

ArcTraveler (version 4.0.2)

Revision History

25 June 2011

Created by Volpe Center

The ArcTraveler program creates shape files from Traveler records that were produced by the Microsimulator. ArcTraveler is used visualize the trips of selected travelers.

ArcTraveler is a console-based program that runs in a command window on either Windows or Linux. The command syntax is:

```
ArcTraveler [-flag] [control_file]
```

The control_file is the file name of an ASCII file that contains the control strings expected by the program. The control_file is optional. If a file name is not provided, the program will prompt the user to enter a file name. The flag parameters are also optional. Any combination of the following flag parameters can be included on the command line:

- Q[uiet] = execute without screen messages
- H[elp] = show program syntax and control keys
- K[eyCheck] = list unrecognized control file keys
- P[ause] = pause before exiting
- N[oPause] = never pause before exiting
- B[atch] = execute in batch processing mode

The program automatically creates a printout file based on the control_file name. If the file name includes an extension, the extension is removed and “.prn” is added. The printout file will be created in the current working directory and will overwrite an existing file with the same name.

Known Gaps in this Document

Control File Examples

EXAMPLE 1 PRODUCE SHAPE FILE FOR SELECTED TRAVELERS

TITLE	Generate a Traveler File for 10.Test
DEFAULT_FILE_FORMAT	TAB_DELIMITED
PROJECT_DIRECTORY	../
NET_DIRECTORY	../network
NET_NODE_TABLE	Node.txt
NET_LINK_TABLE	Link.txt
NET_SHAPE_TABLE	Shape.txt
NET_ACTIVITY_LOCATION_TABLE	Activity_Location.txt

```

SELECT_TRAVELERS      223901, 1006201, 1257401, 1352001, 1720801, 1722401
TRAVELER_FILE          results/10.Test.Traveler.txt

ARCVIEW_TRAVELER_FILE  results/TravelerWithShp.shp

```

This produces a shapefile with 6 lines that follow the routes of the 6 selected travelers. The trip for traveler 1006201, going from the top left portion of the network to the lower left corner, is highlighted as a red dotted line.

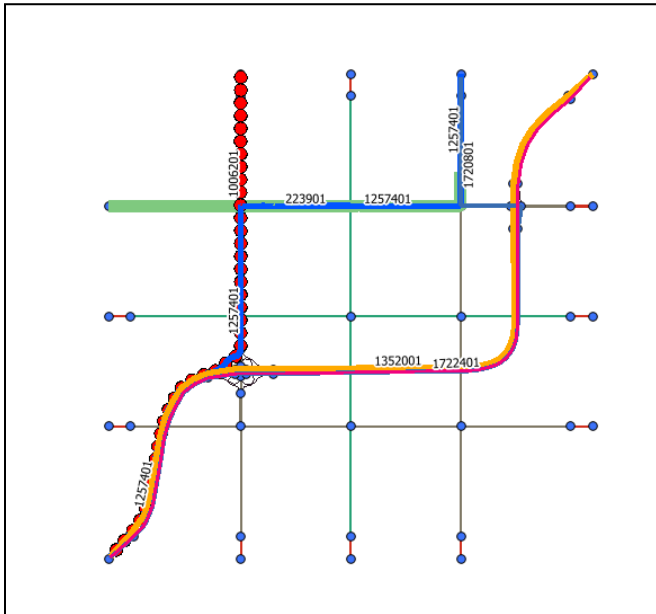


Figure 1 Traveler Shape File

EXAMPLE 2 PRODUCE SHAPE FILE FOR SELECTED TRIPS IN A SUBAREA

```

TITLE                  Generate a Traveler File for Test
DEFAULT_FILE_FORMAT    TAB DELIMITED
PROJECT_DIRECTORY      ../

NET_DIRECTORY          ../network
NET_NODE_TABLE          Node.txt
NET_LINK_TABLE          Link.txt
NET_ACTIVITY_LOCATION_TABLE Activity_Location.txt

SELECT_TRAVELERS      223901, 1006201, 1257401, 1352001, 1720801, 1722401
TRIP_FILE              demand/Test.Trip.txt
SELECT_SUBAREA_POLYGON NewLayer.shp

ARCVIEW_TRAVELER_FILE  results/TravelerTrip.shp

```

This second example produces a shape file for the one trip, 1006201, that is both on the list of trips (in SELECT_TRAVELERS) and is contained within the subarea. Figure 2 illustrates the subarea (green box) and the trip (red dotted line). In this case, the trip is shown as a straight line from origin to destination.

