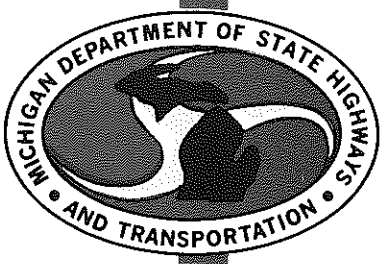
AIR QUALITY REPORT FOR M 153 IN THE CITIES OF WESTLAND AND GARDEN CITY, WAYNE COUNTY



TESTING AND RESEARCH DIVISION
RESEARCH LABORATORY SECTION

AIR QUALITY REPORT FOR M 153 IN THE CITIES OF WESTLAND AND GARDEN CITY, WAYNE COUNTY

Research Laboratory Section
Testing and Research Division
Research Project 77 AP-16A
Research Report No. R-1074

Michigan State Highway Commission
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Lansing, August 1977

This report presents air quality information for a proposed reconstruction of a section of M 153 in the cities of Westland and Garden City, Wayne County as shown in Figure 1. Meteorological data, estimates of pollution levels that might occur adjacent to the present roadway and the proposed roadway, and estimates of the total pollutant burden for the build and no-build cases are included.

Terrain and Demography

The proposed project is located in a highly developed residential-commercial area. The terrain surrounding the project is generally flat with no tall buildings or structures in the immediate vicinity which might hinder dispersion of pollutants. The populations of the cities of Westland and Garden City are 86,749 and 41,864, respectively, according to the 1970 census.

Meteorology

Meteorological conditions in Michigan are generally good for dispersion and dilution of air pollutants. According to air pollution publication AP 101, U. S. Environmental Protection Agency, 1972 (pg. 96) there are few days with a high meteorological potential for air pollution.

Daily weather data recorded every third hour at Detroit Metropolitan Airport were obtained from the National Climatic Center in Asheville, N. C. for the years 1967 through 1973. Figure 2 shows a 36-point bar graph of wind speed and direction occurrences. Figure 3 is a 12-point wind rose obtained by condensing the 36-point wind data.

Figure 4 shows the distribution of wind speeds observed. Wind speeds are greater than 5 mph more than 90 percent of the time. The most probable daytime wind speed was found to be 12 mph.

Existing Ambient Air Quality

Carbon monoxide levels measured in 1976 at Station 013 in the Wayne County Air Quality Monitoring Network are the closest available data to represent existing air quality in the project area. Station 013 is located approximately five miles north of the proposed project in the City of Livonia. This station monitors carbon monoxide continuously year around. Table 1 presents the monthly arithmetic averages, maximum values, and annual summary for 1976. To correct the data to represent conditions in 1982, the probable time of construction, the following estimates were used:

