

# **AIR QUALITY TECHNICAL MEMORANDUM**

## **Widen Florida's Turnpike (SR 91) From South of Kissimmee Park Road to US 192**

Osceola County, Florida

Financial Project Identification Number: 441224-1-22-01

Efficient Transportation Decision Making Number: 14329



Prepared for:

**Florida Department of Transportation  
Florida's Turnpike Enterprise**

Prepared by:

**Dewberry Engineers Inc.**

December 2019

## **1.0 Introduction**

Florida's Turnpike Enterprise (FTE) is conducting a PD&E Study to evaluate alternatives for the widening of Florida's Turnpike (SR 91) from south of Kissimmee Park Road to US 192 in Osceola County, a distance of approximately 4 miles (see Figure 1). The project consists of widening Florida's Turnpike, a major evacuation route for Central and Southeast Florida, by adding general toll lanes. FTE identified the need to widen this portion of Florida's Turnpike to accommodate future traffic volumes of freight and passenger vehicles linked to projected growth in population and employment for the year 2045. The PD&E Study will also evaluate modifications to existing Kissimmee Park Road and US 192 interchanges.

The objective of this air quality screening is to determine whether project-related motor vehicle emissions will cause, or contribute to, a violation of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide, the most prevalent air pollutant emission from motor vehicles.

The Air Quality Technical has been prepared per the requirements as outlined in the FDOT Project Development and Environment (PD&E) Manual, Part 2, Chapter 19. This report contains information regarding the air quality study conducted for the proposed improvements. The preferred Build Alternative, Alternative 2, was evaluated for potential air quality impacts.

Alternative 2 involves the construction of a new diverging diamond interchange between Florida's Turnpike and an extension of New Nolte Road, approximately 3,000 feet north of the Kissimmee Park Road interchange. The existing ramps at Kissimmee Park Road will be removed with this Alternative.

## **2.0 Methodology and Results**

### **2.1 General**

In accordance with the FDOT PD&E Manual (Part 2, Chapter 19 – Air Quality Analysis), the Air Quality Analysis for the Project was accomplished by first performing a “Screening Test” using COFL2012 on Alternative 2. COFL2012 makes conservative worst-case assumptions about meteorology, traffic and site conditions. The screening test uses assumptions to produce a series of curves which can be utilized to determine the carbon monoxide concentrations in parts per million for various receptor sites at an intersection and/or roadway segment. The one- hour and eight-hour carbon monoxide concentrations (including backgrounds concentrations) are calculated at each specified receptor.

