AIR POLLUTION CONTROL DISTRICT

LOUISVILLE, KENTUCKY

GREG FISCHER
MAYOR

LAUREN ANDERSON, DIRECTOR

July 11, 2013

Ms. Jane Spann
Ozone Advance Lead
U.S. EPA, Region 4
61 Forsyth Street
Atlanta, GA 30303-8960

via Electronic Mail

RE: **Louisville/Jefferson County Kentucky Ozone Advance Submission**

Dear Ms. Spann:

The Louisville Metro Air Pollution Control District (LMAPCD) is pleased to submit our Path Forward to meet current and future National Ambient Air Quality Standard for ozone. As an 8-hour ozone maintenance area, Louisville enrolled in EPA's Ozone Advance program on July 16, 2012. The program's goal is to help attainment areas reduce emissions to ensure continued health protection, better position those areas to remain in attainment, and to efficiently direct available resources toward actions to address ozone and its precursors quickly. Since enrolling in the program, LMAPCD staff has performed a thorough analysis of control strategies currently implemented and those that could be adopted by LMAPCD or in partnerships with other agencies in Louisville. Using EPA's guidance document and all of the resource materials on its website, the analysis included research of possible additional control measures that are voluntary or mandatory from all source sectors in the community. Additional resources included programs implemented in other states or locales.

Please contact me at (502) 574-6009 or Ms. Cynthia Lee at (502) 574-7217 if you require more information.

Sincerely,

Lauren Anderson
Executive Director

Enclosure

Louisville Metro Air Pollution Control District

Ozone Advance Program
Path Forward

July 11, 2013

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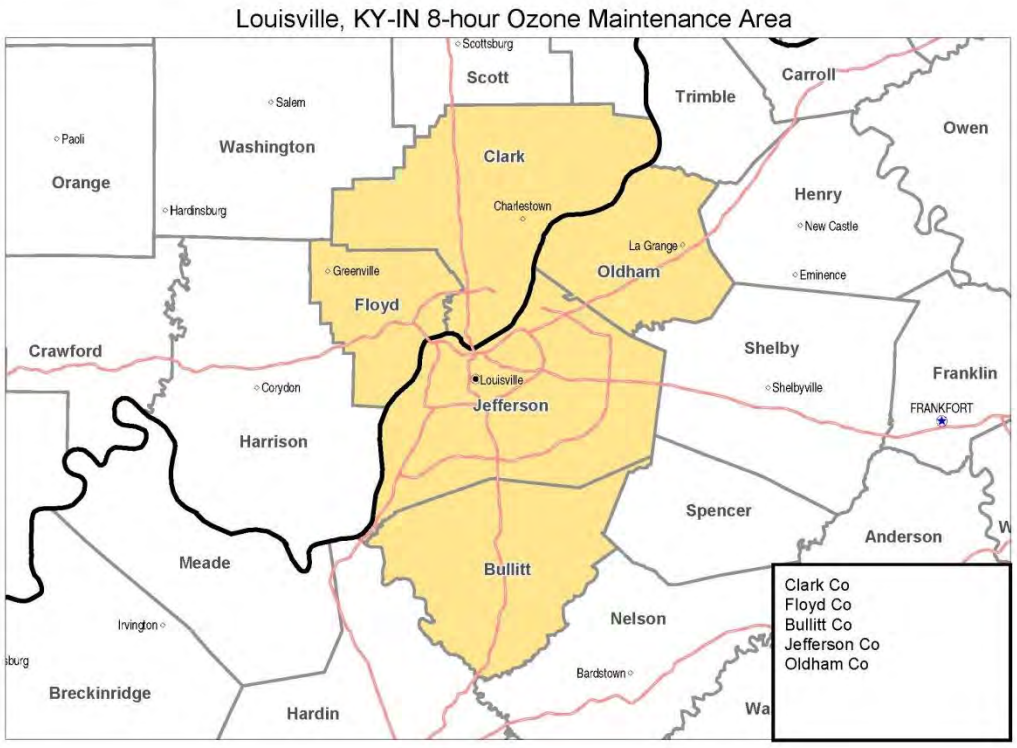
I. Introduction

As an 8-hour ozone maintenance area, Louisville Metro Air Pollution Control District (LMAPCD) enrolled in EPA's Ozone Advance program on July 16, 2012. The program's goal is to help attainment areas reduce emissions to ensure continued health protection, better position those areas to remain in attainment, and to efficiently direct available resources toward actions to address ozone and its precursors quickly. Since enrolling in the program, LMAPCD staff has performed a thorough analysis of control strategies currently implemented and those that could be adopted by LMAPCD or in partnerships with other agencies in Louisville. Using EPA's guidance document and all of the resource materials on its website, the analysis included research of possible additional control measures that are voluntary or mandatory from all source sectors the community. Additional resources included programs implemented in other states or locales. What follows is a discussion of staff findings.

Geographic Boundaries

The Louisville, Kentucky-Indiana, Metropolitan Statistical Area (MSA) is a maintenance area for the 1997 8-hour ozone standard and is an attainment area for the 2008 8-hour ozone standard. The area consists of Bullitt, Oldham, and Jefferson Counties, Kentucky and Clark and Floyd Counties, Indiana (Figure 1). The Indiana Department of Environmental Management (IDEM) has jurisdiction for Clark and Floyd Counties, the Kentucky Division for Air Quality (KDAQ) for Bullitt and Oldham Counties, and LMAPCD for Jefferson County.

Figure 1



Current Ozone Status

Redesignation of the Kentucky portion of the Louisville 8-hour ozone nonattainment area to attainment for the 1997 standard became effective on August 6, 2007 (72 FR 36601 07/05/2007). The redesignation of Indiana's portion of the nonattainment area became effective on July 19, 2007 (72 FR 39571 07/19/2007). Both states' implementation& maintenance plans remain in place and additional voluntary measures have been implemented to meet the national ambient air quality standards (NAAQS). They also revise their State Implementation Plans (SIP) when a need arises.

Attainment of the 8-hour ozone standard at an individual monitor is achieved when the three-year average of the annual fourth highest daily maximum is a concentration of less than 76 ppb. The daily maximum is the highest of the twenty-four possible 8-hour averages. Table 1 shows that only one monitor meets that criterion.

Table 1
2010-2012 4th Maximums and Design Values

Site ID	Site Name	2010 4th max	2011 4th max	2012 4th max	2010-2012 Design Value
18-019-0008	Clark Co. IN	0.077	0.082	0.085	0.081
18-043-1004	Floyd Co. IN	0.072	0.080	0.087	0.079
21-029-0006	Bullitt Co. KY	0.074	0.072	0.080	0.075
21-111-0027	Bates Elementary	0.075	0.081	0.086	0.080
21-111-0051	Watson Lane Elementary	0.074	0.082	0.081	0.079
21-111-0067	Cannons Lane	0.085	0.082	0.090	0.085
21-185-0004	Oldham Co. KY	0.078	0.090	0.092	0.086

Much of the air pollution problems are due to unfavorable meteorological conditions and air mass stagnation in the Ohio River Valley. Climatological data analysis has shown that when days are sunny and sultry and combined with a stagnant air mass in the Ohio River Valley, it creates optimum conditions for ozone formation. Those conditions were abnormally frequent during 2012. The National Weather Service (NWS) determined that Louisville's temperatures were the hottest on record with an average of 2.6°F above normal (official) and 3.2°F above normal near the Cannons Lane monitoring site. NWS data illustrates in Figures 2 and 3 that temperatures were statistically highest for the period from June 18 to July 13.

Figure 2 shows the daily low (blue) and high (red) temperatures with the area between them in shaded gray and superimposed over the corresponding averages (thick lines). The inner band is from the 25th to 75th percentile and the outer band is from the 10th to 90th. The bar at the top of the graph is red when both the daily high and low were above average, blue when they were both below average and white otherwise. Figure 3 shows temperature data for the period of June 18 to July 13. There were only three days that the daily maxima were below the historic mean, and those days did not monitor ozone exceedances. Of the 26-day period, five days recorded minimums less that the averages, of those two registered 8-hour ozone exceedances (Figure 4).
http://weatherspark.com/history/30762/2012/Louisville-Kentucky-United-States

Figure 2
2012 Louisville Temperatures

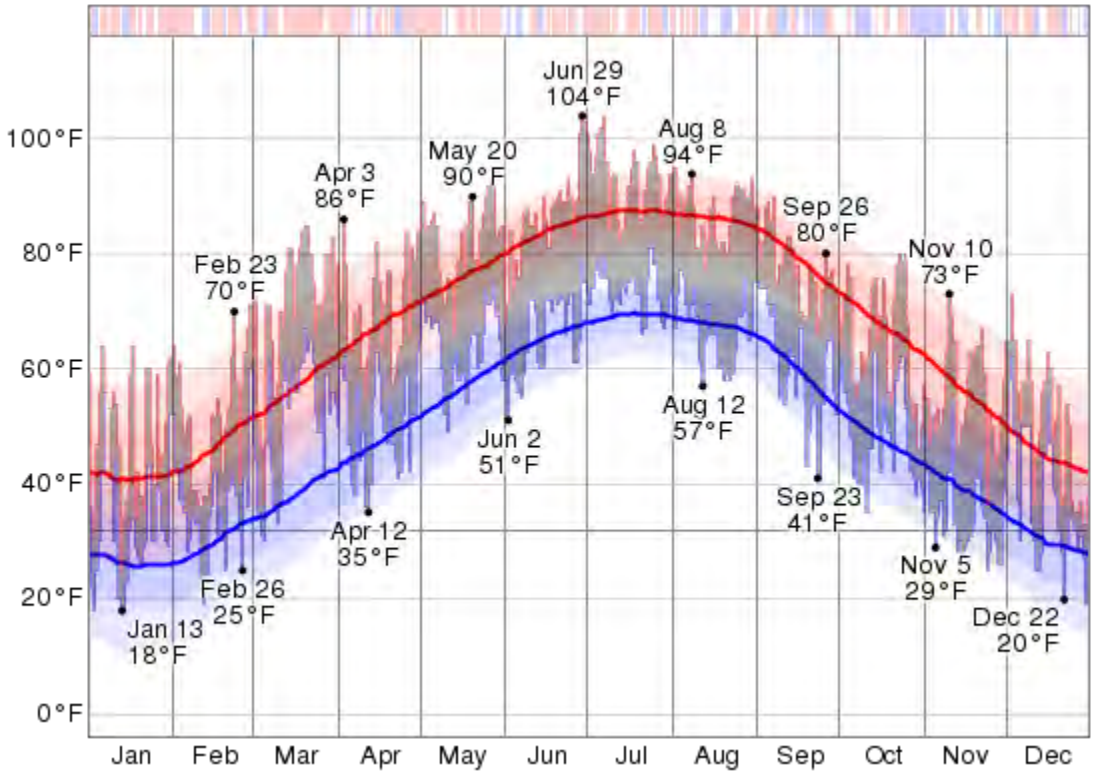


Figure 3
Louisville Temperatures: June 18 to July 13

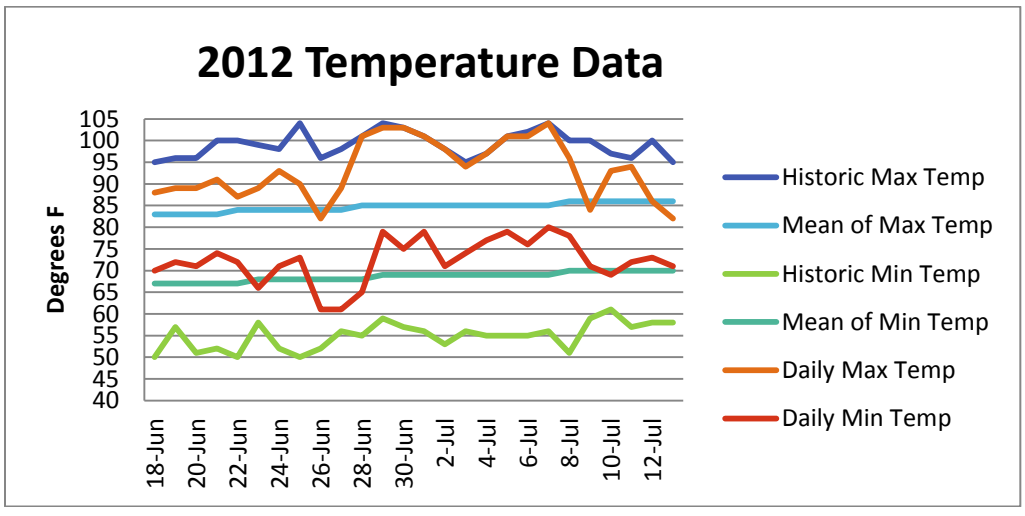
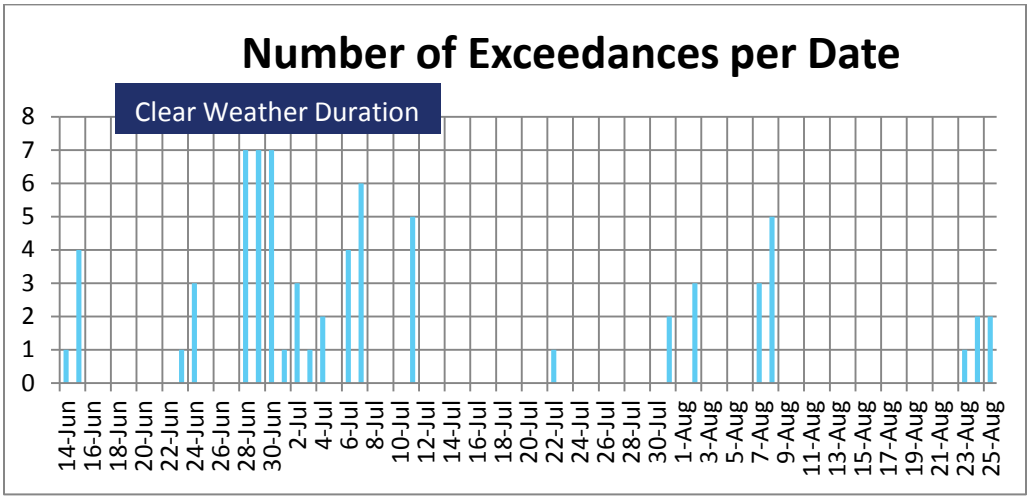


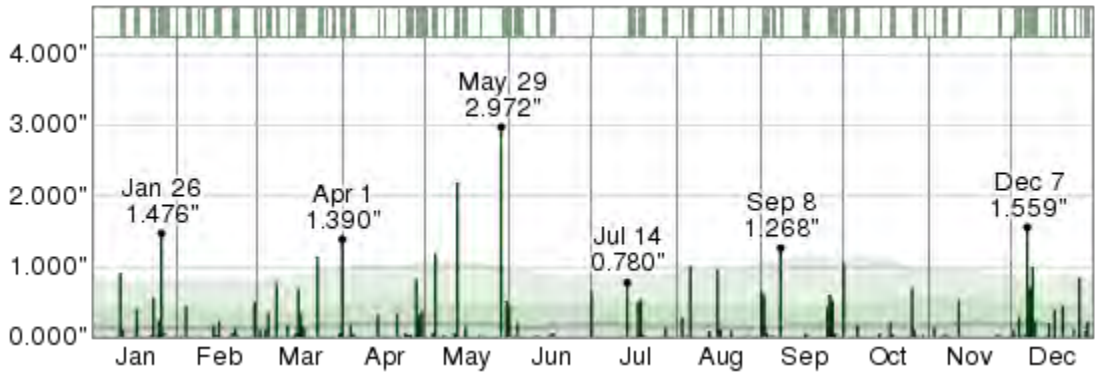
Figure 4 illustrates that 57% or 13 of the 23 exceedance days occurred between June 18 and July 1 and that 66% or 47 of the 71 total monitored exceedances occurred during that same period. Significantly, 73% of the total number of hourly exceedances (285 of 356) occurred during that same date span. http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=lmk&storyid=91054&source=0

Figure 4
2012 8-hour Ozone exceedances



The conclusion that much of the area's ozone problem is due to unfavorable meteorological conditions and air mass stagnation in the Ohio River Valley, is supported by evidence that the clearest month was July, with 87% of the days being more clear than cloudy. As Figure 5 shows below, the longest spell of clear weather was from June 18 to July 13, constituting 26 consecutive days that were clearer than they were cloudy. Figure 6 shows the fraction of time spent in each of the five sky cover categories over the course of 2012 on a daily basis. From the top (bluest) to the bottom (most grey) of the graphic, the categories are clear, mostly clear, partly cloudy, mostly cloudy, and overcast. Pink indicates missing data. The bar at the top of the graph is gray if the sky was cloudy or mostly cloudy for more than half the day, blue if it is clear or mostly clear for more than half the day, and blue-gray otherwise. http://weatherspark.com/history/30762/2012/Louisville-Kentucky-United-States

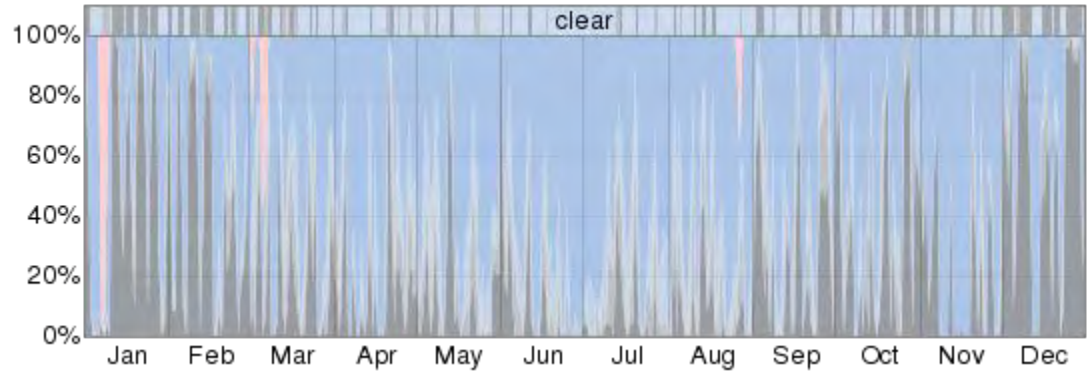
Figure 5
2012 Louisville Precipitation



The NWS also published that during the summer of 2012 Louisville was slightly dryer than average. Figure 5 illustrates the daily measured quantity of water (or liquid equivalent in the case of solid precipitation) precipitation with the median non-zero quantity (thick green line) and 10th, 25th, 75th, and 90th non-zero percentiles (shaded areas). The bar at the top of the graph is green if any

precipitation was measured that day and white otherwise.
http://weatherspark.com/history/30762/2012/Louisville-Kentucky-United-States

Figure 6
2012 Louisville Cloud Coverage



To reiterate, Louisville's climatological data analysis shows that during the summer of 2012 high ozone readings and exceedances were monitored on days that were sunny, sultry, and combined with a stagnant air mass in the Ohio River Valley.

II. Sources of Ozone Precursors

The National Emissions Inventory (NEI) is a comprehensive and detailed estimate of air emissions of criteria and hazardous air pollutants from all air emissions sources. The NEI is prepared every three years by the US EPA based primarily upon emission estimates and emission model inputs provided by state, local and tribal air agencies for sources in their jurisdictions and supplemented by data developed by the EPA. LMAPCD has been gathering emissions inventory data from stationary, area, onroad mobile, and nonroad mobile sources for several decades. Although the NEI contains much data, the following discussion will focus on oxides of nitrogen (NOx) and volatile organic carbon (VOC) emissions; the two main precursors to ozone formation. Table 2 contains NOx and VOC emissions data from those four sectors for the two most recent NEI data collections: 2008 and 2011.

Table 2
Jefferson County 2008 & 2011 Emissions

Source Category	2008 Tons NOx	2011 Tons NOx	2008 Tons VOC	2011 Tons VOC
Stationary[1]	25,479	18,270	8,090	7,947
Area[1,2]	2,461	4,289	14,542	10,408
Onroad mobile[3]	18,049	13,775	6,503	5,269
Nonroad mobile	3,862	3,225	2,569	2,218
TOTAL	**49,851**	**39,557**	**31,705**	**25,841**

[1]NEI2008 GPR 3.0 & NEI2011 v1 draft
[2]Includes biogenic emissions
[3]Using most recent in MOVES2010b analysis data with KY2011 fleet, etc.

The NOx and VOC emissions from all sectors but Area Source trended downward from 2008 to 2011: NOx by 20.6% and VOCs by 18.5%. (Note: EPA is introducing new methodologies for 2011 data, accounting for residential and industrial fuel burning. It is suspected that the emission for Area Source NOx is similar to 2008.) The reductions were in part due to the downturn in the economic climate in Louisville, but also because many voluntary programs were enhanced. Additionally, a majority of LMAPCD Strategic Toxics Air Reductions (STAR) program's deadlines were met in 2011. STAR's focus is on air toxics emitted from permitted sources, much of which are VOCs. Ambient air monitoring by the University of Louisville confirms that sizeable reductions have been made since STAR was adopted by the Air Pollution Control Board in 2005.

Emissions Discussion

Table 3 contains the most recent emissions inventory of NOx in Jefferson County by the NEI Tier 1 name for each sector. The three highest source categories emit 85.95% of the county's NOx inventory. Emissions from Louisville Gas and Electric's (LG&E) electric generating units (EGU) account for 35.80% of all NOx emissions and 50.15% are from onroad and nonroad (nonroad or off-highway consists of marine, airport, rail & construction emissions) vehicles.

Table 3
2011 NOx Emissions Inventory by Sector

TIER1 NAME	2011 Tons NOx	% of Total*
FUEL COMB. ELEC. UTIL.	14,117.51	35.80
HIGHWAY VEHICLES	13,774.55	34.93
OFF-HIGHWAY	6,001.45	15.22
FUEL COMB. INDUSTRIAL	2,696.57	6.84
FUEL COMB. OTHER	1,638.08	4.15
INDUSTRIAL PROCESSES	1,153.31	2.92
CHEMICAL & ALLIED PRODUCT MFG	27.37	0.07
WASTE DISPOSAL & RECYCLING	20.85	0.05
SOLVENT UTILIZATION	3.69	0.01
MISCELLANEOUS	2.89	0.01
STORAGE & TRANSPORT	2.64	0.01
SUBTOTAL	**39,438.90**	
BIOGENIC (part of Area Source in Table 2)	118.483	
TOTAL	**39,557.38**	

*Anthropogenic only

Table 4 contains the most recent emissions of VOCs in Jefferson County by their NEI Tier 1 name. The four highest source categories emit 85.25%. Emissions from permitted industrial sources account for 26.48%. Solvent use emissions from non-industrial commercial and consumer products are 25.75% and slightly over a third of VOC emissions are from onroad and nonroad (nonroad or off-highway consists of marine, airport, rail & construction emissions).

Table 4
2011 VOC Emissions Inventory by Sector

TIER1 NAME	2011 Tons VOCs	% of Total*
INDUSTRIAL PROCESSES	6,187.21	26.48
SOLVENT UTILIZATION	6,016.30	25.75
HIGHWAY VEHICLES	5,269.09	22.55
OFF-HIGHWAY	2,446.71	10.47
FUEL COMB. OTHER	1,673.88	7.16
STORAGE & TRANSPORT	1,160.16	4.97
CHEMICAL & ALLIED PRODUCT MFG	285.16	1.22
FUEL COMB. ELEC. UTIL.	176.22	0.75
FUEL COMB. INDUSTRIAL	89.21	0.38
WASTE DISPOSAL & RECYCLING	57.85	0.25
MISCELLANEOUS	2.69	0.01
SUBTOTAL	**23,364.48**	
BIOGENIC (part of Area Source in Table 2)	2,477.01	
TOTAL	**25,841.49**	

*Anthropogenic only

As stated above, four of LG&E's EGU facilities account for 35.80% of the NOx emissions in the county. Sixty percent of that is generated by Mill Creek Station and the Cane Run Station accounts for nearly forty percent. Paddy's Run and Zorn Station generate much less than one percent of EGU NOx. LG&E's stations are also subject to the Title V program and are inspected by LMAPCD's engineering and compliance sections every three years.

The LG&E Cane Run plant's emissions are planned to be reduced substantially by late 2015 to comply with the Mobile Source Air Toxics (MSAT) and the Boiler MACT (maximum-achievable control technology). The current coal-fired power plant is going to be retired when the company's natural gas-fired combined cycle EGU comes on line. The new power plant will have a rated capacity of 731 MW and consist of two natural gas-fired combustion turbines (F Class) and one steam turbine generator. Each combustion turbine will be equipped with a heat recovery steam generator (HRSG), a duct burner and a catalytic oxidizer. Table 5 below contains emissions from the potential-to-emit (PTE) for the new facility and the actual emissions for the existing EGU's removal. More detailed information may be found in Appendix A.

Table 5
Upcoming Cane Run NOx and VOC Emissions Reductions

	NOx (tpy)	**VOC (tpy)**
Emission increase for new Facility		
	1,166.2	81.2
Creditable emissions decrease from coal-fired boiler removal		
	(5,989.4)	(57.0)
Total emissions decrease		
	(4,823.2)	24.3

The LG&E Mill Creek plant is also reducing its emissions of NOx and SO_2. The Kentucky Public Service Commission has approved that plant to operate its selective catalytic reduction equipment (SCR) year round to reduce NOx and comply with the Clean Air Interstate Rule (CAIR). Additionally, the four EGUs are being modified by adding four new particulate matter control systems before April 16, 2016. They are adding a combined flue gas desulfurization unit (FGD) on two units and adding individual FGDs on the other two. While these new controls do not target VOCs or NOx, they will reduce the plant's particulate matter emissions by 22.5% and SO_2 emissions by more than 50%. The latter is significant because Mill Creek is the major source of SO_2 contributing to exceedances at the Watson Lane Elementary air monitoring station. EPA has proposed that area as the SO_2 nonattainment boundary for Jefferson County. Detailed information about the control device installations may also be found in Appendix A.

A large NOx source directly across the Ohio River from Louisville is Duke Energy's Gallagher Generating Station (Gallagher), located in New Albany, Indiana. It had four 140 megawatt (MW) coal-fired electric generating units. In May 2009, a federal jury found that Duke made illegal modifications to Gallagher Units 1 and 3 that caused significant increases in air pollutants. The company made these modifications

without first complying with pre-construction obligations, including obtaining pre-construction permits and installing and operating state-of-the-art pollution control technology, in violation of the Clean Air Act (CAA) Nonattainment New Source Review and Prevention of Significant Deterioration provisions, 42 U.S.C. §§ 7470-7492, 7501-7515, and the Indiana State Implementation Plan.

The consent decree secured injunctive relief at all four units at the Gallagher Plant even though only Units 1 and 3 were found to be in violation of the CAA. One of the requirements among the suite of options was that Duke could elect to retire Units 1 and 3 from operation by February 1, 2012, which is what it did. Duke was also required to put dry sorbent injection (DSI) on the other units for sulfur dioxide (SO_2) control and that measure was implemented in January, 2011. During the renovation bag houses were also added to those units. Implementation of this settlement is reducing SO_2 emissions by approximately 35,000 tons per year, an 86.6 percent reduction when compared to 2008 emissions. Additionally, besides reducing SO_2, particulate matter, NOx, and VOC emissions have decreased by about 46%. By retiring Units 1 and 3 last year, it is anticipated that Gallagher's total NOx emissions will decrease from 2008 emissions of 4942 tpy to 2663 tpy for 2012 when reported; slightly over 46%. That reduction is approximately equal to a 6% NOx reduction for the county when prevailing winds are southerly.

While LMAPCD does not have jurisdiction over the next highest sources of NOx emissions in Jefferson County: highway and off-highway mobile sources, it has been very active in promoting voluntary measures with a number of partners to reduce mobile source emissions. During the last two years, for example, LMAPCD has aggressively conducted an Idle Free education and outreach campaign to reduce idling from vehicles at businesses and schools, and within the general population. More information can be found in the Section IV. *Local Voluntary Control Measures*, below.

Future VOC emissions reductions are anticipated as LMAPCD's compliance section is preparing to increase its efforts of assisting owners of smaller businesses such as perchloroethylene dry cleaners and auto body repair shops to comply with their operating permits and to implement best practices to reduce their emissions. While compliance with a source's operating permit is the agency's goal, when enforcement actions are necessary, LMAPCD has the regulatory authority to write Notices of Violations and levy penalties as appropriate.

Interestingly, a large number of ethanol fugitive emissions originate from three bourbon aging facilities in the county. LMAPCD has no jurisdiction over them because those emissions do not count toward the 100 tpy applicability threshold for the Clean Air Act Part 70 operating permit program. Jefferson County VOC emissions in 2008 were 3,734 tons per year (tpy) and increased to 4,430 tpy in 2011. There are several similar DAQ permitted facilities in the ozone maintenance area that contribute nearly that amount of fugitive emissions. Like LMAPCD, DAQ has no authority to include bourbon aging fugitive emissions in the facilities' inventories. Combining both counties' fugitive emissions is equivalent to approximately 30% of the all of the VOC emissions inventory in Jefferson County. Unfortunately, these emissions contribute to the area's VOC emission total and to ozone formation.

Source Modeling

LMAPCD is a participant and contributor to Southeastern Modeling, Analysis, and Planning (SEMAP) Program 8-hour ozone modeling efforts. SEMAP members are currently refining numerous direct and indirect inputs for modeling runs anticipated to begin during the summer of 2013 and will model

projections out to 2018. With that information, LMAPCD will be able to assess what additional measures the community might be able to take to further reduce NOx and VOC emissions in the county.

Additionally, EPA's Office of Air Quality Planning and Standards (OAQPS) has begun stakeholder involvement to discuss current plans regarding 2011 emissions for use in EPA's air quality modeling platform. The modeling platform is anticipated to be used in the future for analyses of interstate transport; the Ozone NAAQS review Regulatory Impact Assessment; sharing with states for SIP development; and other purposes. During a conference call in May 2013, EPA mentioned by fall 2013 draft v1 of NEI2011 should be completed, and that during spring 2014 final v1 will be available to use as a marker for transport analyses. LMAPCD anticipates using this information to refine future ozone precursor pollutant assessments.

III. STAKEHOLDER INVOLVEMENT

LMAPCD has engaged stakeholders for many years in an effort to develop policy with greater input from the community and that input has led to pollution emissions reductions from all sectors. Stakeholder groups have included representatives from the regulated community, environmental advocates, and members of the surrounding community who are affected by LMAPCD's regulations or policy decisions.

Achieving attainment with Federal standards for ground level ozone has been the focus of three stakeholder groups convened by LMAPCD: the SIP Advisory Panel (1997-2003), the Air Quality Task Force (2003-2006), and the Ozone Air Quality Task Force (2008). The Fine Particle Air Quality Task Force (2007-2008) developed a report and plan of action for the area to meet the standard for fine particle pollution ($PM_{2.5}$).

