




# Climate Adaptation in Fayetteville, Arkansas



Olivia G. VanBuskirk  
Suraya Y. Yamada-Sapien  
Lauren E. Mullenbach, PhD

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# EXECUTIVE SUMMARY

Located in Northwest Arkansas, Fayetteville is rapidly growing due to a favorable local climate, the presence of multiple corporations, and the University of Arkansas. As the city continues to grow, so does the demand for more development and affordable housing. However, the city is also interested in preserving existing undeveloped space, taking action to reduce greenhouse gas emissions, and adapting to the challenges of a warming climate. Being a relatively progressive city in a conservative state, studying climate adaptation in Fayetteville provides insight into the challenges of local governments that are trying to be environmentally-conscious with limited resources and little state support.

In the coming years, Fayetteville is expected to experience higher temperatures and more intense (but variable) precipitation patterns. To begin preparing for these impacts, the city developed and adopted an Energy Action Plan in 2018, followed by the creation and adoption of a Climate Action Plan in 2024. These documents outline actions for the city to take to reduce their greenhouse gas emissions and become more resilient. The Climate Action Plan also complements existing city documents in order to provide an overall approach to planning that prioritizes the environment and reducing emissions. While developing these plans, the city routinely engaged with community members by encouraging them to take a survey about climate priorities and directly involving residents in the creation of the plan via the Environmental Action Committee.

However, Fayetteville's climate adaptation planning does not come without challenges. Despite the development of multiple planning documents aimed at adaptation, the city has to contend with an adversarial state government and the potential for their adaptation initiatives to be blocked. Furthermore, the city's relationship with the University of Arkansas could be more productive. As a large land-owning entity in Fayetteville, the university has the potential to be a partner or a barrier to climate progress. In addition, there are equity challenges across the city. South Fayetteville was identified by multiple research participants as an area of the city which experiences disproportionate impacts of climate change and residents have fewer resources to deal with these impacts. How the city moves forward while planning for climate change will have important ramifications for how the most vulnerable residents of the community are able to adapt as well.

Overall, Fayetteville's approach to climate adaptation planning can set the example for other communities in similar situations. The city has developed new tools, policies, and ordinances they can use to control development and reduce emissions while continuing to grapple with population growth and demands associated with it. How Fayetteville moves forward as new people continue moving to Northwest Arkansas will have serious impacts on the climate of the local area and the region as whole. With continued action and political courage, Fayetteville has the potential to become a more equitable community where all residents can thrive.





# SCIPP

A NOAA CAP TEAM

This study was conducted by researchers from the Southern Climate Impacts Planning Program (SCIPP), which is a National Oceanic and Atmospheric Administration (NOAA) Climate Adaptation Partnership (CAP) team. SCIPP works to understand the impacts of climate variability and change across the south-central U.S. This includes studying how cities are preparing to handle the challenges associated with climate change, while also building capacity and creating resources on climate hazards. The work presented in this report on Fayetteville is part of a larger study investigating climate adaptation, equity, and justice in three cities throughout the region: Tulsa, Oklahoma, Fayetteville, Arkansas, and Shreveport, Louisiana. This study was approved by the University of Oklahoma's Institutional Review Board (#15845).

## STUDY OBJECTIVES

- 1** Examine climate adaptation activities in Fayetteville
- 2** Analyze the climate adaptation planning process in Fayetteville
- 3** Assess vulnerability and equity

# KEY TERMS

Research on equitable climate adaptation has proliferated over the last decade, with researchers from all over the world contributing to this scholarship. Here, we draw on that literature to provide definitions of terms that frame our work.

## 01. \_\_\_\_\_

### Equity

Equal and fair distribution of opportunities, resources, and environments free from climate hazards and risks, regardless of individual/group identity or background [1].

## 02. \_\_\_\_\_

### Justice

Recognition that minority groups are structurally vulnerable and continually disadvantaged in terms of their cultural, political, and socioeconomic rights [1].

