DPZ CODESIGN

Infrastructure & Environment

Regional Growth Strategy For Northwest Arkansas

10/27/25

Infrastructure & Environment

Executive Summary

Northwest Arkansas faces the challenge of accommodating rapid growth while maintaining quality of life, environmental health, and infrastructure resilience. This document presents a comprehensive assessment of existing infrastructure systems, environmental assets, and anticipated future needs. It integrates spatial data, infrastructure performance, environmental sensitivity, and policy recommendations to support coordinated planning across municipal boundaries.

This document begins with a review of the region's transit systems, highlighting both the University of Arkansas's Razorback Transit and the intercity Ozark Regional Transit (ORT). Ridership patterns, route coverage, and accessibility issues—such as the limited number of ADA-compliant stops—demonstrate both progress and gaps in regional mobility. Ridership is highest in Fayetteville and Springdale, reflecting student density and urban form. Active transportation networks are also emerging as vital components of first- and last-mile connectivity.

A detailed evaluation of roadway infrastructure follows. Most lane miles in the region fall under local jurisdiction, placing a disproportionate maintenance burden on cities. Interstate 49 remains the region's primary artery, but congestion and crash rates are increasing, especially along Highway 71B and U.S. 412. Roadway classification and per capita lane miles reveal significant variation between urban centers and smaller communities. A gap analysis highlights the need for new collectors and arterials west of I-49 to support continued development in fast-growing areas such as Centerton and Tontitown. Overlays with state and regional transportation plans reveal significant long-term investments, including the Highway 612 bypass extension.

Active transportation infrastructure is also a major focus. The region is home to 246 miles of paved multi-use trails and more than 400 miles of soft-surface mountain biking trails. Cities like Bentonville and Rogers lead the region in trail access per capita. However, inconsistencies in data collection present challenges for planning. Standardized data platforms like Strava Metro are recommended to support better coordination and performance tracking.

Analysis of trip generators and walkability maps major employers—such as Walmart, J.B. Hunt, Tyson, and the University of Arkansas—alongside residential development patterns and intersection density. The spatial disconnect between single-family housing concentrations and key destinations underscores the inefficiencies of auto-dependent development models. Low intersection density in many suburban and rural communities further limits walkability and multimodal access.

The review of park and recreation resources shows wide disparities in access. While some cities, like Fayetteville, provide parkland within a 10-minute walk for more than half their population, others lag significantly behind. On average, the region currently provides 17.4 acres of parkland per 1,000 residents—a ratio that will decline sharply without new land acquisitions as the population expands.

Environmental sensitivity is another critical concern. Wetlands, floodplains, tree cover, prairies, and vulnerable karst systems—especially around Cave Springs—face increasing pressure from expanding impervious surfaces and unmanaged development. Growth management strategies that prioritize compact development and coordinated utility extension are essential to protect these ecological assets.

Wastewater treatment infrastructure is under stress, both from population growth and regulatory constraints. Legal disputes between Arkansas and Oklahoma over phosphorus discharge into the Illinois River have resulted in stricter limits, affecting multiple regional treatment plants. Some facilities, like Decatur's, have already faced moratoriums on new sewer connections. A regional wastewater strategy is recommended to address capacity challenges, regulatory compliance, and long-term investment.

Water supply analysis shows nearly all of Northwest Arkansas depends on Beaver Lake, primarily through the Beaver Water District and the Benton Washington Regional Public Water Authority. With summer peak demand nearing existing treatment capacity, additional investments will be needed to ensure reliable water access as the region grows.

Across all infrastructure systems—transportation, parks, wastewater, and water—there is a recurring theme: the need for greater regional coordination. Sustainable growth in Northwest Arkansas will require integrated planning, shared investment strategies, and proactive protection of environmental resources. This document offers both a snapshot of current conditions and a forward-looking vision to guide policy decisions toward a more resilient and equitable regional future.

Infrastructure & Environment

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Transit

Razorback Transit Routes

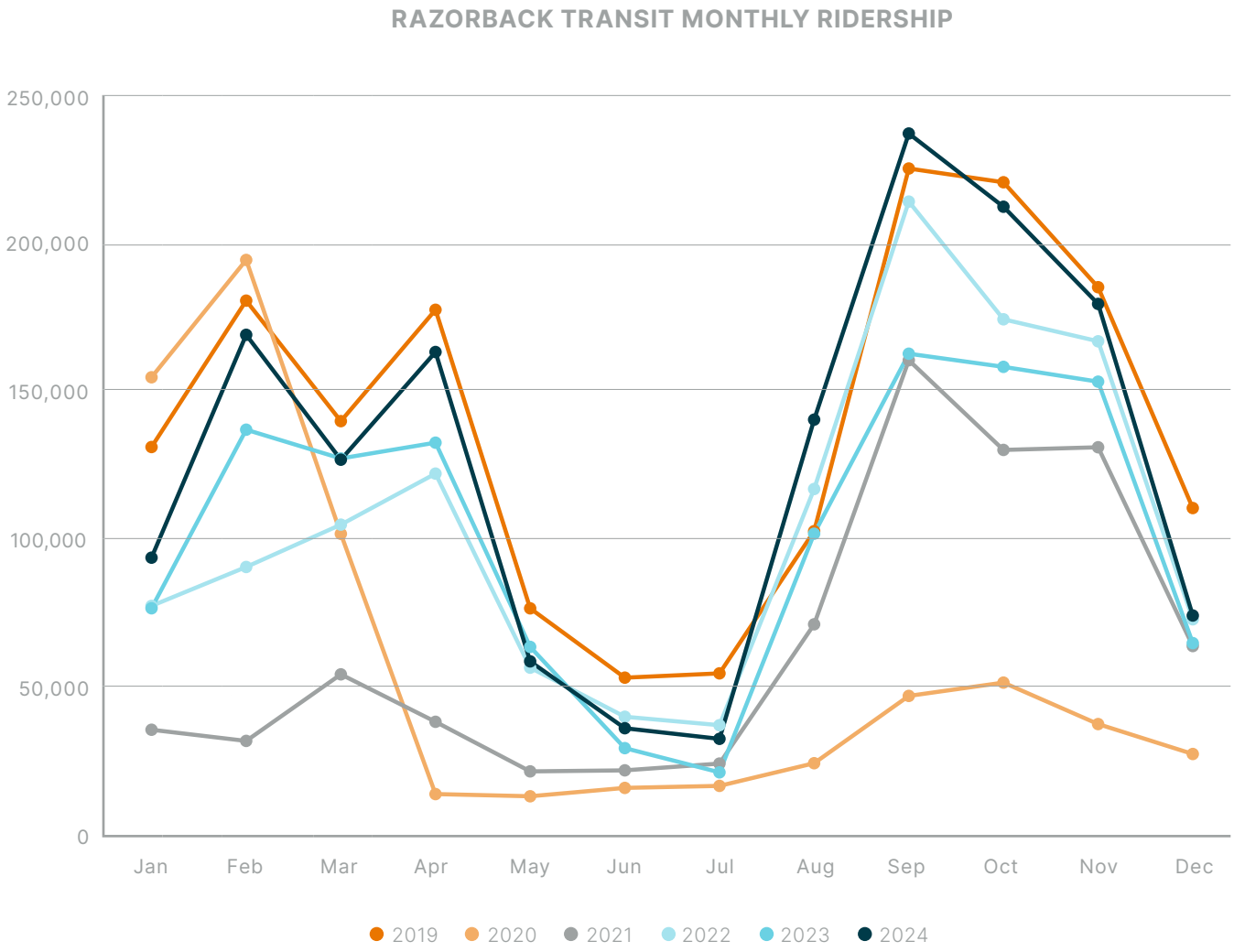
Razorback Transit Routes

Razorback Transit has 12 routes providing students extensive transportation service around Fayetteville, with 161 stops including to the Northwest Arkansas Mall and residential areas along Gregg Avenue. The University of Arkansas transit system has seen growth in ridership recover slowly from the COVID-19 pandemic beginning in 2020. Razorback Transit also offers paratransit services and Safe Ride, an on-demand service into early hours of the morning for students to get home safely.

Peer Region Comparison

Razorback Transit surpasses Ozark Regional Transit in terms of annual unlinked trips (referred to as UPT, the total number of times passengers board public transportation vehicles). In 2023, Razorback Transit saw 1,275,818 UPT, while Ozark Regional Transit saw 272,023.

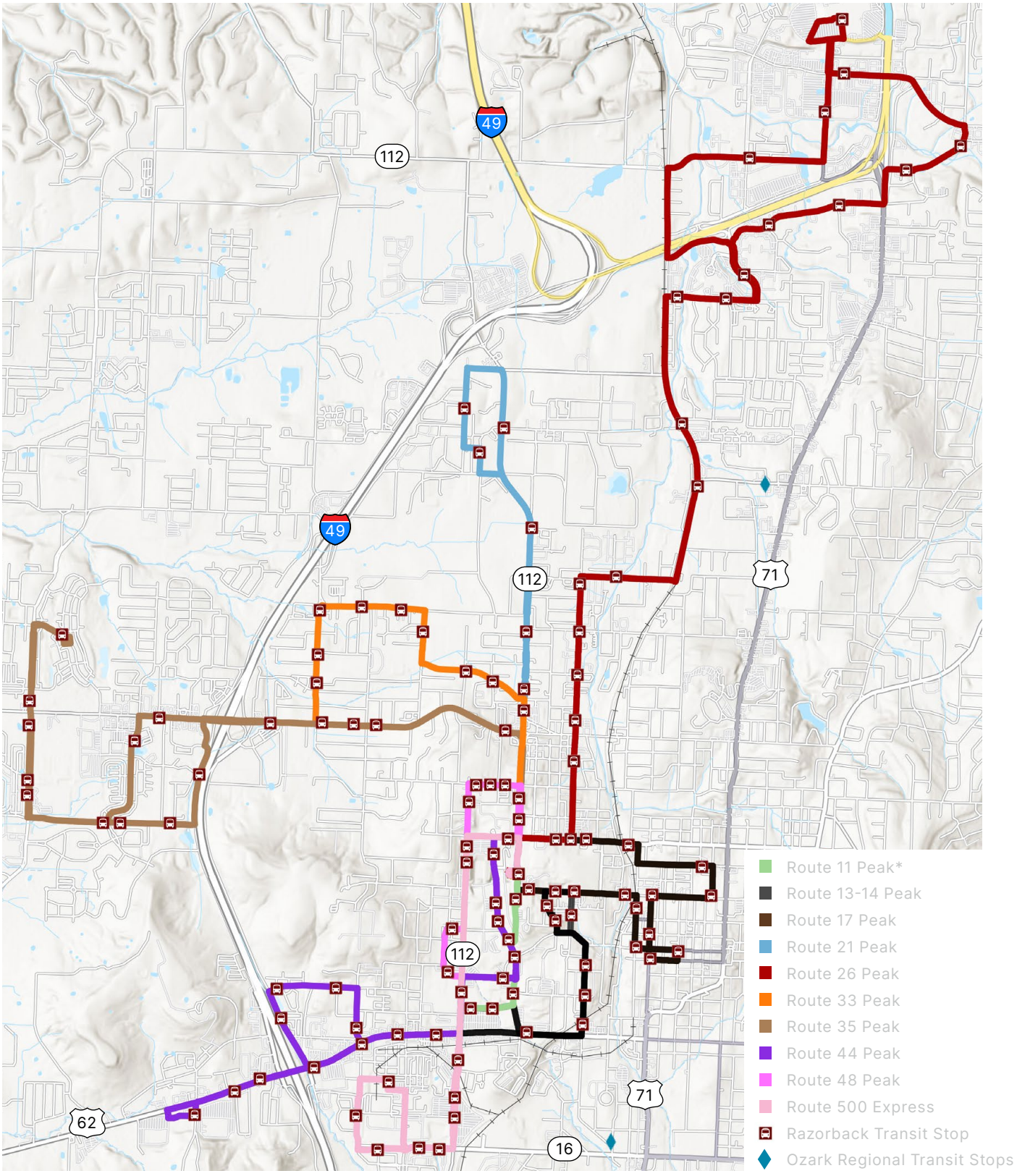
When comparing transit systems in peer communities, planning efficiency was enhanced by local and campus transit systems combining efforts to meet the goals of enhanced bus systems and evenutally bus rapid transit systems. For comparison, Lexington, KY (home of the University of Kentucky) saw a 2023 UPT of 3,468,807 while Columbia, SC (home of the University of South Carolina) saw a 2023 UPT of 1,968,473 (Federal Transit Administration).



Transit

Razorback Transit Routes

RAZORBACK TRANSIT ROUTES



*Peak indicates largest influx of passengers and demand

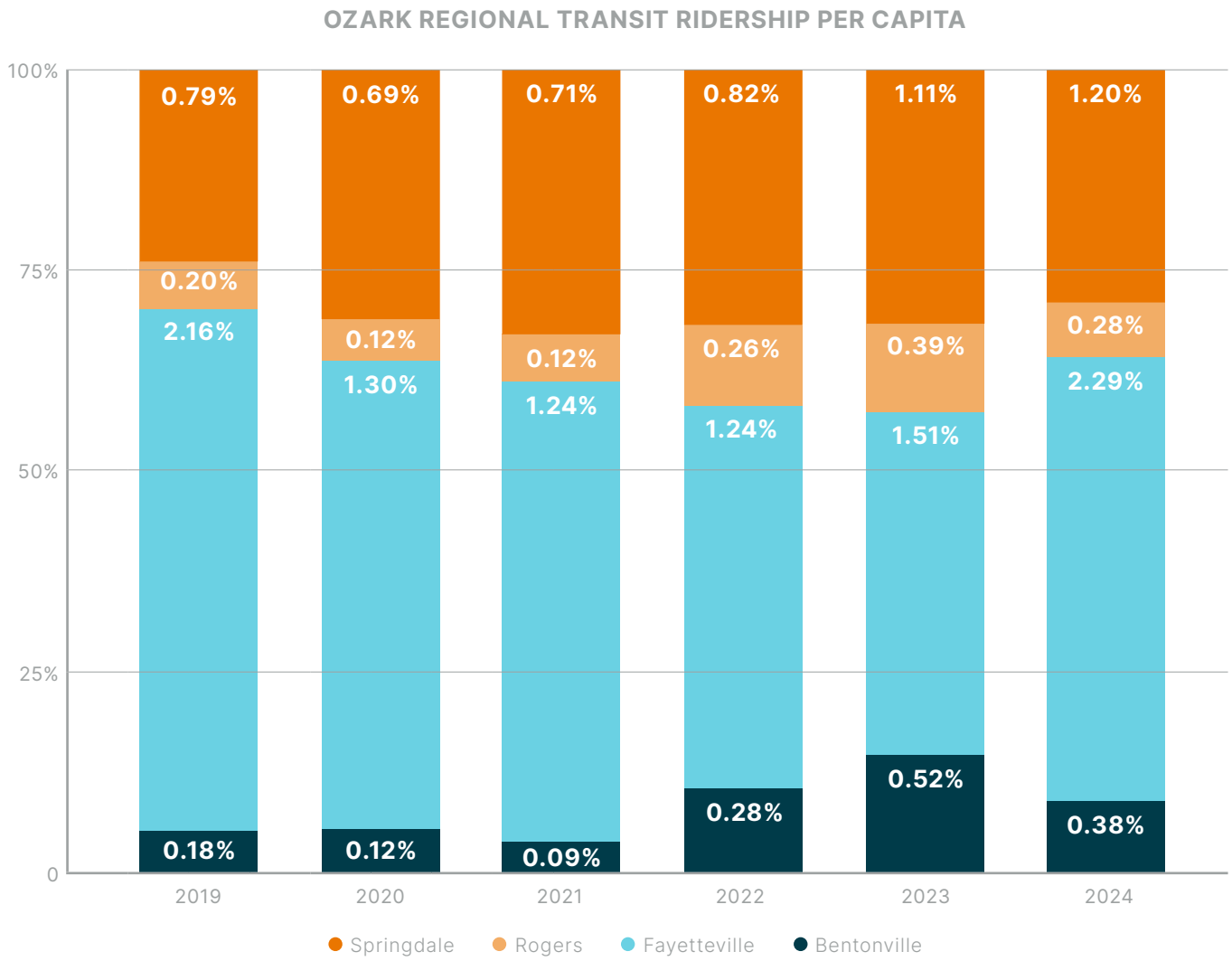
Transit

Ozark Regional Transit

Ozark Regional Transit

Offering transit services and 330 stops for the "Big Four" communities along I-49, Ozark Regional Transit sees the greatest number of monthly riders in Fayetteville (13,541 in 2024), then followed by Springdale (7,103 in 2024). While historically higher than average ridership in Fayetteville may be attributed to a densely concentrated student population, Springdale has a variety of routes and a higher total monthly ridership than Bentonville and Rogers combined.

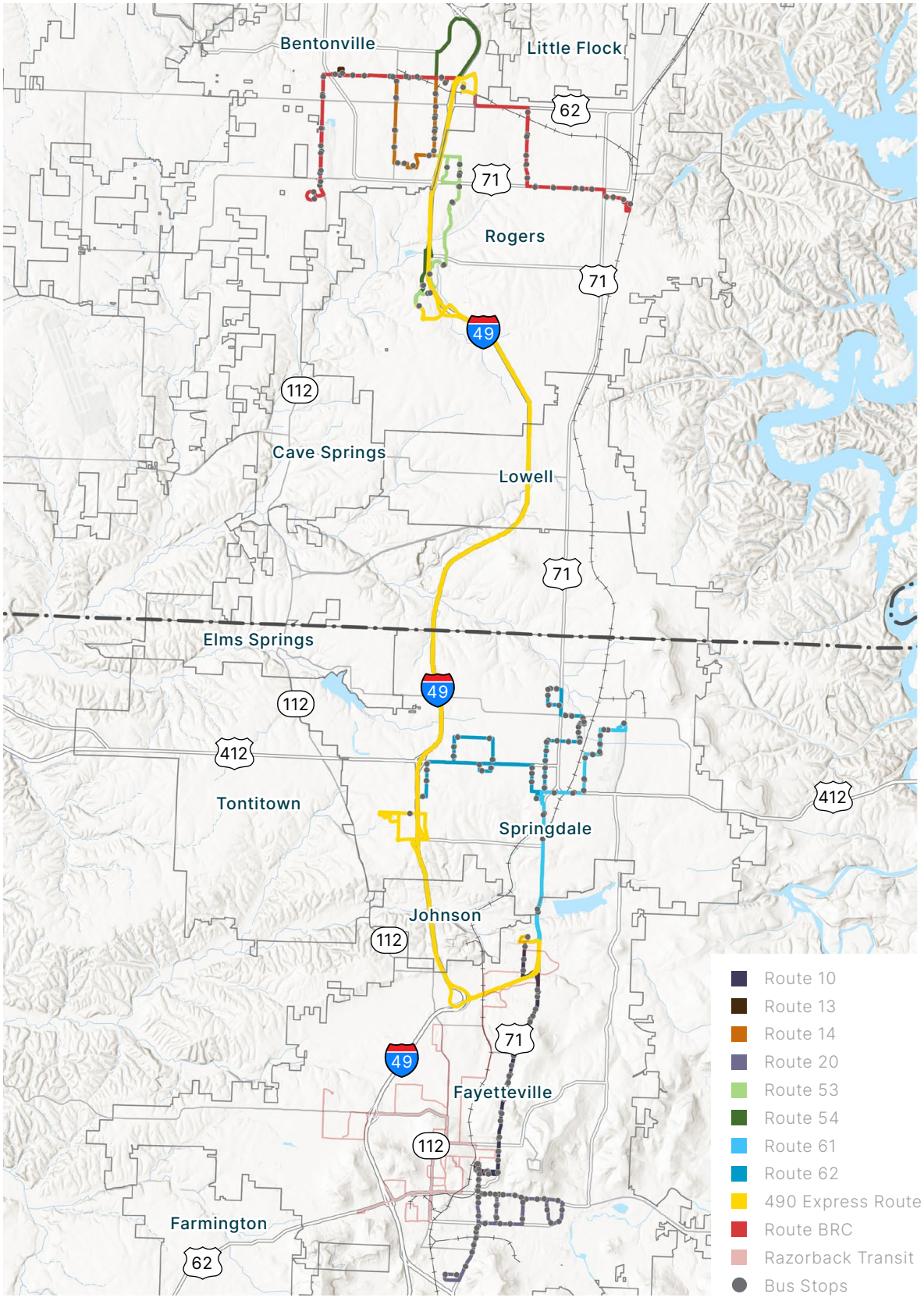
Transit data also indicates a 26.9% year over year growth in bicycle transportation on buses as well, indicating that a growing number of riders utilize active transportation to traverse first- as well as last-mile connections. While ridership continues to rise, only 14.82% of stops are wheelchair accessible, a notable infrastructure gap that should be remediated to provide ADA accessibility. Impact fees, discussed on page 52, are a potential funding solution for bringing ramps up to code, in addition to other issues related to transit.



