Air Quality Overview

Air Quality Advisory Committee

March 26, 2019

East-West Gateway Air Quality Activities

- Coordinates Ozone Data Sharing Project
  - Act as clearinghouse for Illinois and Missouri ozone monitor data
- Works with Illinois and Missouri on strategies to reduce transportation-related emissions
- Performs Transportation Air Quality Conformity Determination
  - Facilitate transportation and air quality peer group, Inter Agency Consultation Group (IACG)
- Administers the competitive Congestion Mitigation Air Quality (CMAQ) grant program

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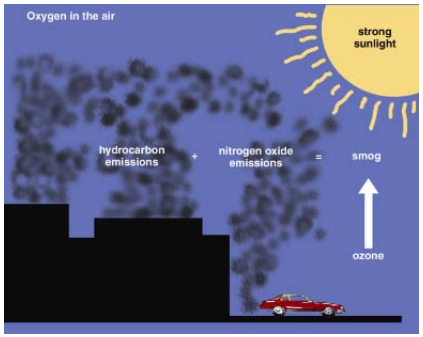
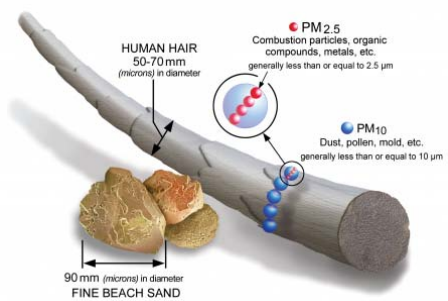
Transportation-Related Pollutants of Concern

- **Ground Level Ozone**
- Formed when hydrocarbons and nitrogen oxides from vehicle exhaust and other industrial processes chemically reaction with oxygen in the lower atmosphere
- Weather influences – strong sunshine, low wind speed, temperature 85º +



- Carried by wind

- **Fine Particulate Matter ($PM_{2.5}$)**
- It 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



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National Ambient Air Quality Standards

Pollutant	Standard	Averaging Time	Source
$PM_{2.5}$	12 ug/m^3	1 year	• Stationary (e.g. smokestacks, chemical reactions) • Construction sites, unpaved roads • Mobile (e.g. brake wear, tire wear, chemical reactions from tailpipe emissions)
Ozone	70 ppb	8 hours	• Mobile (e.g. cars, trucks) • Stationary (e.g. power plants, refineries, chemical plants)

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Health Effects

- **Ground Level 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

- **$PM_{2.5}$**
- 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

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Ozone Standard

- USEPA strengthened the standard in October 2015
- Standard was set at 70 parts per billion (ppb)
- Exceedance is when an 8-hour average for a monitor in a non-attainment area is >70 ppb
- Attainment is when the 3-year average of 4th highest annual average for each monitor in a non-attainment area is ≤ 70 ppb

