ARIZONA DEPARTMENT OF TRANSPORTATION

REPORT NUMBER: FHWA / AZ 86/209

COMPARATIVE ASSESSMENT OF COMPUTER PROGRAMS FOR TRAFFIC SIGNAL PLANNING, DESIGN, AND OPERATIONS

Volume III
Recommended Software Output

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Federal Highway Administration

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16. ABSTRACT

The main goal of this study was to comparatively assess a group of selected computer programs for traffic signal planning, design, and operations. A comprehensive inventory was conducted and a detailed list of the currently available computer software was developed. A short description of individual software was provided, and a comparative processor software, and network software. The final recommendation of software included seven programs for isolated intersections, three preprocessor software, and five network software.

Volume 1 Study Approach, Analysis and Recommendations
Volume 2 Software Descriptions
Volume 3 Recommended Software Output

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Volume 1: Study Approach, Analysis, and Recommendations

TABLE OF CONTENTS

	Page Number
EXECUTIVE SUMMARY	1
INTRODUCTION	3
BACKGROUND INFORMATION	5
STUDY OBJECTIVES	7
SOFTWARE INVENTORY	11
SOFTWARE SELECTION	15
SOFTWARE DESCRIPTION	17
NETWORK DESCRIPTION	27
SOFTWARE COMPARATIVE ASSESSMENT	30
Isolated Intersection Software	31
Preprocessor Software Assessment	40
Network Software Assessment	42
Computer Execution Times	48
SUMMARY AND CONCLUSIONS	51
RECOMMENDATIONS FOR FURTHER RESEARCH	52
REFERENCES	54

LIST OF TABLES

Table Number	Description	Page Number
1	Isolated Intersection Inventory	12
2	Arterial Street Inventory	13
3	Grid Network Inventory	14
4	Traffic Volumes for the Broadway Network	29
5	Isolated Intersection Software Results for the Optimization Option	32
6	Isolated Intersection Software Results for the Design Option	34

Volume 1: Study Approach, Analysis, and Recommendations

LIST OF TABLES (continued)

Table Number	Description	Page Number
7	Isolated Intersection Software Results for the Analysis Option	35
8	Isolated Intersection Software Assessment	37
9	Preprocessor Software Assessment	41
10	Network Software Assessment	43
11	Logics and Measures of Effectiveness for Four Computer Software	45
12	Network Software Results for a Selected Signal Timing Plan	47
13	Comparison of Computer Execution Times for Mainframe, Supermini, and Microcomputers	50

LIST OF FIGURES

Figure Number	Description	Page Number
1	The Broadway Arterial Street Diagram	28

Volume 2: Software Description

TABLE OF CONTENTS

	Page Number
CAPCALC (Circular 212)	1
CAPCALC (1985 HCM)	5
CAPSSI	10
CMA	15
CMA/M	18

Volume 2: Software Description

TABLE OF CONTENTS (continued)

	Page Number
EZ-POSIT	20
ICAP	27
INTERCALC	33
SCA	39
SIAP & FREESIAP	42
SICA	48
SIGNAL	52
SIGNAL 85	57
SOAP 84	63
SOAP 84 (MICROCOMPUTER VERSION)	80
SOAP/M	81
TEXAS	83
EZ-PASSER	97
NOSTOP	101
PASSER II-80 & PASSLOAD	106
PASSER II (84)	111
PASSER II-84 Version 2.3B (MICROCOMPUTER VERSION)	127
SIGART AND TIMESPACE II	134
SPAN	139
TIMDIS II	141
MAXBAND	149
TW-BANDWIDTH (MICROCOMPUTER VERSION OF MAXBAND)	164
PASSER III	168
PASSER III (MICROCOMPUTER VERSION)	185
EDBAND	186
EZ-TRANSYT 1.2	190
NETSIM	195

Volume 2: Software Description

TABLE OF CONTENTS (continued)

	Page Number
NETSIM (MICROCOMPUTER VERSION)	214
PLATOON PROGRSSION DIAGRAM (PPD)	218
PRETRANSYT	224
SIGOP III	229
TW-SIGOP (MICROCOMPUTER VERSION OF SIGOP III)	250
SIGRID	251
TRANSYT-7F	257
TRANSYT-7F (MICROCOMPUTER VERSION)	269
REFERENCES	270

LIST OF TABLES

Table Number	Description	Page Number
1.	Levels of Service Ranges for CMA	26
2.	DATA INPUT SUMMARY OF ICAP	32
3.	Delay, Degree of Saturation, and Queue Clearance Logics of INTERCALC	37
4.	LANE GROUP CONFIGURATION TYPES OF SICA	51
5.	TEXAS Default Driver and Vehicle Characteristics	87
6.	NCHRP DELAY ESTIMATION EQUATION	118
7.	Normal Phasing Patterns	127
8.	Minimum Core Required by the Modules	153
9.	The Six Types of MAXBAND Input Cards	156
10.	LOS Criteria for MOE's on Signalized Movements used in PASSER III	181
11.	Input Phases Codes for Link Card of SIGOP III	235

Volume 2: Software Description

LIST OF FIGURES

Figure Number	Description	Page Number
1.	EZ-POSIT Optimization Process	22
2.	SOAP Phasing Code	67
3.	Schematic Layout of the PASSER II-84 Output	123
4.	Time-Space Diagram Terminologies of MAXBAND	160
5.	PASSER III Traffic Movements	172
6.	Three Basic Phases at Left-Side Intersection of Interchange	174
7.	Phase Sequences for Phasing Codes Used by PASSER III	175
8.	Development of Diamond Interchange Phasing Pattern and Phase Interval Chart from Phasing ABC:ABC and Offset	176
9.	UTCS-1 Vehicle Speed Profile	204
10.	SIGOP III Program Structure	232
11.	Illustrative Node Diagram Depicting Signal Phasing and Traffic Movements Serviced: Four Signal Phases	234
12.	Typical SIGOP III Network	238
13.	Flow Pattern of TRANSYT 7F	264

Volume 3: Recommended Software Output

TABLE OF CONTENTS

	Page Number
CAPCALC 85	1
SIGNAL 85	5
CAPCALC	16
EZ-POSIT	20
SIGNAL	21
SIAP	30
SOAP	39
PASSER II-84	46

Volume 3: Recommended Software Output

TABLE OF CONTENTS (continued)

	Page Number
TW-BANDWIDTH	55
NETSIM	62
TRANSYT-7F	78
TW-SIGOP	93

CAPCALC 85

ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT 3/3/86

BROADWAY mill2

INTERSECTION :
BROADWAY @
BROADWAY @
MILL @
MILL

CBD ? N

PRETIMED SIGNAL

TRAFFIC & ROADWAY CONDITIONS

APP	GRADE (%)	HV (%)	ADJ. PKG LN. Y/N	ADJ. PKG LN. Nm	BUSES (Nb)	PHF	CONF. PEDS (peds/hr)	PED BUTTON Y/N	PED BUTTON SEC	ARR TYPE
EB	0	5	N	0	0	0.69	0	N	8.0	3
WB	0	5	N	0	0	0.62	0	N	8.0	3
NB	0	5	N	0	0	0.82	0	N	8.0	3
SB	0	5	N	0	0	0.81	0	N	8.0	3

GEOMETRICS / VOLUMES

APP	VOLUME LT	VOLUME TH	VOLUME RT	LANE GROUPS 1 MVM	1 LNS	1 WD	2 MVM	2 LNS	2 WD	3 MVM	3 LNS	3 WD
EB	120	544	68	L	1	12.0	TR	3	36.0			
WB	80	900	99	L	1	12.0	TR	2	24.0			
NB	120	929	48	L	1	12.0	TR	2	24.0			
SB	80	398	130	L	1	12.0	TR	2	24.0			

SIGNAL PHASING

APP	PHASE	1ST MV	2ND MV	3RD MV	PROT	PMSV	G	Y+R
EB	1	L			L		0	0
	2	L	TR			LR	0	0
WB	1	L			L		0	0
	2	L	TR			LR	0	0
NB	3	L			L		0	0
	4	L	TR			LR	0	0
SB	3	L			L		0	0
	4	L	TR			LR	0	0

3/3/86 ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT
INTERSECTION mill2

```
                                N
                                |
                            W --+-- E
                                |
                                S

   SB TOTAL                    MILL                          ^   99
     608                    N/S STREET                       `-----
  |        |                                                          WB TOTAL
  |        |                                                  900      1079
 <.        `>                                               <-----
130   |     80     |              |              |
      |            |              |              |            80
      v            |              |              |          .-----
     398           |              |              |          v
                   |   2    1     |              |
                   |              |              |
                   |   |    |     |              |        BROADWAY
                   |   |    |     |              |       E/W STREET
                   |  <*   |     |              |
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            1 ---*

            3 --*>
                v
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  BROADWAY         |              |     |        |
 E/W STREET        |          |   |     |        |
                   |          |   |     |        |
                   |          |   1     2        |          929
                   |          |                  |           ^
                   |          |                  |           |
        120 ^      |          |                  |   120     |     48
        -----.                                   |  <.           .>
EB TOTAL                                         |   |           |
  732    544                                      |   |           |
        ----->                  MILL                                 NB TOTAL
                              N/S STREET                              1097
         68
        -----.
             v
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 ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT 3/3/86

BROADWAY mill2

INTERSECTION :
BROADWAY @
BROADWAY @
MILL @
MILL

CBD ? N

PRETIMED SIGNAL

V O L U M E A D J U S T M E N T

APPROACH	LANE MVM	GROUP VOLUME	FLOW RATE IN GROUP	LANE UTIL FACTOR	ADJ FLOW RATE	PROP OF TURNS LT	RT
EB	L	120	174	1.00	174	1.00	0.00
	TR	612	887	1.10	976	0.00	0.11
WB	L	80	129	1.00	129	1.00	0.00
	TR	999	1611	1.05	1692	0.00	0.10
NB	L	120	146	1.00	146	1.00	0.00
	TR	977	1191	1.05	1251	0.00	0.05
SB	L	80	99	1.00	99	1.00	0.00
	TR	528	652	1.05	685	0.00	0.25

S A T U R A T I O N F L O W

APP	MVM	IDEAL SAT FLOW	# OF LANES	ADJUSTMENT FACTORS WIDTH	H.V.	GRADE	PARK	BUS	AREA	RT	LT	ADJ. FLOW
EB	L	1700	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.95	1583
	TR	1700	3	1.00	0.98	1.00	1.00	1.00	1.00	0.98	1.00	4898
WB	L	1700	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.95	1583
	TR	1700	2	1.00	0.98	1.00	1.00	1.00	1.00	0.98	1.00	3265
NB	L	1700	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.95	1583
	TR	1700	2	1.00	0.98	1.00	1.00	1.00	1.00	0.99	1.00	3299
SB	L	1700	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.95	1583
	TR	1700	2	1.00	0.98	1.00	1.00	1.00	1.00	0.96	1.00	3199

BROADWAY

mill2

INTERSECTION :
BROADWAY @
BROADWAY @
MILL @
MILL

CBD ? N

PRETIMED SIGNAL

C A P A C I T Y A N A L Y S I S

APP	LN GR MVM	ADJ FLOW RATE	PMSV LT FLOW	ADJ SAT FLW RT	FLOW RATIO	CRIT ?	GREEN RATIO	LN GR CAPACITY	V/C RATIO
EB	L	94	80	1583	0.059	Y	0.075	119	0.790
	TR	976	0	4898	0.199	N	0.258	1265	0.772
WB	L	49	80	1583	0.031	N	0.075	119	0.412
	TR	1692	0	3265	0.518	Y	0.258	843	2.007
NB	L	66	80	1583	0.042	N	0.050	79	0.835
	TR	1251	0	3299	0.379	Y	0.500	1649	0.759
SB	L	19	80	1583	0.012	Y	0.050	79	0.241
	TR	685	0	3199	0.214	N	0.500	1599	0.428

CYCLE LENGTH : 120.0
LOSS TIME PER CYCLE : 12

SUM OF CRITICAL LANES' FLOW RATIOS : 0.968
INTERSECTION V/C : 1.076

L E V E L O F S E R V I C E

APP	LN GR MVM	V/C RATIO	GREEN RATIO	CYC LEN	1st DELAY	LN GR CAP	2nd DELAY	PF	LN GR DELAY	LN GR LOS	APP DELAY	APP LOS
EB	L	0.790	0.075	120	41.5	119	19.2	1.00	60.7	F		
	TR	0.772	0.258	120	31.3	1265	2.1	1.00	33.4	D	37.5	D
WB	L	0.412	0.075	120	40.3	119	1.3	1.00	41.6	E		
	TR	2.007	0.258	120	52.1	843	1416.5	1.00	1468.6	F	1366.8	F
NB	L	0.835	0.050	120	42.9	79	33.5	1.00	76.4	F		
	TR	0.759	0.500	120	18.4	1649	1.5	1.00	19.9	C	25.8	D
SB	L	0.241	0.050	120	41.7	79	0.3	1.00	42.0	E		
	TR	0.428	0.500	120	14.5	1599	0.1	1.00	14.6	B	18.0	C

INTERSECTION DELAY : 501.1 secs/veh
LEVEL OF SERVICE : F

SIGNAL 85

SIGNAL85/TEAPAC - SUMMARY OF PARAMETER VALUES

INTERSECTION PARAMETERS

INTERSECTION	1	MILL
METROAREA	FRINGE	
POPULATION	100	
TYPE	1	
PEDTIME	.0	
ANGLE	90	

APPROACH PARAMETERS

APPLABELS	N	E	S	W
PEAKHOURFACTORS	.81	.70	.82	.70
PARKINGSIDES	NONE	NONE	NONE	NONE
BUSVOLUMES	0	0	0	0
BUSSTOPS	NONE	NONE	NONE	NONE
PEDLEVELS	LO	LO	LO	LO
PERMISSIVES	NO	NO	NO	NO
OVERLAPS	YES	YES	YES	YES
DIRECTIONS	APPR	APPR	APPR	APPR
EXITS	.0	.0	.0	.0
MEDIANS	.0	.0	.0	.0

MOVEMENT PARAMETERS

MOVLABELS	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
VOLUMES	130	398	80	99	900	80	48	929	120	68	544	120
WIDTHS	.0	24.0	12.0	.0	24.0	12.0	.0	24.0	12.0	.0	36.0	12.0
LANES	0	2	1	0	2	1	0	2	1	0	3	1
CHANNELIZATIONS	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO	LO
TRUCKPERCENTS	.0	5.0	5.0	.0	5.0	5.0	.0	5.0	5.0	.0	5.0	5.0
REQCLEARANCES	.0	3.0	3.0	.0	3.0	3.0	.0	3.0	3.0	.0	3.0	3.0
MINIMUMS	.0	8.0	8.0	.0	8.0	8.0	.0	8.0	8.0	.0	8.0	8.0
MAXIMUMS	120	120	120	120	120	120	120	120	120	120	120	120
CAPACITIES	0	3400	1700	0	3400	1700	0	3400	1700	0	5100	1700
FACTORS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DELAYFACTORS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NSTOPFACTORS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

ANALYSIS PARAMETERS

GREENTIMES	5.00	3.00	29.00	5.00	3.00	33.00
YELLOWTIMES	2.00	1.00	3.00	2.00	1.00	3.00
CRITICAL	0	0	0	0	0	0

DESIGN PARAMETERS

LEVELOFSERVICE	E	E										
CYCLES	60	120	5									
SEQUENCES	ALL											
EXCESS	0	0	0	0	0	0	0	0	0	0	0	0

-->

SIGNAL85/TEAPAC - INPUT WORKSHEET

Intersection: MILL Area Type: FRINGE

	N			E			S			W		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
VOLUMES	130	398	80	99	900	80	48	929	120	68	544	120
WIDTHS	.0	24.0	12.0	.0	24.0	12.0	.0	24.0	12.0	.0	36.0	12.0
LANES	0	2	1	0	2	1	0	2	1	0	3	1

Appr	Grade	%HV	Adj-Pkg	Buses	PHF	Conf-Peds	Ped-Button	Arr-Type
N	.0	3.9	NO 0	0	.81	0-LO	N 0	3
E	.0	4.5	NO 0	0	.70	0-LO	N 0	3
S	.0	4.8	NO 0	0	.82	0-LO	N 0	3
W	.0	4.5	NO 0	0	.70	0-LO	N 0	3

SEQUENCE 66 (LD/LD)

```
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
!     +     !           ! + +       !           !           !       A   !
!     +     !           ! + +       !           !           !       ++++!
!     +>    !           !<+ +       !           !           !      <++++!
!           !           !   V       !   A   ++++!   A       !           !
!           !       A   !       A   !++++   V   !++++       !           !
!    <+     !    <+ + +>!       + +>!           !++++>      !++++>      !
!     +     !     + + + !       + + !           !++++       !++++       !
!     +     !     + + + !       + + !           !   V       !   V       !
! G/C= .056 ! G/C= .033 ! G/C= .322 ! G/C= .056 ! G/C= .033 ! G/C= .367 !
! G=  5.0 " ! G=  3.0 " ! G= 29.0 " ! G=  5.0 " ! G=  3.0 " ! G= 33.0 " !
! Y=  2.0 " ! Y=  1.0 " ! Y=  3.0 " ! Y=  2.0 " ! Y=  1.0 " ! Y=  3.0 " !
```

C= 90 SEC G= 78.0 SEC = 86.7% Y=12.0 SEC = 13.3% PED= .0 SEC = .0%

SIGNAL85/TEAPAC - VOLUME ADJUSTMENT WORKSHEET

Mvmt	Vol	PHF	Rate	Group	Rate	Lanes	Utiliz	Flow	Plt	Prt
N-RT	130	.81	160	-	0	0	1.00	0	.00	.00
N-TH	398	.81	491	-	652	2	1.00	652	.00	.25
N-LT	80	.81	99	-	99	1	1.00	99	1.00	.00
E-RT	99	.70	141	-	0	0	1.00	0	.00	.00
E-TH	900	.70	1286	-	1427	2	1.00	1427	.00	.10
E-LT	80	.70	114	-	114	1	1.00	114	1.00	.00
S-RT	48	.82	59	-	0	0	1.00	0	.00	.00
S-TH	929	.82	1133	-	1191	2	1.00	1191	.00	.05
S-LT	120	.82	146	-	146	1	1.00	146	1.00	.00
W-RT	68	.70	97	-	0	0	1.00	0	.00	.00
W-TH	544	.70	777	-	874	3	1.00	874	.00	.11
W-LT	120	.70	171	-	171	1	1.00	171	1.00	.00

SIGNAL85/TEAPAC - SATURATION FLOW ADJUSTMENT WORKSHEET

Mvmt	Group	Ideal	Ln	Width	Heavy	Grade	Parkg	Bus	Ar	RtTrn	LtTrn	Fact	Satf
N-TH	-	1800	2	1.000	.981	1.000	1.000	1.00	1.0	.963	1.000	1.00	3402
N-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667
E-TH	-	1800	2	1.000	.977	1.000	1.000	1.00	1.0	.985	1.000	1.00	3467
E-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667
S-TH	-	1800	2	1.000	.976	1.000	1.000	1.00	1.0	.993	1.000	1.00	3489
S-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667
W-TH	-	1800	3	1.000	.978	1.000	1.000	1.00	1.0	.983	1.000	1.00	5192
W-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667

SIGNAL85/TEAPAC - CAPACITY ANALYSIS WORKSHEET

Mvmt	Group	A-Rate	SatFl	Ratio	G/C	Cpcty	V/C	Crit
N-TH	-	652	3402	.19	.32	1096	.59	
N-LT	-	99	1667	.06	.06	93	1.07	
E-TH	-	1427	3467	.41	.37	1271	1.12	
E-LT	-	114	1667	.07	.06	93	1.23	
S-TH	-	1191	3489	.34	.37	1279	.93	
S-LT	-	146	1667	.09	.11	185	.79	
W-TH	-	874	5192	.17	.41	2134	.41	
W-LT	-	171	1667	.10	.11	185	.92	

Cycle Length, C 90 sec Sum(v/s) = .00
Lost Time Per Cycle, L 12.0 sec Xi = .00

SIGNAL85/TEAPAC - LEVEL-OF-SERVICE WORKSHEET

Mvmt	Group	V/C	G/C	Cyc	D1	Cpcty	D2	PF	Delay	LOS	ADly	LOS
N-TH	-	.59	.32	90	19.4	1096	.65	1.0	20.1	C		
N-LT	-	1.07	.06	90	32.4	93	99.68	1.0	132.1	F		
										>	34.9	D
E-TH	-	1.12	.37	90	23.3	1271	63.93	1.0	87.2	F		
E-LT	-	1.23	.06	90	32.7	93	173.71	1.0	206.4	F		
										>	96.1	F
S-TH	-	.93	.37	90	20.8	1279	8.86	1.0	29.7	D+		
S-LT	-	.79	.11	90	29.6	185	13.36	1.0	43.0	E+		
										>	31.1	D+
W-TH	-	.41	.41	90	14.3	2134	.08	1.0	14.3	B		
W-LT	-	.92	.11	90	30.1	185	31.83	1.0	61.9	F		
										>	22.1	C
Int Total		.85									51.1	E

SIGNAL85/TEAPAC - CAPACITY ANALYSIS WORKSHEET

INTERSECTION AVERAGES:
DEGREE OF SATURATION .85 VEHICULAR DELAY 51.1 LEVEL OF SERVICE E

SEQUENCE 66 (LD/LD)

```
-----------------------------------------------------------------------------
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
-----------------------------------------------------------------------------
!     +     !           ! + +       !           !           !       A   !
!     +     !           ! + +       !           !           !       ++++!
!     +>    !           !<+ +       !           !           !      <++++!
!           !           !   V       !   A   ++++!   A       !           !
!           !       A   !       A   !++++   V   !++++       !           !
!    <+     !    <+ + +>!       + +>!           !++++>      !++++>      !
!     +     !     + + + !       + + !           !++++       !++++       !
!     +     !     + + + !       + + !           !   V       !   V       !
-----------------------------------------------------------------------------
! G/C= .056 ! G/C= .033 ! G/C= .322 ! G/C= .056 ! G/C= .033 ! G/C= .367 !
! G=  5.0 " ! G=  3.0 " ! G= 29.0 " ! G=  5.0 " ! G=  3.0 " ! G= 33.0 " !
! Y=  2.0 " ! Y=  1.0 " ! Y=  3.0 " ! Y=  2.0 " ! Y=  1.0 " ! Y=  3.0 " !
-----------------------------------------------------------------------------
C= 90 SEC   G= 78.0 SEC = 86.7%  Y=12.0 SEC = 13.3%  PED=  .0 SEC =   .0%
```

MOVMNT	WDTH /LNS	G/C REQD	G/C USED	CAPACITY E (VPH)	CAPACITY E	DHV	DELAY	L S	MAXIMUM QUEUE
N APPROACH							34.9	D	
TH+RT	24/2	.19	.32	1096	1096	528	20.1	C	282 FT
LT	12/1	.06	.06	93	93	80	132.1	F	120 FT
E APPROACH							96.1	F	
TH+RT	24/2	.41	.37	1271	1271	999	87.2	F	580 FT
LT	12/1	.07	.06	93	93	80	206.4	F	138 FT
S APPROACH							31.1	D+	
TH+RT	24/2	.34	.37	1279	1279	977	29.7	D+	484 FT
LT	12/1	.09	.11	185	185	120	43.0	E+	167 FT
W APPROACH							22.1	C	
TH+RT	36/3	.17	.41	2134	2134	612	14.3	B	220 FT
LT	12/1	.10	.11	185	185	120	61.9	F	195 FT

-->

SIGNAL85/TEAPAC - INPUT WORKSHEET

Intersection: MILL Area Type: FRINGE

	N			E			S			W		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
VOLUMES	130	398	80	99	900	80	48	929	120	68	544	120
WIDTHS	.0	24.0	12.0	.0	24.0	12.0	.0	24.0	12.0	.0	36.0	12.0
LANES	0	2	1	0	2	1	0	2	1	0	3	1

Appr	Grade	%HV	Adj-Pkg	Buses	PHF	Conf-Peds	Ped-Button	Arr-Type
N	.0	3.9	NO 0	0	.81	0-LO	N 0	3
E	.0	4.5	NO 0	0	.70	0-LO	N 0	3
S	.0	4.8	NO 0	0	.82	0-LO	N 0	3
W	.0	4.5	NO 0	0	.70	0-LO	N 0	3

SEQUENCE 66 (LD/LD)

```
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
!     +     !           ! + +       !           !           !       A   !
!     +     !           ! + +       !           !           !       ++++!
!     +>    !           !<+ +       !           !           !      <++++!
!           !           !   V       !   A  ++++!   A       !           !
!           !       A   !       A   !++++  V   !++++       !           !
!    <+     !    <+ + +>!       + +>!           !++++>      !++++>      !
!     +     !     + + + !       + + !           !++++       !++++       !
!     +     !     + + + !       + + !           !   V       !   V       !
!  G/C= .056 !  G/C= .033 !  G/C= .322 !  G/C= .056 !  G/C= .033 !  G/C= .367 !
!  G=  5.0 " !  G=  3.0 " !  G= 29.0 " !  G=  5.0 " !  G=  3.0 " !  G= 33.0 " !
!  Y=  2.0 " !  Y=  1.0 " !  Y=  3.0 " !  Y=  2.0 " !  Y=  1.0 " !  Y=  3.0 " !
```

C= 90 SEC G= 78.0 SEC = 86.7% Y=12.0 SEC = 13.3% PED= .0 SEC = .0%

SIGNAL85/TEAPAC - VOLUME ADJUSTMENT WORKSHEET

Mvmt	Vol	PHF	Rate	Group	Rate	Lanes	Utiliz	Flow	Plt	Prt
N-RT	130	.81	160	-	0	0	1.00	0	.00	.00
N-TH	398	.81	491	-	652	2	1.00	652	.00	.25
N-LT	80	.81	99	-	99	1	1.00	99	1.00	.00
E-RT	99	.70	141	-	0	0	1.00	0	.00	.00
E-TH	900	.70	1286	-	1427	2	1.00	1427	.00	.10
E-LT	80	.70	114	-	114	1	1.00	114	1.00	.00
S-RT	48	.82	59	-	0	0	1.00	0	.00	.00
S-TH	929	.82	1133	-	1191	2	1.00	1191	.00	.05
S-LT	120	.82	146	-	146	1	1.00	146	1.00	.00
W-RT	68	.70	97	-	0	0	1.00	0	.00	.00
W-TH	544	.70	777	-	874	3	1.00	874	.00	.11
W-LT	120	.70	171	-	171	1	1.00	171	1.00	.00

SIGNAL85/TEAPAC - SATURATION FLOW ADJUSTMENT WORKSHEET

Mvmt	Group	Ideal	Ln	Width	Heavy	Grade	Parkg	Bus	Ar	RtTrn	LtTrn	Fact	Satf
N-TH	-	1800	2	1.000	.981	1.000	1.000	1.00	1.0	.963	1.000	1.00	3402
N-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667
E-TH	-	1800	2	1.000	.977	1.000	1.000	1.00	1.0	.985	1.000	1.00	3467
E-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667
S-TH	-	1800	2	1.000	.976	1.000	1.000	1.00	1.0	.993	1.000	1.00	3489
S-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667
W-TH	-	1800	3	1.000	.978	1.000	1.000	1.00	1.0	.983	1.000	1.00	5192
W-LT	-	1800	1	1.000	.975	1.000	1.000	1.00	1.0	1.000	.950	1.00	1667

SIGNAL85/TEAPAC - EVALUATION OF INTERSECTION PERFORMANCE

SEQUENCE 66 (LD/LD)