Other groups were established as part of Louisville's effort to reduce the risk of toxic air contaminants (TACs). These groups met in the years following adoption of the Strategic Toxic Air Reduction (STAR) program in 2005. The STAR Implementation Advisory Group (2005-2007) and the STAR Advisory Group (2009) met to address the concerns of citizens and members of the regulated community regarding the STAR Program and to bring more clarity to its implementation. The STAR Regulation 5.30 Stakeholder Group met in 2006 and 2007 to assess and address the risk to human health and welfare from ambient concentrations of TACs from minor stationary sources, area sources, and nonroad and onroad mobile sources. In an effort to develop recommendations for enhanced leak detection and repair at several of Louisville's emission sources in 2008 the Leak Detection and Repair Workgroup was formed.

Following recommendations from several stakeholder processes, LMAPCD convened the Idling Reduction Working Group in 2008 to help in developing a plan for decreasing pollution by reducing unnecessary vehicle idling.

Shortly after the stakeholder groups' conclusions LMAPCD collated the more than one hundred recommendations and organized them into an Integrated Action Plan (IAP). Since that time, the IAP has been used as a guide to develop environmental policies and programs that reduce emissions. Appendix B contains a summary of those recommendations and the status of the related strategies that have been evaluated and/or implemented. Many of them are the basis for continuing collaborations with individuals, businesses, and governmental entities that were launched during the stakeholder processes.

As LMAPCD moves forward to implement emission reduction strategies, it will continue to rely on public involvement in future rule making opportunities, including the development of proposed Standards of Performance for Offset Lithography Printing Operations, and strengthen partnerships with relevant stakeholders in pursuit of grants and education and outreach activities.

IV. STATUS OF CURRENT LOCAL VOLUNTARY CONTROL MEASURES

The Louisville area has been extremely active at reducing ozone precursor emissions of VOCs and NOx with a variety of voluntary programs, activities, and initiatives for nearly two decades. Emissions like those from cars and energy use are difficult to address because they require changes in human behavior so LMAPCD is engaged in a number of activities that encourage residents and businesses in the area to reduce air pollution emissions by providing community outreach programs to help individuals become aware of air friendly choices they can make in their daily lives. LMAPCD also supports businesses by providing compliance assistance, grant and loan opportunities, and by reviewing development plans.

To continue the work of meeting the NAAQS, LMAPCD collaborates with community members and other government entities to identify emission reduction strategies and integrate air quality principles into their project and program processes. Since 2004, LMAPCD staff has been an active participant in the Partnership for a Green City (PGC), the first of its kind in the country representing a collaborative effort to improve environmental education, health, and management by four of Louisville's largest public entities: Louisville Metro Government (LMG), the University of Louisville (UofL), Jefferson County public VSchools (JCPS), and Jefferson Community and Technical College (JCTC). Together, the partner agencies employ 27,500 people, enroll 136,000 students, operate 531 buildings covering 30 million square feet and 25,135 acres of land, and use 7,000 vehicles in Jefferson County. Over 150 employees work together on PGC teams sharing their knowledge and enabling each other to expand programs and services to their constituencies and the community. They are saving tax dollars by efficiencies of scale through collective purchasing power and education and outreach efforts. Many of the PGC projects and initiatives also reduce pollution emissions and are discussed below.

Another partnership in which LMAPCD staff is a key participant is in the Metro Green Team which is chaired by the director of the Office of Sustainability. The office was created by Mayor Greg Fischer in 2012 to develop sustainable policies and guidelines within Louisville Metro Government (LMG) to effect behavior change, reduce costs, and promote coordination among agencies. In July the office launched a single-stream recycling program across all LMG departments. The Louisville Metro sustainability plan, Sustain Louisville in Appendix C was released in March 2013 and included community feedback that the Mayor received during a public comment period. Divided into six focus areas: energy, environment, transportation, economy, community, and engagement, the plan has three objectives:

- Protect the environment and reduce Louisville's carbon footprint
- Ensure the health, wellness and prosperity of all citizens
- Create a culture of sustainability

Section 2.2 of the sustainability plan highlights the goal that the city needs to achieve and maintain the NAAQS and includes a discussion of current and future air friendly activities.

The remainder of this section describes a number of initiatives with which LMAPCD staff is involved to reduce air pollutants in the community. The discussion includes onroad and nonroad, energy efficiency and renewable energy, and land use strategies.

Mobile Source

- Kentuckiana Air Education (KAIRE)
  This federally funded education and outreach program promotes smarter driving habits and pollution-mitigation behavior. Strategies include car-pooling, bus ridership, walking, cycling, trip-chaining, and idling reduction. KAIRE gets its message out via TV and radio commercials, event sponsorship, school visits, business outreach, social media, and participation in community fairs and festivals. KAIRE employs a full-time coordinator and a public information supervisor who also work for LMAPCD. KAIRE is also responsible for informing the public and local media when there is an Air Quality Alert for ozone or fine particulate matter. It also partners with JCPS, which included Idle Free messaging on 64,300 rearview mirror hang tags distributed to parents who participate in the district's many car-rider pickup lines. KAIRE's Facebook page and Twitter feed promote smarter driving habits and overall awareness of air pollution's impacts. Finally, LMAPCD has been a contributing member to AirShare since 2004. Administered by the Environmental Protection Agency and the National Association of Clean Air Agencies, AirShare provides clean air partners, across the country, with a place to network and leverage ideas and information to purposefully and effectively meet the clean air goals of the 21st century. This integrated website offers a state-of-the-art searchable database for easy accessibility to successful air quality improvement programs. KAIRE activities are periodically posted to the webpage.

- Lawn Care for Cleaner Air
  The Lawn Care for Cleaner Air Program encourages Louisville Metro residents to reduce harmful lawn-related air emissions by using much cleaner electric and human-powered lawn equipment. Funded with penalty fees paid through enforcement actions, Louisville Metro residents can receive rebates by recycling gasoline powered lawn equipment and replacing it with electric or human-powered ones. This year the LCCA program has realigned its commercial user program, LCCA Professional, to provide similar rebates on commercial-grade electric equipment. The commercial program previously rebated 4-stroke equipment, which is now a larger market share than 2-stroke equipment due to EPA small engine emission standards. The goal is reduce emissions that can form ozone and fine particulate matter which are especially harmful to sensitive groups such as children and the elderly. Over the last six years this very successful program has reduced nearly five tons of emissions per year (not including CO_2). Finally, using the current rebate structure, staff is currently researching the possibility of adding a native plant and/or tree rebate program.

- Idling reduction efforts
  Idle Free Louisville is a campaign to educate the public about the air-quality benefits of shutting off idling cars and trucks. The campaign includes TV and radio commercials and direct outreach to schools, businesses, and individual drivers. The program's success has been evident. In last year's survey research, unaided recall of Idle Free messages jumped from 8% in 2010 to 30% in 2012; drivers who turn off their engines while waiting in a car has increased to 63%. Online toolkits offer an array of materials to schools and businesses that are

interested in becoming "idle free." To date, 20 schools and businesses have become officially idle free and display signage to promote their idling reduction efforts. TARC's No Idling Policy, issued in March 2011, covers bus operator standard procedures in common situations to prevent unnecessary fuel consumption and emissions. Additionally, idling restriction policies have been adopted by all of the Partnership for a Green City's entities. More information of the Partnership follows.

- PGC Fleet initiatives
  - Louisville Metro Government's Fleet Services Division is the primary fleet support operation for city-owned vehicles, operating a diverse fleet with about 2,600 on-road vehicles. Fleet Services makes every effort to reduce emissions from its traditionally-fueled vehicles through right-sizing, alternative vehicle technology, and user education. The city's vehicle replacement strategy has focused recently on "right-sizing" vehicles to their intended use. This would include, for example, replacing aged vehicles with V-8 engines with new vehicles that have V-6 engines, and replacing old V-6 engines with 4-cylinder cars when appropriate. The vehicles with smaller engines often cost less, use less fuel and emit fewer harmful pollutants. In addition, Metro fleet's vehicle policy includes anti-idling guidelines.
  - In 2011, Louisville's fleet vehicles used approximately 2.6 million gallons of unleaded fuel, 435,000 gallons of diesel fuel, and 349,000 gallons of B5-biodiesel fuel in 2011. Fleet Services is exploring opportunities to expand the use of alternative fuels in the city's fleet. Alternative fuels, which EPA defines as those derived from sources other than petroleum, often produce less air pollution than gasoline or diesel. The city government operates 39 hybrid electric vehicles and is exploring opportunities for additional hybrid or clean emission vehicles. The Parking Authority of River City (PARC) is evaluating the feasibility of installing charging stations in their garages.
  - Since 2010, LMAPCD has administered over 1.5 million dollars of EPA's Southeast Diesel Collaborative and Kentucky Clean Diesel emission reduction grants for onroad and nonroad mobile vehicles and equipment owned by LMG, the Metropolitan Sewer District (MSD), and the Louisville Regional Airport Authority (LRAA). Completed in 2012, diesel particulate filters (DPFs) were installed on 45 pieces of LMG nonroad equipment and on 14 MSD mobile pumps. Diesel oxidation catalysts (DOCs) were installed on 6 pieces of LRAA port equipment and vehicles. DPF control panels and cleaning units were installed at LMG and MSD maintenance facilities. Spare filter stock was purchased so that there would be no down-time for any of the installations. The retrofitting of 65 vehicles annually reduces $PM_{2.5}$, hydrocarbon and carbon monoxide emissions each by 80% (per the Diesel Emissions Quantifier). Additionally, eighteen refuse trucks were equipped with DPFs. These vehicles operate throughout the urban services district six days a week. Over the course of the lifetime of the vehicles there will be a reduction of 3.63 tons $PM_{2.5}$, 2.81 tons of hydrocarbons and 13.14 tons of CO. This will result in $170,000 in health benefits to the citizens of Jefferson County annually. With an award of additional funds, two more refuse trucks will be equipped with DPFs in 2013.
  - The JCPS system has 1250 buses in its fleet, of which 963 are used in regular routes. The rest are either assigned to schools for activities or are held in reserve. Of the regular route buses, 510 are equipped with diesel oxidations catalysts (DOCs), 257 are equipped with diesel particulate filters (DPFs), and 181 are equipped with both DPFs and selective catalytic reduction systems (SCRs), meeting 2010 emission standards. Of those 2010 compliant buses, 50 are hybrid electric buses, reducing emissions and improving fuel efficiency. This fleet of hybrid buses is larger than any other school districts in the country and is saving more than

700 gallons of fuel annually. Since 2006, the JCPS fleet has been using biodiesel blends of up to 5%.

- In 2014, the Transit Authority of River City (TARC) will begin operating five all-electric "buses of the future" on downtown streets replacing the oldest trolleys in operation. Estimated carbon emissions associated with electric buses are 65 percent lower than emissions from diesel buses. The electric buses will produce zero air polluting emissions. The TARC fleet includes 21 hybrid buses and 11 more will be delivered in 2013. Collectively, those hybrids will use about 65, 000 fewer gallons of diesel fuel each year than standard diesel buses. Beginning in 2008, TARC equipped buses with diesel particulate filters that clean the bus exhaust. In addition to the filter, when a computer sensor determines that excess emissions are resulting from buildup in the bus's fuel and exhaust system, a re-gen process is triggered to clean the filter with a brief blast of extreme heat. There are currently 35 TARC buses equipped with DPF's. Emissions of nitrogen dioxide (NO_2) will be reduced to near zero in all future TARC diesel buses through the use of SCRs including 27 buses now on order.

- TARC has begun replacing cooling systems (read fans) that are driven hydraulically with systems that use electric fans and expects up to a 5% improvement in fuel efficiency as a result. Twenty (20) buses have been retrofitted to date, and all purchases in the future will have the new electric systems, including the 27 that are now on order. TARC is upgrading its fleet of door-to-door paratransit service vehicles for people with disabilities. The new purpose-built vehicles will use 50 percent less fuel than the existing paratransit vehicles.
- Though they operate a relatively small fleet, UofL has a commitment to purchase fuel-efficient models as university fleet vehicles are replaced. They will also require that new vehicles have fuel efficiencies at least 15 percent better than their predecessors. By 2020 the university will increase the efficiency of 60 percent of their fleet by 15 percent. By 2025 the entire fleet will be at least 15 percent more fuel efficient. A 15 percent increase in fuel efficiency for the university fleet would mean an annual reduction of 13,907 gallons of gasoline and 1,209 gallons of diesel. This translates to an annual reduction of 136.3 metric tons of carbon dioxide equivalents (a 0.7 percent reduction from 2008 baseline). Additionally, the University has converted the mower fleet used to maintain its main campus to all propane powered equipment. This has served as a demonstration opportunity to several other large, institutional landscaping fleets and a there is interest in pursuing more propane use in similar nonroad fleets in the city.

- KCFC

The Kentucky Clean Fuels Coalition (KCFC) is a non-profit organization, a SmartWay affiliate, and a national leader in the Clean Cities program. KCFC builds partnerships between fuel providers and users, and raises awareness about the benefits of using alternative fuels and advanced technologies (for stationary as well as mobile needs) to reduce pollution across Kentucky. Nearly 25% of KCFC's membership is located in Jefferson County. KCFC has been an instrumental partner in the purchase of 160 hybrid-electric school buses in 32 school districts. Fifty-five of those buses are transporting students to Bullitt and Jefferson Counties' schools.

Zimride

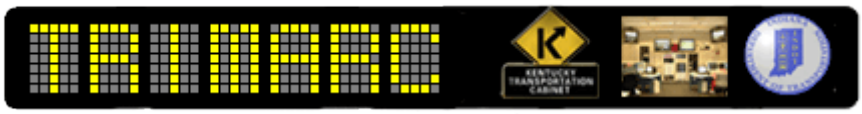
Zimride is a social networking ride-share program at JCTC and UofL. The program allows students, faculty and staff to find friends, classmates and coworkers who are going the same way, thus reducing the need for a vehicle on campus and vehicles miles traveled.

- WeCar at UofL
  WeCar is a joint venture between Enterprise and the UofL and is an exclusive car-sharing service started in the fall of 2012. The WeCar program allows students and faculty/staff the ability to reserve and rent a vehicle on-site for an hour, a day or overnight.
  WeCar vehicles provide a cost-effective and environmentally friendly transportation solution and are available 24/7. Membership includes: fuel, WeCar parking spot, maintenance, up to 200 miles per day, and damage/liability coverage for members 18 and over.
- KIPDA's Ticket to Ride
  As of December 1, 2012, the Ticket to Ride Vanpool Program (ride-sharing) has 81 operating vanpools with approximately 650 participants. The estimated annual VMT reduced is 9,027,936, annual Auto Trips reduced is 69,984 and Gallons of Gasoline Conserved is 996,930.
  Based on these numbers, the estimated annual emissions savings are below:

  VOC – 5,667,794.208 g CO – 79,158,412.51 g
  NOX – 15,004,779.55 g PM – 195,207.071 g
- Bicycle/Pedestrian improvements (Mayor's Healthy Home Town Movement, Bike Louisville, and Louisville's Bike Master Plan)
  Bike Louisville is a program in Metro Government that works to create a bicycling environment that is safe, efficient, and enjoyable for riders of all ages and levels of experience. The program is broken down into five E's and each E has team members from inside and outside local government. The 5 E's are: Education, Enforcement, Encouragement, Engineering, and Evaluation. Bike Louisville serves as an access point for input from the cycling community and the general public. Its website serves as a clearinghouse for bicycling maps, education, safety, programs, events, organizations, clubs, shops, and infrastructure. In 2010 Louisville's Bike Master Plan was released. The plan sets forth the city's vision and goals, provides an overview of existing conditions, explains the planning process that was undertaken to complete the Master Plan, recommends new bicycle projects and programs, establishes performance measures, and sets forward an implementation plan through the year 2030. The Plan's report card is released annually after assessing the progress of the 5 E's goals and includes a list of projects totaling nearly $10 million dollars in federal, state and local funds. Examples of projects include the addition of bicycle lanes, Bike-to-Work days, and Hike-Bike-Paddle days. A very successful outreach program to young people is Bike Sense Cops for Kids program. During the school year, third, fourth, and fifth graders at three schools received a weeklong curriculum on the various aspects of bicycling use and safety. During the summer the program moves out to a community center. In the summer of 2012, over 300 children participated in this very popular program. Further projects budgeted in the Louisville's FY2014 budget include new bike lanes added throughout the county, with an emphasis on lanes connecting the University of Louisville Old Louisville, and

the urban core which contains numerous offices and the campuses of JCTC and Spalding University.

- Safe Routes to School program
  The Safe Routes to School Program (SRTS) is designed to enable and encourage children, including those with disabilities, to walk and bicycle to school; to make bicycling and walking to school a safer and more appealing transportation alternative; and to facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption and air pollution in the vicinity of schools. Six Louisville MSA schools have participated in the program since 2008.
- Employer-Based Trip Reduction Program
  There are three participants in TARC's program that provide their employees with free TARC use: University of Louisville, Louisville Metro Government, and Humana. This benefit is also available to enrollees in UPS' Metropolitan University students.
- Parking Authority of River City (PARC)
  In addition to conventional parking places, PARC provides more than 200 bicycle parking spots distributed through a dozen locations in Louisville's central business district. PARC is currently investigating financing and installation best practices for incorporating electric vehicle charging infrastructure in strategic locations.
- When possible, LMG and many businesses allow their employees to maintain flexible work hours. Telecommuting is encouraged whenever possible.
- Traffic signalization
  By leveraging federal, state, and local funds for more than a decade, Louisville's traffic application software provides direct control to all signals at 595 system intersections through a communications network and on-street control equipment. The signalization system provides numerous timing plans which operators use to accommodate various traffic patterns at different times throughout the day and for current traffic situations. A graphics display permits the viewing of individual sections of the system or individual intersections. The system also identifies and notifies the operator of locations that may have suffered equipment failures.
- TRIMARC
  - TRIMARC is an Intelligent Transportation Systems (ITS) and includes an integrated system of sensors, cameras, dynamic message signs, highway advisory radio and computers monitoring more than 60 miles of interstate traffic in the greater Louisville and Southern Indiana urbanized area. The Louisville control center collects information on traffic flow, construction areas and accidents and then that information is disseminated to motorists via dynamic message signs, mobile applications, and highway advisory radio. By increasing the availability of information on the real-time status of traffic, TRIMARC's purpose is to improve the response time to incidents, prevent the occurrence of secondary incidents and improve air quality through the reduction of traffic congestion.



  - TRIMARC was the first ITS to implement an Auto Incident Recording System (AIRS) to provide data for the monitoring and analysis of extremely dangerous intersections. AIRS has been used to design intersection modifications. At one downtown intersection, for

example, the alterations reduced near and actual incidents by nearly 90%, and thereby also reduced traffic delays on two busy streets.

  - Another traffic safety and vehicle emission reduction feature of TRIMARC's ITS is a warning system on a dangerous I-65 curve in the hospital district where loads on trucks have been known to shift suddenly and cause accidents. The system broadcasts a warning every 90 seconds to truckers making them aware of the approaching curve.

- Bicycle sharing program
  In collaboration with Humana and a private vendor, LMG is implementing a pilot system for the installation of two dozen bicycle sharing kiosks in downtown Louisville.
- In 1995, the governor chose to opt-in to reduce emissions of pollutants from gasoline by requiring Louisville MSA refueling stations to dispense reformulated gasoline (RFG) during the summer. Although the greatest emissions reduction is in carbon monoxide (~16%), RFG also reduces ozone precursor emissions of NOx (~6.4%) and VOCs (~10%).
- Louisville Regional Airport Authority (LRAA)

  - LRAA is developing flight procedures, RNAV, to reduce noise and air pollution emissions. RNAV is a method of instrument flight rules navigation that allows an aircraft to choose any course within a network of navigation beacons, rather than navigating directly to and from the beacons. This can conserve flight distance, reduce congestion, and allow flights into airports without beacons. Area navigation used to be called "random navigation", thus the acronym RNAV.
  - LRAA encourages the use of single engine aircraft taxi procedures to reduce emissions and noise and has installed a new fuel tank so that vehicles can now use bio-diesel fuel.
  - All of the jet bridges are being installed with pre-conditioned air/400Hz power which is the type of electric power that is the standard of the commercial aircraft and aerospace industry because of its light weight, its high power, and its proven reliability. The 400HZ power produced by the alternators on each engine powers the overhead lights and air conditioning, heats food, moves the landing gear up and down, rolls the wing flaps in and out, flushes the toilets, powers the radar, TV screens, radios, etc., etc. It is the primary power on all commercial and military aircraft.
  - To reduce vehicle miles traveled, airport staff communicates through conference calls and uses web-based conferences whenever possible.

- SmartWay Partners
  Jefferson County is the home to five SmartWay partners: 2 shippers - Brown-Forman Corporation and GE Appliances; 2 truck carriers - Mercer Transportation Company and Product Distribution Company; and Total Services, Inc. which is a logistics company. (See UPS below)
- United Parcel Service Inc. (UPS)
  Worldport in Louisville is the largest fully automated package handling facility in the world. The operation currently turns over 130 aircraft daily, processing an average of 1.6 million packages a day with a record 4.2 million packages processed on peak day 2012. UPS has been investing in more efficient technologies for more than 80 years and leads the industry in fuel and energy conservation and in October of 2008 it became the first shipping company to join the EPA's Climate Leaders program.
  - UPS operates the largest private fleet of alternative fuel vehicles in the transportation industry including hybrid electric (HEV, compressed natural gas (CNG) vehicles, use of a biodiesel blend, and has heavy tractor trucks equipped to run on liquefied natural gas (LNG).

- It has optimized its delivery routes using technology to minimize left-hand turns and minimized fuel use in airline operations by reducing the number of engines used during taxiing.
- UPS has deployed a new flight planning system to calculate the most efficient routes based on weather, terrain, winds and other factors.
- It has been a long-time partner of many voluntary programs sponsored by EPA. These include a charter partner of the SmartWay Transport Partnership program, the Green Power Partnership, Waste Wise, and the Energy Star program. UPS has received the EPA's SmartWay Environmental Excellence Award for its leadership in conserving energy and lowering greenhouse gas emissions and in 2010 Louisville hub representatives received the Industry Leadership Award from the Southeast Diesel Collaborative. Learn more at www.sustainability.ups.com.

Energy Efficiency/Renewable Energy

- Union Station energy efficiency project by TARC has begun restoring windows, doors, roofing and HVAC systems. When complete, annual reduction of almost 800,000 kWh and 1.5 million pounds of GHG's per year.
- Louisville Energy Alliance
  The Louisville Energy Alliance is a 501c3 nonprofit corporation promoting energy efficiency through Energy Star in commercial buildings in Louisville. This public-private partnership assists commercial building owners and managers by providing important resources in energy efficiency through three primary initiatives.
  - The Kilowatt Crackdown - This annual competition between building owners and operators promotes energy efficiency awareness and rewards businesses with the most efficient buildings and businesses with the greatest energy improvements. To encourage more energy efficiency the Mayor issued a challenge to commercial real estate and building managers at the annual Kilowatt Crackdown Awards luncheon in April 2013; add 25 new Energy Star certified buildings be the end of this year. LMG will do its part by pursuing certification for 3 to 5 buildings.
  - Annual Commercial Energy Efficiency Expo - The Expo helps businesses learn more about the practices and products that are available to improve energy efficiency.
  - Partnership with ENERGY STAR to provide an abundance of tools and information to help businesses drive down their energy usage with ENERGY STAR's Portfolio Manager Tool.

  Over the past two years 35 Louisville buildings have earned the federal government's ENERGY STAR efficiency rating, saving the businesses millions of dollars in energy expenses.
- JCPS had all 155 schools entered in Kilowatt Crackdown and has nine Energy Star® school buildings. It has also begun installing LED lights at some of its facilities.
- PGC Energy Efficiency/Renewable Energy projects
  - After nearly five years of participating in energy savings performance contracts (ESPC) and as of 2011 PGC entities have saved 29,759,726 kilowatt hours and $3,596,797. With a guaranteed payback of $3,571,455, the ESPC's have been very successful with daily savings of well over $10,000 and 23% less energy use. Last year, all of the partners also conducted Vampire Load awareness campaigns.

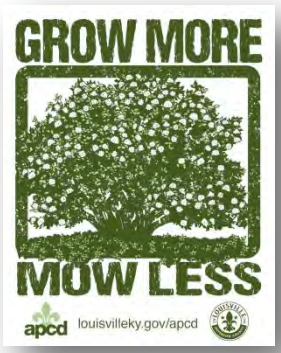
- UofL and JCTC constructed 2 new and renovated buildings meeting LEED Certification standards. Nine Energy Star school buildings and one government building, a new library, have been constructed over the last few years.
- There have been numerous alternative energy installations among the partners. LMG has installed solar photovoltaic (PV) panels on three rooftops. In 2010, LMAPCD installed PV panels that provide approximately 30% of the energy use at its NCore monitoring site. Other installations include geothermal heating and cooling systems and solar thermal panels that heat water. As an example, JCPS has installed four solar hot water heating systems and one windmill among their schools and facilities and are in the planning stages of adding a solar PV to an elementary school.

- Twenty-eight solar and recycling compactors were installed in Louisville's downtown to reduce labor and fuel costs, and therefore emissions.
- LG&E Energy Efficiency/Demand Side Management projects
  LG&E has numerous energy efficiency programs for residential and commercial customers. Four programs will continue through 2014: residential high efficiency lighting, energy saving new homes, dealer referral network, and customer education and public information. Residential programs that have been authorized to continue until 2017 include: demand conservation of peak energy use from a home's central air conditioning system, heat pump, electric water heater and/or pool pump on summer days, online and on-site home energy analysis programs, refrigerator or freezer recycling program, rebates on ENERGY STAR®-qualified appliances, and air conditioner testing and tune-up. Commercial customers may request an on-site inspection of their facilities and an energy specialist will help them find ways to save energy and improve the operating costs of their business. To encourage energy-saving improvements at those facilities and to upgrade certain equipment, commercial customers can participate in the Commercial Rebate Program. Rebates help fund purchases of lighting, air conditioning, refrigeration, etc. Finally, the WeCare Program provides customers who meet certain annual or monthly income guidelines measures to help better manage their energy usage and improve the comfort and safety of their homes. The program offers an on-site home energy analysis, educational materials and home weatherization services. Depending on the customer's needs, they can receive various energy-saving measures, such as insulation, thermostats, appliances and other products.

- LRAA has implemented a number of energy efficiency projects. It has incorporated overhead sky-lighting to increase natural daylight and reduce heating costs in the winter. The airport has installed LED lights on airfield taxiways and is currently installing LED runway signage.
- LMG and the Kentucky Transportation Cabinet converted 637 traffic signals from incandescent bulbs to energy efficient LEDs light-emitting diodes) in 2005. The installation of approximately 20,000 LEDs in traffic signals and 9,000 in pedestrian signals and school flashers has reduced energy consumption by 80%. This is the equivalence of planting 10,000 trees or taking 1000 cars annually off of roads.

Land Use

- Grow More/Mow Less (GMML)
  GMML is an outreach and education program promoting pollution reduction by replacing turf grass with something that doesn't need mowing. Low-mow landscaping saves time and money, and makes the air cleaner all at the same time. Simple



guides provide options of substituting trees, shrubs, flowers, groundcover, edible plants, and low-mow grasses for standard turf grass. GMML has begun a pilot project on LMG's Urban Government Property and is anticipated to be complete by the fall of 2013. Located near downtown and on a high traffic neighborhood street, the installation will include signage explaining the many benefits of reducing turf grass with native plantings; most notably, the reduction in air emissions from gasoline-powered equipment. GMML has also partnered with local retailers to offer discounts on plants that displace turf grass and is seeking to further establish educational partnerships with the Jefferson County Cooperative Extension Office and Bernheim Arboretum and Research Forest. The GMML Facebook page encourages homeowners and businesses to adopt lawn-care methods that use fewer natural resources and require less maintenance, thereby reducing the property's carbon footprint.

- Louisville Metro Tree Advisory Commission

Formed by mayoral executive order in February 2012, citizens, a Metro Council member and LMG employees collaborate to develop policies to better care for existing trees and plant new ones. The Commission advises city officials on the state of Louisville's urban forest, promotes the value of trees and advocates for the ongoing renewal of the tree canopy. As of May 2013, 285 trees had been planted since November 2012. An example of a project undertaken by the Commission was to plant 100 trees at the urban campus of the Center for African American Heritage. That project will be complete by late fall. Anticipated in the city's upcoming fiscal year budget is the Mayor's commitment to include a new urban forester position, provide seed money for an urban tree canopy assessment, and also provide $100,000 for planting trees.

- Louisville's Urban Heat Island

  A project proposal to address Louisville's serious urban heat island (UHI) problem was submitted to the Funder's Network for Smart Growth and Livable Communities and the Urban Sustainability Directors Network's Local Sustainability Matching Fund in May, 2013. The project proposes to engage a distinguished researcher of the drivers of urban heat and its impacts to develop a comprehensive urban heat island assessment for Louisville and to use that information to develop an urban heat mitigation plan. Those elements will help build a robust community engagement program with elements targeted specifically to stakeholders in areas feeling the greatest urban heat impact and to undertake strategic project implementation in order to maximize our resources. There is a need to understand the local causes of this effect, which can accelerate ozone formation, to effectively undertake strategies to mitigate these drivers. Furthermore, there is a need to engage the community in implementing solutions and to instill UHI considerations into both the public and private sectors' building and development decision-making process. The project will establish Louisville's baseline and a metric to quantify project progress and success. It will also guide the city's policy decisions and resource allocation, and provide a focus to build community partnerships.

- SoBro EcoDistrict

  This plan addresses the unique conditions of the south of Broadway – SoBro - neighborhood. It area consists of the central business district and transitions into an area known as Old Louisville. The comprehensive plan provides guidelines and code standards for future development to economically and socially revitalize the SoBro neighborhood. The recommendations encourage mixed-use and compact development, incorporate resource conservation and landscape design, and support alternative transportation methods, making the area more sustainable,

comfortable, and safe for residents and businesses to thrive. The SoBro neighborhood is also the subject of a concerted effort between the city and several area stakeholders to install greener infrastructure and to identify other strategies that would create a replicable "eco-district." This includes reducing storm water run-off, reducing the urban heat island effect, increasing alternative transportation options, and addressing other sustainability measures.

