



NERPM-AB1v3 Overview

January 2017

Overview of Updates to NERPM-AB1v3

1. New Master Network
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5. ArcGIS Versions Compatibility

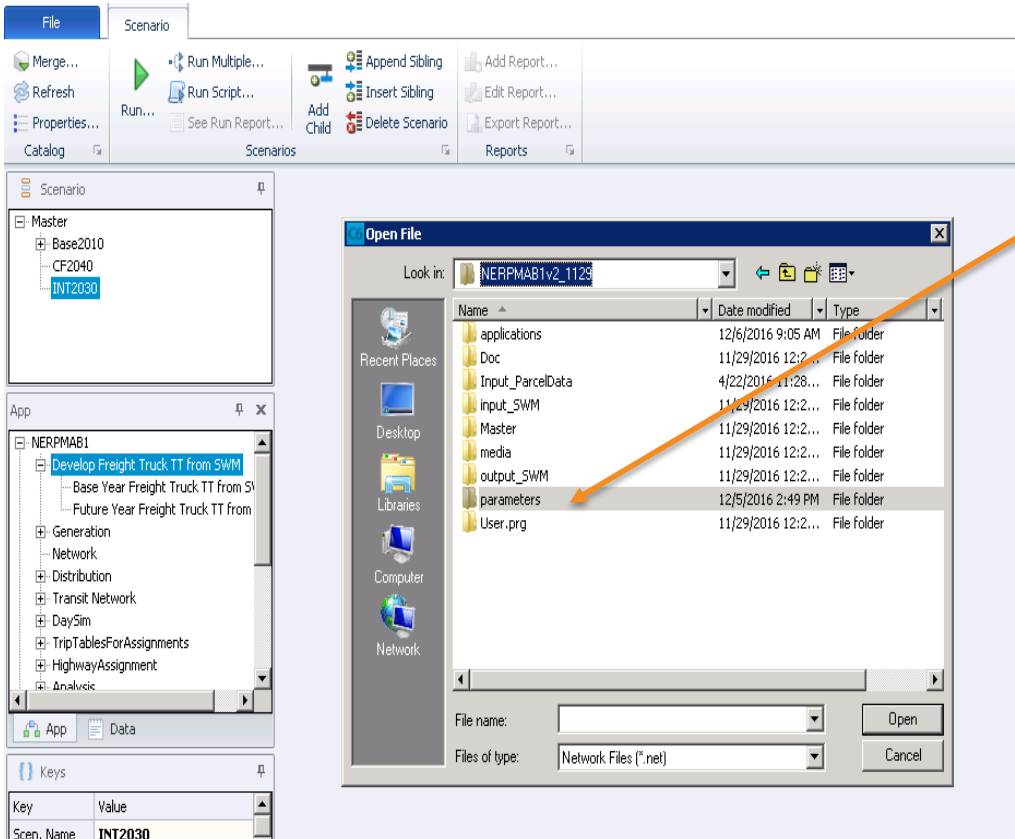




New Master Network

New Master Network

MicroCodedHnet42.net



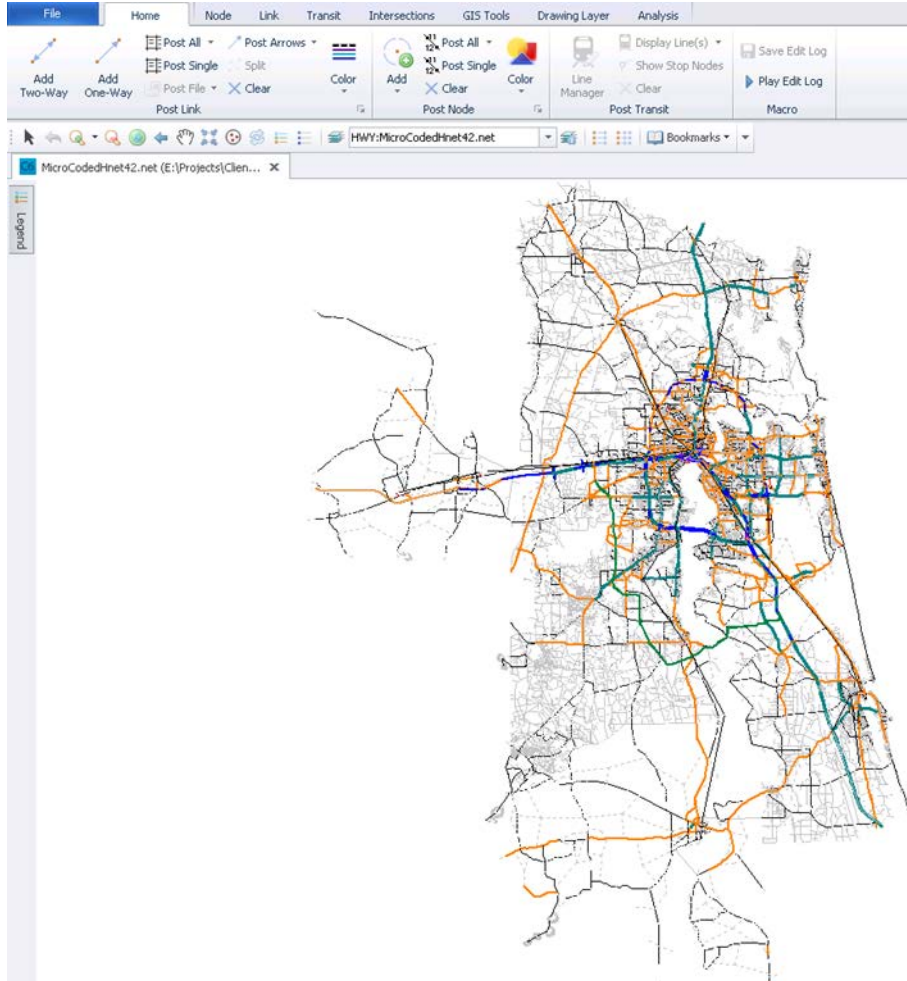
In Cube click on “File”
“Open” and navigate to
the “parameters” folder.

The Master Network
(MicroCodedHnet42.net)
is located in the
parameters folder.



