Louisville Metro Air Pollution Control District
$PM_{2.5}$ Monitoring Report
August 2016

This report summarizes $PM_{2.5}$ data collected by Federal Reference Method (FRM) samplers. Measurements are reported as 24-hour averages in micro-grams per cubic meter (µg/m^3). The data are subject to further quality assurance checks and are not final.

$PM_{2.5}$ Monthly Data Summary for July 2016

	Maximum		Minimum		Sample	Monthly
Site Name	**Conc.**	**Date**	**Conc.**	**Date**	**Recovery**	**Average**
Southwick	11.5	7/20/16	6.2	7/14/16	**	7.8
*Durrett Lane	10.7	7/20/16	6.3	7/4/16	**	8.0
Cannons Lane	9.5	7/20/16	5.7	7/2/16	**	7.3
Watson Lane	9.4	7/20/16	2.9	7/7/16	**	6.7
Overall	11.5	7/20/16	2.9	7/7/16	**	7.4

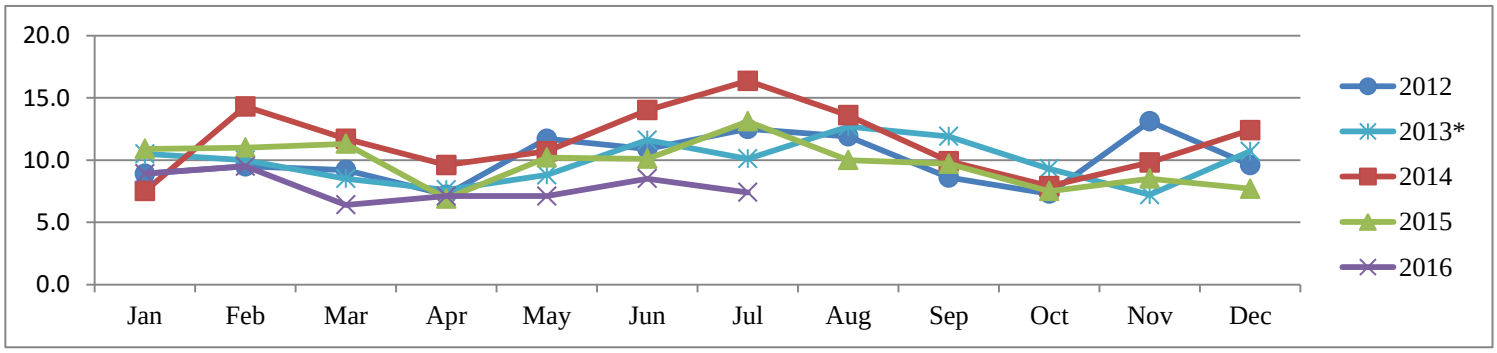
*Durrett Lane replaced Wyandotte on 1/1/2014 **Some data not available at this time

$PM_{2.5}$ Monthly Averages Tracking Table for 2006-2016

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Months >Annual Standard
2006	10.3	13.0	12.5	12.6	11.9	**18.1**	**23.9**	**22.5**	13.6	10.1	13.6	11.1	**3**
2007	9.3	12.2	14.9	11.2	**18.4**	**19.9**	**18.3**	**22.8**	**16.9**	11.1	12.5	14.1	**5**
2008	11.8	12.0	11.9	11.6	12.1	11.8	**18.1**	**17.1**	**17.6**	10.6	14.3	9.4	**3**
2009	14.6	11.1	11.3	9.3	10.3	13.9	13.1	12.6	12.1	8.9	13.8	12.9	**0**
2010	13.3	**16.3**	12.2	12.2	11.0	14.1	**16.0**	**16.4**	11.0	**17.0**	12.6	13.7	**4**
2011	**15.2**	10.6	9.7	8.6	12.1	14.1	**19.7**	**16.2**	11.5	9.0	7.6	9.9	**3**
2012	8.9	9.5	9.2	7.2	11.7	10.9	12.5	11.9	8.6	7.3	13.1	9.6	**0**
2013*	10.5	10.0	8.5	7.6	8.8	11.6	10.1	**12.7**	11.9	9.3	7.2	10.7	**1**
2014	7.5	**14.3**	11.7	9.6	10.7	**14.0**	**16.4**	**13.6**	9.9	7.9	9.8	**12.4**	**5**
2015	10.9	11.0	11.3	6.9	10.2	10.1	**13.1**	10.0	9.7	7.5	8.5	7.7	**1**
2016	8.9	9.5	6.4	7.1	7.1	8.5	7.4						**0**
Average	11.2	11.8	11.3	9.7	11.7	13.9	16.5	16.2	12.3	9.9	11.3	11.2	

*The new $PM_{2.5}$ standardof 12 µg/m^3 became effective on March 18, 2013

$PM_{2.5}$ Monthly Averages 5-Year Trend



National Ambient Air Quality Standards (NAAQS):
National Ambient Air Quality Standards consist of primary and secondary standards. The primary standards define levels of air quality which EPA judges are necessary, with an adequate margin of safety, to protect the public health. The secondary standards define levels of air quality which EPA judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. For $PM_{2.5}$ the levels of the primary and secondary standards are the same.