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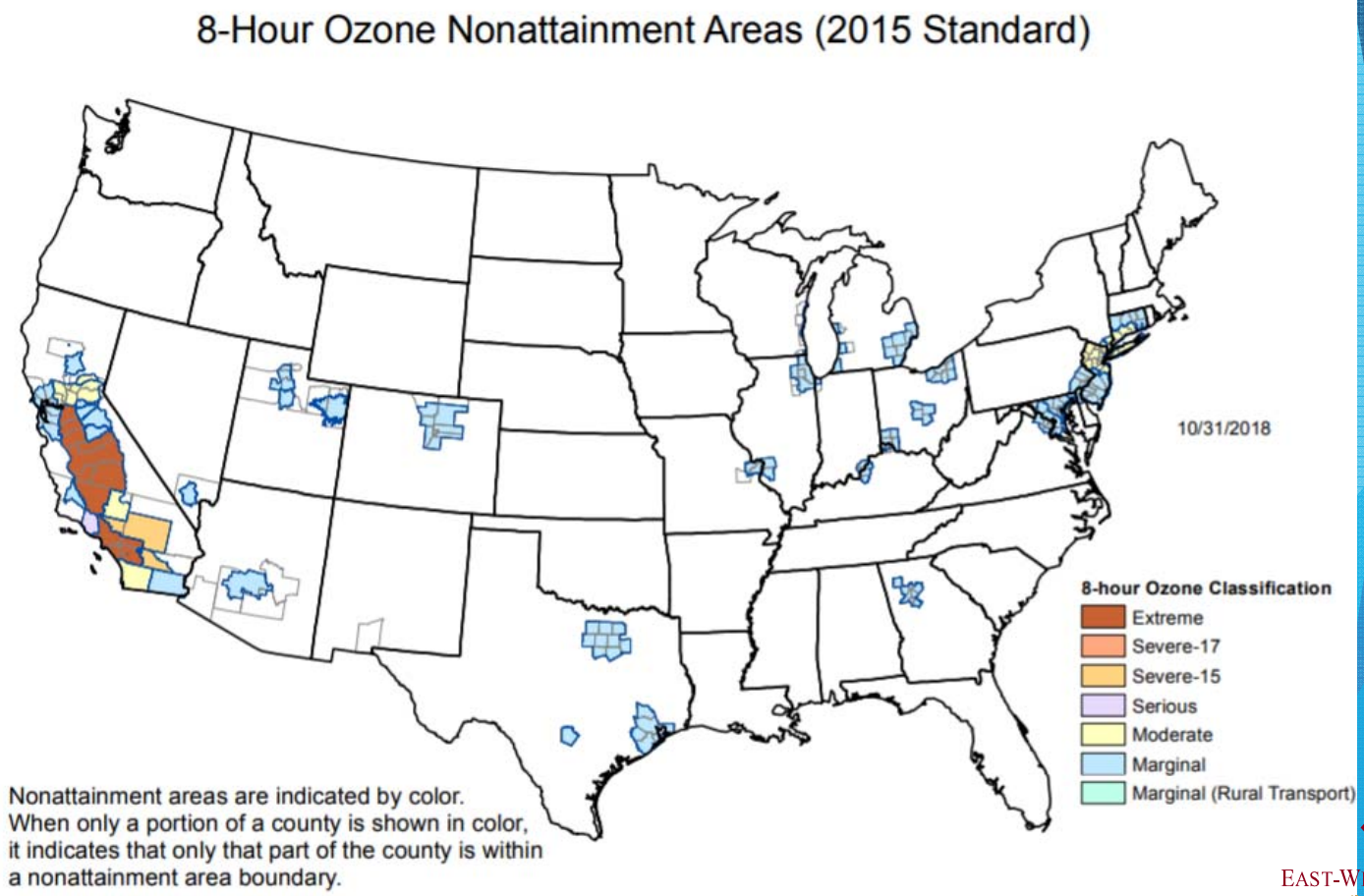
USEPA's Designated Non-Attainment Areas

Classification	Number
Extreme	2
Severe	2
Serious	2
Moderate	5
Marginal	39
Marginal (Rural Transport)	2
Total	52



