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Green Infrastructure in the Ozarks:
Northwest Arkansas Development Policy and the Open Space Plan

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Geography

by

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Abstract

Northwest Arkansas regional planning authorities in 2016 released the Northwest Arkansas Open Space Plan, a voluntary document outlining ways to protect and preserve important open spaces even as the region's population balloons and urban development spreads outward. No one appears to have made a systematic attempt to gauge the Plan's impact on development decisions, however. In this thesis, I conduct a qualitative survey of several cities and counties' planning codes and comprehensive plans to determine how much these policies have in common with the Open Space Plan's essential principles. From that survey, I also conduct two case studies of recent developments to find how differences in policies may manifest in the real world. I find widespread alignment between local policies and the Open Space Plan, though with pertinent variations among the local governments surveyed that appear to play a role in the approval process for the two developments selected as case studies. I conclude that any efforts to incorporate the Open Space Plan more fully into local development decisions could likely focus on particular principles, such as the principle of networking and connecting open spaces, rather than taking a broad and general approach.

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Introduction

Northwest Arkansas is among the fastest growing metropolitan areas in the country, placing an ever-increasing burden on its environment and natural resources (Reynolds et al., 2017). But as the region grows, more attention and resources have also gone to protecting those natural resources, especially in the form of open spaces (Wood, 2023). One prominent tool in these efforts is the Northwest Arkansas Open Space Plan, a voluntary mapping and planning document released by the Northwest Arkansas Regional Planning Commission, the region's intergovernmental organization concerned with infrastructure planning, in 2016. By cataloguing parks, local farms and natural areas, explaining their many benefits, and describing a wide-ranging toolbox of conservation methods, the authors hoped to insert open space and ecological concerns into the region's planning and development alongside more conventional concerns such as traffic, housing and property values.

Since the Open Space Plan's publication, there has been no systematic evaluation of its impact or success. Its recommendation for a dedicated sales tax to generate revenue for buying and managing protected lands has so far not made it to the ballot, and there is no public sign of that happening soon. The Plan is mentioned a few times each year in local media, often briefly (Gill, 2020). The regional planning commission recently noted that 4,000 acres of open land have been conserved by nonprofits, government agencies and others since the Plan's 2016 release, but that update gave no evidence of the Plan's role in that conservation activity and no indication of how those acres fit within its goals and principles (Northwest Arkansas Regional Planning Commission, 2021).

Yet the Plan could still have impact and be reflected in the region's development decisions even without clearing these particular bars. The purpose of this thesis is to evaluate the

alignment between the Open Space Plan and local government policy and decision-making. Is there evidence of its success in this context? My proposition is that alignment with the Plan will vary from city to city, and development decisions in communities integrating the Plan to a greater degree will differ from those that integrate the Plan to a lesser degree.

Literature Review

The term “green infrastructure,” also referred to as GI below, has been in use for several decades, with many researchers tracing its conceptual roots back more than a century (Benedict and McMahon, 2006). As early as the 1860s, proto-environmentalist George Perkins Marsh was exploring the question of how much we can permanently alter landscapes without destroying their potential for habitation and enjoyment (Marsh, 2014). The term has nonetheless surged in interest and use among planning and conservation professionals in the last two decades or so (Lennon and Scott, 2014). Benedict and McMahon provide one of the most commonly cited definitions: “an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife” (Benedict and McMahon, 2006, 1). These spaces typically are actively managed and protected by people in order to take advantage of the various and layered ecological functions they can provide: controlling floodwaters and erosion, cooling urban landscapes, preserving wildlife habitat and abundance, absorbing carbon or otherwise mitigating climate change’s effects on humans and other species, and providing aesthetic and health benefits for nearby residents (Reynolds et al., 2020; Van Teeffelen et al., 2015).

As a result of the plethora of services green infrastructure can fulfill, researchers’ definitions of the term can vary widely, contradict each other or attempt to synthesize the priorities of so many groups that the term’s usefulness becomes diluted (Lennon, 2015). Definitions can be as all-encompassing as “the sum of all our natural resources,” including agricultural lands (Firehock, 2013, 6), or as specific as small, natural elements within a larger agricultural landscape (Van Teeffelen et al., 2015). Whatever the context, the common thread for green infrastructure is that it works best as a network — an arrangement of interconnected,

multifunctional open-space hubs, or cores, and corridors through which water, biomass and energy can flow and pool. The ideal green infrastructure would be arranged like neurons forming circuit upon circuit in a brain, rather than standing alone as open islands in a concrete sea. For example, instead of simply requiring several adjacent subdivisions to set aside a certain amount of land as neighborhood parks, regardless of their placement or connection, a green infrastructure approach might concentrate those leftover open spaces into a single park along an existing trail, stream or other natural corridor that transcends any single development. In this perspective, hubs and corridors can range from a nearly untouched state to fully managed and built by people, as is the case with public parks and drainage channels. They can range in size from national parks to backyard streams.

Green infrastructure, in other words, seeks to reconcile and integrate two systems in a way that leaves both relatively intact, “which includes not only protection, but also enhancing, restoring, creating and designing new ecological networks” (Lennon and Scott, 2014, 569). On one hand is the human system of “gray” infrastructure – the roads, buildings and other paved and impervious surfaces that constitute cities and towns. On the other hand is the natural system of soils and other permeable surfaces that capture water, form the canvas for complex ecosystems, and thereby carry out their many essential ecological services. As more land is paved or altered, less is necessarily unpaved and unaltered, degrading ecosystem functions to the detriment of both the human and natural systems. On the other hand, the spatial constraints of development and need for ecological services pushes cities to integrate green and gray infrastructures (Langemeyer et al., 2020).

There is a great and growing need to establish such a coexistence as human populations grow and alter more land more intensely – in other words, as habitat is fragmented or lost

altogether (Lynch et al., 2019) and as climate change increasingly affects temperature and precipitation patterns around the world (Jay et al., 2018). Habitat loss and more intensive human land use have been linked to the loss of biodiversity (Chase et al., 2020) and the falling abundance of insects and birds, with potentially cascading environmental consequences (Møller, 2019). Benedict and McMahon in their definitive treatise described “a land-use crisis in the United States. We are consuming our open space with subdivisions, strip malls, and highways and we are fragmenting natural systems so that they no longer function effectively” (2006, xv). They continue: “Green infrastructure requires foresight, political will, and sustained effort on the part of a state, region, or community to change the way conservation and land-use planning are undertaken” (251).

This urgency holds true in northwest Arkansas, which is characterized by rapid population growth across a sprawling arrangement of multiple major cities (Reynolds et al, 2017). Climate change is altering precipitation patterns and the hydrological cycle in Arkansas and surrounding areas (Bishop et al., 2019; Brown et al., 2019; Armal et al., 2018), with precipitation events increasing in intensity (Li & Li, 2015; Li et al., 2011). Climate projections indicate the Southeast region, including Arkansas, will also experience more frequent and severe droughts and heavy rainfall in the coming decades, making green infrastructure’s stormwater and flood control capacity more vital (Carter et al., 2018). But government action to meet these threats is constrained in northwest Arkansas: Though the urban cores are less so to varying degrees, the region and state are largely conservative, emphasizing individual property rights and showing substantial skepticism toward the dangers of climate change and other environmental issues (Parry, 2021).

Public willingness to implement green infrastructure measures can be strong among neighborhoods of different income levels or ethnicities and even when green infrastructure installation causes months of inconvenience (Baptiste et al., 2015; Zuniga-Teran et al., 2020). Many researchers and advocates focus on economic and otherwise human-focused benefits that green infrastructure can provide, such as drawing talented workforces and providing neighborhood parks, as a way to build public support for dedicating the needed public and private resources (Alta Planning + Design, 2016; Derkzen et al., 2016). Successful green infrastructure plans require an overarching vision and high levels of coordination within a region; “of particular concern is the need to generate coherent frameworks that help avoid potential mismatches between objectives at different spatial or institutional scales” (Lennon and Scott, 2014, 578). That necessitates confronting and resolving disagreements and differing perspectives (Lennon, 2015). It can also require adequate planning staffs, continual public education and workshops around the topic of green infrastructure, clear timetables, and monitoring of performance and barriers to implementation (Kim and Tran, 2018).

The lack of study into the Open Space Plan is not unusual. Compared to discussions on how and why to formulate regional efforts to protect open space, evaluation of such efforts’ success and effects is limited (Taylor et al., 2007), perhaps because the goals of such efforts are subjective in ways that make them difficult both to accomplish and to study (Romero, 2016). In-depth quantitative analysis requires a great deal of time, expertise and effort, which may also contribute to this imbalance (Bormpoudakis and Tzanopoulos, 2019).

Of the initiatives that have been examined after their implementation, some have failed because of a lack of organized, specific goals or sufficient regional cooperation (Zuniga-Teran et al., 2020; Romero, 2016). One open-space ordinance in Michigan had mixed results, leading to

an increase in the percentage of open space on development sites but also more fracturing and disconnection among open spaces, since the policy didn't specify connectivity and other related factors (Taylor et al., 2007). Others have lacked clear procedures for monitoring and evaluating their progress, without which they cannot "aid in the transition towards sustainable stormwater infrastructure" (Chini et al., 2017). There is also some concern that the green infrastructure perspective could backfire by centering planning and conservation discussions around anthropocentric utility — essentially appraising the environment in terms of its use to humanity — and by avoiding challenges to the current dominant planning system in the West (Lennon, 2015).

The perception of which services are provided by green infrastructure can differ by cultural perspectives and contexts, or even among departments within a single organization, as all of the people involved claim their own understanding of green infrastructure's purpose is most correct. This in turn hinders the collaboration needed to create and manage a green infrastructure network. Municipal policies around North America concerning green infrastructure fall into separate groups depending on whether they emphasize GI's living or biological components, non-living and built components, or a combination of the two (Conway et al, 2020). Planners or other government officials also might not recognize green infrastructure's importance or embrace its major strategies, leading to little influence of the concept on actual practice (Kim and Tran, 2018). Local government officials' attitudes toward green infrastructure adoption are also influenced by their perception of both the concept's usefulness and of their community's readiness to take this approach (Carlet, 2015).

Some researchers have leaned on GIS, population data and spatial modeling to measure and evaluate local governments' GI and open space policy. For example, Dennis and his co-

authors (2018) used publicly available, continuously updated satellite imagery from the Copernicus Scientific Data Hub as well as data from local nonprofits and other organizations to create current, high-resolution maps of the landscape in a large U.K. city. They integrated both land cover types, such as tree canopy or impervious surface, and land use categories like private gardens and public parks in a partly automated process. Gibson and co-authors (2019) measured public park size, distance and quality as it related to population demographics and preferences in order to determine if parks were distributed and designed equitably. And Zhang et al. (2011) modeled the accessibility of parks greater than 0.1 acre around the U.S. using such measures as size, safety and travel cost to find its relationship to poverty rates.

Taylor, Brown and Larsen (2007) focused on a single township's zoning ordinance, which encouraged developers to preserve open space within the developable portion of a site – essentially giving up potential profits – in exchange for greater residential density on the rest of the site in order to make up those profits. With help from planning officials, the researchers selected twenty sites evenly split between those developed before and after the ordinance was implemented. The researchers also examined the sites' land cover before and post-development in order to test predictions of how development played out in reality. As previously stated, they found more, but also more fractured, open space preserved after the ordinance came about, and they suggested that future ordinances specify quality and configuration of open spaces as well as amount.

On the other hand, other researchers have taken a qualitative tack, focusing on the text and meaning of government policies. Chini et al. (2017), Conway et al. (2020) and Kim and Tran (2018) read various combinations of municipal planning, stormwater and other policies as well as comprehensive plans, which lay out a locality's development goals and principles for years or

decades to come. Kim and Tran sorted comprehensive plans into whether and how they met several key principles, such as promoting natural resources and GI maintenance and enforcement, based on a U.S. Environmental Protection Agency water quality scorecard. Chini et al. and Conway et al. both took the route of government websites to find their publicly available documents and ordinances. In Conway and co-authors' case, this involved searching for certain phrases and keywords related to GI to illuminate governments' conception of GI. Chini and co-authors, meanwhile, used their searching to answer multiple qualitative questions such as, if a city had a GI plan, what motivated the city to adopt it.

Northwest Arkansas Open Space Plan

The Northwest Arkansas Open Space Plan was completed by the consultant Alta Planning + Design and closely adapts the green infrastructure models described by Firehock (2013) and by Benedict and McMahon (2006) to northwest Arkansas' particular situation. The terms green infrastructure and open space are used more or less interchangeably within it. The document emphasizes GI's multiple benefits and services and the importance of an interconnected network of open spaces to best provide those services. It lays out a framework to catalog, map, prioritize and conserve the area's green infrastructure as its population and urbanized area continue to grow. Its creators intended it to guide the decisions of regional officials regarding individual properties and all of Benton and Washington counties into the future.

The Plan begins by describing several trends that made its existence necessary. Local development so far has expanded its urban and paved areas and removed half of the region's cropland in the past few decades, for instance. These changes have harmed the region's ecological integrity and water quality, such as by removing key barriers and filters for runoff and

groundwater, but outdoor recreation, farmland and cultural heritage all remain important to residents, the document states. The Plan pairs these trends with corresponding goals: to maintain the region's quality of life, support its economic growth, protect its wildlife habitat and water quality, increase the public's access to outdoor recreation, and preserve northwest Arkansas' local agriculture, history, and sense of place. The document casts these objectives as intertwined, not conflicting, calling itself "a coordinated, voluntary program to protect and promote the region's most valued natural landscapes and open spaces ... thereby maintaining our high quality of life as the region continues to grow and prosper" (Alta Planning + Design, 2016, 4). An overarching purpose of these goals is to preserve open space before development wipes it away, rather than attempting to undo the damage after the fact: "The fact that Northwest Arkansas has access to clean drinking water today does not mean it should be taken for granted. Rather, the region should continue and expand efforts to protect water sources into the future, especially as one of the fastest growing regions in the U.S." (Alta Planning + Design, 2016, 17).

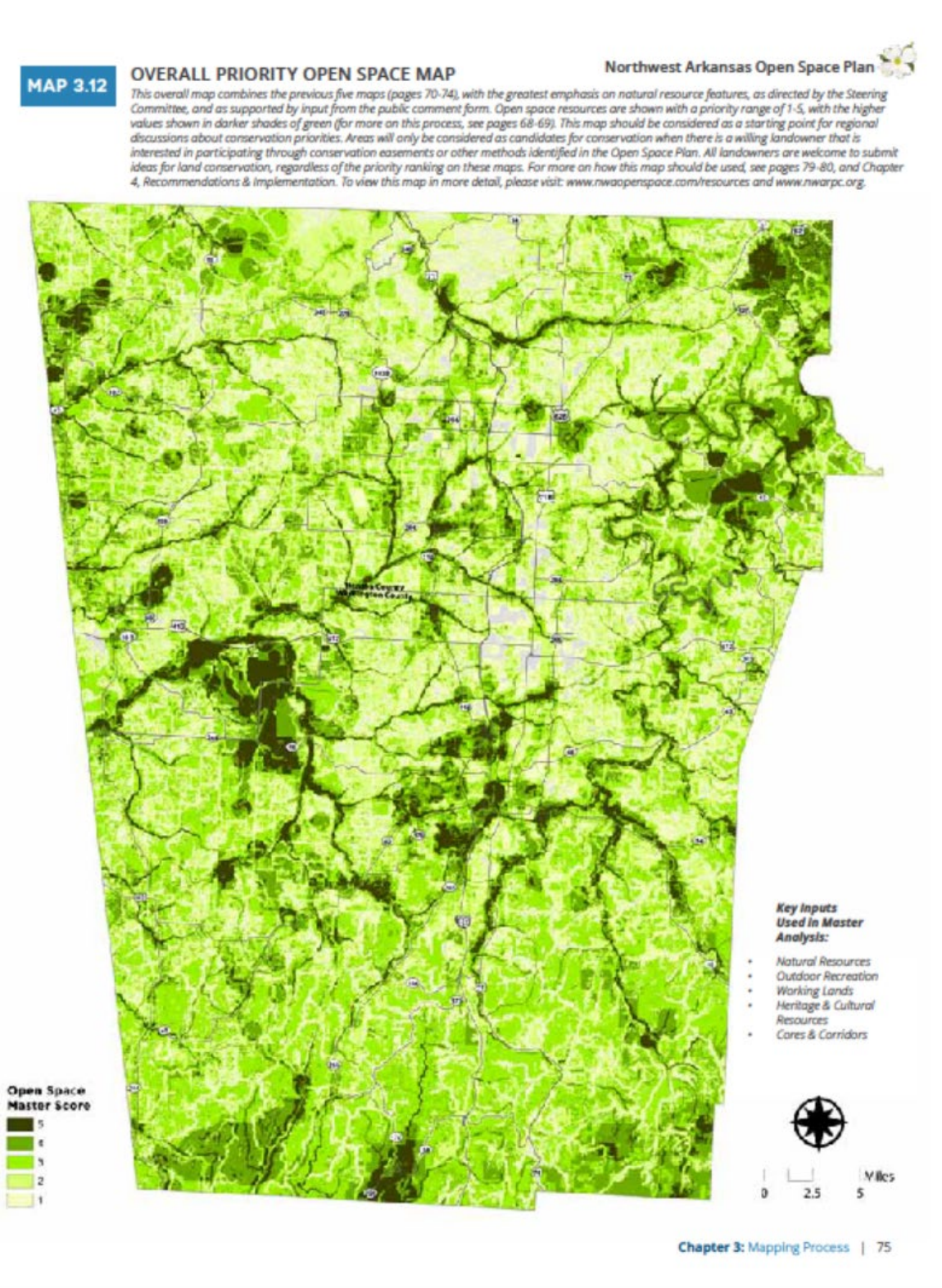
Through years of public meetings and workshops, compiling of GIS data, future growth projections, consultations with local governments and conservation organizations, and other efforts, the Plan's developers assembled several maps of the two counties' green infrastructure features and ranked them by importance in terms of resident priority, water quality, wildlife or other concerns (Fig. 1). Among the highest overall priorities are most of the area's streams and rivers; federal and state protected lands around Beaver Lake, Lake Wedington and Devil's Den State Park; and spaces throughout the city of Fayetteville, the region's largest. This ranking system isn't meant as a directive for what to do with specific pieces of land but instead to provide a framework for cities and other organizations as they go about routine development decisions and assign their budgets and other resources. The Plan's writers take care to emphasize

that its implementation will be entirely voluntary and dependent on landowner collaboration:

“Areas will only be considered as candidates for conservation when there is a willing landowner that is interested in participating through conservation easements or other methods identified in the Open Space Plan” (Alta Planning + Design, 2016, 75).

