The background of the slide features a photograph of the St. Louis Gateway Arch, a large steel catenary arch, silhouetted against a bright sunset sky. The sun is positioned on the right side, creating a lens flare effect. The overall color palette is dominated by the warm tones of the sunset and the dark grey of the arch.

About Air Quality in the St. Louis Region

East-West Gateway Council of Governments

March
2024

Outline

- ▶ About East-West Gateway Council of Governments (EWG)
 - ▶ Activities
 - ▶ Environmental Partners
- ▶ Clean Air Act and National Ambient Air Quality Standards
- ▶ Ground Level Ozone - Transportation-Related Pollutant of Concern
- ▶ Status of Other Criteria Pollutants in St. Louis Region
- ▶ For More Information

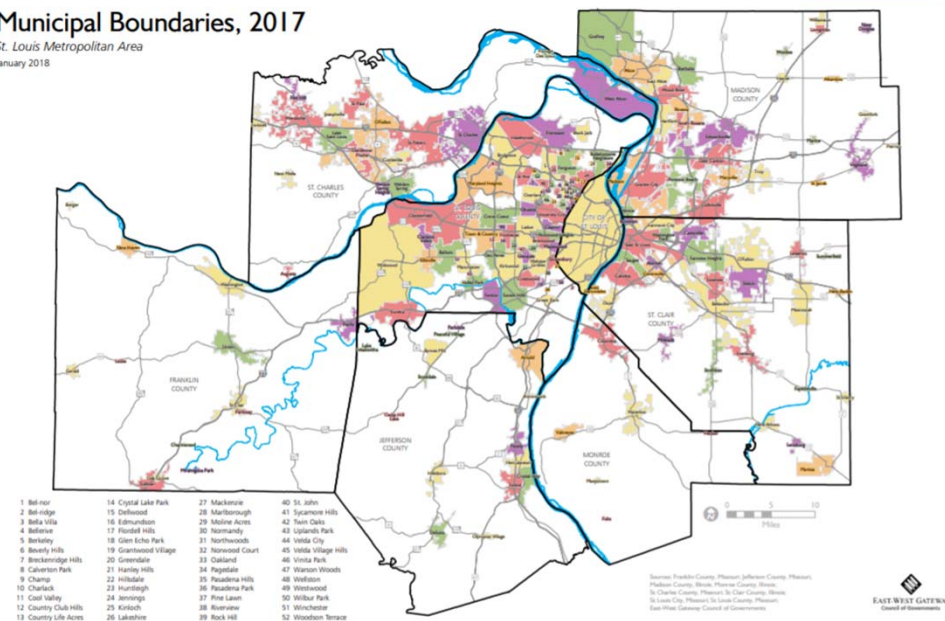


East-West Gateway Council of Governments

- ▶ EWG provides a forum where local governments in the bi-state St. Louis region can coordinate and work together to address and solve problems that cross jurisdictional boundaries.
- ▶ Lead transportation and transportation-related air quality planning agency for the region.
- ▶ Works with Missouri and Illinois on air quality issues.

Municipal Boundaries, 2017

St. Louis Metropolitan Area
January 2018



Gateway's Air Quality Activities

- ▶ Works with Illinois and Missouri on strategies to reduce transportation-related emissions
- ▶ Coordinates Ozone Data Sharing Project
 - ▶ Acts as clearinghouse for Illinois and Missouri ozone monitor data
- ▶ Facilitates the Air Quality Advisory Committee
- ▶ Performs Transportation Air Quality Conformity Determination to ensure that transportation programs and projects do not have a negative impact on air quality
 - ▶ Facilitates transportation and air quality peer group - Inter Agency Consultation Group
- ▶ Administers competitive Congestion Mitigation Air Quality (CMAQ) program which provides federal transportation funds for local projects which will help reduce congestion and improve air quality



Gateway's Environmental Partners

- ▶ Illinois Environmental Protection Agency
- ▶ Illinois Department of Transportation
- ▶ Federal Highway Administration – Illinois
- ▶ USEPA Region 5 (Chicago)
- ▶ Missouri Department of Natural Resources
- ▶ Missouri Department of Transportation
- ▶ Federal Highway Administration – Missouri
- ▶ USEPA Region 7 (Kansas City)



**MISSOURI
DEPARTMENT OF
NATURAL RESOURCES**



EAST-WEST GATEWAY
Council of Governments
Creating Solutions Across Jurisdictional Boundaries

Federal Clean Air Act (CAA)

- ▶ Clean Air Act sets the framework and goals for improving air quality to protect public health and welfare.
- ▶ First passed in 1970, amended in 1977 and 1990
- ▶ Title I of the CAA sets forth provisions for the attainment and maintenance of National Ambient Air Quality Standards (NAAQS):
 - ▶ USEPA is to set NAAQS for six “criteria” pollutants which have the most widespread threat to public health and welfare.
 - ▶ NAAQS are to be reviewed on regular schedule and to be revised as needed.
 - ▶ NAAQS are set at levels to ensure adequate protection of the public against adverse impacts of air pollution.
 - ▶ If monitor(s) in an area are violating a specific NAAQS, area is considered to be in non-attainment of that standard



