


MEMORANDUM

DATE: January 24, 2012

TO: Craig Weinaug, Douglas County Administrator  
Dave Corliss, City Manager

FROM: Dan Partridge 

RE: Report from Health Board and Air Quality Advisory Committee regarding  
the regulation of ground level ozone

On behalf of the Air Quality Advisory Committee and the Lawrence-Douglas County Health Board I respectfully submit to you the attached Air Quality Report. This report outlines the history of ozone regulation in Douglas County as well as our collective efforts to maintain compliance with state and federal air quality standards.

Given that our future compliance cannot be guaranteed and that there are significant consequences for non-compliance we felt it prudent to include within this report a compilation of strategies that other communities have used to reduce ground level ozone.

Thank you for your stewardship and we stand ready to discuss this with you or your Commission's should you desire.

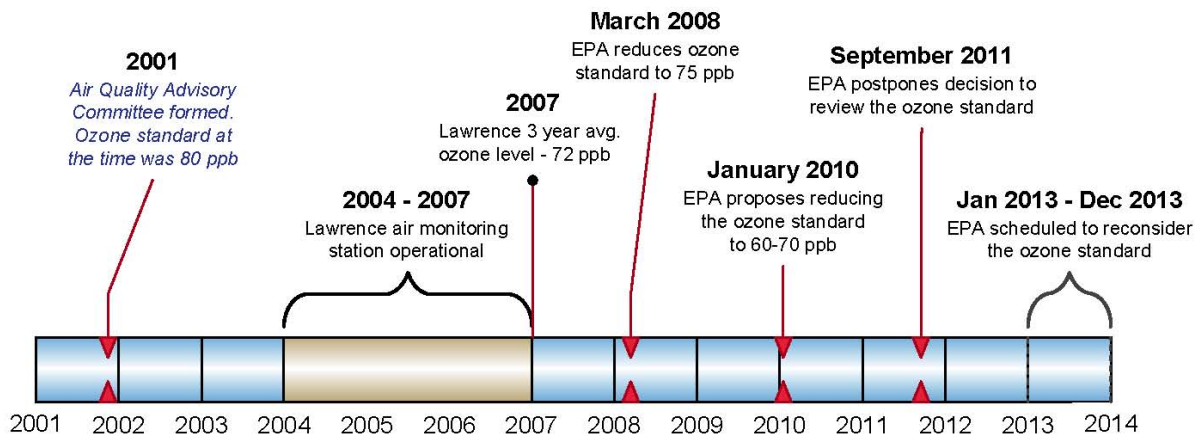
200 Maine, Suite B  
Lawrence, KS 66044-1396

OFFICE: 785/843-3060 FAX: 785/843-3161  
CLINIC: 785/843-0721 FAX: 785/843-2930

## Background

Upon the request of the Douglas County Board of County Commissioners, the Lawrence-Douglas County Health Department Air Quality Advisory Committee was formed in late 2001. This advisory committee is comprised of citizens, businessmen, state and local planning and health officials and local environmental and air quality experts. They meet quarterly to consider air quality data and trends and recommend measures to the Health Board, City and County Commissions related to maintaining compliance with the U.S. Environmental Protection Agency (EPA) air quality standards.

Figure 1: Ozone Air Quality Timeline, 2001 – 2016



The Lawrence-Douglas County community has been attentive to the issue of ozone since the formation of the Air Quality Advisory Committee in 2001. The following list illustrates some of the steps our community has taken to reduce ozone levels over the last decade:

Action Taken	Timeframe	Cost
<b>First Student Bus Co. (USD 497)</b> Lawrence Public Schools bus contractor retrofitted ninety school buses with equipment that reduces diesel exhaust emissions.	2001 - 2002	\$100,000
<b>KDHE / LDCHD</b> Public Outreach (i.e. Earth Day, TV advertisements, Billboards, Newspaper Ads)	2002	\$18,590
<b>City and County</b> Vehicles retrofitted with equipment to reduce diesel emissions (\$26,200), 3 hybrid buses fueled by Natural Gas (\$564,454)	2010-ongoing	\$590,654
<b>Private Industry</b> Westar Lawrence Energy Center emissions reducing equipment	2010 – 2014	Estimated at \$24-\$31 million

In January 2010, EPA proposed to strengthen the standard to a level within the range of 60-70 ppb. Current national ambient air quality standards (NAAQS) for ground-level ozone are set to 75 parts per billion (ppb). The previous standard, set in 1997, was 80 ppb.