Transit

Ozark Regional Transit

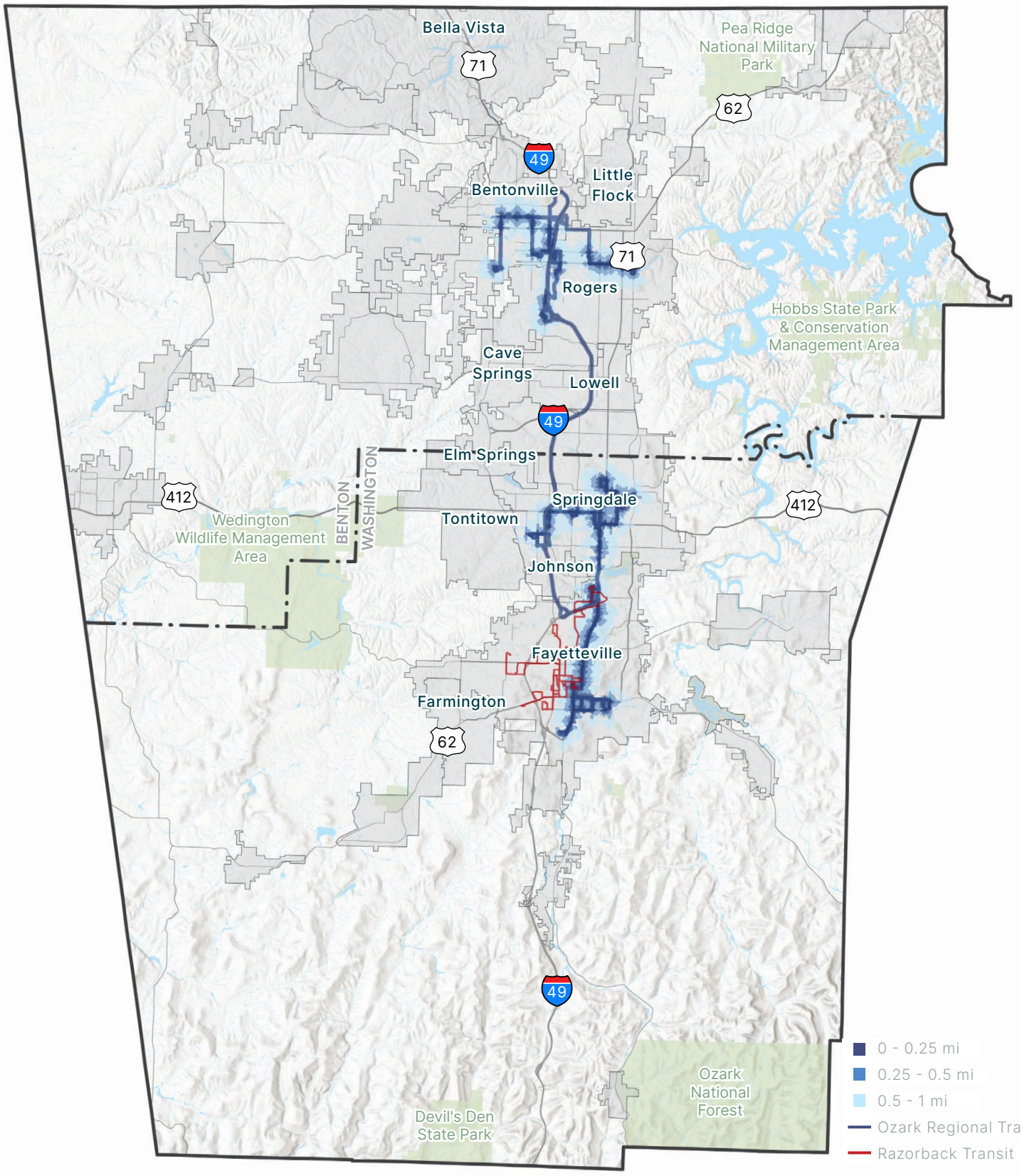
OZARK REGIONAL TRANSIT ROUTES



Transit

Ozark Regional Transit

OZARK REGIONAL TRANSIT SERVICE AREA



Highways, Streets & Roads

Highways, Streets & Roads

Roadway Jurisdiction

Existing Transportation System

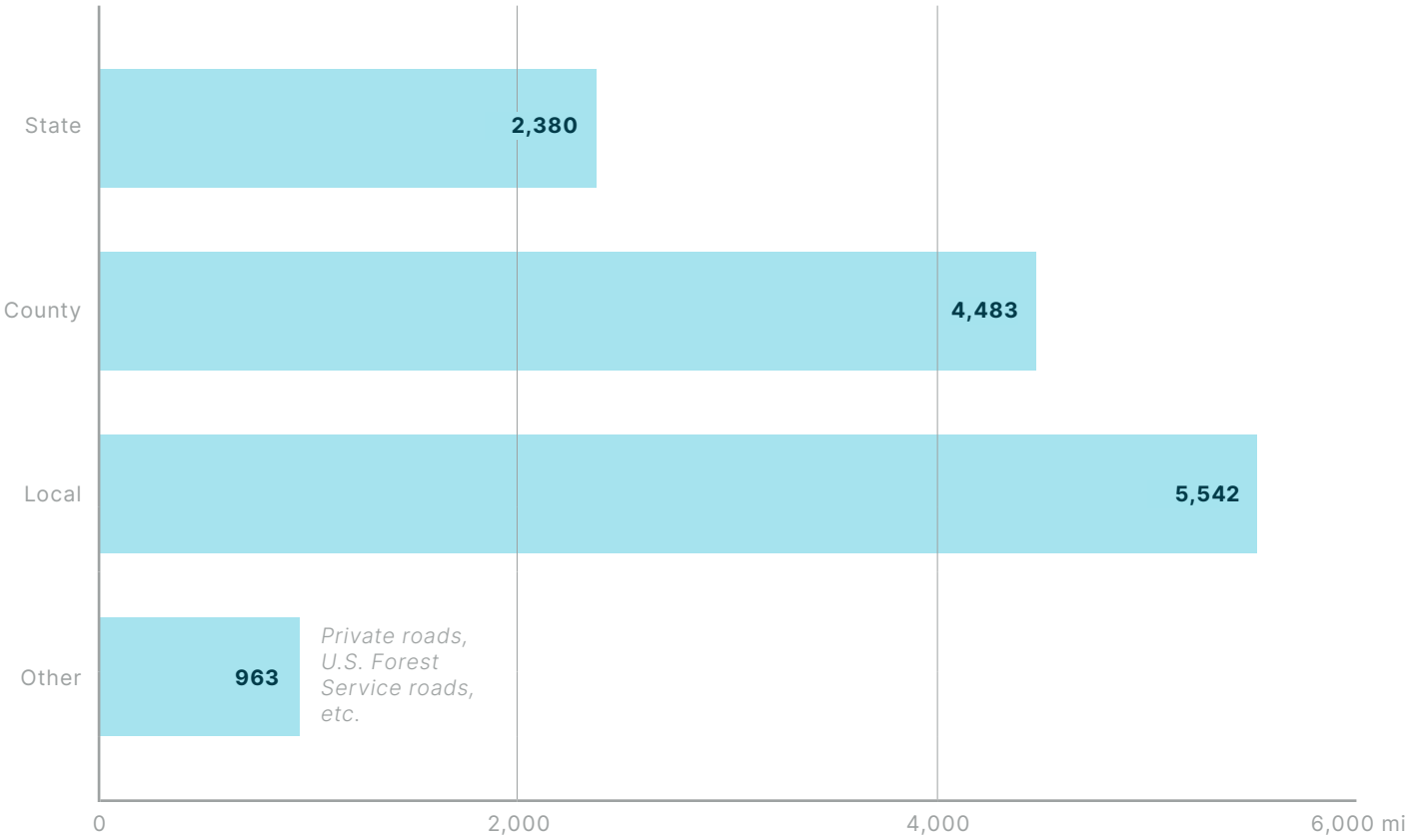
The Northwest Arkansas Regional Planning Commission (NWARPC) creates transportation plans every five years projecting 25 years into the future. The current version of this plan is the Metropolitan Transportation Plan 2045 (MTP 2045). The 2050 study is ongoing. This study investigates vehicular, active transportation, public transit, and multi-modal modes through the lens of population demographics, land use maps, and environmental constraints. The study includes travel patterns and forecasting, facility design recommendations, and transportation projects/funding. This report provides the most comprehensive summary of the existing conditions and future outlook of transportation in NWA.

Roadway Jurisdiction

The majority of roadway lane miles (approximately 5,540) in Northwest Arkansas are under the jurisdiction of individual local communities, followed by county roads (approximately 4,482 miles) and then state highways (approximately 2,380 miles). This indicates that Northwest Arkansas cities also bear the burden of maintaining a disproportionate amount of regional roadway lane miles.

Arkansas ranks as the 9th highest in public road miles per capita in the nation (0.033 road miles per 1,000) despite being the 19th smallest state (Bureau of Transportation Statistics, U.S. Census Bureau 2020 Decennial Census).

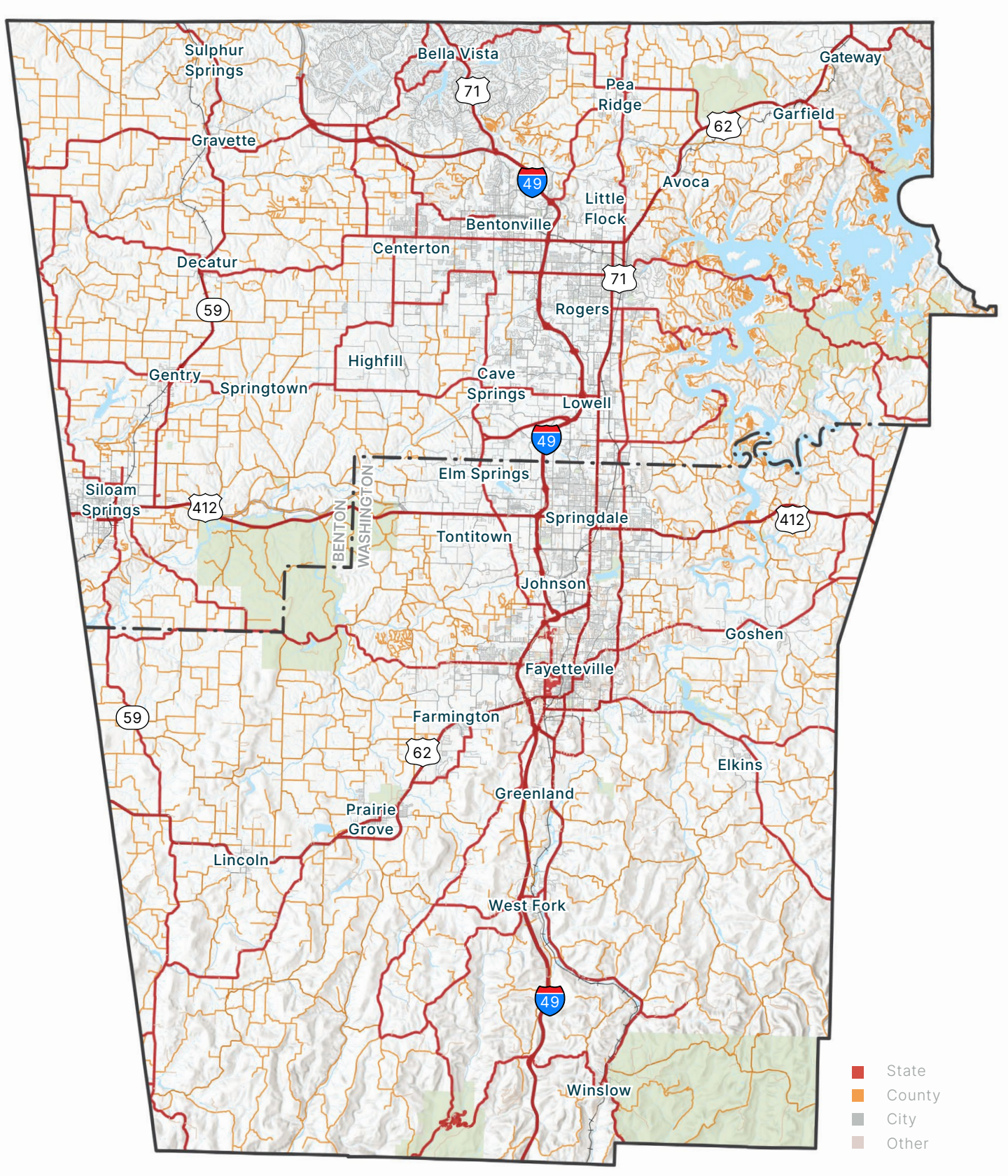
REGIONAL LANE MILES BY TYPE OF JURISDICTION



Highways, Streets & Roads

Roadway Jurisdiction

ROADWAY JURISDICTION

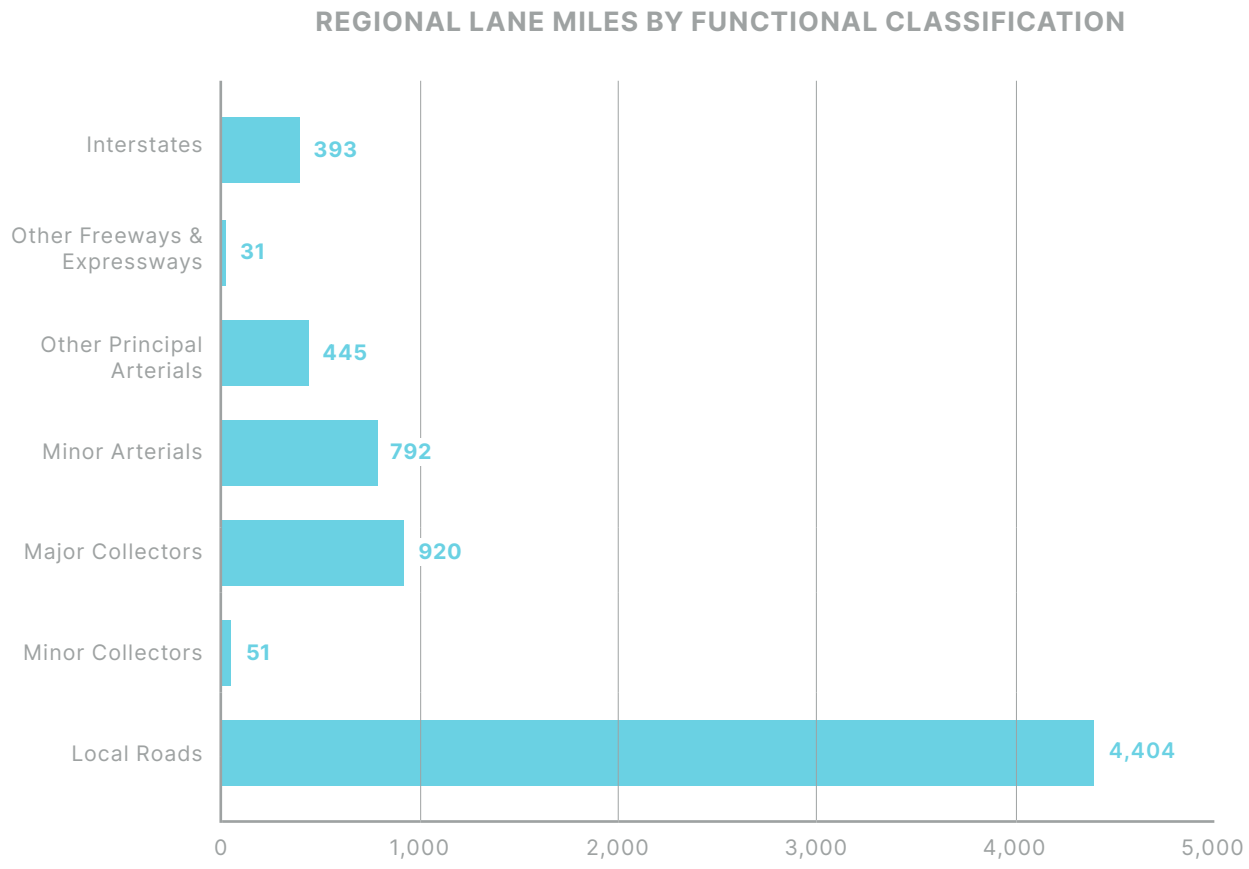


Highways, Streets & Roads

Functional Classification

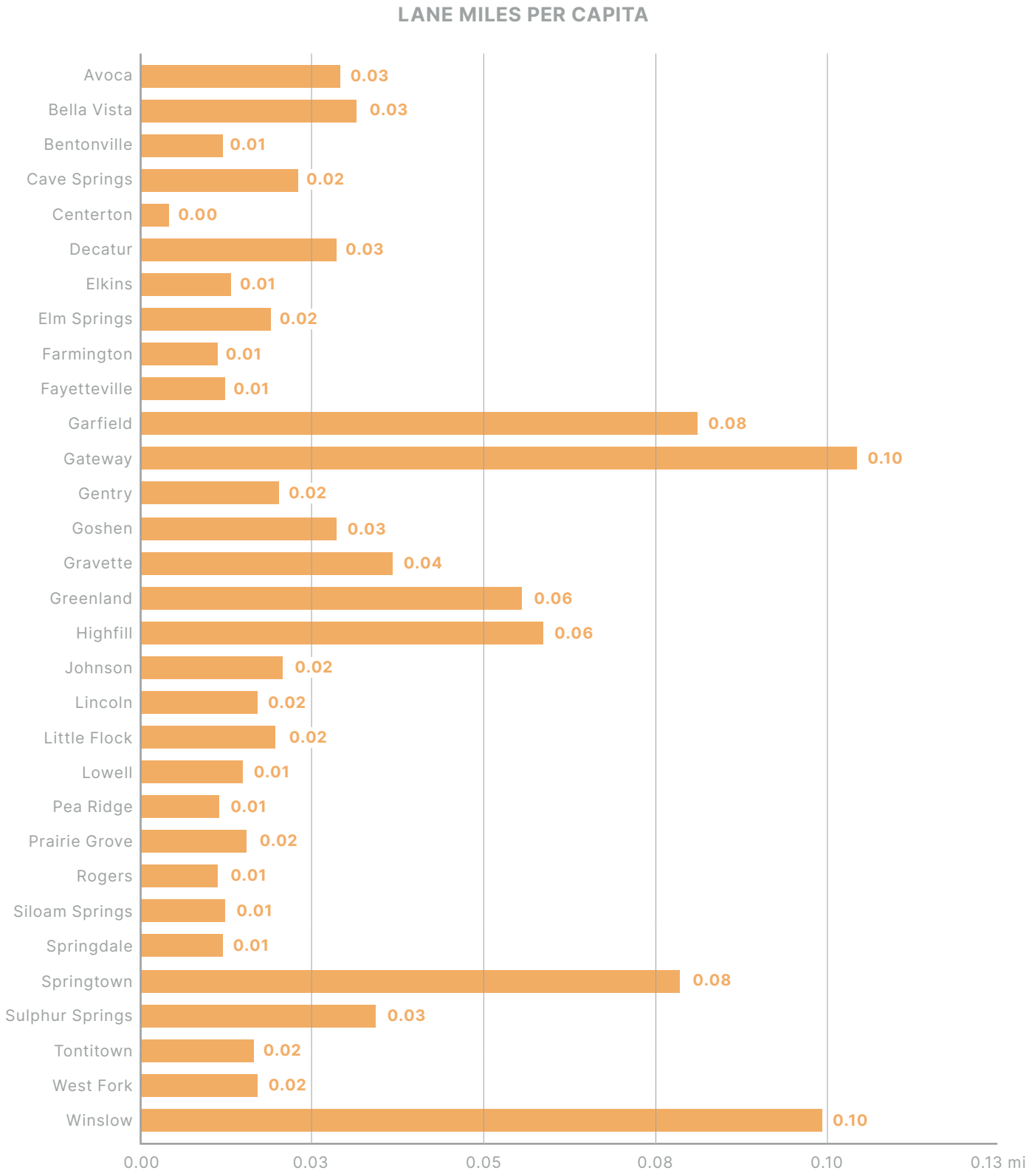
Functional Classification

Local roads comprise the greatest share of functional classification roadway type in Northwest Arkansas (4,404 miles) followed by major collectors (919 miles). When considering total lane miles by community, Fayetteville has the greatest share of total lane miles (1,245) followed by Springdale and Bella Vista (1,067 and 1,052, respectively). However, when measuring the total number of lane miles per capita, smaller communities rise higher on this list, with Gateway and Winslow having the highest ratio of 0.10 lane miles per capita, followed by Garfield and Springtown at 0.08. Fayetteville and Springdale drop significantly by this measurement, with each having 0.01 lane miles per capita.



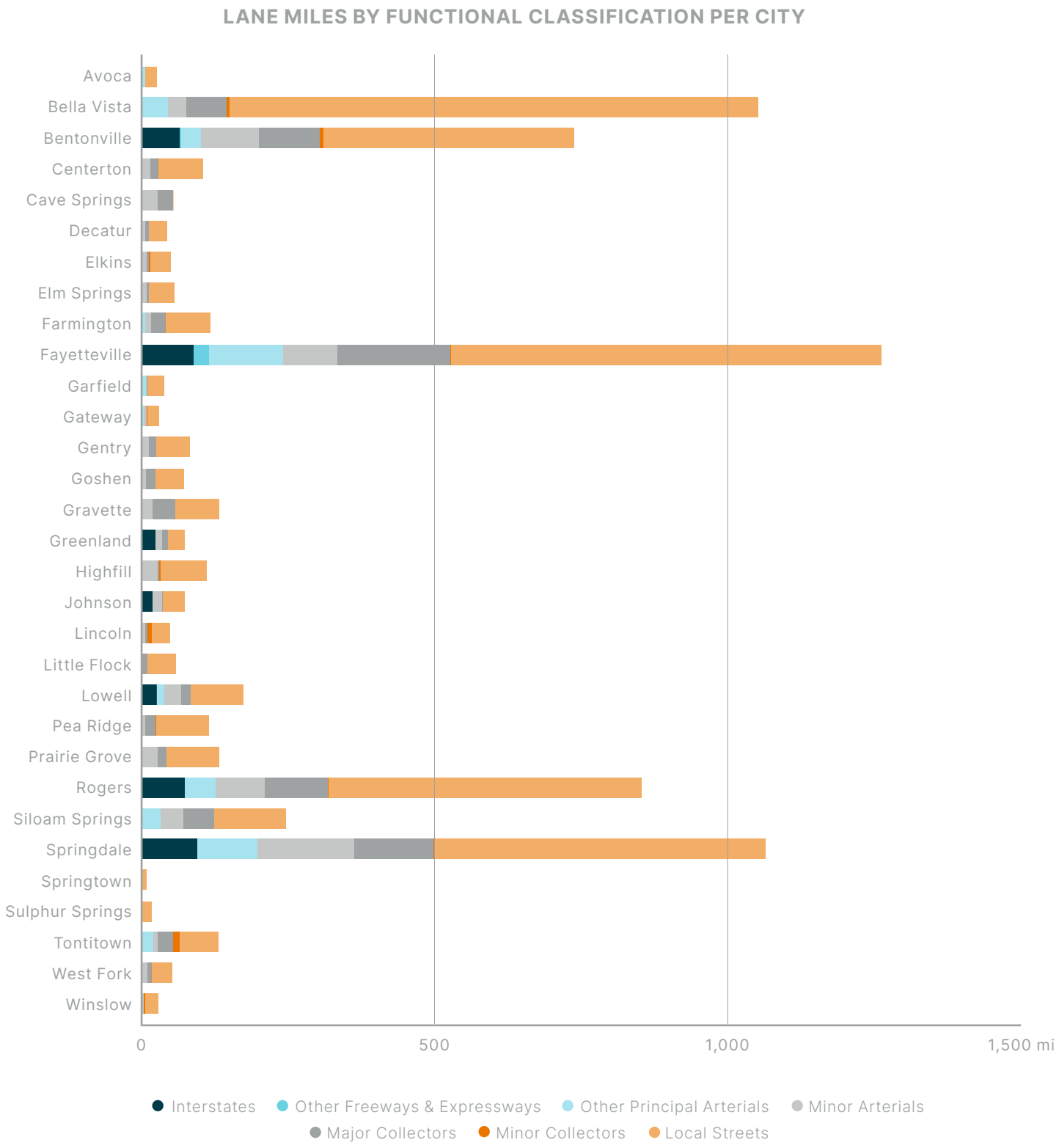
Highways, Streets & Roads

Functional Classification



Highways, Streets & Roads

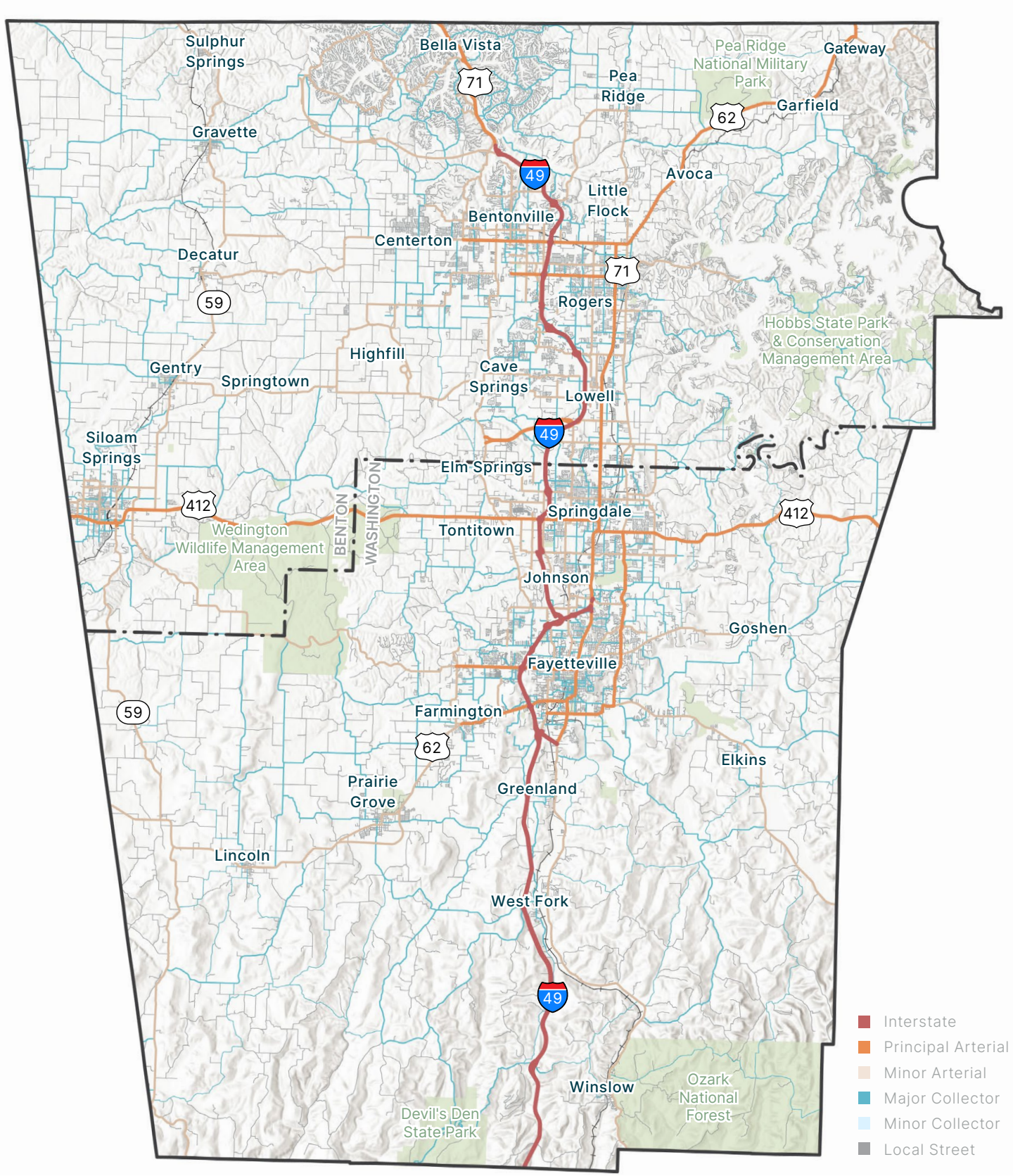
Functional Classification



Highways, Streets & Roads

Functional Classification

FUNCTIONAL CLASSIFICATION



Highways, Streets & Roads

Average Daily Traffic

Annual Average Daily Traffic (ADT)

