



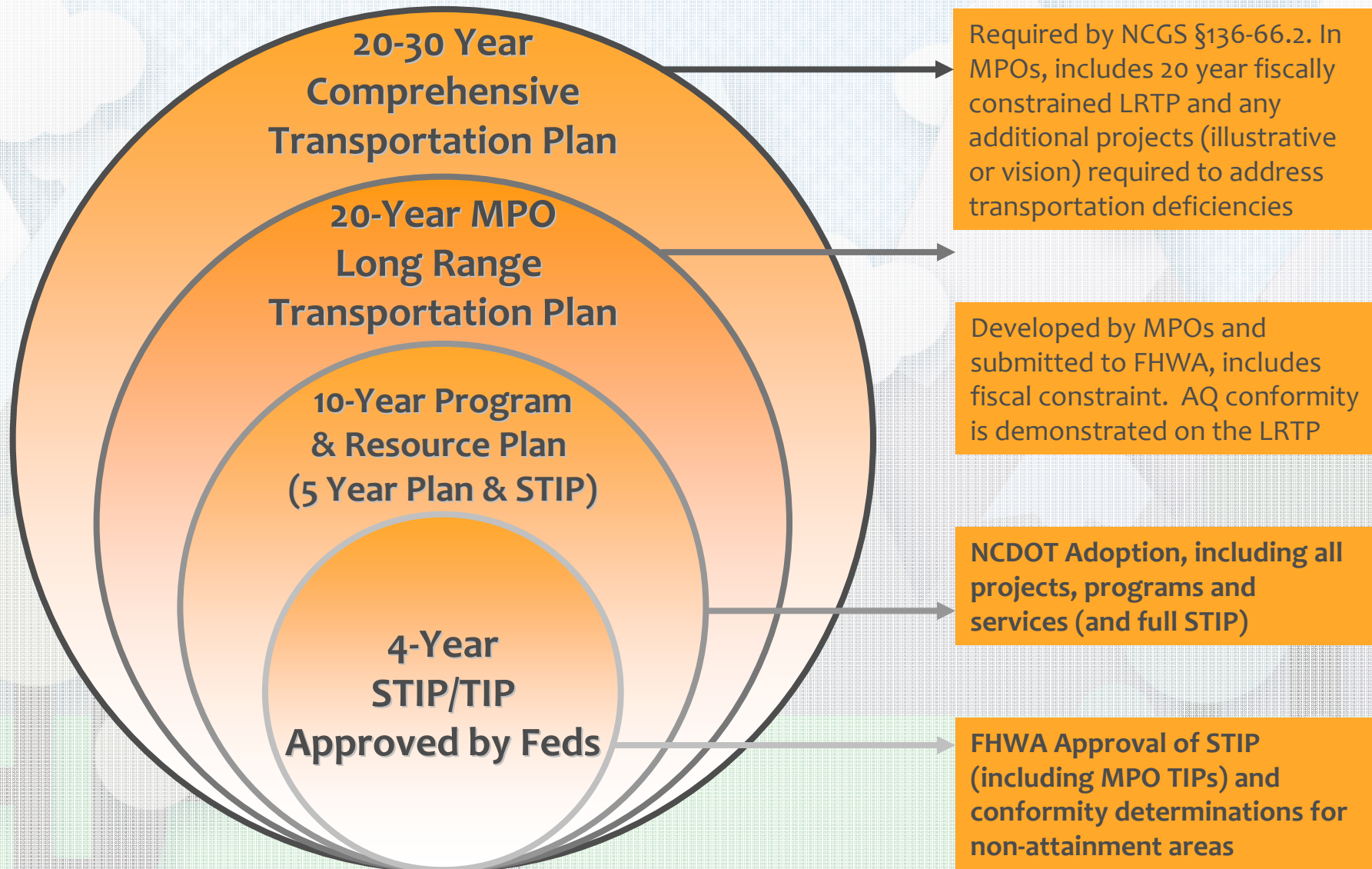
Air Quality  
&  
Transportation  
Conformity  
in  
North Carolina