The Plan recommends that the Northwest Arkansas Regional Planning Commission oversee the yearslong initiative to protect these priorities throughout the two counties. It recommends creating a reliable source of money to pay for those efforts as early as 2019, such as through a regional ballot initiative, and provides a “conservation toolbox” of such open space preservation options as land purchases, conservation easements or leases, and partnerships among governments, nonprofits, landowners and other parties.

Fig. 1. Overall Priority Open Space Map, Northwest Arkansas Open Space Plan (Alta Planning + Design, 2016).



High-priority areas are shown as dark green.

Methodology

Building on the information in the Open Space Plan and on its broader context, this thesis has two main components: a survey of comprehensive plans and development policies, then an examination of several local development project case studies.

Policy survey

The policy survey focused on the region's two primary counties, Benton and Washington, as well as city governments within those counties with populations of at least 5,000 according to the 2020 U.S. Census:

1. Bella Vista
2. Bentonville
3. Cave Springs
4. Centerton
5. Farmington
6. Fayetteville
7. Lowell
8. Pea Ridge
9. Prairie Grove
10. Rogers
11. Siloam Springs
12. Springdale

This population floor was selected to keep the sample at a manageable size while also focusing on the set of cities more likely to go through the time and expense of creating a comprehensive plan. For each jurisdiction, I visited its website and located its code of

ordinances, which have the force of law and determine the rules and public decision-making process for various government functions and community growth.

Codes cover a wide array of topics and may vary greatly from government to government. For this reason, the approach at first was an inductive one, reading through several of the largest cities' regulations as a whole and noting where green infrastructure, open space or a related concept appeared. From this, it was determined that the relevant codes came in three overarching categories: development (such as zoning, subdivision and land use regulations), stormwater and flood control, and green infrastructure, whether the term was used explicitly or not (including tree preservation, landscaping and open space regulations). These categories were the focus of the policy survey for the remaining cities and counties.

This survey likely was not exhaustive because policy categories and descriptions are not standardized from one location to another. It also relied on publicly available documents posted on government websites, and in some cases relevant regulations and guidelines are not published digitally. However, because of the variety of policies captured and the necessity of public involvement and communication in GI policy success, the survey broadly captures each jurisdiction's policy approach to GI-related concepts (Chini et al., 2017).

After locating the pertinent regulations, I also located each jurisdiction's current comprehensive plan on its website, if applicable. Comprehensive plans generally don't have the force of law, since a future government could alter them at will. They instead lay out a community's aspirations, goals and ideal approaches to decision-making as determined at a particular point in time. They typically apply to a certain time period, such as a decade, before being updated or replaced.

Once one or both sets of policies were gathered for each jurisdiction, they were compared to seven essential principles of the Northwest Arkansas Open Space Plan, which were distilled into the following:

1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things and that come in a variety of forms (referred to as the “open space principle” from here on).
2. Open space provides a wide variety of essential ecological services from which we humans benefit (“benefits principle”).
3. Open space and other growth and development goals can complement each other rather than conflict (“complementary principle”).
4. A variety of conservation practices, both public and private, can be used to enhance open space (“practices principle”).
5. Open space is most effective at providing these services when arranged as a connected network throughout a given region (“network principle”).
6. Public and equitable access to open spaces is a priority (“equity principle”).
7. It’s better to protect or set aside open space before development rather than try to undo human alterations afterward (“preservation principle”).

Each jurisdiction’s policies were compared to these seven principles to answer two questions:

1. Does the policy state the principle in at least a broad sense? Essentially, a policy restating the basic thrust of the principle as described above would qualify.

2. If so, does it provide additional detail such as strategy, factual basis or motivation behind the principle's inclusion? A provision providing this kind of detail was considered to satisfy the first question by default.
3. For the final three principles, an additional question was asked: Is adhering to the principle required or is it instead simply an option, suggestion or goal?

Based on the answers to these questions, jurisdictions were organized into an approximate ranking. The highest ranking would come from including all seven principles in city code, providing supporting details and making the final three a requirement. The lowest category would be for jurisdictions that mention few or none of these principles and don't provide supporting details, both in regulations and in the comprehensive plan. And the rest would fall in between by partially meeting these standards or relying extensively on their comprehensive plans to do so. Each of the seven principles was given equal weight for the ranking. Inclusion of a policy principle in a comprehensive plan was given less weight than inclusion in city code, due to comprehensive plans' lack of the force of law and more aspirational, conversational and broadly focused nature. Relevant passages from comprehensive plans, even if stated as a directive, were treated as goals rather than requirements in all cases for the same reasons.

Codes and comprehensive plan tenets weren't required to exactly match Open Space Plan wording or to explicitly mention the Plan. The survey instead aimed to find where code and policy matched the spirit of the Open Space Plan, which concerns not just the existence of open or green spaces but, crucially, *how* and *why* those spaces can be incorporated into urban growth. In this vein, several varieties of codes were excluded from qualifying as a reflection of a given Open Space Plan principle. Codes that were primarily unconcerned with the how and why, such

as those acknowledging that open spaces exist or requiring it to be noted in development site maps, didn't qualify.

Codes that could only generously be construed as touching on open space were likewise excluded. These codes regulated aspects of development that conceivably could take the form of green infrastructure but could also take the form of concrete or other construction materials: for instance, requirements for property line buffers (which could take the forms of walls or fencing), for erosion control (which could be accomplished with concrete barriers and channels) or for paths and sidewalks (which don't necessarily include unpaved areas in their construction). Finally, several city codes include provisions for parking lot islands, but in this author's opinion, a tree or bush surrounded by pavement didn't satisfy the meaning of green infrastructure in the Open Space Plan, which concerns not just the tree but the spatial context wherein it grows. Such codes were also excluded from the survey.

Case studies

Next, two land use projects were chosen through personal observation and input from municipal planning officials. These projects were selected to be illustrative case studies of how the policy survey's results manifested in real-world developments. One project was located in a community within the top rank, and the other was located in a community in the lowest rank. I collected planning commission meeting minutes, agenda packets and other public documents, as well as in-person observations, to determine the following for each project:

1. Is open space present in the project?
2. If so, what are its characteristics in terms of placement, proportion of the property, public access, connectedness to other open space within the property or bordering the property, and type?

3. What is the stated reasoning for the open space and its characteristics? Including relevant conditions and adjustments required by the city or county in question before construction could begin.

Finally, I screened each development through the seven listed principles in two ways: to determine which principles were explicitly mentioned in the site plans and other documents, and to determine which policies identified in the policy survey applied to the project (even if not explicitly mentioned in the documents).

Results: Survey

The survey gathered policy data from 13 of 14 jurisdictions. Because of a technical issue, Washington County's policies were unavailable online during the survey period, approximately September 2022 to April 2023. This data included codes and ordinances for all 13 jurisdictions and comprehensive plan information from 10 of the 13: The city of Lowell and Benton County appeared to have no comprehensive plan, and Farmington had only a future land use map without accompanying text or documents.

All 13 incorporated some form of the first four of the seven Open Space Plan principles in question – the open space, benefits, complementary and practices principles – within their code, comprehensive plan or both. For cities such as Pea Ridge, Rogers and Siloam Springs, the definition of open space is narrow, typically unpaved spaces that may be used for recreation or other purposes. Others, especially Bella Vista and Benton County, describe multiple forms of open spaces, including floodplains, wetlands, natural habitats and recreation areas. Cave Springs and Prairie Grove gave explicit definitions of open space only in their comprehensive plans.

Every jurisdiction enumerated more than one of green infrastructure's functions, most often emphasizing its human-focused uses, such as conduits for floodwaters and spaces for recreation and social gatherings. Fayetteville's descriptions were the most varied and numerous. Within its ordinances for tree preservation, flood damage prevention and landscaping, the city highlighted green infrastructure's role in more than a dozen distinct benefits: providing a healthful environment for residents and businesses; moderating sun, wind and temperature extremes; buffering against noise, visual and air pollution; reducing runoff; reducing erosion; providing habitat for wildlife; fostering water quality; conserving energy; enhancing property

values; promoting ecological integrity; providing recreation opportunities; accommodating and controlling floodwaters; allowing for groundwater recharge; and discouraging invasive species.

Cave Springs, Centerton and Prairie Grove leaned on their comprehensive plans to explicitly state the complementary principle. It was more typical to include some reference to this principle in actual code. For instance, Lowell's Sec. 16-256, states its purpose is "to ensure a minimum of open space and green areas *as an integral part of new development*" (emphasis added).

All jurisdictions provided more than one policy method of conserving or enhancing open space (the practices principle), such as minimum unpaved areas in a given property; tree preservation incentives that softened other regulations such as parking space minimums in exchange for more trees preserved; and alternative zoning districts that allow more variety or density in a development project's design in exchange for greater amounts of preserved open space.

It was in the final three principles that local governments diverged. The preservation principle appeared to be missing from Cave Springs code. All others had some code language to that effect. In most cases, this language was brief, such as statements of an official preference for leaving ground undisturbed or preserving vegetation on a construction site rather than replacing it. Fayetteville made this principle unusually explicit in its regulations for tree preservation (Sec. 167.01): "Preservation shall be the first, best, and standard approach." If it's not possible, on-site mitigation, off-site preservation and payment to a tree escrow account follow in order of preference.

Only six out of 13 jurisdictions stated the equity principle in some form within their codes, often in the context of a planned or alternative zoning district that allows for more unusual

development formats. “Common useable open space constitutes an essential ingredient in a planned unit development and is one of the most basic and important design elements,” Bentonville code Sec. 401.10 states. Four others stated the same only in their comprehensive plans. In general, comprehensive plans take a stronger stance on this principle than code. For example, Fayetteville’s landscaping regulations (Sec. 177.01) state that “providing outdoor spaces and places for people to gather is strongly encouraged.” Meanwhile, the city’s comprehensive plan goes on to say “publicly accessible open space is essential for residents to have convenient access to outdoor amenities,” (134), calls for open spaces to be within walking distance of every resident, and points to its role in tourism. The remaining three jurisdictions, namely Farmington, Lowell and Prairie Grove, had no apparent reference to this principle.

Finally, the network principle was the least-often incorporated principle of all seven. Only four of 13 jurisdictions stated this principle to some extent within their code, being Bella Vista, Farmington, Rogers and Siloam Springs. Farmington’s code touches on this principle in its dedication and landscaping of neighborhood parks regulation, Sec. 14.04.25, which states that “dedicated park land shall be contiguous.” It continues: “When a proposed park dedication calculation is too small in area to provide an open space of suitable size and character, the Planning Commission may require dedicated land to be located next to open spaces or dedicated park land in adjacent development areas, so the combined land areas create park area of adequate size.” Five others mention this principle within their comprehensive plans. Four, namely Benton County, Lowell, Pea Ridge and Springdale, appear to lack this principle altogether within the policies and plans examined.

Five ranking categories were delineated based on how individual jurisdictions fell in the survey: 1) reflecting all seven principles in code; 2) reflecting all seven principles when

comprehensive plans are included; 3) reflecting six out of the seven principles within code or comprehensive plan, with code reflecting most of them; 4) reflecting six of the seven principles but mostly in comprehensive plan alone; and 5) reflecting five of the seven principles. See Appendix A for detailed tables showing results and policy excerpts for each city or county.

Bella Vista and Rogers fell into the top-ranking category. In Rogers' case, this bar was often cleared by a single, narrow policy. For instance, the complementary principle appears only in the Cave Springs area karst resource conservation regulations, which apply to a relatively small area in the city's southwest. (Cave Springs in this case refers to the hydrological feature of that name, not the city). Here the regulation states its purpose is to permit development in a manner that doesn't harm water quality in the area. The Downtown Rogers Development Code, applying to a similarly small patch of the city, included the only reference found in city code to the importance of a network of open spaces: "The illustrative vision for Downtown Rogers recognizes the importance of providing a network of open spaces with passive and active recreation opportunities" (Sec. 14-715, 7.1).

Rogers is in the process of developing a comprehensive plan, so the only version available during the survey was a thinly detailed fact sheet outlining the general approach being taken by the city and its consultant. Nonetheless, this brief outline supported four of the seven principles by stating, The Natural Environment encompasses floodplain, creeks, parks, trails, green networks, and other designated open spaces within the city. The natural environment is a network that supports quality of life, economic growth, water quality, outdoor recreation, and a local sense of place. The city focuses on developing within its municipal boundaries in a way that supports the natural environment" (The Three Ribbons, 2022). Rogers code includes requirements, rather than simply encouragement or options, for two of the three principles tested

in this respect: The Uptown Rogers Development Code states that open space *shall be* incorporated to provide usable public areas there (Sec. 14-732, emphasis added), and regulations for construction site stormwater discharge state that disturbed areas *shall be* minimized (Sec. 14-791, emphasis added).

Conversely, Bella Vista's codes reflect Open Space Plan principles in a deeper and broader way. Zoning ordinances touch most of the seven principles multiple times, for instance by listing a variety of benefits provided by open space, including alleviating heat and other weather conditions and enhancing community character. It goes further by listing benefits that don't apply only to humans directly, such as habitat for endangered and threatened species and the general idea of ecological balance. Bella Vista is also unusual among the surveyed jurisdictions in not only emphasizing within code the importance of an open space network but also explaining how a network may be created. Sec. 109-68 b. reads: "At least 50 percent of the green space *shall be in a contiguous tract. The green space shall adjoin neighboring areas of green space, other protected areas, and non-protected natural areas*" (emphasis added). Flood damage prevention and subdivision development codes also reflect open space principles examined. Of the three principles examined for a requirement component, all are required to at least some extent in Bella Vista, as the word "shall," noted above, demonstrates.

The Bella Vista Comprehensive Plan 2040 deepens these reflections, such as by providing the only reference found among all jurisdictions to creating a grant and land acquisition strategy as one of multiple conservation practices that can enhance green infrastructure. On the subject of natural areas, the plan declares, "These components are a defining feature of Bella Vista, and will likely continue to be one of the city's greatest assets" (Gould Evans and Wilson & Company, 2020, 12).

Into the second category fell Bentonville, Centerton, Fayetteville and Siloam Springs. For the first three, the network principle was present only in their comprehensive plans. Fayetteville stands out in the extensiveness of this principle in its City Plan 2040 (2020), which devotes significant detail to the creation of an Enduring Green Network, a city-specific tool whose purpose follows that of the Northwest Arkansas Open Space Plan almost to the letter: “The Enduring Green Network (EGN) is a mapping tool created to understand areas of the city that have identifiable ecological value and would provide human and biological greenway linkages between major open space anchors. The map was created by highlighting existing natural resources and open spaces including; floodplains, riparian corridors, parks and trails, and land identified as having high ecological value by a 2010 Fayetteville Natural Heritage Association study” (40). The tool includes a city map of priority areas and sets the goal of creating a network of open spaces within walking distance of all residents, which would provide “both environmental services and benefits to the mental and physical health of residents” (41). More typical is Bentonville’s 2018 plan, developed by Houseal Lavigne, which states that “preserving a comprehensive network of open spaces and environmental areas requires a proactive approach amid Bentonville’s rapidly changing landscape” (90) and calls on the city to “use floodplains and greenways to create trail networks that connect open spaces” (98). Siloam Springs leans on its comprehensive plan to state the importance of equitable, public access to open spaces, while Centerton leans on its plan to state the network and complementary principles.

In the middle category are Benton County, Farmington, Pea Ridge, Prairie Grove and Springdale, each with one principle missing. For three of them – Springdale, Pea Ridge and Benton County – the network principle is lacking. Farmington’s park land dedication code described above is the only instance of such a policy found in the survey. Prairie Grove’s

comprehensive plan reflects the network principle as well, setting a goal to “connect existing and identify new potential green spaces, pedestrian infrastructure, recreational areas, water bodies and other natural resources to act as a green network within the City as it grows and develops” (n.d., 14).

Farmington and Prairie Grove, in turn, lack the equity principle. Benton County provides the only example in this ranking category of such a policy, stating in its subdivision regulations that “provisions for open space and useable recreation areas shall be provided by the developer whenever practicable.” Springdale and Pea Ridge, on the other hand, lean on their comprehensive plans in this regard. Springdale’s declares that “parks and recreation areas should be evenly distributed throughout the City and include larger community parks and smaller neighborhood parks” (2010, 11).

