ArcPlan *(version 4.0)*

The ArcPlan program is used to:

1. Create ArcView shapefiles showing the paths from selected records in TRANSIMS plan files.
2. Use the Microsimulator 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.

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

ArcPlan [-flag] [control_file] [partition]

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 partition parameter is optional. It is used to specify the partition number for a particular execution. Partitions are used in the TRANSIMS process for parallel execution on multiple

CPUs. If a partition number is provided, the program will process plans in the specified plan file. A partition number of "0" corresponds to partition files "tAA", "1" equals "tAB", etc.

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.

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. The default value for each key is 0 or "Null". Null parameters do not need to be included in the file. Note that comment lines or extraneous keys can be included in the file. They will be ignored by the program.

A typical ArcNet control file is shown below:

```
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
NET_PARKING_TABLE               Parking.txt
NET_TRANSIT_STOP_TABLE          Transit_Stop.txt
NET_TRANSIT_ROUTE_TABLE         Transit_Route.txt
NET_TRANSIT_DRIVER_TABLE        Transit_Driver.txt

PLAN_FILE                       demand/Plan.txt
PLAN_FORMAT                     VERSION3
NODE_LIST_PATHS                 YES
ARCVIEW_PLAN_FILE               network/arcview/ArcPlan.shp

SELECT_TRAVELERS                767301, 682001
SELECT_LINKS_1                  5, 6
SELECT_TIME_PERIODS             6:00..7:00

LINK_DIRECTION_OFFSET           6.0
ACTIVITY_LOCATION_SIDE_OFFSET   30.0
PARKING_SIDE_OFFSET             15.0
TRANSIT_STOP_SIDE_OFFSET        8.0
TRANSIT_DIRECTION_OFFSET        4.0

INPUT_COORDINATE_SYSTEM         UTM, 10N, METERS
INPUT_COORDINATE_ADJUSTMENT     0.0, 0.0, 1.0, 1.0
OUTPUT_COORDINATE_SYSTEM        STATEPLANE, 3601, FEET
OUTPUT_COORDINATE_ADJUSTMENT    0.0, 0.0, 1.0, 1.0
```

This example generates the ArcView files for plans for selected travelers, traveling through select links at select times. These keys can be defined in a variety of different ways to perform different tasks.

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 signal report file.

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 based on the MAX_WARNING_EXIT_FLAG. This parameter enables the user to modify the default warning limit.

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.

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.

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_NODE_TABLE

The node table key 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.

NET_SHAPE_TABLE

The shape table key is optional. If specifies the name of the TRANSIMS shape file within the network directory. The full path and file name for the shape table is constructed by appending the value of this key to the value of the NET_DIRECTORY key. If the shape table is provided, all links and link related offsets are drawn based on the shape of the link.

NET_ACTIVITY_LOCATION_TABLE

The activity location table key is required. 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.

NET_PARKING_TABLE

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

NET_TRANSIT_STOP_TABLE

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

NET_TRANSIT_ROUTE_TABLE

The transit route table key is optional. It specifies the name of the TRANSIMS transit route file within the network directory. The full path and file name for the transit route table is constructed by appending the value of this key to the value of the NET_DIRECTORY key. If the key is provided, a NET_TRANSIT_STOP_TABLE is required.

NET_TRANSIT_DRIVER_TABLE

The transit driver table key is optional. It specifies the name of the TRANSIMS transit driver file within the network directory. The full path and file name for the transit driver table is constructed by appending the value of this key to the value of the NET_DIRECTORY key. If a NET_TRANSIT_ROUTE_TABLE is provided, this information will be used to draw the routes with link shapes.

PLAN_FILE

The plan file key is appended to the PROJECT_DIRECTORY key to specify the file name for the input plan files. If the command line includes a partition parameter, the program will add ".t*" to this key. If the partition number is "0", the "tAA" extension is added. If the partition

number is "1", the "tAB" extension is added, etc. If the command line does not include a partition parameter and this key ends with ".t*" or ".*", all of the plan files in the file group are processed sequentially. If the plan files have a companion *.def file, the PLAN_FORMAT and NODE_LIST_PATHS keys are not required.

