PlanCompare

Version 5.0.13

Revision History

May 2013 - Created by Volpe Center

The **PlanCompare** program is used to:
1. Compares two plan files and selects plans that have significantly different travel times.
2. Generate convergence statistics and distribution charts by time of day.
3. Includes walk and wait time in the transit travel time comparisons.
4. Includes options to only compare drive legs.
5. Compares plan files generated on different networks.
6. Compares plan files for specified time periods.

Syntax is PlanCompare [-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

NEW_TRIP_MATCH_FILE and NEW_TRIP_MATCH_FORMAT keys were added to write a selection file based on a trip ID match between the input plan file and the compare plan file.

Control Key List

The list of control file keys appears in the tables 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, 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_DIRECTORY	Opt	Path		O
REPORT_FILE	Opt	New		P
REPORT_FLAG	Opt	Bool	FALSE	P
PAGE_LENGTH	Opt	Int.	65	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
SELECTION_FILE	Opt	File		O
SELECTION_FORMAT	Opt	Text	TAB_DELIMITED	P
NEW_SELECTION_FILE	Opt	New		I
NEW_SELECTION_FORMAT	Opt	Text	TAB_DELIMITED	P
NEW_PLAN_FILE	Opt	New		O
NEW_PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P

Data Service Keys

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

PERIOD_CONTROL_POINT	Opt	Text	MID-TRIP	P

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_LINKS_*	Opt	List	ALL	P
SELECT_NODES_*	Opt	List	ALL	P
SELECT_SUBAREA_POLYGON	Opt	File		P
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
PERCENT_COST_DIFFERENCE	Opt	Dec.	0.0 percent	P
MINIMUM_COST_DIFFERENCE	Opt	Dec.	10 impedance	P
MAXIMUM_COST_DIFFERENCE	Opt	Dec.	1000 impedance	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	I
DELETE_HOUSEHOLDS	Opt	List	NONE	P
DELETE_MODES	Opt	List	NONE	P
DELETE_TRAVELER_TYPES	Opt	List	NONE	P

Control Keys

Control File Keys:	Req/Opt	Type	Default	I/O/P
COMPARE_PLAN_FILE	Req	File		I
COMPARE_PLAN_FORMAT	Opt	Text	TAB_DELIMITED	P
COMPARE_GENERALIZED_COSTS	Opt	Bool	FALSE	P
SELECTION_METHOD	Opt	Text	RANDOM	P
MERGE_PLAN_FILES	Opt	Bool	FALSE	P
NEW_TIME_DISTRIBUTION_FILE	Opt	New		P
NEW_COST_DISTRIBUTION_FILE	Opt	New		P
NEW_TRIP_TIME_GAP_FILE	Opt	New		P
NEW_TRIP_COST_GAP_FILE	Opt	New		P
NEW_TRIP_MATCH_FILE	Opt	New		P
NEW_TRIP_MATCH_FORMAT	Opt	Text	TAB_DELIMITED	P
PLANCOMPARE_REPORT_#	Opt	Text		P

Report Options:

TOTAL_TIME_DISTRIBUTION
PERIOD_TIME_DISTRIBUTIONS
TOTAL_TIME_SUMMARY
PERIOD_TIME_SUMMARY
TOTAL_COST_DISTRIBUTION
PERIOD_COST_DISTRIBUTIONS
TOTAL_COST_SUMMARY
PERIOD_COST_SUMMARY
TRIP_TIME_GAP_REPORT
TRIP_COST_GAP_REPORT

Notes

Each '_FILE' key has a corresponding '_FORMAT' key. The following file formats can be used for input and ouput files: TEXT, BINARY, FIXED_COLUMN, COMMA_DELIMITED, SPACE_DELIMITED, TAB_DELIMITED, CSV_DELIMITED, DBASE, SQLITE3, VERSION3

Control Key Changes in PlanCompare Version 5

A number of 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):

- INPUT_PLAN_FILE -> PLAN_FILE
- HOUSEHOLD_LIST -> SELECTION_FILE
- OUTPUT_PLAN_FILE-> NEW_PLAN_FILE
- SELECT_TIME_PERIODS-> SELECT_START_TIMES and SELECT_END_TIMES
- NEW_DISTRIBUTION_FILE->NEW_TIME_DISTRIBUTION_FILE

