

ArcNet

Version 5.0.7

Revision History

July 2011, June 2013 - Created by Volpe Center

The **ArcNet** program is used to:

1. Create ArcView shapefiles from TRANSIMS nodes, links, shape, lane-use, locations, parking, process links, pocket lanes, connections, turn prohibition, unsignalized nodes, signalized nodes, detector, transit routes, transit stop, transit driver, route header, and route nodes files.
2. Draw links and link-related attributes using individual lanes.
3. Draw transit routes using a different offset for each route.
4. Draw the network attributes associates with a specific time period.

Syntax is ArcNet [-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
2. At intersections, ArcNet now produces curved connections, making the output lane connectivity shapefile more readable.
3. The nested fields were dropped from the Route Nodes shape file.

Control Key List

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

- Req / Opt indicates whether the key is **required** or **optional**
- The types include **Text**, Input **Filename**, **New** file, **Boolean**, **Path** (to a file), **Time**, **Integer**, **Decimal**, **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	Opt	File		I
NODE_FORMAT	Opt	Text	TAB_DELIMITED	P
ZONE_FILE	Opt	File		I
ZONE_FORMAT	Opt	Text	TAB_DELIMITED	P
SHAPE_FILE	Opt	File		I
SHAPE_FORMAT	Opt	Text	TAB_DELIMITED	P
LINK_FILE	Opt	File		I
LINK_FORMAT	Opt	Text	TAB_DELIMITED	P

Control File Keys:	Req/Opt	Type	Default	I/O/P
POCKET_FILE	Opt	File		I
POCKET_FORMAT	Opt	Text	TAB_DELIMITED	P
LANE_USE_FILE	Opt	File		I
LANE_USE_FORMAT	Opt	Text	TAB_DELIMITED	P
LOCATION_FILE	Opt	File		I
LOCATION_FORMAT	Opt	Text	TAB_DELIMITED	P
PARKING_FILE	Opt	File		I
PARKING_FORMAT	Opt	Text	TAB_DELIMITED	P
ACCESS_FILE	Opt	File		I
ACCESS_FORMAT	Opt	Text	TAB_DELIMITED	P
CONNECTION_FILE	Opt	File		I
CONNECTION_FORMAT	Opt	Text	TAB_DELIMITED	P
TURN_PENALTY_FILE	Opt	File		I
TURN_PENALTY_FORMAT	Opt	Text	TAB_DELIMITED	P
SIGN_FILE	Opt	File		I
SIGN_FORMAT	Opt	Text	TAB_DELIMITED	P
SIGNAL_FILE	Opt	File		I
SIGNAL_FORMAT	Opt	Text	TAB_DELIMITED	P
TIMING_PLAN_FILE	Opt	File		I
TIMING_PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P
PHASING_PLAN_FILE	Opt	File		I
PHASING_PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P
DETECTOR_FILE	Opt	File		I
DETECTOR_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_SCHEDULE_FILE	Opt	File		I
TRANSIT_SCHEDULE_FORMAT	Opt	Text	TAB_DELIMITED	P
TRANSIT_DRIVER_FILE	Opt	File		I
TRANSIT_DRIVER_FORMAT	Opt	Text	TAB_DELIMITED	P
ROUTE_NODES_FILE	Opt	File		I
ROUTE_NODES_FORMAT	Opt	Text	TAB_DELIMITED	P
VEHICLE_TYPE_FILE	Opt	File		I
VEHICLE_TYPE_FORMAT	Opt	Text	TAB_DELIMITED	P
NOTES_AND_NAME_FIELDS	Opt	Bool	FALSE	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
SIGN_SIDE_OFFSET	Opt	Dec.	2.0 meters	P
SIGN_SETBACK	Opt	Dec.	2.0 meters	P
TRANSIT_STOP_SIDE_OFFSET	Opt	Dec.	2.0 meters	P
TRANSIT_DIRECTION_OFFSET	Opt	Dec.	0.0 meters	P
TRANSIT_OVERLAP_FLAG	Opt	Bool	TRUE	P
DRAW_ONEWAY_ARROWS	Opt	Bool	FALSE	P
ONEWAY_ARROW_LENGTH	Opt	Dec.	7.0 meters	P
ONEWAY_ARROW_SIDE_OFFSET	Opt	Dec.	1.75 meters	P
CURVED_CONNECTION_FLAG	Opt	Bool	FALSE	P

