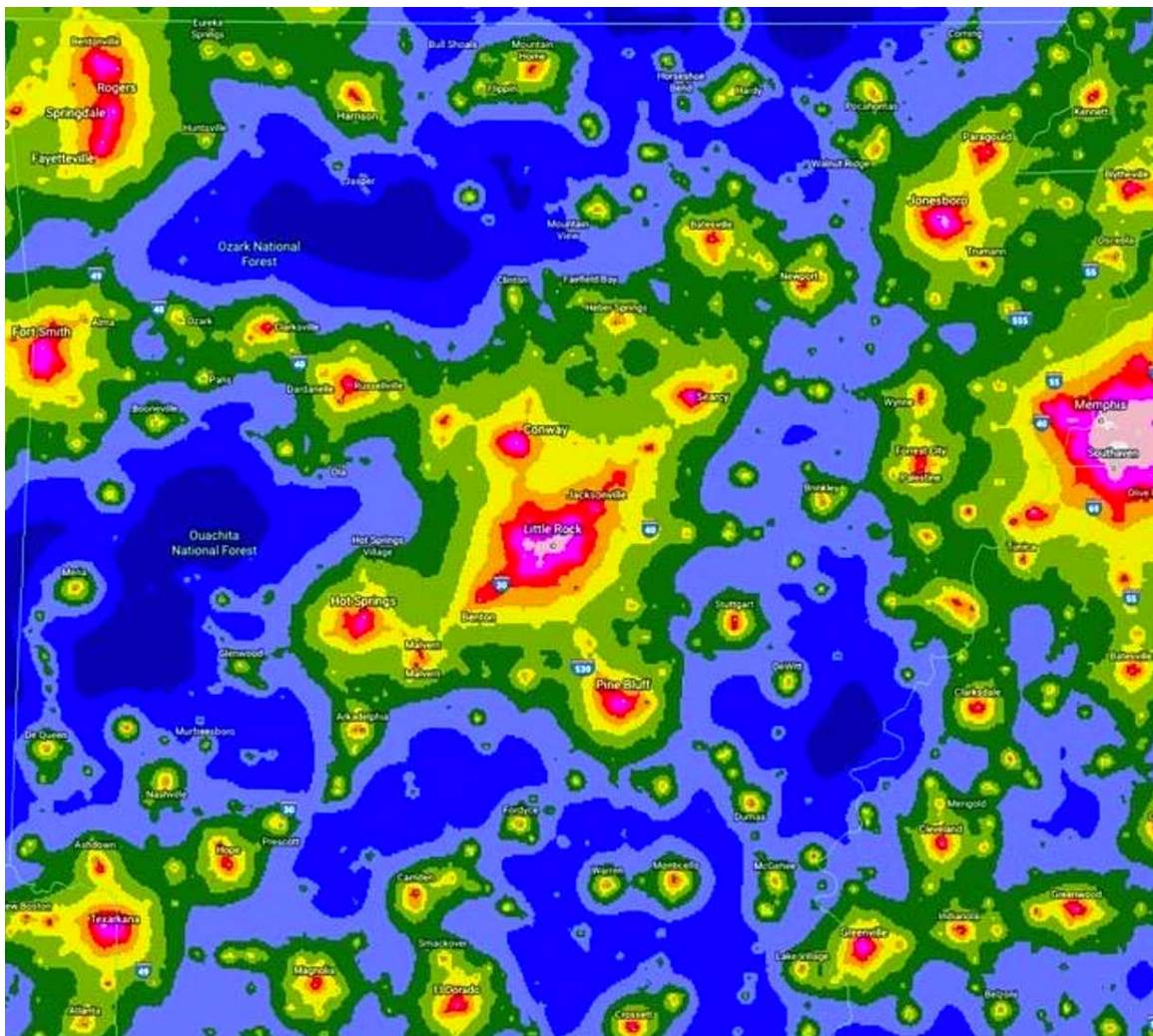


2020 ARKANSAS MUNICIPAL ENVIRONMENTAL RESPONSE SURVEY

Energy, Carbon and Light Pollution



Light pollution map covering Arkansas: Memphis (center right), Little Rock (center), Texarkana (lower left), Fort Smith (upper left), Fayetteville et. al. (upper left corner). There is no place in Arkansas where the sky is devoid of artificial light – even in the National Forests. (darkskyfinder.com)

The Arkansas Natural Sky Association (ANSA)

EXECUTIVE SUMMARY

This document summarizes the first biennial environmental response survey of Arkansas' 25 largest municipalities.

Freedom of Information requests were submitted seeking documents that would reflect each community's efforts to track and reduce energy consumption, carbon production and light pollution.

