

# PlanSelect

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Version 5.0.10

## Revision History

April 2012 - Created by Volpe Center

The **PlanSelect** program is used to:

1. Create a set of selection files that can be used as input to the Router;
2. Select plans based on traveler ID, time of day, activity location, parking lot, transit stop, transit route, V/C ratio, travel time ratio, coordinates, vehicle types, subarea polygon, and path node sequence; and
3. Use link delay information to select plans where the plan duration and the current travel time for the plan path are significantly different.

Syntax is PlanSelect [-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 filename includes an extension (e.g., ".ctl"), the extension is replaced with ".prn". The printout file will be created in the current working directory and will overwrite an existing file with the same name.

## Version 5 Features

- PlanSelect is now multi-threaded
- An option for writing an output plan file (sorted the same way as the input plan file) is now available.
- The VC ratio and time ratio selection criteria now require a link delay file.
- DELETION\_FILE, DELETION\_FORMAT, DELETE\_HOUSEHOLDS, DELETE\_MODES, and DELETE\_TRAVELER\_TYPES keys were activated to delete selected trips from the input plan file.
- Additional selection criteria (such as origin and destination zones) are now available

## Control Key List

The list of control file keys appears in the tables 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**, and **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, refer to the Parameter Reference. For a more detailed description of the Input or Output control keys, refer to the File Reference. These two documents also provide the possible values or range of values allowed for each control key listed below. For instance, files can usually be output to numerous formats beyond TAB\_DELIMITED for additional post-processing / file manipulation actions.

## Configuration 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	P
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
PLAN_FILE	Req	File		I
PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P
NEW_SELECTION_FILE	Req	New		O
NEW_SELECTION_FORMAT	Opt	Text	TAB_DELIMITED	P
NODE_FILE	Opt	File		I
NODE_FORMAT	Opt	Text	TAB_DELIMITED	P
LINK_FILE	Opt	File		I
LINK_FORMAT	Opt	Text	TAB_DELIMITED	P
LANE_USE_FILE	Opt	File		I
LANE_USE_FORMAT	Opt	Text	TAB_DELIMITED	P
CONNECTION_FILE	Opt	File		I
CONNECTION_FORMAT	Opt	Text	TAB_DELIMITED	P

<b>Control File Keys:</b>	<b>Req/Opt</b>	<b>Type</b>	<b>Default</b>	<b>I/O/P</b>
LOCATION_FILE	Opt	File		I
LOCATION_FORMAT	Opt	Text	TAB_DELIMITED	P
VEHICLE_TYPE_FILE	Opt	File		I
VEHICLE_TYPE_FORMAT	Opt	Text	TAB_DELIMITED	P
LINK_DELAY_FILE	Opt	File		I
LINK_DELAY_FORMAT	Opt	Text	TAB_DELIMITED	P
NEW_PLAN_FILE	Opt	New		O
NEW_PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P

## Data Service Keys

<b>Control File Keys:</b>	<b>Req/Opt</b>	<b>Type</b>	<b>Default</b>	<b>I/O/P</b>
DAILY_WRAP_FLAG	Opt	Bool	FALSE	P
SUMMARY_TIME_RANGES	Opt	Text	ALL	P
SUMMARY_TIME_INCREMENT	Opt	Time	15 minutes	P

## Control Keys

<b>Control File Keys:</b>	<b>Req/Opt</b>	<b>Type</b>	<b>Default</b>	<b>I/O/P</b>
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_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
PERCENT_TIME_DIFFERENCE	Opt	Dec	0.0 percent	P
MINIMUM_TIME_DIFFERENCE	Opt	Time	1 minutes	P
MAXIMUM_TIME_DIFFERENCE	Opt	Time	60 minutes	P
SELECTION_PERCENTAGE	Opt	Dec	100.0 percent	P
MAXIMUM_PERCENT_SELECTED	Opt	Dec	100.0 percent	P
DELETION_FILE	Opt	File		I
DELETION_FORMAT	Opt	Text	TAB_DELIMITED	P
DELETE_HOUSEHOLDS	Opt	List	NONE	P
DELETE_MODES	Opt	List	NONE	P

Control File Keys:	Req/Opt	Type	Default	I/O/P
DELETE_TRAVELER_TYPES	Opt	List	NONE	P
SELECT_PARKING_LOTS	Opt	List	ALL	P
SELECT_VC_RATIOS	Opt	Dec	0	P
SELECT_TIME_RATIOS	Opt	Dec	0	P

### Notes

Each '\_FILE' key has a corresponding '\_FORMAT' key. The following file formats can be used for input and output files: TEXT, BINARY, FIXED\_COLUMN, COMMA\_DELIMITED, SPACE\_DELIMITED, TAB\_DELIMITED, CSV\_DELIMITED, DBASE, SQLITE3, VERSION3