PLAN_FORMAT

The plan format key is optional. If provided, it defines the file format of the plan file. The default plan file is in VERSION3 (unformatted text) format. This parameter enables the user to specify that the plan file is in BINARY format.

NODE_LIST_PATHS

The node list paths key is optional and when provided specifies the way the path is identified in the input plan file. The key is "true" by default. This means that the input plans will include a list of the node ID numbers along the travel path. If the key is "false", the program interprets the path as a list of link ID numbers. If the first character of the key is "0", "N", "n", "F", or "f", the key is interpreted as "false".

HOUSEHOLD_LIST

The household list file is optional. If the key is not provided, plans will be processed for all households in the plan file. If it is provided, the key is appended to the value of the PROJECT_DIRECTORY key to identify the full path to one or more household list files. A household list file is a simple list of the household ID numbers. A sample household list is shown below.

```
3
20
32
49
100
120
```

The household list key can be the path to a specific file or the root path to a group of partitioned files. If the command line includes a partition parameter, the program will add ".t*" to the household list key. If the partition number is "0", the household list will include the "tAA" extension. If the partition number is "1", the "tAB" extension is used….

ARCVIEW_PLAN_FILE

The ArcView plan 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 ArcView or ArcMap to read and display the path.

PROBLEM_FILE

The problem file key optional. If provided, the key value is appended to the PROJECT_DIRECTORY key to specify the file name for the input Microsimulator problem file.

The problem file can be used to select plans from the plan file or to show the locations where the Microsimulator had problems processing plans.

PROBLEM_FORMAT

The problem format key is optional. If provided, it defines the file format of the problem file. The default plan file is in VERSION3 (tab delimited text) format. The options include VERSION3, BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, LANL, and SQLITE3.

ARCVIEW_PROBLEM_FILE

The ArcView problem file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_BANDWIDTH_FILE

The ArcView bandwidth file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_TIME_CONTOUR

The ArcView time contour file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_DISTANCE_CONTOUR

The ArcView distance contour file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_ACCESSIBILITY_FILE

The ArcView accessibility file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_RIDERSHIP_FILE

The ArcView transit ridership file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_STOP_DEMAND_FILE

The ArcView transit stop demand file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_STOP_GROUP_FILE

The ArcView transit stop group file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

ARCVIEW_PARKING_DEMAND_FILE

The ArcView auto parking demand file key is optional. If provided, the key value 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 ArcView or ArcMap to read and display the path.

TIME_OF_DAY_FORMAT

The default time of day format will display the time and duration values in the ArcView plan file is 24 hour clock format. This parameter can set the time format to HOURS, SECONDS, 24_HOUR_CLOCK, or 12_HOUR_CLOCK.

SELECT_TRAVELERS

The select travelers parameter enables the user to provide a list of traveler IDs for processing. This parameter is optional. If it is not provided, all travelers will be considered by the selection process. The traveler IDs are interpreted as a comma-delimited list of numbers or number

ranges. A sequential range of traveler IDs are specified by providing the first ID in the range and the last ID in the range separated by two periods (e.g., 1000..2000).

SELECT_NODES_#

The select nodes parameters enable the user to provide a list of node numbers the plan must include before it is processed. This parameter is optional. If it is not provided, the selection process will consider all plan legs. The "#" at the end of the keyword represents a selection set number (e.g., SELECT_NODES_1). Any number of selection sets can be specified. If a path satisfies any one of the selection sets, the plan is included.

Each node parameter is interpreted as a comma-delimited list of node numbers or node number ranges. A sequential range of nodes are specified by providing the first node number in the range and the last node number in the range separated by two periods (e.g., 1000..1010). The path must include all of the nodes in the list in sequential order in order to be selected. The path may include other nodes between nodes included in the list, but it must travel through all of the nodes in the order specified.

SELECT_LINKS_#

The select links parameters enable the user to provide a list of link numbers the plan must include before it is processed. This parameter is optional. If it is not provided, the selection process will consider all plan legs. The "#" at the end of the keyword represents a selection set number (e.g., SELECT_LINKS_1). Any number of selection sets can be specified. If a path satisfies any one of the selection sets, the plan is included.