Within this ranking category, Benton County and Farmington require developers to incorporate two of the three principles tested in this manner. But they typically are ambiguous requirements. For example, “*every effort* shall be made to preserve existing healthy native trees” under Farmington Sec. 14.04.19 (emphasis added). Likewise, Benton County Sec. 5.3 states, “*Consideration* shall be given to the protection of natural resources, such as wetlands, floodplains, existing streams, creeks or open drainage channels on-site, and sensitive biological resources. Subdivisions must *demonstrate* protection of said resources *when applicable*” (emphasis added).

Cave Springs is in the fourth rank alone, with code and the comprehensive plan reflecting six out of seven principles but with the comprehensive plan providing the sole basis for all but one. Missing is the preservation principle. City code touches on green infrastructure’s function as flood conduits, satisfying the benefits principle. Other principles appeared only in the publicly

available draft of the 2040 Cave Springs Vision Plan. This document repeats the language in Prairie Grove’s plan about connecting existing open areas and finding new ones, for example. It also makes repeated references to public recreation spaces. “Similar to the Public/Institutional category, these uses should be within every zoning district within the City,” it states, referring to the principle that development and open space goals can complement each other. “Having an array of both public and private natural and recreation areas benefits the City's citizens, employers, and visitors immeasurably” (n.d., 35).

In the final category is Lowell, whose codes reflect five of seven principles. The city does not appear to have a comprehensive plan, relying instead on the local chamber of commerce to set a vision for the future. Most of the relevant regulations appear in Sec. 16-256, which sets requirements for development landscaping and screening. These regulations call for preserving trees and ensuring “a minimum of open space and green area as an integral part of new development and to protect the health and welfare of citizens.”

Table 1. Policy survey rankings.

City/county	Ranking category (1-5)	Number of principles reflected	Number of principles reflected by comprehensive plan <i>only</i>	Number of principles that include a requirement (tested for 3 of the 7 principles)
Bella Vista	1	7/7	0/7	3/3
Rogers	1	7/7	0/7	2/3
Fayetteville	2	7/7	1/7	1/3
Bentonville	2	7/7	1/7	1/3
Siloam Springs	2	7/7	1/7	1/3
Centerton	2	7/7	2/7	2/3
Benton County	3	6/7	0/7	2/3
Farmington	3	6/7	0/7	2/3
Prairie Grove	3	6/7	1/7	1/3
Pea Ridge	3	6/7	1/7	0/3
Springdale	3	6/7	1/7	0/3
Cave Springs	4	6/7	5/7	0/3
Lowell	5	5/7	0/7	1/3

Results: Case studies

I selected Rogers and Lowell to be the communities from which I drew the two development case studies, given that the two fell on opposite ends of the policy survey ranking and border each other. This proximity would allow the two projects to take place in a similar spatial context, making their comparison more meaningful.

By chance, two large-scale developments have gone through their respective planning commissions' approval process within the past year: one labeled William's Property in Lowell and one called Cottages at Bellview in Rogers. Each is located on the west side of Bellview Road and each is about a half-mile on either side of the Rogers-Lowell border, as shown in the map below (Fig. 2). Their similarities go even further. They both will replace undeveloped land – pasture in one case, vacant land in the other. They're adjacent to neighborhoods as well as other undeveloped tracts, exemplifying a transitional area between rural and urban. They're roughly equal in size, approximately 20 acres, and shape. They're both being developed for similar residential uses. They're both located within the Cave Springs recharge area. They're both located in medium-priority areas as identified in the Open Space Plan (Fig. 3). And both properties include an east-west creek or drainage area – in fact, this drainage area is also on the southern edge of the development in both cases. In other words, the two case studies seem ideal in almost every way for a comparison of their respective cities' development decisions.

Fig. 2. Map of the case study developments and surrounding area.



Fig. 3. Map of the case study developments and surrounding area, as seen in the Northwest Arkansas Open Space Plan priority map (Alta Planning + Design, 2016).



Case Study 1: Cottages at Bellview

The developers in this project went before the Rogers Planning Commission on Nov. 15, 2022, for approval of a large-scale development plan for 156 single-family units near the intersection of South Bellview and West Garrett roads.

Is open space present in the project? Yes. The agenda states the proposed project would be a cottage court/cluster housing-type development, wherein homes are “typically placed in closer proximity than usual with the purpose of retaining an open space area” (56). As shown in the map (Fig. 4), the buildings would be arranged in three east-west corridors divided by parking lots, with stretches of open space along the property’s northern and southern edge.

Fig. 4. Cottages at Bellview site plan showing buildings and paved areas, open space, and the undisturbed creek area on the south edge.

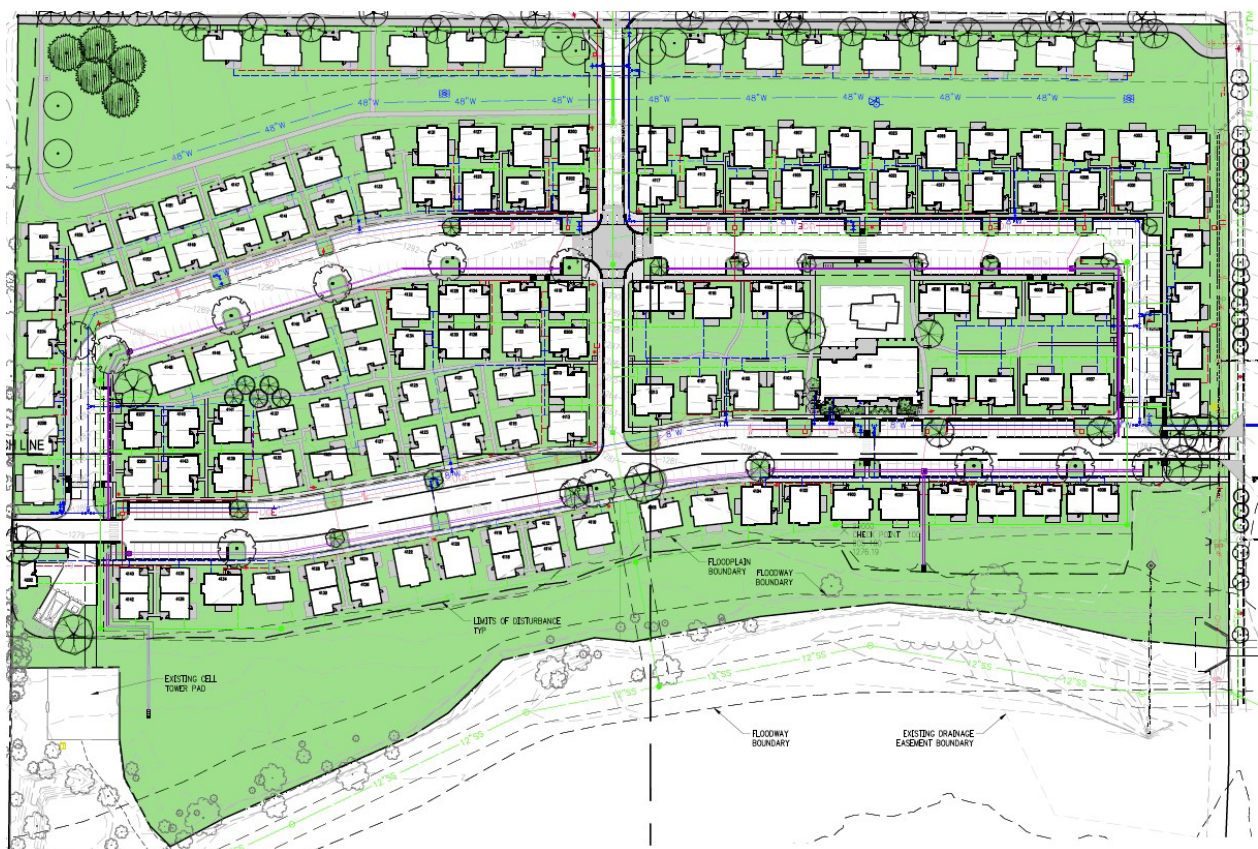


Image credit: Rogers Department of Community Development

If so, what are its characteristics? The site plan stated more than 50% of the property would be left as open space, a drop from 64% of an earlier plan presented in October 2021. The minutes of the meeting show the plan was approved unanimously, with no discussion noted. A stamped site plan dated Feb. 24, 2023, clearing the way for construction to begin, shows a decrease in the number of trees preserved but no change in the proportion of unpaved space. The plan doesn't explicitly discuss use or access to the space. From observations in person and Google Earth Pro, the development borders other open space on three of its four sides, with Bellview Road on the fourth. This is expected to the change as the property just north of this one is also in the process of being developed. But Cross Creek continues into other open spaces to the west of this property and is connected to the east by a tunnel under Bellview to a detention pond and other open spaces that accommodate stormwater. In other words, connectivity between the creek area and adjacent open spaces is maintained.

What is the stated reasoning for the open space and its characteristics? Developers requested a waiver on Rogers minor street connection requirements, a waiver that would result in less connection on the southern edge of the property along Cross Creek. "Cross Creek runs along the property line and would require substantial drainage structures in order to provide adequate flow conveyance. Since the property is a Zone 2 on the Karst Map and Cross Creek has been identified as a losing stream, we are requesting to leave the creek undisturbed," the developers wrote the city (60). City planning staff recommended approval of this waiver, citing their own preference to leave the creek undisturbed.

The documents cited above make reference to two of the seven open space principles: the practices principle, by using cluster housing, and the preservation principle, in the discussion of the street connection waiver. Of the city codes flagged in the policy survey, several appear to

apply to this project and fall within five of the seven principles: the open space principle (the definition of open space found in zoning codes); the benefits principle (fulfilled by tree preservation and flood regulations), complementary principle (noted in the Cave Springs Karst regulations), practices principle (cluster housing under zoning code) and preservation principle (tree preservation codes again).

Case Study 2: William's Property

The developers of this project went before the Lowell Planning Commission on Aug. 15, 2022, for approval of a large-scale development plan for 248 multifamily units near the intersection of South Bellview Road and West Monroe Avenue.

Is open space present in the project? Yes. The site plan in the meeting agenda (Fig. 5) shows a development largely occupied by apartment buildings, a clubhouse and parking lots but with various lawns and other stretches of unpaved space.

Fig. 5. William's Property site plan.



Image credit: Lowell Department of Community Development.

If so, what are its characteristics? The included site plan doesn't provide information on the proportion of open space. But the plan includes three disconnected areas (noted by closely-spaced dots within white polygons in the diagram above) labeled as landscape amenities, including a park area near the center of the development. The longest uninterrupted stretch of open space is along the project's southern edge, bordering an undeveloped, wooded, largely east-west-oriented drainage easement area. From personal observations and Google Earth Pro, the property is bordered by open space on two sides, with Bellview Road and a residential neighborhood on the other two. However, there is only a thin strand of unpaved ground connecting the project to the open space on its north side. The southern side is more substantial, connecting to the drainage easement. This wooded area connects on its eastern end to another open pasture area via a tunnel under Bellview Road but does not connect to an adjacent open space on its west side, instead running into a fenced residential area.

What is the stated reasoning for the open space and its characteristics? The meeting agenda includes an Aug. 9, 2022, report from the city Technical Plat Review, which notes that at least half of the impervious area on the site must be disconnected from other impervious area by way of best management practices such as swales and vegetated buffer strips. The developers note the inclusion of a "forebay" area collecting stormwater for treatment and percolation into the ground. City staff also noted that 10% greenspace is no longer required for multifamily developments, but maximum lot coverage (built area) is 60%.

The documents cited above make reference to one of the seven open space principles, the benefits principle, by mentioning stormwater collection and treatment. Of the city codes flagged in the policy survey, those pertaining to five principles appear to apply to this project: the open space principle (the definition of open space found in the land development code); the benefits

principle (fulfilled by tree preservation, landscaping and flood regulations), complementary principle (via landscaping regulations), practices principle (a tree preservation incentive in landscaping code) and preservation principle (the tree preservation provisions).

Analysis

This study has a number of noteworthy weaknesses and limitations, leaving numerous opportunities for future research. It's based off of an individual's reading of codes and plans, which can miss important details, at the whims of drowsiness or impatience, and doesn't account for possible oversights and variations in interpretation of those codes and plans. It utilizes a limited ranking method in which a phrase in one city's code can carry the same weight as several sentences or paragraphs in another's. It ignores open spaces' variety of quality and form. The lines between the Open Space Plan principles described here at times may overlap or blur, complicating their identification within government documents, and other observers may distill different principles from the Plan.

Further, this thesis is solely a quantitative examination, due to inadequate GIS skills on my part for quantifying such variables as land use cover, fragmentation and function. It does not delve into the realm of local politics – not just what codes say but why, when they were adopted, and why they differ from town to town. Above all, it does not attempt to establish a causal relationship between the publication of the Northwest Arkansas Open Space Plan in 2016 and any change or lack of change in the region's land use decision-making in each community and in the aggregate. It remains unclear if the Plan has affected policy trends in the region or has reflected trends occurring independently. Truly assessing the Open Space Plan's impact or lack of impact would likely require a multidisciplinary approach that surmounts all of these limitations and more, such as by interviewing planning officials and developers in multiple cities who oversaw a wide variety of development projects over a number of years before and after the plan's release. Another straightforward assessment method could be to compare the Plan's

priority map with cities' future development maps, which often denote areas to be reserved for open or recreational areas.

However, as far as this thesis goes, it found widespread alignment between the Open Space Plan and the region's county and municipal development codes and plans. In many cases this overlap is narrow, appearing in only one or two subsections of policy. But this demonstrates that most of these principles are known to local governments and are codified to some extent. The principles in question include an understanding of what open space means, that open space plays many essential functions, that it doesn't need to be seen in opposition to development and growth, and that multiple methods of keeping it are available. In almost every case, comprehensive plans go further than established code. They lack the force of law but indicate local governments' perspective looking toward the future. One plausible interpretation is that almost every city wants to be more proactive and intentional with open space than they are at present. On the other hand, most local governments lack codes establishing the importance of public, equitable access to open spaces and of an interconnected network of the same spaces. Put another way, there's nothing unusual about a given city establishing parks and other open areas, but ensuring that those areas connect to each other and to the public is a more radical step. This arguably makes these two principles the Open Space Plan's most important, at least from the standpoint of measuring its impact.

A cursory examination of the ranking results shows a correlation with population: Bigger cities tend to rank higher, and the average population of cities in each rank category (excluding Benton County) generally drops from rank to rank with the exception of Rank 5 (Table 2). This is despite a mix of political leanings, with many highly ranked cities' residents choosing conservative candidates in the most recent state election (Northwest Arkansas Democrat-Gazette,

2022). This pattern may stem from greater development pressure and sense of urgency over open space preservation in larger cities. The pace of population growth has correlated with loss of open space in other cities around the United States (McDonald et al., 2010).

Table 2. Rank versus population among cities examined.

City/county	Ranking category (1-5)	2020 Population (U.S. Census Bureau, 2021)	Rank population average
Bella Vista	1	30,104	
Rogers	1	69,908	50,006
Bentonville	2	54,164	
Centerton	2	17,792	
Fayetteville	2	93,949	
Siloam Springs	2	17,287	45,798
Farmington	3	7,584	
Prairie Grove	3	7,045	
Pea Ridge	3	6,559	
Springdale	3	87,176	27,091
Cave Springs	4	5,495	5,495
Lowell	5	9,839	9,839

As to the case studies, the approval process for the developments in question largely followed similar paths, with two apparent distinctions: the explicit attention given to open space and its rationale within official documents, and the connectivity of the largest open spaces to those in neighboring properties. The Rogers development exceeded the Lowell development on both counts. Its primary undeveloped area flows from one neighboring open space and into another, and city documents frequently mentioned the fact that this matters to the city. The result aligns more closely with the Open Space Plan and its principles, lending support to the policy survey results and demonstrating the impact that differing codes may have on a given construction project.

Conclusion

On balance, I find support for my proposition, though more study would be worthwhile. A sense that the Open Space Plan has fizzled, due to the failure of its sales tax component and other factors, seems to be inaccurate. Its component principles are a part of the region's planning policy fabric – if not in name, then in spirit. However, more could be done to make the Plan a reality. Larger cities appear to place a higher priority on codifying open space protections, yet some of the area's smallest cities are also among the fastest growing (Jones and Thompson, 2021). These towns must give more priority to this effort now rather than later, before it's too late – a corollary of the preservation principle. I also urge all cities in the region to make these principles a bigger part of their development codes. Prioritizing and connecting open spaces could be as natural and expected as planning out utilities, street connections and school locations. The findings of this report suggest that giving developers options and flexibility – multiple ways that projects and open space can coexist – will be key.

Personal communications with the Northwest Arkansas Regional Planning Commission have shown that the organization and other advocates for open space in recent years have focused on convincing area city councils one by one to adopt non-binding resolutions broadly supportive of open space preservation. This report's findings suggest that this approach may not be needed. Perhaps advocates could instead focus their time and effort on incorporating specific open space principles, such as the equity and network principles, into city code, and on widening the overlap between cities' codes and their loftier comprehensive plans. Both of these actions could lead local governments to make more open-space-friendly development decisions and protect more of Northwest Arkansas' essential ecological services before they're irretrievably lost.