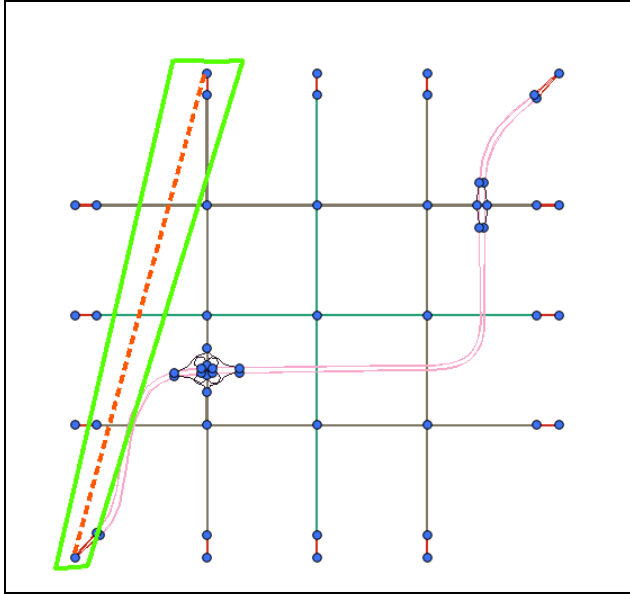


Figure 2 Trip Shape File from ArcTraveler

Control File Parameters

Control parameters are defined using a control key followed by a string or number. The control parameters can be specified in any order. If a given key is defined more than once, the last instance of the key is used. Note that comment lines or extraneous keys can be included in the file. They will be ignored by the program.

The keys recognized by the **ArcTraveler** program are listed below. These keys can be defined in a variety of different ways to perform different tasks.

Required Keys

TRAVELER_FILE

The traveler file key is appended to the PROJECT_DIRECTORY key to specify the file name for the input traveler file copied. The traveler file is created by the microsimulator. For example, the following control keys in Microsimulator.ctl will cause a traveler file for 6 travelers to be produced:

```
OUTPUT_TRAVELER_FILE_1      results/10.Test.Traveler.txt
OUTPUT_TRAVELER_RANGE_1     223901, 1006201, 1257401, 1352001, 1720801, 1722401
```

Either the traveler_file, activity_file or trip_file, is required as an input to ArcTraveler.

ACTIVITY_FILE

The traveler file key is appended to the PROJECT_DIRECTORY key to specify the file name for the input activity file. Either the traveler_file, activity_file or trip_file, is required as an input to ArcTraveler.

TRIP_FILE

The traveler file key is appended to the PROJECT_DIRECTORY key to specify the file name for the input trip file, which was created by ConvertTrips. Either the traveler_file, activity_file or trip_file, is required as an input to ArcTraveler.

NET_NODE_TABLE

The node table specifies the name of the TRANSIMS node file within the network directory. The full path and file name for the node table is constructed by appending the value of this key to the value of the NET_DIRECTORY key.

NET_LINK_TABLE

The link table key specifies the name of the TRANSIMS link file within the network directory. The full path and file name for the link table is constructed by appending the value of this key to the value of the NET_DIRECTORY key.

ARCVIEW_TRAVELER_FILE

The ArcView traveler file key is appended to the PROJECT_DIRECTORY key to specify the file name for the output ArcView shape file. The file name should end with “.shp”. The program automatically creates three files in the output directory. These are the ArcView shape file with the “.shp” extension, the ArcView index file with a “.shx” extension, and the ArcView data file with a “.dbf” extension. All three files are required for a Geographic Information System (GIS) program to read and display the path.

