

## **Chapter 3: Affected Environment**

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### **Introduction**

The Northwest Arkansas Regional Airport Intermodal Access Road Environmental Impact Statement (EIS) study area is located within portions of two counties, Washington and Benton Counties. Both counties are located in northwest Arkansas. Interstate 540 (I-540) defines the eastern boundary, Highway 412 defines the southern boundary, and the Northwest Arkansas Regional Airport defines the northern and western boundaries of the study area. The Cities of Elm Springs, Cave Springs, and Healing Springs are located within the study area, as well as portions of Tontitown, Lowell, and Springdale.

This area of northwest Arkansas is an area of rolling hills, rivers, creeks, springs, and lakes. It is located on the western edge of the Eastern Deciduous Forest. The climate of the area is generally represented by relatively warm summers and mild winters, and is mainly continental, although warm, humid maritime air from the Gulf of Mexico covers the area at frequent intervals. Winters are relatively free of severe cold, although lows below zero degrees Fahrenheit (-18 degrees Celsius) can occur in January. Snowfalls average eight to nine inches (20 to 23 centimeters) per year. Precipitation is fairly well distributed throughout the year and averages nearly forty-five inches (114 centimeters) per year, with spring being the wettest season.

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### **Socioeconomic and Demographic Characteristics**

#### **General Description of Socioeconomic Study Area**

The socioeconomic study area is that geographic area which would be expected to experience both direct and indirect socioeconomic impacts from a major development such as the realignment and improvements proposed for the Intermodal Access Road to

the Northwest Arkansas Regional Airport. For the purpose of this study, the *socioeconomic study area* is comprised of Benton and Washington Counties, in the northwest corner of Arkansas, which is larger than the Study Area defined for identification of physical impacts. These two counties are within the Fayetteville-Springdale-Rogers (F-S-R) Metropolitan Statistical Area (MSA). The area is characterized by wooded hills and grassy uplands crossed by many streams.

This socioeconomic study area is rural to semi-rural, though several urban centers are in or near the study area. The major communities include Fayetteville, Springdale, Rogers, Bentonville, and Siloam Springs. Cave Springs is a smaller city with a population of just over 1,000 and in close proximity to the Airport and the proposed Intermodal Access Road. A smaller town, Highfill, is also very close to the Airport and located near the proposed Intermodal Access Road. The socioeconomic study area contains many other small towns and communities.

The following description of socioeconomic conditions in this study area is based on available 2000, 1990, and 1980 U.S. Census data. Data from various state and local sources and published materials were also used.

### Current Population and Trends

The Northwest Arkansas Regional Airport EIS/Final Report, issued in June 1994, noted that this study area population had grown at a greater rate over the decades of 1970-1980 and 1980-1990 than had that of the state as a whole. During those two decades, the region grew by 40% between 1970 and 1980 and by 18% between 1980 and 1990. At the time of the 1990 Census, Washington County had more residents than Benton County; however, during the decade of the 1990s, population in Benton County grew at a greater rate than its neighboring county. In 1990 the region's population amounted to 9% of the state's total population.

Between 1990 and 2000, the population in Benton County grew by 57%, while that of Washington County experienced a growth rate of 39%. Overall, the region grew by 48%, significantly greater than the state growth of just under 14%. During this decade, the most dramatic population change was the increase in persons of Hispanic origin. In Benton County, the Hispanic population jumped from 1.4% to 8.8% of the population and in Washington County from 1.3% to 8.2% of the population. In 2000, the region's population was approximately 12% of the total state population.

Table C1  
**NORTHWEST ARKANSAS REGION TOTAL POPULATION**  
*Northwest Arkansas Regional Airport Access Road DEIS*

| <b>State/County/City</b> | <b>All Persons<br/>1980</b> | <b>All Persons<br/>1990</b> | <b>All Persons<br/>2000</b> |
|--------------------------|-----------------------------|-----------------------------|-----------------------------|
| State                    | 2,286,455                   | 2,350,725                   | 2,673,400                   |
| Benton County            | 78,115                      | 97,499                      | 153,406                     |
| Washington County        | 100,494                     | 113,409                     | 157,715                     |
| Fayetteville             | 37,985                      | 42,099                      | 58,047                      |
| Springdale               | 26,574                      | 29,941                      | 45,798                      |
| Rogers                   | 18,726                      | 24,692                      | 38,829                      |
| Bentonville              | 9,173                       | 11,257                      | 19,730                      |
| Siloam Springs           | 7,814                       | 8,151                       | 10,843                      |
| Cave Springs             | 429                         | 465                         | 1,103                       |
| Highfill                 | 73                          | 84                          | 379                         |

Source: CACI; U.S. Census 1980, 1990, 2000.

## Housing and Household Characteristics

**Housing Units.** At the time of the 1990 U.S. Census, the study area had a total of 88,700 housing units. Between 1980 and 1990, Rogers experienced a 37% increase in housing units. From 1980 to 1990, housing stock grew in Cave Springs by 100%, Fayetteville by 26%, Bentonville by 25%, Highfill by 22% and Siloam Springs by 3%.

During the 1990s the number of housing units increased by at least 30% in the counties and the cities listed above. Benton County experienced a 55% increase in housing units from 1990 to 2000 and Washington County increased 36%. Highfill reported a 336% increase in housing units and Cave Springs had a 125% increase from 1990 to 2000. Bentonville experienced a 75% increase during this decade. These significant gains in housing units reflected the population growth of the region and the increased demand for housing.

State and national housing vacancy rates remained stable from 1990 to 2000. The state had an approximate 11% vacancy rate in 1990 and in 2000, which was slightly higher than the national average of 10% and 9%, respectively. Benton County's vacancy rate remained the same from 1990 to 2000, at 9%. Washington County experienced a drop in vacancy rate during the 1990s, from 8% to 6%.

In 1980, Benton County reported 89% of occupied housing units in the County as owner-occupied. By 1990, only 66% of the total occupied housing units in Benton

County were owner-occupied, and declined again to 65% in 2000. In 1980, Washington County reported 54% of the occupied housing units as owner-occupied. The ownership rate for occupied units in Washington County increased in 1990 to 56%, but stabilized at this rate through the 1990s. In Cave Springs, 61% of total housing units were owner-occupied in 1990, which increased to 82% in 2000. Owner-occupied housing accounted for 74% of total housing units in Highfill in 1990 and 69% in 2000.

Table C2  
**NORTHWEST ARKANSAS REGION HOUSING CHARACTERISTICS (in Thousand's)**  
*Northwest Arkansas Regional Airport Access Road DEIS*

| County/City       | Total Number<br>Housing Units |       |       | Occupied<br>Housing Units |       |       | Vacant Housing Units |       |      |
|-------------------|-------------------------------|-------|-------|---------------------------|-------|-------|----------------------|-------|------|
|                   | 1980                          | 1990  | 2000  | 1980                      | 1990  | 2000  | 1980                 | 1990  | 2000 |
| Benton County     | 32.2                          | 41.4  | 64.3  | 28.6                      | 37.6  | 58.21 | 3.6                  | 3.9   | 6.07 |
| Washington County | 38.5                          | 49.3  | 64.3  | 36.1                      | 45.4  | 60.15 | 2.4                  | 4.0   | 4.18 |
| Bentonville       | 3.6                           | 4.5   | 7.9   | 3.4                       | 4.3   | 7.46  | 0.2                  | 0.2   | 0.47 |
| Fayetteville      | 14.9                          | 18.8  | 25.49 | 14.0                      | 16.9  | 23.80 | 0.9                  | 1.8   | 1.67 |
| Rogers            | 7.5                           | 10.3  | 14.8  | 7.0                       | 9.7   | 14.01 | 0.5                  | 0.6   | 0.83 |
| Siloam Springs    | 3.1                           | 3.2   | 4.2   | 2.8                       | 3.1   | 3.89  | 0.3                  | 0.1   | 0.33 |
| Springdale        | 10.2                          | 12.0  | 17.0  | 9.6                       | 11.4  | 16.15 | 0.6                  | 0.6   | 0.81 |
| Cave Springs      | 0.1                           | 0.2   | 0.45  | 0.1                       | 0.2   | 0.42  | 0.01                 | 0.01  | 0.03 |
| Highfill          | 0.032                         | 0.039 | 0.17  | 0.03                      | 0.035 | 0.14  | 0.002                | 0.004 | 0.02 |

Source: CACI; U.S. Census 1980, 1990, 2000

**Housing Values.** Residential building permits in Benton County in 1999 numbered 1,196, at a value of just under \$140 million. From 1990 to 1999, residential building permits averaged 1,075 a year in Washington County. The volume of these building permits represents a sizeable increase in the total housing stock in the county during that period.