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Appendix A: Policy survey results by jurisdiction

This appendix provides quotations from local codes and comprehensive plans highlighted during the policy survey portion of this thesis. The pertinent phrases or passages that appeared to satisfy a given Open Space Plan principle are noted with italics.

The cited text is from city or county code unless otherwise noted; comprehensive plans are referred to by name. Specific subsections or clauses of code are noted with numbers and/or letters in parentheses.

As stated previously, this survey wasn't expected to be an exhaustive list of every responsive provision. Instead the highlighted policies should be seen as illustrative and supporting examples demonstrating that a jurisdiction's code or comprehensive plan incorporated each principle.

Bella Vista

	a. The principle appears in at least a broad, general sense.	b. Additional meaning, motivation or factual basis are provided.	c. Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓ ✓	✓ ✓	
4. A variety of conservation practices can be used to enhance open space.	✓ ✓	✓	
5. Open space is most effective as a connected network throughout a given region.	✓		✓
6. Public and equitable access to open spaces is a priority.	✓ ✓	✓	✓
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓ ✓	✓ ✓	✓

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Bella Vista Municipal Code: https://library.municode.com/ar/bella_vista_city

Bella Vista Comprehensive Plan (2020): https://library.municode.com/ar/bella_vista_city

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- Sec. 109.86: Open space may include:
 1. *Wetlands and water bodies*, including the normal pool elevation surface area of retention ponds;
 2. *Active detention ponds*;
 3. *Identified floodplains and floodways* in the currently effective FEMA flood maps adopted by the city;
 4. *Vegetated and landscaped areas*, excluding required parking lot landscaping requirements;
 5. *Natural buffer areas* between the planned zoning district and adjacent properties....
- Sec. 109-3: Open space means land *devoted to conservation or recreational purposes and/or land designated by a municipality to remain undeveloped*.

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 105-6(3): This chapter controls the alteration of natural floodplains, stream channels and natural protective barriers which are involved in *the accommodation and transport of floodwaters*;
- Sec. 107-377(d): Restoration. Land shall be revegetated and restored as close as practically possible to its original conditions so far as *to minimize runoff and erosion*.

- Sec. 109-68(c)(2)a.: Land areas with the following characteristics shall be included in all green space area calculations:

...

7. Habitat areas for populations of endangered or threatened species;

- Sec. 109-211: The purpose of this article is to ensure a minimum of open space and green area as an integral part of new development and to protect the health and welfare of its citizens through the regulation of landscaping of new multifamily, commercial and industrial developments.

(1) Landscaping *enhances the environmental and visual character* of the community.

(2) Green space requirements *preserve and stabilize the area's ecological balance* by establishing a healthier environment.

(3) Green areas help to *mitigate the negative effects of air and noise pollution* by using plants as buffers.

- Sec. 109-212: Landscaping should be an integral part of a development. This article is designed to promote high quality developments, protect property values and public investment in our community. Objectives of this article include, but are not limited to, the following:

(1) *To moderate the effects of sun, wind, and temperature changes;*

(2) *To filter pollutants from the air and release oxygen;*

(3) *To stabilize soil and prevent erosion;*

- Bella Vista Comprehensive Plan 2040: The natural setting of Bella Vista, located on the Springfield Plateau within the Ozark Mountains, *promotes the active lifestyles of its residents* (5).

- Bella Vista Comprehensive Plan 2040, Ch. 4: Open spaces are important for supporting daily public life in a community. Open spaces are diverse in scale and design to be seamlessly integrated into and support related activities and land uses. Designed for the right context, *open spaces can be a place for people to gather, relax, recreate, and access citywide networks* (48).

3(a): Complementary goals in at least a broad sense.

- Sec. 107-377(b): Site conditions. *Developments shall generally conform to the natural contours of the land, natural drainageways, and other existing site conditions.*
- Sec. 109-71(a): General description and purpose. The recreational open space district is designed to protect and enhance vital natural resources such as floodplains, streams, wetlands, exceedingly steep topography, woodlands and wildlife habitat. Further, this district serves to maintain a buffer between incompatible land uses, and to restrict development in areas not suitable for or capable of sustaining development, *while allowing certain uses which are not detrimental to the land.*

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 109-71(a): General description and purpose. The recreational open space district is designed *to protect and enhance vital natural resources such as floodplains, streams, wetlands, exceedingly steep topography, woodlands and wildlife habitat.*
- Bella Vista Comprehensive Plan 2040: These components are a defining feature of Bella Vista, and will likely continue to be one of the city's greatest assets.

Opportunities

- The scenic topography of rolling hills and steep valleys within Ozark Mountains *is an attraction to many, and supports existing and planned mountain bike trails.*
- The abundance of lakes and mature forests *supports recreational amenities, high quality of life, and fitness tourism* (12).
- Bella Vista Comprehensive Plan 2040: The natural character of the community should continue to be preserved and *leveraged to support quality of life and growing fitness tourism, and development should integrate natural features into their design* (30).

4(a): A variety of practices in at least a broad sense.

- Sec. 109-71(c): Green space as defined above shall be protected in perpetuity by a binding legal instrument that is recorded with the deed. The instrument shall be one of the following:
 - (1) *A permanent conservation easement* in favor of a land trust or similar conservation oriented nonprofit organization with legal authority to accept such easements. The organization shall be bona fide and in perpetual existence and the conveyance instrument shall contain an appropriate provision for retransfer in the event the organization becomes unable to carry out its functions.
 - (2) *A permanent restrictive covenant* for conservation purposes in favor of a government entity or property owner's association.
 - (3) *An equivalent legal tool* that provides permanent protection, if approved by the city.
- Sec. 109-222(c)(1): Reduction of parking requirements. To allow an existing or new development to preserve trees within or adjacent to a parking lot, *the number of required off-street parking spaces may be reduced* as described....

- Bella Vista Comprehensive Plan 2040: *Pursue grant funds and prepare a land acquisition/maintenance strategy* to support the creation of family-friendly neighborhood parks (124).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 109-86(a): Purpose. The purpose of the planned zoning district (PZD) is to establish a mechanism to propose a development with a mix of commercial, industrial or residential uses that is innovative but which does not strictly comply with the provisions of the zone in which the property is located and cannot be achieved through traditional zoning.

...

(4) *Encourage efficient use of land for preservation of sensitive environmental areas such as open space and topographic features;*

- Sec. 109-86(f)(1): The planning commission and city council may approve a proposed PZD subject to the following review criteria:

...

d. *The development provides for more usable and suitably located open space, recreation areas, and other common facilities* that would not otherwise be required under conventional land development regulations;

e. The development *maximizes enhancement or minimally disrupts existing natural features and amenities;*

5(a): Effective as a network in at least a broad sense.

- Sec. 109-68: b. At least 50 percent of the green space *shall be in a contiguous tract. The green space shall adjoin neighboring areas of green space, other protected areas, and non-protected natural areas.*

5(c): Effective as a network requirement.

- Sec. 109-68: b. At least 50 percent of the green space *shall be* in a contiguous tract. The green space *shall adjoin* neighboring areas of green space, other protected areas, and non-protected natural areas.

6(a): Public access in at least a broad sense.

- Sec. 109-86(h)(1): All planned zoning districts shall provide and identify common open space in the master development plan. Common open space shall be land devoted to conservation or recreational purposes and shall be designated to remain undeveloped, except within the provisions provided below. *Common open space shall be open to owners, tenants, and customers within the planned zoning district,* and shall adhere to the following requirements.

...

b. Distribution. Open space should be *distributed throughout the planned zoning district in relationship to the dwelling units or other use areas that are intended to be served by the common open space.*

6(b): Public access given detail, meaning or factual basis.

- Bella Vista Comprehensive Plan 2040: Although some parks and trails are publicly accessible, lakes and common ground are generally only accessible by POA members. *As Bella Vista continues to experience population growth, particularly of families with school-aged children, it is critical that creation of publicly accessible open spaces are pursued* (48).

6(c): Public access requirement.

- Sec. 109-86(h)(1): All planned zoning districts shall provide and identify common open space in the master development plan. Common open space shall be land devoted to conservation or recreational purposes and shall be designated to remain undeveloped, except within the provisions provided below. Common open space *shall be open* to owners, tenants, and customers within the planned zoning district, and shall adhere to the following requirements.

7(a): Better before than after in at least a broad sense.

- Sec. 107-374(c): (c)Specifically, the goals of these regulations are:
 - (1)*To prohibit the indiscriminate clearing of property;*
 - (2)To prevent excessive grading, clearing, filling, cutting, or similar activities;
 - (3)To reduce flooding, erosion, and sediment damage within the city;
 - (4)To prevent the pollution of streams, ponds, or other watercourses;
 - (5)To minimize the danger of flood and property loss due to unstable slopes;
 - (6)*To preserve natural vegetation and conceal hillside scars;*

- Sec. 107-382(b)(1): Natural vegetation. The potential for soil loss shall be minimized by *retaining natural vegetation wherever possible*.

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 107-374(c): (c)Specifically, the goals of these regulations are:
 - (1)To prohibit the indiscriminate clearing of property;
 - (2)To prevent excessive grading, clearing, filling, cutting, or similar activities;
 - (3)*To reduce flooding, erosion, and sediment damage within the city;*
 - (4)*To prevent the pollution of streams, ponds, or other watercourses;*
 - (5)*To minimize the danger of flood and property loss due to unstable slopes;*
 - (6)To preserve natural vegetation and conceal hillside scars;
- Sec. 107-382(b)(1): Natural vegetation. *The potential for soil loss shall be minimized* by retaining natural vegetation wherever possible.
- Bella Vista Comprehensive Plan 2040: Protect natural assets – Ensure important natural features are protected *to maintain a healthy environment and ecosystem* (31).

7(c): Better before than after requirement.

- Sec. 107-382(b)(1): Natural vegetation. The potential for soil loss *shall be minimized* by retaining natural vegetation wherever possible.

Benton County

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓	✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.			
6. Public and equitable access to open spaces is a priority.	✓		✓
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓	✓	✓

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Benton County development code:

https://library.municode.com/ar/benton_county/codes/code_of_ordinances

1(a): Definition in at least a broad sense.

- Sec. 2.1: *Open space shall be defined as an area of land or water that either remains in its natural state or is used for agriculture, recreational, or cultural use, free from intensive development for residential, commercial, industrial or institutional use.*

1(b): Definition given detail, meaning or factual basis.

- Sec. 1.4: Areas of critical environmental concern include, among other things, *aquifers and aquifer recharge areas, soils poorly suited to development, floodplains, wetlands, prime agricultural and forestlands, the natural habitat of rare or endangered species, areas with unique ecosystems, or areas recommended for protection in the Arkansas Natural Areas Plan.*
- Sec. 2.1: *Open space can be publicly or privately owned. It includes agricultural and forest land, undeveloped lakeshore or riverbank lands, undeveloped scenic lands, and public parks and preserves. It also includes water bodies themselves such as lakes and bays. In an urban setting, a vacant lot, courtyard, plaza, or a small marsh can be open space. A small park or a narrow corridor for walking or bicycling is open space, though it may be surrounded by developed areas. Cultural and historic resources are part of the heritage of Arkansas and are often protected along with open space.*

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 1.4: General Goals

1. *To protect and provide for safe drinking water sources, including Beaver Lake, for the public health, safety, and general welfare of Benton County, Arkansas.*

2. *To provide for adequate light, air, privacy, to secure safety from fire, flood, and other hazard, and to prevent overcrowding of the land and excessive congestion of population.*

3. *To protect the character and the social and economic stability of all parts of Benton County and to encourage orderly and beneficial development of the community through appropriate growth management tools assuring the timing and sequencing of development and related infrastructure to avoid costly infrastructure extensions.*

4. *To assure proper urban and rural development form and open space separation of urban areas, to protect environmentally critical areas and areas premature for development. Protect agricultural lands and uses as a valuable resource.*

- Sec. 1.4(D)(4): 4. *To prevent the pollution of air, water, and soil; to assure the adequacy of drainage facilities; to safeguard the water table, and to encourage the wise use and management of natural resources throughout Benton County in order to preserve the integrity, stability, and beauty of the community and the value of the land.*

- Sec. 10.4(A)(3): 3. *Control the alteration of natural floodplains, stream channels and natural protective barriers, which are involved in the accommodation of floodwaters.*

3(a): Complementary goals in at least a broad sense.

- Sec. 1.4(i): *Retain the agricultural nature and rural residential character of the County while recognizing the need for industrial land uses*, principally where adequate utilities, roads, and other infrastructure exists or will exist.

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 1.4(E)(3): *To provide for open spaces through the most efficient design and layout of the land, including the use of average density* in providing for minimum width and area of lots, while preserving the density of development as established in these regulations.
- Sec. 4.6(13): All development in the County are encouraged to incorporate Low Impact Development (LID) options in the design and development of projects. Low Impact Development is an *ecologically based Stormwater management approach* contrary to conventional “pipe-and-pond” conveyance infrastructure that channels Stormwater runoff through pipes, *catchment basins*, and curbs and gutters.

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 4.6(13): All development in the County are encouraged to incorporate Low Impact Development (LID) options in the design and development of projects. Low Impact Development is an *ecologically based Stormwater management approach* contrary to

conventional “pipe-and-pond” conveyance infrastructure that channels Stormwater runoff through pipes, *catchment basins*, and curbs and gutters.

- Sec. 5.3(1)(A)(i): While observing minimum lot area standards of this Ordinance, *cluster development may be utilized to reduce grading alterations and preserve the natural features.*
- Sec. 5.8(A): 4. Open Space: The *PUD development shall provide more useable open space through structure grouping, plazas, green roofs, and other innovative design techniques and allow for preservation of unique natural resources*; and,

5. Preservation: *Preservation of appropriate cultural or natural features.* This can include but not be limited to cultural features such as historic building sites, and landscapes or natural features such as balds, forest coves, rivers and streams, ponds, or rock outcrop.

6(a): Public access in at least a broad sense.

- Sec. 5.3(B)(9): Open Space – Provisions for *open space and useable recreation areas* shall be provided by the developer whenever practicable.

6(c): Public access requirement.

- Sec. 5.3(B)(9): Open Space – Provisions for open space and useable recreation areas *shall be provided by the developer whenever practicable.*

7(a): Better before than after in at least a broad sense.

- Sec. 4.6(16): *Existing healthy trees shall be preserved wherever possible.*

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 5.3(1)(A): i. *The development of hillside areas shall preserve the existing natural contours and natural features, where possible.* Structures and required provisions for access and infrastructure should be designed to ensure public safety and *protection of natural features*. Erosion and sediment control measures shall be implemented to the satisfaction of the Planning Board. While observing minimum lot area standards of this Ordinance, cluster development may be utilized *to reduce grading alterations and preserve the natural features*.
- ii. *Natural tree cover should be preserved whenever possible. Landscaping strips are encouraged* to provide visual and sound separation and relieve the monotony of uniform fronts.

7(c): Better before than after requirement.

- Sec. 4.6(16): Existing healthy trees *shall be preserved wherever possible*.
- Sec. 5.3(1)(A): i. The development of hillside areas *shall preserve* the existing natural contours and natural features, *where possible*.

Bentonville

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓ ✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓ ✓	✓ ✓	
4. A variety of conservation practices can be used to enhance open space.	✓ ✓	✓ ✓	
5. Open space is most effective as a connected network throughout a given region.	✓	✓	
6. Public and equitable access to open spaces is a priority.	✓ ✓	✓ ✓	✓
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓ ✓	✓ ✓	

✓ denotes appearance in city/county code. ✓ denotes appearance in comprehensive plan or equivalent.

Bentonville Municipal Code:

<https://bentonville.municipalcodeonline.com/book?type=ordinances>

Bentonville Community Plan (2018):

<https://www.bentonvillear.com/DocumentCenter/View/2919/Bentonville-Community-Plan---Adopted-?bidId=>

1(a): Definition in at least a broad sense.

- Sec. 200.01: Open Space: Open space shall be interpreted to mean:
 1. *All areas of natural plant communities or area replanted with vegetation after construction, such as re-vegetated natural areas; and*
 2. *Tree, shrub, hedge, or ground cover planting areas; and*
 3. *lawns and other areas allowed to be counted as open space as per the City of Bentonville Zoning Code and Land Development Code.*
- Bentonville Community Plan: *Open spaces include undeveloped areas that are either actively preserved or have significant challenges to development, such as floodplains or wetlands, steep slopes, or other unique environmental characteristics (42).*

1(b): Definition given detail, meaning or factual basis.

