ArcPlan

Version 5.0.9

Revision History
July 2013 - Created by Volpe Center

The **ArcPlan** program is used to:

1. Create ArcView shapefiles showing the paths from selected records in TRANSIMS plan files.
2. Use the Simulator problem file to select problem plans and draw ArcView shapefiles for the problem locations.
3. Create ArcView shapefiles showing the vehicle demand on links from selected plans as a bandwidth plot.
4. Create ArcView shapefiles showing travel time contours from a given origin to all destinations.
5. Create ArcView shapefiles showing trip length contours from a given origin to all destinations.
6. Create ArcView shapefiles showing the travel time and trip distance from a given origin to all activity locations.
7. Create ArcView shapefiles summarizing the transit ridership on network link segments as polylines or ridership bandwidths.
8. Create ArcView shapefiles summarizing the transit boardings and alightings at selected transit stops.
9. Create ArcView shapefiles aggregating the transit boardings and alightings from groups of transit stops.
10. Create ArcView shapefiles summarizing the vehicle arrivals and departures at selected parking lots.

Syntax is ArcPlan [-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:

Optional Flags:
-Q[uiet] = execute without screen messages
-H[elp] = show program syntax and control keys
-C[ontrol] = create/update a default control file
-K[eyCheck] = list unrecognized control file keys
-P[ause] = pause before exiting
-N[oPause] = never pause before exiting
-D[etail] = execute with detailed status messages
-X[ML] = write an XML file with control keys

The program automatically creates a printout file based on the control_file name. If the file name includes an extension (e.g., ".ctl"), 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.

Version 5 Features

1. Version 5 requires that the individual output files be specified, rather than just an output directory

Suspected Bugs

Problem and contour file output does not appear to have been implemented yet.

Control Key List

The list of control file keys appears in the table below:

- Req / Opt indicates whether the key is **req**uired or **opt**ional
- The types include **Text**, Input **File**name, **New** file, **Bool**ean, **Path** (to a file), **Time**, **Int**eger, **Dec**imal, **List** of items
- The Default is the default value, used if the key does not appear in the control file.
- I/O/P indicates Input, Output or Parameter.

For a more detailed description of the Parameter control keys, see the Parameter Reference. For a more detailed description of the Input or Output control keys, see the File Reference.

Default Control Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
TITLE	Opt	Text		P
REPORT_FILE	Opt	File		O
REPORT_FLAG	Opt	Bool	FALSE	P
PROJECT_DIRECTORY	Opt	Path		P
DEFAULT_FILE_FORMAT	Opt	Text	TAB_DELIMITED	P
TIME_OF_DAY_FORMAT	Opt	Text	DAY_TIME	P
MODEL_START_TIME	Opt	Time	0:00	P
MODEL_END_TIME	Opt	Time	24:00:00	P
MODEL_TIME_INCREMENT	Opt	Time	15 minutes	
UNITS_OF_MEASURE	Opt	Text	METRIC	P
RANDOM_NUMBER_SEED	Opt	Int.	0	P
MAX_WARNING_MESSAGES	Opt	Int.	100000	P
MAX_WARNING_EXIT_FLAG	Opt	Bool	TRUE	P
MAX_PROBLEM_COUNT	Opt	Int.	0	P
NUMBER_OF_THREADS	Opt	Int.	1	P