Each link parameter is interpreted as a comma-delimited list of link numbers or link number ranges. A sequential range of links are specified by providing the first node number in the range and the last link number in the range separated by two periods (e.g., 1000..1010). The path must include all of the links in the list in sequential order in order to be selected. The path may include other links between links included in the list, but it must travel through all of the links in the order specified.

SELECT_TIME_PERIODS

The select time periods parameter enables the user to specify the times of day that are considered for processing. This parameter is optional. If it is not provided, all times will be considered by the selection process. The parameter is interpreted as a comma-delimited list of time periods. Time periods are specified by providing the beginning time and the ending time separated by two periods. The time values can be provided as integer seconds (e.g., 15000..17000), as decimal hours (e.g., 15.5..17.5), or in standard clock format (e.g., 15:30..17:30). All times must use 24-hour clock conventions.

SELECT_LOCATIONS

The select locations parameter enables the user to specify the activity locations that are considered for processing. This parameter is optional. If it is not provided, all activity locations will be considered by the selection process. The location parameter is interpreted as a comma-delimited list of activity location numbers or activity location number ranges. A sequential range

of activity locations are specified by providing the first activity location number in the range and the last activity location number in the range separated by two periods (e.g., 47..78). The Plan is selected if the origin of the path is included in the activity location list.

SELECT_PARKING_LOTS

The select parking lots parameter enables the user to specify the parking lots that are considered for processing. This parameter is optional. If it is not provided, all parking lots will be considered by the selection process. The parking lots parameter is interpreted as a comma-delimited list of parking lot numbers or parking lot number ranges. A sequential range of parking lots are specified by providing the first parking lot number in the range and the last parking lot number in the range separated by two periods (e.g., 47..78). The Plan leg is selected if the drive path is included in the parking lot list.

SELECT_TRANSIT_STOPS

The select transit stops parameter enables the user to specify the transit stops that are considered for processing. This parameter is optional. If it is not provided, all transit stops will be considered by the selection process. The transit stops parameter is interpreted as a comma-delimited list of stop numbers or stop number ranges. A sequential range of stops are specified by providing the first stop number in the range and the last stop number in the range separated by two periods (e.g., 47..78). The Plan leg is selected if the transit path boards or alights at one of the stops in the transit stop list.

SELECT_TRANSIT_ROUTES

The select transit routes parameter enables the user to specify the transit routes that are considered for processing. This parameter is optional. If it is not provided, all transit routes will be considered by the selection process. The transit routes parameter is interpreted as a comma-delimited list of route numbers or route number ranges. A sequential range of routes are specified by providing the first route number in the range and the last route number in the range separated by two periods (e.g., 47..78). The Plan leg is selected if the transit path uses one of the routes in the transit route list.

SELECT_TRANSIT_MODES

The select transit modes parameter enables the user to specify the transit modes that are considered for processing. This parameter is optional. If it is not provided, all transit modes will be considered by the selection process. The transit modes parameter is interpreted as a comma-delimited list of mode names (e.g., BUS, LOCAL_BUS, EXPRESS, EXPRESS_BUS, TROLLEY, STREETCAR, LIGHTRAIL, RAPIDRAIL, REGIONRAIL). The Plan leg is selected if the transit path uses one of the modes in the transit modes list.

SELECT_PROBLEM_TYPES

The select problem types key enables the user to select travelers with specified problems from the plan file. This parameter is optional. If it is not provided, the problem types will not be used by the selection process. The types parameter is interpreted as a comma-delimited list of problem type labels. The label options include: PATH_BUILDING, TIME_SCHEDULE, ZERO_NODE, VEHICLE_TYPE, PATH_CIRCUITY, TRAVEL_MODE, VEHICLE_ACCESS,

WALK_DISTANCE, WAIT_TIME, WALK_ACCESS, PATH_SIZE, PARK-&-RIDE_LOT, BIKE_DISTANCE, DEPARTURE_TIME, ARRIVAL_TIME, LINK_ACCESS, LANE_CONNECTIVITY, PARKING_ACCESS, LANE_MERGING, LANE_CHANGING, TURNING_SPEED, POCKET_MERGE, VEHICLE_SPACING, TRAFFIC_CONTROL, and ACCESS_RESTRICTION.