ArcNet Control Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
SUBZONE_DATA_FILE	Opt	File		I
NEW_ARC_NODE_FILE	Opt	New		O
NEW_ARC_ZONE_FILE	Opt	New		O
NEW_ARC_LINK_FILE	Opt	New		O
NEW_ARC_CENTERLINE_FILE	Opt	New		O
NEW_ARC_POCKET_FILE	Opt	New		O
NEW_ARC_LANE_USE_FILE	Opt	New		O
NEW_ARC_LOCATION_FILE	Opt	New		O
NEW_ARC_PARKING_FILE	Opt	New		O
NEW_ARC_ACCESS_FILE	Opt	New		O
NEW_ARC_CONNECTION_FILE	Opt	New		O
NEW_ARC_TURN_PENALTY_FILE	Opt	New		O
NEW_ARC_SIGN_FILE	Opt	New		O
NEW_ARC_SIGNAL_FILE	Opt	New		O
NEW_ARC_TIMING_PLAN_FILE	Opt	New		O
NEW_ARC_PHASING_PLAN_FILE	Opt	New		O
NEW_ARC_DETECTOR_FILE	Opt	New		O
NEW_ARC_TRANSIT_STOP_FILE	Opt	New		O

Control File Keys:	Req/Opt	Type	Default	I/O/P
NEW_ARC_TRANSIT_ROUTE_FILE	Opt	New		O
NEW_ARC_TRANSIT_DRIVER_FILE	Opt	New		O
NEW_ARC_ROUTE_NODES_FILE	Opt	New		O
NEW_ARC_SUBZONE_DATA_FILE	Opt	New		O
SELECT_TIME	Opt	Time	0:00	P
TRANSIT_TIME_PERIODS	Opt	Text	0:00	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

Example

A fairly typical control file, without transit, is as follows:

```

TITLE                                ArcNet Network City Street

PROJECT_DIRECTORY =                  ./
DEFAULT_FILE_FORMAT =                TAB_DELIMITED
TIME_OF_DAY_FORMAT =                HOUR_CLOCK
MODEL_START_TIME  =                  0:00
MODEL_END_TIME    =                  27:00
UNITS_OF_MEASURE  =                  METRIC
RANDOM_NUMBER_SEED =                  1345571629
NUMBER_OF_THREADS =                  1

#ARCVIEW_DIRECTORY                  ../network/arcview //No longer used

NODE_FILE                      ../network/Node.txt
ZONE_FILE                      ../network/Zone.txt
SHAPE_FILE                    ../network/Shape.txt
LINK_FILE                     ../network/Link.txt
CONNECTION_FILE               ../network/Connection.txt
PARKING_FILE                  ../network/Parking.txt
LOCATION_FILE                   ../network/Location.txt
POCKET_FILE                   ../network/Pocket.txt
#LANE_USE_FILE                 ../network/Lane_Use.txt
SIGNAL_FILE                   ../network/Signal.txt
TIMING_PLAN_FILE              ../network/Timing_Plan.txt