ADT measures the average number of vehicles (cars and trucks) that use a road or street on a daily basis. Interstate 49 is the busiest corridor in the region as well as U.S. 71B as an alternative north-south route. U.S. 412, U.S. 62, and Arkansas 12 are frequently utilized by outlying communities to travel into the four larger communities.

Levels of Service

The NWARPC maintains highway traffic models for the region. This model analyzes and projects the roadway network's capacity for numbered highways and arterials. The Level of Service (LOS) map conveys the latest (2025) LOS on these facilities across the region. Interstate 49 and U.S. 71B contribute most of the low LOS grades across the region. Particularly poor areas include the intersection of I-49 and U.S. 71B (Walton/Walnut) in Rogers/Bentonville and U.S. 71B north of the Fulbright extension in Fayetteville/Springdale/Johnson. U.S. 412 is also poor west of Interstate 49.

These models are currently being updated for inclusion in the 2050 Metropolitan Transportation Plan, anticipated in late fall of 2025.

Transportation Improvement Plans

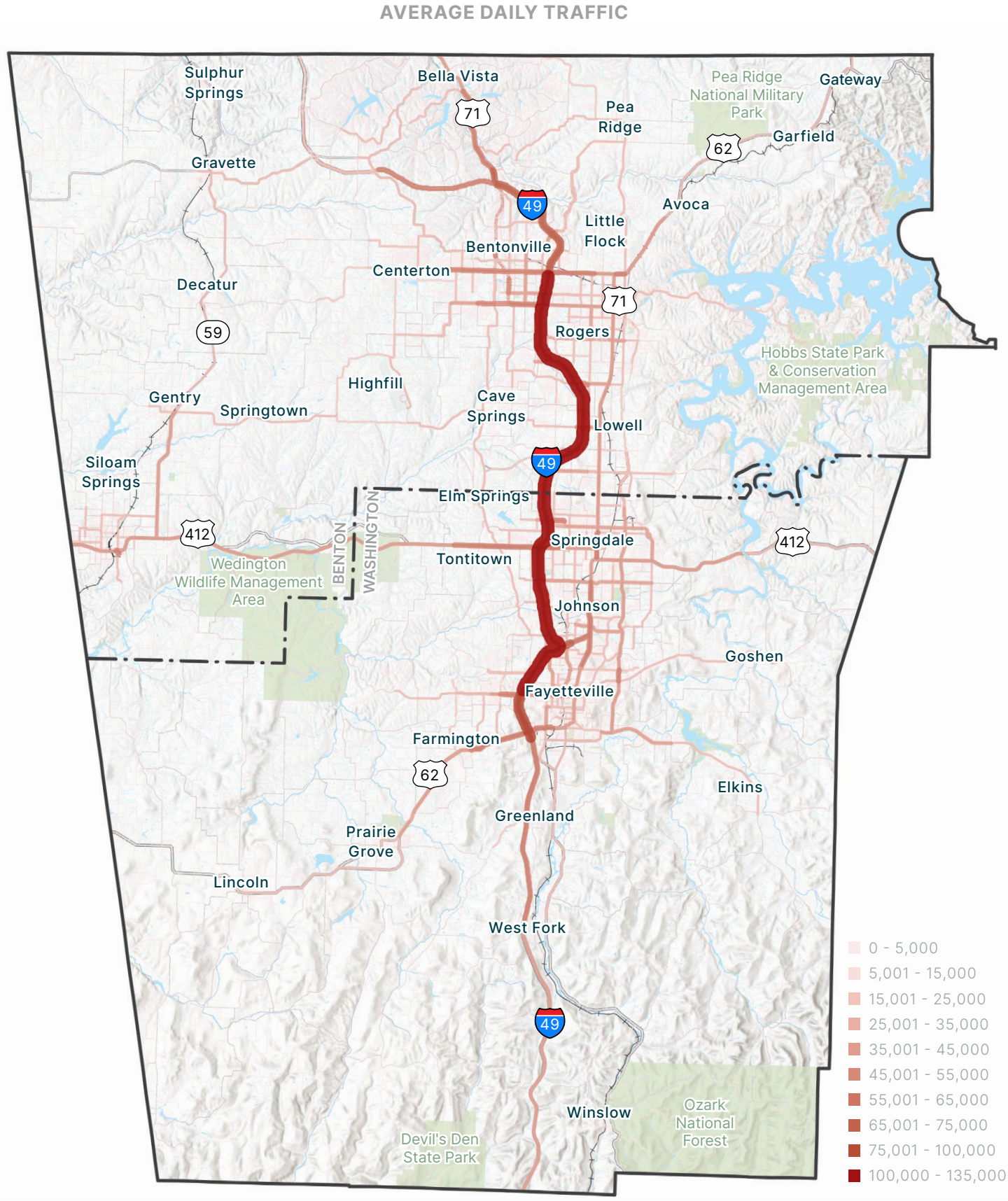
Bridge replacement, pavement preservation, and the extension of the U.S. 612 bypass from U.S. 412 to the east side of Springdale are just a few of the major roadway investments expected in Northwest Arkansas according to the State Transportation Improvement Plan (STIP). The total estimate for these projects, including others such as widening and safety improvements, is nearly $634 million, with nearly $43 million in transit investments as well. A future Interstate 42 between Siloam Springs and Springdale has been proposed as a long-range regional transportation project, but is not currently included on state or regional TIPs.

Local Road Network Gap Analysis

Based on a review of major communities' master street plans and outlying communities projected for major growth, key roadway segments were identified to enhance surface transportation efficiency and ease congestion on Interstate 49. While U.S. 71B currently meets the demands as an alternate north-south connector to the interstate, further analysis and identification of a similar major collector or principal arterial west of I-49 is recommended to accommodate growth in Elm Springs, Tontitown, Highfill, and Centerton.

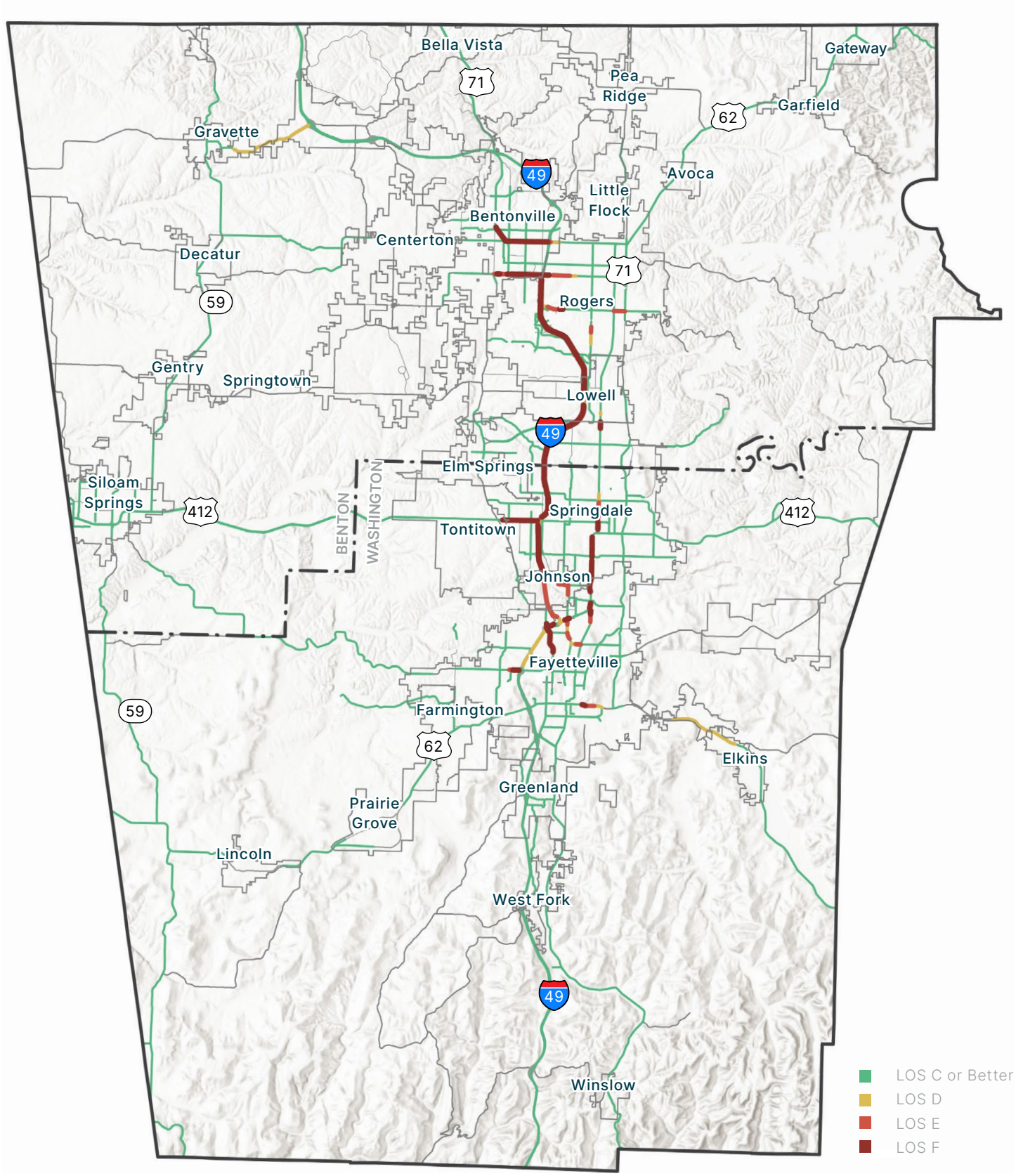
Highways, Streets & Roads

Average Daily Traffic



Highways, Streets & Roads

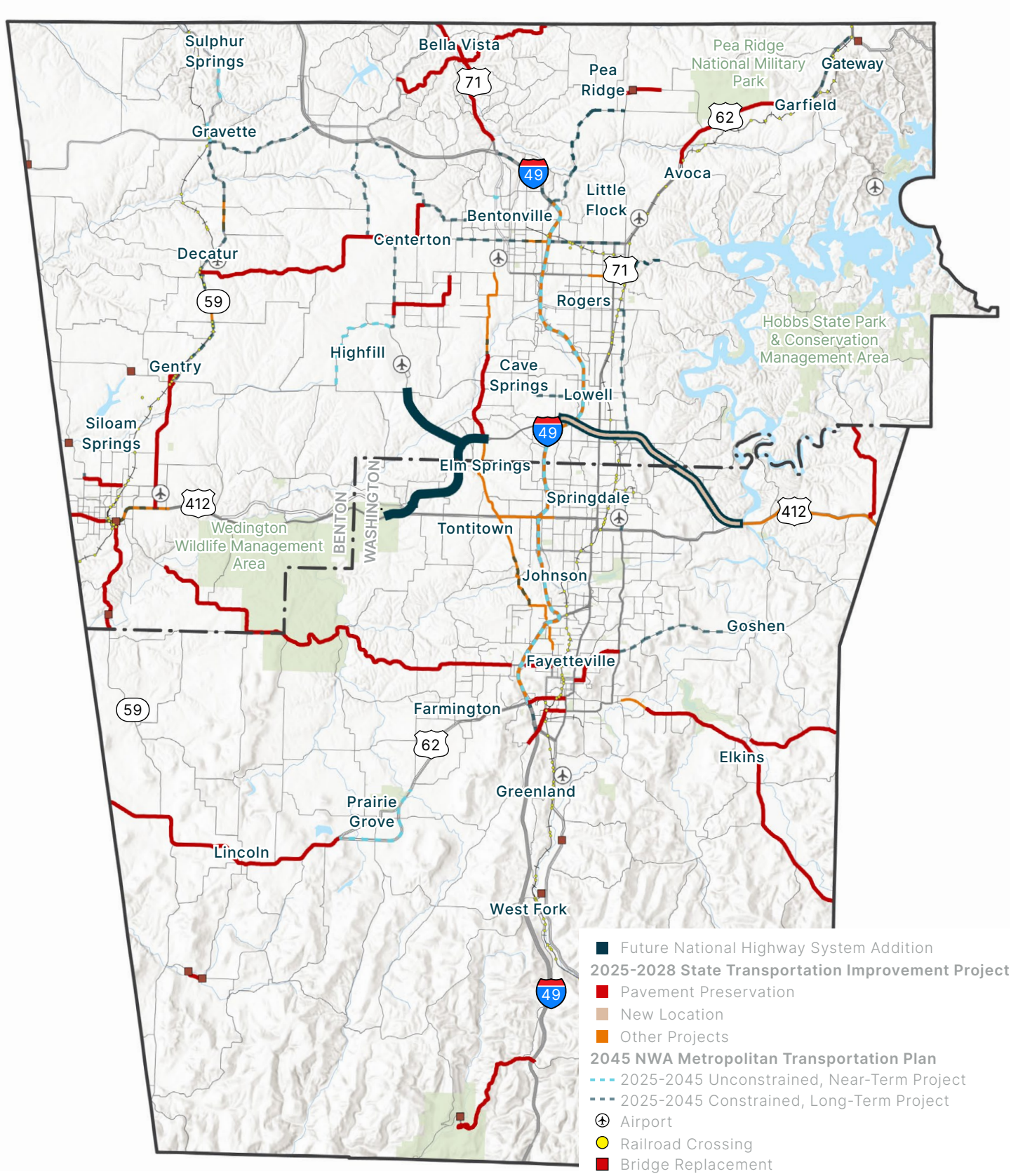
Levels of Service



Highways, Streets & Roads

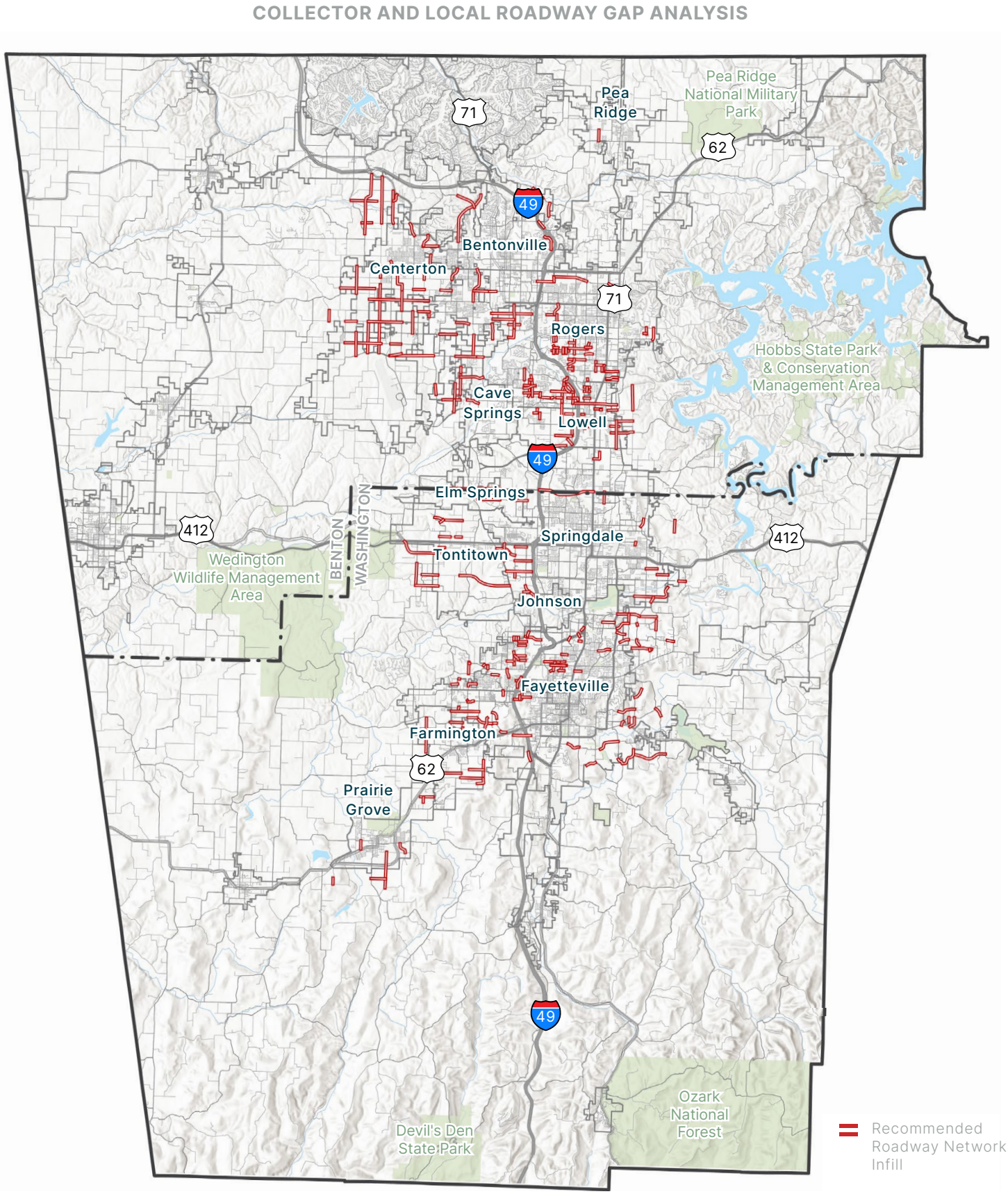
State and Regional Transportation Plans

STATE AND REGIONAL TRANSPORTATION PLAN



Highways, Streets & Roads

Collector and Local Roadway Gap Analysis

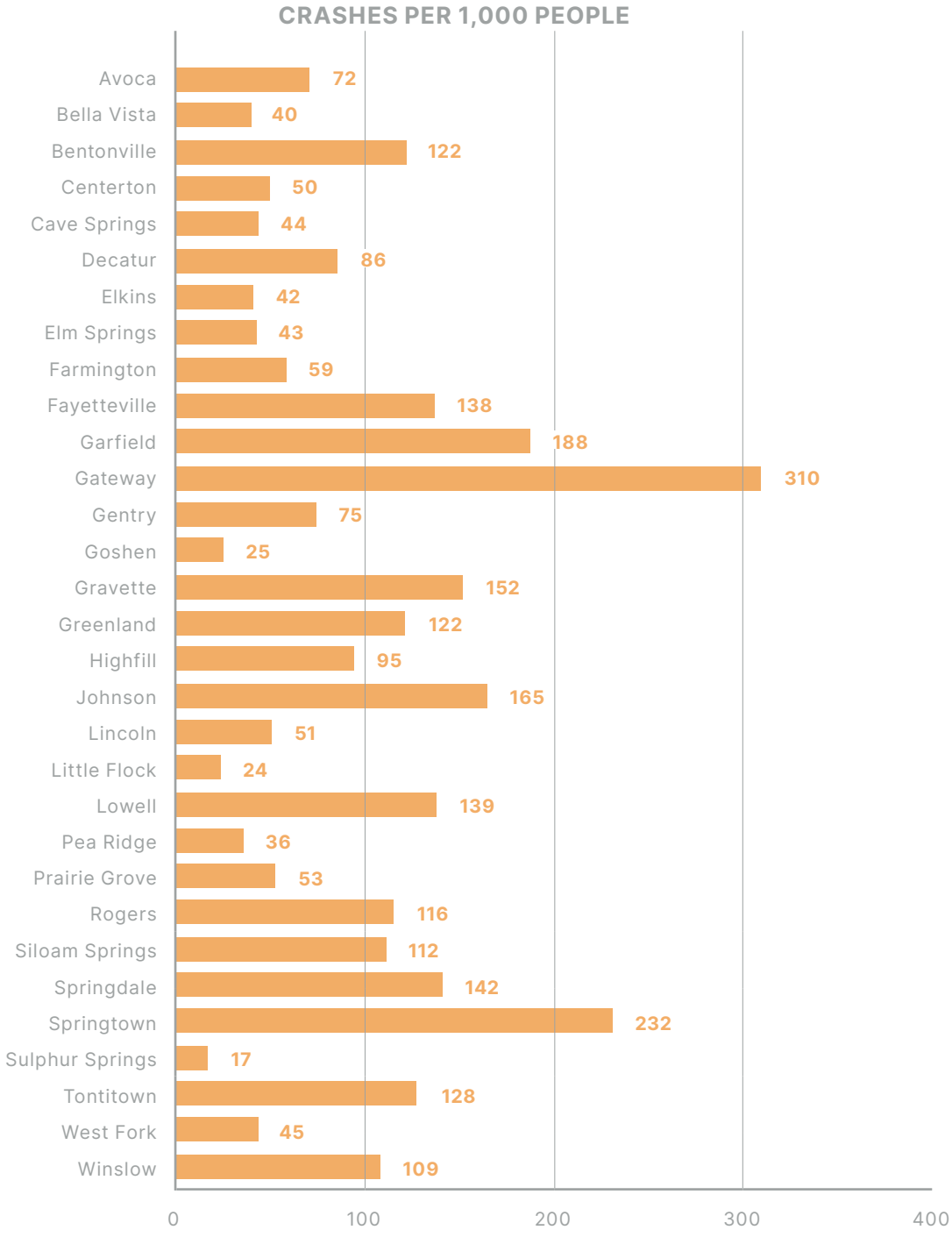


Crashes

Based on data from the Arkansas Department of Transportation, total crashes in Benton and Washington Counties have risen 64% from 2012 - 2023.