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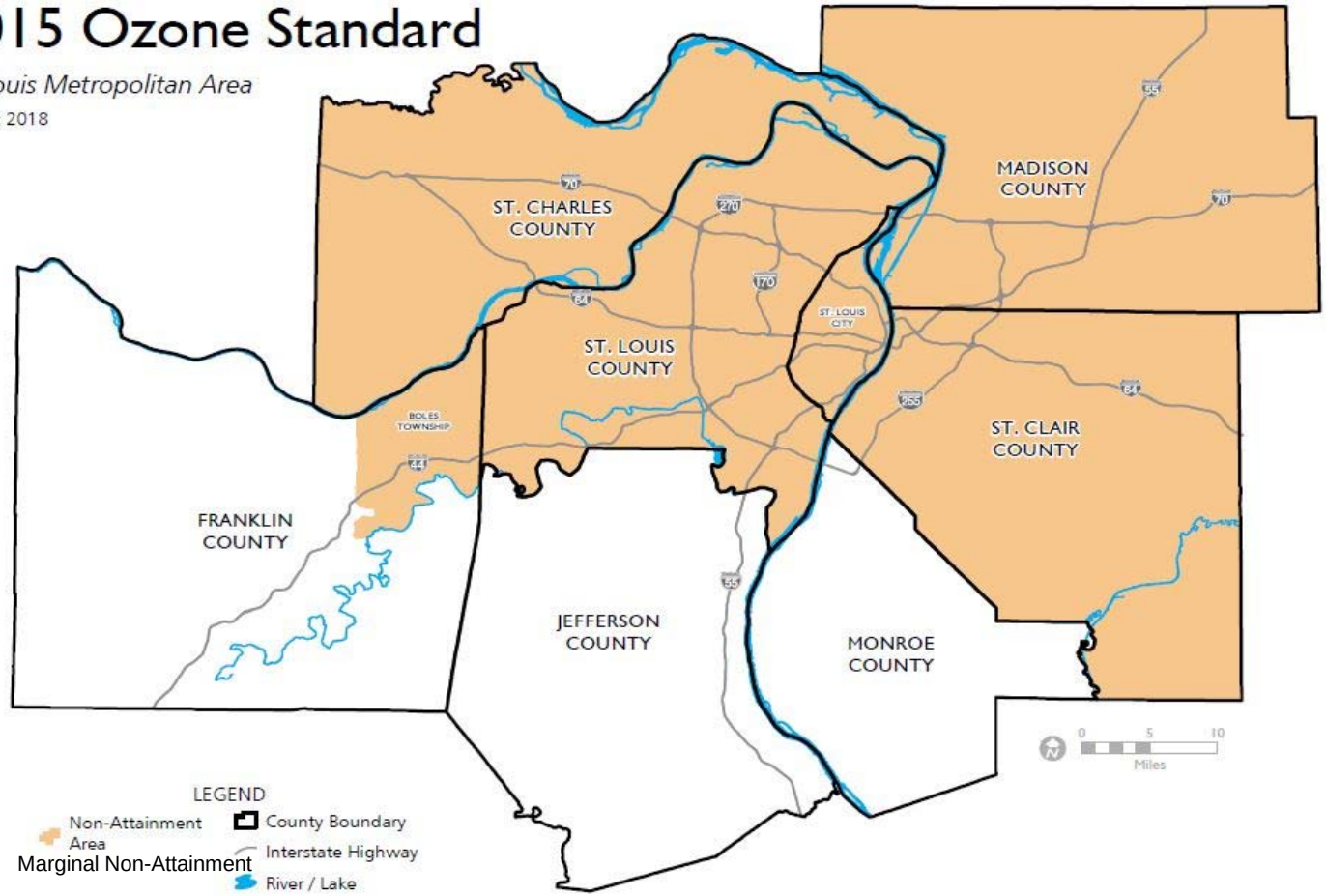
Non-Attainment Area
2015 Ozone Standard