Only five communities could document efforts to formally track energy consumption, and only two of these had documented programs to reduce energy consumption. Only two communities are documenting their carbon footprint and only one has a documented plan to reduce its carbon footprint.

The latter is also the only community that has resolved to become carbon free by a given date and has its public buildings enrolled in an energy efficiency program.

On the light pollution front, four communities have adopted some form of lighting ordinance, but only three have any written policy pertaining to lighting specifications relevant to reducing light pollution. The only community known to have a master lighting plan was too small to be included in this survey.

On the basis of this survey, Arkansas communities have a lot of room to improve their environmental impacts.

PURPOSE OF THE SURVEY

The purpose of the survey is to discover and document what the state's 25 largest municipalities by population are doing to address their environmental footprint in the areas of energy consumption, light pollution, and carbon emissions. The Arkansas Natural Sky Association (ANSA) is an affiliate of the International Dark-Sky Association (IDA). Its mission is to advance policies and practices to eliminate light pollution and its impacts on the nocturnal environment, wildlife, human health, community aesthetics, safety, and sky-glow. Because lighting is a significant user of energy, addressing light pollution necessarily involves energy conservation and the pollution associated with energy production, including carbon emissions. Accordingly, it was determined that the survey should address the full spectrum of environmental stewardship relevant to the proper use of outdoor lighting.

METHODOLOGY

ANSA previously attempted a less structured survey, but the response was poor. Formulating the survey as a Freedom Of Information request made response more certain. The limitation of the FOIA process is that one can only require the production of existing documents.

ANSA is an all-volunteer organization, and hence the requests had to be limited to minimize the volume of documentation to be reviewed. It was also desirable to minimize the demands place on the responding cities. Accordingly, the request was for documents that would best reveal the existence and scope of a municipality's efforts to address the topics of interest. ANSA invited respondents to elaborate if the requested documents would not fairly reflect the efforts being made regarding the subject matter of the requests. Where such elaboration was provided and found relevant, it is shared below in the discussion of each municipality.

Among the documents requested were those concerning the following:

- Quantifying energy use and/or plans to conserve energy.
- Quantifying and/or reducing a carbon footprint.
- Resolutions or other documents committing the respondent to a carbon emission neutral goal.
- Ordinance(s) regulating the use of outdoor lighting.
- A master lighting plan or other document(s) setting forth criteria or specifications the city follows in selecting new outdoor lighting fixtures.
- Documents reflecting the city's participation in programs such as LEED for Cities, Arc for Cities, or the Energy STARS program.

Before reviewing the results of the survey, a brief explanation as to why ANSA believes municipal governments should be concerned with addressing the matters at issue here. As the need to conserve energy is obvious, we confine our comments to carbon emissions and light pollution.

CARBON EMISSIONS

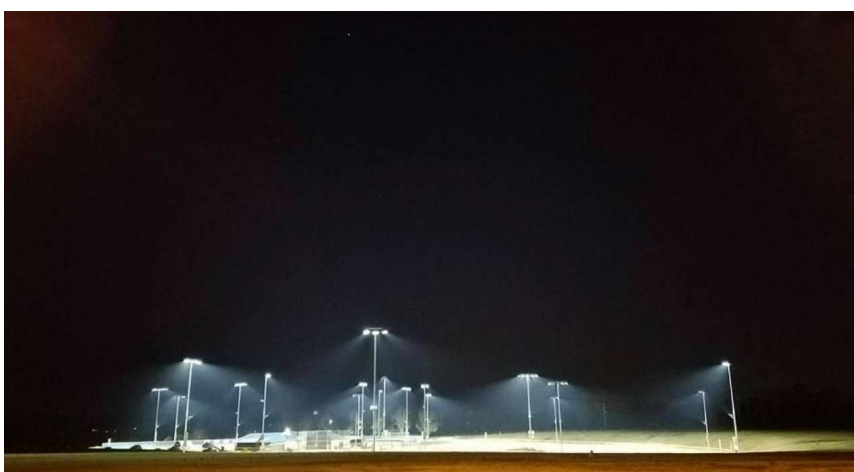
It hardly seems any longer necessary to explain why it is important to reduce our collective carbon footprint, as climate skepticism is melting along with the ice caps.¹

The world's scientific community is expressing increasingly urgent concern about the need to act.² The consequences of climate change are and will continue to fall unevenly on humanity, robbing some of their livelihood, their homes, way of life, health and even their lives. Carbon reduction is thus a moral imperative. Without federal leadership, it has fallen to state and local government, and individual citizens to respond to the challenge. There being no solution without universal action, responding to the threat should be a top priority for every community.