Fayetteville has the highest total 5-year crash rate, followed by Springdale. Highway 71B is the single corridor with the most crashes (3,580) followed by Interstate 49 (2,048) and U.S. 412 (2,565). Gateway and Springtown have the highest five-year crash rates for all Northwest Arkansas communities when analyzed according to crashes per 1,000 people. In Gateway, 64% of crashes occurred on U.S. 62, and as a small community, Springtown sees a disproportionate number of crashes.

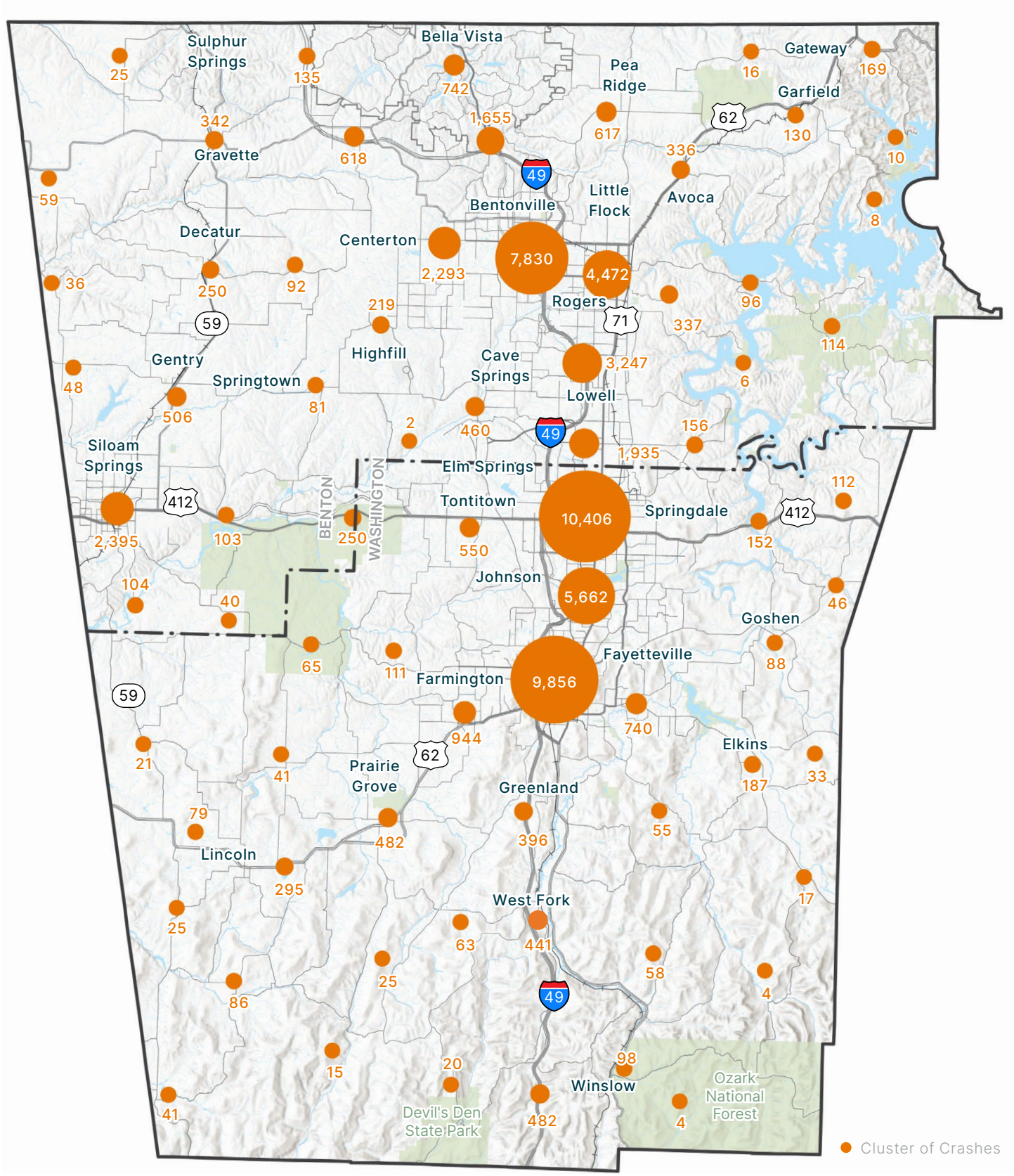
According to an analysis of historical crash data from the Arkansas Department of Transportation, total combined crashes for Benton and Washington counties have increased by 64% between 2011 and 2023.



Highways, Streets & Roads

Crashes

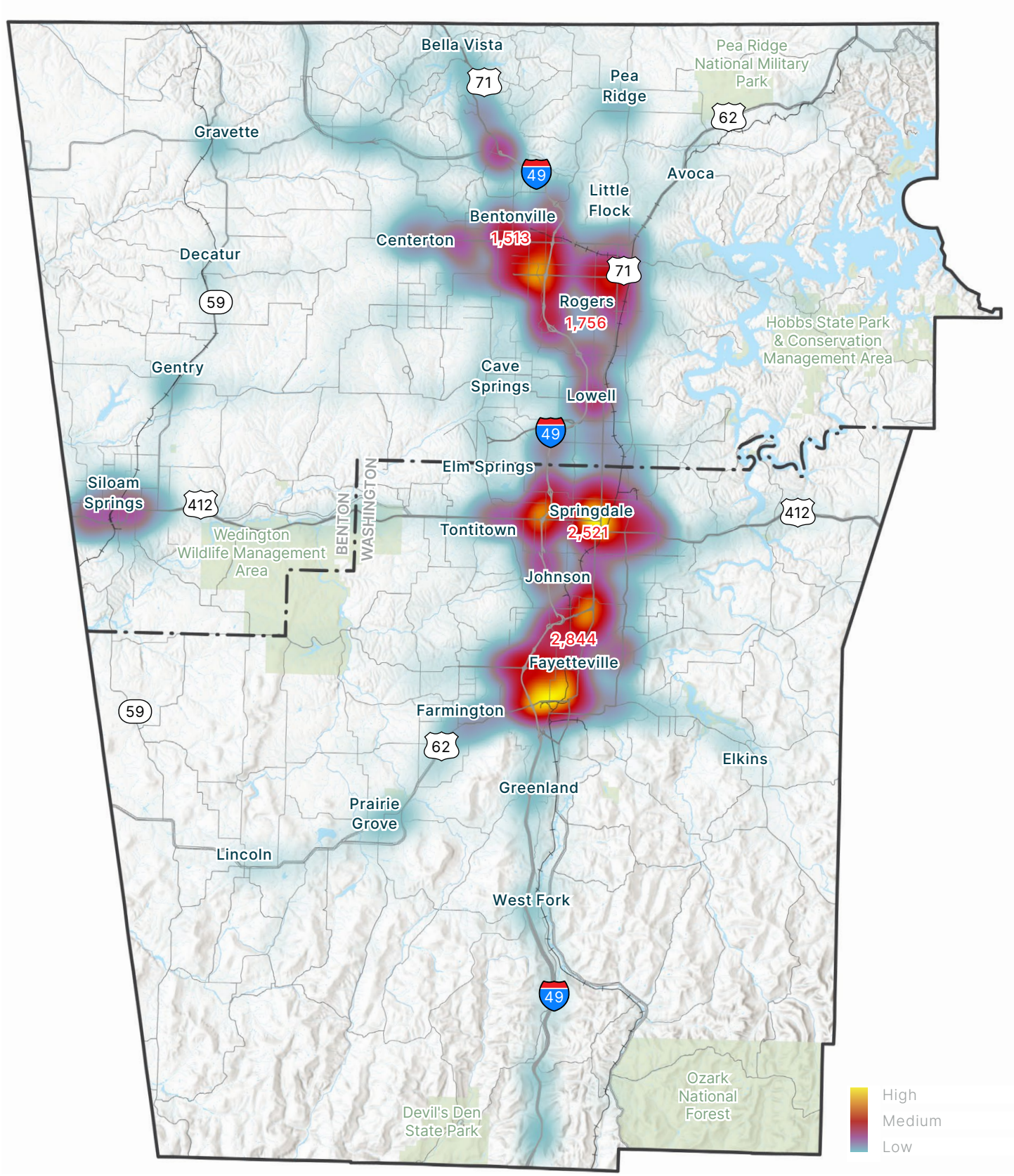
TOTAL CRASHES: 2019-2023



Highways, Streets & Roads

Crashes

AVERAGE ANNUAL CRASH COUNT, LARGEST CITIES (2019-2023)



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Active Transportation

Active Transportation

Trail Infrastructure and Ridership Patterns

Active Transportation

With 246 miles of paved multi-use trails, including 40 miles of the Razorback Greenway stretching from Kessler Mountain in Fayetteville to Bella Vista, Northwest Arkansas is now the model for active transportation and bicycling infrastructure in the state. A 71-mile system of on-street bicycle facilities connect destinations and neighborhoods to multi-use trails, and perhaps most notably, soft-surface mountain biking trails, of which there are nearly 425 miles of varying difficulty singletrack. This infrastructure is critical to the region's identity; for residents as a quality of life and mobility offering, and for out-of-towners an exciting draw to regionally-renowned outdoor recreation. A 2023 study revealed that Northwest Arkansas' bicycling industry generated $159 million in total economic impacts from cycling-related jobs, tourism revenue and taxes. The nonprofit People for Bikes has ranked the following communities on a scale of 0-100:

Fayetteville: **51**

Bella Vista: **44**

Rogers: **38**

Springdale: **34**

Siloam Springs: **16**

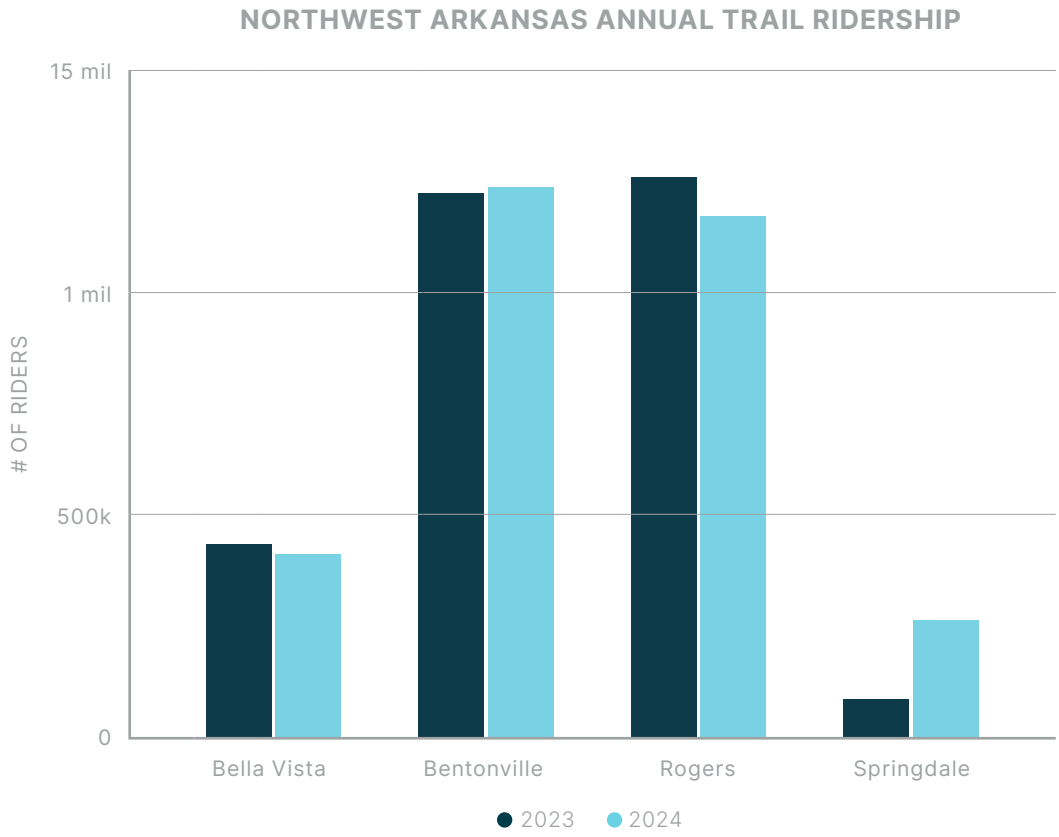
Centerton: **11**

The region's bicycle friendliness competes with much larger regions including Washington DC (with a score of 52) and even Manhattan, New York (with a score of 51).

Ridership

Trail ridership data derived from EcoCounter in Bella Vista, Bentonville, Fayetteville, Rogers, Siloam Springs, and Springdale provide a glimpse of somewhat levelized trail ridership data in 2023 and 2024. Bentonville and Rogers have seen high annual ridership, both communities with over a million riders in both years, although these figures do include the Railyard Bike Park in Rogers, which is recreationally-focused. Physical trail counters with sensors like EcoCounter has become a cost prohibitive metric by which some communities can collect ridership data, and the counters are also prone to weather damage or vandalism. **In the case of Fayetteville, a significant amount of rider data collected on the Razorback Greenway was lost due to damage to trail counters and has not been included below.**

Since there is general consensus among the communities collecting trail ridership data that a new method of collecting metrics is needed to support and enhance the region's identity pertaining to bicycling, it is recommended that a specific organization be designated to manage and share quarterly reports through Strava Metro, the leading platform for collecting granular rider data, reflecting not the behaviors of Strava users, but also aggregating generalized cell phone tracking data.



Active Transportation

Active Transportation Accessibility and Connectivity

Facility Types

Across Northwest Arkansas, communities vary in both the extent and types of active transportation facilities available. Rogers currently leads the region with the greatest number of miles of paved multi-use trails (76 miles), followed by Fayetteville (61 miles) and Bentonville (56 miles). Fayetteville also leads in on-street bicycle facilities, totaling 42 miles. When comparing trail mileage relative to population, Rogers provides 1 mile of paved multi-use trail per 1,000 residents—the highest in the region—followed by Bentonville (0.9 miles per 1,000) and Fayetteville (0.6 miles per 1,000). Bentonville and Bella Vista stand out for their extensive soft-surface mountain biking networks, offering 2.8 and 2.9 miles of trail per 1,000 residents, respectively. Together, these figures highlight the region's investment in varied trail types that support both recreation and transportation.

Population Per Square Mile

Population density patterns across Northwest Arkansas reveal areas of both stability and potential growth. Communities such as Highfill, Tontitown, Greenland, and Gravette are expected to experience continued expansion, while cities of moderate density—like Farmington, Little Flock, and Bella Vista—are well-positioned for suburban retrofit strategies that accommodate future housing and commercial development. Understanding these density trends helps identify where new active transportation facilities may be most impactful in supporting regional connectivity.

Multi-Use Trail Travel Sheds

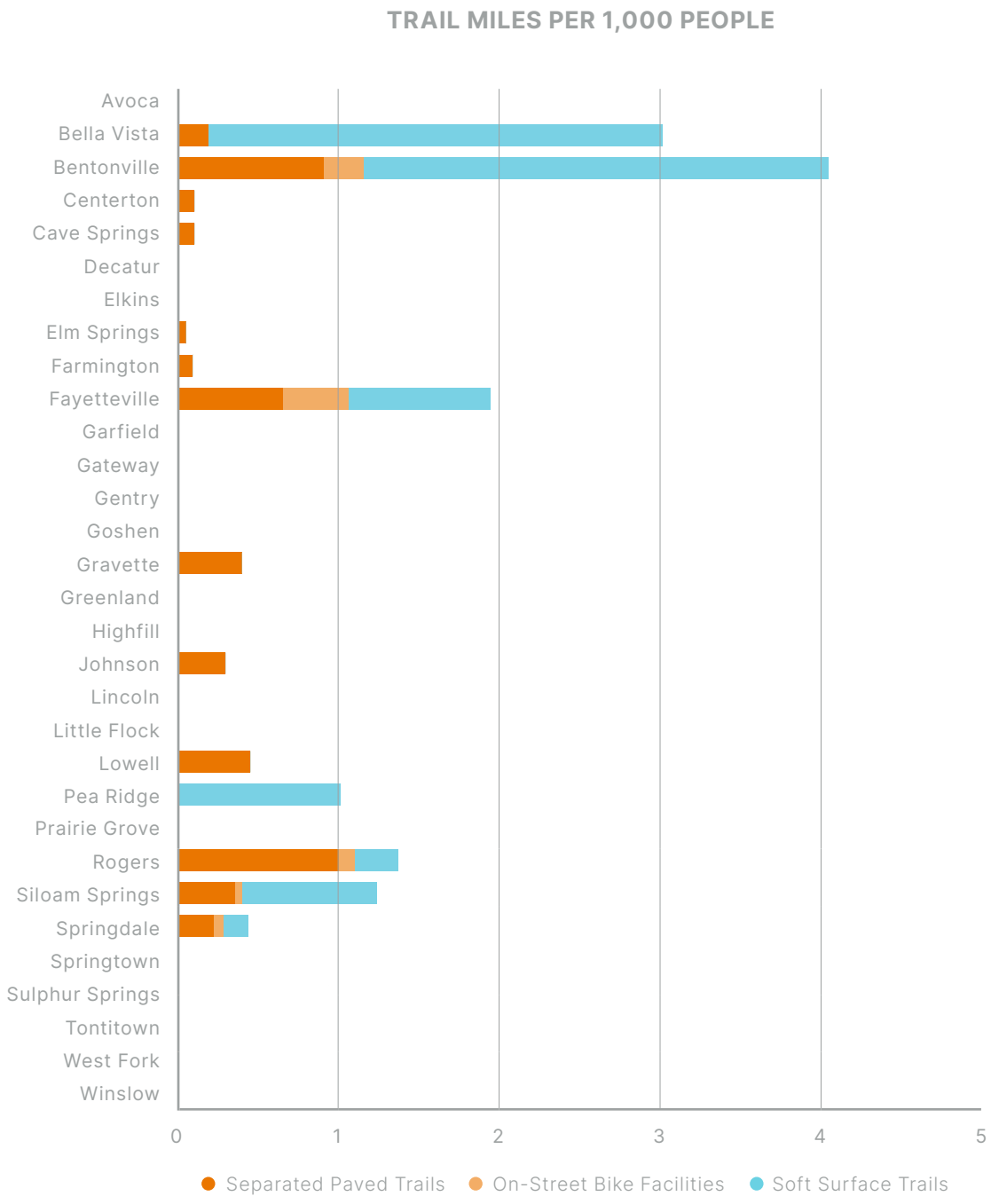
Proximity to paved multi-use trails plays a key role in providing residents with safe, connected, and comfortable options for both recreation and transportation. Areas located within closer reach of existing trail corridors benefit from greater accessibility, while neighborhoods farther from these corridors remain less connected. Fayetteville's well-developed trail network serves much of its central area, demonstrating how integrated planning can promote active mobility. In contrast, as Springdale continues to expand trails from the Razorback Greenway into surrounding neighborhoods and districts, notable gaps remain where residents must travel farther to access a trail. These differences emphasize the importance of continuing to close access gaps across the region.

Intersection Density and Walkability

Walkability across Northwest Arkansas communities can be broadly understood by examining intersection density—the degree to which streets connect at regular intervals, typically every 250 to 350 feet. Areas with higher intersection density tend to support more walkable, pedestrian-friendly environments. Fayetteville's downtown and surrounding neighborhoods, including the University of Arkansas area, show the tightest street grid and most walkable scale. Other strong clusters occur in the downtowns of Springdale, Rogers, Bentonville, Siloam Springs, and Gravette. Smaller centers such as Gentry, Tontitown, and Prairie Grove exhibit moderate connectivity, while lower levels of walkability are evident in Lincoln, Farmington, Centerton, Pea Ridge, and Bella Vista. These distinctions point to opportunities for improving pedestrian access and street connectivity in lower-density areas. Smaller outlying cities lack walkable connectivity in their street networks.