# Agenda

- **Transportation Planning Framework**
- **Air Quality Background**
- **Conformity Basics**
- **Conformity Process**
- **Review**

***Please ask any questions along the way!***

# Transportation Planning Framework



# Air Quality Background



# Why Do We Care About Air Quality?

- **The Clean Air Act (CAA)**

- Sets the framework and goals for improving air quality to protect public health
- Sets provisions for the attainment and maintenance of **National Ambient Air Quality Standards (NAAQS)**
- Ensures that the **State Implementation Plan (SIP)** meets goals to protect human health, coordinates transportation and air quality planning processes and improves data and planning assumptions

# NAAQS

- Set for **criteria pollutants** - those that adversely affect human health and safety
- Set at levels to ensure adequate protection of the public
- In NC, criteria pollutants are ozone ( $O_3$ ), carbon monoxide (CO) and particulate matter ( $PM_{2.5}$ )

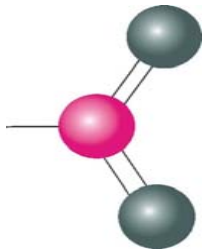
## More on Criteria Pollutants...

- Ozone
  - Occurs naturally in the presence of “precursors” and sunlight
    - Highest in the summer
    - Power plants and motor vehicles are primary man-made source of precursors
  - Causes lung irritation at higher concentrations
  - Ozone is beneficial in the stratosphere where it blocks UV rays

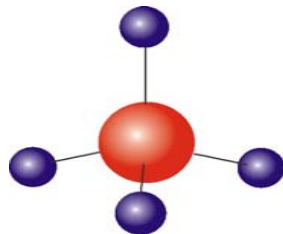
# More on Criteria Pollutants...

## How is ground-level ozone formed?

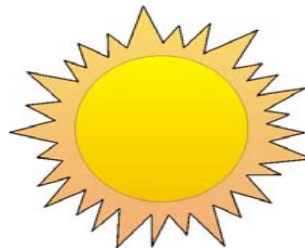
Oxides of Nitrogen (NO<sub>x</sub>)



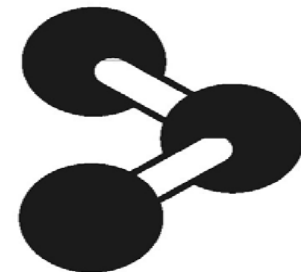
- AND -



Volatile Organic  
Compounds (VOCs)



Strong Spring or Summer Sun  
(with low RH & light winds)



Ozone (O<sub>3</sub>)

# More on Criteria Pollutants...

- **Ozone**

- Current standard

- Eight-hour standard set at 0.08 ppm
    - If a monitored design value is  $> 0.08$  ppm (84 ppb), that monitor is violating the standard
      - The design value is defined as:
        - » 3-year average of the annual 4<sup>th</sup> highest daily maximum 8-hour average

- Revised Eight-hour standard

- Primary Standard (0.060-0.070) ppm
    - Secondary Standard (7-15) ppm-hours
      - Protect the environment (plants & trees)
    - EPA will finalize the standard by **10/31/10**
    - EPA will make designations by **5/12/11**
    - Transportation conformity will be due by **5/12/12**
    - Tougher standard

## More on Criteria Pollutants...

- **Carbon Monoxide**

- Is a colorless, odorless gas formed when carbon in fuel is not burned completely
- Is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide
- Highest levels air typically occur during the colder months of the year when air pollution becomes trapped near the ground beneath a layer of warm air

# More on Criteria Pollutants...

- **Particulate Matter (PM<sub>2.5</sub>)**

- Is a complex mixture of extremely small particles and liquid droplets made up of a number of components, such as acids, organic chemicals, metals, and soil or dust particles
- The size of particles is directly linked to their potential for causing health problems
  - Can pass through the throat and nose and enter the lungs
- For transportation conformity in NC, concerned with fine particles that are 2.5 micrometers in diameter and smaller

