

The background is a stylized, layered landscape. At the top, a light blue sky with a pattern of small white crosses contains several white, fluffy clouds. Below the sky is a range of mountains in shades of light blue and grey. In the foreground, there are several trees with dark green, rounded canopies and dark brown trunks. The ground is a solid green color. The text is overlaid in the center of the image.

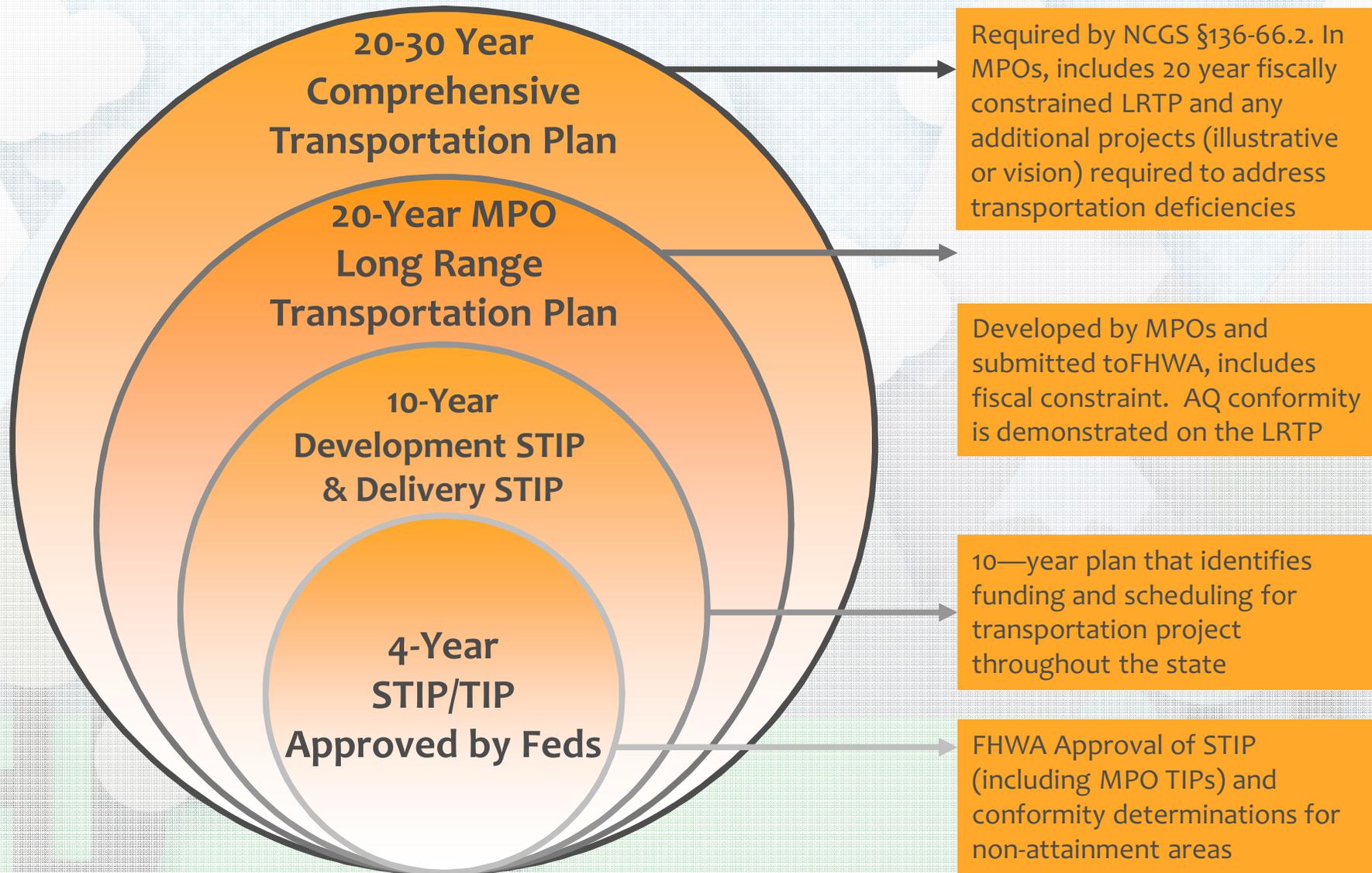
**Air Quality
&
Transportation
Conformity
in
North Carolina**

