



**State Road 46 Widening from East of State Road 415 to County Road 426
Seminole County, Florida**

Project Development and Environmental Study

AIR QUALITY TECHNICAL MEMORANDUM

**Financial Project ID: 240216-4-28-01
Federal Aid Project Number: TCSP-045-U**

Prepared For

Seminole County, Florida

and

Florida Department of Transportation, District 5

Prepared by



November 11, 2013

AIR QUALITY TECHNICAL MEMORANDUM

Date: November 11, 2013

To: Seminole County and Florida Department of Transportation, District Five

From: Kathleen Hale, Environmental Management & Design, Inc.

Subject: **AIR QUALITY SCREENING TEST**

Project Development and Environment (PD&E) Study

SR 46 from SR 415 to CR 426

Seminole County, Florida

Financial Project ID No.: 240216-4-28-01

Federal Aid Project No.: TCSP-045-U

Seminole County, in consultation with the Florida Department of Transportation, is conducting a Project Development and Environment (PD&E) study to evaluate possible alternative improvements to widen 7.4 miles of State Road 46 (SR 46) from east of State Road 415 (SR 415) to County Road 426 (CR 426). SR 46 is an integral component of Central Florida's transportation and evacuation system that traverses Lake, Seminole, and Brevard Counties with interchanges at I-4 and I-95. The proposed Build alternatives include a roadway widening from a two-lane undivided roadway to a four-lane divided roadway. Current land uses within the project area include commercial, institutional (churches), agricultural, recreational, conservation, and scattered residences.

SR 46 is located in Seminole County, an area currently designated as being in attainment for all of the *National Ambient Air Quality Standards* (NAAQS) under the criteria provided in the *Clean Air Act*. Therefore, the *Clean Air Act* conformity requirements do not apply to the project.

The project alternatives were subjected to a carbon monoxide (CO) screening model that makes various conservative worst-case assumptions related to site conditions, meteorology, traffic, and receptor locations. The Florida Department of Transportation's screening model, COFlorida 2012 (version 1.01 January 9, 2012), uses the latest versions of the U.S. Environmental Protection Agency-approved software for detailed mobile source air quality modeling (**MOVES2010a**) for emissions and **CAL3QHC2** for dispersion 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 **NAAQS** for CO which are 35 parts per million (ppm) and 9 parts per million (ppm), respectively.

The two roadway intersections forecasted to have the highest total approach traffic volumes were SR 46 at SR 415 and SR 46 at CR 426. These intersections were evaluated as a worst-case scenario. The Build and No Build alternatives for both the opening year (2015) and the design year (2035) were evaluated. The traffic data input used in the evaluation is attached to this memorandum.

The default environmental data for central Florida was used for the screening test. The land use was evaluated as suburban for SR 46 at SR 415 and urban for SR 46 at CR 426. All predicted CO concentrations included a background of 3.3 ppm for a one-hour averaging time and 2.0 ppm for an eight-hour averaging time for suburban and 5.0 ppm for a one-hour averaging time and 3.0 ppm for an eight-hour averaging time for urban.

Estimates of CO were predicted for 20 default receptors that are located very close to the intersection and that provide a comprehensive 360° representation of potential near-road CO concentrations. Based on the results from the screening model, the highest project-related CO one- and eight-hour levels are not predicted to exceed the one- or eight-hour NAAQS for this pollutant with either the No Build or Build alternative. As such, the project “passes” the screening model. The results of the screening model are attached to this memorandum.

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

TRAFFIC DATA FOR AIR QUALITY ANALYSIS

Financial Project ID No.: 240216-4-28-01
 Federal Aid Project No.: TCSP-045-U
 Project Description: Project Development and Environment (PD&E) Study
 SR 46 from SR 415 to CR 426
 Seminole County, Florida