## Control Key Changes in PlanSelect Version 5

A number of network keys have changed from V4 to V5. Refer to the File Reference and Parameter Reference documents for additional details. Some specific examples include the following control key and file name changes (V4 → V5):

- NET\_NODE\_TABLE -> NODE\_FILE
- NET\_LINK\_TABLE -> LINK\_FILE
- NET\_ACTIVITY\_LOCATION\_TABLE -> ACTIVITY\_FILE
- NET\_LANE\_CONNECTIVITY\_TABLE -> CONNECTION\_FILE
- NET\_LANE\_USE\_TABLE -> LANE\_USE\_FILE
- NEW\_HOUSEHOLD\_LIST -> NEW\_SELECTION\_FILE
- VEHICLE\_TYPE -> VEHICLE\_TYPE\_CODE
- SELECT\_TRAVELERS -> SELECT\_HOUSEHOLDS
- SELECT\_TRAVEL\_MODES -> SELECT\_MODES

The following keys, used in version 4, are not used in version 5:

NET\_DIRECTORY  
 TRAVELER\_SCALING\_FACTOR  
 NODE\_LIST\_PATHS  
 PARKING\_TABLE  
 POPULATION\_FILE  
 NEW\_HOUSEHOLD\_RECORD\_FILE  
 SELECT\_COORDINATES  
 SELECT\_OD\_COORDINATES  
 EXCLUDE\_OD\_COORDINATES  
 SELECT\_TRANSIT\_MODES  
 SELECT\_TRANSIT\_ROUTES  
 SELECT\_TRANSIT\_STOPS

New keys in version 5 include

SELECT\_ORIGINS  
 SELECT\_DESTINATIONS  
 SELECT\_ORIGIN\_ZONES

SELECT\_DESTINATION\_ZONES  
 SELECT\_START\_TIMES  
 SELECT\_END\_TIMES  
 MAX\_PROBLEM\_COUNT  
 MODEL\_START\_TIME  
 MODEL\_END\_TIME  
 MODEL\_TIME\_INCREMENT  
 NEW\_PLAN\_FILE  
 NEW\_PLAN\_FORMAT  
 NUMBER\_OF\_THREADS  
 DELETION\_FILE  
 DELETION\_FORMAT  
 DELETE\_HOUSEHOLDS  
 DELETE\_MODES  
 DELETE\_TRAVELER\_TYPES  
 SUMMARY\_TIME\_INCREMENT  
 SUMMARY\_TIME\_RANGES  
 TIME\_OF\_DAY\_FORMAT  
 UNITS\_OF\_MEASURE

## Examples

### PlanSelect Control File Using Select\_VC\_Ratios

TITLE	Select Travelers to Re-Route in 2 Tiny		
DEFAULT_FILE_FORMAT	TAB_DELIMITED		
PROJECT_DIRECTORY	../		
PLAN_FILE	demand/1.Trip.Plans.*		
LINK_DELAY_FILE	results/1.Trip.LinkDelay		
## NEW_HOUSEHOLD_LIST	NULL		
NEW_SELECTION_FILE	demand/2.HH_List.*		
NODE_FILE	network/Node.txt		
LINK_FILE	network/Link.txt		
PARKING_FILE	network/Parking.txt		
CONNECTION_FILE	network/Connection.txt		
SELECT_VC_RATIOS	1.5		
## PERCENT_TIME_DIFFERENCE	100.0	//---- percent ----	
#SELECT_TIME_RATIOS	2	//---- travel time ratio ----	
#MINIMUM_TIME_DIFFERENCE	1	//---- minutes ----	
#MAXIMUM_TIME_DIFFERENCE	60	//---- minutes ----	
SELECTION_PERCENTAGE	50.0	//---- percent ----	
MAXIMUM_PERCENT_SELECTED	10.0	//---- percent ----	
RANDOM_NUMBER_SEED	355		

### Resulting .prn file from the above control file

```

*****
|                                     |
|      PlanSelect - Version 5.0.10   |
| Copyright 2012 by TRANSIMS Open-Source |
|      Mon Apr 23 09:12:09 2012     |
|                                     |
*****

```

Control File = 2.PlanSelect.ctl  
Report File = 2.PlanSelect.prn (Create)

Select Travelers to Re-Route in 2 Tiny

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 = 355  
Number of Threads = 1

Input System Network Files:  
Node File = ../network/Node.txt  
Link File = ../network/Link.txt  
Connection File = ../network/Connection.txt

Input System Demand Files:  
Link Delay File = ../results/1.Trip.LinkDelay  
Plan File = ../demand/1.Trip.Plans.\* (2 partitions)

Output System Demand Files:  
New Selection File = ../demand/2.HH\_List.\*

Data Service Controls:

