AIR POLLUTION CONTROL DISTRICT
LOUISVILLE, KENTUCKY

GREG FISCHER
MAYOR

KEITH H. TALLEY, SR.
DIRECTOR

September 26, 2017

Ms. Kelly Sheckler
Advance Program Contact
U.S. EPA, Region 4
61 Forsyth Street
Atlanta, GA 30303-8960

RE: Louisville/Jefferson County Kentucky Ozone Advance Update and Request for Participation in PM Advance

Dear Ms. Sheckler:

The Louisville Metro Air Pollution Control District (APCD), in partnership with our colleagues throughout Louisville Metro Government, maintains our commitment to continued improvement in Louisville's air quality and public health. For more than 60 years, APCD has worked to make the air cleaner and healthier for the people of Louisville/Jefferson County. From our early days as a standalone local agency dealing with issues unique to our urban setting within Kentucky, to our present partnership with state and federal regulators implementing the Clean Air Act, APCD continues to seek out ways to advance our air quality goals in Louisville.

The tools to achieve these goals are as varied as the sources of pollution themselves. The implementation of federal regulations has achieved great reductions in criteria pollutants across the nation, giving communities such as ours the tools to drive down emission reductions and achieve compliance with the National Ambient Air Quality Standards (NAAQS). Achieving those standards is not a stopping point, however, and Louisville Metro Government is continuing to pursue policies and programs that aim to further reduce criteria pollutant emissions, while also achieving additional co-benefits such as urban heat reduction, decreasing greenhouse gas emissions, supporting more active lifestyles through alternative transportation choices, cost savings, and reducing community exposure to air toxics.

Please accept this letter and the attached materials that illustrate these efforts across our city as our update submittal for continued participation in the Ozone Advance program. Additionally, following our April 7, 2017 redesignation to attainment of the 1997 Primary Annual $PM_{2.5}$ NAAQS (82 FR 16943), APCD is proud to request inclusion in the PM Advance program as well. We appreciate the additional partnership opportunities that these programs present. Our participation to date in Ozone Advance has

provided excellent information sharing opportunities with EPA and, notably, other communities that are continuing their own clean air journey.

If you have any questions about our submittal, please feel free to contact Michelle King, Director of Program Planning, at michelle.king@louisvilleky.gov or 502-574-7252. APCD looks forward to continued collaboration with EPA staff and our fellow Advance participants.

Thank you,

Keith H. Talley, Sr.
Director

Advance Program Updates

Louisville Metro Air Pollution Control District
September 2017

Air Pollution Control in Louisville

Concerned about the growing problem of air pollution, city leaders in 1945 formed the Louisville Smoke Commission. That evolved into the Louisville Metro Air Pollution Control District, which today is responsible for enforcing national, state, and local air pollution laws and regulations – including the federal Clean Air Act – in Louisville/Jefferson County.

Daytime air pollution over downtown Louisville in 1943

APCD Goals

Ensure healthy air
for breathing

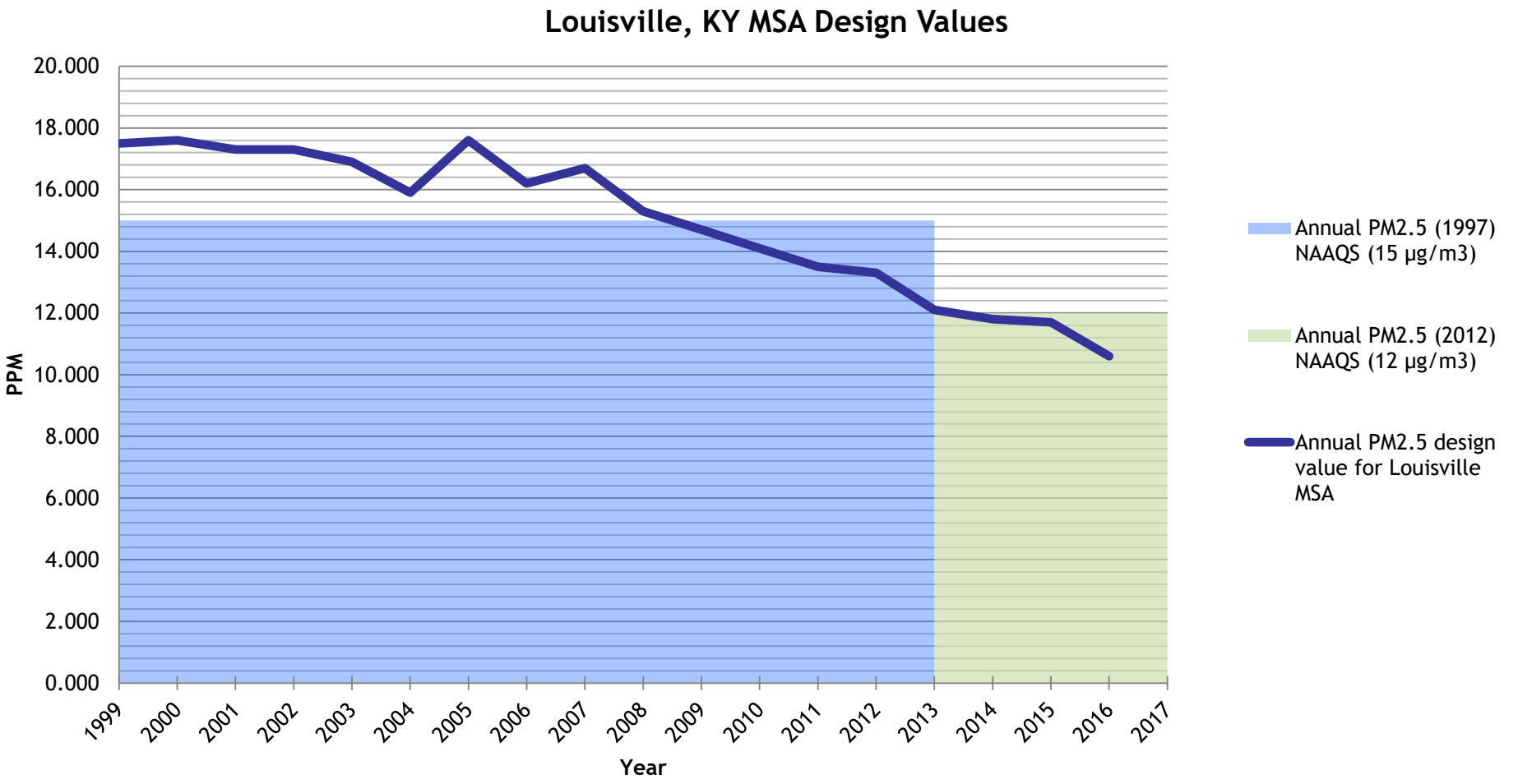
Help local businesses meet
air quality standards