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

- NODE_LIST_PATHS
- TRAVELER_SCALING_FACTOR
- SELECT_TRAVELERS
- SELECT_BY_PERCENT_DIFFERENCE
- SELECT_BY_RELATIVE_GAP
- IGNORE_LOCATION_DIFFERENCES
- INDEX_BY_COMPARE_LOCATION
- ONLY_COMPARE_DRIVE_LEGS
- NEW_DIFFERENCE_FILE
- NEW_TRIP_TIME_FILE
- NEW_START_DIFFERENCE_FILE
- NEW_END_DIFFERENCE_FILE

New keys in version 5 include
- REPORT_DIRECTORY
- PAGE_LENGTH
- MODEL_START_TIME

- MODEL_END_TIME
- MODEL_TIME_INCREMENT
- UNITS_OF_MEASURE
- MAX_PROBLEM_COUNT
- NUMBER_OF_THREADS
- SELECTION_FILE
- NEW_SELECTION_FILE
- DAILY_WRAP_FLAG
- SELECT_HOUSEHOLDS
- SELECT_MODES
- SELECT_PURPOSES
- SELECT_START_TIMES
- SELECT_END_TIMES
- SELECT_ORIGINS
- SELECT_DESTINATIONS
- SELECT_TRAVELER_TYPES
- SELECT_LINKS_*
- SELECT_NODES_*
- SELECT_SUBAREA_POLYGON
- DELETION_FILE
- DELETION_FORMAT
- DELETE_HOUSEHOLDS
- DELETE_MODES
- DELETE_TRAVELER_TYPES
- SELECTION_METHOD
- MERGE_PLAN_FILES
- NEW_COST_DISTRIBUTION_FILE
- NEW_TRIP_TIME_GAP_FILE
- NEW_TRIP_COST_GAP_FILE
- NEW_TRIP_MATCH_FILE
- NEW_TRIP_MATCH_FORMAT

Example

Demonstrating the reports and output files

The following .prn file is used

```
TITLE                           PlanCompare Test

PLAN_FILE          demand/3AON.plans.*
COMPARE_PLAN_FILE       demand/1.plans.*
NEW_PLAN_FILE               demand/3DIF.plans.*

SUMMARY_TIME_RANGES     7:00..7:15, 8:00..8:15
NEW_TIME_DISTRIBUTION_FILE      results/timedist.txt
NEW_COST_DISTRIBUTION_FILE      results/costdist.txt
NEW_TRIP_TIME_GAP_FILE          results/ttimegap.txt
NEW_TRIP_COST_GAP_FILE          results/tcostgap.txt
```

```
NEW_TRIP_MATCH_FILE             results/tmatch.txt


PLANCOMPARE_REPORT_1 TOTAL_TIME_DISTRIBUTION
PLANCOMPARE_REPORT_2 PERIOD_TIME_DISTRIBUTIONS
PLANCOMPARE_REPORT_3 TOTAL_TIME_SUMMARY
PLANCOMPARE_REPORT_4 PERIOD_TIME_SUMMARY
PLANCOMPARE_REPORT_5 TOTAL_COST_DISTRIBUTION
PLANCOMPARE_REPORT_6 PERIOD_COST_DISTRIBUTIONS
PLANCOMPARE_REPORT_7 TOTAL_COST_SUMMARY
PLANCOMPARE_REPORT_8 PERIOD_COST_SUMMARY
PLANCOMPARE_REPORT_9 TRIP_TIME_GAP_REPORT
PLANCOMPARE_REPORT_10 TRIP_COST_GAP_REPORT
```

