

32684843

=====

GENERAL PLANNING CONSULTANT

TECHNICAL MEMORANDUM 86.3.1:

DOCUMENTATION OF THE MEASURES
OF EFFECTIVENESS EVALUATION
PROGRAMS - UEVAL

=====

Prepared for:

Southern California Rapid Transit District

Prepared by:

Barton-Aschman Associates, Inc.

in association with

Schimpeler Corradino Associates, Inc.
The Cordoba Corporation
Myra L. Frank and Associates
Manuel Padron
The Planning Group, Inc.

June 1986

(revised October 1986)

MTA LIBRARY

TABLE OF CONTENTS

	<u>Page</u>
1. <u>SUMMARY</u>	1
2. <u>PROGRAMS</u>	2
3. <u>REPORTS</u>	3
4. <u>DETAILED PROGRAM DESCRIPTIONS</u>	4
4.1 EVAL14
4.2 EVAL2W5
4.3 EVAL2N6
4.4 EVAL37
4.5 EVAL4W9
4.6 EVAL4N	10
5. <u>USING EVAL1 AND EVAL3 TO CREATE A PROJECT DESCRIPTION</u>	12
6. <u>CALCULATING UMTA COST-EFFECTIVENESS INDICES</u>	13
6.1 USING EVAL2W AND EVAL2N TO CALCULATE "OLD" UMTA INDEX . . .	13
6.2 USING EVAL4W AND EVAL4N TO CALCULATE "NEW" UMTA INDEX . . .	13

APPENDICES

1. SUMMARY

UEVAL is a series of six UTPS compatible FORTRAN programs which report major effectiveness measures for a given transit alternative. These measures include bus and rail patronage, amounts of service provided, service utilization and efficiency, automobile utilization, capital and operating costs, and cost-effectiveness.

The programs are designed to complement the normal UTPS demand modeling chain. Numerous data sets which are created during the modeling chain are input data sets to one or more of the evaluation programs.

2. PROGRAMS

The six programs operate independently; most likely the user will choose to operate them in pairs. The function of each program is described below.

EVAL1 - This program computes and presents general information related to a specific alternative including travel and service characteristics, costs, revenues, and service efficiency.

EVAL3 - This program computes and presents automobile utilization measures related to a specific alternative. If requested by the user, this program will compare auto utilization to that for a TSM alternative.

EVAL2W, EVAL2N - These programs (W for work trips, N for non-work trips) calculate the travel time savings associated with a guideway alternative when compared to a TSM alternative. The results are used in the calculation of the old UMTA cost-effectiveness index.

EVAL4W, EVAL4N - These programs (W for work trips, N for non-work trips) calculate the user benefits associated with a guideway or TSM alternative when compared to a Do-nothing alternative. The results are used in the calculation of the new UMTA cost-effectiveness index.

3. REPORTS

Program EVAL1 produces eight reports listing various effectiveness measures, including a summary report.

Titles of these reports are:

- o Daily Regionwide Transit Patronage
- o RTD Rail Patronage
- o Bus Patronage
- o Total RTD Patronage
- o RTD Service
- o RTD Utilization and Efficiency
- o Capital Costs

Samples of these reports are included in Appendix A.

Program EVAL3 produces a single report listing automobile utilization measures. A sample of this report is included in Appendix B. The other four programs do not produce formal reports.

4. DETAILED PROGRAM DESCRIPTIONS

In this section, the purpose, job steps, input data sets, and user parameters for each of the six programs are discussed.

4.1 EVAL1

Purpose: This program obtains, calculates, and presents major effectiveness measures for a given transit alternative.

Job Steps: The program contains three job steps. The last one is the EVAL1 FORTRAN program. The other steps copy needed data sets from tapes to temporary disk storage.

Program Execution: The user must first identify and assemble all of the necessary input data sets and enter the names in the appropriate locations in the EVAL1 JCL. Then the user should decide which RSAs he/she wishes to include in the sub-regional trip summaries listed in the table labeled 'Daily Regionwide Transit Patronage.' The numbers corresponding to these RSAs must be included in the array R. The user should then define an 'alternative name' of up to six characters, and an 'alternative description' of up to 20 characters. EVAL1 is then executed as a stand-alone program.