System File Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
NODE_FILE	Req	File		I
NODE_FORMAT	Opt	Text	TAB_DELIMITED	P
LINK_FILE	Req	File		I
LINK_FORMAT	Opt	Text	TAB_DELIMITED	P
LOCATION_FILE	Req	File		I
LOCATION_FORMAT	Opt	Text	TAB_DELIMITED	P
PARKING_FILE	Req	File		I
PARKING_FORMAT	Opt	Text	TAB_DELIMITED	P
SHAPE_FILE	Opt	File		I
SHAPE_FORMAT	Opt	Text	TAB_DELIMITED	P
CONNECTION_FILE	Opt	File		I
CONNECTION_FORMAT	Opt	Text	TAB_DELIMITED	P
POCKET_FILE	Opt	File		I
POCKET_FORMAT	Opt	Text	TAB_DELIMITED	P
ACCESS_FILE	Opt	File		I
ACCESS_FORMAT	Opt	Text	TAB_DELIMITED	P
TRANSIT_STOP_FILE	Opt	File		I
TRANSIT_STOP_FORMAT	Opt	Text	TAB_DELIMITED	P
TRANSIT_ROUTE_FILE	Opt	File		I
TRANSIT_ROUTE_FORMAT	Opt	Text	TAB_DELIMITED	P
TRANSIT_DRIVER_FILE	Opt	File		I
TRANSIT_DRIVER_FORMAT	Opt	Text	TAB_DELIMITED	P
VEHICLE_TYPE_FILE	Opt	File		I
VEHICLE_TYPE_FORMAT	Opt	Text	TAB_DELIMITED	P
PLAN_FILE	Opt	File		I
PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P
PROBLEM_FILE	Opt	File		I
PROBLEM_FORMAT	Opt	Text	TAB_DELIMITED	P
SELECTION_FILE	Opt	File		I
SELECTION_FORMAT	Opt	Text	TAB_DELIMITED	P
LINK_DELAY_FILE	Opt	File		I
LINK_DELAY_FORMAT	Opt	Text	TAB_DELIMITED	P
PERFORMANCE_FILE	Opt	File		I
PERFORMANCE_FORMAT	Opt	Text	TAB_DELIMITED	P
NOTES_AND_NAME_FIELDS	Opt	Bool	FALSE	P
SAVE_LANE_USE_FLOWS	Opt	Bool	FALSE	P
STOP_EQUIVALENCE_FILE	Opt	File		I

Select Service Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
SELECT_HOUSEHOLDS	Opt	List	ALL	P
SELECT_MODES	Opt	List	ALL	P
SELECT_PURPOSES	Opt	List	ALL	P
SELECT_START_TIMES	Opt	List	ALL	P
SELECT_END_TIMES	Opt	List	ALL	P
SELECT_ORIGINS	Opt	List	ALL	P
SELECT_DESTINATIONS	Opt	List	ALL	P
SELECT_TRAVELER_TYPES	Opt	List	ALL	P
SELECT_FACILITY_TYPES	Opt	List	ALL	P
SELECT_PROBLEM_TYPES	Opt	List	ALL	P
SELECT_LINKS_#	Opt	List	ALL	P
SELECT_NODES_#	Opt	List	ALL	P
SELECT_ORIGIN_ZONES	Opt	List	ALL	P
SELECT_DESTINATION_ZONES	Opt	List	ALL	P
SELECT_SUBAREA_POLYGON	Opt	File		I
SELECTION_PERCENTAGE	Opt	Dec.	100.0 percent	P

Draw Service Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
DRAW_NETWORK_LANES	Opt	Bool	FALSE	P
LANE_WIDTH	Opt	Dec.	3.5 meters	P
CENTER_ONEWAY_LINKS	Opt	Bool	FALSE	P
LINK_DIRECTION_OFFSET	Opt	Dec.	0.0 meters	P
DRAW_AB_DIRECTION	Opt	Bool	FALSE	P
POCKET_SIDE_OFFSET	Opt	Dec.	2.0 meters	P
PARKING_SIDE_OFFSET	Opt	Dec.	3.0 meters	P
LOCATION_SIDE_OFFSET	Opt	Dec.	10.0 meters	P
TRANSIT_STOP_SIDE_OFFSET	Opt	Dec.	2.0 meters	P
TRANSIT_DIRECTION_OFFSET	Opt	Dec.	0.0 meters	P
BANDWIDTH_SCALING_FACTOR	Opt	Dec.	1.0 units/meter	P
MINIMUM_BANDWIDTH_VALUE	Opt	Dec.	0	P
MINIMUM_BANDWIDTH_SIZE	Opt	Dec.	1.0 meters	P
MAXIMUM_BANDWIDTH_SIZE	Opt	Dec.	1000.0 meters	P

ArcPlan Control Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
NEW_ARC_PLAN_FILE	Opt	New		O