Active Transportation

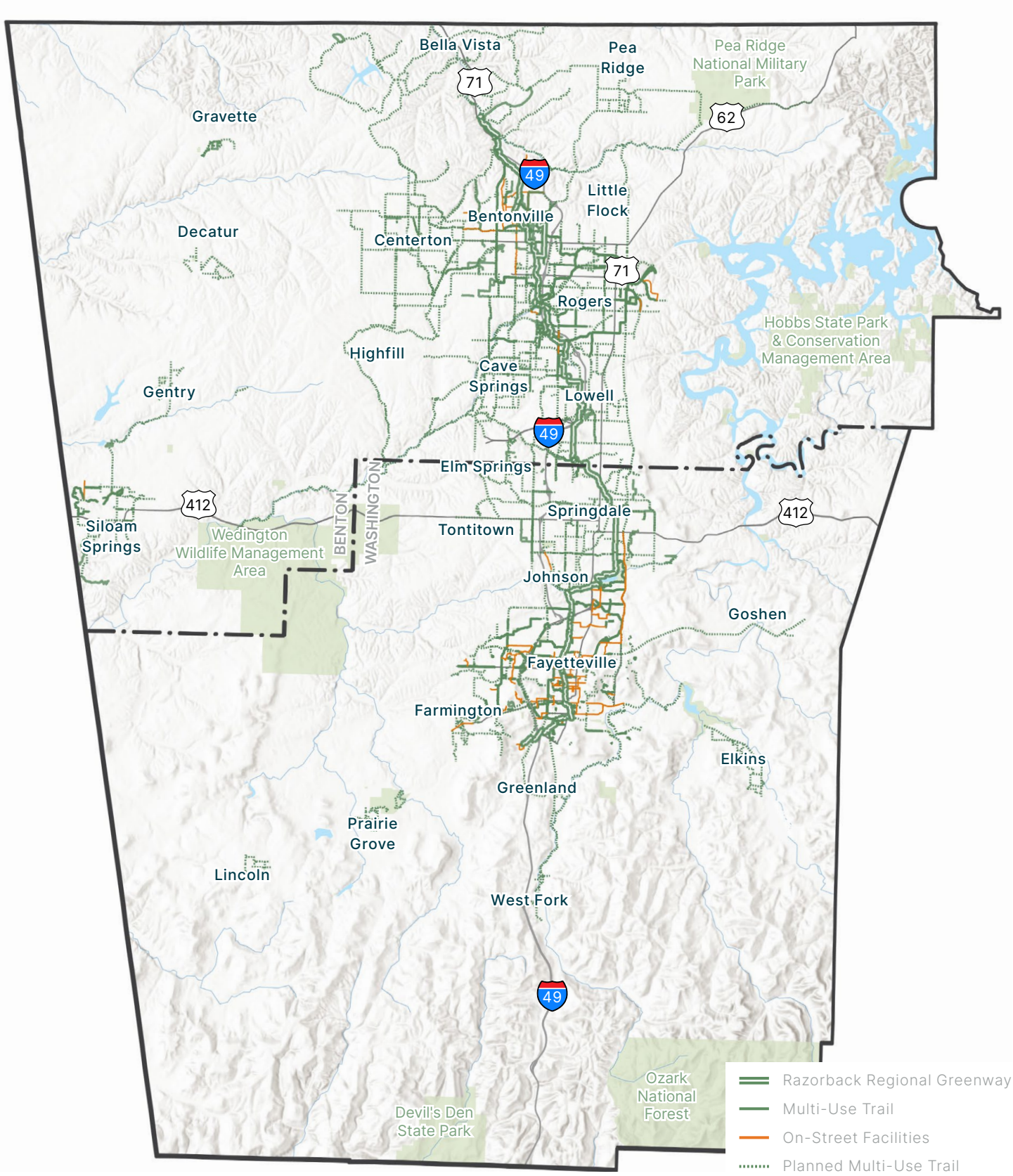
Trail Miles Per 1,000 People



Active Transportation

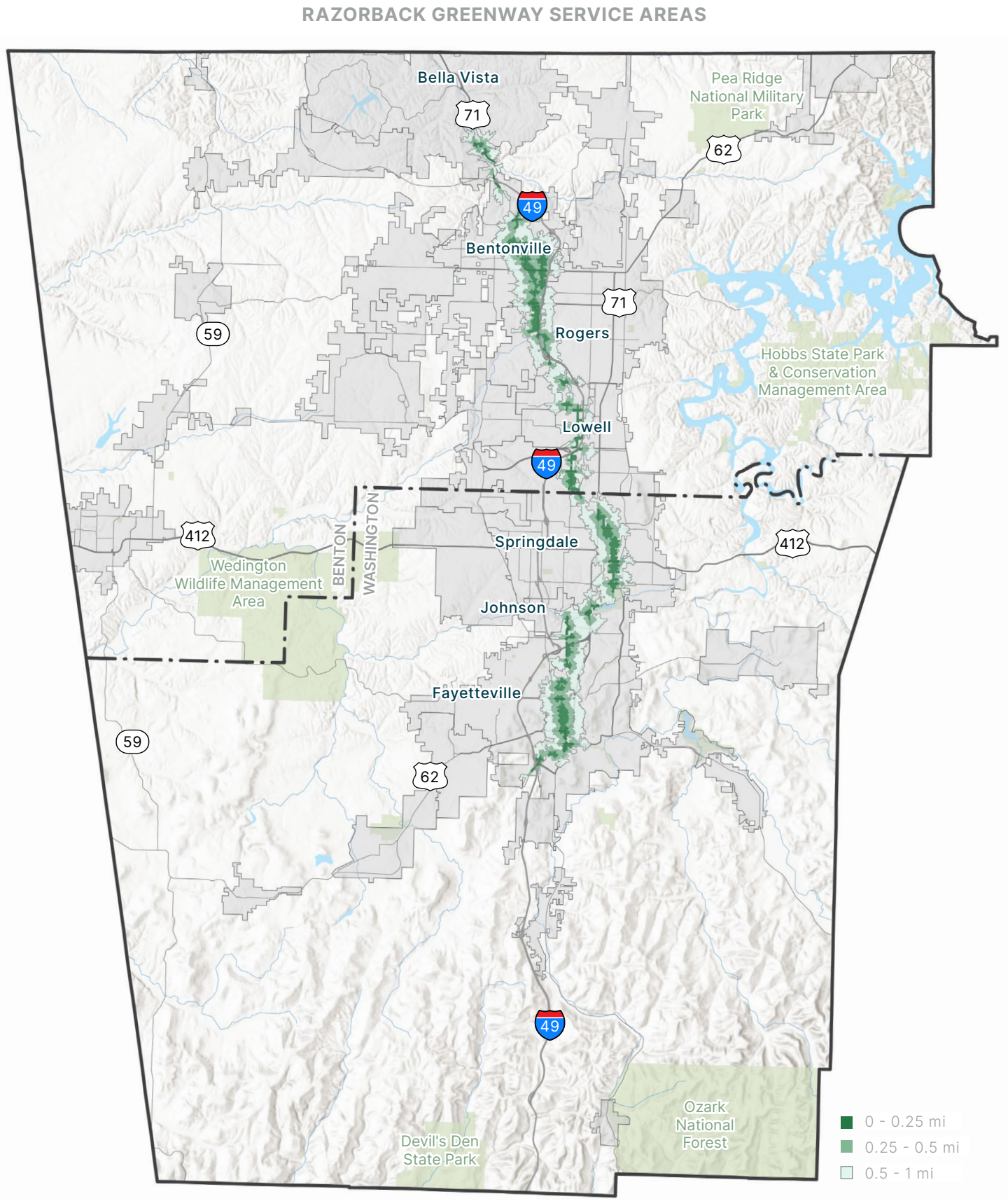
Active Transportation Facilities

ACTIVE TRANSPORTATION FACILITIES



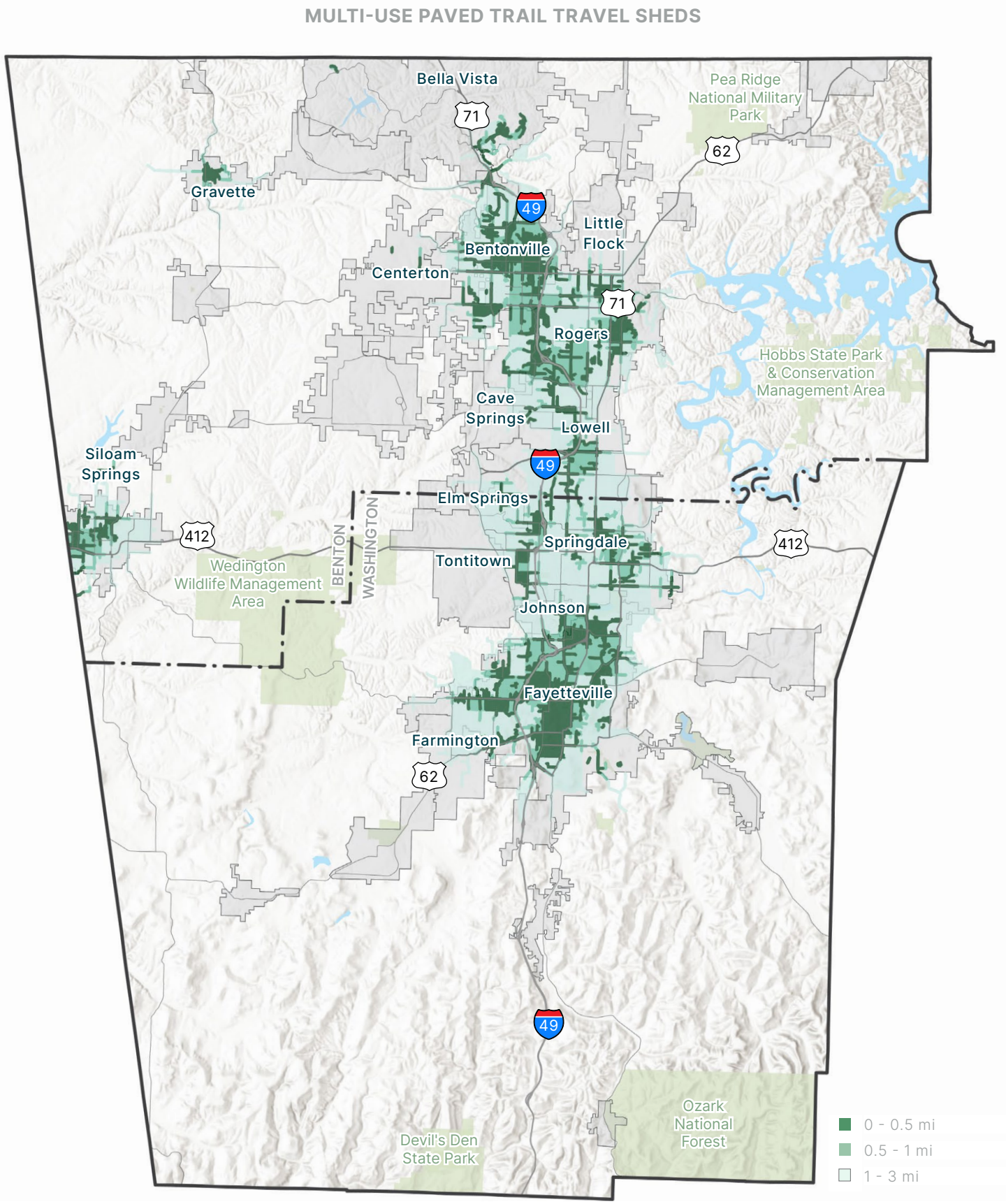
Active Transportation

Razorback Greenway Service Areas



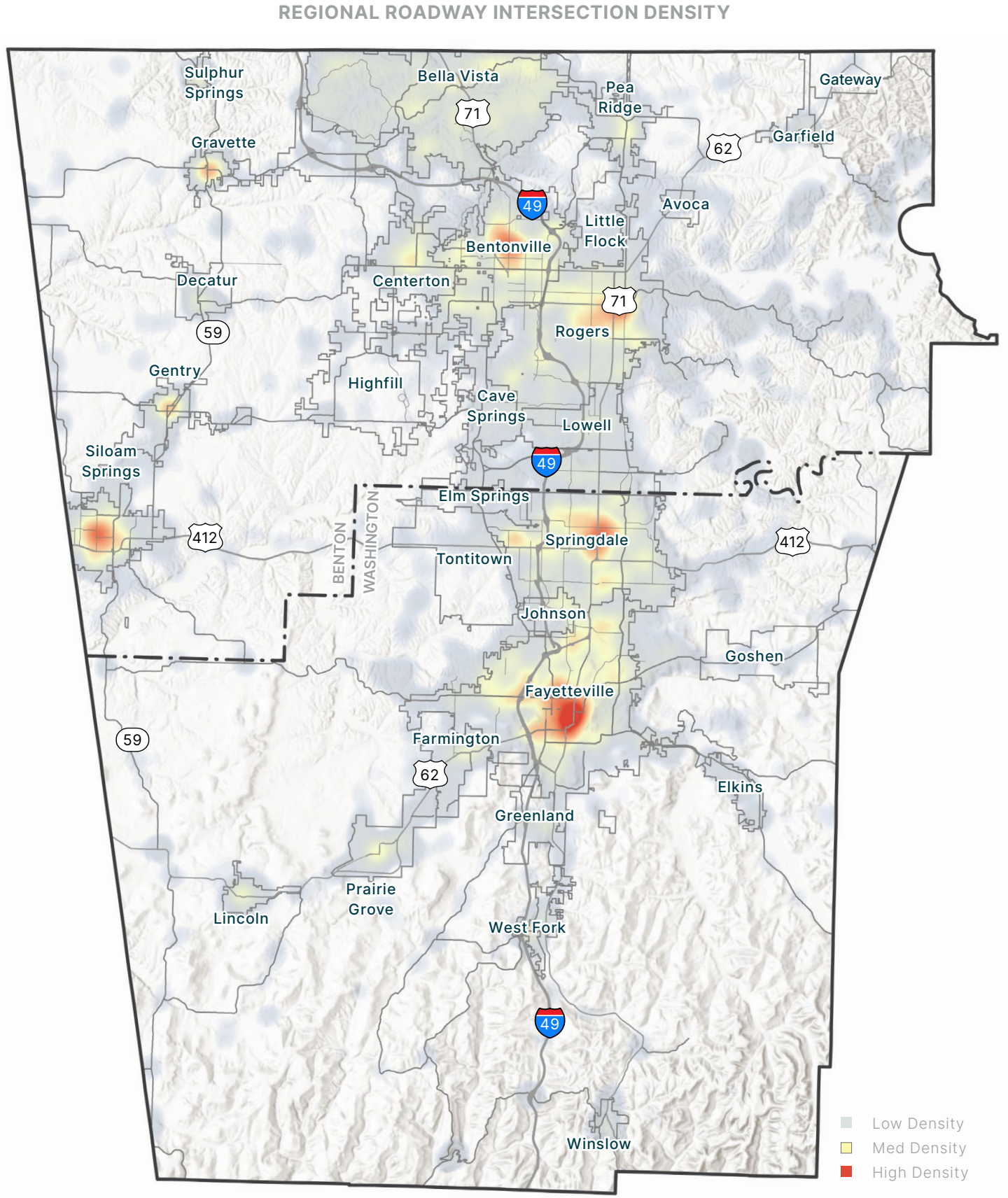
Active Transportation

Multi-Use Paved Trail Travel Sheds



Active Transportation

Regional Roadway Intersection Density



Trip Generators

Trip Generators

Employment, Destinations, and Travel Patterns

Regional Major Employers

Major employers play a defining role in shaping travel patterns across Northwest Arkansas. Along the I-49 corridor, Walmart, J.B. Hunt, Tyson Foods, and Washington Regional Medical Center represent the region's largest employment centers, attracting significant daily commuter traffic. On the U.S. 412 west corridor near Siloam Springs, Cobb-Vantress serves as the area's largest employer. The University of Arkansas System is also a major regional workforce driver, employing an estimated 6,719 full-time and 711 part-time faculty and staff. Collectively, these major employers form the backbone of the region's trip generation network, influencing both local and regional travel demand.

Trip Destinations Analysis

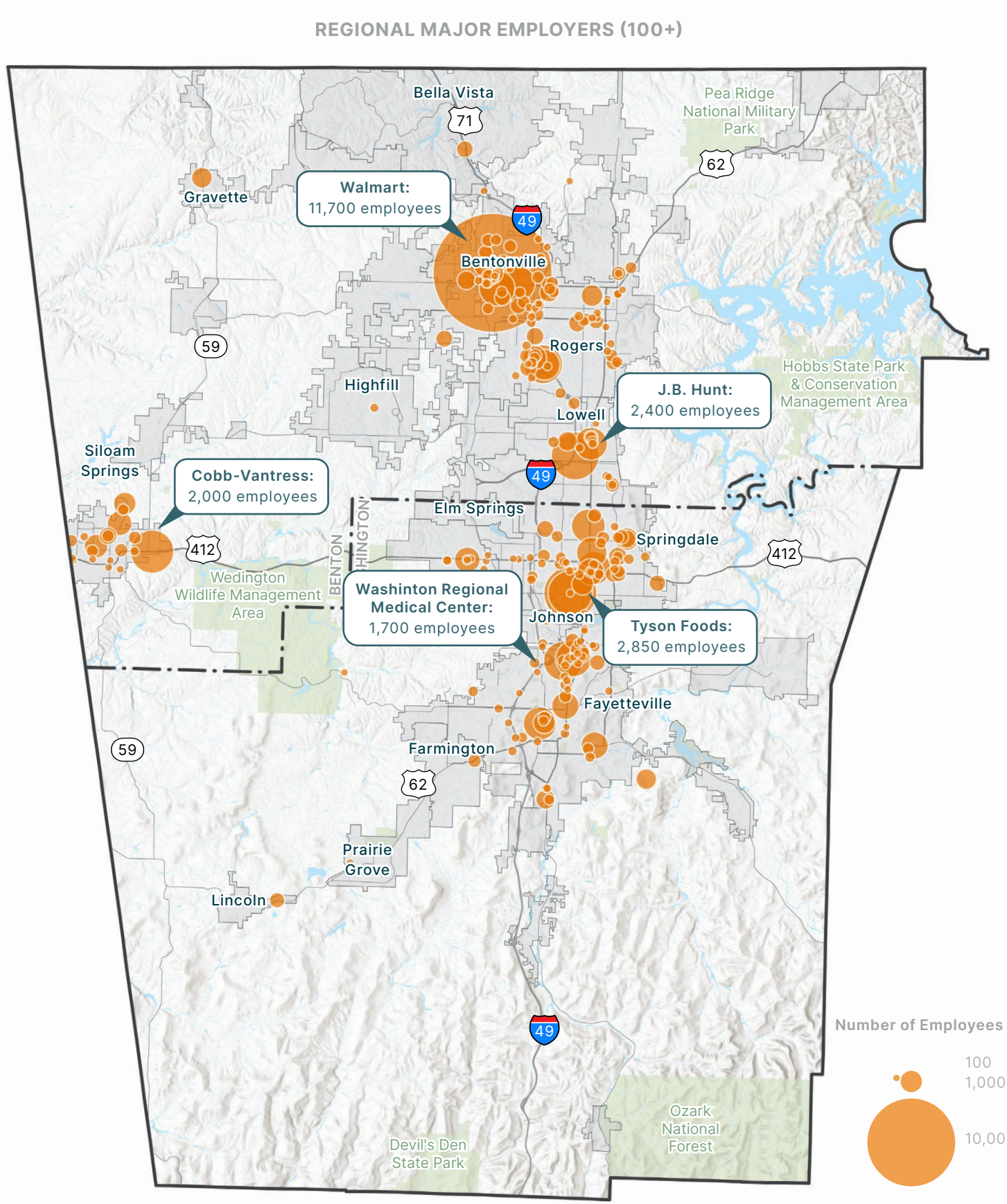
Daily travel patterns across Northwest Arkansas reveal distinct clusters of destination activity. Key trip destinations include grocery stores, schools, medical centers, parks and recreation facilities, and major employment centers. By assessing the typical distance and mode used to reach these destinations—ranging from short walking trips (¼ to 1 mile) and moderate biking trips (1 to 3 miles) to longer local car trips (3 or more miles)—the analysis identifies where multiple activity centers overlap. Areas of high destination concentration emerge most prominently in the region's major cities, forming the most accessible and active urban cores, while areas with moderate or lower concentrations reflect suburban and rural land use patterns.

Trip Initiators / Attractors

Residential development patterns across Northwest Arkansas heavily influence travel behavior. Single-family housing remains the predominant housing type, and its zoning requirements often mandate larger lot sizes that encourage auto-oriented land use and reduce economic productivity per acre. This pattern is evident across Benton and Washington counties, where extensive areas of low-density housing far exceed the compact areas that attract daily trips. Census data shows that nearly 32% of households in Washington County and 31% in Benton County spend 45–54% of their annual income on housing and transportation costs. These conditions contribute to elevated greenhouse gas emissions, averaging 9.81 metric tons per acre in Washington County and 5.45 metric tons per acre in Benton County—underscoring the connection between development form, mobility choices, and environmental outcomes.

Trip Generators

Regional Major Employers

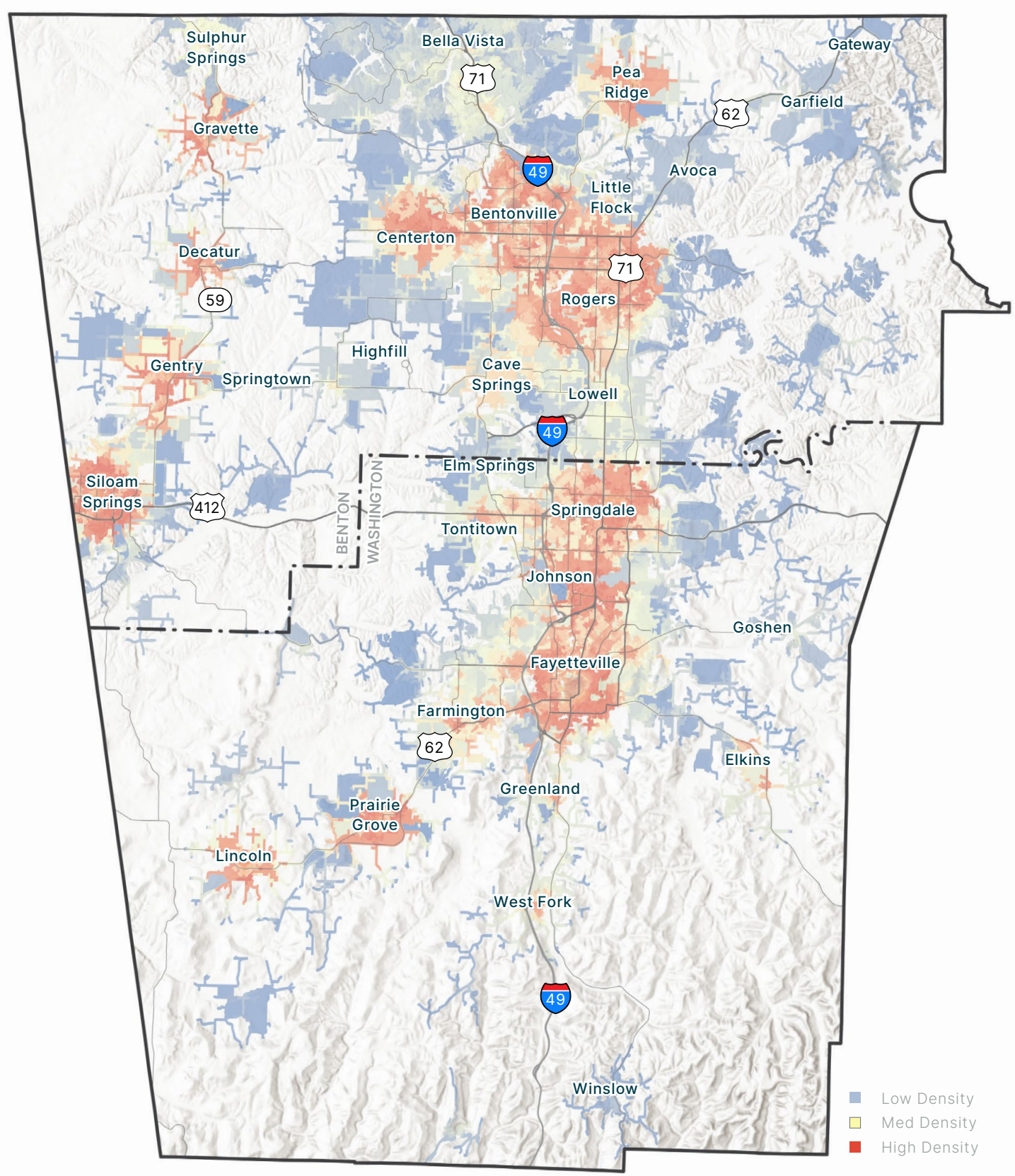


Source: Northwest Arkansas Regional Planning Commission, 2024.