NAAQS Attainment

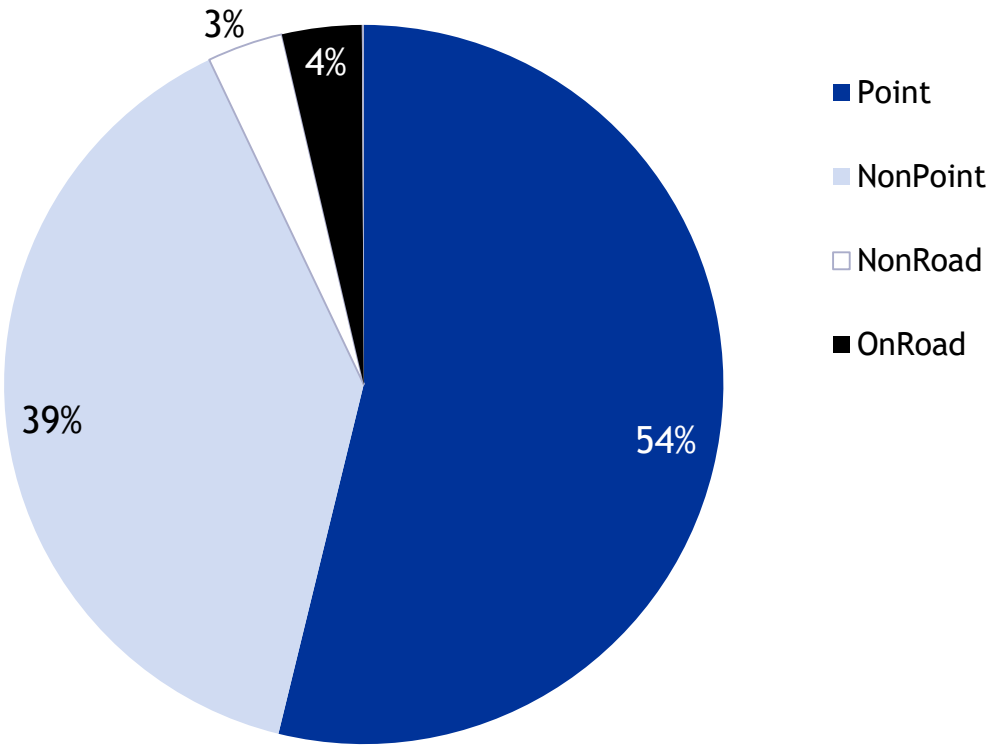
Current Status - Louisville

Pollutant	Standard	Averaging Time	Attainment Status
Carbon Monoxide	9 ppm	8-hour	Attainment
	35 ppm	1-hour	Attainment
Lead	0.15 $\mu g/m^3$	Rolling 3-Mo Average	Attainment
Nitrogen Dioxide	0.053 ppm	Annual Average	Attainment
	0.10 ppm	1-hour	Attainment
Particulate Matter (PM10)	150 $\mu g/m^3$	24-hour	Attainment
Particulate Matter (PM2.5)	15.0 $\mu g/m^3$	Annual Average	Attainment
	12.0 $\mu g/m^3$	Annual Average	Unclassifiable
	35 $\mu g/m^3$	24-hour	Attainment
Ozone	0.075 ppm	8-hour	Attainment
	0.070 ppm	8-hour	TBD
Sulfur Dioxide	0.75 ppm	1-hour	Partial Nonattainment
	0.5 ppm	3-hour	Attainment

Louisville's Fine Particle History

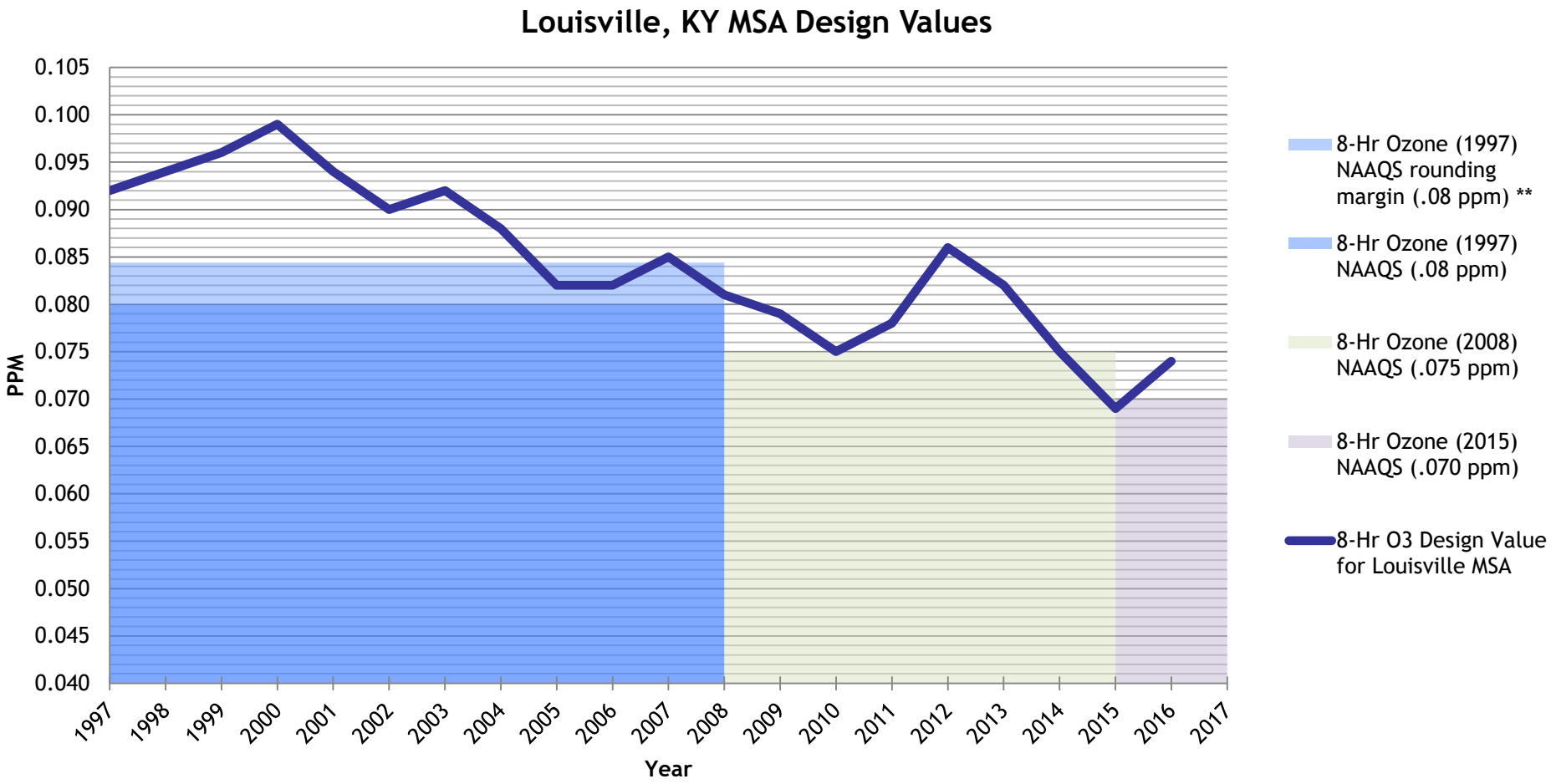


Fine Particulates by Source

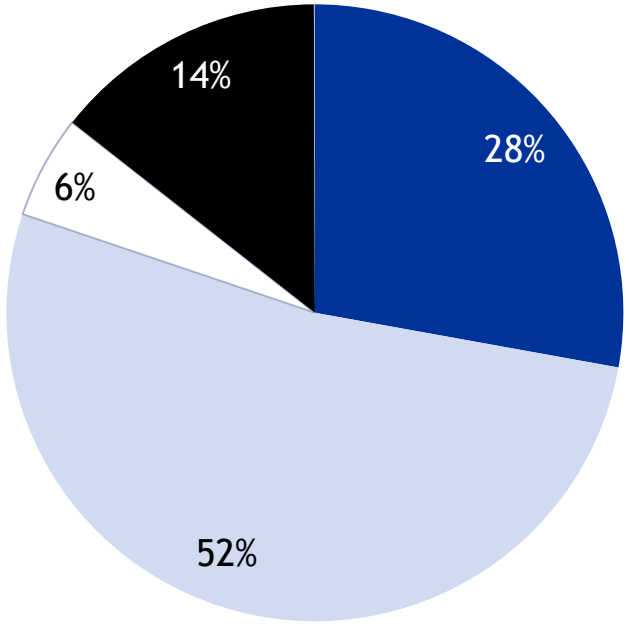


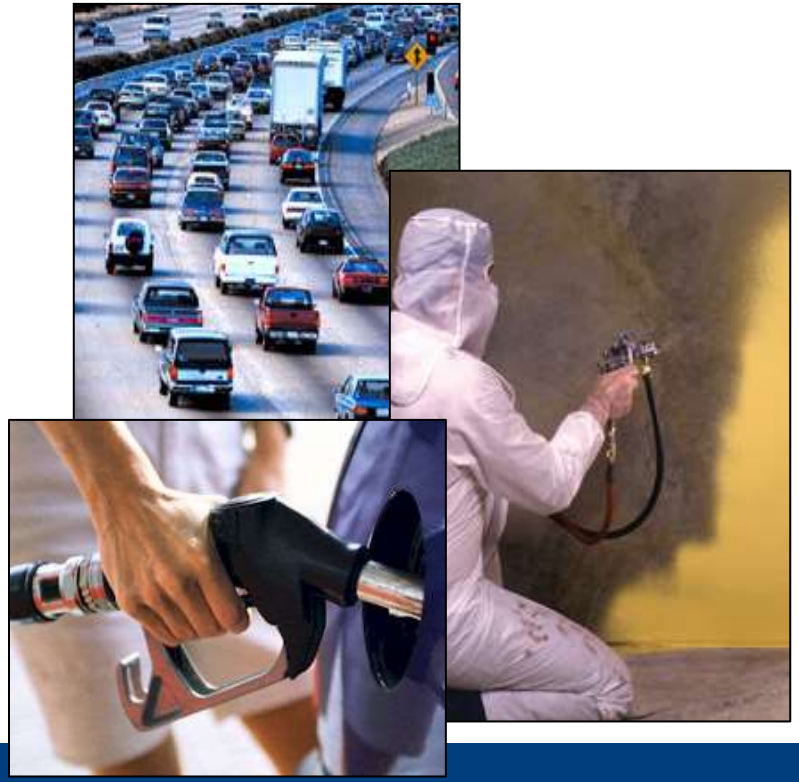
Jefferson County, KY Data from 2014 National Emissions Inventory

