STATE ROAD 45 (U.S. 41) / STATE ROAD 700 (U.S. 98)

PROJECT DEVELOPMENT

AND

ENVIRONMENTAL STUDIES

PASCO AND HERNANDO COUNTIES, FLORIDA

State Project Nos. 14010-1514, 08010-1519
& 08010-1509

W.P. Nos. 7115924, 7112085 & 7112086

Federal Aid No. F-8888(27)

AIR QUALITY REPORT

S.R. 52 in Pasco County

to C.R. 485B in Hernando County

Submitted To:

THE FLORIDA DEPARTMENT OF TRANSPORTATION

Submitted By:

GREINER, INC.

Tampa, Florida

JUNE 1989

EXECUTIVE SUMMARY

An air quality impact assessment was conducted following Florida Department of Transportation (FDOT) guidelines in order to determine the effect on air quality of the proposed improvements to S.R. 45 (U.S. 41) and S.R. 700 (U.S. 98). Essentially, the assessment consisted of a microscale dispersion analysis of carbon monoxide (CO) emissions from motor vehicles using the roadway. For comparative purposes, the analysis was conducted with and without the proposed roadway improvements.

The results of the analysis indicate that the planned improvements to S.R. 45 and S.R. 700 will not cause or contribute to CO concentrations above the one- and eight-hour Ambient Air Quality Standards--levels considered by the EPA to pose no significant health risk. Overall, CO concentrations are expected to be lower with the roadway improvements as a result of increased motor vehicle mobility, faster operating speeds, and less stop-and-go driving.

The project corridor is located within areas where the State Implementation Plan does not contain any transportation control measures. Therefore, the conformity procedures of the Code of Federal Regulations, Title 23, Part 770 do not apply to this project.

Construction activities can cause short-term air quality impacts in the form of dust. This can be minimized by adherence to FDOT standard roadway construction procedures.

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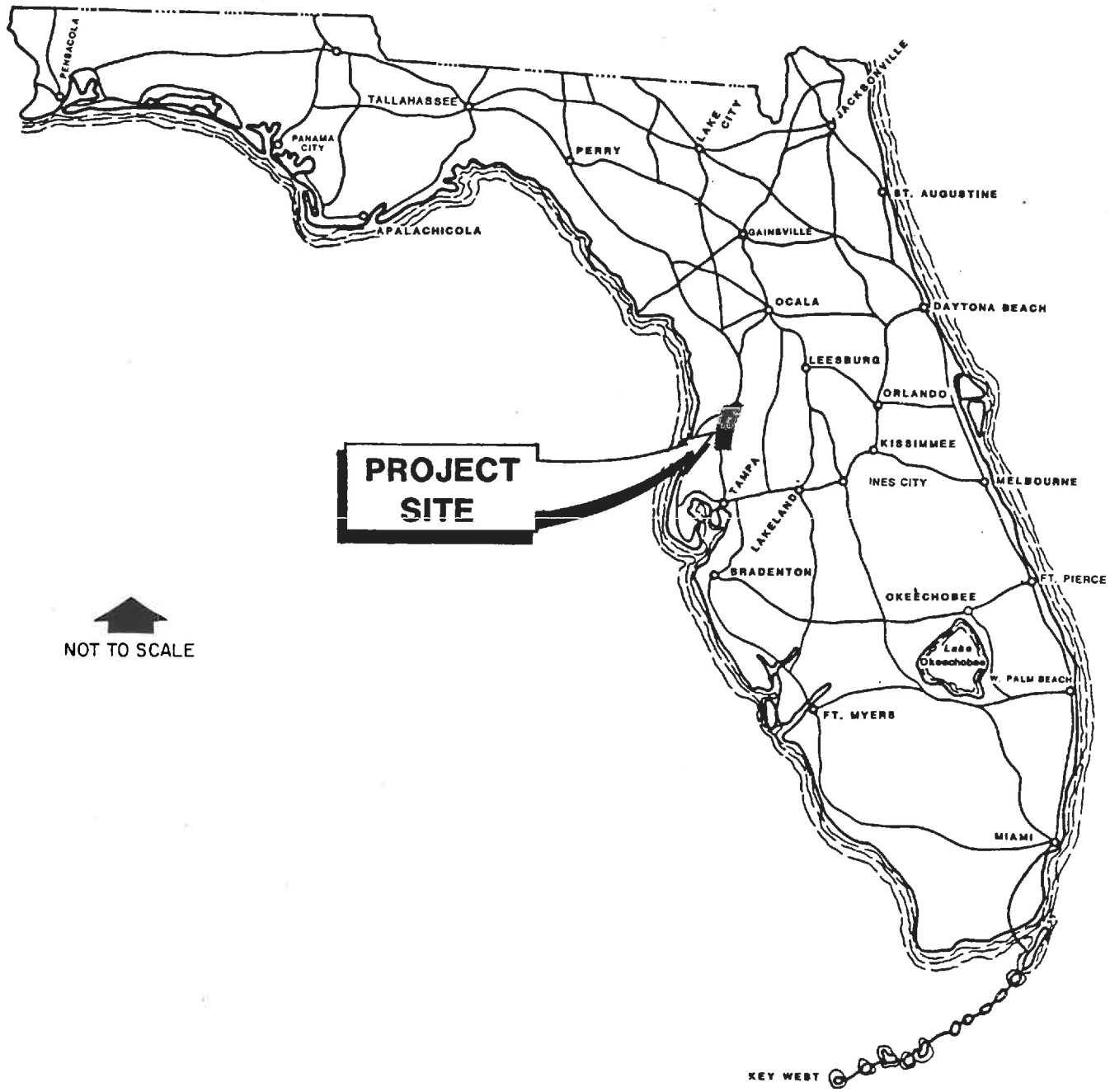
INTRODUCTION

The Florida Department of Transportation (FDOT) is investigating the feasibility of improving S.R. 45 (U.S. 41) from S.R. 52 in Pasco County to S.R. 700 (U.S. 98) in Hernando County and S.R. 700 from S.R. 45 to C.R. 485B in Hernando County. The total project length is 19.3 miles (17.4 miles on S.R. 45 and 1.9 miles on S.R. 700). Location and vicinity maps of the project corridor are presented on Exhibits 1 and 2, respectively.

The objective of this report is to document existing air quality conditions in the vicinity of the project, describe the methodology used to predict future air quality conditions in the project area, discuss the results of the analysis, and provide materials in support of the analysis. This report is prepared using methodology established in Title 23 of the Code of Federal Regulations, Part 770 (23 CFR 770), U.S. Department of Transportation, Federal Highway Administration (FHWA), Air Quality Guidelines.

Existing Facility

In their present configurations, S.R. 45 and S.R. 700 are two-lane roadways. S.R. 45 has 28 feet of pavement with 6-foot grassed shoulders. The rural right-of-way varies in width on S.R. 45 from 100 to 250 feet while urban right-of-way is approximately 128 feet wide. S.R. 700 has 24 feet of pavement with 8-foot grassed shoulders and right-of-way widths of 50 to 190 feet. Within the project corridor, S.R. 45 crosses Scotts Big 'D' Creek and Canal C-534 with bridge structures.