- The central business district tree replacement program began December 11, 2012 and by the end of the month, 166 trees were planted. This is part of an overall goal to reduce the city's urban heat island and increase its declining urban tree canopy.
- There are 25 buildings certified by the U.S. Green Building Council for Leadership in Energy and Environmental Design (LEED). Thirty-one other buildings are in the process of gaining certification. LMG intends to continue that trend and gain LEED certification on any new capital projects.
- Green Roof Installations
  - Completed in 2011, the Romano Mazolli Federal Building in downtown Louisville is the home for 27,000 square feet of vegetation on its lower level rooftops like that shown on the right. MSD joined the Mazzoli Federal building in an effort to keep on the path to going green, investing $250,000 in enhancements to an existing parking lot to allow storm water to infiltrate directly into the ground rather than in the combined sewer system.

  - The University of Louisville has installed vegetated plantings on its Equine Center College of Business and the Nucleus Research and Innovation Park buildings.
  - Louisville Metro Government began installing cool/green roofs in several buildings over the past few years. Louisville Metro Housing Authority's green roof, for example, is expected to generate an energy savings of 26% heat loss reduction, 95% heat gain reduction, and a potential of 76% HVAC (in summer months). Installed in 2008, Metro Development Authority's roof on 444 South Fifth Street is planted with sedum. Four planters contain green hawthorn trees surrounded by prairie dropseed grass. In 2009 the Louisville Zoo received funding to install a green roof and plant two trellis walls, i.e. living walls. The Zoo also installed an interpretive educational display explaining the advances of green roofs: energy demand reductions of 50%; reduce storm water runoff by 60-70%; offer thermal and sound insulation; create an added animal habitat and increase the Zoo's aesthetics. Finally, during replacement cycles, other buildings have had Energy Star® white solar reflective roofs installed.
  - A number of private companies have also added vegetated installations to their rooftops: the America Life & Accident Insurance Building, the Green Building, and the Kentucky Center for the Performing Arts.

V. Status of Current Local Mandatory Control Measures

As part of its Section 103 & 105 grant commitments, LMAPCD's Air Monitoring section in collaboration with IDEM meteorologists prepare $PM_{2.5}$ forecasts year-round and 8-hour ozone during Kentucky's ozone season. If an Air Quality Alert is forecasted, KAIRE staff informs the public and local media with information about the alert. It also advises people on how to reduce their exposure to pollution as well as tips to reduce the pollution they generate from their daily activities.

As part of a consent decree, the Kentucky Utilities Company is providing funds to Louisville Metro Government for the purchase of an all-electric vehicle. That car, Ford's Focus Electric, is one of the most fuel-efficient vehicles on the road with a combine EPA-estimated rating of 105 miles per gallon equivalent (MPGe). Because of a lengthy and excellent working relationship with LMG's Fleet Services, LMAPCD will be the recipient of the Focus this summer. Additionally, LMAPCD is evaluating whether a solar photovoltaic installation would be possible as a renewable energy source at its building.

As the Louisville area has had a difficult time in meeting the 8-hour ozone NAAQS, LMAPCD has taken great strides in permitting and rulemaking to reduce the precursor emissions, VOCs and NOx. It is a delegated authority to enforce the Clean Air Act (CAA) and local air pollution emissions have been reduced by adding business specific pollution control conditions in operating and construction permits. LMAPCD permits approximately 775 companies, 35 of which are Title V and 148 are FEDOOPs. This number does not include gasoline dispensing Stage I and Stage II facilities.

In addition to federal control measures, the CAA also requires states to develop a SIP describing how it will attain and maintain the NAAQS. As the only local air pollution control agency in Kentucky, LMAPCD submits its regulations, permits, and Board Orders that control pollutants to Kentucky DAQ for inclusion in Kentucky's SIP.

Below are three lists of LMAPCD's regulations. List A contains those regulations in the Jefferson County portion of the SIP that address NOx and/or VOCs. List B contains SIP regulations that do not directly relate to ozone precursors. Finally, List C contains local non-SIP regulations that may address NOx and/or VOCs.

A. List of approved LMAPCD regulations in the Kentucky State Implementation Plan* that address NOx and/or VOCs

1.05 Compliance with Emission Standards and Maintenance Requirements
1.10 Circumvention
1.11 Control of Open Burning
2.02 Air Pollution Regulation Requirements and Exemptions
2.03 Permit Requirements - Non-Title V Construction and Operating Permits and Demolition/Renovation Permits
2.04 Construction or Modification of Major Sources In or Impacting Upon Non-Attainment Areas (Emission Offset Requirements)
2.05 Prevention of Significant Deterioration of Air Quality
6.07 Standards of Performance for Existing Indirect Heat Exchangers
6.08 Standard of Performance for Existing Incinerators
6.09 Standards of Performance for Existing Process Operations

6.10 Standard of Performance for Existing Process Gas Streams
6.12 Standard of Performance for Existing Asphalt Paving Operations
6.13 Standard of Performance for Existing Storage Vessels for Volatile Organic Compounds
6.14 Standard of Performance for Selected Existing Petroleum Refining Processes and Equipment
6.15 Standards of Performance for Gasoline Transfer to Existing Service Station Storage Tanks (Stage I Vapor Recovery)
6.16 Standard of Performance for Existing Large Appliance Surface Coating Operations
6.17 Standard of Performance for Existing Automobile and Truck Surface Coating Operations
6.18 Standards of Performance for Solvent Metal Cleaning Equipment
6.19 Standard of Performance for Existing Metal Furniture Surface Coating Operations
6.20 Standard of Performance for Existing Bulk Gasoline Plants
6.21 Standard of Performance for Existing Gasoline Loading Facilities At Bulk Terminals
6.22 Standard of Performance for Existing Volatile Organic Materials Loading Facilities
6.24 Standard of Performance for Existing Sources Using Organic Materials
6.26 Standard of Performance for Existing Volatile Organic Compound Water Separators
6.27 Standards of Performance for Existing Liquid Waste Incinerators
6.28 Standard of Performance for Existing Hot Air Aluminum Atomization Processes
6.29 Standard of Performance for Graphic Arts Facilities Using Rotogravure or Flexographic Printing
6.30 Standard of Performance for Existing Factory Surface Coating Operations of Flat Wood Paneling
6.31 Standard of Performance for Existing Miscellaneous Metal Parts and Products Surface Coating Operations
6.32 Standard of Performance for Leaks from Existing Petroleum Refinery Equipment
6.33 Standard of Performance for Existing Synthesized Pharmaceutical Product Manufacturing Operations
6.34 Standard of Performance for Existing Pneumatic Rubber Tire Manufacturing Plants
6.35 Standard of Performance for Existing Fabric, Vinyl, and Paper Surface Coating Operations
6.38 Standard of Performance for Existing Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industries
6.39 Standard of Performance for Equipment Leaks of Volatile Organic Compounds in Existing Synthetic Organic Chemical and Polymer Manufacturing Plants
6.40 Standard of Performance for Gasoline Transfer to Motor Vehicles (Stage II Vapor Recovery and Control)
6.42 Reasonably Available Control Technology Requirements for Major Volatile Organic Compound- and Nitrogen Oxides-Emitting Facilities
6.43 Volatile Organic Compound Emission Reduction Requirements
6.44 Standards of Performance for Existing Commercial Motor Vehicle and Mobile Equipment Refinishing Operations
6.45 Standards of Performance for Existing Solid Waste Landfills
6.46 Standards of Performance for Existing Ferroalloy and Calcium Carbide Production Facilities
6.48 Standard of Performance for Existing Bakery Oven Operations
6.49 Standards of Performance for Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry
6.50 NOx Requirements for Portland Cement Kilns
7.06 Standards of Performance for New Indirect Heat Exchangers
7.07 Standard of Performance for New Incinerators
7.08 Standards of Performance for New Process Operations
7.09 Standards of Performance for New Process Gas Streams
7.11 Standard of Performance for New Asphalt Paving Operations

7.12 Standard of Performance for New Storage Vessels for Volatile Organic Compounds
7.14 Standard of Performance for Selected New Petroleum Refining Processes and Equipment
7.15 Standards of Performance for Gasoline Transfer to New Service Station Storage Tanks (Stage I Vapor Recovery)
7.20 Standard of Performance for New Gasoline Loading Facilities at Bulk Plants
7.22 Standard of Performance for New Volatile Organic Materials Loading Facilities
7.25 Standard of Performance for New Sources Using Volatile Organic Compounds
7.34 Standard of Performance for New Sulfite Pulp Mills
7.35 Standard of Performance for New Ethylene Producing Plants
7.36 Standard of Performance for New Volatile Organic Compound Water Separators
7.51 Standard of Performance for New Liquid Waste Incinerators
7.52 Standard of Performance for New Fabric, Vinyl and Paper Surface Coating Operations
7.55 Standard of Performance for New Insulation of Magnet Wire
7.56 Standard of Performance for Leaks from New Petroleum Refinery Equipment
7.58 Standard of Performance for New Factory Surface Coating Operations of Flat Wood Paneling
7.59 Standard of Performance for New Miscellaneous Metal Parts and Products Surface Coating Operations
7.60 Standard of Performance for New Synthesized Pharmaceutical Product Manufacturing Operations
7.77 Standards of Performance for New Municipal Solid Waste Incinerators
7.79 Standards of Performance for New Blast Furnace Casthouses
7.81 Standards of Performance for New Commercial Motor Vehicle and Mobile Equipment Refinishing Operations

*This list reflects current versions of LMAPCD regulations. A number of them await EPA Region IV's approval into the SIP.

B. List of approved LMAPCD regulations in the Kentucky State Implementation Plan* that do not address ozone directly

1.01 General Application of Regulations and Standards
1.02 Definitions
1.03 Abbreviations and Acronyms
1.04 Performance Tests
1.06 Source Self-Monitoring, Emissions Inventory Development and Reporting
1.07 Excess Emissions During Startups, Shutdowns, and Upset Conditions
1.08 Administrative Procedures
1.09 Prohibition of Air Pollution
1.14 Control of Fugitive Particulate Emissions
1.18 Rule Effectiveness
1.19 Administrative Hearings
2.01 General Application
2.06 Permit Requirements - Other Sources
2.07 Public Notification for Title V, PSD, and Offset Permits; SIP Revisions; and Use of Emission Reduction Credits
2.09 Causes for Permit Modification, Revocation, or Suspension
2.10 Stack Height Considerations
2.11 Air Quality Model Usage
2.17 Federally Enforceable District Origin Operating Permits
3.01 Ambient Air Quality Standards

4.01 General Provisions for Emergency Episodes
4.02 Episode Criteria
4.03 General Abatement Requirements
4.04 Particulate and Sulfur Dioxide Reduction Requirements
4.05 Hydrocarbon and Nitrogen Oxides Reduction Requirements
4.06 Carbon Monoxide Reduction Requirements
4.07 Episode Reporting Requirements
6.01 General Provisions
6.02 Emission Monitoring for Existing Sources
7.01 General Provisions
*This list reflects current versions of LMAPCD regulations. A number of them await EPA Region IV's approval into the SIP.

C. List of approved LMAPCD Regulations not in the Kentucky State Implementation Plan that may address VOCs and/or NOx

1.12 Control of Nuisances
1.13 Control of Objectionable Odors in the Ambient Air
1.15 Version of Federal Regulations Incorporated by Reference
1.17 Air Quality Trust Fund
1.20 Upset Condition Prevention Programs
2.08 Fees
2.12 Emissions Trading (Including Banking and Bubble Rules)
2.16 Title V Operating Permits
5.00 Definitions
5.01 General Provisions
5.02 Adoption and Incorporation by Reference of National Emission Standards for Hazardous Air Pollutants
5.04 Adoption of Federal Emission Standard for Asbestos
5.11 Standards of Performance for Existing Sources Emitting Toxic Air Pollutants
5.13 Additional Control Standards for Asbestos Removal
5.14 Hazardous Air Pollutants and Source Categories
5.15 Chemical Accident Prevention Provisions
5.16 Control Technology Requirements for New and Reconstructed Major Stationary Sources of Hazardous Air Pollutants
5.20 Methodology for Determining Benchmark Ambient Concentration of a Toxic Air Contaminant
5.21 Environmental Acceptability for Toxic Air Contaminants
5.22 Procedures for Determining the Maximum Ambient Concentration of a Toxic Air Contaminant
5.23 Categories of Toxic Air Contaminants
5.30 Report and Plan of Action for Identified Source Sectors
6.11 Standards of Performance for Existing Iron and Steel Plants
6.41 Standards of Performance for Existing Medical Waste Incinerators
6.47 Federal Acid Rain Program Incorporated by Reference
6.52 Standards of Performance for Solvent Cleaning Operations Associated with Commercial Surface Coating and Printing Processes
7.78 Standards of Performance for New Medical Waste Incinerators
KAR 63:022, New or modified sources emitting toxic air pollutants. This Kentucky regulation is no longer in effect, but through incorporation by reference in Regulation 5.12, the requirements of the regulation are applicable to Jefferson County.

In addition to the regulations listed above, a number of companies have been required to provide LMAPCD with NOx RACT (Reasonably Available Control Technology) plans that have been included in the Kentucky SIP. Table 6 contains eleven SIP approved NOx RACT plans.

Table 6
Jefferson County, Kentucky SIP-Approved Facility NOx RACT Plans

American Synthetic Rubber Company	E.I. du Pont de Nemours	LG&E Cane Run	ReCast (in the SIP as Oxy Vinyls)
CEMEX Kosmos Cement Plant	Ford Louisville Assembly Plant (LAP)	LG&E Mill Creek	Texas Gas
Dow (in the SIP as Rohm and Haas)	General Electric	Louisville Medical Center	

Additional NOx controls at CEMEX Kosmos Louisville Cement Plan are achieved by their standardized operating parameters. LMAPCD also has four SIP-approved source specific bubbles to control VOCs. Two companies can now meet the standards and no longer need special provisions. These have been submitted to EPA requesting removal from the SIP: General Electric with one bubble and two for Alcan Foil Products/Reynolds Metal. Only one facility remains in need of its source specific controls and that is Momentive, known as Borden in the SIP.

Further controls were implemented during a construction permitting process when in 2010 the University of Louisville Belknap's Campus agreed to stop burning coal as a fuel by December 31, 2015. They have already converted the facility to natural gas boilers with low NOx burners and have stopped burning coal. UofL, however, is still permitted to burn coal through December 2015 as needed. In 2008, the plant emitted 28.74 tpy of NOx, in 2009 – 28.09 tpy, in 2010 – 22.69 tpy, in 2011 – 8.47 tpy and in 2012 – 7.19 tpy. This is approximately a 67% reduction from the Belknap Campus and a 0.18% decrease county-wide.

VI. LISTING OF POTENTIAL VOLUNTARY CONTROL MEASURES

As mentioned in the Section I *Introduction,* LMAPCD staff has performed a thorough analysis of voluntary control strategies addressing reductions of ozone precursors. Although LMAPCD is actively involved in many voluntary initiatives as listed in Section IV *Local Voluntary Control Measures,* continues to evaluate programs and seek funding for many more pollution reduction and prevention projects. Those under development and/or evaluation are discussed below. Relevant stakeholder processes and public outreach will continue to be conducted as appropriate.

Reduced Energy Use

- Mitigate urban heat island (UHI) effect of dark paved surfaces in local UHI "hot spot(s)" (emission reductions from energy use reduction for surrounding buildings as well as from reduced evaporative emissions from vehicles) – Parking lot rehabs with cooler paving and increased shade tree coverage. Increase street tree coverage and longevity through proper planting and site preparation.
- Mitigate UHI effect of dark roof tops in local UHI "hot spot(s)" (emission reductions from energy use reduction in the building re-roofed) – Create demonstration projects for cool and/or green roof technologies. An alternative, larger project option would be to fund a cool/green roof rebate program to increase the numbers of cool/green roofs in the urban core (priority given to UHI "hotspots").
- Fund a low-income cool roof/attic insulation grant program (emission reductions from energy use reduction in the home being re-roofed and insulated) – This program would also have social and UHI benefits in addition to the energy use reductions for the home occupant.

Reduced Gasoline- and Diesel-Powered Lawn and Landscaping Equipment Use

- "Adopt" a school or schools (or other not-for-profit institution) and overhaul the grounds with emission reduction strategies including, converting un-used turf grass (i.e., not the sports fields or other areas where the grass is used by the school) to native, low-maintenance landscaping and shade trees that will cool the building and parking lot; replacing equipment with electric or alternative fueled options; and training staff on long-term upkeep of native plants and proper tree care. This project could be further combined with ideas from the energy use reduction strategies above as well, such as green or cool roof projects or parking lot rehabs to create larger cool and sustainable school demonstration projects.

Other Mobile Sources

- Fund idle reduction technology demonstrations for Louisville Metro Police Department (LMPD) fleet vehicles. There are a range of idle reduction technologies on the market that cater to police vehicle use and needs; however, we have not seen enough in-use data from other fleets to justify recommending widespread adoption in our local first responder fleets. The equipment ranges in price from a few hundred dollars apiece to a few thousand, with larger emission reductions possible from the higher price range. A demonstration and data-gathering pilot project to assess the viability of this technology and lack of disruption to operational needs could lead to the opportunity for widespread installation and a major reduction in the amount necessary vehicle idling that is inherent in this type of fleet's work.

- Fund an idle reduction technology grant program for local refrigerated delivery fleets. Like first responder fleets, refrigerated delivery trucks are another area of the on-road fleet that must idle in order to perform their work. The installation of auxiliary power unit (APU) devices allows these trucks to operate without idling the main engine, reducing emissions from this activity (these are largely diesel engines).
- Fund the conversion or replacement of some LMG fleet trucks to/with CNG-powered trucks. This would also require working with LMG to establish adequate refueling opportunities.

Renewable Energy Use that Offsets Fossil Fuel Generated Production

- Fund grants or rebates for solar hot-water heating installations at a commercial or residential level. The US Department of Energy provides information on what to consider and how to calculate savings through application of this technology, which makes good use of available solar resources with a reasonable return on investment. Solar hot water incentive programs have been offered throughout the country, from the southwest to the northeast, showing a wide-range of geographic feasibility and interest.
- Seek grant funds to promote and install solar panels on fleet vehicles to power, for example, in cab no-idle or lift gate power generation and storage, or for safety lighting power in emergency vehicles. Installations will reduce fuel consumption, reduce maintenance costs and reduce polluting emissions.

VII. LISTING OF POTENTIAL MANDATORY CONTROL MEASURES

As discussed in the Section I *Introduction,* LMAPCD staff has performed a thorough analysis of mandatory control strategies that address reductions of ozone precursors. Using EPA's guidance document and the resource materials on its Ozone Advance website, and after identifying options implemented by other state and local air pollution control agencies, the analysis identified very few mandatory control measures not already regulated by federal, state or local laws and regulations. What follows is a discussion of staff findings.

Two new regulations are under review at LMAPCD: 1) Idling Reduction and 2) Standards of Performance for Offset Lithography Printing Operations. Also under consideration is adding VOC leak detection capabilities to the inspection and compliance program to identify leaks and fugitive emissions at some of Louisville's larger stationary sources. Relevant stakeholder processes and public outreach will be conducted as appropriate.

Idling Reduction

In 2008 LMAPCD convened an Idling Reduction Working Group (IRWG) in response to recommendations by previous stakeholder processes to pursue a vehicle idling restriction to reduce emissions of toxic pollutants, fine particles, and ozone precursors and improve public health. Participants in the work group included stakeholders representing a diversity of interests, including owners of motor vehicle fleets and nonroad fleets, owners of businesses with drive-through service windows, environmental and community health advocates, Metro police, and emergency services workers. The IRWG looked at some of the ways that more than 100 other state and local jurisdictions (including over 70 cities) around the country have restricted idling. The group considered and provided input on scope, exemptions, enforcement, outreach, education, and compliance assistance of a possible ordinance. With that information, a draft ordinance was crafted and introduced to the Louisville Metro Council which recommended that an education and outreach campaign be conducted before they would consider adopting an idling ordinance.

As previously mentioned in the Mobile Source subsection in Section IV *Local Voluntary Control Measures,* the Idle Free campaign has been very successful since its development and launch in late 2009. Building on that success and with support from the public LMAPCD, will reengage the IRWG stakeholders and reexamine idling reduction options for Louisville later this year.

Standards of Performance for Offset Lithography Printing Operations

Currently, LMAPCD does not have an established standard for lithography printing. It addresses pollution controls for each application permit as it is received from a company. A regulation is under consideration for implementation resulting in emissions from lithography printing will be standardized.

VOC Leak Detection Capability

Under consideration is the purchase of one or more thermal imaging cameras to be used for visual observation of fugitive-equipment leaks at Louisville's facilities. An infrared camera is able to visualize fugitive leaks by using the physics of gaseous compounds. The camera produces a full picture of the scanned area on the camera's viewfinder or screen, allowing the user to see the emissions as plumes

and identify the exact location of a leak viewed in real-time or recorded for archiving. Depending on a camera's resolution detection of small leaks can be seen from several meters away and large leaks from several hundred meters. The cameras are suitable for use in industrial applications such as chemical facilities, and production, storage, transportation, and distribution operations.

Some examples of the operations where the cameras have uncovered issues in other areas include leaks from moving transport vehicles and observing emissions from point sources (e.g., process vents, stacks, storage tanks, flares). LMAPCD currently does not have the capacity to provide this level of oversight for the sources under its jurisdiction. With the correct infrared camera, LMAPCD would able to record videos from inspections, sometimes even from public access property. This video may then be provided to the facility with the burden of demonstrating that the video does not provide evidence of potential Leak Detection and Repair (LDAR) violations or stack emission limit violations. If the video shows emissions but the source isn't clear, APCD could enter the source property to determine the exact location of emissions to determine the application standards (numerical, operational, control) to assist in compliance of the standards.

VIII. PATH FORWARD IMPLEMENTATION PLAN

The EPA's Ozone Advance program is intended to (1) reduce air pollution, (2) ensure continued healthy air quality levels, (3) avoid violations of the NAAQs that could potentially lead to a nonattainment designation and associated requirements, and (4) increase public awareness about ground level ozone as an air pollutant.[1] In support of these goals, LMAPCD is proposing the following measures as part of its commitment to proactively address ozone precursors.

LG&E Cane Run Station Emission Reductions *2012 – 2016*

As discussed in Section II. *Sources of Ozone Precursors*, LG&E's Cane Run Station is subject to the MATS and Boiler MACT regulations. To comply, LG&E has been authorized by LMAPCD and the Kentucky Public Service Commission (PSC) to convert the current coal-fired power plant to natural gas. Once constructed, the new power plant will have a rated capacity of 731 MW and consist of two natural gas-fired combustion turbines (F Class) and one steam turbine generator. Each combustion turbine will be equipped with a heat recovery steam generator (HRSG), a duct burner and a catalytic oxidizer. As more fully explained in Appendix A, a total net decrease of 4,823.2 tpy of NOx and reduction of 52 tpy of VOCs (<1% county-wide total) is expected after the new power plant comes on line in late 2015.

Improved Combustion Control Strategies *2013 - 2018*

LMAPCD will begin reviewing strategies for improving combustion controls, including, but not limited to requiring NOx controls in series on sources emitting over 1,000 tpy of NOx, consistent with its authority under KRS 224.20-130(2) and considering cost of controls, useful life of the facilities, location or process design, physical site limitations, and other factors.

If a successful control strategy is identified, LMAPCD may convene a stakeholder group prior to proposing a new or revised regulation to implement the strategy. In the event a stakeholder group is not convened, the public, including any affected source, will have an opportunity to comment during an informal comment period, at a meeting of the appropriate committee of the Air Pollution Control Board, during the 30-day public comment period, and at a public hearing prior to consideration by the full Air Pollution Control Board.

Kosmos Cement Tire-derived Fuel (TDF) Use Expansion Project *2013-2015*

After LMAPCD authorized the use of TDF, Kosmos Cement began using it as replacement for fuel stock at its Jefferson County facility in December 2010. TDF may be substituted for up to 25% of kiln fuel. Since that time the company has used over two million whole tires, replacing more than 25,000 tons of fossil fuels. The company has proposed modifying its Title V permit to increase the use TDF by 50%. Based on current data, the use of TDF appears related to lower NOx emissions, which have decreased by 30% over prior years when TDF was not in use (see Table 7). Because TDF has a higher BTU/pound than coal, it is anticipated that emissions will continue to decrease as the company increases its use of TDF. LMAPCD is currently evaluating Kosmos' proposal in

[1] EPA Ozone Advance Guidance, p. 2, available at http://www.epa.gov/ozoneadvance/pdfs/2012404guidance.pdf.

light of the NOx reducing capability and multi-pollutant co-benefit of TDF and other approved non-coal fuels.

Table 7
CEMEX Kosmos Cement Company NOx Emissions Trends for 2006-2012

Year	NOx Emissions (tons/year)	Kiln Operations (hours/year)	NOx Emissions (pounds/hour)
2006	2551.28	7922	644.10
2007	2487.6	7648	650.52
2008	2453	7794	629.46
2009	1353.5	4310	628.07
2010*	2031.74	7421	547.57
2011	1097.04	5782	379.47
2012	1471†	7114	413.55

* TDF usage began in December 2010. Therefore, this total includes approximately one month of TDF usage.
† Company reported, not QA'd

Onroad and Nonroad Mobile Emission Source Reductions *2013 – 2018*

LMAPCD anticipates significant emission reductions from emission standards adopted by the EPA for all types of nonroad engines, equipment, and vehicles, and refining requirements that apply to gasoline and diesel fuel.

Although LMAPCD does not have jurisdiction over onroad or nonroad mobile emission sources, it has been actively promoting voluntary emission reduction measures with a number of partners over the last decade. LMAPCD will continue to implement these measures, which are listed in Section IV. Local Voluntary Control Measures, in conjunction with KAIRE, TARC, JCPS, KCFC, and other stakeholders.

LMAPCD does not have jurisdiction over nonroad and onroad but has been very active for more than a decade in promoting voluntary measures with a number of partners to reduce mobile source emissions. It commits to continue those emission reduction strategies that are in the Local Voluntary Control Measures, Section IV.

Stage II Vapor Recovery and Control Systems *2013 - 2017*

On May 16, 2012, the U.S. Environmental Protection Agency (EPA) determined that onboard vapor recovery (ORVR) technology is in widespread use throughout the motor vehicle fleet for purposes of controlling motor vehicle refueling emissions, thereby waiving the requirement for states and local areas to implement Stage II gasoline vapor recovery and control (Stage II) systems at gasoline dispensing facilities in certain nonattainment areas.

LMAPCD is currently reviewing District Regulation 6.40, *Standards of Performance for Gasoline Transfer to Motor Vehicle (Stage II Vapor Recovery and Control Systems)*, to determine the phase out the requirements for installing and maintaining Stage II systems at gasoline dispensing facilities consistent

with section 110(l) of the Clean Air Act. Based on a preliminary analysis using the EPA's *Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures*, LMAPCD has determined that all Stage II systems must be decommissioned by January 1, 2017, to avoid increases in VOC emissions resulting from incompatibility between the Stage II and ORVR systems.[2]

LMAPCD intends to convene a stakeholder group in August 2013 to consider best decommissioning practices. Rulemaking, following informal consultation with EPA, is expected to begin in late fall 2013. The public, including any affected source, will have an opportunity to comment during an informal comment period, at a meeting of the appropriate committee of the Air Pollution Control Board, during the 30-day public comment period, and at a public hearing prior to consideration by the full Air Pollution Control Board.

Offset Lithographic Printing Operations *2013 - 2016*

LMAPCD will begin evaluating Regulation 6.55, *Standards of Performance for Offset Lithographic Printing Operations,* which was informally proposed as a new regulation in June 2008, to determine the feasibility of controls and emission limits for certain printing operations, consistent with its authority under KRS 224.20-130(2) and the EPA's 2006 Control Techniques Guideline (CTG).

LMAPCD will convene a stakeholder group prior to undertaking rulemaking. The public, including any affected source, will have an opportunity to comment during an informal comment period, at a meeting of the appropriate committee of the Air Pollution Control Board, during the 30-day public comment period, and at a public hearing prior to consideration by the full Air Pollution Control Board.

Idling Reduction Strategy *2013 - 2018*

Since 2003, LMAPCD has worked with three stakeholder groups that recommended idling reductions as an effective strategy to reduce air pollution from ozone, fine particulates, and toxics. See Appendix D for stakeholder recommendations. In response, LMAPCD formed the Idling Reduction Working Group (IRWG) to help examine issues associated with a restriction to reduce idling.

In 2008, the IRWG recommended that the District propose a regulation or ordinance prohibiting the idling of motor vehicles and nonroad equipment. At the request of the Louisville Metro Council, LMAPCD began an anti-idling education campaign at that time in lieu of an ordinance. With the success of its educational campaign, LMAPCD is evaluating an idling regulation that will prohibit the idling of motor vehicles and nonroad equipment, apply to owners and operators. It will not apply to motor vehicles in traffic, includes necessary exemptions, and covers both owners and operators. LMAPCD intends to convene the IRWG to re-evaluate the 2008 recommendations prior to proposing a new regulation. .

Conclusion

Because LMAPCD has implemented nearly all of the feasible ozone precursor voluntary and mandatory control measures, there are only a few options remaining over which it has jurisdiction or can facilitate

[2] U.S. Environmental Protection Agency Office of Air Quality Planning and Standards. (2012). *Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures* (EPA-457/B-12-001).

partnerships. Staff will continue to research and evaluate control measures as they become available in the market place and as funding opportunities arise.

Appendix A

Louisville Gas and Electric's EGU Control Measures

NGCC Project description: One (1) natural gas-fired combined cycle (NGCC) electricity generating unit, designated as unit U15, make and model to be determined (TBD), rated capacity 731 MW, consists of two (2) natural gas-fired combustion turbines (F Class) and one (1) steam turbine generator. Each combustion turbine is equipped with a heat recovery steam generator (HRSG), a duct burner, and a catalytic oxidizer.

