FINAL

Air Quality Technical Memo

State Road 414 Expressway Extension
Project Development and Environment Study
From US 441 to SR 434
Orange County and Seminole County, Florida

CFX Project Number: 414-227

Prepared for:
Central Florida Expressway Authority
4974 ORL Tower Road
Orlando, FL 32807

Submitted by:
Jacobs Engineering Group Inc.
200 S. Orange Ave., Suite 900
Orlando, FL 32801

MAY 2022

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

Acronyms and Abbreviations

CFX	Central Florida Expressway Authority
CO	Carbon monoxide
FDOT	Florida Department of Transportation
NAAQS	National Ambient Air Quality Standards
PD&E	Project Development and Environment
ppm	part(s) per million
SR 414	State Road 414
SR 434	State Road 434
US 441	U.S. Highway 441
USEPA	United States Environmental Protection Agency

Date: August 11, 2021

To: Sunserea Dalton, P.E., Project Manager, Jacobs

From: Wayne Arner, Environmental Scientist, Crawford, Murphy & Tilly, Inc.

Subject: State Road 414 Expressway Extension from U.S. Highway 441 to State Road 434
Project Development and Environment Study
Orange County and Seminole County, Florida
Central Florida Expressway Authority Project Number: 414-227
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The subject project is located in both Orange County and Seminole County, Florida (**Figure 1**), and within an area currently designated by the U.S. Environmental Protection Agency as being in an attainment area for all of the pollutants for which there are National Ambient Air Quality Standards—carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. As such, the proposed project is not expected to create adverse impacts on air quality and a project level air quality analysis is generally not warranted. Nevertheless, a project level screening analysis was performed for CO because CO is the most prevalent emission from motor vehicles.

The project alternatives (i.e., Preferred and No-Build) were subjected to the Florida Department of Transportation's CO screening model (CO Florida 2012) which makes various conservative worst-case assumptions related to site conditions, meteorology and traffic. CO Florida 2012 uses the latest USEPA-approved software to produce estimates of one-hour and eight-hour average CO concentrations at default air quality receptors located from 10 feet to 150 feet along the edge of an intersection approach leg(s). The one-hour and eight-hour estimates are then directly compared to the NAAQS for CO (35 and 9 parts per million, respectively).

The CO screening model was used to evaluate the design year (year 2045) for the proposed project. Since motor vehicle CO emission rates are highest when vehicles are idling and accelerating, and lowest when vehicles are free-flowing, the highest concentrations of motor vehicle-related CO are likely to occur near intersections. Note that under the Preferred Alternative, some of the traffic volume along Maitland Boulevard is diverted to the elevated expressway, which is under free-flowing conditions and located farther away from ground level receptors and was not included in the analysis. With both the Preferred and No-Build alternatives, the intersection forecasted to have the highest approach traffic volume is the SR 414 and Gateway Drive intersection. Because this intersection is forecasted to have the highest traffic volume, the screening model results for the intersection can be considered worst-case.

The traffic data and the CO Florida 2012 output are provided in attachments to this memorandum. Based on the results, the highest predicted CO one- and eight-hour concentrations would not exceed the NAAQS for this pollutant regardless of alternative (**Table 1**). Therefore, the project "passes" the screening test.

Table 1. Intersection CO Screening Results

Alternative	Maximum CO Levels (ppm)		Passes Screening Test?
	NAAQS One-Hour/ Project One-Hour	NAAQS Eight-Hour/ Project Eight-Hour	
No-Build	35/8	9/5	Yes
Preferred	35/7	9/4	Yes

This project is not expected to create adverse impacts on air quality because the project area is an attainment area for all pollutants for which there are NAAQS. Because the project is in an attainment area, the Clean Air Act State Implementation Plan conformity requirements are not applicable. Additionally, because the proposed project is expected to improve capacity which would reduce delay and congestion, it is anticipated that the project would reduce air pollutant emissions within the study area.

