

## MEMORANDUM

To: Bruce Grisenbeck, SACOG  
From: SACSIM Model Enhancement Project Team  
Subject: Circuity Surface Data Preparation  
Date: 27 March 2012

This document provides instructions on how to use the circuity measure data preparation tool. There are 3 steps for preparing the data to be used for parcel to parcel network distance calculation based on circuity.

### STEP 1: NETWORK NODE MAPPING

Parcel and network information are read in and 24 fictitious points around the parcel are created (from the X and Y coordinates of the parcels). The 24 points correspond to 8 directions (East, Northeast, North, Northwest, West, Southwest, South, and Southeast) and 3 distance bands (0.5, 1.0, and 1.5 miles) around each parcel. Each of the 25 points (including the parcel itself) is then mapped to its closest node on the network.

#### Inputs:

1. Parcel file ([parcels.dat](#)): this is a space delimited file that has parcel id, x-coordinate, and y-coordinate.
2. Street nodes file ([street\\_nodes.dbf](#)) – this is a dbf file that currently has four fields. Objectid, NodeID (this is the node identifier and should be unique), x-coordinate, and y-coordinate.

**Executable:** [Network\\_DataPrep.exe](#)

**Argument:** [sacognetprep.ctl](#)

**Batch file:** [\\_run\\_netdata\\_prep.bat](#)

#### Outputs:

1. [input\\_od\\_pairs.csv](#) – this comma delimited file contains three fields. A record id, origin node id and destination node id. This feeds in directly into DTA lite for obtaining the shortest paths.
2. [sacog\\_netout.dat](#) – this space delimited file contains 14 fields:
  - a. record id (this corresponds to the field in [input\\_od\\_pairs.csv](#))
  - b. parcel id
  - c. parcel x-coordinate
  - d. parcel y-coordinate
  - e. direction 1-8 (E, NE, N, NW, W, SW, S, SE respectively)
  - f. distance band 1-3 (0.5, 1.0, 1.5 miles respectively)
  - g. X-coordinate of imaginary point

- h. Y-coordinate of imaginary point
- i. Parcel's network node ID (or origin node ID)
- j. Parcel's network node x-coordinate
- k. Parcel's network node y-coordinate
- l. Imaginary point's network node ID (or destination node ID)
- m. Imaginary point's network node x-coordinate
- n. Imaginary point's network node y-coordinate

## STEP 2: NETWORK DISTANCE (SHORTEST PATH) CALCULATION

In this step, the pairs of network nodes output by the previous step are read in the shortest path tool – DTALite and the shortest path network distance is output for each pair.

### Inputs:

1. [input\\_link.csv](#) should have following fields: from\_node\_id, to\_node\_id, link\_id,length\_in\_mile, direction, name, speed\_limit\_in\_mph, number\_of\_lanes, link\_type, lane\_capacity\_in\_vhc\_per\_hour. The first four variables are critical inputs, which would affect shortest path output. The remaining six variables are not used in computation but in case DTALite checks the input fields, keep these variables and put some numbers or characters in.
2. [input\\_node.csv](#) should have following fields: node\_id, x, and y. X and Y are coordinates of street node.
3. [input\\_od\\_pairs.csv](#) - this is obtained from step 1.
4. Keep the remaining DTA Lite input files as is - [input\\_demand.csv](#), [input\\_link\\_type.csv](#), [input\\_sensor\\_location.csv](#), [input\\_vehicle\\_emission\\_rate.csv](#), [input\\_vehicle\\_type.csv](#), [input\\_VOT.csv](#), and [input\\_zone.csv](#).

**Executable:** [DTALite32.exe](#)/ [DTALite64.exe](#) (depending on the operating system of Windows)

**Batch files:** [\\_run32.bat](#)/ [\\_run64.bat](#)

### Outputs:

1. [output\\_shortest\\_path.txt](#) – This is the same as [input\\_od\\_pairs.csv](#) with the shortest path network distance added as the last column.

## STEP 3: MERGING NETWORK NODE AND SHORTEST PATH DATA

In this step the network data preparation output (from Step 1) - [sacog\\_netout.dat](#) and the output from DTA Lite - [output\\_shortest\\_path.txt](#) are merged to produce the final output that can be used for network parcel distance extrapolation.

### Inputs:



1. [sacog\\_netout.dat](#) – from step 1.
2. [output\\_shortest\\_path.txt](#) – from step 2.

**Executable:** [Network\\_DataPrep.exe](#)

**Argument:** [sacognetmerg.ctl](#)

**Batch file:** [\\_run\\_netdata\\_merg.bat](#)

**Outputs:**

1. [final\\_output.dat](#) – This is merge file containing fields from both [sacog\\_netout.dat](#) and [output\\_shortest\\_path.txt](#).