```

PHASING_PLAN_FILE	../network/Phasing_Plan.txt
DETECTOR_FILE	../network/Detector.txt
SIGN_FILE	../network/Sign.txt
NEW_ARC_NODE_FILE	../network/arcview/node.shp
NEW_ARC_ZONE_FILE	../network/arcview/zone.shp
NEW_ARC_LINK_FILE	../network/arcview/link.shp
NEW_ARC_POCKET_FILE	../network/arcview/pocket.shp
NEW_ARC_CONNECTION_FILE	../network/arcview/connection.shp
NEW_ARC_PARKING_FILE	../network/arcview/parking.shp
NEW_ARC_LOCATION_FILE	../network/arcview/location.shp
NEW_ARC_SIGN_FILE	../network/arcview/sign.shp
NEW_ARC_SIGNAL_FILE	../network/arcview/signal.shp
NEW_ARC_TIMING_PLAN_FILE	../network/arcview/timing_plan.shp
NEW_ARC_PHASING_PLAN_FILE	../network/arcview/phasing_plan.shp
NEW_ARC_DETECTOR_FILE	../network/arcview/detector.shp
DRAW_NETWORK_LANES	TRUE
LANE_WIDTH	12 feet
CENTER_ONEWAY_LINKS	FALSE
LINK_DIRECTION_OFFSET	6 feet
DRAW_AB_DIRECTION	FALSE
POCKET_SIDE_OFFSET	6 feet
PARKING_SIDE_OFFSET	60 feet
LOCATION_SIDE_OFFSET	100 feet
SIGN_SIDE_OFFSET	6 feet
SIGN_SETBACK	6 feet
DRAW_ONEWAY_ARROWS	TRUE
ONEWAY_ARROW_LENGTH	20 feet
ONEWAY_ARROW_SIDE_OFFSET	6 feet
CURVED_CONNECTION_FLAG	TRUE
INPUT_COORDINATE_SYSTEM	UTM, 19N, METERS
INPUT_COORDINATE_ADJUSTMENT	0.0,0.0,1.0,1.0
OUTPUT_COORDINATE_SYSTEM	UTM, 19N, METERS
OUTPUT_COORDINATE_ADJUSTMENT	0.0, 0.0, 1.0, 1.0

The resulting .prn file is as follows. The warning message arises because the pocket lane on link 26 is longer than the link itself.

```

*****
|                                     |
|           ArcNet - Version 5.0.7   |
|   Copyright 2012 by TRANSIMS Open-Source   |
|           Tue Jun 25 13:07:53 2013   |
|                                     |
*****

```

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

ArcNet Network City Streets

Project Directory = ./
Default File Format = TAB_DELIMITED
Time of Day Format = HOUR_CLOCK
Model Start Time = 0:00
Model End Time = 27:00
Units of Measure = METRIC
Random Number Seed = 134557162
Number of Threads = 1

Input System Network Files:

Node File = ../../network/Node.txt
Zone File = ../../network/Zone.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/Location.txt
Sign File = ../../network/Sign.txt
Signal File = ../../network/Signal.txt
Phasing Plan File = ../../network/Phasing_Plan.txt
Timing Plan File = ../../network/Timing_Plan.txt
Detector File = ../../network/Detector.txt

Notes And Name Fields = TRUE

Data Service Controls:

Input Coordinate System = UTM, 19N, METERS
Input Coordinate Adjustment = 0.0,0.0,1.0,1.0
Output Coordinate System = UTM, 19N, METERS
Output Coordinate Adjustment = 0.0, 0.0, 1.0, 1.0

ArcNet Output Files:

New Arc Node File = ../../network/arcview/node.shp
New Arc Zone File = ../../network/arcview/zone.shp
New Arc Link File = ../../network/arcview/link.shp
New Arc Pocket File = ../../network/arcview/pocket.shp
New Arc Location File = ../../network/arcview/location.shp
New Arc Parking File = ../../network/arcview/parking.shp
New Arc Connection File = ../../network/arcview/connection.shp
New Arc Sign File = ../../network/arcview/sign.shp
New Arc Signal File = ../../network/arcview/signal.shp
New Arc Timing Plan File = ../../network/arcview/timing_plan.shp

```
New Arc Phasing Plan File = ../../network/arcview/phasing_plan.shp
New Arc Detector File = ../../network/arcview/detector.shp
```

ArcNet Control Keys:

Draw Service Controls:

```
Draw Network Lanes = TRUE
Lane Width = 3.66 meters
Center Oneway Links = FALSE
Location Side Offset = 30.48 meters
Parking Side Offset = 18.29 meters
Sign Side Offset = 1.83 meters
Sign Setback = 1.83 meters
```

```
Draw Oneway Arrows = TRUE
Oneway Arrow Length = 6.10 meters
Oneway Arrow Side Offset = 1.83 meters
```