LIGHT POLLUTION

Light pollution remains an under-acknowledged environmental concern, and hence requires greater elaboration. Broadly defined, light pollution is any light placed where, when, or in an amount that is not needed to serve a warranted purpose. It is, therefore, at a minimum, wasted energy. Waste arises from the use of cheap poorly designed fixtures that fail to direct light only where it is needed, resulting in glare, "spill-light" or light-trespass if the spill is where it is not wanted, and up-light that goes into the sky creating sky-glow.

The National Park Service estimates that between 20 percent and 50 percent of outdoor lighting ends up as light pollution, from such misdirection.³ Additional waste arises from leaving lights on when it is not useful, or using an excessive amount of light.



PROPERLY ILLUMINATED BALLFIELD: SPRINGDALE, ARKANSAS. NOTE HOW THE LIGHT IS AIMED, WITH MINIMAL OFF-SITE "SPILL LIGHT" AND NO DIRECT UP-LIGHT. (MATT RUSSELL)

¹ <https://climatecommunication.yale.edu/visualizations-data/ycom-us/>

² <https://www.un.org/en/climatechange/reports.shtml>

³ <http://www.nature.nps.gov/night/sources.cfm> 2012

Reducing light pollution is energy saved, and that generally translates into saving money, which should be a concern for any municipality. But, here we are concerned with the environmental impacts of light pollution. Saving energy reduces the full spectrum of air and water pollution associated with the production of energy, including the just discussed greenhouse gas, carbon dioxide.

The most direct way to reduce carbon emissions is to avoid wasting energy. The EPA has estimated that lighting consumes 5 percent of the country's total electricity.⁴ A 100-watt light bulb burning all night for a year can generate nearly half a ton of carbon dioxide. Approximately 15 million tons of carbon dioxide is generated each year for residential outdoor lighting.⁵ This does not include commercial and street lighting.

Eliminating excessive, misdirected, and unnecessary lighting would shave whole percentages of the nation's carbon footprint without any loss of function while saving money. For example, the city of Little Rock's utility provided street-lighting, largely composed of cheap inefficient fixtures that send most of their light into the glare zone or up into the sky, generates approximately 20,759,239 pounds of CO₂ per year.



BARNYARD LIGHTS SUCH AS THIS ARE LESS THAN 30 PERCENT EFFICIENT, SENDING MOST OF THEIR LIGHT OUT IN THE GLARE ZONE OR UP INTO THE SKY. MANY, IN CONSEQUENCE, ARE PAINTED BLACK TO AVOID THROWING MISDIRECTED LIGHT INTO NEARBY HOMES.

4 <http://www.eia.gov/tools/faqs/faq.cfm?id=99&t=3>

5 <https://www.darksky.org/15-million-tons-of-carbon-dioxide-emitted-each-year-on-residential-outdoor-lighting-in-the-u-s/>

However, there are costs associated with nighttime lighting, in particular, not captured directly or indirectly in any energy bill.⁶ The earth has known the cycle of night and day for 4.5 billion years. When we light the night, we are directly altering the natural environment in a way that has direct biological impacts. The American Medical Association has issued two public health statements concerning health risks posed to humans and other life forms occasioned by exposure to artificial light at night (LAN).⁷ Human health risks include diabetes, depression, obesity, breast and prostate cancer, all of which are health features of modernity. Impacts to wildlife involve reproduction, feeding, and migration.

Light from even a modest city can pollute the nocturnal environment over hundreds of square miles, as shown by the light pollution map on the cover of this report. The indiscriminate and careless use of outdoor lighting is thus driving the natural nocturnal environment into ever-shrinking enclaves, and likely contributing to a drop in biomass in heavily light-polluted areas.⁸



LIGHT DOMES RESULTING FROM UPLIGHT AS SEEN FROM THE BUFFALO NATIONAL RIVER, THE STATE'S ONLY DESIGNATED INTERNATIONAL DARK-SKY PARK. (RUTH ATWOOD)

Light pollution also impacts the aesthetics of our communities by generating harmful glare and sky glow. The former is uncomfortable, even blinding, and the latter draws a veil of light between us and nature's grandest spectacle, the universe revealed in a natural night sky, which was until recently an intimate part of our ancestor's lives. Finally, light pollution can be a safety hazard, as it can reduce visibility, something the public often does not appreciate. The Illumination Engineering Society of North America (IESNA) Recommended Practices Manual on Exterior Lighting RP-33-14, section 4.6.1 notes:

Too often, people associate brighter light and glare with "safer" surroundings. In reality, more light and glare do not necessarily equate to better lighting. It can be easily demonstrated that too much light, or poorly directed light, actually causes a loss of visibility.

