Appendix II-A

City of Garland
1992 Staffing Survey

STAFFING LEVEL SURVEY

FIGURE OF INTEREST	AVERAGE			
	POPULATION		AREA	
	100,000 OR LESS	OVER 100,000	50 SQ. MILES OR LESS	OVER 50 SQ. MILES
POPULATION	58,978	364,181	63,603	379,761
SQUARE MILES	30.5	188.0	28.2	194.4
OFFICE PERSONNEL	3.4	12.6	4.0	12.6
REGISTERED ENGINEERS	1.6	3.1	1.6	3.1
ENGINEERING ASST./DRAFTERS	0.9	6.1	1.1	6.0
OTHER	1.5	3.5	1.6	5.9
SIGNAL TECHNICIANS	4.3	17.7	4.3	16.8
SIGNS/MARKINGS TECHNICIANS	4.4	15.2	3.9	15.5
TOTAL SIGNALS	70.6	410.0	67.6	411.2
FIXED TIME SIGNALS	22.8	148.0	22.3	148.0
ACTUATED SIGNALS	47.8	262.0	45.3	263.2
COORDINATED SIGNALS	52.8	278.7	50.5	271.0
SCHOOL FLASHERS	35.3	120.7	37.5	119.8
SIGNALS PER TECHNICIAN	17.1	23.6	16.1	24.0
SIGNALS PER SQUARE MILE	2.5	2.0	2.5	2.0
SIGNALS PER 1000 POPULATION	1.1	1.0	1.0	1.0
SIGNALS PER OFFICE STAFF	23.3	30.6	20.9	29.9
SIGNALS & FLASHERS PER TECH.	25.3	34.0	25.3	32.3
AVG. TROUBLE CALLS/SIGNAL/MONTH	1.2	1.0	1.5	1.0
NUMBER OF CITIES SURVEYED	8	21	8	21

SOURCE: Survey of Various Texas Cities, Okalahoma City and New Orleans
Conducted by City of Garland, Department of Transportation, June 1992
For further information, contact Larry Cervenka,
City of Garland

STAFFING LEVEL SURVEY

FIGURE OF INTEREST	AVERAGE POPULATION 100,000 OR LESS	AVERAGE POPULATION 100,000 – 250,000	AVERAGE POPULATION OVER 250,000
POPULATION	58,978	135,988	651,212
SQUARE MILES	30.5	76.8	329.1
OFFICE PERSONNEL	3.4	6.1	19.8
REGISTERED ENGINEERS	1.6	1.4	5.2
ENGINEERING ASST./DRAFTERS	0.9	2.6	9.4
OTHER	1.5	2.0	5.2
SIGNAL TECHNICIANS	4.3	7.0	30.0
SIGNS/MARKINGS TECHNICIANS	4.4	7.4	24.5
TOTAL SIGNALS	70.6	134.0	711.0
FIXED TIME SIGNALS	22.8	54.7	253.8
ACTUATED SIGNALS	47.8	79.4	457.1
COORDINATED SIGNALS	52.8	64.4	493.5
SCHOOL FLASHERS	35.3	43.5	205.0
SIGNALS PER TECHNICIAN	17.1	22.8	24.3
SIGNALS PER SQUARE MILE	2.5	1.7	2.2
SIGNALS PER 1000 POPULATION	1.1	1.0	1.0
SIGNALS PER OFFICE STAFF	23.3	25.0	36.6
SIGNALS & FLASHERS PER TECH.	25.3	29.9	34.1
AVG. TROUBLE CALLS/SIGNAL/MONTH	1.2	1.0	1.0
NUMBER OF CITIES SURVEYED	8	11	10

SOURCE: Survey of Various Texas Cities, Okalahoma City and New Orleans
Conducted by City of Garland, Department of Transportation, June 1992
For further information, contact Larry Cervenka,
City of Garland

STAFFING LEVEL SURVEY

DATE: 06 / 4 / 92

CITY:	ABILENE	ARLINGTON:	AUSTIN	CARROLTON	DALLAS: **	FARMERS BRANCH: **	FORT WORTH:	GARLAND:	GRAND PRARIE: **	IRVING: **	MESQUITE: **	PLANO:	AVERAGE:
POPULATION:	106,000	260,000	465,222	81,000	1,000,000	25,000	450,000	183,200	102,677	165,000	104,000	134,000	292,545
SQUARE MILES:	110	98	225	35	377	12.5	293	57	60	68	42	70	151.10
OFFICE PERSONNEL:	2.5	15	34	7	17	2	12	2	4	6	3	7	10.28
REGISTERED ENGINEERS:	1	6	5	4	13	2	5	2	1	2	1	2	2.59
ENGINEERING ASSISTANTS/DRAFTSMAN	1	6	18	1	0	0	6	3	2	3	1	4	4.82
OTHER:	0.5	3	11	3	4	0	1	4	1	3	1	1	2.95
SIGNAL TECHNICIANS:	4	19	19	6	56	2	27	6	6	9	3	6	14.00
SIGN/MARKING TECHS:	8	15	15	8	24	N/A	23	7	7	6	4	11	12.45
SIGNALS:	150	225	562	62	1132	47	565	125	90	145	45	90	316.45
													0.00
FIXED TIME:	109	0	338	0	388	5	30	55	9	14	6	3	113.48
ACTUATED:	41	225	224	62	744	42	535	70	81	131	39	87	203.00
													0.00
SCHOOL FLASHERS:	25	70	349	58	600	36	50	54	70	34	28	82	97.10
COORDINATED:	94	179	444	38	926	28	245	69	10	54	9	80	210.79
# SIGNAL SYSTEMS:	6	2	0	7	71	3	2	14	1	6	2	14	13.84
SIGNALS/TECHNICIAN:	37.50	11.84	29.68	7.75	20.21	23.50	20.93	25.00	15.00	16.11	15.00	11.25	21.83
SIGNALS/SQ.MILES:	1.36	2.30	2.50	1.77	3.00	3.76	1.93	3.21	1.13	2.13	1.07	1.29	2.12
SIGNALS/1000 POPULATION:	1.42	0.87	1.21	0.77	1.13	1.88	1.26	0.58	0.88	0.88	0.43	0.67	1.06
SIGNALS/OFFICE STAFF:	60.00	15.00	16.53	8.86	68.59	23.50	47.08	14.00	22.50	18.13	15.00	12.86	25.79
SIGNALS,FLASHERS/TECHS:	43.75	15.53	47.95	14.75	34.50	41.50	22.78	36.00	26.67	19.89	24.33	21.50	30.26
AVG. TROUBLE CALLS/SIG.	2.06	0.48	0.62	2	1.43	2.7	N/A	1.4	1.8	N/A	2.3	0.33	1.06

* PLANNING & OPERATIONS

** FROM PREVIOUS SURVEY

SURVEY.WK1

STAFFING LEVEL SURVEY

DATE: 06 / 04 / 92

CITY:	BEAUMONT **	DENTON:	NEW ORLEANS	LUBBOCK: **	ODESSA:	CORPUS CHRISTI:	AMARILLO:	HURST:	RICHARDSON:	HOUSTON:	WACO: **	TYLER: **	AVERAGE:
POPULATION:	113,000	67,000	500,000	194,148	89,699	208,000	160,772	32,000	76,500	1,630,000	107,000	78,000	292,545
SQUARE MILES:	79	61	368	104	35.03	124	87	9.1	28	561	90.68	44	151.10
OFFICE PERSONNEL:	8	2	9	9	3	9	9	1	8	41	6	4	10.26
REGISTERED ENGINEERS:	1	1	1	1	0	2	1	1	3	9	0	1	2.89
ENGINEERING ASSISTANTS/DRAFTSMAN	1	0	8	7	0	5	8	0	3	18	4	1	4.82
OTHER:	6	1	0	1	3	2	2	0	2	14	1	2	2.95
SIGNAL TECHNICIANS:	12	3	10	8	5	12	5	2	6	61	8	5	14.00
SIGN/MARKING TECHS:	9	3	18	5	7	15	14	2	8	55	6	6	12.45
SIGNALS:	168	69	433	164	169	305	1234	28	84	2000	162	108	318.46
													0.00
FIXED TIME:	96	10	251	5	83	80	89	0	1	1000	85	81	113.48
ACTUATED:	72	59	182	161	86	225	145	28	83	1000	77	25	203.00
													0.00
SCHOOL FLASHERS:	51	10	368	50	24	151	18	9	57	0	23	85	97.10
COORDINATED:	57	27	400	N/A	162	134	154	14	80	1600	123	73	210.79
# SIGNAL SYSTEMS:	1	2	30	1	3	18	8	2	1	140	19	9	13.24
SIGNALS/TECHNICIAN:	14.00	23.00	43.30	20.50	33.80	25.42	46.80	13.00	14.00	32.79	20.25	21.20	21.83
SIGNALS/SQ.MILES:	2.13	1.13	1.18	1.58	4.82	2.46	2.69	2.86	3.00	3.44	1.79	2.41	2.12
SIGNALS/1000 POPULATION:	1.49	1.03	0.87	0.84	1.88	1.07	1.46	0.81	1.11	1.23	1.51	1.36	1.06
SIGNALS/OFFICE STAFF:	21.00	N/A	N/A	18.22	56.33	33.89	26.00	26.00	10.50	48.78	27.00	28.50	25.79
SIGNALS,FLASHERS/TECHS:	18.25	26.33	80.10	28.78	38.60	38.00	80.00	17.50	23.50	32.79	23.13	38.20	30.28
AVG. TROUBLE CALLS/SIG.	1.2	0.3	2.9	0.5	0.8	0.63	0.8	0.5	1.08	0.6	0.8	1.04	1.08

* PLANNING & OPERATIONS

** FROM PREVIOUS SURVEY

SURVEY.WK1

PAGE 3

STAFFING LEVEL SURVEY

DATE: 06 / 04 / 92

	PASADENA: **	OK CITY: **	ORANGE: **	SAN ANTONIO	EL PASO	AVERAGE:
POPULATION:	130,000	450,000	23,628	955,400	515,500	282,545
SQUARE MILES:	58.59	635	20	344	248	151.10
OFFICE PERSONNEL:	3	17	4	26	18	10.26
REGISTERED ENGINEERS:	1	2	1	5	4	2.59
ENGINEERING ASSISTANTS/DRAFTSMAN	1	6	2	18	9	4.82
OTHER:	1	9	1	3	5	2.95
SIGNAL TECHNICIANS:	4	23	3	44	29	14.00
SIGN/MARKING TECHS:	2	25	1	35	20	12.45
SIGNALS:	128	500	2	940	448	316.45
FIXED TIME:	97	10	2	397	44	113.48
ACTUATED:	31	490	0	542	404	202.55
						0.00
SCHOOL FLASHERS:	40	207	5	1	68	97.10
COORDINATED:	106	168	0	549	222	210.79
# SIGNAL SYSTEMS:	2	4	0	N/A	13	13.24
SIGNALS/TECHNICIAN:	32.00	21.74	0.67	21.36	15.45	21.83
SIGNALS/SQ.MILES:	2.18	0.79	0.10	2.73	1.81	2.12
SIGNALS/1000 POPULATION:	0.98	1.11	0.08	0.98	0.87	1.05
SIGNALS/OFFICE STAFF:	42.67	29.41	0.50	36.15	24.89	25.79
SIGNALS,FLASHERS/TECHS:	42.00	30.74	2.33	21.39	17.34	30.28
AVG. TROUBLE CALLS/SIG.	0.6	0.53	1.5	1.92	1.16	1.08