Construction Impacts

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

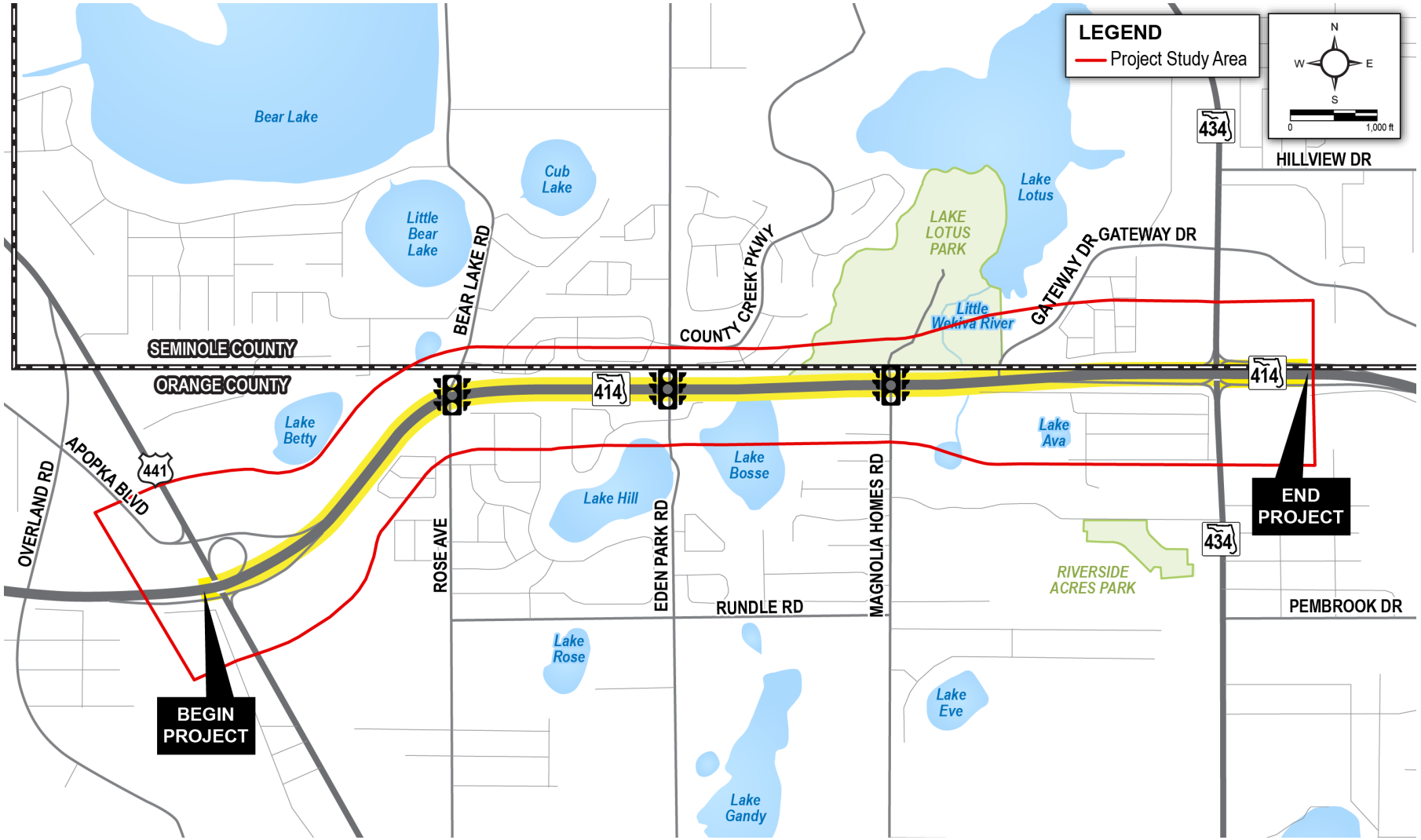

Figure 1. Project Location Map

Attachments

1. Traffic Data for Air Quality Analysis
2. CO Florida 2012 Output File - No-Build
3. CO Florida 2012 Output File - Preferred

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TRAFFIC DATA FOR AIR QUALITY ANALYSIS

650-050-36
Environmental Management
07/20

Date: 3/5/2021 Prepared by: _____

Financial Management Number(s): CFX Project No. 414-227

Federal Aid Number(s): _____

Project Description: SR 414 Expressway Extension

NOTE: Traffic data should be provided for the intersection that is forecast to have the highest total approach traffic volume. The intersection may not be the same for the Build and No-Build alternatives. The number of lanes should be the number of intersection approach through lanes. The traffic volumes should be representative of vehicles per hour (vph) and vehicle speeds should be representative of posted speeds if intersection approach speeds are unknown. This traffic data sheet was prepared to assist in obtaining appropriate traffic data for the FDOT CO Florida 2012 Intersection Screening Model. Additional traffic data is required for interchanges (see CO Florida 2012 User's Guide).

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Design Year: 2045

Intersections: Build Gateway Drive at SR 414 (Maitland Blvd.)

No-Build Gateway Drive at SR 414 (Maitland Blvd.)

Land Use: Urban ☒ Suburban ☐ Rural ☐

	EB			WB			NB			SB		
Intersection/Ramps	No. of Lanes	VPH	Speed	No. of Lanes	VPH	Speed	No. of Lanes	VPH	Speed	No. of Lanes	VPH	Speed
Build	2	2405	45	2	1310	45	0	0	0	1	210	30
No-Build	3	4220	45	3	2325	45	0	0	0	1	100	30

CO Florida 2012 - Results
Thursday, March 25, 2021

Project Description

Project Title	CFX Proj No. 414-227 SR 414 Expy
Facility Name	SR 414 - Gateway Drive
User's Name	L Baumaister CMT
Run Name	No Build
FDOT District	5
Year	2045
Intersection Type	North Tee
Speed	Arterial 30 mph
Approach Traffic	Arterial 4220 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	6.3	3.8
2	6.8	4.1
3	7.4	4.4
4	7.1	4.3
5	6.9	4.1
6	7.4	4.4
7	7.4	4.4
8	7.5	4.5
9	7.5	4.5
10	7.1	4.3
11	7.0	4.2
12	7.0	4.2
13	7.3	4.4
14	7.4	4.4
15	7.7	4.6
16	6.8	4.1
17	6.4	3.8

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**********PROJECT PASSES**********
NO EXCEEDANCES OF NAAQ STANDARDS ARE PREDICTED
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CO Florida 2012 - Results
Thursday, March 25, 2021

Project Description

Project Title	CFX Proj No. 414-227 SR 414 Expy
Facility Name	SR 414 - Gateway Drive
User's Name	L Baumaister CMT
Run Name	Build
FDOT District	5
Year	2045
Intersection Type	North Tee
Speed	Arterial 30 mph
Approach Traffic	Arterial 2405 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	5.8	3.5
2	6.0	3.6
3	6.5	3.9
4	6.2	3.7
5	6.1	3.7
6	6.4	3.8
7	6.4	3.8
8	6.5	3.9
9	6.4	3.8
10	6.3	3.8
11	6.2	3.7
12	6.2	3.7
13	6.3	3.8
14	6.4	3.8
15	6.6	4.0
16	6.1	3.7
17	5.8	3.5

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