Input Data Sets: Since the program obtains and reports a wide variety of information, many input data sets are required:

- FT01F001 - Alternative-Specific Input Data Set. This data set must contain total and annualized capital costs and annual local capital funding for the alternative being evaluated. This data set must be assembled by the user. Its format and content are shown in Appendix C. DSN=MRP.MYEARALT.ALTSPEC
- FT02F001 - URAP Output File. This data set contains bus and rail service and utilization data for the alternative being evaluated. It is the output of the URAP program. DSN=MRP.MYEARALT.URAPOUT
- FT03F001 - BUSCOST Output File. This data set contains operating and maintenance costs for the alternative being evaluated. It must be assembled by the user. Its format and content are shown in Appendix D. DSN=MRP.MYEARALT.BUSCOST
- FT04F001 - Revenue Calculator Program Output File. This data set contains operating revenues for the alternative being evaluated. It must be assembled by the user. Its format and content are shown in Appendix E. DSN=MRP.MYEARALT.REVENUE

- FT09F001 - User-Specified File With Rail Data (Optional). This data set contains information on the rail peak load point and rail station activity. It is assembled by the user with the printout from Mode of Arrival and UPRAS. It is discussed in Appendix F. DSN=MRP.MYEARALT.RAIL.DATA
- FT11F001 - Work Transit Trip Tables for the Alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT14
- FT12F001 - Work Person Trip Table (UTPS).
- FT13F001 - Nonwork Transit Trip Tables for the Alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT12
- FT15F001 - Merged Work Transit Skims for the Alternative being evaluated (UTPS). DSN=MRP.MYEARALT.AM17
- FT16F001 - Merged Nonwork Transit Skims for the Alternative being evaluated (UTPS). DSN=MRP.MYEARALT.MOY5
- FT22F001 - Names of Regional Statistical Areas (RSAs). Data set MRP.RSA.NAMES can be used.
- FT23F001 - Names of Rail Stations. Data set MRP.RAIL.STATION.NAMES can be used.
- FT24F001 - Zone to RSA Equivalence File. Data set MRP.ZONE.TO.RSA.EQUIVS can be used.

User Parameters: A few input parameters must be specified by the user. These are included in an &INPUT card at the end of the program:

<u>Key Word</u>	<u>Explanation</u>
R	- This array of up to 10 values, representing the RSA numbers requested for sub-regional trip end summaries.
ALTNM	- Alternative Name. Dimensioned A4, A2.
DESCR	- Alternative Description. Dimensioned 5A4.
FILE9	- Has FT09 been specified? 1=Yes, 0=No (Default=0).

4.2 EVAL2W

Purpose: This program calculates the travel time savings associated with a guideway alternative when compared to a TSM alternative. The change in ridership is also calculated. EVAL2W calculates these values for work trips only. The results are used in the calculation of the old UMTA cost-effectiveness index.

Job Steps: The program contains three job steps. The last one is the EVAL2W FORTRAN program. The other steps copy needed data sets from tapes to temporary disk storage.

Program Execution: The user must first identify the necessary input data sets and enter the names in the appropriate locations in the JCL. The user should then define guideway and TSM 'alternative names' of up to six characters, and 'alternative descriptions' of up to 20 characters. EVAL2W is then executed as a stand-alone program.

Input Data Sets: The following input data sets are used by the program:

FT11F001 - Merged Work Transit Skims for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.AM17

FT12F001 - Merged Work Transit Skims for the TSM alternative (UTPS). DSN=MRP.MYEARALT.AM17

FT13F001 - Work Transit Trip Tables for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT14

FT14F001 - Work Transit Trip Tables for the TSM alternative (UTPS). DSN=MRP.MYEARALT.TT14

User Parameters: A few input parameters must be specified by the user. These are included in an &INPUT card at the end of the program.

<u>Key Word</u>	<u>Explanation</u>
ALTNM	- Alternative Name. Dimensioned A4, A2.
ALTDES	- Alternative Description. Dimensioned 5A4.
TSMNM	- TSM Alternative Name. Dimensioned A4, A2.
TSMDES	- TSM Alternative Description. Dimensioned 5A4.
TVAL	- Value of work trip travel time in dollars. Default = 4.00
DOLYR	- Year of dollars for travel time. Default = 1984

4.3

EVAL2N

Purpose: This program calculates the travel time savings associated with a guideway alternative when compared to a TSM alternative. The change in ridership is also calculated. EVAL2N calculates these values for non-work trips only. The results are used in the calculation of the old UMTA cost-effectiveness index.

Job Steps: The program contains three job steps. The last one is the EVAL2N FORTRAN program. The other steps copy needed data sets from tapes to temporary disk storage.

