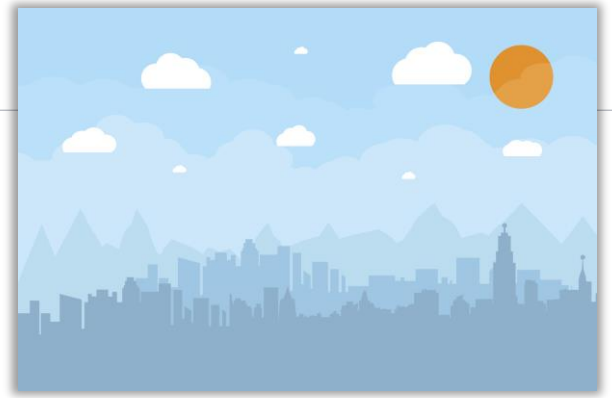
Introduction to
Area Designation and
State Implementation Plan (SIP)



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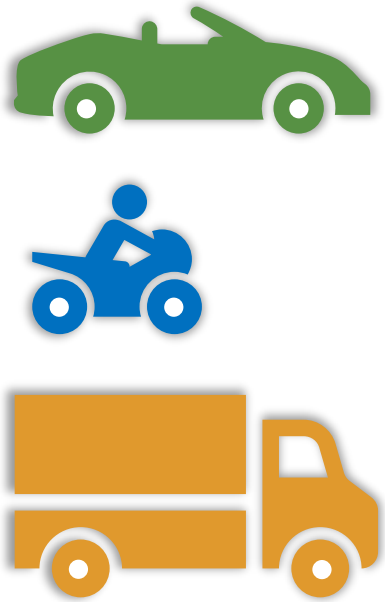
March 24, 2021
10:30 am – 12:00 pm
MS TEAMS Webinar

What Is Air Pollution?

A mixture of solid particles and gases in the air

It occurs when the air contains
harmful amounts of gases, dust, fumes and odor



Criteria Air Pollutants

- Ozone (O_3)
- Sulfur Dioxide (SO_2)