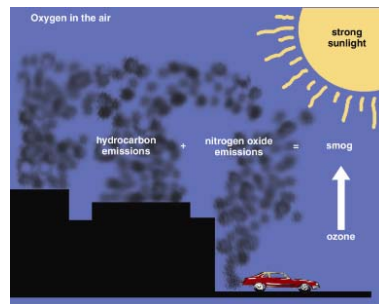
Six Criteria Pollutants with National Ambient Air Quality Standards (NAAQS)

| Pollutant | Standard | Averaging Time | Source |
|---|--|-------------------------|--|
| Carbon Monoxide (CO) | 9 parts per million (ppm) | 8 hours | Mobile (e.g., cars, trucks, machinery) |
| Lead | 0.15 micrograms per cubic meter (ug/m ³) | Rolling 3 month average | Stationary (e.g., ore and metal processing, lead acid battery manufacturing) Mobile (leaded fuel for piston-powered aircraft) |
| Sulfur Dioxide (SO₂) | 75 parts per billion (ppb) | 1 hour | Stationary (e.g., power plants, ore extraction) Natural events (volcanoes) |
| Nitrogen Dioxide (NO₂) | 100 ppb | 1 hour | Mobile (e.g., cars, trucks) Stationary (e.g., power plants, refineries, chemical plants) |
| | 53 ppb | 1 year | |
| Fine Particulate Matter (PM_{2.5}) | 9 ug/m ³ | 1 year | Stationary (e.g., smokestacks, chemical reactions in atmosphere) Construction sites, unpaved roads Mobile (e.g., brake wear, tire wear, chemical reactions in atmosphere with tailpipe emissions) |
| Ozone | 70 ppb | 8 hours | Mobile (e.g., cars, trucks) Stationary (e.g., power plants, refineries, chemical plants) |

Ground Level Ozone

Transportation-Related Pollutant of Concern

- ▶ Ozone is formed when hydrocarbons and nitrogen oxides from vehicle exhaust and other industrial processes have a chemical reaction with oxygen in the lower atmosphere
- ▶ Weather influences – strong sunshine, low wind speed, temperature 85° +
- ▶ Carried by wind
- ▶ Ozone affects children and the elderly
- ▶ High levels can cause headaches, fatigue and eye, nose and respiratory tract irritation
- ▶ Prolonged exposure can aggravate chronic heart disease and chronic respiratory ailments, like asthma



https://www.cdc.gov/climateandhealth/effects/air_pollution.htm



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Ozone Standard

- ▶ USEPA first set a standard for this pollutant in 1979. It has been strengthened in 1997, 2008 and 2015
- ▶ The standard is now 70 parts per billion (ppb) previously, 75 ppb
- ▶ Exceedance is when an 8-hour average for a monitor in a non-attainment area is >70 ppb
- ▶ Attainment is when 3-year average of 4th highest annual average for each monitor in a non-attainment area is ≤ 70 ppb



USEPA Ozone Standard Designations & St. Louis Region Over Time

| Year Averaging Time/Status | Standard | Non-Attainment Designation | Extent | Area designated as in Attainment |
|----------------------------|---|--|---|--|
| 1979 1 Hour Ozone revoked | 120 ppb - rounding convention of 125 ppb was used | 1991 - Moderate Jan 2003 - bumped up Serious | MO - 5 Counties IL - 3 Counties | June 2003 - All |
| 1997 8 Hour Ozone revoked | 80 ppb - average over 8 hours -rounding convention of 85 ppb was used | 2004 - Moderate | MO - 5 Counties IL - 3 Counties & Jersey County | 2012 - IL Counties 2015 - MO Counties |
| 2008 8 Hour Ozone | 75 ppb | 2012 - Marginal | MO - 5 Counties IL - 3 Counties | 2018 - All |
| 2015 8 Hour Ozone | 70 ppb | 2018 - Marginal 2021 - Marginal Nov 2022 - bumped up to Moderate | MO - 3 Counties & 1 Township IL - 2 Counties MO - 1 County IL - 1 County | |