- Sec. 5.1: Stormwater runoff and the velocity of discharge are considerably increased through development and growth of the City. *Prior to the development of land, surface conditions provide a high percentage of permeability and a longer time of concentration.* With the construction of buildings, parking lots, etc., permeability and the time of concentration are significantly decreased.
- Sec. 401.10(f)(1)(e): Common open space options. The required common open space may include:
 1. *Wetlands and water bodies, including the normal water surface area of unfenced retention ponds up to 50% of the required open space area;*
 2. *Active detention ponds that include recreational equipment/facilities;*

3. *Vegetated/landscaped area, excluding required parking lot landscaping requirements;*
4. *Pedestrian paths, trails, sidewalks (exclusive of those required by ordinance) and covered walkways;*
5. *Public plazas and hard surfaced recreation areas; and*
6. *Public pools, tennis courts, basketball courts, baseball fields, soccer fields, or similar outdoor recreation facilities that are open to the residents and users of the PUD.*

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 9.1: Open channels *for use in the major drainage system* have significant advantage in regard to *cost, capacity, multiple use for recreational and aesthetic purposes, and potential for detention storage.*
- Sec. 100.03(g): To encourage the wise use and management of natural resources and to provide *adequate and safe recreational areas of natural beauty and topography* within the community.
- Sec. 1300.02: Objectives of this ordinance include, but are not limited to, the following:
 1. To save trees on public property from indiscriminate destruction or unnecessary removal.
 2. *To moderate the effects of sun, wind, and temperature changes.*
 3. *To filter pollutants from the air and release oxygen.*
 4. *To stabilize soil and prevent erosion.*

5. *To preserve desirable trees.*

- Sec. 1400.01: The goal is to promote and preserve trees, increase the overall tree canopy, and beautify the built environment within the City of Bentonville to reach the following objectives:

1. *Decrease the overall cost of development by decreasing the cost of stormwater systems and facilities.*
2. *Help create a healthier environment by decreasing chemicals and sediments that wash into the water supply, decrease CO₂ (carbon dioxide) and increase oxygen.*
3. *Increase the value of property.*
4. *Improve the physical appearance and visual character of the city.*
5. *Create and improve the living environment of the city.*
6. *Negate the urban heat island effect.*
7. *Support and promote Bentonville's "Tree City USA" designation.*

- Bentonville Community Plan: Wetlands and floodplains are critical features of the natural environment as they *support local wildlife, cleanse ground water, and move stormwater to help avoid localized flooding* (93).
- Bentonville Community Plan: According to the Center for Disease Control, in 2013, 24.5 percent of adults in Benton County age 20 and older reported no leisure time for physical activity. While this could be due to a number of factors, increasing access to greenways and parkland *may eliminate a major barrier to physical activity.*

...

Open spaces have provided the potential for *unique amenities like world-class mountain bicycling trails, recreational programming, and local events* (96).

3(a): Complementary goals in at least a broad sense.

- Bentonville Community Plan: There is concern over rapid growth and sprawling development. *Growth ought to be more sustainable, including natural preservation, solar farms on vacant land, and awareness of open space and environmental issues (27).*

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 401.10: The purpose of the PUD district is to establish a mechanism for a person to propose a commercial, industrial or residential mixed-use development that is innovative but which does not strictly comply with the provisions of the zone in which the property is located and cannot be achieved through traditional zoning. The intent of the PUD district is to promote high quality developments while allowing greater flexibility in the design of such developments. The PUD should produce:
 1. A maximum choice in the types of environment and living units available to the public;
 2. *Common open space and recreation areas;*
 3. *A pattern of development which preserves natural features and prevents soil erosion;*
 4. A creative approach to the use of land and related physical development;
- Bentonville Community Plan: *By focusing community growth and new development into infill areas, the community can better maintain and reinforce its small town character and charm and have less of a negative impact on the natural environment and ecological systems (31).*

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 401.10: The purpose of the PUD district is to establish a mechanism for a person to propose a commercial, industrial or residential mixed-use development that is innovative but which does not strictly comply with the provisions of the zone in which the property is located and cannot be achieved through traditional zoning. *The intent of the PUD district is to promote high quality developments while allowing greater flexibility in the design of such developments.*
- Sec. 401.11(a): This section establishes standards and criteria for *Planned Residential Developments* (PRD). ... The PRD shall produce:
...
4) A minimum of fifteen percent (15%) common, useable open space and recreation areas;
5) A pattern of development which preserves natural features and prevents soil erosion;
6) A creative approach to the use of land and related physical development;
- Sec. 401.11(b): The PRD district shall incorporate Smart Growth principles, including *Traditional Neighborhood Design elements* into the development by such means as:
...
3) Promote distinctive, attractive communities with a strong "sense of place";
4) Preserve open space, farmland, natural beauty, and critical environmental areas;
5) Strengthen and encourage growth in existing communities;
6) Provide an interconnected network of narrow streets that are safe and pleasant for pedestrians and which provide a variety of routes for local traffic; and,

7) *Provide high quality public spaces such as greenbelts, parks, plazas, squares, courtyards, and streets* that are an organizing feature and gathering place for the neighborhood.

- Bentonville Community Plan: *Partner with local organizations to acquire at-risk land.*
Some property owners may be left with undevelopable land due to the increase of the severity of slopes or erosion that has occurred since initial purchase or development. These properties will likely remain unmaintained, creating additional risk of erosion over time. *The City should partner with the Northwest Arkansas Land Trust or other organizations to receive land donations and ensure properties are adequately protected from future erosion (92).*
- Bentonville Community Plan: The City should consider *additional regulatory incentives, such as increased overall density or reduced stormwater requirements for new developments that preserve large areas of trees that support local ecosystems and forested areas (94).*

5(a): Effective as a network in at least a broad sense.

- Bentonville Community Plan: *Preserving a comprehensive network of open spaces and environmental areas* requires a proactive approach amid Bentonville's rapidly changing landscape.

5(b): Effective as a network given detail, meaning or factual basis.

- Bentonville Community Plan: The new Parks and Recreation Plan establishes the new visions:

1. The Grand Loop Trail – *The creation of a grand loop trail that connects existing parks, new parks, and neighborhoods together into a seamless whole (90).*

- Bentonville Community Plan: *Use floodplains and greenways to create trail networks that connect open spaces.* The City has used several greenways as the location for local and regional trails. This should be continued throughout the community where doing so does not impact critical ecosystems or endangered species (98).

6(a): Public access in at least a broad sense.

- Sec. 401.10(f)(1): *Common useable open space constitutes an essential ingredient in a planned unit development* and is one of the most basic and important design elements.

6(b): Public access given detail, meaning or factual basis.

- Sec. 401.10(f)(1): Common useable open space constitutes an essential ingredient in a planned unit development and is one of the most basic and important design elements.
 - a. Minimum area devoted to open space. A minimum of 20% of the total project area, exclusive of public right-of-way and parking lots, shall be devoted to common open space.
 - b. Equitable distribution. *Open space should be distributed more or less equitably throughout the PUD district in relationship to the dwelling units and other use areas that are intended to be served by the common open space.*
...
 - d. Accessible. *Common useable open space shall be open to tenants and customers within the PUD. Access by the general public is desired.*

- Bentonville Community Plan: All residential areas should strive to achieve the following goals.

...

4. *Provide proximity to, or integrate within neighborhood development, resident-based services such as parks, trails, public facilities, and local commerce (55).*

- Bentonville Community Plan: The new Parks and Recreation Plan establishes the new visions:

...

2. The Four Quadrants – The division of Bentonville into park quadrants to ensure the *equitable distribution of parks, services, and amenities across all areas of the community.*

3. Enhancement of Existing Parks and Open Space – *to insure a diversity of park uses that meet the needs of all residents – young and old.*

- Bentonville Community Plan: *Simply providing open spaces does not ensure they will be actively used by residents. Appropriate means of access must be provided* so that all potential users, from youths to senior citizens, can take advantage of open space amenities (98).

6(c): Public access requirement.

- Sec. 401.10(f)(1): Common useable open space constitutes an essential ingredient in a planned unit development and is one of the most basic and important design elements.

...

- d. Accessible. Common useable open space *shall be open to tenants and customers* within the PUD. Access by the general public is desired.

7(a): Better before than after in at least a broad sense.

- Sec. 1300.01: *The purpose of this ordinance is to preserve and protect the natural beauty of Bentonville* and protect the health and safety of its citizens through the regulation of the maintenance, planting and removal of trees within street rights-of-way or on other public grounds within the City of Bentonville.

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 1300.01: The purpose of this ordinance is to preserve and protect the natural beauty of Bentonville and protect the health and safety of its citizens through *the regulation of the maintenance, planting and removal of trees* within street rights-of-way or on other public grounds within the City of Bentonville.
- Bentonville Community Plan: The projected population increase through 2035 will require new development in housing, commerce, and employment. As this occurs, vacant lands will be absorbed, *and if there is no vision for open spaces and environmental preservation as development occurs, the opportunity will be lost* (90).

Cave Springs

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
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2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.	✓	✓	
6. Public and equitable access to open spaces is a priority.	✓	✓	
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.			

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Cave Springs Municipal Code:

https://codelibrary.amlegal.com/codes/cavespringsar/latest/cavesprings_ar/0-0-0-2596

Cave Springs Vision Plan draft (2020):

<https://trplnrmvms001.blob.core.windows.net/uploads/2cf73d63-3cb0-48a8-ab60->

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- 2040 Cave Springs Vision Plan draft: RECREATIONAL/OPEN SPACE (OS)
Parks, recreation areas, floodways, wetlands, and environmentally sensitive lands (35).

2(a): Open space benefits in at least a broad sense.

- 2040 Cave Springs Vision Plan draft: *Having an array of both public and private natural and recreation areas benefits the City's citizens, employers, and visitors immeasurably (35).*

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 152.05(C): This chapter controls the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in *the accommodation, and transport, of floodwaters.*
- 2040 Cave Springs Vision Plan draft: Cave Springs has many beautiful natural features and plays an important role in *the protection of "Karst" areas and the endangered and threatened species' habitats (6).*
- 2040 Cave Springs Vision Plan draft: Trail systems are *not just for recreation, they have proven to also be substantial economic drivers in the region (37).*

3(a): Complementary goals in at least a broad sense.

- 2040 Cave Springs Vision Plan draft: Preserve the small town feel of Cave Springs while *leveraging and integrating its historic core and natural resources into the future fabric of development* (23).

3(b): Complementary goals given detail, meaning or factual basis.

- 2040 Cave Springs Vision Plan draft: Examine areas within the city to *determine if important greenspace and open space areas exist and plan for their future role within the community as development occurs* (24).
- 2040 Cave Springs Vision Plan draft: Parks, recreation areas, floodways, wetlands, and environmentally sensitive lands. Similar to the Public/Institutional category, *these uses should be within every zoning district within the City* (35).

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- 2040 Cave Springs Vision Plan draft: Given the City's size and limited opportunities for public land acquisition, the City should *consider policies aimed at increased open space / parkland dedication as part of the development process*. Such dedication policies should be aligned with the City's growth – especially in residential areas – and may take the form of *standardization based on the intensity of a development*. This may take the form of a *fee-in-lieu structure*, which once established, could serve as a *funding stream to purchase land for recreation and open space purposes* (37).

5(a): Effective as a network in at least a broad sense. Met by 5(b).

5(b): Effective as a network given detail, meaning or factual basis.

- 2040 Cave Springs Vision Plan draft: *Connect existing and Identify new potential green spaces, recreational areas, water bodies and other natural resources to act as a network within the City as it grows and develops* (24).
- 2040 Cave Springs Vision Plan draft: Furthermore, *establishing linkages to existing natural areas such as the Lake Keith Recreation Area and other strategic community amenities* will reinforce the intent of the overall ‘character area’ as a vibrant, community hub (40).

6(a): Public access in at least a broad sense. Met by 6(b).

6(b): Public access given detail, meaning or factual basis.

- 2040 Cave Springs Vision Plan draft: Further, *providing neighborhood parks within walking distance from residential areas is key to a high quality of life. As the City grows, the City should strategically plan its park system to provide neighborhood parks, and depending on how growth patterns mature, perhaps even regional recreation for its citizens* (37).

Centerton

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓ ✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓ ✓	✓ ✓	
5. Open space is most effective as a connected network throughout a given region.	✓	✓	
6. Public and equitable access to open spaces is a priority.	✓ ✓	✓ ✓	✓
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓ ✓	✓	✓

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Centerton Municipal Code: <https://centertonar.us/municipal-code-book>

Centerton Comprehensive Plan (2020):

[https://cityofcenterton.sharepoint.com/sites/Public/Documents/Centerton-Comprehensive%20Plan%20\(Adopted%202020-10-27\)%20LQ.pdf?ga=1](https://cityofcenterton.sharepoint.com/sites/Public/Documents/Centerton-Comprehensive%20Plan%20(Adopted%202020-10-27)%20LQ.pdf?ga=1)

1(a): Definition in at least a broad sense.

- Sec. 14.04.02: Open space: *any unoccupied space on a lot that is open and unobstructed to the sky and occupied by no structures or portion of structures whatever.*

1(b): Definition given detail, meaning or factual basis.

- Comprehensive Plan: Parks include *designated areas for active or passive recreation, such as municipal parks, golf courses, and parks dedicated as a part of local subdivisions*. Open spaces include *undeveloped areas that are either actively preserved or have significant challenges to development, such as floodplains or wetlands, steep slopes, or other unique environmental characteristics* (21).
- Comprehensive Plan: The Parks, Open Space & Environmental Features chapter is organized into three sections:
...
2. Open Spaces, which are outdoor natural areas. *They are not vacant or undeveloped; their primary purpose is either active or passive natural use. Open spaces may include a forested area behind a development, a property with a conservation easement placed on it, green space between subdivisions, or undevelopable property due to flooding, wetlands, or other natural features* (52).

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 14.04.12(B)(7)(a): Open Space land excludes all buildings, accessory structures, yards, streets, or drainage ways & detention, and shall be maintained as common usable open space for the purpose of *providing parks, recreational facilities, ways for pedestrian movement and circulation, and conserving visually pleasing elements of the environment.*
- Sec. 12.08.03: The objectives are to preserve the existing tree canopy and add to it *to reduce storm water runoff, to stabilize and prevent soil erosion, to provide habitat for birds and other wildlife, to screen incompatible land and to enhance property values.*
- Sec. 16.12.04(B): The purposes of this chapter are to:
...
8. Preserve natural vegetation, which *enhances the quality of life of the community.*
- Ordinance No. 2012-07, Sec. 5(C): This ordinance controls the alteration of natural floodplains, stream channels and natural protective barriers which are involved in *the accommodation and transport of flood waters....*
- Comprehensive Plan: Explore green infrastructure practices to *reduce operating costs and improve performance of storm and wastewater systems (17).*
- Comprehensive Plan: Parks, open space, and environmental features play a vital role in *shaping Centerton's quality of life. Parks provide opportunities for social activity, physical exercise, and interaction with nature.* The presence of forests, open spaces, and streams *strengthens biodiversity, beautifies the landscape, and supports healthy lifestyles.*

3(a): Complementary goals in at least a broad sense.

- Comprehensive Plan: The Plan promotes the community's vision, goals, objectives, and policies; establishes a process for orderly growth and development; addresses both current and long-term needs; and provides for *a balance between the natural and built environment* (3).

3(b): Complementary goals given detail, meaning or factual basis.

- Comprehensive Plan: *Conservation design can be implemented in a density neutral manner wherein a clustered subdivision achieves the same number of homes per acre as a conventional subdivision.* The same approach is also applicable for nonresidential development. As such, *the City can encourage open space preservation, while facilitating development that approaches the overall density desired for a given area while preventing potentially damaging development in a floodway.* Conservation development techniques will *allow new development to minimize the impact on quality natural areas, preserving them for public enjoyment while maintaining the small-town character of Centerton* (55).

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 14.04.12 (B)(7)(b): Preservation, maintenance and ownership of required open spaces within the development shall be accomplished by either:
 - i. *Dedication by deed or easement and improvement of the land as a public park or trail system; or*

ii. *Creating a permanent, open space easement* on and over the said private open spaces to guarantee that the open space remains perpetually in recreational use

- Comprehensive Plan: Build a formal community engagement process around parks improvements and natural resource preservation that *identifies potential partnerships with local and national entities for conservation incentives and programs* (17).
- Comprehensive Plan: *Revisit the provisions of the A&P tax to improve funding allocation* for parks and recreation.

Research and develop partnerships with local and regional parks and recreation agencies to find and procure additional funding sources for the development and maintenance of Centerton's parks and recreation system (54).

- Comprehensive Plan: Foster the creation of a *"Friends of Centerton Parks"* group to publicly advocate for the procurement of additional parks and open spaces in the City. *Partner with the Northwest Arkansas Land Trust to identify and procure land to preserve as open space and/or create conservation easements* (55).
- Comprehensive Plan: *Conservation design, also known as clustered development*, promotes the use of an environmentally sensitive development pattern that aims to preserve contiguous areas of open space by grouping structures (residential, commercial, industrial, etc.) together (55).

5(a): Effective as a network in at least a broad sense.

- Comprehensive Plan: Goal: Provide *a high-quality network of parks, trails, and recreational amenities* within Centerton to accommodate open space and the active and passive recreation needs of the community (17).

- Comprehensive Plan: Analyze the existing greenspaces in Centerton to determine the needs and opportunities for *greenway corridors throughout the City* (17).

5(b): Effective as a network given detail, meaning or factual basis.

- Comprehensive Plan: Goal: Provide a high-quality network of parks, trails, and recreational amenities within Centerton *to accommodate open space and the active and passive recreation needs of the community* (17).

6(a): Public access in at least a broad sense.

- Sec. 14.04.12(B)(7)(a): Open Space land excludes all buildings, accessory structures, yards, streets, or drainage ways & detention, and shall be maintained as *common usable open space* for the purpose of providing parks, recreational facilities, ways for pedestrian movement and circulation, and conserving visually pleasing elements of the environment.
- Comprehensive Plan: *Ensuring all residents have easy access to parks and open space* for passive and active recreation (3).
- Comprehensive Plan: In 2015, the Northwest Arkansas Regional Planning Commission adopted the Northwest Arkansas Bicycle/Pedestrian Master Plan, which included several key needs and recommendations for Centerton as follows:
...
 - *Connect parks and public spaces.*
- Comprehensive Plan: Identify areas to expand and enhance the parks system to *provide access to outdoor recreation to all residents* (17).

6(b): Public access given detail, meaning or factual basis.