St. Louis Metropolitan Area

August 2018



Source: East-West Gateway Council of Governments

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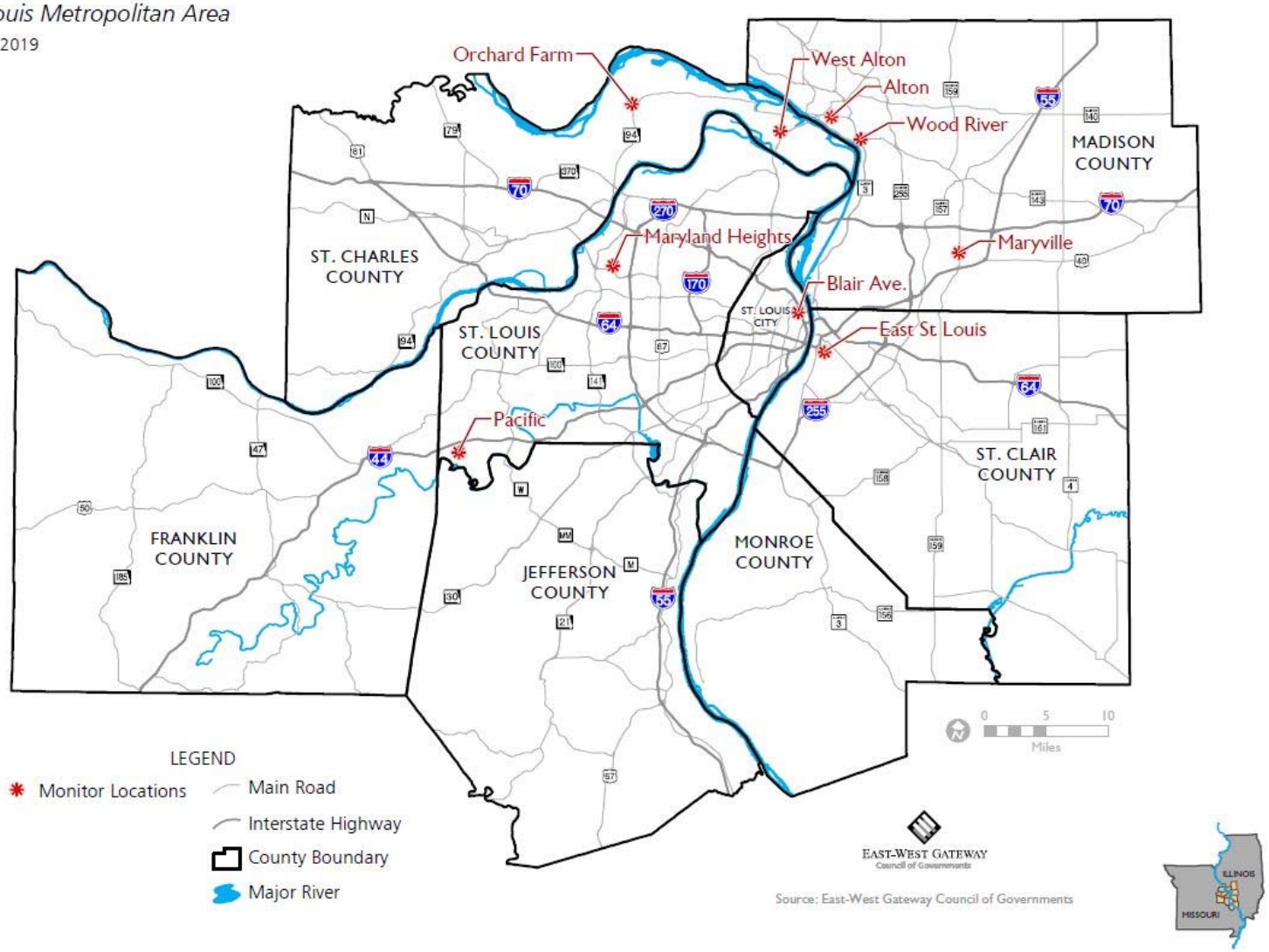
Steps to Take for Area to Attain Ozone Standard

- **State**
  - Assembles three full years of data from each monitor in non-attainment area and uses the fourth highest eight-hour ozone concentration average in each year to calculate a three-year average
    - Three year average used to determine if each monitor has attained standard
  - Prepares plan describing measures (regulations, programs and policies) to be used to reduce emissions in order to attain and maintain standard
    - Marginal non-attainment area has three years to submit plan and attain standard (2020)
- **USEPA**
  - Reviews monitor data and plan, approves plan and re-designates area to attainment

Ozone Monitor Network

St. Louis Metropolitan Area

March 2019



Ozone Monitor Locations In the Non-Attainment Area

Monitor Name	County
Illinois*	
Alton	Madison
Wood River	Madison
Maryville	Madison
East St. Louis	St. Clair
Missouri**	
West Alton	St. Charles
Orchard Farm	St. Charles
Maryland Heights	St. Louis
Pacific	St. Louis
Blair Street	City of St. Louis