## Air Quality Report

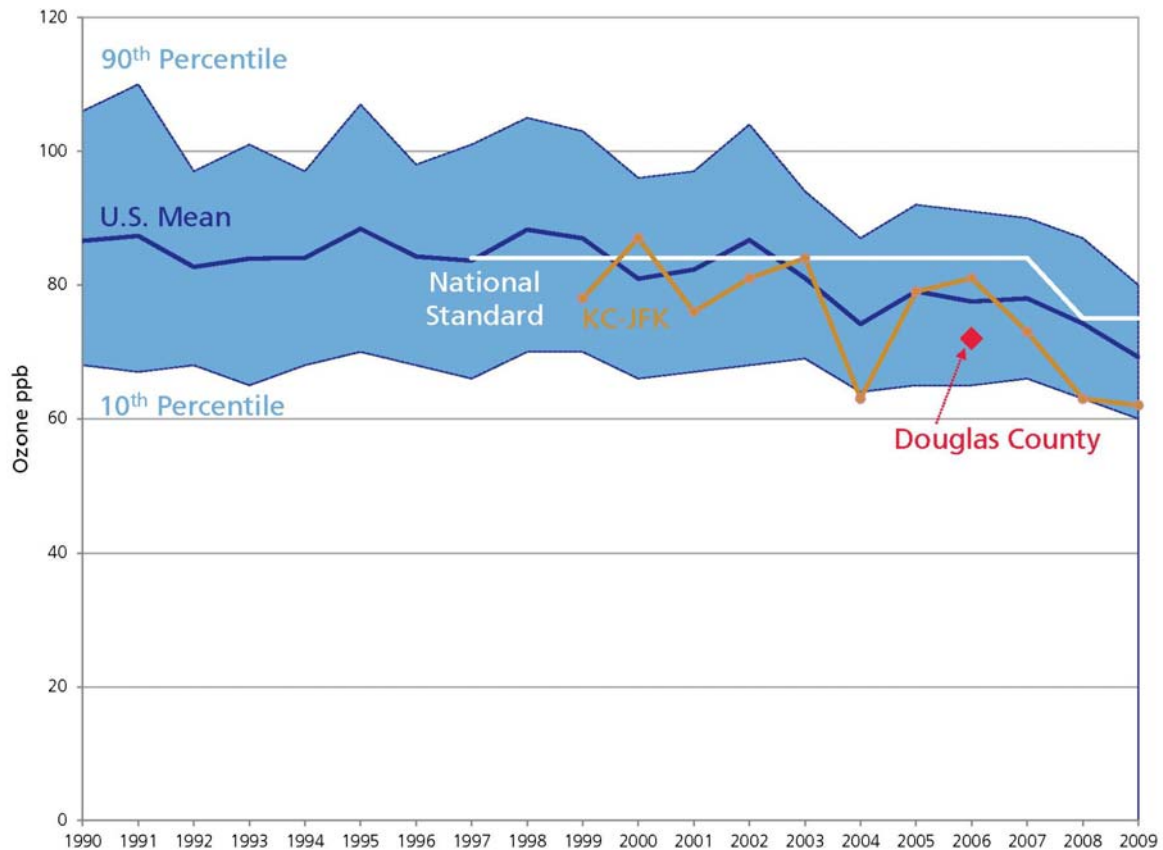
The EPA estimates that implementing a stricter standard of 60-70 ppb would have a national cost of \$19-90 billion and would have significant costs for businesses and industries, particularly the major polluters in counties that exceed the ozone standard. Other communities such as Wichita, Kansas have estimated a non-attainment designation would cost the Wichita metropolitan statistical area (MSA) \$13 million annually.

In September 2011, President Obama directed the EPA to withdraw their draft ozone standard (the 60-70 ppb standard proposed in January 2010). This withdrawal, effectively delaying any downward revision to the standard, was based on an ongoing scientific review of the standard that is expected to be completed in 2013.