```
-----------------------------------------------------------------------------
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
-----------------------------------------------------------------------------
!     +     !           ! + +       !           !           !       A   !
!     +     !           ! + +       !           !           !      ++++!
!     +>    !           !<+ +       !           !           !     <++++!
!           !           !   V       !   A  ++++!   A       !           !
!           !       A   !       A   !++++  V   !++++       !           !
!    <+     !    <+ + +>!       + +>!           !++++>      !++++>      !
!     +     !     + + + !       + + !           !++++       !++++       !
!     +     !     + + + !       + + !           !   V       !   V       !
-----------------------------------------------------------------------------
! G/C= .056 ! G/C= .033 ! G/C= .322 ! G/C= .056 ! G/C= .033 ! G/C= .367 !
! G=  5.0 " ! G=  3.0 " ! G= 29.0 " ! G=  5.0 " ! G=  3.0 " ! G= 33.0 " !
! Y=  2.0 " ! Y=  1.0 " ! Y=  3.0 " ! Y=  2.0 " ! Y=  1.0 " ! Y=  3.0 " !
-----------------------------------------------------------------------------
C= 90 SEC   G= 78.0 SEC = 86.7%  Y=12.0 SEC = 13.3%  PED=  .0 SEC =   .0%
```

PARAMETER:	N APPROACH				N	E APPROACH				E	S APPROACH				S	W
APPROACH	W	INT														
UNITS	RT	TH	LT	APP	RT	TH	LT	APP	RT	TH	LT	APP	RT	TH	LT	APP
TOTAL																
VOLUME: VPH	130	398	80	608	99	900	80	1079	48	929	120	1097	68	544	120	732
3516																
WIDTH/LN:FT/#	0/0	24/2	12/1	36/3	0/0	24/2	12/1	36/3	0/0	24/2	12/1	36/3	0/0	36/3	12/1	48/4
G/C REQD@E: %	0	19	6		0	41	7		0	34	9		0	17	10	
G/C USED: %	0	32	6		0	37	6		0	37	11		0	41	11	
SVC VOL@E:VPH	0	1096	93	1189	0	1271	93	1364	0	1279	185	1464	0	2134	185	2319
6336																
SVC LEVEL:LOS		C	F	F		F	F	F		D+	E+	E+		B	F	F
DEG SATUR:V/C	.00	.59	1.06	.81	.00	1.12	1.23	1.61	.00	.93	.79	1.12	.00	.41	.92	.70
1.13																
AVG DELAY:SEC	.0	26.6	224.7	65.1	.0	227.1	396.8	342.3	.0	41.8	61.9	53.6	.0	19.1	140.3	55.6
144.6																
TOT DELAY:MIN	0	289	371	660	0	5402	754	6156	0	830	151	981	0	279	400	679
8476																
# STOPPED:VPH	0	547	99	646	0	1427	114	1541	0	1145	142	1287	0	619	169	788
4262																
MAX QUEUE:VEH	0	22	10	32	0	196	25	221	0	38	6	44	0	26	8	34
331																
MAX QUEUE: FT	0	282	268	282	0	2519	654	2519	0	485	167	485	0	220	196	220
2519																

-->

SIGNAL85/TEAPAC - SERVICE VOLUMES (VPHG) AND LT CLEARANCE CYCLES (SEC)

LT LOS PHS	N APPROACH RT	TH	LT	E APPROACH RT	TH	LT	S APPROACH RT	TH	LT	W APPROACH RT	TH	LT
VOLUMES	130	398	80	99	900	80	48	929	120	68	544	120
WID/LAN	0/0	24/2	12/1	0/0	24/2	12/1	0/0	24/2	12/1	0/0	36/3	12/1
C= 60"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			468			684			713			468
CYC			76			66			51			44
C= 65"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			432			648			677			432
CYC			76			66			51			44
C= 70"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			401			617			647			401
CYC			76			66			51			44
C= 75"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			374			590			620			374
CYC			76			66			51			44
C= 80"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			351			567			596			351
CYC			76			66			51			44
C= 85"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			330			546			576			330
CYC			76			66			51			44
C= 90"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			312			528			557			312
CYC			76			66			51			44
C= 95"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			296			511			541			296
CYC			76			66			51			44
C=100"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			281			497			526			281
CYC			76			66			51			44
C=105"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			267			483			513			267
CYC			76			66			51			44
C=110"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			255			471			501			255
CYC			76			66			51			44
C=115"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			244			460			490			244
CYC			76			66			51			44
C=120"												
E SEP	0	3402	1667	0	3467	1667	0	3489	1667	0	5192	1667
CON			234			450			479			234
CYC			76			66			51			44

-->

SIGNAL85/TEAPAC - REQUIRED G/C'S (%) AND LT CLEARANCE CYCLES (SEC)

LT LOS	PHS	N APPROACH RT	N APPROACH TH	N APPROACH LT	E APPROACH RT	E APPROACH TH	E APPROACH LT	S APPROACH RT	S APPROACH TH	S APPROACH LT	W APPROACH RT	W APPROACH TH	W APPROACH LT
VOLUMES		130	398	80	99	900	80	48	929	120	68	544	120
WID/LAN		0/0	24/2	12/1	0/0	24/2	12/1	0/0	24/2	12/1	0/0	36/3	12/1
C= 60"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			21.2			16.7			20.5			36.5
	CYC			76			66			51			44
C= 65"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			22.9			17.6			21.6			39.6
	CYC			76			66			51			44
C= 70"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			24.7			18.5			22.6			42.6
	CYC			76			66			51			44
C= 75"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			26.5			19.3			23.5			45.7
	CYC			76			66			51			44
C= 80"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			28.2			20.1			24.5			48.7
	CYC			76			66			51			44
C= 85"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			30.0			20.9			25.3			51.8
	CYC			76			66			51			44
C= 90"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			31.7			21.6			26.2			54.8
	CYC			76			66			51			44
C= 95"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			33.4			22.3			27.0			57.8
	CYC			76			66			51			44
C=100"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			35.2			22.9			27.8			60.9
	CYC			76			66			51			44
C=105"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			37.1			23.6			28.5			64.0
	CYC			76			66			51			44
C=110"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			38.8			24.2			29.1			67.1
	CYC			76			66			51			44
C=115"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			40.6			24.8			29.8			70.1
	CYC			76			66			51			44
C=120"													
E	SEP	.0	19.2	5.9	.0	41.2	6.8	.0	34.1	8.8	.0	16.8	10.3
	CON			42.3			25.3			30.5			73.1
	CYC			76			66			51			44

SIGNAL85/TEAPAC - SUCCESSFUL SEQUENCES

SEQ LD/LD	LOS	MIN CYCLE	REQD G/C+Y/C	NO. OF PHASES
11	E	60	.853	2
12	E	60	.990	3
31	E	60	.887	3
13	E	70	.996	3
14	E	70	.996	3
15	E	70	.996	4
16	E	70	.996	4
33	E	75	.980	4
34	E	75	.980	4
35	E	75	.980	5
36	E	75	.980	5
17	F	120	1.078	3
21	F	120	1.214	3
22	F	120	1.307	4
23	F	120	1.022	4
24	F	120	1.022	4
25	F	120	1.022	5
26	F	120	1.022	5
27	F	120	1.088	4
32	F	120	1.410	4
37	F	120	1.191	4
41	F	120	1.235	3
42	F	120	1.328	4
43	F	120	1.043	4
44	F	120	1.043	4
45	F	120	1.043	5
46	F	120	1.043	5
47	F	120	1.109	4
51	F	120	1.235	4
52	F	120	1.328	5
53	F	120	1.043	5
54	F	120	1.043	5
55	F	120	1.043	6
56	F	120	1.043	6
57	F	120	1.109	5
61	F	120	1.235	4
62	F	120	1.328	5
63	F	120	1.043	5
64	F	120	1.043	5
65	F	120	1.043	6
66	F	120	1.043	6
67	F	120	1.109	5
71	F	120	1.339	3
72	F	120	1.432	4
73	F	120	1.147	4
74	F	120	1.147	4
75	F	120	1.147	5
76	F	120	1.147	5
77	F	120	1.213	4

-->

SIGNAL85/TEAPAC - SEQUENCE 66 PHASE DIAGRAM (LD/LD)

```
-----------------------------------------------------------------------------
!     +      !            ! + +        !            !            !       A   !
!     +      !            ! + +        !            !            !       ****!
!     +>     !            !<+ +        !            !            !      <****!
!            !            !   V        !   A   ****!   A        !            !
!            !       A    !       A    !++++   V   !****        !            !
!    <*      !    <+ + +>!       * *>!            !++++>       !++++>       !
!     *      !     + + + !       * * !            !++++        !++++        !
!     *      !     + + + !       * * !            !   V        !   V        !
-----------------------------------------------------------------------------
-->
```

SIGNAL85/TEAPAC - OPTIMUM TIMINGS FOR SEQ 66-LD/LD

C=120 PHASE	REQUIRED:LOS=F G/C	G/C+Y/C	ADJUSTED G/C	G/C+Y/C	CRIT MVMT
N 1	.088	.113	.083	.108	S-LT
/ 2	.000	.000	.000	.000	-
S 3	.341	.366	.325	.350	S-TH
E 4	.068	.093	.065	.090	E-LT
/ 5	.009	.034	.009	.034	W-LT
W 6	.412	.437	.392	.417	E-TH
TOTAL	.918	1.043	.875	1.000	

-->

SIGNAL85/TEAPAC - MAP OF DESIGN HOUR VOLUMES

```
                **        1        **                  **
                **                 **                  **
                **     00608       **     01148        **
                **                 **                  **
                **   1   2   3     **                  **
                **                 **                  **
                **   0   0   0     **                  **
                **   1   3   0     **                  **
***************   3   9   8     **                  ***************
***************   0   8   0     **                  ***************

                                                     0099  4
   0                                                           0
   1                                                           1
   1                                                     0900  5   0  2
   5                                                           7
   0                                                           9
                                                       0080  6

***************                                      ***************
***************                                      ***************

       12  0120
   0                                                           0
   0                                                           0
4  7   11  0544                                                6
   3                                                           7
   2                                                           2
       10  0068

***************                 **   0   0   0   ***************
***************                 **   1   9   0   ***************
                **              **   2   2   4   **
                **              **   0   9   8   **
                **              **               **
                **              **   9   8   7   **
                **              **               **
                **     00546    **     01097     **
                **              **               **
                **              **       3       **
-->
```

CAPCALC

ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT

BROADWAY
MILL MILL
BROADWAY BROADWAY
MONDAY

MILL
5/5/85

TRAFF FROM	WIDTHS & MOVEMENTS LN1	LN2	LN3	LN4	VOLUMES L	S	R	TRUCKS BUSES	CRITICAL L	S	GAPS R	PEAK HOUR	GRAD IENT	RGHT TURN
NORTH	12.0 L	12.0 S	12.0 SR		80	398	130	5.0% 0.0%	0.0	0.0	0.0	0.81	0.00	1.00
EAST	12.0 L	12.0 S	12.0 SR		80	900	99	5.0% 0.0%	0.0	0.0	0.0	0.62	0.00	1.00
SOUTH	12.0 L	12.0 S	12.0 SR		120	929	48	5.0% 0.0%	0.0	0.0	0.0	0.82	0.00	1.00
WEST	12.0 L	12.0 S	12.0 S	12.0 SR	120	544	68	5.0% 0.0%	0.0	0.0	0.0	0.69	0.00	1.00

ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT

BROADWAY
MILL MILL
BROADWAY BROADWAY
MONDAY

MILL
5/5/85

VOLUME ALLOCATION TO LANES

TRAFFIC FROM	LANE 1 L	LANE 1 S	LANE 1 R	LANE 2 L	LANE 2 S	LANE 2 R	LANE 3 L	LANE 3 S	LANE 3 R	LANE 4 L	LANE 4 S	LANE 4 R
NORTH	80	0	0	0	264	0	0	134	130	0	0	0
EAST	80	0	0	0	500	0	0	401	99	0	0	0
SOUTH	120	0	0	0	489	0	0	441	48	0	0	0
WEST	120	0	0	0	204	0	0	204	0	0	136	68

LEFT TURN CHECK

TRAFFIC FROM	LEFT TURN CAPACITY	LEFT TURN VOLUME	PHASE NEEDED?
NORTH	80	80	Y
EAST	92	80	Y
SOUTH	128	120	Y
WEST	80	120	Y

CYCLE LENGTH : 90 SECONDS

G/C RATIO : NORTH/SOUTH 0.48
EAST/WEST 0.52

PLANNING

PHASE	TRAFFIC FROM	MOVE MENT	CRITICAL VOLUME	PERCENT CAPACITY USED	EFFECTIVE GREEN TIME	AVERAGE DELAY
1	NORTH/SOUTH	LEFT	80	5.8	5	113
2	SOUTH	ALL	40	2.9	3	101
3	NORTH/SOUTH	ALL	449	32.7	29	38
4	EAST/ WEST	LEFT	80	5.8	5	113
5	WEST	ALL	40	2.9	3	101
6	EAST/ WEST	ALL	500	36.4	32	36
		TOTALS	1189	86.5	77	
	LEVEL OF SERVICE		D			

ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT

BROADWAY
MILL MILL
BROADWAY BROADWAY
MONDAY

MILL
5/5/85

VOLUME ALLOCATION TO LANES

TRAFFIC FROM	LANE 1 L	LANE 1 S	LANE 1 R	LANE 2 L	LANE 2 S	LANE 2 R	LANE 3 L	LANE 3 S	LANE 3 R	LANE 4 L	LANE 4 S	LANE 4 R
NORTH	80	0	0	0	264	0	0	134	130	0	0	0
EAST	80	0	0	0	500	0	0	401	99	0	0	0
SOUTH	120	0	0	0	489	0	0	441	48	0	0	0
WEST	120	0	0	0	204	0	0	204	0	0	136	68

LEFT TURN CHECK

TRAFFIC FROM	LEFT TURN CAPACITY	LEFT TURN VOLUME	PHASE NEEDED?
NORTH	80	80	Y
EAST	92	80	Y
SOUTH	128	120	Y
WEST	80	120	Y

CYCLE LENGTH : 90 SECONDS

G/C RATIO : NORTH/SOUTH 0.48
EAST/WEST 0.52

ADJUSTED PER LANE VOLUMES

TRAFFIC FROM	LEFT VOLUME	STRAIGHT VOLUME	RIGHT VOLUME
NORTH	109	359	0
EAST	142	888	0
SOUTH	161	657	0
WEST	192	341	0

ARIZONA STATE UNIVERSITY CIVIL ENGINEERING DEPARTMENT

MILL
5/5/85

OPERATIONS & DESIGN

PHASE	TRAFFIC FROM	MOVE MENT	CRITICAL VOLUME	PERCENT CAPACITY USED	EFFECTIVE GREEN TIME	AVERAGE DELAY
1	NORTH/SOUTH	LEFT	109	6.6		
2	SOUTH	ALL	52	3.2		
3	NORTH/SOUTH	ALL	605	36.7		
4	EAST/ WEST	LEFT	142	8.6		
5	WEST	ALL	50	3.0		
6	EAST/ WEST	ALL	888	53.8		
		TOTALS	1846	111.9		
	LEVEL OF SERVICE		FAILURE			

EZ-POSIT

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%    E Z - P O S I T            %
%        Version II.2           %
%  Copyright 1985, Hobih Chen   %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

Run Title : MILL & BROADWAY

	North-Bound			South-Bound			East-Bound			West-Bound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Actual Green(sec)	---	---	---	---	---	---	---	---	---	---	---	---
Min. Green(sec)	8	8	---	8	8	---	8	8	---	8	8	---
Lane Width (ft)	12	12	---	12	12	---	12	12	---	12	12	---
Local Bus	---	---	---	---	---	---	---	---	---	---	---	---
Number of Lanes	1	2	---	1	2	---	1	3	---	1	2	---
Pedestrians	---	---	---	---	---	---	---	---	---	---	---	---
PHF(%)	---	82	---	---	81	---	---	69	---	---	62	---
Trucks(%)	---	5	---	---	5	---	---	5	---	---	5	---
Volume(vph)	120	929	48	80	398	130	120	544	68	80	900	99

Cycle Length Actual : 0 sec, Minimum : 30 sec, Maximum : 120 sec

Phasing L-X-T L-X-T

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%    E Z - P O S I T            %
%        Version II.2           %
%  Copyright 1985, Hobih Chen   %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

Run Title: MILL & BROADWAY

MEASURE OF EFFECTIVENESS

Mov	PCE	Deg. of Sat.	Delay Ave. (sec)	Delay Total (hrs)	Stop per cent	Excess Fuel gal/hr
NBL	162	1.01	417.1	18.77	99.8	12.9
SBL	109	0.68	57.4	1.74	97.0	2.1
EBL	192	1.07	357.2	19.05	99.7	13.3
WBL	142	0.79	69.2	2.73	97.7	3.0
NBT	657	1.06	120.0	21.89	98.7	19.6
SBT	360	0.58	25.4	2.54	81.9	4.5
EBT	341	0.41	15.5	1.47	65.8	3.1
WBT	888	1.06	90.5	22.33	97.9	22.1

Total Delay : 90 veh-hrs/hr
Total Stop : 2634 veh/hr
Total Fuel Consumption : 80.65 gal/hr
Level of Service : E

	Phase	Oppos Vol	Left Turn Capacity clear	Left Turn Capacity Green	Left Turn Capacity Total	Left Turn Vol	OK
1	NB&SB Left				162	8	9
2	NB&SB Thru				657	31	34
3	EB&WB Left				192	9	10
4	EB&WB Thru				888	42	47
	Total				1899	90	100

Controller Timing

SIGNAL

GOVERCS

SIGNAL/TEAPAC - REQUIRED G/C'S (%) AND LT CLEARANCE CYCLES (SEC)

LT		N APPROACH			E APPROACH			S APPROACH			W APPROACH		
LOS	PHS	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
VOLUMES		130	398	80	99	900	80	48	929	120	68	544	120
WID/LAN		0/0	24/2	12/1	0/0	24/2	12/1	0/0	24/2	12/1	0/0	36/3	12/1
C	SEP	0.0	27.6	7.4	0.0	52.9	7.4	0.0	45.8	11.1	0.0	22.7	11.1
	CON			87.7			54.2			45.1			88.7
	CYC			72			72			48			48
D	SEP	0.0	24.1	6.2	0.0	46.2	6.2	0.0	40.0	9.3	0.0	19.6	9.3
	CON			86.5			53.1			43.3			86.9
	CYC			86			86			58			58
E	SEP	0.0	23.1	5.7	0.0	44.2	5.7	0.0	38.3	8.5	0.0	18.7	8.5
	CON			86.0			52.6			42.6			86.2
	CYC			94			94			62			62

-->

SIGNAL/TEAPAC - SERVICE VOLUMES (VPHG) AND LT CLEARANCE CYCLES (SEC)

	LT	N APPROACH			E APPROACH			S APPROACH			W APPROACH		
LOS	PHS	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
VOLUMES		130	398	80	99	900	80	48	929	120	68	544	120
WID/LAN		0/0	24/2	12/1	0/0	24/2	12/1	0/0	24/2	12/1	0/0	36/3	12/1
C	SEP	0	1912	1080	0	1888	1080	0	2132	1080	0	2694	1080
	CON			221			602			746			249
	CYC			72			72			48			48
D	SEP	0	2192	1296	0	2164	1296	0	2444	1296	0	3118	1296
	CON			265			722			895			299
	CYC			86			86			58			58
E	SEP	0	2290	1404	0	2261	1404	0	2554	1404	0	3279	1404
	CON			287			782			970			324
	CYC			94			94			62			62

-->

```
@VALUATE,66,90


SIGNAL/TEAPAC - EVALUATION OF INTERSECTION PERFORMANCE

SEQUENCE   66
-------------------------------------------------------------------------------
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
-------------------------------------------------------------------------------
!     +     !           ! + +       !           !           !       A   !
!     +     !           ! + +       !           !           !       ++++!
!     +>    !           !<+ +       !           !           !      <++++!
!           !           !   V       !   A   ++++!   A       !           !
!           !       A   !       A   !++++   V   !++++       !           !
!    <+     !    <+ + +>!       + +>!           !++++>      !++++>      !
!     +     !     + + + !       + + !           !++++       !++++       !
!     +     !     + + + !       + + !           !   V       !   V       !
-------------------------------------------------------------------------------
! G/C= .056 ! G/C= .033 ! G/C= .322 ! G/C= .056 ! G/C= .033 ! G/C= .367 !
! G= 5.00 S ! G= 3.00 S ! G=29.00 S ! G= 5.00 S ! G= 3.00 S ! G=33.00 S !
! Y=3.0 SEC ! Y=0.0 SEC ! Y=3.0 SEC ! Y=3.0 SEC ! Y=0.0 SEC ! Y=3.0 SEC !
-------------------------------------------------------------------------------
C= 90 SEC   G= 78.0 SEC = 86.7%  Y=12.0 SEC = 13.3%  PED= 0.0 SEC =  0.0%

PARAMETER:        N APPROACH    N     E APPROACH    E     S APPROACH    S     W APPROACH    W   INT
      UNITS    RT   TH   LT  APP   RT   TH   LT  APP   RT   TH   LT  APP   RT   TH   LT  APP TOTAL
============  ================== ================== ================== ================== =====
VOLUME:   VPH  130  398   80  608   99  900   80 1079   48  929  120 1097   68  544  120  732 3516
WIDTH/LN:FT/@  0/0 24/2 12/1 36/3  0/0 24/2 12/1 36/3  0/0 24/2 12/1 36/3  0/0 36/3 12/1 48/4
G/C REQD@C: %    0   28    7        0   53    7        0   46   11        0   23   11
G/C USED:   %    0   32    6        0   37    6        0   36   12        0   40   12
SVC VOL@E:VPH    0  738   78  816   0  829   78  907   0  908  172 1080   0 1311  172 1483 4286
------------  ------------------ ------------------ ------------------ ------------------ -----
SVC LEVEL:LOS        A    F    F        F    F    F        F   C+    F        A   C+   C+    F
DEG SATUR:V/C  0.00  .72 1.03  .76 0.00 1.21 1.03 1.19 0.00 1.08  .70 1.03 0.00  .47  .70  .50  .92
AVG DELAY:SEC   0.0 29.9197.5 52.0  0.0334.3197.5324.2  0.0165.1 51.1152.6  0.0 20.7 51.1 25.7161.4
TOT DELAY:MIN    0  263  263  526   0 5566  263 5829   0 2688  102 2790   0  211  102  313 9458
@ STOPPED:VPH    0  465   80  545   0  999   80 1079   0  977  115 1092   0  451  115  566 3282
------------  ------------------ ------------------ ------------------ ------------------ -----
MAX QUEUE:VEH    0   18    6   24   0  196    6  202   0   98    5  103   0   18    5   23  352
MAX QUEUE: FT    0  230  146  230   0 2527  146 2527   0 1265  136 1265   0  158  136  158 2527
============  ================== ================== ================== ================== =====
-->SERVICEVOLUME
```

SIGNAL/TEAPAC - CAPACITY ANALYSIS WORKSHEET

BASIC CONDITIONS:
METRO POPLTN 3000
METRO LOCATN OUTLNG DEGREE OF SATURATION .92

SEQUENCE 66

```
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
!     +     !          ! + +       !          !          !       A    !
!     +     !          ! + +       !          !          !      ++++  !
!     +>    !          !<+ +       !          !          !     <++++  !
!           !          !   V       !   A  ++++!   A      !            !
!           !       A  !       A   !++++  V   !++++      !            !
!    <+     !    <+ + +>!       + +>!         !++++>     !++++>       !
!     +     !     + + + !       + + !         !++++      !++++        !
!     +     !     + + + !       + + !         !   V      !   V        !
! G/C= .056 ! G/C= .033 ! G/C= .322 ! G/C= .056 ! G/C= .033 ! G/C= .367 !
! G= 5.00 S ! G= 3.00 S ! G=29.00 S ! G= 5.00 S ! G= 3.00 S ! G=33.00 S !
! Y=3.0 SEC ! Y=0.0 SEC ! Y=3.0 SEC ! Y=3.0 SEC ! Y=0.0 SEC ! Y=3.0 SEC !
```

C= 90 SEC G= 78.0 SEC = 86.7% Y=12.0 SEC = 13.3% PED= 0.0 SEC = 0.0%

MOVMNT	WDTH /LNS	CHT REF	G/C REQD	G/C USED	SRVC VOLUME C (VPH)	SRVC VOLUME E	DHV	L S	MAXIMUM QUEUE
APPROACH N PHF= .81 TK= 5% RT= 21.4% LT= 13.2% NO BUS STOP									
TH+RT	24/2	4	.28	.32	616	738	528	A	230 FEET
LT	12/1+	18B	.07	.06	60	78	80	F	97 FEET
APPROACH E PHF= .70 TK= 5% RT= 9.2% LT= 7.4% NO BUS STOP									
TH+RT	24/2	4	.53	.37	692	829	999	F	407 FEET
LT	12/1+	18B	.07	.06	60	78	80	F	97 FEET
APPROACH S PHF= .82 TK= 5% RT= 4.4% LT= 10.9% NO BUS STOP									
TH+RT	24/2	4	.46	.36	758	908	977	F	405 FEET
LT	12/1+	18B	.11	.12	132	172	120	C+	135 FEET
APPROACH W PHF= .70 TK= 5% RT= 9.3% LT= 16.4% NO BUS STOP									
TH+RT	36/3	4	.23	.40	1078	1311	612	A	157 FEET
LT	12/1+	18B	.11	.12	132	172	120	C+	135 FEET

-->

SIGNAL/TEAPAC - SEQUENCE 66 PHASE DIAGRAM (**/**)

```
-----------------------------------------------------------------------------
!      +      !            ! + +        !            !            !       A   !
!      +      !            ! + +        !            !            !      ++++!
!      +>     !            !<+ +        !            !            !     <****!
!             !            !   V        !   A   ++++!   A        !          !
!             !       A    !       A    !****   V   !++++        !          !
!     <*      !    <+ + +>!        * +>!            !++++>       !++++>     !
!      *      !     + + + !        * + !            !++++        !++++      !
!      *      !     + + + !        * + !            !   V        !   V      !
-----------------------------------------------------------------------------
```

-->MAP

SIGNAL/TEAPAC - MAP OF DESIGN HOUR VOLUMES

```
              **       1        **                **
              **                **                **
              **     00608      **     01148      **
              **                **                **
              **   1   2   3    **                **
              **                **                **
              **   0   0   0    **                **
              **   1   3   0    **                **
****************  3   9   8    **                ****************
****************  0   8   0    **                ****************

                                                0099  4
   0                                                     0
   1                                                     1
   1                                                0900 5    0  2
   5                                                     7
   0                                                     9
                                                    0080  6

****************                                ****************
****************                                ****************

       12  0120
   0                                                     0
   0                                                     0
4  7   11  0544                                          6
   3                                                     7
   2                                                     2
       10  0068