- Lead (Pb)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Particulate Matter (PM)

Air Quality & Public Health

Approximately 200,000 early deaths per year in the U.S.

approximately **53,000** attributed to contributions of road transportation emissions *

NO_x — Oxides of Nitrogen
Irritates airways, especially lungs

O_3 — Ground-Level Ozone
Triggers reactions in people who have asthma

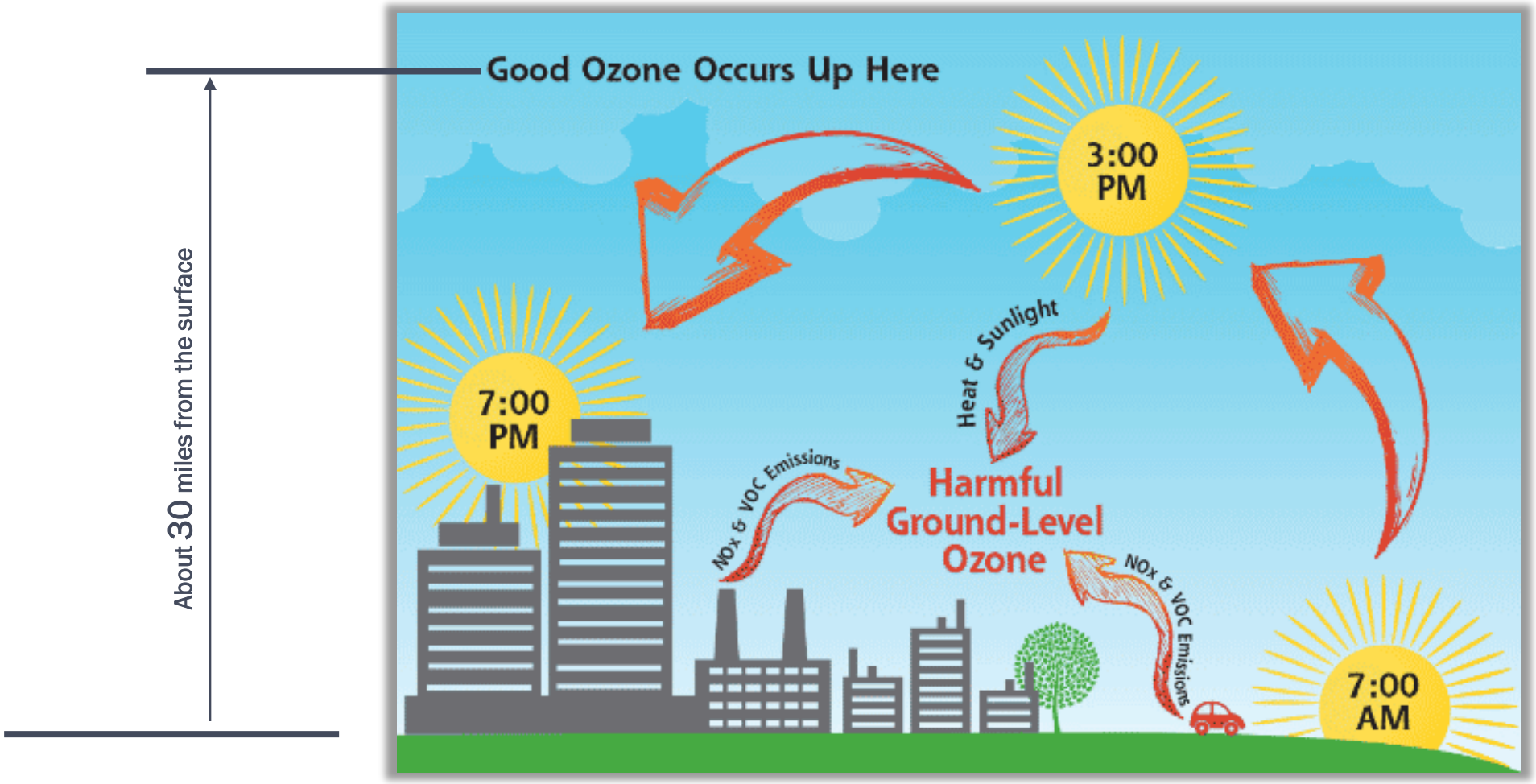
VOCs — Volatile Organic Compounds (Hydrocarbons)
Triggers conjunctival irritation, nose and throat discomfort, cancers, etc.