Program Execution: The user must first identify the necessary input data sets and enter the names in the appropriate locations in the JCL. The user should then define guideway and TSM 'alternative names' of up to six characters, and 'alternative descriptions' of up to 20 characters. EVAL2N is then executed as a stand-alone program.

Input data Sets: The following input data sets are used by the program:

FT11F001 - Merged Nonwork Transit Skims for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.MDY5

FT12F001 - Merged Nonwork Transit Skims for the TSM alternative (UTPS). DSN=MRP.MYEARALT.MDY5

FT13F001 - Nonwork Transit Trip Tables for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT12

FT14F001 - Nonwork Transit Trip Tables for the TSM alternative (UTPS). DSN=MRP.MYEARALT.TT12

User Parameters: A few input parameters must be specified by the user. These are included in an &INPUT card at the end of the program.

<u>Key Word</u>	<u>Explanation</u>
ALTNM	- Alternative Name. Dimensioned A4, A2.
ALTDDES	- Alternative Description. Dimensioned 5A4.
TSMNM	- TSM Alternative Name. Dimensioned A4, A2.
TSMDES	- TSM Alternative Description. Dimensioned 5A4.
TVAL	- Value of work trip travel time in dollars. Default = 4.00. The value of nonwork trip travel time is assumed to be half the value of work trip travel time.
DOLYR	- Year of dollars for travel time. Default = 1984

4.4 EVAL3

Purpose: This program calculates and presents automobile utilization measures for a given transit alternative. It will also compute diverted automobile travel in comparison with a TSM alternative if requested by the user.

Job Steps: The program contains up to five job steps. The last one is the EVAL3 FORTRAN program. The other steps copy needed data sets from tapes to temporary disk storage. One copy step is used if there is no second alternative for comparison. If there is a second alternative for comparison, a total of four copy steps are used if the highway skims for the two alternatives are different, three copy steps if the highway skims are the same.

Program Execution: The user must first determine if a comparison to a TSM alternative is to be made. If a comparison is to be made, the user must then determine if the two alternatives have the same or different highway skims. Then the user must identify the necessary input data sets and enter the names in the appropriate locations in the EVAL3 JCL. Finally the user should then define the guideway and TSM 'alternative names' of up to six characters, and 'alternative descriptions' of up to 20 characters, and enter the necessary user parameters. EVAL3 is then executed as a stand-alone program.

Input Data Sets: The following input data sets are used by the program:

- FT01F001 - 'A' deck for the alternative being evaluated. This data set contains the highway network access times and distances.
- FT02F001 - 'A' deck for the TSM alternative. If no comparison is being made, this data set should not be defined.
- FT11F001 - Work Transit Trip Tables for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT14
- FT12F001 - Nonwork Transit Trip Tables for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT12
- FT13F001 - Highway Skims for the alternative being evaluated (UTPS).
- FT14F001 - Work Transit Trip Tables for the TSM alternative. If no comparison is being made, this data set should not be defined (UTPS). DSN=MRP.MYEARALT.TT14
- FT15F001 - Nonwork Transit Trip Tables for the TSM alternative. If no comparison is being made, this data set should not be defined (UTPS). DSN=MRP.MYEARALT.TT12
- FT16F001 - Highway Skims for the TSM alternative. If no comparison is being made, or if these skims are the same as those for the alternative being evaluated, this data set should not be defined (UTPS).
- FT24F001 - Zone to RSA Equivalence File. Data set MRP.ZONE.TO.RSA.EQUIVS can be used.

User Parameters: A few input parameters must be specified by the user. These are included in an &INPUT card at the end of the program:

<u>Key Word</u>	<u>Explanation</u>
COMPAR	- This is the comparison switch. 'Y' indicates that there is an alternative to be compared to.
GWYNM	- Alternative Name. Dimensioned A4, A2.
GWYDES	- Alternative Description. Dimensioned 5A4.
TSMNM	- TSM Alternative Name. Dimensioned A4, A2.
TSMDES	- TSM Alternative Description. Dimensioned 5A4.
NSKIMS	- Number of highway skim data sets specified by user (1 or 2).

4.5 EVAL4W

Purpose: This program calculates user benefits associated with a given guideway of TSM alternative when compared with a Do-Nothing alternative. EVAL4W calculates benefits for work trips only. The result is used in the calculation of the new UMTA cost-effectiveness index.