## 03. \_\_\_\_\_

### Climate Adaptation

Actions taken to reduce risks associated with today's changed climate conditions and to prepare for further impacts in the future. This includes diverse activities designed to reduce climate risks and increase capacity to prepare for climate impacts [2].

# INTRODUCTION

## Topography and Climate Hazards

The city of Fayetteville is located in the Ozark Mountains, characterized by rolling hills and waterways. This location makes the city susceptible to flash flooding, exacerbated by an increase of impervious surfaces from urban development (causing more surface water accumulation) and more frequent and severe storms [3]. Exceptional drought conditions have continued to stress the watershed and regional ecology, and anticipated hotter weather increases risks of heat-related illnesses and wildfires [4]. The average annual temperature is expected to increase 3.6 °F to 5.4 °F from the long-term average by 2050. Coupled with a predicted reduction in water availability, these higher temperatures would increase ecological pressures [5]. Heat, drought, and heavy precipitation and flooding were identified as the most pertinent extreme weather events concerning the city [6].

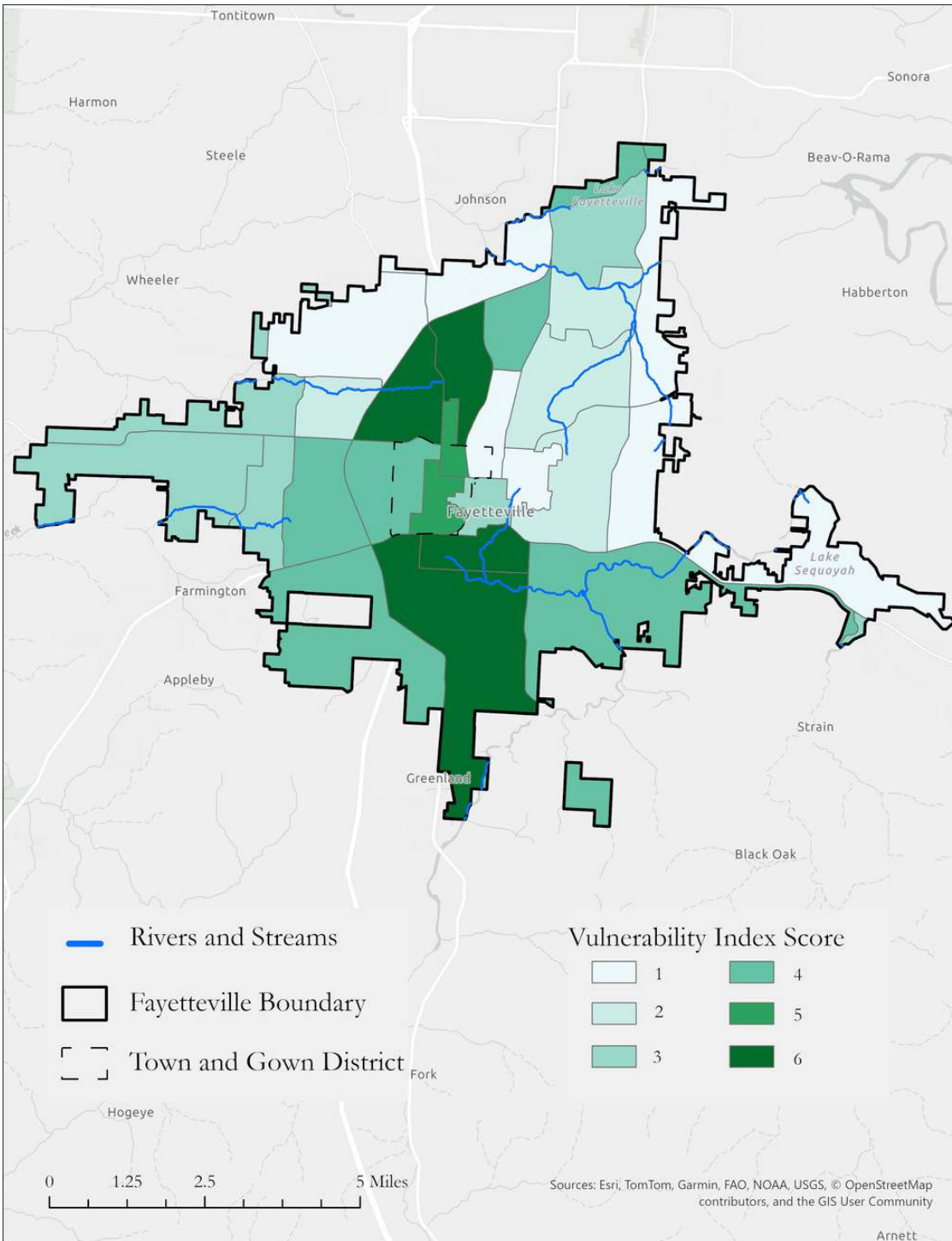


## Local Economic Institutions

The University of Arkansas is the largest employer in the city and the second largest employer in Washington County, preceded by Tyson Foods and followed by the Springdale School District and Walmart Stores [7]. The university is also the largest landowner in the city and coordinates infrastructure projects with the city such as utilities, transit, student housing and police [8]. The University of Arkansas is a state institution and does not have to follow City of Fayetteville regulations. This status can lead to some complications between the university and local government, especially concerning land use, environmental policy, and decision-making.

## Demographics

Fayetteville has a population of 95,000 and is growing annually by about 2% [9]. There was a 33% rise in cost-burdened households from 2021-2022, most of whom live in rental housing [10]. A 2023 report on housing from the Fayetteville City Council found a large shortage of housing units and an urgent need for affordable housing in order to relieve cost burdens [11]. In addition to these burdens, rent prices are increasing at a much higher rate than per capita income [12]. The city anticipates a need of 1,000 more housing units annually to keep up with the expected population growth.