Thus, light pollution is a serious environmental problem that spans a broad spectrum of environmental concerns, from air and water pollutants and greenhouse gas emissions associated with the production of the wasted energy to wildlife impacts and human health and safety concerns. There are no legitimate losers in adopting responsible lighting practices. It is simply a matter of paying attention and learning to light responsibly.

⁶ Illumination Engineering Society, Lighting for Exterior Environments, IES RP-33-14, section 2.2 Environmental and Health Considerations.

⁷ American Medical Association, REPORT 4 OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH (A-12) Light Pollution: Adverse Health Effects of Nighttime Lighting, and REPORT OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH, CSAPH Report 2-A-16, Human and Environmental Effects of Light Emitting Diode (LED) Community.

⁸ Insect declines and agroecosystems: does light pollution matter? *Annals of Applied Biology*, 2018; DOI: 10.1111/aab.12440cite. See also, A Review of the Elements of Human Well-Being with an Emphasis on the Contribution of Ecosystem Services, *Ambio*. 2012 June; 41(4): 327-340.

SURVEY RESULTS

All but two of the surveyed communities responded to the FOI request, and most did so promptly. To simplify the results, we have summarized them in two tables below. The first table summarizes the overall survey results. The second table is the Lighting Ordinance Table and drills down on the quality and breadth of the lighting ordinances provided.

An explanation of the nature and reasons for each request included in the Summary Table will make the results more meaningful.

(1) Energy Inventory/Plans: The purpose of seeking energy inventory and reduction plan documents was to identify municipalities with active strategies to conserve energy. Tracking energy use is the first step in managing one's energy use. A half-credit was given where documents reflected this was being done. Full credit was given if the tracking appeared to be part of an active program to advance efficiencies.

(2) Carbon Inventory/Plans: The purpose of seeking carbon inventory and reduction plan documents was to identify municipalities with an active strategy to reduce carbon emissions. As with energy, tracking carbon emissions is the first step, and half-credit was given for doing so. Full credit was given if the tracking appears to be part of a program to reduce carbon emissions.

(3) Carbon Resolution: The Sierra Club has a program in which local governments are requested to commit to achieving carbon neutrality. This was not placed in the table as Fayetteville is the only Arkansas entity to do so, so far, giving it a total score of 4 out of a possible 6.

(4) LEED, Arc, or Energy STAR Program: These are programs in which facilities and buildings can be enrolled to monitor and gauge energy efficiency. Such programs allow the efficiency of facilities and structures to be compared to others around the country, which can be critical to recognizing where progress remains to be made. A point was awarded if the city was participating in such a program.

(5) Lighting Ordinance: An ordinance governing the use of outdoor lighting is fundamental to addressing light pollution and should advance the community's energy efficiency and carbon footprint. The Illumination Engineering Society offers several model ordinances. While no Arkansas municipality has adopted an IES model ordinance, several have credible ordinances in place. The absence of a meaningful lighting ordinance is indicative of a municipality that has not yet taken light pollution seriously. Ordinances addressing the lighting of signs were not considered, though it is an important area in need of regulation and several respondents addressed sign lighting that did not have general lighting ordinances. A reasonably comprehensive ordinance overtly intended to address light pollution earned a full point. Where the purpose was limited to glare and trespass, half a point was assigned.

(6) Lighting Specifications/Master Lighting Plan: A municipality that is serious about addressing outdoor lighting, energy conservation, and reducing its carbon footprint will have a master lighting plan. Such a plan involves an engineering review of outdoor lighting needs to assure appropriate lighting is provided only when, where, and in the amount and color needed, thereby minimizing energy usage and impacts to the environment. At a minimum, a municipality should establish basic criteria for fixture performance in various applications such as color temperature, up-light/shielding, illumination levels, etc. Specifications that only address placement and style of fixtures are not considered responsive to this request. Having relevant specifications earns half a point, while a full master plan earns a full point in the table.