Trip Generators

Trip Destinations

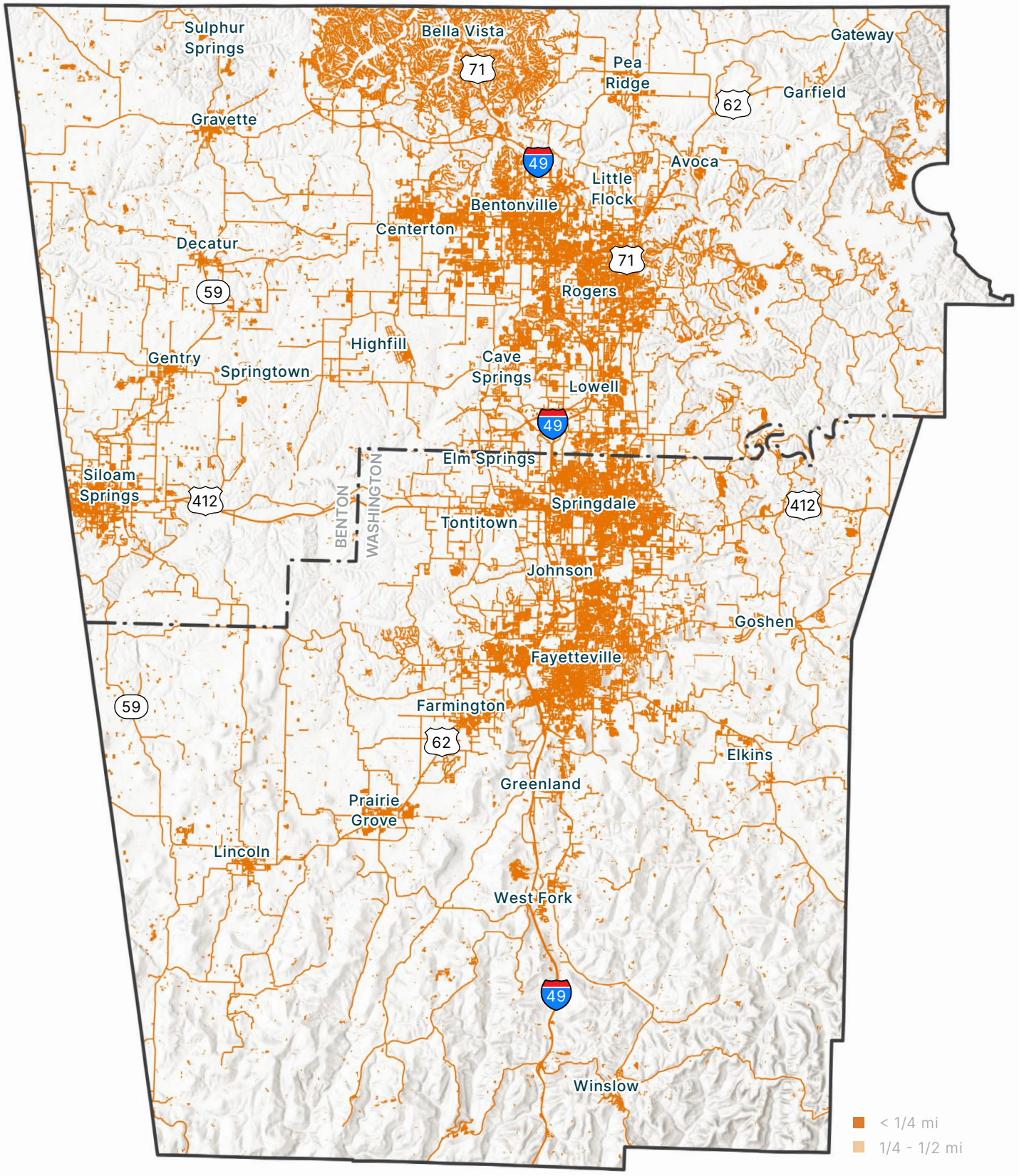
TRIP DESTINATION CONCENTRATION



Trip Generators

Trip Initiators / Attractors

REGIONAL TRIP INITIATORS: SINGLE FAMILY HOUSING CONCENTRATION



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Parks & Recreation

Parks & Recreation

Park Resources

Municipal Park Resources

From a regional level, some communities within Northwest Arkansas provide park and recreation resources within a 10-minute walk to a high percentage of their populations. According to data from the Trust for Public Lands, Fayetteville provides these resources to the highest percentage of its population at nearly 57% served. Other communities providing parks within a 10-minute walk to at least 35% of residents include Gentry, Johnson, and Prairie Grove. Bentonville, Greenland, Rogers, and Siloam Springs provide these resources to at least 25% of their populations.

Bella Vista, the largest city in Northwest Arkansas, has the lowest level of park access among the region's municipalities. Public outdoor recreation access is also disproportionately lacking between Fayetteville and Rogers—in the areas of Springdale, Tontitown, Elm Springs, Lowell, and Cave Springs—where large portions of the population are not within a 10-minute walk of a park.

Park land in Arkansas and surrounding states usually ranges from 10 to 20 acres per 1,000 people. In 2024, the median value was 10.6 acres per 1,000 people in cities and towns reporting nationally, and 13.2 acres per 1,000 people in cities and towns reporting in Arkansas, Oklahoma, Texas, Missouri, Tennessee, Mississippi, Louisiana, and Kansas (median population of 56,150).

The parkland ratio across all Northwest Arkansas municipalities totals 17.4 acres per 1,000 people. As the municipal population grows to a projected 823,521 in urban areas and 1,000,000 in the entire two-county area by 2045, this ratio drops to 10.6 acres per 1,000 people if no additional park land is acquired to serve regional growth.

Furthermore, it is notable that some of these communities' total park acreages include non-municipal park resources located within their boundaries and have been included in the ratios described above.

Peer Region Comparison

Comparable peer regions vary in their park access. Chattanooga, TN has a similar regional population (588,353, U.S. Census Bureau) to Northwest Arkansas Region (605,615, U.S. Census Bureau) and has a public park system wherein 40% of residents can walk 10 minutes or less to access outdoor recreation. And while Madison, WI (population 694,345, U.S. Census Bureau) is similar in its population to Northwest Arkansas, the city's park system coverage is so vast that 98% of residents are within a 10-minute walking distance of a park.

Non-Municipal Park Resources

Three state parks are located within the study area and include the following:

Benton County

- Hobbs State Park Conservation Area (12,000 acres)

Washington County

- Prairie Grove Battlefield State Park (+/- 800 acres)
- Devil's Den State Park (2,500 acres)

Additional major parks or open space resources include:

Benton County

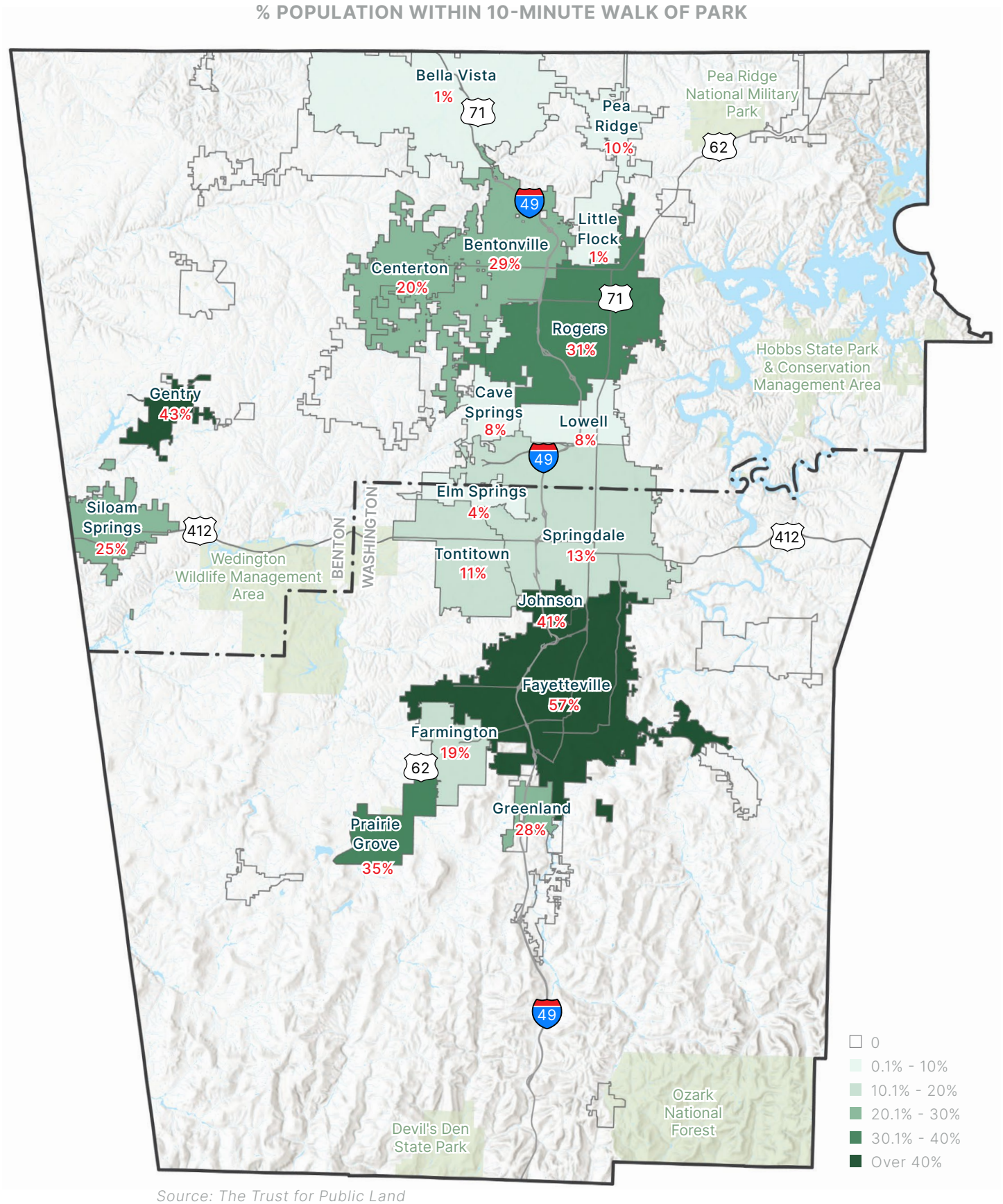
- U.S. Army Corps of Engineers land at Beaver Lake (40,500 acres)
- Pea Ridge National Military Park, National Park Service (4,400 acres)

Washington County

- Wedington Wildlife Management Area, Arkansas Game and Fish Commission (15,900 acres)

Parks & Recreation

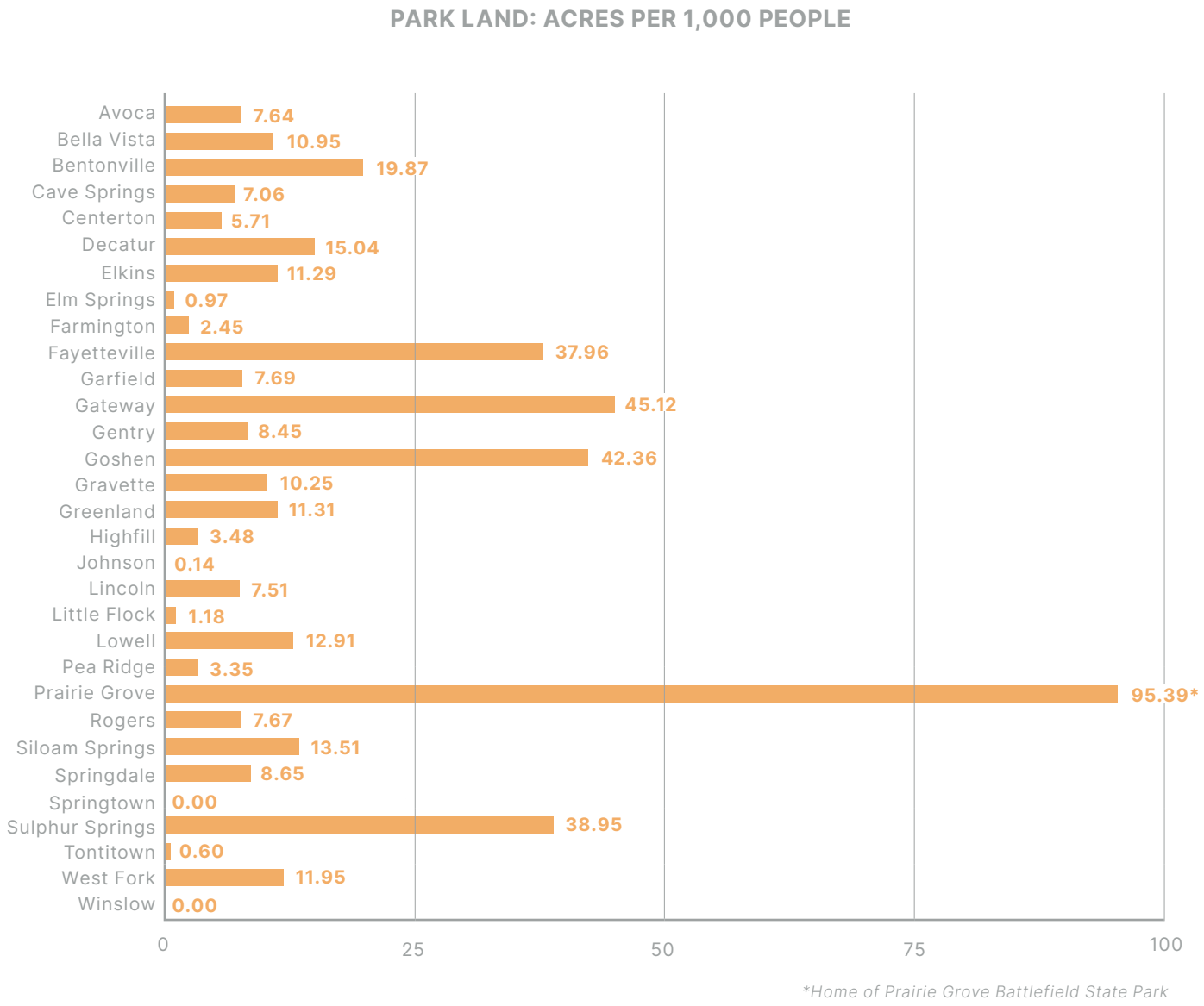
Population Within Walk of Park



Source: The Trust for Public Land

Parks & Recreation

Park Land



**Home of Prairie Grove Battlefield State Park*

Environment

Environment

Environmental Resources, Risks, and Resilience

Impervious Surfaces & Environment

Benton and Washington counties, key growth areas within the Natural State, contain an abundance of distinctive environmental features requiring careful protection and conservation. These include the Boston Mountains and Ozark Highlands, as well as natural prairies, glades, and areas concentrated within the Beaver Reservoir Watershed and the region's sensitive karst landscapes. Impervious surfaces already account for a notable portion of the region's land area, and continued urban development—driven by projected population growth to one million residents by 2050—poses increasing risks to these valuable ecological systems and the cultural identity they help define.

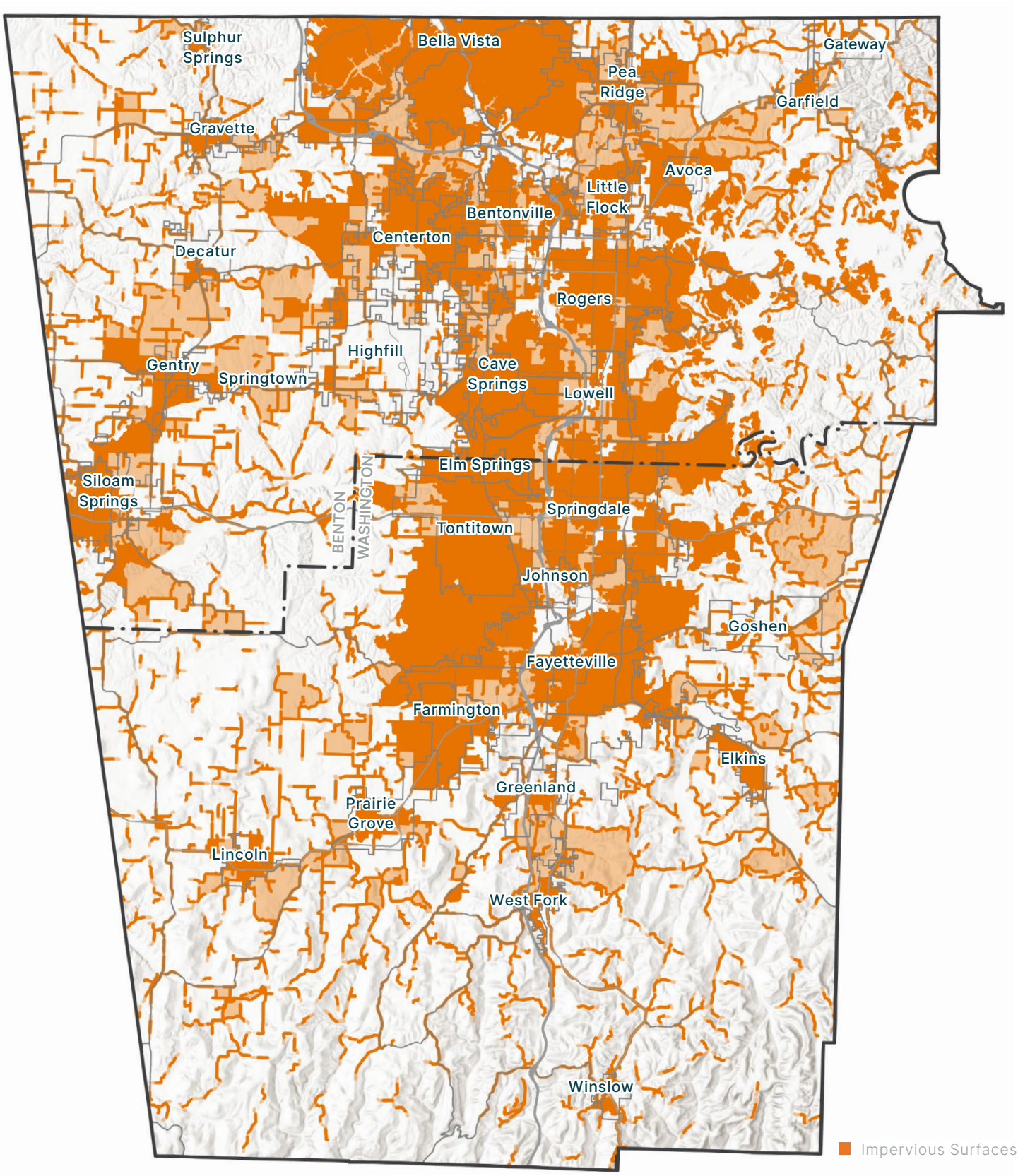
Karst Vulnerability

Karst landscapes represent critical natural resources across Northwest Arkansas, serving as groundwater recharge zones that supply clean drinking water and support diverse ecosystems. According to the U.S. Geological Survey, these formations are uniquely vulnerable to contamination, and remediation is often extremely difficult once pollution occurs. As urban development extends into karst regions, the risks increase for sinkhole formation, unstable ground conditions, and water quality degradation. Protecting these sensitive areas through informed planning and land use regulation is essential to sustaining the region's environmental health.

Environmental Sensitivity

Northwest Arkansas is defined by an exceptional concentration of natural resources, from its forested ridges and clear waterways to native prairies and glades that give the region its outdoor character and ecological richness. Ongoing growth, however, places these resources under mounting pressure. Tree cover is being lost to new subdivisions, prairies are being converted from agricultural or open land to commercial uses, and water quality faces increasing threats from runoff and human activity. Sensitive karst areas distributed across both Benton and Washington counties also require deliberate protection to preserve the integrity of local water systems and natural habitats.