Optional Keys

TITLE

Any text string can be used on this line. This text is printed on the top of each output page.

REPORT_FILE

The report file name is optional. If a file name is not provided, the program automatically creates a report file name based on the input control file name plus the partition number. The report file will overwrite an existing file with the same name if the Report Flag key is False or not specified.

REPORT_FLAG

The report flag key is optional. If it is specified as Yes or True, the report file or default printout file will be opened in 'Append' mode rather than 'Create' mode. This permits the user to consolidate the output of several programs into a single report file.

PROJECT_DIRECTORY

The project directory key is not required. If it is specified, it is added to all non-network file names required by the program. If it is not specified, all non-network file names should fully specify the file path.

DEFAULT_FILE_FORMAT

Default format for files other than network files. Default is VERSION3. Other possible values include BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL and SQLITE3.

MAX_WARNING_MESSAGES

When the program generates a warning message, a counter is incremented and the total number of warning messages is reported and a warning return coded (2) is set at the end of the execution. By default the program prints up to 100,000 warning messages to the print-out file. If more than 100,000 warning messages are sent, the program stops printing additional messages to the file or terminates the program with an error message.

MAX_WARNING_EXIT_FLAG

If the maximum number of warning messages is exceeded, this flag directs the program in what to do. If the flag is TRUE (the default), the program is terminated with an error message about the warning messages. If the flag is FALSE, the program continues execution, but no additional warning messages are sent to the screen or written to the printout file. The warning message counter continues to count the messages and reports the total at the end of the execution.

TRAVELER_SCALING_FACTOR

Undocumented. [In other applications, scales the number of trips, so that each trip in the file represents X trips in reality.] The effect here is unclear.

NET_DIRECTORY

The network directory key is not required. If it is specified, it is added to all network table names. If it is not specified, the network table names should fully specify the file path.

NET_SHAPE_TABLE

The Net_Shape_Table key specifies the name of the TRANSIMS shape file within the network directory. Although this key is optional, it is needed if the arc traveler output shape files are to follow the shape of the network links. Otherwise, they will be straight lines between nodes.

NET_ACTIVITY_LOCATION_TABLE

The activity location table key is optional. It specifies the name of the TRANSIMS activity location file within the network directory. The full path and file name for the activity location table is constructed by appending the value of this key to the value of the NET_DIRECTORY key

ACTIVITY_FORMAT

Format for the activity file. Default is VERSION3. Other possible values include BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL and SQLITE3.

TRIP_FORMAT

Format for the trip file. Default is VERSION3. Other possible values include BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL and SQLITE3.

TRAVELER_FORMAT

Format for the traveler file. Default is VERSION3. Other possible values include BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL and SQLITE3.

LANE_WIDTH

The lane width parameter defines the space between lane lines on links and for lane connectivity at intersections. The default value is 1.0, which means that lane lines will be drawn one meter apart. Values between zero and 25.0 meters are permitted unless the draw network lanes key is true. In this case the value must be greater than 0.0.

CENTER_ONEWAY_LINKS

This key controls the way that links are drawn. If the key is “false”, one-way links are drawn relative to a centerline on the left side of the direction of travel (i.e., like the centerline of a two-way street). If the first character of the key is “0”, “N”, “n”, “F”, or “f”, the key is interpreted as “false”. Anything else is interpreted as “true”. If this key is true, the centerline is interpreted as the center of the one-way pavement. This affects how lane lines and link direction offsets are drawn. It has no effect on links drawn with a single centerline.

DRAW_NETWORK_LANES

This key controls the way that links are drawn. If the key is “false”, links are drawn as a single centerline or as two parallel shapes if the link direction offset is non-zero. If the first character of the key is “0”, “N”, “n”, “F”, or “f”, the key is interpreted as “false”. Anything else is interpreted as “true”. If this key is true, each thru traffic lane is drawn as a parallel shape and appropriate space is provided for the right and left side pocket lanes. The width between the lane lines is controlled by the lane width parameter. If the link is a one-way link, the relationship of the lane lines to the centerline is controlled by the center oneway links key.