PAGE 1

DATE: 07 / 17 / 92

STAFFING LEVEL SURVEY
(UNDER 100,000 POPULATION)

CITY:	ODESSA:	CARROLTON:	HURST:	FARMERS BRANCH:	RICHARDSON:	DENTON:	TYLER: **	ORANGE: **	AVERAGE:
POPULATION:	89,699	81,000	32,000	25,000	75,500	67,000	78,000	23,628	58,976
SQUARE MILES:	35.03	35	9.1	12.5	26	61	44	20	30.56
OFFICE PERSONNEL:	3	7	1	2	8	2	4	4	3.86
REGISTERED ENGINEERS:	0	4	1	2	3	1	1	1	1.53
ENGINEERING ASSISTANTS/DRAFTSMAN	0	1	0	0	3	0	1	2	0.86
OTHER:	3	3	0	0	2	1	2	1	1.50
SIGNAL TECHNICIANS:	5	8	2	2	6	3	5	3	4.25
SIGN/MARKING TECHS:	7	8	2	N/A	8	3	6	1	4.38
SIGNALS:	169	62	26	47	84	69	106	2	70.63
FIXED TIME:	83	0	0	5	1	10	81	2	22.75
ACTUATED:	86	62	26	42	83	59	25	0	47.88
SCHOOL FLASHERS:	24	58	9	36	57	10	85	5	36.25
COORDINATED:	162	38	14	28	80	27	73	0	52.75
# SIGNAL SYSTEMS:	2	7	2	3	1	2	9	0	3.25
SIGNALS/TECHNICIAN:	33.80	7.75	13.00	23.50	14.00	23.00	21.20	0.67	17.11
SIGNALS/SQ.MILES:	4.82	1.77	2.86	3.76	3.00	1.13	2.41	0.10	2.48
SIGNALS/1000 POPULATION:	1.88	0.77	0.81	1.88	1.11	1.03	1.36	0.08	1.12
SIGNALS/OFFICE STAFF:	56.33	8.86	26.00	23.50	10.50	34.50	26.50	0.50	23.34
SIGNALS,FLASHERS/TECHS:	38.60	14.75	17.50	41.50	23.50	26.33	38.20	2.33	25.34
AVG. TROUBLE CALLS/SIG.	11	N/A	0.5	2.7	2.5	2.3	1.04	1.5	2.59

** FROM PREVIOUS SURVEY

SURVEY.WK1

DATE: 07 / 17 / 92

STAFFING LEVEL SURVEY
(100,000 TO 250,000 POPULATION)

CITY:	ABILENE:	LUBBOCK: **	GARLAND	GRAND PRARIE:	IRVING:	MESQUITE:	PLANO:	WACO: **	PASADENA: **	BEAUMONT **	AMARILLO:	AVERAGE:
POPULATION:	106,000	194,148	180,270	102,677	165,000	104,000	130,000	107,000	130,000	113,000	160,772	135,966
SQUARE MILES:	110	104	57	80	68	42	68	90.68	58.59	79	87.2	78.77
OFFICE PERSONNEL:	2.5	9	9	4	8	3	6	6	3	8	9	6.14
REGISTERED ENGINEERS:	1	1	2	1	2	1	3	0	1	1	2	1.36
ENGINEERING ASSISTANTS/DRAFTSMAN	1	7	3	2	3	1	1	4	1	1	5	2.64
OTHER:	0.5	1	4	1	3	1	1	1	1	6	2	1.95
SIGNAL TECHNICIANS:	4	8	4	6	9	3	14	8	4	12	5	7.00
SIGN/MARKING TECHS:	8	5	8	7	8	4	15	6	2	9	9	7.36
SIGNALS:	150	164	117	90	145	45	79	182	128	168	227	134.09
FIXED TIME:	109	5	79	9	14	6	0	85	97	96	102	64.73
ACTUATED:	41	161	38	81	131	39	79	77	31	72	125	79.36
SCHOOL FLASHERS:	25	50	60	70	34	28	82	23	40	51	15	43.45
COORDINATED:	94	N/A	61	10	54	9	35	123	106	57	160	64.45
# SIGNAL SYSTEMS:	8	1	13	1	8	2	0	19	2	1	9	5.82
SIGNALS/TECHNICIAN:	37.50	20.50	29.25	15.00	16.11	15.00	5.64	20.25	32.00	14.00	45.40	22.79
SIGNALS/SQ.MILES:	1.36	1.58	2.05	1.13	2.13	1.07	1.16	1.79	2.18	2.13	2.60	1.74
SIGNALS/1000 POPULATION:	1.42	0.84	0.64	0.88	0.88	0.43	0.61	1.51	0.98	1.49	1.41	1.01
SIGNALS/OFFICE STAFF:	60.00	18.22	13.00	22.50	18.13	15.00	13.17	27.00	42.67	21.00	25.22	25.08
SIGNALS,FLASHERS/TECHS:	43.75	26.75	24.25	26.67	19.89	24.33	11.50	23.13	42.00	18.25	48.40	29.90
AVG. TROUBLE CALLS/SIG.	2.06	0.6	1	1.6	N/A	2.3	0.6	0.8	0.6	1.2	0.6	1.02

** FROM PREVIOUS SURVEY

SURVEY.WK1

DATE: 07 / 17 / 92

STAFFING LEVEL SURVEY
(OVER 250,000 POPULATION)

CITY:	ARLINGTON:	AUSTIN:	NEW ORLEANS	DALLAS: **	CORPUS CHRISTI:	FORT WOR	HOUSTO	OK CITY: **	SAN ANTONIO	EL PASO:	AVERAGE:
POPULATION:	260,000	465,222	500,000	1,000,000	206,000	450,000	1,630,000	450,000	935,400	515,500	651,212
SQUARE MILES:	98	225	366	377	124	293	581	536	344	248	329.10
OFFICE PERSONNEL:	15	34	9	17	9	12	41	17	28	18	19.80
REGISTERED ENGINEERS:	6	5	1	13	2	5	9	2	5	4	5.20
ENGINEERING ASSISTANTS/DRAFTSMAN	6	18	8	0	5	6	18	8	18	9	9.40
OTHER:	3	11	0	4	2	1	14	9	3	5	5.20
SIGNAL TECHNICIANS:	19	19	10	56	12	27	61	23	44	29	30.00
SIGN/MARKING TECHS:	15	15	18	24	15	23	55	25	35	20	24.50
SIGNALS:	225	562	433	1132	305	555	2000	500	940	448	711.00
FIXED TIME:	0	338	251	388	80	30	1000	10	397	44	253.60
ACTUATED:	225	224	182	744	225	535	1000	490	542	404	457.10
SCHOOL FLASHERS:	70	349	368	600	151	60	0	207	1	55	205.10
COORDINATED:	179	444	400	926	134	245	1600	168	549	292	493.50
# SIGNAL SYSTEMS:	2	0	30	71	18	2	140	4	N/A	13	28.00
SIGNALS/TECHNICIAN:	11.84	29.58	43.30	20.21	25.42	20.93	32.79	21.74	21.36	15.45	24.26
SIGNALS/SQ.MILES:	2.30	2.50	1.18	3.00	2.46	1.93	3.44	0.79	2.73	1.81	2.21
SIGNALS/1000 POPULATION:	0.87	1.21	0.87	1.13	1.07	1.26	1.23	1.11	0.98	0.87	1.06
SIGNALS/OFFICE STAFF:	15.00	16.53	48.11	66.59	33.89	47.08	48.78	29.41	36.15	24.89	36.64
SIGNALS,FLASHERS/TECHS:	15.53	47.95	80.10	34.50	38.00	22.78	32.79	30.74	21.39	17.34	34.11
AVG. TROUBLE CALLS/SIG.	0.5	0.62	2.9	1.43	N/A	1.03	0.63	0.63	1.92	1.16	1.07

** FROM PREVIOUS SURVEY

SURVEY.WK1

TRANSPORTATION DEPARTMENT
STAFFING LEVEL COMPARISON (92)

CITIES	ARLINGTON (817) 275-3271	CARROLLTON 466-3050	DALLAS 670-3175	*FT. WORTH (817) 870-8055	GARLAND 205-2439	*GRAND PRAIRIE 660-8132	*IRVING 721-2646	*MESQUITE 216-6215	PLANO 424-6531	RICHARDSON 238-4243
Population	260,000	87,000	1,000,000	450,000	183,270	102,677	165,000	104,000	149,188	75,500
Square Miles	98	35	377	293	57	80	68	42	70	28
Miles of Street	N/A	310	3427	2103	639	415	679	377	709	308
- Lane Miles	2238	774	9744	5443	1548	750	1,662.5	N/A	N/A	871
Item:										
Total Staff	42+	19	118+++	62+	23	17	25	9	26	22
- Office Staff	11	7	48+++	12	10	4	8	3	7	8
- Signal Tech.	17+,++	5++,**	47	27++	5	6	9	3	8	6
- Signs Markings	14	7	23	23	8	7	8	3	11	8
Total Signals:	233	70	1171	565	127	90	145	45	96	86
- Fixed Time	0	0	388	30	58	9	14	6	3	1
- Actuated	233	70	783	535	69	81	131	39	93	85
- Coordinated	188	39	965	245	69	10	54	9	86	84
- School (Flashing Beacons) Signals	70	75	800	50	64	70	34	28	82	57
# Signs	29,286	N/A	N/A	N/A	33,310 (est.)	N/A	N/A	N/A	N/A	11,019

TRANSPORTATION DEPARTMENT
STAFFING LEVEL COMPARISON (SUMMARY)

CITIES	ARLINGTON 275-3271	CARROLLTON 466-3050	DALLAS 670-3175	•FT. WORTH (817) 870-8055	GARLAND 205-2439	•GRAND PRAIRIE 660-8132	•IRVING 721-2646	•MESQUITE 216-6215	PLANO 424-6531	RICHARDSON 238-4243
Sq. Miles/Employee	2.3	1.84	3.2	4.7	2.47	4.7	2.7	4.7	2.7	1.3
1000 Population Per Employee	6.2	4.6	8.49	7.2	7.9	6.0	6.6	11.5	5.7	3.4
Miles of Street Per Employee	N/A	16.3	29.0	33.9	27.78	24.4	27.2	41.8	27.3	14.0
Signals Per Signal Technician	13.72 +, + +	14 + +	24.92	20.93 + +	25.4	15.00	16.11	15.00	12	14.33
Signals/Flashers Per Signal Tech	17.82	29	41.94	22.78	38.2	26.67	19.89	24.33	22.25	23.83
Avg. Trouble Calls/Sig./Mo	0.48	2	1.33	N/A	1	1.6	N/A	2.3	0.33	1.08
Miles of Street Sign/Mark Tech	N/A	44.2	149.0	91.4	79.8	59.2	84.9	125.7	64.5	38.5
Lane Miles Per Signs/Mark Tech	160	111	424	237	194	107	208	125	N/A	109
# Signs Per Sign/Mark Tech	2,092	N/A	N/A	N/A	4164	N/A	N/A	N/A	N/A	1377