****************                **   0   0   0   ****************
****************                **   1   9   0   ****************
              **                **   2   2   4   **
              **                **   0   9   8   **
              **                **               **
              **                **   9   8   7   **
              **                **               **
              **     00546      **     01097     **
              **                **               **
              **                **       3       **
-->
```

DESIGN

SIGNAL/TEAPAC - SUCCESSFUL SEQUENCES

SEQ **/**	LOS	MIN CYCLE	REQD G/C+Y/C	NO. OF PHASES
33	F	90	1.013	4
34	F	90	1.013	4
35	F	90	1.013	5
36	F	90	1.013	5
14	F	90	1.057	3
13	F	90	1.057	3
15	F	90	1.057	4
16	F	90	1.057	4
37	F	90	1.111	4
44	F	90	1.136	4
43	F	90	1.136	4
64	F	90	1.136	5
54	F	90	1.136	5
63	F	90	1.136	5
45	F	90	1.136	5
53	F	90	1.136	5
46	F	90	1.136	5
55	F	90	1.136	6
65	F	90	1.136	6
56	F	90	1.136	6
66	F	90	1.136	6
17	F	90	1.155	3
23	F	90	1.179	4
24	F	90	1.179	4
26	F	90	1.180	5
25	F	90	1.180	5
47	F	90	1.233	4
57	F	90	1.233	5
67	F	90	1.233	5
74	F	90	1.277	4
73	F	90	1.277	4
27	F	90	1.277	4
75	F	90	1.277	5
76	F	90	1.277	5
31	F	90	1.311	3
11	F	90	1.355	2
77	F	90	1.375	4
41	F	90	1.434	3
32	F	90	1.434	4
51	F	90	1.434	4
61	F	90	1.434	4
21	F	90	1.478	3
12	F	90	1.478	3
42	F	90	1.556	4
62	F	90	1.556	5
52	F	90	1.556	5
71	F	90	1.575	3
22	F	90	1.600	4
72	F	90	1.698	4

-->

SORT

SIGNAL/TEAPAC - SORTED SEQUENCES - MAXIMUM PROBABILITY OF SUCCESS

SEQ **/**	LOS	REQD G/C+Y/C	MIN CYCLE	NO. OF PHASES	REQD(E) G/C+Y/C	OPTIMUM CYCLES MIN	OPT	MAX	SUCCESSFUL CYCLES
33	F	1.013	90	4	1.013				
34	F	1.013	90	4	1.013				
35	F	1.013	90	5	1.013				
36	F	1.013	90	5	1.013				
14	F	1.057	90	3	1.057				
13	F	1.057	90	3	1.057				
15	F	1.057	90	4	1.057				
16	F	1.057	90	4	1.057				
37	F	1.111	90	4	1.111				
44	F	1.136	90	4	1.136				
43	F	1.136	90	4	1.136				
64	F	1.136	90	5	1.136				
54	F	1.136	90	5	1.136				
63	F	1.136	90	5	1.136				
45	F	1.136	90	5	1.136				
53	F	1.136	90	5	1.136				
46	F	1.136	90	5	1.136				
55	F	1.136	90	6	1.136				
65	F	1.136	90	6	1.136				
56	F	1.136	90	6	1.136				
66	F	1.136	90	6	1.136				
17	F	1.155	90	3	1.155				
23	F	1.179	90	4	1.179				
24	F	1.179	90	4	1.179				
26	F	1.179	90	5	1.179				
25	F	1.179	90	5	1.179				
47	F	1.233	90	4	1.233				
57	F	1.234	90	5	1.234				
67	F	1.234	90	5	1.234				
74	F	1.277	90	4	1.277				
73	F	1.277	90	4	1.277				
27	F	1.277	90	4	1.277				
75	F	1.277	90	5	1.277				
76	F	1.277	90	5	1.277				
31	F	1.311	90	3	1.311				
11	F	1.355	90	2	1.355				
77	F	1.375	90	4	1.375				
41	F	1.434	90	3	1.434				
32	F	1.434	90	4	1.434				
51	F	1.434	90	4	1.434				
61	F	1.434	90	4	1.434				
21	F	1.478	90	3	1.478				
12	F	1.478	90	3	1.478				
42	F	1.556	90	4	1.556				
62	F	1.556	90	5	1.556				
52	F	1.556	90	5	1.556				
71	F	1.575	90	3	1.575				
22	F	1.600	90	4	1.600				
72	F	1.698	90	4	1.698				

-->

```
SIGNAL/TEAPAC - CAPACITY ANALYSIS WORKSHEET

BASIC CONDITIONS:
  METRO POPLTN     3000
  METRO LOCATN  OUTLNG   DEGREE OF SATURATION  .93

SEQUENCE   66
-------------------------------------------------------------------------------
!  PHASE 1  !  PHASE 2  !  PHASE 3  !  PHASE 4  !  PHASE 5  !  PHASE 6  !
-------------------------------------------------------------------------------
!     +     !           ! + +       !           !           !       A   !
!     +     !           ! + +       !           !           !       ++++!
!     +>    !           !<+ +       !           !           !      <++++!
!           !           !   V       !   A   ++++!   A       !           !
!           !       A   !       A   !****   V   !++++       !           !
!    <+     !     <+ * +>!       + +>!           !++++>      !++++>      !
!     +     !      + * + !       + + !           !++++       !++++       !
!     +     !      + * + !       + + !           !   V       !   V       !
-------------------------------------------------------------------------------
! G/C= .077 ! G/C=0.000 ! G/C= .331 ! G/C= .077 ! G/C=0.000 ! G/C= .382 !
! G= 6.92 S ! G= 0.00 S ! G=29.77 S ! G= 6.92 S ! G= 0.00 S ! G=34.38 S !
! Y=3.0 SEC ! Y=0.0 SEC ! Y=3.0 SEC ! Y=3.0 SEC ! Y=0.0 SEC ! Y=3.0 SEC !
-------------------------------------------------------------------------------
C= 90 SEC   G= 78.0 SEC = 86.6%  Y=12.0 SEC = 13.3%  PED= 0.0 SEC =  0.0%

-------------------------------------------------------------------------------
!         ! WDTH ! CHT !     G/C     ! SRVC VOLUME !       ! L ! MAXIMUM  !
! MOVMNT  ! /LNS  ! REF ! REQD   USED ! C (VPH) E  !  DHV  ! S ! QUEUE   !
-------------------------------------------------------------------------------

APPROACH N   PHF= .81  TK=  5%  RT= 21.4%  LT= 13.2%  NO BUS STOP
===============================================================================
!   TH+RT! 24/2 !  4  !  .28 !  .33 !  632 !  758 !  528 !*A ! 227 FEET !
!   LT   ! 12/1+! 18B !  .07 !  .08 !   83 !  108 !   80 ! C ! 95 FEET !
-------------------------------------------------------------------------------

APPROACH E   PHF= .70  TK=  5%  RT=  9.2%  LT=  7.4%  NO BUS STOP
===============================================================================
!   TH+RT! 24/2 !  4  !  .53 !  .38 !  721 !  864 !  999 ! F ! 397 FEET !
!   LT   ! 12/1+! 18B !  .07 !  .08 !   83 !  108 !   80 !*C ! 95 FEET !
-------------------------------------------------------------------------------

APPROACH S   PHF= .82  TK=  5%  RT=  4.4%  LT= 10.9%  NO BUS STOP
===============================================================================
!   TH+RT! 24/2 !  4  !  .46 !  .33 !  705 !  845 !  977 !*F ! 420 FEET !
!   LT   ! 12/1+! 18B !  .11 !  .11 !  119 !  155 !  120 ! D+! 137 FEET !
-------------------------------------------------------------------------------

APPROACH W   PHF= .70  TK=  5%  RT=  9.3%  LT= 16.4%  NO BUS STOP
===============================================================================
!   TH+RT! 36/3 !  4  !  .23 !  .38 ! 1029 ! 1252 !  612 ! A ! 162 FEET !
!   LT   ! 12/1+! 18B !  .11 !  .11 !  119 !  155 !  120 !*D+! 137 FEET !
-------------------------------------------------------------------------------
-->
```

TIMING,66,YES,YES

SIGNAL/TEAPAC - OPTIMUM TIMINGS FOR SEQ 66-**/**

C= 90 PHASE		REQUIRED:LOS=F G/C	G/C+Y/C	ADJUSTED G/C	G/C+Y/C	CRIT MVMT
N	1	.089	.122	.077	.110	-LT
/	2	.000	.00*	.00*	.00*	S-
S	3	.383	.416	.331	.364	-TH
E	4	.089	.122	.077	.110	S-LT
/	5	.000	.00*	.00*	.00*	W-
W	6	.442	.475	.382	.415	-TH
TOTAL		1.002	1.136	.867	1.000	

-->

FREESIAP & SIAP

```
*******************************************************************************
VERSION: 85.30                                                  RELEASE: (JUNE 85)
                    SIGNALIZED INTERSECTION ANALYSIS PROGRAM

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*******************************************************************************

    ------------------------------
    S I A P   I N P U T   E C H O
    ------------------------------


 CARD ID A   B   NBT  NBL  SBT  SBL  EBT  EBL  WBT  WBL            C
-------- - ---- ---- ---- ---- ---- ---- ---- ---- ----:::::-::::--------------
COMMENT MILL AND BROADWAY
BEGIN*           700  800   60
VOLUME  60  700  977  120  528   80  612  120  999   80
LEFT                                                          NSEW
TRUCK   60  700    5    5    5    5    5    5    5    5
CAPACITY60  700 3400 1700 3400 1700 5100 1700 3400 1700
HEADWAY       3 2.12 2.12 2.12 2.12 2.12 2.12 2.12 2.12
CONTROL 60  700    1   60  120    0
*** NOTE ... ALL RED PERIOD ASSUMED NOT TO EXIST.
DENSE
SEQUENCE                                                 LT   LT
PLOT
TABLES             7   19   20   22   28   33   36   37
TABLES             9
TABLES            38   39   44   45
MINGREEN           8    8    8    8    8    8    8    8
RUN
-------- - ---- ---- ---- ---- ---- ---- ---- ---- ----:::::-::::--------------
 CARD ID A   B   NBT  NBL  SBT  SBL  EBT  EBL  WBT  WBL            C
```

TABLE NO. 7
XSAT - COMPUTED SATURATION FLOW (VEHICLES PER 60 MINUTES OF GREEN)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	3315.	1658.	3315.	1658.	4973.	1658.	3315.	1658.

TABLE NO. 19
LFTSAT - LEFT TURN SAT. FLOW BASED ON OPPOSING THRU (PER 60 MIN. PRD)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	0.	692.	0.	427.	0.	419.	0.	627.

TABLE NO. 20
V/S - VOL/SAT FLOW RATIOS BASED ON UNADJUSTED VOLUMES

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	.295	.072	.159	.048	.123	.072	.301	..048

TABLE NO. 22
V/S' - ADJUSTED CRITICAL VOL/SAT FLOW RATIOS FOR EACH PHASE

PRD	TIME	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
1	700	.072	.295	.072	.301	.000	.000

TABLE NO. 28
GRN/P - CALCULATED GREEN PLUS AMBER TIME FOR EACH PHASE (SECONDS)

PRD	TIME	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
1	700	8.668	26.072	8.668	26.592	.000	.000

TABLE NO. 33
X - CALCULATED DEGREE OF SATURATION (VOLUME/CAPACITY)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	.894	.894	.483	.596	.365	.894	.894	.596

TABLE NO. 36
DELAYU - CALCULATED VALUES OF UNIFORM DELAY (SECONDS/VEHICLE)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	19.0	31.9	15.9	31.1	14.9	31.9	18.7	31.1

TABLE NO. 37
DELAYRS - COMPUTED VALUES OF RANDOM AND SATURATION DELAY (SEC/VEH)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	6.7	44.6	.8	9.7	.3	44.6	6.6	9.7

TABLE NO. 38
DELAY - AVERAGE UNIT DELAY (SECONDS/VEHICLE)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	25.7	76.4	16.7	40.8	15.2	76.4	25.3	40.8

TABLE NO. 39
TOTDLY - TOTAL DELAY PER APPROACH (VEH-HRS PER 60 MINUTE PERIOD)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	6.96	2.55	2.45	.91	2.59	2.55	7.01	.91

TABLE NO. 44
STOP - CALCULATED NUMBER OF VEHICLES STOPPED (PER 60 MINUTE PERIOD)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	928.7	118.9	421.0	77.3	462.7	118.9	948.0	77.3

TABLE NO. 45
EXFUEL - EXCESS FUEL CONSUMPTION (GALLONS PER 60 MINUTE PERIOD)

PRD	TIME	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL
1	700	13.19	2.02	5.55	.86	6.04	2.02	13.40	.86

L E F T T U R N C H E C K (PER 60 MINUTE PERIOD)

		NORTHBOUND		SOUTHBOUND		EASTBOUND		WESTBOUND	
NO	TIME	VOL	CAP	VOL	CAP	VOL	CAP	VOL	CAP
1	700	120.	134.	80.	134.	120.	134.	80.	134.

DESIGN AND EVALUATION SUMMARY

INTERSECTION NAME	RUN TITLE	CONTROLLER TYPE	CONTROLLER DIAL
		PRETIMED	0

SEQUENCE N/S	SEQUENCE E/W	PHASES	LOST TIME /PH	LOST TIME TOTAL	STEP SIZE	STOP PENALTY
LT	LT	4	3.0	12.0	5.0	30.0

M E A S U R E S O F E F F E C T I V E N E S S

MOVEMENTS:	DELAY (VEH-HRS)	STOPS (%)	EXC FUEL (GAL)	EXC LEFT (VEH)	MAXIMUM QUEUE	MAX DEG SAT
NB THRU :	6.96	95.1	13.19		18.1	.89
LEFT	2.55	99.1	2.02	.0	2.3	.89
SB THRU :	2.45	79.7	5.55		8.2	.48
LEFT	.91	96.6	.86	.0	1.5	.60
EB THRU :	2.59	75.6	6.04		9.0	.37
LEFT	2.55	99.1	2.02	.0	2.3	.89
WB THRU :	7.01	94.9	13.40		18.4	.89
LEFT	.91	96.6	.86	.0	1.5	.60
TOTAL/AVG:	25.92	89.7	43.93	.0	18.4	.89

MOVEMENTS:	LEFT TURN TREATMENT PROTECTION	VEH/CYC	SEQUENCE PH 1	PH 2	PH 3	PH 4	PH 5	PH 6
NB THRU :				XXXX				
LEFT :	REST	.0	XXXX					
SB THRU :				XXXX				
LEFT :	REST	.0	XXXX					
EB THRU :						XXXX		
LEFT :	REST	.0			XXXX			
WB THRU :						XXXX		
LEFT :	REST	.0			XXXX			

DESIGN AND EVALUATION SUMMARY

INTERSECTION NAME	RUN TITLE	CONTROLLER TYPE	CONTROLLER DIAL
		PRETIMED	0

SEQUENCE N/S	SEQUENCE E/W	PHASES	LOST TIME /PH	LOST TIME TOTAL	STEP SIZE	STOP PENALTY
LT	LT	4	3.0	12.0	5.0	30.0

ANALYSIS: PERIOD :	DELAY (VEH-HRS)	STOPS (%)	EX. FUEL (GAL)	EX. LEFT (VEH)	MAXIMUM QUEUE	MAX DEG SAT
700- 800:	25.92	89.7	43.93	.0	18.4	.89
TOTAL/MAX:	25.92	89.7	43.93	.0	18.4	.89

PERFORMANCE IMPROVED .0% BY TIMING OPTIMIZATION

MAXIMUM QUEUE = LARGEST QUEUE BASED ON "UNIFORM" FLOW RATES FOR ONE CYCLE.

DESIGN AND EVALUATION SUMMARY

INTERSECTION NAME	RUN TITLE	CONTROLLER TYPE	CONTROLLER DIAL
		PRETIMED	0

SEQUENCE N/S	SEQUENCE E/W	PHASES	LOST TIME /PH	LOST TIME TOTAL	STEP SIZE	STOP PENALTY
LT	LT	4	3.0	12.0	5.0	30.0

ANALYSIS: PERIOD :	DIAL #	ALL RED (SEC)	CYCLE (SEC)	PH 1 (%)	PH 2 (%)	PH 3 (%)	PH 4 (%)	PH 5 (%)	PH 6 (%)
700- 800:	1	.0	70.0	12.4	37.2	12.4	38.0	.0	.0

```
VER. 85.30 (JUNE 85)    SIGNALIZED INTERSECTION ANALYSIS PROGRAM    PAGE -   7

                                                                  CONTROLLER
  INTERSECTION  NAME          RUN  TITLE                           TYPE  DIAL
-------------------------   -------------------------          --------- ----
                                                                 PRETIMED   0
-----------------------------------------------------------------------------

 SEQUENCE                    LOST TIME   STEP    STOP
 N/S   E/W      PHASES       /PH TOTAL   SIZE   PENALTY
----- -----   -----------    --- -----   ----   -------
 LT    LT         4          3.0  12.0    5.0    30.0
-----------------------------------------------------------

                MAXIMUM DEGREE OF SATURATION                  : PERIODS :
A V E R A G E   D E L A Y   (SEC/VEH)

          1.25      1.0      0.75      0.5      0.25       0          0
40         80       120       160      200
           +---------+---------+---------+---------+---------+          +---------
+---------+---------+---------+---------+
                          ***********************************: 700- 800:*******

            A C T U A L   C Y C L E   L E N G T H   (SEC)   : PERIODS : E S T I
M A T E D   O P T I M A L   C Y C L E (SEC)

         150       120        90        60        30        0          0
30        60        90       120       150
           +---------+---------+---------+---------+---------+          +---------
+---------+---------+---------+---------+
                                       ************************: 700- 800:*********
***********
```

S I A P I N P U T E C H O

CARD ID	A	B	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL	C
END											

>>>>>>>>>>>>>>>>>>>>>>>>>NORMAL SIAP TERMINATION<<<<<<<<<<<<<<<<<<<<<<<<<

NO ERRORS ENCOUNTERED DURING RUN.

```
*****************************************************************************************************************

VERSION: 84.03                                                                                  RELEASE:  JUNE, 1985
                              S I G N A L   O P E R A T I O N S   A N A L Y S I S   P A C K A G E

                                  OFFICE OF IMPLEMENTATION ...FEDERAL HIGHWAY ADMINISTRATION

                                     TECHNICAL SUPPORT MESSAGE CENTER:  (904) 392-0378

*****************************************************************************************************************

  ----------------------------
  S O A P   I N P U T   E C H O
  ----------------------------


  NO.  CARD ID A   B   NBT  NBL  SBT  SBL  EBT  EBL  WBT  WBL          COMMENT
 ----!-------- - ---- ---- ---- ---- ---- ---- ---- ---- ----++++-++++----------------!
   2 !BEGIN           700  800   60                                                  !
   3 !VOLUME  60  700  977  120  528   80  612  120  999   80                        !
   4 !LEFT                                                          NSEW             !
   5 !CAPACITY60  700 3400 1700 3400 1700 5100 1700 3400 1700                         !
   6 !TRUCK   60  700    5    5    5    5    5    5    5    5                         !
   7 !HEADWAY       3 2.12 2.12 2.12 2.12 2.12 2.12 2.12 2.12                         !
   8 !CONTROL 60  700    1   60  120    0                                             !
   9 !SEQUENCE                                              LT   LT                   !
  10 !PLOT                                                                            !
  11 !TABLES            7   19   20   22   28   33   36   37                         !
  12 !TABLES            9                                                             !
  13 !TABLES           38   39   44   45                                             !
  14 !DENSE                                                                           !
  15 !MINGREEN          8    8    8    8    8    8    8    8                         !
  16 !RUN                                                                             !
 ----!-------- - ---- ---- ---- ---- ---- ---- ---- ---- ----++++-++++----------------!
  NO.  CARD ID A   B   NBT  NBL  SBT  SBL  EBT  EBL  WBT  WBL          COMMENT
```

TABLE NO. 7
CALCULATED SATURATION FLOWS (VEHICLES PER 60 MINUTES OF GREEN TIME)

XSAT	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	3400.000	1700.000	3400.000	1700.000	5100.000	1700.000	3400.000	1700.000

TABLE NO. 19
LEFT TURN SATURATION FLOW BASED ON OPPOSING THRU VOLUME (PER 60 MINUTE PERIOD)

LFTSAT	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	.000	647.378	.000	338.688	.000	328.106	.000	573.483

TABLE NO. 20
VOLUME SATURATION FLOW RATIOS BASED ON UNADJUSTED VOLUMES

V/S	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	.296	.073	.160	.048	.124	.073	.303	.048

TABLE NO. 22
CRITICAL VOLUME SATURATION FLOW RATIOS FOR EACH PHASE BASED ON ADJUSTED VOLUMES

CRITY	TIME	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
1	700	.073	.296	.073	.303	.000	.000

TABLE NO. 28
CALCULATED GREEN PLUS AMBER TIME FOR EACH PHASE (SECONDS PER CYCLE)

GRN/P	TIME	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
1	700	8.668	26.072	8.668	26.592	.000	.000

TABLE NO. 33
CALCULATED DEGREE OF SATURATION (VOLUME/CAPACITY) (IF X = 999.999, NO GREEN TIME)

X	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	.898	.898	.485	.599	.367	.898	.898	.599

TABLE NO. 36
CALCULATED VALUES OF UNIFORM DELAY (SECONDS/VEHICLE)

DELAYU	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	22.343	31.880	18.725	31.068	17.553	31.880	22.060	31.068

TABLE NO. 37
CALCULATED VALUES OF RANDOM AND SATURATION DELAY (SECONDS/VEHICLE)

DELAYR	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	6.789	44.866	.756	9.573	.303	44.866	6.645	9.573

TABLE NO. 38
AVERAGE UNIT DELAY (SECONDS/VEHICLE)

AVDEL	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	29.132	76.745	19.481	40.641	17.856	76.745	28.705	40.641

TABLE NO. 39
TOTAL DELAY PER APPROACH (VEHICLE HOURS PER 60 MINUTE PERIOD)

TDELAY	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	8.143	2.635	2.943	.930	3.127	2.635	8.204	.930

TABLE NO. 44
CALCULATED NUMBER OF VEHICLES STOPPED (PER 60 MINUTE PERIOD)

STOP	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	958.236	122.499	434.007	79.586	476.849	122.499	978.226	79.586

TABLE NO. 45
CALCUATED EXCESS FUEL CONSUMPTION (GALLONS PER 60-MINUTE PERIOD)

EXFUEL	TIME	1 - NBT	2 - NBL	3 - SBT	4 - SBL	5 - EBT	6 - EBL	7 - WBT	8 - WBL
1	700	14.468	2.806	6.106	1.334	6.644	2.806	14.705	1.334

LEFT TURN CHECK (PER 60 MINUTE PERIOD)

PERIOD		NORTHBOUND		SOUTHBOUND		EASTBOUND		WESTBOUND	
NO.	TIME	VOL	CAP	VOL	CAP	VOL	CAP	VOL	CAP
1	700	124.	138.	82.	138.	124.	138.	82.	138.

DESIGN AND EVALUATION SUMMARY

INTERSECTION NAME	RUN NO. AND TITLE	CONTROLLER TYPE	CONTROLLER DIAL	SEQUENCE N/S	SEQUENCE E/W	PHASES	LOST TIME /PH	LOST TIME TOTAL	STEP SIZE	STOP PENALTY
	1:	PRETIMED	1	LT	LT	4	3.0	12.0	5.0	30.0

M E A S U R E S O F E F F E C T I V E N E S S

MOVEMENTS:	DELAY (VEH-HRS)	STOPS (%)	EXC FUEL (GAL)	EXC LEFT (VEH)	MAXIMUM QUEUE	V/C RATIO	LEFT TURN TREATMENT PROTECTION	VEH/CYC	SEQUENCE PH 1	PH 2	PH 3	PH 4	PH 5	PH 6
NB THRU :	8.14	95.2	14.47		18.6	.90				XXXX				
LEFT :	2.63	99.1	2.81	.0	2.4	.90	REST	.0	XXXX					
SB THRU :	2.94	79.8	6.11		8.4	.49				XXXX				
LEFT :	.93	96.6	1.35	.0	1.5	.60	REST	.0	XXXX					
EB THRU :	3.13	75.6	6.64		9.3	.37						XXXX		
LEFT :	2.63	99.1	2.81	.0	2.4	.90	REST	.0			XXXX			
WB THRU :	8.20	95.1	14.70		19.0	.90						XXXX		
LEFT :	.93	96.6	1.35	.0	1.5	.60	REST	.0			XXXX			

M E A S U R E S O F E F F E C T I V E N E S S / S I G N A L T I M I N G

ANALYSIS: PERIOD :	DELAY (VEH-HRS)	STOPS (%)	EX. FUEL (GAL)	EX. LEFT (VEH)	MAXIMUM QUEUE	V/C RATIO	ALL RED (SEC)	DIAL NO.	CYCLE (SEC)	PH 1 (%)	PH 2 (%)	PH 3 (%)	PH 4 (%)	PH 5 (%)	PH 6 (%)
700- 800:	29.55	89.8	50.24	.0	19.0	.90	.0	1	70.0:	12.4	37.2	12.4	38.0		
SUMMARY :	29.55	89.8	50.24	.0	19.0	.90	PERFORMANCE IMPROVED .0% BY TIMING OPTIMIZATION								

INTERSECTION NAME	RUN NO. AND TITLE	CONTROLLER TYPE	CONTROLLER DIAL	SEQUENCE N/S	SEQUENCE E/W	PHASES	LOST TIME /PH	LOST TIME TOTAL	STEP SIZE	STOP PENALTY
	1:	PRETIMED	1	LT	LT	4	3.0	12.0	5.0	30.0

```
     VOLUME/CAPACITY RATIO   : PERIODS :     AVERAGE DELAY  (SEC/VEH)

1.25     1.0      0.75     0.5      0.25     0        0        40       80       120      160      200
 +--------+--------+--------+--------+--------+        +--------+--------+--------+--------+--------+
           ##################################: 700- 800:#######
 +--------+--------+--------+--------+--------+        +--------+--------+--------+--------+--------+
1.25     1.0      0.75     0.5      0.25     0        0        40       80       120      160      200

 PREFERRED CYCLE LENGTH (SEC)  : PERIODS :   FUEL CONSUMPTION  (GAL/VEH)