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FLORIDA DEPARTMENT OF TRANSPORTATION

AIR QUALITY REPORT

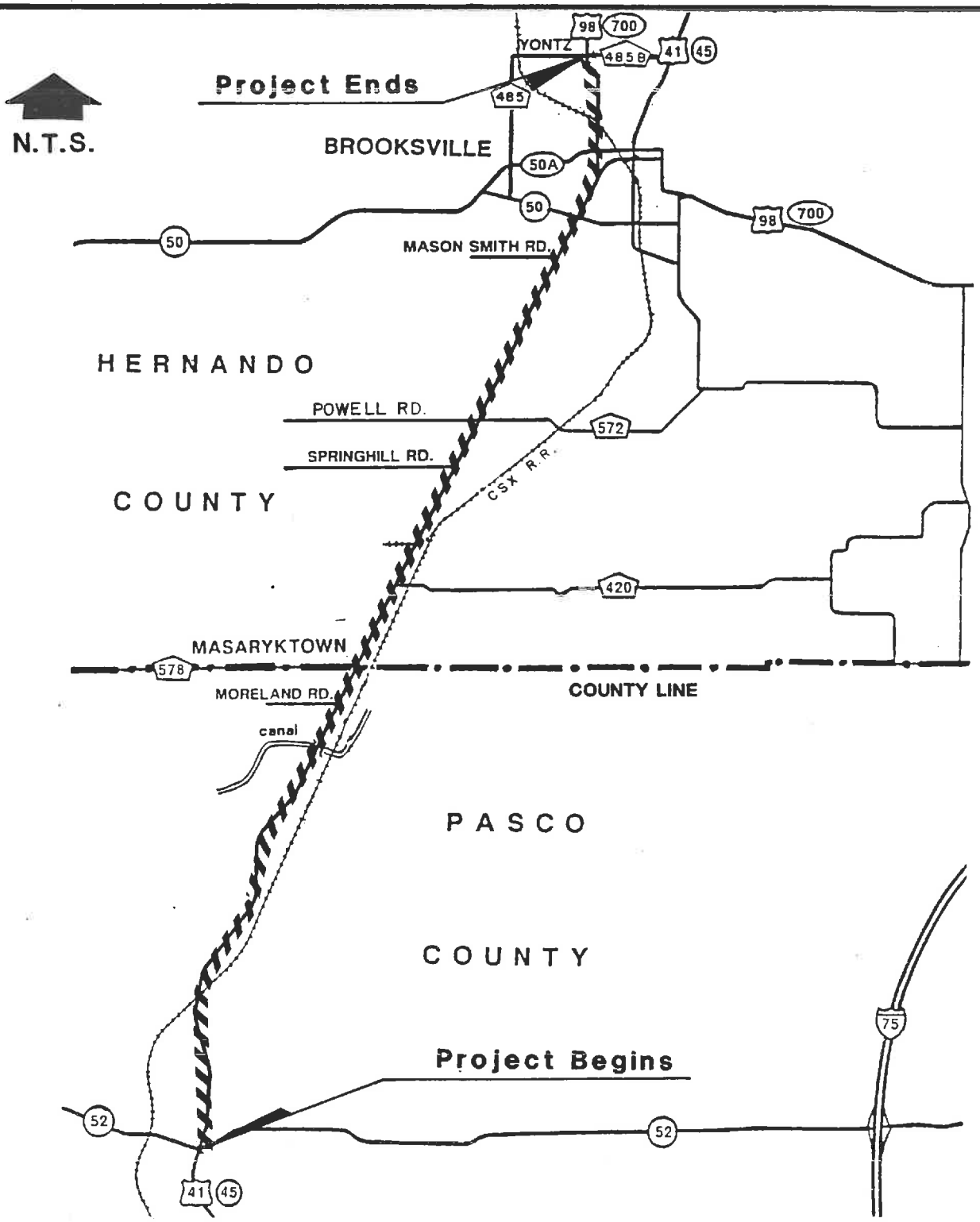
S.R. 45 (U.S. 41) / S.R. 700 (U.S. 98)

From S.R. 52 to C.R. 485B

Pasco and Hernando Counties, Florida

LOCATION MAP

EXHIBIT 1



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LEGEND

/// Project Area

FLORIDA DEPARTMENT OF TRANSPORTATION

AIR QUALITY REPORT

S.R. 45 (U.S. 41) / S.R. 700 (U.S. 98)

From S.R. 52 to C.R. 485B

Pasco and Hernando Counties, Florida

VICINITY MAP

EXHIBIT 2

Proposed Improvements

This project involves upgrading the existing S.R. 45 and S.R. 700 two-lane facilities to multi-lane divided facilities. The improvements on S.R. 45 from S.R. 52 to Moreland Road would include a rural four-lane divided section with provisions for future expansion to an ultimate six-lane divided section. From Moreland Road to 1400 feet north of Springhill Road, the facility is to be improved to an urban six-lane divided section. A rural six-lane divided section is proposed from 1400 feet north of Springhill Road to 1400 feet south of Mason Smith Road. From 1400 feet south of Mason Smith Road to S.R. 700, the facility is to be improved to a urban six-lane divided section. The improvement on S.R. 700 from S.R. 45 to C.R. 485B would be a urban four-lane divided section. The bridge structure located at Scotts Big 'D' Creek is recommended for replacement. The bridge at Canal C-534 is recommended for improvement without replacement. Further details regarding the proposed improvements are provided in the Preliminary Engineering Report for this project.[2]

AIR QUALITY IMPACT ANALYSIS

Existing Conditions

Air Quality

Although monitoring is the most reliable means of determining existing ambient air quality conditions, there are no historical or existing air monitoring stations in either Pasco or Hernando counties. However, the EPA has designated Pasco and Hernando

counties as attainment areas for all of the criteria air pollutants. As a result of this designation, neither county is currently subject to the guidelines of a State Implementation Plan (SIP).

Land Use

The existing land use adjacent to S.R. 45 and S.R. 700 is primarily commercial and residential with scattered open space.

Microscale Analysis

The purpose of the microscale analysis is to predict the impact of the proposed S.R. 45 and S.R. 700 improvements on future air quality conditions in the immediate project vicinity. Specifically, the microscale analysis examines the generation and transport of carbon monoxide (CO), the most prevalent air emission from motor vehicles. The results of the microscale analysis are used to compare the improved S.R 45 and S.R. 700 facilities to the unimproved facilities and indicate whether or not CO emissions in the vicinity of the project would contribute to CO concentrations above the AAQS.

The microscale analysis for the S.R. 45 and S.R. 700 project corridor was conducted for select areas having a combination of the heaviest traffic volumes, lowest vehicular speed and closest sensitive receptors. The premise of this approach is that CO concentrations elsewhere along the project corridor will be lower when compared to these worst-case locations. Based on these criteria, the intersections of S.R. 45/S.R. 50 and S.R. 45/Summit Road were selected for the microscale analysis. CO

concentrations were predicted at these worst-case locations for the years 2000 and 2010 to coincide with the expected opening year and the design year of the facility.

The dispersion model used in the microscale analysis was the TEXIN2 intersection model. Using this model, the generation and dispersion of emissions from both free flow and queuing motor vehicles were analyzed. Free flow emissions are those attributable to moving motor vehicles and queued emissions are those associated with stopped, or idling, motor vehicles.

Peak-hour traffic volumes and corresponding operating conditions modeled for the selected intersections were obtained from data derived from the S.R. 45 and S.R. 700 traffic analysis. Input data concerning vehicle mix, operating mode, air temperature and other important modeling parameters for the microscale analysis are provided in the Appendix.

The microscale analysis was designed to model worst-case meteorological conditions. A series of 36 wind directions (0°-350° at 10° intervals) was simulated over the modeling grid in order to determine the most critical wind angles. Other simulated worst-case meteorological factors include an average wind speed of one meter per second, an atmospheric mixing height of 1,000 meters, and a stable atmosphere.