National Ambient Air Quality Standard for $PM_{2.5}$ - Annual Standard:
The annual standard is designed to provide an appropriate level of protection from long-term exposure to $PM_{2.5}$. The standard is met when the annual design value is less than or equal to 12 µg/m^3. The standard changed from 15 µg/m^3 to 12 µg/m^3 on March 18, 2013. The annual design value is calculated by averaging the annual means of 3 consecutive complete years of air quality data. The table below compares data collected from 2010 through year-to-date 2016 to the $PM_{2.5}$ annual standard.

$PM_{2.5}$ Annual Means and Annual Design Values

	Annual Means µg/m^3							Annual Design Values				
Site Name	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2010-2012**	**2011-2013**	**2012-2014**	**2013-2015**	**2014-2016**
Southwick	13.5	12.1	12.3	12.3	11.2	10.4	7.8	12.6	12.2	11.9	11.3	9.8
Durrett Lane*	13.8	12.3	10.3	10.2	12.0	10.0	8.6	12.1	10.9	10.8	10.7	**10.2**
Cannons Lane**	13.3	13.1	12.3	11.1	11.0	9.5	7.2	12.9	12.2	11.5	10.5	9.2
Watson Lane	14.8	11.9	13.3	12.5	12.2	10.4	7.4	**13.3**	**12.6**	**12.7**	11.7	10.0

Bold: Design value for Louisville *Durrett Lane replaced Wyandotte in 2014 ** Cannons Lane replaced Barret in 2009

National Ambient Air Quality Standard for $PM_{2.5}$ - 24-Hour (Daily) Standard:
The 24-hour standard is designed to provide an appropriate level of protection from short-term exposure to $PM_{2.5}$. The standard is met when the 24-hour design value is less than or equal to 35 µg/m^3. The design value is based on 3 consecutive complete years of air quality data and is calculated by taking the average of the 98th percentile value for each of the 3 years. The 98th percentile value is the 24-hour average out of a year of $PM_{2.5}$ monitoring data below which 98 percent of all 24-hour averages fall. The table below compares data collected from 2010 through year-to-date 2016 to the 24-hour standard for $PM_{2.5}$.

$PM_{2.5}$ Annual 98th Percentiles and 24-Hour Design Values

	Annual 98th Percentile Value µg/m^3							24-Hour Design Values				
Site Name	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2010-2012**	**2011-2013**	**2012-2014**	**2013-2015**	**2014-2016**
Southwick	33.1	29.6	24.1	24.0	24.3	22.3	15.3	**28.9**	25.9	24.1	23.5	20.6
Durrett Lane*	28.8	26.8	22.1	20.6	26.0	22.1	16.7	25.9	23.2	22.9	22.9	**21.6**
Cannons Lane**	25.8	32.6	23.2	22.5	23.9	21.7	13.0	27.2	26.1	23.2	22.7	19.5
Watson Lane	26.1	31.3	26.3	23.8	26.2	22.8	14.4	27.9	**27.1**	**25.4**	**24.3**	21.1

Bold: Design value for Louisville *Durrett Lane replaced Wyandotte in 2014 ** Cannons Lane replaced Barret in 2009

Louisville Metro Air Pollution Control District

8-Hour Ozone Monitoring Report

August 2016

This report summarizes ozone data collected by Automated Equivalent Method (AEM) ozone analyzers located within the Louisville Metropolitan Statistical Area. Measurements are reported as 8-hour averages in parts-per-billion (ppb). The data are subject to further quality assurance checks and are not final.

