


**DRAFT**

**Air Quality Technical Memorandum**  
**Project Development and Environment (PD&E) Study**  
**Poinciana Parkway Extension from CR 532 to North of**  
**I-4/SR 429 Interchange**  
**Osceola and Polk Counties**  
**Financial Project No. 446581-1**  
**ETDM No. 14445**  
**November 2022**



Date: November 23, 2022  
To: Michael Leo, PE, FTE Project Manager  
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Transportation Specialist (RS&H, Inc.)  
Project: Poinciana Parkway Extension (SR 538) from CR 532 to North of I-4/SR 429  
Interchange  
Osceola and Polk Counties, Florida  
Financial Management Number: 446581-1  
Subject: Air Quality Technical Memorandum

## INTRODUCTION

The Florida Department of Transportation's (FDOT) Florida's Turnpike Enterprise is performing a Project Development and Environment (PD&E) Study to extend the Poinciana Parkway (SR 538) from County Road 532 (CR 532) to the Interstate 4 (I-4)/SR 429 interchange. The proposed improvements also include the modification of the I-4/SR 429 interchange to accommodate the Poinciana Parkway connection and increasing capacity of the segment of SR 429 from the I-4/SR 429 interchange to the SR 429/Sinclair Road interchange. The total project length is approximately four miles. The study area (see **Figure 1**) includes portions of Osceola and Polk Counties and extends from south of CR 532 to Sand Hill Road and along I-4, from east of CR 532 to west of World Drive.

Poinciana Parkway is part of a future limited access toll facility, often referred to as the "Southern Beltway". The Southern Beltway would provide a regional, limited access facility that connects I-4 on the west to the interchange of Boggy Creek Road/SR 417 on the east, a distance of approximately 50 miles. The westernmost portion of the Southern Beltway is referred to as the Poinciana Parkway.

The Poinciana Parkway currently terminates at the intersection of US 17/92 and CR 54. As part of a separate effort, the Poinciana Parkway is being extended approximately 1.75 miles north to CR 532. Therefore, this project would complete the remaining 2.5-mile gap in the Poinciana Parkway between CR 532 and I-4/SR 429.

As part of this PD&E Study, the project has been reviewed for air quality impacts consistent with the guidance provided by Federal Highway Administration (FHWA) as described in Part 2, Chapter 19 of the FDOT PD&E Manual entitled Air Quality (dated July 1, 2020). The purpose of this Technical Memorandum is to document the findings of the air quality analysis.

## Air Quality Analysis

The proposed project is located in Osceola and Polk Counties, Florida which are currently designated as being in attainment for the following criteria air pollutants: ozone, nitrogen dioxide, particulate matter (2.5 microns in size and 10 microns in size), lead, sulfur dioxide and carbon monoxide.

The Build and No Build Alternatives were subjected to a carbon monoxide (CO) screening model that makes various conservative worst-case assumptions related to site conditions, meteorology, and traffic. The FDOT's screening model, CO Florida 2012, uses the United States Environmental Protection Agency (USEPA) software [Motor Vehicle Emission Simulator (MOVES) version 2010a and CAL3QHC] to produce estimates of one-hour and eight-hour CO concentrations at default air quality receptor locations. The one-hour and eight-hour estimates can be directly compared to the one- and eight-hour National Ambient Air Quality Standards for CO that are 35 parts per million (ppm) and 9 ppm, respectively.