Emission Units:

Emission Unit	Emission Points	New or Existing	Description	Estimated Operation Date	Control ID
U15	E31	New	Two (2) natural gas-fired combustion turbine (F Class), designated as GT-7A and GT-7B, equipped with a heat recovery steam generator (HRSG) and a duct burner.	Late 2015 (Application)	C23, C24

Control Devices:

Control ID	New or Existing	Description	Performance Indicator	Stack ID
C23	New	One (1) catalytic oxidizer burning natural gas, make and model TBD, used to control CO and VOC emissions for turbine GT-7A.	See Specific Condition S4.b	S22
C24	New	One (1) catalytic oxidizer burning natural gas, make and model TBD, used to control CO and VOC emissions for turbine GT-7B.	See Specific Condition S4.b	S23

Existing Units to be Shut Down:

Emission Unit	Emission Points	New or Existing	Description	Control ID	Stack ID
U4	E1, E2	Existing	Unit 4 Coal-fired boiler and coal bunker	C1,C2,C7	S1, S4
U5	E3, E4	Existing	Unit 5 Coal-fired boiler and coal bunker	C3,C4,C8	S2, S5
U6	E5, E6	Existing	Unit 6 Coal-fired boiler and coal bunker	C5,C6,C9	S3, S6
U7	E9 - E14, E22 -E24	Existing	Sludge processing plant	C11, C12-16	S9-S14
U8	E16	Existing	Unit 6 SDRS ash storage silo	C18	S16
U10	E18, E20, E21, E25	Existing	Fossil fuel handling process		
U12	E26	Existing	Five Parts washers		
U14	E27-E30	Existing	Four Porta batch lime slurry systems	C19-22	S18-S21

Emission decreases based on:

(PTE for new NGCC) – (Actual emissions for existing EGUs to be removed)

	NO_X	CO	PM	PM10	PM2.5	VOC	CO2e
Emission increase for new NGCC							
PTE for NGCC unit (and associated units)	1,166.2	456.2	275.9	275.3	275.3	81.2	2,601,214
Creditable Emission Decrease							
Removing coal fire boiler U4, U5, U6	-5,989.4	-410.8	-657.0	-460.6	-327.4	-57.0	-3,500,016
New Port-O-Batch unit (U14)			0.13	0.03	0.03		
Emission Decreases after NGCC project							
Emission Decreases (tpy)	(4,823.2)	45.47	(380.9)	(185.3)	(52.0)	24.3	(898,801)

Project description: Modification of the control devices for electric generation units (EGU) U1, U2, U3, and U4, including: four (4) new HAP Particulate Matter control systems for each of the EGUs, one (1) new combined Flue Gas Desulfurization Unit (FGD) for U1 and U2, and two (2) new FGD for U3 and U4.

Control Devices Description:

Control ID	Unit	Description	Estimated Operation Date (per application)	Stack ID
C8	U3	One (1) Flue Gas Desulfurization (FGD) unit for SO_2 control using limestone scrubbing liquor, make & model TBD. This new FGD replaces the existing FGD (C8) for unit U3.	November, 2014	S4
C26	U1, U2	One (1) HAP particulate matter control system, consists of: one (1) powdered activated carbon (PAC) injection system; one (1) hydrated lime injection system; and one (1) pulse-jet fabric filter (PJFF) baghouse used for collecting PM from the boiler and PAC and lime injection system. Make & model TBD.	May, 2015	S33
C27	U1	One (1) combined Flue Gas Desulfurization (FGD) unit for SO_2 control using limestone scrubbing liquor, make & model TBD.	April/May, 2015	S33
C28	U2	One (1) HAP particulate matter control system, consists of: one (1) powdered activated carbon (PAC) injection system; one (1) hydrated lime injection system; and one (1) pulse-jet fabric filter (PJFF) baghouse used for collecting PM from the boiler and PAC and lime injection system. Make & model TBD.	April, 2015	S33
C29	U3	One (1) HAP particulate matter control system, consists of: one (1) powdered activated carbon (PAC) injection system; one (1) hydrated lime injection system; and one (1) pulse-jet fabric filter (PJFF) baghouse used for collecting PM from the boiler and PAC and lime injection system. Make & model TBD.	October, 2015	S4
C30	U4	One (1) HAP particulate matter control system, consists of: one (1) powdered activated carbon (PAC) injection system; one (1) hydrated lime injection system; and one (1) pulse-jet fabric filter (PJFF) baghouse used for collecting PM from the boiler and PAC and lime injection system. Make & model TBD.	November, 2014	S34
C31	U4	One (1) Flue Gas Desulfurization (FGD) unit for SO_2 control using limestone scrubbing liquor, make & model TBD.	November, 2014	S34

Emission decreases based on: (Projected PTE with new control) – (Baseline actual emissions)

	PM	PM10	PM2.5	SO2	Hg	HCl
U1 Boiler						
New Control Description	C26	C26	C26	C27	C26	C26
Estimated operation date	5/2015	5/2015	5/2015	5/2015	5/2015	5/2015
U1 Projected PTE with new control	405.4	287.8	206.7	2702.5	0.016	27.0
U1 Baseline (07-09 actual emissions)	619.7	440.0	316.1	3962.8	0.039	563.8
U1 Emission Decrease	(214.4)	(152.2)	(109.3)	(1260.3)	(0.023)	(536.7)
U2 Boiler						
New Control Description	C28	C28	C28	C27	C28	C28
Estimated operation date	4/2015	4/2015	4/2015	5/2015	4/2015	4/2015
U2 Projected PTE with new control	405.4	287.8	206.7	2702.5	0.016	27.0
U2 Baseline (07-09 actual emissions)	594.0	421.7	302.9	4777.2	0.039	563.1
U2 Emission Decrease	(188.6)	(133.9)	(96.2)	(2074.8)	(0.023)	(536.0)
U3 Boiler						
New Control Description	C29	C29	C29	C8	C29	C29
Estimated operation date	10/2015	10/2015	10/2015	11/2014	10/2015	10/2015
U3 Projected PTE with new control	552.4	392.2	281.7	3682.7	0.022	36.8
U3 Baseline (07-09 actual emissions)	685.5	486.7	349.6	9780.1	0.056	810.4
U3 Emission Decrease	(133.1)	(94.5)	(67.9)	(6097.4)	(0.034)	(773.6)
U4 Boiler						
New Control Description	C30	C30	C30	C31	C30	C30
Estimated operation date	11/2014	11/2014	11/2014	11/2014	11/2014	11/2014
U4 Projected PTE with new control	660.3	468.8	336.7	4401.9	0.026	44.0
U4 Baseline (07-09 actual emissions)	711.0	504.8	362.6	9178.0	0.065	940.0
U4 Emission Decrease	(50.7)	(36.0)	(25.9)	(4776.1)	(0.039)	(896.0)
U1-U4 total decrease	(586.8)	(416.6)	(299.2)	(14208.6)	(0.118)	(2742.4)

Appendix B

Louisville Metro Sustainability Plan

Sustain

LOUISVILLE

LOUISVILLE METRO SUSTAINABILITY PLAN

CREATED MARCH 2013

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OBJECTIVES:

PROTECT THE ENVIRONMENT AND REDUCE LOUISVILLE'S CARBON FOOTPRINT

ENSURE THE HEALTH, WELLNESS AND PROSPERITY OF ALL CITIZENS

CREATE A CULTURE OF SUSTAINABILITY

GREG FISCHER, MAYOR

LETTER FROM THE MAYOR

Dear citizens:

My goal is for Louisville to be one of the nation's greenest and most environmentally friendly cities – and this document is the plan for getting us there.

Sustain Louisville is our city's first comprehensive sustainability plan — and it's designed to not only green Metro Government, but to advance sustainability issues across our city's roughly 400 square miles. Government can do its part to create a more sustainable city, but it takes everyone, all 750,000 residents, to ensure that we leave this Earth better than we found it.

This plan has six major focus areas — Energy, Environment, Transportation, Economy, Community and Engagement — with 19 broad goals and numerous programs and tactics to reach those goals. Sustain Louisville was a year in the planning and this document incorporates ideas and priorities we heard from citizens and community and business leaders.

It is my hope that, years from now, future generations will look back on this plan as the beginning of a major shift in Louisville to becoming a more sustainable city.

Greg Fischer

EXECUTIVE SUMMARY

Louisville Metro Government is pleased to present Sustain Louisville, the city's first sustainability plan. Sustain Louisville is a vital element for ensuring an environmentally sound, vibrant, and prosperous future for Louisville and its citizens. The plan was prepared by the Office of Sustainability with the input of city government employees and community stakeholders. Sustain Louisville is intended to be a living document that celebrates our strengths and identifies goals for future success. As the city makes progress toward meeting Sustain Louisville's goals, or as priorities change, the plan will evolve and remain fluid. Implementation of the initiatives and progress toward achieving Sustain Louisville's goals will be reported to the community on an annual basis.

Sustainability is traditionally defined as "meeting today's needs without compromising the ability of future generations to meet their own needs." This is often applied to environmental elements such as air and water; however, Sustain Louisville is using a "triple bottom line" approach which recognizes the interconnectivity of people, prosperity and the planet. Triple bottom line sustainability is an essential perspective for city sustainability planning because of the opportunity to drive success and connect mutually-beneficial related efforts that achieve multiple objectives. In other words, sustainability is good for business, our citizens and our planet.

OBJECTIVES:

1. **Protect the environment and reduce Louisville's carbon footprint.**
2. **Ensure the health, wellness and prosperity of all citizens.**
3. **Create a culture of sustainability.**

Sustain Louisville is divided into six focus areas: energy, environment, transportation, economy, community and engagement. These focus areas were identified based on an evaluation of national benchmarks and local issues, and specifically because efforts need to be made or enhanced in these areas to drive sustainability in Louisville. In each section, goals and initiatives are detailed that include metrics for success and anticipated completion timelines.

Sustain Louisville's goals and initiatives are closely interconnected and success in one area will likely affect results in other areas.

THE ENERGY SECTION provides information regarding both citywide and city government energy use and identifies existing and proposed initiatives to achieve Sustain Louisville's goals and objectives. The goals and initiatives completion dates range from one year to the long-term alternative energy goals of 2025.

THE ENVIRONMENT SECTION provides goals and initiatives that promote clean air, clean water and reducing waste. Addressing the vital topics of climate adaptation and resilience is included in this section as well as water quality and waterway protection.

THE TRANSPORTATION SECTION identifies efforts that are planned or underway such as the city's Multimodal Strategic Transportation Plan and the state's Metropolitan Transportation Plan, and sets goals to include sustainability elements in each plan. As indicated, significant improvement and investment is needed to make transportation more sustainable in Louisville.

THE ECONOMY SECTION describes existing and proposed efforts to promote a clean economy and foster economic development. Prosperity in the community is a key element in developing a more sustainable city.

THE COMMUNITY SECTION includes health and equity as well as sustainable land management. Connecting the community with the natural environment helps promote healthy living, environmental awareness and improves the overall quality of life in Louisville. The section also highlights the value of trees in combating the urban heat island effect and as an element of green infrastructure. Wastewater management and green infrastructure goals and initiatives also are included in this section.

THE ENGAGEMENT SECTION discusses perhaps the most vital aspect of Sustain Louisville. An engaged and aware community is the most effective way to advance sustainability. The goal of this section is to educate the community and inspire everyone to do their part to achieve Sustain Louisville's goals.

In 2013, the Office of Sustainability will engage with the community to assess opportunities for launching a signature project. This project will be a big, bold effort that will unite Louisville's citizens around a large-scale sustainability project.

Sustain Louisville goals and initiatives are summarized on the next page.

GOALS

Sustain Louisville – Goals Summary

FOCUS AREA	GOALS	TARGET DATE
1.0 Energy	1. Decrease energy use citywide per capita by 25%	2025
	2. Decrease energy use in city-owned buildings by 30%	2018
2.0 Environment	3. Mitigate the risk of climate change impacts	2018
	4. Achieve and exceed National Ambient Air Quality Standards	Ongoing
	5. Improve waterway quality	2018
	6. Increase recycling citywide by 25%	2015
	7. Achieve 90% residential recycling participation	2025
	8. Divert 50% of solid waste away from the landfill by 2025 and 90% by 2042	2025
3.0 Transportation	9. Decrease transportation-related greenhouse gas emissions by 20%	2020
	10. Reduce vehicle miles traveled by 20%	2025
4.0 Economy	11. Provide opportunities for clean economy organizations and innovators, and develop a qualified workforce to support it	2015
	12. Expand the local food system by 20%	2018
5.0 Community	13. Increase access to healthy foods by 20%	2018
	14. Increase opportunities for active living	2015
	15. Incorporate sustainability into the Land Development Code and the Comprehensive Plan	2015
	16. Replace and reforest parks property and provide nature-based recreation	2018
	17. Expand green infrastructure incentives citywide	2018
	18. Establish a robust urban tree canopy and implement strategies to mitigate the urban heat island effect	2018
6.0 Engagement	19. Engage the community in sustainablility practices and principles	Ongoing

INTRODUCTION

Sustain Louisville is Louisville's first sustainability plan which heralds an exciting chapter in Louisville's history and affirms Louisville Metro Government's commitment to becoming one of the greenest cities in the country. Sustain Louisville will guide the city and its many partners in uniting multiple sustainability objectives and creating far-reaching impacts. Sustain Louisville is a foundational framework to shape citywide efforts, including public- and private-sector organizations and individuals, to promote a vibrant, prosperous and healthy community with a better quality of life for all Louisville citizens now and in the future.

TRIPLE BOTTOM LINE

Sustainability is traditionally defined as "Meeting today's needs without compromising the ability of future generations to meet their own needs." This often is applied primarily to environmental elements such as air and water. However, Sustain Louisville is using a "triple bottom line" approach which recognizes the interconnectivity of people, prosperity and the environment, and which can have an exponential effect on the community through multiple efforts.

Sustain Louisville's key objectives are intended to represent and balance social equity and economic health with those of the environment that align with triple bottom line sustainability principles. For example, promoting energy efficiency will help improve Louisville's air quality, and it also will help building occupants reduce energy costs. While Sustain Louisville is intended to be comprehensive in nature and is designed to set a course for long-term aspirations, it also imparts a sense of urgency toward achieving Louisville's short-term goals.

PURPOSE OF THE OFFICE OF SUSTAINABILITY

Mayor Greg Fischer established the city's first-ever Office of Sustainability in January 2012 to move Louisville toward becoming one of the greenest cities in the country. This cross-functional office also is tasked with strategic sustainability planning, development, and implementation of sustainability programs, policies and guidelines for both city government and the community. The Office is establishing public-private partnership opportunities toward achieving Louisville's sustainability goals.

The mission of the Office of Sustainability is to embed sustainability into the culture of Louisville's citizens. Creating a culture of sustainability will be achieved through broad-based education and awareness efforts as well as implementation of projects and initiatives to influence behavior change.

2005	Rank	Per Capita Carbon Footprint in Metric Tons
Honolulu, HI	1	1.36
Louisville, KY-IN	**96**	**3.23**
Toledo, OH	97	3.24
Cincinnati-Middletown, OH-KY-IN	98	3.28
Indianapolis, IN	99	3.36
Lexington-Fayette, KY	100	3.46

Brookings Institution, 2008

SUSTAINABILITY OBJECTIVES

Sustain Louisville is driving three objectives to successfully achieve the Office of Sustainability's mission and vision.

1. **Protect the environment** and reduce Louisville's carbon footprint. In 2005, Louisville was ranked with the fifth-highest carbon footprint per capita among the 100 largest metropolitan areas (Brookings Institution, 2008). A carbon footprint is the measurement of total greenhouse gas emissions from a specific source such as a building, organization or person. Protecting the environment will help ensure that Louisville has clean air, clean water and thriving ecosystems which go hand in hand with reducing Louisville's carbon footprint.

2. **Ensure the health, wellness and prosperity of all citizens.** Providing access to healthy foods, transit options, green spaces, equitable housing and urban core development will foster a healthy, active, safe and livable community. These activities help support social justice and will provide economic vitality by supporting clean economy jobs and business development opportunities.

3. **Create a culture of sustainability.** Louisville Metro Government will provide robust community engagement and education opportunities on sustainability practices and principles to support and ensure Louisville's vibrant future.

GOALS AND INITIATIVES

The goals and initiatives outlined in Sustain Louisville align with and support the objectives, and include bold ideas that advance energy efficiency, enhance and increase transportation options and create collaboration across sectors. Sustain Louisville is divided into the focus areas of energy, environment, transportation, economy, community and engagement. These focus areas were identified based on an evaluation of national benchmarks and local issues and specifically because efforts need to be made or enhanced in each area to drive sustainability in Louisville. Within the focus areas, initiatives and metrics are identified to achieve both the focus area goals and the overarching Plan objectives. It should be noted that implementation of the initiatives and progress toward meeting the goals is dependent upon the available resources.

The initiatives in Sustain Louisville are the starting point to move toward goal achievement within each focus area. The initiatives are listed in charts in each section and are identified as underway, planned or proposed. Initiatives identified as underway are being worked on now, initiatives identified as planned will be launched or completed within three years, and initiatives identified as proposed will be launched or completed in four years or longer. The Office of Sustainability continually evaluates and considers new initiatives and opportunities that could help achieve the Plan goals.

Sustain Louisville is a living and fluid document, and as resources and priorities change, the goals may evolve. The Plan goals and initiatives are not mutually exclusive of other possible opportunities and are not in any particular priority or ranking. Rather, they are interconnected, and success in one area will likely affect results in other areas.

Sustain Louisville will be updated annually and the progress toward meeting the goals and completing initiatives will be reported.

EARLY SUSTAINABILITY EFFORTS

Louisville Metro Government began its green initiatives in 2005 when former Mayor Jerry Abramson signed the U.S. Mayor's Climate Protection Agreement, which was endorsed by the U.S. Conference of Mayors. Mayor Fischer continued Louisville's commitment to climate protection by renewing this agreement on his first day in office, January 3, 2011.

In 2004, Louisville Metro Government was a founding member in the Partnership for a Green City (PGC),

go green louisvi!!e

an innovative environmental collaboration of city government, Jefferson County Public Schools and the University of Louisville, which are the largest public employers in the city and in the Commonwealth of Kentucky. The PGC was formed to focus on environmental management, environmental education and environmental health initiatives. A fourth public employer, Jefferson Community & Technical College, joined the partnership in 2011.

In 2008, the city launched Go Green Louisville, a precursor to the Office of Sustainability, which promoted a variety of sustainable practices, including the improvement of air quality, energy conservation, wise water use, land management and recycling practices.

In cooperation with the PGC, the Louisville Metro Air Pollution Control District (APCD) completed a comprehensive greenhouse gas (GHG) emissions inventory that was detailed in the PGC's Climate Action Report (CAR), released on April 22, 2009. The CAR included 175 recommendations to mitigate the community's GHG emissions and to prepare for local climate change impacts. Action has been taken, or is ongoing, to address 140 of those recommendations. Each partner organization is preparing plans to reduce its GHG emissions and is working on related initiatives including energy efficiency, transportation, education, recycling and green space management programs. GHG data from the CAR is referenced in this Plan and will be used as the baseline for carbon footprint-reduction goals.

The Office of Sustainability is establishing public-private partnership towards achieving Louisville's sustainability goals, such as the Louisville Sustainability Council. The Louisville Sustainability Council was formed in 2012, based on the work and recommendations of the Leadership Louisville Bingham Fellows Class of 2010, to promote sustainability in Louisville. The LSC Board of Directors represents the Bingham Fellows Class of 2010 and professionals from a cross-section of Louisville's business, public and nonprofit community. Now, more than ever, city government wants to partner and collaborate with citizens and organizations to both provide guidance and leverage expertise in the community as it becomes a more sustainable city.

VISION LOUISVILLE

The Phase 1 Research and Discovery efforts of Vision Louisville were completed in 2012. Vision Louisville is an aspirational plan for the future development of Louisville. Focused on the built environment and its development over the next 25 years, Vision Louisville will emphasize growth, authenticity, preservation, sustainability and quality of place. The Office of Sustainability is working in concert with the visioning effort because of the multitude of ways that Vision Louisville incorporates sustainable practices and elements.

SIGNATURE PROJECT

In 2013 the Office of Sustainability will engage with the community to assess opportunities for launching a signature project. This will be a big, bold effort that unites the city around a large scale sustainability project. Ideas could be leveraged from the Phase 1 Research and Discovery efforts of Vision Louisville such as create a carbon neutral Fairgrounds, create a green jobs and solar power program, or establish a public transportation asset such as light rail or rapid transit buses.

CITY SUSTAINABILITY RANKINGS

Louisville Metro Government is committed to working towards measurable and achievable goals in our efforts to become a national green leader. One way to do this is to participate in a national benchmarking ranking program. One such ranking system is STAR Communities, which was piloted in 2012. This nonprofit effort from ICLEI – Local Governments for Sustainability, endeavors to advance a national framework, rating system and best practice sharing for achieving city sustainability.

NEXT STEPS

Louisville has numerous strengths to build upon and celebrate, and assets that can be leveraged to advance sustainability. Sustainability efforts in the community already are supported by philanthropic organizations, corporations, nonprofit groups, civic leaders and grassroots efforts that are made up of passionate individuals who know that by doing their part the community becomes a better place. With its many partners, city government will leverage mutually beneficial opportunities that promote its commitment toward becoming a more sustainable community.

Achieving the sustainability goals set out in Sustain Louisville will require the efforts of not only city government, but also the many partnerships and concerted efforts of 750,000 citizens who have a role in helping Louisville become a truly sustainable city.

1.0 ENERGY

As a city located in one of the top coal-producing states, Louisville's electricity is primarily generated by coal-fueled power plants. This carbon-intense energy source creates unique challenges and opportunities as it relates to Sustain Louisville's objective of reducing Louisville's carbon footprint. Louisville Gas and Electric (LG&E), the utility serving Louisville and much of the surrounding communities, produced approximately 97% of its net kilowatt energy using coal-fired generating units in 2010.

Louisville's energy rates are among the lowest in the United States and research shows that low utility costs result in less consumer conservation than in areas with high utility costs. In 2009, Kentucky consumed 435 million BTUs per person compared to a national average of 308 million, which is likely due to its low energy costs. In 2010, Kentucky had the fourth-lowest electric rates in the country. Even with low energy costs, city government is encouraging the community to pursue energy efficiency, energy conservation and renewable energy options. These efforts help improve Louisville's air quality and provide cost savings for the user.

In 2008, the Louisville Metro Air Pollution Control District (APCD) completed a comprehensive GHG emissions inventory using data from 1990 and 2006. GHG emissions, measured in tons of carbon dioxide equivalent (CO_2e), were calculated for the energy used in the residential, commercial and industrial sectors, as well as for transportation, public transit and waste disposal. The GHG emissions inventory findings were presented in the Climate Action Report (CAR) in 2009. The CAR indicated that the largest sources of GHG emissions were from the transportation and residential sectors, respectively, which contributed more than half of the inventoried emissions. These emissions are a result of indirect emissions from electricity usage and direct emissions from natural gas usage in residential buildings, as well as direct emissions from fuel usage in vehicles. Measured GHG emissions increased by 5.7% between 1990 and 2006. The inventory shows that the GHG emissions per capita within the Louisville Metro area are among the highest in the nation for large municipalities.

1.1 Energy Conservation

EXISTING EFFORTS

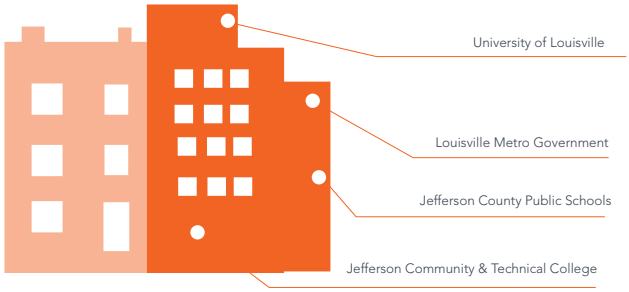
In an effort to reduce its energy consumption, promote energy efficiency and be more environmentally responsible, city government began an energy savings performance contract (ESPC) in 2010. Energy efficiency upgrades were implemented in 24 city-owned buildings with a guarantee of 23% savings on energy costs, or $693,000 annually. The project had a 13-year return on investment and an estimated reduction of 7,500 metric tons of greenhouse gas emissions annually. This is the equivalent of planting 185,100 trees or removing 1,430 vehicles from the road. The Office of Sustainability will share the ESPC results as the measurement and verification activities are quantified in 2013. Another example of energy efficiency in city government is the Department of Technology Services server virtualization program. The city server farm is slightly more than 50% virtualized and virtual servers are the default purchase for new or replacement systems, saving about 1.5 megawatt hours of electricity per year, the equivalent of the necessary energy to run one household for a month.

The Office of Sustainability created an energy strategy workgroup, which is comprised of city employees from multiple agencies who are working together to better understand our energy consumption and actively manage the associated energy usage of their respective functional areas. This workgroup is developing an Energy Management Policy which will guide facility managers and occupants on the expectations around energy usage such as thermostat setbacks and controls. The policy also will include behavior-change management initiatives such as providing prompts for turning off lights when not in use.

Other factors to improve energy efficiency in city government buildings include improved preventative maintenance and equipment upkeep practices. Routine preventative maintenance helps keep equipment functioning properly and more efficiently and thereby using less energy. In addition, the PGC Green Building Team is monitoring the ESPC's at Louisville Metro, JCPS, JCTC and UofL that have resulted in a combined savings of nearly 30 million kilowatt hours and $3.6 million in annual energy costs.

Partnership for a Green City Energy Savings

Savings of nearly 30 million kilowatt hours and $3.6 million in annual energy costs



LOUISVILLE GAS AND ELECTRIC COMPANY offers its residential and commercial customers a variety of energy efficiency programs that help them save energy and money. Customers can apply for rebates for making energy upgrades, perform an online home energy analysis or schedule an on-site analysis, receive summer energy bill credits by enrolling in a program that helps the utility better manage peak energy demand, and arrange to have their air conditioners tested and tuned up, to name a few of the available opportunities.

Green and Cool Roofs

Louisville Metro Government currently has green (vegetated) roofs on the Metro Development Center and the 645 Industry Building A, and has Energy Star white roofs on the 645 Industry Building B, the Firearms Training Center and the Alexander Building. Green roofs are an excellent way to increase energy efficiency, decrease rainwater runoff and help mitigate urban heat island (UHI) issues. Cool roofs (roofs with a high solar reflective index –SRI – value, which are made with highly reflective or white material) reflect sunlight, retain less heat, are more energy efficient and help reduce UHI impacts. A growing number of green roofs are located across Louisville including at the America Life building, the Green Building, the Louisville Zoo, University of Louisville's Equine Center, the Louisville Metro Housing Authority administrative building and at Brown-Forman's main campus.

Energy Star

In an effort to manage city government's energy usage and the associated costs, energy usage for all city-managed facilities is tracked in the EPA Energy Star Portfolio Manager software. Portfolio Manager is a free database that uses a rating scale of 1 to 100 to benchmark buildings based on building age, square footage and occupancy levels, among other things. Portfolio Manager also normalizes for regional weather factors. Buildings that achieve a rating of at least 75 are eligible to become Energy Star certified. The Louisville Metro Old Jail Building is Energy Star certified and is one of 44 Energy Star certified buildings located in the city.

One effort to increase the use of Portfolio Manager and encourage buildings to get Energy Star certified is the Louisville Energy Alliance's Kilowatt Crackdown competition. A product of Louisville's participation as a Partner City in the Energy Star program, the Kilowatt Crackdown challenges commercial and institutional building owners and operators to improve their facilities' energy efficiency and recognizes those that make the greatest strides. The Louisville Energy Alliance is a public-private partnership among Louisville Metro Government, the Kentucky Department for Energy Development and Independence and local chapters of several commercial real estate associations.

LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

Louisville Metro Government owns one building, the Newburg Library that is Silver certified by the U.S. Green Building Council for Leadership in Energy and Environmental Design (LEED). LEED buildings generally have 10% lower operating costs and are up to 10% more energy efficient per square foot than conventional buildings.

The city anticipates achieving LEED certification for two additional buildings, including the new Southwest Library, which will begin construction in 2013, and also is committed to develop future city-owned buildings to LEED certified standards. The Office of Sustainability will identify and incorporate sustainability goals for city capital projects, including environmental, social and economic factors.

There are 25 buildings in Louisville that are certified by the U.S. Green Building Council for LEED. These certified buildings run the gamut from a 115-year-old multiuse LEED Platinum building to new construction warehouses and offices. In addition, there are 31 buildings registered for LEED certification, which means that they are working on the certification process.

In 2012, the East Market Street District received an Affordable Green Neighborhoods Grant. This **$25,000 grant** is funded by the US Green Building Council and Bank of America, and will support the application for LEED Neighborhood Development (ND) in the 200-acre project area. This project is scheduled to launch in 2013.

PROPOSED INITIATIVES

To reduce Louisville's carbon footprint from the fifth-worst in the country, the city's goal is to decrease the energy use citywide per capita by 25% by 2025 relative to the 2006 baseline (Partnership for a Green City's CAR). Achievement of this goal will require broad participation from Louisville's citizens to implement energy conservation and efficiency measures. As indicated in the CAR, the residential sector is a large contributor to Louisville's carbon footprint and as such, community education initiatives will be needed, particularly with respect to energy efficiency and conservation practices. In addition, the vast majority of homes in Louisville were constructed before the building code required insulation. Rehabilitation and weatherization of older housing stock would reduce energy use, save the occupants money and help improve Louisville's air quality. The Office of Sustainability will develop a community engagement program to educate and encourage the community to adopt energy efficiency and conservation practices.

To contribute to the citywide energy use reduction goal of 25%, Louisville Metro Government's goal is to reduce energy use in its buildings by 30% by 2025. This goal will be achieved through a variety of programs that include both mechanical improvements and behavior-change initiatives, such as implementation of the Energy Management Policy being devised by the energy strategy group and development of a preventative maintenance program as outlined above. In addition, city government launched its second phase of energy savings performance in its facilities at the beginning of 2013.

The Metropolitan Sewer District (MSD) offers a stipend for green roof construction projects that are located within the combined sewer overflow area. The stipend is calculated based on the square footage of green roofs and its value for decreasing the rainwater runoff flowing into the sewer system. In an effort to increase green roofs in the city, the Office of Sustainability will collaborate with MSD to investigate opportunities to expand and broaden its green roof incentive program for buildings located outside the combined sewer overflow area. This could include rebating a portion of the green roof installation cost through a property tax deduction, for example. In addition, the Office of Sustainability will establish goals for increasing green and cool roofs citywide and develop a best practices guide that provides design and cost information.

Through continued partnership with the Louisville Energy Alliance, the Office of Sustainability will develop an Energy Star Certification program in an effort to get the city on the top 25 ranking list for cities with the most Energy Star certified buildings by 2018, and into the top 10 by 2025. This program will encourage building owners to use Portfolio Manager for benchmarking purposes as well as offer assistance with achieving Energy Star certification. Encouraging participation in this program also will help meet the citywide goals for decreased energy usage.

In support of inspiring green building practices in Louisville, a green building construction, renovation and demolition incentive program will be developed. An element of the program will include an expedited building permit process for projects that include green elements. In addition, the city will require an Energy Star building benchmark disclosure for commercial buildings that will have building owners track the buildings' energy performance in Portfolio Manager and disclose the buildings' energy star rating. The Office of Sustainability will convene a work group to help identify best practices and establish a program that includes these initiatives as well as realistic, achievable goals and guidelines.