SELECT_RANDOM_PERCENTAGE

The select random percentage parameter enables the user to randomly select a percentage of the household that satisfy all other selection criteria. This parameter is optional. If it is provided, the value is specified as floating point number (e.g., 10.0 percent).

RANDOM_NUMBER_SEED

This key specifies the random number seed used with the random percentage to select household for processing If the key is not provided or the key value is zero, the random number seed will be set by the computer clock.

LINK_DIRECTION_OFFSET

The link direction offset determines how paths on two way links are draw. The default value is 0.0, which means that the link centerline is used to draw the path. If the value is greater than 0.0, it represents the number of meters to the right or left that a path on a two way link is drawn. If the link is a one-way link, the path will be draw using the centerline of the roadway in the direction of travel. This parameter is used to draw non-transit modes.

PARKING_SIDE_OFFSET

The parking side offset is used to display the origin and destination parking location for a drive plan. The default value is 5.0 meters. In this case the parking lot is draw five meters to the right or left of the centerline of the link shape at the appropriate offset.

ACTIVITY_LOCATION_SIDE_OFFSET

The activity location side offset is used to display the origin and destination activity location for a travel plan. The default value is 15.0 meters. In this case the activity location is draw fifteen meters to the right or left of the centerline of the link shape at the appropriate offset.

TRANSIT_STOP_SIDE_OFFSET

The transit stop side offset is used to display the boarding and alighting transit stops for transit plans. The default value is 5.0 meters. In this case the transit stop is draw five meters to the right of the centerline of the link shape at the appropriate offset.

TRANSIT_DIRECTION_OFFSET

The transit direction offset determines how the transit routes used by a transit plans are drawn on two way links. The default value is 0.0, which means that the route is drawn on the centerline of the link. If the value is greater than 0.0, it represents the number of meters to the right of a two way link the transit route is drawn. If the link is a one-way link, the route is drawn on the centerline of the roadway in the direction of travel.

Bandwidth Shape Files

The ArcView Bandwidth File displays the cumulative number of vehicles using individual links on the network by direction. The following six keys are used to determine how to convert the number of vehicles to width in meters and smooth the outside edge of the polygon.

BANDWIDTH_SCALING_FACTOR

The bandwidth scaling factor is used to convert the number of selected vehicles on a link to the width of the bandwidth polygon in meters. The inside edge of the polygon follows the shape of the link centerline. The outside edge is offset from the centerline by this value. The default width factor is 1.0 meters per vehicle. The accepted range is between 0.01 and 100,000 meters.

MINIMUM_BANDWIDTH_VALUE

The minimum bandwidth value determines the fewest number of vehicles for which a bandwidth polygon is drawn. The default value is zero which means the polygon is draw if the link has one or more vehicles. The accepted range is between zero and 100,000 vehicles.

MINIMUM_BANDWIDTH_SIZE

The minimum bandwidth size determines the minimum width in meters of the bandwidth regardless of the number of vehicles (greater than or equal to the minimum value) on the link. The default minimum size is 0.01 meters. The accepted range is between 0.001 and 10.0 meters.

MAXIMUIM_BANDWIDTH_SIZE

The maximum bandwidth size determines the maximum width in meters of the bandwidth regardless of the number of vehicles on the link. The default maximum size is 1000 meters. The accepted range is between 1.0 and 10,000 meters.

MAXIMUIM_SHAPE_ANGLE

The maximum shape angle is used to smooth the link shapes as they are offset from the centerline of the link. Smoothing helps to minimize distortions created by small imperfections in the link shape that become exaggerated when large offsets are applied. The default maximum shape angle is 45 degrees. The acceptable range is 5 to 120 degrees. If the edge of the polygon includes angle greater than this value, shape points are removed or added to smooth out the shape transitions.