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) and particulate matter ($PM_{2.5}$)
- Previously, carbon monoxide (CO)

More on Criteria Pollutants

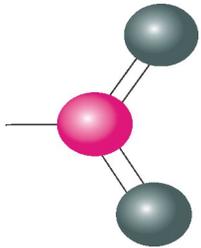
- Ozone

- 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

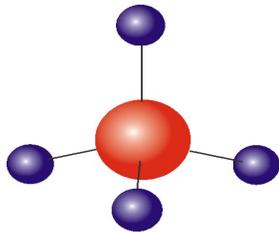
More on Criteria Pollutants

How is ground-level ozone formed?

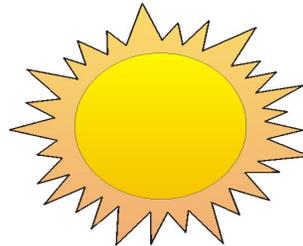
Oxides of Nitrogen (NO_x)



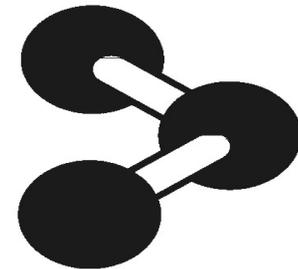
- AND -



Volatile Organic
Compounds (VOCs)



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



Ozone (O₃)

More on Criteria Pollutants

- **Ozone**

- 2008 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 4th highest daily maximum 8-hour average

- 2015 Eight-hour standard

- Primary Standard 0.070 ppm
 - Secondary Standard set same as Primary
 - Protect the environment (plants & trees)
 - EPA finalized on **10/31/15**
 - EPA will make designations by **10/31/17**
 - Transportation conformity will be due by **10/31/18**
 - Tougher standard but current design values show state attaining

More on Criteria Pollutants

- **Particulate Matter (PM_{2.5})**

- 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

- **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

- **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)

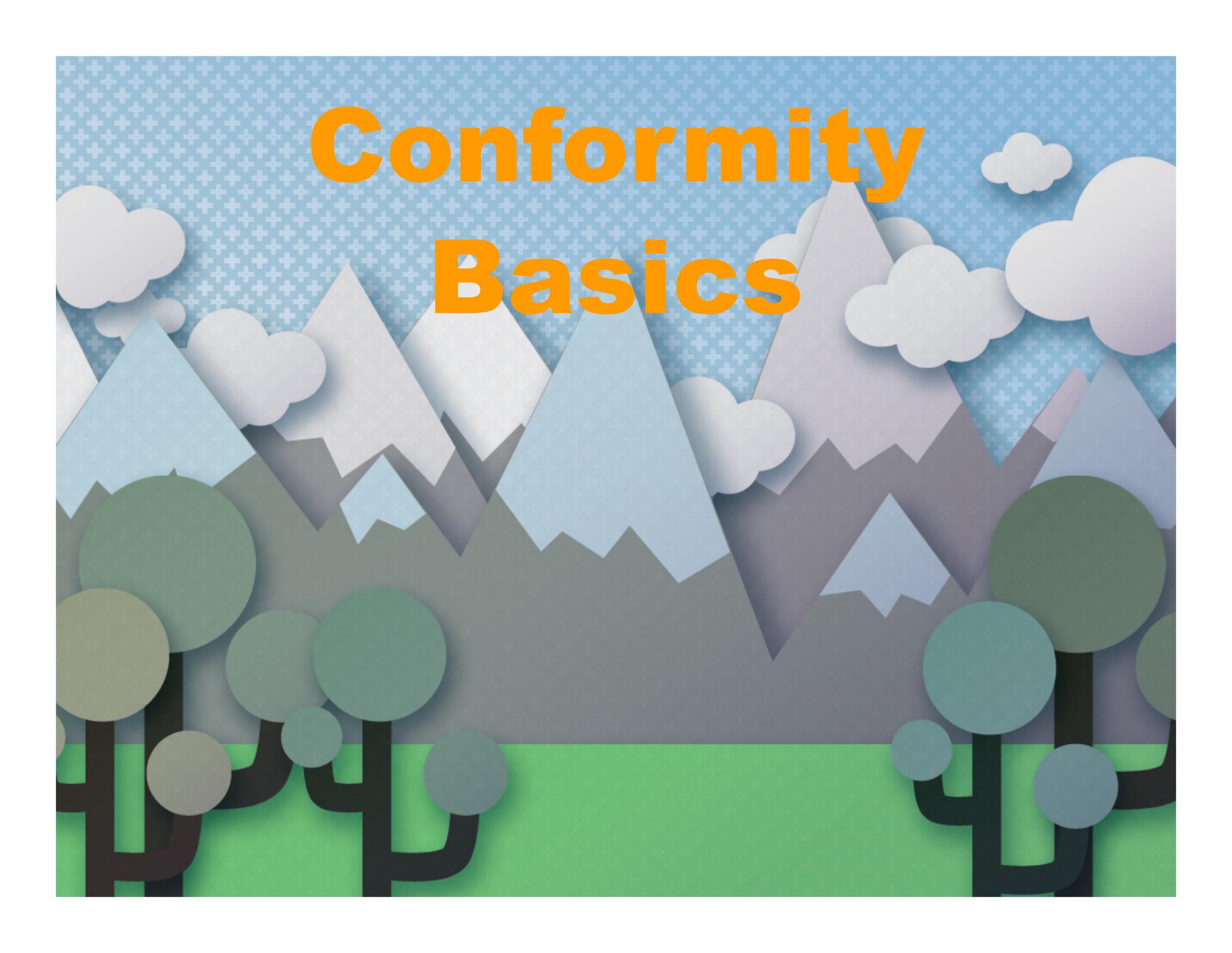
State Implementation Plan (SIP)