Control File Keys:	Req/Opt	Type	Default	I/O/P
NEW_ARC_PROBLEM_FILE	Opt	New		O
NEW_ARC_BANDWIDTH_FILE	Opt	New		
NEW_ARC_TIME_CONTOUR_FILE	Opt	New		O
NEW_ARC_DISTANCE_CONTOUR_FILE	Opt	New		O
NEW_ARC_ACCESSIBILITY_FILE	Opt	New		O
NEW_ARC_RIDERSHIP_FILE	Opt	New		O
NEW_ARC_STOP_DEMAND_FILE	Opt	New		O
NEW_ARC_STOP_GROUP_FILE	Opt	New		O
NEW_ARC_PARKING_DEMAND_FILE	Opt	New		O
MAXIMUM_SHAPE_ANGLE	Opt	Dec.	0.0 meters	P
MINIMUM_SHAPE_LENGTH	Opt	Dec.	0.0 meters	P
CONTOUR_TIME_INCREMENTS	Opt	Dec.	0.0 meters	P
CONTOUR_DISTANCE_INCREMENTS	Opt	Dec.	0.0 meters	P
RIDERSHIP_SCALING_FACTOR	Opt	Dec.	0.0 meters	P
MINIMUM_RIDERSHIP_VALUE	Opt	Dec.	0.0 meters	P
MINIMUM_RIDERSHIP_SIZE	Opt	Dec.	0.0 meters	P
MAXIMUM_RIDERSHIP_SIZE	Opt	Dec.	0.0 meters	P
ARCPLAN_REPORT_#	Opt	Text		P

Coordinate Projection Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
INPUT_COORDINATE_SYSTEM	Opt	List		P
INPUT_COORDINATE_ADJUSTMENT	Opt	List		P
OUTPUT_COORDINATE_SYSTEM	Opt	List		P
OUTPUT_COORDINATE_ADJUSTMENT	Opt	List		P
OUTPUT_XYZ_SHAPES	Opt	Bool	FALSE	P
OUTPUT_XYM_SHAPES	Opt	Bool	FALSE	P

Examples

Example 1, Overview

A control file that provides an overview for a 15-minute period is as follows:

```
TITLE                                   ArcPlan Default Control Keys

#---- System File Keys ----

NODE_FILE                       network/node.txt
LINK_FILE                       network/link.txt
CONNECTION_FILE                 network/connection.txt
POCKET_FILE                     network/pocket.txt
```

```
PARKING_FILE                    network/parking.txt
LOCATION_FILE                   network/location2.txt
SELECTION_FILE                  demand/select.txt
VEHICLE_TYPE_FILE               inputs/vehicle_type.txt
SHAPE_FILE                   network/shape.txt
ACCESS_FILE                  network/access_link.txt
TRANSIT_STOP_FILE            network/transit_stop.txt
TRANSIT_ROUTE_FILE           network/transit_route.txt
TRANSIT_DRIVER_FILE          network/transit_driver.txt
PLAN_FILE                    demand/10.plans.*

#---- Select Service Keys ----

SELECT_START_TIMES              8:00..8:15
SELECTION_PERCENTAGE            100.0 percent  //---- 0.01..100.0 percent

#---- Draw Service Keys ----

BANDWIDTH_SCALING_FACTOR   10.0 units/meter //---- 0.01..100000 units/meter
MINIMUM_BANDWIDTH_VALUE    0                    //---- 0..100000
MINIMUM_BANDWIDTH_SIZE    1.0 meters           //---- 0.001..10 meters
MAXIMUM_BANDWIDTH_SIZE    1000.0 meters        //---- 1..10000 meters

#---- ArcPlan Control Keys ----

NEW_ARC_BANDWIDTH_FILE            network/arcview/bandwidth.shp
NEW_ARC_PARKING_DEMAND_FILE        network/arcview/parking_demand.shp

#---- Coordinate Projection Keys ----
```