Traffic Data for SR 46 and SR 415

Year	Project Alternative	Roadway Segment (# of lanes)	Design Hour Intersection Approach Volume (PM)	Intersection Approach Speed (miles per hour)
Opening Year (2015)	No Build	SR 46 Eastbound (1 lane)	663	35
		SR 46 Westbound (1 lane)	588	35
		SR 415 Northbound (1 lane)	775	35
		SR 415 Southbound (1 lane)	722	35
	Build	SR 46 Eastbound (2 lanes)	706	35
		SR 46 Westbound (2 lanes)	626	35
		SR 415 Northbound (2 lanes)	768	35
		SR 415 Southbound (2 lanes)	722	35
Design Year (2035)	No Build	SR 46 Eastbound (1 lane)	1,478	35
		SR 46 Westbound (1 lane)	1,311	35
		SR 415 Northbound (1 lane)	1,467	35
		SR 415 Southbound (1 lane)	1,331	35
	Build	SR 46 Eastbound (2 lanes)	1,742	35
		SR 46 Westbound (2 lanes)	1,544	35
		SR 415 Northbound (2 lanes)	1,474	35
		SR 415 Southbound (2 lanes)	1,336	35

Source: Intersection Volumes and Speeds from GMB Engineers & Planners, Inc. (February 20, 2012)

Traffic Data for SR 46 and CR 426

Year	Project Alternative	Roadway Segment (# of lanes)	Design Hour Intersection Approach Volume (AM)	Intersection Approach Speed (miles per hour)
Opening Year (2015)	No Build	SR 46 Eastbound (1 lane)	549	35
		SR 46 Westbound (1 lane)	325	35
		CR 426 Northbound (1 lane)	569	25
		CR 426 Southbound (1 lane)	148	25
	Build	SR 46 Eastbound (2 lanes)	583	35
		SR 46 Westbound (2 lanes)	342	35
		CR 426 Northbound (1 lane)	579	25
		CR 426 Southbound (1 lane)	145	25
Design Year (2035)	No Build	SR 46 Eastbound (1 lane)	1,216	35
		SR 46 Westbound (1 lane)	720	35
		CR 426 Northbound (1 lane)	1,045	25
		CR 426 Southbound (1 lane)	198	25
	Build	SR 46 Eastbound (2 lanes)	1,431	35
		SR 46 Westbound (2 lanes)	847	35
		CR 426 Northbound (1 lane)	1,148	25
		CR 426 Southbound (1 lane)	198	25

Source: Intersection Volumes and Speeds from GMB Engineers & Planners, Inc. (February 20, 2012)

AIR QUALITY SCREENING MODEL RESULTS
COFlorida 2012

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at CR426-Opening Year 2015 No Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at CR426 2015 No Build
FDOT District 5
Year 2015
Intersection Type 4 X 4
Speed Arterial 25 mph
Approach Traffic Arterial 569 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	5.4	3.2
2	5.7	3.4
3	5.9	3.5
4	5.9	3.5
5	5.5	3.3
6	5.3	3.2
7	5.6	3.4
8	5.9	3.5
9	5.9	3.5
10	5.5	3.3
11	5.3	3.2
12	5.7	3.4
13	6.0	3.6
14	5.9	3.5
15	5.5	3.3
16	5.4	3.2
17	5.7	3.4
18	6.0	3.6
19	5.9	3.5
20	5.4	3.2

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at CR426-Opening Year 2015 Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at CR426 2015 Build
FDOT District 5
Year 2015
Intersection Type 4 X 4
Speed Arterial 25 mph
Approach Traffic Arterial 583 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	5.4	3.2
2	5.7	3.4
3	5.9	3.5
4	5.9	3.5
5	5.5	3.3
6	5.4	3.2
7	5.6	3.4
8	5.9	3.5
9	5.9	3.5
10	5.5	3.3
11	5.4	3.2
12	5.7	3.4
13	6.0	3.6
14	5.9	3.5
15	5.5	3.3
16	5.4	3.2
17	5.7	3.4
18	6.0	3.6
19	5.9	3.5
20	5.4	3.2

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at CR426-Design Year 2035 No Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at CR426 2035 No Build
FDOT District 5
Year 2035
Intersection Type 4 X 4
Speed Arterial 25 mph
Approach Traffic Arterial 1216 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	5.5	3.3
2	5.6	3.4
3	5.9	3.5
4	5.7	3.4
5	5.6	3.4
6	5.5	3.3
7	5.6	3.4
8	5.9	3.5
9	5.7	3.4
10	5.6	3.4
11	5.5	3.3
12	5.7	3.4
13	5.9	3.5
14	5.7	3.4
15	5.6	3.4
16	5.5	3.3
17	5.7	3.4
18	5.9	3.5
19	5.7	3.4
20	5.6	3.4