* Operated by Illinois Environmental Protection Agency

** Operated by Missouri Department of Natural Resources

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USEPA's Air Quality Index

- Air Quality Index (AQI) tool informs people about air pollution levels and associated health impacts – www.airnow.gov
- For ozone, AQI tool takes the eight-hour average and converts it to a standardized AQI value (0 to 500) with 100 being equal to the 2015 standard
- Six color-coded categories have a different level of health concern

Air Quality Index					
Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy	Hazardous
0 ←→ 50	51 ←→ 100	101 ←→ 150	151 ←→ 200	201 ←→ 300	301 ←→ +

- During the summer, St. Louis Clean Air Partnership/KMOV Channel 4 meteorologists prepare daily ozone air quality forecasts – www.cleanair-stlouis.com

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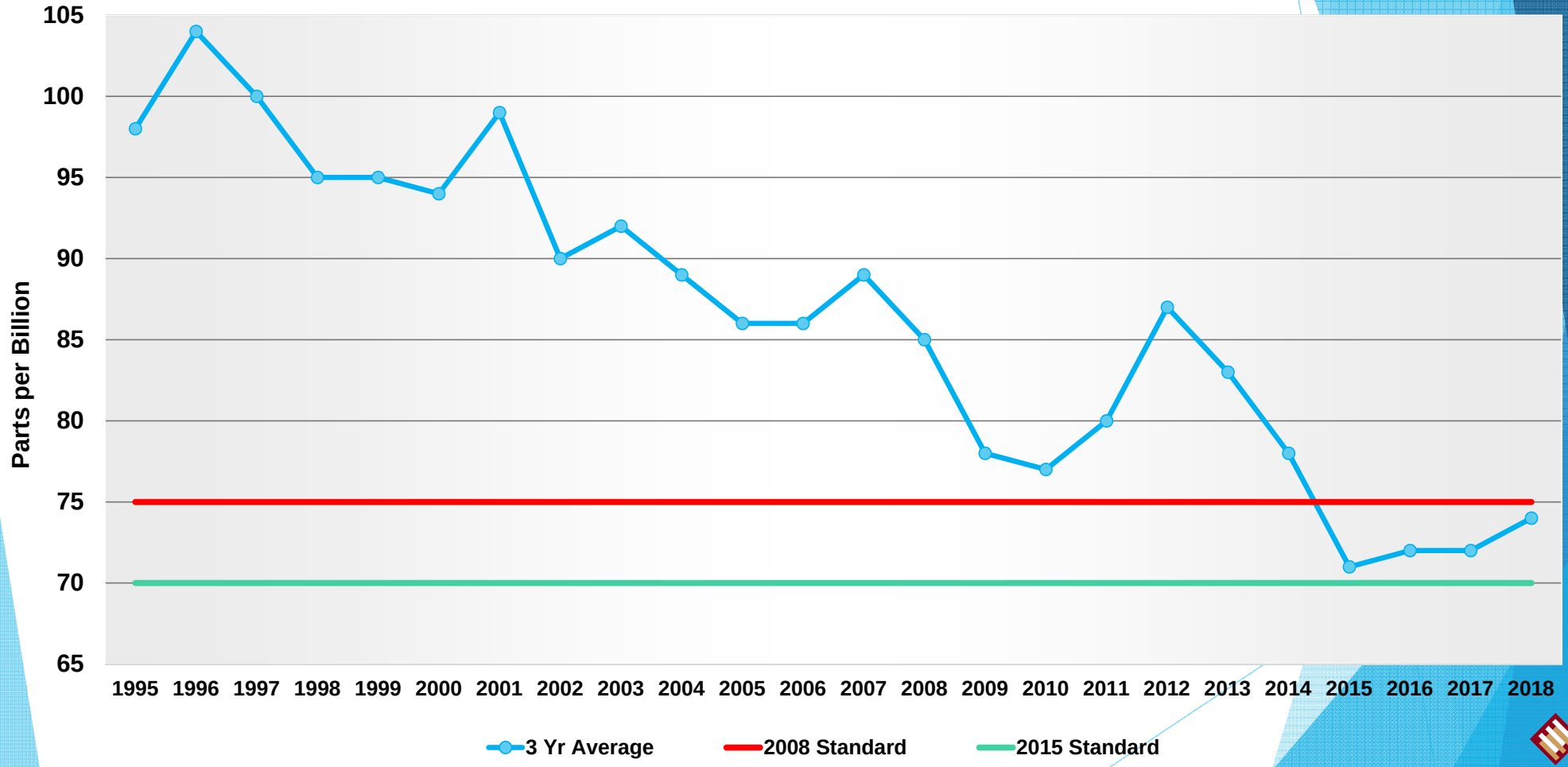
General Ozone Trends 1992 – 2018*