In order to understand existing vulnerability in Fayetteville, we created an index to highlight social and economic inequities. Using data from the American Community Survey [9], we identified Census tracts which exceeded the state average across four variables (percent of the population that is non-white, median rent, and the percentage of the population without a Bachelor's degree at the city and state level) and which were below the state average for median incomes and home values. Each tract was given a score of 0 (false) and 1 (true) for each variable. Then, the individual scores were summed to create a vulnerability index score for the city. Higher scores on the index indicate areas with higher vulnerability.



## Energy Action Plan

In 2018, the Fayetteville City Council adopted the city's Energy Action Plan [13], a document outlining strategies that could be taken to reduce greenhouse gas emissions and energy use, and encourage more sustainable behavior from residents and the city. The plan was drafted in 2017 after a survey of Fayetteville residents found that climate change planning was a community priority. In addition to community and stakeholder feedback, Fayetteville drew on resources from peer cities, the Urban Sustainability Director's Network, the Local Governments for Sustainability (ICLEI), and other resources to develop energy-reducing actions.

The plan focused on **emissions reductions** across four topical areas: buildings, energy supply, waste, and transportation, with some cross-sector initiatives as well. Specific strategies and actions included in the plan touch on developing new energy efficient housing and commercial buildings, reducing urban heat island effects, advocating for more renewable energy, encouraging active transportation (e.g., biking, walking) and the use of electric vehicles, and increasing access to recycling and composting across the city. Overall, the plan set out a vision for a more environmentally-conscious Fayetteville and identified steps the city could take to begin reducing their emissions.



## Climate Action Plan

Starting in 2023, Fayetteville began the process of updating the Energy Action Plan and developing its new Climate Action Plan [14]. The city drew on community input, worked with non-profits across the area, and engaged with the Fayetteville Environmental Action Committee (EAC) to develop this plan, which was adopted by the City Council in July 2024.