Job Steps: The program contains five job steps. The last one is the EVAL4W FORTRAN program. The other steps copy needed data sets from tapes to temporary disk storage.

Program Execution: The user must first identify the necessary input data sets and enter the names in the appropriate locations in the JCL. The user should then define the appropriate 'alternative names' of up to six characters, and 'alternative descriptions' of up to 20 characters. EVAL4W is then executed as a stand-alone program.

Input Data Sets: The following input data sets are used by the program:

- FT11F001 - Merged Work Transit Skims for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.AM17
- FT12F001 - Merged Work Transit Skims for the Do-Nothing alternative (UTPS). DSN=MRP.MYEARALT.AM17
- FT13F001 - Work Transit Trip Tables for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT14
- FT14F001 - Work Transit Trip Tables for the Do-Nothing Alternative (UTPS). DSN=MRP.MYEARALT.TT14

FT15F001 - Work Transit Fares for the alternative being evaluated (UTPS). DSN=MRP.AMFARE.MYEARALT

FT16F001 - Work Transit Fares for the Do-Nothing alternative (UTPS). DSN=MRP.AMFARE.MYEARALT

User Parameters: A few input parameters must be specified by the user. These are included in an &INPUT card at the end of the program.

<u>Key Word</u>	<u>Explanation</u>
ALTNM	- Alternative Name. Dimensioned A4, A2.
ALTDES	- Alternative Description. Dimensioned 5A4.
DNNM	- Do-Nothing Alternative Name. Dimensioned A4, A2.
DNDES	- Do-Nothing Alternative Description. Dimensioned 5A4.
TVAL	- Value of work trip travel time in dollars. Default=4.00
AINFL	- Inflation factor for converting input fares to the same year dollars as the value of time for alternative being evaluated.
DINFL	- Inflation factor for converting input fares to the same year dollars as the value of time for do-nothing alternative.
DOLYR	- Year of dollars for the value of time. Default=1984.

4.6 EVAL4N

Purpose: This program calculates user benefits associated with a given guideway or TSM alternative when compared with a Do-Nothing alternative. EVAL4N calculates benefits for non-work trips only. The result is used in the calculation of the new UMTA cost-effectiveness index.

Job Steps: The program contains five job steps. The last one is the EVAL4N FORTRAN program. The other steps copy needed data sets from tapes to temporary disk storage.

Program Execution: The user must first identify the necessary input data sets and enter the names in the appropriate locations in the JCL. The user should then define the appropriate 'alternative names' of up to six characters, and 'alternative descriptions' of up to 20 characters. EVAL4N is then executed as a stand-alone program.

Input Data Sets: The following input data sets are used by the program:

- FT11FD01 - Merged Nonwork Transit Skims for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.MDY5
- FT12F001 - Merged Nonwork Transit Skims for the Do-Nothing alternative (UTPS). DSN=MRP.MYEARALT.MDY5
- FT13F001 - Nonwork Transit Trip Tables for the alternative being evaluated (UTPS). DSN=MRP.MYEARALT.TT12
- FT14F001 - Nonwork Transit Trip Tables for the Do-Nothing alternative (UTPS). DSN=MRP.MYEARALT.TT12
- FT15F001 - Nonwork Transit Fares for the alternative being evaluated (UTPS). DSN=MRP.MDFARE.MYEARALT
- FT16F001 - Nonwork Transit Fares for the Do-Nothing alternative (UTPS). DSN=MRP.MDFARE.MYEARALT

User Parameters: A few input parameters must be specified by the user. These are included in an &INPUT card at the end of the program.

<u>Key Word</u>	<u>Explanation</u>
ALTNM	- Alternative Name. Dimensioned A4, A2.
ALTDES	- Alternative Description. Dimensioned 5A4.
DNNM	- Do-Nothing Alternative Name. Dimensioned A4, A2.
DNDES	- Do-Nothing Alternative Description. Dimensioned 5A4.
TVAL	- Value of work trip travel time in dollars. Default=4.00. The value of nonwork trip travel time is assumed to be half the value of work trip travel time.
AINFL	- Inflation factor for converting input fares to the same year dollars as the value of time for alternative being evaluated.
DINFL	- Inflation factor for converting input fares to the same year dollars as the value of time for do-nothing alternative.
DOLYR	- Year of dollars for the value of time. Default=1984.