While several measures have been taken to reduce ozone in Douglas County, and while the pending reconsideration of the standard has recently been delayed, Douglas County is at risk of being designated as a non-attainment area in the future. This risk is based on the following considerations:

1. **In response to the 2008 ozone standard revision, the Kansas Department of Health and Environment (KDHE) submitted a recommendation to EPA Region VII to designate Johnson and Wyandotte Counties as non-attainment using 2006-2008 ozone data\***. All Kansas counties in the Kansas portion of the Kansas City MSA, along with Douglas County, were reviewed for possible inclusion in the non-attainment designation in 2009 by the Kansas Department of Health and Environment Bureau of Air (KDHE). Based upon the factors specified in EPA's December 4, 2008 guidance, no Kansas counties outside the recommended two-county non-attainment area significantly cause or contribute to ozone violations within the recommended Kansas City non-attainment area. The exclusion of Douglas County was based on prevailing wind patterns and commuting patterns of Douglas County residents. While prevailing wind patterns are unlikely to change, commuting patterns can change over time in response to local availability of employment. (\*note – This original recommendation was not acted upon because of EPA's 2010 reconsideration of the 75 ppb standard. In response to EPA's withdrawal of the reconsideration, KDHE has resubmitted an updated letter to EPA recommending attainment status for Johnson and Wyandotte Counties based on 2008-2010 data.)
2. An ozone monitor was located at the Lawrence Municipal Airport in 2004, 2005 and 2006. The 4th highest 8-hour value (design value) for the monitor was 64 ppb in 2004, 73 ppb in 2005 and 81 ppb in 2006. The 3 year average for 2004-06 was 72 ppb. KDHE could reinstall an ozone monitoring station in Lawrence future federal monitoring regulations require it.
3. Nationwide, from 1990 to 2009, ground-level ozone decreased 21%. This reduction corresponds to a reduction in oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC), which react in the presence of heat and sunlight to form ozone. While this reduction is significant, higher projected summer temperatures may support scientific arguments for further regulatory reductions in NO<sub>x</sub> and VOC.

Figure 2: Ozone Air Quality, 1990 – 2009  
(Based on annual 4th maximum 8-hour average concentration, ppb)  
National Trend based on 523 Sites



## Consequences should Douglas County receive non-attainment designation

Non-attainment creates many costs to the community through regulation of roadways, vehicles and businesses by the EPA and Department of Transportation (DOT) regulations that will apply to Douglas County if we are designated as non-attainment. Such a designation would require the KDHE to develop a State Implementation Plan (SIP) covering Douglas County. A SIP is a technical report that outlines the strategies for emissions reductions in order to bring the area back into compliance with the ozone standard. This SIP would need to be submitted to the EPA within three years of the date of non-attainment designation. The following actions could potentially be included in a SIP covering Douglas County:

### Transportation:

- Metropolitan Planning Organization (MPO) document approval for the Transportation Improvement Program and Metropolitan Transportation Plan would require an Air Quality Conformity Analysis which would model and analyze each document and major transportation project in regards to its ozone emissions. This will require more staff resources and time to complete,

## Air Quality Report

it could have significant budget impacts on the MPO operations in Douglas County and it could delay project start dates.

- Retrofitting of commercial vehicles to improve fuel mileage and reduce emissions (new engines, exhaust systems, auxiliary power units, etc.).
- Idling restrictions for commercial vehicles.
- Inventory of all motor emissions which would entail number, type, age, vehicles miles traveled, etc.
- Possible reduction in speed limits on highway and expressways.

### Consumer:

- Required citizen motor vehicle maintenance program that includes IM240 testing, remote-sensing clean screen, gas cap checks, and advisory On-Board Diagnostics (OBDII) checks which can cost anywhere from \$20-\$40 per vehicle.
- Higher gasoline prices during the summer months from the use of reformulated gasoline designed to reduce ozone-forming emissions.
- A public education campaign and an ozone alert program are generally required in non-attainment areas.
- Increased health impacts in the community with increased medical costs.

### Economic Development:

- Stricter regulations on new businesses.
- More stringent and expensive control equipment for industry. Industries most affected would include those using burners, boilers and heavy engines as well as painting, coating and solvent users.
- Small industrial emitters would have increased regulations.
- Require low-bleed control devices on all new and existing pneumatic valves in oil and gas pumps and engines.