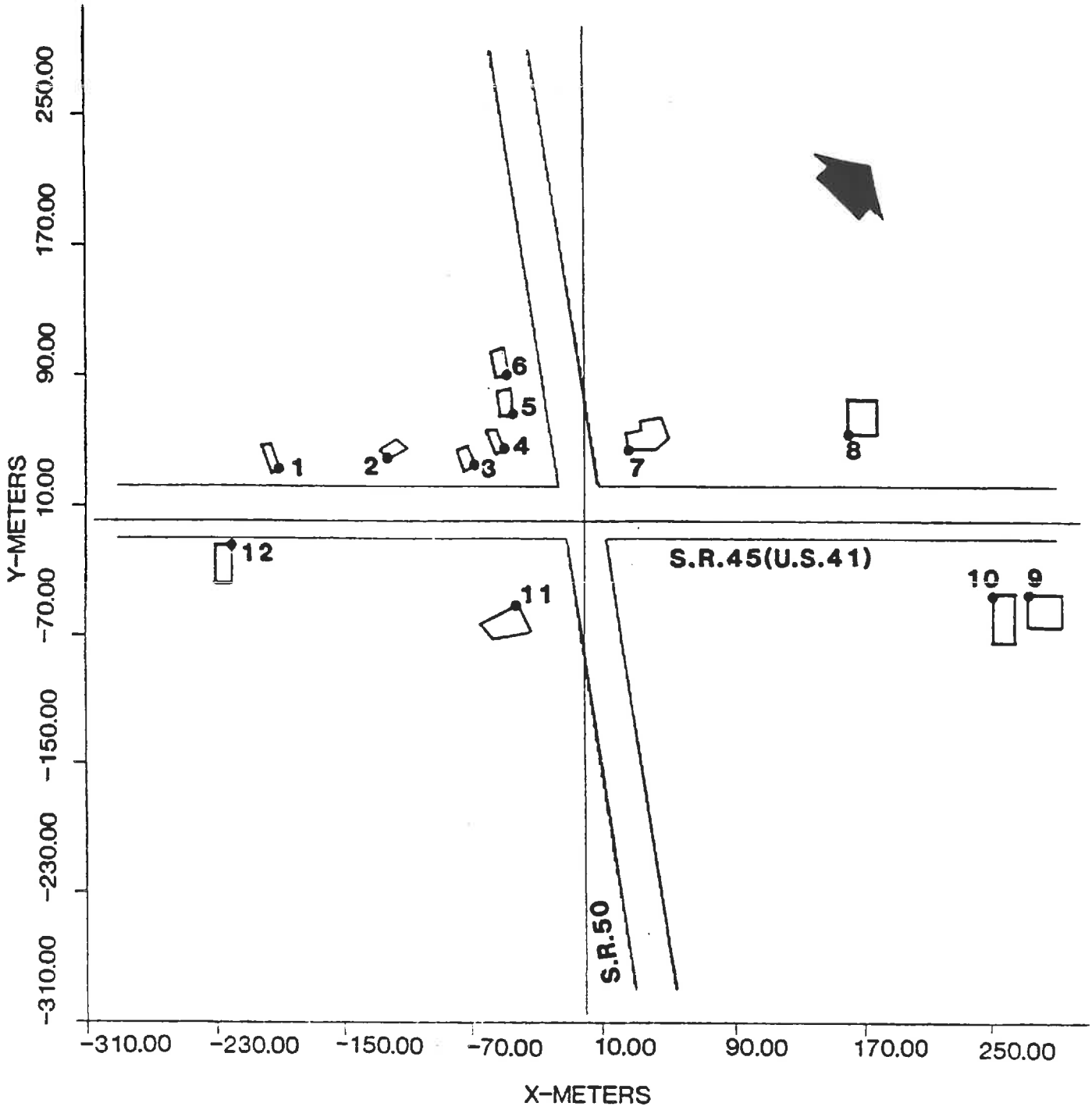
The computer modeling of worst-case traffic and meteorological data was conducted for the peak one-hour period. To account for the long-term variation in traffic and meteorological data over time, persistence factors were used to convert the one-hour modeled conditions to comparable worst-case eight-hour conditions. In this way, the

results can be compared to the AAQS which are also based on one-hour and eight-hour time periods. For this analysis, traffic and meteorological one-hour to eight-hour persistence factors of 0.75 and 0.60, respectively, were used for this purpose.

In the absence of site-specific background CO monitoring data, a default background CO value of 1.5 ppm was added to the modeled one-hour and the computed eight-hour results to account for CO sources beyond the microscale analysis study area.

Receptors were located representing sites of closest routine public access in the area of each intersection modeled. As such, twelve receptors were placed in the vicinity of the S.R. 45/S.R. 50 intersection and eight receptors were placed in the vicinity of the S.R. 45/Summit Road intersection. To restate, CO concentrations at receptors located elsewhere along the S.R. 45 and S.R. 700 project corridor are expected to be less when compared to these worst-case locations. Exhibits 3 through 6 illustrate the CO microscale analysis study areas and receptor locations.

The results of the microscale analysis are presented in Tables 1 through 4. For ease in assimilating the data, the results are shown with and without the proposed improvements and CO concentrations are compiled to include contributions from future-year traffic and background concentrations. Both the one-hour and eight-hour values are provided along with a brief description of each receptor location. For comparative purposes, the corresponding one-hour and eight-hour AAQS for CO are also shown.



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LEGEND

- Receptor Location
- Edge of Pavement

FLORIDA DEPARTMENT OF TRANSPORTATION

AIR QUALITY REPORT

S.R. 45 (U.S. 41) / S.R. 700 (U.S. 98)