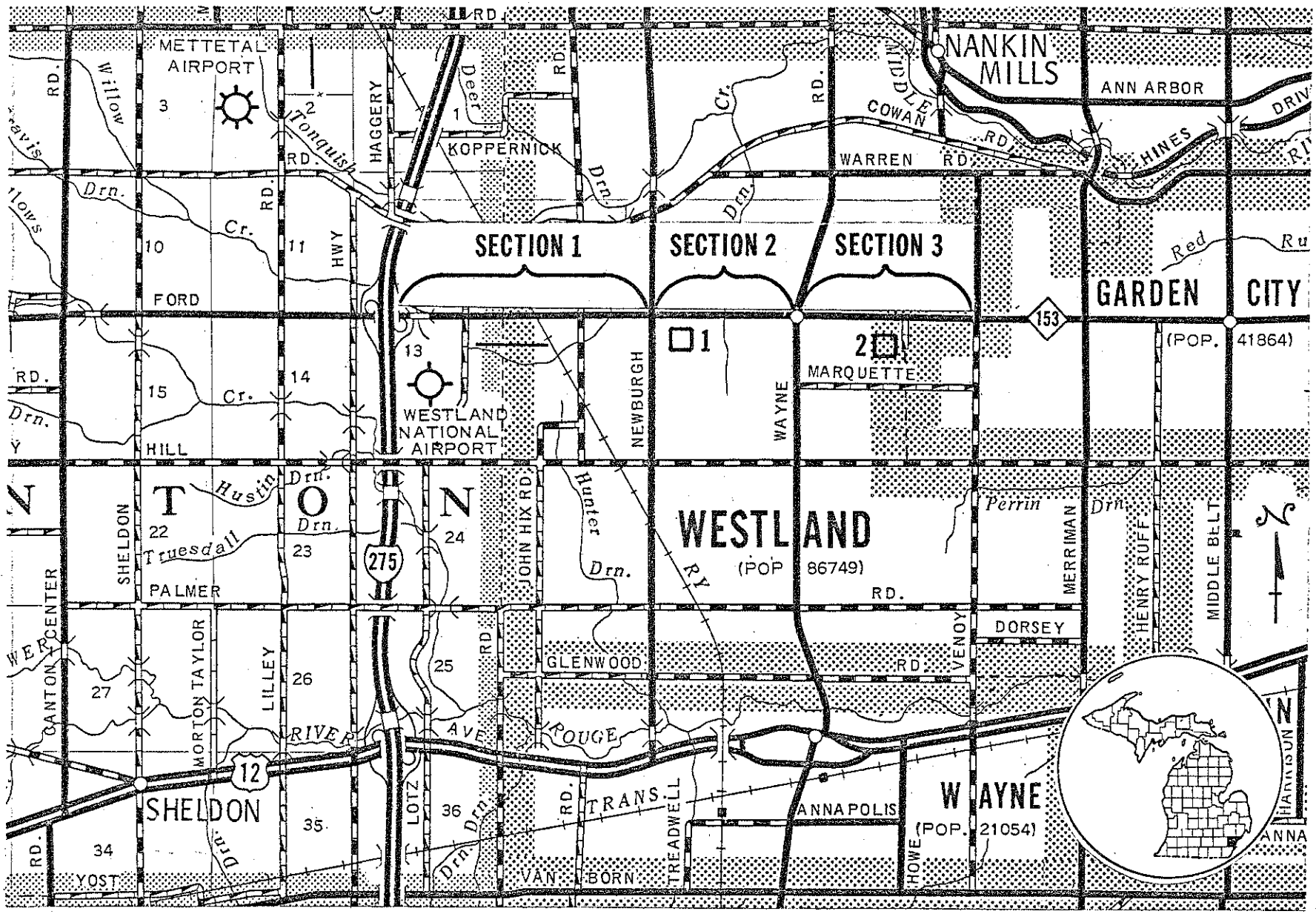

Figure 1. Proposed M 153 in the cities of Westland and Garden City.

1. Carbon monoxide in the project area is 80 percent transportation related. Non-transportation related carbon monoxide is not expected to increase significantly and may decrease.

2. Transportation-related emissions will decrease by 50 percent between 1976 and 1982, due to Federal controls on emissions of new vehicles. This was estimated by extending current 1977 emission standards through 1980, then using proposed 1978 standards for 1981 and 1982.

3. Traffic volumes in the project area will increase by 20 percent by 1982.

The highest one-hour (19.2 mg/cu m in October) and eight-hour (8.1 mg/cu m in December) values from 1976 were selected to represent the maximum background carbon monoxide and corrected to represent 1982 conditions as follows:

Let: V_N = non-transportation related carbon monoxide, which is 20 percent of the 1976 value (0.2 x 1976 value)

V_T = transportation related carbon monoxide, which is 80 percent of the 1976 value increased by 20 percent (multiplied by 1.2) due to the increase in traffic and reduced by 50 percent due to reduction in emissions because of emission controls thus V_T = 1976 value x 0.8 x 1.2 x 0.5

then: the 1982 value = $V_N + V_T$

and: 1982 maximum one-hour value = (0.2) (19.2) + 0.8 (19.2) (1.2) (0.5) = 13.1 mg/cu m

1982 maximum eight-hour value = (0.2) (8.1) + 0.8 (8.1) (1.2) (0.5) = 5.5 mg/cu m

Pollution Estimates

Estimates of carbon monoxide concentrations were made at a height of 1.5 meters (5 ft) above ground level. A mathematical model based on the Gaussian diffusion equation, modified for a line source, was used[1]. Inputs to the model include wind speed and direction, traffic volumes, vehicle emission factors and design of the highway.

[1] Beaton, J. L., Ranzieri, A. J., Shirley, E. C., and Skog, J. B., "Mathematical Approach to Estimating Highway Impact on Air Quality," Prepared by California Division of Highways, Report No. FHWA-RD-72-36. CALINE 2 modification, programmed March 1975, was used.