New Master Network

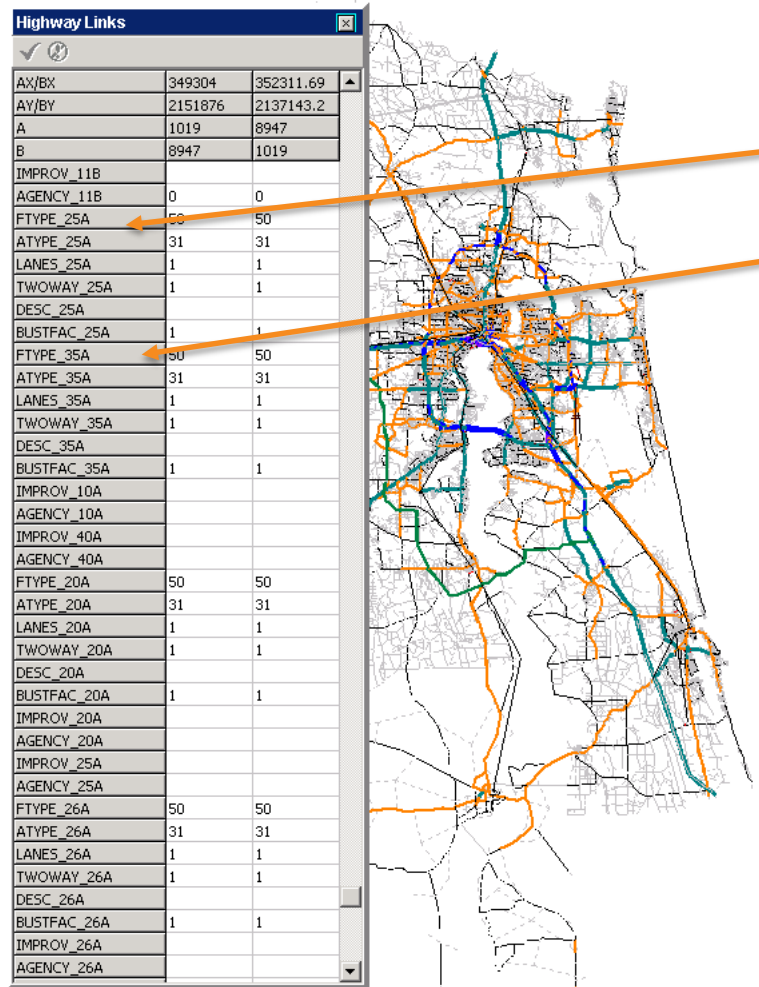
MicroCodedHnet42.net



Double-click on the *MicroCodedHnet42.net* and the network will open and appear in the Cube window.

New Master Network

MicroCodedHnet42.net



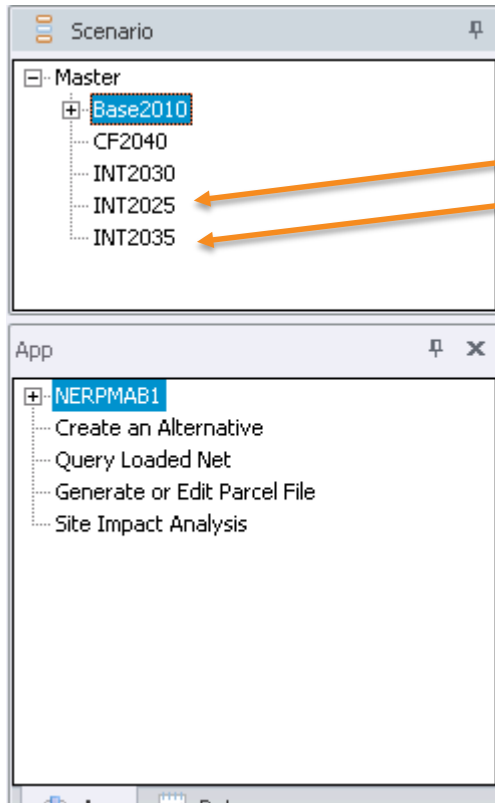
AX/BX	349304	352311.69
AY/BY	2151876	2137143.2
A	1019	8947
B	8947	1019
IMPROV_11B		
AGENCY_11B	0	0
FTYPE_25A	50	50
ATYPE_25A	31	31
LANES_25A	1	1
TWOWAY_25A	1	1
DESC_25A		
BUSTFAC_25A	1	1
FTYPE_35A	50	50
ATYPE_35A	31	31
LANES_35A	1	1
TWOWAY_35A	1	1
DESC_35A		
BUSTFAC_35A	1	1
IMPROV_10A		
AGENCY_10A		
IMPROV_40A		
AGENCY_40A		
FTYPE_20A	50	50
ATYPE_20A	31	31
LANES_20A	1	1
TWOWAY_20A	1	1
DESC_20A		
BUSTFAC_20A	1	1
IMPROV_20A		
AGENCY_20A		
IMPROV_25A		
AGENCY_25A		
FTYPE_26A	50	50
ATYPE_26A	31	31
LANES_26A	1	1
TWOWAY_26A	1	1
DESC_26A		
BUSTFAC_26A	1	1
IMPROV_26A		
AGENCY_26A		

Each link is associated with attributes. The updated MicroCodedHnet42.net has added attributes for 2025 and 2035, while corrections were made to the 2010, 2030, and 2040 networks.



New Master Network

MicroCodedHnet42.net



Scenarios have been added for 2025 and 2035. All the input files for these added scenarios are stored in the INT2025 and INT2035 folders in the Master directory.

The previous version (NERPM-AB1v2) included the scenarios Base2010, INT2030, and CF2040.

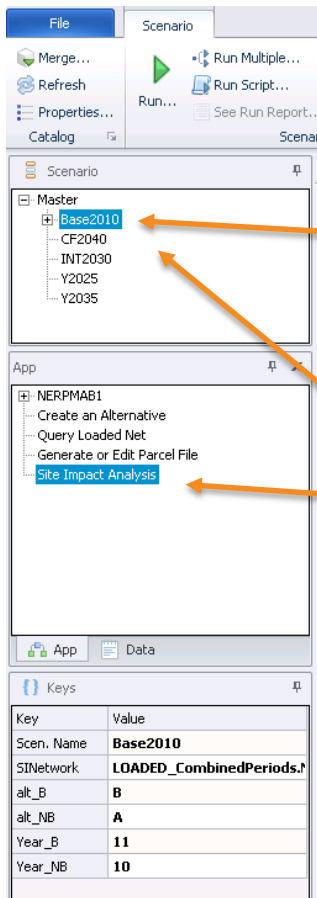
Please note that due to corrections and updates made to the networks, the turn penalty files for the INT2030 and CF2040 were updated as well.





Site Impact Analysis Application

Site Impact Analysis Application



In order to activate the Site Impact Analysis application, select the No Build scenario—in this example, Base2010.