Louisville's Ozone History



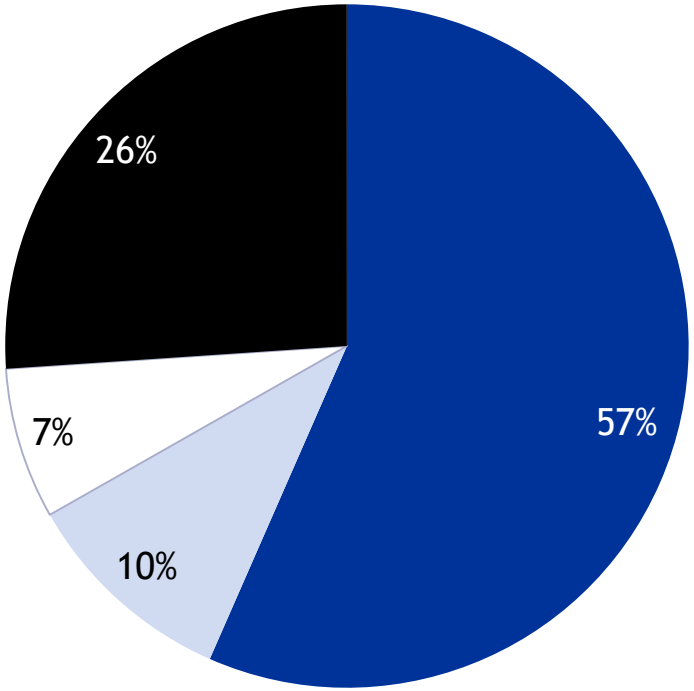
Volatile Organic Compounds by Source





Jefferson County, KY Data from 2014 National Emissions Inventory

Oxides of Nitrogen by Source



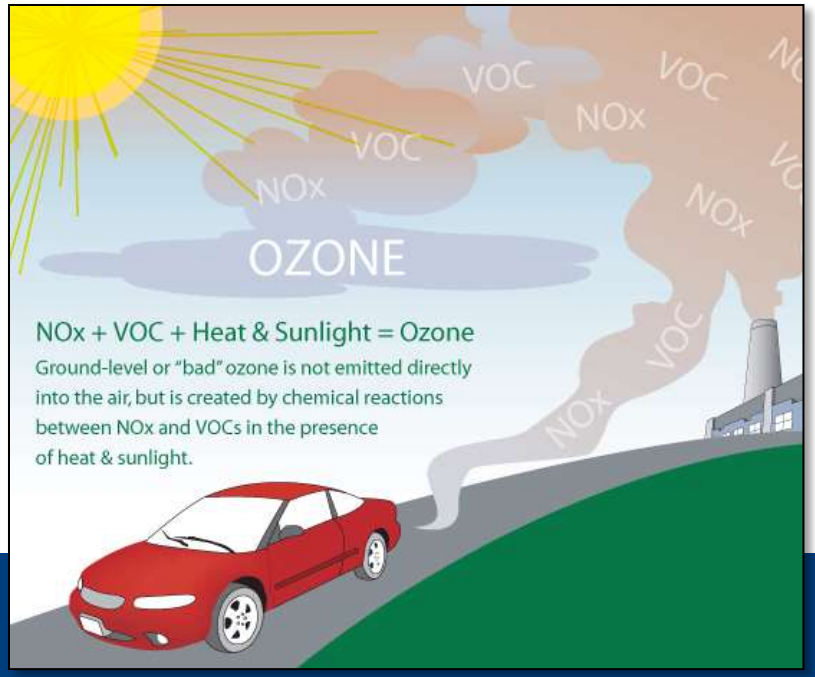
Jefferson County, KY Data from 2014 National Emissions Inventory

Is there another component of Ozone can we control?

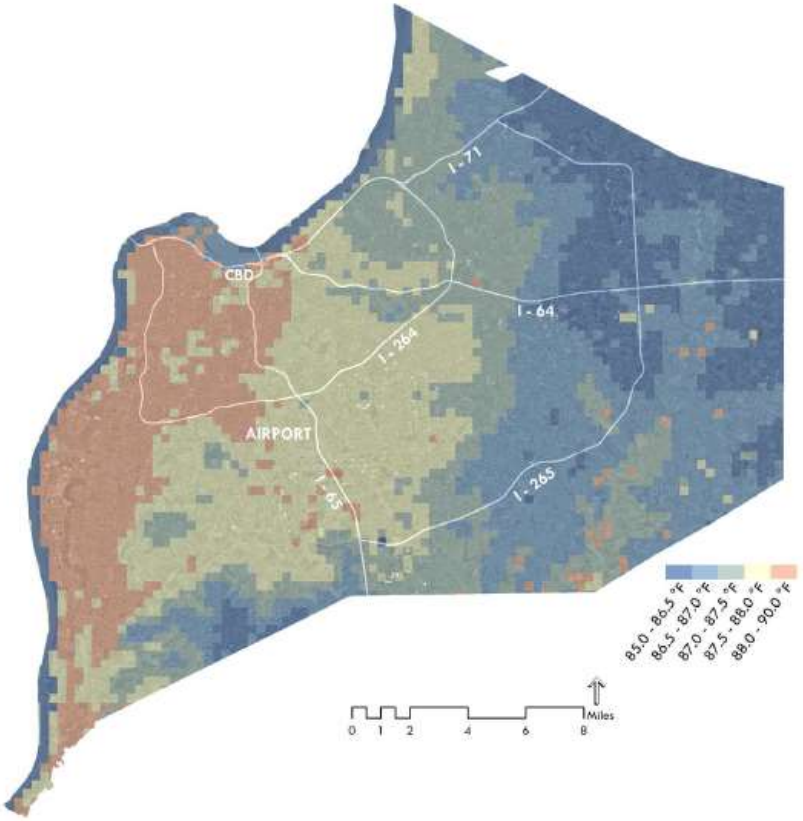
$$NOx + VOCs + Sunlight = O_3$$

HEAT

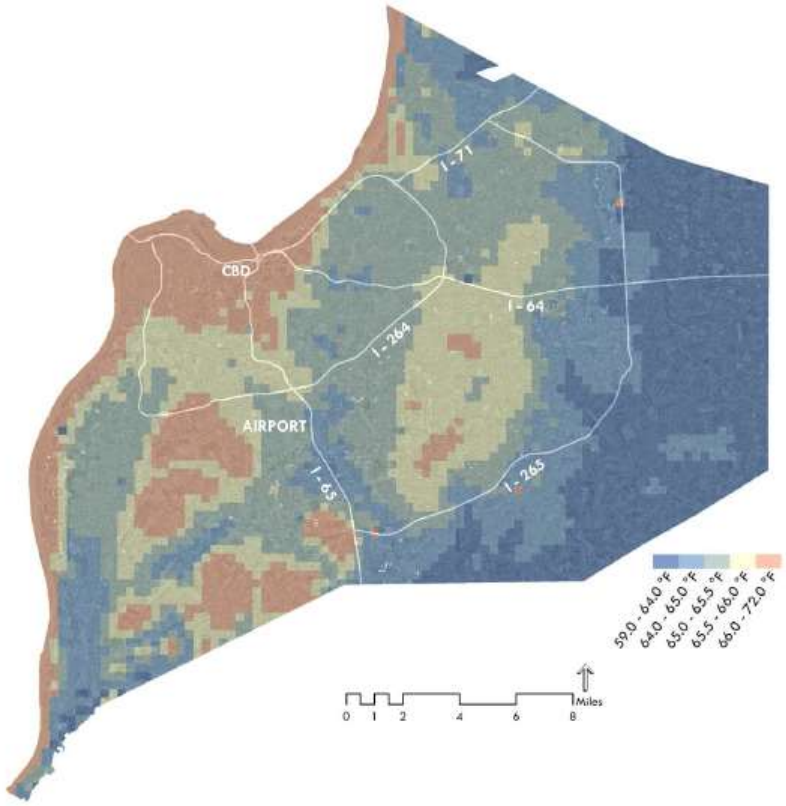
- Heat adds energy, speeding up this reaction
- If we reduce the addition of anthropogenic heat, can we slow this reaction and reduce ozone formation?