It produces the following .prn file (Headers were added to the reports to improve readability of this document):

```
*********************************************
|                                           |
|        PlanCompare - Version 5.0.13        |
|   Copyright 2012 by TRANSIMS Open-Source  |
|          Tue May 28 16:08:21 2013         |
|                                           |
*********************************************


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


PlanCompare Test


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 = 1369771701
Number of Threads = 2
Warning: PlanCompare is Not Thread Enabled


Input System Demand Files:
Plan File = ../demand/3AON.plans.* (2 partitions)


Output System Demand Files:
New Plan File = ../demand/3DIF.plans.*


Data Service Controls:


Summary Time Ranges = 7:00..7:15, 8:00..8:15
Number of Time Periods = 2


Select Service Controls:


PlanCompare Control Keys:
```

```
Compare Plan File = ../demand/1.plans.*


New Time Distribution File = ../results/timedist.txt
New Cost Distribution File = ../results/costdist.txt
New Time Trip Gap File = ../results/ttimegap.txt
New Cost Trip Gap File = ../results/tcostgap.txt
New Trip Match File = ../results/tmatch.txt

PlanCompare Reports:  1. TOTAL_TIME_DISTRIBUTION
                      2. PERIOD_TIME_DISTRIBUTIONS
                      3. TOTAL_TIME_SUMMARY
                      4. PERIOD_TIME_SUMMARY
                      5. TOTAL_COST_DISTRIBUTION
                      6. PERIOD_COST_DISTRIBUTIONS
                      7. TOTAL_COST_SUMMARY
                      8. PERIOD_COST_SUMMARY
                      9. TRIP_TIME_GAP_REPORT
                     10. TRIP_COST_GAP_REPORT


New Trip Match File Records = 28251


Number of Plan File Partitions = 2
Number of Plan File Records    = 308344
Number of Plan File Households = 28251
Number of Plan File Persons    = 28251
Number of Plan File Tours      = 28251
Number of Plan File Trips      = 28251


Number of Compare Plan File Partitions = 2
Number of Compare Plan File Records    = 309775
Number of Compare Plan File Households = 28251
Number of Compare Plan File Persons    = 28251
Number of Compare Plan File Tours      = 28251
Number of Compare Plan File Trips      = 28251


Total Number of Trips = 28251
Number of Trips Selected = 28251 (100.0%)
Number of Trips Written = 28251 (100.0%)


Number of New Plan File Partitions = 2
Number of New Plan File Records    = 308344
Number of New Plan File Households = 28251
Number of New Plan File Persons    = 28251
Number of New Plan File Tours      = 28251
Number of New Plan File Trips      = 28251


Number of New Time Distribution File Records = 8
Number of New Cost Distribution File Records = 28
Number of New Time Trip Gap File Records = 3
Number of New Cost Trip Gap File Records = 3
```

Time Difference Distribution for All Time Periods

```
Difference                ---------------- Percent of Total Trips ------------------
(minutes)   Trips Percent     6   12   17   23   29   35   41   46   52   58   64   70

    -2        15    0.2
    -1        17    0.2
     0 >=    290    3.8--***
     1 ==   5348   69.6  **********************************************************
     2 <=   1546   20.1  ****************
     3       173    2.3  **
     4       256    3.3  ***
     5        36    0.5
```

Time Difference Distribution for 7:00..7:15

```
Difference                ---------------- Percent of Total Trips ------------------
(minutes)   Trips Percent     8   15   23   30   38   46   53   61   69   76   84   91

     0 >=    209    7.6--*****
     1 ==   2510   91.4  ***********************************************************
     2        26    0.9  *
     3         1    0.0
```

Time Difference Distribution for 8:00..8:15

```
Difference                ---------------- Percent of Total Trips ------------------
(minutes)   Trips Percent     5   10   14   19   24   29   34   38   43   48   53   58

    -2        15    0.3
    -1        17    0.3
     0 >=     81    1.6--**
     1 ==   2838   57.5  **********************************************************
     2      1520   30.8  ****************************
     3 <=    172    3.5  ****
     4       256    5.2  *****
     5        36    0.7  *
```

```
Number of Trips Compared = 7681
Average Input Travel Time = 4.87 minutes
Average Compare Travel Time = 4.20 minutes
Average Travel Time Difference = 0.67 minutes (16.02%)
Average Absolute Difference = 0.68 minutes (16.23%)
Minimum Time Difference = -1.38 minutes
Maximum Time Difference = 4.43 minutes
85th Percentile Range = 0.00 to 0.93 minutes
Total Absolute Difference = 87.2231 hours
Total User Benefit = 86.1103 hours
```