2016 8-Hour Ozone Maximum Values and Exceedances through July 31st

Date	# of 8-Hour Exceeds	# of Days Exceeds	Charlestown Clark County IN	New Albany Floyd County IN	Bates Elem. Jefferson County KY	Watson Lane Jefferson County KY	Cannons Lane Jefferson County KY	Buckner Oldham County KY	Shepherdsville Bullitt County KY
03/15/16	0	0	55.8	52.5	52.0	*	54.8	53.2	54.8
03/30/16	0	0	54.0	51.5	51.1	52.0	54.2	52.9	56.3
03/31/16	0	0	*	41.0	51.7	50.8	54.6	53.7	56.5
04/18/16	1	1	**73.4**	66.0	70.5	56.8	69.8	69.8	64.2
04/19/16	2	1	**72.1**	65.6	69.2	63.6	**71.0**	68.4	62.8
04/20/16	2	1	**71.1**	**73.0**	69.5	66.0	70.7	68.1	66.9
05/23/16	0	0	61.1	66.4	*	68.4	64.6	56.0	62.2
05/24/16	2	1	70.3	65.4	65.1	61.9	**72.0**	**74.8**	64.3
06/03/16	1	1	52.0	59.4	58.1	**73.1**	65.2	53.1	62.8
06/09/16	2	1	**77.8**	**71.6**	62.2	59.0	69.6	66.3	62.3
06/10/16	4	1	**83.4**	**79.8**	**71.2**	70.3	**80.6**	69.9	68.0
06/11/16	5	1	**72.5**	**73.1**	**82.0**	70.8	**80.8**	**72.7**	67.8
06/12/16	0	0	*	52.4	65.1	58.6	62.5	67.6	60.2
06/13/16	3	1	64.0	**71.1**	65.8	**73.9**	**76.5**	62.5	60.1
06/25/16	2	1	63.8	**83.9**	63.7	64.7	**72.6**	63.3	62.6
06/30/16	2	1	66.6	70.8	**74.2**	57.1	**86.7**	63.0	60.1
07/11/16	0	0	44.8	70.3	44.6	50.5	60.8	45.0	48.2
07/19/16	1	1	55.0	56.0	62.9	62.8	**72.1**	54.6	68.6
07/21/16	2	1	**73.0**	55.0	56.6	48.5	**74.4**	69.2	42.4
07/22/16	0	0	38.5	41.8	66.1	43.8	63.1	43.7	49.5
07/23/16	1	1	69.0	56.5	53.0	45.4	**71.3**	60.5	43.0
Total Exceeds	30	14	7	6	3	2	10	2	0
Truncated 4th Maximum			73	73	70	70	76	69	66

Values in **BOLD/RED** exceed the level of the 2016 ozone standard of 70 ppb (parts-per-billion)

* Indicates no data was available.

8-Hour Ozone Exceedances:

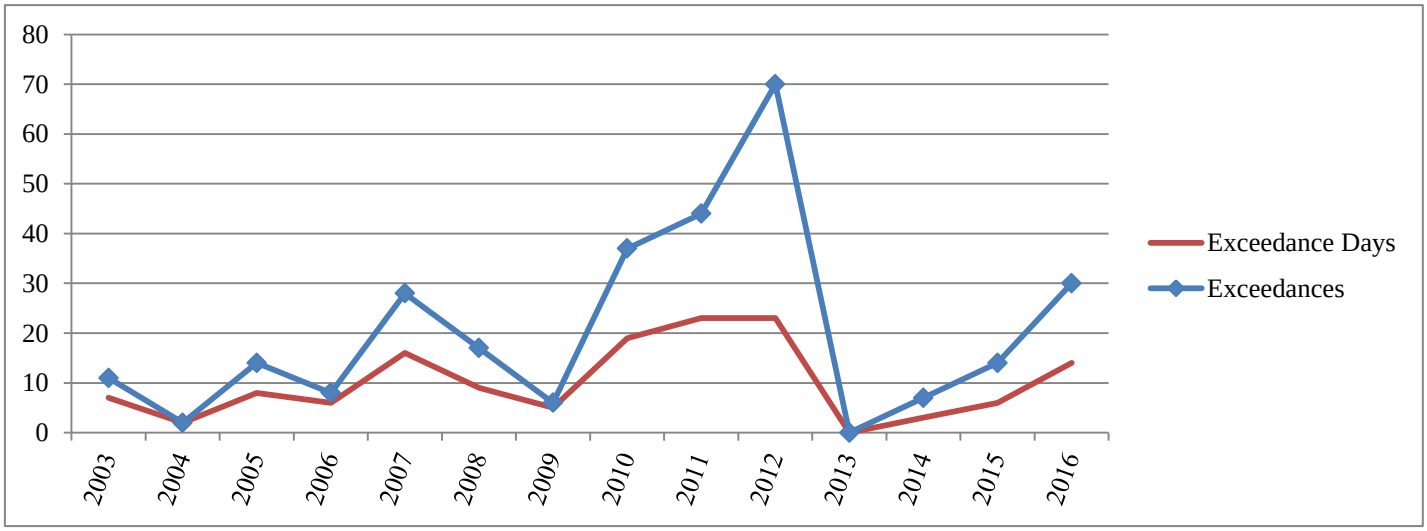
The National Ambient Air Quality Standard for ozone is measured as an 8-hour average. An ozone exceedance occurs when the highest 8-hour average for each day is greater than the NAAQS. The NAAQS was lowered from 80 ppb to 75 ppb in 2007 and from 75 ppb to 70 ppb in 2016. The data below lists the number of exceedances based on the NAAQS at the time the data was collected.