CO — Carbon Monoxide
Decreases the ability of your blood to carry oxygen

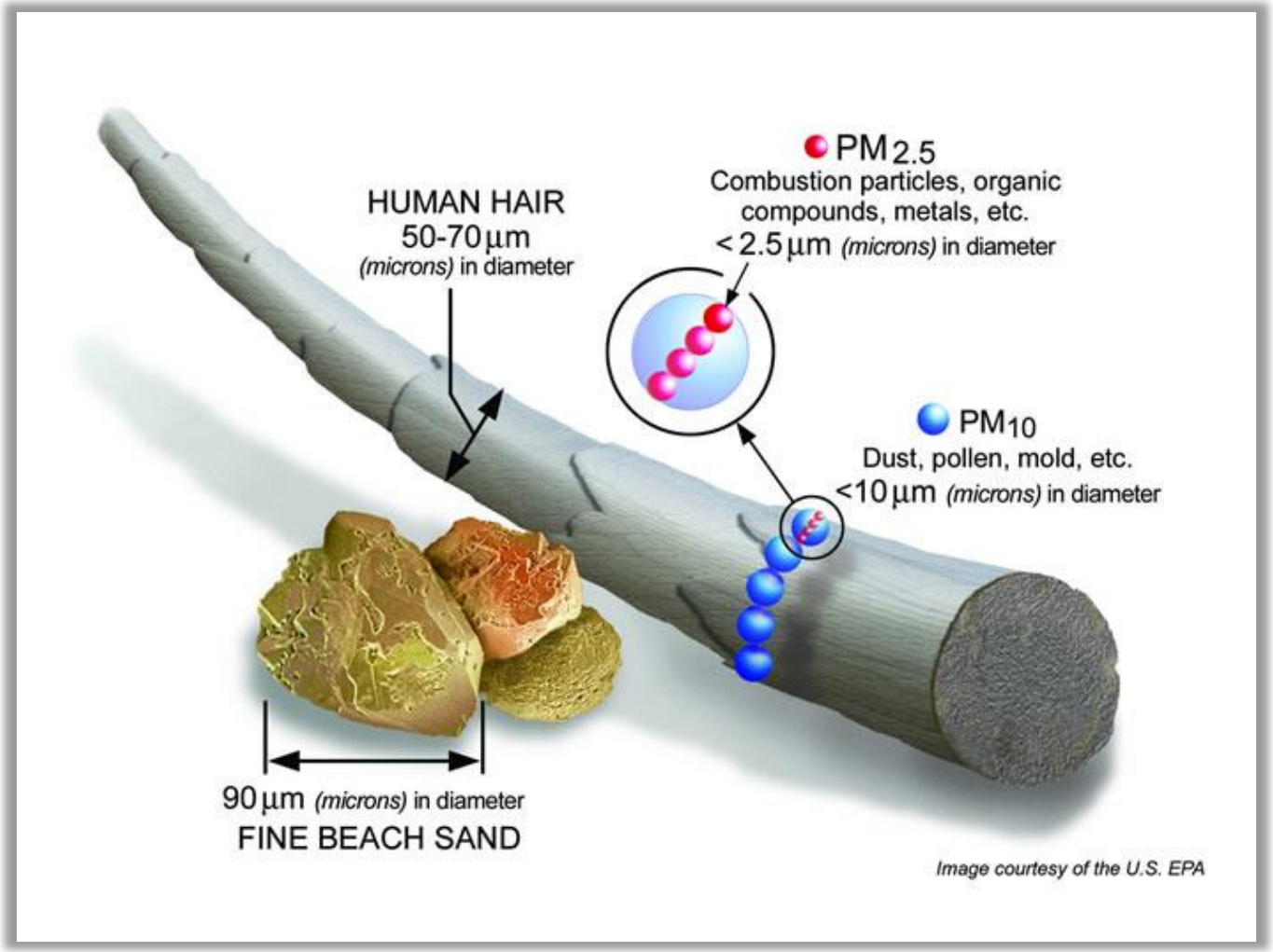
PM — Particulate Matter
Aggravates symptoms in individuals who already suffer from respiratory or cardiovascular diseases