The Climate Action Plan builds on the goals of the Energy Action Plan, focusing on **emissions reductions** across four sectors (energy, transportation, waste, and water) and **nature-based solutions** (ecosystems services, ecosystems resilience, and carbon sequestration). The overarching emissions reduction goal of the plan is to be net-zero by 2050 by achieving clean energy usage, reducing transportation emissions, reducing waste diversion, and conserving water across the community. For the nature-based solutions portion of the plan, the city intends to protect areas that provide a large number of ecosystem services, have high levels of biodiversity, or which provide carbon sequestration. Finally, the Climate Action Plan lays out specific climate equity goals, specifically focusing on understanding the impacts of climate change in more vulnerable and underserved neighborhoods of the city.

In addition, the city developed a Climate Resilience Scoring system, which combines the ecosystem services, ecosystem resilience, carbon sequestration potential, and climate equity to understand the climate resilience of each parcel in the city's planning area [15].



# RESEARCH METHODS

## Focus Groups and Interviews

We conducted interviews and focus groups with city planners, non-profits, the Fayetteville Environmental Action Committee (EAC), and city staff from the sustainability department. We worked with staff members from the sustainability department to coordinate our focus groups with the city planners and EAC, and reached out to non-profit staff who were involved in the creation of the Climate Action Plan.

In our first focus group, we spoke with eight **staff from city planning** who were involved in various initiatives focused on sustainability and climate adaptation. In our second focus group, we met with seven members of the **Environmental Action Committee**, which is a collaborative effort between the Fayetteville City Council and city residents to provide feedback on climate adaptation and other environmental initiatives in the city. Our third focus group included three members of the **Fayetteville Sustainability Office** whom we spoke with in more detail about the creation of the Climate Action Plan. We also conducted interviews with employees from two environmental non-profits working in the area; the **Beaver Watershed Alliance and Northwest Arkansas Land Trust**. Both of these organizations have previously worked with the City of Fayetteville to protect the city's source of drinking water (Beaver Lake) and protect land across all of Northwest Arkansas for conservation.



## Fayetteville Climate Action Plan

To understand Fayetteville's approach to climate adaptation, we read the city's recently updated Climate Action Plan and documented key themes and strategies that were included. Doing so allowed us to understand how the city is thinking about future challenges related to sustainability, climate change, and the environment, and helped to frame our interview questions. Additionally, we were interested in the extent to which Fayetteville understood, discussed, and planned for the equity and justice challenges associated with climate adaptation.

# RESULTS

**1**

**Climate Issues Identified**

**2**

**Tools, Policies, and Ordinances**

**3**

**Sources of Tension**

**4**

**Community Engagement**

**5**

**South Fayetteville**



# Climate Issues Identified

In the south-central United States, climate change impacts are expected to result in higher temperatures, more days with temperatures greater than 100 degrees Fahrenheit, and more intense precipitation events with longer dry spells in between. These issues were top of mind for interview participants across Fayetteville.

## Flooding and Changing Precipitation Patterns

Particularly of concern was flooding as nearly every interviewee mentioned the impacts of increasingly heavy precipitation events. Coupled with increasing urbanization, precipitation events lead to more stormwater runoff and flooding, especially in south Fayetteville, which has a higher population of low-income residents compared to the rest of the city. The city has previously bought out homes in these flood-prone areas, but flooding impacts will likely continue to be an issue.

When it does rain, higher intensity precipitation will lead to more flooding. However, there are also expected to be longer periods between precipitation events, resulting in drought conditions across Arkansas. This is of concern to Fayetteville because the city's water source, Beaver Lake, is surface water and therefore susceptible to fluctuations in runoff. Non-profit organizations and the city are working to engage residents in water conservation initiatives and mitigate issues related to water quality and quantity.



## Extreme Heat and Urban Heat Islands

Extreme heat and associated heat-related illnesses will also affect Fayetteville residents, due to hotter weather and more heat waves. The urban tree canopy and other green infrastructure can help offset these higher temperatures and provide shade. However, there is less tree canopy in south Fayetteville, so residents there tend to experience warmer weather and more heat stress than the rest of the city. Rising temperatures will worsen this heat island effect, unless the city intervenes and takes action.