• From Previous Survey
\+ Also Responsible for Street Lighting
\+ + Responsible for Signal Construction
\+ + + Not Including Airport or Parking Regulation Functions
•• Responsible for Freeway Median Lights
\+ + + Not Including Airport or Parking Regulation Personnel
•• Maintains Highway Median Lighting

rel:LWC7/StatComp

TRANSPORTATION DEPARTMENT
ADJUSTED STAFFING LEVEL COMPARISON

BASED ON	ARLINGTON	CARROLLTON	DALLAS	FT. WORTH	GARLAND Actual	GRAND* PRAIRIE	IRVING*	MESQUITE *	PLANO	RICHARDSON
1000 Population Per Employee	30	40	22	25	23	31	28	16	32	64
Miles Street Per Employee	*N/A	39	22	19	23	26	23	15	23	48
Signals Per Signal Technicians	9+, ++	9	5	6	5	8	8	8	11	9
Signals/Flashers Per Signal Technicians	11	7	5	8	5	7	10	8	9	8
Miles of Street Per Sign/Marking Technician	*N/A	14	4	7	8	11	8	5	10	17
Lane Miles of Street Per Sign/Marking Technician	10	14	4	7	8	14	7	N/A	N/A	14
# Signs Per Sign/Marking Technician	16	N/A	N/A	N/A	8	N/A	N/A	N/A	N/A	24

*From Previous Survey
+ Also Responsible for Street Lighting
+ + Also responsible for signal construction

This table shows the number of employees that would be required for the City of Garland to match the given ratio in the comparison cities. For example, for Garland to match the per 1000 population to employee ratio in Arlington, 30 employees would be required.

PAGE 1

TRAFFIC SIGNAL MAINTENANCE SURVEY

DATE: 06 / 4 / 92

CITY:	ABILENE:	AMARILLO:	ARLINGTON:	AUSTIN:	CARROLTON:	CORPUS CHRISTI:	EL PASO:	AVERAGE:
POPULATION:	106,000	160,000	262,000	465,222	81,100	260,000	515,500	352,549
SQUARE MILES:	110	87	98	225	35	246	248	155.17
SIGNAL TECHNICIANS:	4	5	19	19	5	12	29	20.86
SIGNAL TECHNICIANS IN I.M.S.A.:	0	3	17	4	5	1	0	3.57
TRAFFIC SIGNALS (TOTAL):	150	234	226	562	67	305	448	367.29
FIXED TIME:	109	89	0	338	0	80	44	153.07
ACTUATED:	41	145	225	224	67	225	404	233.36
COORDINATED:	94	158	179	444	38	134	292	278.21
# SIGNAL SYSTEMS/MASTERS:	6	6	2	N/A	7	18	13	16.36
AFTER HOURS CALL OUTS:	489	N/A	400	998	N/A	762	641	301.21
SIGNAL TIMING REVISIONS:	16	N/A	20	N/A	N/A	45	203	76.29
SCHEDULED MAINTENANCE CALLS:	1690	N/A	250	120	N/A	295	50	444.36
EMERGENCY MAINTENANCE CALLS:	2233	N/A	157	N/A	N/A	3962	939	846.43
SIGNAL TROUBLE CALLS/MONTH/SIGNAL:	2.06	N/A	N/A	0.62	2	0.63	1.18	0.81
SCHOOL FLASHERS:	25	16	70	349	58	151	55	69.71
SCHOOL FLASHER MAINT. CALLS:	40	20	53	N/A	N/A	51	217	36.50

TRAFFIC SIGNAL MAINTENANCE SURVEY

DATE: 06 / 04 / 92

CITY:	FORT WORTH	GARLAND:	HOUSTON	HURST:	ODESSA:	PLANO:	RICHARDSON:	SAN ANTONIO:	AVERAGE:
POPULATION:	450,000	183,270	1,630,000	32,000	89,699	120,000	75,500	935,400	362,549
SQUARE MILES:	293	57	581	9.1	35	69.04	28.2	344	155.17
SIGNAL TECHNICIANS:	27	5	128	2	4	12	6	44	20.86
SIGNAL TECHNICIANS IN I.M.S.A.:	0	4	0	1	3	6	6	0	3.57
TRAFFIC SIGNALS (TOTAL):	565	126	2000	28	159	86	84	940	367.29
FIXED TIME:	30	58	1000	0	24	3	1	397	153.07
ACTUATED:	535	68	1000	26	134	83	83	542	233.36
COORDINATED:	245	59	1600	14	163	81	80	549	278.21
# SIGNAL SYSTEMS/MASTERS:	2	13	140	2	3	14	1	N/A	18.36
AFTER HOURS CALL OUT:	1182	N/A	52	55	N/A	342	160	128	301.21
SIGNAL TIMING REVISIONS:	47	N/A	104	3	N/A	33	630	N/A	76.29
SCHEDULED MAINTENANCE CALLS:	1807	N/A	2000	N/A	N/A	192	50	1574	444.36
EMERGENCY MAINTENANCE CALLS:	N/A	N/A	1200	87	N/A	544	163	2565	646.43
SIGNAL TROUBLE CALLS/MONTH/SIGNAL:	N/A	1	0.6	N/A	N/A	0.33	1.06	1.92	0.81
SCHOOL FLASHERS:	60	64	0	9	24	97	57	1	86.64
SCHOOL FLASHER MAINT. CALLS:	N/A	N/A	0	4	N/A	87	87	0	36.80

PAGE 2

TRAFFIC SIGNAL MAINTENANCE SURVEY

DATE: 06 / 04 / 92

CITY:	FORT WORTH	GARLAND:	HOUSTOI	HURST:	ODESSA:	PLANO:	RICHARDSON:	SAN ANTONIO:	AVERAGE:
POPULATION:	450,000	183,270	1,630,000	32,000	89,699	120,000	75,500	955,400	362,549
SQUARE MILES:	293	57	581	9.1	35	69.04	28.2	344	155.17
SIGNAL TECHNICIANS:	27	5	128	2	4	12	6	44	20.86
SIGNAL TECHNICIANS IN I.M.S.A.:	0	4	0	1	3	6	6	0	3.57
TRAFFIC SIGNALS (TOTAL):	565	126	2000	28	169	86	84	940	387.29
FIXED TIME:	30	58	1000	0	24	3	1	397	153.07
ACTUATED:	535	68	1000	26	134	83	83	542	233.36
COORDINATED:	245	59	1600	14	163	81	80	549	278.21
# SIGNAL SYSTEMS/MASTERS:	2	13	140	2	3	14	1	N/A	16.36
AFTER HOURS CALL OUT:	1182	N/A	52	55	N/A	342	160	128	301.21
SIGNAL TIMING REVISIONS:	47	N/A	104	3	N/A	33	630	N/A	75.29
SCHEDULED MAINTENANCE CALLS:	1807	N/A	2000	N/A	N/A	192	50	1574	444.36
EMERGENCY MAINTENANCE CALLS:	N/A	N/A	1200	87	N/A	544	163	2565	846.43
SIGNAL TROUBLE CALLS/MONTH/SIGNAL:	N/A	1	0.6	N/A	N/A	0.33	1.08	1.92	0.81
SCHOOL FLASHERS:	50	64	0	9	24	97	57	1	66.64
SCHOOL FLASHER MAINT. CALLS:	N/A	N/A	0	4	N/A	87	67	0	36.50

Appendix II-B

IH 287 Incident Management Plan

Source: Freeway Incident Management Handbook, July, 1991, U.S. Department of Transportation, Federal Highway Administration, Washington, DC.

TRANSCOM
Incident Management Plan

I-287, NEW YORK STATE THRUWAY
THROUGH ROCKLAND COUNTY

FROM: EXIT 15, SUFFERN

TO: TAPPAN ZEE BRIDGE, NYACK

The preparation of this report has been financed in part by the U.S. Department of Transportation, Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

Incident Management Plan

Regional Highway Segment:

New York State Thruway, Interstate 287,
Rockland County
From Interchange 15, Suffern
To Tappan Zee Bridge, Nyack

Responsible Agencies:

New York State Thruway Authority
Coordinator: H. Peter Gustafson, P.E.
Director of Traffic Engineering
P.O. Box 189
Albany, New York 12201
518-436-2838

New York State Police - Troop T
Coordinator: Major Bruce Arnold
Commanding Officer
Troop T Headquarters
P.O. Box 189
Albany, New York 12201
518-436-2791

New York State Department of Transportation
Coordinator: Frederick Slade, Jr., P.E.
Supv. Traffic Operations Center
901 Bedford Road
Pleasantville, NewYork 10570
914-747-1118

Rockland County
Coordinator: Donald McGuire
Director, Office of Emergency Management
Fire Training Center
Firemen's Memorial Drive
Pomona, New York 10970
914-354-8259

TRANSCOM
Coordinator: John M. Ashe
Manager, Incident Management Planning
25 Journal Square
Jersey City, New Jersey 07306
201-963-4033 (Office)
1-800-TRAFFIC
(Operations Information Center)

Participating Agencies:

Bergen County Police

Clarkstown Police Department

New Jersey Highway Authority -
Garden State Parkway

New York State Department of Transportation

New York State Police - Troops F, K, T

New York State Thruway Authority

Nyack Police Department

Orangetown Police Department

Palisades Interstate Park Commission

Port Authority of New York and New Jersey
George Washington Bridge

Ramapo Police Department

Rockland County Department of Public Transportation

Rockland County Office of Emergency Management

Rockland County Sheriff's Department

Sloatsburg Police Department

South Nyack Police Department

Spring Valley Police Department

Suffern Police Department

Tarrytown Police Department

Triborough Bridge and Tunnel Authority
Bronx Whitestone Bridge
Throgs Neck Bridge
Triborough Bridge

Westchester County Department of Public Safety

Summary of Plan

This plan of coordinated management of traffic around and away from road closing incidents concerns the highway corridor of the New York State Thruway, Interstate 287, between its Interchange 15 in Suffern, and the Tappan Zee Bridge.

Projections of traffic indicate that, by the year 1995, the average daily traffic through the corridor may reach 76,000 vehicles. These projections, coupled with recent increases in the number of road closing incidents involving tractor trailers and tankers, make it imperative to plan for the management of traffic around and away from such incidents.

Regional Diversion of Traffic

By virtue of the cooperative spirit growing amongst the consortium of transportation agencies of the region in conjunction with the formation of the Transportation Operations Coordinating Committee, TRANSCOM, it is now more easily possible to call for help in diverting traffic.

When a major incident occurs on the Thruway in Rockland County, requests will be made for the large, over the roadway, changeable message signs, now operated by the New York State Thruway at the Tappan Zee Bridge, the Port Authority at the George Washington Bridge, and the Triborough Bridge and Tunnel Authority at the Throgs Neck, Bronx Whitestone, and Triborough bridges, to warn motorists of the problem, and recommend alternate routes to be used by them.