Louisville's Urban Heat Island



Warm season average daily **high** temperatures
(May through September, 2012)



Warm season average daily **low** temperatures
(May through September, 2012)

Urban Heat Island Project

https://louisvilleky.gov/government/sustainability/urban-heat-island-project

- Modeled air temperatures throughout Louisville (2012)
- Modeled scenarios to estimate mitigation strategy potential
  - Greening
  - Cool Surfaces
  - Reduced Waste Heat
  - Combined
- Population Vulnerability Assessment
- Policy Recommendations

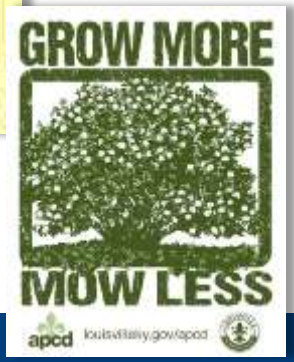
Heat Control Measures

- Vegetation
  - Tree canopy
  - Green roofs
  - Green spaces
- Cool Surfaces
  - Cool roofs
    - Cool Roof Rebate Program
  - Cool pavement
- Energy Efficiency – Reduced Waste Heat
  - Reduce VMT
  - Reduce Idling
  - Reduce Building A/C

- Co-benefits of HCMs:
  - Reduce heat-related morbidity & mortality
  - Air pollutant removal
  - Storm water control
  - Carbon sequestration

APCD: Educate & Assist

- Promote air quality awareness and education
  - Kentuckiana Air Education (KAIRE)
- Promote emission reduction programs
  - Idle Free Louisville
  - Grow More Mow Less
  - Lawn Care for Cleaner Air
- Apply for grant funding
- Facilitate stakeholder involvement
- Participate in community initiatives

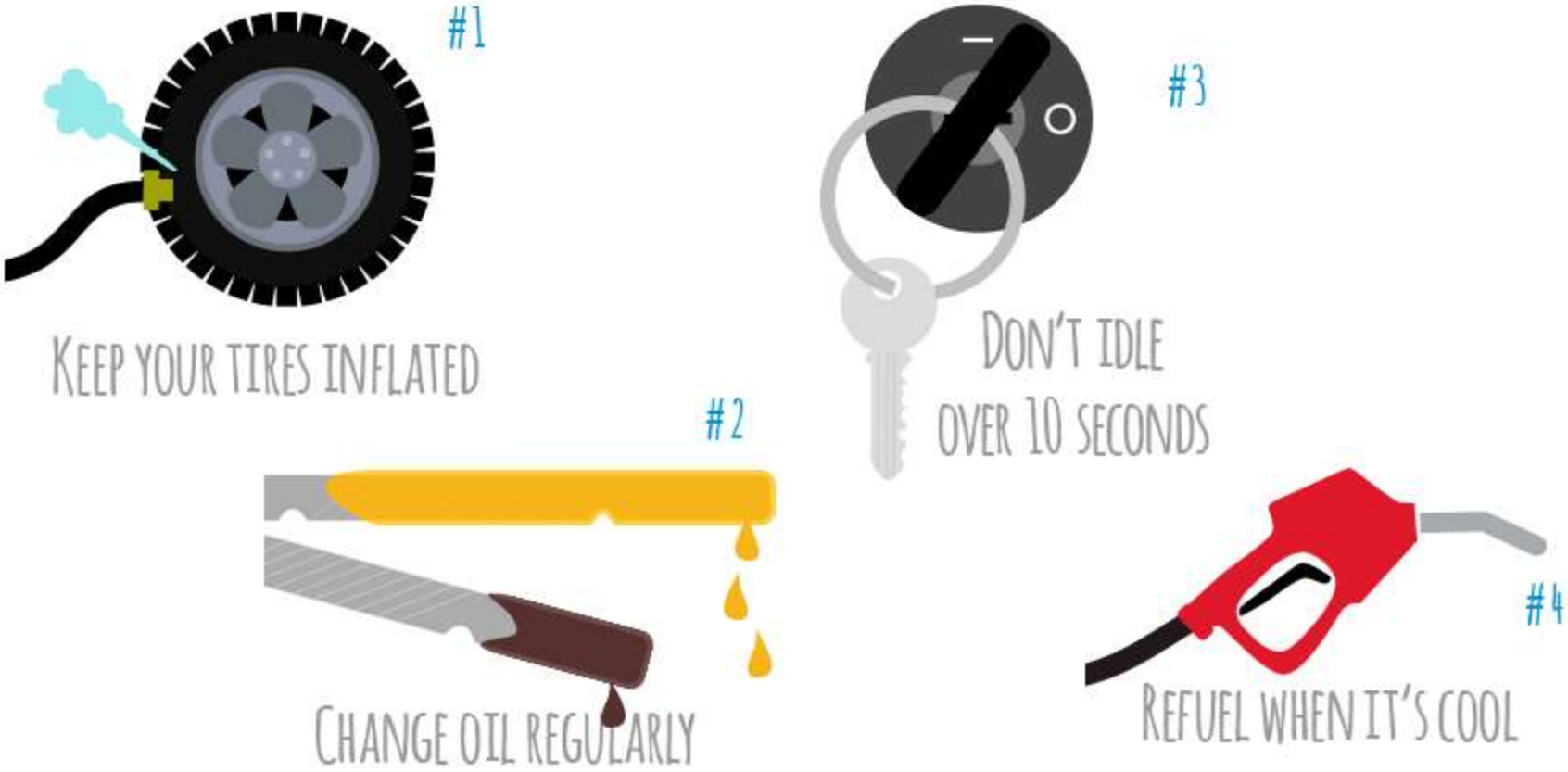


Kentuckiana Air Education

An APCD outreach and education program, KAIRE uses many means of communication to deliver messaging around air quality to the Louisville metropolitan area:

- Social media
- Website
- Events
- Partnerships

HelpTheAir.org



KAIRE

Every year, KAIRE participates in dozens of community events, including Healthy Hoops Kentucky, community events, employer health fairs, and many more.

Idle Free Louisville

Partnerships with Business and Neighborhood Associations, Schools, and Parks encourage Idle Free spaces.