* **Source:** Caiazzo, Fabio, et al. "Air pollution and early deaths in the United States. Part I: Quantifying the impact of major sectors in 2005." Atmospheric Environment 79 (2013): 198-208.

Good Ozone, Not So Good Ozone



Particulate Matter (PM)



How Area Designation Works?

EPA United States Environmental Protection Agency **is required to review**

the **National Ambient Air Quality Standards (NAAQS)**

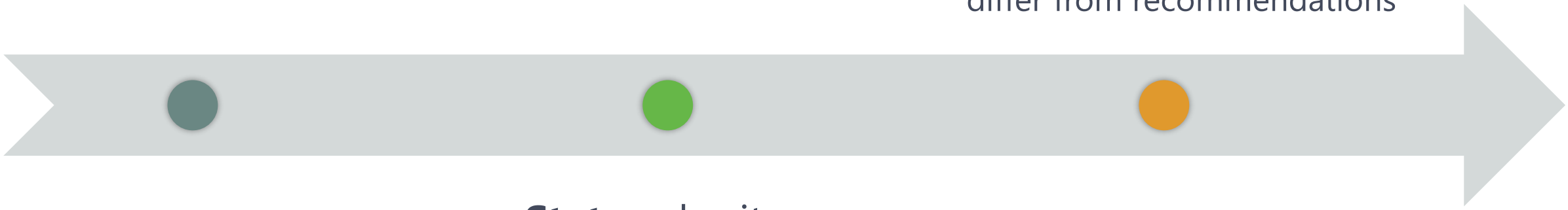
every 5 years

Area Designation Process

EPA sets
New or Revised NAAQS

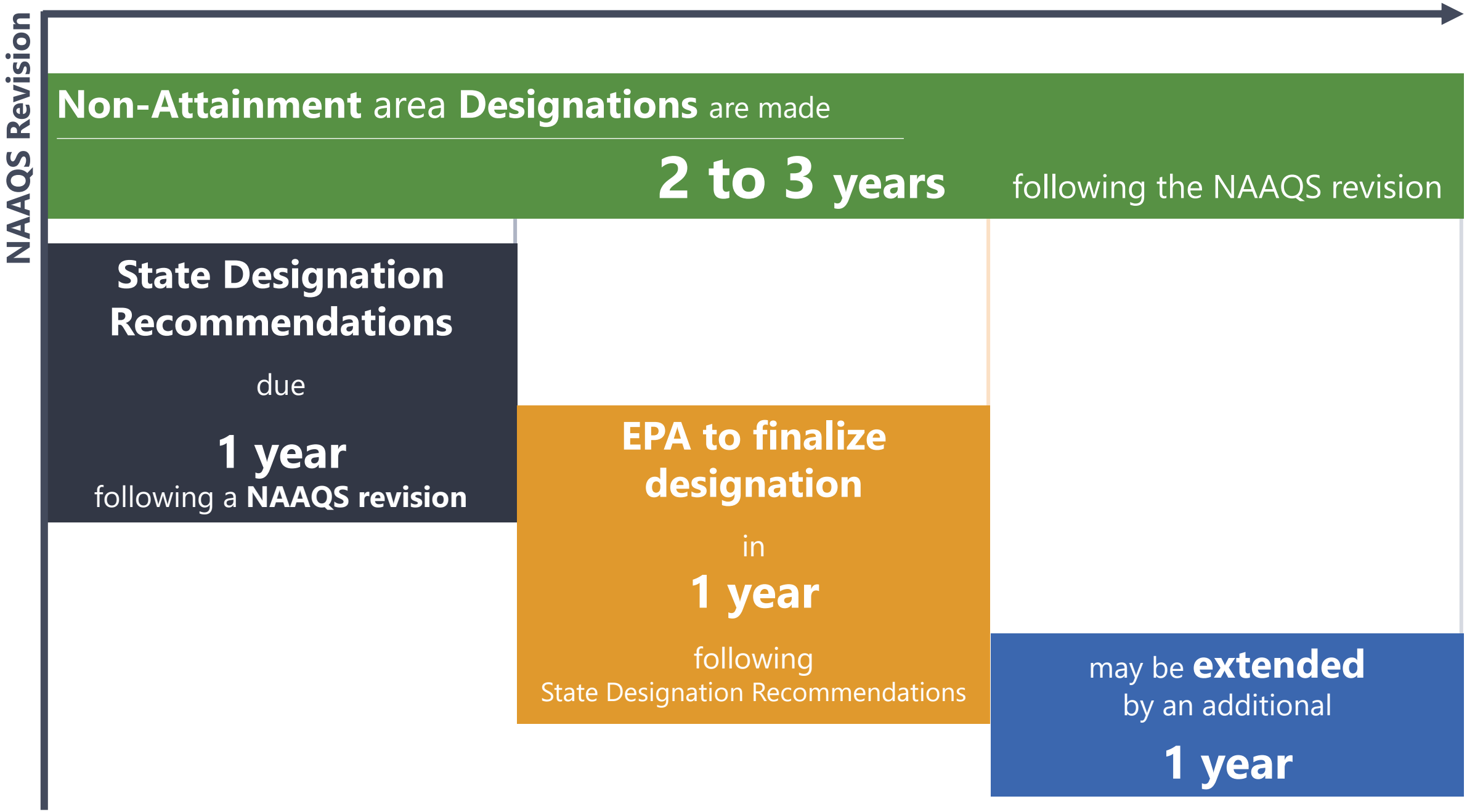
EPA makes
Final Designations

- 120-day notice to the state if designations differ from recommendations



State submits
State Designation Recommendations

- *Attainment*
- *Nonattainment*
- *Unclassifiable*


NAAQS Revision
Non-Attainment area Designations are made
2 to 3 years
following the NAAQS revision
State Designation Recommendations
due
1 year
following a NAAQS revision
EPA to finalize designation
in
1 year
following
State Designation Recommendations
may be extended
by an additional
1 year

State makes **area designation recommendations** (i.e. state designation recommendation) based on

Monitoring Data

- **Ground-Level Ozone:**

  3-year average of
  4th highest of 8-hour daily maximums

- **Particulate Matter (PM)**

  PM10*:

  3-year average of
  Number of 24-hour average exceedance

  PM2.5** (fine PM):