Time Period Summary (Minutes)

Time Period	Number Trips	--Travel Time-- Current	Base	------- Time Difference ------- Average	Percent	Absolute	Percent	-- 85% Range -- Low	High
7:00..7:15	2746	4.24	4.11	0.12	3.02	0.12	3.02	0.00	0.93
8:00..8:15	4935	5.23	4.25	0.98	23.02	0.99	23.34	0.09	2.55
Total	7681	4.87	4.20	0.67	16.02	0.68	16.23	0.05	1.93

Cost Difference Distribution for All Time Periods

```
Difference                 ----------------- Percent of Total Trips ------------------
(dollars)   Trips Percent    3    6    9   12   15   18   21   24   27   30   32   35

     0 >=     132    1.7--***
     1        2720   35.4  ************************************************************
     2 ==     1049   13.7  *********************
     3         680    8.9  ***************
     4         441    5.7  **********
     5         372    4.8  ********
     6         409    5.3  *********
     7         328    4.3  *******
     8         325    4.2  *******
     9         329    4.3  *******
    10         152    2.0  ***
    11 <=      247    3.2  *****
    12          61    0.8  *
    13          78    1.0  **
    14          19    0.2
    15           7    0.1
    16           4    0.1
    17          29    0.4  *
    18           3    0.0
    19           8    0.1
    20           2    0.0
    21         106    1.4  **
    22          55    0.7  *
    23          78    1.0  **
    24          31    0.4  *
    25          12    0.2
    26           2    0.0
    27           2    0.0
```

Cost Difference Distribution for 7:00..7:15

```
Difference                 ----------------- Percent of Total Trips ------------------
(dollars)   Trips Percent    7   13   20   26   33   39   46   52   59   65   72   79

     0 >=     105    3.8--***
     1 ==     2157   78.6  *****************************************************
     2 <=      430   15.7  ************
```

```
     3          30    1.1  *
     4           2    0.1
     5           2    0.1
     6          11    0.4
     7           6    0.2
     8           3    0.1


Cost Difference Distribution for 8:00..8:15

Difference                 ---------------- Percent of Total Trips ------------------
(dollars)   Trips Percent    1    2    3    4    5    7    8    9   10   11   12   13


     0          27    0.5--**
     1 >=      563   11.4  **************************************************
     2         619   12.5  *******************************************************
     3         650   13.2  ***********************************************************
     4         439    8.9  ****************************************
     5 ==      370    7.5  *********************************
     6         398    8.1  ************************************
     7         322    6.5  ****************************
     8         322    6.5  ****************************
     9         329    6.7  ****************************
    10         152    3.1  **************
    11         247    5.0  **********************
    12          61    1.2  ******
    13 <=       78    1.6  *******
    14          19    0.4  **
    15           7    0.1  *
    16           4    0.1
    17          29    0.6  ***
    18           3    0.1
    19           8    0.2  *
    20           2    0.0
    21         106    2.1  **********
    22          55    1.1  *****
    23          78    1.6  *******
    24          31    0.6  ***
    25          12    0.2  *
    26           2    0.0
    27           2    0.0


Number of Trips Compared = 7681
Average Input Travel Cost = 206.69 dollars
Average Compare Travel Cost = 202.75 dollars
Average Travel Cost Difference = 3.94 dollars (1.94%)
Average Absolute Difference = 3.94 dollars (1.94%)
Minimum Cost Difference = 0.00 dollars
Maximum Cost Difference = 26.68 dollars
85th Percentile Range = 0.05 to 1.65 dollars
Total Absolute Difference = 30237.8 dollars
Total User Benefit = 30237.8 dollars
```

Time Period Summary (Dollars)

	Number	--Travel Cost--		------- Cost Difference -------			-- 85% Range --	
Time Period	Trips	Current	Base	Average	Percent	Absolute	Percent	Low	High
7:00..7:15	2746	198.96	198.34	0.62	0.31	0.62	0.31	0.05	1.65
8:00..8:15	4935	210.99	205.21	5.78	2.82	5.78	2.82	0.61	12.85
Total	7681	206.69	202.75	3.94	1.94	3.94	1.94	0.16	10.68