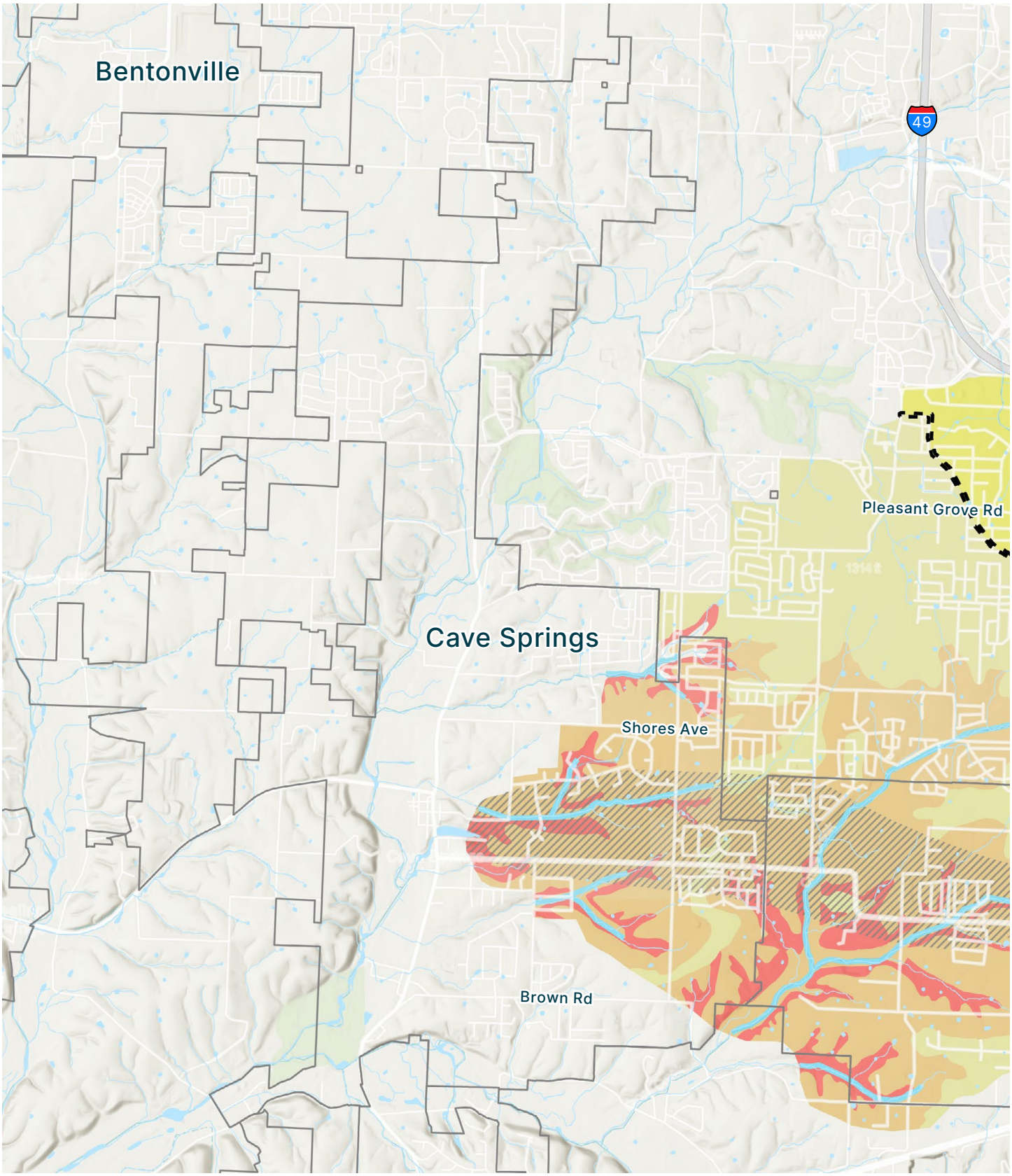
IMPERVIOUS SURFACES



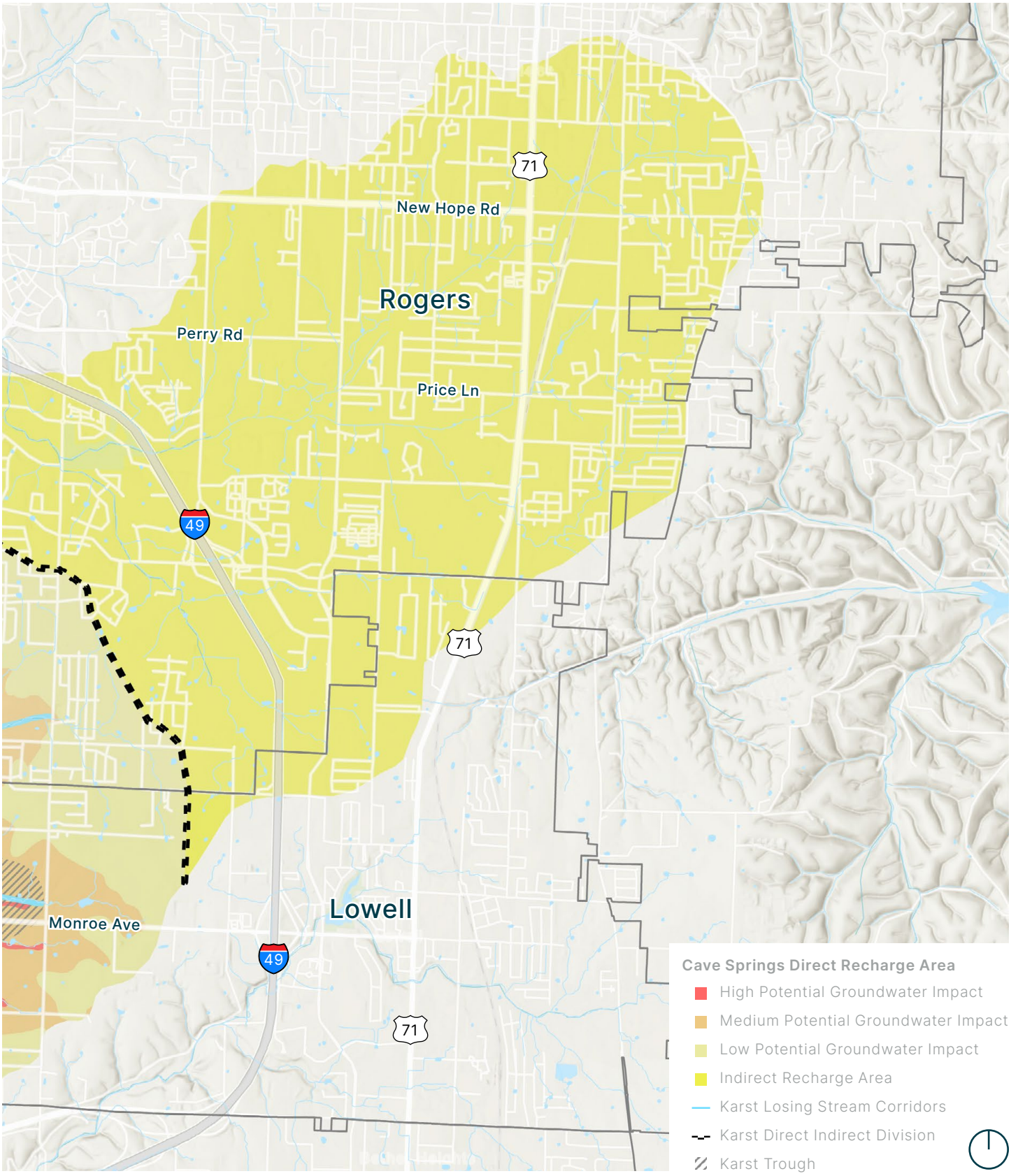
Environment

Karst Vulnerability Zones

KARST VULNERABILITY ZONES

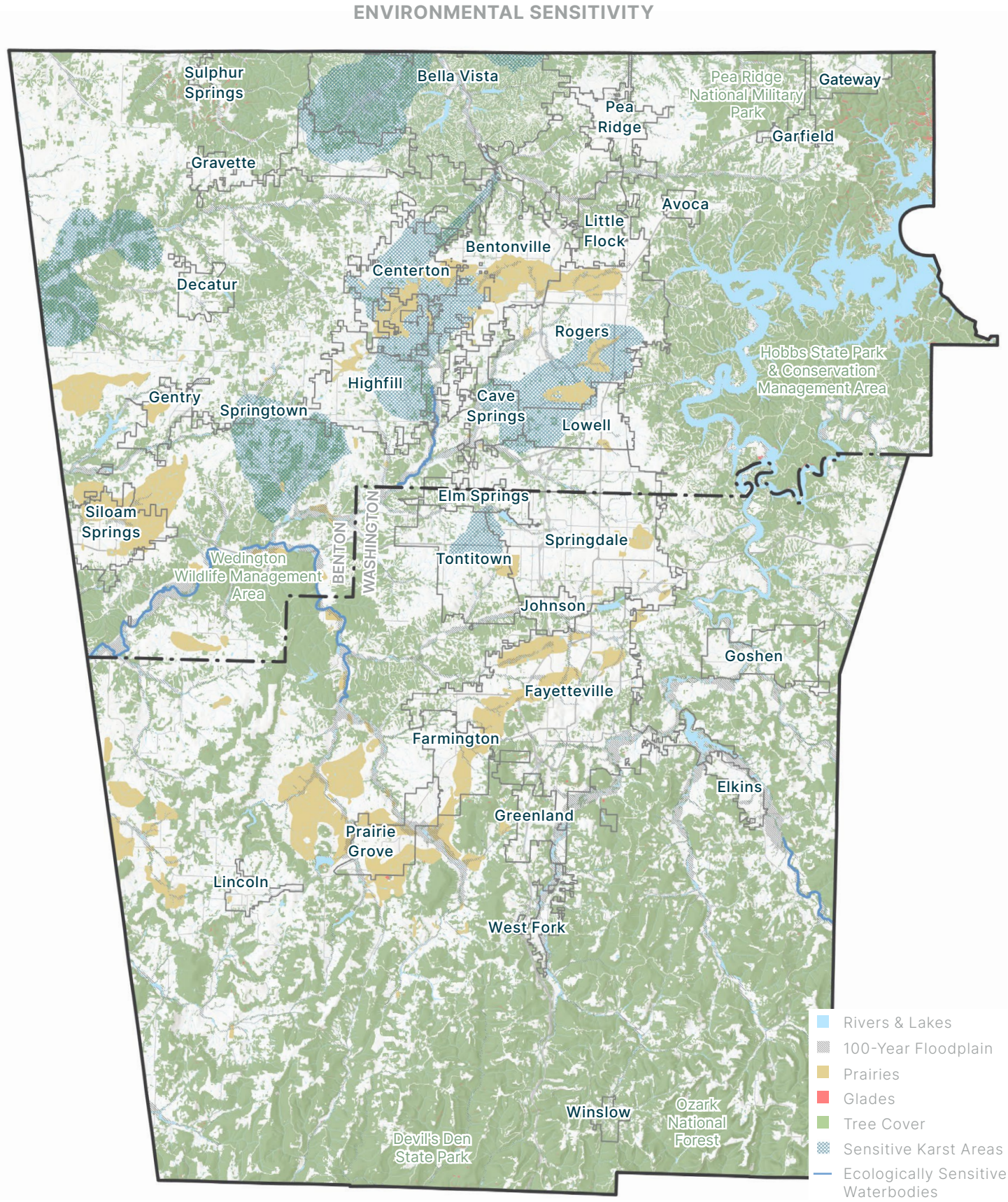


KARST VULNERABILITY ZONES



Environment

Environmental Sensitivity



Wastewater

Wastewater

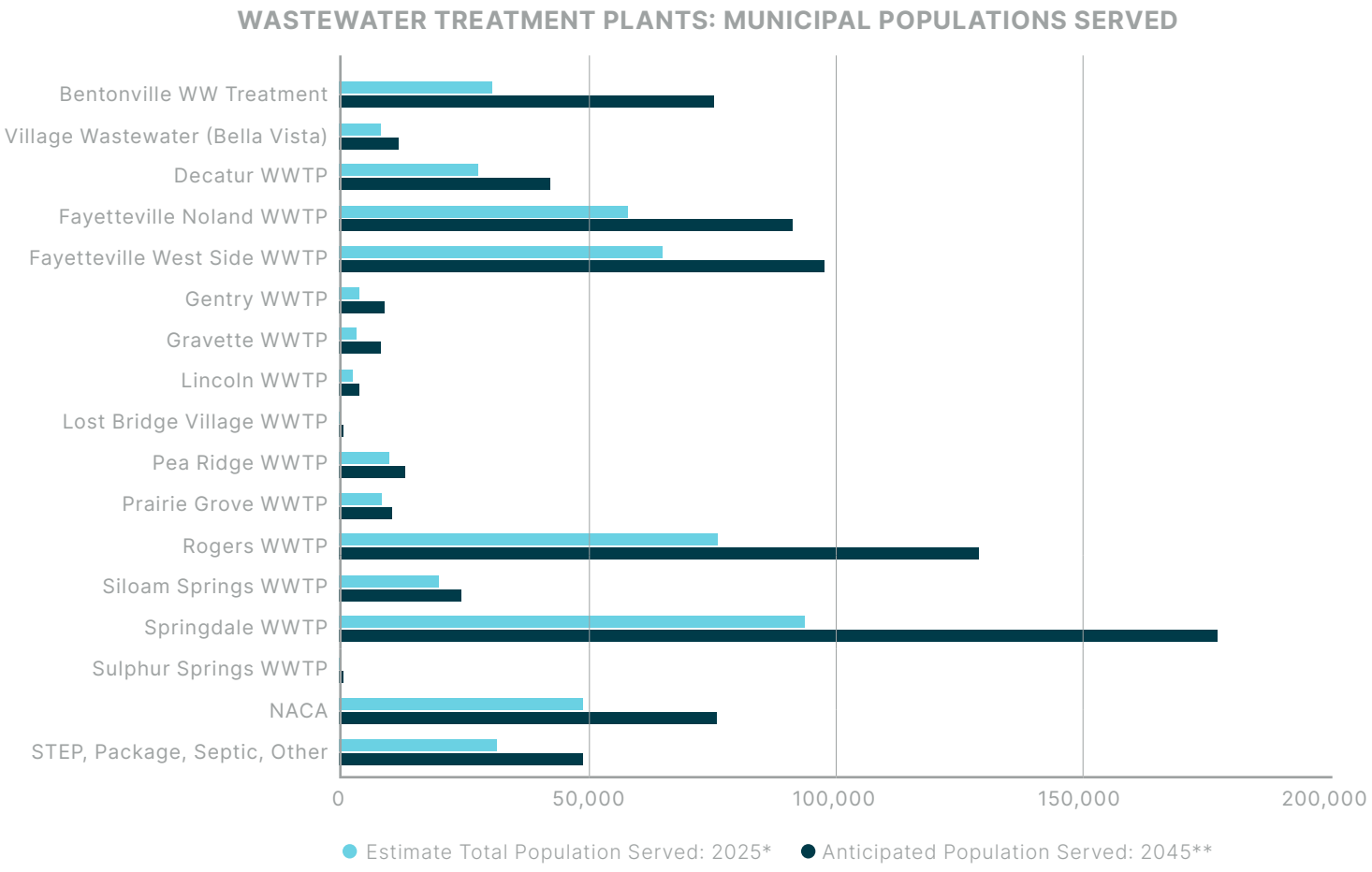
Background & Context

Overview

As a critical factor for enabling long-term population growth, Northwest Arkansas wastewater infrastructure is encountering development, financial, and environmental obstacles.

Developed areas of Northwest Arkansas are primarily located within three major watersheds: Beaver Reservoir, Illinois River, and Elk River, with western growth areas of the region located in the Lower Neosho River watershed. Since 1977 when the Illinois River was established by Oklahoma as a scenic river, ongoing coordination between the States of Oklahoma and Arkansas, as well as a lawsuit between the State of Oklahoma and corporations pertaining to elevated levels of phosphorus from agricultural runoff have impacted Northwest Arkansas' 16 wastewater treatment operations. While Northwest Arkansas comprises sufficient developable land, the region's rapid population expansion since the 1990s.

In 2002, the Northwest Arkansas Conservation Authority (NACA) was founded in a partnership between Rogers and Springdale to address wastewater treatment in both Washington and Benton counties, and now includes seven additional municipal members. As regional development continues, communities are navigating stricter permitting requirements and capacity limitations at existing treatment facilities. Permitting requirements, specifically pertaining to total phosphorus (TP) levels, has been the focus of bi-state coordination and is still in question with a 2022 objection from the Environmental Protection Agency regarding two permitted treatment plants in Northwest Arkansas, setting even stricter TP limits. Municipalities are navigating permit renewals as well as expansions and upgrades to their collection, storage, and treatment facilities as population in the region continues to grow.



**U.S. Census Bureau Population Estimates*

***Based on Northwest Arkansas Regional Planning Commission Population Projection Estimates*

Issues

Phosphorus Limits

The issue of wastewater capacity in Northwest Arkansas began with the State of Oklahoma's opposition to elevated levels of total phosphorus (TP) in the Illinois River over two decades ago. Because of Northwest Arkansas' close proximity to Oklahoma and the ongoing legal issues surrounding water quality between the two states, the region is under scrutiny regarding its municipal and agricultural impacts within the watershed, an issue compounded by the region's high growth rate and concerns surrounding local wastewater treatment capacity. Early agreements between the two states set TP discharge limits of 1.0 mg/L, but a 2022 objection by the EPA to two wastewater treatment plant permits resulted in a new TP limit of 0.1 mg/L, one to which the State of Arkansas objects and has subsequently filed lawsuit against.

Treatment Capacity

Currently, municipalities in Northwest Arkansas handle wastewater in one of four ways: by treating their wastewater locally, by sending to NACA for treatment, by sending to another municipality for treatment, or by handling with local septic, STEP, or package plants (either publicly or privately operated).

Jurisdictions currently sending wastewater to NACA:

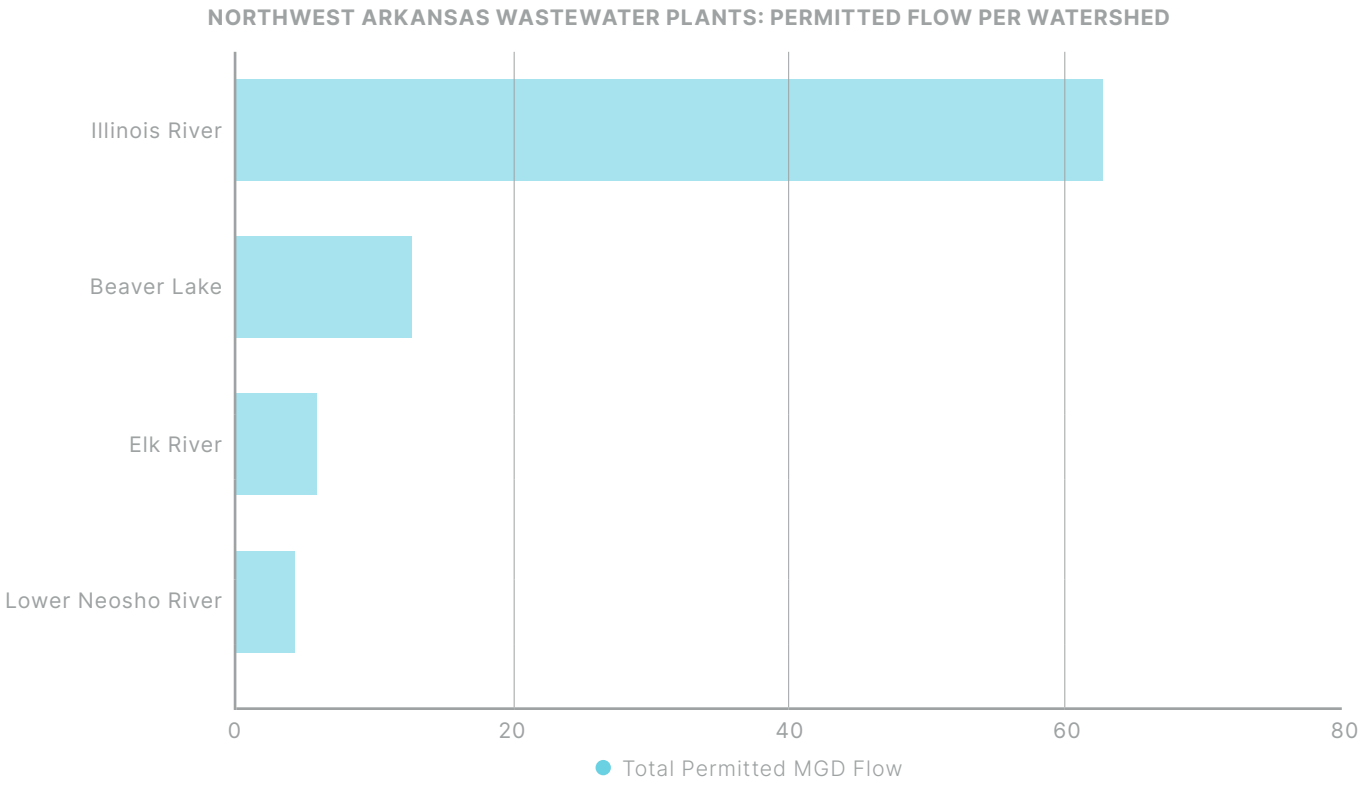
- Bentonville
- Cave Springs
- Elm Springs
- Tontitown
- Highfill (line to NACA in progress)

Additional NACA member communities:

- Centerton
- Lowell
- Springdale
- Rogers

Wastewater treatment plants serving their city exclusively:

- Bentonville
- Village Wastewater (Bella Vista)
- Gentry
- Gravette
- Lincoln
- Garfield (Lost Bridge Village Water and Sewer)
- Pea Ridge



Wastewater

Issues

- Prairie Grove
- Siloam Springs
- Sulphur Springs

Wastewater treatment plants serving multiple jurisdictions:

- Decatur: serves Centerton, Highfill (partial), Simmons plant
- Fayetteville Noland WWTP: serves Elkins, Greenland, Johnson (south)
- Fayetteville West Side WWTP: serves Farmington, West Fork
- Rogers: serves Lowell (north)
- Springdale: serves Johnson (north), Lowell (south)

Communities exclusively utilizing septic, STEP or package plants:

- Avoca
- Gateway
- Goshen
- Little Flock
- Springtown
- Winslow

While NACA and most larger municipalities are expanding their facilities to accommodate increased demands, instances of exceeded treatment capacity at some smaller municipal plants have resulted in sharp regulatory action. The Arkansas Department of Health has limited some cities' ability to add new wastewater connections in specific areas or in some cases, throughout the entire city, until overall treatment capacity has been expanded. Other issues reflecting a lack of regional coordination on this matter have occurred.