2003-2016 8-Hour Ozone Exceedance Summary through July 31st

Year	Charles-town	New Albany	Bates	Watson	*WLKY& Cannons Lane	Buckner	Shepherds-ville	Louisville MSA Total		Jefferson County Total	
								Exceedances	Days	Exceedances	Days
2003	4	4	1	0	0	2	0	11	7	1	1
2004	0	0	1	0	0	0	1	2	2	1	1
2005	3	2	0	4	1	4	0	14	8	5	4
2006	3	1	0	1	0	3	0	8	6	1	1
2007	8	3	8	4	2	3	0	28	16	14	11
2008	3	3	2	2	1	4	2	17	9	5	5
2009	0	0	2	4	0	0	0	6	5	6	5
2010	4	2	3	3	15	8	2	37	19	21	15
2011	6	5	6	5	8	13	1	44	23	19	14
2012	8	13	7	11	13	14	4	70	23	31	17
2013	0	0	0	0	0	0	0	0	0	0	0
2014	1	2	0	2	2	0	0	7	3	4	3
2015	3	0	4	1	4	2	0	14	6	9	5
2016	7	6	3	2	10	2	0	30	14	15	11

* Cannons Lane replaced WLKY in 2010. 2004-2009 data are from WLKY.

Historical Graph of 8-Hour Ozone Exceedances



National Ambient Air Quality Standard for Ozone - 8-Hour Standard:

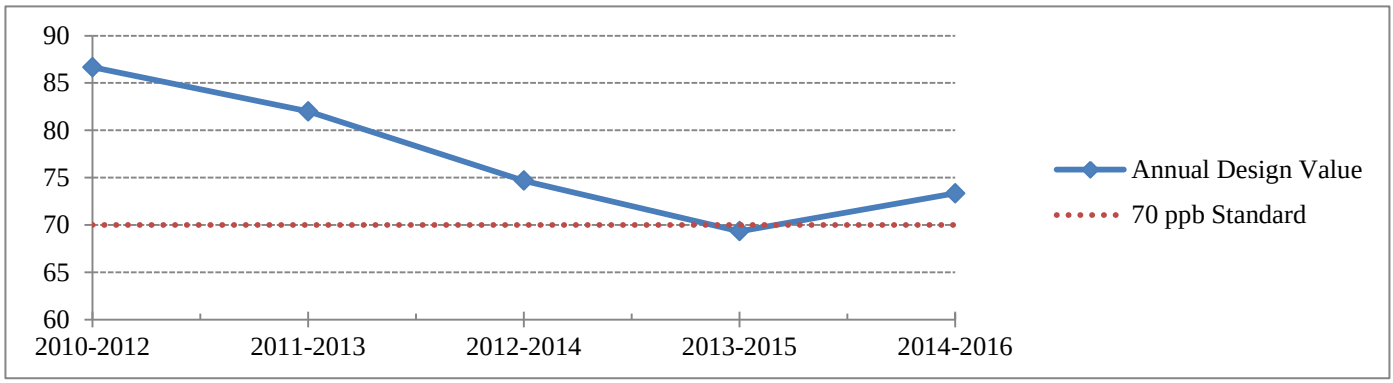
Attainment of the 8-hour standard for ozone at an individual monitor is achieved when the three-year average of the annual fourth-highest daily maximum (4th maximum) 8-hour average ozone concentration is less than 71 ppb. This three-year average is the design value for that monitor. The Louisville MSA row represents the largest 4th maximum and design value for all monitors within the MSA.