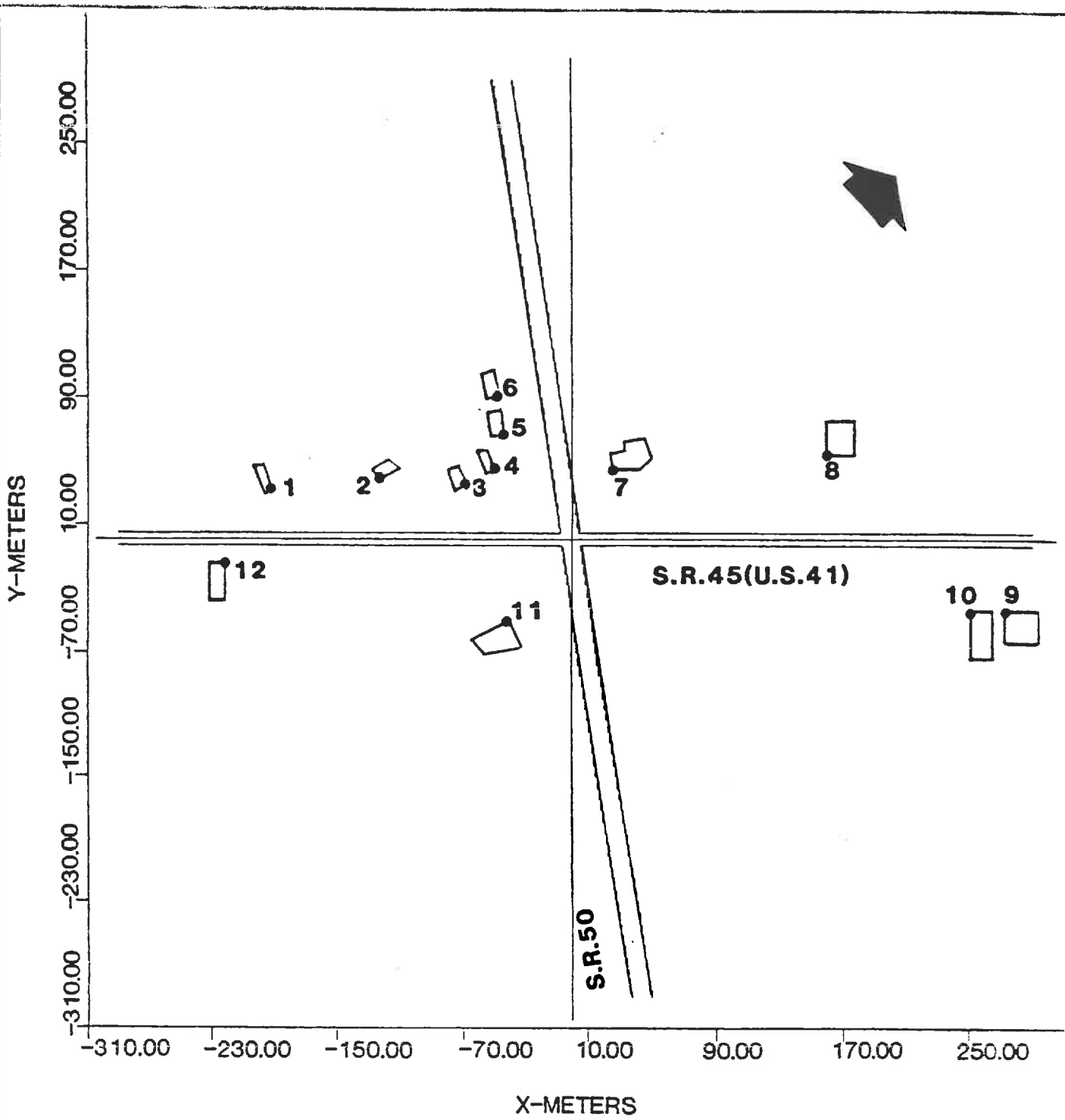
From S.R. 52 to C.R. 485B

Pasco and Hernando Counties, Florida

S.R.45(U.S.41)/S.R.50 INTERSECTION MICROSCALE ANALYSIS AREA - WITH IMPROVEMENTS

See Appendix For Receptor Coordinates

EXHIBIT 3



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LEGEND

- Receptor Location
- Edge of Pavement

FLORIDA DEPARTMENT OF TRANSPORTATION

AIR QUALITY REPORT

S.R. 45 (U.S. 41) / S.R. 700 (U.S. 98)