MINIMUM_SHAPE_LENGTH

The minimum shape length is used to smooth the link shapes as they are offset from the centerline of the link. Smoothing helps to minimize distortions created by small imperfections in the link shape that become exaggerated when large offsets are applied. The default minimum shape length is 5 meters. The acceptable range is 1 to 50 meters. If the edge of the polygon includes distances between shape points that are less than this value, shape points are removed from the edge until the minimum length is met.

CONTOUR_TIME_INCREMENTS

The contour time increments are required when the ArcView Time Contour file is requested. The process assumes that the input plan file is generated by a one to many path building application of the Router. Travel time contours are constructed by tracing the paths from a selected origin activity location to all destination activity locations. The travel time along the path is estimated using an input link delay file or free-flow travel time. If the link delay file includes turn delays and a lane connectivity file is provided, the turning delays are considered in the travel time estimate.

What the contour time increments do is determine where breakpoints in the path travel times are generated. The key includes a comma-separated list of one or more travel times in seconds. If the last value is proceeded by a "*", the value is interpreted as a time increment that is added to the last value in the list until the cumulative time points reach midnight. For example, "120, 300, 600, 900, *1800" generates a time point after 2 minutes, 5 minutes, 10 minutes, 15 minutes, and every 30 minute increment after 15 minutes (i.e., 45 minutes, 75 minutes, etc.). A value of "*900" will generate a time point very 15 minutes.

As each link is processed on the path, it is assigned to one of the time point ranges. If the time point range entering the link is different from the time point range exiting the link, the link is split into two (or more) link segments based on the interpolated point where the time ranges change. This makes it possible to display the time range value for each link segment with a different color and visualize the travel time contours. Note that each link is only processed once, so paths that enter a link from both ends will only show the segments from the first path.

CONTOUR_DISTANCE_INCREMENTS

The contour distance increments are required when the ArcView Distance Contour file is requested. The process assumes that the input plan file is generated by a one to many path building application of the Router. Travel distance contours are constructed by tracing the paths from a selected origin activity location to all destination activity locations. The distance along the path is calculated from the link lengths.

What the contour distance increments do is determine where breakpoints in the path trip length are generated. The key includes a comma-separated list of one or more distances in meters. If the last value is proceeded by a "*", the value is interpreted as a distance increment that is added to the last value in the list until the cumulative trip length reaches 1,000,000 meters. For example, "1000, 2000, 5000, *10000" generates a trip length value at 1,000 meters, 2,000 meters, 5,000 meters, and every 10,000 meter increment after 5,000 meters (i.e.,15,000 meters, 25,000 meters, etc.). A value of "*1000" will generate a distance point very 1,000 meters.

As each link is processed on the path, it is assigned to one of the distance ranges. If the distance range entering the link is different from the distance range exiting the link, the link is split into two (or more) link segments based on the interpolated point where the distance ranges change. This makes it possible to display the distance range value for each link segment with a different color and visualize the trip length contours. Note that each link is only processed once, so paths that enter a link from both ends will only show the segments from the first path.

Ridership Shape Files

The ArcView Ridership File displays the cumulative transit ridership on individual link segments by direction. The file can be generated as polyline or polygon file. A polyline file stores each link segments as a shape vector. The polygon file shows the link segment ridership as a bandwidth. A bandwidth file is generated if the Ridership Scaling Factor is non-zero. The length of each link segment is defined by the stop locations on the link. A separate link segment is created between each stop and the nodes at both ends of the link. Note that the MAXIMUM_SHAPE_ANGLE and MINIMUM_SHAPE_LENGTH keys also apply to transit bandwidths.

RIDERSHIP_SCALING_FACTOR

The ridership scaling factor is used to convert the number of transit ridership on a link segment to the width of the bandwidth polygon in meters. The inside edge of the polygon follows the shape of the link centerline. The outside edge is offset from the centerline by this value. The default width factor is 0.0 meters per ridership which means that the link segment will be drawn as a polyline rather than a polygon. The accepted range is between 0.01 and 100,000 meters.

MINIMUM_RIDERSHIP_VALUE

The minimum ridership value determines the fewest number of riders for which a bandwidth polygon is drawn. The default value is zero which means the polygon is draw if the link has one or more riders. The accepted range is between zero and 100,000 riders.