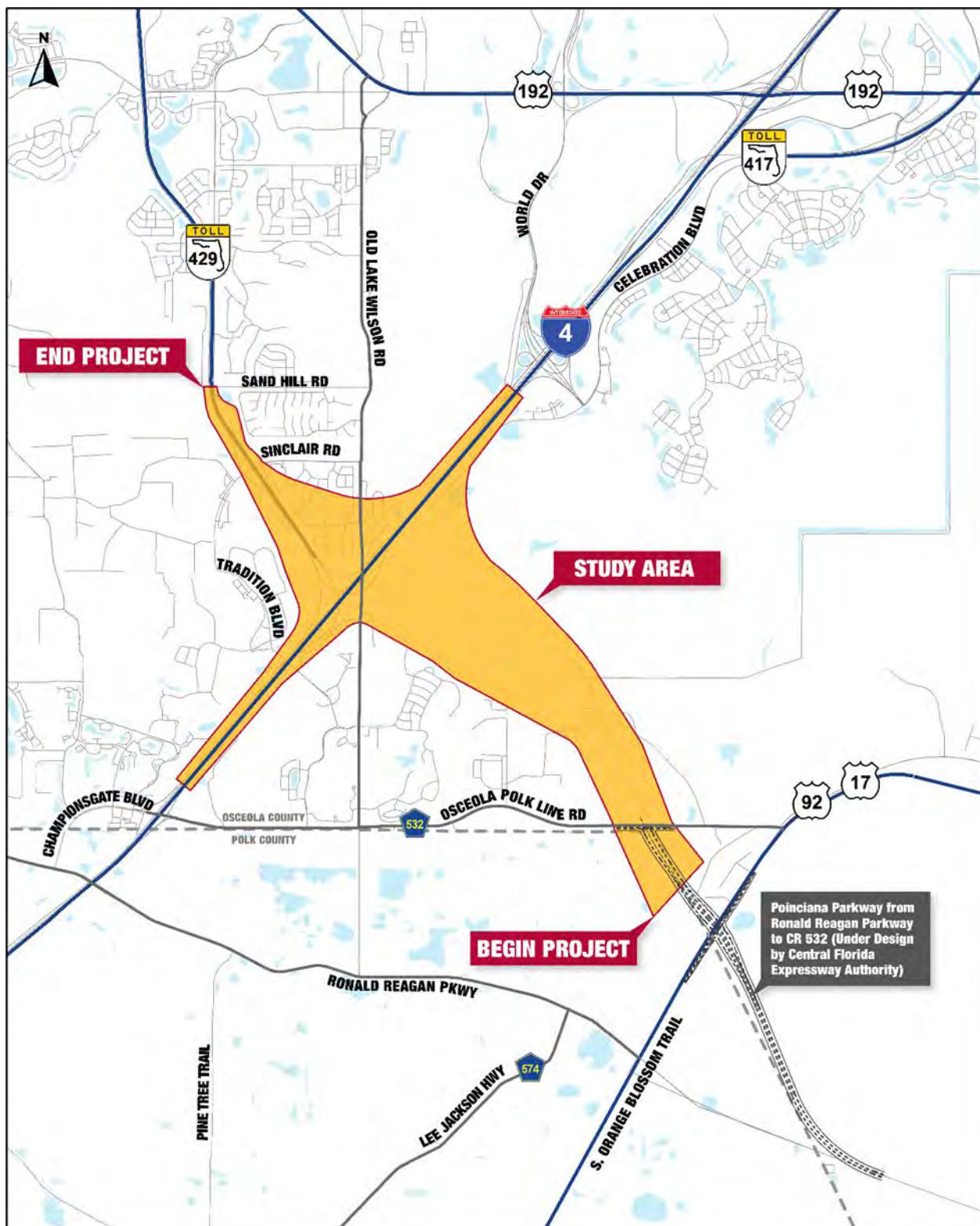
The highest total traffic volumes for the Build and No Build Alternatives are associated with the Western Beltway (SR 429) and I-4 interchange. Both the Build and No Build Alternatives were evaluated for the project's design year 2050. The traffic data used in this evaluation is provided in **Table 1**, which was developed from the Project Traffic Forecast Memorandum (PTFM) dated January 2021.

Estimates of CO were predicted for the default receptors that are located 10 feet to 150 feet from the edge of the roadway. The results of the screening test are summarized in **Table 2**. Only the maximum one-hour and eight-hour CO concentrations are presented in this table. The results of the screening model are included as an attachment to this memorandum. Based on the results from the screening model, the highest project-related CO one- and eight-hour levels are not predicted to meet or exceed the one- or eight-hour National Ambient Air Quality Standards for this pollutant with either the Build or No Build Alternatives. As such, the project "passes" the screening model.

The project is located in an area which is designated in attainment for CO Ambient Air Quality Standards under the criteria provided in the Clean Air Act. Therefore, the Clean Air Act conformity requirements as related to transportation improvements do not apply to the project.

Construction activities will cause short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to all applicable State and local regulations and to the FDOT Standard Specifications for Road and Bridge Construction.

**Figure 1: Project Location Map**



**Table 1: Traffic Data for Air Quality Analysis**

Roadway Type	Roadway Name	Roadway Segment	2050	
			Vehicles Per Hour	Cruise Speed (mph)
No Build Alternative				
North/South Freeway	Western Beltway (SR 429)	Northbound Approach	-	-
		Southbound Approach	4,780	65
East/West Freeway	I-4	Eastbound Approach	6,620	65
		Westbound Approach	6,260	65
Build Alternative				
North/South Freeway	Western Beltway (SR 429)/ Poinciana Pkwy. (SR 538)	Northbound Approach	1,810	65
		Southbound Approach	5,460	65
East/West Freeway	I-4	Eastbound Approach	6,180	65
		Westbound Approach	6,490	65