In addition, a request may be made to the Bergen County Police for the use of their Variable Message Sign (VMS) sign trucks to be placed at appropriate locations. Depending upon the location and direction of the road closing event, the New Jersey Highway Authority, operator of the Garden State Parkway, will be requested to display messages on their portable VMS vehicles to warn motorists approaching the region what has taken place.

Local Diversion of Traffic

The traffic plan which follows sub-divides the Thruway from exit to exit. It is arranged sequentially with northbound sections followed by southbound sections. One or more alternate routes for traffic is provided.

Degrees Of Implementation

When an incident occurs which causes all lanes of the highway to be closed in a certain direction, a series of actions will take place, the extent of which will depend upon the time of day, the day of the week, and the estimate of how soon it will be before the roadway is cleared and returned to service.

When an incident occurs which causes congestion to a lesser degree than a full roadway closure, only partial implementation of this plan would be necessary. Using this plan as a basis for decisions, traffic control may be implemented by the corridor management team to as severe a degree as is warranted by the situation.

Levels of Implementation of Traffic Management Plans

A series of five levels of implementation have been established which reflect the increasing intensity of traffic management required in relation to the magnitude of the incident that has taken place. As the level of implementation gets higher, it is important that all steps in the preceding level(s) have taken place prior to, or are being accomplished concurrently.

The actions to be taken as an incident escalates are described below. An estimate of the level of operations which should be implemented, based upon the hour and day of the week, is at the end of this section.

Level 1

The Preparation

Whenever an incident takes place that has serious implications, all operation centers should be notified and an initial preparation made to handle a more serious event in case it develops.

- A message should be transmitted to appropriate agencies on the TRANSCOM network.
- Alternate Routes within the section of the corridor in which the incident has occurred are to be inspected to see that they are clear to handle the expected increase in traffic. Unless any department reports a problem such as a utility company digging up the road or other impediment, the 1st Alternate Route of the plan will be used as the Primary Alternate.

Level II

The Incident Can Be Handled at the Local Level

Traffic is light and the incident is expected to be cleared before there would be a heavy traffic demand on the roadway.

- Level I action must be taken.
- TRANSCOM notifies Shadow Traffic of the Primary Alternate Route to be used for localized traffic. Shadow is requested to recommend to commuters who normally used the I-287 corridor to switch to mass transit or to carpool for the day.
- Agencies prepare for the need for extra traffic coverage. (Who will work longer; who will be called in early?)
- Police patrols uncover any permanently mounted alternate route markers.

Level III

Voluntary Diversion of Traffic is Necessary

There is sufficient volume of traffic so that congestion has already occurred and it would be timely for motorists to use the local alternate routes that have been set up to get past the incident.

- Level I and II actions must be taken.
- TRANSCOM notifies Shadow Traffic and recommends that trucks use Alternate routes around the I-287 Corridor.
- Local agencies commit personnel to agreed to emergency posts to PREVENT Grid Lock.

Level IV

Mandatory Diversion of Traffic is Necessary

With assistance from regional agencies helping to divert traffic away from the corridor: At this level, sufficient congestion is affecting the surrounding highways leading toward the corridor, and the extent of the incident is such that it will be in the best interest of the motorist to spend the extra time to use the recommended regional diversion to get to the other side of the incident.

- Level I, II, and III actions must be taken.
- TRANSCOM advises Shadow Traffic of the ramp closings and local alternate routes which are now necessary.
- TRANSCOM requests the Regional agencies to set messages on their permanently installed Changeable Message signs (CMS).
- Variable Message sign (VMS) trucks are requested to take up their previously agreed to positions and display their messages.

Level V

Long Term Diversion of Traffic is Necessary

At this level, the incident is of such magnitude that the roadway will be closed for a long period of time, and one or more days of alternate operation can be expected.

- All previous levels of action must be taken.
- Special signing is prepared for long term diversion.

Action Levels of Incident/Implementation

TIME OF DAY	ESTIMATED DURATION	LANES CLOSED 1	2	3	ACTION
Midnight to 0500	1 Hour	--	--	I	CLASS "A" ACTIONS
	2 to 4 Hours	--	I	II	
	More than 4 Hours	II	II	III	
0500 to 1100 and 1400 to 2000	1 Hour	I	II	V	CLASS "B" ACTIONS
	2 to 4 Hours	III	IV	V	
	More than 4 Hours	III	IV	V	
1100 to 1400 and 2000 to Midnight	1 Hour	I	II	IV	CLASS "C" ACTIONS
	2 to 4 Hours	II	III	IV	
	More than 4 Hours	III	IV	IV	

Note: The grid above is intended for use on Monday thru Friday. For Saturday, Sunday and Holiday, Class "A" will be used from 2100 to 0800. Class "C" will be used from 0800 to 2100.

Appendix II-C

IH 287 Alternate Routing Plan

Source: Freeway Incident Management Handbook, July, 1991, U.S. Department of Transportation, Federal Highway Administration, Washington, DC.

Alternate Routing Plan
Scope Of Work

Introduction

The purpose of this project is to develop an Alternate Routing Plan to provide the framework and guidelines for responding to incidents that require closure of section(s) of the freeway system,. Traffic will be re-routed onto the adjacent surface street system that parallels the freeway, and allowed to re-enter at the next appropriate interchange.

Specifically, the plan will: 1) identify alternate traffic routes between each interchange on the system; 2) establish authority and responsibility of the Department of Transportation, police agencies, and other affected agencies, and 3) document the notification process and standard procedures to be utilized for implementing the alternate route(s) and later removal following the termination of the incident period.

Project Scope

The system between ___ and ___ shall be covered.

Tasks

Task 1

Assemble and Index Data

Data required to develop the Alternate Routing Plan shall be assembled and indexed. This will include the following:

- Roadway maps and plans
- Location of maintenance shops
- Location of police jurisdictions
- Traffic data
- Volumes on freeway system and ramps as well as on potential alternate routes
- Accident summary records at critical locations on alternate routes
- Existing signing on freeway and alternate routes

Task 2

Establish Alternate Route Criteria

Criteria shall be established under which alternate routes shall be selected. These include:

- Length of alternate versus freeway route
- Jurisdiction of detour (i.e. number of travelled lanes, number of signalized intersections, number of turns, number of left turns, number of route changes
- Accident history
- Capacity

Criteria shall be established for alternates which are:

- Long-term
- Short-term

Task 3

Identify Preliminary Alternate Routes

Assemble a set of preliminary detour routes and sketch on 8 1/2" x 11" sheets.

Task 4

Drive And Videotape Preliminary Alternate Routes

Each preliminary alternate route shall be driven and critical sections or junctions videotaped. Critical turn areas shall also be videotaped. Total

distance of each route will be measured by car odometer or a distance measuring instrument as necessary, and recorded. Relevant features and characteristics shall be recorded such as structures with limited overhead clearance, and weight restrictions, or route number changes.

Task 5

Revise Preliminary Alternate Routes

Based on the data and experience of driving the preliminary alternate routes, a revised set of alternate routes will be prepared. These will be presented as simplified maps on 8 1/2" x 11" sheets with explanations and descriptions of significant features.

Task 6

Identify Problem Areas

A list of alternate routes shall be compiled indicating any problem sections. The problem section will be keyed to the simplified map of the detour route. These problems will include:

- Significant delays
- Limited fuel availability (diesel and conventional)
- Overhead clearance limitations
- Structures with weight restrictions
- Residential areas
- School, hospital, church zones
- High accident zones
- Heavy pedestrian flows
- Tight turn radii
- Locations where temporary signals may be necessary will be identified.

Task 7

Identify Commercial Vehicle Restrictions

Alternate routes with vehicle restrictions shall be compiled including weight, length, height and any other restrictions.

Task 8

Determine Signing

The following aspects of signing shall be analyzed and recommendations made:

A. On Freeway

- Type (i.e. Velcro; small semi-permanent; large guide)
- Storage (stockpiling; locations of stockpiles; computerized inventory)
- Fabrication (by Agency; by contractors)
- Placement
- Erection (truck mounted; permanent folding sign, post requirements)

B. Off Freeway

- Permanent trailblazers
- Placement (location on detour routes from diversion point to the next entrance ramp)
- Temporary signing
- Storage (stockpiling; locations of stockpiles; computerized inventory)
- Fabrication (by Agency; by contractors)
- Placement
- Erection (truck mounted; permanent folding sign; post requirements)

C. Trailer Mounted Variable Message Signs (VMS)

- Assess the need for trailer mounted VMS.

Task 9

Assess Highway Advisory Radio

The use of highway advisory radio (HAR) will be assessed for use in emergency alternate routing. Aspects to be explored are:

- Permanent HAR locations
- Truck mounted HAR
- Compatibility with other operations
- Construction
- Weather advisory

Included in this task will be plan to utilize a public telephone number to convey alternate route information.

Task 10

Develop Operational Procedural Guide For Termination Of Alternate Routes

An operational procedural guide shall be developed. This guide shall be targeted to enforcement and other personnel with incident traffic management responsibilities. The guide shall notify, identify and explained each affected party's duties at the specified interchange including where signs are stored and who is to erect them both on and off the freeway.

The assistance and concurrence of the involved officials shall be obtained in development of this guide. The following aspects shall be included:

- Responsible parties and duties
- Maintenance
- State police patrols
- Roadside service to disabled vehicles
- Retrieval of signs and/or temporary covering
- Storage
- Replacement
- Restocking of maps

Task 11

Develop Notification Procedures

Notification procedures shall be developed that will allow the alternate routes to be updated on a continuous basis if affected by construction of a permanent or long-term nature, closures of surface street routes, bridge limitations or other factors.