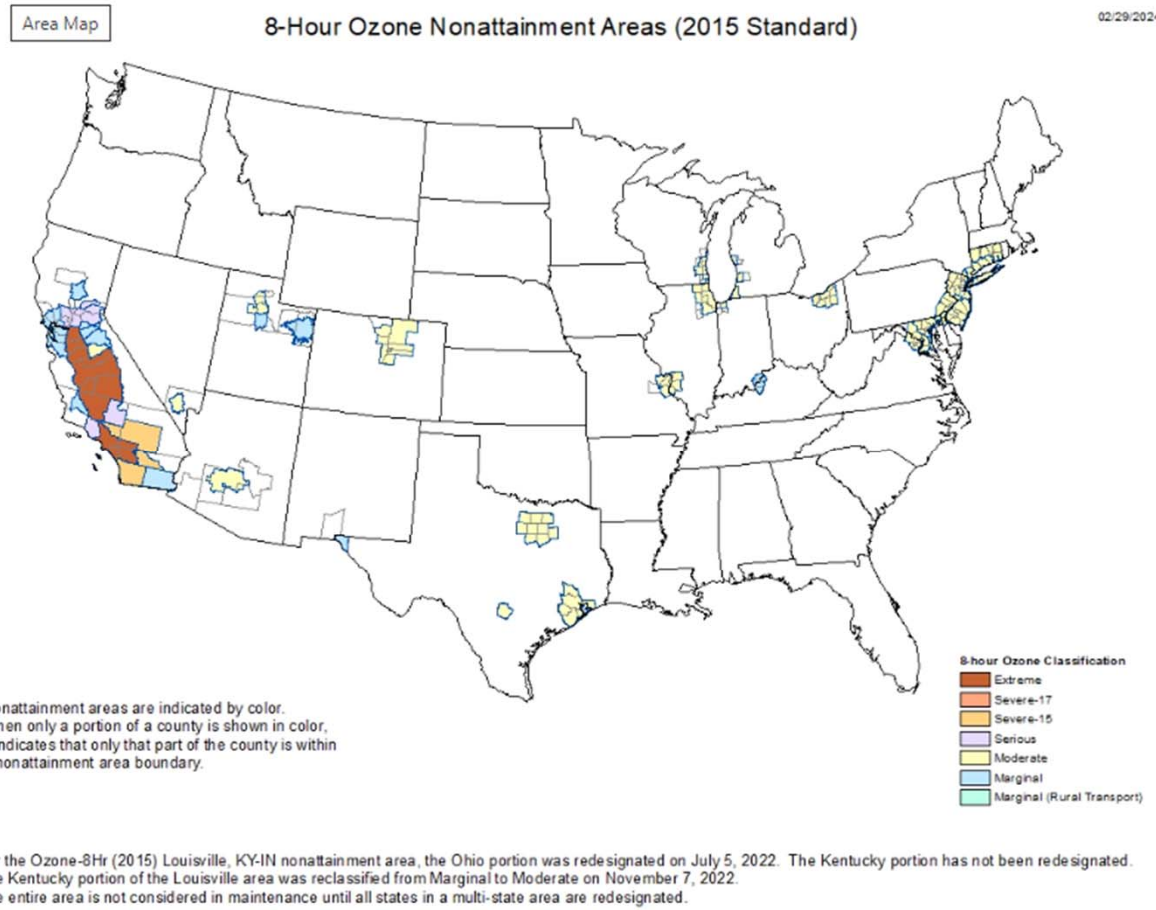
If area is meeting the more stringent standard, assumed that previous standard is being met

Timeline of Designations in St. Louis Area for 2015 Ozone Standard

- ▶ Attainment - August 2018
 - ▶ Jefferson County and all of Franklin County except Boles Township in Missouri and Monroe County in Illinois
- ▶ Marginal Nonattainment – August 2018
 - ▶ St. Charles and St. Louis Counties, City of St. Louis and Boles Township in Franklin County in Missouri and Madison and St. Clair Counties in Illinois
- ▶ Marginal Nonattainment - July 2021 (as result of court decision USEPA re-examined historical data and reclassified)
 - ▶ Jefferson County in Missouri and Monroe County in Illinois
- ▶ Moderate Nonattainment – November 2022 (reclassified from marginal as monitoring data for 2018 – 2020 showed that the area did not attain standard by August 3, 2021)
 - ▶ Jefferson, St. Charles and St. Louis Counties, City of St. Louis and Boles Township in Franklin County in Missouri and Madison, Monroe and St. Clair Counties in Illinois