Figure 1: Project Location Map



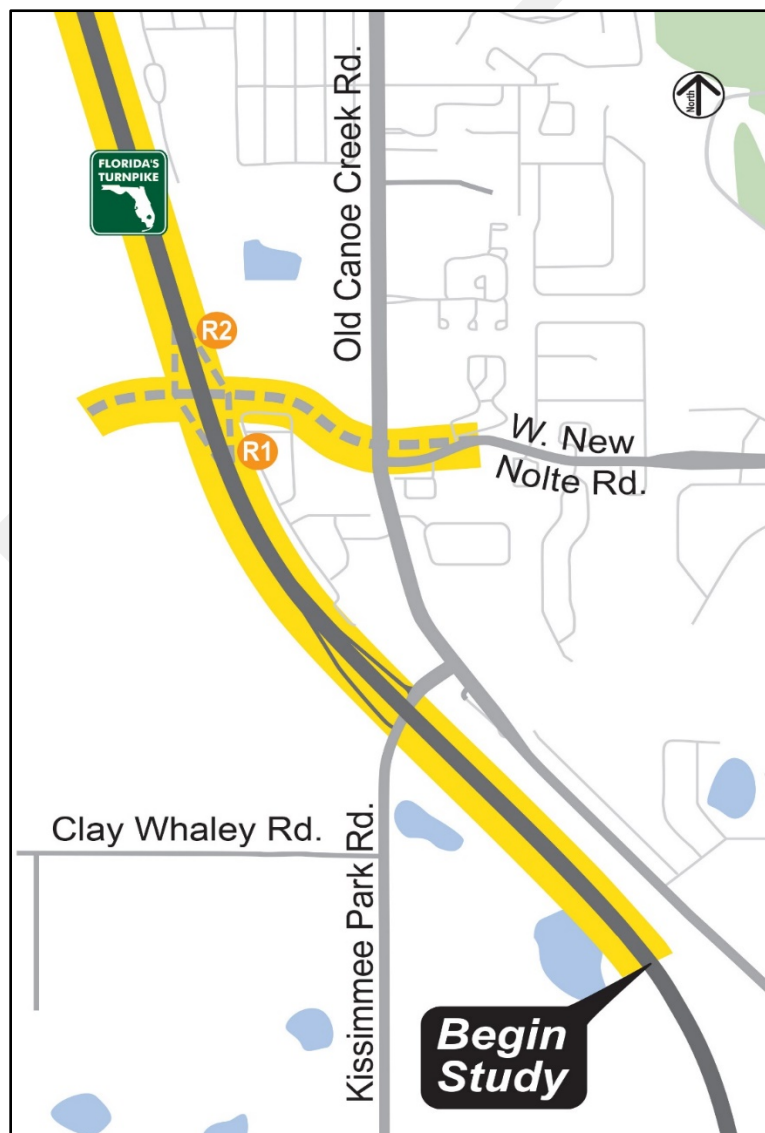
## 2.2 Screening Test

The roadway segment chosen for the screening test is typically the one with the combination of highest traffic volumes, lowest vehicular speeds, and closest receptors. For this project the proposed northbound on-ramp to the Turnpike mainline from the extension of New Nolte Road and the

northbound off-ramp from the Turnpike mainline were selected as the worst-case roadway segments due to the projected traffic volumes, reduced speeds and proximity of the residences.

A receptor site is a place where people can reasonably be expected to spend a significant amount of time, such as the backyard of a residence. Two receptors sites (R1 and R2) were selected as the closest reasonable air quality receptors to the roadway. The southbound (west) side of the Turnpike is currently undeveloped therefore the proposed receptor sites are on the northbound (east) side of the Turnpike. R1 is located in the southeast area of the proposed interchange near Teka Village and R2 is located near the intersection of the northbound on-ramp with the New Nolte Road extension (see Figure 2). For R1 the northbound general use lanes of the Florida's Turnpike were used for the worse-case. For R2, the northbound on-ramp was used. The screening test for urban areas in Central Florida was used.

Figure: 2



## 2.3 Traffic Data

The traffic data was provided by FTE for the design year (2045) for the build and no-build Alternatives (see Appendix A). The following data was used in the analysis:

Table 1 –CO Florida 2012 Input Data \*

Year	Facility	AM Peak Hour Approach Traffic Volumes				Approach Speed (MPH)
		Eastbound	Westbound	Northbound	Southbound	
2045	On-Ramps	1,400	1,300	N/A	N/A	35
	Off-Ramps	N/A	N/A	190	240	50
* Source: Project Traffic Projections, Prepared by Florida Turnpike Enterprise, November 2019						

Table 2 – CO Florida 2012 Input Data \*

Year	Facility	PM Peak Hour Approach Traffic Volumes				Approach Speed (MPH)
		Eastbound	Westbound	Northbound	Southbound	
2045	On-Ramps	730	580	N/A	N/A	35
	Off-Ramps	N/A	N/A	380	2,270	50
* Source: Project Traffic Projections, Prepared by Florida Turnpike Enterprise, November 2019						

## 2.4 Results

Table 3- AM Predicted Maximum One – and Eight – Hour CO Concentrations

Year	Scenario	Maximum CO Concentrations (ppm)*	
		1-Hour	8-Hour
	Build	1.7	1.0

Table 4 – PM Predicted Maximum One – and Eight- Hour CO Concentrations

Year	Scenario	Maximum CO Concentrations (ppm)*	
		1-Hour	8-Hour
	Build	3.3	2.0

Table 5 – No Build Alternative Predicted Maximum One – and Eight – Hour CO Concentrations

Year	Scenario	Maximum CO Concentrations (ppm)*	
		1-Hour	8-Hour
	No Build	3.3	2.0