SURVEY OVERVIEW TABLE

MUNICIPALITY	ENERGY INVENTORY/ PLANS	CARBON INVENTORY/ PLANS	ENERGY STAR, ETC.	LIGHTING ORDINANCE	LIGHTING SPECS PLAN	SCORE (OUT OF 6)
LITTLE ROCK	0	0	0	0	.5 ⁹	.5
FORT SMITH	0 ¹⁰	0	0	1	0	1
FAYETTEVILLE	1 ¹¹	1 ¹²	0 ¹³	1 ¹⁴	0	4
SPRINGDALE	0	0	0	.5 ¹⁵	0	.5
JONESBORO	0	0	0	0	0	0
NORTH LITTLE ROCK	.5 ¹⁶	0	0 ¹⁷	0	0	.5
CONWAY	.5 ¹⁸	0	0	0 ¹⁹	.5 ²⁰	1
ROGERS	1	0	0	0	0	1
PINE BLUFF	-	-	-	-	-	-. ²¹
BENTONVILLE	0	0	0	1	.5 ²²	1.5
HOT SPRINGS	.5	.5	0	0	0	1 ²³
BENTON	0	0	0	0	0	0
TEXARKANA	0	0	0	0	0	0
SHERWOOD	0	0	0	0 ²⁴	0	0
RUSSELLVILLE	.5	0	0	0	0	.5
JACKSONVILLE	0	0	0	0	0	0
BELLA VISTA	0	0	0	0	0	0
WEST MEMPHIS	-	-	-	-	-	-
PARAGOULD	0	0	0	0	0	0
CABOT	1	0	0	0 ²⁵	0	1
SEARCY	0	0	0	0	0	0
EL DORADO	0	0	0	0	0	0
MAUMELLE	0	0	0	0	0	0
BRYANT	.5	0	0	0	1	1.5
VAN BUREN	0	0	0	0	0	0

9 Little Rock's response in this regard is particularly problematic. Please see the discussion section of the report.

10 Produced only a Clear-Result report on the wastewater treatment facility.

11 <https://fayetteville-ar.gov/3246/Energy-Action-Plan>

12 <http://fayetteville-ar.gov/3234/Climate-and-Energy>

13 Fayetteville says it has participated in the Star Energy Program in the past and intends to do so in 2020, but is not currently participating as reflected by a zero rating by the Stars program.

14 https://library.municode.com/ar/fayetteville/codes/code_of_ordinances?nodeid=CD_ORD_TITXVUNDECO_CHI76OULI

15 Shielding and aiming provisions are limited in purpose to impacting adjoining property with glare, leaving generalized light pollution unaddressed.

16 Provided an inventory of last year's electrical use. No apparent ongoing effort to use the data in a plan.

17 Has adopted LEED building standards for new city construction, but current building not tracked for efficiency.

18 Tracking electrical usage over time, and vehicle fuel usage. No apparent ongoing plan to use the data in a plan.

19 Appears that there is a policy to require certain developments to shield and aim fixtures down, but no ordinance provisions provided. Entered into a Guaranteed Energy Savings Performance contract in 2009, but not apparent that there is an ongoing program to review and improve energy efficiency.

20 Having initially opted out of shielding statutes, it appears that the city and its utility are nonetheless endeavoring to utilize dark-sky compliant fixtures. However, no policy statement was provided documenting the policy and it is unclear how general the practice is.

21 Failed to respond to the FOIA request.

22 Has a specification but the only element touching on energy or light pollution is requirement for "cutoff" shielding.

23 This does not do justice to Hot Springs' environmental program. While it does not have documents fitting the description requested, it has a substantial city wide commitment to reducing its environmental footprint as relates to energy and carbon. Unfortunately, it does not extend to addressing light pollution.

24 Zoning ordinance requires fully shielded fixtures for mini storage units.

25 The only ordinance reference to lighting is parking facility lighting is to be directed away from residential areas.

DETAILED REVIEW OF LIGHTING ORDINANCES

Not all lighting ordinances are created equal. The next table summarizes the quality and scope of the ordinances based upon the following elements:

(1) Shielding and Aiming: Placing light where it is needed and not where it is wasted or harmful is the cornerstone of any lighting ordinance and a function of the design of the fixture, or its shielding and its aiming. If both of these are addressed, two points are assigned.

(2) Sensors/Curfews: For purposes of reducing sky glow and promoting energy conservation, the use of sensors, timers, and switches should be required to dim or extinguish lighting when not in use. Two points are given if both of these are addressed.