- 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

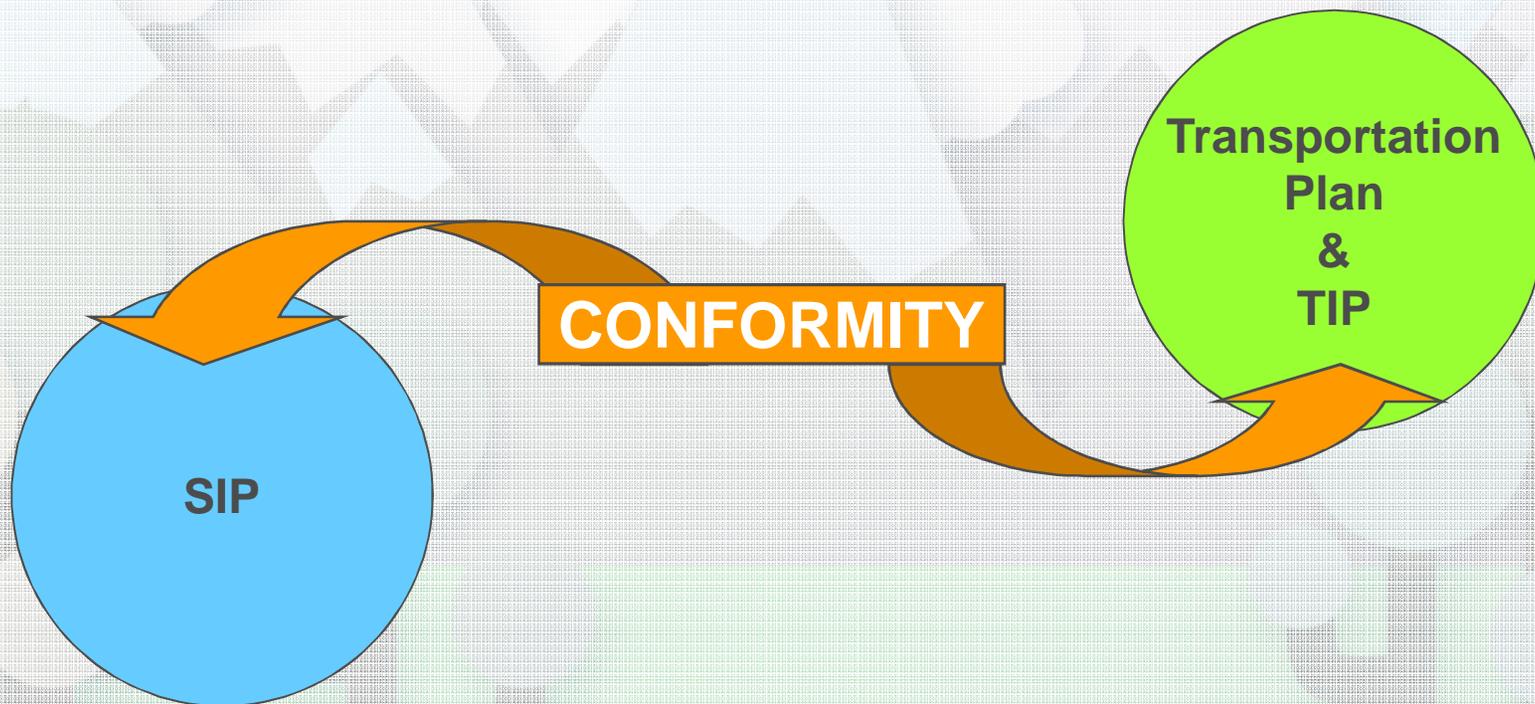


What is Transportation Conformity?

- 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
 - Metropolitan Transportation Plans (MTPs)
 - 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 MTP 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
 - MOVES Model
 - Released December 23, 2009