\*Parts per Million

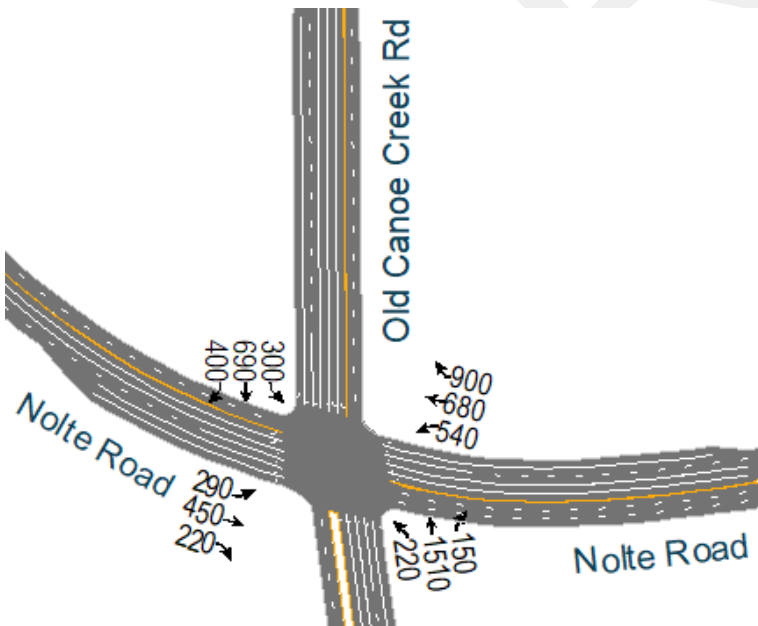
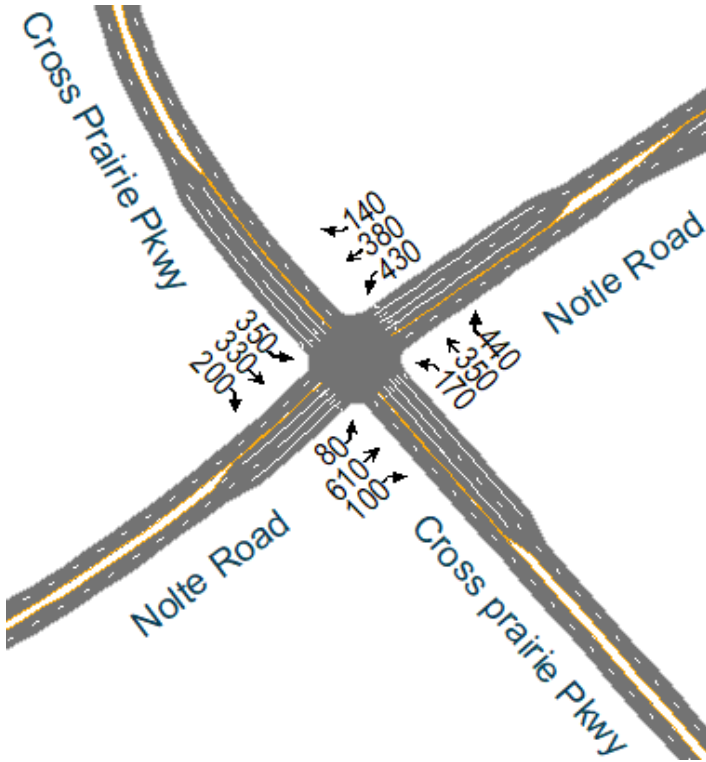
All of the scenarios passed the screening and “No Exceedances of NAAQ Standards are Predicted” (see Appendix B).

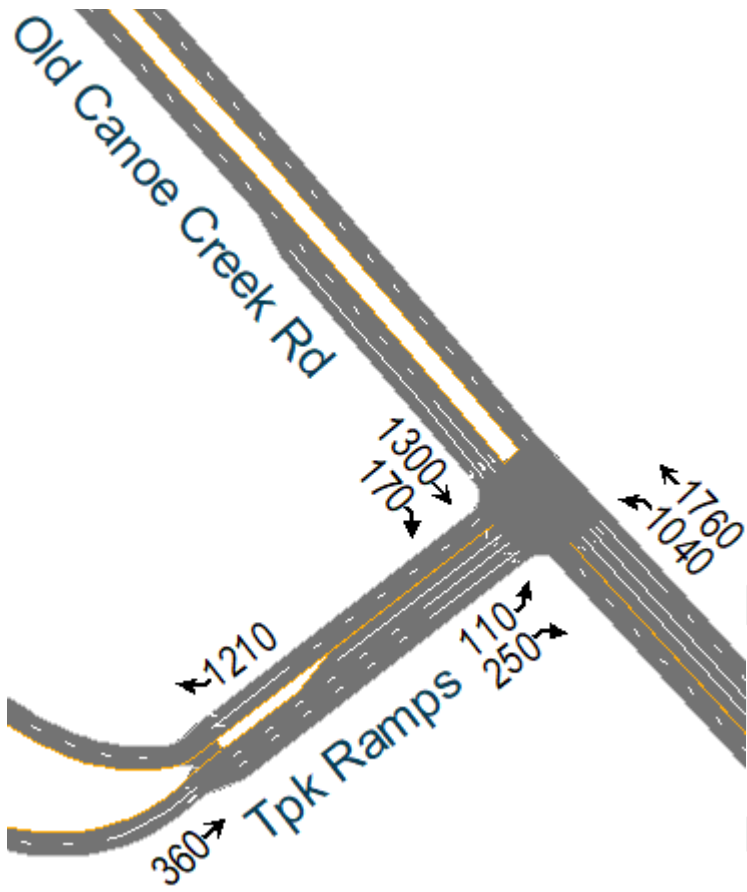
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## Appendix A: Traffic Data