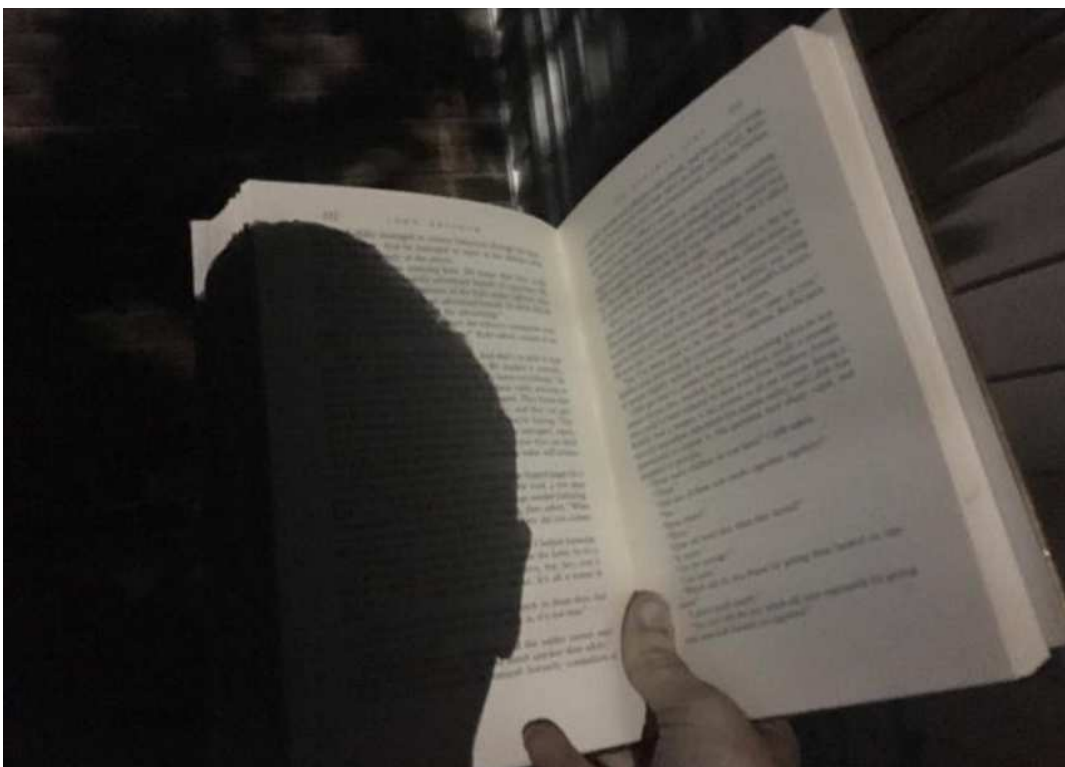
(3) Lighting Levels: One point is assigned if illumination levels are specified and two points if maximum levels are set.

(4) Light Trespass: A point is assigned if light trespass (shining light directly onto another's property) is addressed, and two points if an objective, quantifiable level is established.

(5) Glare: This is treated similarly to trespass, except you can't quantify glare.

(6) Exemptions: All lighting ordinances contain grandfather clauses and exemptions for necessary special-purpose lighting. No penalty is assessed for such exemptions. However, unjustified exemptions, such as the common exemption for single and double occupancy residential property, is a negative point if it is limited to shielding requirements, and two points if the exemption applies to the entire ordinance, to include trespass and glare provisions.

(7) Color Temperature: Color temperature has emerged as a major consideration when addressing biological and sky-glow impacts of artificial light, as well as glare. A point is assigned for addressing this issue by specifying the use of fixtures of 3000k CCT or lower temperature or otherwise limiting blue light content.



LITTLE ROCK RESIDENT AND TRESPASS VICTIM READING BOOK IN BACK YARD 260 FEET FROM A 1,000-WATT HORIZONTALLY AIMED UTILITY INSTALLED "SECURITY LIGHT." CRIME INCREASED AFTER INSTALLATION. (ANDREW JESTER)

LIGHT ORDINANCE TABLE

MUNICIPALITY	SHIELDING/ AIMING	SWITCHES/ SENSORS	SPECIFIED ILL. LEVELS	TRESPASS	GLARE	EXEMPTIONS	COLOR TEMP	SCORE
LITTLE ROCK	0	0	0	0	0	0	0	0
FORT SMITH	2	2	1	2	1	-2	0	7
FAYETTEVILLE	2	0	0	1	1	-2	0	2
SPRINGDALE	1	0	0	1	1	0	0	3
JONESBORO	0	0	0	0	0	0	0	0
NORTH LITTLE ROCK	0	0	0	0	0	0	0	0
CONWAY	0	0	0	0	0	0	0	0
ROGERS	0	0	0	0	0	0	0	0
PINE BLUFF	-	-	-	-	-	-	-	-
BENTONVILLE	2 ²⁶	0	0	1	1	2	0	2 ²⁷
HOT SPRINGS	0	0	0	0	0	0	0	0
BENTON	0	0	0	0	0	0	0	0
TEXARKANA	0	0	0	0	0	0	0	0
SHERWOOD	0	0	0	0	0	0	0	0
RUSSELLVILLE	0	0	0	0	0	0	0	0
JACKSONVILLE	0	0	0	0	0	0	0	0
BELLA VISTA	0	0	0	0	0	0	0	0
WEST MEMPHIS	-	-	-	-	-	-	-	-
PARAGOULD	0	0	0	0	0	0	0	0
CABOT	0	0	0	0	0	0	0	0
SEARCY	0	0	0	0	0	0	0	0
EL DORADO	0	0	0	0	0	0	0	0
MAUMELLE	0	0	0	0	0	0	0	0
BRYANT	0	0	0	0	0	0	0	0
VAN BUREN	0	0	0	0	0	0	0	0