TIME_OF_DAY_FORMAT

The time of day format defines how the activity start and end times are written to the activity file. The default format will display values in seconds. The format options include HOURS, SECONDS, 24_HOUR_CLOCK, and 12_HOUR_CLOCK

SELECT_TRAVELERS

List of selected travelers. May be specified as a range, as a set of comma-separated values, or as a set of comma-separated ranges. For example: 1006201, 1720801..1722401

SELECT_TIME_PERIODS

Defaults to All time periods. A Time Range (e.g., 0:00..6:00, 18:00..23:00) can be entered.

SELECT_SUBAREA_POLYGON

A subarea polygon, used to select certain trips.

INPUT_COORDINATE_SYSTEM

The input coordinate system determines how the Easting and Northing data fields in the Node and Activity Location files are translated into generic Latitude and Longitude values. This key is optional. It is only needed if coordinate conversions are desired and then only if the input coordinates are not in degrees of Latitude and Longitude. By default, TRANSIMS data files store coordinate data in UTM coordinates in meters.

The input coordinate command includes three parts separated by a comma. The first part is the coordinate system description. The options include UTM, STATEPLANE, and LATLONG. The second part identified the code number within the coordinate system that relates to the local conversion parameters. For UTM coordinates these codes range from 1N to 23N. Stateplane coordinates are defined using four digit FIPS codes (e.g., Oregon North = 3601). A code is not needed for the Latitude/Longitude system. The third parameter defines the coordinate units. By default, UTM is in meters, Stateplane is in feet, and Latitude/Longitude is in degrees. The user can override these assumptions using the following keywords: FEET, METERS, MILES, KILOMETERS, DEGREES, and MILLION_DEGREES.

INPUT_ADJUSTMENT_FACTORS

The input coordinate adjustment enables the user to manipulate the coordinates before they are sent to the input coordinate conversion calculation. This key is optional. It is only needed if the coordinates are not in the units expected by the conversion algorithm. By default, TRANSIMS data files store coordinate data in meters that don't require any adjustments. The adjustment command includes four floating-point numbers separated by commas. The first two numbers are the X and Y offsets. The last two numbers are X and Y adjustment factors. The process adds the offset value to the coordinate and then applies the adjustment factor. In other words:

$$X = (EASTING + X_offset) * X_factor$$

$$Y = (NORTHING + Y_offset) * Y_factor$$

OUTPUT_COORDINATE_SYSTEM

The output coordinate system determines how the internal Latitude and Longitude values are converted into X-Y coordinates in the output ArcView shape file. This key is optional. It is only needed if coordinate conversions are desired and then only if the output coordinates are not in degrees of Latitude and Longitude. If both the input coordinate system and the output coordinate system keys are NULL, no coordinate conversion takes place. The output coordinates will be the same as the input coordinates. In TRANSIMS, this means that the output ArcView shape file will be in UTM coordinates and meters.

The output coordinate command includes three parts separated by a comma. The first part is the coordinate system description. The options include UTM, STATEPLANE, and LATLONG. The second part identified the code number within the coordinate system that relates to the local conversion parameters. For UTM coordinates these codes range from 1N to 23N. Stateplane coordinates are defined using four digit FIPS codes (e.g., Oregon North = 3601). A code is not needed for the Latitude/Longitude system. The third parameter defines the coordinate units. By default, UTM is in meters, Stateplane is in feet, and Latitude/Longitude is in degrees. The user can override these assumptions using the following keywords: FEET, METERS, MILES, KILOMETERS, DEGREES, and MILLION_DEGREES.

OUTPUT_ADJUSTMENT_FACTORS

The output coordinate adjustment enables the user to manipulate the coordinates after they are returned from the output coordinate conversion calculation. This key is optional. It is only needed if the output coordinates should be in units that are different from the conversion algorithm.

The adjustment command includes four floating-point numbers separated by commas. The first two numbers are the X and Y offsets. The last two numbers are X and Y adjustment factors.