Median housing values of owner-occupied units continued to increase over 50% from 1980 to 2000. Median housing values in Benton and Washington Counties were in the high \$50,000's in 1990. Both counties had over 60% increases in the median value from 1990 to 2000, reporting at \$94,800 for Benton County and \$90,100 for Washington County. These figures are over \$18,000 higher than the state national median home value for 2000. The national median value for owner-occupied units was \$30,000 over the median value for Benton County and \$25,000 over the median values for Washington County. In 1990, Cave Springs and Highfill had significantly lower median values of owner-occupied housing compared to the county and the other major cities of

the county. In 2000, Highfill had the lowest median housing unit value and rent when compared to surrounding towns and cities. Conversely, the Cave Springs median housing unit value escalated 191% from \$35,417 in 1990 to \$103,000 in 2000.

During the 1990s, median monthly rent for occupied units increased over 79% in Benton and Washington Counties. Benton County experienced an 85% increase in the median rent to \$528 in year 2000. Washington County reported \$490 as the median rent in 2000, up from \$274 in 1990. The median rent for Cave Springs and Highfill remained below the average median rent in the county and surrounding towns.

Table C3  
**NORTHWEST ARKANSAS REGION SELECTED HOUSING CHARACTERISTICS, 2000**  
*Northwest Arkansas Regional Airport Access Road DEIS*

| <b>County/City</b> | <b>Owner Occupied<br/>Units</b> | <b><sup>1</sup>Median<br/>Values (\$)</b> | <b><sup>1</sup>Median<br/>Rent (\$)</b> |
|--------------------|---------------------------------|-------------------------------------------|-----------------------------------------|
| Benton County      | 33,120                          | 94,800                                    | 528                                     |
| Washington County  | 26,641                          | 90,100                                    | 490                                     |
| Fayetteville       | 8,875                           | 100,300                                   | 480                                     |
| Springdale         | 8,615                           | 87,500                                    | 505                                     |
| Rogers             | 8,206                           | 91,700                                    | 535                                     |
| Bentonville        | 4,438                           | 91,200                                    | 545                                     |
| Siloam Springs     | 1,901                           | 78,600                                    | 458                                     |
| Cave Springs       | 237                             | 103,000                                   | 473                                     |
| Highfill           | 27                              | 49,300                                    | 371                                     |

<sup>1</sup>Based on specified owner-occupied housing units and specified renter-occupied housing units paying cash rent  
**Source:** U.S. Census 2000 SF3; <http://factfinder.census.gov/>; Accessed on March 1, 2006.

**Households.** In 1990, the total number of households in Benton and Washington Counties was 80,927, representing an increase of 25% over the total households in 1980. By the year 2000, the combined number of households in Benton and Washington counties had grown to 302,930. The decade brought a significant increase in households, a growth of 274%.

As in the rest of the United States, household size had decreased in Arkansas for over three decades. The average household size in Arkansas in 1990 was 2.57 persons; in Benton and Washington Counties it was 2.55 and 2.52 persons per household, respectively. Of the cities and towns in the area studied in 1990, Bentonville, Springdale, and Cave Springs had households larger than the state average, while Fayetteville and

Highfill had the smallest household sizes. The number of persons per household also grew during the 1990s, from 2.535 persons in 1990 to 2.625 in 2000.

Table C4  
**NORTHWEST ARKANSAS REGION HOUSEHOLD CHARACTERISTICS**  
*Northwest Arkansas Regional Airport Access Road DEIS*

| County/City    | Number of Households |        |        | Persons Per Household |      |      |
|----------------|----------------------|--------|--------|-----------------------|------|------|
|                | 1980                 | 1990   | 2000   | 1980                  | 1990 | 2000 |
| Benton County  | 28,622               | 37,555 | 58,212 | 2.68                  | 2.55 | 2.63 |
| Washington Co. | 36,072               | 43,372 | 60,151 | 2.63                  | 2.52 | 2.62 |
| Fayetteville   | 13,968               | 16,894 | 7,458  | 2.32                  | 2.26 | 2.65 |
| Springdale     | 9,635                | 11,432 | 420    | 2.72                  | 2.59 | 2.63 |
| Rogers         | 6,993                | 9,705  | 23,798 | 2.61                  | 2.31 | 2.44 |
| Bentonville    | 3,407                | 4,266  | 144    | 2.66                  | 2.59 | 2.63 |
| Siloam Springs | 2,825                | 3,052  | 14,005 | 2.53                  | 2.45 | 2.77 |
| Cave Springs   | 142                  | 170    | 3,894  | 2.82                  | 2.74 | 2.78 |
| Highfill       | 29                   | 35     | 16,144 | 2.52                  | 2.4  | 2.84 |

Source: CACI; U.S. Census 1980, 1990, 2000

## Income

In 1999, per capita income in Benton County was \$19,377, the second highest county per capita income in the state. Washington County's per capita personal income was \$17,347 in 1999. These amounts were greater than the state's average per capita income of \$16,904, but less than that of the U.S. (\$21,587).

Median household income in 1999 in Benton County was \$40,281 and \$34,691 in Washington County. The 1999 figures represent an increase in the annual median household income of 50% or more from 1989 to 1999. The 1999 figures are less than the median household income for the United States (\$41,994) in 2000, but greater than the median household income in Arkansas (\$32,182).

In 1989, 26% of total households in Benton County were estimated to have had incomes below \$15,000 and in Washington County, the estimate was 30%. These percentages decreased in 1999 to 13% and 19%, respectively. In 1999, Arkansas had 22% of households earning incomes below \$15,000 a year, well above the national average of 16%.

Table C5

**NORTHWEST ARKANSAS REGION MEDIAN ANNUAL HOUSEHOLD INCOME: 1979, 1989, 1999***Northwest Arkansas Regional Airport Access Road DEIS*


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| State/ County     | 1979     | 1989     | % Change<br>1979-1989 | 1999     | % Change<br>1989-1999 |
|-------------------|----------|----------|-----------------------|----------|-----------------------|
| State of Arkansas | \$12,214 | \$21,147 | 73%                   | \$31,182 | 47%                   |
| Benton County     | \$13,930 | \$26,021 | 87%                   | \$40,281 | 55%                   |
| Washington County | \$12,800 | \$23,124 | 81%                   | \$34,691 | 50%                   |

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**Source:** U. S. Census 1980, 1990, 2000. <http://www.census.gov/hhes/income/histinc/county/county1.html>;  
[http://factfinder.census.gov/home/saff/main.html?\\_lang=en](http://factfinder.census.gov/home/saff/main.html?_lang=en); Accessed March 2, 2006.

**Note:** Income is in actual dollar values for the respective year.

## Employment Characteristics

The labor force in Benton and Washington Counties has increased at a steady pace from 1980 to 2000. In Benton County the labor force increased by 57% between 1990 and 2000. Washington County showed a 34% increase in its total labor force during that decade. The Arkansas Department of Workforce Services (DWS) reports that the total employment for 2000 was 74,500 for Benton County, and 79,600 for Washington County. Total employment in Washington County grew by an annual employment growth rate of 4% between 1990 and 1998, which was a higher rate than for the state or nation for the same period.

From 1980 through 2000, Benton and Washington Counties have sustained unemployment rates lower than that of the state. Unemployment rates in the study area dropped over 20% from 1990 to 2000. The DWS reports that study area unemployment rates declined to between 3.1 and 3.9% from 1980 to 1990. Unemployment continued to decrease in 2000, as stated in the September 2000 edition of "BusinessLink", which reported an unemployment rate of 2.2% in the MSA, reflecting the overall prosperity of the region and of the nation during the 90s. The early 2000s saw an economic downshift, which is reflected in Arkansas' 2005 unemployment rate of 4.9%. Fortunately, Benton and Washington Counties fared this economic change rather well, as the unemployment rate in 2005 for the counties hovered between 2.8% to 3.1%.

Table C6

**NORTHWEST ARKANSAS REGION EMPLOYMENT CHARACTERISTICS***Northwest Arkansas Regional Airport Access Road DEIS*

| State/County      | Total Labor Force<br>In Thousands |         |                   | Total Employed in<br>Thousands |         |                   | Unemployment Rate |      |                   |
|-------------------|-----------------------------------|---------|-------------------|--------------------------------|---------|-------------------|-------------------|------|-------------------|
|                   | 1990                              | 2000    | 2005 <sup>1</sup> | 1990                           | 2000    | 2005 <sup>1</sup> | 1990              | 2000 | 2005 <sup>1</sup> |
| Arkansas          | 1,125.9                           | 1,256.1 | 1,359.9           | 1,049.8                        | 1,203.4 | 1,297.2           | 6.8%              | 4.2% | 4.9%              |
| Benton County     | 48.8                              | 76.7    | 98.8              | 47.1                           | 74.5    | 96.0              | 3.6%              | 2.8% | 2.8%              |
| Washington County | 61.1                              | 82.0    | 101.8             | 58.9                           | 79.6    | 98.7              | 3.7%              | 2.9% | 3.1%              |

**Source:** Labor Market Info – Local Area Profile, Arkansas Department of Workforce Services, 2006, <http://www.discoverarkansas.net/cgi/databrowsing/localAreaProQSSelection.asp?menuChoice=localAreaPro>, Accessed March 7, 2006.