- Sec. 14.04.12(B)(7)(a): Open Space land excludes all buildings, accessory structures, yards, streets, or drainage ways & detention, and shall be maintained as common usable open space *for the purpose of providing parks, recreational facilities, ways for pedestrian movement and circulation, and conserving visually pleasing elements of the environment.*
- Comprehensive Plan: The half-mile service area indicates that the northern part of the City (north of Centerton Boulevard) is well-served *by parks; however, the southern part only has a single park facility*, Hickory Creek Park. This does not include the Walker Nature Preserve, *which is currently not maintained for public access.*

...

Recommendations

Develop a new park on the south side of Centerton to provide outdoor recreation space to existing and future residents in the growing areas of the City. Consider the agricultural land south of the Fish Hatchery and in the vicinity of the future Junior High School site.

...

Program the Walker Nature Preserve to *establish it as a formal and accessible option for recreation* in Centerton.

6(c): Public access requirement.

- Sec. 14.04.12(B)(7)(a): Open Space land excludes all buildings, accessory structures, yards, streets, or drainage ways & detention, and *shall be maintained as common usable open space* for the purpose of providing parks, recreational facilities, ways for pedestrian movement and circulation, and conserving visually pleasing elements of the environment.

7(a): Better before than after in at least a broad sense.

- Sec. 12.08.09 (A): Subdivision and development plans shall be designed to *preserve natural vegetation areas as much as possible*. Streets, parcels, structures and parking areas shall be laid out to *minimize the destruction of wooded areas* or outstanding tree specimens.
- Comprehensive Plan: *Mitigate impacts to the natural environment* and cultural resources when planning, constructing, and operating transportation systems (17).

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 12.08.09 (A): Developers of land are encouraged to designate wooded areas *as park reserves or wildlife habitat*.
- Sec. 16.12.03 (A)(5): Best Management Practices shall be implemented *to prevent the release of sediment from construction sites. Disturbed areas shall be minimized....*
- Comprehensive Plan: Identify natural areas within the City, *such as McKissick Spring and Walker Nature Preserve, for conservation and protection to provide additional open space for recreation* (17).
- Comprehensive Plan: Regardless of development type, *open space and natural areas should be preserved where possible*. Conservation design strategies should be considered *to protect existing wooded areas, waterways and wetlands, natural topography, wildlife habitat/corridors, and view sheds* (20).

7(c): Better before than after requirement.

- Sec. 12.08.09 (A): Subdivision and development plans *shall be designed to preserve* natural vegetation areas as much as possible. Streets, parcels, structures and parking areas

shall be laid out to minimize the destruction of wooded areas or outstanding tree specimens.

- Sec. 16.12.03 (A)(5): Best Management Practices *shall be implemented* to prevent the release of sediment from construction sites. Disturbed areas *shall be minimized....*

Farmington

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓	✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.	✓	✓	✓
6. Public and equitable access to open spaces is a priority.			
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓	✓	✓

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.
Farmington Municipal Code: <https://library.municode.com/ar/farmington>

1(a): Definition in at least a broad sense.

- Sec. 14.04.27: *Greenspace means any area retained as permeable unpaved ground and dedicated on the site plan to supporting vegetation.*

...

Open Space means all areas of natural plant communities or area replanted with vegetation after construction, such as re-vegetated natural areas; tree, shrub, hedge, or ground cover planting areas; and lawns.

1(b): Definition given detail, meaning or factual basis.

- Sec. 15.04.01: *Open space means land, including parks, recreation areas, school sites, community or public building sites and other lands not intended for automobile use, which is dedicated or reserved for acquisitions for non-buildings use by public groups or private owners in common or by individuals.*

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 14.04.05(c)(2): *The Planned Unit Development should:*

...

b. *Provide open space not only for traditional private use in setbacks and yards surrounding structures, but also conveniently located open space in residential and commercial areas for the benefit of the community and public as places for relaxation, recreation and social interaction.*

- c. Achieve a pattern of development which preserves and enhances natural features and native vegetation, *prevents soil erosion, and protects water quality.*
- d. Allow a creative approach to the use of land and related physical development.
- e. Encourage *an efficient use of land resulting in smaller networks of utilities and streets,* and thereby lowering costs.
- Sec. 14.04.14: The requirements set forth herein are enacted to: promote the health and safety of the citizens of Farmington; make the City more attractive by establishing standards for landscaping of new developments or additions in certain zones; prevent unnecessary removal and damage of native and specimen trees during construction; prevent unnecessary grading of land during construction; provide for tree, plant, and other natural vegetation material replacement; *provide visual screening and sound buffers*; screen incompatible land uses; *improve air quality; slow or prevent storm water runoff*; enhance appearance of parking lots; *provide enhanced habitat for wildlife*; provide option of establishing parks within developments; and ensure compliance with these standards in new developments and renovations.
- Sec. 14.04.25(a): Parks provide *health and wellness through recreational opportunities, social engagement, neighborhood community building, nature education*; parks *increase neighborhood and city property values and contribute to overall quality of life.*

3(a): Complementary goals in at least a broad sense. Met by 3(b).

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 14.04.05(c)(2): The Planned Unit Development should:

...

- b. Provide open space not only for traditional private use in setbacks and yards surrounding structures, but also *conveniently located open space in residential and commercial areas* for the benefit of the community and public as places for relaxation, recreation and social interaction.
- c. *Achieve a pattern of development which preserves and enhances natural features and native vegetation, prevents soil erosion, and protects water quality.*
- d. *Allow a creative approach to the use of land and related physical development.*
- e. *Encourage an efficient use of land resulting in smaller networks of utilities and streets, and thereby lowering costs.*

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 14.04.05(c)(2): *The Planned Unit Development* should:

...

- b. Provide open space not only for traditional private use in setbacks and yards surrounding structures, but also conveniently located open space in residential and commercial areas for the benefit of the community and public as places for relaxation, recreation and social interaction.
- c. Achieve a pattern of development which preserves and enhances natural features and native vegetation, prevents soil erosion, and protects water quality.
- d. Allow a creative approach to the use of land and related physical development.

e. Encourage an efficient use of land resulting in smaller networks of utilities and streets, and thereby lowering costs.

- Sec. 14.04.20(c): *Existing shade trees with diameter of eight inches or greater may be included as part of the vegetative screening requirement* in a ratio of one preserved tree to three new trees.

5(a): Effective as a network in at least a broad sense.

- Sec. 14.04.25(f): Location of Park. The most suitable location for park may be determined by developer but *dedicated park land shall be contiguous* and shall be dedicated in perpetuity. Land, when dedicated, shall be shown on preliminary and final plats and on Site Plan and Landscaping Plan.

5(b): Effective as a network given detail, meaning or factual basis.

- Sec. 14.04.25(g): Small Land Area. When a proposed park dedication calculation is too small in area to provide an open space of suitable size and character, the Planning Commission *may require dedicated land to be located next to open spaces or dedicated park land in adjacent development areas, so the combined land areas create park area of adequate size.*

5(c): Effective as a network requirement.

- Sec. 14.04.25(f): Location of Park. The most suitable location for park may be determined by developer but dedicated park land *shall be contiguous* and shall be dedicated in perpetuity. Land, when dedicated, shall be shown on preliminary and final plats and on Site Plan and Landscaping Plan.

7(a): Better before than after in at least a broad sense. Met by 7(b).

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 14.04.14: The requirements set forth herein are enacted to: promote the health and safety of the citizens of Farmington; make the City more attractive by establishing standards for landscaping of new developments or additions in certain zones; *prevent unnecessary removal and damage of native and specimen trees during construction; prevent unnecessary grading of land during construction....*
- Sec. 14.04.18(i)(1): As is practical, *do not remove healthy, disease-free vegetation and environmentally sensitive or significant natural areas such as woodlands, prairie, and wetlands located on the development site.*
- Sec. 14.04.19 (multiple appearances): *Every effort shall be made to preserve existing healthy native trees of eight inch or larger diameter* within the street frontage buffer area unless preservation creates traffic hazards.

7(c): Better before than after requirement.

- Sec. 14.04.18(i)(1): As is practical, *do not remove healthy, disease-free vegetation and environmentally sensitive or significant natural areas such as woodlands, prairie, and wetlands located on the development site.*

Fayetteville

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓ ✓	✓ ✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓ ✓	✓ ✓	
4. A variety of conservation practices can be used to enhance open space.	✓ ✓	✓ ✓	
5. Open space is most effective as a connected network throughout a given region.	✓	✓	
6. Public and equitable access to open spaces is a priority.	✓ ✓	✓ ✓	
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓	✓	✓

✓ denotes appearance in city/county code. ✓ denotes appearance in comprehensive plan or equivalent.

Fayetteville Municipal Code:

https://library.municode.com/ar/fayetteville/codes/code_of_ordinances

City Plan 2040 (2020): <https://www.fayetteville-ar.gov/DocumentCenter/View/18363/City-Plan-2040-Update-7-6-2020?bidId=>

1(a): Definition in at least a broad sense.

- Sec. 150.01: Public open space (development). Open space, including but not limited to, any *park, lake, stream, playground, or natural area* commonly open to the public.

1(b): Definition given detail, meaning or factual basis.

- Sec. 150.01: Public open space (development). Open space, including but not limited to, any *park, lake, stream, playground, or natural area commonly open to the public.*
- City Plan 2040: Fayetteville's location on the divide between the Springfield Plateau and the Boston Mountains results in a wide variety of land forms and features worthy of environmental preservation. These include *native prairie wetlands, steeply sloped and forested uplands, and a variety of streams and water bodies* (40).

2(a): Open space benefits in at least a broad sense.

- Sec. 167.01: It is the purpose of this chapter to *preserve and protect the health, safety, and general welfare, and enhance the natural beauty of Fayetteville* by providing for regulations of the preservation, planting, maintenance, and removal of trees within the city
- Sec. 167.04(I)(9)(a): The intent is to allow previously developed sites with at least 50% existing impervious area and limited space for planting trees to use on-site mitigation alternatives to meet the mitigation requirements and still contribute *beneficial plant materials that provide positive ecosystem services.*

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 167.01 (A): Objectives.
 - (1)To preserve existing tree canopy;
 - (2)*To create a healthful environment for Fayetteville residents, businesses, and industries;*
 - (3)*To moderate the harmful effects of sun, wind, and temperature changes;*
 - (4)*To buffer noise, air and visual pollution;*
 - (5)*To filter pollutants from the air that assist in the generation of oxygen;*
 - (6)*To reduce storm water runoff and the potential damage it may create;*
 - (7)*To stabilize soil and prevent erosion, with an emphasis on maintaining tree canopy on hillsides defined as canopied slopes in Chapter 151;*
 - (8)*To provide habitat for birds and other wildlife;*
 - (9)*To preserve riparian banks and beds, and prevent sedimentation;*
 - (10)*To screen incompatible land;*
 - (11)*To promote energy conservation; and*
 - (12)*To protect and enhance property values.*
- Sec. 168.01(A): The purpose of this chapter is to promote the public health, safety and general welfare, to prevent adverse impacts from any floodplain development activities, and to minimize public and private losses due to flooding events in identified special flood hazard areas. This flood damage prevention code advances the stated purpose through provisions designed to:
 - (1)*Protect human life and health;*

(2)Protect natural floodplains against unwise development;

(3)Eliminate adverse impacts of necessary floodplain development;

(4)Protect, restore and maintain the chemical, physical, and biological integrity of the water resources;

(5)Reduce pollutants in surface waters by filtering, settling, and transforming pollutants in runoff;

(6)Stabilize the banks of streams to reduce erosion and the downstream transport of sediment and nutrients;

(7)Maintain tree canopy to shade streams, reduce water temperatures, promote desirable aquatic organisms resulting in ecological integrity with improved fishing, greater scenic value and recreational opportunity;

- Sec. 168.01(B)(3): This ordinance controls the alteration of natural floodplains, stream channels and natural protective barriers which are involved in the *accommodation and transport of flood waters*;
- Sec. 168.12(E)(1)(a): The following may be permitted in the waterside zone, provided the standards of the Streamside Best Management Practices Manual shall be followed where applicable and that these uses and any necessary construction is designed and built to minimize the impact upon streamside areas and minimize any excavation or filling that will only be allowed by express authorization of the City Engineer...
 - (i)Open space uses that are primarily passive in character including: *preserves, fishing areas and docks, parkland, and natural trails.*
 - (ii)*Streambank restoration or stabilization.*
 - (iii)*Water quality monitoring, education and scientific studies.*

(iv) *Revegetation and reforestation.*

- Sec. 177.01(B): The standards found within this chapter accomplish these purposes with existing and new vegetation by:

(1) Promoting the beautification of the City of Fayetteville and enhancing its aesthetic quality;

(2) Promoting reasonable conservation and replenishment of valued tree canopy and vegetation;

(3) Aiding in restoring ecological balance by contributing to air purification, oxygen regeneration, and ground water recharge;

(4) Providing for vegetation to reduce storm water runoff and the potential damage it may create;

...

(6) Creating a healthy environment for Fayetteville residents, businesses, and industries;

(7) Moderating the harmful effects of sun, wind, and temperature changes;

(8) Buffering noise, air and visual pollution;

(9) Screening incompatible land uses and enhancing the appearance of parking lots in all zoning districts;

(10) Promoting energy conservation; and

(11) Protecting and enhancing property values.

- City Plan 2040: In light of the ongoing effects of climate change, trees and their associated canopy have innumerable benefits and an urban forest plays a role in *carbon sequestration, mitigating stormwater issues, filtering pollutants, increasing property values, improving public health, and reducing the heat island impacts* associated with

urban areas. A healthy urban tree canopy can *address the three major weather events that are anticipated to affect Northwest Arkansas: unpredictable but more impactful rain events, drought, and heat waves* (89).

3(a): Complementary goals in at least a broad sense.

- Sec. 177.01(B): The standards found within this chapter accomplish these purposes with existing and new vegetation by:

...

(5) Achieving a meaningful urban landscape while permitting economically feasible urban development to occur.

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 179.03: (A) Definition. For the purposes of this chapter Low Impact Development (LID) is a stormwater management strategy concerned with maintaining, restoring or replicating the natural hydrologic functions of a site, where possible, by *employing a variety and combination of natural and built features* that reduce the volume and velocity of stormwater runoff, filter out its pollutants, and facilitate the infiltration of water into the ground.

(B) Site Design Strategies. Generally, site design strategies will address the arrangement of buildings, roads, parking areas, and other features, and the conveyance of stormwater runoff across the site. *LID site design strategies are intended to complement the natural and built environment* while minimizing the generation of runoff. Site design strategies should address some or all of the following considerations

- City Plan 2040: Promote conservation easements and alternative development patterns that encourage efficient use of land. The City can *proactively encourage the preservation of land while still allowing development by creating new policies or best management practices* for lands that have identified ecological, environmental or agricultural values (41).

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 167.04(F)(4): Developers have the option of *creating cluster development, such as a Planned Zoning District, which would encourage more open space and tree preservation*. In this pattern of development, the trees preserved or open space on each lot can be transferred to a larger Tree Preservation Easement instead of individual lots required to meet minimum percent requirements.
- Sec. 169.04 (B)(3): Stabilization practices may include: *temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, and preservation of mature vegetation* and other appropriate measures.
- Sec. 179.01: Some of the existing natural site features typically *protected through the use of LID techniques are*: wetlands, floodplains, forested areas, hillsides, riparian corridors and existing soils.
- City Plan 2040: Promote conservation easements and alternative development patterns that encourage efficient use of land. The City can proactively encourage the preservation of land while still allowing development by creating *new policies or best management practices* for lands that have identified ecological, environmental or agricultural values.

For instance, *property owners that are interested in preserving their land from future development may choose to place their lands in a conservation easement. ... The City can also create new development tools such as low-density zoning designations (one home per 20 acres), or a conservation subdivision design ordinance that allows a denser cluster development in exchange for perpetual open space conservation of the more environmentally sensitive areas of the property (40-41).*

5(a): Effective as a network in at least a broad sense.

- City Plan 2040: We will assemble an *Enduring Green Network (40)*.

5(b): Effective as a network given detail, meaning or factual basis.

- City Plan 2040: The Enduring Green Network (EGN) is a mapping tool created to understand areas of the city that have identifiable ecological value and would provide *human and biological greenway linkages between major open space anchors. ... The EGN was mapped as a very generalized and broad boundary for use in locating property that would have high value in creating a continuous network of greenspaces and trails throughout the City. As the Enduring Green Network is realized, it will likely be a network of many narrow and interconnected green ribbons and parks.*

...

Future land acquisitions will likely not be on this scale but may include pocket parks, stream corridors, and urban plazas. *A network of these smaller open spaces within walking distance of all residents provides both environmental services and benefits to the*

mental and physical health of residents in surrounding neighborhoods that may not have access to larger, regional parks (40-41).

- City Plan 2040: The guiding policies for Natural Areas are:
 1. *Preserve a network of habitat and open space, thereby protecting biodiversity and enhancing the City's quality of life.*
 2. *Preserve native vegetation and meet the habitat needs of multiple species (126).*

6(a): Public access in at least a broad sense.

- Sec. 161.35(B)(7): Provision of more usable and suitably located *open space, recreation areas and other common facilities* that would not otherwise be required under conventional land development regulations.
- City Plan 2040: *Publicly accessible open space is essential for residents to have convenient access to outdoor amenities (134).*

6(b): Public access given detail, meaning or factual basis.