  3-year average of
  98th percentile of 24-hour averages

* PM with diameter less than or equal to 10 micrometers

** PM with diameter less than or equal to 2.5 micrometers

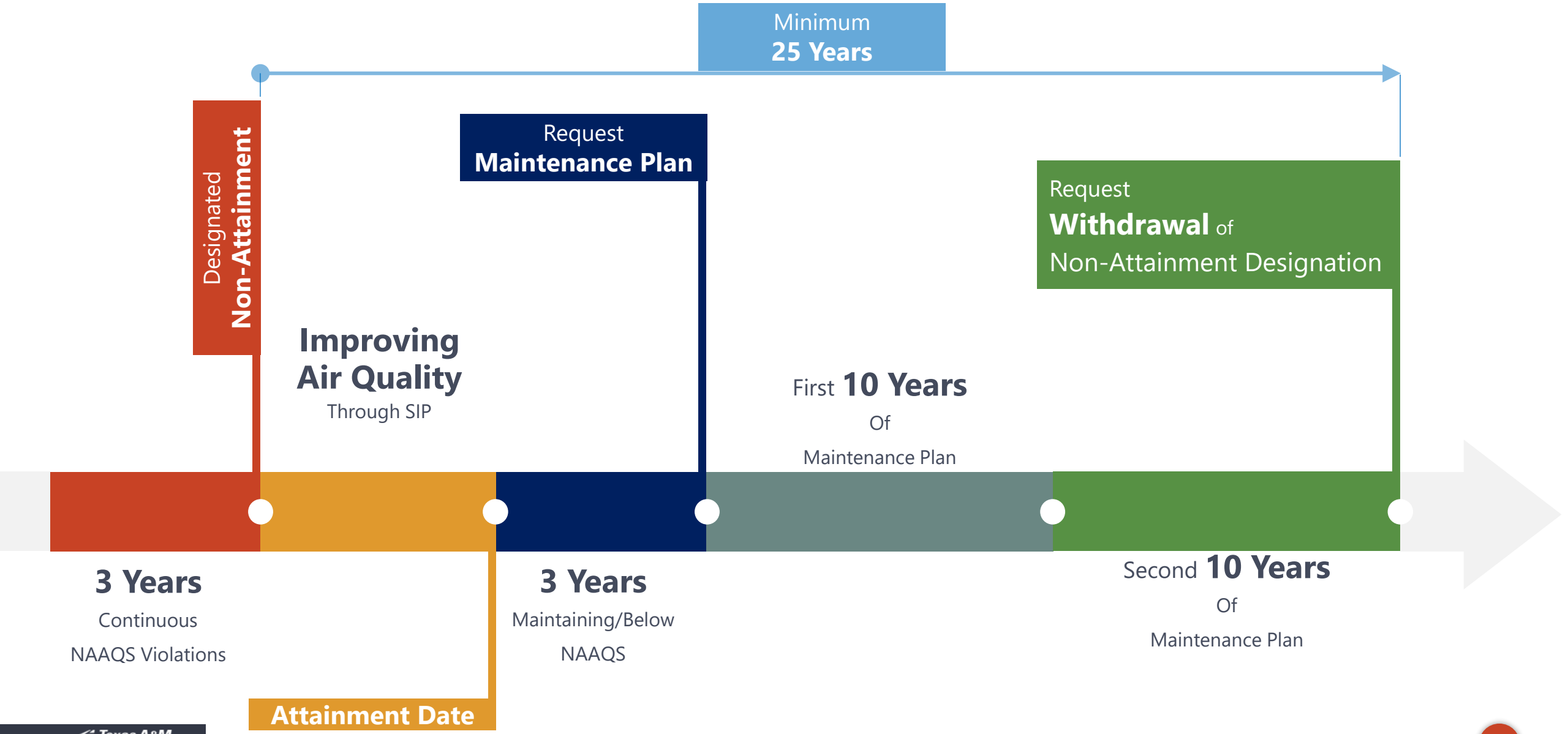
An area is designated as **Non-Attainment** if

there is a **violation of NAAQS** in the area

or

The area is found to **contribute to a violation** in a **nearby area**

Ideal Life Cycle of a Non-Attainment Area



What is SIP and How Does It Work?

What is a SIP?

State's
Air Quality Plan
to meet the NAAQS

Covers
All areas of the state

Federal requirement and enforceable

Prepared and updated by state's air quality agency

What is the **Purpose of the SIP?**

Describes how the **state** will

- **Monitor air quality**, and
- **Determine** and **enforce compliance** with NAAQS
- Meet **consultation** process **requirements**
- Develop **processes** to **allow for attainment** and maintenance of NAAQS

Establishes

- **Control strategies**
- **Target dates** for reducing emissions
- Stationary source **permitting** program

For **non-attainment** and **maintenance** areas:

- **Sets limits/budget** for criteria pollutants from **On-Road Transportation Sources**
- Demonstrate **compliance** with Clean Air Act (CAA) and **progress** toward attainment

Only

One SIP

for each state

parts of the SIP are simply

Revised As Needed

Texas' SIP was initially approved in May 1972

SIP

Components

How the **SIP Process** works

CAA or **Court Case** mandates plan submittal OR **State** decides to revise its own SIP

State prepares and adopts plan after public hearing

State submits SIP to EPA regional office

EPA reviews SIP for completeness. If complete, propose in Federal Register

EPA approves/disapproves plan after considering public comments

After SIP approval, the plan becomes **Federally Enforceable**

Texas SIP

- Section I: Introduction
- Section II: Regional Classification
- Section III: Public Participation/Intergovernmental Coordination
- Section IV: Preliminary Review
- Section V: Legal Authority
- Section VI: Control Strategy
- Section VII: Compliance Schedule
- Section VIII: Texas Air Pollution Emergency Episode Contingency Plan
- Section IX: Air Quality Surveillance Plan
- Section X: Review of New Sources and Modifications
- Section XI: Source Surveillance
- Section XII: Resources
- Section XIII: Intergovernmental Cooperation