Curved Connection Flag = TRUE

```
Number of Node File Records = 25
Number of Zone File Records = 7
Number of Shape File Records = 61
Number of Link Shape Records = 15
Number of Link File Records = 26
Number of Directional Links = 41
Warning: Link 26 Pocket Length 109.1 is Too Long
```

```
Number of Pocket File Records = 5
Number of Connection File Records = 51
Number of Parking File Records = 80
Number of Location File Records = 80
Number of Sign File Records = 1
Number of Signal File Records = 12
Number of Detector File Records = 13
Number of Timing Plan File Records = 39
Number of Phasing Plan File Records = 150
```

Tue Jun 25 13:07:54 2013 -- Process Complete with 1 Warning (0:00:01)

Using ArcNet for Visualization

ArcNet outputs are used by a Geographic Information System for network visualization, and are an essential tool for debugging a TRANSIMS network. The next few figures show some examples.

Figure 1, whose extent from left edge to right edge is about 1 mile, depicts a few city streets. The long brown lines are the links; the purple dots are the nodes, and the shorter blue lines are the pocket lanes. Signals and signs are also shown.

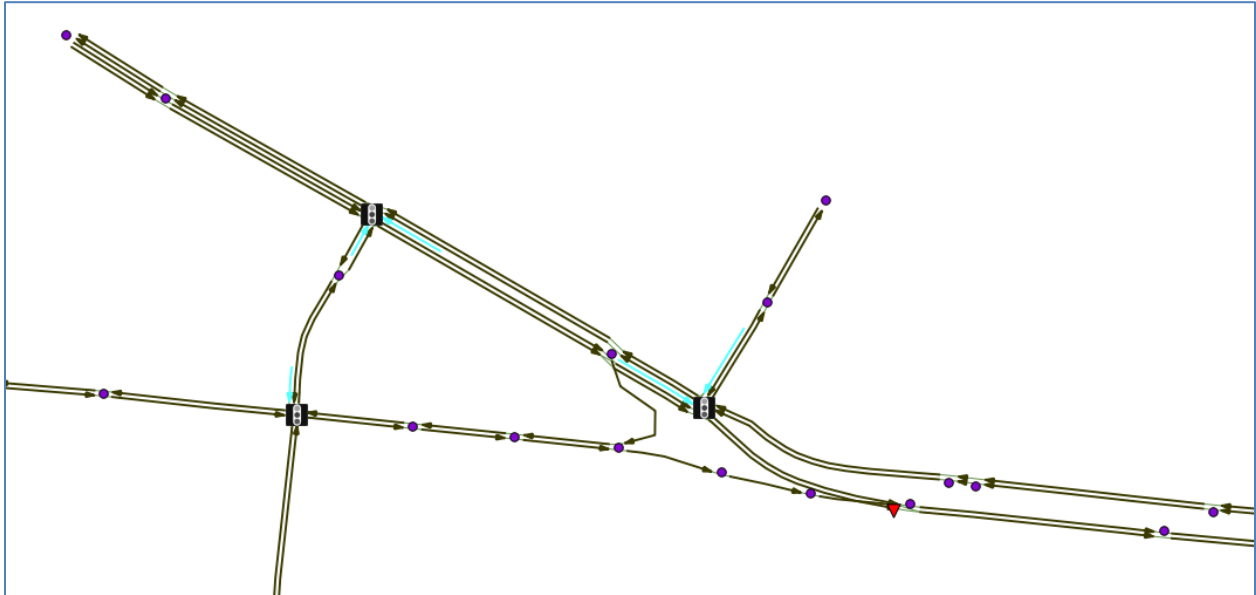


Figure 1 ArcNet Links, Nodes, Pockets, Connections, Signals and Signs

Figure 2 shows a close-up of one intersection.