# More on Criteria Pollutants...

- **Sources of Pollutants**

- Point (e.g., electric utilities, refineries, etc.)
- Area (e.g., dry cleaners, paints, solvents, etc.)
- Mobile (e.g., cars, trucks, construction equipment, etc.)
- On-Road (Cars, trucks, buses)
- Non-Road (Airplanes, trains, construction equipment)
- Biogenic (e.g., trees, vegetation, soils)

# State Implementation Plan (SIP)

- An air quality plan that shows how an area will meet the NAAQS
- Required by the CAA for nonattainment or maintenance areas of one or more NAAQS
- Prepared by the NC Division of Air Quality and approved by EPA
- Prepared within 3 years after the effective date of a nonattainment designation
- Provide for the implementation and enforcement of emission control measures from all source categories

# State Implementation Plan (SIP)

- Contain an emissions inventory used to establish an emissions “budget” for each pollutant
  - Not all nonattainment / maintenance areas are required to have budgets
  - Budget must be determined “adequate” or approved by EPA
  - Motor vehicle emissions budgets act as the upper limit for pollutant emissions
    - **Conformity** is demonstrated using the motor vehicle emissions budgets
- Contain control measures / strategies to reduce emissions as necessary to attain or maintain standard

# Conformity Basics

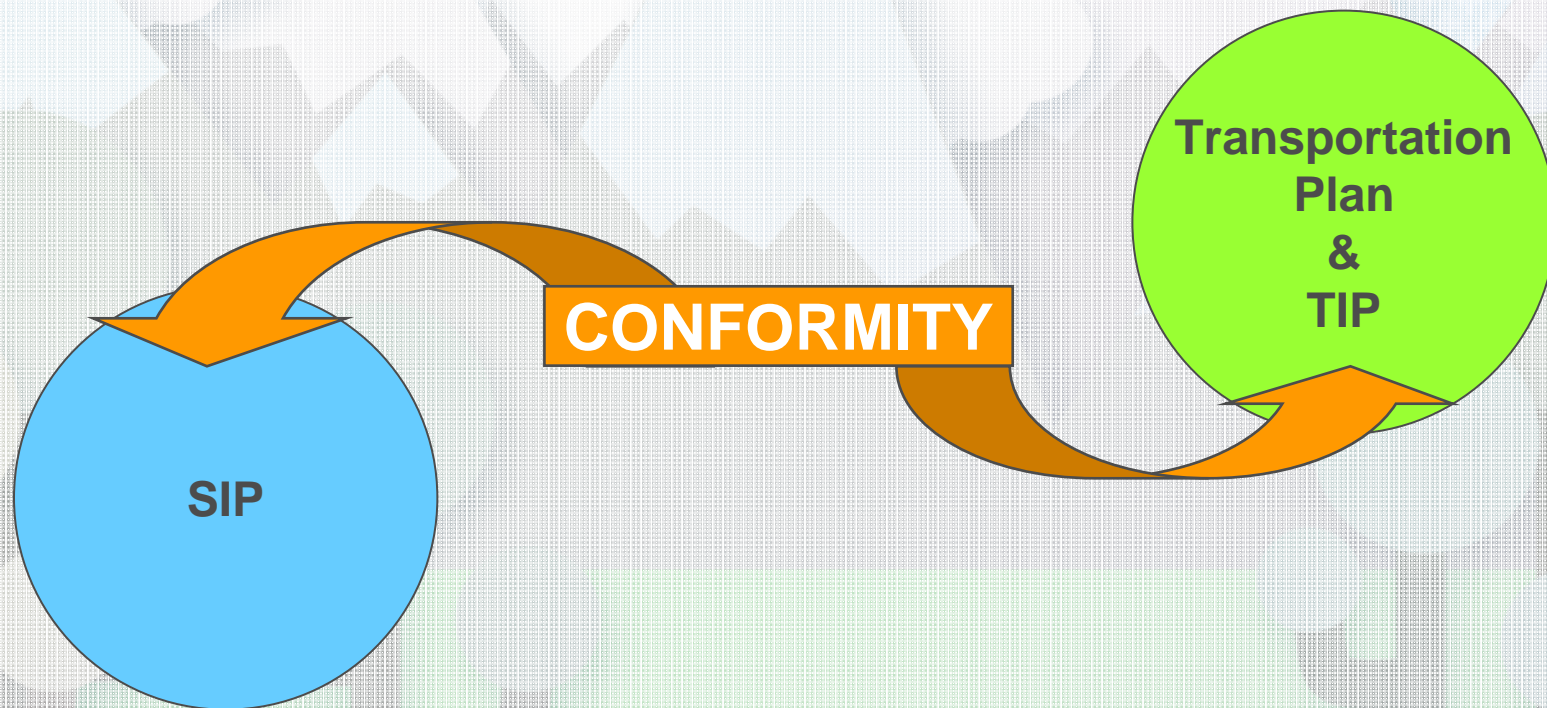


# What is Transportation Conformity?

- It's how we ensure that Federal funding and approval goes to transportation activities that are consistent with air quality (AQ) goals
- It applies in areas where transportation-related pollutants:
  - Are currently violating the NAAQS
  - Have violated the NAAQS in the past
- It's a way to meet CAA requirements and ensure that transportation plans, programs and projects do not:
  - Create new violations of the NAAQS
  - Increase the frequency or severity of NAAQS violations
  - Delay timely attainment of the NAAQS

# Transportation Conformity...

- Connects air quality and transportation planning



# Transportation Conformity...

- Applies to
  - Long Range Transportation Plans (LRTPs)
  - Transportation Improvement Programs (TIPs)
  - Projects funded by FHWA or FTA in nonattainment or maintenance areas

# How often are conformity determinations required?

- For existing non-attainment or maintenance areas:
  - Every four years
  - Whenever an LRTP or TIP is updated
- For newly designated areas:
  - Within one year after the effective date of designation

# Who Makes a Conformity Determination?

- Metropolitan Planning Organizations (MPOs)
  - In metropolitan areas
- North Carolina Department of Transportation (NCDOT)
  - Areas outside of MPOs called Donut Areas

# Who Else is Involved in the Conformity Process?

- Interagency consultation process involves many groups:
  - EPA
  - FHWA
  - FTA
  - NCDOT
  - MPOs & RPOs
  - NCDAQ
  - Other Local Transportation or Air Quality Agencies

# How is conformity determined?

- Regional emissions analysis
  - Performed to show that the transportation plans/TIPs are consistent with the SIP motor vehicle emissions budgets
  - Projected regional emissions are estimated based on highway and transit usage according to LRTPs and TIPs
  - Projected emissions are compared to limits set in the budgets for each criteria pollutant and must not exceed those limits
  - Must include all **regionally significant projects** and Federally-funded projects

# How is conformity determined?

- Regionally significant projects
  - Transportation projects that serve regional transportation needs
    - Major activity centers
    - Major planned developments
    - New retail malls
    - Sports complexes
    - Transportation terminals
    - Principal arterials
    - All fixed guideway transit facilities
  - The MPO/RPO/NCDOT determines what projects are regionally significant
  - The interagency consultation partners review the list and negotiate agreement on list of regionally significant projects

# How is conformity determined?

- Mobile source emissions modeling
  - Performed by NCDAQ
  - Mobile 6.2
    - Model currently in use
  - MOVES Model
    - Released December 23, 2009
    - Should be used as expeditiously as possible
    - It is approved for SIP and transportation conformity analysis as of March 2, 2010.
    - There is a 2-year grace period before MOVES2010 emissions model is required to be used in new regional emissions analyses for transportation conformity
    - Grace period ends March 2, 2012
    - Will become EPA's approved model for VOCs, NO<sub>x</sub>, CO and direct PM<sub>2.5</sub>
    - Will be used for Mobile Source Air Toxics and greenhouse gas emissions analysis