5. USING EVAL1 AND EVAL3 TO CREATE A PROJECT DESCRIPTION

By combining the output of programs EVAL1 and EVAL3 for a given transit alternative, the user creates a nine-page description of an alternative's merits. Descriptions for various alternatives can then be reviewed by decision-makers for use in their evaluations.

6. CALCULATING UMTA COST-EFFECTIVENESS INDICES

Programs EVAL2W, EVAL2N, and EVAL4W, and EVAL4N provide the patronage data needed in the calculation of the UMTA indices. Financial information is also necessary. The procedure for computing the necessary patronage data is described below.

6.1 USING EVAL2W AND EVAL2N TO CALCULATE "OLD" UMTA INDEX

Define: Guideway Alternative
TSM Alternative

- 1: Run EVAL2W comparing Guideway and TSM alternatives.
Results - Annual value of time savings (work)
Annual delta riders (work)
- 2: Run EVAL2N comparing Guideway and TSM alternatives.
Results - Annual value of time savings (nonwork)
Annual delta riders (nonwork)
- 3: Calculate inputs to formula.
 $\$TT = \text{Annual value of time savings (work)} + \text{Annual value of time savings (nonwork)}.$

$RIDERS = \text{Annual delta riders (work)} + \text{Annual delta riders (nonwork)}.$

Note that if the guideway alternative is superior to the TSM alternative, the values of time savings will be negative.

6.2 USING EVAL4W AND EVAL4N TO CALCULATE "NEW" UMTA INDEX

Define: Guideway Alternative
TSM Alternative
Do-Nothing Alternative

- 1: Run EVAL4W comparing Guideway and Do-Nothing alternatives.
Result - Annual user benefits (Guideway, work)
- 2: Run EVAL4N comparing Guideway and Do-Nothing alternatives.
Result - Annual user benefits (Guideway, nonwork).
3. Run EVAL4W comparing TSM and Do-Nothing alternatives.
Result - Annual user benefits (TSM, work)
4. Run EVAL4N comparing TSM and Do-Nothing alternatives
Result - Annual user benefits (TSM, nonwork)
5. Calculate input to formula.

$$\Delta \text{ USER BENEFITS} = [\text{Annual user benefits (Guideway, work)} + \text{Annual user benefits (Guideway, nonwork)}] - [\text{Annual user benefits (TSM, work)} + \text{Annual user benefits (TSM, nonwork)}]$$

APPENDIX A

EVAL1 Sample Reports

SUMMARY RESULTS

ALTERNATIVE NAME ALT H DESCRIPTION WESTERN/HOL/PICO H

TOTAL TRANSIT TRIPS	1669486	(3.34%)
WORK TRANSIT TRIPS	580651	(6.29%)
NON-WORK TRANSIT TRIPS	1088835	(2.67%)
DAILY TRANSIT REVENUE	\$ 753804.25	
AVG. TRANSIT FARE PER LINKED TRIP	\$ 0.45	

DAILY RTD RAIL BOARDINGS	260706
RTD RAIL REVENUE	\$ 8503.80
AVERAGE RAIL FARE	\$ 0.03

DAILY RTD BUS BOARDINGS	1247616
EXPRESS BUS BOARDINGS	259528
LOCAL BUS BOARDINGS	988088
RTD BUS REVENUES	\$ 611293.06
AVG. BUS FARE PER BOARDING	\$ 0.49

TOTAL RTD BOARDINGS	1508322
TOTAL RTD REVENUE	\$ 619796.81
AVG. FARE/BOARDING	\$ 0.41

RTD BUSES	PEAK	1907	OFF-PEAK	1089
-----------	------	------	----------	------

RTD OPERATING COST	BUS	\$4592411.00
	RAIL	\$ 502482.00
	TOTAL	\$5094893.00

RTD OPERATING COST/BOARDING	BUS	\$ 3.68
	RAIL	\$ 1.93
	TOTAL	\$ 3.38

RTD OPERATING RATIO	BUS	0.13
	RAIL	0.02
	TOTAL	0.12

OPERATING SUBSIDY/BOARDING	BUS	\$ 3.19
	RAIL	\$ 1.89
	TOTAL	\$ 2.97

DAILY REGIONWIDE TRANSIT PATRONAGE

ALTERNATIVE NAME ALT H DESCRIPTION WESTERN/HOL/PICO H

	WORK	NON-WORK	TOTAL
PERSON TRIPS	9236240	40773584	50009824
TRANSIT TRIPS	580651	1088835	1669486
TRANSIT MODE SPLIT	(6.29%)	(2.67%)	(3.34%)