- Sec. 177.01(C)(6): *Providing outdoor spaces and places for people to gather* is strongly encouraged.
- City Plan 2040: Publicly accessible open space is essential for residents *to have convenient access to outdoor amenities.*

...

The guiding policies for Civic and Private Open Space/Parklands are:

1. Encourage parkland dedication and conservation easements for trails that support the City's Active Transportation Plan, Parks Master Plan and the Enduring Green Network.

2. *Provide an integrated network of open space areas throughout the City to serve local residents and visitors to the City.*

...

8. *Encourage pocket parks, especially in areas identified as Urban Center areas.*

7(a): Better before than after in at least a broad sense.

- Sec. 161.35(B): The City Council may consider any of the following factors in review of a Planned Zoning District application.

...

(8)Natural Features. *Maximum enhancement and minimal disruption of existing natural features and amenities.*

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 167-01(B): This chapter shall be enforced according to the following principles:
 - (1)*Preservation shall be the first, best, and standard approach.*
 - (2)*If preservation cannot be achieved, on-site mitigation (trees) shall next be pursued.*
 - (3)*If on-site mitigation (trees) cannot be achieved, off-site preservation shall be pursued.*
- Sec. 177.01(C)(5): *Preservation is primary; therefore landscaping shall make a concerted attempt to incorporate existing on-site trees and shrubbery.*

7(c): Better before than after requirement.

- Sec. 167-01(B): This chapter shall be enforced according to the following principles:
 - (1)*Preservation shall be the first, best, and standard approach.*
 - (2)*If preservation cannot be achieved, on-site mitigation (trees) shall next be pursued.*

(3) If on-site mitigation (trees) cannot be achieved, *off-site preservation shall be pursued.*

- Sec. 177.01(C)(5): Preservation is primary; *therefore landscaping shall make a concerted attempt* to incorporate existing on-site trees and shrubbery.

Lowell

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓	✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓		
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.			
6. Public and equitable access to open spaces is a priority.			
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓	✓	✓

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.
 Lowell Municipal Code: https://library.municode.com/ar/lowell/codes/code_of_ordinances

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- Sec. 16-64: Open space, common, means the area of land that is *designed to be accessible for the use and enjoyment of all owners and/or tenants. This space may contain complementary structures, recreational areas and other such improvements, but shall not include parking lots or streets.*

Open space, private, means an area of land owned or occupied by a property owner or tenant and *available for their private use and enjoyment.*

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 12-135(3): This article controls the alteration of natural floodplains, stream channels and natural protective barriers which are involved in *the accommodation and transport of floodwaters....*
- Sec. 16-170(a): Landscaped areas shall be provided *to protect water quality, and reduce erosion, heat and glare.*
- Sec. 16-256(b): The goals and objectives of this section are as follows:
...
(2) To moderate the effects of sun, wind, and temperature changes.
(3) To filter pollutants from the air and release oxygen.
(4) To stabilize and prevent erosion.

3(a): Complementary goals in at least a broad sense.

- Sec. 16-256(a): The purpose of this section is to ensure *a minimum of open space and green area as an integral part of new development* and to protect the health and welfare of citizens through the regulation of landscaping.

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 16-256(h)(2): Each preserved tree with a minimum 24-inch DBH can be *counted toward the new tree requirement* and is equivalent to five new trees.

7(a): Better before than after in at least a broad sense. Met by 7(b).

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 16-170(a): Landscaped areas shall be provided to protect water quality, and reduce erosion, heat and glare. Such areas shall be maintained in an attractive condition. *Existing trees on a development site shall be retained where possible.*
- Sec. 16-256(h)(1): *Every reasonable effort should be made to preserve existing tree canopy on site*, using means and methods established using the City of Lowell's standard tree preservation detail.

7(c): Better before than after requirement.

- Sec. 16-170(a): Landscaped areas shall be provided to protect water quality, and reduce erosion, heat and glare. Such areas shall be maintained in an attractive condition. Existing trees on a development site *shall be retained where possible*.

Pea Ridge

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓	✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓ ✓	✓ ✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.			
6. Public and equitable access to open spaces is a priority.	✓	✓	
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓ ✓	✓ ✓	

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.
 Pea Ridge Municipal Code: <https://cityofpearidge.com/pea-ridge-municipal-code-book/>

Comprehensive Land Use Plan 2021 (2021): https://cityofpearidge.com/wp-content/uploads/2021/05/Comprehensive_Land_Use_Plan_FINAL_Pea-Ridge_April_20_2021.pdf

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- Sec. 14.04.02(2): Open space, common: The area of land that is designed to be *accessible for the use and enjoyment of all owners and/or tenants*. This space may contain complementary structures, *recreational areas*, and other such improvements, *but shall not include parking lots or streets*.

Open space, private: An area of land owned or occupied by a property owner or tenant and available for their *private use and enjoyment*.

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 11.06.01: These drainage regulations are intended to:
...
C. Increase groundwater recharge by infiltration.
- Sec. 11.06.06(1): The decisions made by the city of Pea Ridge should include consideration of the following issues:
 - a. *Quality agricultural areas* for cropland and maintaining economic viability of such.
 - b. *Ground water recharge* of post-development, approximately the same as pre-development.
 - c. Protecting *historical, scenic and natural beauty* area.

- d. Protecting wetlands and stream corridors.
- e. *Providing open spaces and parks.*
- f. Developing attractive residential, institutional and industrial areas.
- g. *Maintaining flood plains for flood storage.*
- h. *Water supply protection source.*
- i. *Critical wildlife habitat areas.*
- j. *Buffer zones along critical border areas.*
- Sec. 11.06.06(2): The preservation of the above areas will *enhance the environmental quality of the community.*
- Sec. 11.07.01: Purpose
 - A. *Promote a positive image for the city of Pea Ridge;*
 - B. *Protect property values;*
 - C. *Promote water conservation;*
 - D. Encourage planting and preservation of trees and vegetation;
 - E. *Increase ground permeability, retard water runoff and control erosion;*
 - F. *Abate noise, glare, dust and heat.*

3(a): Complementary goals in at least a broad sense.

- Comprehensive Land Use Plan 2021: The challenge of creating *a community that is in harmony with its natural surroundings* and provides a healthful environment for people cannot be stressed enough. Two overriding principals have emerged with this challenge:
 - a. The first is to recognize that the *existing natural systems that have evolved are not without their own capacities to serve development.*

b. The second principal concerns impacts. *Some natural systems are more able than others to sustain the impact of development and use (7).*

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 11.06.06(1): *The decisions made by the city of Pea Ridge should include consideration of the following issues:*
 - a. Quality agricultural areas for cropland and maintaining economic viability of such.
 - b. Ground water recharge of post-development, approximately the same as pre-development.
 - c. Protecting historical, scenic and natural beauty area.
 - d. Protecting wetlands and stream corridors.
 - e. Providing open spaces and parks.
 - f. Developing attractive residential, institutional and industrial areas.
 - g. Maintaining flood plains for flood storage.
 - h. Water supply protection source.
 - i. Critical wildlife habitat areas.
 - j. Buffer zones along critical border areas.
- Sec. 11.06.06(2): The preservation of the above areas will *enhance the environmental quality of the community.*
- Sec. 15.04.01(A): These Subdivision Regulations are intended to set forth the procedures, requirements and minimum standards governing the subdivision of land within the Planning Area of the city of Pea Ridge and shall be administered in the following manner:

...

9. To encourage the wise use and management of natural resources and to provide adequate and safe recreational areas of natural beauty and topography within the community

10. To ensure the development and maintenance of *a healthy, attractive, and efficient community that provides for the conservation and protection of its natural and human resources.*

- Comprehensive Land Use Plan 2021: A series of basic policies to ensure protection of our natural environment and open space have developed from these two principals:
 - 1) Large parks and open spaces should be established so as to *take advantage of, as well as protect, natural processes and unique landscape features and to provide for an assortment of outdoor recreational and other activities;*
 - 2) Environmentally critical areas of land and water, and historically significant lands should be protected from incompatible uses and from pollutants generated by urbanization in the area;
 - 3) *Wooded areas that serve functional purposes in aesthetics and pollution control, should be preserved as part of an urban forest and open-space system ... (7).*

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 11.07.05(F): In order to further encourage innovative site designs that enhance the quality of the environment in Pea Ridge, the Planning Commission may grant *a waiver of any landscaping standards outlined in this chapter where the commission finds that the*

proposed plan display an innovative use of the site design features, open space or landscaping which will enhance the use and value of neighboring properties.

6(a): Public access in at least a broad sense. Met by 6(b).

6(b): Public access given detail, meaning or factual basis.

- Comprehensive Land Use Plan 2021: The primary goal of recreation policy is the provision of a *recreational program to serve all residents of the area, while preserving scenic areas and open space for the public and enjoyment.*

This can be achieved by:

- a. *Properly distributing recreational areas and facilities throughout the community ...*
(10-11).

7(a): Better before than after in at least a broad sense. Met by 7(b).

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 11.06.06(2): The preservation of the above areas will *enhance the environmental quality of the community.*
- Comprehensive Land Use Plan 2021: A series of basic policies to ensure protection of our natural environment and open space have developed from these two principals:
 - 1) Large parks and open spaces should be established so as to take advantage of, *as well as protect*, natural processes and unique landscape features and to provide for an assortment of outdoor recreational and other activities;

2) Environmentally critical areas of land and water, and historically significant lands should be protected from incompatible uses and from pollutants generated by urbanization in the area;

3) Wooded areas that serve functional purposes in aesthetics and pollution control, should be preserved as part of an urban forest and open-space system ... (7).

Prairie Grove

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.	✓	✓	
6. Public and equitable access to open spaces is a priority.			
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓ ✓	✓	✓

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Prairie Grove Municipal Code:

https://library.municode.com/ar/prairie_grove/codes/code_of_ordinances

Prairie Grove Vision Plan:

https://www.prairiegrovearkansas.org/sites/default/files/fileattachments/prairie_grove_planning_commission/page/125/prairie_grove_vision_plan_document_rfs.pdf

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- Prairie Grove Vision Plan: Recreational/Open Space (REC) *Includes parks, recreational areas, flood ways, wetlands, and environmentally sensitive lands* (17).

2(a): Open space benefits in at least a broad sense.

- Prairie Grove Vision Plan: Including this type of development within each zoning district *benefits citizens, visitors, and employers* (17).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec 11.48.01: The requirements set forth herein are enacted to:

...

H. Improve air quality;

I. Slow or prevent storm water runoff;

J. Enhance appearance of parking lots;

K. Provide option of establishing parks within developments;

L. Provide enhanced habitat for wildlife

- Prairie Grove Vision Plan: Recreational/Open Space (REC) *Includes parks, recreational areas, flood ways, wetlands, and environmentally sensitive lands* (17).

3(a): Complementary goals in at least a broad sense.

- Prairie Grove Vision Plan: Preserve the small town character of Prairie Grove while leveraging and *integrating open space, its historic downtown and neighborhood core, and public amenities into the future fabric of development* (13).

3(b): Complementary goals given detail, meaning or factual basis.

- Prairie Grove Vision Plan: Along with single family residential growth, *plan for commercial, institutional, and neighborhood service land uses in areas of new development within the City*. This development should be planned in nodes throughout future growth areas and not just along the Highway/Bypass corridors.

These areas should include a variety of residential development types, commercial services, offices, *parks/open space*, institutional uses, etc. Coordination of these nodal areas with civic/institutional uses like future schools and City buildings is highly desirable (13).
- Prairie Grove Vision Plan: *Investigate areas within the city to determine if important unprotected greenspace and open space areas currently exist and plan for their future role within the community as development occurs* (14).

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 11.48.05(D)(2): Credit for preservation of trees with a six-inch diameter or larger, or specimen trees, may result *in reduction of number of required new trees and/or shrubs*,

after review and approval of developer's tree preservation proposal by planning commission.

5(a): Effective as a network in at least a broad sense. Met by 5(b).

5(b): Effective as a network given detail, meaning or factual basis.

- Prairie Grove Vision Plan: *Connect existing and identify new potential green spaces, pedestrian infrastructure, recreational areas, water bodies and other natural resources to act as a green network within the City as it grows and develops* (14).

7(a): Better before than after in at least a broad sense.

- Prairie Grove Vision Plan: Investigate areas within the city to determine if important unprotected greenspace and open space areas currently exist and *plan for their future role within the community* as development occurs (14).

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 11.48.01: The requirements set forth herein are enacted to:
...
(C) *Protect native and specimen trees from unnecessary removal and from damage during construction;*
- Sec. 11.48.01(D)(1): *Retain and incorporate as is practical, substantial stands of healthy, disease free vegetation and environmentally sensitive or significant natural areas such as woodlands, prairie, and wetlands, into the development site.*

7(c): Better before than after requirement.

- Sec. 11.48.01(D)(1): *Retain and incorporate as is practical*, substantial stands of healthy, disease free vegetation and environmentally sensitive or significant natural areas such as woodlands, prairie, and wetlands, into the development site.

Rogers

	a. The principle appears in at least a broad, general sense.	b. Additional meaning, motivation or factual basis are provided.	c. Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓ ✓	✓ ✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓ ✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.	✓ ✓	✓	
6. Public and equitable access to open spaces is a priority.	✓	✓	✓
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓	✓	✓

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Rogers Municipal Code: https://library.municode.com/ar/rogers/codes/code_of_ordinances

Three Ribbons document (n.d.):
https://transportationplanroom01.blob.core.windows.net/uploads/923bddd7-30b3-4f7d-9e3a-9ecf963f8829-Three_Ribbons.pdf

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- Sec. 14-697 through 714 (repeated): *Open space shall not include areas covered by building, structures, parking, loading and other paved areas and internal streets. Open space shall contain living ground cover and other landscaping materials.*
- Comprehensive Growth Plan, “Three Ribbons” document, Natural Environment heading: The Natural Environment encompasses *floodplain, creeks, parks, trails, green networks, and other designated open spaces* within the city.

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 14-715, 7.1: The illustrative vision for Downtown Rogers recognizes the importance of providing a network of open spaces with *passive and active recreation* opportunities.
- Sec. 14-796(b): The purposes of this article are to:

...

(3) *Substantially reduce flooding, erosion and sediment damage* within the City.

...

(8) *Preserve natural vegetation, which enhances the quality of life* of the community.

...

(11) Provide a *visual buffer* and screen against traffic and *some buffer against noise pollution*.

(12) Provide *protections against severe weather*.

(13) Provide a *haven for birds, which in turn assist in the control of insects*.

(14) *Conserve and enhance the City's physical and aesthetic environment*.

- Sec. 22-24: This article controls the alteration of natural floodplains, stream channels and natural protective barriers which are involved in the *accommodation and transport of floodwaters*;
- Comprehensive Growth Plan, “Three Ribbons” document, Natural Environment heading: The natural environment is a network that *supports quality of life, economic growth, water quality, outdoor recreation, and a local sense of place*.

3(a): Complementary goals in at least a broad sense.

- Sec. 14-3(b): The purpose of these CSK regulations is to *permit the development of property in a manner which will not degrade or adversely affect the water quality of the Cave Springs direct recharge area* which includes the following specific purposes:

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 14-3(a): These Cave Springs area karst resource conservation regulations ("CSK regulations") are enacted *to protect the water quality of the Cave Springs recharge area and to protect the aquatic habitat of Cave Springs, including but not limited to the habitat for the Ozark cavefish*.

- Comprehensive Growth Plan, “Three Ribbons” document, Natural Environment heading: The city focuses on *developing within its municipal boundaries in a way that supports the natural environment*.

4(a): A variety of practices in at least a broad sense.

- Sec. 14-3(b)(1): Establish effective water quality regulations to protect the Cave Springs recharge area through the use of *stream buffers, runoff reduction practices, filtration, source controls, construction practices and control measures, waste water policies and practices, requirements for buried facilities that are potential pollutant sources, and spill prevention and control practices* to protect the quality of water that enters the groundwater system.
- Sec. 14-695 (b)(1)(l): *Cottage Court/Cluster Housing is a secondary use classification encompassing a grouping of three or more detached units on one lot that are typically placed in closer proximity than usual with the purpose of retaining an open space area.*
This type of development allows for site built or non-mobile manufactured houses.

4(b): A variety of practices given detail, meaning or factual basis.

- Sec. 14-3(c)(1): As used in this section, best management practices (BMPs) means economically feasible conservation, construction management, site improvements, on-going maintenance and/or treatment practices that *prevent, reduce or minimize degradation of water quality or prevent, reduce or minimize the increase of discrete recharge to the Cave Springs recharge area.*

5(a): Effective as a network in at least a broad sense.

- Sec. 14-715, 7.1: The illustrative vision for Downtown Rogers *recognizes the importance of providing a network of open spaces* with passive and active recreation opportunities. *The open space network* will be serviced by an interconnected network of sidewalks, trails and paths for pedestrians and bicyclists alike, providing desired amenities and facilities for residents and visitors to Downtown Rogers.
- Comprehensive Growth Plan, “Three Ribbons” document, Natural Environment heading: *The natural environment is a network* that supports quality of life, economic growth, water quality, outdoor recreation, and a local sense of place.

5(b): Effective as a network given detail, meaning or factual basis.

- Sec. 14-715, 7.1: The open space network will be serviced by an interconnected network of sidewalks, trails and paths for pedestrians and bicyclists alike, *providing desired amenities and facilities for residents and visitors* to Downtown Rogers.

6(a): Public access in at least a broad sense.