## Strategies for the Lawrence- Douglas County community to consider

The risk of Douglas County being designated non-attainment increases to the extent that;

- commuting patterns change
- ozone standards change
- a monitor is located in the county
- ground air temperature increases during the ozone season (*April 1 – Oct. 31*)

To mitigate this risk several communities have created Clean Air Action Plans (CAAP), which are comprehensive, community-based plans of voluntary strategies to reduce ground-level ozone pollution. For example, the Mid-America Regional Council (MARC) CAAP is a voluntary strategy to reduce ozone-forming and greenhouse gas emissions in the Kansas City region, both in the near future and long term. Wichita is also addressing ground-level ozone through a Be Air Aware public information campaign that encourages voluntary actions to reduce ozone.

## Air Quality Report

Steps already taken by Lawrence and Douglas County to improve sustainability could align well with a CAAP. The steps to reduce ozone are many of the same recommendations that the City's Climate Protection Plan, Peak Oil Task Force Final Report, and Horizon 2020's Environment Chapter have recommended.

A CAAP using voluntary strategies is a critical first step in addressing ozone pollution. The creation of a CAAP would develop community strategies for raising community awareness and developing sustainability projects and actions that help improve our current air quality. This plan should be comprehensive and call for voluntary actions with a goal of reducing ground-level ozone pollution. Components of the plan could include public education and awareness, promotion of sustainability initiatives, and encouragement for transportation alternatives. A variety of different strategies to include in a Clean Air Action Plan are listed below:

### Transportation/Planning

- Policy
  - Approval and implementation of a Complete Streets policy that encourages active transportation and low-emission travel options such as bikeways, sidewalks, transit and Safe Routes to Schools
  - Develop idling policies for government and commercial fleet that will save fuel and reduce emissions
  - Operating policies for truck and non-perishable loads. (e.g. can only idle for a set time when loading and unloading)
  - Implement transportation enhancements, such as Intelligent Transportation System (ITS), to alleviate intersection roadway congestions
  - Increase use of emissions reductions technology for trucks carting perishable loads (e.g. use of auxiliary power units to refrigerate trailers while truck is turned off)
- Commuter programs
  - Support available carpool matching programs
  - Public education of carpooling as a commuting option
  - Challenge programs
    - An eight-week employer-based contest where employees can earn points and win prizes for using alternative forms of transportation for work.
    - Scoring system for awarding points to employers with highest participation levels

### Community Outreach and Education

- Vehicle Maintenance Events
  - Gas Cap promotion
  - Volunteer based car inspection event
  - Showcase for alternative hybrid, electrical vehicles, electrical lawnmowers, etc.
- Development of Small Business Action Plan with Lawrence Chamber of Commerce:
  - Information how to understand the regulations, etc. (what does it mean for your business)
  - Incentives for preventive measures
  - Assistance provided confidentially and free

## Air Quality Report

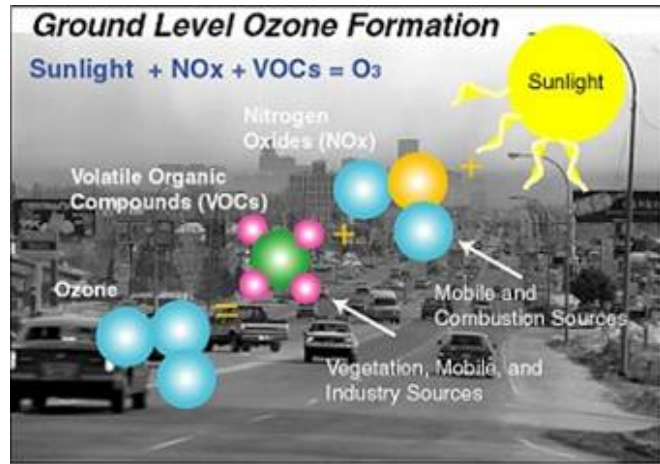
- Training for local governments and non-construction professionals on Leadership in Energy and Environmental Design (LEED), Energy Star and International Energy Conservation Code (IECC) building codes, and encouragement for using those programs to encourage new and retrofitted building
- Promotion of energy efficiency (reducing energy use at home, vehicles and lawnmowers)
- Development of Environmental Health Volunteer Program:
  - Identify, select and place volunteers committed to improving the environmental health of the community
  - Develop environmental health education campaigns to improve community education regarding air quality and other environmental health concerns
  - Support community engagement in environmental health issues through traditional health education and outreach as well as use of social media technologies
- Clean Air Campaign
  - Provide posters and brochures at possible auto shops, gas stations, etc.
  - Development of an interactive website
    - Education information
    - Alert days
- Sustainable Lifestyles Corporate Plan
  - A business/corporate plan that can function as similar to a corporate wellness programs yet is for reducing pollution through the participation in alternative transportation and sustainable lifestyles.