Goals and Initiatives

ENERGY	
1. Decrease energy use citywide per capita by 25%	**2025**
INITIATIVES	
Launch an EPA Energy Star building certification program	Underway
Launch a Cool and Green Roof program	Planned
Launch an education program to promote energy efficiency and energy conservation	Planned
Launch a green building incentive program	Planned
Require an Energy Star building benchmark disclosure for commercial buildings	Planned
2. Decrease energy use in city owned buildings by 30%	**2018**
INITIATIVES	
Launch the second energy savings performance contract for city owned buildings	Underway
Implement an Energy Management Policy for city owned buildings	Underway
Identify sustainability goals for city government capital projects	Planned

1.2 Renewable Energy

EXISTING EFFORTS

A further demonstration of city government's commitment to sustainability is the solar photovoltaic panels on three building rooftops, including the Metro Development Center, Ashland Firehouse, and the Newburg Library. The Metro Development Center also has solar thermal panels which provide enough hot water to meet the needs of the buildings' 550 occupants. The panels have provided more than 32,700 kilowatt hours of solar power for the three city facilities in the last year. APCD also has a solar panel array at the Cannons Lane air monitoring station that provides approximately 30% of the power needs for the station. In addition, three firehouses have geothermal heating and cooling systems which significantly decrease operating costs.

PROPOSED INITIATIVES

To draw on the success of these projects, the city will investigate opportunities and develop a program to increase the use of renewable energy technologies by 50% by 2025, on both existing and new buildings. In addition, the city will develop a renewable energy demonstration project such as solar carports or a solar roadway. The project will serve as a living laboratory that will give the community a hands-on way to learn about renewable energy as well as create the linkage to innovative solutions and experimentation around the rapidly evolving field of renewable energy.

City government hopes to foster a viable atmosphere for renewable energy options in the community by leveraging public private partnerships, pilot projects and grant opportunities. To this end, Sustain Louisville will introduce citywide renewable energy goals, and review potential incentive or legislative options to help facilitate this process such as:

• Property Assessed Clean Energy (PACE) – PACE is a financing mechanism for energy efficiency and renewable energy infrastructure (e.g. solar photovoltaic panels). PACE funding allows commercial property owners to receive financing from a third party lender, which is repaid through an incremental property tax increase as determined by the project cost, for a term of up to 20 years. The repayment obligation remains with the property regardless of a transfer of ownership. The owner realizes immediate cost savings through decreased energy consumption which offsets and often exceeds the property tax payments. PACE programs have bi-partisan support at federal, state and local levels, and are offered through legislation by 28 states and the District of Columbia. Current Kentucky legislation does not support PACE programs.

• Power Purchase Agreement (PPA) – PPA is a legal contract between an electricity generator and a power purchaser. During the contract term, the power purchaser buys energy from the electricity generator. With distributed generation where the generator is located on a building site and energy is sold to the occupant, commercial PPAs enable businesses, schools and governments to purchase electricity directly from the generator rather than a utility.

• Renewable Portfolio Standards (RPS) – RPS is a regulation that requires the increased energy production from renewable sources such as wind, solar, biomass or geothermal. The RPS generally requires electric companies to produce a specified fraction of their electricity from renewable energy sources. Certified renewable energy generators earn certificates for every unit of electricity they produce, and can sell these along with their electricity.

Goal and Initiatives

ENERGY

1. Decrease energy use citywide per capita by 25%	2025
INITIATIVES	
Establish citywide renewable energy goals and strategies	Planned
Assess renewable energy incentive programs and legislative options	Planned
Install a living laboratory solar demonstration project	Planned
Increase the use of renewable energy technologies in city-owned buildings by 50% by 2025	Proposed

2.0 ENVIRONMENT

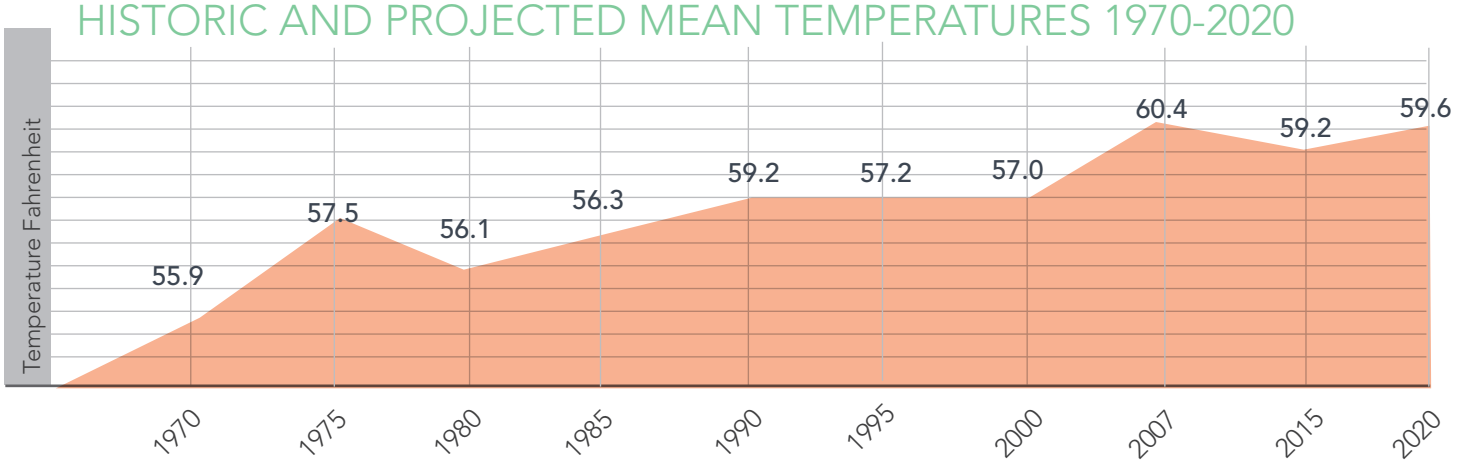
CLEAN AIR, CLEAN WATER, CLIMATE CHANGE AND WASTE MANAGEMENT ARE VITAL ENVIRONMENTAL SUSTAINABILITY ELEMENTS THAT CONTRIBUTE TO LOUISVILLE'S OVERALL SUSTAINABILITY PERFORMANCE. THE GOALS AND INITIATIVES IDENTIFIED IN THIS SECTION SUPPORT SUSTAIN LOUISVILLE'S THREE OBJECTIVES TO PROTECT THE ENVIRONMENT; ENSURE THE HEALTH, WELLNESS AND PROSPERITY OF ALL CITIZENS; AND CREATE A CULTURE OF SUSTAINABILITY. THIS SECTION ALSO DETAILS THE IMPROVED QUALITY OF LIFE RECOGNIZED AS A RESULT OF THESE EFFORTS.

2.1 Climate Adaptation

Developing an understanding of the risks that climate change poses to the Louisville area is an important first step in making the city more resilient. Regional reports indicate that climate hazards such as increased heat, precipitation and drought will become more frequent and intense in the coming years. Louisville's temperature and precipitation data has been collected by the National Oceanic Atmospheric Agency (NOAA) since 1948. From the 60-year data set (1948 to 2007) the mean, maximum and minimum air temperatures have increased systematically since 1970. The greatest rate of change in these measurements is the pronounced rise in minimum temperatures particularly since 1970. Projections for 2020, using the collected data and assuming that GHG emissions stay the same, indicate that the mean temperature will increase between two and four degrees. Annual precipitation totals have remained steady; however the annual precipitation levels in the form of snowfall have declined since 1960 and are projected to continue to decline based on this model.

Louisville has experienced an average of thirty two days above 90 degrees over the past thirty years. The record amount of days over 90 degrees in a year is 81, which happened in 1954 and the least amount is three days in 1974. By late this century under the high emissions scenario, the Union of Concerned Scientists projects that Louisville will face more than 80 days above 90 degrees and nearly 25 days above 100 degrees. Prolonged excessive heat poses particular health risks for all vulnerable populations and may adversely affect the city's infrastructure and operations. Potential effects on infrastructure include power outages, weathering of vehicles, pavement buckling and damage to roads and bridges, all of which can potentially disrupt important city services.

HISTORIC AND PROJECTED MEAN TEMPERATURES 1970-2020



Source: National Oceanic and Atmospheric Administration

FLOODING

Louisville is located along the Ohio River, where up to 75 billion gallons of water flow by the city every day. The Ohio River basin includes 204,000 square miles across 14 states, therefore extreme weather events both locally and upstream can cause flooding in the Louisville area. To protect Louisville from Ohio River flooding, a 30-mile floodwall and levee system was constructed. The system is three feet higher than the 1937 flood stage (52.2 feet), which is Louisville's highest recorded flood level, and is more than ten feet higher than any other recorded flood. Additionally, there are 16 flood pump station facilities designed to remove internal flood waters and displace those waters to the river. As such, a greater likelihood of flooding impacts in Louisville is from our internal urban waterways.

The changes in climate patterns are creating more erratic weather events, including the intensity of storm events and storm cycles, the incidence of extreme weather and the length and intensity of periods of drought and precipitation. Changes in the distribution of rainfall throughout the year will likely produce conditions such as broader flood plains, increased flooding during storm events, heightened effects of stormwater runoff, and water scarcity and increased demands for area water from other parts of the state or nation.

Increased flooding and drought in Louisville could decrease water quality and increase water treatment costs. Currently, most water companies manage elevated contaminants during flooding events and prolonged droughts. However, changes in the frequency and timing of these events may pose economic, environmental and health risks.

CITY IMPACTS

The impacts of climate change pose social, economic and environmental risks in Louisville. The U.S. Government Accountability Office reports that 88% of all property losses paid by insurers between 1980 and 2005 were weather related. According to NOAA, in 2011, ten separate weather events in the U.S. each resulted in more than $1 billion in damage.

Adapting for climate resilience requires the acceptance that climate change is already happening and that we need to prepare for weather trends outside of our control. We need to integrate climate change risks and adaptation into our planning and development goals, including protection of distribution systems such as roads and highways.

City government is entrusted to guide physical development to manage risks from natural hazards, including long-term risks associated with climate change. Increased susceptibility to flooding, intense weather events and higher temperatures require the city to consider appropriate adaptive measures such as cooling centers and disaster relief services. Enhancing the resilience of key services and infrastructure in advance of potential climate impacts is essential as city departments maintain, operate, and build infrastructure that will support and strengthen Louisville's growing economy. The city has a Multi-Hazard Mitigation Plan which includes preparedness measures for the effects of unanticipated natural disasters.

PROPOSED INITIATIVES

The Office of Sustainability will convene a work group to study the Multi-Hazard Mitigation Plan, and develop and integrate strategies and goals for increasing resilience to the impacts of climate change.

Goal and Initiatives

ENVIRONMENT

3. Mitigate the risk of climate change impacts	**2018**
INITIATIVES	
Identify and implement climate change adaption and resilience goals and best practices	Planned

2.2 Air

The Air Pollution Control District has worked to improve Louisville's air quality for 67 years and is authorized to implement the federal Clean Air Act. Under the direction of the Air Pollution Control Board, APCD collects air monitoring and emissions data, administers rules and regulations, issues and enforces permits, provides education and assists the community by addressing air quality challenges.

EXISTING EFFORTS

Section 108 of the Clean Air Act requires all areas in the United States to meet the National Ambient Air Quality Standards (NAAQS). The NAAQS include criteria air pollutants whose emissions may reasonably be anticipated to endanger public health or welfare. The EPA reviews the NAAQS guidance every five years and revises the standards as necessary. While Louisville's air quality continues to improve, meeting more stringent NAAQS requirements is a challenge. Of the six NAAQS pollutants (particulate matter, ground-level ozone, carbon monoxide, sulfur dioxide, nitrogen oxides and lead), the three which cause the most widespread health threats in Louisville are ozone, fine particulate matter (PM2.5) and sulfur dioxide (SO2). Based on a number of variables, Louisville's air quality and the associated NAAQS attainment fluctuates.

EPA has designated Louisville as meeting the ozone standard (i.e., "in attainment") but because of 2012 weather patterns, the area (Clark and Floyd Counties in Indiana and Bullitt, Jefferson and Oldham Counties in Kentucky) is violating the NAAQS. As a result, the area will submit a plan to the EPA in 2013 that identifies control strategies and an implementation timeline to improve air quality.

The Louisville area is designated as nonattainment for PM2.5, but because recent monitoring data indicates that the area has met the standard, APCD requested redesignation to attainment from the EPA. In 2010, EPA strengthened the SO2 standard and APCD anticipates that a portion of Louisville will be designated as nonattainment in 2013. In anticipation of this timeline and because approximately 95% of Louisville's SO2 emissions are generated by LG&E at its Mill Creek and Cane Run electric generating stations, APCD is working with LG&E to revise its air permits to reduce emissions.

In an effort to improve air emissions from its energy plants, LG&E is building four new pollution scrubbers at the Mill Creek power plant. The scrubbers will better control fine particulate emissions, remove more than 98% of sulfur dioxide emissions, which is an improvement from about 90% now, and a filter baghouse will hold back more than 90% of the toxic mercury, an improvement from about 50% now. In addition, the Cane Run plant will begin conversion to natural gas in 2013 which will greatly improve air emissions from the plant.

APCD's Strategic Toxic Air Reduction (STAR) Program, implemented in 2005, regulates harmful pollutants from large industrial emitters. A long-term air monitoring effort being conducted by the University of Louisville confirms the STAR program's effectiveness in lowering toxic emissions and improving air quality especially in the western portion of Louisville.

AIR QUALITY AWARENESS

Many emission sources in the community are not subject to APCD's regulatory authority, notably mobile sources such as cars, trains, trucks and airplanes. Mobile air pollution sources also include lawn and landscaping equipment. APCD's EPA award-winning Lawn Care for Cleaner Air program encourages residents to switch from gas-powered to manual or electric-powered equipment. APCD is developing a commercial version of this program for high-powered equipment which will be launched in 2013. The Grow More Mow Less program seeks to reduce lawn-related air pollution by encouraging low-mow landscaping.

KAIRE
www.helptheair.org

KENTUCKIANA AIR EDUCATION, MOST COMMONLY KNOWN AS KAIRE, IS APCD'S COMMUNITY OUTREACH AND EDUCATION PROGRAM. KAIRE'S PRIMARY GOAL IS TO INCREASE PUBLIC AWARENESS OF THE IMPACT THAT INDIVIDUAL CHOICES CAN HAVE ON LOCAL AIR QUALITY. EDUCATING PEOPLE ON THE BENEFITS OF REDUCED VEHICLE IDLING IS THE SUBJECT OF A FOCUSED OUTREACH CAMPAIGN CALLED IDLE FREE LOUISVILLE WHICH IS HELPING TO BUILD MOMENTUM TOWARD ENSURING WIDESPREAD IDLING REDUCTION IN LOUISVILLE. THE IDLE FREE PROGRAM PROMOTES "THE 10 SECOND RULE" – IF YOU STOP YOUR VEHICLE FOR MORE THAN 10 SECONDS, TURN THE ENGINE OFF – IT SAVES GAS, REDUCES WEAR AND TEAR ON YOUR VEHICLE AND MINIMIZES HARMFUL POLLUTION EMISSIONS. IDLE FREE LOUISVILLE ALSO HAS PROGRAMS FOR SCHOOLS AND BUSINESSES, WHICH ENCOURAGE ELIMINATING UNNECESSARY ENGINE IDLING.

IDLE FREE

VEHICLE EMISSIONS

According to the GHG data reported in the Partnership for a Green City's CAR, the transportation sector accounts for approximately 30% of Louisville's carbon footprint. A significant portion of these transportation emissions results from single-occupancy vehicles. Reducing single-occupancy vehicle miles traveled (VMT) requires development and transportation planning that supports multi-modal activity and mass transit. Cities like Austin, Denver, Madison and Chicago have programs underway that integrate economic development, transportation and land use strategies to reduce vehicle miles traveled. (Information regarding Louisville's transportation planning is located in section 3.0 Transportation.)

TRAFFIC LIGHT COORDINATION

In 2009 Louisville received $1.5 million from the US Department of Energy (DOE) under the American Recovery and Reinvestment Act of 2009 (ARRA) for traffic signal coordination. The project consisted of software and hardware upgrades of the Advanced Traffic Management System software, retiming of 133 signals on 10 arterials, and development of a communication design plan. The annual savings for the timing project include more than 500,000 vehicle hours due to reduced congestion, $1 million in fuel costs from improved traffic flow and reduced greenhouse gas emissions ranging from 2% to 29% among the 10 arterial locations. The city will continue efforts to expand light coordination efforts with the goal of integrating all traffic signals citywide.

GREEN FLEET INITIATIVES

To help reduce diesel emissions, Louisville received $1.2 million from the EPA Diesel Emissions Reduction Act (DERA) fund to retrofit 70 pieces of non-road diesel equipment with EPA-verified technologies to reduce pollutants, primarily particulate matter (PM). In addition to the environmental concerns, diesel exhaust has been found to cause adverse health effects. Reducing diesel emissions improves air quality and reduces the potential to negatively affect workers using diesel-powered equipment.

In addition to this non-road equipment retrofit project, the city retrofitted 18 Department of Solid Waste trucks with diesel particulate filters (DPF), using funds awarded by the Kentucky Division for Air Quality through its Kentucky Clean Diesel Grant Program. The trucks that were retrofitted include solid waste, and recycling packer and dump trucks. In addition to DPFs, these trucks were equipped with closed crankcase ventilation systems that improve air quality in the passenger cabin.

APCD works with Louisville Metro Fleet Services to implement projects that reduce emissions from the city's fleet vehicles and equipment. Louisville's Fleet Services Division is the primary fleet support operation for city-owned vehicles, operating a diverse fleet with about 2,600 on-road vehicles. Fleet Services makes every effort to reduce emissions from its traditionally-fueled vehicles through right-sizing, alternative vehicle technology and user education. The city's vehicle replacement strategy replaces aged vehicles which have V-8 engines with new vehicles that have V-6 engines. The vehicles with smaller engines often cost less, use less fuel and emit fewer harmful pollutants. In addition, the city's vehicle policy includes anti-idling guidelines.

Louisville Metro Government's fleet vehicles used approximately 2.6 million gallons of unleaded fuel, 435,000 gallons of diesel fuel and 349,000 gallons of B5-biodiesel fuel in 2011. Fleet Services is exploring opportunities to expand the use of alternative fuels in the city's fleet. Alternative fuels, which EPA defines as those derived from sources other than petroleum, often produce less air pollution than gasoline or diesel. The city operates 39 hybrid electric vehicles and is exploring opportunities for additional hybrid or clean emission vehicles. The Parking Authority of River City is evaluating the feasibility of installing charging stations in its garages and the University of Louisville already has an electric vehicle charging station.

TARC

- In 2013, TARC will begin operating five all electric "buses of the future" on downtown streets replacing the oldest trolleys in operation. Estimated carbon emissions associated with electric buses are 65 percent lower than emissions from diesel buses.
- TARC's fleet includes 21 hybrid buses and 11 more will be delivered in 2013. Collectively, those hybrids will use about 65,000 fewer gallons of diesel fuel each year than standard diesel buses.
- TARC is upgrading its fleet of door-to-door paratransit service vehicles for people with disabilities. The new purpose-built vehicles will use 50% less fuel than the existing paratransit vehicles.

JEFFERSON COUNTY PUBLIC SCHOOLS

JCPS IS THE 28TH LARGEST SCHOOL DISTRICT IN THE COUNTRY WITH 101,000 STUDENTS AND 155 SCHOOLS. THE DISTRICT OWNS 1,200 BUSES THAT RUN 962 ROUTES, TRANSPORTING APPROXIMATELY 70,000 STUDENTS TO SCHOOL, DRIVING APPROXIMATELY 100,000 MILES A DAY. OF THE BUS FLEET, 50 BUSES ARE HYBRID-ELECTRIC, THE LARGEST HYBRID-ELECTRIC FLEET IN THE NATION. A TYPICAL SCHOOL BUS AVERAGES 6.5 MILES PER GALLON WHILE THE NEW HYBRID ELECTRIC FLEET AVERAGES 9.5 MILES PER GALLON. THE ENTIRE BUS FLEET IS HIGHLY EFFICIENT WITH DPFS AND OTHER POLLUTION CONTROL DEVICES ADDED TO THE OLDER BUSES, WHICH ARE WELL-MAINTAINED FOR MAXIMUM BENEFICIAL USE UNTIL THEY ARE RETIRED. THE EXHAUST RETROFITS, ANTI-IDLING PROCEDURES AND TRAFFIC CONGESTION REDUCTION IS THE EQUIVALENT OF REMOVING ABOUT 28,000 CARS FROM LOUISVILLE ROADS IN THE MORNING AND AFTERNOON. JCPS USES MORE THAN 3.2 MILLION GALLONS OF BIODIESEL A YEAR OF B2–B5 FUEL BLEND IN ITS BUSES ALONG WITH 125,000 GALLONS OF 10% ETHANOL-CONTAINING FUEL IN THE REMAINDER OF THE DISTRICT FLEET.

UNIVERSITY OF LOUISVILLE

The University of Louisville has committed to purchase fuel-efficient vehicles as university fleet vehicles are replaced. It also will require that new vehicles have fuel efficiencies at least 15% better than their predecessors. By 2020 the university will increase the efficiency of 60% of its fleet by 15 percent. By 2025 the entire fleet will be at least 15% more fuel efficient, which will mean an annual reduction of 13,907 gallons of gasoline and 1,209 gallons of diesel. This translates to an annual reduction of 136.3 metric tons of carbon dioxide equivalents.

PROPOSED INITIATIVES

The proposed initiatives in this section are identified in support of achieving and exceeding the National Ambient Air Quality Standards. Louisville Metro Government is exploring opportunities to fund converting its heavy-duty truck fleet to compressed natural gas (CNG) and to use propane in its landscaping equipment vehicles. The city is evaluating opportunities and initiatives to further reduce its fleet vehicle emissions such as using a higher blend of biodiesel fuels and purchasing alternative fuel and advanced technology vehicles. In support of reducing vehicle emissions in the community, the Office of Sustainability will work with community stakeholders to evaluate opportunities and develop a strategy to advance the use of alternative fuel and advanced technology vehicles.

The city will assess opportunities to implement and expand the traffic light coordination program. Expanding this program will help the city reduce traffic congestion and the associated greenhouse gas emissions from vehicle idling, which will go toward the goal of reducing transportation-related greenhouse gas emissions.

Goal and Initiatives

ENVIRONMENT

4. Achieve and Exceed National Ambient Air Quality Standards	**Ongoing**
INITIATIVES	
Form a partnership to implement an alternative fuel and advanced technology vehicle strategy	Planned
Explore opportunities to fund conversion of city heavy-duty fleet vehicles to compressed natural gas	Proposed
Increase city fleet vehicle biodiesel fuel blend to B10 or greater	Proposed
Implement an alternative fuel vehicle replacement strategy for the city fleet	Planned
Expand traffic light coordination program	Planned

CLEAN WATER IS THE HALLMARK OF A DEVELOPED SOCIETY, AND THE ABILITY TO HAVE POTABLE WATER AS WELL AS WATER THAT IS SAFE FOR AQUATIC AND WILDLIFE SPEAKS TO THE SUSTAINABILITY OF A COMMUNITY. LOUISVILLE IS FORTUNATE TO HAVE A RELIABLE WATER SUPPLY AND WE MUST PRESERVE AND PROTECT THIS RESOURCE FOR FUTURE GENERATIONS.

2.3 Water

EXISTING EFFORTS

The Louisville Water Company has produced drinking water since 1860 and produces an average of 124 million gallons of drinking water daily for Louisville Metro and surrounding counties. Louisville Water has been cited by industry peers and government regulators as one of the premier systems in the country. In 1996, Louisville Water began a branded program known as Louisville pure tap® which was the first branded "tap water" in the nation. As Louisville pure tap® turned fifteen, the Louisville Water Company revived its primary message that customers can "bottle your own" Louisville pure tap® using any cup, glass, or bottle. In support of its environmental stewardship goals, the plastic "branded" water bottle program was retired, and instead, LWC offers sustainable options such as reusable bottles, bio-compostable cups, pitchers, coolers and mobile units. In addition, pumping and treating drinking water is energy intensive, so wise water use will help reduce Louisville Water's carbon impact. (Green infrastructure strategies and solutions are detailed in Section 5.4.)

In addition to being on the Ohio River, Louisville also has approximately 400 miles of mapped streams within its boundaries. Over the course of Louisville's history, its water resources have provided reliable drinking water and recreational venues for visitors and residents. Louisville is fortunate to have plentiful water resources and the community must preserve and protect this resource for future generations.

One of the greatest challenges to Louisville's waterways is the need to reduce the amount of impervious surfaces in urban watersheds, as well as point and non-point sources of pollution so that streams meet water quality and aquatic life standards. Reducing the amount of impervious services will require changes in how the city manages existing areas, new property developments and infrastructure retrofits throughout Louisville.

An additional challenge is maintaining riparian vegetation, which does more to protect streams than almost any other effort. Louisville must protect and reclaim the intermittent tributaries to the creeks and streams system which play a critical role in pollutant filtration and hydrology, and serve as an important aquatic habitat.

PROPOSED INITIATIVES

The Office of Sustainability will assess the development of a "depave" program to reduce impervious surface area which reduces stormwater runoff and increases the amount of land available for habitat restoration, urban farming and trees. This will include initiatives to minimize or reduce the amount of impervious pavement in construction projects and promote the responsible and creative reuse and recycling of concrete and asphalt. The city will research and develop a pilot project to restore one mile of riparian vegetation along a local waterway, the results of which will be shared in a best practices guide book.

Goals and Initiatives

ENVIRONMENT	
5. Improve waterway quality	**2018**
INITIATIVES	
Launch a program to decrease the amount of impervious surfaces that impact watershed systems	Planned
Develop a pilot project to restore ten miles of riparian vegetation	Planned

MANAGING LOUISVILLE'S WASTE STREAMS IS A SUSTAINABILITY ISSUE THAT IMPACTS EVERY LOUISVILLE CITIZEN. FOR SOLID WASTE MATERIALS, LOUISVILLE HAS TWO SANITATION SERVICE DISTRICTS AND MANY INCORPORATED SMALL CITIES. FOLLOWING THE CITY-COUNTY GOVERNMENT MERGER IN 2003, RESIDENTS IN THE OLD CITY BOUNDARY (URBAN SERVICES DISTRICT) HAVE WASTE COLLECTION AND DISPOSAL SERVICES INCLUDED IN THEIR PROPERTY TAXES WHILE RESIDENTS IN THE OLD COUNTY BOUNDARY (SUBURBAN AREAS) AND INCORPORATED SMALL CITIES ARE RESPONSIBLE TO CONTRACT WITH PRIVATE WASTE HAULERS THAT PROVIDE RESIDENTIAL WASTE REMOVAL SERVICES.

2.4 Waste

EXISTING EFFORTS

The Louisville Metro Solid Waste division provides waste services inside the Urban Services District including curbside garbage, yard waste, recycling, and junk collection. The Louisville Metro/Jefferson County Waste Management District, a state entity, regulates all waste material disposal and waste haulers in the county. In 2012, the Waste Management District adopted a detailed Five Year Solid Waste Management Plan as required by Kentucky Revised Statutes 224.43, which is viewed as a new beginning to the city's approach to solid waste management. Where solid waste was traditionally landfilled, the state is shifting to a new focus on resource recovery where the majority is recycled, composted, or used as fuel in lieu of virgin materials.

Louisville Metro Government is eager to increase recycling practices in the city. Recycling not only conserves landfill space, it reduces the demand for raw materials and helps conserve natural resources. To increase awareness and educate the public about the importance of recycling, Louisville launched an expanded recycling program in July 2012. This program is partly driven by one of the Mayor's five Innovation Delivery Teams whose projects are funded through a $5 million Bloomberg Philanthropies Grant that Louisville received in 2011. The program aims to reinforce and champion the reduce-reuse-recycle message and to build Louisville's reputation for thinking and acting green. The recycling program initiatives range from residential, commercial and city office recycling pilot programs to a food waste compost pilot program for area schools.

The city expanded its recycling program by adopting a single stream recycling program in city buildings. This program is unique because the employees are allowed to put only recyclable materials in their deskside containers. Housekeeping staff pick up the recyclable materials and the employees are responsible for taking their true trash to the central container in their work area. Since the program began, city buildings have increased recycling by over **56%** and more importantly, diverted **112** tons of waste away from the landfill.

CITYWIDE RECYCLING INITIATIVES LAUNCHED IN 2012 INCLUDE:

- Expanded business recycling in the Central Business District to weekly service.
- The first public street-level recycling opportunity, with the installation of solar-powered recycling and garbage compactors throughout downtown.
- A residential pilot program in two neighborhoods where residents were provided with 95-gallon wheeled recycling carts with lids. The program is studying whether having a large container with a lid would encourage residents to recycle more. Data collection is underway to assess the program's success.
- Option for residents in the Urban Services District to purchase 95-gallon wheeled recycling carts.

A UNIQUE RECYCLING PILOT PROJECT WAS LAUNCHED IN THE 9TH DISTRICT BY COUNCILWOMAN TINA WARD-PUGH IN 2010. THE PROJECT PROVIDED CURBSIDE RECYCLING COLLECTION AND WAS THE FIRST BUSINESS RECYCLING PROGRAM OUTSIDE OF THE CENTRAL BUSINESS DISTRICT. PROJECT PARTICIPANTS PURCHASED 95-GALLON WHEELED CARTS AND RECEIVED FREE CURBSIDE SERVICE. THE SUCCESSFUL PROJECT WAS REPLICATED IN OTHER DISTRICTS AND WAS LATER EXPANDED TO ALLOW RESIDENCES IN THE 9TH DISTRICT TO PURCHASE THE LARGE CARTS.

PROPOSED INITIATIVES

Many initiatives in the recycling chapter of the District's management plan align with Louisville's sustainabiliy efforts. For example, the District is investigating options to implement a plastic bag ban for residential yard waste. Plastic bag bans for yard waste are common in other areas of the country and it would go a long way toward keeping compostable materials out of the landfill.

In 2013, plans are underway to study options to manage food waste and keep it out of the landfill. Research shows that food waste can occupy up to 40% of the waste stream so having alternatives to putting it in landfills is a necessary step toward increased landfill diversion rates. Activities such as backyard composting and co-mingling food waste with yard waste are solutions under evaluation that are commonly used in other cities. The city also will launch pilot projects to develop composting programs in school cafeterias.

The short-term goal of these recycling initiatives is to increase recycling by **25%** citywide by 2015. A mid-term goal is to have **90%** residential recycling participation and **50%** landfill diversion by 2025. The long-term goal is to divert **90%** of citywide solid waste away from the landfill by 2042 through increased reduce-reuse-recycle and enhanced materials management practices. A key effort to achieve these goals will be development and implementation of a robust education campaign to inform the public on the value and need to recycle. The city also will launch pilot projects to enhance recycling practices in commercial buildings, restaurants, retail stores and multi-tenant apartments. Lastly, the city will investigate the potential for, and viability of, alternatives to traditional landfill practices such as waste-to-energy and wet/dry segregated disposal.