150      120      90       60       30       0        0        0.01     0.02     0.03     0.04     0.05
 +--------+--------+--------+--------+--------+        +--------+--------+--------+--------+--------+
                          ####################: 700- 800:##############
 +--------+--------+--------+--------+--------+        +--------+--------+--------+--------+--------+
150      120      90       60       30       0        0        0.01     0.02     0.03     0.04     0.05
```

SOAP INPUT ECHO

NO.	CARD ID	A	B	NBT	NBL	SBT	SBL	EBT	EBL	WBT	WBL	COMMENT
17	END											

+++ END OF SOAP JOB +++

+++ GOOD NEWS: NO ERRORS ENCOUNTERED DURING THIS JOB +++

PASSER II-84

TEXAS DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
MULTIPHASE ARTERIAL PROGRESSION - 145101
tempe broadway DISTRICT 1 03/21/86 RUN NO.
- PROGRESSION MODE.
- SPEED VARIATION.

INPUT DATA

NUMBER OF INTERSECTIONS	LOWER CYCLE LENGTH	UPPER CYCLE LENGTH	CYCLE INCREMENT
6	60	120	5

Input Data Continued ....

**** INTERSECTION 1 MILL

DISTANCE 0 TO 1	SPEED	DISTANCE 1 TO 0	SPEED
0. FT	0. MPH	0. FT	0. MPH

A SIDE QUEUE CLEARANCE 0 SECS
B SIDE QUEUE CLEARANCE 0 SECS

ARTERIAL PERMISSIBLE PHASE SEQUENCE LEFT TURNS FIRST NO OVERLAP
CROSS ST PHASE SEQUENCE IS LEFT TURNS FIRST NO OVERLAP

MOVEMENTS (NEMA)

	5	6	1	2	3	4	7	8
VOLUMES (VPH)	120	999	80	612	120	528	80	977
SAT FLOW RATE (VPHG)	1700	3400	1700	5100	1700	3400	1700	3400
MINIMUM GREEN (SEC)	8	8	8	8	8	8	8	8

Input Data Continued ....

**** INTERSECTION 2 COLLEGE

DISTANCE 1 TO 2	SPEED	DISTANCE 2 TO 1	SPEED
1499. FT	40. MPH	1499. FT	40. MPH

A SIDE QUEUE CLEARANCE 0 SECS

B SIDE QUEUE CLEARANCE 0 SECS

ARTERIAL PERMISSIBLE PHASE SEQUENCE LEFT TURNS FIRST NO OVERLAP

CROSS ST PHASE SEQUENCE IS LEFT TURNS FIRST NO OVERLAP

	MOVEMENTS (NEMA)							
	5	6	1	2	3	4	7	8
VOLUMES (VPH)	120	1104	80	552	60	358	93	546
SAT FLOW RATE (VPHG)	1700	3400	1700	5100	1700	1700	1700	1700
MINIMUM GREEN (SEC)	8	8	8	8	8	8	8	8

Input Data Continued ....

**** INTERSECTION 3 RURAL

DISTANCE 2 TO 3	SPEED	DISTANCE 3 TO 2	SPEED
1632. FT	40. MPH	1632. FT	40. MPH

A SIDE QUEUE CLEARANCE 0 SECS

B SIDE QUEUE CLEARANCE 0 SECS

ARTERIAL PERMISSIBLE PHASE SEQUENCE LEFT TURNS FIRST NO OVERLAP

CROSS ST PHASE SEQUENCE IS LEFT TURNS FIRST NO OVERLAP

	MOVEMENTS (NEMA)							
	5	6	1	2	3	4	7	8
VOLUMES (VPH)	130	964	80	510	140	658	93	1051
SAT FLOW RATE (VPHG)	1700	3400	1700	5100	1700	3400	1700	5100
MINIMUM GREEN (SEC)	8	8	8	8	8	8	8	8

Input Data Continued ....

**** INTERSECTION 4 TERRACE

DISTANCE 3 TO 4	SPEED	DISTANCE 4 TO 3	SPEED
1119. FT	40. MPH	1119. FT	40. MPH

A SIDE QUEUE CLEARANCE 0 SECS

B SIDE QUEUE CLEARANCE 0 SECS

ARTERIAL PERMISSIBLE PHASE SEQUENCE LAGGING GREEN WITH OVERLAP

CROSS ST PHASE SEQUENCE IS LEADING GREEN NO OVERLAP

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
VOLUMES (VPH)	0	984	40	594	60	0	0	40
SAT FLOW RATE (VPHG)	0	5100	1700	5100	1700	0	0	1700
MINIMUM GREEN (SEC)	0	8	8	8	8	0	0	8

Input Data Continued ....

**** INTERSECTION 5 DORSEY

DISTANCE 4 TO 5	SPEED	DISTANCE 5 TO 4	SPEED
1500. FT	40. MPH	1500. FT	40. MPH

A SIDE QUEUE CLEARANCE 0 SECS

B SIDE QUEUE CLEARANCE 0 SECS

ARTERIAL PERMISSIBLE PHASE SEQUENCE LAGGING GREEN WITH OVERLAP

CROSS ST PHASE SEQUENCE IS LEADING GREEN NO OVERLAP

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
VOLUMES (VPH)	0	874	40	594	150	0	0	20
SAT FLOW RATE (VPHG)	0	5100	1700	5100	1700	0	0	1700
MINIMUM GREEN (SEC)	0	8	8	8	8	0	0	8

Input Data Continued ....

**** INTERSECTION 6 McCLINTOCK

DISTANCE 5 TO 6	SPEED	DISTANCE 6 TO 5	SPEED
1621. FT	40. MPH	1621. FT	40. MPH

A SIDE QUEUE CLEARANCE 0 SECS

B SIDE QUEUE CLEARANCE 0 SECS

ARTERIAL PERMISSIBLE PHASE SEQUENCE LEFT TURNS FIRST NO OVERLAP

CROSS ST PHASE SEQUENCE IS LEFT TURNS FIRST NO OVERLAP

MOVEMENTS (NEMA)

	5	6	1	2	3	4	7	8
VOLUMES (VPH)	110	930	70	484	160	485	100	1070
SAT FLOW RATE (VPHG)	1700	5100	1700	5100	1700	3400	1700	3400
MINIMUM GREEN (SEC)	8	8	8	8	8	8	8	8

Best Solution....

**** INT. 1 .0 SEC OFFSET ARTERIAL PHASE SEQ IS LEFT TURNS FIRST

MILL .0 % OFFSET CROSS STREET PHASE SEQ IS LEFT TURNS FIRST

	ARTERIAL				CROSS STREET			
MOVEMENTS	1+5	1+6	2+6	TOTAL MAJOR	3+7	3+8	4+8	TOTAL MINOR
GREEN TIME (SECS)	8.8	.0	24.1	32.9	8.7	.0	23.4	32.1
GREEN TIME (%)	13.5	.0	37.1	50.6	13.4	.0	36.0	49.4

MEASURES OF EFFECTIVENESS

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
X-RATIO	.96	.95	.64	.39	.98	.52	.65	.96
LEVEL OF SERVICE	E	E	B	A	E	A	B	E
DELAY (SECS/VEH)	93.3	30.9	38.3	17.7	101.6	19.5	39.4	41.5
LEVEL OF SERVICE	E	C	D	B	E	B	D	D
PROBABILITY OF CLEARING QUEUE	.10	.30	.74	1.00	.06	1.00	.72	.23
LEVEL OF SERVICE	E	E	D	A	E	A	D	E
STOPS (STOPS/HR)	111.	593.	72.	436.	111.	399.	72.	874.

TOTAL INTERSECTION DELAY 34.7 SECS/VEH

MINIMUM DELAY CYCLE 104 SECS

Best Solution....
**** INT. 2 29.5 SEC OFFSET ARTERIAL PHASE SEQ IS LEFT TURNS FIRST
COLLEGE 45.4 % OFFSET CROSS STREET PHASE SEQ IS LEFT TURNS FIRST

	ARTERIAL				CROSS STREET			
MOVEMENTS	1+5	1+6	2+6	TOTAL MAJOR	3+7	3+8	4+8	TOTAL MINOR
GREEN TIME (SECS)	9.2	.0	28.1	37.3	8.0	.0	19.7	27.7
GREEN TIME (%)	14.2	.0	43.2	57.4	12.3	.0	30.3	42.6

MEASURES OF EFFECTIVENESS

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
X-RATIO	.88	.88	.59	.29	.57	.87	.89	1.33
LEVEL OF SERVICE	E	E	A	A	A	E	E	F
DELAY (SECS/VEH)	69.1	14.0	34.9	11.6	36.5	40.2	79.0	105.0
LEVEL OF SERVICE	E	B	D	B	D	D	E	F
PROBABILITY OF CLEARING QUEUE	.28	.66	.82	1.00	.80	.47	.24	.00
LEVEL OF SERVICE	E	D	C	A	C	E	E	E
STOPS (STOPS/HR)	110.	364.	71.	284.	54.	315.	86.	558.

TOTAL INTERSECTION DELAY
39.2 SECS/VEH

MINIMUM DELAY CYCLE
120 SECS

Best Solution....
**** INT. 3 1.8 SEC OFFSET ARTERIAL PHASE SEQ IS LEFT TURNS FIRST
RURAL 2.8 % OFFSET CROSS STREET PHASE SEQ IS LEFT TURNS FIRST

	ARTERIAL				CROSS STREET			
MOVEMENTS	1+5	1+6	2+6	TOTAL MAJOR	3+7	3+8	4+8	TOTAL MINOR
GREEN TIME (SECS)	9.7	.0	25.4	35.1	10.2	.0	19.7	29.9
GREEN TIME (%)	14.9	.0	39.1	54.0	15.7	.0	30.3	46.0

MEASURES OF EFFECTIVENESS

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
X-RATIO	.87	.86	.54	.30	.86	.80	.57	.85
LEVEL OF SERVICE	E	E	A	A	E	D	A	E
DELAY (SECS/VEH)	64.1	23.6	32.2	15.3	60.1	28.4	32.7	29.1
LEVEL OF SERVICE	E	C	C	B	E	C	D	C
PROBABILITY OF CLEARING QUEUE	.32	.68	.89	1.00	.35	.78	.87	.72
LEVEL OF SERVICE	E	D	C	A	E	C	C	D
STOPS (STOPS/HR)	119.	687.	71.	323.	127.	563.	82.	912.

TOTAL INTERSECTION DELAY
28.2 SECS/VEH

MINIMUM DELAY CYCLE
82 SECS

Best Solution....
**** INT. 4 57.8 SEC OFFSET ARTERIAL PHASE SEQ IS LAGGING GREEN
TERRACE 88.9 % OFFSET CROSS STREET PHASE SEQ IS LEADING GREEN

	ARTERIAL				CROSS STREET			
MOVEMENTS	1+6	2+6	2+5	TOTAL MAJOR	3+8	4+8	4+7	TOTAL MINOR
GREEN TIME (SECS)	11.7	44.2	.0	55.9	9.1	.0	.0	9.1
GREEN TIME (%)	18.0	68.0	.0	86.0	14.0	.0	.0	14.0

MEASURES OF EFFECTIVENESS

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
X-RATIO	.00	.24	.20	.19	.45	.00	.00	.30
LEVEL OF SERVICE		A	A	A	A			A
DELAY (SECS/VEH)	.0	3.6	26.0	4.1	30.8	.0	.0	28.8
LEVEL OF SERVICE		A	C	A	C			C
PROBABILITY OF CLEARING QUEUE	1.00	1.00	1.00	1.00	.95	1.00	1.00	1.00
LEVEL OF SERVICE		A	A	A	B			A
STOPS (STOPS/HR)	0.	493.	33.	180.	53.	0.	0.	35.

TOTAL INTERSECTION DELAY
5.9 SECS/VEH

MINIMUM DELAY CYCLE
40 SECS

Best Solution....
**** INT. 5 17.5 SEC OFFSET ARTERIAL PHASE SEQ IS LAGGING GREEN
DORSEY 26.9 % OFFSET CROSS STREET PHASE SEQ IS LEADING GREEN

	ARTERIAL				CROSS STREET			
MOVEMENTS	1+6	2+6	2+5	TOTAL MAJOR	3+8	4+8	4+7	TOTAL MINOR
GREEN TIME (SECS)	10.9	40.1	.0	51.0	14.0	.0	.0	14.0
GREEN TIME (%)	16.8	61.7	.0	78.5	21.5	.0	.0	21.5

MEASURES OF EFFECTIVENESS

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
X-RATIO	.00	.24	.22	.21	.57	.00	.00	.08
LEVEL OF SERVICE		A	A	A	A			A
DELAY (SECS/VEH)	.0	2.1	26.7	3.9	28.4	.0	.0	23.5
LEVEL OF SERVICE		A	C	A	C			C
PROBABILITY OF CLEARING QUEUE	1.00	1.00	1.00	1.00	.92	1.00	1.00	1.00
LEVEL OF SERVICE		A	A	A	B			A
STOPS (STOPS/HR)	0.	183.	34.	147.	128.	0.	0.	16.

TOTAL INTERSECTION DELAY
5.9 SECS/VEH

MINIMUM DELAY CYCLE
40 SECS

Best Solution....
**** INT. 6 4.3 SEC OFFSET ARTERIAL PHASE SEQ IS LEFT TURNS FIRST
McCLINTOCK 6.6 % OFFSET CROSS STREET PHASE SEQ IS LEFT TURNS FIRST

	ARTERIAL				CROSS STREET			
MOVEMENTS	1+5	1+6	2+6	TOTAL MAJOR	3+7	3+8	4+8	TOTAL MINOR
GREEN TIME (SECS)	8.9	.0	18.0	26.9	10.9	.0	27.2	38.1
GREEN TIME (%)	13.7	.0	27.7	41.4	16.8	.0	41.8	58.6

MEASURES OF EFFECTIVENESS

MOVEMENTS (NEMA)	5	6	1	2	3	4	7	8
X-RATIO	.86	.85	.55	.44	.89	.40	.55	.88
LEVEL OF SERVICE	E	D	A	A	E	A	A	E
DELAY (SECS/VEH)	65.4	30.3	33.7	20.2	62.1	15.8	31.2	26.9
LEVEL OF SERVICE	E	C	D	C	E	B	C	C
PROBABILITY OF CLEARING QUEUE	.33	.72	.86	1.00	.31	1.00	.90	.63
LEVEL OF SERVICE	E	D	C	A	E	A	C	D
STOPS (STOPS/HR)	101.	811.	62.	345.	146.	331.	88.	912.

TOTAL INTERSECTION DELAY
28.5 SECS/VEH

MINIMUM DELAY CYCLE
83 SECS

*** PASSER II-84 BEST SOLUTION SUMMARY - TOTAL ARTERIAL SYSTEM PERFORMANCE ***

tempe broadway
DISTRICT 1 03/21/86 RUN NO. 1

CYCLE LENGTH = 65 SECS BAND A = 9 SECS BAND B = 16 SECS
AVERAGE PROGRESSION SPEED - BAND A = 40 MPH BAND B = 40 MPH

.20 EFFICIENCY .73 ATTAINABILITY

AVERAGE INTERSECTION DELAY
27.0 SECS/VEH

TOTAL SYSTEM DELAY
126.5 VEH-HR/HR

TOTAL NUMBER VEHICLES
16860.

TOTAL SYSTEM FUEL CONSUMPTION
265.26 GAL/HR

TOTAL SYSTEM STOPS
11490. STOPS

MAXIMIN CYCLE
120 SECS

EFFICIENCY VERSUS CYCLE LENGTH

	CYCLE LENGTH	EFFICIENCY
	60	.18
	65	.20
	70	.20
	75	.20
	80	.20
	85	.20
	90	.20
	95	.20
	100	.20
	105	.20
	110	.20
	115	.20
	120	.20
BEST SOLUTION	65	.20

```
       tempe   DISTRICT  1   RUN NO.  1
                broadway     03/21/86                 CYCLE LENGTH =  65 SECONDS
HORIZONTAL SCALE  1 INCH =  40 SECONDS      (1 inch = 10 characters)
  VERTICAL SCALE  1 INCH = 1000 FEET        (1 inch = 6 lines)

  McCLINTOCK    *              :
  4.3S  6.6%    *====          :******          ******          ******          *
                *              :
               **              :
                *  .   .       :                 . .
                *              :
                *              :
                *              :
                *              :
      DORSEY   **     .   .    :            . .
 17.5S 26.9%    * ---==========   ---==========   ---==========   ---==========
                *              :
                *              :
                *              :
                *          .   .          . .
               **              :
                *              :
                *              :
    TERRACE     *              :
 57.8S 88.9%    *=========  -.-===.=.==.==  ---===========  ---===========  ---=
                *              :
               **              :
                *              :
                *              :
                *              :  . . .
       RURAL    *              :
  1.8S  2.8%    *======        :*******         *******         *******         **
               **              :
                *              :
                *              : .   .   .
                *              :
                *              :
                *              :
               **              :
                *          .  .:          .   .
    COLLEGE     *              :
 29.5S 45.4%    *     *********:       *********       *********       *********
                *              :
                *              :
               **       . .    :             .   .
                *              :
                *              :
                *              :
                *              :
        MILL    *  .   .       :                 .   .
   .0S   .0%   *******         :*******         *******         *******         **

                      Zero Offset Line
                 "A"                          "B"
               40 MPH                       40 MPH
           9 SECOND BAND                16 SECOND BAND
                  (NEMA PHASE DESIGNATION)
*** BOTH LEFTS      (1+5)     +++ LEADING GREEN (2+5)
=== BOTH THROUGHS   (2+6)     --- LAGGING GREEN (1+6)
End of Run.
```

TW-BANDWIDTH

```
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+                                                         +
+                 >>>  TW-BANDWIDTH  <<<                  +
+                                                         +
+        BAND2 (Part 2) MAXIMAL BANDWIDTH TRAFFIC         +
+                                                         +
+          SIGNAL SETTING OPTIMIZATION PROGRAM            +
+                                                         +
+         (C) Copyright 1984, 1985 By TransWare           +
+                                                         +
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MPCODE HAS SUCCESSFULLY COMPLETED.
A REPORT BASED ON THE OPTIMAL SOLUTION WILL BE WRITTEN.

                                    **** MPCODE STATISTICS ****

NUMBER OF BRANCH AND BOUND ITERATIONS PERFORMED:        333     NUMBER OF BRANCH AND BOUND REINVERSIONS PERFORMED:     0

MAXIMUM NUMBER OF ITERATIONS PERFORMED BY A LINEAR PROGRAM:    38
MAXIMUM NUMBER OF REINVERSIONS PERFORMED BY A LINEAR PROGRAM:     0

NUMBER OF SOLUTIONS FOUND:   2     VALUE OF OBJECTIVE FUNCTION AT LAST SOLUTION:  .526929
```

**** TW-BANDWIDTH SOLUTION REPORT ****

THIS IS AN ARTERY PROBLEM.

NAME OF ARTERY: BROADWAY NUMBER OF INTERSECTIONS: 6
ARTERY IS ENTERED FROM: WEST UNITS: ENGLISH

**** BEST SOLUTION ****

CYCLE TIME: 45.00 SECS EASTBOUND BANDWIDTH (B(1)): .1784 (FRACTION OF A CYCLE) WESTBOUND BANDWIDTH (B(2)): .3121 (FRACTION OF A CYCLE)

OBJECTIVE FUNCTION (C(1)B(1) + C(2)B(2)): .526929

ALL PHASE STARTING TIMES ARE RELATIVE TO THE START OF GREEN IN THE EASTBOUND DIRECTION AT SIGNAL 1.

INTERSECTION INFORMATION

SIGNAL NO.	NODE NO.	SEQUENCE NO.	CROSS STREET NAME	LEFT TURN PATTERN SELECTED
1	1	1	MILL	3
2	2	2	COLLEGE	3
3	3	3	RURAL	3
4	4	4	TERRACE	1
5	5	5	DORSEY	1
6	6	6	MCCLINTOCK	3

PHASE SETTINGS -- FRACTIONS OF A CYCLE

SIGNAL NO.	DIRECTION	GREEN BEGIN	GREEN END	GREEN DURATION	LEFT BEGIN	LEFT END	LEFT DURATION	RED BEGIN	RED END	RED DURATION	BAND BEGIN	BAND END	BAND DURATION	ADVANCED BY QUEUE CLEAR TIME
1	EASTBOUND	.0000	.3709	.3709	.8652	.0000	.1348	.3709	.0000	.6291	.1925	.3709	.1784	.0000
	WESTBOUND	.0000	.3709	.3709	.8652	.0000	.1348	.3709	.0000	.6291	.0000	.3121	.3121	.0000
2	EASTBOUND	.5263	.9583	.4320	.3843	.5263	.1420	.9583	.5263	.5680	.6063	.7847	.1784	.0000
	WESTBOUND	.5263	.9583	.4320	.3843	.5263	.1420	.9583	.5263	.5680	.5862	.8983	.3121	.0000
3	EASTBOUND	.0568	.4478	.3910	.9078	.0568	.1490	.4478	.0568	.6090	.0568	.2352	.1784	.0000
	WESTBOUND	.0568	.4478	.3910	.9078	.0568	.1490	.4478	.0568	.6090	.1357	.4478	.3121	.0000
4	EASTBOUND	.3286	.0086	.6800			.0000	.0086	.3286	.3200	.3642	.5426	.1784	.0000
	WESTBOUND	.3286	.1886	.8600	.0086	.1886	.1800	.1886	.3286	.1400	.8408	.1529	.3121	.0000
5	EASTBOUND	.3817	.0017	.6200			.0000	.0017	.3817	.3800	.7576	.9360	.1784	.0000
	WESTBOUND	.3817	.1616	.7799	.0017	.1616	.1599	.1616	.3817	.2201	.4475	.7596	.3121	.0000
6	EASTBOUND	.9898	.4076	.4178	.8220	.9898	.1678	.4076	.9898	.5822	.1624	.3408	.1784	.0000
	WESTBOUND	.9898	.4076	.4178	.8220	.9898	.1678	.4076	.9898	.5822	.0426	.3547	.3121	.0000

PHASE SETTINGS -- SECONDS

SIGNAL NO.	DIRECTION	GREEN BEGIN	GREEN END	GREEN DURATION	LEFT BEGIN	LEFT END	LEFT DURATION	RED BEGIN	RED END	RED DURATION	BAND BEGIN	BAND END	BAND DURATION	ADVANCED BY QUEUE CLEAR TIME
1	EASTBOUND	.0	24.1	24.1	56.2	.0	8.8	24.1	.0	40.9	12.5	24.1	11.6	.0
	WESTBOUND	.0	24.1	24.1	56.2	.0	8.8	24.1	.0	40.9	.0	20.3	20.3	.0
2	EASTBOUND	34.2	62.3	28.1	25.0	34.2	9.2	62.3	34.2	36.9	39.4	51.0	11.6	.0
	WESTBOUND	34.2	62.3	28.1	25.0	34.2	9.2	62.3	34.2	36.9	38.1	58.4	20.3	.0
3	EASTBOUND	3.7	29.1	25.4	59.0	3.7	9.7	29.1	3.7	39.6	3.7	15.3	11.6	.0
	WESTBOUND	3.7	29.1	25.4	59.0	3.7	9.7	29.1	3.7	39.6	8.8	29.1	20.3	.0
4	EASTBOUND	21.4	.6	44.2			.0	.6	21.4	20.8	23.7	35.3	11.6	.0
	WESTBOUND	21.4	12.3	55.9	.6	12.3	11.7	12.3	21.4	9.1	54.7	9.9	20.3	.0
5	EASTBOUND	24.8	.1	40.3			.0	.1	24.8	24.7	49.2	60.8	11.6	.0
	WESTBOUND	24.8	10.5	50.7	.1	10.5	10.4	10.5	24.8	14.3	29.1	49.4	20.3	.0
6	EASTBOUND	64.3	26.5	27.2	53.4	64.3	10.9	26.5	64.3	37.8	10.6	22.2	11.6	.0
	WESTBOUND	64.3	26.5	27.2	53.4	64.3	10.9	26.5	64.3	37.8	2.8	23.1	20.3	.0

PROGRESSION TIMES AND SPEEDS

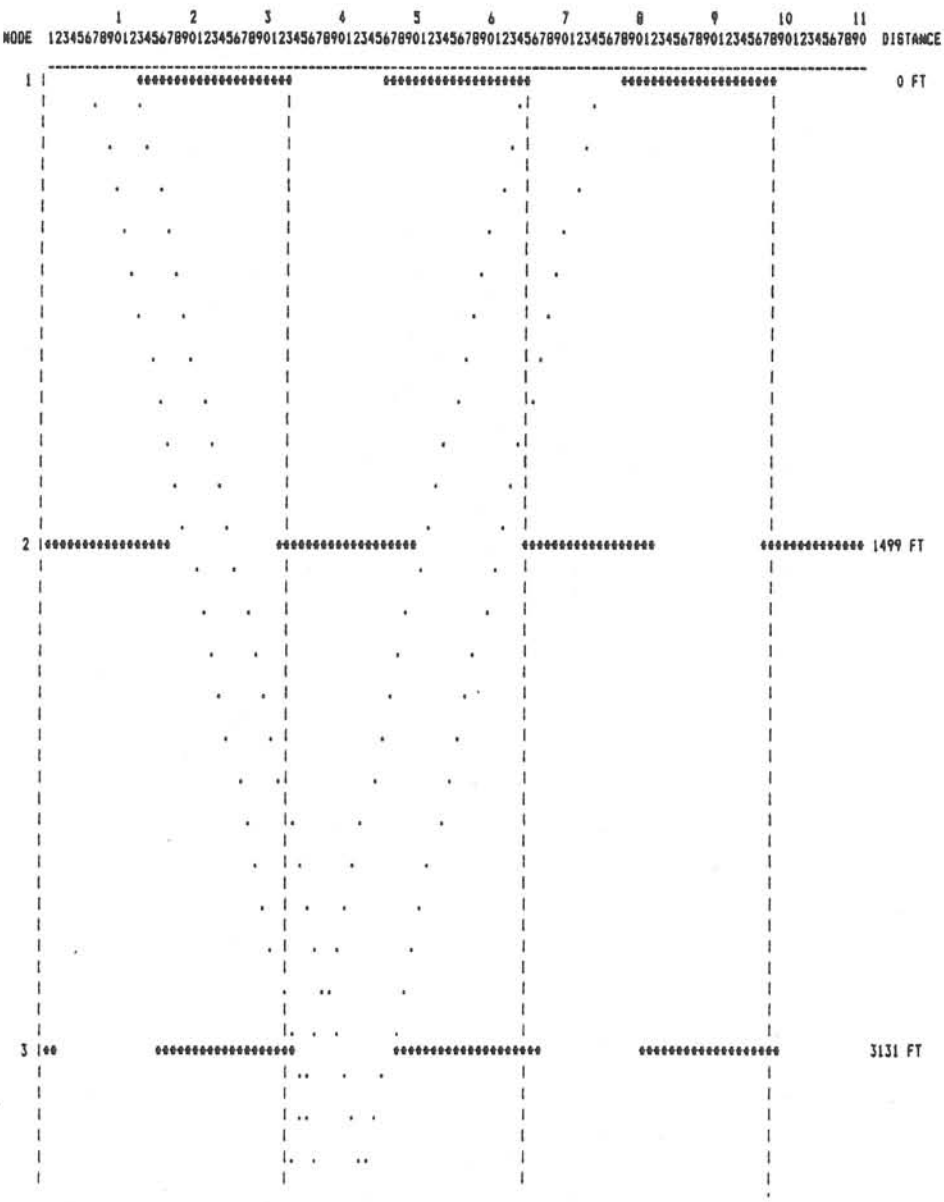
SIGNAL NO.		EASTBOUND LENGTH (FEET)	EASTBOUND PROGRESSION TRAVERSAL TIME (SECS)	EASTBOUND PROGRESSION SPEED (MILES/HOUR)	WESTBOUND LENGTH (FEET)	WESTBOUND PROGRESSION TRAVERSAL TIME (SECS)	WESTBOUND PROGRESSION SPEED (MILES/HOUR)
1							
	-------	1499.00	26.896	38.000	1499.00	26.896	38.000
2							
	-------	1632.00	29.282	38.000	1632.00	29.282	38.000
3							
	-------	1119.00	19.982	38.182	1119.00	19.169	39.801
4							
	-------	1500.00	25.568	40.000	1500.00	25.568	40.000
5							
	-------	1621.00	26.315	42.000	1621.00	26.315	42.000
6							
ENTIRE ARTERY		7371.00	128.04	39.250	7371.00	127.23	39.501

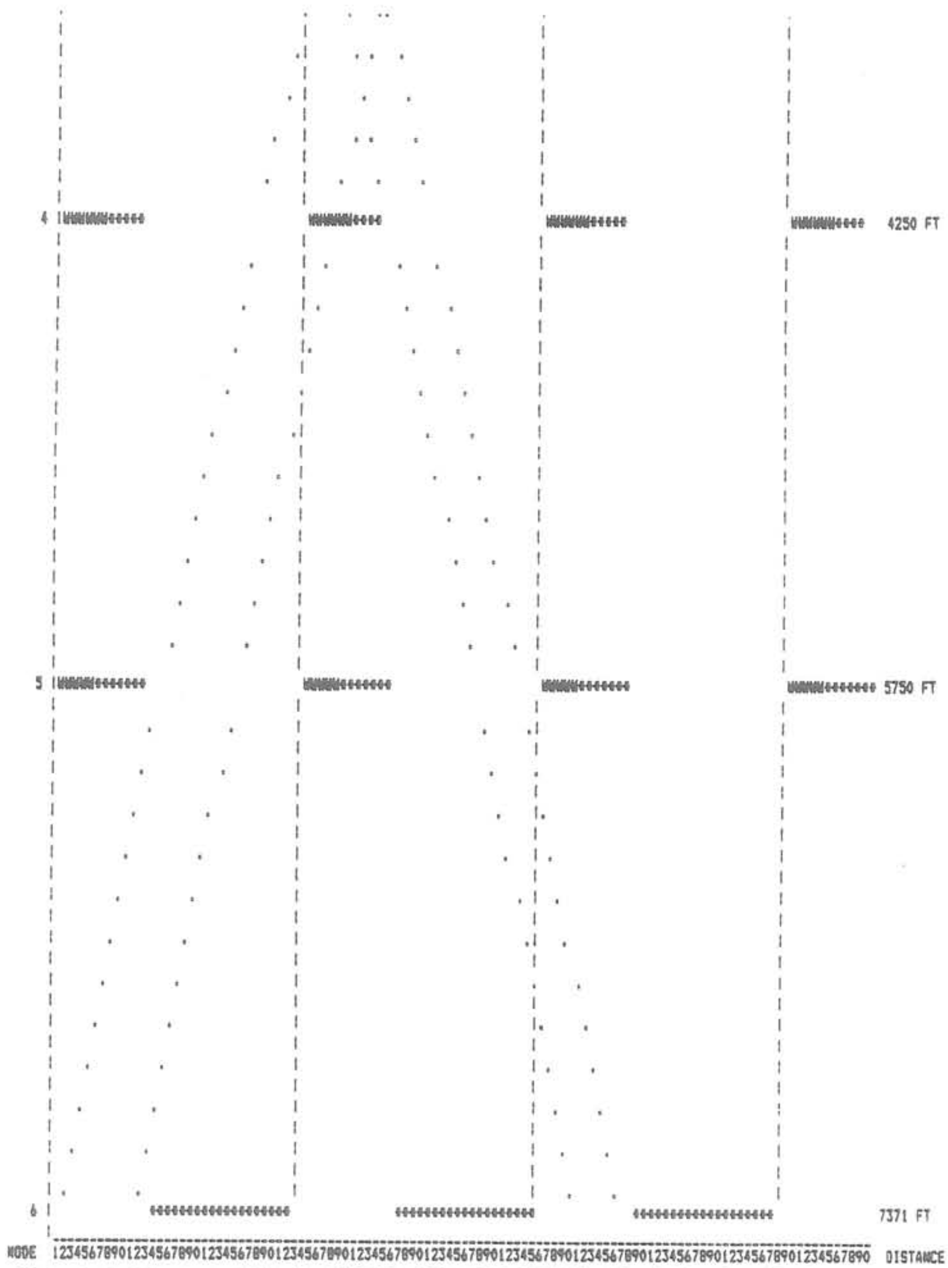
**** TW-Bandwidth TIME-SPACE DIAGRAM ****

**** WARNING **** THE TIME SCALE HAS BEEN CHANGED TO 2 SEC/CHAR.
THE ORIGINAL INPUT SCALE OF 1 SEC/CHAR CANNOT ACCOMMODATE A T-S PLOT WITH
PROGRESSION BANDS OF BOTH DIRECTIONS FULLY SHOWN.

NAME OF ARTERY: BROADWAY TIME SCALE = 2 SEC/CHAR

CYCLE LENGTH : 65.00 SECONDS DIST. SCALE = 67 FT/LINE



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NODE    1 ---> NODE    6:  EASTBOUND DIRECTION (DOWN)          EEE  EASTBOUND GREEN (DOWN)
NODE    6 ---> NODE    1:  WESTBOUND DIRECTION (UP  )          WWW  WESTBOUND GREEN (UP  )
 EASTBOUND BAND =  11.6 SECONDS AT 39.2 MILES/HOUR                  GREEN IN BOTH DIRECTIONS
 WESTBOUND BAND =  20.3 SECONDS AT 39.5 MILES/HOUR             ***   RED IN BOTH DIRECTIONS

**************************************************************
*                                                            *
*            >>>  TW-BANDWIDTH ENDED  <<<                    *
*                                                            *
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NETSIM

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                    START OF CASE   1

TEST NETWORK FOR NETSIM (ORIGINAL)

BROADWAY ARTERIAL   ,                    ,              0  7/20/85

          SEED FOR RANDOM NUMBER GENERATOR IS     4456737
```