# What if conformity determination cannot be made?

- The use of Federal aid funds is stopped
  - Impacts design work, right-of-way acquisition, construction, permitting and approval of environmental documents

# What initiates the need for a conformity determination?

- Designation of a new non-attainment area
  - Must be made within one year after designation
- Adoption or amendment of a LRTP
- Adoption or amendment of a local TIP or STIP
- Modification to the SIP
- End of the four-year required update clock

# Does the conformity requirement ever go away???

- **It can! But only when:**
  - A nonattainment area is redesignated to a maintenance area AND
  - After designated maintenance has successfully performed conformity for a minimum 20 year period

# Non-Attainment Areas in NC

- **8-Hour Ozone**

- Metrolina: Cabarrus, Gaston, Iredell(p), Lincoln, Mecklenburg, Rowan, Union
- Triangle: Chatham(p), Durham, Franklin, Granville, Johnston, Orange, Person, Wake
- Rocky Mount: Edgecombe and Nash
- Great Smoky Mountain National Park: National Park Boundary of Haywood and Swain
- Anticipate new areas with revised standard

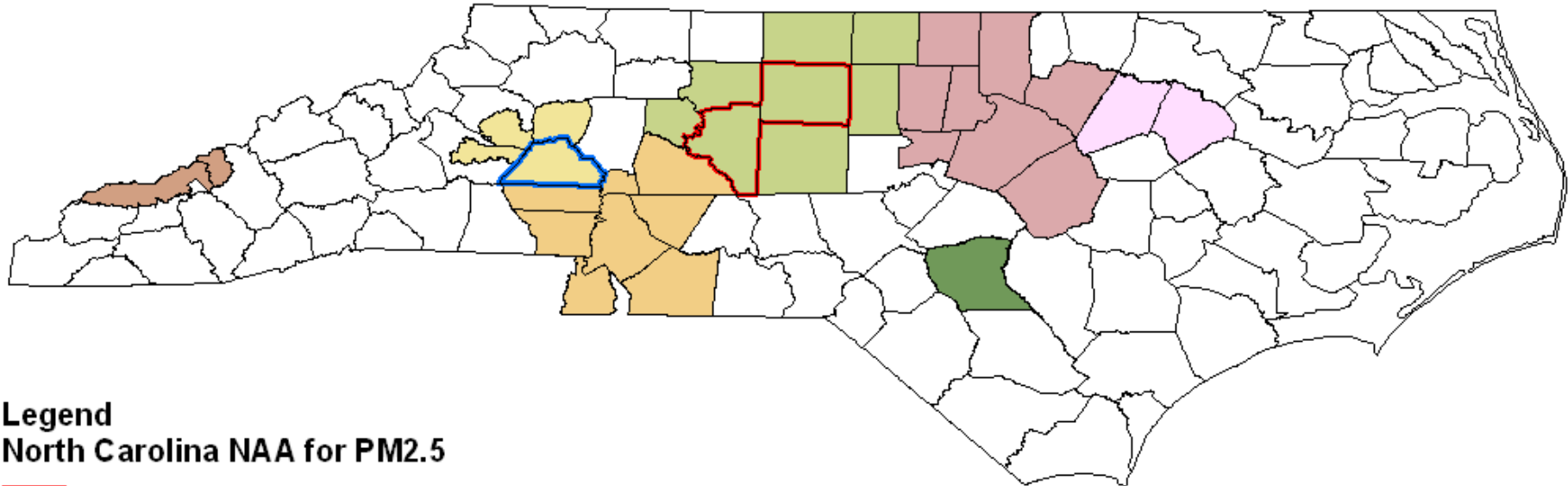
# Non-Attainment Areas in NC

- **CO**

- Metrolina: **Mecklenburg**
- Triangle: **Durham and Wake**
- Triad: **Forsyth**