Trip Gap Report (Minutes)

	Number	---------- Travel Time (minutes) ----------			
Time Period	Trips	Input	Compare	Difference	Trip Gap
7:00..7:15	2746	11631	11289	341	0.030228
8:00..8:15	4935	25788	20963	4892	0.233374

Trip Gap Report (Minutes)

	Number	---------- Travel Time (minutes) ----------			
Time Period	Trips	Input	Compare	Difference	Trip Gap
Total	7681	37419	32252	5233	0.162265

Trip Gap Report (Dollars)

	Number	---------- Travel Cost (dollars) ----------			
Time Period	Trips	Input	Compare	Difference	Trip Gap
7:00..7:15	2746	546338	544649	1689	0.003101
8:00..8:15	4935	1041239	1012690	28549	0.028191
Total	7681	1587577	1557339	30238	0.019416

Tue May 28 16:08:30 2013 -- Process Complete with 1 Warning (0:00:09)

Output Files

NEW_TIME_DISTRIBUTION_FILE

The NEW_TIME_DISTRIBUTION_FILE replaces the NEW_DISTRIBUTION_FILE from version 4. The difference in travel times (MINUTES) is the Plan travel time minus the Compare_Plan travel time. This file presents the data for a histogram of this difference, by one-minute increments. -2 minutes means between -1 and -2 minutes. Information is

presented for both the whole day and for specified time intervals (see SUMMARY_TIME_RANGES). An example file appears below:

MINUTES	TOTAL	P700_715	P800_815
-2	15	0	15
-1	17	0	17
0	290	209	81
1	5348	2510	2838
2	1546	26	1520
3	173	1	172
4	256	0	256
5	36	0	36

NEW_COST_DISTRIBUTION_FILE

This file, which has the same name in version 4, presents the differences in generalized cost (Input_Plan cost minus the Compare_Plan cost). This file presents the data for a histogram of this difference, by one-dollar increments. -5 dollars means between 4 and 5 dollars. Information is presented for both the whole day and for specified time intervals (see SUMMARY_TIME_PERIODS). An example file appears below:

DOLLARS	TOTAL	P700_715	P800_815
0	132	105	27
1	2720	2157	563
2	1049	430	619
3	680	30	650
4	441	2	439
5	372	2	370
6	409	11	398
7	328	6	322
8	325	3	322
9	329	0	329
10	152	0	152
11	247	0	247
12	61	0	61
13	78	0	78
14	19	0	19
15	7	0	7
16	4	0	4
17	29	0	29
18	3	0	3
19	8	0	8
20	2	0	2
21	106	0	106
22	55	0	55
23	78	0	78
24	31	0	31
25	12	0	12
26	2	0	2
27	2	0	2

NEW_TRIP_TIME_GAP_FILE

The NEW_TRIP_TIME_GAP_FILE, which is similar to the version 4 NEW_TRIP_TIME_FILE, compares trip times between the two plans.

PERIOD	COUNT	INPUT_TIME	COMPARE_TIME	DIFFERENCE	TRIP_GAP
7:00..7:15	2746	11630.63	11289.38	341.25	0.030228
8:00..8:15	4935	25788.00	20962.63	4892.13	0.233374
Total	7681	37418.63	32252.02	5233.38	0.162265

NEW_TRIP_COST_GAP_FILE

The NEW_TRIP_COST_GAP_FILE compares generalized costs.

PERIOD	COUNT	INPUT_COST	COMPARE_COST	DIFFERENCE	TRIP_GAP
7:00..7:15	2746	546338.07	544649.13	1688.94	0.003101
8:00..8:15	4935	1041239.19	1012690.30	28548.89	0.028191
Total	7681	1587577.26	1557339.43	30237.83	0.019416

NEW_TRIP_MATCH_FILE

The NEW_TRIP_MATCH_FILE is a selection file that is based on a trip ID match between the input plan file and the compare plan file. Fields in this selection file include HHOLD, PERSON, TOUR, TRIP, and PARTITION.