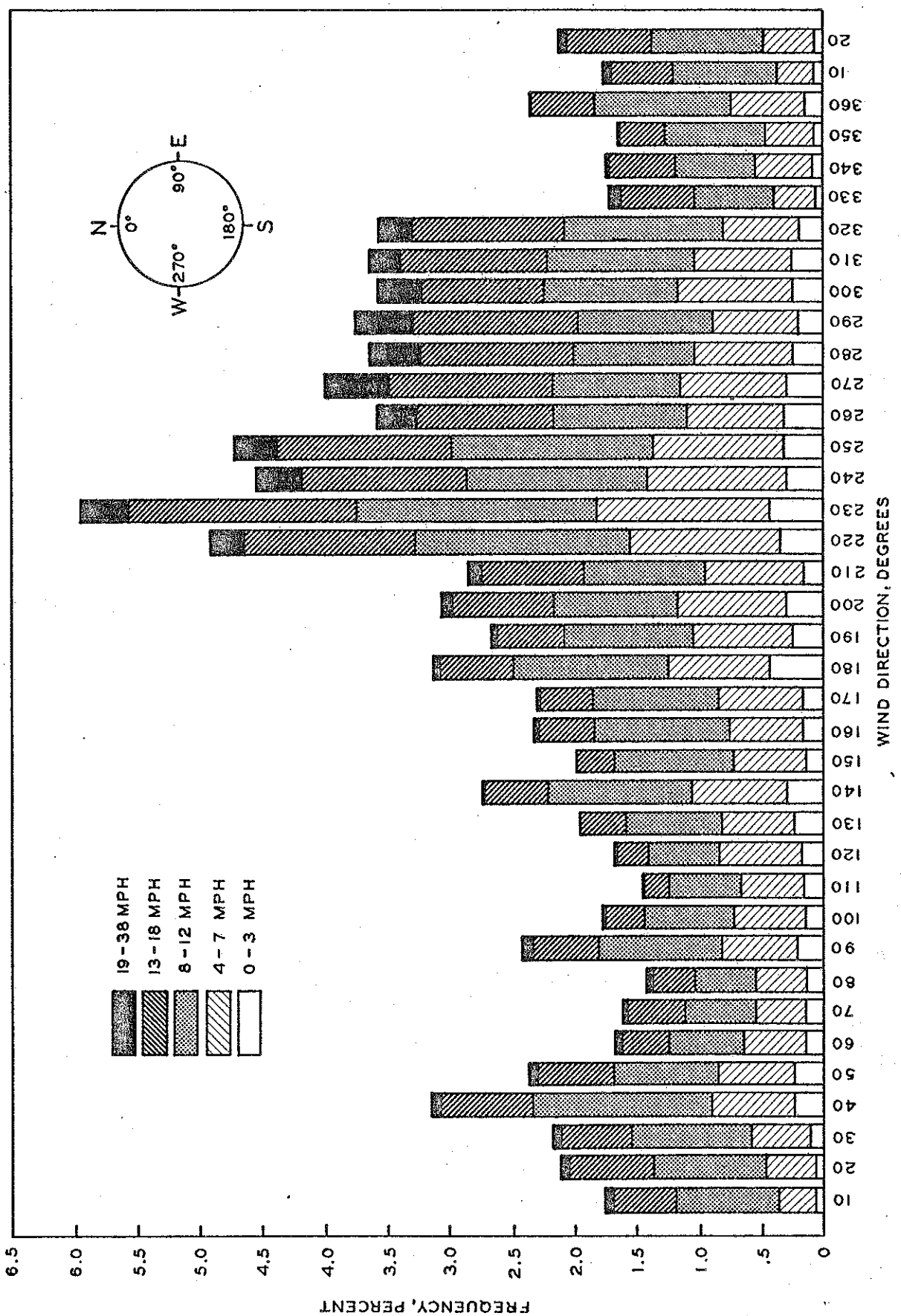

Figure 2. Wind speed and direction occurrences at Detroit Metropolitan Airport.

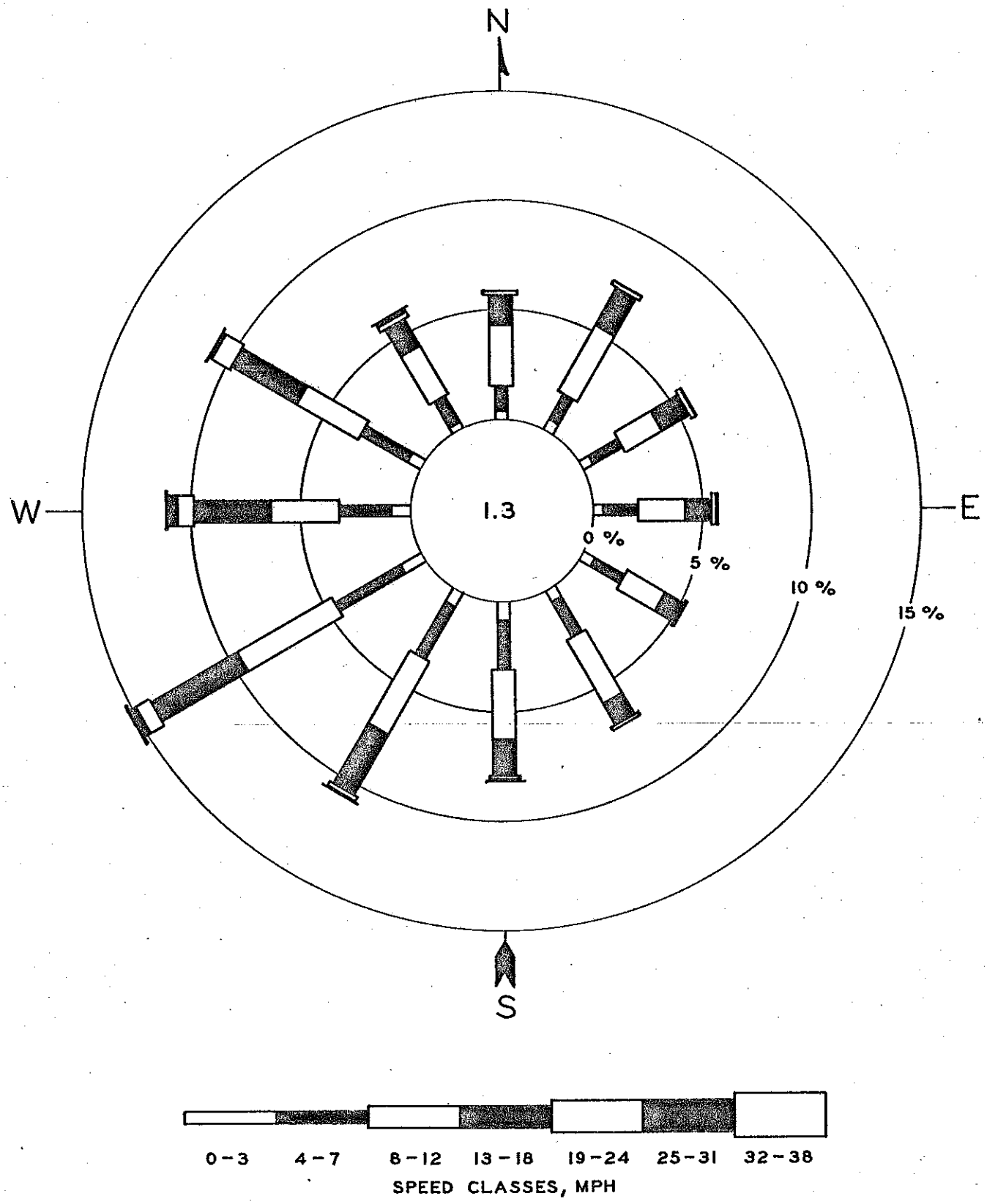

Figure 3. Frequency of wind direction and speed at Detroit Metropolitan Airport (calms, recorded 1.3 percent of the time, are distributed).