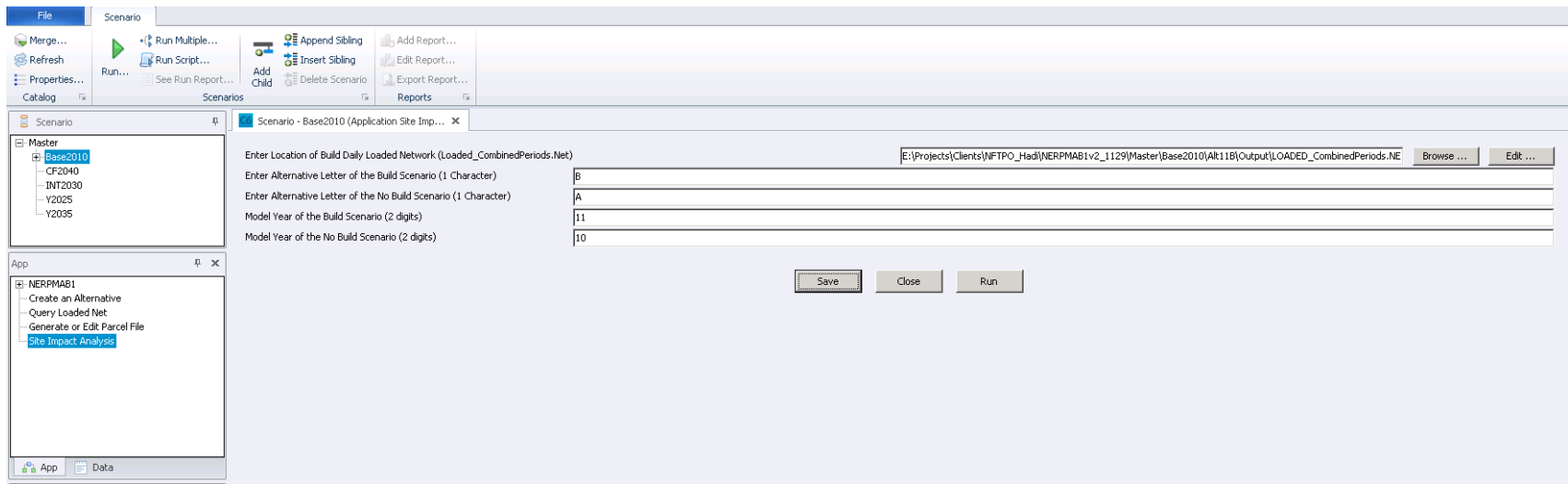
Next, select the Site Impact Analysis application.

Double-click on the No Build scenario.



Site Impact Analysis Application

The following window will open.



Site Impact Analysis Application

In the window, use the browse button to select the loaded highway network (Loaded_CombinedPeriods.Net) in the Build output folder. In this example, Alt11B.

Scenario - Base2010 (Application Site Imp... x

Enter Location of Build Daily Loaded Network (Loaded_CombinedPeriods.Net) E:\Projects\Clients\NFTPO_Hadl\NERPMAB1v2_1129\Master\Base2010\Alt11B\Output\LOADED_CombinedPeriods.NET Browse ... Edit ...

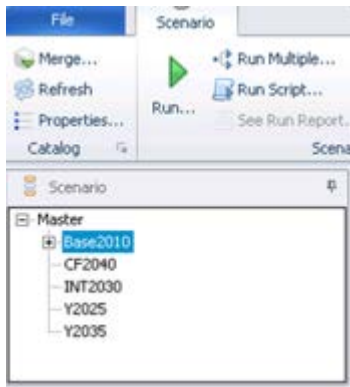
Enter Alternative Letter of the Build Scenario (1 Character) B

Enter Alternative Letter of the No Build Scenario (1 Character) A

Model Year of the Build Scenario (2 digits) 11

Model Year of the No Build Scenario (2 digits) 10

Save Close Run

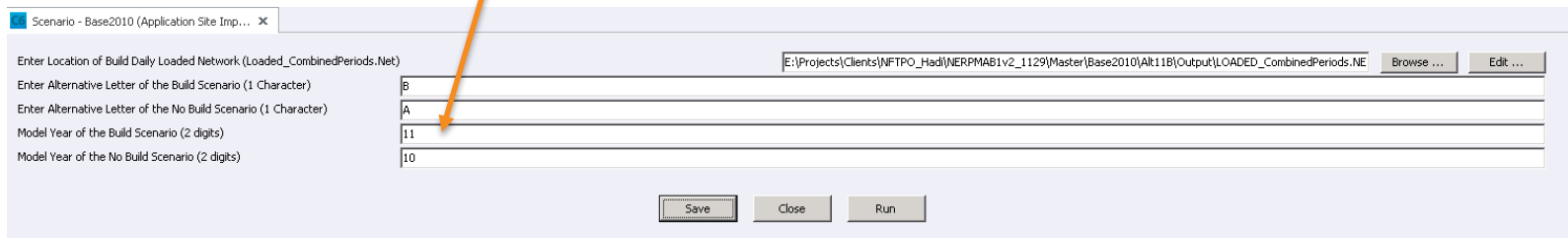


Make sure you are in the No Build scenario, Base2010 in this example, when you open the Site Impact Analysis Application.



Site Impact Analysis Application

Next, enter the scenario character and the model year for the No Build and Build scenarios. In this example, 10A is the No Build and 11B is the Build scenario.



The screenshot shows a software window titled "Scenario - Base2010 (Application Site Imp... x)". It contains several input fields and buttons:

- Enter Location of Build Daily Loaded Network (Loaded_CombinedPeriods.Net): E:\Projects\Clients\WFTPO_Hadl\NERPMAB1v2_1129\Master\Base2010\Alt11B\Output\LOADED_CombinedPeriods.NE [Browse ...] [Edit ...]
- Enter Alternative Letter of the Build Scenario (1 Character): B
- Enter Alternative Letter of the No Build Scenario (1 Character): A
- Model Year of the Build Scenario (2 digits): 11
- Model Year of the No Build Scenario (2 digits): 10

At the bottom of the window are three buttons: Save, Close, and Run. An orange arrow points to the "Enter Alternative Letter of the Build Scenario" field.

