field title and select "Turn Field Off"