8-Hour Ozone 4th Maximums and Design Values through July 31st

	4th Maximums							8-Hour Design Values				
Site Name	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2010-2012**	**2011-2013**	**2012-2014**	**2013-2015**	**2014-2016**
Charlestown	77	82	85	67	66	74	73	81	78	73	69	71
New Albany	72	80	87	68	66	67	73	80	78	74	67	69
Bates	75	81	86	64	65	78	70	81	77	72	69	71
Watson Lane	74	82	81	65	69	69	70	79	76	72	68	69
*Cannons Lane	85	82	90	64	68	76	76	86	79	74	69	**73**
Buckner	78	90	92	64	68	75	69	87	82	75	69	71
Shepherdsville	74	72	80	64	65	68	66	75	72	70	66	66
Louisville MSA	85	90	92	68	69	78	76	87	82	75	69	73

* Cannons Lane replaced WLKY in 2010. 2007-2009 data are from WLKY.

8-Hour Ozone Design Value Trend Chart



Louisville Metro Air Pollution Control District
Air Monitoring Report for Sulfur Dioxide (SO_2)
August 2016

On June 2, 2010, EPA strengthened the primary National Ambient Air Quality Standard for SO_2. Specifically, EPA replaced the existing annual (30 ppb) and 24-hour (140 ppb) primary standards with a new 1-hour standard set at 75 ppb. The 1-hour standard was set to better protect public health by reducing exposure to high short-term concentrations of SO_2. The new standard took effect August 23, 2010.

Exceedances of the 1-Hour SO_2 Standard:

An exceedance occurs when a measured 1-hour average is greater than 75 ppb. Since up to twenty-four 1-hour averages are recorded each day, multiple exceedances may occur in one day. However, only the maximum 1-hour average (Daily Max) for each day is used in determining if the area is in compliance with the standard. The table below indicates the number of exceedances and the daily maximums reported thus far this year. The data are subject to further quality assurance checks and are not final.

SO_2 Daily Maximums and Exceedances through July 31st

	Fire Arms Training		Watson Lane Elementary		Cannons Lane NCore		New Albany Indiana	
Date	Exceeds	Daily Max	Exceeds	Daily Max	Exceeds	Daily Max	Exceeds	Daily Max
01/02/16		1.8		20.9		2.0		2.5
01/11/16		8.3		5.4		2.6		12.0
01/28/16		2.8		8.4		9.0		2.0
01/30/16		12.2		3.0		1.1		2.2
02/05/16		13.3		14.5		3.3		11.1
02/07/16		3.1		6.4		7.0		2.7
03/07/16		7.1		5.8		0.8		10.0
03/14/16		1.6		26.8		0.5		0.3
03/20/16		2.8		1.5		4.5		2.5
04/04/16		1.4		14.5		6.6		1.2
04/06/16		7.9		4.3		7.1		7.1
04/18/16		8.9		11.6		1.1		1.6
05/04/16		4.0		2.9		1.5		2.3
05/19/16		2.6		2.5		3.3		5.8
05/29/16		1.2		5.3		1.1		3.0
06/10/16		3.9		4.5		1.5		10.8
06/15/16		1.3		29.2		1.9		4.0
06/28/16		12.1		5.1		0.8		2.5
06/30/16		2.8		15.3		4.6		4.7

Louisville Metro Air Pollution Control District
Air Monitoring Report for Sulfur Dioxide (SO_2)
August 2016

Continuation of SO_2 Daily Maximums and Exceedances through July 31st

Date	Fire Arms Training		Watson Lane Elementary		Cannons Lane NCore		New Albany Indiana	
	Exceeds	Daily Max	Exceeds	Daily Max	Exceeds	Daily Max	Exceeds	Daily Max
07/17/16		0.6		2.3		7.3		2.8
07/19/16		15.6		12.3		2.1		2.5
07/23/16		0.0		1.4		4.1		10.1
Totals/Max	0	15.6	0	29.2	0	9.0	0	12.0
99th Percentile		12.2		20.9		7.1		10.8

*data not available

Attainment of the SO_2 Standard:

Attainment of the new standard is achieved when the 3-year average of the 99th percentile annual distribution of the daily maxima is less than or equal to 75 ppb. Since this value can be calculated from historical data, the chart below indicates those values based on 2010-2016 data.

SO_2 Annual 99th Percentiles and Annual Design Values

	Annual 99th Percentiles (ppb)							Annual Design Values				
Site Name	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2010-2012**	**2011-2013**	**2012-2014**	**2013-2015**	**2014-2016**
Watson Lane	107	114	147	93	149	56	21	123	118	130	99	75
Fire Arms	100	35	35	37	42	25	12	57	36	38	35	26
Cannons Lane	45	51	31	27	29	22	7	42	36	29	26	19
New Albany	123	38	32	21	44	29	11	64	30	32	31	28