Task 12

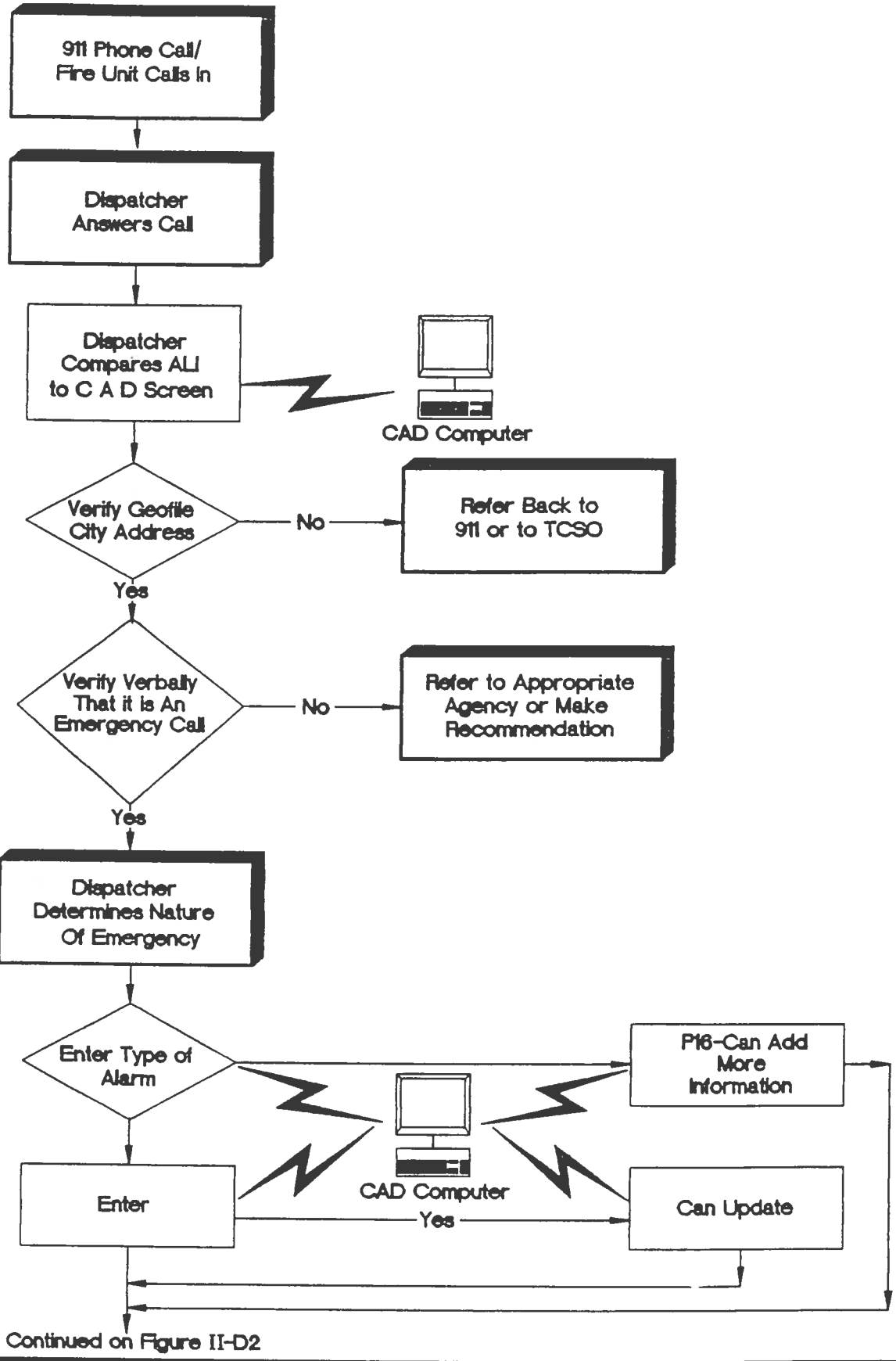
Estimate Costs

Cost to implement the procedures, identified for alternate routing shall be estimated. These costs shall include:

- Signs
- Printing
- Material
- Trucks
- Other equipment

Appendix II-D

Austin Fire Department Alarm Dispatch of a Multi-Company Response



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

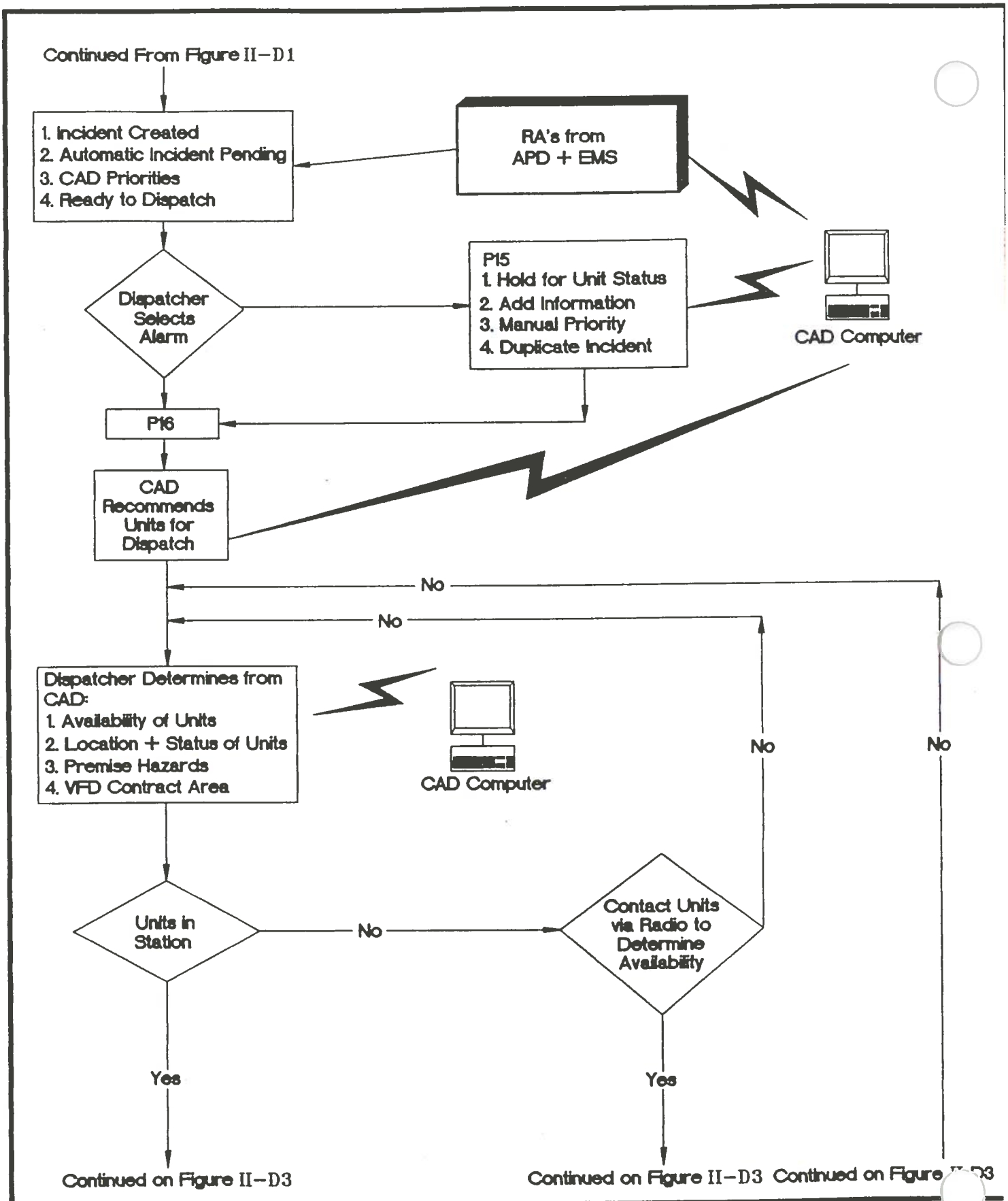
NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure
II-D1



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

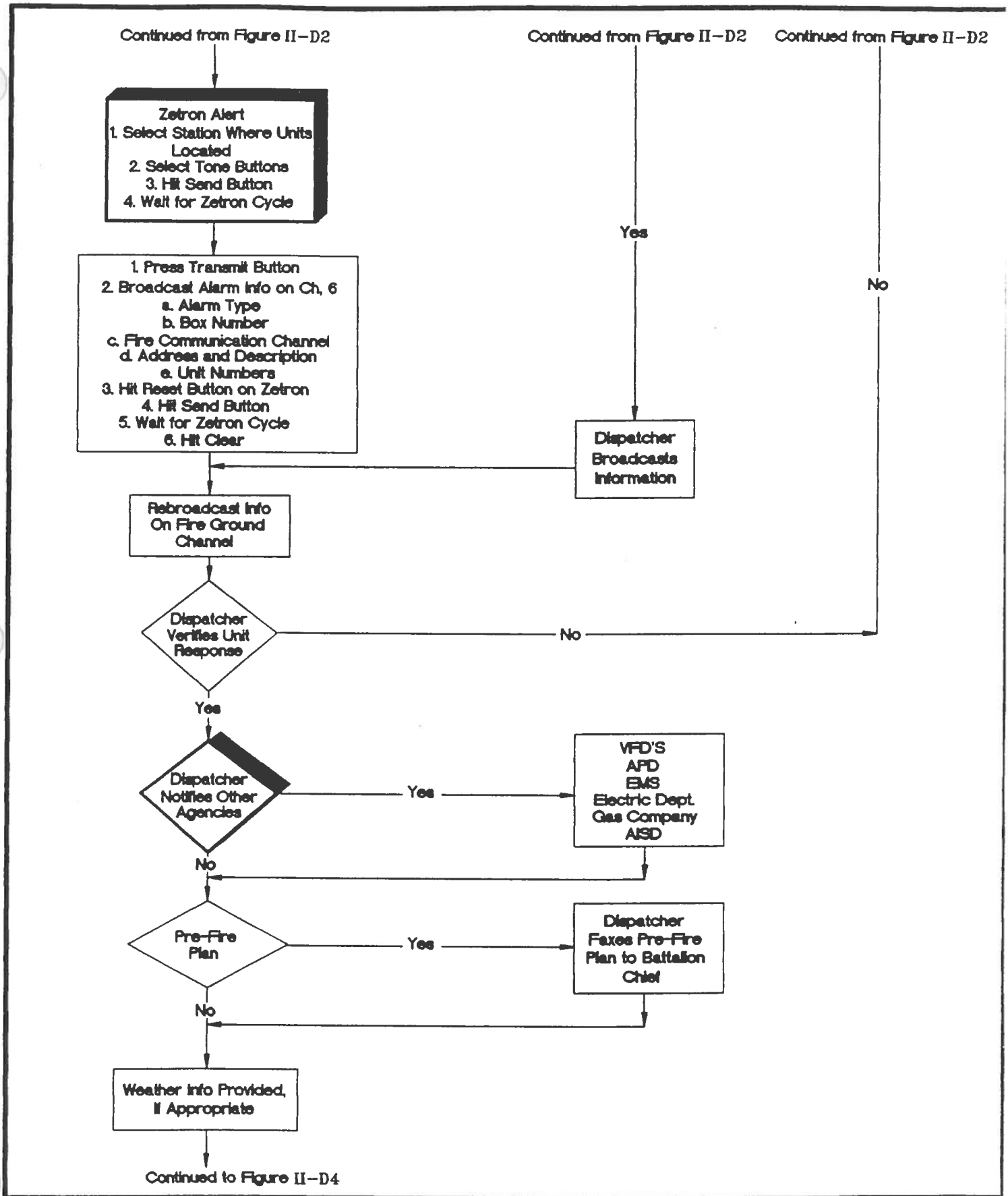
NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure II-D2