* 2016 – 2018 still to be quality assured

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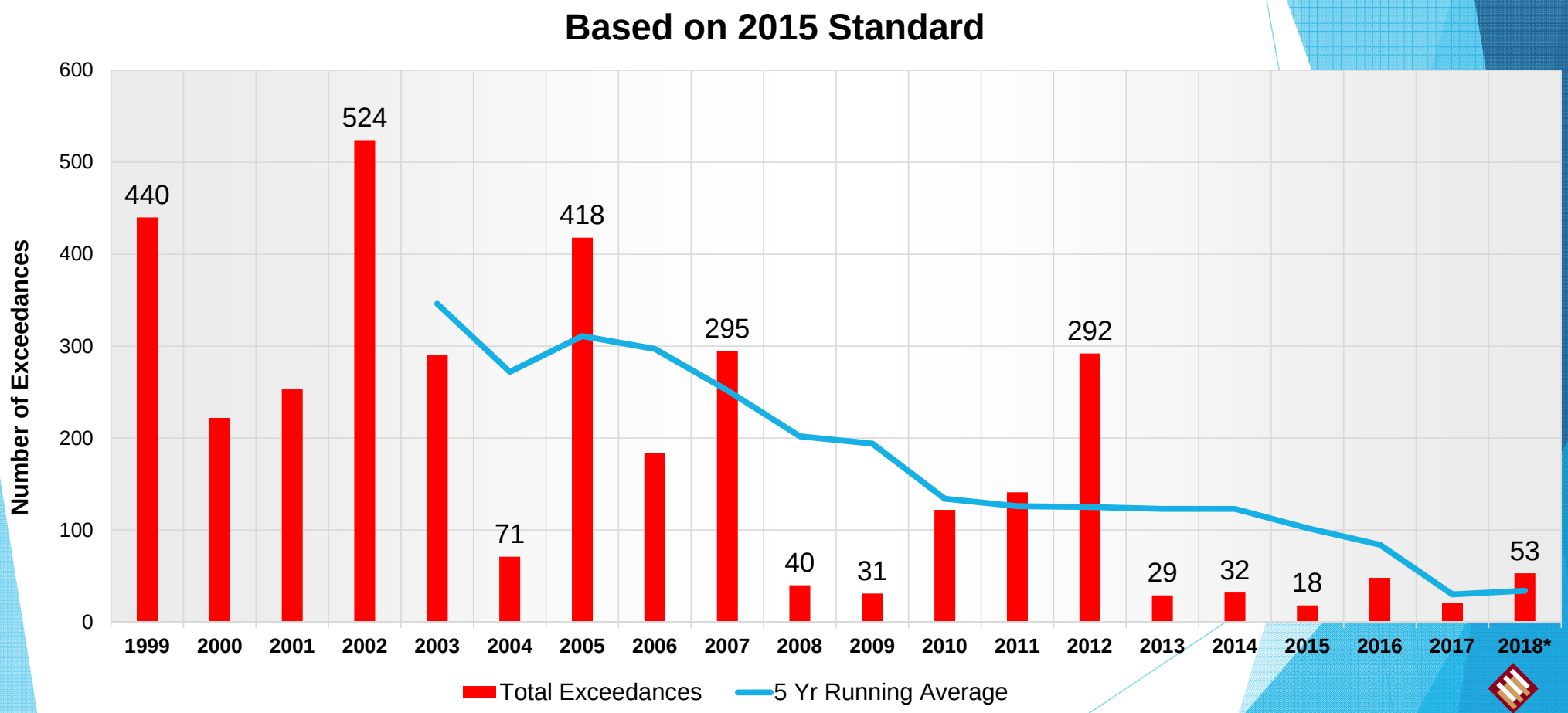
1999-2018* Exceedances