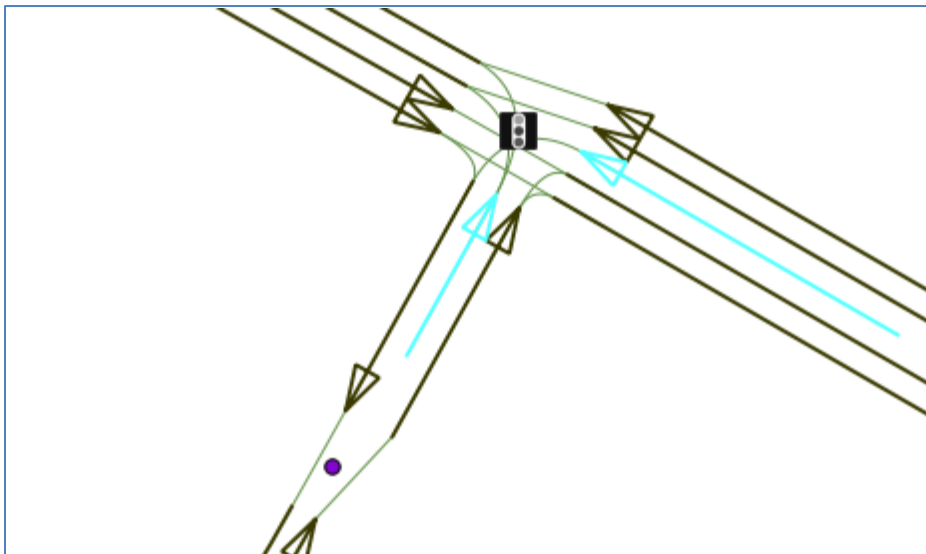


Figure 2 Close-up of one intersection

In it, the connections are seen as thin lines that connect the links and pocket lanes from one side of an intersection to another. Examination of individual intersections can reveal issues with multiple turn lanes, and the like.

Figure 3 adds the activity locations (green diamonds) and parking locations. It uses the default 3 locations on each side of each link, which may not correspond to reality.

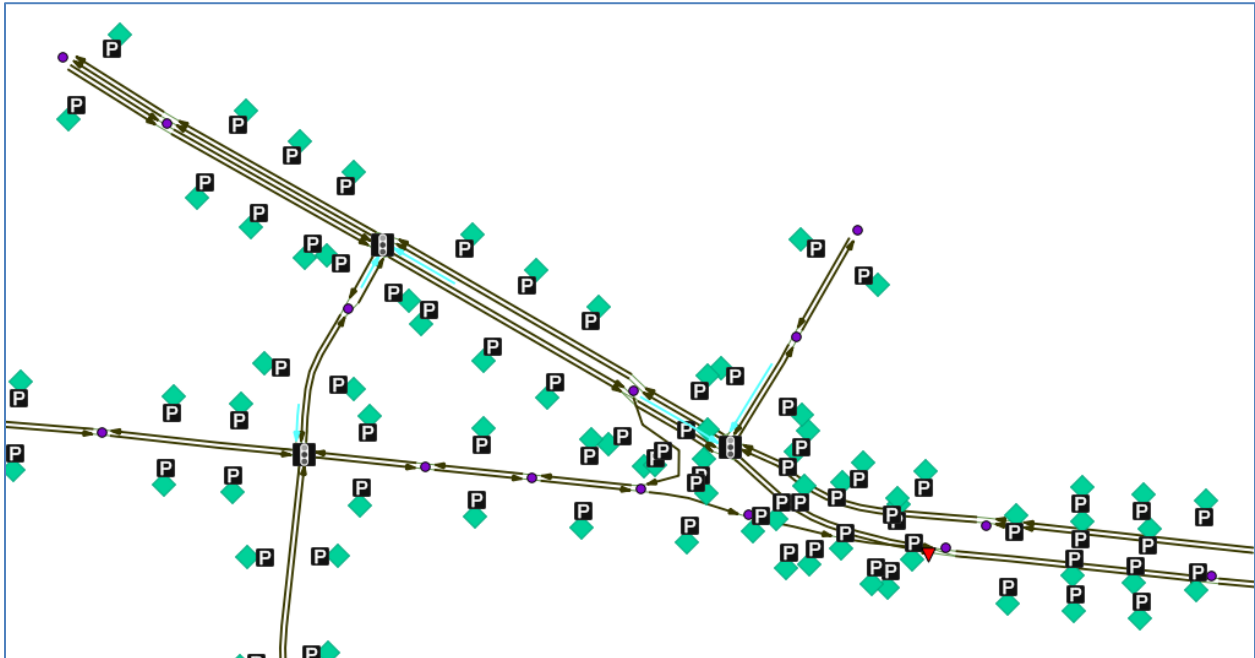


Figure 3 ArcNet Locations and Parking

Figure 4 and Figure 5 show the network along with an aerial overlay.