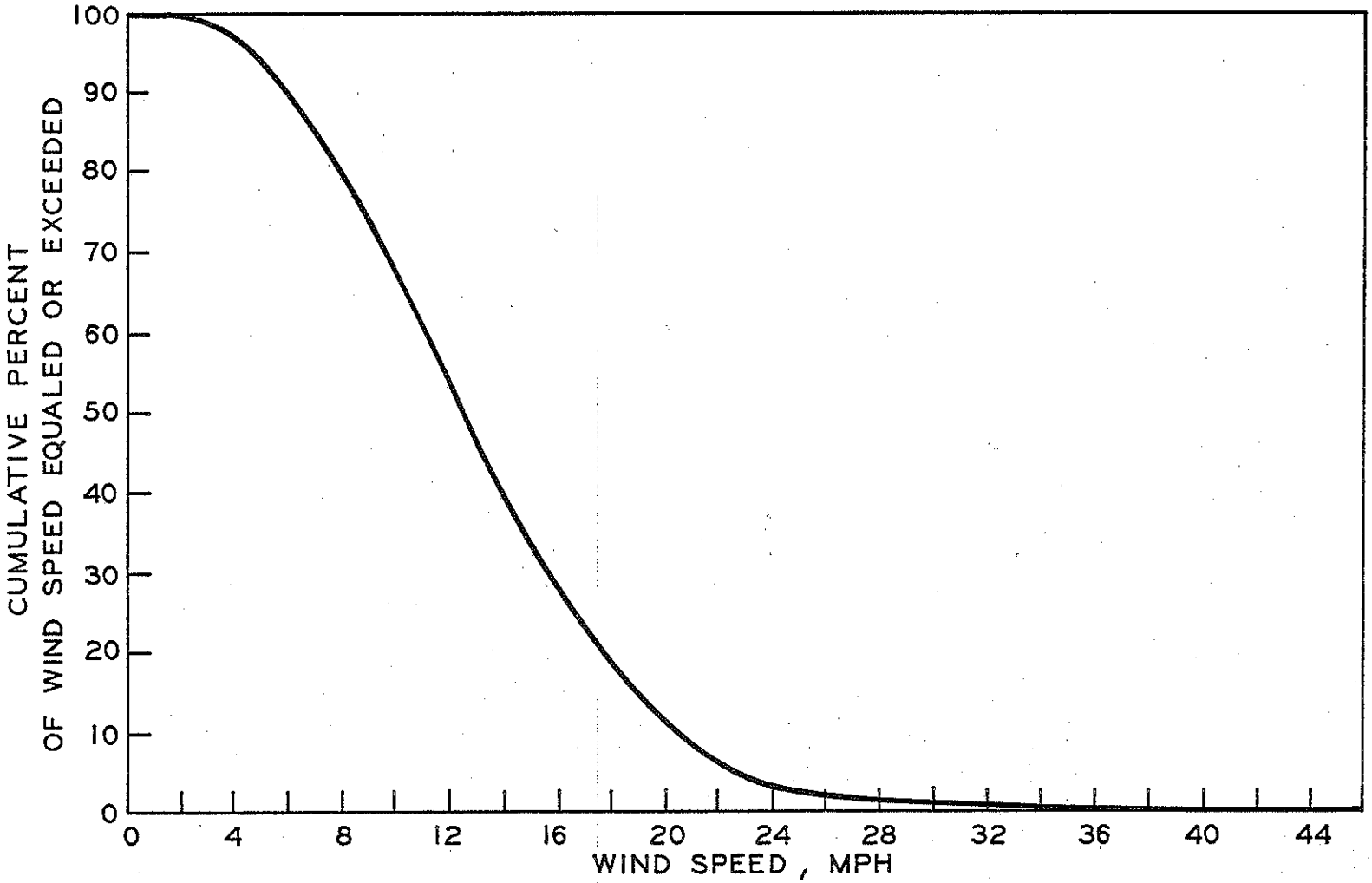

Figure 4. Wind speed distributions at Detroit Metropolitan Airport.