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

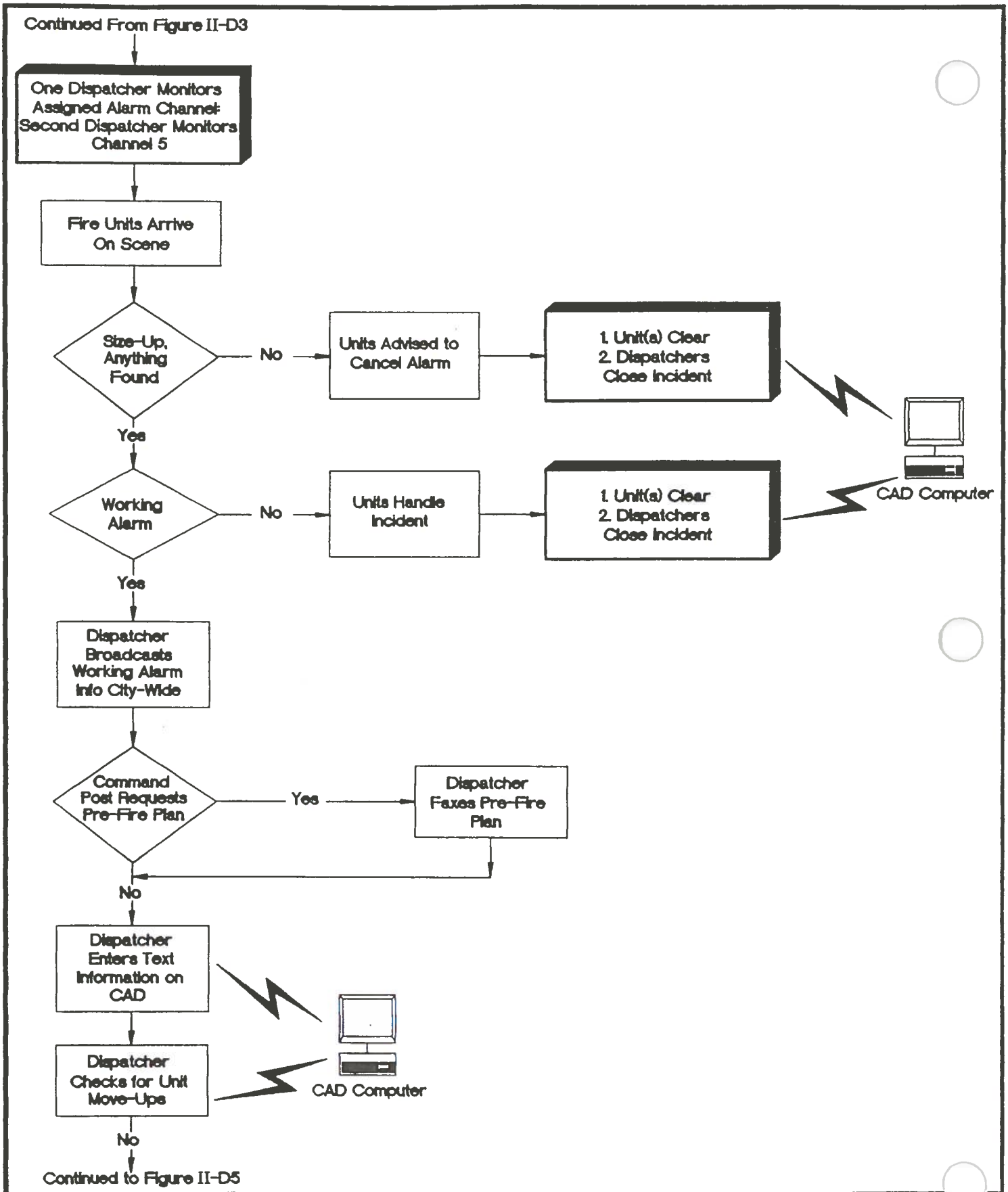
NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure II-D3



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

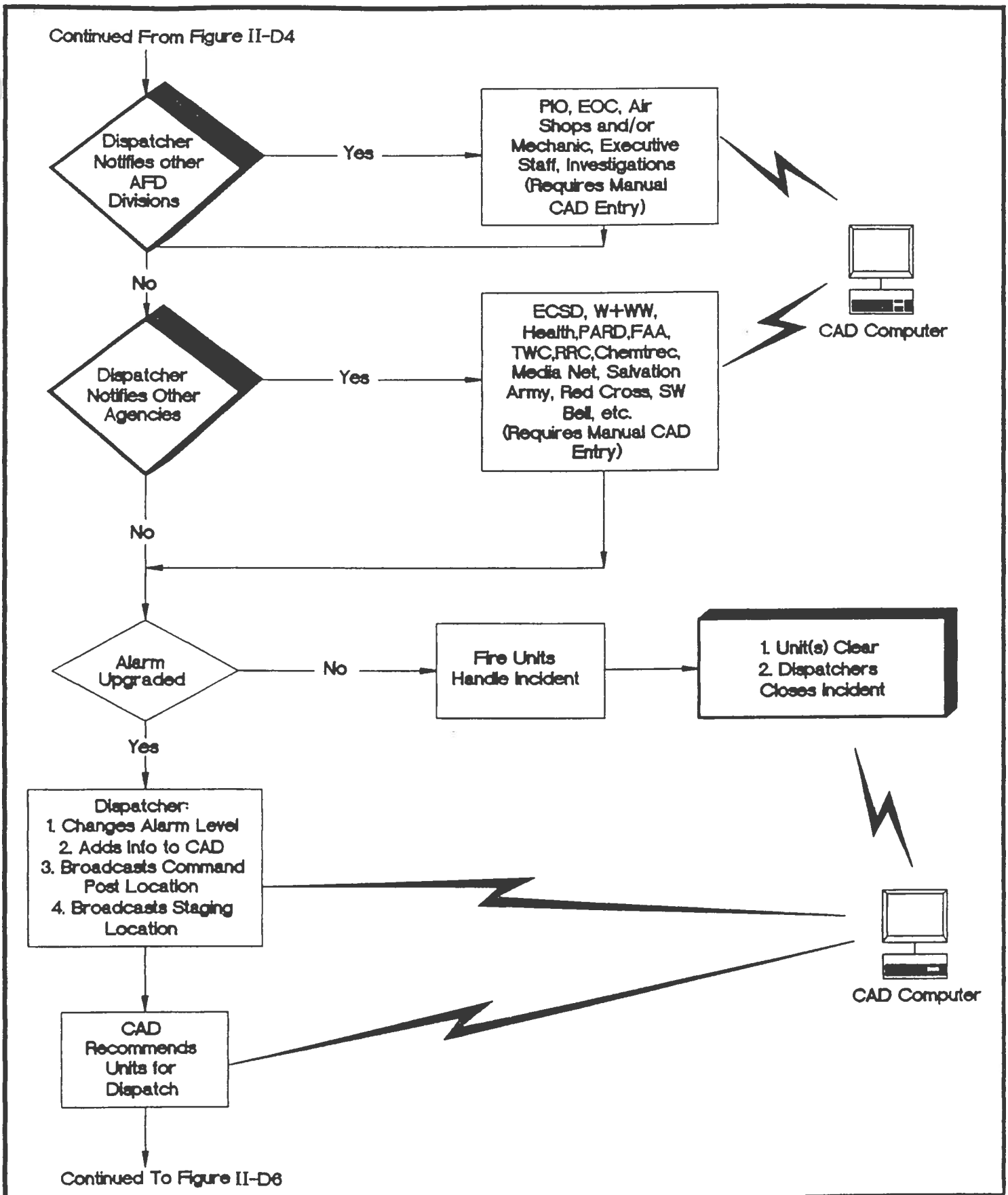
NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure II-D4



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

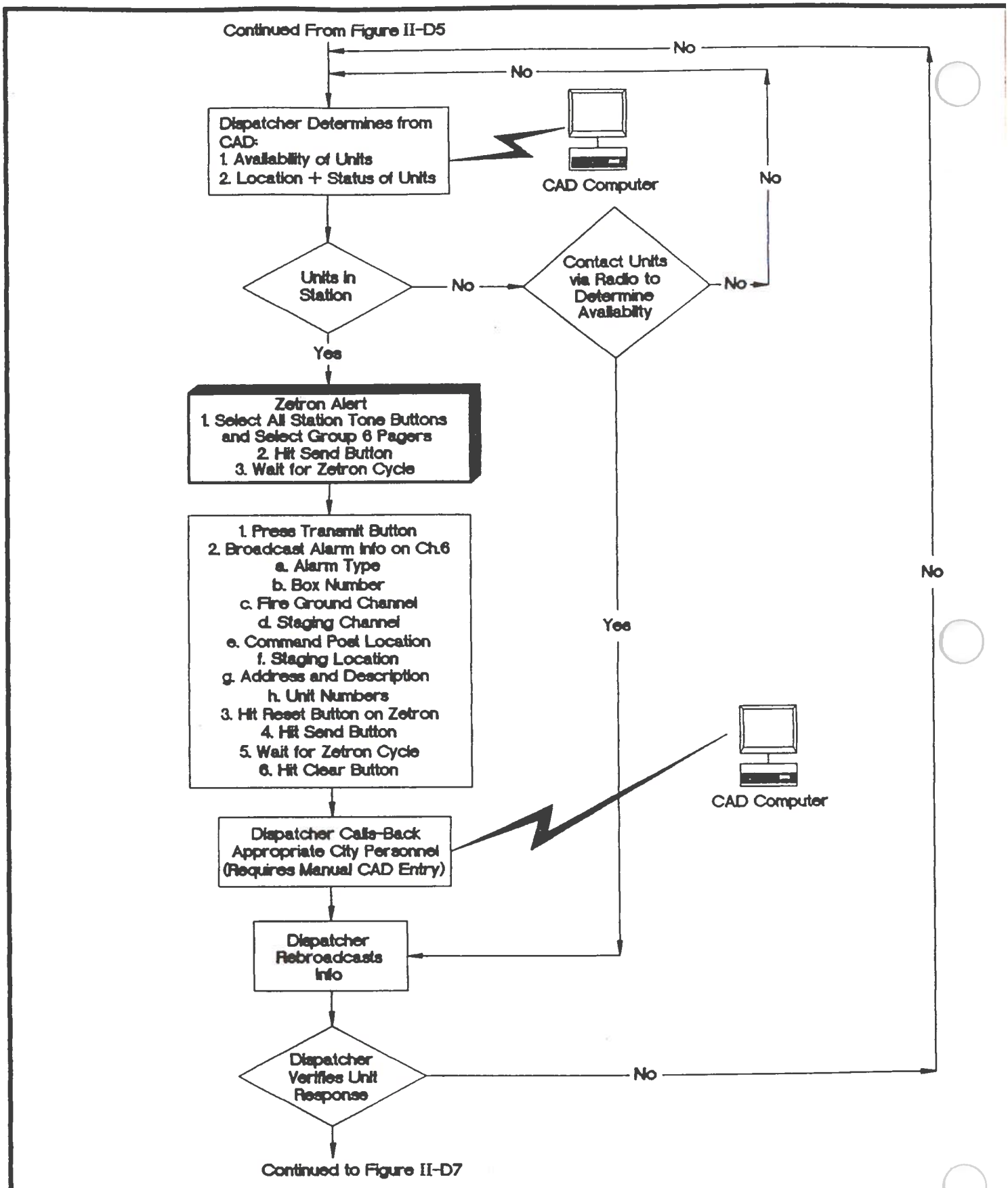
NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure II-D5