**Note:** <sup>1</sup>Figures are the median of 2005 monthly totals.

## Occupations

Bureau of Economic Analysis (BEA) 1998 reports indicate that retail trade, services, and the FIRE (finance, insurance, and real estate) sectors showed growth in employment in the 1990-1998 period, while manufacturing employment declined at the same time. Retail services grew at a rate of 7.6% from 1990 to 1998 in Benton County. During the same period, manufacturing grew by only 1.1%. By 1998, manufacturing employment represented only 20% of total employment in Benton County. Also for that period, growth rates in Washington County were comparable, though smaller.

By the end of the year 2000, retail trade accounted for about 21,800 employees in Benton County, where Wal-Mart is the largest employer. At the same time in Washington County, retail trade businesses employed approximately 16,390 persons.

The Third Quarter 2000 Covered Employment and Earning Report<sup>1</sup>, prepared by the DWS, reports Washington and Benton County's business patterns. In that quarter, of a total covered employment of 147,222 in both counties, Retail Trade (26%) had more covered employment than Manufacturing (24%), Services (20%), Transportation and Other Public Utilities (7%) and Local Government (7%, includes both State and Local government). The Construction industry employed 5% of the covered employees, while 4% of covered workers were in the Wholesale Trade industry and in Finance, Insurance and Real Estate (FIRE) industries.

<sup>1</sup> The Third Quarter 2000 report was used because the DWS revised the industry groups in 2001 to match the North American Industry Classification System and the 2000 groups are comparable to 1990 data.

The DWS released long-term employment projections from 2002 base employment through 2012 and ranked the fastest growing occupations in the Northwest Arkansas region. All of the top five growth occupations have an estimated growth rate of over 60%. Three of the top five fastest growing occupations for Northwest Arkansas are in the medical field and include medical assistants, medical records and health information technicians, and physician assistants. The other two occupations in the top five fastest growing occupations are manufactured building and mobile home installers and environmental science and protection technicians.

The DWS also estimated annual job openings for each occupation in Northwest Arkansas. The top five occupations, ranked by the estimated job openings (number of annual openings noted in parentheses) include: office and administrative support (712); sales and related occupations (540); education, training and library (429); and transportation and material moving (413).

Table C7  
**NORTHWEST ARKANSAS REGION EMPLOYMENT BY INDUSTRY**  
*Northwest Arkansas Regional Airport Access Road DEIS*

| Industry (SIC)                   | Benton Co.         |                      | Washington Co.     |                      |
|----------------------------------|--------------------|----------------------|--------------------|----------------------|
|                                  | 1990               | 2000,3Q <sup>1</sup> | 1990               | 2000,3Q <sup>1</sup> |
| Total Employees                  | 51,708             | 69,626               | 59,917             | 77,596               |
| Contract Construction            | 1,736              | 3,111                | 2,642              | 3,961                |
| Manufacturing                    | 16,549             | 17,169               | 15,552             | 18,232               |
| Transportation, Public Utilities | 3,077              | 4,439                | 4,744              | 5,596                |
| Wholesale/Retail Trade           | 15,605             | 23,888               | 14,264             | 20,081               |
| Finance, Insurance, Real Estate  | 2,165              | 2,561                | 1,873              | 2,784                |
| Services                         | 7,664              | 12,449               | 11,666             | 17,086               |
| State/Local Government           |                    | 4,813                |                    | 8,907                |
| Other Non-Manufacturing          | 4,912 <sup>2</sup> | 1,097                | 9,176 <sup>2</sup> | 948                  |

Source: Arkansas Employment Security Department, 1993, 2000

<sup>1</sup>Third Quarter, Year 2000, average of 3 months

<sup>2</sup>1990 data include 1990 state/local government employment

## Business and Industry

The Northwest Arkansas region is a center for production, distribution, and trucking. The world's largest retailer, Wal-Mart, is headquartered in the study area and had sales over \$285 billion in fiscal 2005. In addition, Tyson Foods, the country's leading producer of poultry products and J.B. Hunt Transport, one of the largest publicly owned

providers of truckload freight services are located in the study area. In recent years, other major national and international companies have expanded and/or located new facilities in the area.

In Benton County, Retail Trade had a larger proportion of covered workers than the Manufacturing industry. The Services Industry followed fairly closely behind. Although Washington County had more total covered employees in the third quarter 2000, Benton County had more employees in Manufacturing. In fact, there were almost 1,000 more employees in Manufacturing in Benton County than in Washington County, belying its image as a more rural area. Even so, a larger proportion of Washington County's covered workers were in Manufacturing, followed closely by Services and then Retail Trade. The Services industry in Washington County employed over 4,600 more covered workers than Benton County in 2000.

The DWS projected industry employment from 2002 base data through 2012 for the Northwest Arkansas region. Projections reveal that the top five industries, ranked by estimated growth rates (noted in parentheses), include: couriers and messengers (91.6); electronics and appliance stores (65.2); store retailers (54.7); ambulatory health care services (52.0); and administrative and support services (51.8). When ranking the projected industry employment by total employment in the year 2012 (total 2012 employment is noted in parentheses), the top five industries are: Services – Providing (293,075); Goods – Producing (96,061); Trade, Transportation and Utilities (61,335); Education and Health Services (54, 145); and Manufacturing (46,615).

## Governance

The counties in Arkansas are governed by a Quorum Court, comprised of the County Judge and no fewer than nine nor more than fifteen Justices of the Peace (JP). The County Judge has administrative responsibility for the county. The Judge presides over the Quorum Court and has no vote, but does have veto power. While the Judge has some judicial powers, the operation of the county road system and maintenance of county property are the primary responsibilities.

County government is responsible for the administration of justice, law enforcement, real and personal property tax administration and public record keeping. The County may provide many other services.

The major revenue sources for the county are the ad valorem taxes levied on real and personal property, the sales tax, sale of bonds, and the imposition of fees, fines, license fees, etc., for services provided. The Benton County assessor's office reports a total of \$2.015 billion in assessed property values for 2000. In Washington County also, the total assessed property value has grown since 1990 at an annual average rate of 8.9%, for a

total value of \$1.472 billion in 2000. Most of this increase can be attributed to new construction.

Cities of 2,500 or more population are designated “first class cities;” those with 500 to 2,500 population are designated “second class cities.” Unincorporated towns have fewer than 500 residents. The cities are governed by one of several forms of municipal government. All towns and second-class cities have the Mayor-Council form of government. First-class cities may select one of the other forms. Most other cities and towns in the study area operate under the Mayor-Council form.

Cities are incorporated and have responsibility for public safety; they may provide many other services, such as in the areas of sanitation, water and sewer services, utilities, streets, parks and recreation, and various social and cultural services.

In addition to county and city or town governments, there are boards and districts providing various governmental services, including provision of utility services and public education. The study region is served by the Northwest Arkansas Regional Planning Commission.

## **Parks and Recreation**

Because of the natural environment in the area, outdoor recreation is a major activity and economic development generator. The many lakes, rivers, and hills provide appropriate settings for water sports, fishing, hunting, hiking, and camping. In addition to the numerous privately-owned recreational facilities, cities provide developed parks for use by their residents and visitors, as do state and federal agencies, including the U.S. Forest Service, U.S. Corps of Engineers, National Park Service, and Arkansas State Parks.

There are numerous parks and recreational facilities in the two-county area. Public schools in the two counties also provide recreational opportunities. State parks also provide important recreational opportunities. Beaver Lake State Park/Hobbs Estate Management Area, located in Benton County, is comprised of 11,644 acres (4,712 hectares). Two state parks are found in Washington County: Devil’s Den State Park, with 2,200 acres (890 hectares); and Prairie Grove Battlefield State Park, with 304 acres (123 hectares).

According to the Arkansas Department of Parks and Tourism (letter in Appendix C2), there are three recreation facilities owned and managed by government organizations located within the study area. The Elm Springs City Park is located in Elm Springs on Jay Roe Street. Lake Elmdale is an approximate 200-acre (81-hectare) lake managed by the Arkansas Game and Fish Commission, and is located roughly one mile (1.6

kilometers) east of Elm Springs. Cave Springs City Park is located in Cave Springs on Johnson Street.