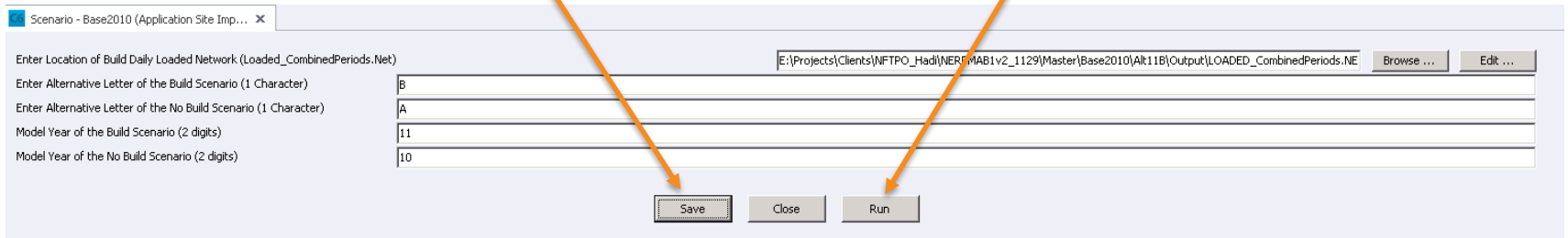
It is important to note that the networks in the No Build and Build scenario need to have the same node numbers and the same active links in both networks (facility type > 0). Facility types equal to 0 are not carried over into the loaded highway network and inconsistencies between the Build and No Build will cause the Site Impact Analysis application to fail.

All attributes, such as facility types (other than type 0), area types, and number of lanes, etc. can be different between the scenarios.



Site Impact Analysis Application

Next, click on the “Save” button and then the “Run” button.



The screenshot shows the application window titled "Scenario - Base2010 (Application Site Imp...". The interface includes several input fields and buttons:

- Enter Location of Build Daily Loaded Network (Loaded_CombinedPeriods.Net): E:\Projects\Clients\WFTPO_Had\WER\MAB1v2_1129\Master\Base2010\Alt11B\Output\LOADED_CombinedPeriods.NE
- Enter Alternative Letter of the Build Scenario (1 Character): B
- Enter Alternative Letter of the No Build Scenario (1 Character): A
- Model Year of the Build Scenario (2 digits): 11
- Model Year of the No Build Scenario (2 digits): 10

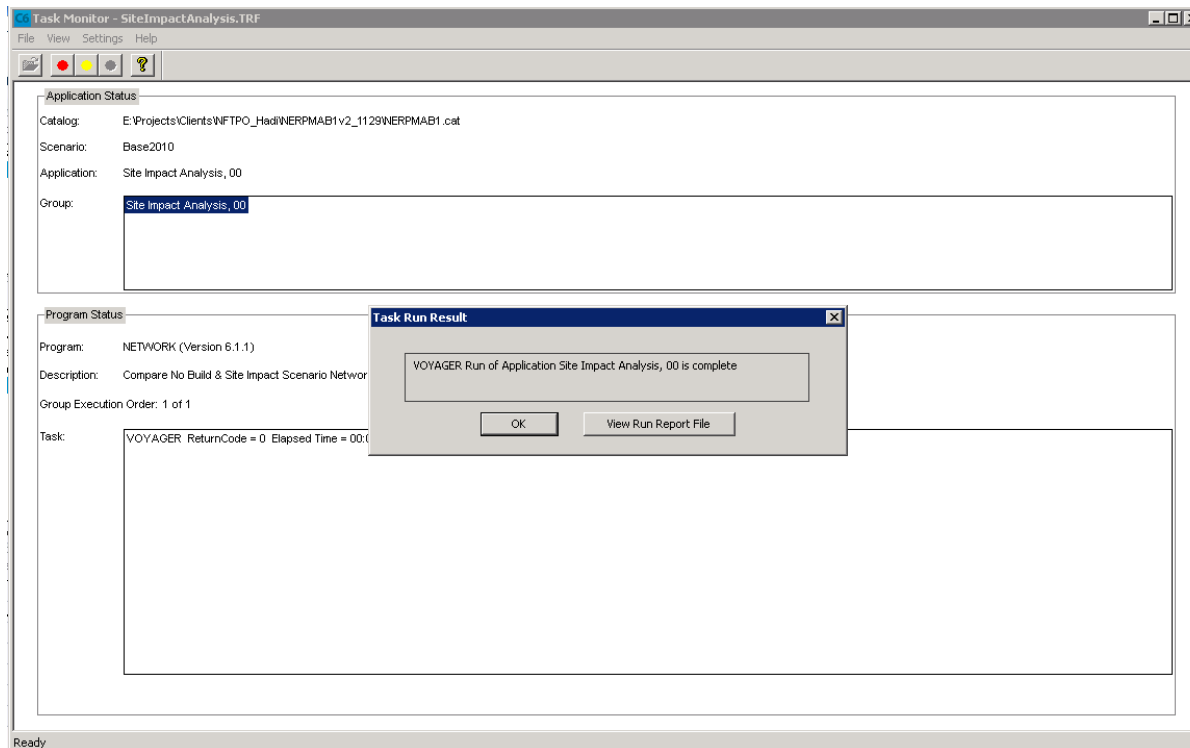
At the bottom of the form, there are three buttons: "Save", "Close", and "Run". Two orange arrows point to the "Save" and "Run" buttons, indicating the next steps in the process.

Running the Site Impact Analysis Application will only take a couple of minutes.