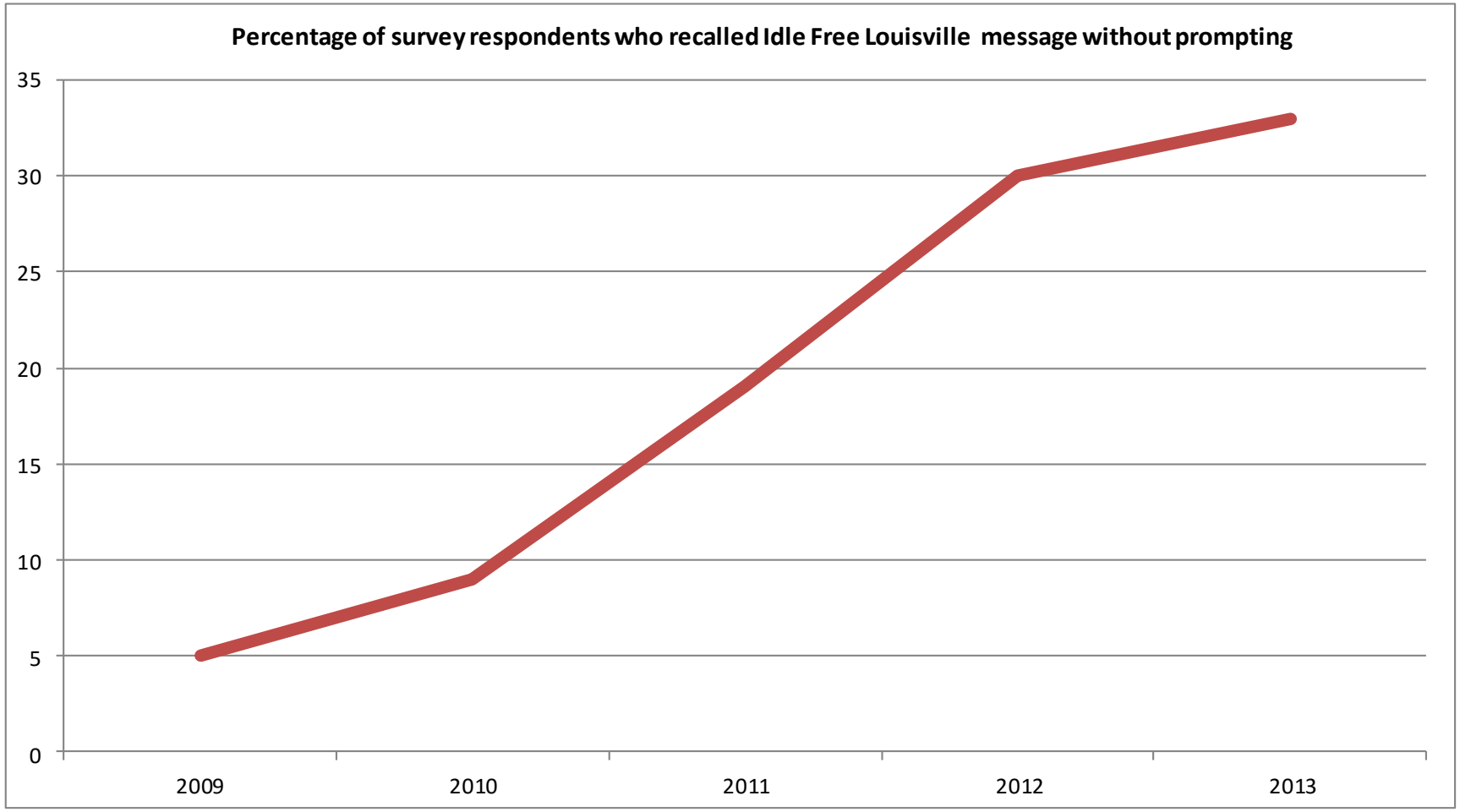
CLEAN AIR Excellence Awards

Idle Free Louisville

Idle Free Louisville posters and signs are displayed in businesses and schools throughout the city.

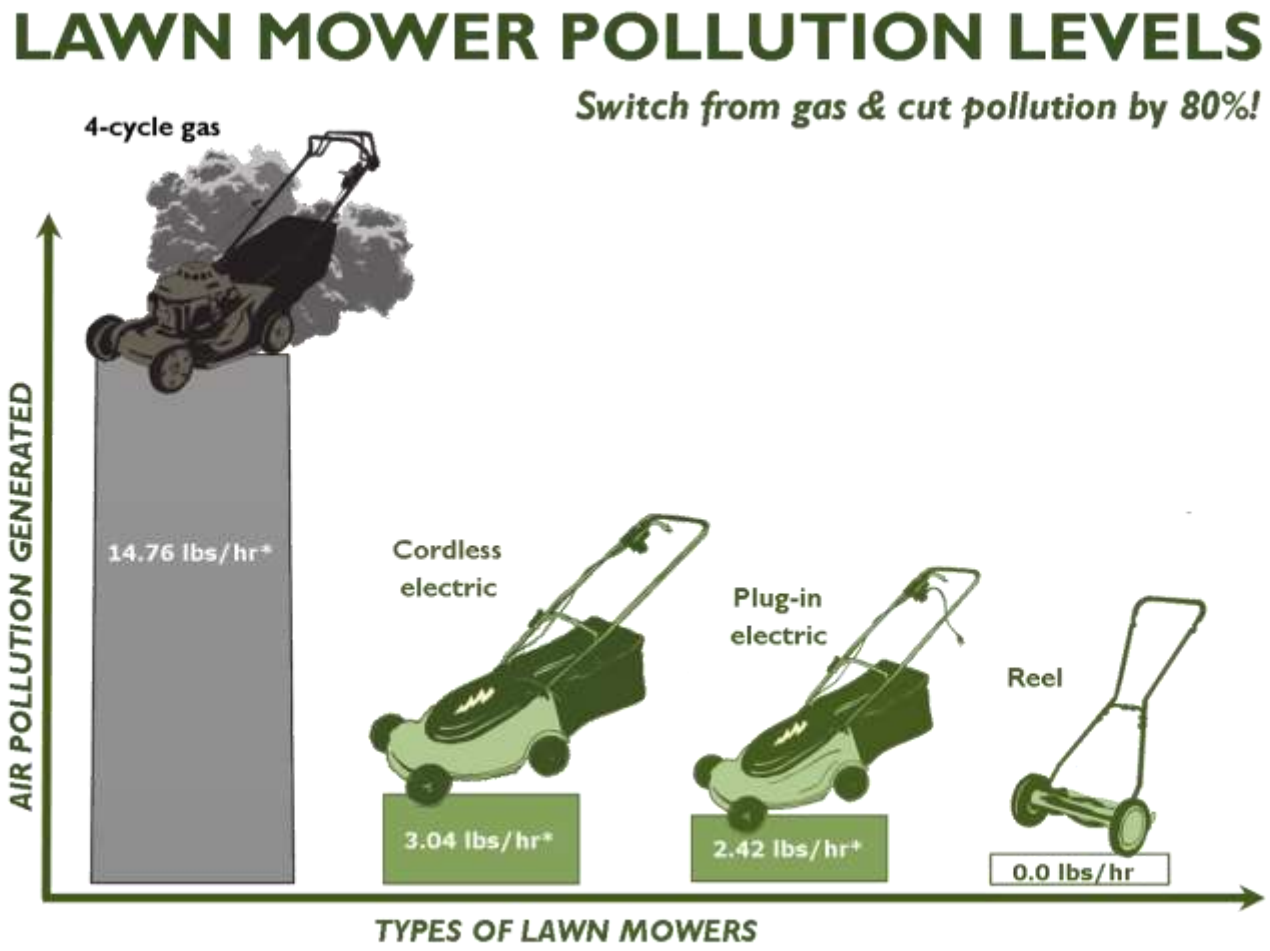
www.helptheair.org/idle-free

People are getting the message



Source: Aeffect surveys of Louisville MSA 2009, 2010, 2011, 2012, 2013

Lawn Care for Cleaner Air



*Source: EPA and DOE energy and emissions data for carbon monoxide, carbon dioxide, methane, non-methane hydrocarbons, nitrogen oxides, sulfur dioxide, and particulate matter. Carbon dioxide (CO_2) represents a significant portion of the above emissions data. Without CO_2 in the calculations, electric lawn mowers actually reduce air pollution by more than 97 percent compared to their gas counterparts.

Lawn Care for Cleaner Air

- Rebates on electric & reel lawn equipment for Louisville Metro residents
- Bonus rebate for recycling a similar piece of old gas or electric equipment
- 9,843 rebates distributed since 2003
- Funded by air pollution penalty fees

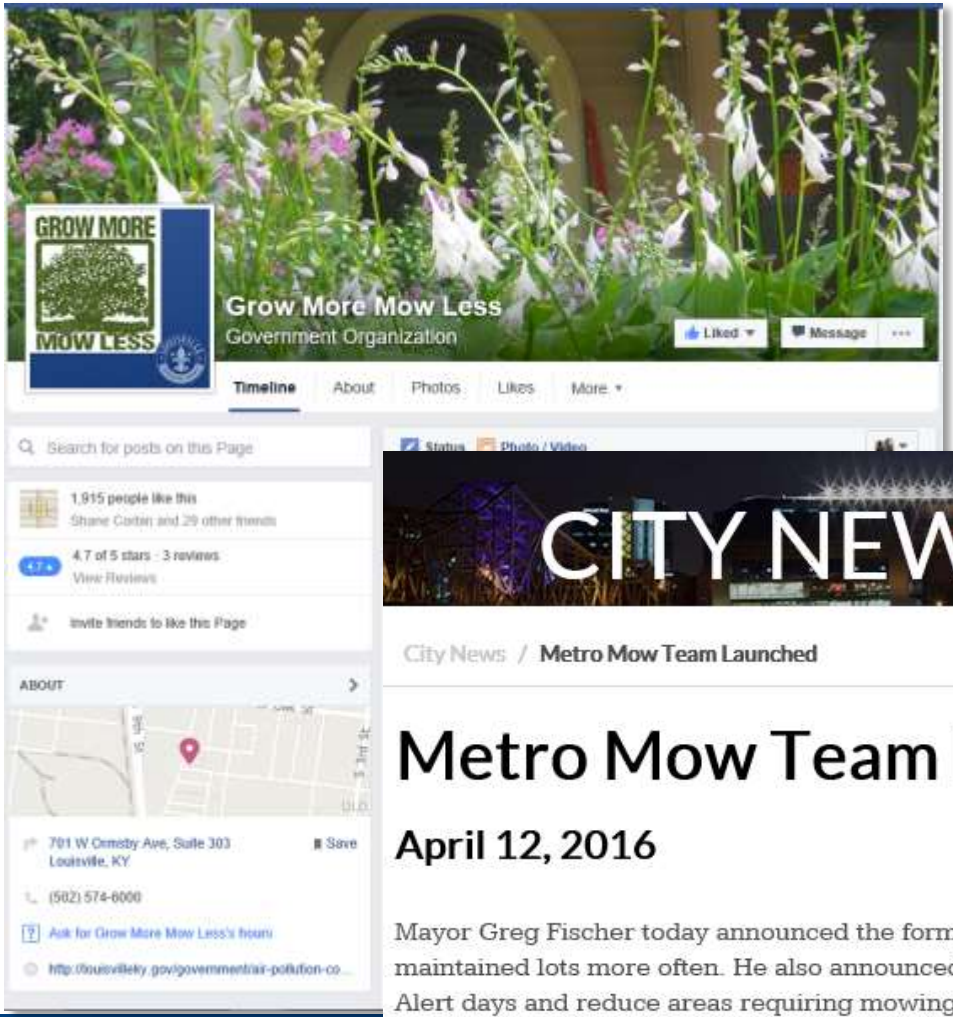
https://louisvilleky.gov/government/lawn-care-cleaner-air