### Lawrence-Douglas County Air Quality Advisory Committee Members

KDHE Air Quality Program- Tom Gross  
KDHE Air Quality Program- Doug Watson  
KDHE Northeast Office- Julie Coleman  
Lawrence Chamber- Hank Booth  
Douglas County Administration Dept- Linda Finger  
City of Lawrence Planning Dept- Todd Girdler  
League of Women Voters- Alan Black  
City of Lawrence Planning Dept.-Jessica Mortinger  
University of Kansas- Stan Loeb  
Community Health-Health Department- Charlie Bryan  
Director-Health Department- Dan Partridge  
Director of Environmental Health- Richard Ziesenis  
Westar Energy-Bill Eastman  
ICL Performance Products-Shane Munsch

## What is Ozone?

Ozone is an extremely reactive gas molecule composed of three oxygen atoms, O<sub>3</sub>. It is a gas that is present in both the Earth's upper atmosphere and at ground level. Upper atmosphere ozone found in our stratosphere is beneficial because it filters out some of the sun's ultraviolet radiation. Ground level ozone is considered harmful to human health and the environment. Ground level ozone is created during chemical reactions between nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight. This reaction



is the cause for urban smog in many large cities due primarily to large populations commuting to work by car. However, car and truck exhaust are not the only cause of ground levels ozone, NO<sub>x</sub> and VOCs can also come

AQI Value	Actions to Protect Your Health From Ozone
Good (0-50)	None
Moderate (51-100*)	Unusually sensitive people should consider reducing prolonged or heavy outdoor exertion.
Unhealthy for Sensitive Groups (101-150)	The following groups should <u>reduce</u> prolonged or heavy outdoor exertion: <ul style="list-style-type: none"> <li>• People with lung disease, such as asthma</li> <li>• Children and older adults</li> <li>• People who are active outdoors</li> </ul>
Unhealthy (151-200)	The following groups should <u>avoid</u> prolonged or heavy outdoor exertion: <ul style="list-style-type: none"> <li>• People with lung disease, such as asthma</li> <li>• Children and older adults</li> <li>• People who are active outdoors</li> </ul> Everyone else should <u>limit</u> prolonged outdoor exertion.
Very Unhealthy (201-300)	The following groups should <u>avoid all</u> outdoor exertion: <ul style="list-style-type: none"> <li>• People with lung disease, such as asthma</li> <li>• Children and older adults</li> <li>• People who are active outdoors</li> </ul> Everyone else should <u>limit</u> outdoor exertion.

\* An AQI of 100 for ozone corresponds to an ozone level of 0.075 parts per million (averaged over 8 hours).

from industrial facilities, electric utilities, gasoline vapors, and chemical solvents in the form of either nonpoint sources or point sources. The sources of VOCs include specifically motor vehicles with a large total of 40% of total emissions, industrial processes, particularly the chemical and petroleum industries, and any use of paints, coatings, and solvent. Service stations, pesticide application, dry cleaning, fuel combustion, and open burning are other significant sources of VOCs as well. NO<sub>x</sub> come from motor vehicles and fuel combustion by electric utilities and other industrial sources.

Ground-level Ozone is a public health concern. The World Health Organization estimated that 1.3 million people die every year due to urban ozone pollution. Certain demographics are more at risk than others such as the elderly, pregnant women, active adults who exercise or work outside and children under the age of 14. People who suffer from asthma or Chronic Obstructive Pulmonary Disease (COPD) are advised to avoid participating in outside physical activity during periods of high ground level ozone.

Health problems that can come from ground level ozone include:

- Increased risk of permanent lung damage through repeated short term exposure
- Increased incidence of chronic lung diseases such as COPD and asthma, especially in children
- Reduced lung capacity making it difficult to breath
- Increased susceptibility to pneumonia and bronchitis.
- Increase risk of cardiac impacts

Ozone can also interfere with the ability of sensitive plants to produce and store food. It can also make them more susceptible to disease, insects, and other pollutants and harsh weather. The repercussions of these effects on crop yields can be significant.