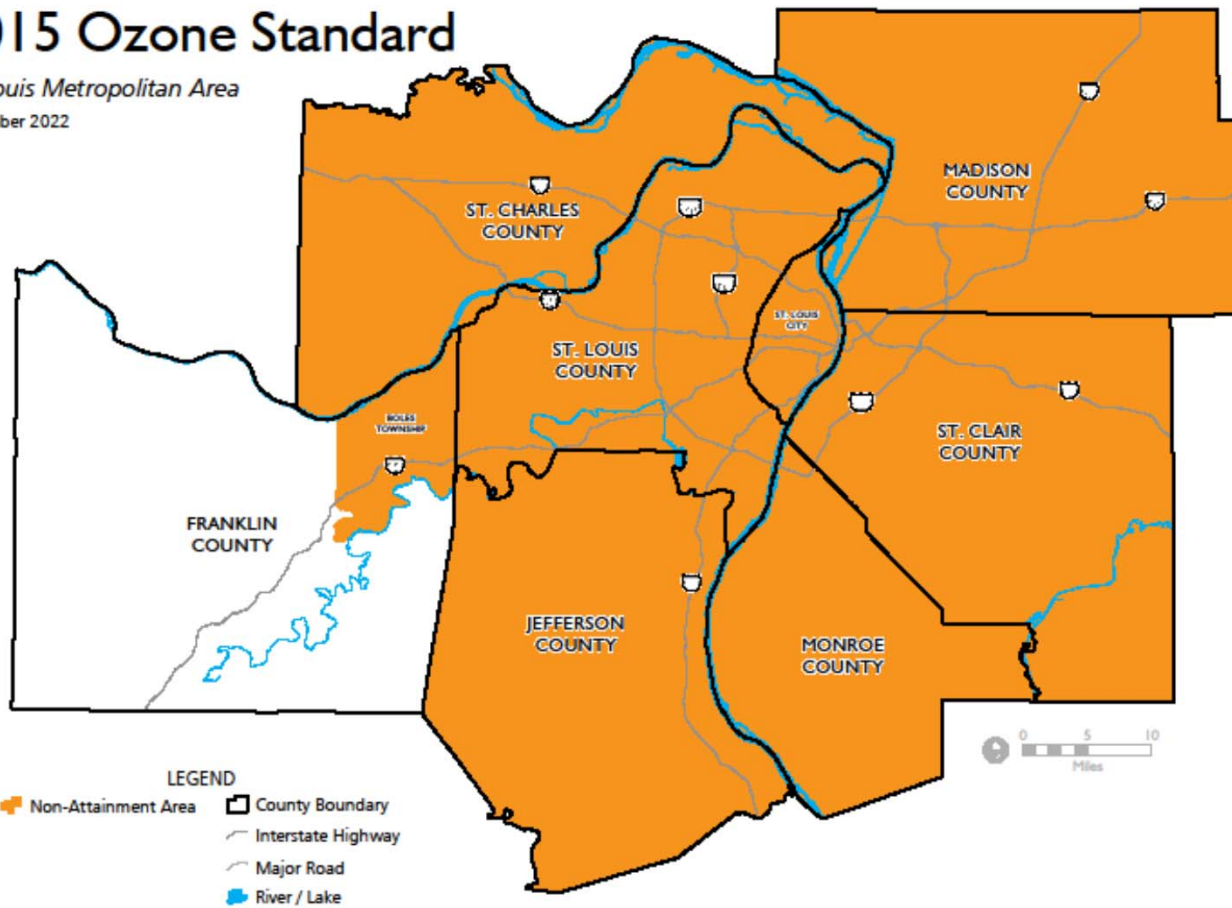
USEPA's Designated Ozone Non-Attainment Areas – Feb 2024



| <u>Classification</u> | <u>Number</u> |
|----------------------------|---------------|
| Extreme | 2 |
| Severe | 3 |
| Serious | 5 |
| Moderate | 23 |
| Marginal | 12 |
| Marginal (Rural Transport) | 1 |
| Total | 46 |

