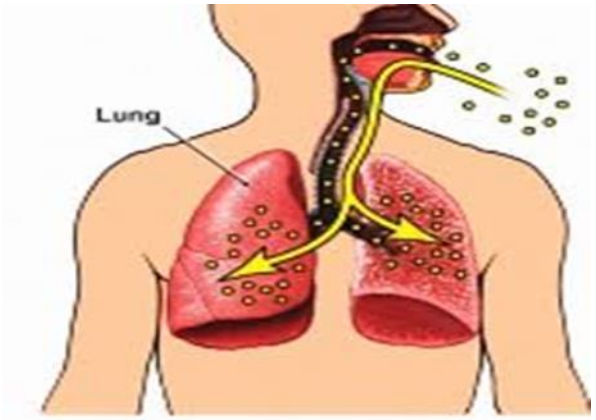
Air Quality



The environmental review, consultation, and other actions required by applicable federal environmental laws described in this training are carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 executed by FHWA and FDOT.

History of U.S. Clean Air Legislation

- Clean Air Act of 1967 focused on technical information associated with air pollution, including research, grants, and interstate air pollution
- Clean Air Act of 1970 established the National Ambient Air Quality Standards (NAAQS). Also required states to prepare and implement state implementation plans (SIPs) to show how they could achieve the NAAQS.
- Clean Air Act Amendments of 1990 included:
  - Strategies to achieve and maintain the NAAQS,
  - Approaches to reduce air pollutants from mobile sources,
  - Enforcement sanctions for not achieving and maintaining the NAAQS

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Environmental Protection Agency (EPA)

- Key Role – Establishing new or revising existing NAAQS
- EPA in 1970 established NAAQS for six criteria pollutants:
  - ozone,
  - nitrogen dioxide,
  - particulate matter,
  - sulfur oxides,
  - carbon monoxide, and
  - lead.
- NAAQS have been reviewed and updated by EPA since 1970 with the most recent changes to the 8-hour ozone standard.

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National Ambient Air Quality Standards (NAAQS)

- EPA must designate areas as meeting (attainment) or not meeting (nonattainment) the NAAQS.
- Clean Air Act requires states to develop a general plan to meet the NAAQS. This plan is also known as a state implementation plan or SIP.
- Each NAAQS is concentration based and has one or more averaging times.
- Primary standards protect public health. Secondary standards protect public welfare by protecting against decreased visibility, crop damage, and affects on the built environment.

Table of National Ambient Air Quality Standards

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

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NAAQS Designations

- All areas of U.S. are designated with respect to each NAAQS as:
  - ✓Attainment – air quality better than the NAAQS,
  - ✓Non-attainment – air quality worse than the NAAQS,
  - ✓Maintenance – non-attainment areas redesignated as attainment (all areas of Florida have been redesignated as attainment)
  - ✓Unclassifiable – no data to make a designation, but typically treated as attainment areas for conformity purposes.
- EPA Green Book lists the attainment/nonattainment status of all areas of the U.S. and is available at: https://www.epa.gov/green-book

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State Implementation Plans (SIPs)

- SIPs are prepared for all areas designated non-attainment or maintenance.
- SIPs not prepared for attainment or unclassified areas.
- Two main purposes of SIPs:

1) Demonstrate that the state has the basic air quality management program in place to implement the new or revised NAAQS
2) Identify the emission control requirements the state will rely on to attain or maintain the NAAQS

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Project Specific Air Quality Analysis

Air Pollutants in FDOT Documents

- Nitrogen Dioxide – not analyzed
- Sulfur Dioxide – not analyzed
- Lead – not analyzed
- Ozone – not analyzed on an individual project basis; since ozone is an area-wide pollutant, its only analyzed regionally and then only within a designated ozone non-attainment or maintenance area
- Carbon Monoxide – analyzed for most projects
- Particulate Matter – not required because Florida conforms to the PM NAAQS
- Greenhouse Gases – discussion includes standard FDOT text

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Carbon Monoxide Modeling

- Goal – Determine whether the project would cause or contribute to violations of the national 1-hour (35 ppm) or 8-hour (9 ppm) ambient air quality standards.
- Levels of CO tend to be highest immediately adjacent to roadways and intersections. Therefore FDOT evaluates levels of this pollutant for all projects.

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Particulate Matter

- Construction activities generate dust from earthwork and mobiles sources traveling on unpaved roads. Minimized by adherence to all applicable state and local regulations and to FDOT standard Specifications for Road and Bridge Construction.
- All areas of Florida are currently attainment for the national $PM_{2.5}$ and PM_{10} ambient air quality standards. Consequently, quantitative analysis of $PM_{2.5}$ and PM_{10} concentrations resulting from transportation projects is not required in Florida.
- Quantitative modeling only needed if EPA were to declare Florida (or a portion thereof) as nonattainment for PM_{10} or $PM_{2.5}$.

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State Environmental Impact Reports (SEIR)

- If an air quality analysis is performed, the results are included in the Environmental Analysis Section of the SEIR.

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