Source: Project Traffic Analysis Report (January 2021)

**Table 2: Predicted CO Concentrations**

Alternative	Design Year	Receptor Site Number(s)	Maximum One-Hour CO Concentration (ppm)	Maximum Eight-Hour CO Concentration (ppm)
Western Beltway (SR 429)/Poinciana Parkway (SR 538) and I-4 Interchange				
No Build	2050	6 & 16	10.2	6.1
Build	2050	6 & 16	10.1	6.1

Note: \* The predicted worst-case one-hour and eight-hour CO concentrations for the No Build and Build Alternatives are below the NAAQS of 35 ppm for one-hour concentrations and 9 ppm for eight-hour concentrations

## Mobile Source Air Toxics

For the preferred alternative analyzed in the State Environmental Impact Report (SEIR) for this PD&E Study, the amount of mobile source air toxics (MSAT) emitted would be proportional to the vehicle miles traveled (VMT), if other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative is slightly higher than that for the No Build Alternative because the additional capacity increases the efficiency of the roadway and may attract traffic from other facilities in the transportation network. Refer to **Table 3** Annual Average Daily Traffic (AADT) and VMT along the Western Beltway (SR 429)/Poinciana Parkway (SR 538).

An increase in VMT would lead to higher MSAT emissions for the preferred alternative along the Western Beltway (SR 429) corridor and the Poinciana Parkway (SR 538) extension, along with a corresponding decrease in MSAT emissions along the parallel routes. The increase is offset by lower MSAT emission rates due to increased speeds; according to the Environmental Protection Agency’s (EPA) MOVES2014a model, emissions of all priority MSAT decrease as speed increases. Also, emissions for the preferred build alternative will likely be lower than present levels in the design year because of EPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent between 2010 and 2050, as shown in **Figure 2**.

**Table 3: Annual Average Daily Traffic (AADT) and Vehicle Miles Traveled VMT along the Western Beltway (SR 429), Poinciana Parkway Ext. (SR 538)**

Location	No-Build	Build	Length (miles)*	No-Build	Build	% Change
	2050 AADT**			VMT		
I-4/SR 429/Poinciana Pkwy. (SR 538) to Sinclair Road	31,800	99,300	1.02	32,436	101,286	+212
I-4/SR 429/Poinciana Pkwy (SR 538) to CR 532	-	45,900	2.59	-	118,881	+100

\*Lengths were measured from the center of interchange to interchange / location

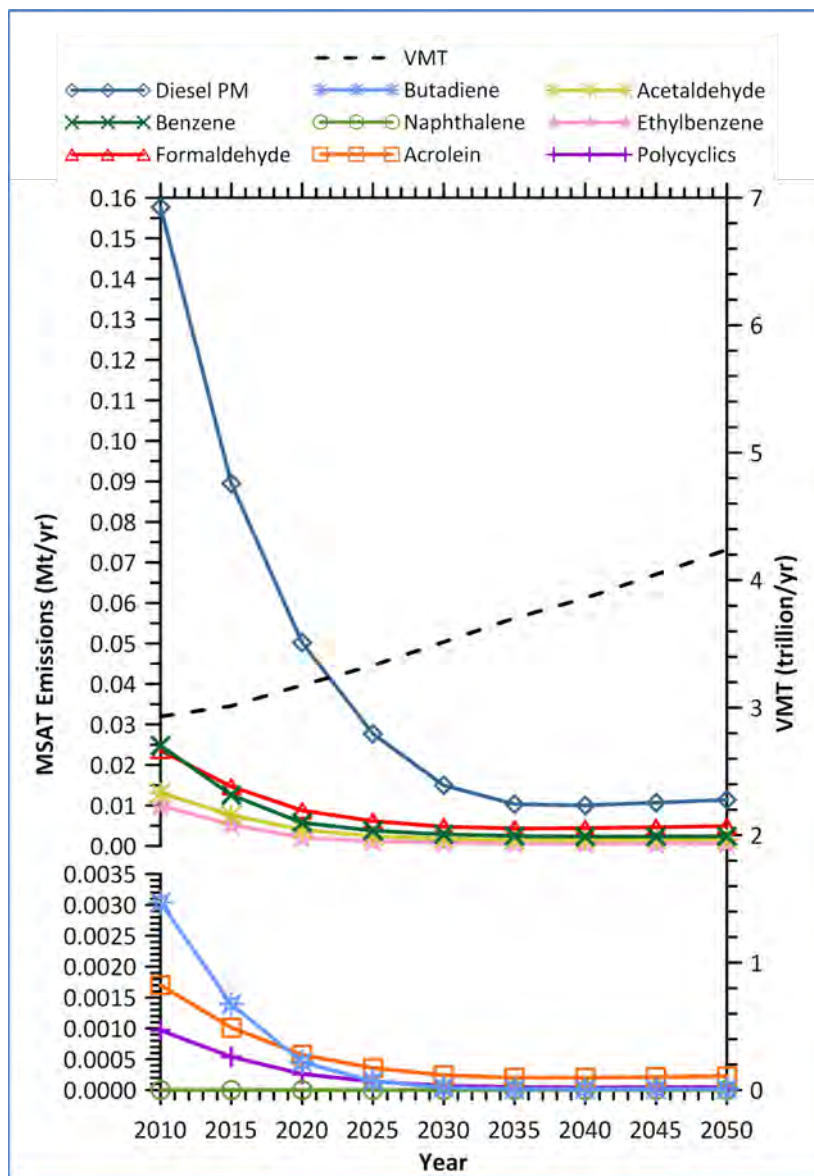
\*\*2050 AADT from the Preliminary Traffic Forecasting Memo dated January 2021.

Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is substantial (even after accounting for VMT growth) and should result in MSAT emissions in the project area to be lower in the future in nearly all cases.

The proposed improvements may have the effect of moving some traffic closer to nearby populated areas; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the Build Alternatives than the No-Build Alternative. However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot reliably be quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel

regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region wide MSAT levels to be significantly lower than today.

**Figure 2: FHWA Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways Using EPA’s MOVES2014a Model**



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**ATTACHMENTS**

**Air Quality Screening Results**

**CO Florida 2012**



CO Florida 2012 - Results  
 Thursday, November 10, 2022

Project Description

Project Title	Poinciana Parkway Extension		
Facility Name	I-4 @ SR 429 (Westren Beltway)/Poinciana Pkwy.		
User's Name	Mariano Berrios		
Run Name	2050 PM No-Build		
FDOT District	5		
Year	2050		
Intersection Type	E-W Diamond		
Speed	Arterial 65 mph	Freeway	65 mph
Approach Traffic	Arterial 6260 vph	Freeway	6620 vph

Environmental Data

Temperature	47.8 °F
Reid Vapor Pressure	13.3 psi
Land Use	Urban
Stability Class	D
Surface Roughness	175 cm
1 Hr. Background Concentration	5.0 ppm
8 Hr. Background Concentration	3.0 ppm

Results  
 (ppm, including background CO)

Receptor	Max 1-Hr	Max 8-Hr
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1	7.5	4.5
2	8.6	5.2
3	9.3	5.6
4	6.6	4.0
5	8.5	5.1
6	10.2	6.1
7	8.7	5.2
8	9.2	5.5
9	8.8	5.3
10	8.2	4.9
11	7.7	4.6
12	8.7	5.2
13	9.3	5.6
14	6.6	4.0
15	8.5	5.1
16	10.2	6.1
17	8.7	5.2
18	9.1	5.5
19	8.9	5.3
20	8.1	4.9

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 \*\*\*\*\*PROJECT PASSES\*\*\*\*\*  
 \*NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED\*  
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CO Florida 2012 - Results  
Thursday, November 10, 2022

Project Description

Project Title Poinciana Parkway Extension  
 Facility Name I-4 @ SR 429 (Westren Beltway)/Poinciana Pkwy.  
 User's Name Mariano Berrios  
 Run Name 2050 PM Build  
 FDOT District 5  
 Year 2050  
 Intersection Type E-W Diamond  
 Speed Arterial 65 mph Freeway 65 mph  
 Approach Traffic Arterial 5460 vph Freeway 6490 vph

Environmental Data

Temperature 47.8 °F  
 Reid Vapor Pressure 13.3 psi  
 Land Use Urban  
 Stability Class D  
 Surface Roughness 175 cm  
 1 Hr. Background Concentration 5.0 ppm  
 8 Hr. Background Concentration 3.0 ppm

Results

(ppm, including background CO)

Receptor	Max 1-Hr	Max 8-Hr
1	7.3	4.4
2	8.4	5.0
3	9.0	5.4
4	6.5	3.9
5	8.4	5.0
6	10.1	6.1
7	8.6	5.2
8	8.9	5.3
9	8.6	5.2
10	8.0	4.8
11	7.5	4.5
12	8.5	5.1
13	9.0	5.4
14	6.5	3.9
15	8.4	5.0
16	10.1	6.1
17	8.6	5.2
18	8.9	5.3
19	8.6	5.2
20	7.9	4.7

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