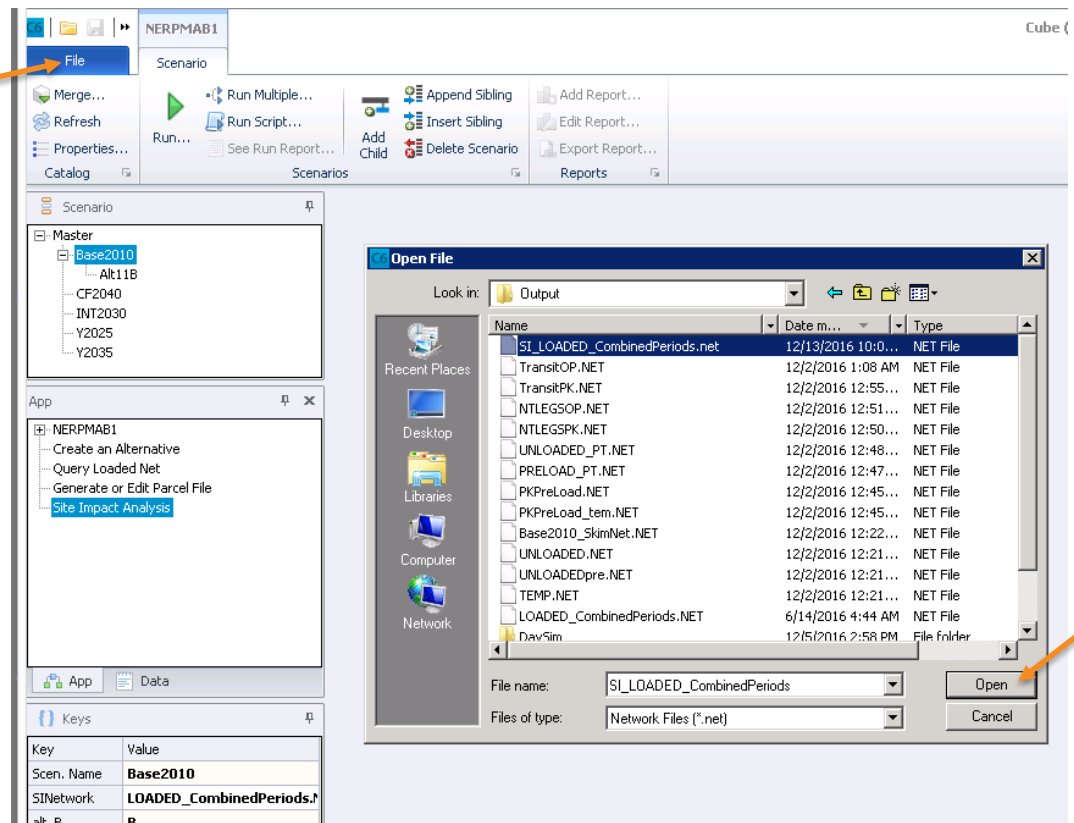
Site Impact Analysis Application

Next, the Task Monitor window will open showing the execution of the application. Once completed, the Task Run Result box will open. Click “OK.”

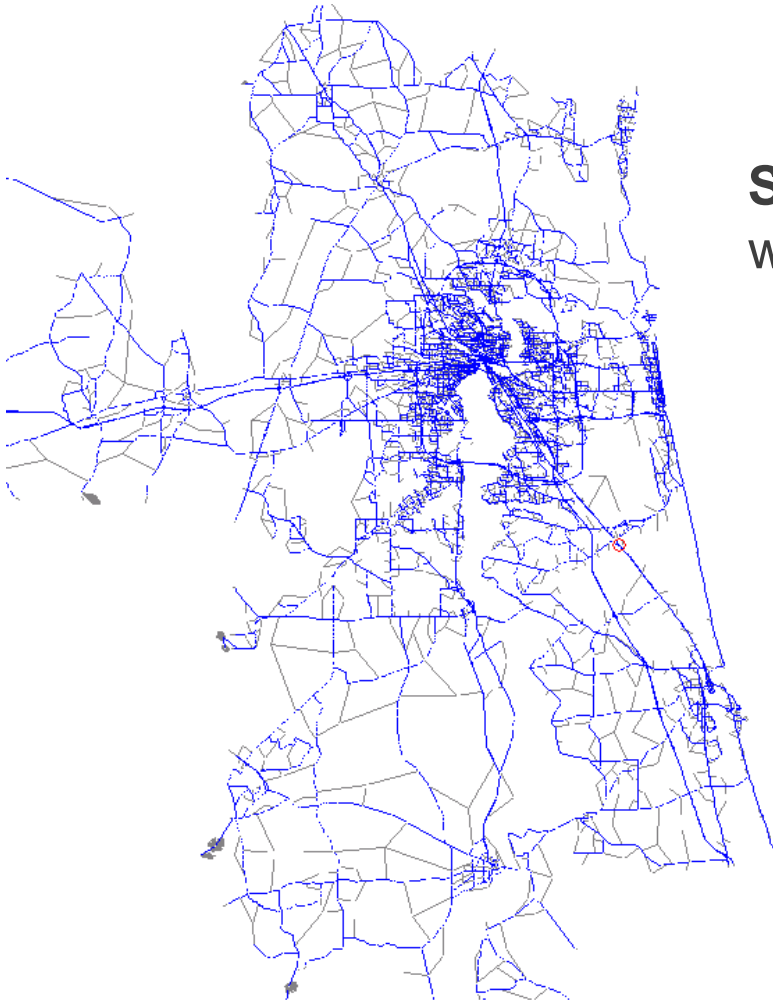


Site Impact Analysis Application

Next, click on “File” and navigate to the output folder of the No Build scenario (Base2010 in this example) and select the Site Impact loaded network file (SI_LOADED_CombinedPeriods.net). Click “Open.”

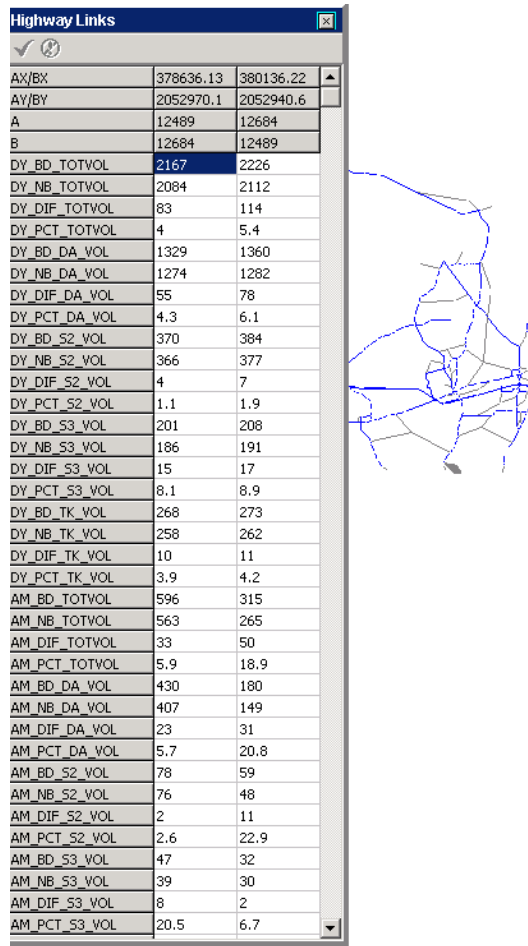


Site Impact Analysis Application



SI_LOADED_CombinedPeriods.net
will open in the Cube window.