- **PM 2.5**

- Triad: **Guilford and Davidson**
- Hickory: **Catawba**



**Legend**

**North Carolina NAA for PM2.5**

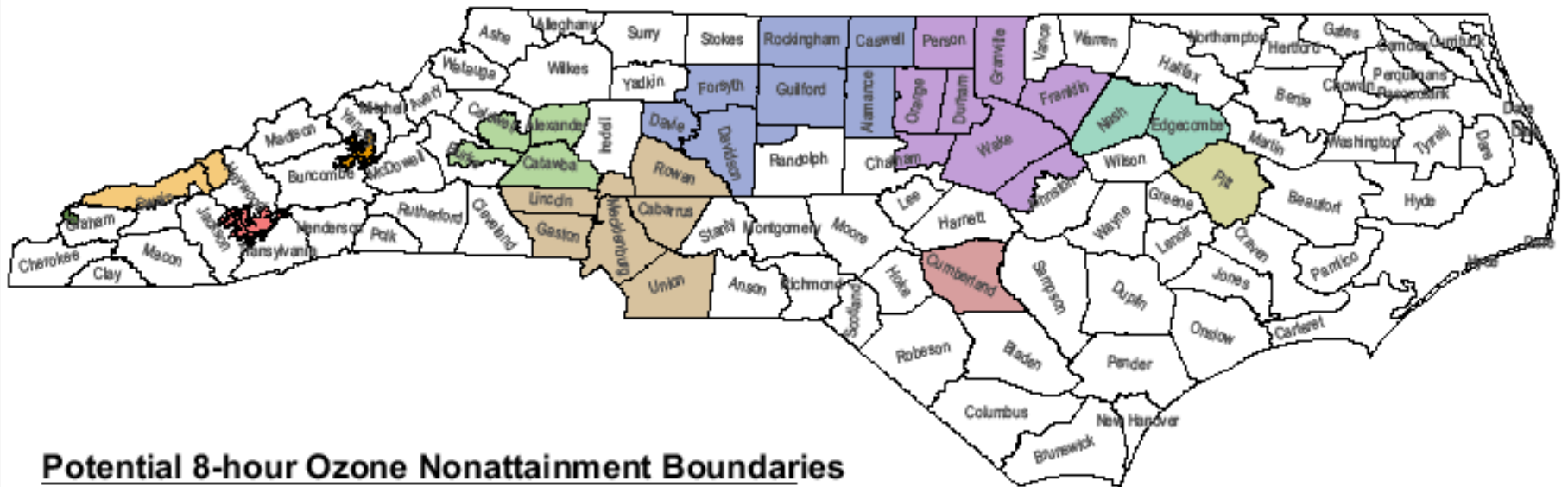
- Greensboro-Winston Salem-High Point, Nonattainment
- Hickory, Nonattainment

**North Carolina NAA For Ozone**

**AREA NAME; STATUS**

- Fayetteville, NC; EAC, Designated as Attainment April 15, 2008
- Greensboro-Winston Salem-High Point, NC; EAC, Designated as Attainment April 15, 2008
- Hickory-Morgantown-Lenoir, NC; EAC, Designated as Attainment April 15, 2008
- Charlotte-Gastonia-Rock Hill, NC-SC; Nonattainment, Moderate
- Haywood and Swain Counties (Great Smoky Mountain NP); Currently Attaining the Standard, Redesignation in Process
- Raleigh-Durham-Chapel Hill, NC; Attainment/Maintenance, Redesignated as Attainment December 26, 2007
- Rocky Mount, NC; Attainment/Maintenance, Redesignated as Attainment January 5, 2007

# North Carolina's Recommendation On 8-Hour Ozone Nonattainment Area Boundaries



## Potential 8-hour Ozone Nonattainment Boundaries

- Snow Bird Mountains (4000 feet & greater) - Joyce Kilmer-Slickrock Wilderness, Nonattainment
- Great Smoky Mountains National Park, Nonattainment
- Great Balsam Mountains (4000 feet & greater) - Shining Rock Wilderness Area, Nonattainment
- Black Mountains (4000 feet & greater), Nonattainment
- Hickory-Lenoir-Morganton, Nonattainment
- Charlotte-Gastonia-Salisbury, Nonattainment
- Greensboro-Winston-Salem-High Point, Nonattainment
- Raleigh-Durham-Cary, Nonattainment
- Fayetteville, Nonattainment
- Rocky Mount, Nonattainment
- Greenville, Unclassifiable