A current listing of Wild and Scenic Rivers in Arkansas was obtained from the National Park Service, U.S. Department of Interior. There are no such designated rivers within the Study Area. The Department of Arkansas Heritage was contacted in reference to Natural Areas and species of concern. The Department responded identifying the same species of concern as other agencies and indicated that the only Natural Area in the project vicinity is the Cave Springs Natural Area, just east of the community of Cave Springs adjacent and north of Highway 264 (see letter in Appendix C2).

## Education

According to the 2000 U.S. Census, Arkansas lagged the nation in the percent of the total population that completed high school or completed college. Benton and Washington Counties outpaced the state with the percent of population completing these educational goals, which were similar to the national figures. Approximately 80% of the population of Washington County completed high school and about 25% had a college degree. Eighty percent of the population completed high school in Benton County. Only 20% completed a college program in Benton County, which was 4% lower than the national average.

In 2004, approximately 30,667 students were enrolled in public schools within Washington County. In Benton County, there were 30,421 students enrolled in public schools during 2004. In the 1999-2000 school year, sixteen school districts served the student population of the two counties, seven districts in Benton County and nine in Washington County. In addition to the public school districts, there are 14 private schools that provide elementary and/or secondary education.

The main campus of the University of Arkansas system is located in Fayetteville on a 420-acre (170-hectare) campus. This campus has had student enrollment exceeding 14,000 for every year since 1990. It is the largest single employer in Fayetteville. In Fall 2004, student enrollment was 17,326. John Brown University, a private Christian institution with 1,914 students, is located in Siloam Springs. Northwest Arkansas Community College, located in Bentonville, is the third largest two-year college in Arkansas with 5,467 students. Remington College, with over 200 students, is located in Fayetteville. Northwest Technical Institute, a state supported technical training institution with approximately 900 students, is located in Springdale. Other educational experiences are provided in the study area by several business, industrial, and technical schools, most of which are operated by the private sector.

## Cultural Resources

The study area is rich in cultural resources. From the early days of Native American life, to the Civil War battles, to the period of settlement by Italians and other Europeans, the area has a diverse cultural heritage. Many community fairs and festivals celebrate aspects of this heritage.

A variety of museums and historical sites provide education and interest to visitors and area residents. Among these are the Arkansas Air Museum, Walton Arts Center, and the University of Arkansas's Fine Arts Center in Fayetteville; the Shiloh Museum and the Arts Center of the Ozarks in Springdale; War Eagle Cavern near Rogers; the Pea Ridge National Military Park and the Civil War Cave near Bella Vista; the Wal-Mart Visitors Center in Bentonville; and in Rogers, the Little Theatre and the Historical Museum. Future visitors and area residents will be able to enjoy the Crystal Bridges Museum of American Art in Bentonville, which is planned to be both a museum and cultural center.

## Transportation

The study area is served by several major highways; I-540, U.S. Highway 71, and State Highways 112, 59, and 265, serve north-south vehicular traffic. East-west highways include U.S. Highways 412 and 62, and State Highways 12, 16, 72, 102, and 264.

Regular passenger train service is no longer available in the study area, although the AR-MO Railroad provides excursion passenger service. Freight service is available.

The new Northwest Arkansas Regional Airport provides commercial service passenger flights, including jet service, and also accommodates freight traffic. Some air passenger, general aviation, and/or freight traffic, is accommodated by Drake Field in Fayetteville and other public airports in Springdale, Rogers, Bentonville, and Siloam Springs.

## Health and Medical Care Services

A wide range of health and medical services are available in Benton and Washington Counties, including both public and private hospital facilities, outpatient surgery centers, and home health-care services. Northwest Health System, which provides health care throughout the region, includes three community hospitals, Northwest Medical Center in Springdale, Bates Medical Center in Bentonville and Willow Creek Women's Hospital in Johnson, seven family care clinics, a center for women's services, and two senior health centers, along with home healthcare services.

Additional facilities include the Washington Regional Medical Center, which completed a new hospital complex in 2003, the VA Medical Center in Fayetteville, the NW Arkansas

Radiation Therapy Institute in Springdale, St. Mary's Hospital in Rogers, the Willow Creek Women's Hospital in Johnson and the Lowell Medical Center. The region offers 20 nursing homes and residential care facilities.

## Emergency Services

Emergency services in the study area are provided by both local and county-level entities. Given the rural nature of much of the area, a significant amount of the service is volunteer-based. In addition to the Sheriff's Department, there are 12 municipal police departments, 5 fire departments and 20 volunteer fire departments in Benton County.

Emergency ambulance and medical care in Benton County is available from the Bella Vista, Bentonville, Rogers, and Siloam Springs Fire Departments, the Pea Ridge Police Department, the Elk River Ambulance Service in Gravette, the Air Evac Lifeteam in Springdale, and the Volunteer Ambulance Service of North East Benton County in Garfield.

Washington County contains 9 police departments, in addition to the County Sheriff's Department. Lincoln, Prairie Grove and Farmington all have fire departments. There are also numerous volunteer departments in the county. Emergency medical service in Washington County is available through the Central EMS.

## Social Environment

Since 1990, the region has grown more urban, with more than half the population living in the five largest cities. By 1999, only 40% resided in smaller communities and rural areas. Even with more urbanization, social life centers on the family, church, and community. Many families have lived in the same houses or on the same land for several generations. In addition to these "old-timers," many newcomers have moved to the area to seek employment, enjoy its beautiful natural resources and its small-town atmosphere. Numerous retirees have settled in the area because of its quality of life, the scenery, the recreational opportunities and its relatively low cost-of-living.

The area has experienced growth in recent years and most residents have welcomed the economic support that growth has given the area. Some others see the growth as a mixed blessing, not wishing to experience the changes in their lives that they fear growth will bring. Communities also have an attitude that calls for protection of the natural beauty and resources of the area, a significant appeal to residents and visitors.

The study area is one where neighbors know each other, church members look after each other, and each small town is like an extended family to its residents.

Much of the growth in this area has occurred in the cities, although new residential growth during the 90s was strong in the suburbs. In these large and small cities, growth has brought business development and expansion. Numerous business services are provided in these communities. Community services and public facilities have been added to accommodate the needs of the larger population. Residents of these cities generally see their communities as places of opportunity. They tend to view population and economic growth in a more positive light than their more rural neighbors. Residents of the very small towns and more rural parts of the study area see their communities and area as “the last frontier.”

As noted earlier, the study area is comprised of moderate-sized cities, small towns, and rural areas. While commercial, educational, and cultural opportunities are present in the large communities, those opportunities are more limited in the small towns and rural areas. There, family relationships are paramount and the church is perhaps the single most important institution in a person’s life. The area surrounding the new Airport is distinctly rural in character and well recognized as such. Farms dot the area and many are reported as having been in the same family for several generations.

The communities closest to the new airport and the proposed improved roadway are Cave Springs, Highfill, Elm Springs, and Healing Springs, all of which are small in population. The Cave Springs town center is limited to approximately two blocks of commercial development. Highfill, for the most part, is a crossroads intersection with limited commercial development. However, Highfill has grown in area in recent years due to annexations. The residents of these two communities and surrounding areas tend to rely upon the cities of Bentonville, Rogers, and Springdale for much of their daily commerce, such as shopping, banking, and other business-related activities.

Participation in community social or civic activities appears to be minimal in these two small towns, aside from local church-related functions. There are no school facilities in either Cave Springs or Highfill; therefore, the school-age children attend schools in various locations outside their immediate community area.

The rural area can be characterized as one where residents are strongly satisfied with the area as it is. In an earlier study, residents were asked what they like best about the area. Almost uniformly, the respondents said that it was the isolation and absence of population.

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## Air Quality

The Federal Clean Air Act, as amended in 1990, requires states to have State Implementation Plans (SIP) to achieve established air quality goals. These air quality goals were established by the Environmental Protection Agency (EPA) in 1970 and are called the National Ambient Air Quality Standards (NAAQS). The Federal Clean Air Act requires that all areas achieve the standards for these pollutants.

The State of Arkansas has adopted ambient air quality standards identical to the federal standards. These standards have been established for the following pollutants: Carbon Monoxide (CO), Particulate Matter (PM<sub>10</sub>), Ozone (O<sub>3</sub>), Sulfur Dioxide (SO<sub>2</sub>), lead, and Nitrogen Oxides (NO<sub>2</sub>). Areas that exceed these standards are considered non-attainment areas and a plan must be developed to bring the area into compliance.

On November 6, 1991, the EPA released an updated list that identifies non-attainment areas. With the exception of West Memphis, the updated list indicates that all of the State of Arkansas is classified as being an attainment area for all pollutants listed in the NAAQS.