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

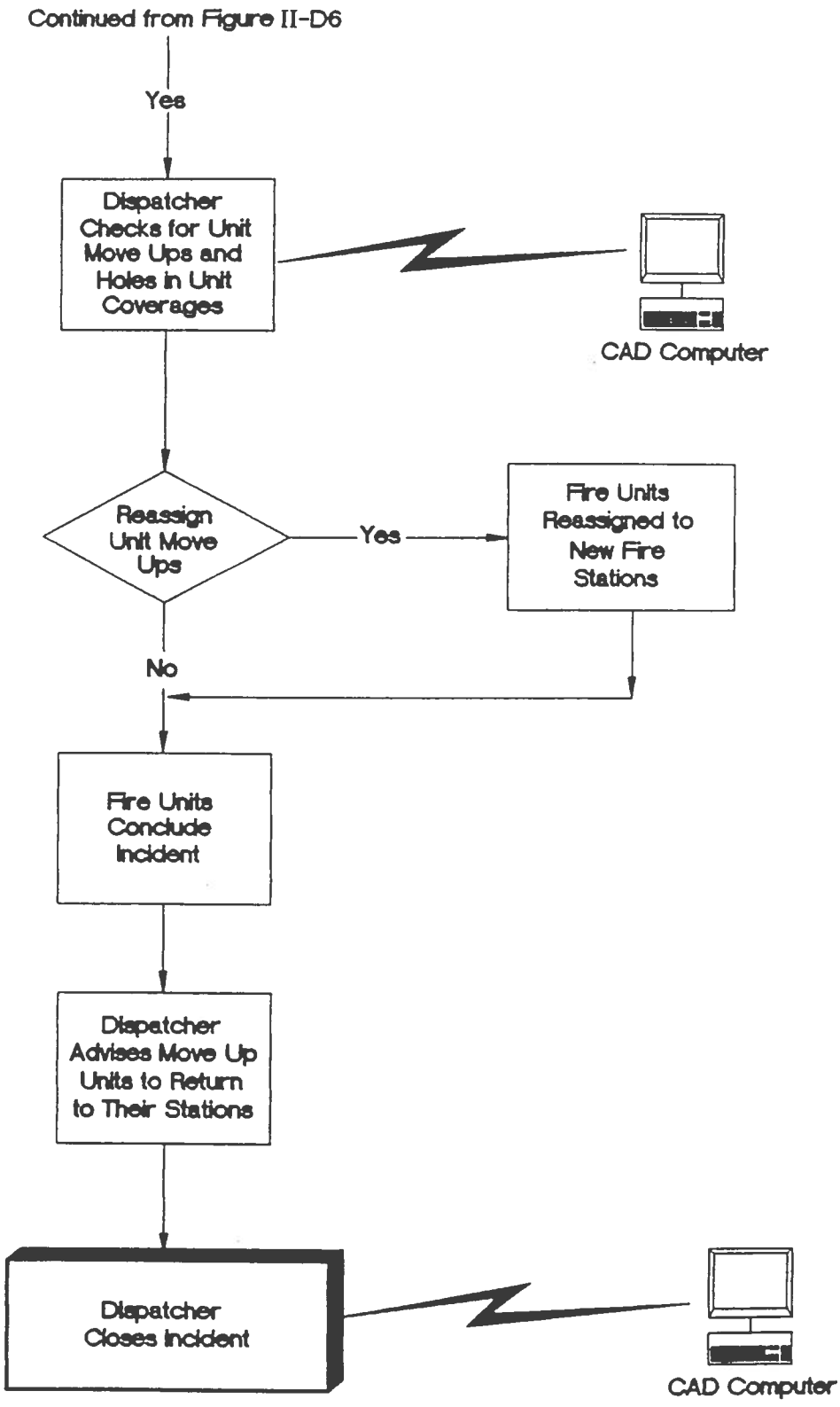
NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure II-D6



WILBUR SMITH ASSOCIATES
CONSULTING ENGINEERS AND PLANNERS
HOUSTON, TEXAS

NORTH AMERICAN CONTROLS CORPORATION
ADVANCED TRAFFIC ENGINEERING
KESSMANN & ASSOCIATES

AFD Alarm Dispatch of a Multi-Company Response

Austin Area-Wide ITS

Austin, Texas

Figure II-D7

Appendix II-E

Freight Element of Austin Metropolitan Area Transportation Plan

4.6 FREIGHT ELEMENT

4.6.1 Introduction

Freight movement, as an impact on transportation, has received minimal consideration in past planning efforts. However, ISTEA now requires consideration of freight movement in transportation planning. The efficient movement of freight is especially significant for the Austin metropolitan area, where freight transporters and passenger vehicles generally utilize the same transportation corridors. The Freight Movement Element addresses the federal requirements (ISTEA), impacts of the North American Free Trade Agreement (NAFTA), and significant aspects of roadway freight, rail freight, and air freight in the Austin metropolitan area. Recommended policies are grouped as issues pertaining to: SH-130, Ordinances and Operational Regulations, Alternative Freight Routes, Interchanges and Bridges, and Other Studies.

4.6.1.1 ISTEA Requirements

The passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 requires Metropolitan Planning Organizations (MPOs) to consider "methods to enhance the efficient movement of freight." This legislation forces planners to look beyond the needs of passenger vehicles, and directs all modes of transportation to receive equal attention with respect to planning a future transportation network. Addressing this factor (ISTEA factor #11) will require many areas to undertake goods-movement studies.

4.6.1.2 Roadway Freight

In order to enhance freight movement, it is necessary to study the means by which freight is moved. In the Austin metropolitan area the majority of freight is moved by truck (roadway freight). Roadway freight is addressed in this document as being either through (non-stop), or local.

Through (non-stop) Roadway Freight

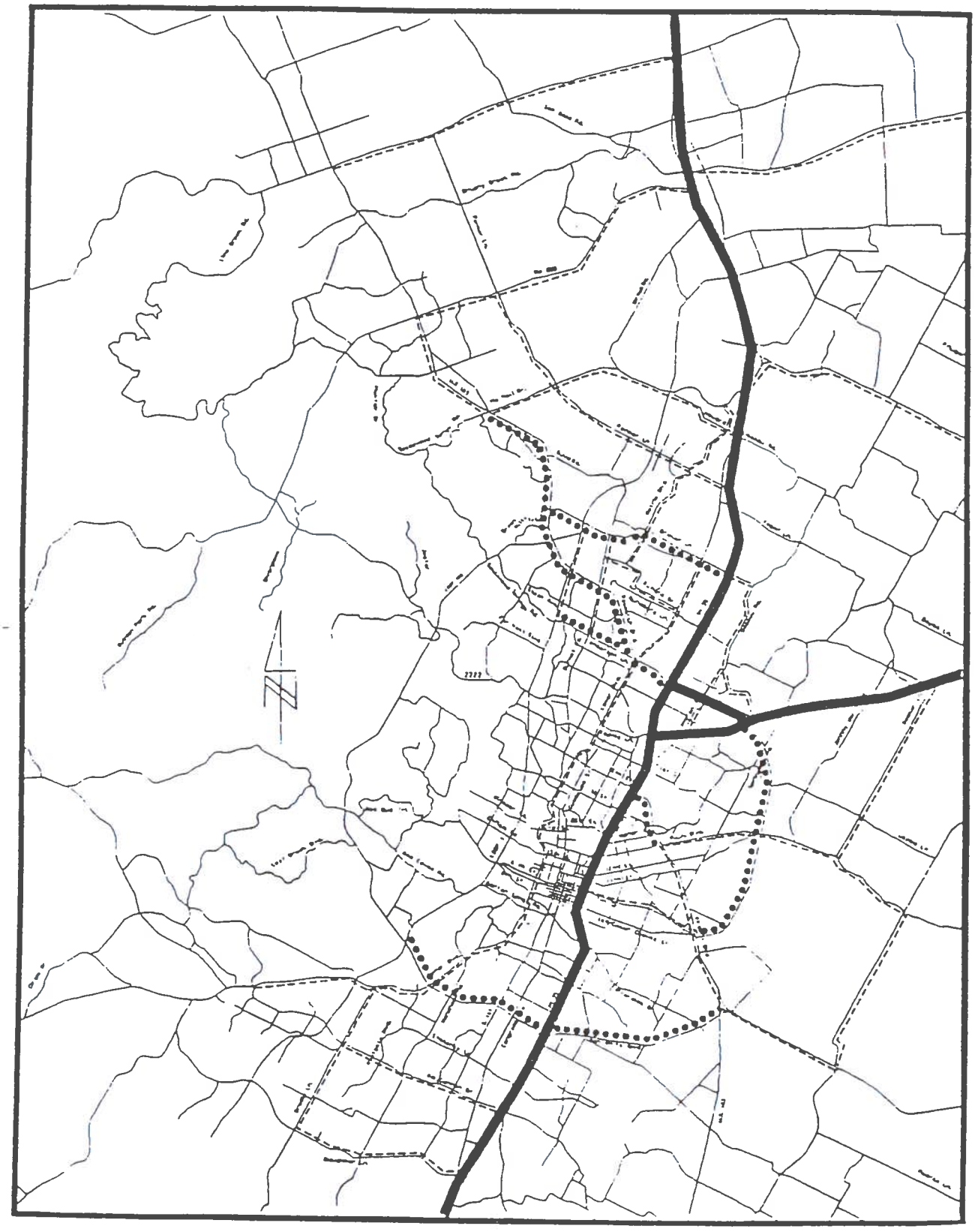
Through roadway freight pertains to trucks traveling *through* Austin, having no origin or destination inside the metropolitan area. Most of the through roadway freight traveling from Mexico (along the Laredo - San Antonio - Dallas/Fort Worth corridor) is carried on IH-35, and therefore moves directly through the center of Austin. This freight traffic places a huge burden on IH-35, which is already over capacity with commuters at peak hours. Interstates in many major cities include bypasses around the CBD; trucks hauling through freight on these Interstates can be diverted around urban traffic congestion. This is not the case for Austin, where IH-35 passes through the CBD. As stated previously, through roadway freight traffic is anticipated to increase steadily over the next few years.

Local (stop) Roadway Freight

Local roadway freight pertains to any trucks having an origin or destination(s) inside the Austin metropolitan area. Austin has a higher level of inbound roadway freight than outbound freight. This fact is explained by the nature of Austin business. The Austin metropolitan area is unique in that its highest paying jobs are in fields that produce a lower-than-average volume of outgoing freight. A large portion of the work force is characterized by young, affluent households which are huge consumers of sports and entertainment products, electronic equipment, clothes, furniture, disposable paper products, building materials, automobiles, and food and beverages. This high level of consumption generates a high volume of incoming freight trips in the Austin area (see Figure 4.6-1).

Figure 4.6-1
Roadway Freight Corridors, by Volume of Trips

Volume of Trips: ----High ●●●●Higher ■■■■Highest



Preliminary findings indicate that a majority of consumable goods, especially food products, enter Austin from the south (San Antonio), while durable goods tend to come from the north (Dallas/Fort Worth). Almost all of this freight travels on IH-35. Many of these trucks have an Austin destination east of IH-35 (see Figure 4.6-2). Most commercial distribution centers (warehouses), as well as UPS, Federal Express, the General Mail Facility, and all five (5) landfills are located east of IH-35.