Map Drawn To Approximate Scale  
 North Is Represented As Up  
 Map Valid: 03-12-2009

# If you take nothing else away...

- **SIP**
  - Plan to show that NC will attain the NAAQS
- **Transportation Conformity**
  - Process to show that transportation plans meet the SIP

# Conformity Process



# What does all this mean to you?

- **Transportation Conformity Process**
  - Transportation Conformity Tasks
  - Agency Roles/Responsibilities
  - Transportation Conformity Process Documents

# Transportation Conformity Tasks

- **MPO Areas**

- **LRTP (MPO) (2 to 4 year process)**

- TAC endorsement of LRTP pending conformity determination
    - Conformity work begins at year 3 of this process

# Transportation Conformity Tasks

## – Interagency Consultation (IC) Meeting (MPO/NCDOT/FHWA)

- MPO, RPO, Local AQ Agency, NCDOT, NCDAQ, FHWA, EPA, FTA
- Document conformity parameters (Consensus Plan)
  - LRTP horizon year, conformity analysis year, MVEB, mobile model, TDM, non-modeled area analysis, etc.
- Conformity schedule
- Agency concurrence

# Transportation Conformity Tasks

## – Transportation Modeling (MPO/NCDOT)

### 70 Days

- Travel Demand Model
- Extract VMT and Speeds
  - Used to develop emission factors

## – Emission Factor Development (NCDAQ)

### 15 Days

# Transportation Conformity Tasks

- **Draft Conformity Determination Report (CDR)** (MPO/NCDOT) **10 Days**
- **Review and Comment of draft CDR** (NCDAQ) **21 Days**
  - Mandated by State Law
  - Document is also reviewed by EPA, FHWA, FTA, Local AQ Agency, RPO and NCDOT
  - Major conformity issues addressed/resolved

# Transportation Conformity Tasks

- **IC Meeting** (MPO/NCDOT/FHWA)
  - Discuss review comments and agency responses
  - Issue resolution
- **“Clean” review letter** (NCDAQ)
- **Final CDR** (MPO/NCDOT) **5 Days**

# Transportation Conformity Tasks

- **Final CDR Public Review and Comment Period** (MPO/RPO) **30 Day Minimum**
  - Address comments and document responses
- **IC Meeting** (*if necessary*) (MPO/NCDOT/FHWA)
- **MPO TAC makes conformity determination and adopts LRTP/TIP** (MPO/NCDOT)

# Transportation Conformity Tasks

- **Federal Review of Final CDR and LRTP**  
(EPA/FTA/FHWA) **30 Days**
- **“Clean” Review Letter (EPA)**
- **USDOT Conformity Determination**  
(FTA/FHWA)
- **Process Complete**
  - 9 to 12 months

# Transportation Conformity Tasks

- **Donut Area Conformity**

- Conformity process is the same as described for MPO except for the following:

- Projects from STIP is the planning document for the donut area
- NCDOT “non-modeled area analysis” is the TDM for the donut area (if the area is not covered by a model).
- NCDOT makes the conformity determination
- RPO may also make a conformity determination (but it is not required).
- NCDOT adopts STIP

# Agency Roles and Responsibilities

- **MPO**
  - LRTP
  - IC Meetings
  - Compose CDR
  - Public Review and Comment Period
  - Response to Agency/Public Comments
  - TAC makes the conformity determination and adopts the LRTP/TIP
  - Final CDR/LRTP packages provided to review agencies

# Agency Roles and Responsibilities

- **RPO**

- Participate in IC Meetings
- Review and comment on analysis and documentation
- Assist with Public Review and Comment Period
- Assist with responses to Agency/Public Comments
- The RPO may also make a conformity determination (but it is not required)