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## Noise

Noise has been defined as unwanted sound. Sound is technically described in terms of loudness (amplitude) and frequency (pitch). The standard unit of measurement of the loudness of sound is the Decibel (dB). Decibels are based on the logarithmic scale, which compresses the wide range in sound pressure levels to a more usable range of numbers. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud, and 20 dB higher is judged to be four times as loud, and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

The description, analysis, and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-weighted noise level to quantify noise impacts on humans and can be

divided into two categories: single event and cumulative. Single event metrics describe the noise levels from an individual event. Cumulative metrics average the total noise over a specific time period, which is typically 1 or 24 hours for community noise problems.

The Equivalent Noise Level (Leq) is a cumulative noise scale corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq can be measured for any time period, but for traffic noise it is measured for one hour. This one-hour noise level is the “energy” average of all the events and background noise levels occurring during the time period. All traffic noise levels in this analysis will utilize the one-hour Leq metric.

### **Current Noise Levels**

The existing ambient noise levels were measured at 16 receptor sites along the proposed corridor alignments and are included in Figure C1, entitled *NOISE MEASUREMENT LOCATIONS*. The noise measurements were used to determine the existing ambient noise levels and are representative of the existing noise environment. The noise study assessment for the Northwest Arkansas Regional Airport Intermodal Access Road can be found in Appendix C1.

Measurements of the ambient noise levels were made during the daytime hours between 10:00 a.m. and 6:00 p.m. These measurements were made on October 29, 2008. One 15-minute measurement was made at each site. The measurements were continued for a long enough period to insure that they were representative of the Leq for one hour. The measurement levels are presented in Table C8 and are presented in terms of the Leq average noise level, Lmax maximum noise level, and Lmin minimum noise level.

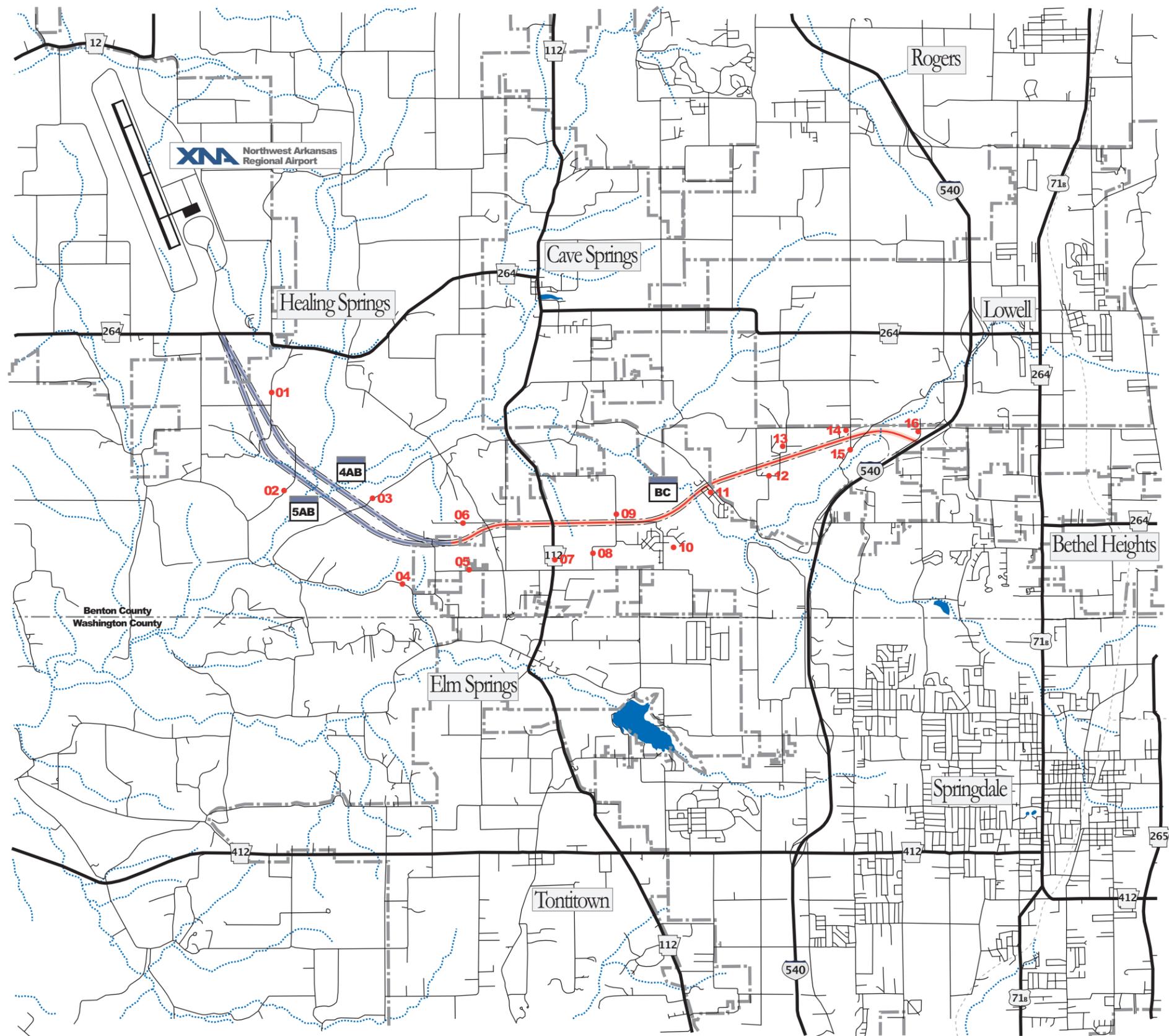


Figure C1 Noise Measurement Locations

- Noise Receptor Site
- Section AB
- Section BC
- Interstate Highway
- U.S. Highway
- State Highway
- 5 Intermodal Access Road Alternatives

**N**  
 Approximate Scale  
 1" = 6,000'

**Northwest Arkansas  
 Regional Airport  
 Intermodal Access Road  
 Environmental Impact  
 Statement**



Table C8

**EXISTING AMBIENT NOISE LEVELS***Northwest Arkansas Regional Airport Intermodal Access Road DEIS*

| Site | Location                     | Time     | Leq  | Lmax | Lmin | Noise Sources                                                                           |
|------|------------------------------|----------|------|------|------|-----------------------------------------------------------------------------------------|
| 1    | Holmes Road                  | 10:07 AM | 34.4 | 51.1 | 28.4 | Birds, Distant Dogs, Aircraft, Cows                                                     |
| 2    | Hayden Road                  | 10:55 AM | 40.7 | 53.1 | 33.4 | Birds, Insects, Rustling Leaves                                                         |
| 3    | Wager Road                   | 11:38 AM | 36.1 | 44.6 | 32.1 | Birds, Insects, Rustling Leaves                                                         |
| 4    | Snavelly Road                | 12:19 PM | 47.0 | 57.1 | 44.2 | Birds, Insects, Distant Saw, Distant Dog                                                |
| 5    | Marchant Road                | 12:58 PM | 42.0 | 52.6 | 37.4 | Farm Equipment, Occasional Local Traffic                                                |
| 6    | Fair Lane                    | 1:33 PM  | 40.4 | 51.9 | 33.1 | Machinery, Insects, Rustling Leaves, People Talking, Aircraft, Occasional Local Traffic |
| 7    | Highway 112                  | 2:42 PM  | 65.6 | 84.4 | 37.2 | Traffic on Main Street                                                                  |
| 8    | Grimsley Road                | 2:58 PM  | 49.4 | 64.7 | 38.5 | Insects, Frequent Local Traffic                                                         |
| 9    | West Miller Road             | 3:31 PM  | 37.7 | 43.4 | 34.1 | Birds, Insects, Cows, Distant Voices                                                    |
| 10   | South Miller Road            | 4:03 PM  | 38.1 | 43.3 | 33.7 | Birds, Insects, Rustling Leaves, Distant Traffic, Aircraft                              |
| 11   | Wagon Wheel Road             | 4:40 PM  | 47.2 | 57.8 | 42.3 | Insects, Occasional Local Traffic, Rustling Leaves                                      |
| 12   | Sharp Springs Road           | 5:10 PM  | 45.3 | 48.6 | 40.8 | Birds, Insects, Rustling Leaves, Distant Traffic, Occasional Local Traffic, Aircraft    |
| 13   | Zion Road                    | 11:46 AM | 50.7 | 61.8 | 46.1 | Insects, Rustling Leaves, Distant Traffic, Aircraft, Occasional Local Traffic           |
| 14   | Spring Creek Road            | 12:17 PM | 59.6 | 72.5 | 51.6 | Rustling Leaves, Distant Traffic (I-540), Dog, Occasional Local Traffic                 |
| 15   | Puppy Creek Road             | 12:42 PM | 57.1 | 63.0 | 53.2 | Rustling Leaves, Distant Traffic (I-540), Occasional Local Traffic, Aircraft            |
| 16   | Burrel Place at Conrad Place | 1:31 PM  | 61.6 | 67.0 | 57.0 | Insects, Traffic on I-540                                                               |

Source: Mestre Greve Associates, 2009.