Non-Attainment Area 2015 Ozone Standard

St. Louis Metropolitan Area
November 2022



Sources: East-West Gateway Council of Governments



Ozone Monitors in Non-Attainment Area

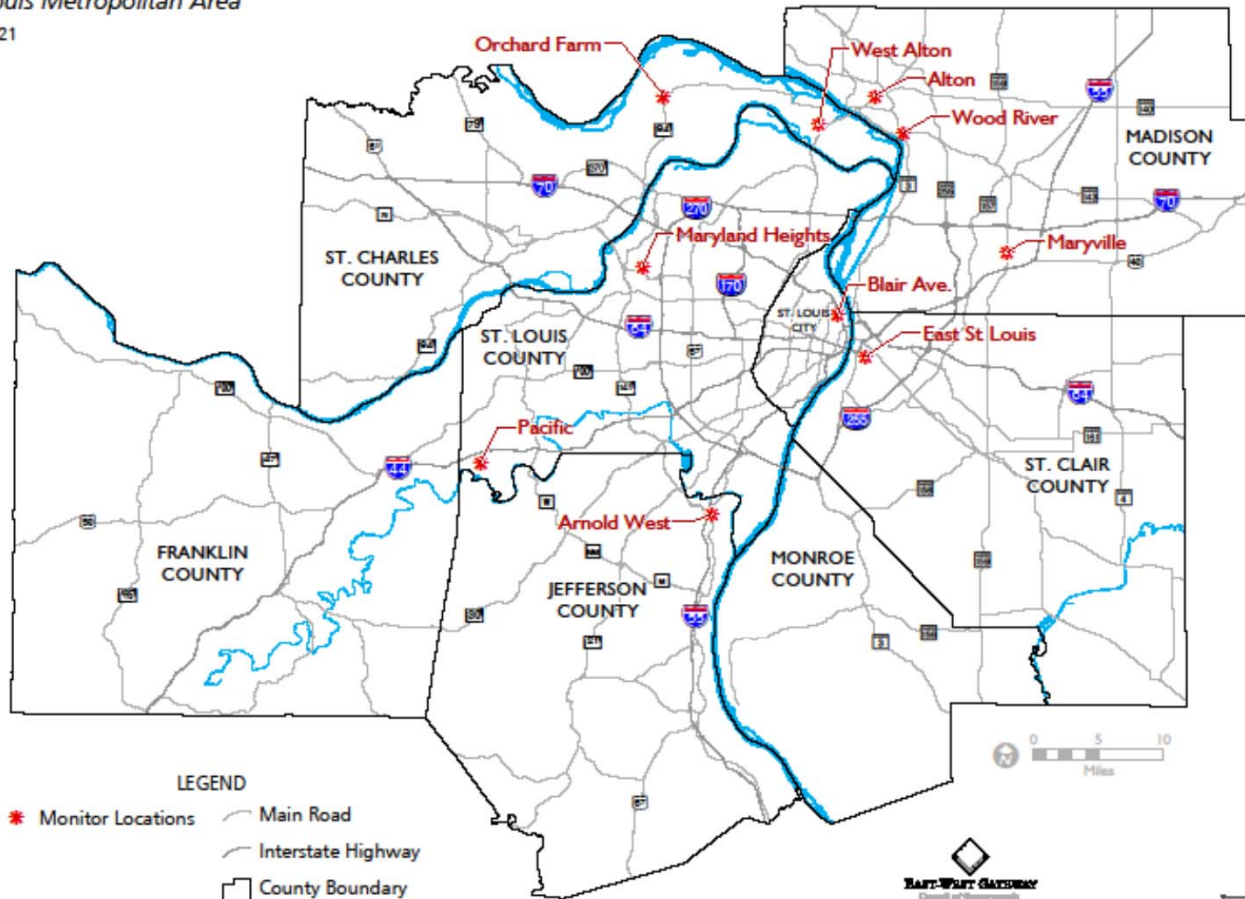
| Monitor Name | County |
|--|-------------------|
| Illinois – Operated by Illinois Environmental Protection Agency | |
| Alton | Madison |
| Wood River | Madison |
| Maryville | Madison |
| East St. Louis | St. Clair |
| Missouri – Operated by Missouri Department of Natural Resources | |
| West Alton | St. Charles |
| Orchard Farm | St. Charles |
| Maryland Heights | St. Louis |
| Pacific | St. Louis |
| Blair Street | City of St. Louis |
| Arnold West | Jefferson |