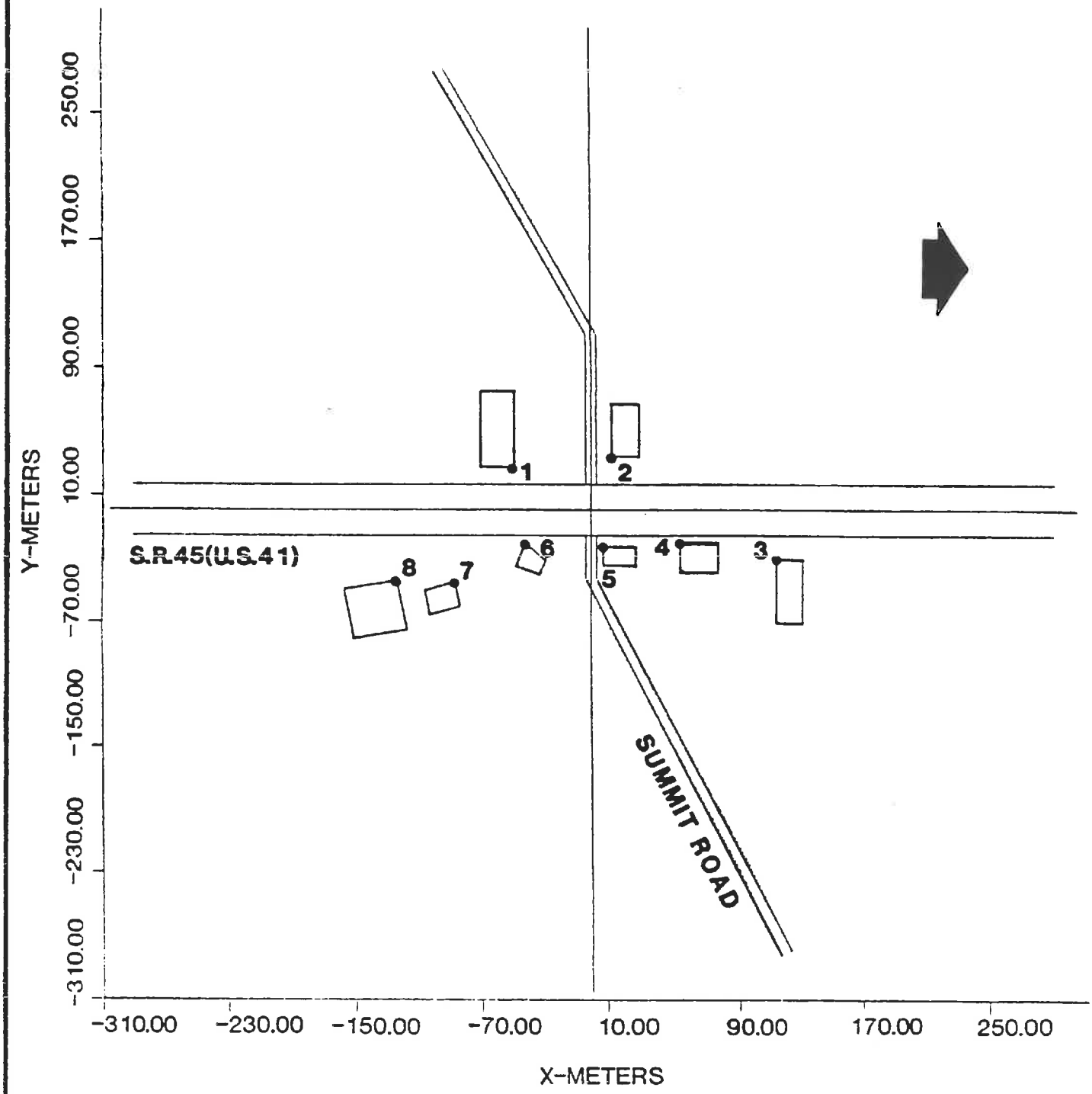
From S.R. 52 to C.R. 485B

Pasco and Hernando Counties, Florida

S.R.45(U.S.41)/S.R.50 INTERSECTION MICROSCALE ANALYSIS AREA - WITHOUT IMPROVEMENTS

EXHIBIT 4

See Appendix For Receptor Coordinates



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LEGEND

- • Receptor Location
- ——— Edge of Pavement

See Appendix For Receptor Coordinates

FLORIDA DEPARTMENT OF TRANSPORTATION

AIR QUALITY REPORT

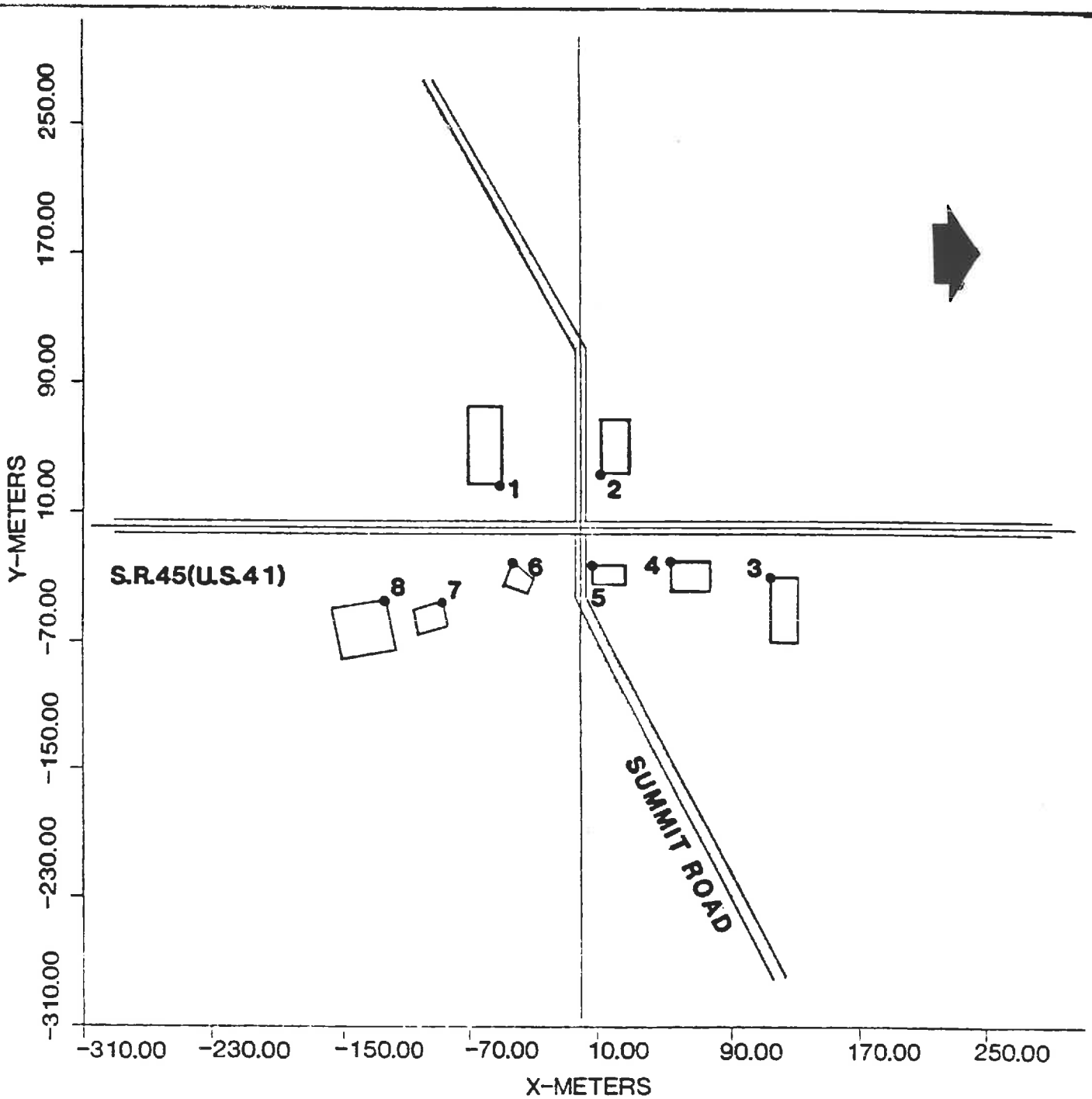
S.R. 45 (U.S. 41) / S.R. 700 (U.S. 98)

From S.R. 52 to C.R. 485B

Pasco and Hernando Counties, Florida

S.R.45(U.S.41)/SUMMIT ROAD INTERSECTION MICROSCALE ANALYSIS AREA - WITH IMPROVEMENTS

EXHIBIT 5



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LEGEND

- Receptor Location
- Edge of Pavement

See Appendix For Receptor Coordinates

FLORIDA DEPARTMENT OF TRANSPORTATION

AIR QUALITY REPORT

S.R. 45 (U.S. 41) / S.R. 700 (U.S. 98)

From S.R. 52 to C.R. 485B

Pasco and Hernando Counties, Florida

S.R.45(U.S.41)/SUMMIT ROAD INTERSECTION MICROSCALE ANALYSIS AREA - WITHOUT IMPROVEMENTS

EXHIBIT 6

TABLE 1

PREDICTED (2000) ONE- AND EIGHT-HOUR, WORST-CASE CARBON MONOXIDE LEVELS IN THE VICINITY OF THE S.R. 45 (U.S. 41)/S.R. 50 INTERSECTION

Receptor Number[a]	With Improvements		Without Improvements		Receptor Location
	One-Hour Average[b]	Eight-Hour Average[b]	One-Hour Average[b]	Eight-Hour Average[b]	
1	5	3	8	4	S.W. quadrant
2	6	4	7	4	S.W. quadrant
3	7	4	8	5	S.W. quadrant
4	7	4	8	4	S.W. quadrant
5	7	4	8	4	S.W. quadrant
6	7	4	8	4	S.W. quadrant
7	7	4	9	5	N.W. quadrant
8	5	3	6	4	N.W. quadrant
9	4	3	6	4	N.E. quadrant
10	4	3	6	4	N.E. quadrant
11	6	4	8	4	S.E. quadrant
12	6	3	11	6	S.E. quadrant

[a] See Exhibits 3 and 4 for receptor locations.
[b] Includes background concentration of 1.5 ppm.

Ambient Air Quality Standards (AAQS) for carbon monoxide--levels considered not to pose any significant health risk:

*One-Hour = 35 parts per million
*Eight-Hour = 9 parts per million

TABLE 2

PREDICTED (2010) ONE- AND EIGHT-HOUR, WORST-CASE CARBON MONOXIDE LEVELS IN THE VICINITY OF THE S.R. 45 (U.S. 41)/S.R. 50 INTERSECTION

Receptor Number[a]	With Improvements		Without Improvements		Receptor Location
	One-Hour Average[b]	Eight-Hour Average[b]	One-Hour Average[b]	Eight-Hour Average[b]	
1	7	4	9	5	S.W. quadrant
2	8	4	9	5	S.W. quadrant
3	8	5	10	5	S.W. quadrant
4	8	4	9	5	S.W. quadrant
5	8	4	9	5	S.W. quadrant
6	8	4	9	5	S.W. quadrant
7	8	5	10	5	N.W. quadrant
8	6	4	7	4	N.W. quadrant
9	5	3	7	4	N.E. quadrant
10	5	3	7	4	N.E. quadrant
11	7	4	9	5	S.E. quadrant
12	7	4	13	7	S.E. quadrant

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[a] See Exhibits 3 and 4 for receptor locations.
[b] Includes background concentration of 1.5 ppm.

Ambient Air Quality Standards (AAQS) for carbon monoxide--levels considered not to pose any significant health risk:

*One-Hour = 35 parts per million
*Eight-Hour = 9 parts per million

TABLE 3

PREDICTED (2000) ONE- AND EIGHT-HOUR, WORST-CASE CARBON MONOXIDE LEVELS IN THE VICINITY OF THE S.R. 45 (U.S. 41)/SUMMIT ROAD INTERSECTION

Receptor Number[a]	With Improvements		Without Improvements		Receptor Location
	One-Hour Average[b]	Eight-Hour Average[b]	One-Hour Average[b]	Eight-Hour Average[b]	
1	7	4	9	5	S.W. quadrant
2	7	4	7	4	N.W. quadrant
3	9	5	10	5	N.E. quadrant
4	9	5	11	6	N.E. quadrant
5	7	4	9	5	N.E. quadrant
6	6	4	8	4	S.E. quadrant
7	5	3	7	4	S.E. quadrant
8	5	3	6	4	S.E. quadrant

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[a] See Exhibits 5 and 6 for receptor locations.
[b] Includes background concentration of 1.5 ppm.