The noise measurement levels in Table C8 are representative of the existing ambient noise environment and indicate that the existing residential areas within the project vicinity currently experience ambient Leq noise levels ranging from 34- to 66 dBA. The loudest Leq was measured at Site 7, which was located adjacent to Highway 112. Traffic noise from Highway 112 determined the noise level at Site 7. The next highest Leq levels were measured at Sites 14, 15, 16. The noise levels at these sites were higher due to their proximity to I-540. The lowest noise levels were measured at Sites 1, 3, 9, and 10, which are located away from existing noise sources and typical of a quiet agricultural community.

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## Land Use

A proper inventory of existing land uses within the study area, coupled with zoning patterns and future land uses, is important in an environmental planning effort so as to ensure land use compatibility with future roadway development. A general description of these elements for the study area follows.

Most of the study area was initially not within the city limits of any incorporated community, however, the rapid growth and development pressure in the area has led to recent annexations by Springdale that have encroached into the study area. Benton and Washington Counties do not have adopted zoning maps or ordinances. The entire study area is within the jurisdiction of the Northwest Arkansas Regional Planning Commission, which does not have land use control authority.

Existing land uses throughout the study area are dominated by agriculture, with poultry farming being widespread. Rural residential uses are spread throughout the study area, with the more concentrated residential developments located in or near Elm Springs, Cave Springs, Healing Springs, and Tontitown. However, medium density residential subdivision development is starting to occur in the recently annexed areas of Springdale in the center of the project area.

Small pockets of commercial development are also congregated in these communities. Tontitown has a moderate amount of commercial development along Highway 412. A rock quarry is located just west of Interstate 540 at the Wagon Wheel Road interchange. Several religious facilities of various denominations are located within the study area. These generalized land uses are plotted in Figure C2, entitled *CURRENT LAND USE DESIGNATIONS AS ZONED BY CITIES*, reflecting appropriately zoned land.

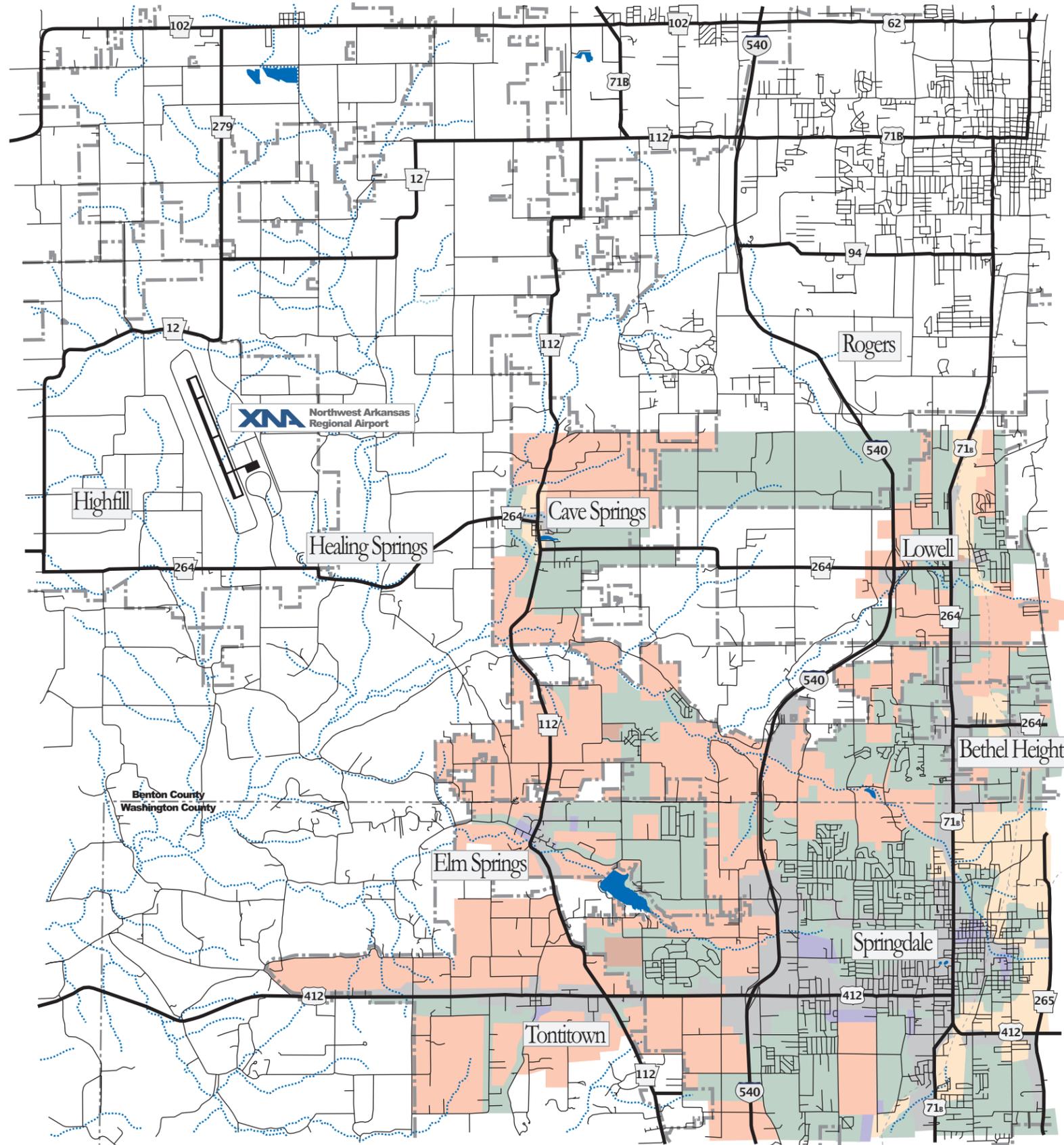


Figure C2 **Current Land Use Designations as Zoned by Cities**

- Commercial
- Industrial
- Mixed
- Public
- Residential
- Agricultural
- Undeveloped

**N**  
 Approximate Scale  
 1" = 8,500'

**Northwest Arkansas  
 Regional Airport**  
 Intermodal Access Road  
 Environmental Impact  
 Statement



## Future Land Use

This area of northwest Arkansas is experiencing rapid growth and continued development pressure. As stated previously, the Northwest Arkansas Regional Planning Commission does not have land use control authority. However, as the designated Metropolitan Planning Organization (MPO), the Commission works with all the communities, as well as Benton and Washington Counties, in assisting and coordinating land use plans, comprehensive plans and master street plans. In Arkansas, land use control authority rests with the local governments.

Springdale has recently updated its comprehensive land use plan, which reflects the selected alignment for the SNB. Low density residential is the dominant future land use designation for the areas surrounding the SNB. Regional commercial nodes are designated at the intersections of the SNB with Highway 112 and the NWARA Intermodal Access Road. Springdale's zoning classifications within the study area include Agricultural (A-1), Low Density Single Family Residential (SF-1) and Medium Density Single Family Residential (SF-2). The Springdale Zoning Map also shows the Selected alignment for the SNB.

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## Natural and Physical Environment

### Terrain, Physical Features, and Visual Environment

The study area is characterized by gently sloping to rolling hills, with the steeper slopes located near the many creeks scattered throughout the region. The highest elevation of 1,330 feet (405 meters) occurs close to the eastern edge of the study area adjacent to I-540 near Lowell. The lowest elevation of approximately 1,080 feet (329 meters) occurs at the point where Osage Creek leaves the study area to the southwest.

The study area lies within the Boston Mountains and in the Springfield Plateau, which with the Salem Plateau to the north, make up the Ozark Plateau Province. The Boston Mountains form the highest and most rugged features of the province. The terrain is classified as karst topography and has an unknown number of subterranean cavities.

The vegetation in the area is mostly prairie and pasture grasses used for agricultural purposes, with oak-hickory forest types on the slopes and mountains. These forest species are known for their fall color. The entire study area is high in visual quality due to the changing terrain patterns, the many streams in the area and the semi-rural to rural nature of large portions of the area compared to dense urban development in the eastern and southern sectors of the area.