- Sec. 14-715, 7.1: Much of the publicly owned and maintained open space already exists in Downtown Rogers, with the Frisco Park in the center of Downtown, *connectivity to ancillary public open space is essential* for the public open space to be activated in conjunction with redevelopment.
- Sec. 14-732, 5.1(e): Open space(s) shall be incorporated to provide *usable public areas integral to the urban environment*;

6(b): Public access given detail, meaning or factual basis.

- Sec. 14-715, 7.1: Much of the publicly owned and maintained open space already exists in Downtown Rogers, with the Frisco Park in the center of Downtown, connectivity to ancillary public open space is essential *for the public open space to be activated in conjunction with redevelopment.*

6(c): Public access requirement.

- Sec. 14-732, 5.1(e): *Open space(s) shall be incorporated* to provide usable public areas integral to the urban environment;

7(a): Better before than after in at least a broad sense.

- Sec. 14-285(3): *Developer should attempt to incorporate existing on-site trees into the landscaping plan and indicate on plan.*
- Sec. 14-791(d): *Disturbed areas shall be minimized*, disturbed soil shall be managed and construction site entrances shall be managed to prevent sediment tracking.
- Sec. 14-832(a): *An ounce of prevention is worth a pound of cure.* Construction BMPs fall into two categories, erosion control and sediment control. Erosion control is the protection of the soil surface from the impact of rain drops and the resulting detachment of soil particles. Sediment control are the practices that capture soil particles that have been detached and transported down slope. *It is far more efficient and cost effective to prevent erosion than to capture sediment.*

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 14-796(b): The purposes of this article are to:

...

(6) Prevent the pollution of streams, ponds and other watercourses by sediment.

(7) Minimize the danger of flood loss and property loss due to unstable slopes.

(8) Preserve natural vegetation, which enhances the quality of life of the community.

- Sec. 14-832(c)(1): Clearing of natural vegetation and vehicular traffic on the site will expose and compact soils causing erosion and greater amounts of runoff. *"Minimization of clearing and compaction" will decrease the amount of soil exposed to erosion and will decrease the amount runoff from due to compacted soil.*

7(c): Better before than after requirement.

- Sec. 14-791(d): Disturbed areas *shall be minimized*, disturbed soil shall be managed and construction site entrances shall be managed to prevent sediment tracking.

Siloam Springs

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓		
2. Open space provides a wide variety of essential ecological services that benefit people.	✓ ✓	✓ ✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓ ✓	✓ ✓	
4. A variety of conservation practices can be used to enhance open space.	✓ ✓	✓ ✓	
5. Open space is most effective as a connected network throughout a given region.	✓ ✓	✓ ✓	✓
6. Public and equitable access to open spaces is a priority.	✓	✓	
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓ ✓	✓ ✓	

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Siloam Springs Municipal Code: https://library.municode.com/ar/siloam_springs

Our Vision, Our Future (2022):

<https://www.arcgis.com/sharing/rest/content/items/e11b04ac1f3a4479977e370367b91fd6/data>

1(a): Definition in at least a broad sense.

- Sec. 53-1: Open space means *the unoccupied portion of a lot or building site, containing no vehicular parking, that is open to the sky and may or may not contain landscaping, landscaping structures, or outdoor recreation facilities.*

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Stormwater Management and Drainage Manual Sec. 3.2.3: Drainage system planning and design for all development must be compatible with regional comprehensive plans and should be coordinated with planning for land use, open space, and transportation corridors. Urban drainage must *consider and address the interrelated issues of erosion and sedimentation control, flood control, site grading criteria, and regional water quality.*

...

Good drainage designs incorporate the effectiveness of natural systems rather than negate, replace or ignore them. Existing features such as *natural drainageways, depressions, wetlands, floodplains, permeable soils, and vegetation provide for infiltration, help control the velocity of runoff, extend the time of concentration, filter sediment and other pollutants, and recycle nutrients.*

- Stormwater Management and Drainage Manual Sec. 10.2: The ideal channel is a natural one carved by nature over a long period of time. The benefits of such a channel are:
(1) *Velocities are usually low, resulting in longer concentration times and lower downstream peak flows.*
(2) *Channel storage tends to decrease peak flows.*

(3) *Maintenance needs are usually low* because the channel is somewhat stabilized.

(4) *The channel provides a desirable green belt and recreational area, adding significant social benefits.* Generally speaking, the natural channel or the man-made channel that most nearly conforms to the character of the natural channel is the most efficient and desirable.

- Stormwater Management and Drainage Manual Sec. 13.8.3.4: From the Watershed Resource Guide by the Center for Watershed Protection, Urban tree canopy (UTC) is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. In urban areas, the UTC provides *an important stormwater management function by intercepting rainfall that would otherwise run off of paved surfaces and be transported into local waters through the storm drainage system*, picking up various pollutants along the way. UTC also *reduces the urban heat island effect, reduces heating/cooling costs, lowers air temperatures, reduces air pollution, increases property values, provides wildlife habitat, and provides aesthetic and community benefits such as improved quality of life.*
- Our Vision, Our Future: In addition to providing *recreational amenities* for the community, the parks can be *a tourism generator*, bringing visitors from throughout the region into Siloam Springs (44).
- Our Vision, Our Future: The term green infrastructure (GI) is used most often in relation to *stormwater controls*, such as bioswales, rain gardens, and permeable pavement. GI can also refer to related natural controls, such as using plants *to filter the air or to mitigate urban heat island effects* (83).

- Our Vision, Our Future: Consider the development of *educational* rain gardens. In addition to serving as a *functional rain garden and a public amenity*, these features can be used to demonstrate benefits to the community, such as slowing stormwater runoff, reducing flooding, and improving water quality (85).

3(a): Complementary goals in at least a broad sense.

- Our Vision, Our Future: The City celebrates the natural environment as an essential component of Siloam Springs' unique identity (17).

3(b): Complementary goals given detail, meaning or factual basis.

- Stormwater Management and Drainage Manual Sec. 13.5(3): 3. *BMP's should enhance the site, the community, and the environment.* Visual aesthetics are rarely considered during the engineering design process and should be provided more than a cursory thought. A well-engineered facility should not preclude blending into the natural environment.
- Our Vision, Our Future: All physical development of land affects the land and other natural resources, either positively or negatively. *Cities can require development patterns and practices that protect the natural environment*, such as safeguards for floodplains, slopes, and other environmentally sensitive areas (83).

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Our Vision, Our Future: A cluster subdivision, or “clustering”, refers to *concentrating increased residential density in one area of a development in order to preserve a natural area or feature in another area of the development*. The development has smaller lot sizes, but the overall density is maintained (29).
- Our Vision, Our Future: Amend the development code (Chapter 87 Subdivision of Land) to require the *dedication of park land, park improvement amenities, and trails in new subdivisions* to support the recreational needs of the growing population. *Develop a parks, recreation, and open space master plan* to advance the community's recreational goals and opportunities (43).
- Our Vision, Our Future: *Low-impact development (LID) is a broader term, referring to any practice that seeks to counteract the effects of development*. LID includes GI, but also includes practices such as cluster subdivisions (i.e., increased and concentrated density to preserve natural areas), walkable neighborhoods, and bike-/pedestrian-friendly transportation options (83).
- Our Vision, Our Future: Review the City’s floodplain and drainage standards and evaluate protections for riparian areas and streambanks. Consider *establishing a required setback or buffer from waterways* to reduce erosion and pollution and protect riparian areas. *Encourage or require developers to design “single-loaded” streets along creeks* (i.e., there are only homes on one side of the street and no homes backing up to the creek) to increase access to creekside trails and viewsheds. Update the zoning regulations to *establish a maximum percentage of impervious cover for lots* to reduce stormwater

runoff. Update the current drainage design manual *to include best practices and green infrastructure approaches* (85).

5(a): Effective as a network in at least a broad sense.

- Our Vision, Our Future: The City has preserved and enhanced key physical features by investing and expanding the City's downtown and *interconnected open space system* (22).

5(b): Effective as a network given detail, meaning or factual basis.

- Stormwater Management and Drainage Manual Sec. 3.3.1.10: Planning for water quality and flood detention shall be integrated within all development. In this context, site planning and design techniques shall reduce runoff volumes and velocities to the maximum extent practicable by implementing LID measures that *minimize directly connected impervious area*.
- Our Vision, Our Future: *Preserve a natural greenbelt area around the outer edges of the Planning Area* to mark entryways into Siloam Springs (18).
- Our Vision, Our Future: *Prepare a greenway plan along Sager Creek to protect the environmental integrity of the creek while supporting community amenities*, such as additional trails, parks, and Creekside destinations. This “riverwalk” style feature could expand upon the existing trails to provide an exciting and unique activity for residents and visitors to walk or bike to key destinations throughout the City. *A greenway plan could also evaluate the environmental considerations, such as erosion prevention, water quality, and natural habitats* (90).

5(c): Effective as a network requirement.

- Stormwater Management and Drainage Manual Sec. 3.3.1.10: Planning for water quality and flood detention shall be integrated within all development. In this context, site planning and design techniques *shall reduce runoff volumes and velocities to the maximum extent practicable by implementing LID measures that minimize directly connected impervious area.*

6(a): Public access in at least a broad sense.

- Our Vision, Our Future: Ensure community gathering spaces are incorporated in future developments and *accessible for all residents* (19).

6(b): Public access given detail, meaning or factual basis.

- Our Vision, Our Future: *Access to public spaces such as parks and plazas should be prioritized in these areas, providing informal gathering places and supporting a vibrant atmosphere* (35).
- Our Vision, Our Future: The Siloam Springs Kayak Park was established by the City in 2014. The park is located along the Illinois River, just south of Siloam Springs. *Access to the park is free for all users* and provides rapids, trails, climbing rocks, picnic areas, and a range of other amenities, *making the park appealing to a wide range of visitors* (44).
- Our Vision, Our Future: Ensure that all future recreational spaces include amenities that are *accessible for those with physical disabilities or other challenges* (i.e., “all abilities” or “accessible and inclusive” playgrounds). Evaluate opportunities for grant funding and other resources to help fund these facilities. When possible, include amenities that *serve all age groups from small children to seniors.*

...

In conjunction with LU-5.b (page 43) to develop a parks master plan, *consider whether new park or other recreational amenities are lacking in currently developed areas* (91).

7(a): Better before than after in at least a broad sense.

- Our Vision, Our Future: Review the existing tree preservation and mitigation regulations *to help preserve the natural environment and rural atmosphere as the community grows* (85).

7(b): Better before than after given detail, meaning or factual basis.

- Stormwater Management and Drainage Manual Sec. 13.1: It becomes even more important that management of these resources occur in a manner that *minimizes destructive long-term impacts to drainage infrastructure and the natural features that help protect water quality and control flooding*.
- Our Vision, Our Future: The City should consider purchasing currently undeveloped areas along major corridors *to ensure the long-term preservation of the rural character* for those entering into Siloam Springs (43).
- Our Vision, Our Future: Review the existing tree preservation and mitigation regulations to help preserve the natural environment and rural atmosphere as the community grows. For developing sites, *the current regulations credit preserved trees toward the landscaping requirements; however, there are no requirements to preserve or replace the trees. Consider adding a requirement to require the replacement of mature, native tree*

species and possibly to require approval from the Board of Directors to remove especially large trees (85).

Springdale

	(a) The principle appears in at least a broad, general sense.	(b) Additional meaning, motivation or factual basis are provided.	(c) Adhering to the principle is a requirement rather than a goal or option.
1. Open space generally means unpaved, unbuilt areas that host a community of plants and other living things, ranging from managed farms and parks to wilderness.	✓	✓	
2. Open space provides a wide variety of essential ecological services that benefit people.	✓	✓	
3. Open space and other development goals can complement each other rather than conflicting.	✓	✓	
4. A variety of conservation practices can be used to enhance open space.	✓	✓	
5. Open space is most effective as a connected network throughout a given region.			
6. Public and equitable access to open spaces is a priority.	✓	✓	
7. It's better to protect or set aside open space before development rather than try to undo human alterations afterward.	✓	✓	

✓ denotes appearance in city code. ✓ denotes appearance in comprehensive plan or equivalent.

Springdale Municipal Code:

https://library.municode.com/ar/springdale/codes/code_of_ordinances

Comprehensive Land Use Plan (2010): [https://core-](https://core-docs.s3.amazonaws.com/documents/asset/uploaded_file/3541/Springdale/2678517/Land_Use_Plan.pdf)

[docs.s3.amazonaws.com/documents/asset/uploaded_file/3541/Springdale/2678517/Land_Use_Plan.pdf](https://core-docs.s3.amazonaws.com/documents/asset/uploaded_file/3541/Springdale/2678517/Land_Use_Plan.pdf)

1(a): Definition in at least a broad sense. Met by 1(b).

1(b): Definition given detail, meaning or factual basis.

- Sec. 56-28: Open space shall be interpreted to mean: *All areas of natural plant communities or area replanted with vegetation after construction, such as revegetated natural areas; tree, shrub, hedge, or ground cover planting areas; and lawns; and* Other areas allowed to be counted as open space as per this Code.
- Ch. 130, Article 6, Sec. 2.16: Landscaped open areas. *Landscaped open space is that part of the site not occupied by any building or buildings (except swimming pools or open air recreation facilities) which is predominantly landscaped by way of the planting of gardens, lawns, shrubs or trees and is available for use and enjoyment by the occupants of the building erected on the site area, but does not include that part of the site area used for driveways and parking areas.*

2(a): Open space benefits in at least a broad sense. Met by 2(b).

2(b): Open space benefits given detail, meaning or factual basis.

- Sec. 50-30(3): This article controls the alteration of natural floodplains, stream channels and natural protective barriers which are involved in the *accommodation and transport of floodwaters;*
- Sec. 56-27: (a) Goals. Goals of this chapter include, but are not limited to, the following:
...
(2) *To moderate the effects of sun, wind, and temperature changes.*

(3) *To filter pollutants from the air and release oxygen.*

(4) *To stabilize soil and prevent erosion.*

(b) Objectives. The following are objectives that this landscaping and open space chapter intends to accomplish:

(1) Landscaping would *enhance the environmental and visual character* of the community.

(2) Green space requirements *preserve and stabilize the area's ecological balance* by establishing a healthier environment.

(3) Green areas help *to mitigate the negative effects of air and noise pollution* by using plants as buffers.

- Ch. 130, Article 6, Sec. 2.16: Objective:

1. To provide open space *for recreation and use by the residents.*

2. To *enhance the quality of the built environment* by providing a satisfactory balance of open space to buildings.

3. To integrate the landscaped area with the surrounding of the building.

4. *To reduce the paved area on the site.*

5. *To improve the visual amenity of the city.*

6. *To ensure that recreation areas are of useable dimensions.*

3(a): Complementary goals in at least a broad sense.

- Ch. 130, Article 4, Sec. 5.3(2): In order to build or operate any structure or use, it must be an allowable use among those specified as allowable uses in the base or principal zoning classification; provided further *no such use shall adversely affect the capacity of the*

channels or floodways of any designated creek, stream, tributary to the main stream, drainage ditch, or other drainage facility or system....

3(b): Complementary goals given detail, meaning or factual basis.

- Sec. 56-26: The purpose of this chapter is to ensure *a minimum of open space and green area as an integral part of new development and to protect the health and welfare of its citizens through the regulation of landscaping of new multi family, commercial and industrial developments.*
- Sec. 56-27(b)(4): *Landscaping should be an integral part of a development—not an afterthought.* This chapter is designed to *promote high quality developments, protect property values and public investment in our community.*
- Ch. 130, Article 4, Sec. 5.1: Due to the flexibility allowed in development density, *well-designed open space is an important factor in providing for innovative design and visual attractiveness.*

4(a): A variety of practices in at least a broad sense. Met by 4(b).

4(b): A variety of practices given detail, meaning or factual basis.

- Ch. 130, Article 4, Sec. 5.1: In order to enhance the integrity and attractiveness of the development, and when deemed necessary to protect adjacent properties, the planning commission shall require landscaping and screening as part of *a PUD*. ... Due to the flexibility allowed in development density, *well-designed open space is an important factor in providing for innovative design and visual attractiveness.*

- Sec. 42-154(9): *The committee will encourage and foster the planting of trees and other vegetation for the beautification of the city; and disseminate information to the public concerning selection and care of trees.*

6(a): Public access in at least a broad sense.

- Comprehensive Land Use Plan: Growth and development of public lands which include recreational areas, schools, library and museum facilities, transportation facilities and health and safety facilities *should be encouraged to locate in specific areas* (11).

6(b): Public access given detail, meaning or factual basis.

- Comprehensive Land Use Plan: Schools, *parks and community facilities should be located close to or within residential neighborhoods for accessibility* and to provide a focal point for effective and cohesive neighborhood design.

...

Parks and recreation areas should be evenly distributed throughout the City and include larger community parks and smaller neighborhood parks, some of which may serve as buffers between different land use types (11).

7(a): Better before than after in at least a broad sense. Met by 7(b).

7(b): Better before than after given detail, meaning or factual basis.

- Sec. 50-28: The purpose of this article is to promote the public health, safety and general welfare, to prevent adverse impacts from any floodplain development activities, and to

minimize public and private losses due to flooding events in identified special flood hazard areas. This article advances the stated purpose through provisions designed to:

...

(2) Protect natural floodplains against unwise development;

- Sec. 56-27(a): Goals of this chapter include, but are not limited to, the following:

(1) To save trees on public property from indiscriminate destruction or unnecessary removal.