SIMULATION OF TRAFFIC

THE NETSIM MODEL

TEST NETWORK FOR NETSIM (ORIGINAL)

BROADWAY ARTERIAL , , 0 7/20/85

SEED FOR RANDOM NUMBER GENERATOR IS 4456737

LINK	LANE	SPAN	POCK L	POCK R	MEAN U-F	H	TURNING MOVEMENTS LEFT	THRU	RT	DIAG	DESTINATION NODES LEFT	THRU	RT	DIAG	PED LOST	PED DEN	LANE CHAN 1	2	3	4	5	TYPE	G	L	IDENTIFICATION
(800, 18)	3	600	0	0	ENTRY	20	0	100	0	0	0	1	0	0	30		0	0	0	0	0	1	2	1	
(18, 1)	3	600	6	0	40	20	16	74	10	0	17	2	7	0	30	0	0	0	0	0	0	1	2	2	
(1, 18)	2	600	0	0	40	20	0	100	0	0	0	800	0	0	30	0	0	0	0	0	0	1	2	3	
(803, 7)	2	600	0	0	ENTRY	20	0	100	0	0	0	1	0	0	30		0	0	0	0	0	1	2	4	
(7, 1)	2	600	6	0	40	20	11	85	4	0	18	17	2	0	30	0	0	0	0	0	0	1	2	5	
(1, 7)	2	600	0	0	40	20	0	100	0	0	0	803	0	0	30	0	0	0	0	0	0	1	2	6	
(802, 17)	2	600	0	0	ENTRY	20	0	100	0	0	0	1	0	0	30		0	0	0	0	0	1	2	7	
(17, 1)	2	600	6	0	40	20	13	66	21	0	2	7	18	0	30	0	0	0	0	0	0	1	2	8	
(1, 17)	2	600	0	0	40	20	0	100	0	0	0	802	0	0	30	0	0	0	0	0	0	1	2	9	
(804, 16)	1	600	0	0	ENTRY	20	0	100	0	0	0	2	0	0	30		0	0	0	0	0	1	2	10	
(16, 2)	1	600	6	0	40	20	21	53	26	0	3	8	1	0	30	0	0	0	0	0	0	1	2	11	
(2, 16)	1	600	0	0	40	20	0	100	0	0	0	804	0	0	30	0	0	0	0	0	0	1	2	12	
(805, 8)	1	600	0	0	ENTRY	20	0	100	0	0	0	2	0	0	30		0	0	0	0	0	1	2	13	
(8, 2)	1	600	6	0	40	20	10	87	3	0	1	16	3	0	30	0	0	0	0	0	0	1	2	14	
(2, 8)	1	600	0	0	40	20	0	100	0	0	0	805	0	0	30	0	0	0	0	0	0	1	2	15	
(806, 15)	2	600	0	0	ENTRY	20	0	100	0	0	0	3	0	0	30		0	0	0	0	0	1	2	16	
(15, 3)	2	600	6	0	40	20	12	72	16	0	4	9	2	0	30	0	0	0	0	0	0	1	2	17	
(3, 15)	3	600	0	0	40	20	0	100	0	0	0	806	0	0	30	0	0	0	0	0	0	1	2	18	
(807, 9)	3	600	0	0	ENTRY	20	0	100	0	0	0	3	0	0	30		0	0	0	0	0	1	2	19	
(9, 3)	3	600	6	0	40	20	12	83	5	0	2	15	4	0	30	0	0	0	0	0	0	1	2	20	
(3, 9)	2	600	0	0	40	20	0	100	0	0	0	807	0	0	30	0	0	0	0	0	0	1	2	21	
(808, 10)	1	600	0	0	ENTRY	20	0	100	0	0	0	4	0	0	30		0	0	0	0	0	1	2	22	
(10, 4)	1	600	6	0	40	20	60	0	40	0	3	0	5	0	30	0	0	0	0	0	0	1	2	23	
(4, 10)	1	600	0	0	40	20	0	100	0	0	0	808	0	0	30	0	0	0	0	0	0	1	2	24	
(809, 11)	1	600	0	0	ENTRY	20	0	100	0	0	0	5	0	0	30		0	0	0	0	0	1	2	25	
(11, 5)	1	600	6	0	40	20	88	0	12	0	4	0	6	0	30	0	0	0	0	0	0	1	2	26	
(5, 11)	1	600	0	0	40	20	0	100	0	0	0	809	0	0	30	0	0	0	0	0	0	1	2	27	
(811, 12)	2	600	0	0	ENTRY	20	0	100	0	0	0	6	0	0	30		0	0	0	0	0	1	2	28	
(12, 6)	2	600	6	0	40	20	13	80	7	0	5	14	13	0	30	0	0	0	0	0	0	1	2	29	
(6, 12)	2	600	0	0	40	20	0	100	0	0	0	811	0	0	30	0	0	0	0	0	0	1	2	30	
(810, 14)	2	600	0	0	ENTRY	20	0	100	0	0	0	6	0	0	30		0	0	0	0	0	1	2	31	
(14, 6)	2	600	6	0	40	20	17	70	13	0	13	12	5	0	30	0	0	0	0	0	0	1	2	32	
(6, 14)	2	600	0	0	40	20	0	100	0	0	0	810	0	0	30	0	0	0	0	0	0	1	2	33	
(801, 13)	3	600	0	0	ENTRY	20	0	100	0	0	0	6	0	0	30		0	0	0	0	0	1	2	34	
(13, 6)	3	600	6	0	40	20	7	68	25	0	12	5	14	0	30	0	0	0	0	0	0	1	2	35	
(6, 13)	3	600	0	0	40	20	0	100	0	0	0	801	0	0	30	0	0	0	0	0	0	1	2	36	
(1, 2)	3	1499	6	0	40	20	18	78	4	0	16	3	8	0	30	0	0	0	0	0	0	1	2	37	
(2, 1)	2	1499	6	0	40	20	8	83	9	0	7	18	17	0	30	0	0	0	0	0	0	1	2	38	
(2, 3)	3	1632	6	0	40	20	20	69	11	0	15	4	9	0	30	0	0	0	0	0	0	1	2	39	
(3, 2)	2	1632	6	0	40	20	7	76	17	0	8	1	16	0	30	0	0	0	0	0	0	1	2	40	
(3, 4)	3	1119	0	0	40	20	0	93	7	0	0	5	10	0	30	0	0	0	0	0	0	1	2	41	
(4, 3)	2	1119	6	0	40	20	8	88	4	0	9	2	15	0	30	0	0	0	0	0	0	1	2	42	
(4, 5)	3	1500	0	0	40	20	0	96	4	0	0	6	11	0	30	0	0	0	0	0	0	1	2	43	
(5, 4)	3	1500	6	0	40	20	4	96	0	0	10	3	0	0	30	0	0	0	0	0	0	1	2	44	
(5, 6)	3	1621	6	0	40	20	18	68	14	0	14	13	12	0	30	0	0	0	0	0	0	1	2	45	
(6, 5)	3	1621	6	0	40	20	5	95	0	0	11	4	0	0	30	0	0	0	0	0	0	1	2	46	

TOPOLOGICAL FEATURES OF NETWORK

LINKS WITH LEFT-TURN MOVEMENT

LINK	OPPOSING	LINK	OPPOSING	LINK	OPPOSING	LINK	OPPOSING
(18, 1)	(2, 1)	(7, 1)	(17, 1)	(17, 1)	(7, 1)	(16, 2)	(8, 2)
(8, 2)	(16, 2)	(15, 3)	(9, 3)	(9, 3)	(15, 3)	(12, 6)	(14, 6)
(14, 6)	(12, 6)	(13, 6)	(5, 6)	(1, 2)	(3, 2)	(2, 1)	(18, 1)
(2, 3)	(4, 3)	(3, 2)	(1, 2)	(4, 3)	(2, 3)	(5, 4)	(3, 4)
(5, 6)	(13, 6)	(6, 5)	(4, 5)	(			

LEFT-TURNS FROM THE FOLLOWING LINKS HAVE UNOPPOSED MOVEMENT

(10, 4) (11, 5) (

PLEASE VERIFY AND PREPARE TYPE 8 INPUT CARD IF NECESSARY

PEDESTRIAN DENSITY CATEGORIES

CODE	VOLUME (PEDS/HR)
0	100 TO 250
1	250 TO 500
2	ABOVE 500
3	NO PEDESTRIANS

TRAFFIC SIGNAL DATA

* INDICATES RTOR IN EFFECT FOR THIS APPROACH

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (18, 1)*	(17, 1)*	(2, 1)*	(7, 1)*	(
1	1	6 (9%)	0 (0%)	4	2	4	2	
1	2	3 (5%)	6 (9%)	0	2	0	2	
1	3	21 (32%)	9 (14%)	9	2	9	2	
1	4	3 (5%)	30 (46%)	0	2	0	2	
1	5	6 (9%)	33 (51%)	2	4	2	4	
1	6	3 (5%)	39 (60%)	2	0	2	0	
1	7	20 (31%)	42 (65%)	2	9	2	9	
1	8	3 (5%)	62 (95%)	2	0	2	0	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (1, 2)*	(16, 2)*	(3, 2)*	(8, 2)*	(
2	1	6 (9%)	30 (46%)	4	2	4	2	
2	2	3 (5%)	36 (55%)	0	2	0	2	
2	3	25 (38%)	39 (60%)	9	2	9	2	
2	4	3 (5%)	64 (98%)	0	2	0	2	
2	5	5 (8%)	2 (3%)	2	4	2	4	
2	6	3 (5%)	7 (11%)	2	0	2	0	
2	7	17 (26%)	10 (15%)	2	9	2	9	
2	8	3 (5%)	27 (42%)	2	0	2	0	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (2, 3)*	(15, 3)*	(4, 3)*	(9, 3)*	(
3	1	7 (11%)	2 (3%)	4	2	4	2	
3	2	3 (5%)	9 (14%)	0	2	0	2	
3	3	22 (34%)	12 (18%)	9	2	9	2	
3	4	3 (5%)	34 (52%)	0	2	0	2	
3	5	7 (11%)	37 (57%)	2	4	2	4	
3	6	3 (5%)	44 (68%)	2	0	2	0	
3	7	17 (26%)	47 (72%)	2	9	2	9	
3	8	3 (5%)	64 (98%)	2	0	2	0	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (3, 4)*	(5, 4)*	(10, 4)*	(
4	1	9 (14%)	58 (89%)	2	1	2	
4	2	3 (5%)	2 (3%)	2	0	2	
4	3	41 (63%)	5 (8%)	9	9	2	
4	4	3 (5%)	46 (71%)	0	0	2	
4	5	6 (9%)	49 (75%)	2	2	8	
4	6	3 (5%)	55 (85%)	2	2	0	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (4, 5)#	(6, 5)#	(11, 5)#	(
5	1	8 (12P)	18 (28P)	2	1	2	
5	2	3 (5P)	26 (40P)	2	0	2	
5	3	37 (57P)	29 (45P)	9	9	2	
5	4	3 (5P)	1 (2P)	0	0	2	
5	5	11 (17P)	4 (6P)	2	2	8	
5	6	3 (5P)	15 (23P)	2	2	0	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (5, 6)#	(14, 6)#	(13, 6)#	(12, 6)#	(
6	1	6 (9P)	4 (6P)	4	2	4	2	
6	2	3 (5P)	10 (15P)	0	2	0	2	
6	3	15 (23P)	13 (20P)	9	2	9	2	
6	4	3 (5P)	28 (43P)	0	2	0	2	
6	5	8 (12P)	31 (48P)	2	4	2	4	
6	6	3 (5P)	39 (60P)	2	0	2	0	
6	7	24 (37P)	42 (65P)	2	9	2	9	
6	8	3 (5P)	1 (2P)	2	0	2	0	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (1, 7)#	(803, 7)#	(
7	1	65 (100P)	0 (0P)	1	1	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (2, 8)#	(805, 8)#	(
8	1	65 (100P)	0 (0P)	1	1	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (3, 9)#	(807, 9)#	(
9	1	65 (100P)	0 (0P)	1	1	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (4, 10)#	(808, 10)#	(
10	1	65 (100P)	0 (0P)	1	1	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (5, 11)#	(809, 11)#	(
11	1	65 (100P)	0 (0P)	1	1	

NODE	INTVL	DURATION	OFFSET	SIGNAL CODES FACING INDICATED APPROACHES (6, 12)#	(811, 12)#	(
12	1	65 (100P)	0 (0P)	1	1	

```
NODE    INTVL    DURATION       OFFSET                    SIGNAL CODES FACING INDICATED APPROACHES
                                                    (  6, 13)*   (801, 13)*   (
 13       1      65  (100P)     0  (  0P)                1            1

NODE    INTVL    DURATION       OFFSET                    SIGNAL CODES FACING INDICATED APPROACHES
                                                    (810, 14)*   (  6, 14)*   (
 14       1      65  (100P)     0  (  0P)                1            1

NODE    INTVL    DURATION       OFFSET                    SIGNAL CODES FACING INDICATED APPROACHES
                                                    (806, 15)*   (  3, 15)*   (
 15       1      65  (100P)     0  (  0P)                1            1

NODE    INTVL    DURATION       OFFSET                    SIGNAL CODES FACING INDICATED APPROACHES
                                                    (804, 16)*   (  2, 16)*   (
 16       1      65  (100P)     0  (  0P)                1            1

NODE    INTVL    DURATION       OFFSET                    SIGNAL CODES FACING INDICATED APPROACHES
                                                    (802, 17)*   (  1, 17)*   (
 17       1      65  (100P)     0  (  0P)                1            1

NODE    INTVL    DURATION       OFFSET                    SIGNAL CODES FACING INDICATED APPROACHES
                                                    (800, 18)*   (  1, 18)*   (
 18       1      65  (100P)     0  (  0P)                1            1
```

INTERPRETATION OF SIGNAL CODES

0	YIELD OR AMBER
1	GREEN
2	RED
3	RED WITH GREEN RIGHT ARROW
4	RED WITH GREEN LEFT ARROW
5	STOP OR RED WITH RIGHT TURN PERMITTED
6	RED WITH GREEN DIAGONAL ARROW
7	NO TURNS-GREEN THRU ARROW
8	RED WITH LEFT AND RIGHT GREEN ARROWS
9	NO LEFT TURN-GREEN THRU AND RIGHT

MAXIMUM NODE NUMBER IS 18

NUMBER OF ENTRY LINKS IS 12

SUB-INTERVAL 1

ENTRY LINK STATISTICS

LINK	FLOW RATE (VEH/HR)	PCT. TRUCKS
(800, 18)	732	5
(803, 7)	1097	5
(802, 17)	608	5
(804, 16)	451	5
(805, 8)	606	5
(806, 15)	751	5
(807, 9)	1191	5
(808, 10)	100	5
(809, 11)	170	5
(811, 12)	1230	5
(810, 14)	585	5
(801, 13)	1000	5

CARD FILE LIST

```
1       1 12  2        1                                                    99
TEST NETWORK FOR NETSIM (ORIBINAL)                                 4456737  0
BROADWAY ARTERIAL                                              7 20 85      1
-260  715                                                                   3
800 18 600        1      18  1 600   6 17  2  7    1 18 600      800       4
803  7 600        1       7  1 600   6 18 17  2    1  7 600      803       4
802 17 600        1      17  1 600   6  2  7 18    1 17 600      802       4
804 16 600        2      16  2 600   6  3  8  1    2 16 600      804       4
805  8 600        2       8  2 600   6  1 16  3    2  8 600      805       4
806 15 600        3      15  3 600   6  4  9  2    3 15 600      806       4
807  9 600        3       9  3 600   6  2 15  4    3  9 600      807       4
808 10 600        4      10  4 600   6  3     5    4 10 600      808       4
809 11 600        5      11  5 600   6  4     6    5 11 600      809       4
811 12 600        6      12  6 600   6  5 14 13    6 12 600      811       4
810 14 600        6      14  6 600   6 13 12  5    6 14 600      810       4
801 13 600        6      13  6 600   6 12  5 14    6 13 600      801       4
  1  21499   6 16  3  8    2  11499   6  7 18 17    2  31632   6 15  4  9   4
  3  21632   6  8  1 16    3  41119         5 10    4  31119   6  9  2 15   4
  4  51500        6 11    5  41500   6 10  3       5  61621   6 14 13 12   4
  6  51621   6 11  4                                                        4
800 18 3   2030          18  1 3 402030           1 18 2 402030             5
803  7 2   2030           7  1 2 402030           1  7 2 402030             5
802 17 2   2030          17  1 2 402030           1 17 2 402030             5
804 16 1   2030          16  2 1 402030           2 16 1 402030             5
805  8 1   2030           8  2 1 402030           2  8 1 402030             5
806 15 2   2030          15  3 2 402030           3 15 3 402030             5
807  9 3   2030           9  3 3 402030           3  9 2 402030             5
808 10 1   2030          10  4 1 402030           4 10 1 402030             5
809 11 1   2030          11  5 1 402030           5 11 1 402030             5
811 12 2   2030          12  6 2 402030           6 12 2 402030             5
810 14 2   2030          14  6 2 402030           6 14 2 402030             5
801 13 3   2030          13  6 3 402030           6 13 3 402030             5
  1  2 3 402030           2  1 2 402030           2  3 3 402030             5
  3  2 2 402030           3  4 3 402030           4  3 2 402030             5
  4  5 3 402030           5  4 3 402030           5  6 3 402030             5
  6  5 3 402030                                                             5
800 18   100        18  1 16 74 10      1 18   100       803  7   100       7
  7  1 11 85  4      1  7   100       802 17   100        17  1 13 66 21   7
  1 17   100       804 16   100        16  2 21 53 26     2 16   100       7
805  8   100         8  2 10 87  3     2  8   100       806 15   100       7
 15  3 12 72 16      3 15   100       807  9   100         9  3 12 83  5   7
  3  9   100       808 10   100        10  4 60    40     4 10   100       7
809 11   100        11  5 88    12     5 11   100       811 12   100       7
 12  6 13 80  7      6 12   100       810 14   100        14  6 17 70 13   7
  6 14   100       801 13   100        13  6  7 68 25     6 13   100       7
  1  2 18 78  4      2  1  8 83  9     2  3 20 69 11     3  2  7 76 17    7
  3  4    93  7      4  3  8 88  4     4  5    96  4     5  4  4 96        7
  5  6 18 68 14      6  5  5 95                                            7
  1     18 17  2  7      64242    30202   219292    30202    62424    32020 10
  1   0                 202929    32020                                    11
  2     1 16  3  8       64242    30202   259292    30202    52424    32020 10
  2  30                 172929    32020                                    11
  3     2 15  4  9       74242    30202   229292    30202    72424    32020 10
  3   2                 172929    32020                                    11
  4  58  3  5 10         9212     3202    41992     3002     6228     3220 10
```

```
  5  18  4  6 11          8212     3202    37992     3002    11228     3220  10
  6      5 14 13 12       64242    30202   159292    30202    82424    32020  10
  6   4                  242929    32020                                      11
  7      1803            6511                                                 10
  8      2805            6511                                                 10
  9      3807            6511                                                 10
 10      4808            6511                                                 10
 11      5809            6511                                                 10
 12      6811            6511                                                 10
 13      6801            6511                                                 10
 14    810  6            6511                                                 10
 15    806  3            6511                                                 10
 16    804  2            6511                                                 10
 17    802  1            6511                                                 10
 18    800  1            6511                                                 10
800 18 732 5 803  71097 5 802 17 608 5 804 16 451 5 805  8 606 5 806 15 751 5 20
807  91191 5 808 10 100 5 809 11 170 5 811 121230 5 810 14 585 5 801 131000 5 20
3600         20020080010                                                      60

                                    MAXIMUM INITIALIZATION PERIOD =-260 SECONDS.
```

SIMULATION TIME INTERVAL =3600 SECONDS.

SCANNING INTERVAL=1 SECOND

INTERMEDIATE OUTPUT COMMENCES 200 SECONDS AFTER BEGINNING OF SUB-INTERVAL

FOR A PERIOD OF 800 SECONDS, PRINT-OUT WILL APPEAR AT INTERVALS OF 200 SECONDS

CUMULATIVE OUTPUT WILL APPEAR EVERY 10 MINUTES DURING SUB-INTERVAL

CLOCK TIME NOW

7 15 A.M.

FUEL CONSUMPTION AND EMISSIONS WILL NOT BE PROCESSED

VEHICLE TRAJECTORY DATA WILL NOT BE WRITTEN TO UNIT 23

EQUILIBRIUM ATTAINED

PERIOD	OCCUPANCY	CHANGE
1	218	0
2	218	27
3	191	64

DURING PAST CYCLE, 218 VEHICLES OCCUPIED THE NETWORK. NET CHANGE IN OCCUPANCY WAS 27 AT TIME=260

DURING PAST CYCLE, 191 VEHICLES OCCUPIED THE NETWORK. NET CHANGE IN OCCUPANCY WAS 64 AT TIME=195

INITIALIZATION PERIOD COMPLETED AFTER 260 SECONDS

COMMENCE SIMULATION AND GATHER STATISTICAL DATA

LINK STATISTICS AT TIME 7 10 20

LINK	OCC.	VEH DIS	TURN MOVEMENT LEFT	THRU	RT.	QUEUE LENGTH BY LANE 1	2	3	4	5	DELAY/ VEH.	STOP DLY(P)	CYC FLR	EVNT	CURRENT CHANNELIZATION					AVG. SPEED	NO. STOP	SIB CODE
(800, 18)	0	41	0	41	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(18, 1)	10	40	8	40	2	2	0	1	0	2	23.0	61	0	0	0	0	0	0	0	12.4	31	4
(1, 18)	0	52	0	52	0	0	0	0	0	0	5.1	0	0	0	0	0	0	0	0	26.6	0	1
(803, 7)	0	61	0	61	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(7, 1)	13	56	8	59	3	1	5	0	0	1	41.3	71	2	0	0	0	0	0	0	7.9	61	2
(1, 7)	0	29	0	29	0	0	0	0	0	0	4.9	5	0	0	0	0	0	0	0	26.3	1	1
(802, 17)	0	34	0	34	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(17, 1)	3	33	8	21	8	0	0	0	0	0	22.0	60	0	0	0	0	0	0	0	12.5	23	2
(1, 17)	12	57	0	66	0	0	0	0	0	0	6.1	2	0	0	0	0	0	0	0	25.0	3	1
(804, 16)	0	25	0	25	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(16, 2)	7	25	6	16	9	3	0	0	0	1	31.2	67	0	0	0	0	0	0	0	10.0	22	4
(2, 16)	1	33	0	35	0	0	0	0	0	0	6.4	1	0	0	0	0	0	0	0	24.3	1	1
(805, 8)	0	34	0	34	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(8, 2)	24	25	4	42	3	20	0	0	0	1	119.4	92	3	0	0	0	0	0	0	3.1	37	4
(2, 8)	0	18	0	19	0	0	0	0	0	0	6.6	4	0	0	0	0	0	0	0	24.6	0	1
(806, 15)	0	42	0	42	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(15, 3)	3	41	7	34	4	0	0	0	0	0	22.7	60	0	0	0	0	0	0	0	12.2	31	2
(3, 15)	16	66	0	78	0	0	0	0	0	0	6.1	1	0	0	0	0	0	0	0	25.1	1	1
(807, 9)	0	67	0	67	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(9, 3)	9	64	7	62	4	0	1	0	0	0	31.4	69	1	0	0	0	0	0	0	9.8	57	2
(3, 9)	9	46	0	52	0	0	0	0	0	0	5.0	3	0	0	0	0	0	0	0	26.0	2	1
(808, 10)	0	6	0	6	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(10, 4)	1	5	5	0	1	0	0	0	0	0	36.9	68	0	0	0	0	0	0	0	8.7	5	2
(4, 10)	0	7	0	7	0	0	0	0	0	0	5.0	5	0	0	0	0	0	0	0	30.8	1	1

(809, 11)	0	10	0	10	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(11, 5)	4	9	13	0	0	0	0	0	0	3	40.3	76	0	0	0	0	0	0	0	8.0	10	8
(5, 11)	1	4	0	6	0	0	0	0	0	0	7.0	5	0	0	0	0	0	0	0	20.3	1	1
(811, 12)	1	69	0	70	0	0	1	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(12, 6)	11	64	13	57	5	1	1	0	0	0	29.4	63	0	0	0	0	0	0	0	10.2	57	2
(6, 12)	4	36	0	39	0	0	0	0	0	0	5.1	0	0	0	0	0	0	0	0	27.1	0	1
(810, 14)	0	32	0	32	0	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(14, 6)	3	32	5	29	1	0	0	0	0	0	21.2	58	0	0	0	0	0	0	0	13.2	22	2
(6, 14)	13	70	0	81	0	0	0	0	0	0	6.2	1	0	0	0	0	0	0	0	25.0	2	1
(801, 13)	0	55	0	56	0	0	0	1	0	0	.0	0	0	0	0	0	0	0	0	.0	0	1
(13, 6)	14	55	2	45	20	2	2	3	0	0	27.3	66	1	0	4	0	0	0	0	10.9	44	4
(6, 13)	1	25	0	26	0	0	0	0	0	0	4.7	3	0	0	0	0	0	0	0	27.5	3	1
(1, 2)	9	41	11	35	3	0	0	0	0	3	13.6	28	0	0	0	0	0	0	0	25.6	18	2
(2, 1)	19	47	8	52	8	1	1	0	0	0	15.2	39	0	0	0	0	0	0	0	25.0	24	4
(2, 3)	13	36	9	36	5	0	0	1	0	0	13.2	32	0	0	0	0	0	0	0	25.4	14	4
(3, 2)	10	55	3	53	8	0	0	0	0	0	20.4	42	0	0	0	0	0	0	0	23.3	25	2
(3, 4)	4	33	0	32	5	1	0	1	0	0	8.1	23	0	0	0	0	0	0	0	26.8	9	9
(4, 3)	18	51	7	60	2	8	5	0	0	0	39.4	76	1	0	0	0	0	0	0	13.6	53	4
(4, 5)	0	31	0	30	1	0	0	0	0	0	7.6	54	0	0	0	0	0	0	0	30.6	9	2
(5, 4)	10	53	1	64	0	0	0	0	0	0	3.9	15	0	0	0	0	0	0	0	33.3	7	9
(5, 6)	13	25	6	26	6	0	0	0	0	0	12.7	49	0	0	0	0	0	0	0	26.0	12	4
(6, 5)	3	51	5	47	0	0	0	0	0	0	9.5	19	0	0	0	0	0	0	0	30.0	11	2