SUB-REGIONAL MODE SPLIT

RSA	LOCATION	TRIP END	WORK TRANSIT TRIPS	MODE SPLIT	NON-WORK TRANSIT TRIPS	MODE SPLIT
16	SANTA MONICA	P	24409	10.13%	57047	5.49%
16	SANTA MONICA	A	18163	8.27%	35161	3.34%
23	LA CBD	P	35395	52.18%	105859	16.70%
23	LA CBD	A	151101	35.73%	434832	36.25%
25	SAN GAB VALLEY	P	42558	8.71%	50350	2.38%
25	SAN GAB VALLEY	A	25347	5.83%	18769	0.95%
40	LAGUNA	P	1068	0.41%	2840	0.30%
40	LAGUNA	A	666	0.49%	2371	0.24%

WALK-TO-TRANSIT MODE SPLIT (WORK TRIPS)

RSA	LOCATION	TRIP END	WALK-TO-TRANSIT TRIPS	MODE SPLIT
16	SANTA MONICA	P	22561	9.36%
23	LA CBD	P	33685	49.66%
25	SAN GAB VALLEY	P	25578	5.23%
40	LAGUNA	P	1068	0.41%

AVERAGE TRIP LENGTH PER LINKED TRIP (WORK) 45.76 MINUTES

AVERAGE TRIP LENGTH PER LINKED TRIP (NON-WORK) 44.22 MINUTES

AVERAGE TRIP LENGTH PER LINKED TRIP (ALL) 44.76 MINUTES

REGIONAL TRANSIT TRIP ENDS 3338972
CORE AREA TRANSIT TRIP ENDS 727187

DAILY TRANSIT REVENUE \$ 753804.25
AVERAGE TRANSIT FARE PER LINKED TRIP \$ 0.45

RTD RAIL PATRONAGE

ALTERNATIVE NAME ALT H DESCRIPTION WESTERN/HOL/PICO H

DAILY BOARDINGS 260706

PEAK HOUR PEAK LOAD: UNION STATION 2500
CIVIC CENTER

MOST UTILIZED STATIONS:

NAME	DAILY ARRIVALS	PEAK HOUR ARRIVALS
WILSHIRE/FAIRFAX	3000	1700
CIVIC CENTER	2800	98
WILSHIRE/ALVARADO	2000	1900
	2400	1846

DAILY RAIL REVENUE \$ 8503.80

AVERAGE RAIL FARE \$ 0.03

AVERAGE TRIP LENGTH PER BOARDING 4.46 MILES
9.17 MINUTES

BUS PATRONAGE

ALTERNATIVE NAME ALT H

DESCRIPTION WESTERN/HOL/PICO H

	RTD LOCAL	RTD EXPRESS	RTD TOTAL	ALL BUSES
DAILY BOARDINGS	988088	259528	1247616	1528737
DAILY REVENUE			\$ 611293.06	\$ 745300.44
AVERAGE FARE PER BOARDING			\$ 0.49	\$ 0.49
AVG. TRIP LENGTH				
PER BOARDING: MILES	4.33	7.63	5.02	4.96
MINUTES	19.11	18.60	19.00	18.91

TOTAL RTD PATRONAGE

ALTERNATIVE NAME ALT H DESCRIPTION WESTERN/HOL/PICO H

DAILY BOARDINGS:	LOCAL BUS	988088
	EXPRESS BUS	259528
	RAIL	260706
	TOTAL	1508322

DAILY REVENUE \$ 619796.81

AVG. FARE PER PASSENGER BOARDING \$ 0.41

AVERAGE TRIP LENGTH
PER PASSENGER BOARDING 4.92 MILES
17.30 MINUTES

RTD SERVICE

ALTERNATIVE NAME ALT H DESCRIPTION WESTERN/HOL/PICO H

	LOCAL BUS	EXPRESS BUS	ALL BUS	RAIL
PEAK VEHICLES	1354	553	1907	16
OFF-PEAK VEHICLES	965	124	1089	6
NUMBER OF ROUTES	222	64	286	2
ROUTE-MILES	6549	2292	8841	46
DAILY REV. VEHICLE MILES	216603	90312	306915	4258
DAILY REV. VEHICLE HOURS	18739	4682	23421	162
REV. VEHICLE MILES/VEHICLE	159.97	163.31	160.94	266.12
REV. VEHICLE HOURS/VEHICLE	13.84	8.47	12.28	10.13
VEHICLE MILES/VEHICLE HOUR	11.56	19.29	13.10	26.28