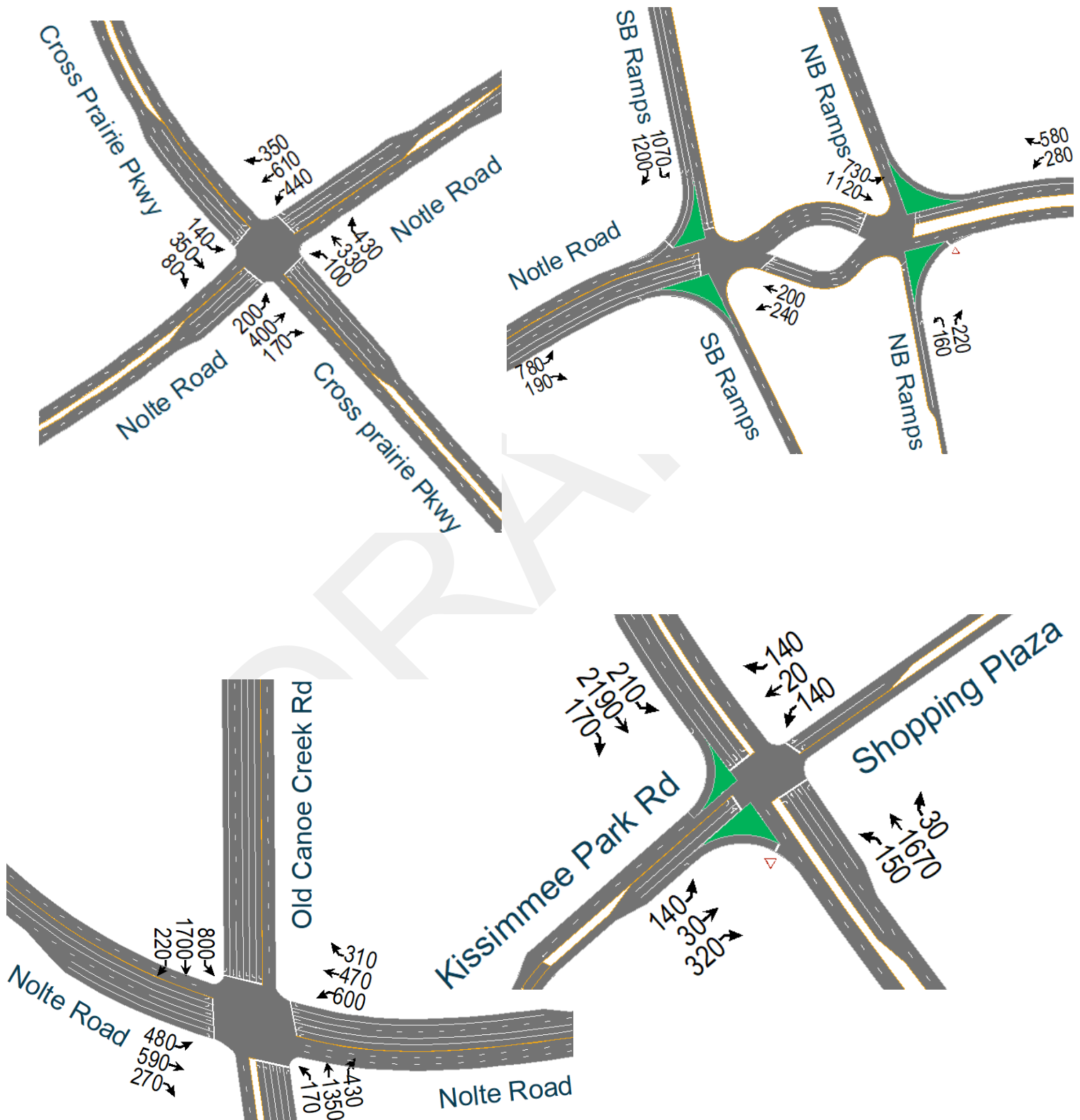
## 2045 AM Build Alternative 2 Volumes

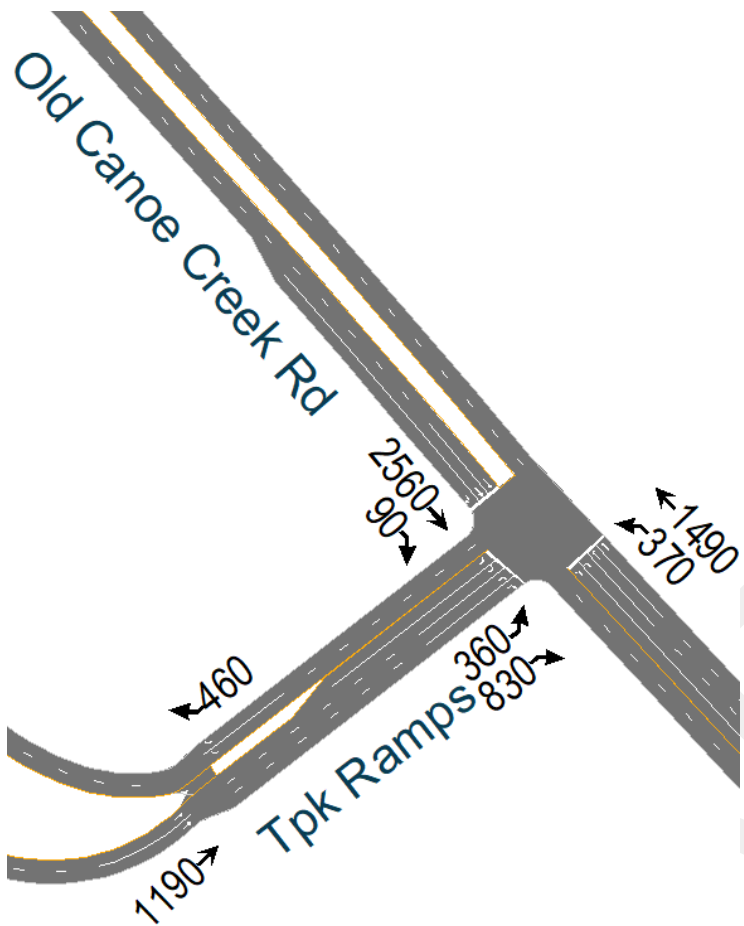






## 2045 PM Alternative 2 Volumes





### Legend

Florida's Turnpike

Arterial

AM (PM) Volume

Signalized Intersection

Unsignalized Intersection

**Intersection Detail Boxes:**

- Top Left:**
  - Left: 4,780 (6,200) →, 420 (590) →
  - Right: 6,200 (4,780) ←, 5,200 (6,790) ←
- Top Center:**
  - Left: 230 (140) →, 1,850 (2,670) →
  - Right: 1,340 (560) ←, 1,590 (1,710) ←
- Top Right:**
  - Left: 50 (210) →, 1,800 (2,470) →
  - Right: 70 (260) ←, 2,500 (1,790) ←
- Middle Left:**
  - Left: 140 (230) →, 1,520 (1,470) →
  - Right: 560 (1,340) ←, 1,590 (1,710) ←
- Middle Center:**
  - Left: 900 (1,440) →, 1,500 (1,310) →
  - Right: 340 (970) ←, 960 (490) ←, 1,120 (970) ←
- Middle Right:**
  - Left: 680 (1,110) →, 1,540 (1,310) →
  - Right: 960 (2,070) ←, 480 (570) ←
- Bottom Left:**
  - Left: 140 (440) →, 440 (140) →, 250 (80) →
  - Right: 1,020 (1,240) ←, 80 (250) ←, 1,100 (1,170) ←
- Bottom Right:**
  - Left: 1,110 (680) →, 1,390 (2,700) →
  - Right: 2,070 (960) ←, 480 (570) ←

**Map Labels:** 192, Florida's Turnpike, New Nolte Rd., Old Canoe Creek Rd., Kissimmee Park Rd., Clay Whaley Rd., 525.

Florida's Turnpike PD&E Study  
 From MP 238.5 to 242  
 Systems Interchange Modification Report (SIMR)

2045 Design Hour  
 Volumes for No Build

Figure  
 5.4

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## **Appendix B: CO Florida 2012 Data**