 - EPA's approved model for VOCs, NO_x, CO and direct PM_{2.5}
 - 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 MTP
- 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
- Or when a new tighter standard is promulgated and EPA revokes the previous standard

Non-Attainment Areas in NC

- **8-Hour Ozone**

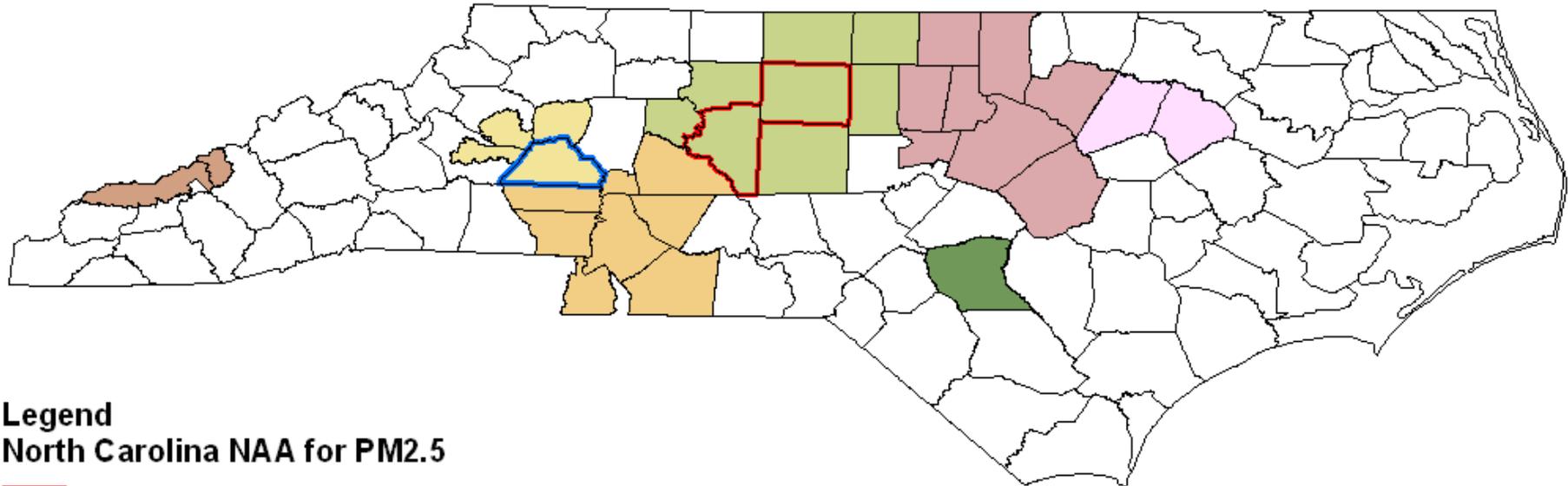
- Metrolina: Cabarrus (p), Gaston (p), Iredell (p), Lincoln (p), Mecklenburg, Rowan (p), Union (p)