Overall, the climate issues in Fayetteville, such as the urban heat island and stormwater runoff, will be exacerbated by the rapid growth the city has been experiencing. Northwest Arkansas is increasingly viewed as a good place to live because of lower costs compared to nearby population centers like Austin, Texas, recreation opportunities, and a favorable climate. Additionally, the location of nearby industries (e.g., Walmart and Tyson) continues to bring new employees to the area. In the future, Fayetteville will have to balance growth and demand for housing with sustainability and climate adaptation.



# Tools, Policies, and Ordinances

Fayetteville has developed multiple tools, policies, and ordinances to make progress on climate and environmental issues. In the latest update of the Climate Action Plan, the city developed a **climate resilience scoring system** which can be combined with the existing **infill development matrix** and **ecosystem services matrix** to help guide decision-making about future development. Additionally, the city is working to combine these tools to help identify areas that are important for climate resilience but not necessarily for infill. The hope is this tool can be used to argue for land conservation instead of future development.



The Climate Action Plan is also aligned with multiple other city planning documents. The plan explains *“Intentionally, this CAP aligns with other city master plans and is meant to reinforce the sustainability and resilience-oriented goals, strategies, and actions identified in the City Plan 2040, the Fayetteville mobility plan, the parks master plan, the recycling and trash master plan, the urban forestry master plan, and the active transportation plan,”* (CAP p. 3). While Fayetteville will likely use the Climate Action Plan to develop new ordinances, the city has multiple existing ordinances to advance environmental issues, such as their **low-impact development ordinance, tree protection ordinance, or stream-side protections** that will conserve riparian corridors. In the past, the city has also worked with the Northwest Arkansas Land Trust to protect land for conservation purposes and Fayetteville has a line item in the city budget to help with purchasing land and preventing future development on it.

While these policies, plans, tools, and ordinances are important for environmental work in Fayetteville, some issues exist. First, as with any city, there are limited resources and staff members to go around. This can affect enforcement due to lack of staff, as we heard happened with the stormwater department. Efforts related to water, land protection, and education are often carried out via non-profits, potentially creating communication challenges between the city and its residents. Planners are limited by the existing city ordinances and it can be difficult to pass new ones, particularly if there is a lack of political will or resident support for an issue. One planner explained there is also a lag between the passing of the Climate Action Plan and the adoption of updated policies, so major progress may be delayed. Finally, when asked what steps they would like to see the city of Fayetteville take next, one of the non-profit employees we interviewed said **“More education on the existing tools instead of trying to create more stuff. Look at what you already have written,”** describing the need for more education about what tools the city already has, as the amount of information available can be overwhelming and hard to keep up with.

# Sources of Tension

Progress in any city doesn't happen without disagreement or tension. As a relatively progressive city in a conservative state, Fayetteville has to deal with pressure from the state government when developing new policies, plans, or ordinances. This has created significant tension between Fayetteville and the “people in Little Rock,” [referring to the state government] as described by participants. As one interviewee put it, **“It’s always like, how far do we want to push it in the state of Arkansas before somebody realizes what we’re up to and slaps our hands?”** In the past, the state has preempted the city government on a natural gas ban as well as limitations on short-term rentals. Although the Fayetteville City Council adopted the new climate action plan in summer 2024, interview participants from the EAC and city expressed some concern that their ability to implement parts of the plan would be limited by the state government. When developing the Climate Action Plan, this tension led the city to focus on incentives, education, and steps to “set the table” for future actions rather than creating new policies or regulations.

## Arkansas State Government

Policy and decision-making in Arkansas is heavily influenced by state priorities. Before 2011, cities only had powers which were explicitly granted to them by the state. Now, municipalities have slightly more flexibility in their policy-making, and are able to exercise their own legislative power in order to carry out their municipal affairs [16]. However, the state is still able to preempt and block any local policies which it finds unsavory, leading to tension between more progressive cities and the conservative state government.