Goal and Initiatives

ENVIRONMENT

6. Increase recycling city-wide by 25%	**2015**
7. Achieve 90% residential recycling participation	**2025**
8. Divert 50% of solid waste away from the landfill by 2025 and 90% by 2042	**2025**
INITIATIVES	
Pilot expanded recycling for commercial buildings, restaurants, retail stores, and multi-tenant apartments	Underway
Establish partnerships to champion sustainability education and awareness campaigns	Planned
Launch a plastic bag ban for residential yard waste	Planned
Launch a food waste compost pilot project in school cafeterias	Planned
Launch a residential food waste compost pilot program	Planned
Promote food waste composting at all city sponsored events	Planned
Offer composting, yard waste reduction and recycling awareness workshops	Planned
Expand participation in food waste composting to institutional cafeterias citywide	Proposed
Investigate alternatives to landfill waste disposal practices	Proposed

3.0 TRANSPORTATION

TRANSPORTATION IS A KEY COMPONENT OF DECREASING LOUISVILLE'S CARBON FOOTPRINT, MANAGING LAND USE, ENSURING HEALTH AND WELLNESS, FOSTERING ECONOMIC GROWTH AND ENHANCING THE OVERALL QUALITY OF LIFE. AS WITH MANY U.S. CITIES, PASSENGER AND LOCAL COMMUTING IN LOUISVILLE IS BASED PRIMARILY ON AUTOMOBILES AND THE PUBLIC BUS SYSTEM, WITH THE GREATEST PERCENTAGE OF VEHICLE MILES TRAVELED BEING SINGLE-OCCUPANCY CAR TRIPS.

3.1 Transportation Planning

The Metropolitan Transportation Plan, Horizon 2030, is the planning document that reflects all surface transportation investments through the year 2030 in the Louisville Metropolitan Planning Area (MPA). Each transportation project that is regionally significant and/or utilizes federal transportation funds must be identified in the Metropolitan Transportation Plan, providing a vision of how our transportation network will function and appear in the future.

EXISTING EFFORTS

In 2008, Louisville Metro adopted a Complete Streets Policy ensuring that "Louisville Metro's transportation system shall accommodate and balance a broad range of factors within all transportation and development projects…" The goal of this policy is to develop a multi-modal network that manages the demand for travel and improves the efficiency of the community's transportation system as envisioned in Cornerstone 2020. To implement the Complete Streets Policy and the vision of Cornerstone 2020, Louisville is developing a transportation plan that looks at moving people rather than moving cars and studies how all networks are connected and provide mobility within Louisville.

This newly developed plan, called the Multimodal Strategic Transportation Plan (MMSTP), funded in part through a federal grant, will serve as a unique and innovative approach to identify future system needs and community values, and will provide a method to incorporate them into future transportation decisions and solutions. The MMSTP will be a baseline study and should be flexible enough to evolve as community goals are updated. The MMSTP also will help establish criteria to ensure interagency coordination in new project prioritization, availability of matching funds, timeline adjustments, and project withdraws.

More than 60% of Kentucky's transportation funding comes from the state gasoline tax which can be used only for state highway and road projects, not transit. Therefore Louisville is challenged with funding availability for the projects it can implement. However, through completion of these transportation and vision-planning efforts, and integration with triple bottom line sustainability principles, Louisville is poised to implement a comprehensive and sustainable transportation framework.

PROPOSED INITIATIVES

The city will begin preparing the MMSTP in 2013, with an estimated completion date of 2014. Sustainability will be a critical element of this effort and the goals and performance measures that result from the Plan will align with Sustain Louisville. The MMSTP will set specific transportation targets and a full set of sustainability metrics and performance timelines, through rigorous analysis and evaluation.

The Kentuckiana Regional Planning & Development Agency (KIPDA) has initiated a new Metropolitan Transportation Plan called Connecting Kentuckiana. The city and KIPDA will coordinate efforts on both plans to ensure resulting recommendations of each effort are consistent and strategic. City transportation planners will consistently advocate for system-wide sustainability goals, and will continue to research and plan multiple modes of transportation, coordinate land use plans and economic development goals that will facilitate the affordable, efficient, accessible, safe and healthy transport of people and goods. This includes promoting transit-oriented development as a way of planning for more livable, sustainable communities through the integration of transit and development at the community, corridor and neighborhood levels. This coordinated process also will allow for planning of additional transit modes such as light rail.

Goal and Initiatives

TRANSPORTATION	
9. Decrease transportation-related greenhouse gas emissions by 20%	**2020**
INITIATIVES	
Identify sustainability goals for the Strategic Multimodal Transportation Plan and the Metropolitan Transportation Plan that promote transit-oriented development	Underway

3.2 Public Transportation

EXISTING EFFORTS

The availability and use of public transportation is linked to Louisville's sustainability initiatives in all social, economic and environmental aspects. The availability and use of public transportation also is inextricably linked to the region's development patterns. In fact, Louisville's public transit system, TARC, seeks "to explore and implement transportation opportunities that enhance the social, economic and environmental well-being of the Greater Louisville community."

TARC is the only transportation option for many members of our community including people with disabilities. According to KIPDA, 10% of occupied housing in Jefferson County is without a motor vehicle. Some census tract areas have greater percentages of households without a vehicle and have limited mobility options. Economically, TARC is critical for getting people to work and school, which accounts for 70% of the 50,000 trips each weekday. Environmentally, when more people take TARC instead of driving cars, congestion is reduced, resulting in improved air quality and fuel consumption savings.

TARC currently has 224 buses and 89 paratransit vehicles in its fleet. "Frequent service" routes, which schedule buses to arrive in 10- to 20-minute intervals, have demonstrated the popularity of convenient public transportation. TARC began frequent service in February 2011 on two major routes, and ridership on those routes increased 20%. Ridership on a third major route increased more than 8% in September 2012, the first full month of improved frequent service, compared to the same month in 2011. Of course, initiatives that increase the availability and convenience of transit are dependent on additional resources.

Improved infrastructure and transit facilities also help bolster ridership. TARC is working with Metro Public Works, the Louisville Metro Council and the Federal Transit Administration to provide miles of new or restored sidewalks, as well as benches and shelters at bus stops. This program is making it safer and easier to access public transportation especially for people with disabilities.

TARC has a number of public transportation programs to connect people to jobs and educational opportunity, resulting in positive social, economic and environmental benefits. Nearly 14 million TARC trips have been provided under TARC partnerships with Humana, Louisville Metro Government, the University of Louisville and UPS Metropolitan College and School to Work programs. Under these pre-paid programs, affiliates of companies or the university ride fare-free with their company or school I.D. cards. In addition, more than 30 companies take advantage of employer ticket purchasing and/or payroll deduction programs to encourage the use of public transportation.

BICYCLING

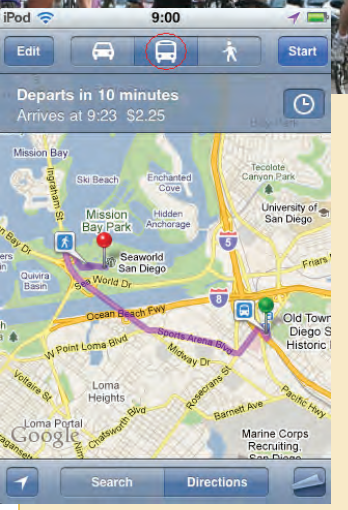
Louisville has 45 miles of on-street bike lanes and has received national attention for its initiatives to promote both utilitarian and recreational bicycling. Bicycle Magazine ranked Louisville as the 21st most bike-friendly city out of the 50 cities surveyed. More walking and cycling, and consequently less dependence on the car, is good for the environment. One of the main contributing factors to climate change is heavy reliance on the car, even for short journeys. Research shows that nearly half of all car trips could be replaced by walking, cycling or public transport. Making more trips on foot or by cycling is a lifestyle change that would help reduce Louisville's carbon footprint. Getting more people walking and cycling requires behavioral change, which also is dependent on making the city's transportation system more environmentally, economically and socially sustainable.

PROPOSED INITIATIVES

TARC has established an ambitious goal of increasing public transportation availability and ridership by 25% by 2018. A 25% increase in ridership would equal 62,500 boardings per weekday, compared to 50,000 currently. To increase ridership, TARC will continue to expand frequent service routes and is evaluating a feeder system concept for potential implementation in Louisville. A feeder system would connect frequent-service buses to job centers and neighborhoods by developing systems with vehicles such as vans and taxis to connect riders in remote areas to major bus lines with high-frequency service.

Louisville Metro Government is evaluating options for a car sharing program, which is a rental model where cars are rented for short periods of time, often hourly. Car sharing is beneficial in many ways, most notably in that vehicle miles traveled per driver decrease almost 50% when car owners switch to car sharing. In addition, car share programs help increase city livability and can reduce harmful air emissions.

Ride sharing is another option that is being evaluated as a way to reduce single-occupancy vehicle trips. Mobile device applications make coordinating ride sharing easier than ever. For example, Avego's free iPhone or Android app enables private cars to become part of the transport network by providing a marketplace for drivers to offer their unused seats to other people in real time. The app matches private car routes with anyone searching for a ride along the same route and also provides fully automated payment transaction management, driver/rider safety features, and commute reporting for more flexible and verifiable ride sharing.



TARC IS CONTINUALLY MAKING SERVICE IMPROVEMENTS AND WILL REPLACE THE EXISTING FARE BOXES WITH A NEW AND MODERN FARE COLLECTION SYSTEM IN 2013. THE NEW FARE COLLECTION SYSTEM WILL IMPROVE OPERATING EFFICIENCY AND DATA COLLECTION ABOUT RIDERSHIP PATTERNS WHICH WILL LEAD TO BETTER PLANNING AND MORE EFFICIENT OPERATIONS. TO MAKE ITS RIDERS' SCHEDULE EVEN MORE CONVENIENT, TARC JOINED GOOGLE TRANSIT FOR ONLINE TRIP PLANNING AND PLANS TO HAVE REAL-TIME BUS ARRIVAL INFORMATION AVAILABLE ONLINE IN 2013. WITH CONTINUED IMPROVEMENTS, TARC RIDERSHIP WILL CONTINUE TO GROW, RESULTING IN LASTING SOCIAL, ECONOMIC AND ENVIRONMENTAL BENEFITS FOR THE COMMUNITY.

TICKET TO RIDE – TARC AND KIPDA OVERSEE A VANPOOL SERVICE FOR AREA COMMUTERS. TARC OWNS AND MAINTAINS THE VANS AND KIPDA COORDINATES THE RIDE SHARING AMONG PARTICIPANTS. THIS WIDELY SUCCESSFUL PROGRAM HAS MORE THAN 625 PARTICIPANTS IN 80 VANPOOLS AND FREQUENTLY HAS A WAITING LIST.

Louisville Metro Government has completed a Bike Master Plan and a Pedestrian Master Plan, which call for expanding the bicycle road and trail system to more than 550 miles, and the pedestrian system to more than 600 miles. To encourage and enable more bicycling as a transportation mode, Louisville is evaluating options for a bike sharing program. Bike sharing is a popular way to address "first/last mile" predicaments often associated with the use of public transportation. Users have access to bikes from multiple bike stations and then have the flexibility to return the bike to any station in the network. Bike share programs typically increase not only bicycling, but also use of public transportation, while simultaneously reducing the amount of cars and resulting air emissions.

Other bicycling initiatives include achieving Gold Level Bicycle Friendly Community Status with the League of American Bicyclists, increasing bicycle facilities by 40 lane miles within three miles of the Central Business District and increasing bicycle ridership by 100% from 2012 levels.

Goal and Initiatives

TRANSPORTATION

10. Reduce vehicle miles traveled by 20%	2025
INITIATIVES	
Launch a bike share program	Underway
Investigate feasibility of car share and ride share programs	Planned
Increase TARC ridership by 25%	Planned
Achieve Gold Level Bicycle Friendly Community Status with the League of American Bicyclists	Planned
Increase bicycle facilities by 40 lane miles within 3 miles of the Central Business District	Planned
Increase bicycle ridership by 100% from 2012 levels	Planned

4.0 ECONOMY

FOR LOUISVILLE TO BE SUSTAINABLE, IT ALSO MUST BE A PLACE WHERE BUSINESSES WANT TO BE – EITHER TO EXPAND OR TO LOCATE NEW OPERATIONS. BY PROVIDING A SKILLED AND READY WORKFORCE AND A WELCOMING ATMOSPHERE FOR INNOVATORS AND ENTREPRENEURS, LOUISVILLE WILL ATTRACT MORE EMPLOYERS AND WORKERS WHO WANT TO LIVE HERE, THEREBY MAKING LOUISVILLE A VIBRANT CITY.

4.1 Economic Development

EXISTING EFFORTS

Louisville Metro Government received federal funding that has helped further sustainability activities, and has initiated projects to assess where Louisville is now and how government can continue to improve. The city was awarded $7 million by the U.S. Department of Energy (DOE) under the American Recovery and Reinvestment Act of 2009 (ARRA) Energy Efficiency & Conservation Block Grant (EECBG), to create different projects or programs that helped foster sustainable behaviors or products for area businesses.

One of the programs is a $1.4 million revolving loan fund, named the Go Green loan program, which offers low-interest loans through the existing Metropolitan Business Development Corporation (METCO) program, to Louisville businesses that create new green products, services or processes. To date, the city has made more than $1.6 million in loans and uses repayment money from the initial loan to continue funding new projects as funds become available.

Other programs funded with stimulus money include energy audits for non-profit organizations, which identified where improvements could be made in their facilities, and an energy efficiency improvement grant, also available to only non-profits, enabling them to implement the improvements outlined in their audits.

In addition to the Go Green loan and the non-profit energy efficiency grants, the city also has instituted four energy-efficiency technology demonstration projects with stimulus funding, to increase energy efficiency and cost savings in city-owned buildings. Louisville is tracking the results of renewable energy technologies on and at government-owned buildings and facilities. As described in Section 1.2, the projects include solar energy and green and cool roofs. Performance data from these efforts will be shared in an effort to identify effective practices and provide a model for the comunity that promotes environmental sustainability and environmentally beneficial initiatives.

BROWNFIELD REDEVELOPMENT

As in most cities around the nation, where Louisville's urban manufacturing and employment center was once booming with jobs and commerce, many of these companies have shut down, or moved to suburban business parks. This leaves underutilized properties, sometimes contaminated, that are eyesores for the surrounding neighborhoods and which often lead to further deterioration. The city continues to mitigate these issues in neighborhoods through actively pursuing grants and brownfield redevelopment opportunities by working with state and federal agencies, and private developers.

By promoting economic growth, job creation and community vitality, the city hopes to attract new employers to these underutilized areas. The west side of Louisville has almost one-fifth of the city's unused land; however, much of this unused land contains abandoned or degraded structures and is, or is perceived to be, contaminated. Louisville is using EPA brownfield community-wide assessment grants as well as contaminant remediation funds to help brownfield redevelopment become a tool for economic revitalization of socio-economically disadvantaged areas that are disproportionately exposed

to environmental degradation, unemployment and low educational attainment.

PROPOSED INITIATIVES

A skilled green workforce will be needed to implement the energy efficiency, alternative energy and alternative fuel and advanced technology vehicle initiatives set forth in this plan. In order to prepare for and take advantage of these and other opportunities, a Green Workforce Advisory Team will be formed to assess how to best support green job training and placement in skilled professional and technical positions for the 21st century. The Advisory Team will identify best practices in defining and tracking "green" job creation. Education and training in energy efficiency and alternative energy options such as solar, geothermal, biomass and advanced technology vehicles and fuels will be promoted.

The Advisory Team will evaluate development of a Green Youth Corps that would support clean technology training through secondary and technical schools such as Jefferson Community & Technical College. This Youth Corps would consist of training and job placement including energy auditors, energy managers, retrofitters, solar panel installers, green roof installers and advanced vehicle and alternative fuel technicians.

Similarly, the Office of Sustainability will research and evaluate opportunities to develop an incentive program for businesses that promote reuse, reduce landfill-bound waste or make sustainable products. One potential mechanism for this initiative is to launch a business plan contest that is geared to encourage entrepreneurs in the creation, startup and early implementation stages of clean economy businesses in Louisville. The contest would focus on identifying opportunities that could help achieve the goals in Sustain Louisville as well as provide economic development and job creation.

Establishing a Green District learning model is a way to leverage existing clean-tech efforts in the community to help attract research, development and technology opportunities. The University of Louisville's Conn Center for Renewable Energy Research, the Ford CNG plant and UPS Worldport are examples of local green technology hotspots where the Office of Sustainability could begin to

Goals and Initiatives

ECONOMY

11. Provide business opportunities for clean economy organizations and innovators and develop a qualified workforce to support it	**2015**
INITIATIVES	
Establish a Green Workforce Advisory Team	Planned
Research best practices for green business incentive programs	Planned
Establish Green Districts to promote and leverage existing green technology efforts	Planned
Launch a clean economy business plan contest	Planned
12. Expand the local food system by 20%	**2018**
INITIATIVES	
Incorporate urban agriculture guidance in 2013 Land Development Code amendments	Underway
Develop a step-by-step guide for citizen engagement in urban agriculture	Planned
Assess opportunities for community and market gardens on vacant and abandoned properties	Planned
Support and expand the Louisville Farm to Table Program	Underway

4.2 Local Food Economy

Louisville began studying the importance of local food in 2007 by researching the economic potential of locally grown food. The study concluded that the economic vitality of our city could be enhanced by supporting local agricultural markets, and making better connections between consumers and farmers. Actions taken as a result of this study have included support of Community-Supported Agriculture (CSA), community gardens and farmers markets. A robust local food program is a key component to ensuring the health, wellness and prosperity of Louisville's citizens.

EXISTING EFFORTS

The Louisville Farm to Table program, launched in 2009, is helping build relationships between Kentucky farmers, consumers and commercial buyers. Louisville Farm to Table's efforts have resulted in approximately $1.2 million in farmers' sales and have raised awareness and interest in local food. Farm to Table hosts workshops for farmers and food buyers, and has worked with the food procurement offices of large institutions such as JCPS, U of L and Jewish Hospital/St. Mary's Hospital System to encourage local food purchasing.

Since 2009, Louisville farmers' markets have expanded from 21 to 27

Louisville Farm to Table also is working with processors to develop and increase local food-processing capacity to serve the institutional and consumer markets. The lack of fresh-cut, minimally-processed and locally-raised fruits and vegetables in Louisville, as well as inadequate meat-processing capacity for locally-raised animals, are impediments to the local food economy.

The Local Food Initiatives Division of Louisville Metro Government works with the Jefferson County Extension Office to promote gardening and manage 10 gardens across Louisville. There are currently more than 70 community and market gardens throughout Louisville, managed either by the Extension Office, neighborhood groups or private citizens. Plans are underway to extend the availability of community gardens through the winter so that gardeners interested in using cold frames or low tunnels can do so. Efforts are being made to amend the Land Development Code to provide guidance for developing community gardens for consumer and commercial agricultural activities. There is an interest in the community to use vacant or abandoned properties for community gardens and this option is under review by city government stakeholders.

Since 2009, Louisville farmers' markets have expanded from 21 to 27. These markets are primarily located in East Louisville, with fewer markets in the west and southwest areas of the community. Efforts were made to develop two markets in West Louisville; however the markets were unsuccessful and closed due to low patronage.

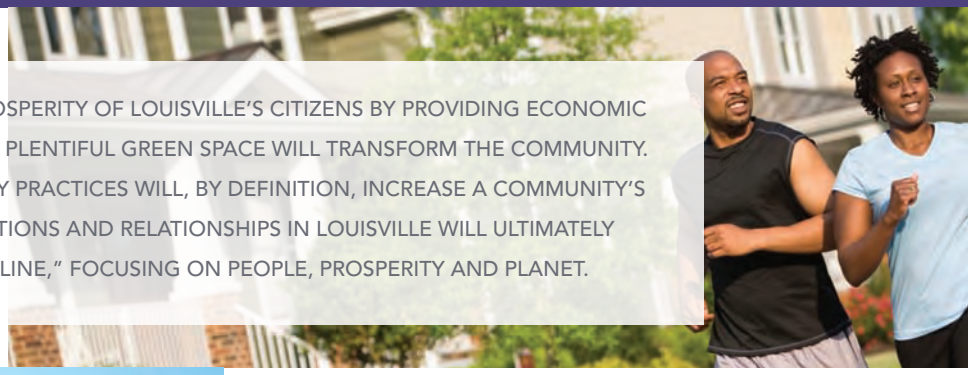
City government is promoting economic development in the local food arena through the Louisville Agribusiness Loan Program, which awards loans for value-added processing of Kentucky-raised food for businesses that relocate to the city's Portland neighborhood. Starting in 2013, the program will award at least five loans with a maximum loan of $100,000, and is administered jointly through METCO and the Kentucky Agricultural Finance Corporation.

In 2012, the Local Food Initiatives Division in partnership with Seed Capital, KY and Karp Resources, conducted a local food demand study for Louisville. The study involved surveying local food demand among consumer and commercial buyers, recording qualitative information about buying habits and experiences with local food, and investigating barriers to increased purchases. The findings of the study are being compiled and will provide information for farmers on the local food market potential for their products, entrepreneurs' interest in local food, and guidance for the Local Food Initiatives Division to improve the local food system.

PROPOSED INITIATIVES

Once the Land Development Code guidance for community gardens has been issued, a step-by-step guide will be developed to engage and educate citizens on urban agriculture practices and requirements. In addition, use of select vacant or abandoned properties as community gardens is being considered.

5.0 COMMUNITY



ENSURING THE HEALTH, WELLNESS AND PROSPERITY OF LOUISVILLE'S CITIZENS BY PROVIDING ECONOMIC STABILITY, ACCESS TO HEALTHY FOODS AND PLENTIFUL GREEN SPACE WILL TRANSFORM THE COMMUNITY. IMPROVING A COMMUNITY'S SUSTAINABILITY PRACTICES WILL, BY DEFINITION, INCREASE A COMMUNITY'S OVERALL QUALITY OF LIFE. COMMUNITY ACTIONS AND RELATIONSHIPS IN LOUISVILLE WILL ULTIMATELY UNITE THE GOALS OF THE "TRIPLE BOTTOM LINE," FOCUSING ON PEOPLE, PROSPERITY AND PLANET.

5.1 Health and Equity

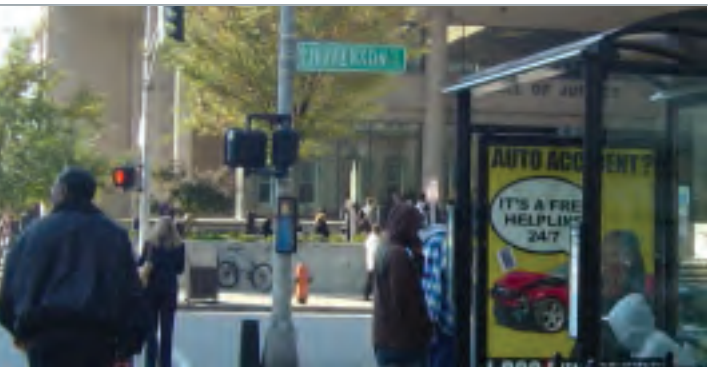
The health and wellness objective of Sustain Louisville increases awareness about everything from healthy food systems, to physical activity, to mitigation of climate change factors such as excessive heat and flooding, to outdoor recreation. Efforts by Louisville Metro's Department of Public Health and Wellness (LMPHW) continue to create a healthier community by identifying and solving community health problems, developing policies and plans that support community health efforts, and evaluating the effectiveness and accessibility of community health services.

Advancing health, health equity and sustainable neighborhoods by linking people to the necessary services, and developing community partnerships, will significantly enhance health outcomes in Louisville. Environmental justice issues ranging from transportation to food access, health hazards and the fair distribution of environmental benefits and burdens are a vital concern in Louisville. With respect to energy, areas of the city with older housing stock which is less energy efficient are frequently where low income persons live, and consequently where a disproportionate amount of occupants income is spent on utility bills. Similarly, Louisville's floodplain maps, when compared to poverty maps, have significant overlap. (Energy efficiency and climate adaptation strategies and goals are described in Section 1.0 Energy.)

Housing and transportation costs often are higher in urban areas relative to suburban areas, and the cost of working around existing infrastructure represents challenges for sustainable transportation and development planning. Providing affordable and accessible public transportation in Louisville which ensures all people can access jobs, health services, and the city's full array of amenities, is a continued challenge. Lastly, the prevalence of underutilized and brownfield properties in the low-income areas of the city is an environmental burden on the area residents. (Transportation and development planning is detailed in Section 3.0 Transportation, and brownfields are addressed in Section 4.1 Economic Development.)

EXISTING EFFORTS

The city recognizes that active lifestyles contribute to long-term health and well-being, and supports many programs to this end. The Mayor's Healthy Hometown Movement endorses community actions that educate and encourage healthy lifestyles for all ages and ability levels. LMPHW offers low-cost fun fitness classes at numerous places across the city and also offers education series on topics such as diabetes, wellness and weight control. More than six in 10 people in Louisville are considered seriously overweight, in a state that ranks seventh in the nation for obesity. The rates continue to rise, while the percentage of the population reporting any physical activity outside of work has remained nearly the same despite public campaigns advocating more walking and biking. Physical activity can reduce the risk of heart disease, stroke and type II diabetes, and also can have a positive impact on general health and psychological well-being.



TRANSIT ACCESS

Approximately 50% of Louisville's population does not own a motor vehicle, necessitating a public transit system that can serve this population and provide transportation throughout the metro area. TARC, the public bus system, is a transit option that helps ensure that every individual has access to medical, social, employment, religious or other needs, which are crucial to maintaining good health and a positive quality of life. Developing accessible transportation services of all modes and for people of all abilities requires active partnerships and collaborations with agencies, organizations and community leaders.

TARC and KIPDA, through its Division of Social Services, have worked together since 2005 to improve access to transportation for elderly and disabled citizens. This partnership resulted in the development of the Regional Mobility Council (RMC), whose vision is "a regional coordinated transportation system that provides accessible, affordable, universal and diverse transportation options. This system meets community transportation needs and serves every person, especially people with disabilities and older adults." The RMC also seeks to identify safe and accessible travel for all users of the road and to ensure that the streets are friendly to all modes of transportation in a context-sensitive manner.

Toward this goal, TARC is continually making safety improvements to streets and sidewalks that ensure safe access to the TARC bus system. TARC's public engagement efforts also advocate for transportation options such as walking and bicycling.

FOOD ACCESS

Healthy eating plays a significant role in public health. To improve access to healthy foods for Louisville residents, Louisville's Local Food Initiatives Division supports a number of efforts across the community. One example is The People's Garden, a community and market garden that was developed with funds from a federal Communities Putting Prevention to Work grant awarded to LMPHW. It includes two high tunnels, a market garden and 16 community garden plots. Produce from The People's Garden's first growing season was sold at local stores and restaurants, including the Healthy in a Hurry corner stores throughout West Louisville.

City government also promotes farmers' markets, and supports the use of electronic benefit transfer (EBT) at those markets as a form of payment. Mobile EBT readers are available at select farmers' markets so that Supplemental Nutrition Assistance Program (SNAP) dollars can be accepted at the market, allowing low- to moderate-income individuals to have better access to fresh produce. Providing additional EBT readers could further promote access to healthy foods.

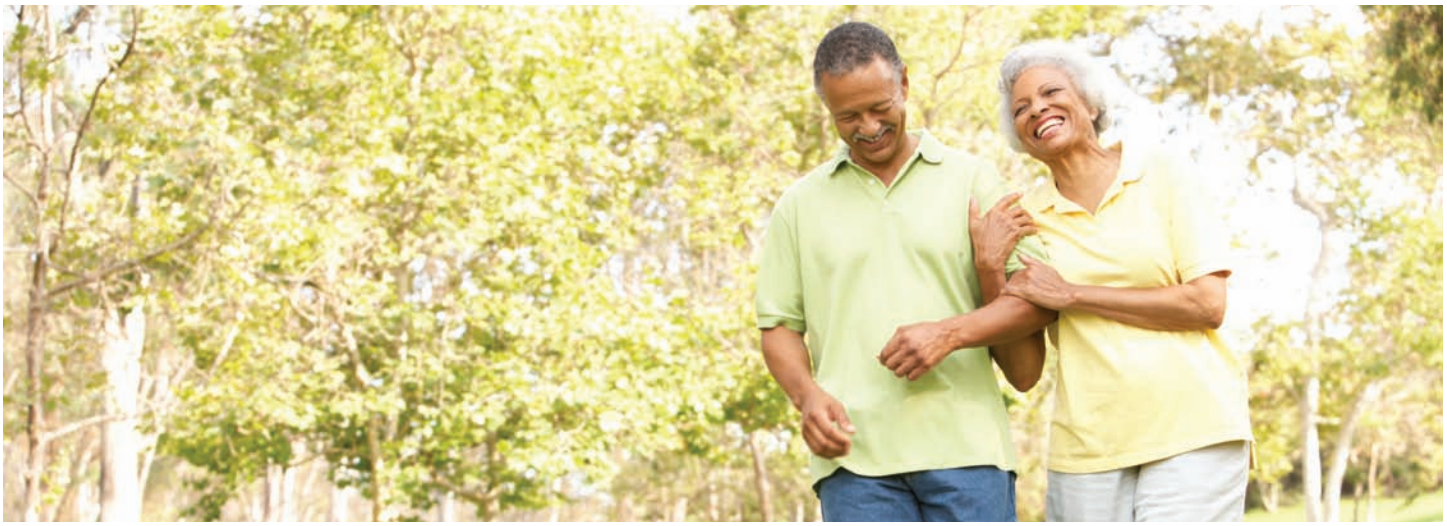
In Louisville's west end and east downtown areas, there is one grocery store for every 25,000 residents, while the rest of the city has one store per 12,500 residents. Such "food deserts" are areas over-served by fast food restaurants and convenience stores, yet underserved by supermarkets and fresh food vendors. The Center for Health Equity, a division of LMPHW, has taken an active role in addressing this inequity by working with partner organizations represented on the Mayor's Healthy Hometown Movement's Healthy Eating Committee. The Center supports farmers markets, community gardens, local food entrepreneurs and policy and economic development strategies that help increase access to healthy food.