CUMULATIVE STATISTICS SINCE BEGINNING OF SIMULATION

PRESENT TIME IS 8 15 0, ELAPSED SIMULATED TIME IS 60 MINUTES, 0 SECONDS

LINK STATISTICS

LINK	VEH-MILES	VEH TRP	MOV. TIME V-MIN	DELAY TIME V-MIN	M/T	TOTAL TIME V-MIN	T-TIME / VEH. SEC	T-TIME/ VEH-MILE SEC/MILE	D-TIME / VEH SEC	D-TIME/ VEH-MILE SEC/MILE	PCT STOP DELAY	AVG. SPEED MPH	AVG. OCC.	STOPS /VEH	AVG SAT PCT	CYCL FAIL
(18, 1)	83.8	737	126.5	259.4	.33	385.9	31.4	276.5	21.1	185.8	59	13.0	6.3	.70	7	0
(1, 18)	124.1	1097	190.3	101.4	.65	291.7	16.0	141.1	5.5	49.1	2	25.5	4.8	.04	9	0
(7, 1)	113.8	1001	169.9	2330.9	.07	2500.8	149.9	1319.1	139.7	1229.5	95	2.7	41.6	1.15	63	54
(1, 7)	63.1	558	95.0	51.0	.65	145.9	15.7	138.8	5.5	48.5	3	25.9	2.4	.06	5	0
(17, 1)	69.0	607	104.1	220.6	.32	324.7	32.1	282.4	21.8	191.9	59	12.7	5.3	.69	9	0
(1, 17)	121.3	1071	183.4	111.3	.62	294.6	16.5	145.8	6.2	55.0	2	24.7	4.9	.05	9	0
(16, 2)	51.5	453	76.7	191.2	.29	267.9	35.5	312.2	25.3	222.8	63	11.5	4.2	.81	12	0
(2, 16)	77.2	687	117.9	72.0	.62	189.9	16.6	147.7	6.3	56.0	3	24.4	3.1	.07	12	0
(8, 2)	48.9	430	72.0	1411.8	.05	1483.8	207.0	1822.0	197.0	1733.6	99	2.0	24.7	1.13	69	55
(2, 8)	39.3	347	60.2	34.0	.64	94.1	16.3	143.7	5.9	51.9	4	25.1	1.6	.08	6	0
(15, 3)	84.4	743	128.3	338.6	.27	466.8	37.7	331.8	27.3	240.6	66	10.9	7.6	.80	12	6
(3, 15)	133.2	1174	202.2	118.6	.63	320.7	16.4	144.5	6.1	53.4	1	24.9	5.3	.03	7	0
(9, 3)	135.8	1195	203.0	598.2	.25	801.2	40.2	354.0	30.0	264.3	68	10.2	13.2	.84	14	13
(3, 9)	78.6	694	120.4	66.7	.64	187.1	16.2	142.9	5.8	50.9	3	25.2	3.1	.06	6	0
(10, 4)	11.4	100	16.9	39.8	.30	56.6	34.0	299.1	23.9	209.9	59	12.0	1.0	.82	3	0
(4, 10)	9.0	81	13.3	9.5	.59	22.8	16.9	151.6	7.0	62.9	11	23.8	.4	.30	2	0
(11, 5)	19.5	172	29.2	74.9	.28	104.1	36.3	319.6	26.1	229.9	65	11.3	1.7	.78	5	0
(5, 11)	7.7	69	11.4	8.0	.59	19.4	16.9	150.5	7.0	62.2	10	23.9	.3	.28	2	0
(12, 6)	138.5	1219	204.6	1132.5	.15	1337.1	65.8	579.2	55.7	490.5	79	6.2	22.2	1.09	34	44
(6, 12)	63.0	558	95.4	50.0	.66	145.4	15.6	138.4	5.4	47.6	3	26.0	2.4	.07	5	0
(14, 6)	65.7	578	100.2	186.6	.35	286.8	29.8	262.0	19.4	170.5	56	13.7	4.7	.67	8	1
(6, 14)	151.1	1340	229.0	135.9	.63	364.9	16.3	144.9	6.1	54.0	1	24.8	6.0	.04	12	0
(13, 6)	113.8	1001	168.6	547.4	.24	716.0	42.9	377.7	32.8	288.7	70	9.5	11.9	.87	13	24
(6, 13)	64.5	571	99.6	43.9	.69	143.5	15.1	133.5	4.6	40.8	4	27.0	2.4	.07	3	0

(1, 2)	188.0	663	288.7	155.4	.65	444.1	40.2	141.7	14.1	49.6	41	25.4	7.4	.33	4	1
(2, 1)	295.9	1044	451.7	365.4	.55	817.1	47.0	165.7	21.0	74.1	46	21.7	13.6	.52	9	0
(2, 3)	195.0	631	297.2	132.6	.69	429.8	40.9	132.3	12.6	40.8	43	27.2	7.2	.42	3	0
(3, 2)	358.9	1163	543.1	576.0	.49	1119.1	57.7	187.1	29.7	96.3	56	19.2	18.6	.66	12	6
(3, 4)	122.4	579	189.2	68.5	.73	257.7	26.7	126.3	7.1	33.6	19	28.5	4.3	.18	3	0
(4, 3)	218.7	1032	328.2	604.6	.35	932.7	54.2	255.9	35.1	165.9	77	14.1	15.6	.90	14	14
(4, 5)	163.7	577	252.9	75.4	.77	328.3	34.1	120.3	7.8	27.6	55	29.9	5.5	.28	3	0
(5, 4)	287.5	1012	440.9	67.3	.87	508.2	30.1	106.0	4.0	14.0	25	33.9	8.5	.13	4	0
(5, 6)	177.1	577	273.7	128.3	.68	402.0	41.8	136.2	13.3	43.5	49	26.4	6.7	.45	3	2
(6, 5)	278.7	909	423.3	142.6	.75	565.9	37.4	121.8	9.4	30.7	12	29.6	9.4	.16	4	0

NETWORK STATISTICS

VEHICLE-MILES=4153.93 VEHICLE-MINUTES= 16756.8 VEHICLE-TRIPS (EST.)= 8287 STOPS/VEHICLE= 1.37

MOVING/TOTAL TRIP TIME= .376 AVG. SPEED (MPH)=14.87 MEAN OCCUPANCY= 278.1 VEH. AVG DELAY/VEHICLE= 75.66 SEC

TOTAL DELAY=10450.2 MIN. DELAY/VEH-MILE= 2.52 MIN/V-MILE TRAVEL TIME/VEH-MILE= 4.03 MIN/V-MILE

STOPPED DELAY AS A PERCENTAGE OF TOTAL DELAY=70.3

SEED FOR RANDOM NUMBER GENERATOR IS 83191217

LAST CASE PROCESSED

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        T R A N S Y T - 7 F  --  T R A F F I C   S I G N A L   S Y S T E M   O P T I M I Z A T I O N   P R O G R A M

RELEASE 4   JUNE, 1984                                                                                  VERSION 4.0

SPONSORED BY:                                                                  DEVELOPED BY:
FEDERAL HIGHWAY ADMINISTRATION                                                 TRANSPORT AND ROAD RESEARCH LABORATORY
OFFICE OF TRAFFIC OPERATIONS                                                   UNITED KINGDOM AND
                                                                               TRANSPORTATION RESEARCH CENTER
                                                                               UNIVERSITY OF FLORIDA

                                  ---------------------------------------------
                                  I N P U T   D A T A   R E P O R T   F O R   R U N   1
                                  ---------------------------------------------

FIELDS:  1     2     3     4     5     6     7     8     9    10    11    12    13    14    15    16
        ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----

LINE                                                  RUN  TITLE  CARD
 NO.    TITLE

  1)    BROADWAY ARTERIAL

                                                   NETWORK  CONTROL  CARD
                                          SEC/   SEC/
LINE   CARD   MIN    MAX   CYCLE   STEP   STEP   LOST   GREEN   STOP  OUTPUT INITIAL  PERIOD  SEC(0)  SPD(0) ENGL(0)  PUNCH
 NO.   TYPE   CYCLE  CYCLE  INCR.   CYCLE  NORMAL  TIME  EXTEN. PENALTY LEVEL TIMINGS  LENGTH PERC(1) TIME(1) METR(1) DECK(1)

  2)    1     65     65     0       0      1      3      1     -1      0     0       0      0      0      0      1

+++ 106 +++ WARNING + THE SEC/STEPS FACTOR IN FIELD 6 IS TOO SMALL FOR CYCLE LENGTHS ABOVE  60 SECONDS.
                      IT WILL BE INCREASED TO ALLOW A MAXIMUM OF 60 STEPS/CYCLE.

+++ 107 +++ WARNING + A STOP PENALTY OF (-1) WILL RESULT IN AUTOMATIC CALCULATION OF THE PI TO MINIMIZE FUEL CONSUMPTION.
                      LINK SPECIFIC DELAY OR STOP WEIGHTS ON CARDS TYPE 37 & 38 WILL STILL BE APPLIED, HOWEVER.

+++ 112 +++ WARNING + A VALUE OF 1 IN FIELD 16 CAUSES A DATA DECK WITH OPTIMIZED TIMINGS
                      TO BE OUTPUT ON UNIT  7.
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RUN TITLE: BROADWAY ARTERIAL

FIELDS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
							SYSTEM	MASTER	DATA							
LINE NO.	CARD TYPE	MASTER NODE	DEF. YELLOW	CLEARANCES ALL-RED	SYSTEM SATFLOW	EXTERNAL SPEED	SYSTEM PDF	FUEL FACTOR	VEHICLE LENGTH							
3)	10	1	3	0	1700	40	35	100	25	0	0	0	0	0	0	0

INTERSECTION 1

CONTROLLER TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	OFFSET/ YLD.PT.	REF INT	INTERVAL DURATIONS (SECS. OR PERCENT) INT1	INT2	INT3	INT4	INT5	INT6	INT7	INT8	INT9	INT10	INT11	DOUBLE CYCLE
4)	14	1	33	1	6	3	20	3	6	3	21	3	0	0	0	0

PHASE TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	START INTVL	VARIAB. INTVL	YELLOW INTVL	ALL-RED INTVL	MINIM. SECS.	LINKS MOVING IN THIS PHASE								CONT. FLAG
5)	21	1	1	1	2	0	5	102	104	0	0	0	0	0	0	0
6)	22	1	3	3	4	0	8	101	103	0	0	0	0	0	0	0
7)	23	1	5	5	6	0	5	106	108	0	0	0	0	0	0	0
8)	24	1	7	7	8	0	8	105	107	0	0	0	0	0	0	0

LINK DATA

LINE NO.	CARD TYPE	LINK NO.	LINK LENGTH	SAT. FLOW	TOTAL VOL.	MID-BLK. VOL.	FIRST INPUT LINK.... NO.	VOL.	SPD/TT	SECOND INPUT LINK.... NO.	VOL.	SPD/TT	THIRD INPUT LINK.... NO.	VOL.	SPD/TT	QUEUE CAP.
9)	28	102	0	1700	120	0	0	0	0	0	0	0	0	0	0	0
10)	28	101	0	3400	977	0	0	0	0	0	0	0	0	0	0	0
11)	28	104	0	1700	80	0	0	0	0	0	0	0	0	0	0	0
12)	28	103	0	3400	528	0	0	0	0	0	0	0	0	0	0	0
13)	28	106	0	1700	120	0	0	0	0	0	0	0	0	0	0	0
14)	28	105	0	5100	612	0	0	0	0	0	0	0	0	0	0	0
15)	28	108	1499	1700	80	0	207	80	40	0	0	0	0	0	0	0
16)	28	107	1499	3400	999	0	203	120	40	207	819	40	202	60	40	0

INTERSECTION 2

CONTROLLER TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	OFFSET/ YLD.PT.	REF INT	INTERVAL DURATIONS (SECS. OR PERCENT) INT1	INT2	INT3	INT4	INT5	INT6	INT7	INT8	INT9	INT10	INT11	DOUBLE CYCLE
17)	14	2	2	1	5	3	17	3	6	3	25	3	0	0	0	0

PHASE TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	START INTVL	VARIAB. INTVL	YELLOW INTVL	ALL-RED INTVL	MINIM. SECS.	LINKS MOVING IN THIS PHASE								CONT. FLAG
18)	21	2	1	1	2	0	5	202	204	0	0	0	0	0	0	0
19)	22	2	3	3	4	0	8	201	203	0	0	0	0	0	0	0
20)	23	2	5	5	6	0	5	206	208	0	0	0	0	0	0	0
21)	24	2	7	7	8	0	8	205	207	0	0	0	0	0	0	0

FIELDS: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

LINK DATA

LINE NO.	CARD TYPE	LINK NO.	LINK LENGTH	SAT. FLOW	TOTAL VOL.	MID-BLK. VOL.	FIRST INPUT LINK.... NO.	VOL.	SPD/TT	SECOND INPUT LINK.... NO.	VOL.	SPD/TT	THIRD INPUT LINK.... NO.	VOL.	SPD/TT	QUEUE CAP.
22)	28	202	0	1700	60	0	0	0	0	0	0	0	0	0	0	0
23)	28	201	0	1700	546	0	0	0	0	0	0	0	0	0	0	0
24)	28	204	0	1700	93	0	0	0	0	0	0	0	0	0	0	0
25)	28	203	0	1700	358	0	0	0	0	0	0	0	0	0	0	0
26)	28	206	1499	1700	120	0	105	120	40	0	0	0	0	0	0	0
27)	28	205	1499	5100	552	0	101	48	40	105	424	40	104	80	40	0
28)	28	208	1632	1700	80	0	307	80	40	0	0	0	0	0	0	0
29)	28	207	1632	3400	1104	0	303	120	40	307	844	40	302	140	40	0

INTERSECTION 3

CONTROLLER TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	OFFSET/ YLD.PT.	REF INT	INTERVAL DURATIONS (SECS. OR PERCENT) INT1	INT2	INT3	INT4	INT5	INT6	INT7	INT8	INT9	INT10	INT11	DOUBLE CYCLE
30)	14	3	37	1	7	3	17	3	7	3	22	3	0	0	0	0

PHASE TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	START INTVL	VARIAB. INTVL	YELLOW INTVL	ALL-RED INTVL	MINIM. SECS.	LINKS MOVING IN THIS PHASE								CONT. FLAG
31)	21	3	1	1	2	0	5	302	304	0	0	0	0	0	0	0
32)	22	3	3	3	4	0	8	301	303	0	0	0	0	0	0	0
33)	23	3	5	5	6	0	5	306	308	0	0	0	0	0	0	0
34)	24	3	7	7	8	0	8	305	307	0	0	0	0	0	0	0

LINK DATA

LINE NO.	CARD TYPE	LINK NO.	LINK LENGTH	SAT. FLOW	TOTAL VOL.	MID-BLK. VOL.	FIRST INPUT LINK.... NO.	VOL.	SPD/TT	SECOND INPUT LINK.... NO.	VOL.	SPD/TT	THIRD INPUT LINK.... NO.	VOL.	SPD/TT	QUEUE CAP.
35)	28	302	0	1700	140	0	0	0	0	0	0	0	0	0	0	0
36)	28	301	0	5100	1051	0	0	0	0	0	0	0	0	0	0	0
37)	28	304	0	1700	93	0	0	0	0	0	0	0	0	0	0	0
38)	28	303	0	3400	658	0	0	0	0	0	0	0	0	0	0	0
39)	28	306	1632	1700	130	0	205	130	40	0	0	0	0	0	0	0
40)	28	305	1632	5100	510	0	201	20	40	205	397	40	204	93	40	0
41)	28	308	1119	1700	80	0	407	80	40	0	0	0	0	0	0	0
42)	28	307	1119	3400	964	0	407	904	40	402	60	40	0	0	0	0

INTERSECTION 4

CONTROLLER TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	OFFSET/ YLD.PT.	REF INT	INTERVAL DURATIONS (SECS. OR PERCENT) INT1	INT2	INT3	INT4	INT5	INT6	INT7	INT8	INT9	INT10	INT11	DOUBLE CYCLE
43)	13	4	49	1	6	3	9	3	41	3	0	0	0	0	0	0

PHASE TIMING DATA

FIELDS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE NO.	CARD TYPE	NODE NO.	START INTVL	VARIAB. INTVL	YELLOW INTVL	ALL-RED INTVL	MINIM. SECS.	LINKS MOVING IN THIS PHASE								CONT. FLAG
44)	21	4	1	1	2	0	5	402	409	0	0	0	0	0	0	0
45)	22	4	3	3	4	0	8	407	408	409	0	0	0	0	0	0
46)	23	4	5	5	6	0	8	405	407	408	0	0	0	0	0	0

LINK DATA

LINE NO.	CARD TYPE	LINK NO.	LINK LENGTH	SAT. FLOW	TOTAL VOL.	MID-BLK. VOL.	FIRST INPUT LINK.... NO.	VOL.	SPD/TT	SECOND INPUT LINK.... NO.	VOL.	SPD/TT	THIRD INPUT LINK.... NO.	VOL.	SPD/TT	QUEUE CAP.
47)	28	402	0	1700	60	0	0	0	0	0	0	0	0	0	0	0
48)	28	409	0	1600	40	0	0	0	0	0	0	0	0	0	0	0
49)	28	405	1119	5100	594	0	301	61	40	305	440	40	304	93	40	0
50)	28	408	1500	1700	40	0	507	40	40	0	0	0	0	0	0	0
51)	28	407	1500	5100	984	0	507	834	40	502	150	40	0	0	0	0

INTERSECTION 5

CONTROLLER TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	OFFSET/ YLD.PT.	REF INT	INTERVAL DURATIONS (SECS. OR PERCENT) INT1	INT2	INT3	INT4	INT5	INT6	INT7	INT8	INT9	INT10	INT11	DOUBLE CYCLE
52)	13	5	4	1	11	3	8	3	37	3	0	0	0	0	0	0

PHASE TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	START INTVL	VARIAB. INTVL	YELLOW INTVL	ALL-RED INTVL	MINIM. SECS.	LINKS MOVING IN THIS PHASE								CONT. FLAG
53)	21	5	1	1	2	0	5	502	509	0	0	0	0	0	0	0
54)	22	5	3	3	4	0	5	507	508	509	0	0	0	0	0	0
55)	23	5	5	5	6	0	8	505	507	508	0	0	0	0	0	0

LINK DATA

LINE NO.	CARD TYPE	LINK NO.	LINK LENGTH	SAT. FLOW	TOTAL VOL.	MID-BLK. VOL.	FIRST INPUT LINK.... NO.	VOL.	SPD/TT	SECOND INPUT LINK.... NO.	VOL.	SPD/TT	THIRD INPUT LINK.... NO.	VOL.	SPD/TT	QUEUE CAP.
56)	28	502	0	1700	150	0	0	0	0	0	0	0	0	0	0	0
57)	28	509	0	1700	20	0	0	0	0	0	0	0	0	0	0	0
58)	28	505	1500	5100	594	0	409	40	40	405	554	40	0	0	0	0
59)	28	508	1621	1700	40	0	607	40	40	0	0	0	0	0	0	0
60)	28	507	1621	5100	874	0	603	74	40	607	640	40	602	160	40	0

INTERSECTION 6

CONTROLLER TIMING DATA

LINE NO.	CARD TYPE	NODE NO.	OFFSET/ YLD.PT.	REF INT	INTERVAL DURATIONS (SECS. OR PERCENT) INT1	INT2	INT3	INT4	INT5	INT6	INT7	INT8	INT9	INT10	INT11	DOUBLE CYCLE
61)	14	6	31	1	8	3	24	3	6	3	15	3	0	0	0	0

PHASE TIMING DATA

FIELDS:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE NO.	CARD TYPE	NODE NO.	START INTVL	VARIAB. INTVL	YELLOW INTVL	ALL-RED INTVL	MINIM. SECS.	LINKS MOVING IN THIS PHASE								CONT. FLAG
62)	21	6	1	1	2	0	5	602	604	0	0	0	0	0	0	0
63)	22	6	3	3	4	0	8	601	603	0	0	0	0	0	0	0
64)	23	6	5	5	6	0	5	606	608	0	0	0	0	0	0	0
65)	24	6	7	7	8	0	8	605	607	0	0	0	0	0	0	0

LINK DATA

LINE NO.	CARD TYPE	LINK NO.	LINK LENGTH	SAT. FLOW	TOTAL VOL.	MID-BLK. VOL.	FIRST INPUT LINK.... NO.	VOL.	SPD/TT	SECOND INPUT LINK.... NO.	VOL.	SPD/TT	THIRD INPUT LINK.... NO.	VOL.	SPD/TT	QUEUE CAP.
66)	28	602	0	1700	160	0	0	0	0	0	0	0	0	0	0	0
67)	28	601	0	3400	1070	0	0	0	0	0	0	0	0	0	0	0
68)	28	604	0	1700	100	0	0	0	0	0	0	0	0	0	0	0
69)	28	603	0	3400	485	0	0	0	0	0	0	0	0	0	0	0
70)	28	606	1621	1700	110	0	505	110	40	0	0	0	0	0	0	0
71)	28	605	1621	5100	484	0	509	20	40	505	464	40	0	0	0	0
72)	28	608	0	1700	70	0	0	0	0	0	0	0	0	0	0	0
73)	28	607	0	5100	930	0	0	0	0	0	0	0	0	0	0	0

GRAPH PLOT CARDS

LINE NO.	CARD TYPE	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	LINK NO.	
74)	40	105	107	205	207	305	307	405	407	505	507	605	607	0	0	0

RUN CARD

LINE NO.	CARD TYPE															
75)	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

--- PROGRAM NOTE --- A CARD TYPE 51 CAUSES JOB TO BE EXECUTED AS A SIMULATION RUN,
DELETING ANY OPTIMIZATION VALUES INPUT.

--- PROGRAM NOTE --- NO ERRORS DETECTED. TRANSYT-7F NOW BEGINS FINAL PROCESSING.
IF ERRORS ARE DETECTED, FURTHER PROCESSING IS SUSPENDED.

--- PROGRAM NOTE --- THERE ARE A TOTAL OF 6 NODES AND 42 LINKS (INCLUDING BOTTLENECKS, IF ANY) IN THIS RUN.

--- PROGRAM NOTE --- THERE WERE A TOTAL OF 3 WARNING MESSAGES ISSUED IN THE ABOVE REPORT.

<PERFORMANCE WITH INITIAL SETTINGS>

NODE NO	LINK NO	FLOW (VEH/H)	SAT FLOW (VEH/H)	DEGREE OF SAT (%)	TOTAL TRAVEL (VEH-MI/H)	TOTAL TIME (VEH-H/H)	DELAY UNIFORM	DELAY RANDOM (VEH-H/H)	DELAY TOTAL	AVERAGE DELAY (SEC/VEH)	UNIFORM STOPS (VEH/H;%)	MAX BACK OF QUEUE (VEH/LK)	QUEUE CAPACITY (VEH/LK)	FUEL CONSUM (GA/H)	PHASE LENGTH (SEC)	LINK NO
1	101	977	3400	104*	.00	29.37	6.59	22.79	29.37	108.2	920.6(94%)	35	> 0	30.56	23	101
1	102	120	1700	115*	.00	10.19	1.13	9.06	10.19	305.8	104.5(87%)	3	> 0	8.49	9	102
1	103	528	3400	56	.00	3.02	2.84	.18	3.02	20.6	416.5(79%)	8	> 0	6.30	23	103
1	104	80	1700	76	.00	1.24	.66	.58	1.24	55.9	74.5(93%)	1	> 0	1.64	9	104
1	105	612	5100	41	.00	3.16	3.09	.07	3.16	18.6	456.6(75%)	9	> 0	6.80	24	105
1	106	120	1700	115*	.00	10.32	1.26	9.06	10.32	309.5	104.5(87%)	4	> 0	8.58	9	106
1	107	999	3400	101*	283.68	23.35	4.04	12.29	16.33	58.8	927.4(93%)	18	120	31.37	24	107
1	108	80	1700	76	22.72	1.96	.83	.58	1.40	63.1	66.9(84%)	1	60	2.51	9	108
1N:		3516	MAX =	115*	306.40	82.62	20.43	54.60	75.03	76.8	3071.4(87%)			96.25	PI =	85.3
2	201	546	1700	139*	.00	83.16	5.69	77.48	83.16	548.3	392.3(72%)	15	> 0	64.76	20	201
2	202	60	1700	76	.00	1.06	.50	.56	1.06	63.8	55.9(93%)	1	> 0	1.33	8	202
2	203	358	1700	91	.00	4.48	2.41	2.07	4.48	45.1	327.5(91%)	6	> 0	6.50	20	203
2	204	93	1700	119*	.00	9.40	1.02	8.38	9.40	363.8	78.4(84%)	3	> 0	7.65	8	204
2	205	552	5100	31	156.75	5.13	1.21	.03	1.25	8.1	323.8(59%)	7	180	9.75	28	205
2	206	120	1700	115*	34.08	11.34	1.44	9.06	10.50	314.9	97.9(82%)	4	60	9.88	9	206
2	207	1104	3400	92	340.94	14.80	3.94	2.42	6.35	20.7	810.0(73%)	18	131	24.93	28	207
2	208	80	1700	76	24.71	2.17	.98	.58	1.55	69.9	78.5(98%)	1	65	2.81	9	208
2N:		2913	MAX =	139*	556.47	131.54	17.18	100.58	117.76	145.5	2164.4(74%)			127.61	PI =	107.8
3	301	1051	5100	89	.00	8.87	7.07	1.80	8.87	30.4	959.0(91%)	18	> 0	15.92	20	301
3	302	140	1700	107*	.00	8.05	1.21	6.84	8.05	207.0	129.4(92%)	3	> 0	7.17	10	302
3	303	658	3400	84	.00	5.42	4.36	1.06	5.42	29.7	591.3(90%)	11	> 0	9.78	20	303
3	304	93	1700	71	.00	1.16	.74	.42	1.16	45.1	85.7(92%)	2	> 0	1.70	10	304
3	305	510	5100	33	157.50	5.29	1.35	.04	1.39	9.8	329.1(65%)	7	196	9.93	25	305
3	306	130	1700	99*	40.15	5.55	.95	3.61	4.56	126.3	100.7(77%)	2	65	5.78	10	306
3	307	964	3400	92	204.26	12.56	4.98	2.52	7.50	28.0	782.3(81%)	16	90	20.62	25	307
3	308	80	1700	61	16.95	1.42	.77	.24	1.00	45.2	79.2(99%)	1	45	2.13	10	308
3N:		3626	MAX =	107*	418.86	48.33	21.43	16.53	37.96	37.7	3056.8(84%)			73.03	PI =	58.1
4	402	60	1700	57	.00	.68	.49	.19	.68	40.7	55.2(92%)	1	> 0	1.04	9	402
4	405	594	5100	19	125.86	3.89	.76	.01	.77	4.7	176.4(30%)	3	134	6.82	44	405
4	407	984	5100	25	279.42	7.12	.18	.02	.20	.7	71.5(7%)	2	180	10.83	56	407
4	408	40	1700	3	11.36	.29	.01	.00	.01	.7	2.7(7%)	0	60	.44	56	408
4	409	40	1600	10	.00	.21	.21	.00	.21	19.1	29.2(73%)	1	> 0	.44	21	409
4N:		1718	MAX =	57	416.64	12.18	1.65	.22	1.87	3.9	335.0(20%)			19.57	PI =	4.7