Site Impact Analysis Application



Attribute	Value 1	Value 2
AX/BX	378636.13	380136.22
AY/BY	2052970.1	2052940.6
A	12489	12684
B	12684	12489
DY_BD_TOTVOL	2167	2226
DY_NB_TOTVOL	2084	2112
DY_DIF_TOTVOL	83	114
DY_PCT_TOTVOL	4	5.4
DY_BD_DA_VOL	1329	1360
DY_NB_DA_VOL	1274	1282
DY_DIF_DA_VOL	55	78
DY_PCT_DA_VOL	4.3	6.1
DY_BD_S2_VOL	370	384
DY_NB_S2_VOL	366	377
DY_DIF_S2_VOL	4	7
DY_PCT_S2_VOL	1.1	1.9
DY_BD_S3_VOL	201	208
DY_NB_S3_VOL	186	191
DY_DIF_S3_VOL	15	17
DY_PCT_S3_VOL	8.1	8.9
DY_BD_TK_VOL	268	273
DY_NB_TK_VOL	258	262
DY_DIF_TK_VOL	10	11
DY_PCT_TK_VOL	3.9	4.2
AM_BD_TOTVOL	596	315
AM_NB_TOTVOL	563	265
AM_DIF_TOTVOL	33	50
AM_PCT_TOTVOL	5.9	18.9
AM_BD_DA_VOL	430	180
AM_NB_DA_VOL	407	149
AM_DIF_DA_VOL	23	31
AM_PCT_DA_VOL	5.7	20.8
AM_BD_S2_VOL	78	59
AM_NB_S2_VOL	76	48
AM_DIF_S2_VOL	2	11
AM_PCT_S2_VOL	2.6	22.9
AM_BD_S3_VOL	47	32
AM_NB_S3_VOL	39	30
AM_DIF_S3_VOL	8	2
AM_PCT_S3_VOL	20.5	6.7

Click on any link and the attribute box will appear.

The attributes that are listed for each link are the volumes for the No Build and Build scenarios for each of the time periods (DY, AM, MD, PM, NT) by the different trip tables (TOTVOL, DA, S2, SR3, TK), as well as the difference in volume and percentage between the No Build and Build scenarios by direction.

In the name of the attribute BD refers to the Build scenario and the NB refers to the No Build scenario.

Site Impact Analysis Application

Highway Links		
AX/BX	470143.69	470890.69
AY/BY	2101861	2101695.5
A	50888	51261
B	51261	50888
DY_BD_TOTVOL	4940	5064
DY_NB_TOTVOL	4664	4802
DY_DIF_TOTVOL	276	262
DY_PCT_TOTVOL	5.9	5.5
DY_BD_DA_VOL	2995	3061
DY_NB_DA_VOL	2805	2896
DY_DIF_DA_VOL	190	165
DY_PCT_DA_VOL	6.8	5.7
DY_BD_S2_VOL	995	1017
DY_NB_S2_VOL	931	955
DY_DIF_S2_VOL	64	62
DY_PCT_S2_VOL	6.9	6.5
DY_BD_S3_VOL	608	624
DY_NB_S3_VOL	599	596
DY_DIF_S3_VOL	9	28
DY_PCT_S3_VOL	1.5	4.7
DY_BD_TK_VOL	342	362
DY_NB_TK_VOL	329	356
DY_DIF_TK_VOL	13	6
DY_PCT_TK_VOL	4	1.7
AM_BD_TOTVOL	992	708
AM_NB_TOTVOL	1013	703

In this example, link 50888 - 51261 is shown. In the AB direction, the total daily volume for the Build scenario (DY_BD_TOTVOL) is 4,940. The total daily volume for the No Build scenario (DY_NB_TOTVOL) is 4,664. The difference in volume (DY_DIF_TOTVOL) between the two is 276, while the percent difference (DY_PCT_TOTVOL) is 5.9.

Drive alone (DA), followed by the 2+ (SR2), 3+ (SR3) and the truck (TK) trip tables are also provided.



Site Impact Analysis Application

Highway Links		
AX/BX	470143.69	470890.69
AY/BY	2101861	2101695.5
A	50888	51261
B	51261	50888
DY_NB_S3_VOL	599	596
DY_DIF_S3_VOL	9	28
DY_PCT_S3_VOL	1.5	4.7
DY_BD_TK_VOL	342	362
DY_NB_TK_VOL	329	356
DY_DIF_TK_VOL	13	6
DY_PCT_TK_VOL	4	1.7
AM_BD_TOTVOL	992	708
AM_NB_TOTVOL	1013	703
AM_DIF_TOTVOL	-21	5
AM_PCT_TOTVOL	-2.1	0.7
AM_BD_DA_VOL	734	384
AM_NB_DA_VOL	748	372
AM_DIF_DA_VOL	-14	12
AM_PCT_DA_VOL	-1.9	3.2
AM_BD_S2_VOL	112	130
AM_NB_S2_VOL	117	138
AM_DIF_S2_VOL	-5	-8
AM_PCT_S2_VOL	-4.3	-5.8
AM_BD_S3_VOL	84	154
AM_NB_S3_VOL	83	156
AM_DIF_S3_VOL	1	-2
AM_PCT_S3_VOL	1.2	-1.3
AM_BD_TK_VOL	61	40
AM_NB_TK_VOL	64	38
AM_DIF_TK_VOL	-3	2
AM_PCT_TK_VOL	-4.7	5.3
MD_BD_TOTVOL	1805	1825
MD_NB_TOTVOL	1713	1706
MD_DIF_TOTVOL	92	119
MD_PCT_TOTVOL	5.4	7
MD_BD_DA_VOL	1025	1040
MD_NB_DA_VOL	965	1016
MD_DIF_DA_VOL	60	24
MD_PCT_DA_VOL	6.2	2.4
MD_BD_S2_VOL	408	418

The next time period listed is the AM, followed by the MD, PM, and NT.

For all time periods, the same information is listed for both the No Build and the Build; the total daily volume by scenario and the difference in volume in numbers and in percentages between the scenarios by the different trip tables.



Site Impact Analysis Application

The screenshot displays the 'Site Impact Analysis Application' interface. The top menu bar includes 'File', 'Home', 'Scenario', 'Node', 'Link', 'Transit', 'Intersections', 'GIS Tools', 'Drawing Layer', and 'Analysis'. The 'Network Tools' ribbon is active, with the 'Post All' tool highlighted by an orange arrow. Below the ribbon, the 'Scenario' tree shows a hierarchy: Master > Base2010 > CF2040 > INT2030 > Y2025 > Y2035. The 'App' tree shows: NERPMAB1 > Create an Alternative > Query Loaded Net > Generate or Edit Parcel File > Site Impact Analysis. The 'Keys' table at the bottom left shows 'Scen. Name' with the value 'Base2010'. A 'Posting Selection' dialog box is open in the foreground, showing 'Set: 1:' and 'Name:'. The dialog has a section for 'DY_BD_TOTVOL' with a blue bar and a 'Round to nearest' dropdown set to '1'. There are four rows of 'Link Color' and 'Fix Color' radio buttons. The 'Selection Criteria' field is empty. Buttons for 'OK', 'Cancel', and 'Save Configuration' are at the bottom.