The .prn output is as follows

```
****************************************
|                                      |
|         ArcPlan - Version 5.0.9      |
|  Copyright 2012 by TRANSIMS Open-Source  |
|         Thu Jul 18 11:22:13 2013     |
|                                      |
****************************************

Control File = ArcPlanOverview.ctl
Report File  = ArcPlanOverview.prn (Create)

ArcPlan Default Control Keys

Project Directory = ../
Default File Format = TAB_DELIMITED
Time of Day Format = HOUR_CLOCK
Model Start Time = 6:00
Model End Time = 10:00
Units of Measure = ENGLISH
Random Number Seed = 1374160933
Number of Threads = 2
Warning: ArcPlan is Not Thread Enabled

Input System Network Files:
```

```
Node File = ../network/node.txt
Shape File = ../network/shape.txt
Link File = ../network/link.txt
Pocket File = ../network/pocket.txt
Connection File = ../network/connection.txt
Parking File = ../network/parking.txt
Location File = ../network/location2.txt
Access File = ../network/access_link.txt
Transit Stop File = ../network/transit_stop.txt
Transit Route File = ../network/transit_route.txt
Transit Driver File = ../network/transit_driver.txt

Input System Demand Files:
Selection File = ../demand/select.txt
Vehicle Type File = ../inputs/vehicle_type.txt
Plan File = ../demand/10.plans.* (2 partitions)

Notes And Name Fields = TRUE

Data Service Controls:

Select Service Controls:
Select Start Times = 8:00..8:15
Selection Percentage = 100.00 percent

New Arc Bandwidth File = ../network/arcview/bandwidth.shp
New Arc Parking Demand File = ../network/arcview/parking_demand.shp

Draw Service Controls:
Bandwidth Scaling Factor = 3.05 impedance/foot
Minimum Bandwidth Value = 0
Minimum Bandwidth Size = 3.28 feet
Maximum Bandwidth Size = 3280.83 feet
Number of Node File Records = 57

Number of Shape File Records = 153
Number of Link Shape Records = 15
Number of Link File Records = 72
Number of Directional Links = 114
Number of Pocket File Records = 32
Number of Vehicle Type File Records = 14
Number of Parking File Records = 196
Number of Location File Records = 196

Number of Transit Stop File Records = 154
Number of Access File Records = 1
Number of Transit Route File Records = 174
Number of Route Data Records = 6
Number of Transit Driver File Records = 54
Number of Selection File Records = 26780
Number of Plan File Partitions = 2
Number of Plan File Records    = 309992
Number of Plan File Households = 28048
Number of Plan File Persons    = 28048
Number of Plan File Tours      = 28048
```

```
Number of Plan File Trips      = 28048

Number of Arc Bandwidth Shape Records = 114
Number of Arc Parking Demand Shape Records = 196

Thu Jul 18 11:22:15 2013 -- Process Complete with 1 Warning (0:00:02)
```

Figure 1 illustrates the output. The bandwidth shape file contains volume by direction for each link. The directional volume is then represented by a line along the link (actually, a polygon) whose thickness depends on the volume. There is 1 meter of thickness for each 10 vehicles, as was specified in the BANDWIDTH_SCALING_FACTOR. The parking demand file contains arrivals and departures for each parking lot. It is a point file with one point for each parking lot. The GIS was then used to create pie charts showing the relative magnitude of the arrivals and departures.