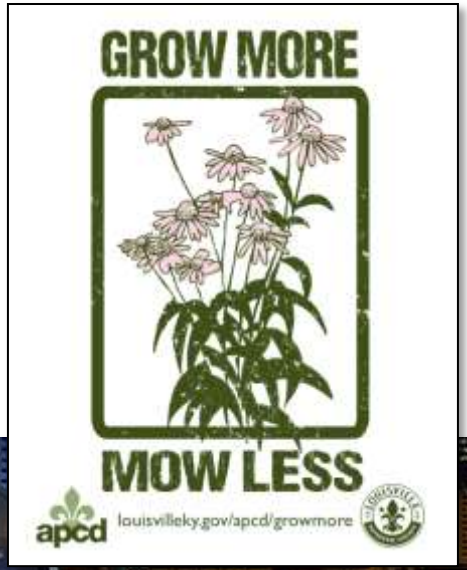
Grow More Mow Less

- Louisville Metro has over 260,000 residential lots
- Hours required to maintain (e.g., mowing, trimming, etc.) turf grass add up to significant ground level air pollution
- **272 tons** of criteria pollutants are produced from gas-powered equipment each week assuming:
  - Each lot takes 1 hr. to mow
  - 2 lbs. of pollution per hr.

www.louisvilleky.gov/government/air-pollution-control-district/grow-more-mow-less

Grow More Mow Less





City News / **Metro Mow Team Launched**

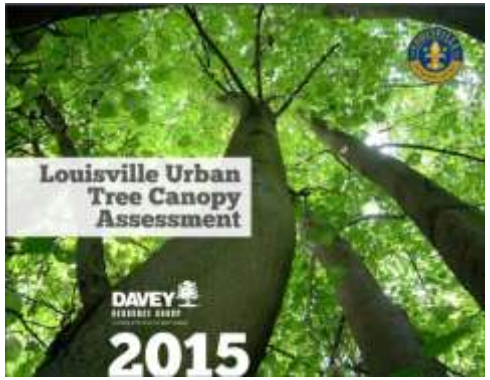
Metro Mow Team Launched

April 12, 2016

Mayor Greg Fischer today announced the formation of the Metro Mow Team that will be able to mow city maintained lots more often. He also announced new policies to pause most mowing by city crews on Air Quality Alert days and reduce areas requiring mowing.

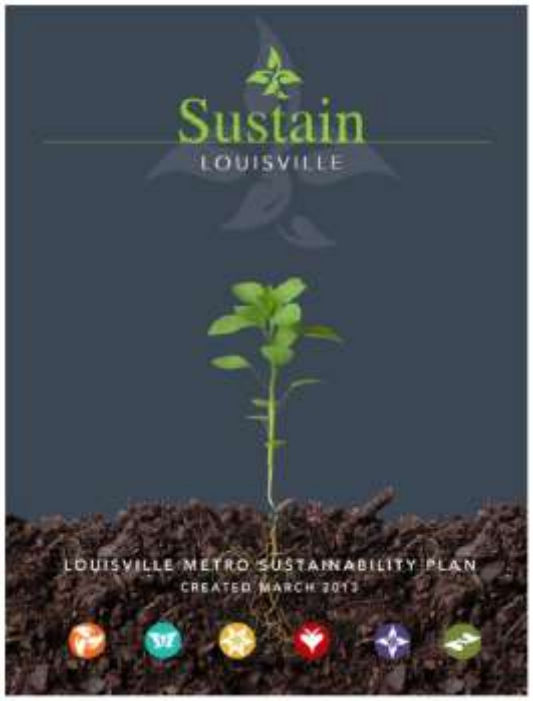
Partnering on Policy & Program Development

- Sustain Louisville
  - Louisville's first Sustainability Plan
- Green Infrastructure/Tree Canopy
  - Urban Heat Island reduction
  - Pollution reduction
    - Reduce energy use
    - Cut emissions from gas/diesel lawn equipment
- Vehicle and Equipment Technology
  - Clean engines
  - Clean fuels
  - Idle reduction
- Transportation Planning/Land Development
  - Complete Streets
  - Expanded alternative transportation choices
    - MOVE Louisville



APCD is constantly seeking opportunities to collaborate with the community.

Sustain Louisville



www.louisvilleky.gov/government/sustainability/sustain-louisville

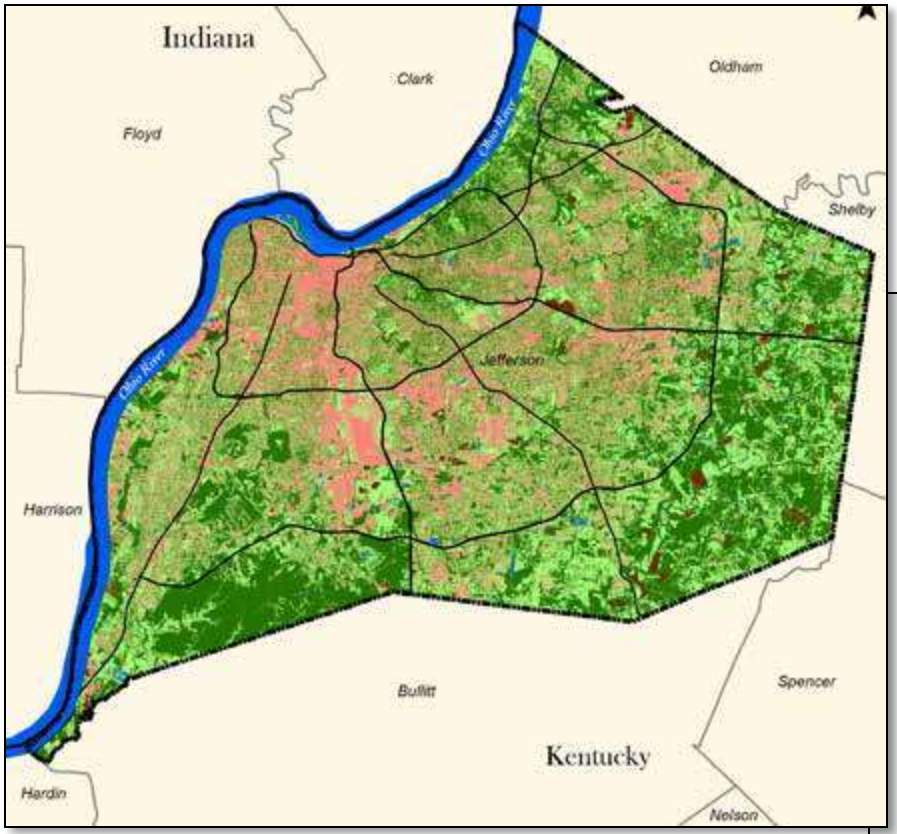
FOCUS AREA	GOALS	TARGET DATE
1.0 Energy	1. Decrease per capita energy use citywide 25%	2025
	2. Decrease energy use in city-owned buildings 30%	2018
2.0 Environment	3. Mitigate the risk of climate change impacts	2018
	4. Achieve and maintain National Ambient Air Quality Standards	Ongoing
	5. Improve waterway quality	2018
	6. Divert 90% of solid waste from the landfill	2042
3.0 Transportation	7. Decrease transportation-related greenhouse gas emissions 20%	2020
	8. Reduce vehicle miles traveled 20%	2025
4.0 Economy	9. Provide business opportunities for clean economy organizations and innovators, and develop a qualified workforce to support it	2015
	10. Expand the local food system 20%	2018
5.0 Community	11. Increase access to healthy foods 20%	2018
	12. Increase access to green space and recreation resources	2015
	13. Incorporate sustainability into the Land Development Code and the Comprehensive Plan	2015
	14. Maintain and expand a robust parks system	Ongoing
	15. Expand green infrastructure incentives citywide	2018
	16. Establish a robust urban tree canopy	2018
6.0 Engagement	17. Engage the community in sustainablility practices and principles	Ongoing