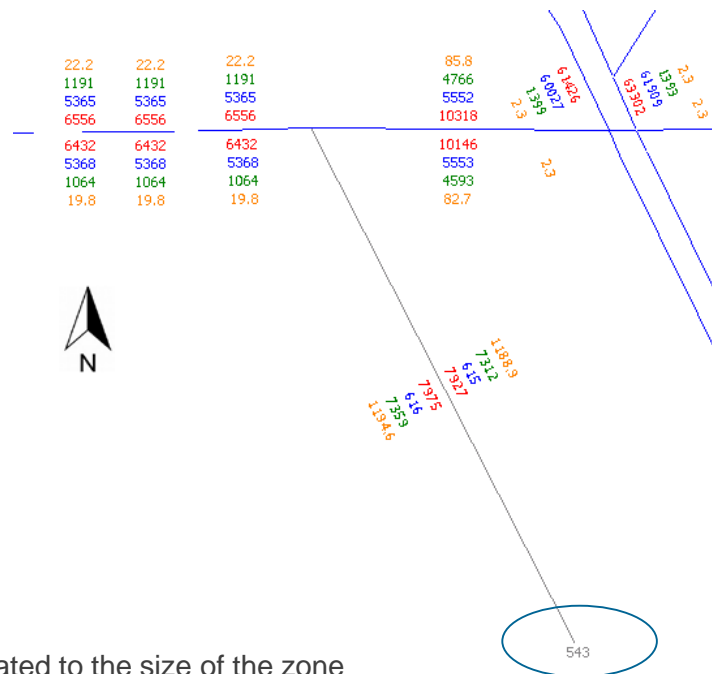
Next, the user can analyze the results using the typical Cube tools. In the following example, “Post All” is used to post information on the highway network links.



Site Impact Analysis Application

The percentages that are listed show the percent increase from the No Build scenario. If we look in the eastbound direction, west of the centroid the percent increase is 19.8% (1,064/5,368) and the increase east of the centroid connector is 82.7% (4,593/5,552), etc.

The total number of trips generated by the 7,000 office employees is 14,671 (7,312 + 7,359). Of those, 11,614 are assigned to the network (1,191 + 1,064 + 4,766 + 4,593). The difference remains within the zone and is referred to as internal trips*.



* The number of internal trips generated in a zone is related to the size of the zone and the type of land uses within the zone



Site Impact Analysis Application

1,191/11,614 = 10% 4,766/11,614 = 41%

1,064/11,614 = 9% 4,593/11,614 = 40%

This diagram shows the distribution of the 11,614 trips associated with the 7,000 office employees in TAZ 543 in volume and in percentage.



543

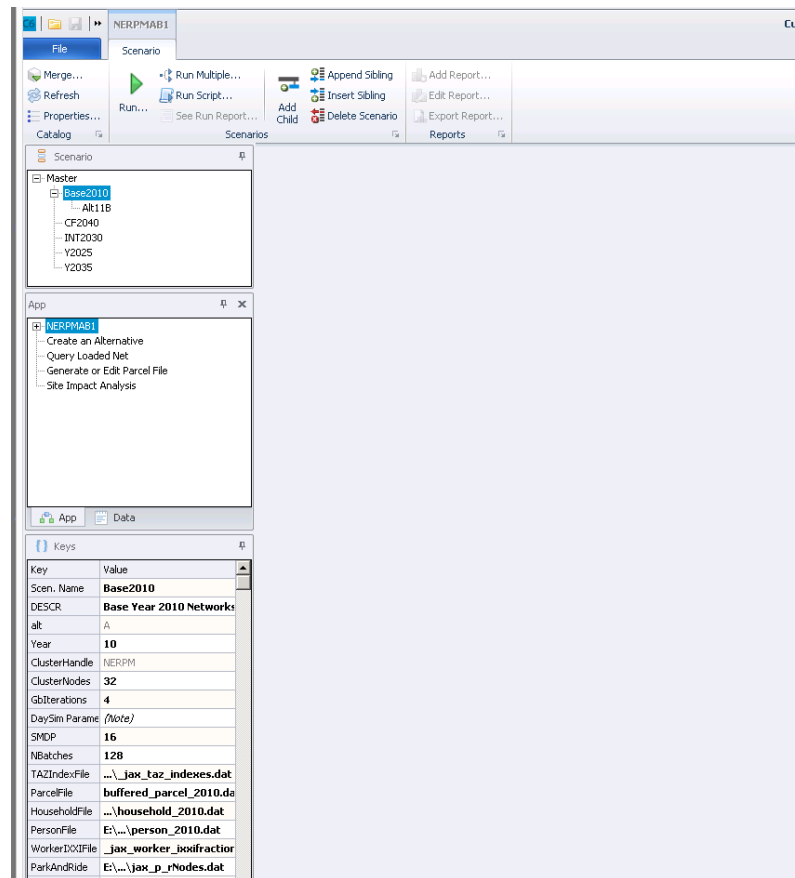




Highway Assignment

Highway Assignment

When starting the NERPM-AB1v3, the following window will open.



Highway Assignment

Double-click on the scenario and the User Interface will open up. In this example, the ALT11B was selected. Click on the “Next” button until the last page is reached.