EXISTING WASTEWATER TREATMENT FACILITIES

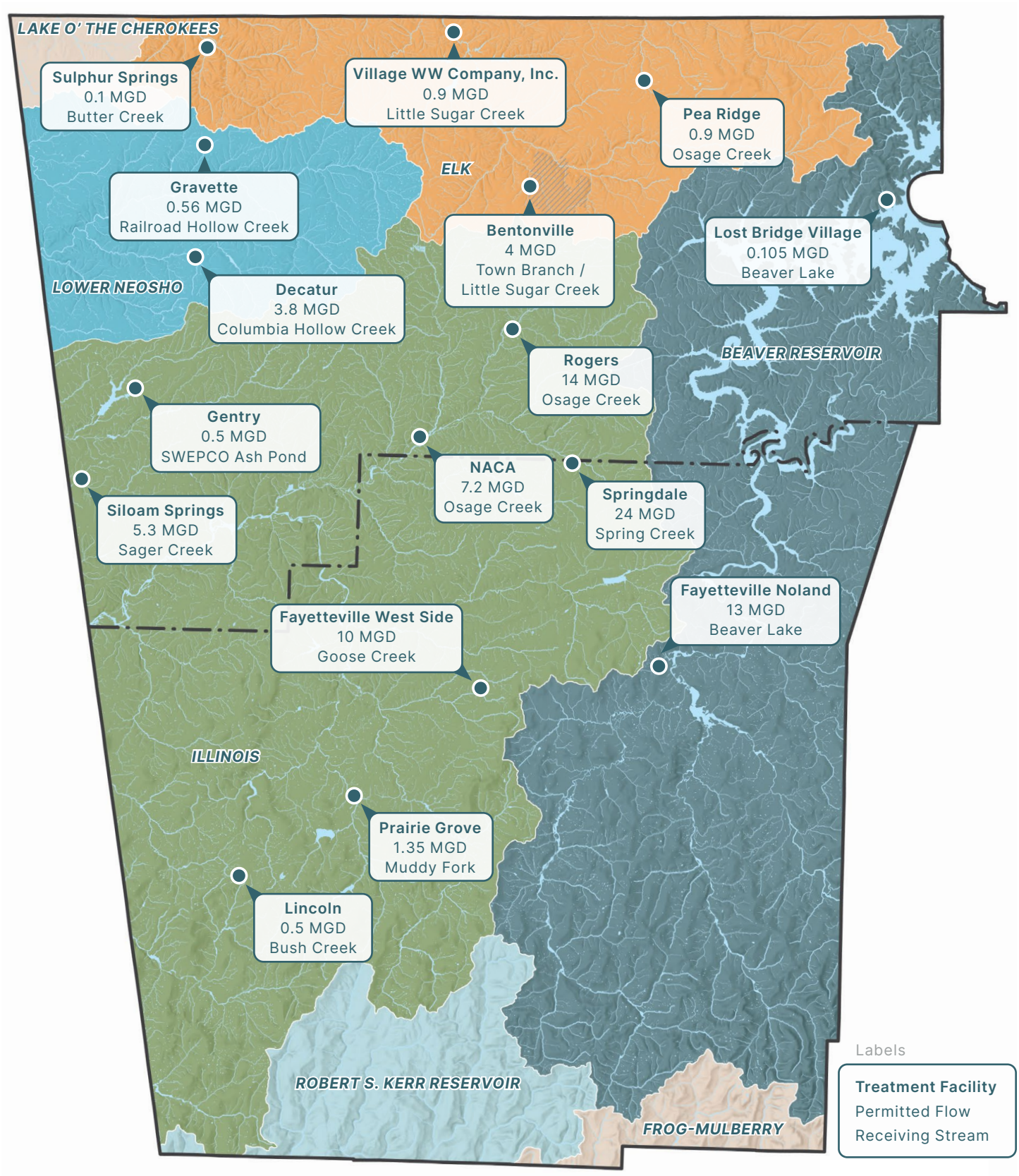
Jurisdiction	Treatment Plant Name	Permitted Capacity (MGD)	Capacity In Use/Avg Daily Flow (MGD)	% of Total Capacity Remaining	Watershed
Bentonville	Bentonville WW Treatment Plant	4	2.88	28.00%	Elk River
Bella Vista	Village Wastewater Company Inc	0.9	0.33	63.33%	Elk River
Decatur	Decatur WWTP	3.8	4.1	-7.89%	Lower Neosho
Fayetteville	Paul R. Noland WWTP	12.6	4.43	64.84%	Beaver Lake
Fayetteville	West Side WWTP	10	7.53	24.70%	Illinois River
Gentry	Gentry WWTP	0.5	0.4	20.00%	Illinois River
Gravette	Gravette WWTP	0.56	0.149	73.39%	Lower Neosho
Lincoln	Lincoln WWTP	0.5	0.139	72.20%	Illinois River
Garfield	Lost Bridge Village Water and Sewer District	0.105	n/a	n/a	Beaver Lake
Pea Ridge	Pea Ridge WWTP	0.9	0.46	48.89%	Elk River
Prairie Grove	Prairie Grove WWTP	1.35	0.9	33.33%	Illinois River
Rogers	Rogers WWTP	14	9	35.71%	Illinois River
Siloam Springs	Siloam Springs WWTP	5.3	3.1	41.51%	Illinois River
Springdale	Springdale WWTF	24	12.9	46.25%	Illinois River
Sulphur Springs	City of Sulphur Springs WWTP	0.1	n/a	n/a	Elk River
NACA	Northwest Arkansas Conservation Authority Regional WWTP	7.2	3.85	46.53%	Illinois River

Source: Crafton Tull research

Wastewater

Watersheds & Wastewater Treatment

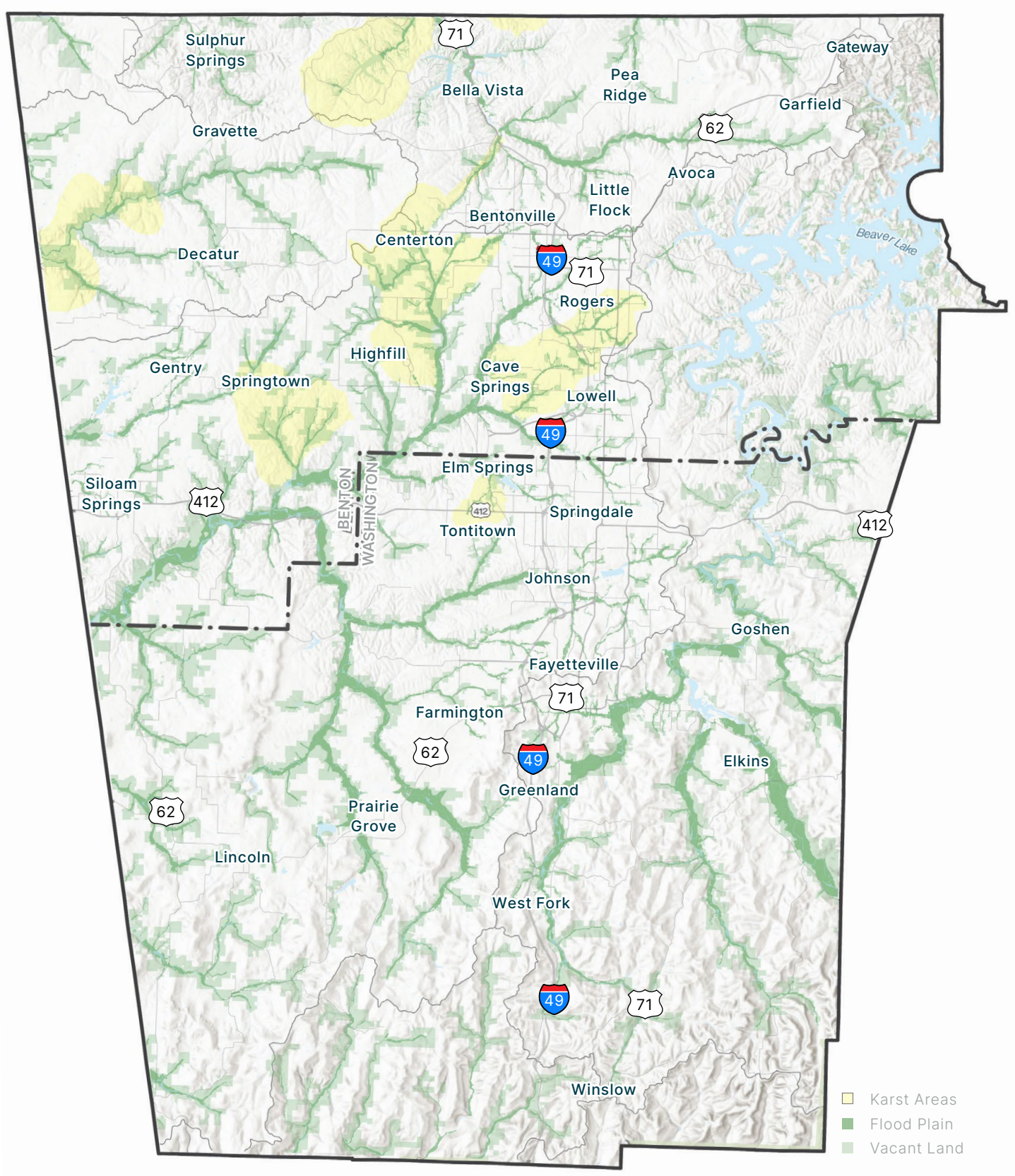
Watersheds and Wastewater Treatment



Wastewater

Regional Drainage Ways

REGIONAL DRAINAGE WAYS



Financial Implications of Capacity and Treatment Technology

Planning for expanded capacity for the entire region is critical from a financial burden perspective: sewer treatment facility upgrade costs led to the shuttering of Bethel Heights as an incorporated community in 2020 when it was annexed by Springdale. In addition, Bentonville, Decatur, Gentry, Prairie Grove, Springdale and NACA are currently expanding or have plans to expand their respective wastewater treatment capacity, both for residents and businesses locally as well as additional jurisdictions they may be serving. The estimated cost for these planned WWTP upgrades totals $385 million according to each city's capital improvement plan. Other communities rely on private systems that require consistent investment in maintenance. For example, approximately 75% of the population of Bella Vista utilizes septic systems that is the financial and maintenance responsibility of individual property owners. Expansion, along with the need for new technology that results in lower phosphorus levels, will require considerable economic resources now and as communities grow.

Solutions

Addressing the wastewater capacity challenges in Northwest Arkansas requires a comprehensive, forward-looking strategy that aligns with the region's projected growth to 1 million residents by 2050. Though each municipality may be able to work to provide service to all areas of their town, this often would not be the most efficient solution as topography and city borders don't agree. A thorough regional wastewater study would allow for coordinated planning to meet the demands from projected growth. Regional solutions across citylines will often prove the best answer. This study should:

- Further identify existing treatment capacity limitations for quantity and capability to meet proposed EPA standards.
- Identify capacity limitations in interceptors within the collection systems.
- Work with municipalities as well as private commercial and industrial entities to project residential, commercial and industrial growth across the region to forecast wastewater demands.
- Identify locations for future wastewater treatment plants and project future upgrade needs to existing lift stations.
- Consider short-term strategies as a stop gap.
- Consider regional approaches to wastewater issues.

It is vital that communities across Northwest Arkansas proactively assess the potential capital needs related to sewer treatment plant expansions. Short-term or interim strategies should also be explored to relieve pressure on existing systems. These may include mobile treatment trucks or strategically located package plants concurrent with regional facility improvements as well as nutrient trading mechanisms as recommended by the Arkansas Department of Energy and Environment, Department of Health (ADH), and Division of Environmental Quality (DEQ). Additional strategies may emerge as early findings from the regional wastewater study are reviewed, particularly through an examination of peer communities who have faced and overcome similar constraints.

Following completion of the regional wastewater study, the most critical step to take will be regional alignment on implementation. Municipalities must work collaboratively to prioritize and address early action items related to sewer infrastructure development. Coordinated investment in strategically phased infrastructure improvements will ensure wastewater capacity keeps pace with both population and commercial/industrial growth, supporting sustainable development across the region.

Based on the findings of this study, the recommendations with regard to wastewater include the following.

1. Conduct a thorough regional wastewater study to ensure regional coordination that meets the demands of 1 million residents in Northwest Arkansas by 2050. Additional factors this study will unveil is which plants can meet new standards set by the EPA and which are problematic or requiring a greater level of investment to bring up to code.
2. Assess potential required expenditures related to sewer treatment plant expansion, explore short-term solutions regarding mobile treatment trucks, strategic package plants (for use while constructing regional facilities),
3. Explore opportunities for nutrient trading as proposed by DEQ. *"Associate director of DEQ Stacie Wassell announced that the Energy and Environment Department is planning to propose rules allowing nutrient trading. This would give larger utilities with the means to implement costly wastewater treatment improvements the option of selling some of the benefit to smaller utilities in the same watershed that are unable to afford such treatment improvements, among other things." Source: Garver Insights, April 2024*
4. Implement other strategies yet to be discovered. These can be based on early findings from the regional wastewater study from reviews of peer-community solutions to wastewater.
5. Additional long-term solutions include upgrades to technology allowing immediate or faster TP and chemical readouts that are more commonplace in newer wastewater treatment facilities.

Wastewater

Impact Fees & Sewer Connection Fees

Impact Fees & Sewer Connection Fees

Impact fees are already in place in most, but not all, Northwest Arkansas communities and are one of the best avenues for funding sewer improvements as the population increases. The table below shows which communities utilize sewer and water impact fees (as well as fire, police, parks, library, and general transportation). In order to bring the region up to speed with regards to a lack of capacity for sewer treatment, each Northwest Arkansas community should consider adopting some form of sewer impact fee as a means to fund capital improvements.

Impact fees could be the answer not just to major sewer capacity concerns, but also the answer to funding public safety and quality of life improvements to meet the needs of the region's population in 2050. Public safety needs will become more important, meaning that police and fire will require expanded staff, facilities and equipment. Residents will require high quality parks, including staffing and programming.

NWA IMPACT FEES

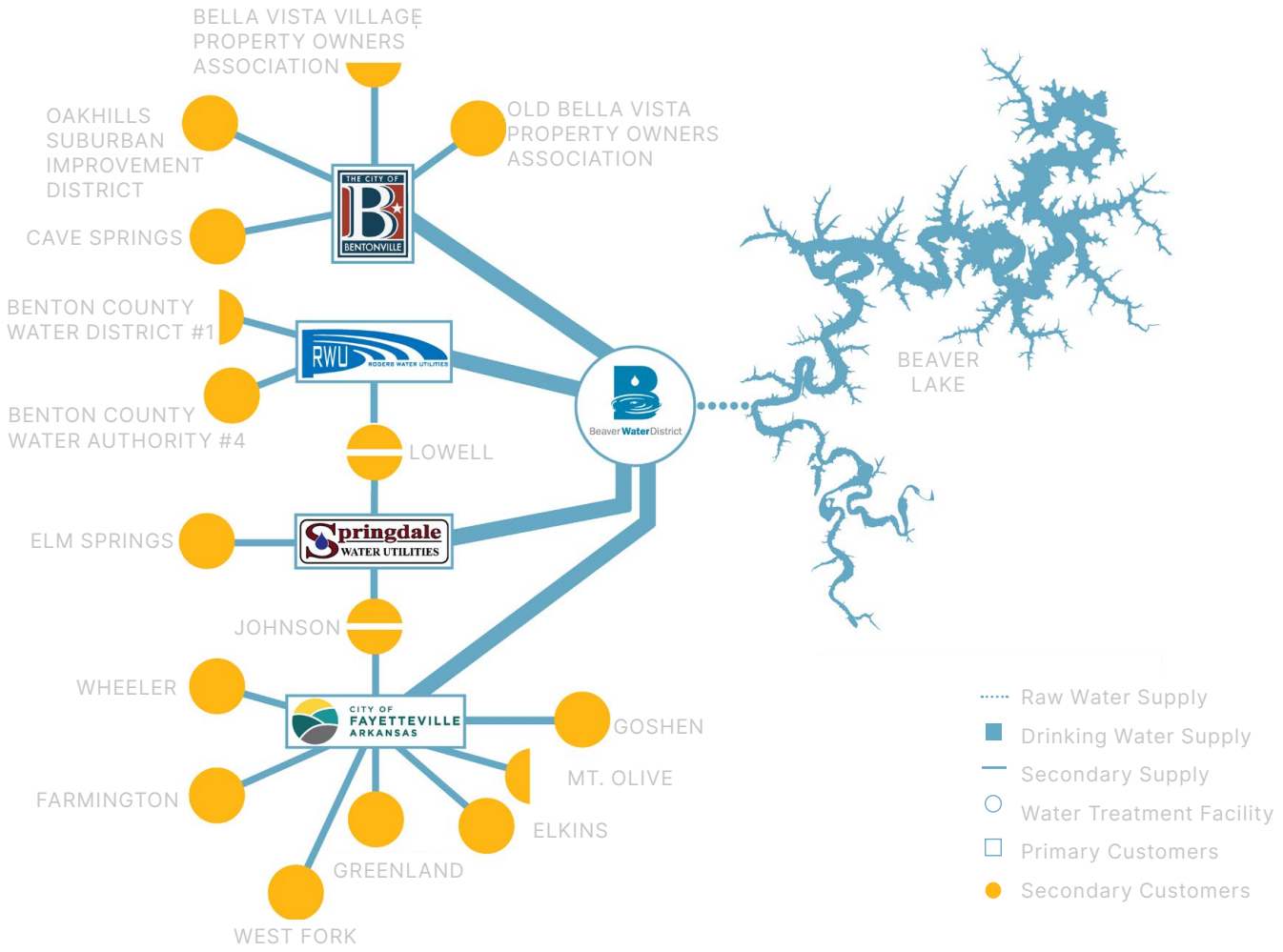
	Fire	Police	Parks	Library	Sewer	Water	Transportation
Avoca							
Bella Vista	✓	✓		✓			
Bentonville	✓	✓	✓	✓		✓	
Cave Springs					✓		
Centerton	✓	✓	✓				✓
Decatur						✓	
Elkins	✓	✓			✓	✓	
Elm Springs							
Farmington					✓		
Fayetteville	✓	✓			✓	✓	
Garfield						✓	
Gateway							
Gentry							
Goshen							
Gravette							
Greenland							
Highfill							
Johnson							
Lincoln					✓	✓	
Little Flock							
Lowell	✓		✓		✓		
Pea Ridge					✓	✓	
Prairie Grove	✓	✓					
Rogers					✓	✓	
Siloam Springs					✓	✓	
Springdale					✓	✓	
Springtown							
Sulphur Springs							
Tontitown	✓				✓	✓	✓
West Fork							
Winslow							

Source: Crafton Tull research

Water

Water

Water Source



Source: Beaver Water District

Water

Water in the region is primarily supplied from Beaver Lake by two entities: Beaver Water District (BWD) and the Benton Washington Regional Public Water Authority (BWRPWA) (commonly known as "Two-Ton").

Beaver Water District's (BWD) daily water treatment capacity is 140 MGD. The daily pumping capacity at BWD's intake is 150 MGD. The average daily demand to BWD is currently 72 MGD with a peak day in the summer reaching over 100 MGD. BWU's master plan includes increasing intake and treatment capacity to 220 MGD by the year 2032. BWD's current agreement with the USACE allows it to draw an average of 120 MGD.

BWD directly serves the cities of Fayetteville, Springdale, Rogers, and Bentonville. Indirectly BWD serves the following customers through their primary customers: Bella Vista POA, Old Bella Vista POA, Oakhills Suburban Improvement District, Cave Springs, Benton County Water District #1, Benton County Water Authority #4, Lowell, Elm Springs, Tontitown, Johnson, Wheeler, Farmington, West Fork, Greenland, Elkins, Mount Olive, and Goshen.

Benton Washington Regional Public Water Authority (BWRPWA) daily water treatment capacity is 37 MGD. The average daily demand to BWRPWA is currently 72 MGD with a peak day in the summer reaching over 100 MGD.

BWCWA directly serves the following communities: Benton County Water District #1 (Avoca & Little Flock), Bella Vista POA, Centerton, Decatur, Garfield, Gateway, Gentry (and Colcold, OK), Gravette (w/ Hiwasse), Highfill (XNA), Lincoln (w/ Summers), Lost Bridge Village, Pea Ridge, Prairie Grove, Siloam Springs (Forest Hills Subdivision), Tontitown, Washington Water Authority (including Farmington), Westville Utility Authority (Westville, Ok).

Water Source

Additionally some cities have secondary water sources. These include:

- Siloam Springs primarily treats water from the Illinois River.
- Decatur utilizes three wells tapping the Gunter Sandstone Aquifer.
- Sulphur Springs utilizes a well tapping the Gunter Sandstone Aquifer.
- Prairie Grove receives water from its city-owned lake some days and is also a customer of Two-Ton.

WATER SOURCE BY MUNICIPALITY

Municipality	Beaver Water District	BWRPWA	Other	Notes
Avoca		Primary		via Benton County Water District #1
Bella Vista	Primary	Primary		BWD via Bentonville
Bentonville	Primary			
Centerton		Primary		
Cave Springs	Primary			via Bentonville
Decatur		Secondary	3 Wells	Wells in the Gunter Sandstone Aquifer
Elkins	Primary			via Fayetteville
Elm Springs	Primary			via Springdale
Farmington	Primary			via Fayetteville
Fayetteville	Primary			
Garfield		Primary		
Gateway		Primary		
Gentry		Primary		w/ Colcord, OK
Goshen	Primary			via Fayetteville
Gravette		Primary		
Greenland	Primary			via Fayetteville
Highfill		Primary		w/ XNA
Johnson	Primary			via Fayetteville
Lincoln		Secondary	Primary	Primary: Illinois River
Little Flock		Primary		via Benton County Water District #1
Lowell	Primary	Primary		via Rogers & Springdale
Pea Ridge		Primary		
Prairie Grove		Secondary	Primary	Primary: Prairie Grove Lake
Rogers	Primary			
Siloam Springs		Secondary	Primary	Primary: Illinois River
Springdale	Primary			
Springtown		Primary		
Sulphur Springs			Well	Well in the Gunter Sandstone Aquifer
Tonitown	Secondary	Primary		
West Fork	Primary			via Fayetteville
Winslow			Primary	Primary: Fort Smith Water Utilities

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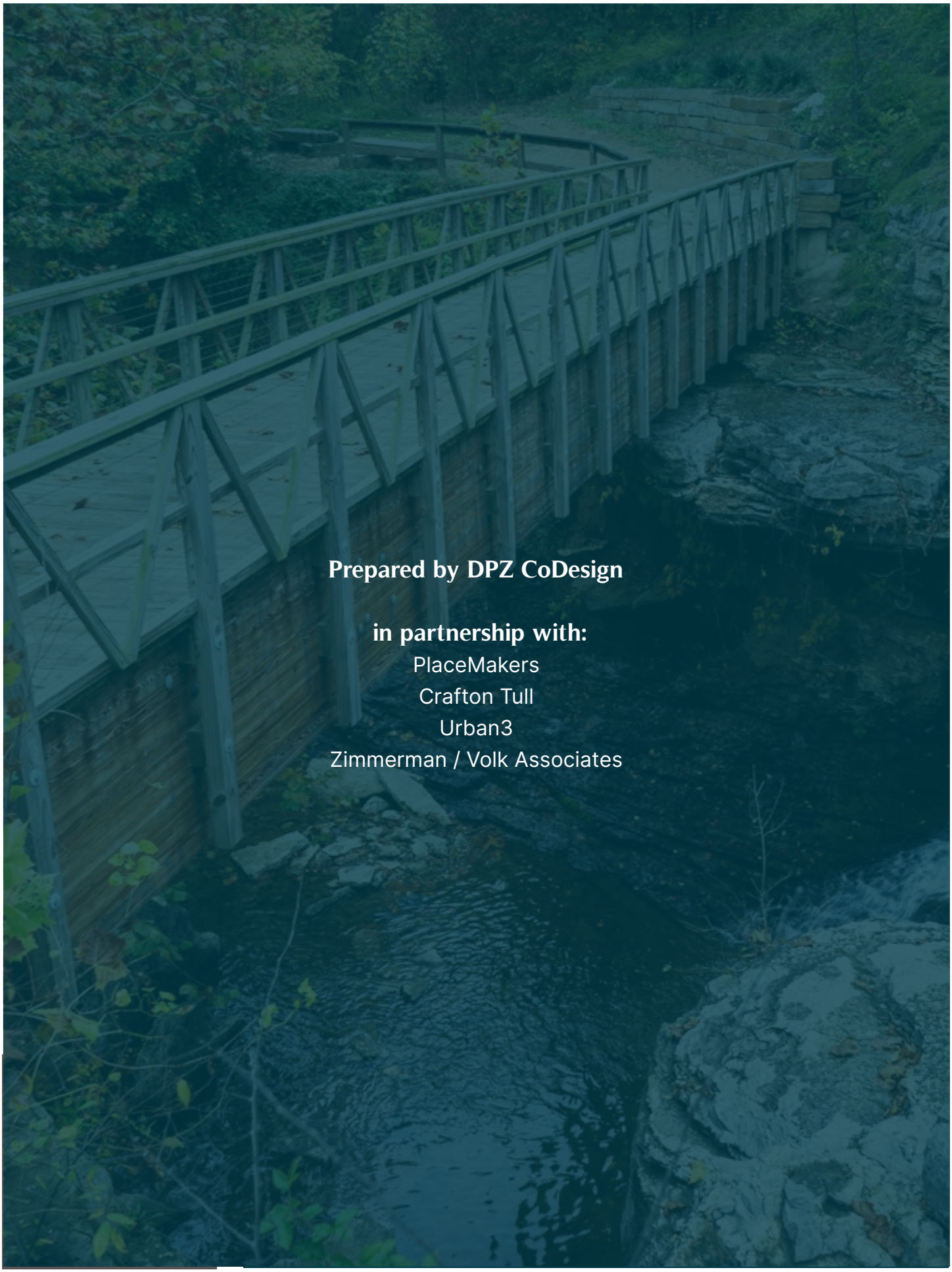

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