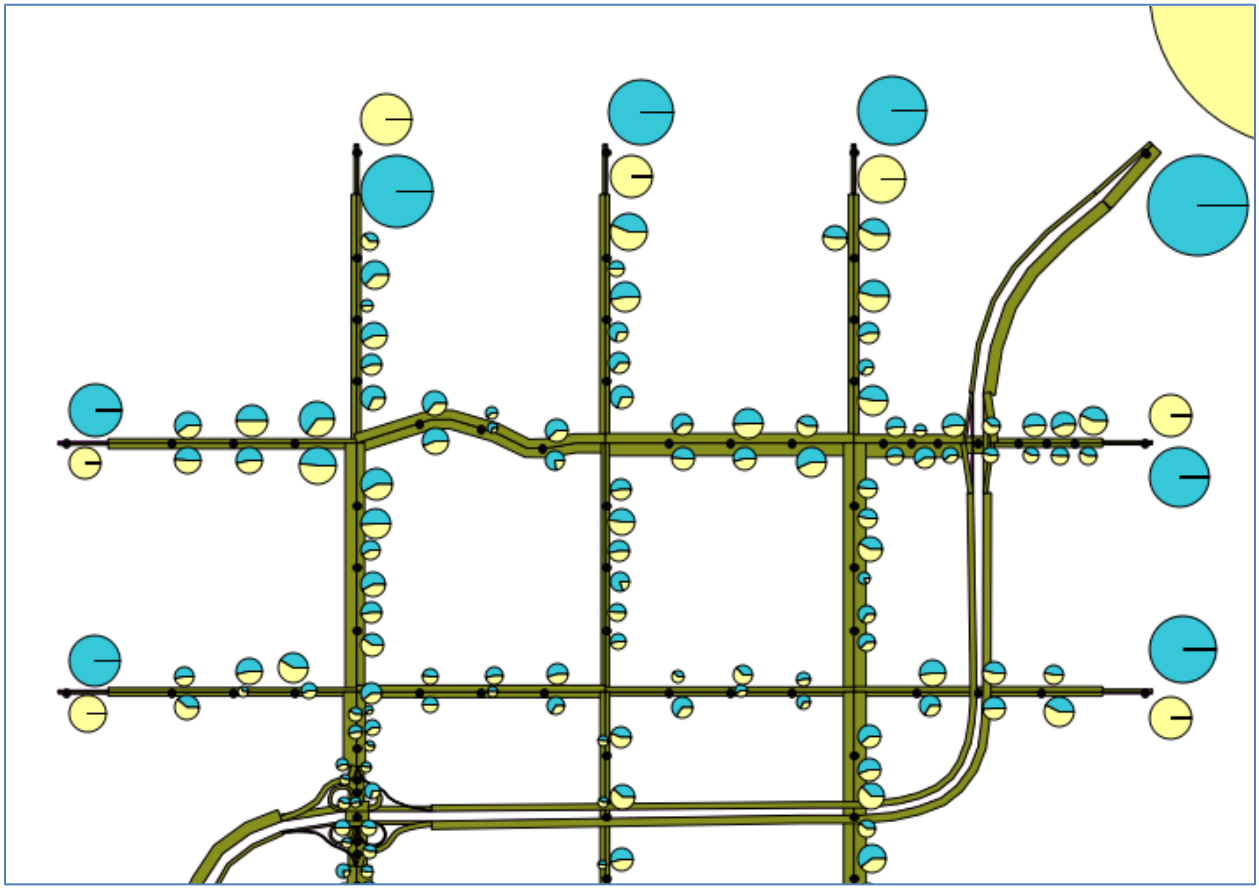

Figure 1 ArcPlan Overview Output

Example 2, Flow from One Location

```
TITLE                                    ArcPlan Default Control Keys

#---- System File Keys ----

NODE_FILE                      network/node.txt
LINK_FILE                      network/link.txt
CONNECTION_FILE                network/connection.txt
POCKET_FILE                    network/pocket.txt
PARKING_FILE                   network/parking.txt
LOCATION_FILE                  network/location2.txt
SELECTION_FILE                 demand/select.txt
VEHICLE_TYPE_FILE              inputs/vehicle_type.txt
SHAPE_FILE                     network/shape.txt
ACCESS_FILE                    network/access_link.txt
TRANSIT_STOP_FILE              network/transit_stop.txt
TRANSIT_ROUTE_FILE             network/transit_route.txt
TRANSIT_DRIVER_FILE            network/transit_driver.txt
PLAN_FILE                      demand/10.plans.*

#---- Select Service Keys ----


SELECT_START_TIMES    8:00..8:15
SELECT_ORIGINS        27   //Activity location at northeast corner
#SELECT_DESTINATIONS  53..58,80 //Commented out, so using ALL destinations
SELECTION_PERCENTAGE  100.0 percent

#---- Draw Service Keys ----

BANDWIDTH_SCALING_FACTOR   1.0 units/meter
MINIMUM_BANDWIDTH_VALUE                 0
MINIMUM_BANDWIDTH_SIZE                  1.0 meters
MAXIMUM_BANDWIDTH_SIZE                  1000.0 meters

#---- ArcPlan Control Keys ----

NEW_ARC_PLAN_FILE                 network/arcview/plan2799.shp
NEW_ARC_BANDWIDTH_FILE            network/arcview/bandwidth2799.shp
NEW_ARC_ACCESSIBILITY_FILE       network/arcview/accessibility2799.shp

#---- Coordinate Projection Keys ----
```