RTD UTILIZATION AND EFFICIENCY

ALTERNATIVE NAME	ALT	H	DESCRIPTION	WESTERN	HQ/L	PICO	H	
				LOCAL	EXPRESS	ALL		
				BUS	BUS	BUS	RAIL	
							TOTAL	
BOARDINGS PER VEH. MILE				4.56	2.87	4.07	61.23	4.85
BOARDINGS PER VEH. HOUR				52.73	55.43	53.27	1609.30	63.96
BOARDINGS PER PEAK VEHICLE				729.75	469.31	654.23	16294.12	
OPERATING COST				\$3857460.	\$734951.	\$4592411.	\$502482.	\$5094893.
OPERATING COST/BOARDING				\$ 3.90\$	2.83\$	3.68\$	1.93\$	3.38
OPERATING SUBSIDY/BOARDING					\$	3.19\$	1.89\$	2.97
OPERATING RATIO						0.1331	0.0169	0.1217

CAPITAL COSTS

ALTERNATIVE NAME ALT H	DESCRIPTION WESTERN/HOL/PICO H	TOTAL	ANNUALIZED
	RAIL CAPITAL COSTS	\$ 1174899970.	\$ 124632512.
	INITIAL BUS EXPANSION COSTS	\$ 12600000.0	\$ 1849218.00
	OTHER BUS CAPITAL COSTS	\$ 0.0	\$ 0.0
	BUS REPLACEMENT COSTS	\$ 344100096.	\$ 50501264.0
	OTHER CAPITAL COSTS	\$ 0.0	\$ 0.0
	ALL CAPITAL COSTS	\$ 1531600130.	\$ 176982976.
	LOCAL CAPITAL FUNDING		\$ 52970016.

SINOFF 6400 (WARNING): PROGRAM NAME EVAL1 NOT FOUND IN LOG FILE.

SINOFF 6700 (INFORMATION): EVAL1 ENDED AT 12.04.07 (RETURN CODE= 0)

APPENDIX B

EVAL3 Sample Report

AUTOMOBILE UTILIZATION

GUIDEWAY ALT. NAME ALT H DESCRIPTION WESTERN/HOL/PICO H

DAILY AUTOMOBILE PERSON TRIPS 48340320

DAILY AUTO VMT 234743040

DAILY AUTO VHT 7239005

DAILY AUTO PERSON-MILES OF TRAVEL 348305408

CORE AREA AUTO PERSON TRIP ENDS 1597155

CORE AREA AUTO VEHICLE TRIP ENDS 936533

WHEN COMPARED TO ALT A3, VERMONT/PICO ALT A3

DIVERTED AUTOMOBILE PERSON TRIPS 11024

DIVERTED AUTO VMT 52672

DIVERTED CORE AREA AUTO VEHICLE TRIP ENDS 483

APPENDIX C

Program EVAL1: FT01F001

Alternative-Specific Input Data Set

Alternative-Specific Input Data Set

<u>Variable</u>	<u>Description</u>
RLCCT	Total Rail Capital Costs
RLCCA	Annualized Rail Capital Costs
IBECT	Total Initial Bus Expansion Costs
IBECA	Annualized Initial Bus Expansion Costs
OBCCT	Total Other Bus Capital Costs
OBCCA	Annualized Other Bus Capital Costs
BRCT	Total Bus Replacement Costs
BRCA	Annualized Bus Replacement Costs
OCCT	Total Other Capital Costs
OCCA	Annualized Other Capital Costs
ACCT	Total of All Capital Costs
ACCA	Annualized Total Capital Cost
LCFNDA	Annual Local Capital Funding

COMMAND ==>

SCROLL ==> 0019

	10	20	30	40	50	
				TOP	OF	DATA
RLCCT	1174900000.00	RLCCA		124632508.77		00000100
IBECT	12600000.00	IBECA		1849217.77		00000200
OBECT		0.00	OBCCA		0.00	00000300
BRCT	344100000.00	BRCCA		50501256.73		00000400
OCCT		0.00	OCCCA		0.00	00000500
ACCT	1531600000.00	ACCCA		176982983.27		00000600
LCFNDA	52970021.43					00000700