DISCUSSION

In some instances, it is useful to elaborate on the bare results reflected in the table and footnotes. But first, a note of caution about a trap municipalities risk falling into regarding the Arkansas Shielded Outdoor Lighting Act. Recently, the city of Russellville fell into this trap, installing unshielded fixtures selected for their aesthetic design rather than function. Fortunately, a fix was found involving the installation of a dimmer in each fixture to bring them under the threshold requiring shielding. Without that fix, this could have proven a very expensive mistake.

Opting Out of the Arkansas Shielded Outdoor Lighting Act - Some respondents provided copies of resolution opting out of the state's shielding law. The Arkansas Shielded Outdoor Lighting Act requires that publicly funded lighting above a certain wattage be fully shielded. However, it also provides an exemption where the cost of shielding was deemed prohibitive. Utility company tariffs for shielded fixtures were higher than unshielded at the time the Act was passed. Many municipalities took advantage of this and opted out of compliance by passing the required resolution. With no advocacy group in the state at the time to monitor this, these resolutions were not challenged.

²⁶ Shielding is compromised by a high lumen threshold (2000lm) and allowing "cutoff" shielding.

²⁷ Ordinance includes prohibition against spotlight marketing, and requires canopy lighting to be recessed. Also, addresses sports facilities but this could be done better by referencing applicable IES standards.

²⁸ Most modern LED fixtures don't require shielding as they are designed to avoid uplight. The Statute needs amending to address changes in terminology and fill some gaps.

Today, though, these resolutions are a trap for the unwary as they are not a permanent means of avoiding the statutory requirement. However valid when passed, lighting technology has changed, and shielding has become commonplace. Today, it is unlikely that unshielded municipally-owned fixtures can be justified based upon cost. On the contrary, municipalities across the country are swapping out legacy fixtures with properly shielded LED fixtures precisely to save money.

Municipalities that ignore the shielding statute, thinking their original ordinance exempts them, run the risk of having to remove non-compliant fixtures if discovered by an increasingly aware citizenry. As the public is becoming better educated about lighting, noncompliance, as in the Russellville instance, is more likely to be discovered and complaints raised by citizens.

LITTLE ROCK: The state's capital and largest city is totally missing in action in regards to the subjects of this survey. It took 2.5 months to respond to the FOIA, even though it had no responsive documents to produce. It did take up the offer to elaborate by providing several memos, presumably generated for the purpose of responding to the request for documents defining the specifications the city uses to select lighting. Unfortunately, the provided memos fail to reflect sensitivity to the environment in two respects that merit elaboration.

First, the city noted that the Arkansas Department of Transportation requires Color Corrected Temperature of 4000-kelvin CCT (Color Corrected Temperature) for LED highway lighting, and for "reasons of consistency" the city is using that CCT in all applications. While there may be good reason for blue light in highway lighting, there is no sound reason for blue light on city streets or in parks and residential areas. Blue light, in such settings, is aesthetically unpleasant, prone to unhelpful glare, enhances sky-glow, and is responsible for most biological impacts. The latter is the reason why the AMA has joined IDA in recommending 3000K CCT lighting or warmer (lower temperature) for outdoor lighting. Many progressive cities are deploying 2700K CCT fixtures, which have even less blue light creating a more "natural" warm light with less glare.

The second concern is the city indicates that it uses manufacturers statements of equivalency in replacing heirloom technology with LEDs. Why this is not appropriate is a complex topic.

Suffice it to note here that reliance upon such statements, while perhaps useful for a home owner buying a replacement element at a home supply store, is a crude way to transition to LEDs that often results in over-lighting and wasted energy. A detailed explanation for why can be found here: <https://darkskyarkansas.org/over-lighting>

A city that spends over \$2 million dollars on outside nighttime lighting each year should have a more nuanced approach to its lighting that involves using appropriate colors and deploying warranted minimum levels of lighting.²⁹



ANOTHER LITTLE ROCK TRESPASS VICTIM. COMMERCIAL SIZE FIXTURE AIMED AT A NEIGHBOR'S HOUSE, CREATING GLARE AND SHADOWS. (BRUCE MCMATH)

29 Shielding is compromised by a high lumen threshold (2000lm) and allowing "cutoff" shielding.

FAYETTEVILLE: When it comes to energy and carbon stewardship, Fayetteville appears to be setting the curve in Arkansas by a substantial margin. It garnered four out of six potential points on the overall survey. No other city earned more than one and a half points. It is the only city in the state that has taken up the [Sierra Club's 100 percent carbon-free resolution challenge](#), giving it the extra point not listed in the table. Its energy and carbon efforts are well documented on its website. See the footnote links.