Ambient Air Quality Standards (AAQS) for carbon monoxide--levels considered not to pose any significant health risk:

*One-Hour = 35 parts per million
*Eight-Hour = 9 parts per million

TABLE 4

PREDICTED (2010) ONE- AND EIGHT-HOUR, WORST-CASE CARBON MONOXIDE LEVELS IN THE VICINITY OF THE S.R. 45 (U.S. 41)/SUMMIT ROAD INTERSECTION

Receptor Number[a]	With Improvements		Without Improvements		Receptor Location
	One-Hour Average[b]	Eight-Hour Average[b]	One-Hour Average[b]	Eight-Hour Average[b]	
1	8	5	10	5	S.W. quadrant
2	8	4	9	5	N.W. quadrant
3	10	5	12	6	N.E. quadrant
4	10	6	12	6	N.E. quadrant
5	8	4	10	5	N.E. quadrant
6	7	4	9	5	S.E. quadrant
7	6	4	7	4	S.E. quadrant
8	6	4	7	4	S.E. quadrant

[a] See Exhibits 5 and 6 for receptor locations.
[b] Includes background concentration of 1.5 ppm.

Ambient Air Quality Standards (AAQS) for carbon monoxide--levels considered not to pose any significant health risk:

*One-Hour = 35 parts per million
*Eight-Hour = 9 parts per million

As shown in Table 1, the highest predicted one- and eight-hour CO concentrations in the vicinity of the S.R. 45/S.R. 50 intersection with the proposed improvements are 7 and 4 ppm, respectively. By comparison, the highest predicted one- and eight-hour CO concentrations at these same receptors without the improvements are 11 and 6 ppm, respectively. These results indicate that by the year 2000, CO concentrations in the vicinity of the S.R. 45/S.R. 50 intersection should decrease with the improvement, and no exceedances of either the one- or eight-hour AAQS for CO are likely to occur at any of the twelve receptors analyzed.

As shown in Table 2, by 2010, the highest predicted one- and eight-hour CO concentrations in the vicinity of the S.R. 45/S.R. 50 intersection with the proposed improvements are 8 and 4 ppm, respectively. By comparison, the highest predicted one- and eight-hour CO concentrations at these same receptors without the improvements are 13 and 7 ppm, respectively. Again, these results indicate that by 2010, CO concentrations in the vicinity of the S.R. 45/S.R. 50 intersection should decrease with the proposed improvement, and no exceedances of either the one- or eight-hour AAQS for CO are likely to occur at any of the twelve receptors analyzed.

As shown in Table 3, the highest predicted one- and eight-hour CO concentrations in the vicinity of the S.R. 45/Summit Road intersection with the proposed improvements are 9 and 5 ppm, respectively. The highest predicted one- and eight-hour CO concentrations at these same receptors without the improvements are 11 and 6 ppm, respectively. These results indicate that by 2000, CO concentrations in the vicinity of the S.R. 45/Summit Road intersection should decrease with the proposed improvements and no exceedances of either the one- or eight-hour AAQS for CO are likely to occur at any of the eight receptors analyzed.

Finally, as shown in Table 4, by 2010 the highest predicted one- and eight-hour CO concentrations in the vicinity of the S.R. 45/Summit Road intersection with the proposed improvements are 10 and 6 ppm, respectively. The highest predicted one- and eight-hour CO concentrations at these same receptors without the improvements are 12 and 6 ppm, respectively. These results indicate that by 2010, CO concentrations in the vicinity of the S.R. 45/Summit Road intersection should decrease with the proposed improvements and no exceedances of either the one- or eight-hour AAQS for CO are likely to occur at any of the eight receptors analyzed.

CONSTRUCTION IMPACTS

Construction activities can have a short-term impact on local air quality primarily during periods of site preparation, with particulate matter (dust) having the greatest impact. This impact would occur in association with excavation and earth moving; cement, asphalt, and aggregate handling; heavy equipment operation; use of haul roads; and wind erosion of exposed areas and materials storage piles.

The effects of dust would be temporary and would vary in scale depending on local weather conditions, level of construction activity, and the nature of the operation. Where excess dust is likely to become a problem, effective dust control measures can be implemented according to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. These measures include:

* minimization of exposed erodible earth area to the extent possible;
* stabilization of exposed earth with grass, mulch, pavement, or other cover as early as possible;

* periodic sweeping, or applications of water or stabilizing agents to the working and haulage areas;
* covering, shielding, or stabilizing of stockpiled material as necessary; and
* the use of covered haul trucks.

Should open burning of land clearing debris become necessary, it will be conducted in ways that will minimize unconfined emissions and be consistent with all local and state requirements.

CONCLUSION

Based on the results of the microscale dispersion analysis conducted under simulated worst-case conditions, the planned improvements to S.R. 45 and S.R. 700 will not contribute to CO concentrations above the one- and eight-hour AAQS for CO. Furthermore, comparison with the results derived from the simulated conditions without the project show a reduction in CO concentrations with the improvements.

This project is in an area where the SIP does not contain any transportation control measures. Therefore, the conformity procedures of 23 CFR 770 do not apply to this project. The S.R. 45 and S.R. 700 project is in conformance with the SIP because it would not cause violations of air quality standards and will not interfere with any transportation control measures.

APPENDIX

APPENDIX TABLE OF CONTENTS

SUMMARY OF MICROSCALE DISPERSION MODELING PARAMETERS

Model	Parameter	Value
TEXIN2	* Region	Low altitude
	* Operating mode	20.6% cold, 27.3% hot
	* Ambient Temperature	52° F
	* Vehicle mix	Default
	* Analysis year	2000, 2010
	* Stability class	5 (E)
	* Wind speed	1 meter/second
	* Wind direction	0°-350° @ 10° intervals
	* Mixing height	1,000 meters
	* Receptor locations	Sensitive sites
	* Receptor height	5 feet
	* Persistence factors	
	- Traffic	0.75
	- Meteorological	0.6
	* Background concentration	1.5 ppm
	* Surface roughness	108 centimeters

********** TAMU INTERSECTION MODEL --- TEXIN2 **********

TITLE: SR54(US41)/SR50 - BUILD - 2000

METEOROLOGICAL CONDITIONS:

WIND SPEED	= 1.0 M/S	STABILITY CLASS	= 5 (E)	SURFACE ROUGHNESS	= 108. CM
WIND BEARING	= 10. DEG	MIXING HEIGHT	= 1000. M	AVERAGING TIME	= 60. MIN
TEMPERATURE	= 54.0 F	AMBIENT CONCENTRATION	= 0.0 PPM		

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE	= SIGNALIZED	CYCLE LENGTH	= 120.0 SEC	SIGNAL PHASES	= 3
DELAY LINKS	= 0	NON-DELAY LINKS	= 1	TFLAG	= 0

INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLTL	NRTL	ELI	ERI	LIELG	IHWIDE	LIWIDE
1	AG	32.0	0.0	1662.	30.0	3	2	1	.2700	.1300	1	3.66	3.66
2	AG	24.4	0.0	1441.	30.0	2	2	1	.1600	.3200	1	3.66	3.66
3	AG	32.0	0.0	1228.	30.0	3	2	1	.3500	.1200	1	3.66	3.66
4	AG	22.9	0.0	1044.	30.0	2	2	1	.1400	.4100	1	3.66	3.66