The city of Fayetteville also has a difficult relationship with the University of Arkansas, particularly as the student population continues to increase, affecting housing and environmental issues in the city. The university keeps growing its enrollment and campus size, yet is reluctant to participate in city decision-making processes or collaborate with city staff when planning. One interviewee explained, **“They don’t seek our input for much. If I can be candid, I mean, if they [the University of Arkansas] decide they want a parking garage, they will build it and they will build it when they want it.”** Further complicating planning efforts, the university is a state organization and therefore does not have to comply with local regulations. As one interview participant stated **“They’re not controlled out of Fayetteville, they’re controlled out of Little Rock.”** As an example, the university has their own municipal separate storm sewer system (MS4) and the city cannot regulate it, even if they wanted to implement something like a stormwater fee. Overall, this tension makes it difficult for the city to plan for climate change when a major organization does not participate in the planning process.

Another source of tension comes from Fayetteville residents themselves. It can be difficult to convince residents that certain policies are important and should be enacted. During the time of our interviews, the city was discussing the implementation of a stormwater utility fee for residents, and we heard about the difficulty of convincing people that the fee would help with climate efforts in the long run. Similarly, the city is focusing on infill development downtown rather than building sprawling new neighborhoods. Although this would change the existing fabric of the city, a more dense urban center could help Fayetteville achieve some of its sustainability and climate goals. Despite potential benefits, some residents resist this change and want to retain the image of Fayetteville that they already have.

“I think, all we ask, everybody’s welcome but this is Fayetteville. We’re pretty much progressive. We have loud music on Dickson Street. This is the way we roll. Don’t come in and try to change it, you know? Everybody’s welcome but we like it how it is, don’t mess with it.”

Because of these pressures, some interviewees expressed hesitation around passing new ordinances. Fear of state pre-emption or of decisions not passing city council led to less willingness to try and change. We also noticed that sometimes participants would feel that they have done enough, proud of the progress that Fayetteville has already achieved and seeming to think that the existing policies were sufficient for addressing the challenges associated with climate change. This attitude was not present across the entire interview sample, but was something we encountered more than once.



# Community Engagement

We also spoke with city staff members about their community engagement efforts during planning processes, not necessarily limited to updating the climate action plan. There were many ways the city contacted and shared information with residents: fliers, mailing lists, posting signs, and newspaper stories, among others. Fayetteville also frequently uses its “Speak Up” platform to gather resident feedback and concerns about different topics affecting the city. Additionally, residents are able to participate on city commissions, and the Environmental Action Committee was involved in the development of the Climate Action Plan. During our interview with city planners, participants explained that the city lacked enough resources to identify what equitable climate adaptation planning would look like and carry out the type of community engagement that it would require. While the city does have many avenues for residents to participate in planning, the engagement elicited through the types of interactions the city seeks out is often reactive, with community members able to speak on topics affecting them but only after the city has decided some sort of course forward.



## South Fayetteville

Throughout our interviews, we routinely heard participants identify south Fayetteville as one of the most vulnerable parts of the city. Compared to the rest of the city, south Fayetteville tends to have lower incomes, lower home values, a higher percentage of renters, and a larger proportion of the population which identifies as non-white. Some of the worst flooding impacts are concentrated in this part of the city, because it is low-lying, but it seems unclear if planners and the city have a plan for addressing this issue besides home buyouts. Additionally, gentrification of south Fayetteville was brought up as a main concern across multiple interviews, but participants struggled to articulate how they would approach the need for more affordable housing and the pressures of population growth that Fayetteville is facing.

# IMPLICATIONS

**1**

**Equitable Adaptation**

**2**

**Challenges of Growth**

**3**

**Setting an Example**



# Equitable Climate Adaptation

Fayetteville has developed a substantial mechanism for engaging residents in the planning process and routinely conducts surveys of community members' opinions. Their ability to survey residents is impressive, with some surveys receiving thousands of responses. In addition, the city has a robust Environmental Action Committee that was involved in the development of the Climate Action Plan. If the city were striving to be more inclusive in their planning processes, they might consider reaching out specifically to residents of south Fayetteville—an area of the city that nearly everyone we interviewed agreed was home to many of the city's low-income population. This area might have perspectives on flooding mitigation that other areas of the city may overlook, given how often this area experiences flooding. Furthermore, the city may need to create a community engagement plan or policy that they follow for each major project, such as a climate action plan, that includes additional steps they can take to engage residents. This might include strategic committees, youth outreach, online/social media outreach, and holding meetings outside of normal business hours in neighborhoods around the city. A more inclusive planning process might offer residents opportunities to be involved from the beginning of the planning process, rather than solely commenting on plans once they have been initiated.