The screenshot displays the DaySim software interface for configuring a scenario. The interface is divided into several panes:

- Scenario Tree:** Shows a hierarchy starting with 'Master' and 'Base2010', with 'ALT11B' selected.
- App Pane:** Contains options like 'Create an Alternative', 'Query Loaded Net', 'Generate or Edit Parcel File', and 'Site Impact Analysis'.
- Keys Table:** A table with columns 'Key' and 'Value'. The 'Scen. Name' is 'ALT11B'. Other keys include 'DESCR' (Base Year 2010 Networks), 'alt' (B), 'Year' (11), 'ClusterHandle' (NERPM), 'ClusterNodes' (32), 'GlobalIterations' (4), and various file paths for TAZ, parcels, HH, person, and worker data.
- Parameter Configuration:** A grid of fields for model settings. The 'Model Description' is 'Base Year 2010 Networks and SE Data with 7000 employees added to 543'. Other fields include 'Alternative Letter' (B), 'Model Year' (11), 'ClusterHandle' (NERPM), 'Number of CPUs' (32), 'Global Feedback Iterations' (4), and 'DaySim Parameters' (Users should adjust these values correspondingly). The DaySim parameters include 'Half of Number of CPUs' (16), '4 times of CPUs' (128), and various file paths for TAZ, parcels, HH, person, and worker data.
- Check box below if there are changes in employment distribution and you are running the scenario the first time:** This checkbox is checked.
- User-specified Values:** A grid of fields for user-defined values. The 'Maximum internal zone number' is 2494, 'Maximum external zone number' is 2578, 'ZONESA1' is 2579, 'CBD Zone for Reporting' is 730, 'Nearest Zones to Average for Intrazonal Time' is 2, 'Maximum Iterations In Gravity Model' is 40, and 'Maximum Equilibrium Assignment Iterations' is 150.
- Buttons:** At the bottom right, there are buttons for 'Save', 'Close', 'Next...', 'Back...', and 'Run'. An orange arrow points to the 'Next...' button.



Highway Assignment

On the last page, the user has the option to select the highway assignment time periods of interest. The user can select the AM, MD, PM, and/or NT highway assignment. In this example, the PM time period was selected for the Build scenario (Alt11B). To obtain daily assignment, select all assignment periods (AM, MD, PM, NT).

The screenshot displays a software interface with three main panels. The top-left panel shows a tree view under 'Master' with 'Base2010' expanded to 'Alt11B'. The bottom-left panel shows an 'App' tree with 'NERPMAB1' selected. The right panel contains a list of parameters and checkboxes. An orange arrow points to the 'Run PM Highway Assignment' checkbox, which is checked.

IntrCty_Nassau	0.15
IntrCty_Putnam	0.0001
IntrCty_STJohns	0.6
AMProcessList	1-32
PMProcessList	1-32
MDProcessList	1-16
NTProcessList	17-32
MD First Processor Number for Assignment	1
NT First Processor Number for Assignment	17
<input type="checkbox"/> Run AM Period Highway Assignment	
<input type="checkbox"/> Run MD Highway Assignment	
<input checked="" type="checkbox"/> Run PM Highway Assignment	
<input type="checkbox"/> Run NT Highway Assignment	



Highway Assignment

Prior to running one or more time periods, the user must ensure that:

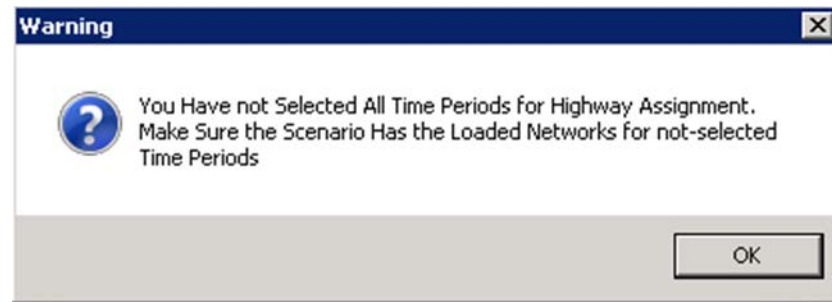
1. The FINAL.ASGN_*.net files for those time periods that are not being run are in the output folder of the scenario which is being run (in this example, the Alt11B output folder). The user can copy these files from another scenario provided the network is the same (node numbers and links).
2. The user needs to set the correct number of cores for the time period being run.



Highway Assignment

Selecting one time period

If the user does not select all time periods, the following message will appear to remind the user to copy the necessary FINAL.ASGN_*.NET files.



Copy the FINAL.ASGN_*.net files for the time periods you are not going to run in the output folder and click "OK." After a couple of seconds, the program will start back up automatically.

Highway Assignment

Selecting one time period

If only one period is run, such as the PM time period, then the user needs to copy the FINAL.ASGN_AM.NET, FINAL_ASGN_MD.NET, and FINAL.ASGN_NT.NET into the scenario's output folder prior to running the PM assignment.

The results for the PM run can be found in the LOADED_PM_Period.NET loaded network output file.

It is important to note that only the PM time period will be reflected correctly in the LOADED_CombinedPeriods.net. All other time periods (DY, AM, MD, and NT) will either not have been updated (AM, MD, NT) or will not reflect the correct volume (DY).



Highway Assignment

Setting number of cores

In this example, the machine has 32 cores. Cores 1 through 32 are used for the AM and PM highway assignment, while Cores 1 through 16 are used for the MD and 17 through 32 for the NT highway assignment.

AMProcessList	1-32
PMProcessList	1-32
MDProcessList	1-16
NTProcessList	17-32
MD First Processor Number for Assignment	1
NT First Processor Number for Assignment	17
<input type="checkbox"/> Run AM Period Highway Assignment	
<input type="checkbox"/> Run MD Highway Assignment	
<input checked="" type="checkbox"/> Run PM Highway Assignment	
<input type="checkbox"/> Run NT Highway Assignment	

In this set up, the AM and PM assignment run in sequence, while the MD and NT run in parallel (at the same time). If the user **only** wants to run the midday (MD) highway assignment then setting the processlist to 1-32 would allow the user to make use of all the cores. The same holds true if the user **only** wants to run the NT highway assignment—in order to use all the cores, the user would change the processlist to 1-32.





Cube Version 6.4.2

Cube Version 6.4.2

NERPM-AB1v3 was run using the latest Cube version 6.4.2. The highway and transit assignments were compared against Cube Version 6.1.1 and no significant differences were identified.

The NERPM-AB does not run with Cube version 6.4.1.





ArcGIS Versions Compatibility

ArcGIS Versions Compatibility

The Generate of Edit Parcel File Application developed for use with the NERPM-AB model has been tested and is compatible with ArcGIS10.2. The Generate of Edit Parcel File Application might not be compatible with the newer versions of ArcGIS.

Recently, the Generate of Edit Parcel File Application was tested with ArcGIS 10.4 and the following changes will need to be made to the code in order for the tool to work with this latest version.

New code statements:

```
import csv
with open(ouput_parcel_csv,'wb') as f:
    w = csv.writer(f)
    w.writerow(fieldnames)
for row in arcpy.da.SearchCursor(output_parcel_csv, field_names=fieldnames):
    w.writerow(row)
```



Questions?

Please contact us with any questions concerning the NERPM-AB model by emailing Nerpm_Support@rsginc.com or directly contacting Milton Locklear at the North Florida TPO at 904-306-7503 or mlocklear@northfloridatpo.com