TABLE 1
CARBON MONOXIDE MEASURED AT WAYNE COUNTY
STATION 013 DURING 1976

Month	Arithmetic Average mg/cu m	Maximum One-Hour mg/cu m	Maximum Eight-Hour mg/cu m	Number of Times	
				One-Hour Average Over 40 mg/cu m	Eight-Hour Average Over 10 mg/cu m
Jan.	0.6	8.7	3.8	0	0
Feb.	0.6	7.7	3.4	0	0
Mar.	a	7.0	4.6	0	0
Apr.	0.6	4.3	2.6	0	0
May	0.6	4.3	2.5	0	0
June	0.7	3.1	1.9	0	0
July	0.6	4.7	1.8	0	0
Aug.	0.8	5.4	3.1	0	0
Sept.	0.8	7.2	2.4	0	0
Oct.	0.8	19.2	5.4	0	0
Nov.	0.7	4.9	2.4	0	0
Dec.	a	9.8	8.1	0	0
Annual Results	0.7	19.2	8.1	0	0

Number of one-hour samples for year - 7,202
Second highest one-hour value (mg/cu m) - 9.8
Second highest eight-hour value (mg/cu m) - 5.4

a - insufficient samples collected to calculate accurately.

TABLE 2

TRAFFIC ESTIMATES FOR PROPOSED M 153 AND MAJOR CROSSROADS IN THE CITIES OF WESTLAND AND GARDEN CITY

Year	Alternate	Section 1	Section 2	Section 3	I 275	Wayne Rd
1982	No-Build	32,900 ⟨2,500(25)⟩ [1,320(45)]	36,000 ⟨2,700(30)⟩ [1,440(35)]	50,350 ⟨3,770(20)⟩ [2,010(35)]	59,100 ⟨5,850(55)⟩ [2,950(55)]	35,250 ⟨2,820(38)⟩ [1,420(45)]
	Build (Five Lanes)	36,470 ⟨3,400(40)⟩ [1,640(45)]	38,600 ⟨3,470(40)⟩ [1,700(45)]	54,600 ⟨4,860(35)⟩ [2,160(40)]	58,465 ⟨5,790(55)⟩ [2,920(55)]	34,850 ⟨2,790(38)⟩ [1,400(45)]
	Build (Seven Lanes)	36,470 ⟨3,400(40)⟩ [1,640(45)]	38,600 ⟨3,470(40)⟩ [1,700(45)]	54,600 ⟨4,860(35)⟩ [2,160(40)]	58,465 ⟨5,790(55)⟩ [2,920(55)]	34,850 ⟨2,790(38)⟩ [1,400(45)]
1987	No-Build	34,500 ⟨2,500(25)⟩ [1,725(35)]	38,160 ⟨2,700(25)⟩ [1,700(30)]	51,860 ⟨3,770(20)⟩ [2,070(30)]	70,600 ⟨6,980(50)⟩ [3,530(55)]	39,200 ⟨3,136(38)⟩ [1,570(45)]
	Build (Five Lanes)	39,000 ⟨3,500(35)⟩ [1,760(45)]	46,900 ⟨4,000(35)⟩ [2,100(45)]	57,500 ⟨4,600(35)⟩ [2,400(40)]	69,440 ⟨6,870(50)⟩ [3,500(55)]	38,500 ⟨3,080(38)⟩ [1,540(45)]
	Build (Seven Lanes)	39,000 ⟨3,500(40)⟩ [1,760(45)]	46,900 ⟨4,200(40)⟩ [2,100(45)]	57,500 ⟨5,100(40)⟩ [2,400(40)]	69,440 ⟨6,870(50)⟩ [3,500(55)]	38,500 ⟨3,080(38)⟩ [1,540(45)]
1997	No-Build	36,500 ⟨2,500(20)⟩ [1,800(30)]	39,200 ⟨2,710(20)⟩ [1,820(30)]	52,660 ⟨3,780(20)⟩ [2,370(30)]	93,600 ⟨9,270(50)⟩ [4,660(55)]	47,200 ⟨3,780(35)⟩ [1,890(45)]
	Build (Five Lanes)	52,700 ⟨4,110(35)⟩ [2,000(45)]	63,400 ⟨4,850(35)⟩ [2,400(45)]	66,900 ⟨5,220(35)⟩ [2,540(40)]	90,300 ⟨8,940(50)⟩ [4,500(55)]	42,300 ⟨3,380(38)⟩ [1,690(45)]
	Build (Seven Lanes)	52,700 ⟨4,700(35)⟩ [2,100(45)]	63,400 ⟨5,700(35)⟩ [2,650(45)]	66,900 ⟨6,000(35)⟩ [2,810(40)]	90,300 ⟨8,940(50)⟩ [4,500(55)]	42,300 ⟨3,380(38)⟩ [1,690(45)]

Commercial vehicles - M 153 all sections, 5 percent of peak, 7 percent of off-peak; I 275, 6 percent of peak, 14 percent of off-peak; Wayne Rd, 4 percent of peak, 7 percent of off-peak.

000 = average daily traffic, vehicles in 24 hr
⟨000⟩ = p.m. peak traffic, vehicles per hr
[000] = off-peak traffic, vehicles per hr
(00) = average traffic speeds, mph

Carbon monoxide concentrations were estimated for:

1) Three representative sections which covered the length of the project. See Figure 1 for the location of the sections which are identified as follows:

Section	Location
1	I 275 to Newburg Rd
2	Newburg Rd to Wayne Rd
3	Wayne Rd to Venoy Rd

2) Two major crossroads - I 275 and Wayne Rd.

3) The no-build and build alternates for the years 1982, 1987, and 1997.

4) Two alternative cross-sections.

5) At a 4 m distance from the edge of the proposed roadway (estimated distance to the nearest receptor) and two sensitive receptors.