The Center for Health Equity partnered with the local YMCA to address the lack of fresh produce and vegetables in low income areas of our community. The resulting initiative, named "Healthy in a Hurry," provided the infrastructure and expertise for six corner stores to sell fresh fruits and vegetables – some of which are locally grown – in an effort to turn a food desert into a food oasis. The Healthy in a Hurry Corner Store initiative makes it possible for residents in food desert neighborhoods to purchase fresh produce and other healthy foods that might otherwise not be available, based on the philosophy that everyone deserves access to fresh, affordable produce. The end goal is to pursue economic development by focusing on full–scale grocery stores in underserved areas, based on the success of the new full-service grocery, First Choice Market, in the Park DuValle neighborhood.

PROPOSED INITIATIVES

Efforts that support physical activity include advancing changes in the community by installing ten Mayors Miles locations, particularly in neighborhoods with connections to the Louisville Loop and areas that connect businesses to destinations downtown. In addition, LMPHW will continue to offer programs and opportunities that promote healthy and active living.

Efforts will be pursued to increase healthy food access by involving youth in urban agriculture entrepreneurship and by increasing the number of community gardens designated as market gardens. The Office of Sustainability also will support the acquisition and expanded use of electronic benefit transfer mobile readers at farmers markets to foster the use of supplemental nutrition assistance program dollars.



Goals and Initiatives

COMMUNITY

13. Increase access to healthy foods by 20%	**2018**
INITIATIVES	
Identify strategies to incentivize grocers to offer healthy food	Planned
Expand the use of electronic benefit transfer mobile readers to three farmers markets	Planned
Open three new farmers markets in underserved areas of the community	Proposed
14. Increase opportunities for active living	**2015**
INITIATIVES	
Install 10 Mayor's Miles locations	Planned

5.2 Sustainable Land Management

AMONG OTHER THINGS, LOUISVILLE'S LAND DEVELOPMENT CODE (LDC) IS INTENDED TO PRESERVE THE NATURAL ENVIRONMENT; PRESERVE THE VALUE OF LAND, BUILDINGS AND STRUCTURES; AND FACILITATE THE ADEQUATE PROVISION FOR TRAFFIC, TRANSPORTATION, WATER, SEWERAGE, SCHOOLS, PARKS AND OTHER PUBLIC REQUIREMENTS. LOUISVILLE'S LDC IS BEING UPDATED AND EFFORTS ARE UNDERWAY TO INCLUDE MORE AGGRESSIVE SUSTAINABILITY GUIDANCE AND STANDARDS.

EXISTING EFFORTS

Current sustainability provisions in the LDC include the Green Building and Site Design Incentives that allow for additional building height and parking reduction for builders and developers who choose to incorporate various design elements, such as proximity to transit corridors, use of paving and roofing materials with high solar reflective index, dedicated open space, parking in shaded areas, use of a vegetative roof and reuse of existing building stock. The Code also includes a subdivision development option called a Conservation Subdivision, which allows greater open space conservation while potentially increasing dwelling unit densities on the most suitable portions of a site.

PROPOSED INITIATIVES

The revised LDC will include sustainability policies, regulations and incentives that facilitate infill development, effective use of existing infrastructure and clean-up, and reuse and rehabilitation of already-developed sites. Land reuse efforts should be a priority and when there is expansion into undeveloped areas, bonuses and incentives should be provided to encourage density for residential use. This not only preserves green space, but density also creates economic vitality by encouraging nearby amenities, reduces car use and increases public transit use. Standardized sustainability elements will be identified for inclusion in all small area, corridor and neighborhood planning projects. In addition, a green pilot project from the SoBro (South of Broadway) Neighborhood Plan will be implemented to showcase sustainable neighborhood planning.

Louisville's Comprehensive Plan, Cornerstone 2020, lacks a dedicated sustainability component and should be amended to include sustainability in order to make overarching changes. The Comprehensive Plan will be updated in 2013 to reflect the latest census information. A major Comprehensive Plan update, which will include a sustainability component, is anticipated to start in 2014 after Phase 2 of Louisville's 25-year Vision is complete. The Office of Sustainability will work with the Department of Planning and Design Services to review these documents and develop a plan to incorporate specific sustainability guidelines.

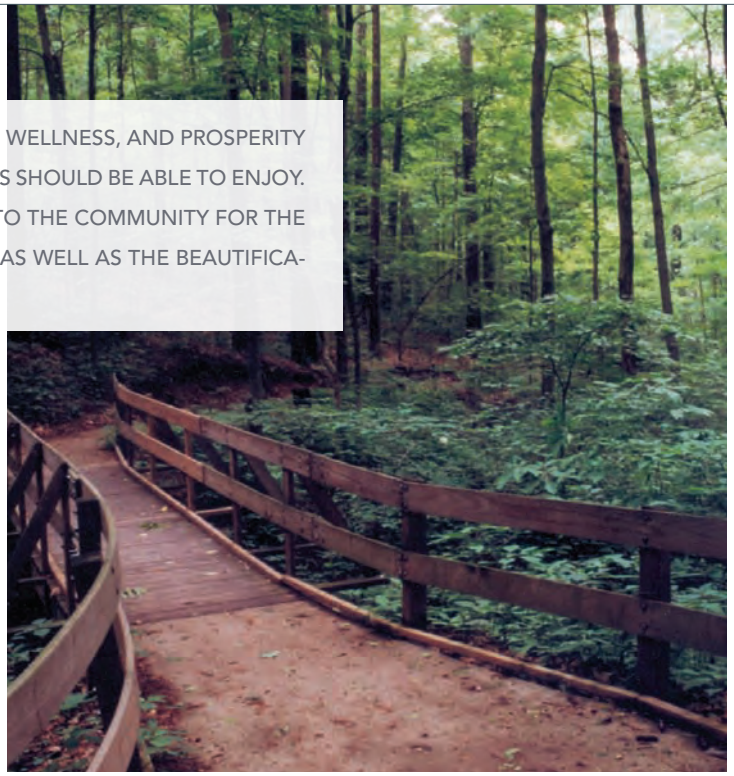
Goals and Initiatives

COMMUNITY

15. Incorporate sustainability into the Land Development Code and the Comprehensive Plan	**2015**
INITIATIVES	
Establish priority sustainability components to include in the Land Development Code and Comprehensive Plan	Underway
Identify standard sustainability elements to include in all small area, corridor and neighborhood plans	Planned
Implement a green pilot project from the SoBro Neighborhood Plan	Planned

5.3 Parks and Green Space

PARKS AND GREEN SPACES ARE VITAL TO ENSURING THE HEALTH, WELLNESS, AND PROSPERITY OF OUR CITIZENS, AND ARE BASIC AMENITIES THAT ALL RESIDENTS SHOULD BE ABLE TO ENJOY. MAINTAINING OUR EXISTING PARKS AND GREEN SPACE IS VITAL TO THE COMMUNITY FOR THE ENVIRONMENTAL BENEFITS SUCH AS CARBON SEQUESTRATION, AS WELL AS THE BEAUTIFICATION AND HEALTHY LIFESTYLE AMENITIES OUR PARKS PROVIDE.



Green space conservation and park creation are investments that can produce significant sustainability and economic benefits for Louisville's visitors and residents. Parks attract non-resident visitors who put new dollars into local economies. Proximity to parks and open space enhances the value of residential properties. Green space captures precipitation, reduces stormwater management costs and protects underground water sources, which can reduce the cost of drinking water up to tenfold. Trees and shrubs enhance air quality and protect animal habitats.

EXISTING EFFORTS

Louisville has more than 12,500 acres of public parks, which are a significant asset to our community. Metro Parks provides and facilitates equitable access to nature-based outdoor recreation and education by connecting all citizens to the environment regardless of their geographic, ethnic and socioeconomic status. As a social equity concern, minorities are generally underrepresented in participation in nature-based outdoor recreational pursuits. The Metro Parks system, including Jefferson Memorial Forest and Natural Areas Division, provides hundreds of opportunities for outdoor recreational activities such as hiking, biking, camping and environmental education programs. Metro Parks also oversees and provides a multitude of services and programs including recreational sporting leagues, community center activities, and aquatics. The Natural Areas Division provides students with nature-based recreation, stewardship and education through its Engaging Children Outdoors (ECHO) program at the Jefferson Memorial Forest.

The Metro Parks Planning, Design and Construction Division develops and implements the Parks and Open Space Master Plan through strategic land acquisition, grant writing, planning, designing and building improvements throughout the Metro Parks system. These efforts improve human and ecosystem health, increase access to parks and trails, expand bike and pedestrian transportation connectivity, and offer opportunities for ecological and cultural tourism.

Metro Parks' Forestry and Landscape Division manages approximately 14,000 trees in the parks and along parkways. The Metro Parks Natural Areas Division has a goal of restoring degraded park natural areas by removing invasive plants and replanting 1,500 native trees and shrubs on approximately five acres per year. These land management activities are vital to the health of the parks' natural areas.

Metro Parks also works to develop and implement the City of Parks Master Plan and partners with organizations like Olmsted Conservancy, 21st Century Parks, the Louisville Metro Parks Foundation and the Louisville/Jefferson County Environmental Trust to protect green space and complete projects like the Parklands of Floyds Fork and the Louisville Loop.

Great parks are part of Louisville's nature, partly due to the work of world-renowned landscape architect Frederick Law Olmsted, who, in 1891, designed Louisville's first park system, which included three large signature parks — Iroquois, Shawnee and Cherokee — all connected by tree-lined boulevards. The Olmsted Parks Conservancy operates to restore, enhance and preserve the Frederick Law Olmsted Parks and Parkways, and works in partnership with Metro Parks on large projects where the Olmsted Parks are located within the Metro Parks system.

THE 21ST CENTURY PARKS' PARKLANDS OF FLOYDS FORK PROJECT IS SCHEDULED TO OPEN IN 2015. THE PARKLANDS PROJECT WILL BE A WORLD-CLASS ADDITION TO LOUISVILLE'S PARKS SYSTEM, AND INCLUDES FOUR MAJOR PARKS LINKED BY A PARK DRIVE, A WORLD-CLASS URBAN TRAIL SYSTEM, AND A REMARKABLE WATER TRAIL, ALL TRACING FLOYDS FORK, A CLASSIC KENTUCKY STREAM. THE UNIQUE PUBLIC/PRIVATE PROJECT ENCOMPASSES NEARLY 4,000 ACRES OF PRESERVED LANDS IN THE LAST UNDEVELOPED CORRIDOR OF THE COMMUNITY. OVER THE ENTIRE DEVELOPMENT OF THE 4,000-ACRE PARKLANDS PROJECT, 21ST CENTURY PARKS PLANS TO PLANT 250,000 TREES.

The Louisville Loop is an estimated 100-mile loop shared-use path system that will leverage the impact of the original Olmsted Parks and Parkway system and help shape the future experience of our community. It will form a network of shared-use paths, soft surface trails, on-road bike lanes, stream corridors, parkways, greenways, and connections to existing bicycle, pedestrian and transit routes. The Loop will be managed and maintained through development of the Louisville Loop Master Plan, which outlines targets for the Loop, including the development of 60 miles in the next five years, and completion of the 100–mile Loop by 2020. Metro Parks partnered with external agencies such as MSD and the U.S. Army Corps of Engineers to integrate green infrastructure, flood protection and stream and bank protection in the Loop design.

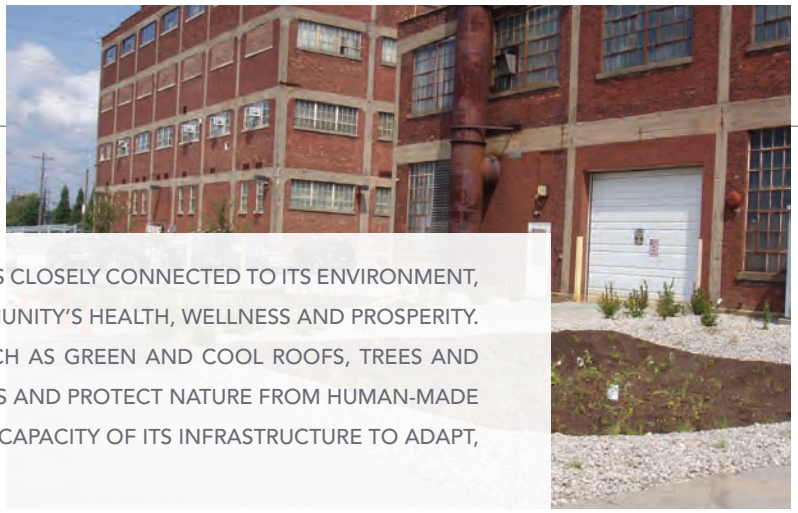
PROPOSED INITIATIVES

To maintain the high caliber of parks in Louisville, Metro Parks Forestry and Landscape Division will implement the City of Parks Master Plan, including land acquisition, planting trees and providing tree care and maintenance designed to expand the urban tree canopy. In addition, the Natural Areas Division will increase the acreage of land that is managed for habitat, outdoor recreation and environmental education. The Natural Areas Division also seeks to engage minority children and their families in nature-based recreation, stewardship and education by expanding ECHO to include an out-of-school time program.

Goals and Initiatives

COMMUNITY

16. Replace and reforest parks property and provide nature-based recreation	2018
INITIATIVES	
Provide out-of-school time nature-based recreation for six schools	Underway
Increase the acreage of natural areas land under active management by 25%	Planned
Acquire 4,000 acres of park land and conservation easements	Proposed



5.4 Green Infrastructure

A CITY'S INFRASTRUCTURE – ROADS, SEWERS, UTILITIES, ETC. – IS CLOSELY CONNECTED TO ITS ENVIRONMENT, WITH BOTH POSITIVE AND NEGATIVE INFLUENCES ON A COMMUNITY'S HEALTH, WELLNESS AND PROSPERITY. HOLISTIC AND INTEGRATED INFRASTRUCTURE ELEMENTS, SUCH AS GREEN AND COOL ROOFS, TREES AND BIOSWALES, CAN PROVIDE SOLUTIONS TO URBAN CHALLENGES AND PROTECT NATURE FROM HUMAN-MADE HAZARDS. A CITY'S RESILIENCE IS OFTEN DEPENDENT ON THE CAPACITY OF ITS INFRASTRUCTURE TO ADAPT, EVOLVE AND IMPROVE TO REFLECT ITS CITIZENS' NEEDS.

EXISTING EFFORTS

Green infrastructure solutions are being pursued by Metropolitan Sewer District (MSD) to help reduce combined sewer overflow (CSO) issues in the city. In 2005, MSD, the U.S. EPA, the U.S. Department of Justice and the Kentucky Department of Environmental Protection (KDEP) entered into a Consent Decree to eliminate sanitary sewer overflows and reduce the volume and frequency of CSOs. This agreement was amended in 2009 and, in response, MSD prepared a plan for reduction and elimination of overflows with approximately $850 million of improvements dedicated primarily to construct storage basins, treatment facilities and increased conveyance piping. The plan includes adaptive management techniques that would allow MSD to utilize green infrastructure, or natural solutions such as vegetated roofs, in-ground storage, rain gardens and pervious pavement, to accomplish the same level of control for sewer overflow reduction. The intent of MSD's Green Infrastructure program is to reduce the amount of stormwater overflow through natural solutions, thus reducing gray project sizes and costs, and signaling a new era in stormwater management in Louisville. Gray projects are the traditional systems of building storage capacity in tanks or other holding structures that simply hold the rainwater during a rain event and thereby reduce the overflow volumes. MSD also completed 19 green demonstration projects, which are being used as testing grounds for monitoring and modeling. The long-term performance of green infrastructure will be documented, including the amount of stormwater runoff captured, maintenance cycles, stormwater infiltration rates and ultimately CSO volumes.

In 2011, MSD launched a Green Incentives and Savings Program, which established financial incentives for private property owners to help offset green infrastructure construction costs, as well as provide an opportunity for credits on stormwater fees for a period of time. The incentives are based upon a business case where the value of removing impervious surface area from the combined sewer system was calculated and quantified by accounting for reduced gray project sizes, and the cost to treat stormwater.

PROPOSED INITIATIVES

To promote green infrastructure practices citywide, the Office of Sustainability will investigate opportunities to collaborate with MSD to expand its incentive program. The program will encourage use of green infrastructure in both redevelopment and new development areas which may be outside of MSD's priority incentive area. For example, establishing best practices and cost-neutral options to build green infrastructure elements will help all developers better handle stormwater runoff. In addition, the city will use green infrastructure elements in all future projects when feasible and based on the project resources.

IN 2010 A COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT BETWEEN EPA'S OFFICE OF RESEARCH AND DEVELOPMENT, UNIVERSITY OF LOUISVILLE AND MSD WAS SIGNED TO EVALUATE GREEN INFRASTRUCTURE ON THE MACRO AND MICRO LEVEL. THIS AGREEMENT WILL PROVIDE DATA ON THE PERFORMANCE OF GREEN INFRASTRUCTURE TECHNIQUES, MAINTENANCE CYCLES, AND MODELING OF OVERFLOW REDUCTION THROUGH THE WIDESPREAD AND TARGETED APPLICATION OF GREEN PRACTICES IN DIVERSE WATERSHEDS. A NUMBER OF PROJECTS ARE BEING MODELED, EVALUATED OR ARE IN DESIGN.

Goals and Initiatives

COMMUNITY	
17. Expand green infrastructure incentives citywide	**2018**
INITIATIVES	
Identify green infrastructure best practices and launch an incentive program	Planned

5.5 Tree Canopy and Urban Heat Island

TREES PROVIDE MANY BENEFITS TO THE COMMUNITY IN ADDITION TO BEAUTIFICATION. TREES FILTER AIR POLLUTANTS, PROVIDE SHELTER AND SHADE, AND REDUCE STORMWATER RUNOFF, ALSO KNOWN AS ECOSYSTEM SERVICES. TREES ARE AN ESSENTIAL ELEMENT TO COMBAT URBAN HEAT ISLAND (UHI) EFFECTS, WHICH HELP ENSURE THE HEALTH, WELLNESS AND PROSPERITY OF OUR CITIZENS. UHI DESCRIBES THE PHENOMENON WHERE CITIES ARE HOTTER THAN THE SURROUNDING SUBURBAN AREAS. THE MAIN CONTRIBUTORS TO THE UHI EFFECT ARE LOW AMOUNTS OF VEGETATION, HIGH COVERAGE BY IMPERVIOUS SURFACES AND LOW COVERAGE BY UNPAVED SOIL, WHICH WOULD OTHERWISE HOLD COOLING MOISTURE BETWEEN RAIN EVENTS. BUILDINGS AND ROADS CONTRIBUTE GREATLY TO THE HEAT ISLAND BECAUSE THEY TYPICALLY ABSORB A HIGH PERCENTAGE OF INCIDENT SOLAR ENERGY AND HAVE A HIGH HEAT STORAGE CAPACITY.

A robust urban tree canopy conveys tremendous advantages to many environmental challenges as well as improving the quality of place and economic value of the places where people live and work. Benefits of urban forests also include energy efficiency, carbon sequestration and stormwater runoff mitigation. The right tree properly placed can help reduce energy usage for heating and cooling homes and buildings. A single tree can store almost 100 gallons of stormwater, which is significant for green infrastructure and stormwater mitigation efforts, particularly in urban settings. As mentioned in Section 5.2, Land Development Code revisions are underway which will update the tree canopy regulations to better support the rebuilding of Louisville's declining tree canopy.

Hot cities are uncomfortable. Excess heat strains infrastructure, raises energy costs, exacerbates chronic illnesses and contributes to premature death. According to recent studies by Kalkstein L., Greene S., Mills D., Samenow S. and Dr. Brian Stone with Georgia Institute of Technology, Louisville's UHI problem is escalating faster than most urban areas around the country. Addressing UHI and related health issues with a comprehensive, strategic approach is a priority for Louisville.

The science behind UHI mitigation is fairly straightforward. Materials with low reflectivity and low emissivity get hot in the sun and stay hot longer. In contrast, temperatures can be significantly cut through the use of reflective roofs, green roofs, green walls, emissive building and infrastructure materials, cool infrastructure, and notably, shade trees.

EXISTING EFFORTS

In 2012, Mayor Fischer signed an Executive Order that created the Louisville Metro Tree Advisory Commission to advise city officials on the development of policies to better care for, preserve, expand and improve Louisville's existing tree canopy and to plant new trees. The Tree Commission is actively seeking partnerships and contributions, including in-kind donations, to undertake projects that will help grow Louisville's tree canopy.

The Commission is working on tree planting projects with non-profits, schools and MSD, ensuring that all donated trees are properly cared for and maintained. In 2012, the Commission received a generous tree donation from Ecotech LLC of 100 trees per year for 10 years. The Commission will continue efforts to partner with the community, organizations and developers to increase, improve and care for the city's tree canopy.

PROPOSED INITIATIVES

The Tree Advisory Commission will facilitate preparation of an urban tree canopy analysis and develop a plan to support the Mayor's goal of planting 10,000 trees by 2015. Tree-planting efforts will focus on areas of greatest need and will target areas where co-benefits can be realized, such as planting trees in locations that provide green infrastructure and stormwater mitigation while also providing shade and energy efficiency benefits for adjacent buildings.

Part of a plan to address UHI will include implementing new approaches to infrastructure construction and maintenance practices that incorporate cool elements. The Office of Sustainability will research programs and best practices and prepare a guidebook on how to implement cool infrastructure practices. (Green and cool roof initiatives are described in Section 1.0 Energy.)

Because reducing the local impact of the UHI effect can slow down ozone formation in Louisville, a critical piece of improving air quality, a partnership will be formed to establish mitigation goals with key stakeholders who will help identify the data needs, coordinate community resources and engage individuals and businesses to help improve Louisville's UHI issues.

Goals and Initiatives

COMMUNITY

18. Establish a robust urban tree canopy and implement strategies to mitigate the urban heat island effect — **2018**

INITIATIVES	
Update the Land Development Code to better support the growth and protection of Louisville's tree canopy	Underway
Complete an urban tree canopy analysis and establish tree planting goals	Planned
Complete planting of 10,000 trees	Underway
Establish community partnerships and implement strategies to mitigate the UHI effect	Underway

6.0 ENGAGEMENT

ONE OF MAYOR FISCHER'S TOP GOALS IS TO MAKE LOUISVILLE A HEALTHIER CITY – PHYSICALLY, ENVIRONMENTALLY, SOCIALLY AND FINANCIALLY. CREATING A CULTURE OF SUSTAINABILITY BY ENGAGING AND EDUCATING CITIZENS ON THE NECESSITY OF SUSTAINABILITY PRACTICES WILL HELP MAKE LOUISVILLE A MUCH HEALTHIER CITY. COMMUNITY AWARENESS, UNDERSTANDING AND ACTION ARE KEY ASPECTS OF LOUISVILLE'S FUTURE, AND THE OFFICE OF SUSTAINABILITY SEEKS TO ENGAGE CITIZENS AND STAKEHOLDERS TO BROADEN THE UNDERSTANDING OF THE NEED FOR SUSTAINABILITY PLANNING AND ACTION.

EXISTING EFFORTS

Since it was formed in January 2012, the Office of Sustainability has engaged hundreds of citizens to discuss Louisville's sustainability programs and goals. Engaging the community in sustainability is perhaps the most vital aspect of Sustain Louisville because in order to become a truly sustainable city, every citizen must understand the principles as well as participate in efforts to achieve Sustain Louisville's goal. Examples of community engagement activities, organizations and initiatives are described below.

BRIGHTSIDE

SINCE 1985, BRIGHTSIDE HAS BEEN KEEPING LOUISVILLE CLEAN AND GREEN, AND HAS BEEN UNITING PEOPLE WITH ACTIVITIES TO BEAUTIFY THE CITY AND FOSTER COMMUNITY PRIDE. BRIGHTSIDE IS UNIQUE BECAUSE IT FUNCTIONS AS A PUBLIC/PRIVATE PARTNERSHIP, MERGING THE RESOURCES OF CITY GOVERNMENT WITH THOSE OF PRIVATE CITIZENS. IN ADDITION TO COMMUNITY-WIDE CLEANUPS THAT INVOLVE THOUSANDS OF VOLUNTEERS, BRIGHTSIDE ALSO OFFERS NATURESCAPE BEAUTIFICATION PROJECT GRANTS, COMMUNITY GARDEN PROGRAMS AND WILDFLOWER AND TREE-PLANTING EFFORTS.

CYCLOUVIA

In October 2012, Louisville held its first-ever open street event, called CycLOUvia. A three-mile stretch of one of Louisville's most bustling urban corridors was closed to vehicles, and citizens were encouraged to walk, cycle, skateboard or dance along Bardstown Road and Baxter Avenue. With the aspiration of making it a semi-annual or annual event, CycLOUvia raises the awareness of transportation alternatives and helps to make Louisville a more active, healthy and livable city.

GREEN TEAM

The Office of Sustainability launched a cross-functional, city employee Green Team to help create a culture of sustainability in city government. Green Team volunteers represent more than 20 city departments and agencies, and are working to raise awareness of sustainable practices at work, and developing and implementing programs and policies toward this end. In 2012, the Green Team grants committee submitted two grant applications and will continue applying for additional grant opportunities as they arise. In addition, the education committee is partnering with the Office of Sustainability on several ongoing projects, including the city's expanded recycling program and the community sustainability education pilot program described below.

CENTER FOR NEIGHBORHOODS GREEN INSTITUTE

THE GREEN INSTITUTE IS AN ENVIRONMENTAL LEADERSHIP/EDUCATION PROGRAM ESTABLISHED IN 2012 BY THE CENTER FOR NEIGHBORHOODS, A NON-PROFIT CIVIC ORGANIZATION. THE GREEN INSTITUTE EQUIPS NEIGHBORHOOD LEADERS WITH THE SKILLS AND RESOURCES NEEDED TO IMPROVE THE ENVIRONMENTAL, SOCIAL AND ECONOMIC SELF-DIRECTED NEIGHBORHOOD SUSTAINABILITY PROJECTS BASED ON ACTIONABLE COMMUNITY INITIATIVES THAT IMPROVE THE VITALITY AND LONG-TERM SUSTAINABILITY OF THE PARTICIPANTS' COMMUNITIES.

MAYOR'S HIKE, BIKE & PADDLE

Recognizing that providing active lifestyle options will create healthy options and opportunities for citizens of Louisville and Kentucky, the Mayor's Healthy Hometown Initiative's signature event, the Hike, Bike & Paddle series, takes place three times a year on Memorial Day, Labor Day and a weekend in October. Mayor Fischer re-energized the series in 2011 by adding a paddling component as well as Tai Chi and Yoga programs. All activities are free and open to all community members and visitors, encouraging citizens to make healthy lifestyle choices. Nearly 20,000 people participate in the three activities each year.

PROJECT WARM

SINCE 1982, PROJECT WARM HAS PROVIDED FREE WEATHERIZATION SERVICES TO PEOPLE WITH LOW INCOMES, AS WELL AS ENERGY CONSERVATION EDUCATION AND TRAINING THROUGH WORKSHOPS AND SPECIAL PROGRAMS. PROJECT WARM'S GOAL IS TO RAISE AWARENESS ABOUT REDUCING ENERGY CONSUMPTION AND PRACTICING CONSERVATION, WHICH LEADS TO SAVING MONEY AND PROTECTING THE ENVIRONMENT. VOLUNTEERS ARE TRAINED TO PERFORM ENERGY AUDITS AND INSTALL WEATHERIZATION MATERIALS IN HOMES, WHILE EARNING FREE MATERIALS FOR THEIR EFFORTS. PROJECT WARM IS A NON-PROFIT ORGANIZATION FUNDED IN PART BY LG&E AND THE CITY.

SUSTAINABILITY EDUCATION

The Office of Sustainability launched a pilot program to engage organizations in sustainability planning, setting goals, and promoting a consistent message about the value and need for sustainable practices citywide. The program was launched as part of a summer intern's project with the Partnership for a Green City, and was introduced to a small group of organizations to share best practices and resources and to offer guidance for developing their sustainability goals. This program can be replicated and scaled up to reach many organizations and help engage the business community to implement sustainable practices and contribute to achieving Sustain Louisville's goals.

PROPOSED INITIATIVES

Since it was formed in January 2012, the Office of Sustainability has engaged hundreds of citizens to discuss Louisville's sustainability programs and goals. Engaging the community in sustainability is perhaps the most vital aspect of Sustain Louisville because in order to become a truly sustainable city, every citizen must understand the principles as well as participate in efforts to achieve Sustain Louisville's goal.

The Office of Sustainability will engage with the community to assess and develop concepts for launching a signature project. This project will be a big, bold effort that will unite Louisville's citizens around a large-scale sustainability project. Ideas could be leveraged from the Phase 1 Research and Discovery efforts of Vision Louisville, such as making the Fairgrounds carbon neutral, creating a solar power program, or establishing a public transportation asset such as light rail or rapid bus transit. All ideas are welcome, with a particular emphasis on those that are specific, measurable, attainable, realistic and time-framed.

Other city departments and non- and for-profit organizations will be brought together to expand existing sustainability efforts, identify champions and develop a broad-based education and awareness program for the community.

Much as the Louisville Energy Alliance is partnering with the city on the Energy Star challenge, organizations will be invited to create similar public private partnerships toward achieving the Sustain Louisville goals. These collaborations would help establish out-of-school programs for children that promote interactions with the natural environment as well as education and outreach initiatives for businesses and the community through workshops and robust internet and social media campaigns.

The Office of Sustainability will work with the Partnership for a Green City to develop a program to better integrate sustainability components at local schools, from elementary to secondary programs. Environmental literacy helps individuals recognize the components of healthy natural- and human-made systems, and the actions necessary to maintain, restore and improve them. The Partnership for a Green City is leveraging the skills of its member institutions to develop a sustainability education pipeline. JCPS students have Environmental Magnet options at Cane Run and Portland Elementary Schools as well as Valley Traditional, Moore Traditional, and Waggener Traditional High Schools. JCTC and the Kentucky Community & Technical College System are developing a "2+2" Sustainability degree program that would allow 2-year associate or technical sustainability degrees to transition to a four-year sustainability degree program at the University of Louisville or other universities. These curricula additions will create a seamless transition that meets the needs of students and provides them opportunities to continue their sustainability education.

The Office of Sustainability will leverage existing research activities at UofL and other universities to establish a sustainability education and behavioral program that will implement and evaluate change. This program will focus not only on educating the public on best practices but also will identify mechanisms to influence true behavior change. The program could have broad impacts on Louisville's citizens, community groups and businesses as behavior change initiatives generate success and gain momentum.