4.6.1.3 Rail Freight

A high level of rail freight traffic moves by train *through* Austin non-stop. These trains must decrease speed because of restrictive grades, slow speed curves, and the single-track Colorado River bridge. The Union Pacific Railroad (UPRR) currently operates about 20 *through* trains per day. The current UPRR track capacity (without significant delays) is about 25 trains. Industry forecasts suggest that the amount of rail traffic through the Austin corridor to San Antonio and Laredo will double (to 40) between 1993 and 1998. Improvements to the current Austin rail configuration may require building a modern double-track bridge, or possibly rerouting the main tracks to enhance the movement of rail freight.

The level of *local* rail freight traffic (stopping) in Austin is relatively light compared to the total volume of rail freight moving through the city. Goods carried into Austin by rail include beer, lumber, paper, plastics, and some chemicals. Goods carried out of Austin are primarily aggregates from mines and quarries in Georgetown, Austin and Marble Falls.

There are currently no facilities in the ATS service area for transferring freight from trucks onto trains. San Antonio, less than 200 miles away, currently provides this service at a reasonable price.

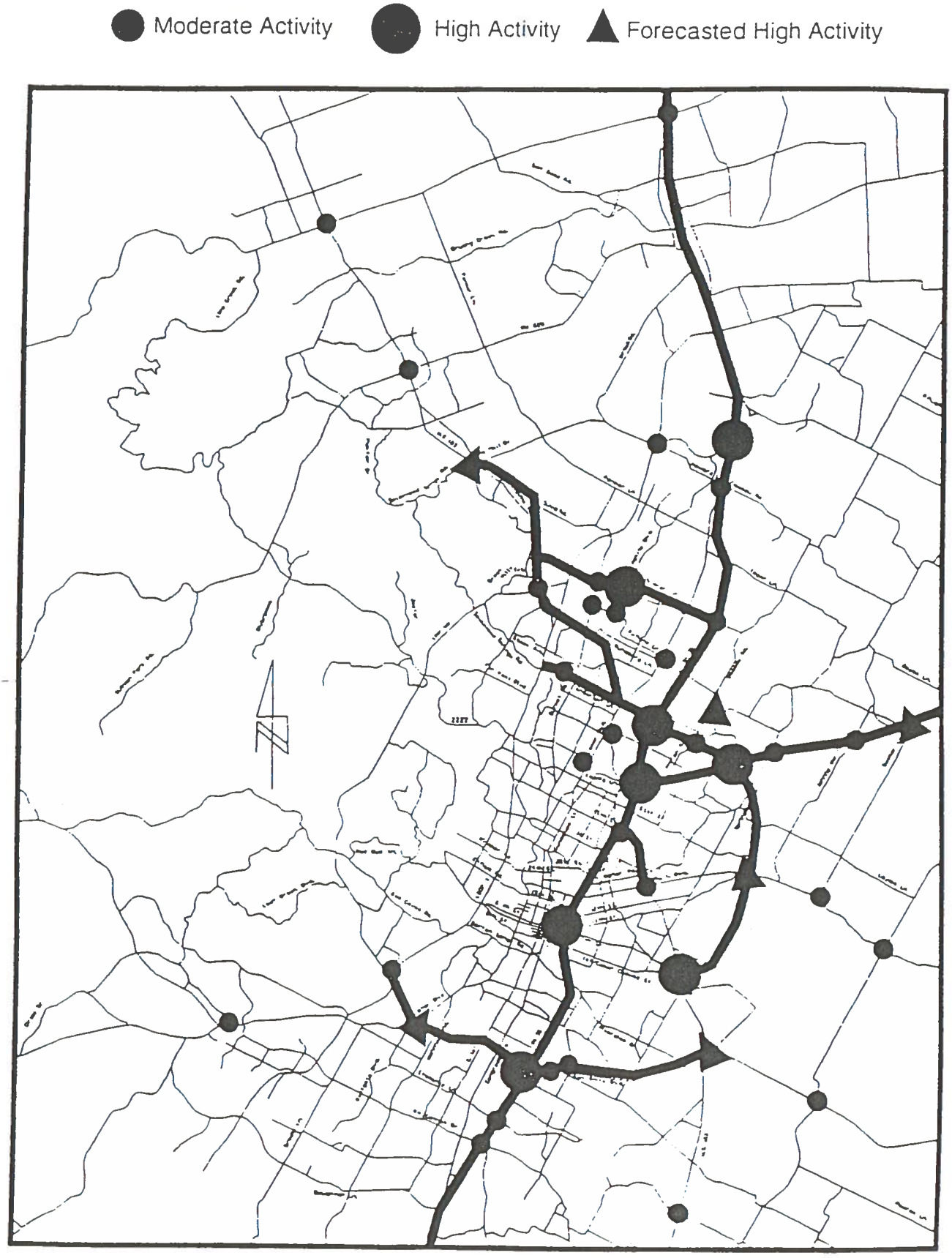
4.6.1.4 Air Freight

Austin serves as a regional air freight hub. The Austin metropolitan area sustains a very high per capita volume of air freight, due largely to its business climate (high-tech and academic). This volume of air freight is expected to continue to grow rapidly, and this growth may result in conflicts between passenger and freight traffic at and near the new airport.

4.6.1.5 Effects of NAFTA

The North American Free Trade Agreement took effect on January 1, 1994. The City of Laredo currently accounts for 60 percent of all trade between the US and Mexico. About 80 percent of that traffic moves by truck; most of the remaining 20 percent moves by rail. It is estimated that at least 30 percent of that truck traffic travels along IH-35 *through Austin* enroute to the mid-west and Canada; 80 percent of the rail traffic travels the Union Pacific Railroad (UPRR) main track *through Austin*. From October 1991 to December 1993, Austin experienced a 40 percent increase in cross-border truckloads passing through the city destined for Mexico (from 13,000 to 18,000 truck loads per month) and a 25 percent increase in truckloads coming from Mexico (from 8,500 to 10,400 per month). This traffic is anticipated to continue to increase at 20 percent per year through the year 1998, coinciding with the initial phase-in of the Agreement. It will likely level off after the year 1998, proceeding with a more normal 10 percent growth rate as experienced prior to the announcement of NAFTA.

Figure 4.6-2
Areas of Concentrated Roadway Freight Activity



4.6.2 Policies to Enhance Freight Movement

A. SH-130

Policy A-1: Accelerate feasibility study/planning of SH-130 (segments A & B, east of IH-35, around the CBD.

- Preliminary reports from TxDOT indicate a completion date beyond the year 2020.

Policy A-2: Make the enhancement of freight movement a priority in the planning of SH-130. Design SH-130 as an express freight route away from the CBD, with interchanges and ramp exits planned to encourage through traffic. This will minimize the number of ramps, thus minimizing cost.

- If SH-130 is designed primarily to cater to the needs of passenger cars, then trucks will continue to use IH-35, as the most direct route. Increased efficiency through reduced congestion will be the main incentive for trucks to use SH-130.

Policy A-3: Study the feasibility of relocating UPRR to the east (e.g. SH-130 corridor) for rail freight movement.

- If this transportation corridor is adopted by ATS and implemented, the existing UPRR track through the center of Austin could be utilized for local/regional passenger service during the 5:00 am - 11:00 pm time frame, allowing local freight operations during the nighttime. Provision of adequate rail right of way should be addressed in the planning of SH-130, including provisions for air cargo - rail transfer of containers.

B. Ordinances and Operational Regulations

Policy B-1: Restrict large commercial trucks to the right lane(s) of IH-35, US 290, and US 183, using local ordinances or changes to state law, if necessary.

Policy B-2: Establish an adequate number of designated delivery parking spaces for commercial vehicles, especially in the CBD.

Policy B-3: Identify and enforce an alternative route for trucks transporting hazardous materials.

C. Alternative Roadway and Rail Routes

Policy C-1: Evaluate US 183 (Ed Bluestein Blvd.) as an interim alternative freight route for through freight in order to bypass the heavy congestion on IH-35, until construction of SH-130. To connect US 183 to IH-35, consider using either FM 1327, or the Slaughter Lane extension east of IH-35, or SH 71.

- Expansion at the US 183 Montopolis bridge is incomplete. Current southbound capacity is reduced to one lane for through traffic on US 183. Northbound lanes have new bridge piers but no bridge. This bridge must be completed to full capacity in order to utilize US 183 as a freight route.

Policy C-2: Notify trucking companies, truck stops and the Department of Public Safety (DPS) of this alternative route(s) and provide incentive to trucks who use them. Also, install Route signs to inform trucks of "Truck Route" (see *Manual on Uniform Traffic Control Devices*).

Policy C-3: Study benefit of Commercial Vehicle Only lanes as part of current feasibility study for HOV lanes.

- The high level of commercial/freight activity in Austin may indicate this type of lane to be at least as beneficial as an HOV lane. Also, consider a combination of both lane types. Additionally, if Williamson County implements a transit commute plan, a new level of HOV demand will be introduced to IH-35.

Policy C-4: Examine feasible alternative rail alignments and improvements. This evaluation should include the following options: (1) building a double-track bridge at the present Colorado River bridge location, (2) double-tracking other segments of the existing line, and (3) constructing a *new* rail alignment (see Policy A-3).

D. Interchanges

Policy D-1: Evaluate the Airport Blvd./IH-35 interchange for improvement as this location appears to have an increasingly high level of truck freight traffic, not necessarily related to airport cargo operations.

Policy D-2: Evaluate possible solutions to the IH-35/US 290 East interchange as this location has a high level of commuter traffic, mixing with inbound truck freight and intercity bus traffic.

Policy D-3: Evaluate current plans for IH-35/US 183 interchange to facilitate future freight movement.

- Current plans for this interchange show dedicated lanes for traffic movement westbound on US 183 only. Traffic moving eastward on US 183 from IH-35 will be required to stop at a signalized intersection. This configuration will slow down the movement of freight and will impede the northern connection of the US 183 alternate freight route.

E. Further Study

Policy E-1: Conduct a freight origin/destination study for trucks utilizing IH-35 as part of an origin/destination study that TxDOT will conduct in 1997 in the ATS area.

- Determine the percentage of inbound/outbound traffic from both the south (San Antonio and Mexico) and the north (Dallas/Fort Worth). Determine which carriers have a destination in ATS area and which are passing through.

Policy E-2: Study economic impact of traffic delays to local businesses who require freight transport/shipping or deliveries by truck.

Policy E-3: Conduct an hourly freight movement study. Hourly traffic counts that show number of trucks are necessary to improve traffic signal timing. Efficient traffic signal timing is important to enhance the movement of freight.

Policy E-4: Study current freight corridors to determine the need for and existence of dedicated left turn signals, left turn lanes, and wide-radius right turn lanes. Trucks need these features to expedite their travel through intersections.

4.6.3 List of Background Studies and Documents

4.6.3.1 Vehicle Classification Report

4.6.3.2 Impacts of NAFTA on Freight Transportation in Austin

4.6.3.3 Introduction to Freight Terminology

4.6.3.4 Traffic Volume Analysis

4.6.3.5 Characteristics of Major Freight Operations

4.6.3.6 Summary of TXDOT Major Investment Studies (SH-130 and IH-35)