

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.

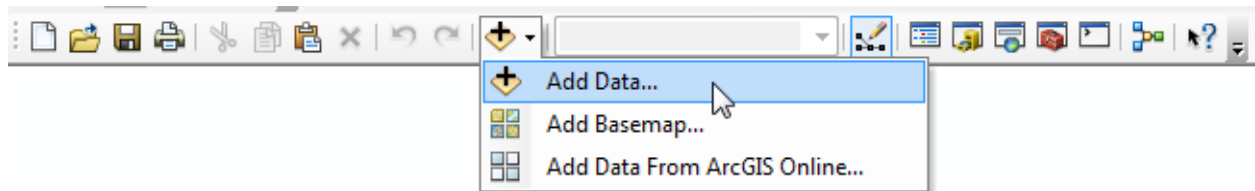
After determining the desired files to download, the user should click on the download link for whatever files they wish to download. Clicking on the link will prompt a download of a compressed file geodatabase (.zip) that contains one or more shapefiles. Agree to the download and store the file geodatabase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

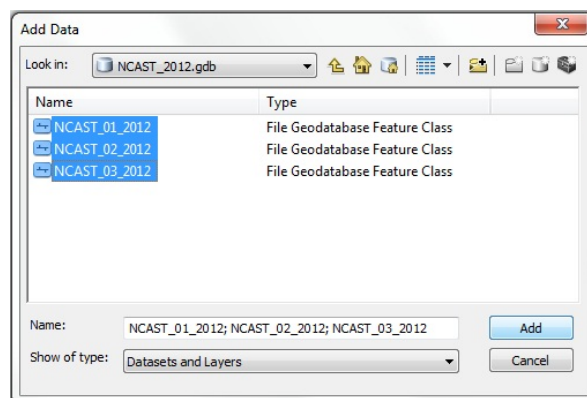
- 1) Download the file geodatabase located at <http://atri-online.org/n-cast/> to your computer.
- 2) Unzip the compressed file (.zip) and store the uncompressed file (.gdb) on your computer.
- 3) Open the ArcMap software and start with a new blank map project.
- 4) Add data to the map by choosing "Add Data" from the standard toolbar (Figure 1):

Figure 1 – Adding Data



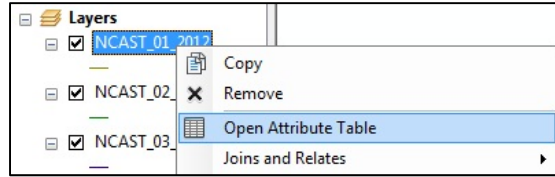
Navigate to the location where you saved the uncompressed N-CAST files and double-click on the file geodatabase. Within the geodatabase will be one or more shapefiles, each corresponding to a specific month of data. Click on the name of the shapefile(s) you wish to add (use CTRL key to select more than 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



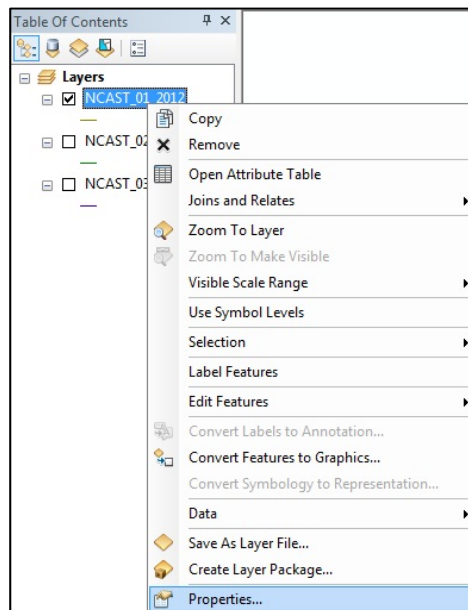
This will allow you to see the contents of each shapefile in tabular form, as shown in the Figure 4 example.