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at CR426-Design Year 2035 Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at CR426 2035 Build
FDOT District 5
Year 2035
Intersection Type 4 X 4
Speed Arterial 25 mph
Approach Traffic Arterial 1431 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	5.6	3.4
2	5.8	3.5
3	6.1	3.7
4	5.8	3.5
5	5.8	3.5
6	5.6	3.4
7	5.8	3.5
8	6.1	3.7
9	5.8	3.5
10	5.8	3.5
11	5.6	3.4
12	5.8	3.5
13	6.1	3.7
14	5.8	3.5
15	5.8	3.5
16	5.6	3.4
17	5.9	3.5
18	6.1	3.7
19	5.9	3.5
20	5.8	3.5

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at SR415-Opening Year 2015 No Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at SR 415 2015 No Build
FDOT District 5
Year 2015
Intersection Type 4 X 4
Speed Arterial 35 mph
Approach Traffic Arterial 775 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	4.1	2.5
2	4.2	2.5
3	4.6	2.8
4	4.2	2.5
5	4.3	2.6
6	4.2	2.5
7	4.2	2.5
8	4.6	2.8
9	4.2	2.5
10	4.3	2.6
11	4.2	2.5
12	4.2	2.5
13	4.6	2.8
14	4.3	2.6
15	4.3	2.6
16	4.2	2.5
17	4.3	2.6
18	4.7	2.8
19	4.3	2.6
20	4.1	2.5

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at SR415-Opening Year 2015 Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at SR 415 2015 Build
FDOT District 5
Year 2015
Intersection Type 4 X 4
Speed Arterial 35 mph
Approach Traffic Arterial 768 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	4.1	2.5
2	4.2	2.5
3	4.5	2.7
4	4.2	2.5
5	4.3	2.6
6	4.2	2.5
7	4.2	2.5
8	4.5	2.7
9	4.2	2.5
10	4.3	2.6
11	4.1	2.5
12	4.2	2.5
13	4.5	2.7
14	4.3	2.6
15	4.3	2.6
16	4.1	2.5
17	4.3	2.6
18	4.6	2.8
19	4.3	2.6
20	4.1	2.5

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at SR415-Design Year 2035 No Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at SR 415 2035 No Build
FDOT District 5
Year 2035
Intersection Type 4 X 4
Speed Arterial 35 mph
Approach Traffic Arterial 1478 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	4.3	2.6
2	4.6	2.8
3	4.7	2.8
4	4.5	2.7
5	4.2	2.5
6	4.3	2.6
7	4.6	2.8
8	4.6	2.8
9	4.5	2.7
10	4.2	2.5
11	4.3	2.6
12	4.6	2.8
13	4.7	2.8
14	4.5	2.7
15	4.2	2.5
16	4.3	2.6
17	4.7	2.8
18	4.6	2.8
19	4.6	2.8
20	4.2	2.5

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

CO Florida 2012 - Results
Monday, November 11, 2013

Project Description

Project Title SR46 at SR415-Design Year 2035 Build
Facility Name SR46 from SR415 to CR426
User's Name Kathy Hale
Run Name SR46 at SR 415 2035 Build
FDOT District 5
Year 2035
Intersection Type 4 X 4
Speed Arterial 35 mph
Approach Traffic Arterial 1742 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	4.5	2.7
2	4.7	2.8
3	5.0	3.0
4	4.6	2.8
5	4.5	2.7
6	4.5	2.7
7	4.7	2.8
8	4.9	2.9
9	4.6	2.8
10	4.5	2.7
11	4.5	2.7
12	4.7	2.8
13	5.0	3.0
14	4.6	2.8
15	4.5	2.7
16	4.5	2.7
17	4.8	2.9
18	4.9	2.9
19	4.7	2.8
20	4.5	2.7

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