TRANSYT-7F: BROADWAY ARTERIAL 65 SECOND CYCLE 60 STEPS PAGE 7

NODE NO	LINK NO	FLOW (VEH/H)	SAT FLOW (VEH/H)	DEGREE OF SAT (%)	TOTAL TRAVEL (VEH-MI/H)	TOTAL TIME (VEH-H/H)	DELAY UNIFORM (VEH-H/H)	DELAY RANDOM (VEH-H/H)	DELAY TOTAL	AVERAGE DELAY (SEC/VEH)	UNIFORM STOPS (VEH/H;%)	MAX BACK OF QUEUE (VEH/LK)	QUEUE CAPACITY (VEH/LK)	FUEL CONSUM (GA/H)	PHASE LENGTH (SEC)	LINK NO
5	502	150	1700	64	.00	1.37	1.09	.28	1.37	32.8	134.2(89%)	3	> 0	2.32	14	502
5	505	594	5100	22	168.68	5.10	.91	.01	.93	5.6	200.8(34%)	4	180	8.71	40	505
5	507	874	5100	24	268.28	7.13	.47	.02	.49	2.0	129.6(15%)	3	195	11.22	51	507
5	508	40	1700	3	12.28	.31	.01	.00	.01	.7	2.0(5%)	0	65	.46	51	508
5	509	20	1700	4	.00	.09	.09	.00	.09	15.6	13.0(65%)	0	0	.19	25	509
5N:		1678	MAX =	64	449.24	14.00	2.57	.31	2.88	6.2	479.4(29%)			22.91	PI =	6.9
6	601	1070	3400	93	.00	8.97	6.12	2.85	8.97	30.2	960.3(90%)	18	> 0	16.00	27	601
6	602	160	1700	102*	.00	6.40	1.33	5.07	6.40	144.0	151.5(95%)	4	> 0	6.18	11	602
6	603	485	3400	42	.00	2.29	2.22	.08	2.29	17.0	347.1(72%)	7	> 0	5.09	27	603
6	604	100	1700	64	.00	1.06	.79	.27	1.06	38.2	91.4(91%)	2	> 0	1.68	11	604
6	605	484	5100	47	148.57	6.00	2.21	.11	2.32	17.3	363.4(75%)	7	195	10.64	18	605
6	606	110	1700	105*	33.77	6.78	.90	5.05	5.95	194.7	101.3(92%)	4	65	6.58	9	606
6	607	930	5100	91	.00	8.73	6.51	2.22	8.73	33.8	856.7(92%)	16	> 0	14.81	18	607
6	608	70	1700	67	.00	.89	.56	.33	.89	45.7	64.0(91%)	1	> 0	1.28	9	608
6N:		3409	MAX =	105*	182.33	41.13	20.64	15.97	36.61	38.7	2935.7(86%)			62.25	PI =	55.7

<SYSTEM WIDE TOTALS INCLUDING ALL LINKS>

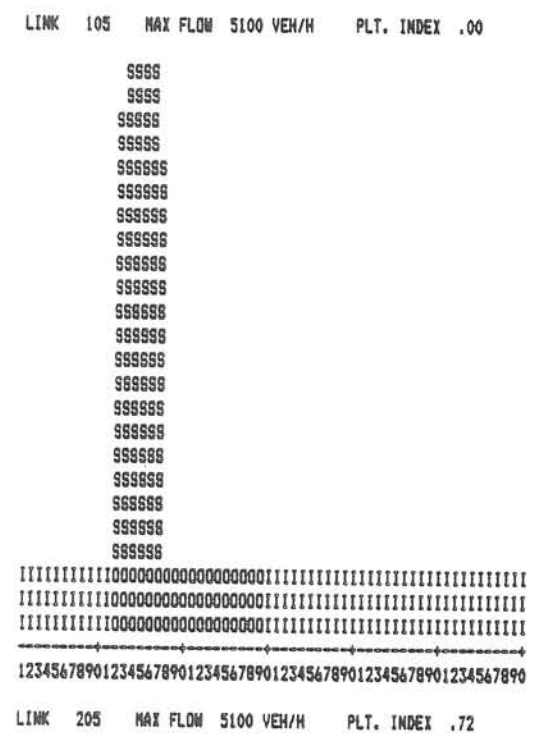
TOTAL DISTANCE TRAVELED (VEH-MI/H)	TOTAL TRAVEL TIME (VEH-H/H)	TOTAL UNIFORM DELAY (VEH-H/H)	TOTAL RANDOM DELAY (VEH-H/H)	TOTAL DELAY (VEH-H/H)	AVERAGE DELAY (SEC/VEH)	TOTAL UNIFORM STOPS (VEH/H-%)	TOTAL FUEL CONSUM (GA/H)	PERFORMANCE INDEX	SPEED (MI/H)
2329.94	329.80	83.89	188.22	272.11	58.10	12042.8(71%)	401.63	318.51	19.38 <TOTALS>

(TRANSYT-7F FLOW PROFILE DIAGRAMS)

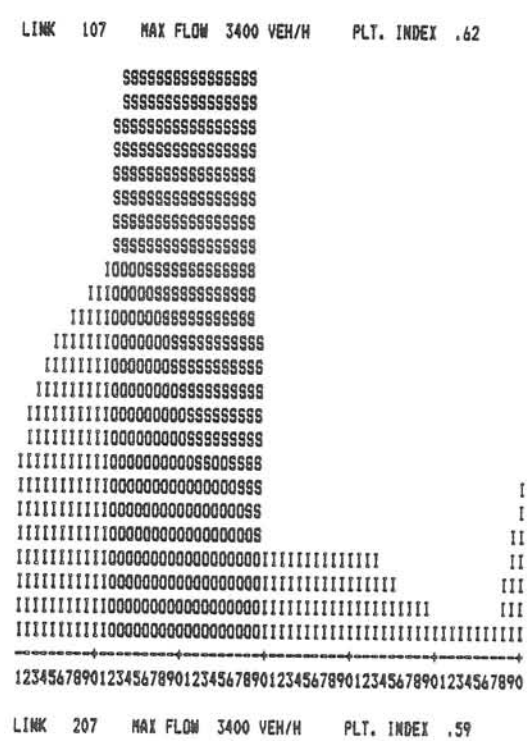
```
-KEY-  I :  ARRIVALS THAT QUEUE (NORMALLY ON RED).
       S :  DEPARTURES FROM QUEUE (NORMALLY AT THE SATURATION FLOW RATE).
       O :  ARRIVALS AND DEPARTURES ON GREEN.
     -,+ :  DELINEATORS ("+" MARKS EVERY TENTH STEP).
       N :  THE NUMBERS ACROSS THE BOTTOM ARE A TIME SCALE IN UNITS OF STEPS.

NOTE: THE FLOW PROFILE DIAGRAM SHOWS EFFECTIVE GREEN AND RED, NOT ACTUAL.
      FUTHERMORE, THE "OFFSET" TO THE LINK EFFECTIVE GREEN HAS NOT BEEN
      ADJUSTED TO THE MASTER CONTROLLER, IF THERE IS ONE.
```

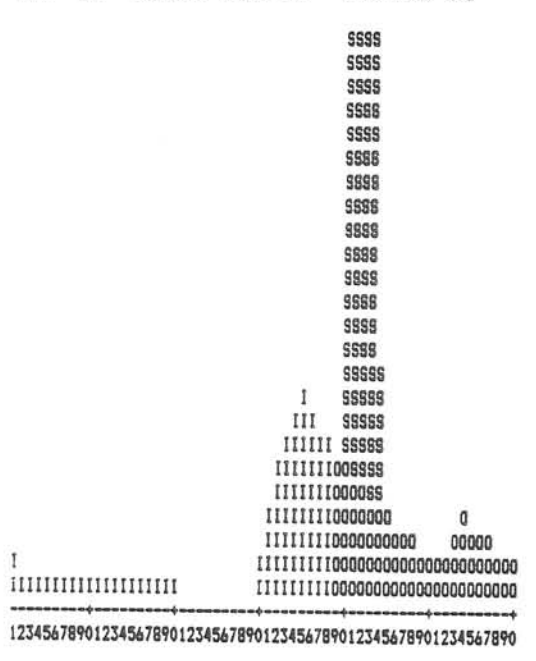
LINK 105 MAX FLOW 5100 VEH/H PLT. INDEX .00



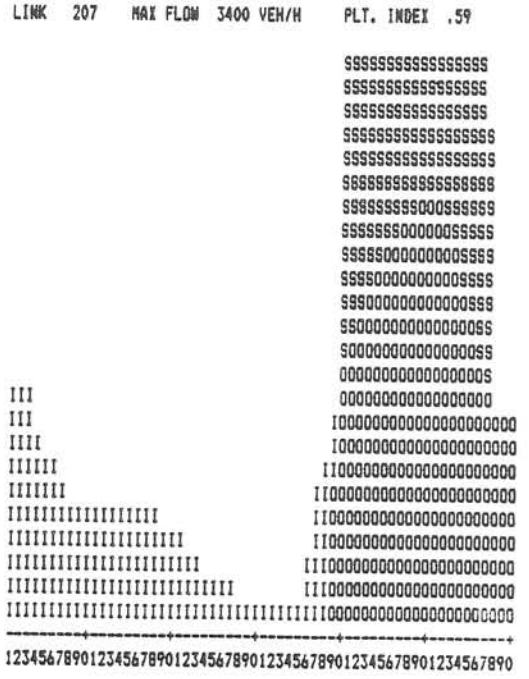
LINK 107 MAX FLOW 3400 VEH/H PLT. INDEX .62



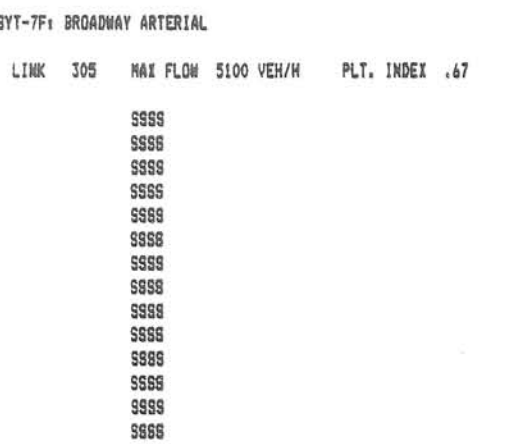
LINK 205 MAX FLOW 5100 VEH/H PLT. INDEX .72



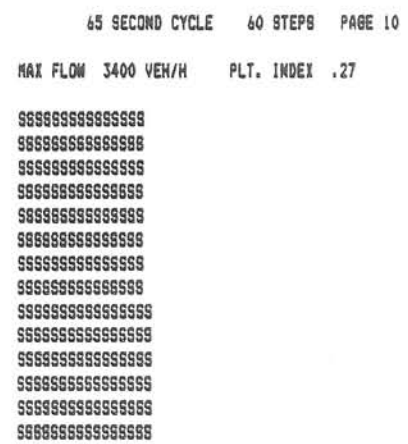
LINK 207 MAX FLOW 3400 VEH/H PLT. INDEX .59



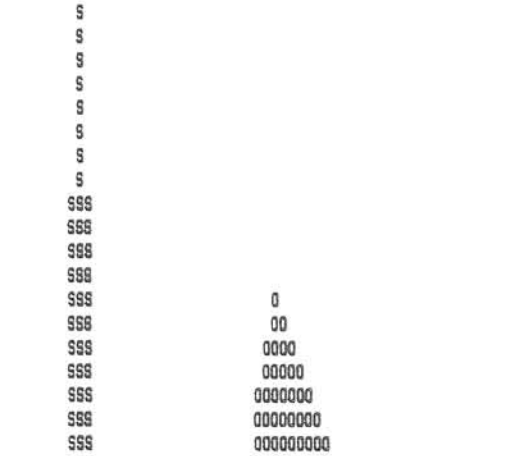
LINK 305 MAX FLOW 5100 VEH/H PLT. INDEX .67



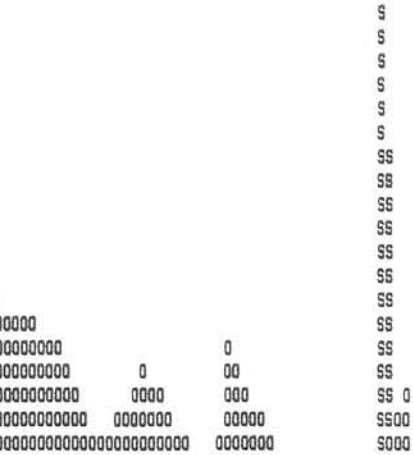
LINK 307 MAX FLOW 3400 VEH/H PLT. INDEX .27



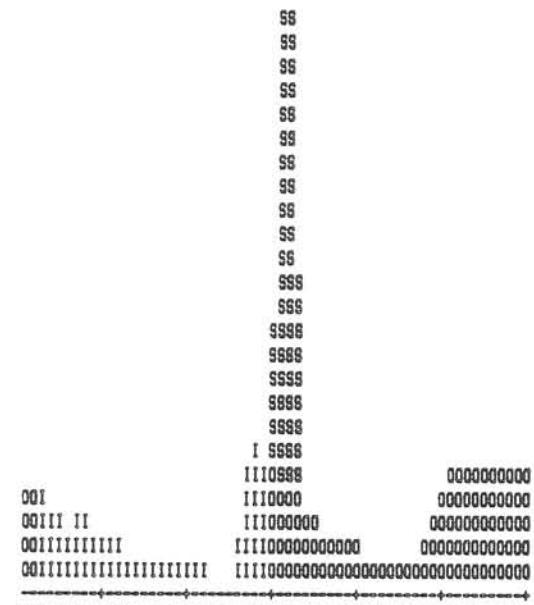
LINK 405 MAX FLOW 5100 VEH/H PLT. INDEX .70



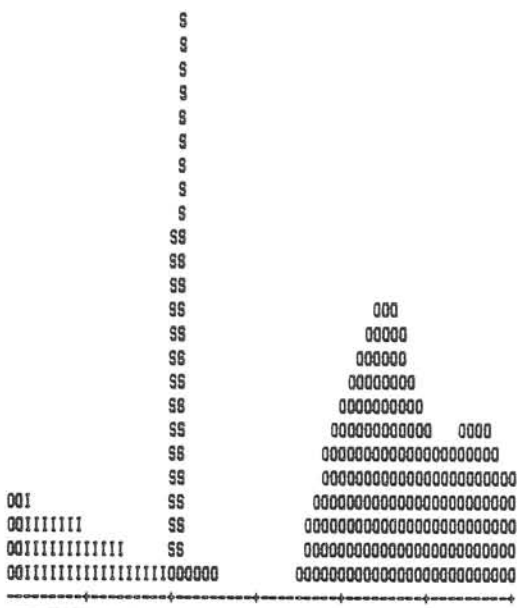
LINK 407 MAX FLOW 3531 VEH/H PLT. INDEX .39



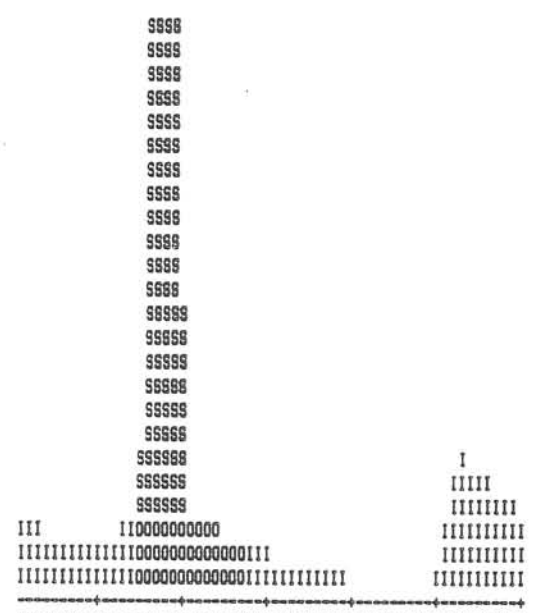
LINK 505 MAX FLOW 5100 VEH/H PLT. INDEX .54



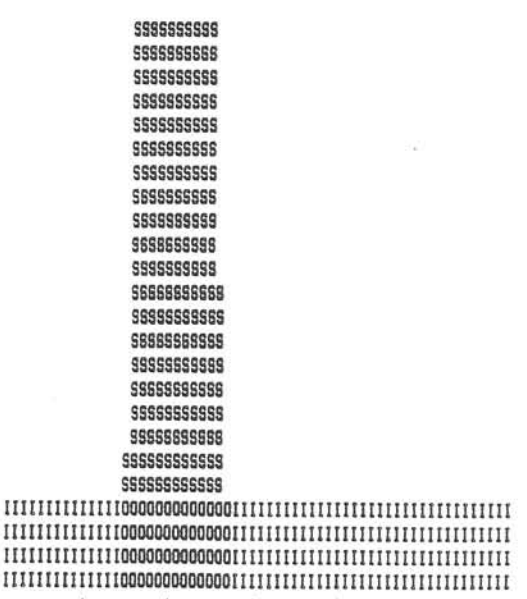
LINK 507 MAX FLOW 5100 VEH/H PLT. INDEX .75



LINK 605 MAX FLOW 5100 VEH/H PLT. INDEX .53



LINK 607 MAX FLOW 5100 VEH/H PLT. INDEX .00



```
-KEY-  I :  ARRIVALS THAT QUEUE (NORMALLY ON RED).
       S :  DEPARTURES FROM QUEUE (NORMALLY AT THE SATURATION FLOW RATE).
       O :  ARRIVALS AND DEPARTURES ON GREEN.
     -,+ :  DELINEATORS ("+" MARKS EVERY TENTH STEP).
       N :  THE NUMBERS ACROSS THE BOTTOM ARE A TIME SCALE IN UNITS OF STEPS.

NOTE: THE FLOW PROFILE DIAGRAM SHOWS EFFECTIVE GREEN AND RED, NOT ACTUAL.
      FUTHERMORE, THE "OFFSET" TO THE LINK EFFECTIVE GREEN HAS NOT BEEN
      ADJUSTED TO THE MASTER CONTROLLER, IF THERE IS ONE.
```

--- PROGRAM NOTE --- THIS IS THE INPUT DATA REPORT FOR TIME-SPACE DIAGRAM NO. 1

TIME-SPACE DIAGRAM DATA

LINE NO.	CARD TYPE	NO. NODES	TIME FLAG	TIME SCALE	DIST. SCALE										
761	60	6	0	3	67	0	0	0	0	0	0	0	0	0	0

LINE NO.	TITLE
771	BROADWAY

PLOT TITLE CARD

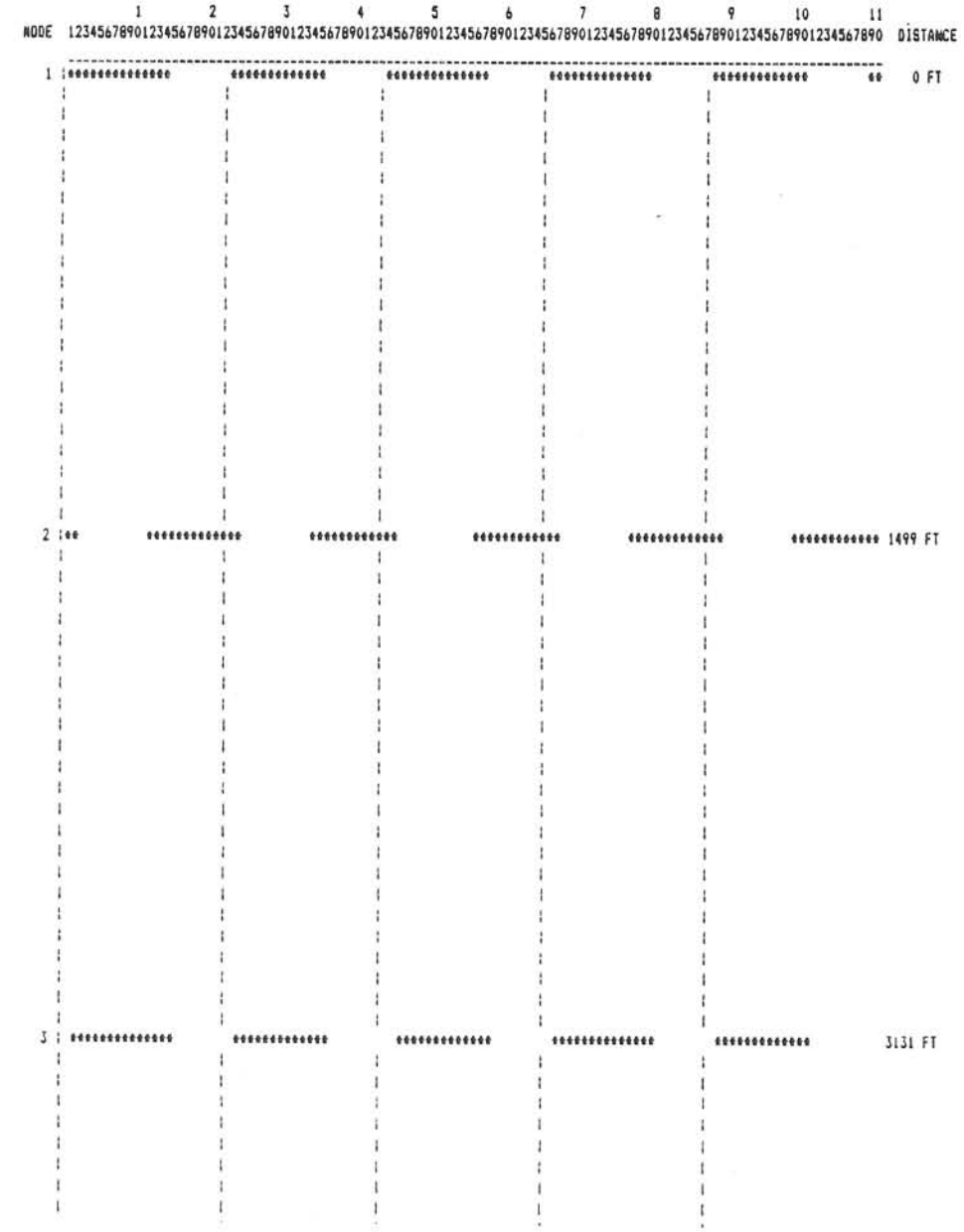
PLOT LINK STREAM CARD

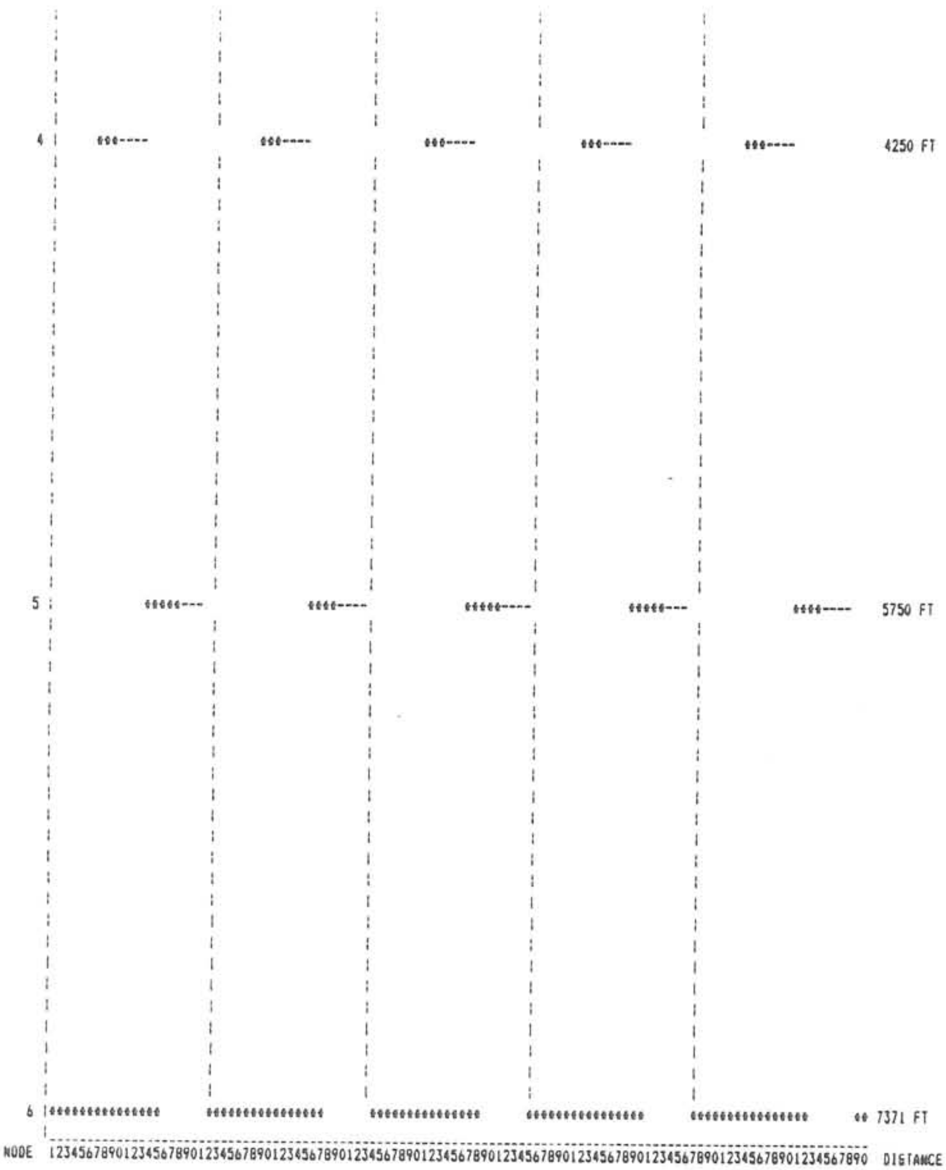
LINE NO.	CARD TYPE	LINK PAIRS ALTERNATING BY DIRECTION DOWN AND UP		DOWN AND UP		DOWN AND UP		DOWN AND UP		DOWN AND UP		DOWN AND UP		DOWN AND UP		
781	61	105	107	205	207	305	307	405	407	505	507	605	607	0	0	0

(TRANSYT-7F TIME-SPACE DIAGRAM)

PLOT NO. 1 PLOT TITLE: BROADWAY

TIME AXIS IS IN: SEC TIME SCALE = 3 SEC/CHAR, DIST. SCALE = 67 FT/LINE





SCALE CONVERSIONS:
TIME/INCH = 3 * 10 (AT 10 CHAR/INCH)
DIST/INCH = 67 * 6 (AT 6 LINES/INCH)

+++ GREEN IN DOWN DIRECTION
GREEN IN BOTH DIRECTIONS
--- GREEN IN UP DIRECTION
*** RED IN BOTH DIRECTIONS

AVG. TIME DISPLACEMENT:
1675.23 / SPEED

TRANSYT-7F: BROADWAY ARTERIAL 65 SECOND CYCLE 60 STEPS PAGE 15

TERMINATION CARD

LINE NO.	CARD TYPE															
79)	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

--- PROGRAM NOTE --- END OF JOB!