- **CO**

- All areas have completed their 20 years of maintenance to the standard

- **PM 2.5**

- Triad: Guilford and Davidson
- Hickory: Catawba



Legend

North Carolina NAA for PM2.5

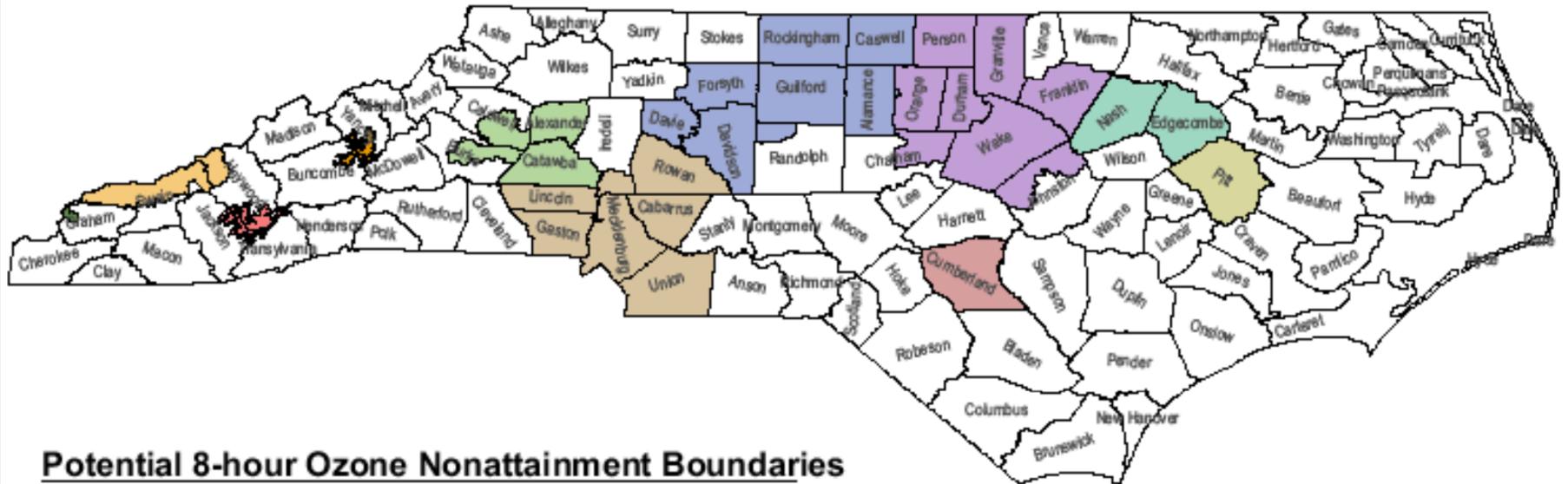
- Greensboro-Winston Salem-High Point, Nonattainmentment
- Hickory, Nonattainmentment