# Agency Roles and Responsibilities

- **NCDOT**

- Runs/oversight of the Travel Demand Model/Non Modeled Area Analysis
- Monitors MPO Conformity Process Schedule
- IC Meetings
- Assists with drafting CDR
- Assists MPO with Commitment Follow-Up
- Makes conformity determination in the donut areas

# Agency Roles and Responsibilities

- **NCDAQ**
  - SIP
  - Mobile Emissions Model
  - Develops Emission Factors
  - CDR 21 Day Review and Comment Period
  - CDR Review and Comment Letter

# Agency Roles and Responsibilities

- **Local AQ Agency**
  - Review conformity documentation
  - Provide technical advice/guidance

# Agency Roles and Responsibilities

- **FHWA**

- Coordinate conformity determination federal review process
- Schedule/coordinate/facilitate IC meetings
- Drafts/monitors MPO Conformity Process Schedule
- Assist MPO/NCDOT with commitment follow-up
- Provide technical advice/guidance on conformity
- Review conformity documentation report
- USDOT conformity determination letter

# Agency Roles and Responsibilities

- **EPA**

- Regulations
- Approve the SIP
- Provide technical advice/guidance on conformity
- Review conformity determinations reports
- CDR review and comment letter

# Agency Roles and Responsibilities

- **FTA**

- Review conformity documentation reports
- USDOT conformity determination letter

# Conformity Process Documents

- LRTP
- CDR
- NCDAQ review and comment letter
- EPA review and comment letter
- MPO TAC/NCDOT resolution that makes the conformity determination and adopts the LRTP/TIP
- RPO conformity determination (optional)
- USDOT conformity determination letter

The image features a stylized, layered landscape illustration. The background is a light blue color with a repeating pattern of small white crosses. In the foreground, there are several dark green, rounded trees with black trunks. Behind the trees is a range of mountains with jagged peaks, colored in shades of grey and blue. The sky is filled with white, fluffy clouds of various sizes. The text "Pop Quiz!" is written in a bold, orange, sans-serif font across the center of the image, overlapping the mountains and clouds.

# Pop Quiz!

**What are “donut areas?”**

**A – Non-attainment areas within MPOs**

**B – Non-attainment areas outside of MPOs**

**C – A great break-time location for TPB employees**

***B – Non-attainment areas outside of MPOs***

**True or False – The EPA develops the SIP?**

***False – DAQ develops the SIP and EPA approves it.***

**True or False – The three criteria pollutants in NC are ozone, carbon dioxide and PM2.5?**

***False – They are ozone, carbon MONoxide and PM2.5***

**True or False – NCDOT must make a conformity determination on each adopted CTP?**

***False – NCDOT makes a conformity determination on the STIP in rural areas.***

**Name one example of a point source of pollution.**

***Electric utilities, refineries, smoke stacks***

**Why is particulate matter a health concern?**

***Because when you breathe them in they can enter your lungs***

**Fill in the blanks – Conformity connects \_\_\_\_\_ and \_\_\_\_\_.**

***SIP; Transportation Plans OR Transportation; Air Quality***

**True or False – Vehicle emissions are a type mobile source of air quality pollutants.**

***True***

**What three things must be present to produce ozone?**

***NOx + VOC + Sunlight = Ozone***

**What is the major implication of not being able to make a conformity determination?**

***Use of Federal Aid funding stops***

**True or False – The Southern Environmental Law Center determines what projects are regionally significant**

***False – The MPO or NCDOT (in rural areas) determines which projects are regionally significant.***

**When is ozone found at its highest concentrations?**

***In the summer months***

**What is the difference between the SIP and Transportation Conformity?**

***SIP is a plan to show the NAAQS are attained; Conformity is a process to show that transportation plans meet the SIP***

**How long does the transportation conformity process take?**

***9 – 12 months***

**Name three things that can trigger the need for a conformity determination?**

***Designation of a new non-attainment area; Adoption/amendment of LRTP; Adoption/amendment of local TIP or STIP; Modification to the SIP; End of the four-year update clock***



That's all folks!

Anymore  
questions?