Number of Time Periods = 108

Select Service Controls:  
Selection Percentage = 50.00 percent  
Maximum Percent Selected = 10.00 percent

PlanSelect Control Keys:  
Select Vc Ratios = 1.5

Number of Node File Records = 23

Number of Link File Records = 24  
Number of Directional Links = 37

Number of Connection File Records = 49

Number of Link Delay File Records = 3348  
Number of Link Direction Records = 3348  
Number of Link Connection Records = 0

Number of Summary Time Periods = 108  
Percent of Link Periods with Travel Time Data = 83.8%  
Percent of Time Periods with Link Delay Data = 89.8%

```

Number of Plan File Partitions = 2
Number of Plan File Records   = 1014578
Number of Plan File Households = 96830
Number of Plan File Persons   = 96830
Number of Plan File Tours     = 96831
Number of Plan File Trips     = 96837

```

```

Total Number of Trips = 96837
Number of Trips Selected = 6559 (6.8%)
Number of Trips Written = 3298 (3.4%)

```

```
New Selection File Records = 3298 (2 files)
```

```
Mon Apr 23 09:12:16 2012 -- Process Complete (0:00:07)
```

## PlanSelect Control File Using Percent Time Difference

```

TITLE                               Select Travelers to Re-Route in 2 Tiny
DEFAULT_FILE_FORMAT                 TAB_DELIMITED
PROJECT_DIRECTORY                   ../

PLAN_FILE                           demand/1.Trip.Plans.*
LINK_DELAY_FILE                     results/1.Trip.LinkDelay

NEW_SELECTION_FILE                  demand/2.HH_List.*

NODE_FILE                           network/Node.txt
LINK_FILE                           network/Link.txt
PARKING_FILE                        network/Parking.txt
CONNECTION_FILE                     network/Connection.txt

PERCENT_TIME_DIFFERENCE             20.0           //---- percent ----

MINIMUM_TIME_DIFFERENCE              1             //---- minutes ----
MAXIMUM_TIME_DIFFERENCE              10            //---- minutes ----
SELECTION_PERCENTAGE                  50.0          //---- percent ----
MAXIMUM_PERCENT_SELECTED              10.0          //---- percent ----

RANDOM_NUMBER_SEED                   255

```

The Travel Time Difference criteria are defined with three control keys PERCENT\_TIME\_DIFFERENCE, MINIMUM\_TIME\_DIFFERENCE, and MAXIMUM\_TIME\_DIFFERENCE. These keys are only considered if the link delay file is provided. The link delay file provides the time period travel for each link. The program then reads the node list for each plan leg between parking lots. The appropriate travel time for the link at the time of day the plan arrives at that link is added to the total travel time for the path. This time is subtracted from the plan duration to calculate the travel time difference. If this difference is less than the MINIMUM\_TIME\_DIFFERENCE, the plan is not selected. If this difference is greater than or equal to the MAXIMUM\_TIME\_DIFFERENCE, the plan is selected. If the difference is greater than or equal to the MINIMUM\_TIME\_DIFFERENCE and less than the MAXIMUM\_TIME\_DIFFERENCE, the PERCENT\_TIME\_DIFFERENCE is used. The percent difference is based in the plan duration. If the percent difference is greater than or equal to the PERCENT\_TIME\_DIFFERENCE key, the plan is selected.

The program generates a list of all of the selected households and calculates the total number of households in each plan file. If the SELECTION\_PERCENTAGE and/or the MAXIMUM\_PERCENT\_SELECTED keys are specified, the program takes a random sample of the selected households to output to the household ID file. The SELECTION\_PERCENTAGE defines the percentage of the selected households that will be written to the household ID file. If the resulting number of households divided by the total number of households in the plan file is greater than MAXIMUM\_PERCENT\_SELECTED, the selection percentage is reduced to MAXIMUM\_PERCENT\_SELECTED.

### Resulting .prn file from the above control file

```
*****
|                               |
|   PlanSelect - Version 5.0.10   |
| Copyright 2012 by TRANSIMS Open-Source |
|   Fri May 04 11:40:14 2012   |
|                               |
*****
```

```
Control File = 2.PlanSelect.ctl
Report File  = 2.PlanSelect.prn (Create)
```

Select Travelers to Re-Route in 2 Tiny

```
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 = 255
Number of Threads = 1
```

```
Input System Network Files:
Node File = ../network/Node.txt
Link File = ../network/Link.txt
Connection File = ../network/Connection.txt
```

```
Input System Demand Files:
Link Delay File = ../results/1.Trip.LinkDelay
Plan File = ../demand/1.Trip.Plans.* (2 partitions)
```

```
Output System Demand Files:
New Selection File = ../demand/2.HH_List.*
```