* 2018 data is preliminary and still needs to be quality assured

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Contributing to Improvements in 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

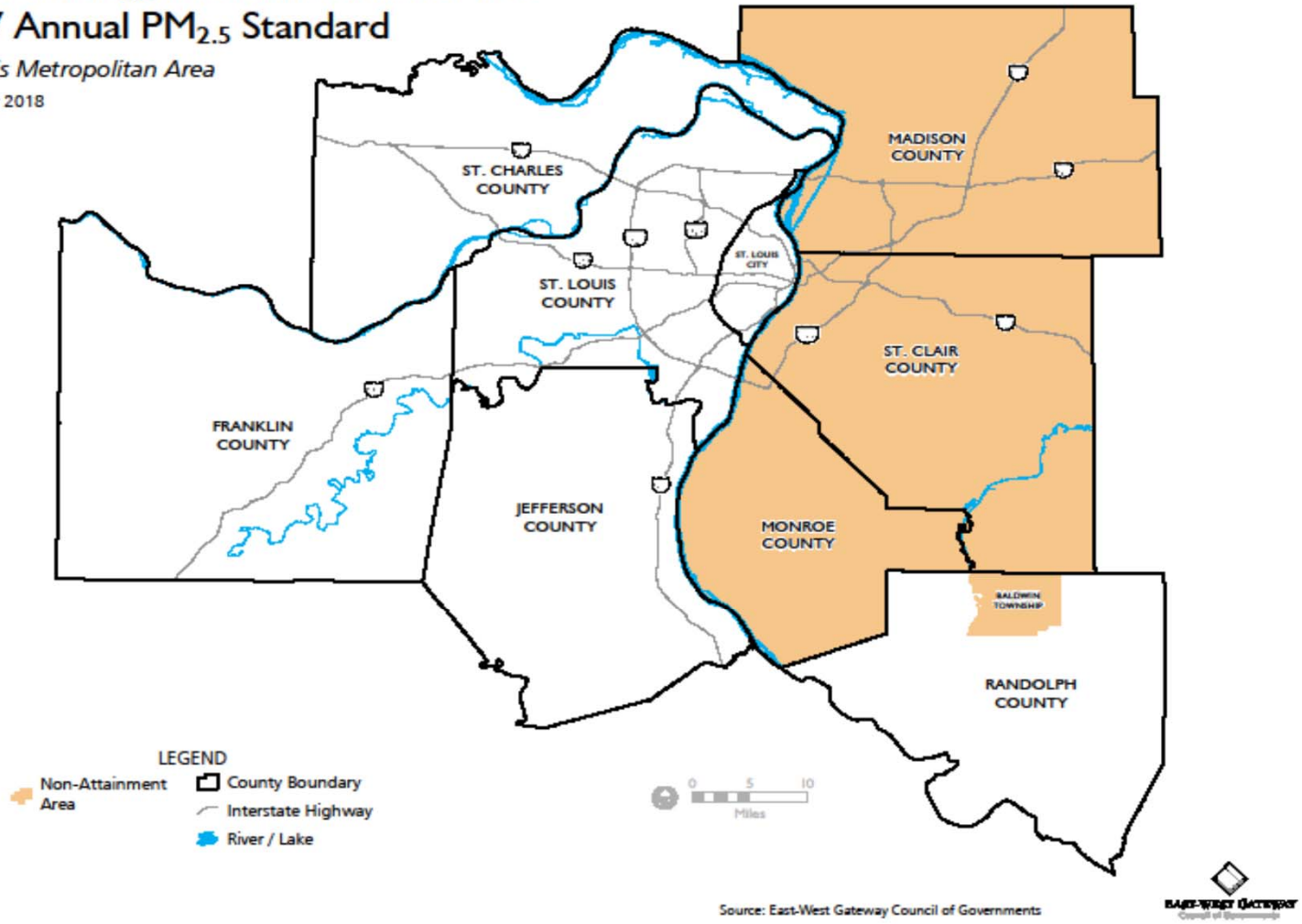
$PM_{2.5}$ History

- **1997 Annual $PM_{2.5}$ Standard**
  - USEPA designated the St. Louis region (MO-IL) and Baldwin Township, Randolph county IL as a moderate non-attainment area in 2005
  - USEPA found Missouri counties in attainment in October 2018
  - In March 2019, USEPA announced a proposed rule finding that the Illinois counties/townships are in attainment and have begun a 30 day comment period
- **2012 Annual $PM_{2.5}$ Standard**
  - USEPA in 2015 noted St. Louis region (MO-IL) as unclassifiable due to data quality assurance issues
  - Issues have been resolved and USEPA action on Illinois request to classify as attainment should be finalized in 2019
  - Issues have been resolved and Missouri working on a similar request to USEPA

St Louis $PM_{2.5}$ Non-Attainment Area