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-190.5	30.5	1.5	100.0	3.6
2	-121.9	36.6	1.5	110.0	4.7
3	-67.1	33.5	1.5	120.0	5.6
4	-50.3	42.7	1.5	130.0	5.4
5	-44.2	64.0	1.5	150.0	5.3
6	-47.2	88.4	1.5	150.0	5.1
7	25.9	42.7	1.5	210.0	5.9
8	158.5	51.8	1.5	250.0	3.6
9	271.3	-45.7	1.5	280.0	2.8
10	249.9	-45.7	1.5	280.0	2.9
11	-42.7	-51.8	1.5	30.0	4.6
12	-221.0	-15.2	1.5	90.0	4.0

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

TITLE: SR54(US41)/SR50 - NOBUILD - 2000

METEOROLOGICAL CONDITIONS:

WIND SPEED	= 1.0 M/S	STABILITY CLASS	= 5 (E)	SURFACE ROUGHNESS	= 108. CM
WIND BEARING	= 10. DEG	MIXING HEIGHT	= 1000. M	AVERAGING TIME	= 60. MIN
TEMPERATURE	= 54.0 F	AMBIENT CONCENTRATION	= 0.0 PPM		

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE	= SIGNALIZED	CYCLE LENGTH	= 120.0 SEC	SIGNAL PHASES	= 3
DELAY LINKS	= 0	NON-DELAY LINKS	= 1	TFLAG	= 0

INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IHWIDE	LIWIDE
1	AG	7.3	0.0	1662.	5.0	1	1	0	.2700	.1300	1	3.66	3.66
2	AG	7.3	0.0	1441.	5.0	1	1	0	.1600	.3200	1	3.66	3.66
3	AG	7.3	0.0	1228.	7.0	1	1	0	.3500	.1200	1	3.66	3.66
4	AG	7.3	0.0	1044.	16.0	1	1	0	.1400	.4100	1	3.66	3.66

WARNING ACCORDING TO THE CMA PLANNING PROCEDURE, INTERSECTION VOLUME GREATER THAN CAPACITY, V/C= 2.09

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-190.5	30.5	1.5	100.0	6.5
2	-121.9	36.6	1.5	100.0	5.9
3	-67.1	33.5	1.5	110.0	6.7
4	-50.3	42.7	1.5	150.0	6.5
5	-44.2	64.0	1.5	160.0	6.5
6	-47.2	88.4	1.5	160.0	6.3
7	25.9	42.7	1.5	190.0	7.6
8	158.5	51.8	1.5	250.0	4.7
9	271.3	-45.7	1.5	290.0	4.9
10	249.9	-45.7	1.5	290.0	4.9
11	-42.7	-51.8	1.5	70.0	6.2
12	-221.0	-15.2	1.5	80.0	9.7

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

********** TAMU INTERSECTION MODEL --- TEXIN2 **********

TITLE: SR54(US41)/SR50 - BUILD - 2010

METEOROLOGICAL CONDITIONS:

WIND SPEED	= 1.0 M/S	STABILITY CLASS	= 5 (E)	SURFACE ROUGHNESS	= 108. CM
WIND BEARING	= 10. DEG	MIXING HEIGHT	= 1000. M	AVERAGING TIME	= 60. MIN
TEMPERATURE	= 54.0 F	AMBIENT CONCENTRATION	= 0.0 PPM		

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE	= SIGNALIZED	CYCLE LENGTH	= 120.0 SEC	SIGNAL PHASES	= 3
DELAY LINKS	= 0	NON-DELAY LINKS	= 1	TFLAG	= 0

INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IHWIDE	LIWIDE
1	AG	32.0	0.0	2132.	30.0	3	2	1	.2700	.1300	1	3.66	3.66
2	AG	24.4	0.0	1801.	28.0	2	2	1	.1600	.3200	1	3.66	3.66
3	AG	32.0	0.0	1574.	30.0	3	2	1	.3500	.1200	1	3.66	3.66
4	AG	22.9	0.0	1338.	30.0	2	2	1	.1400	.4100	1	3.66	3.66

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-190.5	30.5	1.5	100.0	5.2
2	-121.9	36.6	1.5	110.0	6.1
3	-67.1	33.5	1.5	110.0	6.7
4	-50.3	42.7	1.5	130.0	6.3
5	-44.2	64.0	1.5	150.0	6.4
6	-47.2	88.4	1.5	150.0	6.1
7	25.9	42.7	1.5	190.0	6.9
8	158.5	51.8	1.5	250.0	4.5
9	271.3	-45.7	1.5	280.0	3.7
10	249.9	-45.7	1.5	280.0	3.9
11	-42.7	-51.8	1.5	50.0	5.3
12	-221.0	-15.2	1.5	80.0	5.6

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

TITLE: SR54(US41)/SR50 - NOBUILD - 2010

METEOROLOGICAL CONDITIONS:

WIND SPEED	= 1.0 M/S	STABILITY CLASS	= 5 (E)	SURFACE ROUGHNESS	= 108. CM
WIND BEARING	= 10. DEG	MIXING HEIGHT	= 1000. M	AVERAGING TIME	= 60. MIN
TEMPERATURE	= 54.0 F	AMBIENT CONCENTRATION	= 0.0 PPM		

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE	= SIGNALIZED	CYCLE LENGTH	= 120.0 SEC	SIGNAL PHASES	= 3
DELAY LINKS	= 0	NON-DELAY LINKS	= 1	TFLAG	= 0

INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

-----LINK SUMMARY-----

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IWWIDE	LIWIDE
1	AG	7.3	0.0	2132.	5.0	1	1	0	.2700	.1300	1	3.66	3.66
2	AG	7.3	0.0	1801.	5.0	1	1	0	.1600	.3200	1	3.66	3.66
3	AG	7.3	0.0	1574.	5.0	1	1	0	.3500	.1200	1	3.66	3.66
4	AG	7.3	0.0	1338.	5.0	1	1	0	.1400	.4100	1	3.66	3.66

WARNING ACCORDING TO THE CMA PLANNING PROCEDURE, INTERSECTION VOLUME GREATER THAN CAPACITY, V/C= 2.66

-----TEXIN2 WORST CASE WIND ANGLE ANALYSIS-----

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-190.5	30.5	1.5	100.0	7.7
2	-121.9	36.6	1.5	100.0	7.3
3	-67.1	33.5	1.5	100.0	8.2
4	-50.3	42.7	1.5	110.0	7.9
5	-44.2	64.0	1.5	160.0	7.9
6	-47.2	88.4	1.5	160.0	7.4
7	25.9	42.7	1.5	190.0	8.8
8	158.5	51.8	1.5	250.0	5.7
9	271.3	-45.7	1.5	280.0	5.9
10	249.9	-45.7	1.5	290.0	5.9
11	-42.7	-51.8	1.5	70.0	7.1
12	-221.0	-15.2	1.5	80.0	11.9

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

********** TAMU INTERSECTION MODEL --- TEXIN2 **********

TITLE: SR54(US41)/SUMMIT ROAD - BUILD - 2000

METEOROLOGICAL CONDITIONS:

WIND SPEED = 1.0 M/S
WIND BEARING = 10. DEG
TEMPERATURE = 54.0 F
STABILITY CLASS = 5 (E)
MIXING HEIGHT = 1000. M
AMBIENT CONCENTRATION = 0.0 PPM
SURFACE ROUGHNESS = 108. CM
AVERAGING TIME = 60. MIN