Information used as input to the model consisted of:

1) Vehicle emission factors, shown in the following table, were calculated using procedures from "Compilation of Air Pollution Emission Factors," AP 42, Supplement No. 5, December 1975 edition, U. S. Environmental Protection Agency. Emission factors were calculated at temperatures of 30 F and 60 F with 20 percent of vehicles in a cold start condition, 27 percent of vehicles in a hot start condition, and the remainder of vehicles in a hot operation mode. Vehicle age mix data used were for Michigan registrations obtained from the Secretary of State. National estimates from AP 42 for average annual miles driven for various age vehicles were used.

Emission Factors for Carbon Monoxide, g/mi

Temperature	Year	Average Vehicle Speed, mph													
		20 (5)	25 (5)	30 (5)	30 (7)	35 (4)	35 (5)	35 (7)	38 (4)	40 (5)	40 (7)	45 (7)	50 (6)	55 (6)	55 (14)
30 F	1982	37.7	29.8	24.3	--	--	20.5	21.3	18.0	17.8	18.5	16.6	--	16.2	18.9
	1987	23.2	18.4	--	16.0	--	12.7	13.6	11.0	11.1	11.8	10.6	10.2	--	13.0
	1997	19.9	--	--	13.8	10.5	10.9	--	9.4	--	10.2	9.2	8.8	--	11.4
60 F	1982	24.0	19.1	15.6	--	--	13.2	14.1	11.4	11.5	12.4	11.1	--	10.7	13.8
	1987	14.2	11.3	--	10.4	--	7.9	8.8	6.7	6.9	7.8	7.0	6.6	--	9.6
	1997	12.5	--	--	9.2	6.5	6.9	--	5.9	--	6.9	6.2	5.8	--	8.6

(00) Percent heavy duty vehicles.

2) Estimated peak p.m. (4:00 to 5:00) and off-peak traffic volumes. Traffic estimates are shown in Table 2. Off-peak traffic was taken as the median hour volume.

3) Meteorological Conditions

a) Worst meteorological conditions were taken as a 2.2 mph (1 m/sec) wind parallel to the roadway, under atmospheric stability class D.

b) Most probable meteorological conditions, a 12 mph wind at 230 degrees under atmospheric stability class D. Table 3 shows the frequency distribution of atmospheric stability classes for the meteorological data used.

4) Road Profile. All sections are at grade.

5) Roadway Width. Alternate 1, all sections, five 12-ft lanes with curb and gutter. Alternate 2, all sections, seven 12-ft lanes with curb and gutter.

TABLE 3
STABILITY CLASS FREQUENCY DISTRIBUTION BY HOUR
(Percent)

Hour	Stability Class					
	A	B	C	D	E	F
1	0.0	0.0	0.0	49.7	22.0	28.3
4	0.0	0.0	0.0	49.8	21.1	29.1
7	8.8	16.4	10.1	47.4	9.9	7.3
10	3.7	13.9	22.2	60.2	0.0	0.0
13	2.3	9.8	21.6	66.4	0.0	0.0
16	1.3	9.1	22.4	64.7	2.1	0.4
19	0.0	0.0	0.0	62.7	26.4	10.9
22	0.0	0.0	0.0	50.7	24.8	24.4
Overall percent	2.0	6.1	9.5	56.5	13.3	12.6

All estimates of carbon monoxide levels represent maximum one hour concentrations and are in addition to existing background levels. Table 4 presents estimates of carbon monoxide, excluding background, 4 m from the edge of the pavement. Table 5 presents estimated carbon monoxide levels excluding background, 4 m from the edge of each roadway near the intersections of the proposed roadway and the major crossroads.

Comparison of Estimates with Air Quality Standards

a) Eight-hour carbon monoxide air quality standard - 10 mg/cu m (9 ppm)

The Federal Highway Administration's report "Project Level Considerations to Assure Adequate Air Quality Analyses" suggests a technique for determining the eight-hour carbon monoxide concentration from the one-hour concentrations.

$$\frac{V_8}{V_1} \times (\text{1-hr CO concentration}) \times P = \text{8-hr CO concentration}$$

where V_8 = average hourly traffic volume in both directions during the eight-hour period of interest

V_1 = peak hour traffic volume in both directions

P = one to eight-hour meteorological persistence factor for the eight-hour period

A value of $P = 0.6$ is suggested unless data are available to calculate a persistence factor for the proposed highway project.

If this technique is used to calculate the eight-hour carbon monoxide level in 1982 for Section 3 (the highest traffic volume section), and also adjacent to the Wayne Rd intersection (the I 275 intersection is the highest traffic volume intersection, but traffic speeds are much lower at the Wayne Rd intersection so carbon monoxide levels are higher) the highest eight-hour concentration from the roadway for the no-build and build alternates are:

$$\text{No-Build} = \frac{2,010 \text{ vehicles per hour}}{3,770 \text{ vehicles per hour}} \times 14.9 \text{ mg/cu m} \times 0.6$$

$$= 4.8 \text{ mg/cu m}$$

TABLE 4
ESTIMATES OF CARBON MONOXIDE CONCENTRATIONS (mg/cu m)
FOUR METERS FROM ROADWAY
(Not Including Background)