MINIMUM_RIDERSHIP_SIZE

The minimum ridership size determines the minimum width in meters of the bandwidth regardless of the number of riders (greater than or equal to the minimum value) on the link. The default minimum size is 0.01 meters. The accepted range is between 0.001 and 10.0 meters.

MAXIMUIM_RIDERSHIP_SIZE

The maximum ridership size determines the maximum width in meters of the bandwidth regardless of the number of riders on the link. The default maximum size is 1000 meters. The accepted range is between 1.0 and 10,000 meters.

STOP_EQUIVALENCE_FILE

The stop equivalence file is required if the ArcView Stop Group File is requested. This file provides the list of transit stops included in each stop group. The total boardings and alightings for all selected transit routes that use one or more stops in the stop group are output to the shapefile. The location of the shape point is the simple average X and Y coordinates associated with each stop in the group.

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, STATEPLAN, 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_COORDINATE_ADJUSTMENT

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, STATEPLAN, 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_COORDINATE_ADJUSTMENT

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.

Algorithm Notes

The program reviews each leg using the selection criteria. A leg is selected if and only if it satisfies all five selection criteria (Traveler ID, Time Period, at least one Node Sequence, at least one Link Sequence, and Activity Location). Any or all of the selection criteria can be undefined. If all of the criteria are undefined, all of the plans are processed. It is generally not logical to use Node Sequences, Link Sequences, and Activity Locations criteria at the same time.

If one or more Node Sequences are provided, the path must travel through all of the nodes in the sequence in order. If one of the nodes is not included on the path or the nodes are not traversed in the order listed, the path is not selected. For example, if the selection criterion is:

```
SELECT_NODES_1    100, 200, 300
```

the path must first travel through node 100, then travel through node 200, and then travel through node 300 before it is selected. If the plan includes the following node list, the path would be selected.

```
50, 100, 150, 200, 250, 300, 350, 400
```

If the plan includes any of the following node lists, it would be rejected.

```
50, 100, 150, 200, 250, 350, 400
50, 100, 150, 300, 250, 200, 350
```

Sample Printout

The printout file generated by ArcPlan will look something like the example below. It 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.

```
*****************************************
|                                       |
|         ArcPlan - Version 4.0.0       |
|   Copyright (c) 2006 by AECOM Consult |
|         Thu Jul 27 11:56:03 2006      |
|                                       |
*****************************************

Control File = ArcPlan.ctl
Report_File  = ArcPlan.prn (Create)

Plan File Display Utility

Project Directory = d:\software\test\case3

Network Directory = d:\software\test\case3\network
Node File = d:\software\test\case3\network\Node.txt
Link File = d:\software\test\case3\network\Link.txt
Parking File = d:\software\test\case3\network\Parking.txt
Activity Location File = d:\software\test\case3\network\Activity_Location.txt
Transit Stop File = d:\software\test\case3\network\Transit_Stop.txt
Transit Route File = d:\software\test\case3\network\Transit_Route.txt
Transit Driver File = d:\software\test\case3\network\Transit_Driver.txt

Plan File = d:\software\test\case3\demand\Plan.txt
Plan File Format = VERSION3
Plan File contains Node List Paths

ArcView Plan File = d:\software\test\case3\network\arcview\ArcPlan.shp

Time of Day Format = 24_HOUR_CLOCK

Select Links for Group #1 = 5

Link Direction Offset = 6.00 meters
Activity Location Side Offset = 30.00 meters
Parking Side Offset = 15.00 meters
Transit Stop Side Offset = 8.00 meters
Transit Direction Offset = 4.00 meters


Number of Node Records = 21

Number of Link Records = 24
Number of Directional Links = 48

Number of Parking Records = 96
```

```
Number of Activity Location Records = 96

Number of Transit Stop Records = 16

Number of Transit Route Records = 18
Number of Transit Routes = 2

Number of Transit Driver Records = 17

Number of Plan Files = 1
Number of Input Plans = 20661
Number of Input Records = 137683
Number of Input Travelers = 7251
Number of Input Trips = 6528

Number of ArcView Shape Records = 923
```