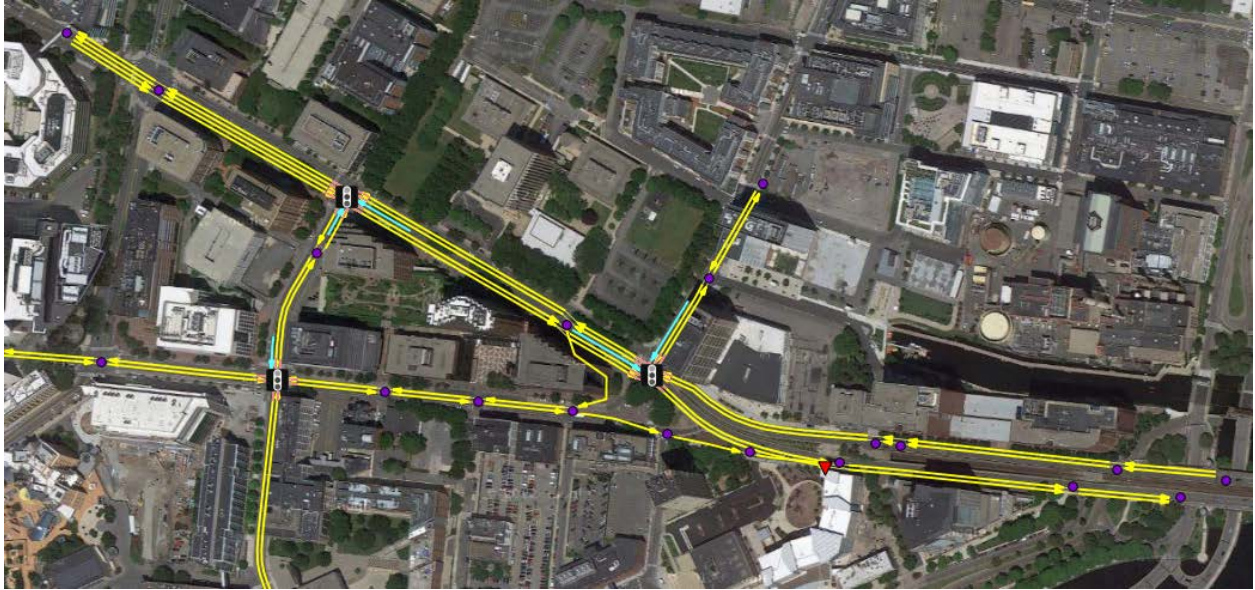


Figure 4 Network overview with aerial imagery

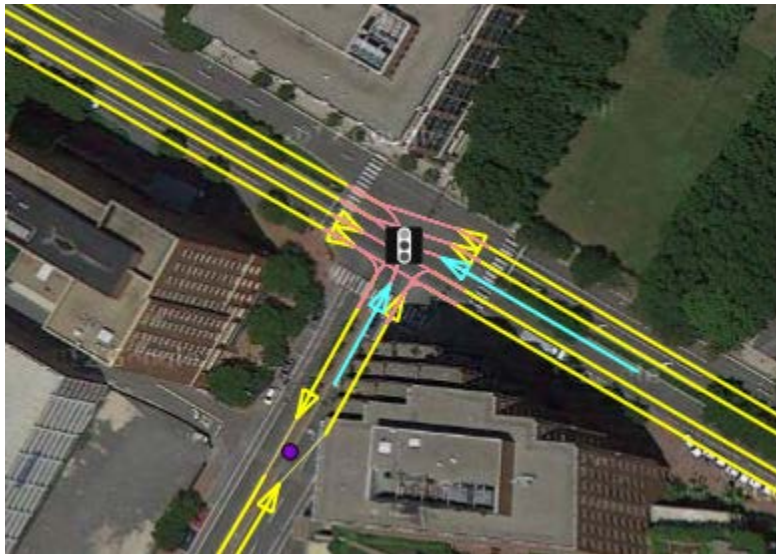


Figure 5 Network closeup with aerial imagery