Energy Efficiency

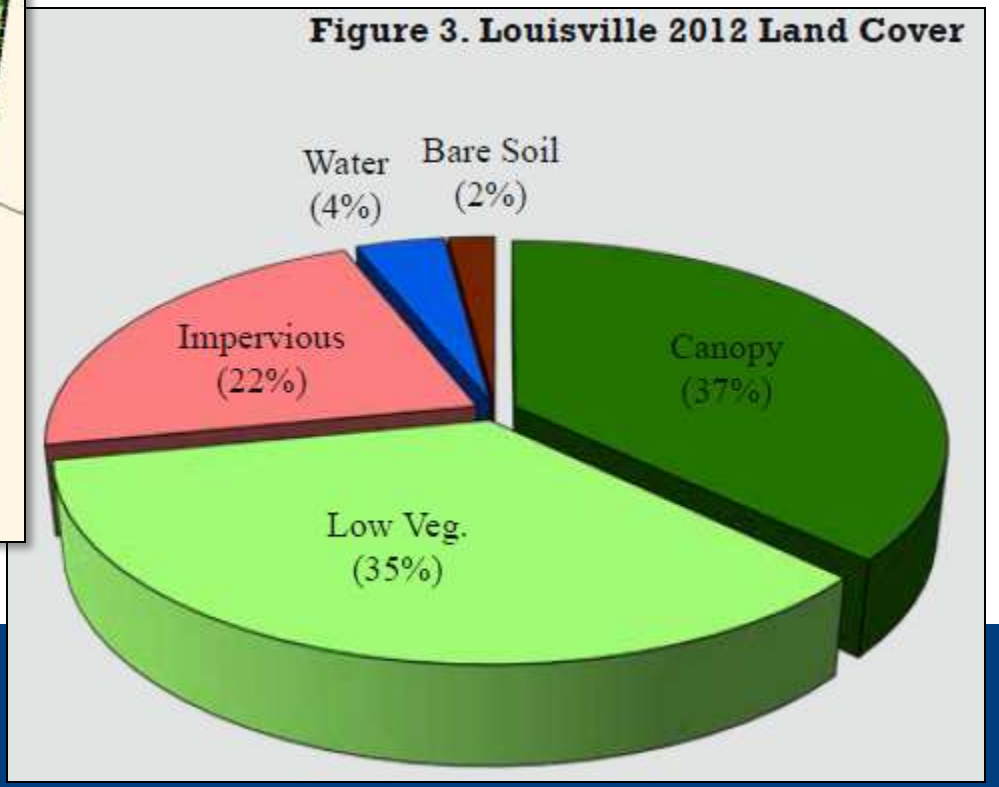
- Energy reduction goals & incentives for government and the community
  - Energy Project Assessment District (EPAD) - www.louisvilleky.gov/government/sustainability/epad-program
- Partnering to promote energy efficiency in commercial buildings

http://www.louisvilleenergyalliance.org/

Louisville Urban Tree Canopy Assessment



UTC: 37%
UTC w/o Major Parks: 30%
UTC in "Old City Limits": 27%

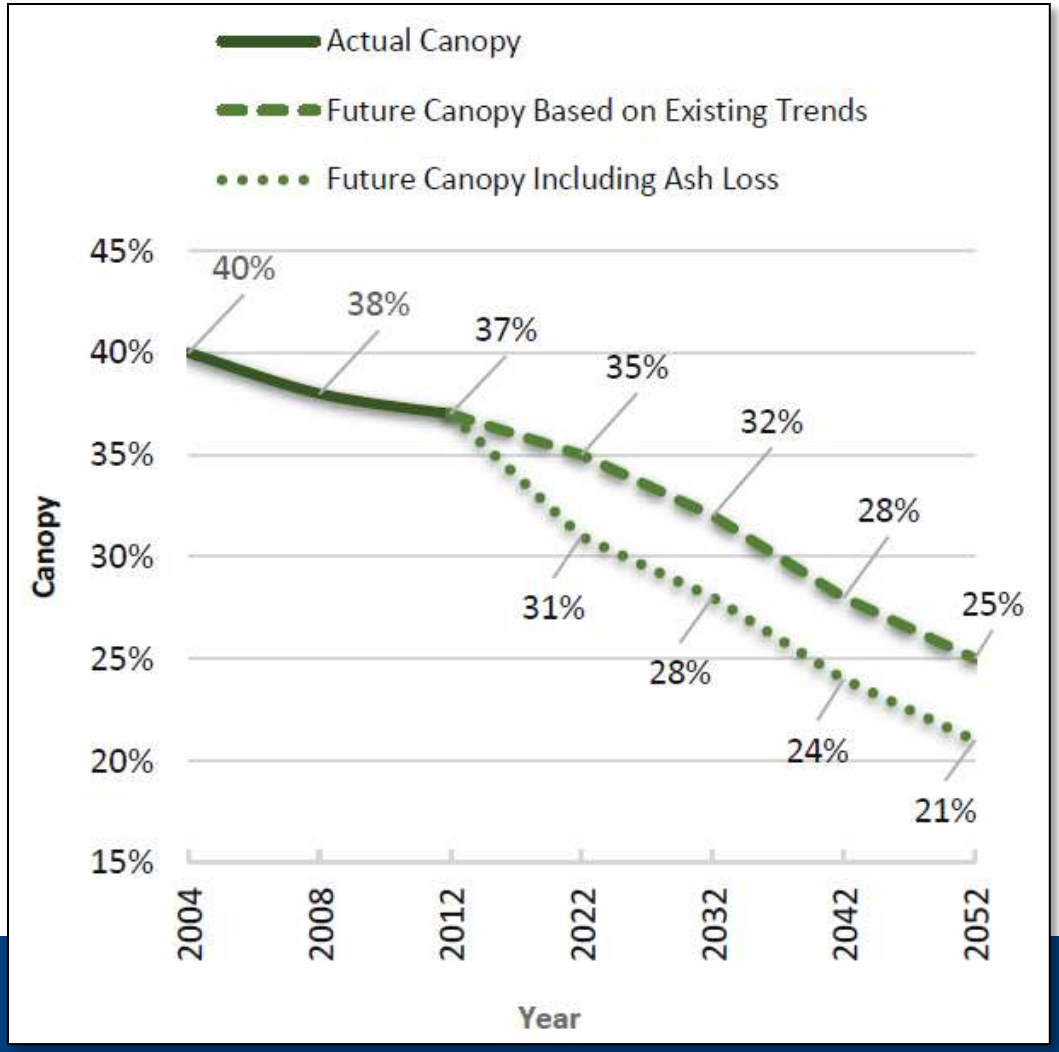


Canopy Cover Change Over Time

40% in 2004 → **38%** in 2008 → **37%** in 2012

Louisville has lost approximately 6,500 acres of canopy since 2004, averaging 820 acres or 54,000 trees per year.