Ozone Monitor Network

St. Louis Metropolitan Area

July 2021



Source: East-West Gateway Council of Governments

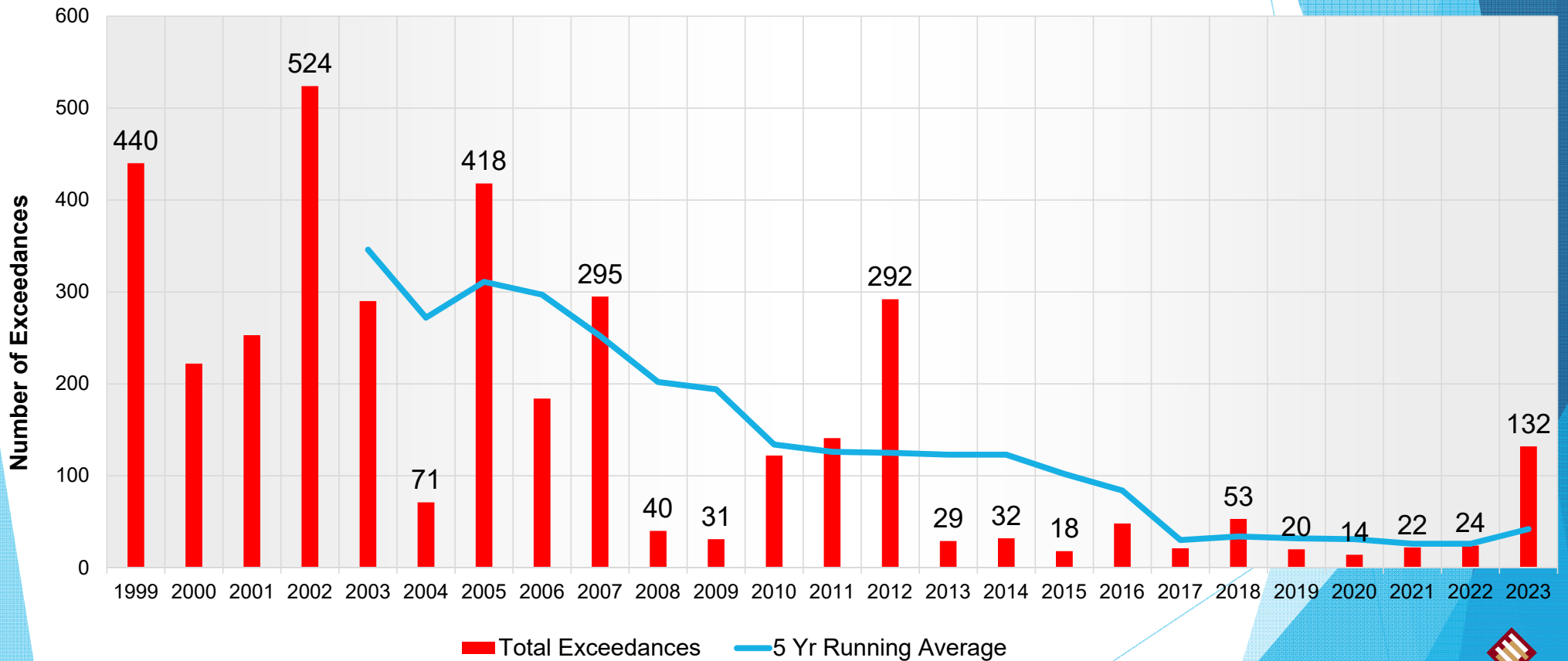


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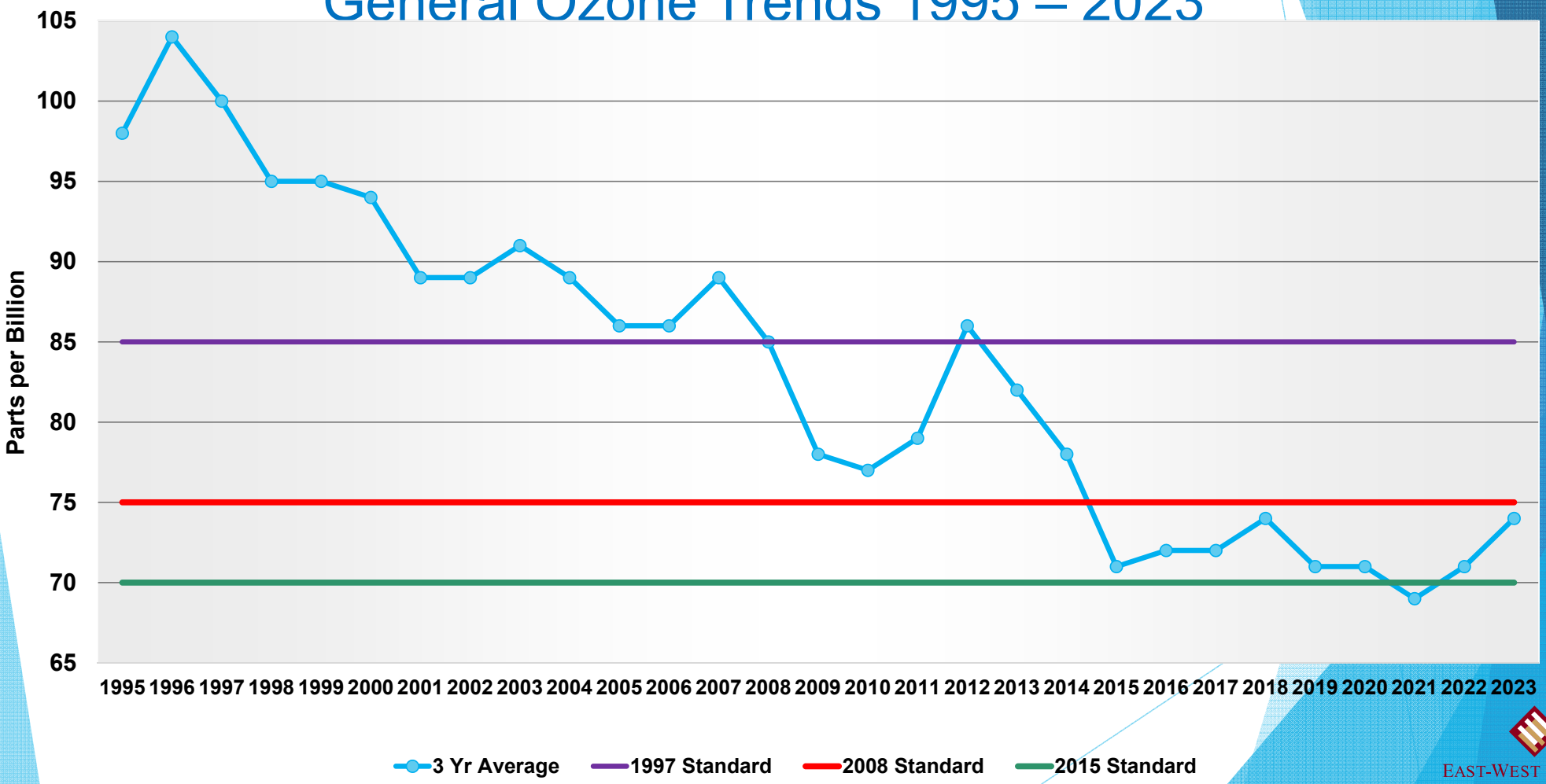
St. Louis Region 1999-2023 Exceedances