## Challenges of Growth

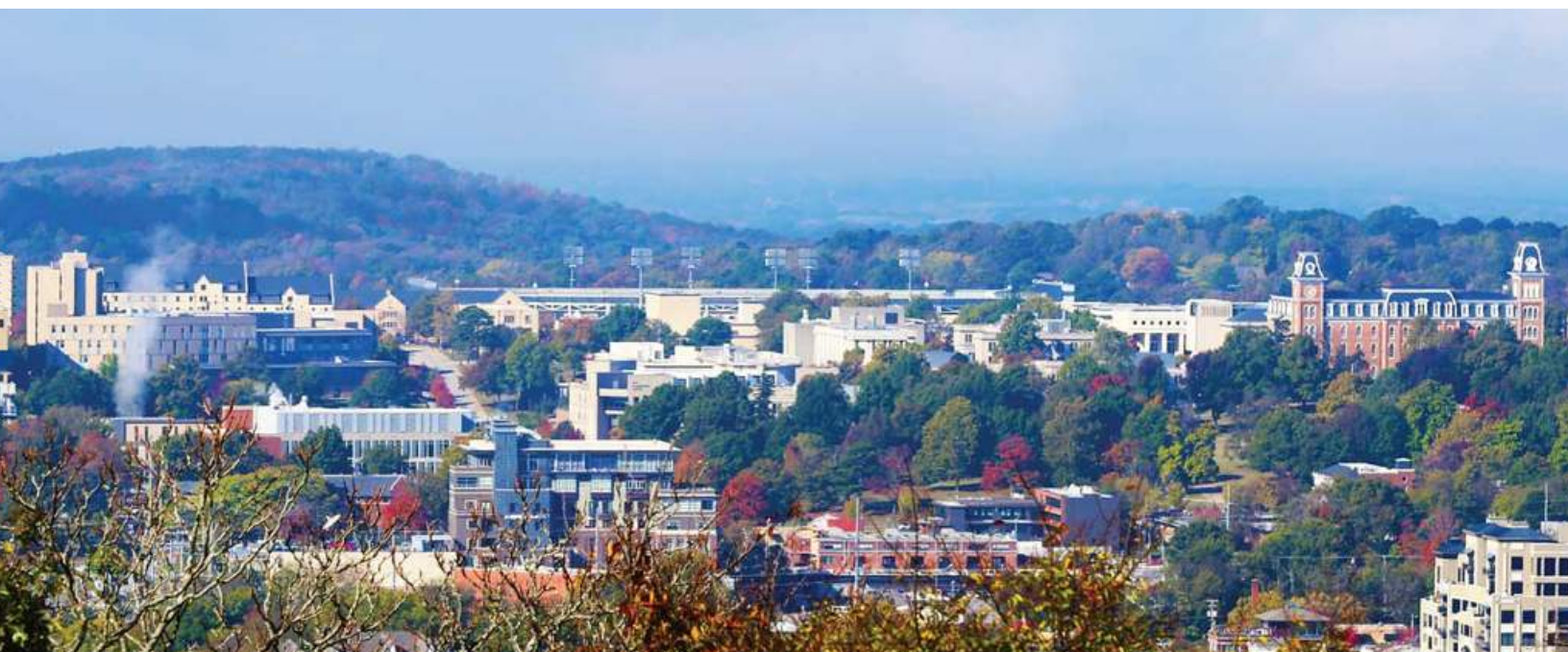
One of the biggest challenges our interviewees identified was how to balance the city's growing population, the demand for affordable housing, and conserving the environment. As the economy of Northwest Arkansas continues to grow and major corporations are attracting new workers, the population of Fayetteville will continue to rise. In addition, the university student population has also been increasing, leading to demands for more off-campus housing. These pressures have led to tension between the need for environmentally-conscious decision-making and significantly more housing being built in the city. Additionally, Fayetteville city staff and planners expressed a lack of cohesive strategy for addressing affordable housing concerns, meaning the city does not have a plan in place to explicitly increase affordable housing. Moving forward, Fayetteville will have to figure out how to maintain affordable housing and keep up with its population growth. Otherwise, gentrification that has already started occurring in the city will continue, leading to increased inequality. The good news is, as part of developing the Climate Action Plan, Fayetteville also created an infill development matrix and ecosystems services matrix which can help guide decisions, identifying areas that would benefit from infill development and other areas which should be conserved.