CO Florida 2012 - Results Thursday,  
December 19, 2019

Project Description

Project Title Kissimme Park Road  
Facility Name Dewberry Engineering Inc.  
User's Name MBattle  
Run Name 2045 AM Alternative 2  
FDOT District 5  
Year 2045  
Intersection Type N-S Diamond  
Speed Arterial 35 mph Freeway 50 mph  
Approach Traffic Arterial 1200 vph Freeway 240 vph

Environmental Data

Temperature 47.8 °F  
Reid Vapor Pressure 13.3 psi  
Land Use Rural  
Stability Class E  
Surface Roughness 10 cm  
1 Hr. Background Concentration 1.7 ppm  
8 Hr. Background Concentration 1.0 ppm

Results

(ppm, including background CO)

Receptor	Max 1-Hr	Max 8-Hr
1	2.5	1.5
2	2.3	1.4
3	3.3	2.0
4	3.1	1.9
5	3.1	1.9
6	3.0	1.8
7	3.0	1.8
8	3.0	1.8
9	2.0	1.2
10	2.0	1.2
11	2.5	1.5
12	2.3	1.4
13	3.1	1.9
14	2.9	1.7
15	3.1	1.9
16	3.1	1.9
17	3.0	1.8
18	3.0	1.8
19	2.1	1.3
20	2.0	1.2

\*\*\*\*\*  
\*\*\*\*\*PROJECT PASSES\*\*\*\*\*  
\*NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED\*

CO Florida 2012 - Results Thursday,  
December 19, 2019

Project Description

Project Title Kissimmee Park Road  
Facility Name Dewberry Engineering Inc.  
User's Name MBattle  
Run Name 2045 PM Alternative 2  
FDOT District 5  
Year 2045  
Intersection Type N-S Diamond  
Speed Arterial 35 mph Freeway 50 mph  
Approach Traffic Arterial 730 vph Freeway 2270 vph

Environmental Data

Temperature 47.8 °F  
Reid Vapor Pressure 13.3 psi  
Land Use Suburban  
Stability Class D  
Surface Roughness 108 cm 1 Hr.  
Background Concentration 3.3 ppm  
8 Hr. Background Concentration 2.0 ppm

Results (ppm, including background CO)		
Receptor	Max 1-Hr	Max 8-Hr
1	4.8	2.9
2	4.3	2.6
3	4.5	2.7
4	4.2	2.5
5	4.0	2.4
6	4.2	2.5
7	4.4	2.6
8	4.3	2.6
9	3.8	2.3
10	4.6	2.8
11	4.8	2.9
12	4.3	2.6
13	4.4	2.6
14	4.1	2.5
15	3.9	2.3
16	4.1	2.5
17	4.3	2.6
18	4.2	2.5
19	3.8	2.3
20	4.6	2.8

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\*\*\*\*\*PROJECT PASSES\*\*\*\*\*  
\*NO EXCEEDANCES OF NAAQ STANDARDS AREPREDICTED

CO Florida 2012 - Results Thursday,  
December 05, 2019

Project Description

Project Title	Kissimmee Park Road		
Facility Name	Dewberry Engineering Inc.		
User's Name	MBattle		
Run Name	No Build Atlernative		
FDOT District	5		
Year	2045		
Intersection Type	N-S Diamond		
Speed	Arterial 35 mph	Freeway	65 mph
Approach Traffic	Arterial 2410 vph	Freeway	5220 vph

Environmental Data

Temperature	47.8 °F
Reid Vapor Pressure	13.3 psi
Land Use	Suburban
Stability Class	D
Surface Roughness	108 cm 1 Hr.
Background Concentration	3.3 ppm
8 Hr. Background Concentration	2.0 ppm

Results

(ppm, including background CO)			
Receptor	Max 1-Hr	Max 8-Hr	
1	5.8	3.5	
2	4.7	2.8	
3	5.7	3.4	
4	5.2	3.1	
5	5.2	3.1	
6	5.8	3.5	
7	5.8	3.5	
8	5.8	3.5	
9	4.3	2.6	
10	5.8	3.5	
11	5.8	3.5	
12	4.7	2.8	
13	5.6	3.4	
14	5.2	3.1	
15	5.1	3.1	
16	5.8	3.5	
17	5.8	3.5	
18	5.8	3.5	
19	4.4	2.6	
20	5.8	3.5	

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 \*\*\*\*\*PROJECT PASSES\*\*\*\*\*  
 \*NO EXCEEDANCES OF NAAQ STANDARDS AREPREDICTED\*