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

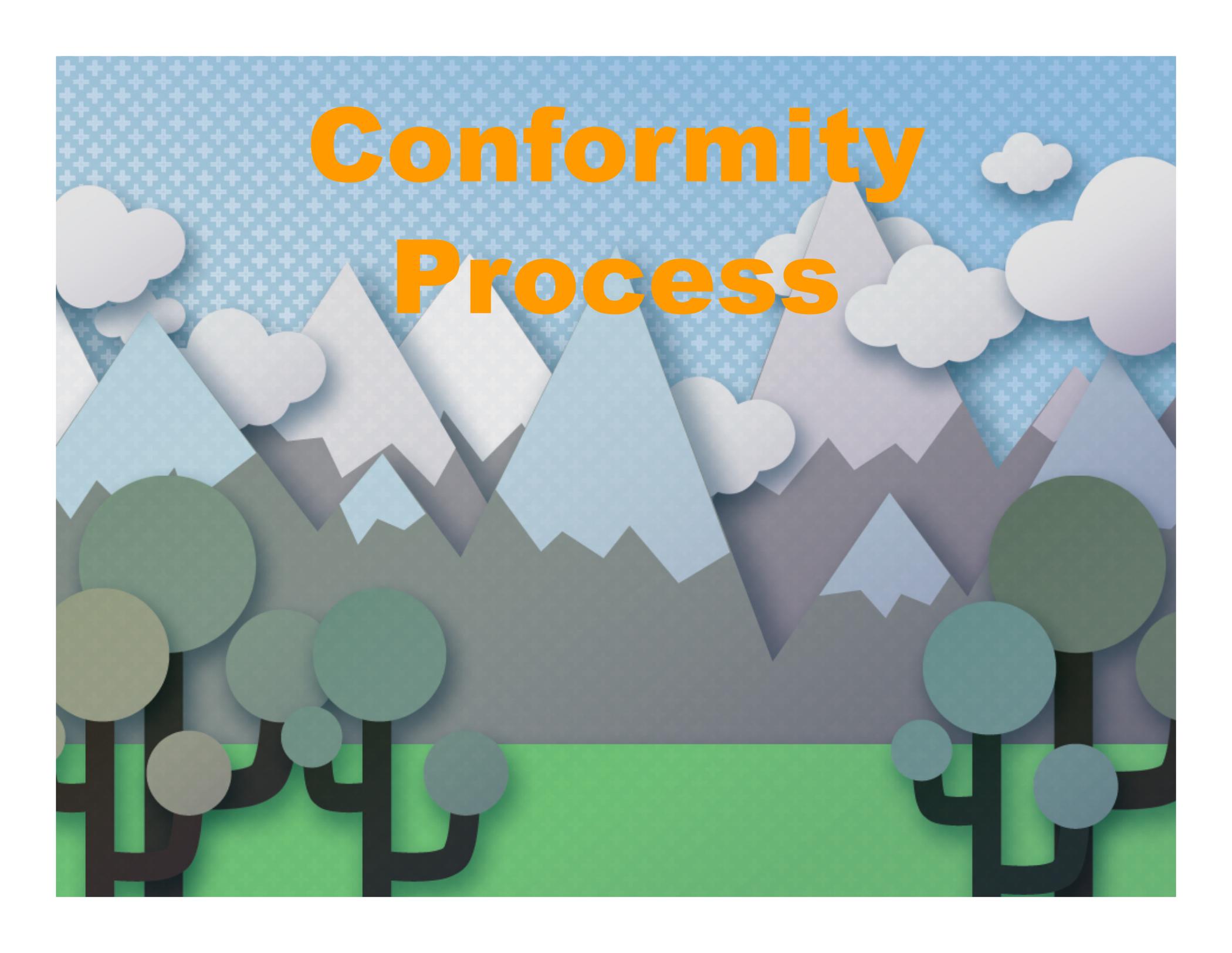
- Snow Bird Mountains (4000 feet & greater) - Joyce Kilmer-Slickrock Wilderness, Nonattainment
- Great Smoky Mountains National Park, Nonattainment
- Great Balsam Mountains (4000 feet & greater) - Shining Rock Wilderness Area, Nonattainment
- Black Mountains (4000 feet & greater), Nonattainment
- Hickory-Lenoir-Morganton, 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
 - LRTP horizon year, conformity analysis year, MVEB, mobile model, TDM, rural spreadsheet, 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 Days**
 - 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 “rural spreadsheet” 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/Rural Spreadsheet
- Monitors MPO Conformity Process Schedule
- IC Meetings
- Assist with drafting CDR
- Assist MPO with Commitment Follow-Up

Agency Roles and Responsibilities

- **NCDAQ**
 - SIP
 - Mobile Model-M6
 - 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/NCDDOT resolution that makes the conformity determination and adopts the LRTP/TIP
- RPO conformity determination (optional)
- USDOT conformity determination letter

Pop Quiz!

The image features a vibrant, layered paper-cut style landscape. The background is a light blue sky with a repeating pattern of small white crosses. In the foreground, there are several stylized trees with dark brown trunks and circular green canopies of varying sizes. Behind the trees is a range of jagged mountains in shades of grey and blue. The sky is filled with several white, fluffy clouds of different shapes and sizes, some appearing to be layered on top of the mountains. The overall aesthetic is clean, modern, and playful.

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?**