Based on 2015 Standard



2023 data still to be quality assured

St. Louis Region General Ozone Trends 1995 – 2023



Requirements for Moderate Nonattainment Areas

- ▶ Attainment date – August 3, 2024
 - ▶ 2021 – 2023 monitor data is to show no violation of 2015 ozone standard (for all 10 monitors in nonattainment area)
- ▶ Missouri and Illinois are to continue to carry out the planning requirements for Marginal nonattainment areas
 - ▶ Emissions inventory – point, area and mobile sources and commitment to update
 - ▶ Emissions statement rule - obligating major point sources (emitting 100 tons per year or tpy) in nonattainment area to report emissions on an annual basis
 - ▶ Nonattainment area new source review (NNSR) program – permitting regulations for new or modified existing point sources in nonattainment area
- ▶ Missouri and Illinois are to address planning requirements for Moderate nonattainment areas
 - ▶ Attainment Demonstration State Implementation Plan (SIP)
 - ▶ Enhanced monitoring plan

Requirements for Moderate Nonattainment Areas - Continued

- ▶ Demonstration that motor vehicle emissions Inspection/Maintenance (I/M) program(s) in place meets requirements of Basic I/M program
- ▶ 15% Rate of Progress SIP demonstrating reduction in emissions over a set time frame
- ▶ Demonstration that state implements VOC/NO_x Reasonably Available Control Technology (RACT) rules for major point sources or for sources which have EPA-developed Control Techniques Guidelines
- ▶ Contingency measures called out if area found to fail to attain standard
- ▶ Control requirements
 - ▶ NSR offset rate for new major sources (100 tpy) is reducing 1.15 tons of existing emissions for every 1 ton of new emissions. Marginal nonattainment area offset rate was 1.1 tons of existing emissions for 1 ton of new emissions.

Strategies to Improve Ozone Levels

- ▶ Vehicle technology improvements
- ▶ Cleaner burning gasoline
- ▶ Illinois and Missouri vehicle emissions testing programs
- ▶ Transportation projects to reduce congestion
- ▶ Ridesharing program and MetroLink
- ▶ Controls on industry and power plants
- ▶ Individual behavior decisions
- ▶ Still work to be done



Status of the Other Criteria Pollutants for the St. Louis Region

| Pollutant | Missouri | Illinois |
|-------------------|--|--|
| PM _{2.5} | 1997 standard - Maintenance (standard revoked by EPA) 2012 standard - Attainment | 1997 standard - Maintenance (standard revoked by EPA) 2012 standard - Attainment |
| CO | Attainment - 20-year maintenance period for City of St. Louis and portion of St. Louis County within I-270 ended in March 2019 | Attainment |
| Lead | Nonattainment within city limits of Herculaneum in Jefferson County - Remainder Attainment | Maintenance for Granite City and Venice Townships in Madison County - Remainder Attainment |
| NO ₂ | Attainment | Attainment |
| SO ₂ | Maintenance for portion of east-central Jefferson County - Remainder Attainment | Nonattainment for portion of Alton Township in Madison County - Remainder Attainment |

Attainment - Area meets standard

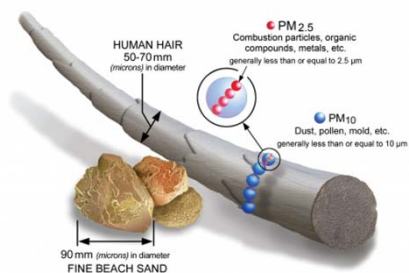
Nonattainment - Area does not meet standard, work underway so it will

Maintenance - Area redesignated from nonattainment to attainment of standard - requirements to attain standard have been and continue to be met for 20 years

Nonattainment Areas for Criteria Pollutants (EPA Green Book) as of February 29, 2024

Fine Particulate Matter (PM_{2.5}) - Another Transportation-related Pollutant of Concern

- ▶ PM_{2.5} is a mix of solid particles and liquid droplets suspended in the atmosphere
- ▶ It can be emitted directly into the air from combustion or formed as a result of chemical reaction of gases in the atmosphere
- ▶ PM_{2.5} is about 1/30 the width of a human hair
- ▶ Affects children and the elderly
- ▶ Most at risk from exposure are people with asthma, heart or lung disease and those who are active outdoors when levels are predicted to be high
- ▶ PM_{2.5} is able to penetrate and get deep into lungs
- ▶ Effects include eye irritation, sore throat, coughing, chest tightness and shortness of breath



PM_{2.5} History – St. Louis Region

- ▶ **1997 Annual PM_{2.5} Standard (15 ug/m³)**
 - ▶ USEPA designated St. Louis region (MO-IL) and Baldwin Township, Randolph County IL as moderate non-attainment area in 2005
 - ▶ USEPA found Missouri counties in attainment in October 2018 and Illinois counties and township in attainment in May 2019
 - ▶ When redesignation to attainment occurred, USEPA revoked the 1997 standard
 - ▶ Considered “Maintenance area (standard revoked)”
- ▶ **2012 Annual PM_{2.5} standard (12 ug/m³)**
 - ▶ In 2015 due to data quality assurance issues, USEPA identified St. Louis region (MO-IL) as unclassifiable (additional information needed to make determination)
 - ▶ Issues were resolved and USEPA was able to classify as in attainment: all of Illinois in January 2019; and Missouri counties in St. Louis region in July 2019
- ▶ **St. Louis region currently in attainment for these PM_{2.5} standards**
- ▶ **2024 Annual PM_{2.5} standard (9 ug/m³)**
 - ▶ Should know late in 2026 what the air quality classification of the region will be