1997 Annual $PM_{2.5}$ Standard

St. Louis Metropolitan Area

November 2018



Source: East-West Gateway Council of Governments

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)

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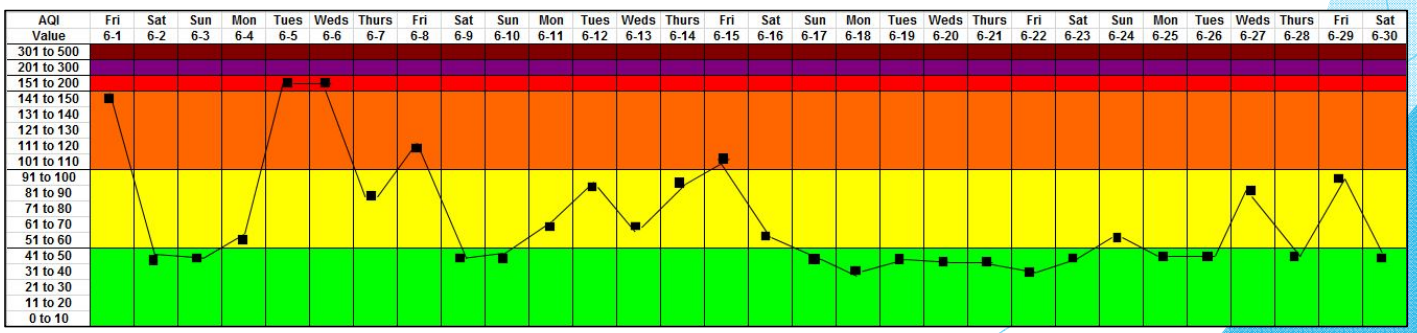
For Additional Information

- 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 – www.epa.Illinois.gov/air
- Missouri Department of Natural Resources – www.dnr.mo.gov/env/apcp/
- Plain English Guide to the Clean Air Act, USEPA – www.epa.gov/sites/production/files/2015-08/documents/peg.pdf
- USEPA AirNow – www.airnow.gov

Daily AQI Calendar for June 2018



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Mid day October 28, 1938 looking east along Pine from 200 block of N. Tucker – St. Louis Post-Dispatch

October 29, 2018 – Looking east from SSM St. Mary's Health Center
MDNR Visual Air Pollution Camera

Children playing at CityGarden

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Questions?

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