***** BOTTOM OF DATA *****

Format for Read : 10X,F15.2, 10X,F15.2

APPENDIX D

Program EVAL1: FT03F001

Bus Cost Output Data Set

Bus Cost Output Data Set

<u>Variable</u>	<u>Description</u>
OPCOST(1)	Daily RTD Local Bus Operating Cost
OPCOST(2)	Daily RTD Express Bus Operating Cost
OPCOST(3)	Daily RTD Bus Operating Cost
OPCOST(4)	Daily RTD Rail Operating Cost
OPCOST(5)	Daily RTD Operating Cost
ANNOMC	Annual RTD Operating Cost

BROWSE - MRF.TEST.BUSCOST.OUTPUT----- LINE 000000 COL 001 080

COMMAND ==>

SCROLL ==> 0019

*****10|*****20|***** TOP OF DATA *****

OPCOST(1)	3857460	00000100
OPCOST(2)	734951	00000200
OPCOST(3)	4592411	00000300
OPCOST(4)	502482	00000400
OPCOST(5)	5094893	00000500
ANNONC	1482359400	00000600

***** BOTTOM OF DATA *****

Format for Read : 10X, F10.0

APPENDIX E

Program EVAL1: FT04F001

Revenue Program Output Data Set

Revenue Program Output Data Set

<u>Variable</u>	<u>Description</u>
TRNREV	Daily Regional Transit Revenue
RLREV	Daily RTD Rail Revenue
BUSREV(3)	Daily RTD Bus Revenue
BUSREV(4)	Daily Regional Bus Revenue

BROWSE - MRP.TEST.REVENUE.OUTPUT----- LINE 000000 COL 001 080

COMMAND ==> SCROLL ==> 0019

***** TOP OF DATA *****

TRENREV	753804.25	00000100
RLREV	8503.80	00000200
BUSREV(3)	611293.05	00000300
BUSREV(4)	745300.45	00000400

***** BOTTOM OF DATA *****

Format for Read : 10X, F15.2

APPENDIX F

Program EVAL1: FT09F001

User-Specified File With Rail Data (Optional)

User-Specified File With Rail Data (Optional)

The information needed for this file must be obtained by the user from the results of transit assignment and mode-of-arrival. The first three items are determined by review of the peak hour assignment for the rail lines. The remaining items are determined by review of the daily and a.m. peak hour demand from mode-of-arrival.

<u>Variable</u>	<u>Description</u>
ANODE	From-node for the a.m. peak hour peak load rail link. If multiple lines run on certain links, the respective volumes should be summed to determine which link carries the peak load.
BNODE	To-node for the a.m. peak hour peak load rail link.
VOLUME	The a.m. peak hour volume on the a.m. peak hour peak load rail link.
STN1	The node number of the rail station with the most daily station arrivals for rail trips.
DBRD1	The volume of daily station arrivals for rail trips at STN1.
PBRD1	The volume of a.m. peak hour station arrivals for rail trips at STN1.
STN2	The node number of the rail station with the second most daily station arrivals for rail trips.
DBRD2	The volume of daily station arrivals for rail trips at STN2.
PBRD2	The volume of a.m. peak hour station arrivals for rail trips at STN2.
STN3	The node number of the rail station with the most a.m. peak hour station arrivals for rail trips, excluding STN1 and STN2.
DBRD3	The volume of daily station arrivals for rail trips at STN3.
PBRD3	The volume of a.m. peak hour station arrivals for rail trips at STN3.
STN4	The node number of the rail station with the second most a.m. peak hour station arrivals for rail trips, excluding STN1 and STN2.
DBRD4	The volume of daily station arrivals for rail trips at STN4.
PBRD4	The volume of a.m. peak hour station arrivals for rail trips at STN4.

```

BROWSE - MFP.TEST.RAIL.DATA----- LINE 000000 COL 001 080
COMMAND ==> SCROLL ==> 0019
*****10j*****20j*****30j*****40j*****50j*****
ANODE      8000                                00000100
ENODE      8001                                00000200
VOLUME     2500                                00000300
STN1       8005 DBRD1      3000PBRD1      1700      00000400
STN2       8012 DBRD2      2800PBRD1         98      00000500
STN3       8001 DBRD3      2000PBRD3      1900      00000600
STN4       8006 DBRD4      2400PBRD4      1846      00000700
*****BOTTOM OF DATA*****

```

Format for Read:

- Lines 1 and 2 - 10X, I4
- Line 3 - 10X, F10.0
- Lines 4 thru 7 - 10X, I4, 6X, I10, 5X, I10