The output .prn file is as follows

```
*****************************************
|                                       |
|         ArcPlan - Version 5.0.9       |
|  Copyright 2012 by TRANSIMS Open-Source  |
|         Thu Jul 18 11:53:46 2013      |
|                                       |
*****************************************
```

```
Control File = ArcPlanDetail.ctl
Report File  = ArcPlanDetail.prn (Create)

ArcPlan Default Control Keys

Project Directory = ../
Default File Format = TAB_DELIMITED
Time of Day Format = HOUR_CLOCK
Model Start Time = 6:00
Model End Time = 10:00
Units of Measure = ENGLISH
Random Number Seed = 1374162826
Number of Threads = 2
Warning: ArcPlan is Not Thread Enabled

Input System Network Files:
Node File = ../network/node.txt
Shape File = ../network/shape.txt
Link File = ../network/link.txt
Pocket File = ../network/pocket.txt
Connection File = ../network/connection.txt
Parking File = ../network/parking.txt
Location File = ../network/location2.txt
Access File = ../network/access_link.txt
Transit Stop File = ../network/transit_stop.txt
Transit Route File = ../network/transit_route.txt
Transit Driver File = ../network/transit_driver.txt

Input System Demand Files:
Selection File = ../demand/select.txt
Vehicle Type File = ../inputs/vehicle_type.txt
Plan File = ../demand/10.plans.* (2 partitions)

Notes And Name Fields = TRUE

Data Service Controls:

Select Service Controls:
Select Start Times = 8:00..8:15
Select Origins = 27
Selection Percentage = 100.00 percent

New Arc Plan File = ../network/arcview/plan2799.shp
New Arc Bandwidth File = ../network/arcview/bandwidth2799.shp
New Arc Accessibility File = ../network/arcview/accessibility2799.shp

Draw Service Controls:
Bandwidth Scaling Factor = 0.30 impedance/foot
Minimum Bandwidth Value = 0
Minimum Bandwidth Size = 3.28 feet
Maximum Bandwidth Size = 3280.83 feet
```

```
Number of Node File Records = 57

Number of Shape File Records = 153
Number of Link Shape Records = 15
Number of Link File Records = 72
Number of Directional Links = 114
Number of Pocket File Records = 32
Number of Vehicle Type File Records = 14
Number of Parking File Records = 196
Number of Location File Records = 196
Number of Transit Stop File Records = 154
Number of Access File Records = 1
Number of Transit Route File Records = 174
Number of Route Data Records = 6
Number of Transit Driver File Records = 54
Number of Selection File Records = 26780

Number of Plan File Partitions = 2
Number of Plan File Records    = 309992
Number of Plan File Households = 28048
Number of Plan File Persons    = 28048
Number of Plan File Tours      = 28048
Number of Plan File Trips      = 28048

Number of Arc Plan Shape Records = 456
Number of Arc Bandwidth Shape Records = 55
Number of Arc Accessibility Shape Records = 152

Thu Jul 18 11:53:48 2013 -- Process Complete with 1 Warning (0:00:02)
```

Figure 2 illustrates the three shape files in this example. Similar to Figure 1, the bandwidth represents the flow along each link (green lines along the links). The BANDWIDTH_SCALING_FACTOR specifies 1 meter of thickness for every 1 vehicle, so the line is thicker than what was seen in Figure 1. The red lines indicate the plans. The GIS permits you to click on a red line, and display the plans using that link. The blue diamonds are the accessibility records. These are point records that show the distance and travel time from one origin to each activity location. Here they are labeled with the number of miles from the origin (integer only, so that 1 – 2 miles shows as a 1).