Location	Traffic Projection Year	Worst Condition, Parallel Wind, 1 m/sec, Stability Class D						Most Probable Condition[1], Stability Class D					
		Peak Traffic			Off-Peak Traffic			Peak Traffic			Off-Peak Traffic		
		No-Build	Build 5 Lanes	Build 7 Lanes	No-Build	Build 5 Lanes	Build 7 Lanes	No-Build	Build 5 Lanes	Build 7 Lanes	No-Build	Build 5 Lanes	Build 7 Lanes
Section 1	1982	7.8	6.3	6.2	2.3	2.8	2.8	0.7	0.6	0.6	0.2	0.3	0.3
	1987	4.8	4.7	4.0	2.5	2.0	1.9	0.4	0.4	0.4	0.2	0.2	0.2
	1997	5.2	4.7	5.3	2.6	1.9	2.0	0.5	0.4	0.5	0.3	0.2	0.2
Section 2	1982	6.9	6.4	6.3	3.2	2.9	2.9	0.6	0.6	0.6	0.3	0.3	0.3
	1987	5.2	5.3	4.8	2.9	2.3	2.3	0.5	0.5	0.4	0.3	0.2	0.2
	1997	5.7	5.5	6.4	2.6	2.3	2.5	0.5	0.5	0.6	0.3	0.2	0.2
Section 3	1982	14.9	10.4	10.2	4.5	4.2	4.1	1.4	1.0	0.9	0.4	0.4	0.4
	1987	9.3	6.1	5.8	3.5	3.0	2.9	0.8	0.5	0.5	0.3	0.3	0.3
	1997	7.9	5.9	6.7	3.4	2.7	2.9	0.7	0.5	0.6	0.3	0.3	0.3

[1] Most probable wind: 12 mph peak and off-peak; angle between wind direction and roadway direction, 40°.

TABLE 5
ESTIMATES OF CARBON MONOXIDE CONCENTRATIONS (mg/cu m)[1] ADJACENT TO MAJOR INTERSECTIONS
(Not Including Background)

Location	Traffic Projection Year	Worst Condition, Stability D, 1 m/sec Wind, Peak Traffic[2]		
		No-Build	Build 5 Lanes	Build 7 Lanes
I 275	1982	9.3	8.7	8.7
	1987	6.7	6.5	6.3
	1997	7.5	7.1	7.4
Wayne Rd	1982	16.7	12.1	11.9
	1987	10.3	7.3	7.0
	1997	9.3	7.0	7.8

[1] Tabular values are the sum of carbon monoxide from the highway and the crossroad.

[2] Worst case condition for the I 275 intersection was found to be the wind parallel to I 275 and 90° to the proposed roadway. Worst case condition for the Wayne Rd intersection was found to be the wind parallel to the proposed roadway and 90° to Wayne Rd.

$$\text{Build (Five Lanes)} = \frac{2,160 \text{ vehicles per hour}}{4,860 \text{ vehicles per hour}} \times 10.4 \text{ mg/cu m} \times 0.6$$

$$= 2.8 \text{ mg/cu m}$$

$$\text{Build (Seven Lanes)} = \frac{2,160 \text{ vehicles per hour}}{4,860 \text{ vehicles per hour}} \times 10.2 \text{ mg/cu m} \times 0.6$$

$$= 2.7 \text{ mg/cu m}$$

The highest eight-hour concentration adjacent to the Wayne Rd intersection for the no-build and build alternates are:

$$\text{No-Build} = \frac{2,010 + 1,420 \text{ vehicles per hour}}{3,770 + 2,820 \text{ vehicles per hour}} \times 16.7 \text{ mg/cu m} \times 0.6$$

$$= 5.2 \text{ mg/cu m}$$

TABLE 6
TRAFFIC ESTIMATES FOR TOTAL BURDEN (MESOSCALE) ANALYSIS

Roadway	1982						1992					
	No-Build			Build			No-Build			Build		
	Vehicle Miles Traveled Per Day	Avg. Speed, mph	Percent Commercial	Vehicle Miles Traveled Per Day	Avg. Speed, mph	Percent Commercial	Vehicle Miles Traveled Per Day	Avg. Speed, mph	Percent Commercial	Vehicle Miles Traveled Per Day	Avg. Speed, mph	Percent Commercial
M 153 (Ford Rd)												
W of Wayne	108,000	35	7	115,800	40	7	116,100	25	7	153,450	35	7
E of Wayne	151,050	30	7	163,800	35	7	156,900	25	7	189,450	35	7
Cherry Hill Rd												
W of Wayne	63,420	35	3	60,420	35	3	84,120	35	3	72,120	40	3
E of Wayne	80,160	35	3	74,160	40	3	94,440	35	3	85,440	40	3
Palmer Rd	7,680	35	0	7,680	35	0	15,000	35	0	9,360	35	0
US 12 (Michigan)	224,400	40	7	224,400	40	7	331,800	40	7	331,800	40	7
Warren Rd												
W of Wayne	15,900	38	3	12,900	38	3	36,900	35	3	24,900	38	3
E of Wayne	50,400	38	3	44,520	38	3	73,800	35	3	61,500	35	3
Joy Rd												
W of Wayne	50,850	38	3	50,850	38	3	73,500	38	3	61,500	38	3
E of Wayne	63,300	38	3	63,300	38	3	81,000	38	3	72,000	38	3
Plymouth Rd												
W of Wayne	74,400	38	8	74,400	38	8	106,500	32	8	100,500	38	8
E of Wayne	93,300	38	8	93,300	38	8	131,700	30	8	125,700	35	8
Haggerty Rd												
S of M 153	4,680	40	1	4,680	40	1	9,000	40	1	5,700	40	1
N of M 153	9,480	40	1	9,480	40	1	12,600	40	1	11,550	40	1
Hix Rd	8,400	30	0	8,400	30	0	16,380	30	0	10,380	30	0
I 275	354,600	55	14	351,000	55	14	487,800	53	14	479,400	55	14
Newburg Rd												
S of M 153	66,600	33	3	66,600	33	3	81,300	30	3	75,300	32	3
N of M 153	58,500	33	3	58,500	33	3	77,400	33	3	71,400	33	3
Wayne Rd												
S of M 153	110,700	40	6	104,400	40	6	133,200	38	6	124,200	40	6
N of M 153	92,700	40	6	86,400	40	6	121,500	40	6	109,500	40	6
Venoy Rd												
S of M 153	45,300	35	1	44,700	35	1	63,300	35	1	57,300	35	1
N of M 153	98,100	33	1	95,100	33	1	117,000	33	1	110,000	33	1
Merriman Rd												
S of M 153	63,000	33	4	61,500	33	4	79,500	33	4	77,100	33	4
N of M 153	63,600	33	4	61,800	33	4	80,100	33	4	77,700	33	4