The process adds the offset value to the coordinate and then applies the adjustment factor. In other words:

```
X = (X + X_offset) * X_factor
Y = (Y + Y_offset) * Y_factor
```

OUTPUT_XYZ_SHAPES

By default, the ArcView shapefiles are generated with X and Y coordinates. If this key is specified as TRUE, the output shapefile will be constructed with X, Y, and Z coordinates. (The ArcView shapefile will also include M (measure) values and each M value will be equal to the corresponding Z value). If the TRANSIMS network does not include Z coordinates, the output Z coordinates will be zero.

OUTPUT_XYM_SHAPES

By default, the ArcView shapefiles are generated with X and Y coordinates. If this key is specified as TRUE, the output shapefile will be constructed with X, Y, and M coordinates where the M (measure) value will be equal to the Z coordinate in the TRANSIMS network. If this key is TRUE, it overrides the OUTPUT_XYZ_SHAPES key. This file structure generates a smaller shapefile than the XYZ structure.

NET_DEFAULT_FORMAT

Default format for network files. The default file format is set by DEFAULT_FILE_FORMAT. Other options include VERSION3, BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL.

NET_*_FORMAT

The file format key enables the user to specify the input format for an input network file. Replace the * with any of the network file types: node, link, activity_location, shape. The default file format is set by NET_DEFAULT_FORMAT. Other options include VERSION3, BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL.

Sample Printouts

Sample printout files generated by the ArcTraveler program are shown below. Each printout is an ASCII text file with a maximum of 95 characters per line and 65 lines per page. The file can be viewed or printed using a variety of text editors. For best results in a word processor, use a 10-point Courier font and 0.5 inch margins on all sides. In the examples, headings for reports have been reformatted to improve readability.

Example 1

```
*****
|                                     |
|      ArcTraveler - Version 4.0.2    |
| Copyright (c) 2009 by AECOM Consult |
|      Thu Jun 23 16:23:12 2011      |
|                                     |
*****

Control File = I:/TestNet/RTE/ctl/10_Visualize.Test.ArcTraveler.ctl
Report_File  = I:/TestNet/RTE/ctl/10_Visualize.Test.ArcTraveler.prn (Create)

Generate a Traveler File for 10.Test

Project Directory = ../

Default File Format = TAB_DELIMITED

Network Directory = ../network
Node File = ../network\Node.txt
Link File = ../network\Link.txt

Traveler File = ../results/10.Test.Traveler.txt

New ArcView Traveler File = ../results/Traveler.shp

Time of Day Format = 24_HOUR_CLOCK

Select Traveler IDs = 223901, 1006201, 1257401, 1352001, 1720801, 1722401

Select Time Periods = All

Number of Node File Records = 57

Number of Link File Records = 72
Number of Directional Links = 114

Number of Traveler Records Read = 1529
Number of Traveler Records Saved = 9

Thu Jun 23 16:23:12 2011 -- Process Complete (0:00:00)
```

Example 2

```

*****
|
|      ArcTraveler - Version 4.0.2
|      Copyright (c) 2009 by AECOM Consult
|      Mon Jun 27 10:42:21 2011
|
|
*****

```

```

Control File = I:/TestNet/RTE/ctl/Visualize.Test.ArcTraveler.ctl
Report_File  = I:/TestNet/RTE/ctl/Visualize.Test.ArcTraveler.prn (Create)

```

Generate a Traveler File for Test

Project Directory = ../

Default File Format = TAB_DELIMITED

```

Network Directory = ../network
Node File = ../network\Node.txt
Link File = ../network\Link.txt
Activity Location File = ../network\Activity_Location.txt

```

Trip File = ../demand/Test.Trip.txt

New ArcView Traveler File = ../results/TravelerTrip.shp

Time of Day Format = 24_HOUR_CLOCK

Select Traveler IDs = 223901, 1006201, 1257401, 1352001, 1720801, 1722401

Select Time Periods = All

Select Subarea Polygon = ../NewLayer.shp

Number of Activity Location File Records = 142

```

Number of Trip Records Read = 23725
Number of Traveler Records Saved = 1

```

Mon Jun 27 10:42:21 2011 -- Process Complete (0:00:00)