  (Federal Register Vol.48 No.63 13427 - March 31, 1983)
- Section XIV: TCEQ Adopted Rules and Regulations

Types of SIP Revisions

Attainment Demonstrations and **Reasonable Further Progress**

Redesignation Requests and **Maintenance Plans**

Infrastructure and **Transport Plans**

Regional Haze Plans

Infrastructure Plan

Does Texas have the means and authority to implement the SIP?

Transport Plan:

Does Texas significantly contribute to non-attainment or interfere with maintenance in another state?

SIP Revision Development – Texas Style

Formal Commission Action by TCEQ

- Publication of the proposal
- Public meetings, hearings, review of public comments
- Adoption by TCEQ's commissioners
- Takes about **18 months**
- Once SIP revision and associated rules adopted by commission: **legally binding** and **enforceable** under **state law**

Initial Research

- Data collected and modeled
- Control strategies proposed and tested
- Revision drafted
- Typically requires **1-4 years**

Submitted to EPA for Review and Approval

- Once approved by EPA, SIP revision and rules become **Federally Enforceable**

Triggers of SIP Revision

New Laws or Rules are Enacted

Final enactment of a NAAQS triggers a SIP revision

An Area's Designation is Changed

Non-attainment and **maintenance** designations trigger SIP revision requirements

Non-Attainment Area Reclassification

Reclassification is the most common reason for SIP revision

New Data or Model Becomes Available

New data or emissions model **may trigger** a SIP revision

SIP Requirements for **Ozone Non-Attainment Areas**

MARGINAL

(3 Years)

- Emissions Inventory
- Emissions Statements
- Non-attainment New Source Review Program & Emissions Offsets
- Reasonably Available Control Technology (RACT) Fixups
- Inspection and Maintenance (I/M) Corrections
- Conformity

MODERATE

(6 Years)

- Basic I/M
- RACT & Reasonably Available Control Measures (RACM) Emissions Controls
- Attainment Demonstration
- Contingency Measures
- RFP - 15% Volatile Organic Compounds (VOC) Reductions within 6 years

SERIOUS

(9 Years)

- Enhanced Monitoring and I/M
- Modeled Attainment Demonstration
- 3% per Year VOC Reductions After 6 Years
- Reasonable Further Progress (RFP) Milestone Contingency Measures
- Clean Fuels Program
- Vehicle-Mile-Traveled (VMT) Demonstration

SEVERE

(15-17 Years)

- VMT Growth Offset
- Major Source Fees for Failure to Attain (185 Fees)

EXTREME

(20 Years)

- Clean Fuels and Controls for Boilers
- Traffic Controls During Congestion

Key Elements & Concepts

RFP: Reasonable Further Progress

Annual incremental reduction in emissions may reasonably be required

To ensure that the amount of the needed reduction (i.e. **attainment of NAAQS)** will be achieved by **Attainment Date**

AD Plan: Attainment Demonstration Plan

How and When **a non-attainment** area will **achieve attainment** of a standard

required for most areas that have been **designated non-attainment**

Maintenance Plan

How a **former non-attainment** area will **maintain attainment** of a standard

required for areas that have been designated as **attainment maintenance**

Reasonable Further Progress SIP Revision

Describes how annual incremental emissions reductions requirements will be met in a non-attainment area

Components of Reasonable Further Progress

- Emission Inventory
- Control Strategies
- RFP Demonstration
- Motor Vehicle Emission Budget (MVEB)

Attainment Demonstration SIP Revision

Describes in detail the strategies and emissions control measures that show **how a non-attainment area will improve air quality** and meet the NAAQS by the attainment date