Figure 4 – Viewing Attribute Table

Shape *	State	Hwy_Class	Hwy_Num	Mile_Seg	Hwy_Dir	Seg_ID	Timezone	Length	AM	MD	PM	OP	AVG	Seg_ID_2	AM_PCT	MD_PCT	PM_PCT	OP_PCT	SMPL_REL
Polyline	AL	I	10	1	E	AL_I_10_1_E	Central	1	63.768778	63.406134	63.48708	63.615385	63.549582	AL_H_010_001_E	0.202808	0.321386	0.231183	0.244624	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	1	W	AL_I_10_1_W	Central	1	62.456853	62.592437	62.846154	64.401869	63.093434	AL_H_010_001_W	0.248737	0.300505	0.180556	0.270202	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	10	E	AL_I_10_10_E	Central	1	64.928554	65.493827	64.470332	63.902299	64.753986	AL_H_010_010_E	0.217712	0.288893	0.289373	0.214022	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	10	W	AL_I_10_10_W	Central	1	63.917874	64.819742	65.026987	65.087179	64.672	AL_H_010_010_W	0.276	0.310667	0.153333	0.28	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	11	E	AL_I_10_11_E	Central	1	64.951807	64.942529	64.872727	64.713333	64.883752	AL_H_010_011_E	0.219287	0.344782	0.217966	0.217966	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	11	W	AL_I_10_11_W	Central	1	63.603175	64.16087	63.815385	63.717054	63.832714	AL_H_010_011_W	0.234201	0.285008	0.16109	0.319703	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	12	E	AL_I_10_12_E	Central	1	65.583784	65.286409	64.691099	63.850515	64.873341	AL_H_010_012_E	0.22316	0.312425	0.230398	0.234017	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	12	W	AL_I_10_12_W	Central	1	56.83004	64.755725	63.963964	63.985782	62.060932	AL_H_010_012_W	0.30227	0.313023	0.132616	0.252091	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	13	E	AL_I_10_13_E	Central	1	63.868019	64.530303	63.731959	63.872093	64.009988	AL_H_010_013_E	0.213483	0.329588	0.242197	0.214732	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	13	W	AL_I_10_13_W	Central	1	58.577114	64.092742	64.262774	63.266094	62.532357	AL_H_010_013_W	0.245421	0.302808	0.167277	0.284493	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	14	E	AL_I_10_14_E	Central	1	61.085227	62.031496	61.935673	61.284024	61.62987	AL_H_010_014_E	0.228571	0.32987	0.222078	0.219481	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	14	W	AL_I_10_14_W	Central	1	60.417112	59.713693	57.891667	59.781719	59.590796	AL_H_010_014_W	0.232507	0.298751	0.148254	0.318408	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	15	E	AL_I_10_15_E	Central	1	59.005747	53.5	59.528409	59.774569	57.219653	AL_H_010_015_E	0.201158	0.374566	0.203468	0.220809	AM_A; MD_A; PM_A; OP_A; AVG_A
Polyline	AL	I	10	15	W	AL_I_10_15_W	Central	1	58.802871	58.77821	58.958333	58.509346	58.6876	AL_H_010_015_W	0.26125	0.32125	0.15	0.2675	AM_A; MD_A; PM_A; OP_A; AVG_A
Bookline	AL	I	10	16	E	AL_I_10_16_E	Central	1	51.538171	51.872897	58.738847	58.720513	53.707006	AL_H_010_016_E	0.230361	0.340764	0.221868	0.207008	AM_A; MD_A; PM_A; OP_A; AVG_A

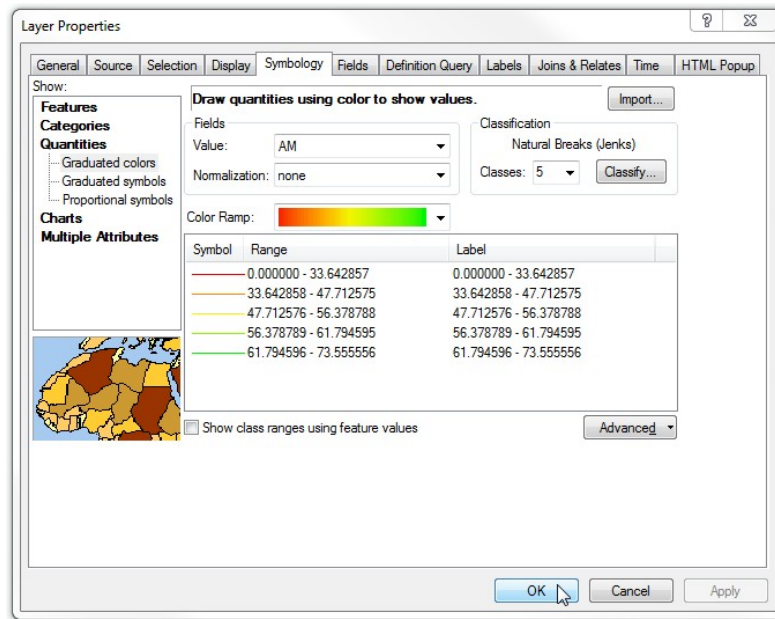
6) To map the average speed data, you will need to adjust the layer symbology. In the Table of Contents, right click on one of the layers and select Properties (Figure 5).

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.


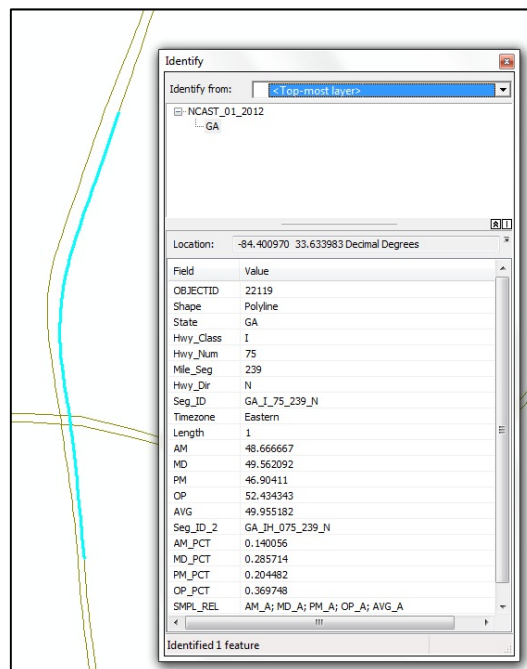
8) Use the “Identify” tool  to view attribute information for a particular segment. The attribute information will appear in the “Identify” pop-up window, as shown in Figure 7.

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:
 - “I”- Interstate

Field: Hwy_Num

- * Field description: Highway Number.
- * Description of values: Numerical values of roadway name (i.e. 10 for I-10).
 - 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"