Fayetteville is also one of the few communities that eschewed the temptation to opt-out of the Outdoor Shielding Act. In fact, it had adopted shielding practices before the Act was passed, and among the few municipalities to have a credible lighting ordinance, though it could be improved.

FORT SMITH: Fort Smith's energy efforts pale in comparison to Fayetteville. However, its deceptively simple lighting ordinance is more comprehensive in significant ways. It is the only ordinance reviewed to address the use of motion sensors and curfews so that lighting is only on when needed. It is also the only one to provide a concrete criterion for offensive light trespass. Nevertheless, it also could be materially improved.

ROGERS: While Rogers strikes out on all but one request, it has had a comprehensive energy review performed in each of the last two years. The most recent one identified potential energy savings of 25–35 percent. The city produced documents reflecting extensive specifications for its street lighting, addressing aesthetics of the physical structures. But, unfortunately, none of it addressed the quality, quantity, need, color temperature or efficiency of the light generated.

HOT SPRINGS: The table does not do justice to Hot Springs' environmental program. While Hot Springs did not have the precise documents requested, it produced a copy of its [Green Initiative](#), which demonstrated a substantial citywide commitment to reducing its environmental footprint. Literally, every department of the city has been tasked with modifying its functions to conserve energy, and the plan also includes an ambitious solar energy program. The website does not yet have the latest on its efforts evident in the documents produced. Unfortunately, its progressive environmental agenda does not yet extend to addressing light pollution. Overall, its energy efforts come the closest to rivaling Fayetteville's.

BRYANT: Due to its size, Bryant can't be expected to be setting the pace in these matters, but it is when it comes to planning its outdoor lighting. Bryant, it seems, is the only municipality in the state to have a professionally developed master outdoor lighting plan. One goal of the plan, to the extent utility provided fixture would permit, was to have universal dark-sky compliance.

NOTES ON SMALLER MUNICIPALITIES: Some municipalities, too small to make the list of 25 largest, must be mentioned where known to be active in relevant respects. **Harrison**, population <15,000, has the same lighting ordinance as Fayetteville, which raises the question: how hard can it be to copy? The **Goshen** community, even smaller has a credible ordinance as well. Why don't the state's planning professionals hammer out a model ordinance for small- and medium-sized communities to use? **Eureka Springs** is one of the few municipalities in the state that shielded its outdoor lighting as required by the Shielded Outdoor Lighting Act instead of opting out on grounds of expense. **Gilbert**, the state's smallest incorporated community, frustrated with its inability to obtain affordable dark-sky compliant street lighting from its electric utility, has retained a consultant to help take ownership of the 16 fixtures lighting its streets so it can install state-of-the-art, dark-sky compliant lighting. If successful, it will have pioneered an end-run around excessive utility company tariffs for modern lighting.

CONCLUSIONS

The general failure of Arkansas municipalities to address light pollution is disappointing, but not surprising. Decades of marketing by utility companies, seeking to sell electricity during the off-peak hours of the night, has engendered a false impression about the utility of outdoor lighting in the minds of the public. At the same time, the costs of lighting the night are, as yet, not well appreciated. This makes it hard for municipal leaders to take aggressive action in this area. The solution, of course, is public education, which progressive municipalities could help facilitate by partnering with ANSA.

What's surprising is the widespread failure of communities to systematically pursue energy efficiency and carbon reduction, especially when you consider the fact that doing so would help with municipal budgets. It is hard to avoid the conclusion that inertia is the principle roadblock.

Across the country, communities that are environmentally progressive also tend to have a greater emphasis on providing a high quality of life for their residents. Such communities have a competitive advantage, as being more desirable places to live makes them more attractive to high-value employers.

Hopefully, by sharing what other communities in the state are doing, this survey will motivate communities to become more environmentally sensitive and responsible, and such progress will be evident when this survey is repeated in 2022.

ACKNOWLEDGEMENTS:

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The Arkansas Natural Sky Association is an Arkansas Unincorporated Nonprofit Association and the International Dark Sky Association's Arkansas affiliate. The Association is governed by a Steering Committee.

Membership is open to the public, but membership is not required to become involved, which can be done by joining our mobilize.io site.

Our mission is to educate others on the adverse consequences of careless lighting and the how and why of proper lighting so as to preserve, to the extent practical, dark sky environments in the Natural State for their ecological and aesthetic value and minimize other environmental impacts of artificial lighting.



darkskyarkansas.org



info@arkansasdarksky.com



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