Components of Attainment Demonstration

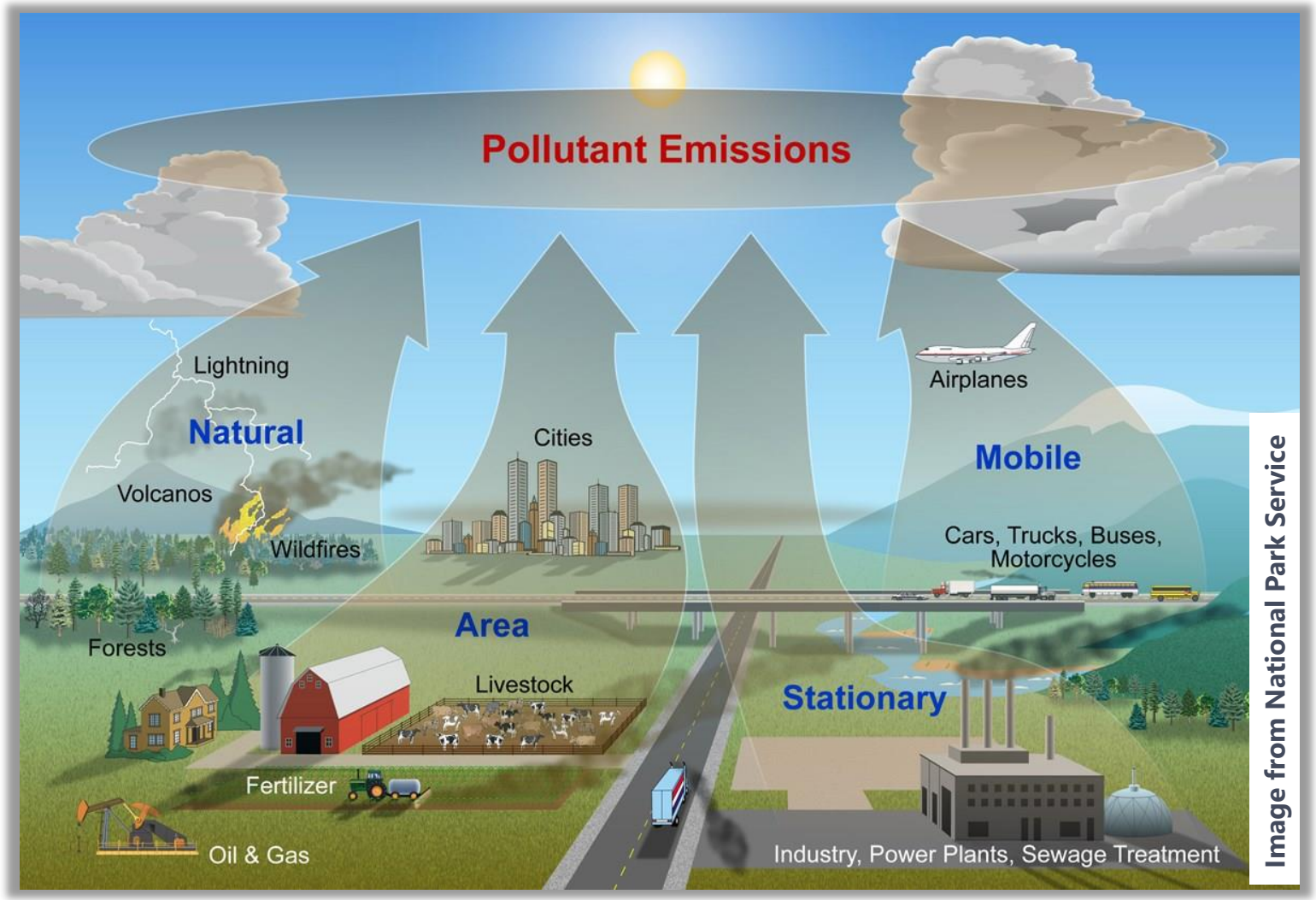
- MVEB
- Monitoring data
- Emissions Inventory
- Photochemical Modeling
- Control Strategy

Emissions Inventory:

Amount of each pollutant emitted in an area by type of emissions sources

Types of process and control devices employed at each plant or source category

Types of Emissions Sources



- **On-Road Mobile Sources**
- **Non-Road Mobile Sources**
- **Stationary Point Sources**
- **Area Sources**

Photochemical Air Quality Modeling

Computer Tool

To estimate **concentrations** of pollutants in the air

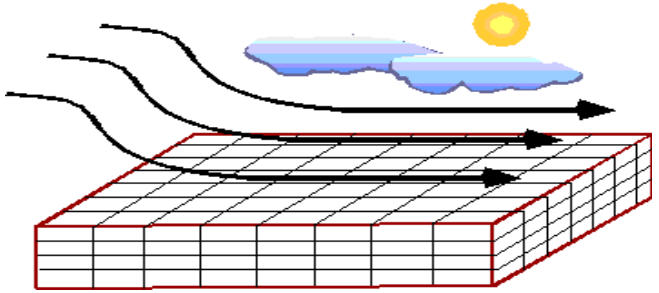
Baseline/Historical

To **evaluate performance** of the model for an area

Future Years

To **evaluate effectiveness** of control strategies in reaching attainment

Real World Situation



Computer Grid Simulation

Development of Control Strategies

Analysis to determine **type** and **need** for emissions reductions to attain the NAAQS