Goals and Initiatives

ENGAGEMENT

19. Engage the community in sustainability practices and principles	**Ongoing**
INITIATIVES	
Launch a community engagement process to develop a signature sustainability project	Planned
Establish partnerships to provide sustainability education programs for the community, children and organizations	Planned
Offer sustainability-based community education programs and workshops	Proposed
Coordinate with academic institutions to support sustainability education and awareness programs	Proposed

7.0 CONCLUSION

Work toward achieving the Plan's goals has already begun. As a dynamic plan, Sustain Louisville will continually improve and evolve to meet the community's needs, and new objectives, goals and initiatives will be developed as necessary.

Realizing the goals identified in Sustain Louisville into fruition will require the community's involvement. Individuals, organizations, and businesses can make a large collective impact in their individual efforts to achieve Sustain Louisville's goals by modeling Louisville Metro Government's existing efforts, proposed initiatives and programs, or by partnering with the Office of Sustainability to implement citywide sustainability programs and initiatives.

Participation and support are welcome as the city unites multiple sustainability objectives that together will ensure a vibrant, prosperous and healthy community with a better quality of life for all Louisville citizens now and in the future.

Sustain
LOUISVILLE

ACKNOWLEGEMENTS

THANK YOU TO THE MANY PEOPLE WHO PROVIDED CONTENT, INPUT AND FEEDBACK TOWARD PREPARATION OF SUSTAIN LOUISVILLE. THESE INDIVIDUALS HELPED DEVELOP THE GOALS AND INITIATIVES THAT ARE IDENTIFIED IN THIS TRANSFORMATIONAL SUSTAINABILITY DOCUMENT AND WERE VITAL TO THE PREPARATION OF SUSTAIN LOUISVILLE.

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MARCH 2013

Appendix C

LMAPCD Integrated Action Plan

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
1	The Board continues to recognize and consider the District's expertise and recommendations	-----	• Board requested APCD review of recommendations and subsequent prioritization of recommendations as an implementation plan	Ongoing	---		2	28
2	Continue to give updates on the status of major projects monthly	APCD Policy	• APCD provides periodic reports at Board meetings and other occasions	In Progress	---		3	
3	Continue to implement the permit improvement process and enhance evaluation criteria to give priority to pollution prevention projects	APCD Policy	• APCD is continuing to optimize its permitting processes	In Progress	S			34 35
4	Continue to apply for grant funding for projects that reduce mobile emissions	Funding	• Assisted with applications to retrofit JCPS fleet • Assisted with application for CMAQ funds awarded for UPS biodiesel infrastructure project • Applied for CMAQ funds to replace switch engines at P&L Rail • Seeking funding sources and working with GLI's Logistics Network to develop project ideas • Awarded one EPA DERA and 3 Kentucky Clean Diesel grants	Ongoing	M	4 6 23 27 28	10 28 32	6 15 26 52 63
5	Continue to identify and evaluate opportunities to provide incentives to businesses to voluntarily reduce emissions from mobile sources	Outreach & Education	• Awarded DERA P.O.W.E.R. loan in 2008, but no entity applied for a loan	Complete	M	4 6 20 23	28	6 15 55 63
6	Continue to evaluate opportunities to increase utilization of, and incentives for, alternative modes of transportation, e.g. bike/ped and transit	Outreach & Education	• APCD participates in the Mayor's Healthy Hometown Pedestrian Summit and Bike Summit • KAIRE continues to collaborate with TARC on projects • Added Forecastle Festival to annual events for sponsorship by KAIRE • Improved bike/ped access included in Sustain Louisville comprehensive sustainability plan	In Progress	M	2 5 10	29	16

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion…	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
7	Continue to encourage Metro Fleet Services to review its current fleet and create a plan to improve fleet emissions and provide technical assistance when appropriate	Outreach & Education	• APCD has implemented DERA grant funds for 65 diesel emissions retrofit projects on onroad and nonroad vehicles	Complete	M	4 6	24 25	7 13 14
8	Continue to increase public awareness and access to funding sources to address pollutants from mobile sources	Outreach & Education	• The Idle Free Louisville outreach program was developed in 2011 and has partnered with more than 40 schools, businesses, organizations, and neighborhoods. • KAIRE conducts annual media campaign to promote air pollution awareness on local TV, radio, and web • KAIRE included in Sustain Louisville comprehensive sustainability plan • APCD created air quality awareness PSA with Metro TV. • KAIRE continues to seek collaboration opportunities with Metro TV.	In Progress	M	2 5 7 9 10	23 31	24 28 48 50 51 52
9	Continue to increase public awareness and access to funding sources for energy efficiency projects	Outreach & Education	• Participating in PGC's Energy Use Partnership • Added a webpage of links to energy efficiency and renewable energy programs and information as part of its leadership of the CCC	In Progress	S	7 8 9		28 41 42 43 53 54
10	Continue to increase public awareness and access to funding sources to address pollutants from area sources (e.g. charcoal grills, woodstoves, etc.)	Outreach & Education	• APCD created an open burning PSA to run on Metro TV.	Complete	A	7 9		28 44 46 47 49 59
11	Continue to attend regular meetings of the KCFC and increase participation to support its work	Partnership	• Attending quarterly meetings	Ongoing	M	3	26	26 62

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
12	Continue to partner with Metro sister agencies to assess and advocate for signal synchronization and TRIMARC improvements and assist funding searches	Partnership	• Attending TRIMARC meetings	Ongoing	M	16 24	20 21	17 18
13	Continue to attend regular meetings of the PGC, highlight the importance of emission reduction projects and encourage high priority be given to energy efficiency projects and the use of alternative fuels and technologies by PGC entities	Partnership	• Attending meetings • Provide assistance to Partners in preparing emission reduction grant applications • Chaired CCC and provided staff support to subcommittees. Completed Climate Action Report April 2009 & continuing to implement recommendations.	Ongoing	All	8	24 25 32	7 8 20
14	Continue cultivating a relationship with the Louisville RAA and provide technical assistance when appropriate	Partnership	• APCD provided comment on emissions inventories for LRAA, including Standiford and Bowman Fields • Partnered with LRAA to retrofit 6 onroad diesel vehicles with DOCs using DERA grant funds	Ongoing	M	14 17 25		
15	Continue to participate in the interagency consultation process to analyze air quality impacts from transportation projects and emphasize the need to minimize traffic backups and delays	Partnership	• APCD reviews all Metro road construction projects • APCD collaborates with partners in an Interagency Consultation MOU authored by KIPDA, the MPO for the MSA	Ongoing	M	11	22	10
16	Continue to enforce existing APCD regulations and address identified and future emission sources through additional regulation	Regulatory	• APCD is preparing to propose several regulatory actions that will reduce emissions from perc dry cleaners, offset lithography printing, plastic parts coating and vehicle idling	Under development	All	1 18 19	9 13 14 15 16 17 18	21 22 23 33 39
17	Continue to develop, propose and revise SIP submissions in concert with the states of Kentucky and Indiana	Regulatory	• Convene stakeholder groups for ozone and fine particles • Provide technical assistance when appropriate	Under development	—			38

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
18	Continue convening ad hoc stakeholder groups on an issue-specific, as-needed basis	Stakeholder Group	• APCD convened the IRWG in 2008 to assist in the development of a draft regulation to reduce idling of mobile sources	Complete	---		8	28 29 30
19	Send a letter to the Kentucky Fabricare Association requesting that they purchase the LDAR unit and begin preparation for a required training course	Partnership	• LDAR unit purchased and in use since 2009; a training program is under development. • Newly hired staff member is currently in training to perform inspections.	Complete	S		14 15	
20	Convene idling reduction working group	Stakeholder Group	• Stakeholder advisory group report with 14 recommendations was released in August 2008	Complete	M	1	9	33
21	Include link to federal grants (grants.gov) on the APCD website	Outreach & Education	• Links to awards are cited as grants become available	In Progress	---		28 32 34 35	6 11 15 52
22	Send a letter to GLI encouraging the creation of a "Green Star" recognition program	Outreach & Education	•Discuss concept with Office of Sustainability, which would need to coordinate program criteria development and implementation among several Metro departments.	In Progress	All	7	31	50 54
23	Send a letter from the Director, Board and/or Mayor to encourage LMPD & regional law enforcement to strictly enforce speed limits to improve air quality	Outreach & Education	• Public information officer will draft letter with guidance from Director and Environmental Programs	In Progress	M	12		2
24	Send letter to county officials in each of the NAAQS nonattainment counties in the Louisville MSA encouraging the enactment of local ordinances to restrict open burning, emphasizing the need for a ban on days when Air Quality Alerts have been issued	Outreach & Education	• Public information officer will draft letter with guidance from Director and Enforcement Chief.	In Progress	A			4
25	Send letters to KY DAQ and IDEM regarding issues of open burning and NAAQS attainment	Outreach & Education	• Public information officer will draft letter with guidance from Director and Enforcement Chief.	In Progress	A			3 5

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
26	Request Metro & others to include preference for contractors that provide the best emissions profile in contracts and provide technical assistance when appropriate	Outreach & Education	• APCD staff participating in SEDC Construction Committee efforts to draft model contract language • APCD staff to discuss potential purchasing preferences and contract language using EPA's National Clean Diesel Campaign resources.	In Progress	M	17 25		12
27	Develop a presentation to educate local businesses and organizations (e.g. Home Builders Association of Louisville) about the District's fugitive dust regulation	Outreach & Education	• Public information officer will facilitate with guidance from Enforcement Chief.	In Progress	A			23
28	Develop a presentation to educate citizens and local businesses about the District's open burning regulation	Outreach & Education	• APCD staff updated its open burning brochure in 2012	Complete	A			22
29	Produce new open burning PSA for Metro TV to include information on updates to the regulation and encourage citizens to report illegal burning activities	Outreach & Education	• APCD staff created a PSA in 2008 that can be watched at: http://youtu.be/fFGW510vbCw; APCD also distributes an open burning brochure and maintains an open burning webpage.	Complete	A			22
30	Advance efforts to establish tire pressure stations and free gas cap programs	Partnership	• APCD staff explored several partnering opportunities in 2007; project did not move forward due to potential liability issues	Complete	M	13	30	19
31	Advise Metro sister agencies that APCD stakeholder processes recommended actions affecting their operations	Partnership	• APCD staff continues to collaborate with sister agencies to reduce emissions.	Complete	M	12		11 14
32	Work with JCPS to reduce idling through education and outreach	Partnership	• JCPS has issued an Idle Free bus fleet policy and actively promotes Idle Free campuses in collaboration with KAIRE.	In Progress	M		23	
33	Propose offset lithography regulation to Board	Regulatory	• Draft regulation released for informal external review • Under staff review	Under develop-ment	S A	18		
34	Revise STAR regulations	Regulatory	• Revisions completed June/July 2011	Complete	S			

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
35	Propose a Board resolution to encourage the Mayor to issue an executive order requiring the use of biodiesel and other alternative fuels and technologies	Regulatory	• Metro fleets currently 5% biodiesel blend	Under development	M		24 25	14
36	Assess risk from gas stations	Research	• Initial assessment began in 2008 and subsequently as needed	Complete	A		4	
37	Finalize IRWG Advisory Report	Stakeholder Group	• Completed October 2008	Complete	M	1	9	33
38	Begin promoting free on-board diagnostic testing programs	Outreach & Education	Implemented 2009	Complete	M	13	30	19
39	Produce fugitive dust PSA for Metro TV to include information on the regulation and encourage citizens to report fugitive dust events	Outreach & Education	• Enforcement Division will assist public information officer in the production of a PSA.	In Progress	A			23
40	Propose idling restriction package to Board	Regulatory	• Ordinance proposal presented to Metro Council in late 2009 (APCD regulation under consideration) • Began Idle Free campaign 2011	Under development	M	1	9	33
41	Rollout public education campaign for idling restriction and begin outreach to affected businesses	Outreach & Education	• Initiated in Fall 2011	In Progress	M	1	9	33
42	Educate the community on land use and site planning techniques that improve air quality and public health	Outreach & Education	•APCD staff participating in the public LCD Improvement process in order to bring air quality considerations into the discussion. •APCD intern currently researching near-road air quality impacts. Research will continue and include near road and "hot spot" (distribution centers, depots, etc.) mitigation strategies.	In Progress	M		33	

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
43	Send letters to the KY EEC, IDEM and IN OED encouraging the creation of an interstate stakeholder group to improve air quality through coordinated regional efforts to address modeling, monitoring, emissions inventory methods and sources by sector	Outreach & Education	• Public information officer draft letters under direction of APCD leadership.	In Progress	All	11		1 9 25 26 27 31 36 40 45 53 56 57 58 60
44	Redesign the District's website to make information on air quality issues more accessible to the regulated body and the general public	Outreach & Education	• Internal workgroup updated and implemented a major revision in 2010 & is on-going	In Progress	All	5 8 9	23 32 33	22 23 28 44 47 49
45	Coordinate with GLI to meet with businesses with fleets to assess the next steps needed to increase availability and use of vehicles that use alternative fuels and technologies	Partnership	• Under consideration at GLI	In Progress	M	3	27	61
46	Prepare for land use and transportation planning stakeholder group	Research	• APCD intern recently completed research on near-road air quality impacts. Research will continue and include near road and "hot spot" (distribution centers, depots, etc.) mitigation strategies.	Complete	M	10 11 15 21 22 26	11 12	16 32 37 60
47	Revise stack height regulation to include minimum stack height and rain cap removal	Regulatory	• External workgroup met and determined that the recommendation would void equipment warranties.	Complete	S A		18 19	

District Integrated Action Plan
Proposed Timeline for Implementation

No.	Action	Implementation Category	Steps taken toward completion...	Status	Group			
					Source Sector	Ozone Rec#	STAR Rec#	PM2.5 Rec#
48	Review EPA designations for the 24-hour fine particle standard and determine whether to reconvene the Fine Particle Air Quality Task Force in light of available monitoring and emissions data	Stakeholder Group	• Unnecessary because the Louisville area is attaining the standard.	Complete	All			30
49	Partner with Metro Planning and Design to convene a land use and transportation planning stakeholder group of local planners and developers to create a best practices guide to reduce air quality impacts from development	Stakeholder Group	• APCD staff is currently participating in the public LDC Improvement process in order to bring air quality considerations into the discussion and build partnerships.	Ongoing	M	10 11 15 21 22 26	11 12	16 32 37 60
50	Rulemaking for dry cleaning regulation package	Regulatory	• Developed and currently issue standardized permits	Complete	S A		14 16 17	
51	Revise miscellaneous metal parts regulation and include rules for plastic parts coating	Regulatory	• Revisions to proposed Regulation 2.02 resolve this issue	Under develop-ment	S A	19		
52	Partner with Metro Planning and Design to promote the best practices guide created by the land use and transportation planning stakeholder group	Partnership	•APCD staff is currently participating in the public LDC Improvement process in order to bring air quality considerations into the discussion and build partnerships.	Ongoing	M	10 11 15 21 22 26	11 12	16 32 37 60
53	Finalize best practices guide of land use and transportation planning stakeholder group	Stakeholder Group	• APCD staff is currently participating in the public LDC Improvement process in order to bring air quality considerations into the discussion and build partnerships.	Ongoing	M	10 11 15 21 22 26	11 12	16 32 37 60

List of Acronyms

APCD	Air Pollution Control District
CCC	PGC Climage Change Committee
CMAQ	Congestion Mitigation and Air Quality
DAQ	Division for Air Quality
DERA	Diesel Emissions Reduction Act
DOC	Diesel Oxidation Catalyst
EEC	Kentucky Energy and Environment Cabinet
EPA	Environmental Protection Agency
GLI	Greater Louisville Inc
IAP	Integrated Action Plan
IDEM	Indiana Department of Environmental Management
IRWG	Idling Reduction Working Group
JCPS	Jefferson County Public Schools
KAIRE	Kentuckiana Air Education
KCFC	Kentucky Clean Fuels Coalition
KIPDA	Kentuckiana Regional Planning & Development Agency
LDC	Land Development Code
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
LDAR	Leak Detection and Repair
LMPD	Louisville Metro Police Department
OED	Indiana Office of Energy Development
P&L	Paducah and Louisville Railway
Perc	Perchloroethylene
PGC	Partnership for a Green City
PSA	Public Service Announcement
LRAA	Louisville Regional Airport Authority
SEDC	Southeast Diesel Collaborative
STAR	Strategic Toxic Air Reduction
TARC	Transit Authority of River City
TRIMARC	Traffic Response and Incident Management Assisting the River Cities

Source Sectors

A - Area
M - Mobile
S - Stationary
All - Area, Mobile and Stationary

Key for Implentation Plan Tab, Column F

Complete - Concluded activities or inactive at the moment
In Progress - Initiatives underway
Ongoing - Outreach and development action items
Under Development - Regulatory matters

Links to stakeholder reports

Ozone Report http://www.louisvilleky.gov/NR/rdonlyres/BFB56EFA-1324-4EE7-987F-E4AE58F07087/0/FinalAQTF_Report.pdf
STAR Report http://www.louisvilleky.gov/APCD/Stakeholder/STAR5-30StakeholderGroup.htm
PM2.5 Report http://www.louisvilleky.gov/NR/rdonlyres/5D2FB2EB-BFA8-4A65-8289-EA108AC7CB06/0/AQTFPMRAPAFINAL.pdf
Idling Report http://www.louisvilleky.gov/NR/rdonlyres/65D21FA5-4CBD-465D-B8EA-159C912593CB/0/IRWGAdvisoryReportFINAL20081015.pdf

Appendix D

Stakeholder Recommendations on Idling Reduction

MEMORANDUM

TO: Senior Staff
FROM: Lauren Anderson, Louisville Metro Air Pollution Control District
DATE: June 26, 2013
RE: Proposed idling regulation

What is idling?

- Idling occurs when a vehicle's main engine is running but the vehicle is not moving; or the engine of a piece of offroad equipment is running when the equipment is not being used for work.

Why should we reduce idling in Louisville?

- Like driving, idling releases emissions into the air. Unlike driving, most idling is unnecessary.
- Reducing idling will:
  - Reduce unnecessary emissions of ozone precursors, fine particles, toxic chemicals and greenhouse gases.
  - Improve public health by reducing air pollution that can contribute to increased rates of asthma, other respiratory illnesses and cancer.
  - Reduce fuel consumption in Louisville by an estimated 4.2 million gallons annually.

Why is APCD developing an idling regulation?

- Three stakeholder groups APCD worked with recommended idling reduction as an effective strategy to reduce air pollution from ozone, fine particulates, and toxics.
- In response, APCD formed the Idling Reduction Working Group (IRWG) to help examine issues associated with a restriction to reduce idling. The IRWG report can be found on APCD's website at: http://www.louisvilleky.gov/NR/rdonlyres/65D21FA5-4CBD-465D-B8EA-159C912593CB/0/IRWGAdvisoryReportFINAL20081015.pdf.

What does the draft regulation provide?

- The draft regulation:
  - Prohibits idling of motor vehicles and nonroad equipment.
  - Does not apply to vehicles in traffic.
  - Applies to owners as well as operators.
  - Provides defenses for owners.

What does the draft regulation exempt?

- The draft regulation exempts activities and conditions that require idling. This includes idling that is necessary for health or safety or to operate machinery. There are ten exemptions listed in the draft regulation that cover every occasion when idling might be necessary the IRWG members could think of.

Attached:

- Pages 2-4: Members of Ozone, PM2.5, and STAR 5.30 (air toxics) stakeholder groups
- Pages 4-5: Recommendations from Ozone, PM2.5, and STAR 5.30 reports re idling
- Page 6: Members of Idling Reduction Working group

List of all the stakeholders from each of the 3 groups that recommended idling as a control measure

Ozone Air Quality Task Force (2003 – 2006, reconvened 2008)

1. C. Bruce Traughber – Louisville Metro Economic Development Department
2. Leslie Barras – River Fields
3. Graham Baughman – Thornton Oil
4. Christy Brown – Louisville Stoneware
5. Bill Conway – Louisville Coalition of Neighborhoods
6. Tim Corrigan – The Rotunda Group (Greater Louisville, Inc.)
7. Tom FitzGerald – Kentucky Resources Council
8. Arnita Gadson – University of Louisville; West Jefferson County Community Task Force
9. Charles Garmon – Wooded Glen Retreat and Conference Center
10. Tim Hagerty – Frost Brown Todd (Greater Louisville, Inc.)
11. Dennis Karl – Ford Motor Company
12. Judge Mary Ellen Kinser – Oldham County Judge-Executive
13. Dewey McClearn – Representing Bullitt Co. Judge-Executive
14. Reginald Meeks – KY State Representative
15. Pat Moran – Stites & Harbison
16. Larry Palmer – University of Louisville
17. Suzy Post – Metropolitan Housing Coalition
18. Dr. Robert Powell – Norton Healthcare
19. Jack Ragland – Southern Indiana Economic Development
20. Bill Samuels – Maker's Mark
21. George Siemens – Louisville Gas & Electric
22. Councilwoman Mary Woolridge – 3rd District

STAR Regulation 5.30 Stakeholder Group (2006 – 2007)

1. J. Barry Barker – Transit Authority of River City
2. Russ Barnett – University of Louisville
3. Leslie Barras – River Fields, Inc.
4. Derek Bland – Houston-Johnson, Inc. [Greater Louisville, Inc.]
5. Gregory Brotzge – Kentucky Paint Council
6. Wallace Deener – Louisville Metro Development Authority
7. Carolyn Embry – American Lung Association of Kentucky
8. Mary Rose Evans – Louisville Neighborhoods
9. Tom FitzGerald – Kentucky Resources Council
10. Chuck Fleischer – Jefferson County Public Schools
11. Mike Fothergill – Holiday Cleaners
12. Christopher French – Louisville Metro Planning and Design Services
13. Arnita Gadson – University of Louisville, West Jefferson County Community Task Force
14. Sam George – American Commercial Barge Lines
15. Tim Hagerty – GLI Environmental Affairs Committee
16. Susan Hamilton – Metro Development Authority
17. Matt Hanka – University of Louisville Center for Sustainable Urban Neighborhoods

18. Cathy Hinko – Metropolitan Housing Coalition
19. Melissa Howell – Kentucky Clean Fuels Coalition
20. Mark Hussung – GE Consumer & Industrial
21. Dr. John Lewis – KIESD [Greater Louisville Medical Society] and Health Care Excel of Kentucky
22. Joan Lindop – Sierra Club
23. Jesse Mayes –Kentucky Transportation Cabinet Division of Planning
24. Cam Metcalf – University of Louisville, KY Pollution Prevention Center
25. Kirsten Morell – United Parcel Service
26. Mike Mulheirn – Jefferson County Public Schools Division of Facilities
27. Anne K. Nash – Highland Cleaners
28. Patrick Peak – Ivy Hill Corporation
29. Dionne Reams – University of Louisville student
30. Karen Scott – Louisville Regional Airport Authority
31. Barbara Sexton Smith – Air Pollution Control Board
32. William Somplatsky-Jarman – Presbyterian Church USA
33. Dr. David Tollerud – University of Louisville
34. Dr. Adewale Troutman – Department of Public Health and Wellness
35. David Wicks – Jefferson County Public Schools
36. Mark Young – Grinstead Group [auto body repair]

Fine Particle Air Quality Task Force (2007 – 2008)

1. Tony Arnold – University of Louisville
2. Graham Baughman – Thorntons Inc.
3. John Brazel – Associated General Contractors of Kentucky
4. Lona Brewer – Kentucky Division for Air Quality
5. Christy Lee Brown – Community Representative
6. Dennis Conniff – Frost Brown Todd LLC (Greater Louisville, Inc. Air Toxics Task Force)
7. Tim Corrigan – The Rotunda Group (Greater Louisville, Inc.)
8. Pat Daniel – Indiana Department of Environmental Management
9. Sharon Dodson – E.ON U.S.
10. Jamie Fiepke – Kentucky Motor Transport Association
11. Tom FitzGerald – Kentucky Resources Council
12. Arnita Gadson – University of Louisville; West Jefferson County Community Task Force
13. Tim Hagerty – Frost Brown Todd LLC (Greater Louisville, Inc. Environmental Affairs Committee)
14. Dr. Lauren Heberle – University of Louisville
15. Regina Henry – Cemex Kosmos Cement Company
16. Wayne Hicks – Transit Authority of the River City
17. Mark Hussung – General Electric
18. Bill Jacob – United Parcel Service
19. Rick Larkins – Highview Fire District
20. Dr. John Lewis – Greater Louisville Medical Society
21. Jesse Mayes – Kentucky Transportation Cabinet
22. Heidi McKenzie – Ford Motor Company
23. Wallace McMullen – Sierra Club

24. Patrick Moran – Community Representative
25. Suzy Post – Metropolitan Housing Coalition
26. Dr. Robert Powell – Norton Healthcare (Greater Louisville Medical Society & Louisville Metro Air Pollution Control Board)
27. Karen Scott – Regional Airport Authority
28. Kevin Spangler – OxyVinyls, L.P.
29. Jim Vaughn – Jefferson County Public Schools
30. Dan Weiss – Duke Energy
31. Paul Wheatley – One Southern Indiana

Pages from the 3 reports that discuss idling

From the *Louisville Air Quality Task Force Report* (2006)

The Air Quality Task Force recommended "idling restrictions, especially diesel engine idling" as a strategy to reduce emissions from mobile sources. (pg 7)

"Businesses and local government need to address the impact of fleet vehicles as well. Certainly, strategies that encourage fleet vehicle maintenance, that restrict idling, and that provide support for diesel retrofitting of fleet vehicles should be explored. Businesses and local government should work together to increase the number of docking facilities for powering electric compressors to replace the use of diesel engines. Local government also may develop incentives to encourage new fleet vehicles that burn cleaner fuel or use hybrid technology to reduce emissions." (pg 27)

A 2007 violation of the National Ambient Air Quality Standard for ozone obligated the Air Pollution Control District to review the 8-hour ozone contingency plan and determine which additional emission reduction measures should be pursued to address the violation. The District reconvened the Ozone Air Quality Task Force in early 2008. The Task Force held two stakeholder meetings, coming to a consensus that the adoption of two regulations, an offset lithography regulation and an idling restriction regulation, were sufficient to meet the federal requirement. (Board Minutes March 19, 2008).

From the *STAR Regulation 5.30 Stakeholder Group Report and Plan of Action* (2007)

"…the [Mobile and Non-road Mobile Source] Committee determined four major categories of strategies available for reducing adverse impacts from mobile and non-road mobile source emissions that could be addressed at the local level. The categories included retrofitting and upgrading equipment, reductions in idling, the use of renewable and/or alternative fuels and technologies, and long-range land use and transportation planning. The Committee also recognized the importance of new federal engine requirements and fuel standards in reducing emissions from mobile sources. However, the federal Clean Air Act does not provide regulatory authority for local jurisdictions, like the District, to strengthen these federal regulations. The Committee discussed recommendations for each of four categories of strategies and agreed upon more than twenty strategies to reduce adverse impacts from mobile and non-road mobile source emissions." (pg 56)

"The [Mobile and Non-Road Mobile Source] Committee agreed that idling is a significant source of toxic emissions. The Committee also endorsed a diesel engine idling regulation. However, there was not consensus among all Committee members on the specific language of a draft idling regulation. The Committee recommended the Air Pollution Control Board's adoption of an idling regulation, to be initiated by convening a stakeholder process. The Committee agreed that the EPA's model state idling law, as slightly revised by the District into regulation form, included as Appendix 16, should serve as a starting point for discussion.

"Beyond a regulation, several other idling reduction strategies were discussed. The Committee was particularly concerned with potentially significant increases in idling and toxic emissions from the Louisville-Southern Indiana Ohio River Bridges project and other major development planned for the region in the near future. The Committee recommended significant coordination among state and local transportation officials and private fleets from both sides of the Ohio River during major highway repair and construction projects to develop plans to minimize traffic backups and delays. Increased coordination will reduce idling and toxic emissions.

"The Committee believed that developing an outreach program to discourage idling at public and private schools, expanding the synchronization of traffic signals throughout Louisville, and improving the Traffic Response and Incident Management Assisting the River Cities (TRIMARC) system are important strategies to help reduce idling and the resulting toxic emissions.

Recommendation 2:

> *Initiate a stakeholder process for local adoption of an idling regulation with the proposed draft regulation, included as Appendix 16, as a starting point for discussion.*" (pg 58)

From the *Fine Particle Air Quality Task Force Report and Plan of Action* (2008)

"Louisville Metro and the states of Kentucky and Indiana do not have idling restrictions or regulations. The Committee discussed the connection between idling reduction, especially of diesel vehicles, and reductions of direct $PM_{2.5}$ and precursor emissions. The Committee agreed with the conclusion of the STAR 5.30 Stakeholder Group that an idling regulation is needed in this community. The Committee further addresses idling reduction in Section 7.3.3 of this Report.

Recommendation 8:

> *The District should initiate a stakeholder process for local adoption of an idling regulation with the proposed Draft Idle Reduction Regulation (included as Appendix 10) used as a starting point for discussion.*" (pg 48)

The Task Force included this committee recommendation as one of eight Leading recommendations that should be give implementation priority. (pg. 53-54)

Members of Idling Reduction Working Group

A. J. Borromeo
MV Transit

Mike Cecil
JBS Swift & Company

Tim Corrigan
Greater Louisville Inc.
Environmental Affairs Committee

Bill Doggett
E.ON U.S.
Alt. Steve Ramsey

Gay Dwyer
Kentucky Retail Federation

Liz Edmondson
Kentucky Resources Council
Alt. Tom FitzGerald

Jamie Fiepke
Kentucky Motor Transport Association

Chuck Fleischer
Jefferson County Public Schools
Alt. Jim Vaughn
Alt. Ike Pinkston

Major Glen Gagel
Louisville Fire Department

Keith Hackett
Public Works & Assets
Solid Waste Management Division

Lauren Hardwick
Greater Louisville Inc.
Logistics Network

Dr. Lauren Heberle
Center for Environmental Policy and Management
University of Louisville

Greg Hicks
Public Works & Assets
Operations and Maintenance

Wayne Hicks
Transit Authority of the River City
Alt. Jim Barrett
Alt. William Harris

Melissa Howell
Kentucky Clean Fuels Coalition

Robert Lee
National Solid Wastes Management Association

Ted Mason
Kentucky Grocers Association
Kentucky Association of Convenience Stores

Jesse Mayes
Kentucky Transportation Cabinet

Michael Nelson
Rumpke Consolidated Companies, Inc.

Judy Nielsen
Louisville Metro Health and Wellness

Shawn O'Connor
Enterprise Rental
Commercial Truck Division

Dr. Neal Richmond
Louisville Metro Emergency Medical Services
Alt. Michael Will
Alt. Bill Pasel

Bryan Slade
Industrial Disposal

Dave Vogel
Louisville Water Company
Alt. Kate Farrow

Mathew Welch
Jefferson County Attorney's Office

Shannon Williams
Louisville Transportation Company

Lieutenant Ryan Wilfong
Louisville Metro Police Department