TW-SIGOP III

NOVEMBER 11, 1984

ALGORITHM TO PROVIDE OPTIMAL, CYCLE-BASED, TRAFFIC SIGNAL TIMING PATTERNS

FOR THE PERIOD EXTENDING FROM 715 TO 815 HOURS

RUN NUMBER 1 EXECUTED ON 8/27/1985

CASE STUDY FOR BROADWAY ARTERIAL IN TEMPE

LINK FROM,TO	RECV NODE	LNGTH (FT)	NO LN	L-PK LANE	R-PK LANE	TRK PCT	SPD MPH	HDWY (SECONDS)	LST	WT.	PRI-VOL (VPH)	SEC-VOL (VPH)	S/S-VOL (VPH)	L-TRN (VPH)	R-TRN (VPH)	RED-CLR (SEC)	CODES T	L	R	L
(1, 2)	3	1499	3	1	0	5	40	2.2*	3.0*	1.0*	544	128	0	120	25	0	2	1	44	1
(2, 1)	18	1499	2	1	0	5	40	2.2*	3.0*	1.0*	899	180	0	80	99	0	2	1	44	2
(2, 3)	4	1632	3	1	0	5	40	2.2*	3.0*	1.0*	527	113	0	130	70	0	2	1	44	3
(3, 2)	1	1632	2	1	0	5	40	2.2*	3.0*	1.0*	924	260	0	80	205	0	2	1	44	4
(3, 4)	5	1119	3	0	0	5	40	2.2*	3.0*	1.0*	440	154	0	0	40	0	2	50	41	5
(4, 3)	2	1119	2	1	0	5	40	2.2*	3.0*	1.0*	984	60	0	80	40	0	2	1	44	6
(4, 5)	6	1500	3	0	0	5	40	2.2*	3.0*	1.0*	554	40	0	0	20	0	2	50	41	7
(5, 4)	3	1500	3	1	0	5	40	2.2*	3.0*	1.0*	874	150	0	40	0	0	12	1	50	8
(5, 6)	13	1621	3	1	0	5	40	2.2*	3.0*	1.0*	574	20	0	110	80	0	2	1	44	9
(6, 5)	4	1621	3	1	0	5	40	2.2*	3.0*	1.0*	680	234	0	40	0	0	12	1	50	10
(800, 18)	1	600	3	0	0	5	40	2.2*	3.0*	1.0*	732	0	0	0	0	0	12	50	50	11
(18, 1)	2	600	3	1	0	5	40	2.2*	3.0*	1.0*	732	0	0	120	68	0	2	1	44	12
(1, 18)	800	600	2	0	0	5	40	2.2*	3.0*	1.0*	900	250	0	0	0	0	12	50	50	13
(803, 7)	1	600	2	0	0	5	40	2.2*	3.0*	1.0*	1097	0	0	0	0	0	12	50	50	14
(7, 1)	17	600	2	1	0	5	40	2.2*	3.0*	1.0*	1097	0	0	120	48	0	4	3	44	15
(1, 7)	803	600	2	0	0	5	40	2.2*	3.0*	1.0*	398	148	0	0	0	0	12	50	50	16
(802, 17)	1	600	2	0	0	5	40	2.2*	3.0*	1.0*	608	0	0	0	0	0	12	50	50	17
(17, 1)	7	600	2	1	0	5	40	2.2*	3.0*	1.0*	608	0	0	80	130	0	4	3	44	18
(1, 17)	802	600	2	0	0	5	40	2.2*	3.0*	1.0*	929	219	0	0	0	0	12	50	50	19
(804, 16)	2	600	1	0	0	5	40	2.2*	3.0*	1.0*	451	0	0	0	0	0	12	50	50	20
(16, 2)	8	600	1	1	0	5	40	2.2*	3.0*	1.0*	451	0	0	93	120	0	4	3	44	21
(2, 16)	804	600	1	0	0	5	40	2.2*	3.0*	1.0*	526	325	0	0	0	0	12	50	50	22
(805, 8)	2	600	1	0	0	5	40	2.2*	3.0*	1.0*	606	0	0	0	0	0	12	50	50	23
(8, 2)	16	600	1	1	0	5	40	2.2*	3.0*	1.0*	606	0	0	60	20	0	4	3	44	24

(2, 8)	805	600	1	0	0	5	40	2.2*	3.0*	1.0*	238	105	0	0	0	0	12	50	50	25
(806	15) 3	600	2	0	0	5	40	2.2*	3.0*	1.0*	751	0	0	0	0	0	12	50	50	26
(15, 3)	9	600	2	1	0	5	40	2.2*	3.0*	1.0*	751	0	0	93	120	0	4	3	44	27
(3, 15)	806	600	3	0	0	5	40	2.2*	3.0*	1.0*	990	170	0	0	0	0	12	50	50	28
(807, 9)	3	600	3	0	0	5	40	2.2*	3.0*	1.0*	1191	0	0	0	0	0	12	50	50	29
(9, 3)	15	600	3	1	0	5	40	2.2*	3.0*	1.0*	1191	0	0	140	61	0	4	3	44	30
(3, 9)	807	600	2	0	0	5	40	2.2*	3.0*	1.0*	538	150	0	0	0	0	12	50	50	31
(808, 10)	4	600	1	0	0	5	40	2.2*	3.0*	1.0*	100	0	0	0	0	0	12	50	50	32
(10, 4)	0	600	0	1	1	5	40	2.2*	3.0*	1.0*	100	0	0	60	40	0	50	3	3	33
(4, 10)	808	600	1	0	0	5	40	2.2*	3.0*	1.0*	10	80	0	0	0	0	12	50	50	34
(809, 11)	5	600	1	0	0	5	40	2.2*	3.0*	1.0*	170	0	0	0	0	0	12	50	50	35
(11, 5)	0	600	0	1	1	5	40	2.2*	3.0*	1.0*	170	0	0	150	20	0	50	3	3	36
(5, 11)	809	600	1	0	0	5	40	2.2*	3.0*	1.0*	10	60	0	0	0	0	12	50	50	37
(810, 14)	6	600	2	0	0	5	40	2.2*	3.0*	1.0*	585	0	0	0	0	0	12	50	50	38
(14, 6)	12	600	2	1	0	5	40	2.2*	3.0*	1.0*	585	0	0	100	74	0	4	3	44	39
(6, 14)	810	600	2	0	0	5	40	2.2*	3.0*	1.0*	990	360	0	0	0	0	12	50	50	40
(811, 12)	6	600	2	0	0	5	40	2.2*	3.0*	1.0*	1230	0	0	0	0	0	12	50	50	41
(12, 6)	14	600	2	1	0	5	40	2.2*	3.0*	1.0*	1230	0	0	160	80	0	4	3	44	42
(6, 12)	811	600	2	0	0	5	40	2.2*	3.0*	1.0*	411	150	0	0	0	0	12	50	50	43
(801, 13)	6	600	3	0	0	5	40	2.2*	3.0*	1.0*	1000	0	0	0	0	0	12	50	50	44
(13, 6)	5	600	3	1	0	5	40	2.2*	3.0*	1.0*	1000	0	0	70	250	0	2	1	44	45
(6, 13)	801	600	3	0	0	5	40	2.2*	3.0*	1.0*	404	180	0	0	0	0	12	50	50	46

* INDICATES THESE ARE SPECIFIED ON NETWORK CARD

MINIMUM PHASE DURATIONS (SEC)

NODE	PHASES			
	I	II	III	IV
1	8	8	8	8
2	8	8	8	8
3	8	8	8	8
4	8	8	8	0
5	8	8	8	0
6	8	8	8	8
7	8	8	0	0
8	8	8	0	0
9	8	8	0	0
10	8	8	0	0
11	8	8	0	0
12	8	8	0	0
13	8	8	0	0
14	8	8	0	0
15	8	8	0	0
16	8	8	0	0
17	8	8	0	0
18	8	8	0	0

PHASE CODES

THE SIGNAL PHASES SERVICING EACH TRAFFIC MOVEMENT ARE SPECIFIED FOR EACH APPROACH LINK AS INDICATED BELOW

CODE	PHASES			
	I	II	III	IV
1	X			
2		X		
3			X	
4				X
12	X	X		
13	X		X	
14	X			X
23		X	X	
24		X		X
34			X	X
41	X	X	X	
42	X	X		X
43	X		X	X
44	X	X	X	X
45		X	X	X
50	INDICATED MOVEMENT NOT SERVICED			

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                                        A TOTAL OF  2 PLOTS ARE REQUESTED

        PLOT  1 -                   TIME-DISTANCE DIAGRAM EASTBOUND

          SEQUENCE OF NODES-   1   2   3   4   5   6

        PLOT  2 -                   TIME-DISTANCE DIAGRAM WESTBOUND

          SEQUENCE OF NODES-   6   5   4   3   2   1
NODE   1  PHASE  2  4  3  1  IS MAJOR-MINOR-MAJOR-MINOR
NODE   2  PHASE  2  4  3  1  IS MAJOR-MINOR-MAJOR-MINOR
NODE   3  PHASE  2  4  3  1  IS MAJOR-MINOR-MAJOR-MINOR
NODE   6  PHASE  2  4  3  1  IS MAJOR-MINOR-MAJOR-MINOR
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SPECIFIED NETWORK-WIDE PARAMETERS

CYCLE LENGTHS- MINIMUM= 65 SEC. MAXIMUM= 65 SEC. INCREMENTAL CHANGES=10 SEC.

CODE FOR DOUBLE-CYCLING = 1

NETWORK-WIDE START-UP LOSS=3.0 SECONDS DISCHARGE HEADWAY=2.2 SECONDS

WEIGHT ASSIGNED TO VEHICLE STOPS IS 4

VALUE OF PERCENT SATURATION BELOW WHICH A NODE MAY BE DOUBLE-CYCLED IS 25 PERCENT

MIN. DURATION OF HALVED CYCLE LENGTH IS 0 SEC.

MIN. DURATION OF MINOR PHASES IS 8 SEC.

THE MAXIMUM DISUTILITY ARISING FROM A QUEUE EXTENDING THE FULL LENGTH OF A LINK IS 250 VEH-SECONDS (EQUIV.)

RESIDUAL STORAGE THRESHOLD IS 100 FEET

SATURATION CODE= 0 CONTINUITY CODE= 0 CONVERGENCE CODE= 4 PROCESSING CODE=0

PROGRAM WILL DETERMINE NETWORK DISUTILITY FOR THE FOLLOWING SIGNAL TIMING

SPECIFIED SIGNAL TIMING PATTERN

NODE NUMBER	OFFSET REF. TO PHASE I	DURATION OF PHASE I (SEC)	DURATION OF PHASE II (SEC)	DURATION OF PHASE III (SEC)	DURATION OF PHASE IV (SEC)
1	32	8	24	9	24
2	59	9	28	8	20
3	32	10	25	10	20

IDUR(1)= 10 IBUFF(14+ 1)= 10

IDUR(2)= 25 IBUFF(14+ 2)= 25

IDUR(3)= 10 IBUFF(14+ 3)= 10

IDUR(4)= 20 IBUFF(14+ 4)= 20

N= 3 IBUFF(14)= 32 IDUR(1)= 10 IDUR(2)= 25 IDUR(3)= 10 ICN= 65 II= 3

NPHSE= 3 1 4 2

IBUFF= 3 32 25 20 10 10

IDUR= 10 25 10 20

I= 302 K= 13 IBUFF(K+1)= 12 IBUFF(K+5)= 10

4	58	12	44	9	0
5	18	11	40	14	0
6	40	9	18	11	27
7	0	35	30	0	0
8	0	35	30	0	0
9	0	35	30	0	0
10	0	35	30	0	0
11	0	35	30	0	0
12	0	35	30	0	0
13	0	35	30	0	0
14	0	35	30	0	0
15	0	35	30	0	0
16	0	35	30	0	0
17	0	35	30	0	0
18	0	35	30	0	0

NUMBER OF OUTPUT COPIES- 1

ADDITIONAL RUNS (IF ANY) WILL APPLY THE FOLLOWING PERCENTAGES OF THE INITIAL VOLUMES- 0 0 0 0

* * * THERE WERE A TOTAL OF 0 INPUT ERRORS * * *

NOSC 1 1 1

NETWORK-WIDE SIGNAL SETTINGS

SWEEP NUMBER 1

NODE	PHASE	APPROACH LINKS	OFFSET (SEC)	OFFSET (PCT)	DURATION (SEC.)	SPLIT (PCT.)	CYCLE (SEC.)	CONGEST (1,0)
1	II	(2, 1) (18, 1) (7, 1) (17, 1)	8	(12)	24	37	65	0,MAJR
1	IV	(2, 1) (18, 1) (7, 1) (17, 1)	41	(63)	24	37	65	0,MAJR
1	III	(2, 1) (18, 1) (7, 1) (17, 1)	32	(49)	9	14	65	0,MINR
1	I	(2, 1) (18, 1) (7, 1) (17, 1)	0	(0)	8	12	65	0,MINR
2	II	(1, 2) (3, 2) (16, 2) (8, 2)	39	(60)	28	43	65	0,MAJR
2	IV	(1, 2) (3, 2) (16, 2) (8, 2)	10	(15)	20	31	65	0,MAJR
2	III	(1, 2) (3, 2) (16, 2) (8, 2)	2	(3)	8	12	65	0,MINR
2	I	(1, 2) (3, 2) (16, 2) (8, 2)	30	(46)	9	14	65	0,MINR
3	II	(2, 3) (4, 3) (15, 3) (9, 3)	12	(18)	25	38	65	0,MAJR
3	IV	(2, 3) (4, 3) (15, 3) (9, 3)	47	(72)	20	31	65	0,MAJR
3	III	(2, 3) (4, 3) (15, 3) (9, 3)	37	(57)	10	15	65	0,MINR
3	I	(2, 3) (4, 3) (15, 3) (9, 3)	2	(3)	10	15	65	0,MINR
4	II	(3, 4) (5, 4)	5	(8)	44	68	65	0,MAJR
4	III	(3, 4) (10, 4)	49	(75)	9	14	65	0,MAJR
4	I	(3, 4) (5, 4)	58	(89)	12	18	65	0,MINR
5	II	(4, 5) (6, 5)	29	(45)	40	62	65	0,MAJR
5	III	(4, 5) (11, 5)	4	(6)	14	22	65	0,MAJR
5	I	(4, 5) (6, 5)	18	(28)	11	17	65	0,MINR
6	II	(5, 6) (13, 6) (14, 6) (12, 6)	13	(20)	18	28	65	0,MAJR
6	IV	(5, 6) (13, 6) (14, 6) (12, 6)	42	(65)	27	42	65	0,MAJR
6	III	(5, 6) (13, 6) (14, 6) (12, 6)	31	(48)	11	17	65	0,MINR
6	I	(5, 6) (13, 6) (14, 6) (12, 6)	4	(6)	9	14	65	0,MINR
7	II	(803, 7) (1, 7)	35	(54)	30	46	65	0,MAJR
7	I	(803, 7) (1, 7)	0	(0)	35	54	65	0,MAJR
8	II	(805, 8) (2, 8)	35	(54)	30	46	65	0,MAJR
8	I	(805, 8) (2, 8)	0	(0)	35	54	65	0,MAJR
9	II	(807, 9) (3, 9)	35	(54)	30	46	65	0,MAJR
9	I	(807, 9) (3, 9)	0	(0)	35	54	65	0,MAJR
10	II	(808,10) (4,10)	35	(54)	30	46	65	0,MAJR
10	I	(808,10) (4,10)	0	(0)	35	54	65	0,MAJR
11	II	(809,11) (5,11)	35	(54)	30	46	65	0,MAJR
11	I	(809,11) (5,11)	0	(0)	35	54	65	0,MAJR

12	II	(811,12)	(6,12)	35	(54)	30	46	65	0,MAJR
12	I	(811,12)	(6,12)	0	(0)	35	54	65	0,MAJR
13	II	(801,13)	(6,13)	35	(54)	30	46	65	0,MAJR
13	I	(801,13)	(6,13)	0	(0)	35	54	65	0,MAJR
14	II	(810,14)	(6,14)	35	(54)	30	46	65	0,MAJR
14	I	(810,14)	(6,14)	0	(0)	35	54	65	0,MAJR
15	II	(806,15)	(3,15)	35	(54)	30	46	65	0,MAJR
15	I	(806,15)	(3,15)	0	(0)	35	54	65	0,MAJR
16	II	(804,16)	(2,16)	35	(54)	30	46	65	0,MAJR
16	I	(804,16)	(2,16)	0	(0)	35	54	65	0,MAJR
17	II	(802,17)	(1,17)	35	(54)	30	46	65	0,MAJR
17	I	(802,17)	(1,17)	0	(0)	35	54	65	0,MAJR
18	II	(800,18)	(1,18)	35	(54)	30	46	65	0,MAJR
18	I	(800,18)	(1,18)	0	(0)	35	54	65	0,MAJR

THE FIRST TWO PHASES ARE THE MAJOR PHASES SERVICING THE INDICATED APPROACHES

THE REMAINING PHASES (IF ANY) ARE THE MINOR PHASES

SYSTEM DISUTILITY

SWEEP	DISUTILITY
1	794603

SWEEP NO. 1 PROVIDES MINIMUM DISUTILITY, 794603, AT A CYCLE OF 65 SECONDS

VEHICLE-MILES/HOUR= 4270.0 VEHICLE-HOURS/HOUR= 544.6 MEAN SPEED= 7.84 M. P. H. STOPS/MINUTE= 328

LINK FROM, TO	VOLUME (P.C.U./HR.)	EFF. SPEED (M.P.H.)	DELAY (SEC./P.C.U.)	STOPS (PER MIN.)	CAPACITY (P.C.U./HR.)	PERCENT SATURATION	MAXIMUM QUEUE	FUEL (GAL./HR.)
(1, 2)	719	12.4	56.8	12.0	2271	32	3	22
(2, 1)	1170	17.2	33.9	20.3	1440	81	8	30
(2, 3)	698	14.1	51.0	11.1	2382	29	5	22
(3, 2)	1309	17.5	35.9	20.3	1883	70	7	35
(3, 4)	640	27.8	8.4	5.5	3212	20	2	10
(4, 3)	1118	7.5	82.7	24.9	1440	78	6	35
(4, 5)	635	8.9	89.8	9.2	2880	22	3	24
(5, 4)	1085	30.4	8.1	7.4	4265	25	1	21
(5, 6)	651	7.7	115.8	10.1	2049	32	3	30
(6, 5)	969	27.3	12.9	7.4	3877	25	1	21
(18, 1)	794	1.4	275.5	12.9	2160	37	4	52
(1, 18)	1219	22.6	7.9	11.1	3157	39	6	10
(7, 1)	1176	2.4	161.2	27.7	1329	88	12	48
(1, 7)	579	28.1	4.3	.0	3157	18	0	5
(17, 1)	679	17.9	12.6	2.8	1883	36	1	7
(1, 17)	1217	20.5	9.7	9.2	3157	39	6	11
(16, 2)	510	2.3	166.2	7.4	1052	48	7	22
(2, 16)	903	22.4	8.0	2.8	1551	58	4	8
(8, 2)	648	3.1	120.2	11.1	1495	43	12	21
(2, 8)	363	23.5	7.2	1.9	1551	23	2	3
(15, 3)	828	2.7	143.6	12.0	1495	55	4	31
(3, 15)	1229	22.4	8.0	8.3	4708	26	3	10
(9, 3)	1278	3.3	112.2	23.1	1717	74	8	39

(3, 9)	729	23.7	7.0	7.4	3157	23	4	6
(10, 4)	117	25.0	6.1	.0	498	23	0	1
(4, 10)	96	22.3	8.1	1.9	1551	6	2	1
(11, 5)	186	3.7	100.9	2.8	886	21	3	6
(5, 11)	75	22.2	8.2	.0	1551	5	0	1
(14, 6)	640	6.6	51.6	1.9	1828	35	2	12
(6, 14)	1431	22.5	8.0	12.0	3157	45	7	12
(12, 6)	1325	2.8	136.1	23.1	1662	80	12	47
(6, 12)	595	28.8	4.0	.0	3157	19	0	5
(13, 6)	1127	2.9	132.6	20.3	2382	47	8	39
(6, 13)	619	23.0	7.5	.0	4708	13	0	5

TOTAL FUEL CONSUMPTION FOR THIS TIMING PLAN IN GALLONS PER HOUR IS 652.

TOTAL EMISSIONS FOR THIS TIMING PLAN

HYDROCARBONS	113 POUNDS / HOUR
CARBON MONOXIDE	1267 POUNDS / HOUR
NITRIC OXIDE	33 POUNDS / HOUR

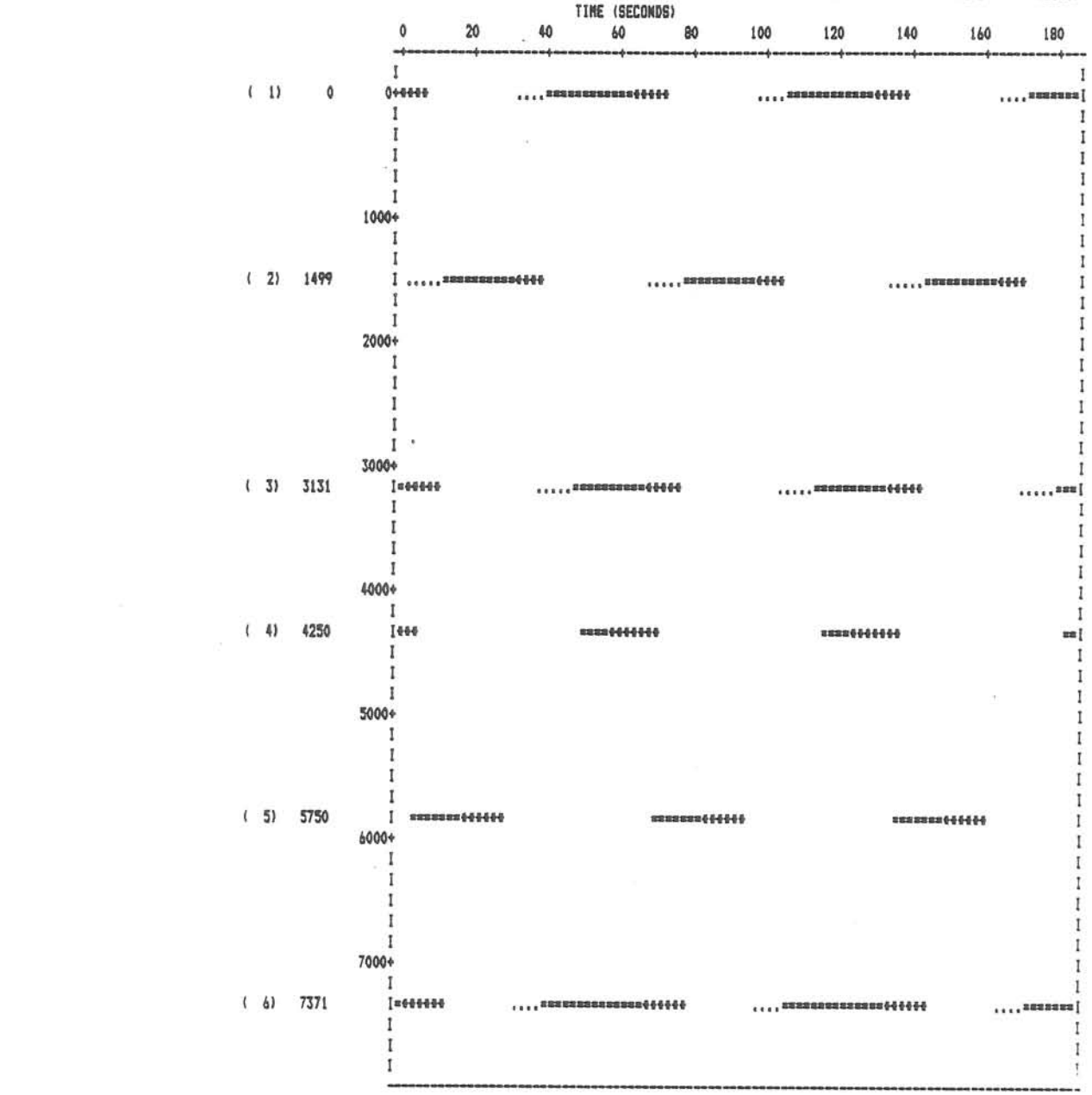
EMISSIONS WILL INCREASE AS THE AMBIENT AIR TEMPERATURE DROPS BELOW 80 F AND AT ELEVATIONS ABOVE 4000 FT.

EMISSIONS WILL BE LOWER IN CALIFORNIA.

TIME-DISTANCE DIAGRAM EASTBOUND

HORIZONTAL SCALE 1 INCH= 20 SECONDS CYCLE LENGTH= 65 SECONDS PHASE A - BLANK PHASE C - ... (LAG)

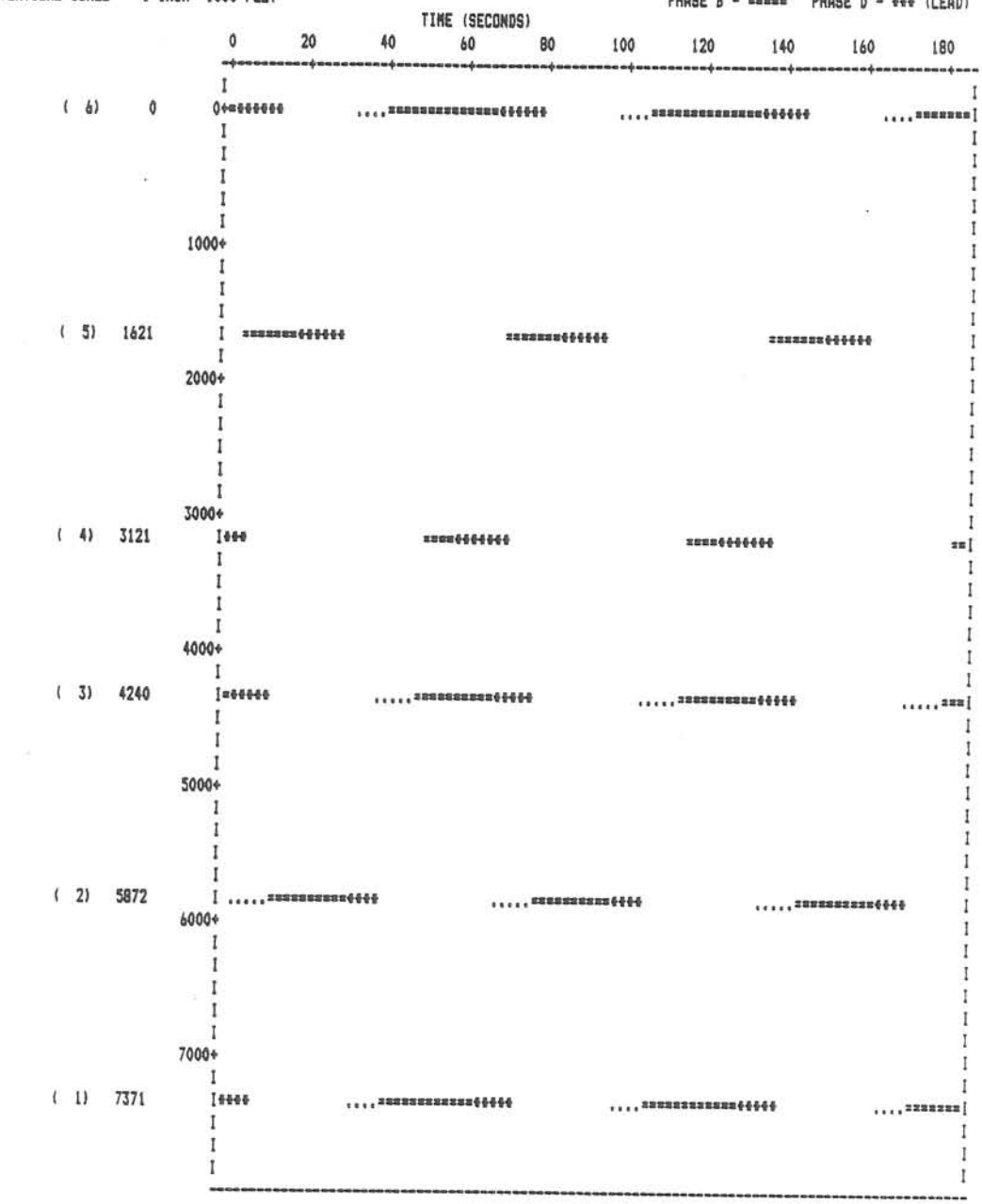
VERTICAL SCALE 1 INCH= 1000 FEET PHASE B - ===== PHASE D - +++ (LEAD)



TIME-DISTANCE DIAGRAM WESTBOUND

HORIZONTAL SCALE 1 INCH= 20 SECONDS CYCLE LENGTH= 65 SECONDS PHASE A - BLANK PHASE C - ... (LAG)

VERTICAL SCALE 1 INCH= 1000 FEET PHASE B - ===== PHASE D - +++ (LEAD)



BEST CYCLE LENGTH SO FAR IS 65 SECONDS

+++++ NO ADDITIONAL DATA - PROGRAM END +++++