Data Service Controls:

Number of Time Periods = 108

```
Select Service Controls:
Percent Time Difference = 20.00 percent
Minimum Time Difference = 1.00 minutes
Maximum Time Difference = 5.00 minutes
Selection Percentage = 50.00 percent
Maximum Percent Selected = 10.00 percent
```

```
PlanSelect Control Keys:
Number of Node File Records = 23
Number of Link File Records = 24
```



```

Number of Directional Links = 37
Number of Connection File Records = 49
Number of Link Delay File Records = 3348
Number of Link Direction Records = 3348
Number of Link Connection Records = 0

Number of Summary Time Periods = 108
Percent of Link Periods with Travel Time Data = 83.8%
Percent of Time Periods with Link Delay Data = 89.8%
Percent of Connection Periods with Travel Time Data = 0.0%
Percent of Time Periods with Connection Delay Data = 0.0%

Number of Plan File Partitions = 2
Number of Plan File Records      = 1014341
Number of Plan File Households = 96819
Number of Plan File Persons      = 96819
Number of Plan File Tours        = 96819
Number of Plan File Trips        = 96819

Total Number of Trips = 96819
Number of Trips Selected = 3821 (3.9%)
Number of Trips Written = 1900 (2.0%)

New Selection File Records = 1900 (2 files)

Fri May 04 11:40:28 2012 -- Process Complete (0:00:14)

```

## PlanSelect Control File Using Link Sequence

```

TITLE                               Select Travelers to Re-Route in 2 Tiny
DEFAULT_FILE_FORMAT                 TAB_DELIMITED
PROJECT_DIRECTORY                   ../

PLAN_FILE                           demand/1.Trip.Plans.*
LINK_DELAY_FILE                     results/1.Trip.LinkDelay

NEW_SELECTION_FILE                  demand/2.HH_List.*

NODE_FILE                           network/Node.txt
LINK_FILE                           network/Link.txt
CONNECTION_FILE                     network/Connection.txt

SELECT_LINKS_1                      -4, 7
RANDOM_NUMBER_SEED                   355

NEW_PLAN_FILE                       demand/2.PlanSelectOutput.*

```

If one or more Link Sequences are provided, the path must travel through all of the links in the sequence in order (a minus sign means that the link is traversed in the B->A direction). If one of the links is not included on the path or the links are not traversed in the order listed, the path is not selected. For example, if the selection criterion is:

```
SELECT_LINKS_1      -4, 7
```

the path must first travel through link 4 in the B->A direction, then travel through link 7 in the A->B direction, before it is selected.

## Resulting .prn file from the above control file

```
*****
|
|      PlanSelect - Version 5.0.10      |
| Copyright 2012 by TRANSIMS Open-Source |
|      Tue Apr 24 14:07:18 2012      |
|
|
*****
```

Control File = 2.PlanSelect.ctl  
Report File = 2.PlanSelect.prn (Create)

Select Travelers to Re-Route in 2 Tiny

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 = 355  
Number of Threads = 1

Input System Network Files:  
Node File = ../network/Node.txt  
Link File = ../network/Link.txt  
Connection File = ../network/Connection.txt

Input System Demand Files:  
Link Delay File = ../results/1.Trip.LinkDelay  
Plan File = ../demand/1.Trip.Plans.\* (2 partitions)

Output System Demand Files:  
New Selection File = ../demand/2.HH\_List.\*  
New Plan File = ../demand/2.PlanSelectOutput.\*

Data Service Controls:

Number of Time Periods = 108

Select Service Controls:  
Select Links = -4, 7

PlanSelect Control Keys:

Number of Node File Records = 23  
Number of Link File Records = 24  
Number of Directional Links = 37  
Number of Connection File Records = 49

Number of Link Delay File Records = 3348  
Number of Link Direction Records = 3348  
Number of Link Connection Records = 0

Number of Summary Time Periods = 108  
Percent of Link Periods with Travel Time Data = 83.8%  
Percent of Time Periods with Link Delay Data = 89.8%

Number of Plan File Partitions = 2  
Number of Plan File Records = 1014578  
Number of Plan File Households = 96830  
Number of Plan File Persons = 96830  
Number of Plan File Tours = 96831  
Number of Plan File Trips = 96837

Total Number of Trips = 96837  
Number of Trips Selected = 935 (1.0%)  
Number of Trips Written = 935 (1.0%)

Number of New Plan File Partitions = 2  
Number of New Plan File Records = 8994  
Number of New Plan File Households = 935  
Number of New Plan File Persons = 935  
Number of New Plan File Tours = 935  
Number of New Plan File Trips = 935

New Selection File Records = 935 (2 files)

Tue Apr 24 14:07:31 2012 -- Process Complete (0:00:13)