



OFFICE OF  
PERFORMANCE  
IMPROVEMENT  
AND INNOVATION

Proposal for air quality awareness initiative:  
“100 Points of Light”

Objective: Increase situational awareness of air quality to at-risk populations in Louisville, Ky.

Start Date: January 2018

Summary: Design, create and deploy RGB LED light bulbs with instructions and promotional materials that connects with the Office of Civic Innovation’s IFTTT initiative to communicate air quality levels to at-risk Louisville citizens in public buildings, schools, eldercare facilities or other locations. This kit will retrieve the Air Quality from Louisville Metro Government's Air Pollution Control District and update the LIFX bulb colors to correspond with the federal AQI color scheme.

Root Cause: Asthma affects an estimated 14.9 million Americans and its prevalence is highest in the South, with over 220,000 Kentuckians affected. Nearly 72 percent occur in persons under age 45 and the prevalence is increasing in nearly all population groups, especially children. There were 5,338 deaths nationwide in 1997 due to asthma and 86 deaths in Kentucky during the same year. There are approximately 9 million physician office visits related to asthma annually nationwide, and there were 6,482 hospital discharges with that diagnosis in Kentucky during 1996. This indicates that there is a heavy illness burden from this disease, but death from asthma is uncommon.<sup>1</sup>

COPD effects an estimated 16.5 million Americans. It is the fourth leading cause of death in the United States and in Kentucky. It caused 106,027 deaths nationwide in 1996 and 1,979 deaths in Kentucky in 1997. The disease is primarily a disease of older persons and is rare in younger age groups. Its prevalence has been estimated as high as ten percent of the population greater than age 55. Both prevalence and mortality have increased markedly during the last two decades, especially in persons over the age of 65.

Asthma contributes to substantial economic burden in Kentucky each year. The U.S. Centers for Disease Control estimates that in 2014 asthma cost Kentucky \$399 million in direct medical costs and \$46 million in indirect costs associated with missed school days, missed work days and early death. In 2014, there were 19,678 emergency department visits with a primary diagnosis of asthma

amounting to total billed charges of over \$42 million. Also in 2014, there were 5,111 hospitalizations with a primary diagnosis of asthma with total billed charges of over \$150 million. The average length of an asthma hospital stay was 4.5 days with an average charge of \$29,446. About 23 percent of these charges were billed to Medicaid and 28.5 percent of the patients were covered by Medicaid. <sup>4</sup>

AIR Louisville, a first-of-its-kind data-driven collaboration among public, private and philanthropic organizations to use digital health technology to improve asthma, calculates the healthcare costs of living in polluted air. Based on the data collected from 1,147 participants, they can estimate the healthcare costs of a high ozone day. When ozone exceeds the EPA limit of 70 parts per billion, the community could expect to see more than 65,000 asthma rescue inhaler uses among all people with asthma in Jefferson County. That adds up to healthcare costs of up to \$129,000 on just that day. In 2016, ozone exceeded the 70 ppb limit on 19 days, so those high ozone days could translate to more than \$2.4 million in healthcare costs. <sup>5</sup>

Asthma affects more than 140,000 Louisvillians, or about 12 percent of the population, and is the leading cause of children's missed school days, according to the American Lung Association in Kentucky. The national average of asthma sufferers is 9 percent.<sup>2</sup>

On days when summer smog – or ozone pollution – gets bad enough to exceed the federal health standard, Louisville asthmatics would be expected to reach for their emergency inhalers 14,437 more times, costing them some \$28,584 additional medication expenses.

Scope: The targeted area is the entirety of Jefferson County, prioritizing at-risk population centers such as eldercare facilities, as defined by EMA/Metrosafe (See LOJIC ArcGIS layer)

Along with this deployment, we will commit to supporting a media awareness campaign in partnership with Air Pollution Control District (APCD), to publicize the program.

The first deployment wave will consist of 100 kits deployed in & around the Jefferson County area, and then expanding to other locations as dictated by demand and public building locations.

Sign up form & website to receive kit, outside of initially identified deployments locations. This website will also include a map of deployed locations.

After placing kits in Jefferson County, we will work with APCD to identify the neighborhoods most likely to have at-risk air quality populations to expand our target deployment.

KPI reporting: Monthly written progress updates with performance reports of kit adoption.

Cost: There are 3 tiers of deployment that are in scope

(1) Kit - Bill of Materials

<i>Description</i>	<i>Cost</i>
1 RGB LED Light Bulb	~\$53.00
1 Printed Instruction Sheet	~\$1.00
3 Informational Stickers	~\$3.00
<u>Recycled Packaging</u>	<u>~\$0.50</u>
	~\$57.50
 <u>100 Kits</u>	 ~\$5,750
<u>300 Kits</u>	~\$17,250
<u>500 Kits</u>	~\$28,750

Project Duration: 1 – 3 Months, with potential hand off to Air Pollution Control District

Project Close: Lessons Learned & Post Mortem briefing to include OPI leadership & staffing, possibly Institute for Healthy Air, Water, Soil; Air Louisville

Project Outcome Communicate air quality information to at-risk population. Reduce air & breathing related incidents that require either a hospital visit or medication usage (inhaler or breathing treatment) by 25% per occurrence day. This would equate to \$32,350 in savings per occurrence day, or an estimated \$612,750 in 2016, from just 19 bad ozone days. This does not include other factors which may cause medication usage or hospital visits.

Sources:

- 1 - <http://chfs.ky.gov/NR/ronlyres/F64BDA29-5054-4131-8214-F52FE0DCA9EA/0/HKY2010Ch24.pdf>
- 2 - <http://www.courier-journal.com/story/tech/science/environment/2017/06/28/hey-theres-app-that-asthma-attack-risk-covers-much-louisville/397768001/>
- 3- <https://www.ncbi.nlm.nih.gov/pubmed/10390402>
- 4 - <http://chfs.ky.gov/NR/ronlyres/23A767BB-66D2-4F3D-A060-C81F8F5A36C3/0/2016KentuckyStatePlanforAddressingAsthmarevised.pdf>
- 5 - <https://www.airlouisville.com/results.html>