# Fayetteville: Setting an Example

In developing multiple ordinances, policies, and tools to guide environmental decision-making, Fayetteville sets an example for other communities that are embarking on climate adaptation planning, particularly those in conservative states. Despite an unfavorable state political environment that has blocked action in Fayetteville before, the city continues to use the tools it has to its advantage in order to continue protecting land and making environmentally-friendly choices. However, the city's budget is limited, therefore actions are often prioritized if they can have multiple wins (e.g., good for the environment and the economy) and Fayetteville could benefit from partnering with other organizations in the area that have more capacity to protect land, such as the Northwest Arkansas Land Trust.

Overall, Fayetteville is in a difficult position. The city has a growing population which creates housing, flooding, and land conservation issues but at the same time there is high local capacity to deal with these issues. Across multiple city departments, resident-led initiatives, and the work of non-profit organizations, there is significant brain power ready to solve environmental problems, if the city can effectively tap into and harness this ability. Although they are in a position to be a leader in this region for other municipalities, Fayetteville is not perfect. Their attitude towards newcomers moving to the area could be more inclusive, and they could try to bridge the gap between new and existing populations. In addition, a stronger focus on equitable planning and the needs of the most vulnerable residents, which people easily identified as South Fayetteville, could have substantial quality-of-life impacts for some of the underserved areas of the city. Still, Fayetteville is doing better than many other cities in the south-central U.S., particularly when it comes to being forward-thinking and proactive about environmental issues and using the tools that it does have available to make real change.



# REFERENCES

- [1] Chu & Cannon (2021). Equity, inclusion, and justice as criteria for decision-making on climate adaptation in cities. *Current Opinion in Environmental Sustainability*.
- [2] Wasley et al. (2023). Ch. 31: Adaptation. In: *Fifth National Climate Assessment*. U.S. Global Change Research Program, Washington DC, USA
- [3] First Street Foundation (2024). *Fayetteville, AR, Flood Map and Climate Risk Report*.
- [4] U.S. Drought Monitor Data, <https://droughtmonitor.unl.edu/Data.aspx>
- [5] U.S. Federal Government, 2023: U.S. Climate Resilience Toolkit Climate Explorer. [Online] <https://crt-climate-explorer.nemac.org/> Accessed January 2025.
- [6] City of Fayetteville (2018). *Climate Resilience Assessment*.
- [7] Arkansas Department of Workforce Services (2016). *Arkansas Economic Development Commission Strategic Plan*.
- [8] University of Arkansas Office of Financial Affairs (2023). *Annual Report 2023*.
- [9] United States Census American Community Survey, 2017-2022 5-year estimates.
- [10] United States Census American Community Survey, 2021 and 2022 ACS 1-Year Estimates Subject Tables S2503
- [11] City of Fayetteville (2023). *City Council Housing Report*.
- [12] Bureau of Economic Analysis (2024). GDP and Personal Income Summary Data.
- [13] City of Fayetteville (2018). *Energy Action Plan*.
- [14] City of Fayetteville (2024). *Climate Action Plan*.
- [15] City of Fayetteville (2024). *Climate Resilience Scores*.
- [16] Arkansas Municipal League (2015). *Guidebook for Municipal Officials of Mayor/Council Cities*.

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