$$\text{Build (Five Lanes)} = \frac{2,160 + 1,400 \text{ vehicles per hour}}{4,860 + 2,790 \text{ vehicles per hour}} \times 12.1 \text{ mg/cu m} \times 0.6$$
$$= 3.4 \text{ mg/cu m}$$

$$\text{Build (Seven Lanes)} = \frac{2,160 + 1,400 \text{ vehicles per hour}}{4,860 + 2,790 \text{ vehicles per hour}} \times 11.9 \text{ mg/cu m} \times 0.6$$
$$= 3.3 \text{ mg/cu m}$$

Adding these concentrations to the 5.5 mg/cu m estimated maximum eight-hour background results in total carbon monoxide concentrations of 10.3, 8.3, and 8.2 mg/cu m for the no-build and build alternates respectively, for the Section 3 roadway and 10.7, 8.9, and 8.8 mg/cu m for the Wayne Rd intersection. The eight-hour carbon monoxide standard may be exceeded by 1982 with the no-build alternate. Carbon monoxide for both build alternates is below the air quality standard. For 1987 and 1997 the carbon monoxide concentrations are estimated to be much lower than 1982 concentrations due to a larger percentage of exhaust controlled vehicles required by Federal law.

b) One-hour carbon monoxide standard - 40 mg/cu m (36 ppm)

The maximum estimated one-hour concentrations of carbon monoxide from the roadway in 1982 are 14.9, 18.4, and 10.2 mg/cu m for the no-build and build alternates, respectively, and 16.7, 12.1, and 11.9 mg/cu m for the Wayne Rd intersection. Adding these concentrations to the 13.1 mg/cu m estimated background results in total one-hour concentrations of 28.0, 23.4, and 23.3 mg/cu m from the roadway and 29.8, 25.2, and 25.0 mg/cu m for the Wayne Rd intersection. All are below the 40 mg/cu m standard.

The estimated concentrations of carbon monoxide, including existing background, near each of the build alternate routes of the proposed roadway are within national air quality standards. No significant difference in carbon monoxide concentrations between the two build alternates was found and no adverse environmental effects are expected. The project is consistent with the State implementation plan for meeting national air quality standards for carbon monoxide.

Additional Information for Receptor Sites

Concentrations of carbon monoxide were estimated at a school, and a park near the proposed route (Fig. 1). The locations are as follows:

1. The park located on Carlson St approximately 500 ft south of the proposed route.

2. The school located on Radcliff Rd approximately 500 ft south of the proposed route.

Estimated worst case levels of carbon monoxide from the roadway under peak traffic conditions, with a 1 m/sec wind blowing from the roadway toward the receptor under stability D, were less than 1 mg/cu m.

Total Pollutant Burden Analysis

A total pollutant burden analysis for carbon monoxide, hydrocarbons, and oxides of nitrogen is included for both the no-build and build alternates for the years 1982 and 1997. Information used included:

1) Vehicle emission factors calculated as described previously in item (1), p. 9, information used as input to the model.

2) Estimates of daily vehicle miles traveled, average vehicle speeds, and percent heavy duty vehicles for the proposed roadway and for other roadways that are significantly affected by the proposed roadway (Table 6). The total pollutant burden data presented in Table 7 show a slight reduction in all pollutants if the proposed project is built.

TABLE 7
ESTIMATES OF TOTAL POLLUTANT BURDEN

Year	Alternate	Hydrocarbons tons/day		Oxides of Nitrogen tons/day		Carbon Monoxide tons/day	
		30 F	60 F	30 F	60 F	30 F	60 F
1982	No-Build	7.3	6.1	7.6	7.0	42.7	28.1
	Build	7.2	6.0	7.5	6.9	41.1	27.1
1992	No-Build	4.6	3.8	6.7	6.3	32.6	21.5
	Build	4.3	3.6	6.6	6.2	29.2	19.4