Contributing to Improvements in PM_{2.5} Levels

- ▶ Point source controls
- ▶ Vehicle technology improvements
- ▶ Clean diesel fuel formulation
- ▶ Illinois and Missouri vehicle emissions testing programs
- ▶ Replacing older diesel vehicles (school buses, etc.)
- ▶ Switching out old diesel engine for new (marine vessels, trains)



USEPA's Air Quality Index

- ▶ The Air Quality Index (AQI) tool informs people about air pollution levels and associated health impacts – www.airnow.gov
- ▶ It uses six color-coded categories that represent levels of health concerns

| Air Quality Index | | | | | |
|-------------------|----------|--------------------------------|-----------|----------------|-----------|
| Good | Moderate | Unhealthy for sensitive groups | Unhealthy | Very Unhealthy | Hazardous |
| 0 ↔ 50 | 51 ↔ 100 | 101 ↔ 150 | 151 ↔ 200 | 201 ↔ 300 | 301 ↔ + |

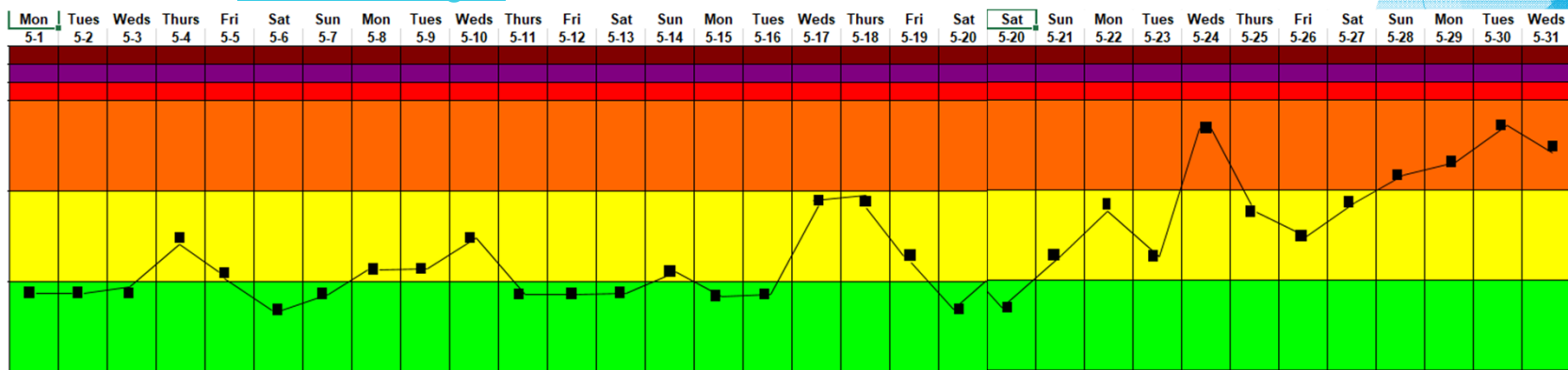
- ▶ For ozone, the AQI tool takes the eight-hour ozone average and converts it to a standardized AQI value (0 to 500) with 100 being equal to 70 ppb, the 2015 standard
- ▶ East-West Gateway displays the AQI data for the St. Louis region as a calendar <https://www.ewgateway.org/community-planning/environmental/air-quality/ozone-monitoring/>
- ▶ During the summer, St. Louis Clean Air Partnership/KMOV Channel 4 meteorologists prepare daily ozone air quality forecasts – www.cleanair-stlouis.com
- ▶ Clean Air Partnership information about potential unhealthy days can also be found on NWS St Louis web site - <https://www.weather.gov/lx/StLouisAirQualityAlerts>



For Additional Information

- ▶ East West Gateway Council of Governments – www.ewgateway.org/community-planning/environmental/air-quality
- ▶ St. Louis Regional Clean Air Partnership – www.cleanair-stlouis.com
- ▶ Illinois Environmental Protection Agency – www2.illinois.gov/epa/general_information/Pages/air-quality.aspx
- ▶ Missouri Department of Natural Resources – www.dnr.mo.gov/air
- ▶ Plain English Guide to the Clean Air Act, USEPA (2007) – www.epa.gov/sites/default/files/2015-08/documents/peg.pdf
- ▶ USEPA AirNow – www.airnow.gov

Daily AQI Calendar for May 2023



“Clean air is not an aesthetic luxury,
it is a public health necessity.”

- Douglas M. Costle, USEPA Administrator 1977 - 1981



Children playing at CityGarden