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 |
| 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 |

| |

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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.

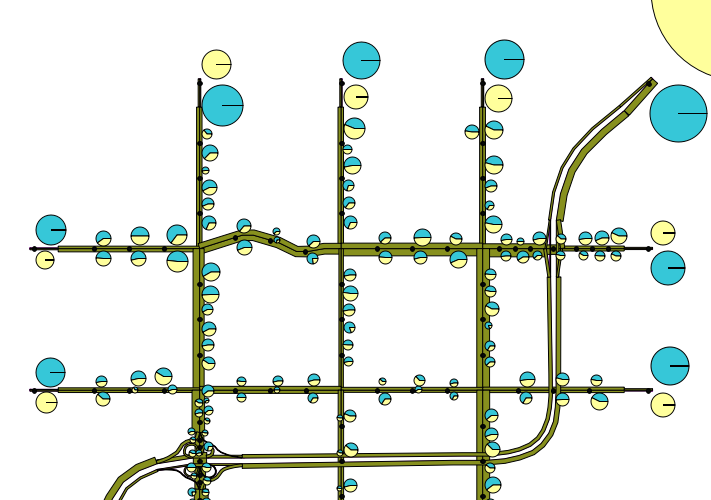


Figure 1 ArcPlan Overview Output

## 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 |

| |

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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 . 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).

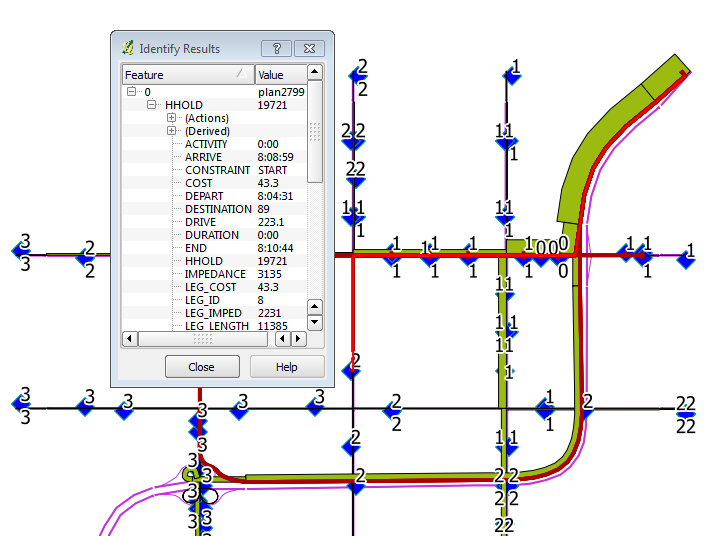


Figure 2 ArcPlan Flow from One Location Output