The area receives between 40 and 60 inches (102 to 152 centimeters) per year in annual rainfall. There are seasonal variations, with most coming in the spring months. There are numerous springs throughout the region, many of which supply local drinking water. Generalized environmental constraints are indicated on Figure C3, *ENVIRONMENTAL CONSTRAINTS MAP*, on the following page.

Communities in the study area include Highfill, Healing Springs, Elm Springs, Lowell, and Bethel Heights. Bethel Heights and Lowell can be characterized as suburban communities, while Highfill, Healing Springs, and Elm Springs are characterized as rural communities. Virtually all the communities and much of the rural area are experiencing residential growth due to their proximity to the expanding metropolitan area. Continuing residential subdivision development is occurring near Miller Road, Carrie Smith Road, Wagon Wheel Road, and Puppy Creek Road. Additionally, a large quarry is also located within the project area west of I-540 near the Wagon Wheel Road interchange. A portion of the quarry may be visible from the Intermodal Access Road when completed, as will parts of the residential and commercial development.

As stated earlier, there is variety in the types of vegetation within the area, ranging from pasture to bottomland to ridgelines, adding visual diversity. There are scattered farm and ranch buildings, in addition to the communities. The visual quality and diversity of the area is appealing. There are no officially designated scenic areas in the study area.

## Geology and Soils

The Boone Formation, a thick sequence of interbedded limestone and chert, underlies the study area. The full Boone Formation is usually 350-390 feet (107-119 meters) thick, but a variable section of the upper part of the sequence has been removed by erosion. The Boone Formation is a principle source of drinking water in the rural areas of the region via water wells. Additionally, it contains abundant caves and other solution features both in the study area and elsewhere in northern Arkansas. No significant faults have been mapped in the area (see letter from Arkansas Geological Commission in Appendix C2).

The mineral resources known in and around the study area potentially include limestone, clay, sand, gravel, lead, zinc, and tripoli. Of these mineral resources, only limestone, sand, and gravel have deposits in abundance for commercial development. In fact, a rock quarry is located in the eastern segment of the study area, adjacent to I-540 and Wagon Wheel Road.

The study area contains three primary soil associations within Benton County and two primary soil associations in Washington County. The soil associations in Benton County

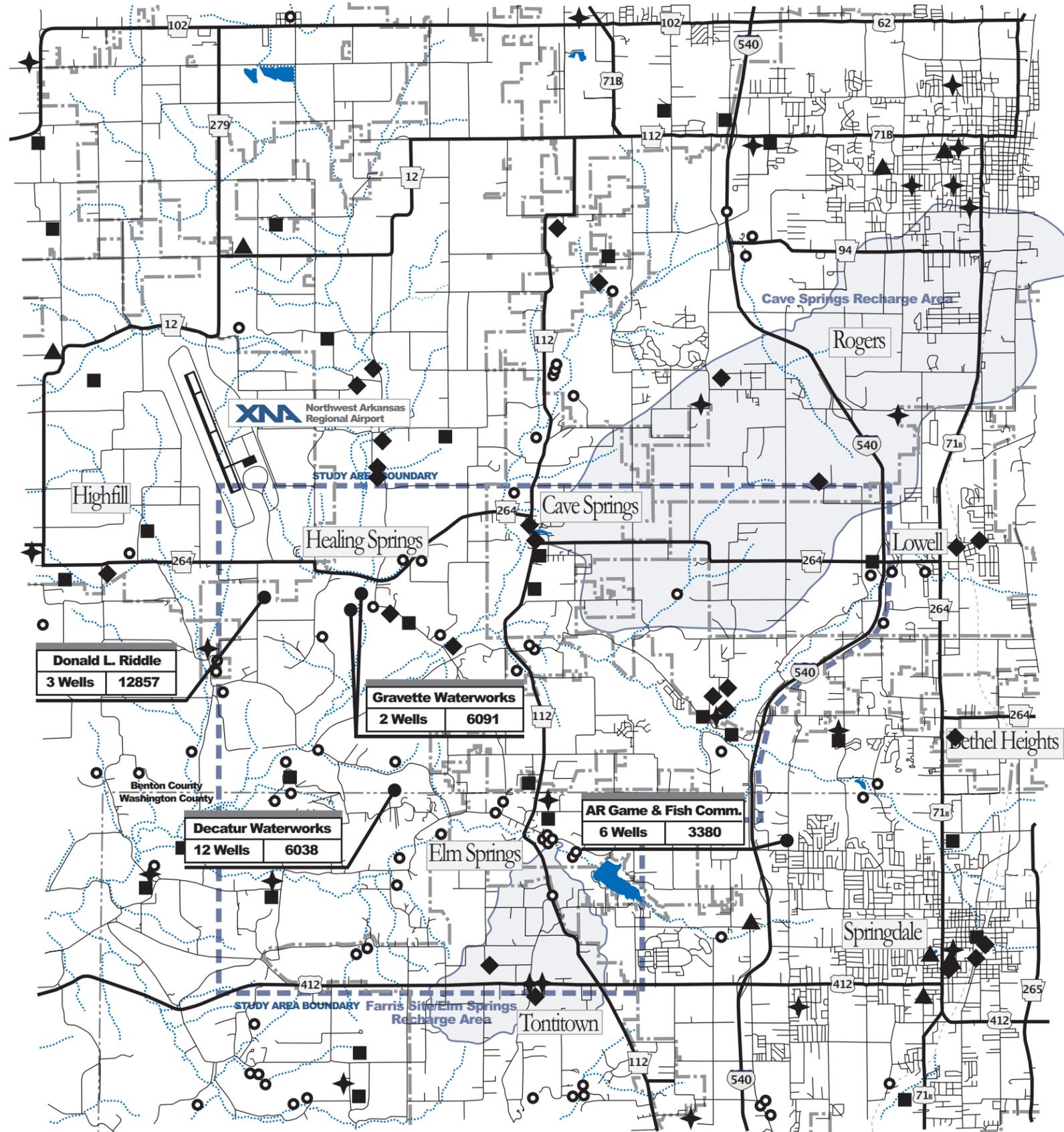


Figure C3 Environmental Constraints Map

**Legend**

- Spring
- ◆ Historic Site
- Cemetery
- ✦ Church
- ▲ School
- Surface Water Run-Off Recharge Area

| Owner of Well |        |
|---------------|--------|
| Quantity      | Well # |

|                         |       |
|-------------------------|-------|
| <b>Donald L. Riddle</b> |       |
| 3 Wells                 | 12857 |

|                            |      |
|----------------------------|------|
| <b>Gravette Waterworks</b> |      |
| 2 Wells                    | 6091 |

|                           |      |
|---------------------------|------|
| <b>Decatur Waterworks</b> |      |
| 12 Wells                  | 6038 |

|                                 |      |
|---------------------------------|------|
| <b>AR Game &amp; Fish Comm.</b> |      |
| 6 Wells                         | 3380 |

**N**  
Approximate Scale  
1" = 8,500'

**Northwest Arkansas  
Regional Airport**  
Intermodal Access Road  
Environmental Impact  
Statement



are the Clarksville-Nixa-Noark, the Tonti-Nixa-Captina, and the Secesh-Britwater-Captina. The Clarksville-Nixa-Noark association is somewhat excessively drained to moderately well drained, gently sloping to steep, deep and moderately deep, cherty soils on hills and ridges. The Tonti-Nixa-Captina association is moderately well drained, nearly level to moderately sloping, deep and moderately deep, loamy and cherty soils on ridges and broad uplands. The Secesh-Britwater-Captina association is well drained and moderately well drained, level to moderately sloping, deep, loamy soils on flood plains and terraces.

The two soil associations located within Washington County are the Clarksville-Nixa-Baxter and the Captina-Nixa-Picwick. The Clarksville-Nixa-Baxter association is cherty, deep and moderately shallow, moderately well drained to excessively drained, gently sloping to steep soils on hillsides and narrow ridges. The Captina-Nixa-Picwick association is silty and cherty, deep and moderately shallow, moderately well drained to well drained, nearly level to sloping soils.

## Farmland

The United States Department of Agriculture, Natural Resources Conservation Service was contacted concerning prime and unique farmlands. The Service responded that there are areas of Important Farmland which are in the project area that may be impacted (see letter in Appendix C2).

## Water Resources

The major water bodies in the study area are creeks and streams. Osage Creek is the largest of the creeks and flows in a general southwest direction from the north-central study area boundary to the western boundary. Little Osage Creek, which has been designated as an Ecologically Sensitive Waterbody under the Arkansas Department of Environmental Quality's Regulation No. 2, flows in a southerly direction to join Osage Creek at a point roughly three miles (4.8 kilometers) south of the Northwest Arkansas Regional Airport. Spring Creek flows from the eastern boundary of the study area in a westerly direction before joining Osage Creek in the north-central portion of the study area. Brush Creek flows from east to west in the southern portion of the study area. Cross Creek and Puppy Creek are smaller tributaries of Spring Creek that are located in the eastern segment of the study area. Numerous springs are also situated throughout the study area. Lake Elmdale is located approximately one mile (1.6 kilometers) east of Elm Springs in the southeastern corner of the study area.