Estimated Future Urban Tree Canopy If No Action Taken



Louisville's Tree Benefits (from 2012 Canopy)			
	Quantity	**Unit**	**Value**
STORMWATER: Runoff Reduction	18,835,266,390	gallons	$62,909,790
ENERGY: Savings from Avoided Cooling	67,649,325	kWhs	$5,463,356
PROPERTY: Increases in Property Values	-	$	$239,969,791
AIR: Carbon Monoxide (CO) Removed	149,120	lbs.	$99,078
AIR: Nitrogen Dioxide (NO_2) Removed	517,780	lbs.	$219,678
AIR: Ozone (O_3) Removed	4,366,940	lbs.	$7,932,540
AIR: Sulfur Dioxide (SO_2) Removed	622,280	lbs.	$78,727
AIR: Dust, Soot, Other Particles Removed (Particulate Matter, PM_{10})	1,242,280	lbs.	$3,879,821
Carbon Sequestered	444,112	tons	$8,599,490
	Total Annual Benefits		**$329,152,271**
Carbon Storage over Canopy's Lifetime (not an annual benefit)	11,941,333	tons	$231,224,066
	Total Benefits Overall		**$560,376,337**

Increasing Tree Canopy

Development Underway:

- Tree Protection Ordinance Proposal
- Tree Canopy Master Plan

Ongoing:

- Public Tree Planting
- Tree Giveaways & Rebates

https://louisvilleky.gov/government/division-community-forestry

Community Partners:

TREES LOUISVILLE

LOUISVILLE grows

LOVE LOUISVILLE TREES

DIVISION OF COMMUNITY FORESTRY
Office of Sustainability – Louisville Forward

Move Louisville

- Strategic approach to transportation planning and investment
- Prioritizes limited transportation dollars, with recommendations to:
  - Reduce VMT,
  - Preserve existing streets & sidewalks,
  - Provide better connectivity & options,
  - Improve link between land use & transportation,
  - Position Louisville to enhance its transportation funding, &
  - Identify opportunities for redevelopment.

www.louisvilleky.gov/government/advanced-planning/move-louisville

Drive Clean Louisville

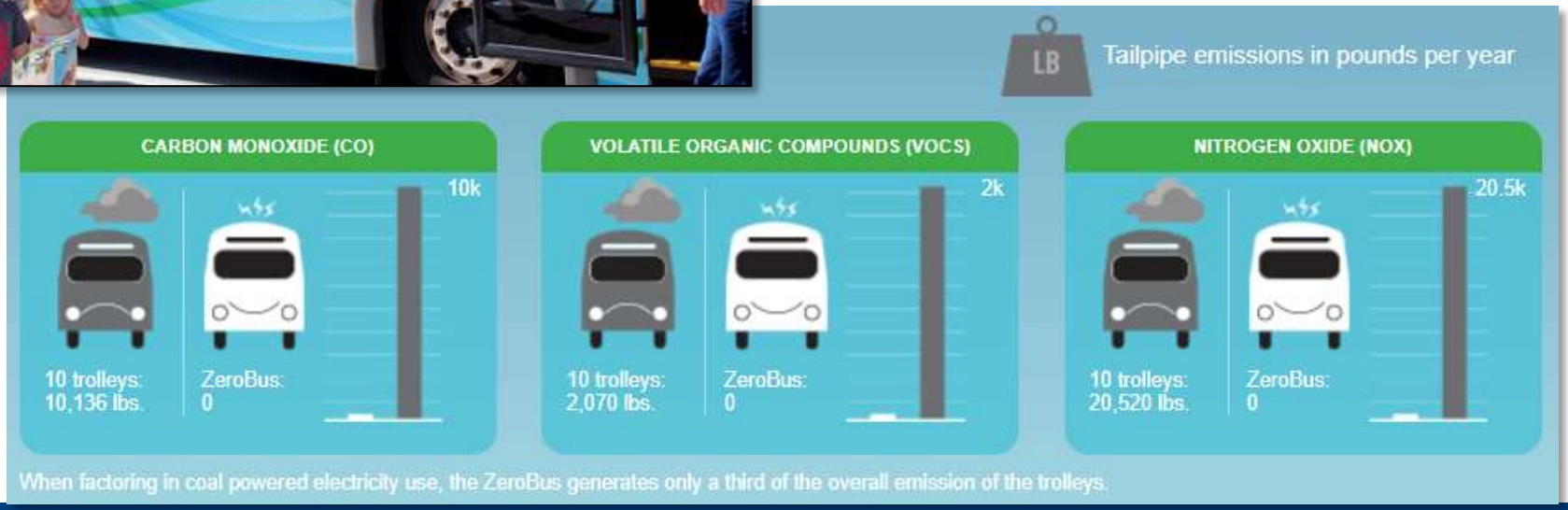
- Concerted effort to increase alternative fuel and clean engine vehicles across all sectors
  - Electric Vehicles & Charging Infrastructure
  - CNG Trucks & Fueling Stations
  - Clean Diesel Engines
- Community Partnership
  - Air Pollution Control District
  - Mayor's Office
  - Office of Sustainability
  - Office of Performance Improvement and Innovation
  - EVolve Kentucky
  - Kentucky Clean Fuels Coalition

Bike Louisville

www.louisvilleky.gov/government/bike-louisville

Transit Authority of River City

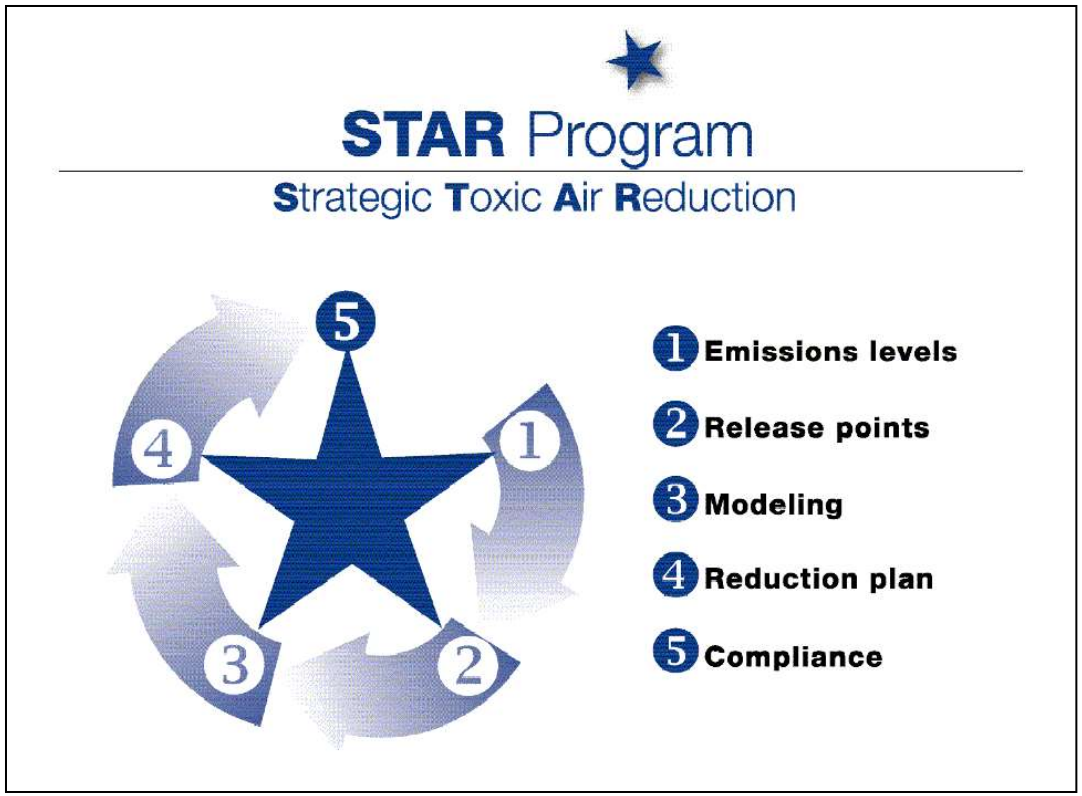
https://www.ridetarc.org/zerobus-and-hops



Beyond Federal Regs

- Clean Air Act delegation from the U.S. Environmental Protection Agency (EPA)
- Concurrent jurisdiction from the Kentucky Division for Air Quality (DAQ)
- Must be at least as stringent as state and federal laws, but can be more stringent where needed.

Strategic Toxic Air Reduction Program



www.louisvilleky.gov/government/air-pollution-control-district/strategic-toxic-air-reduction-program

Total Air Toxics Reductions

Jefferson County, Ky. Sources	2005 Air Releases in Pounds	2015 Air Releases in Pounds	% Change
Electric Generating Utilities (NAICS 2211)	4,710,016	2,076,785	56% Decrease
All Other Sources	5,141,564	2,659,926	48% Decrease
Total	9,851,580	4,736,711	52% Decrease

Source: EPA Toxics Release Inventory

Thank You

AIR POLLUTION CONTROL DISTRICT

701 W. Ormsby Ave.
Ste. 303
Louisville, Ky. 40203

(502) 574-6000
www.louisvilleky.gov/APCD

Keith H. Talley Sr., Director