State, local, and federal strategies are considered

Rules are adopted and incorporated into the SIP as needed

If area **fails to attain** by attainment date **contingency measures** included in the SIP to be implemented

How **Transportation** Fits into …

State Implementation Plan

Permitting

Emissions Budget
for
Motor Vehicles

Regulations On Products and Materials

Motor Vehicle Emission Budget (MVEB)

Not-to-exceed limit for pollutant emissions from **on-road** vehicles in the SIP

Area-specific

Only for pollutant(s) that the area is in **non-attainment** or **maintenance**

Used for **Transportation Conformity**

The mechanism to ensure that **transportation planning activities conform to the SIP**

Set Through

- **Attainment Demonstration**
- **Maintenance Plan**
- **Reasonable Further Progress**

Consequences of Failing to Submit or Implement a **Valid SIP**

- Start of a Federal Implementation Plan clock
- SIP call
- EPA **sanctions** or other penalties on the state
  - Cutting off federal highway funds
  - More stringent pollution offsets for certain emitters

SIP Failures

- Disapproval with a Protective Finding
- Disapproval without a Protective Finding
- Failure to submit
- Incompleteness

What is a Protective Finding?

Finding by EPA that SIP identifies control measures to achieve 15% ROP, or attainment for MVEBs

- SIP provides adopted control measures or written commitments for enforceable control measures
- SIP revision submitted

SIP Failures

Disapproval with a Protective Finding

If SIP is disapproved with a protective finding

- Budgets can still be used if found adequate for conformity purposes
- Lapse may still occur
- Lapse begins when highway sanctions are imposed
- Effective 2 years after EPA disapproval

SIP Failures

Disapproval without a Protective Finding

Consequences of SIP Disapproval without a Protective Finding

- A SIP disapproval without a protective finding results in a conformity freeze on the effective date of EPA's final disapproval

Conformity Freeze

- Only projects in the first 4 years of the currently conforming plan and TIP can proceed
- No new plan or TIP conformity can be made
- Conformity lapse grace applies if plan/TIP expires during conformity freeze
- Conformity lapse occurs at (whichever comes first)
  - end of lapse grace period
  - When highway sanctions apply

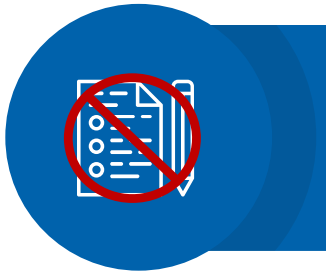
Impacts on Project during Conformity Freeze

All new transportation plans/TIPs or projects are affected

- Projects that are included in the first four years of the transportation plan/TIP may go forward including all subsequent phases if included in the plan/TIP conformity analysis and meet project-level criteria
- No new plans, TIPs, or plan / TIP amendments

Exempt projects can proceed at any time as long as all planning requirements are met

SIP Failures



Failure to submit

Incompleteness

Consequences of Failure to Submit and Incompleteness findings

EPA determines that the State has failed to submit a control strategy, SIP, or the submission is incomplete

- Starts CAA sanction process
- Conformity on plan/TIP lapses on the date that highway sanctions are imposed

Sanctions

Sanctions may occur due to SIP deficiencies

- non-submittal,
- incompleteness,
- lack of implementation, or
- disapprovals

Sanctions are not imposed for maintenance plan failures

- Once an area is officially notified, the sanction's clock is triggered
- Eighteen months later – offset sanction on stationary sources imposed
- Six months after offset sanctions, highway sanctions will be imposed

Federal Implementation Plans (FIPs)

If EPA promulgates a FIP that contains motor vehicle emissions budget(s) as a result of a SIP failure, the conformity lapse imposed because of that failure is removed

Additional Resources

- EPA - Basic Information about Air Quality SIPs
  https://www.epa.gov/sips/basic-information-air-quality-sips
- FHWA - Transportation Conformity Reference Guide
  https://www.fhwa.dot.gov/pressroom/fhwa0047.cfm
- TCEQ - Texas State Implementation Plan
  https://www.tceq.texas.gov/airquality/sip

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Questions and Comments

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