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE = SIGNALIZED
DELAY LINKS = 0
CYCLE LENGTH = 120.0 SEC
NON-DELAY LINKS = 2
SIGNAL PHASES = 3
TFLAG = 0
INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IWWIDE	LIWIDE
1	AG	32.0	0.0	1850.	30.0	3	1	0	.0500	.0200	1	3.66	3.66
2	AG	7.3	0.0	277.	30.0	1	0	0	.5700	.3700	1	3.66	3.66
3	AG	32.0	0.0	1261.	30.0	3	1	0	.0300	.0800	1	3.66	3.66
4	AG	7.3	0.0	86.	30.0	1	0	0	.3400	.5200	1	3.66	3.66

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-48.8	27.4	1.5	110.0	5.6
2	13.7	33.5	1.5	200.0	5.0
3	54.9	-19.8	1.5	280.0	7.3
4	7.6	-22.9	1.5	330.0	7.4
5	-29.0	-32.0	1.5	70.0	5.2
6	115.8	-30.5	1.5	290.0	4.8
7	-85.3	-45.7	1.5	70.0	3.9
8	-121.9	-45.7	1.5	70.0	3.8

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

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********** TAMU INTERSECTION MODEL --- TEXIN2 **********

TITLE: SR54(US41)/SUMMIT ROAD - NOBUILD - 2000

METEOROLOGICAL CONDITIONS:

WIND SPEED = 1.0 M/S
WIND BEARING = 10. DEG
TEMPERATURE = 54.0 F
STABILITY CLASS = 5 (E)
MIXING HEIGHT = 1000. M
AMBIENT CONCENTRATION = 0.0 PPM
SURFACE ROUGHNESS = 108. CM
AVERAGING TIME = 60. MIN

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE = SIGNALIZED
DELAY LINKS = 0
CYCLE LENGTH = 120.0 SEC
NON-DELAY LINKS = 2
SIGNAL PHASES = 3
TFLAG = 0
INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IHWIDE	LIWIDE
1	AG	7.3	0.0	1850.	5.0	1	0	0	.0500	.0200	1	3.66	3.66
2	AG	7.3	0.0	277.	30.0	1	0	0	.5700	.3700	1	3.66	3.66
3	AG	7.3	0.0	1261.	7.0	1	0	0	.0300	.0800	1	3.66	3.66
4	AG	7.3	0.0	86.	30.0	1	0	0	.3400	.5200	1	3.66	3.66

WARNING ACCORDING TO THE CMA PLANNING PROCEDURE, INTERSECTION VOLUME GREATER THAN CAPACITY, V/C= 1.57

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-48.8	27.4	1.5	100.0	7.0
2	13.7	33.5	1.5	200.0	5.9
3	54.9	-19.8	1.5	280.0	8.5
4	7.6	-22.9	1.5	280.0	9.1
5	-29.0	-32.0	1.5	80.0	7.0
6	115.8	-30.5	1.5	280.0	6.3
7	-85.3	-45.7	1.5	80.0	5.1
8	-121.9	-45.7	1.5	80.0	4.9

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

********** TAMU INTERSECTION MODEL --- TEXIN2 **********

TITLE: SR54(US41)/SUMMIT ROAD - BUILD - 2010

METEOROLOGICAL CONDITIONS:

WIND SPEED	= 1.0 M/S	STABILITY CLASS	= 5 (E)	SURFACE ROUGHNESS	= 108. CM
WIND BEARING	= 10. DEG	MIXING HEIGHT	= 1000. M	AVERAGING TIME	= 60. MIN
TEMPERATURE	= 54.0 F	AMBIENT CONCENTRATION	= 0.0 PPM		

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE	= SIGNALIZED	CYCLE LENGTH	= 120.0 SEC	SIGNAL PHASES	= 3
DELAY LINKS	= 0	NON-DELAY LINKS	= 2	TFLAG	= 0

INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IHWIDE	LIWIDE
1	AG	32.0	0.0	2372.	30.0	3	1	0	.0500	.0200	1	3.66	3.66
2	AG	7.3	0.0	338.	30.0	1	0	0	.5700	.3700	1	3.66	3.66
3	AG	32.0	0.0	1617.	30.0	3	1	0	.0300	.0800	1	3.66	3.66
4	AG	7.3	0.0	108.	30.0	1	0	0	.3400	.5200	1	3.66	3.66

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-48.8	27.4	1.5	110.0	6.7
2	13.7	33.5	1.5	200.0	6.3
3	54.9	-19.8	1.5	280.0	8.8
4	7.6	-22.9	1.5	290.0	8.9
5	-29.0	-32.0	1.5	70.0	6.2
6	115.8	-30.5	1.5	290.0	5.7
7	-85.3	-45.7	1.5	70.0	4.6
8	-121.9	-45.7	1.5	70.0	4.5

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

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********** TAMU INTERSECTION MODEL --- TEXIN2 **********

TITLE: SR54(US41)/SUMMIT ROAD - NOBUILD - 2010

METEOROLOGICAL CONDITIONS:

WIND SPEED = 1.0 M/S
WIND BEARING = 10. DEG
TEMPERATURE = 54.0 F
STABILITY CLASS = 5 (E)
MIXING HEIGHT = 1000. M
AMBIENT CONCENTRATION = 0.0 PPM
SURFACE ROUGHNESS = 108. CM
AVERAGING TIME = 60. MIN

COMMENT: WIND ANGLE WILL BE INCREMENTED FROM 0 TO 360 DEG BY 10.0 DEG FOR WORST CASE ANALYSIS.

INTERSECTION INFORMATION:

TYPE = SIGNALIZED
DELAY LINKS = 0
CYCLE LENGTH = 120.0 SEC
NON-DELAY LINKS = 2
SIGNAL PHASES = 3
TFLAG = 0
INTERSECTION CALCULATIONAL PROCEDURE: CMA PLANNING

LINK SUMMARY

LINK	TYPE	WIDTH	HEIGHT	VPHI	VSP	NLN	NLIL	NRIL	ELI	ERI	LIELG	IWWIDE	LWIDE
1	AG	7.3	0.0	2372.	5.0	1	0	0	.0500	.0200	1	3.66	3.66
2	AG	7.3	0.0	338.	30.0	1	0	0	.5700	.3700	1	3.66	3.66
3	AG	7.3	0.0	1617.	5.0	1	0	0	.0300	.0800	1	3.66	3.66
4	AG	7.3	0.0	108.	30.0	1	0	0	.3400	.5200	1	3.66	3.66

WARNING ACCORDING TO THE CMA PLANNING PROCEDURE, INTERSECTION VOLUME GREATER THAN CAPACITY, V/C= 1.99

TEXIN2 WORST CASE WIND ANGLE ANALYSIS

RECEPTOR	XR	YR	ZR	ANGLE (DEG)	CO (PPM)*
1	-48.8	27.4	1.5	100.0	8.1
2	13.7	33.5	1.5	260.0	7.7
3	54.9	-19.8	1.5	280.0	10.1
4	7.6	-22.9	1.5	280.0	10.9
5	-29.0	-32.0	1.5	80.0	8.0
6	115.8	-30.5	1.5	280.0	7.4
7	-85.3	-45.7	1.5	80.0	5.9
8	-121.9	-45.7	1.5	80.0	5.7

*INCLUDES BACKGROUND AMBIENT CONCENTRATION OF 0.0 PPM

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