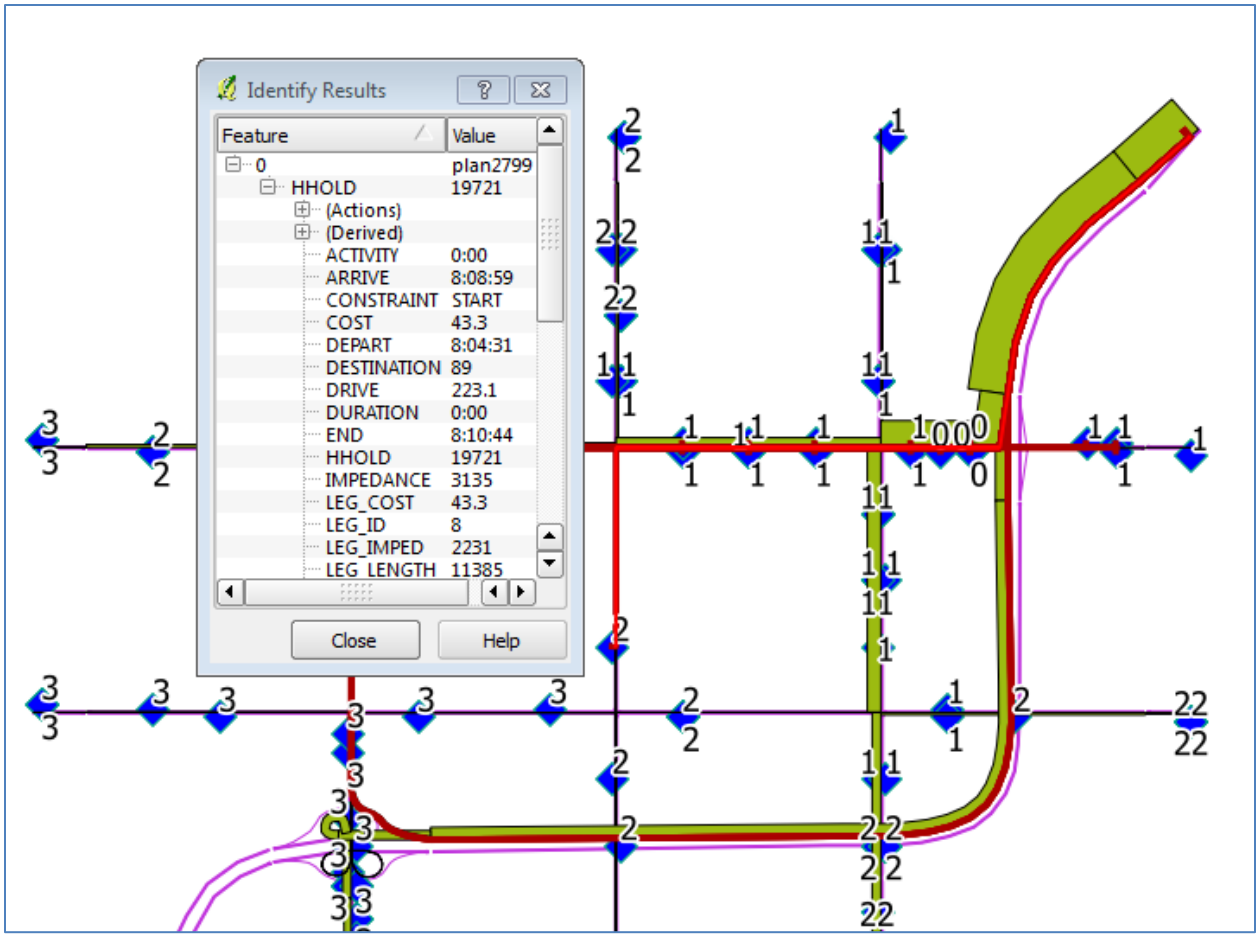

Figure 2 ArcPlan Flow from One Location Output