## Surface Water Quality

The study area is located in Water Quality Planning Segment 3J of the Arkansas River Basin, as defined by the Arkansas Department of Environmental Quality. The waters within this segment have been designated as suitable for the propagation of fish and wildlife; primary and secondary contact recreation; and public, industrial, and agricultural water supplies. The total water quality planning segment contains 204 stream miles (328 kilometers). Approximately 139 stream miles (224 kilometers) were monitored and an additional 32 miles (52 kilometers) were evaluated by the Arkansas Department of Environmental Quality.

All of the assessed stream miles within this water quality planning segment supported the designated uses, with the following exceptions:

- 13.5 stream miles (22 kilometers) of Clear Creek did not meet the criteria for aquatic life use, primarily due to siltation and turbidity from agricultural sources; and
- 3 miles (5 kilometers) of Town Branch, a tributary of Little Sugar Creek, did not meet the criteria for drinking water use, primarily due to the discharge of nutrients from a municipal point source.

These two exceptions are not within the study area for the Intermodal Access Road.

Non-point sources that affect water quality in Segment 3J include the application of poultry waste products to pasture land, in-stream gravel removal, and road construction and maintenance.

The area is also located within the Ozark Highlands Ecoregion, which is noted for its mountainous terrain with steep gradients and fast-flowing, spring fed streams. A large percentage of the streams from within the Ozark Highlands Ecoregion are designated as Extraordinary Resources Waters.

## Groundwater Quality

The following aquifers, separated by confining layers, comprise the Ozark Plateau's aquifer system:

- The Springfield Plateau Aquifer is the shallowest aquifer, with an average water yield of 5 gallons per minute (gpm) [19 liters per minute (lpm)]. The aquifer is used primarily for domestic and livestock wells.

- The Ozark Aquifer is the principal source of groundwater in northern Arkansas. Typical water yields range from 100 to 300 gpm (380 to 1,140 lpm).
- The St. Francois Aquifer is the deepest aquifer in the Ozark Plateau's system. The St. Francois Aquifer is not used as a water source in the area because it is located at depths ranging from 1,500 feet (457 meters) to more than 4,000 feet (1,219 meters) below the surface.

The Springfield Plateau and Ozark Aquifers are listed as Class I aquifers in the Arkansas State Groundwater Quality Protection Strategy.

As stated above, the Ozark aquifer underlies much of the area and is the major source of groundwater in northwest Arkansas. Yields from wells utilizing this aquifer range from 100 to 300 gallons per minute (380 to 1,140 lpm), with some wells yielding up to 500 gallons per minute (1,900 lpm). The Springfield Plateau aquifer is overlaid by a karst topography, with many subsurface openings, sinkholes, caves and irregular subsurface openings into the aquifer. This formation is not only a source of domestic/agricultural water use but also home to federally listed threatened and endangered species (see Endangered/Threatened Species section). This formation has been studied extensively as it relates to these species, with additional study and evaluation specific to this assessment.

Karst is a landscape developed on a soluble bedrock in which appreciable groundwater flow occurs through solutionally widened openings in the bedrock. The term "water table" is familiar; the term commonly conveys the impression that the water table is a flat, continuous, and uniform boundary between the zone of saturation (where all voids are filled with water) and the overlying zone of non-saturation. However, the water table in karst areas (such as the study area) is not necessarily a flat, continuous, and uniform boundary. Instead, the water table is better visualized as an irregular, sometimes non-continuous, non-uniform boundary between the zones of saturation and non-saturation. Field observations in the region suggest that approximately 75% of the mean annual water yield from the study area will enter and pass through the groundwater system. Some of this water will enter the groundwater system through diffuse recharge. Diffuse recharge is the general and relatively slow seepage and percolation of recharge water toward the water table. However, much of the water will enter the groundwater system through localized recharge zones. Many of these zones are in valleys where they create losing streams. A losing stream is a surface stream which "loses" appreciable quantities of water to the groundwater system through discrete recharge zones. While the losing stream valleys are very important sources of groundwater recharge, discrete recharge zones also exist in upland areas. (Aley, 1992)

The quality of the subsurface water in this formation is directly related to the type of land use that is associated with recharge areas. The greatest potentials for contamination appear to be agricultural activities (animal waste) and septic tanks.

## Wetlands and Floodplains

The study area contains water bodies that fall under the regulatory jurisdiction of the U.S. Army Corps of Engineers, Little Rock District. These include Osage Creek, Little Osage Creek, Spring Creek, Brush Creek, Cross Creek, and Puppy Creek. These primary riparian systems are considered “waters of the U.S.” and subject to regulation (permitting) up to the plane of the ordinary high water mark.

## Wetlands

The U.S. Army Corps of Engineers *Wetlands Delineation Manual* (1987 Manual) (U.S. Army Corps of Engineers, 1987) defines wetlands as “Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands can include old creek or river channels, sloughs, swamps, bogs, ponded pasture areas, and seep areas. Three characteristics must be present for a wetland to exist. These are 1) the presence of hydric soils; 2) hydrophytic vegetation; and 3) wetland hydrology.” Any discharge of dredged or fill material into wetlands as a result of this project is subject to regulation under the Clean Water Act.

Wetlands that could potentially be crossed by each alternative corridor were initially identified using published data and mapping by local, state, and federal agencies. Published data and mapping included U.S. Fish and Wildlife Service NWI mapping, aerial photography, USGS topographic quadrangle mapping, county soil survey mapping, and county hydric soils listings.

An initial limited field reconnaissance of the Study Area that could be affected by the proposed Intermodal Access Road was conducted to verify the locations and interpretations of published data and mapping and to identify wetlands, if any, that did not appear in published information. The 1987 Manual was utilized for guidance to determine the locations of jurisdictional wetlands along the alternative corridors. Potential jurisdictional wetlands along the alternative corridors were also classified utilizing the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deep Water Habitats of the United States* (1979).

Although the project area includes the main channels and tributaries of Osage Creek, Little Osage Creek, Spring Creek, and Puppy Creek, the field reconnaissance did not

identify the presence of any jurisdictional wetlands within the approximate estimated right-of-way limits of any alternative corridor. Each alternative corridor would also cross several artificially created farm ponds that are primarily used to provide a source of drinking water for cattle. These farm ponds have been created either by diking/impounding soil around low-lying areas to hold water, or by excavating the ground surface and using the excavated material to create a berm around the area to hold water. None of these farm ponds are fed by stream channels or are hydrologically connected to other bodies of water. Therefore, these farm ponds are considered to be isolated waterbodies and are not wetlands or waters of the U.S. that are subject to the jurisdiction of the U.S. Army Corps of Engineers.

## Floodways and Floodplains

Floodplains are those areas subject to a 1% or greater chance of flooding in any given year, i.e., an area that would be inundated by a 100-year flood. The Federal Emergency Management Agency (FEMA) has established regulations for modifications to floodways and floodplains. The floodplains of the major drainages in the study area are vital in mitigating the passage of both perennial and extraordinary flood-level flows. Those areas designated Zone A are subject to inundation by the 100-year flood. Floodplain values may include fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

Upon review of the Flood Insurance Rate Maps (FIRMs) for Benton and Washington Counties, the potential encroachment into the Osage Creek 100-year floodplain is almost certainly unavoidable. The potential encroachment into the 100-year floodplain of other major drainage features within the study area includes Little Osage Creek, Spring Creek, and Puppy Creek. Figure C4 presents the 100-year floodplain and floodway locations for the project area.

## Biotic Communities and Endangered/Threatened Species

Washington and Benton Counties are, for the most part, rural in nature, with varied species of wildlife and vegetation. The area contains pasture lands, hardwoods, and pine forests, with many creeks and streams cutting their way through the region. The study area is located in the Central Hardwood Forest section of the Eastern Deciduous Forest, in the oak-hickory ecosystem. Typical tree species include various oaks (*Quercus* spp.), sweetgum (*Liquidambar styraciflua*), various hickories (*Carya* spp.), shortleaf Pine (*Pinus echinata*), ashes (*Fraxinus* spp.), elms (*Ulmus* spp.), black locust (*Robinia pseudoacacia*), black walnut (*Juglans nigra*), red maples (*Acer rubrum*), beech (*Fagus grandifolia*), and dogwood (*Cornus florida*). The south facing slopes usually contain more post oak-blackjack oak community, with the other slopes being dominated by the black oak-red oak-white oak

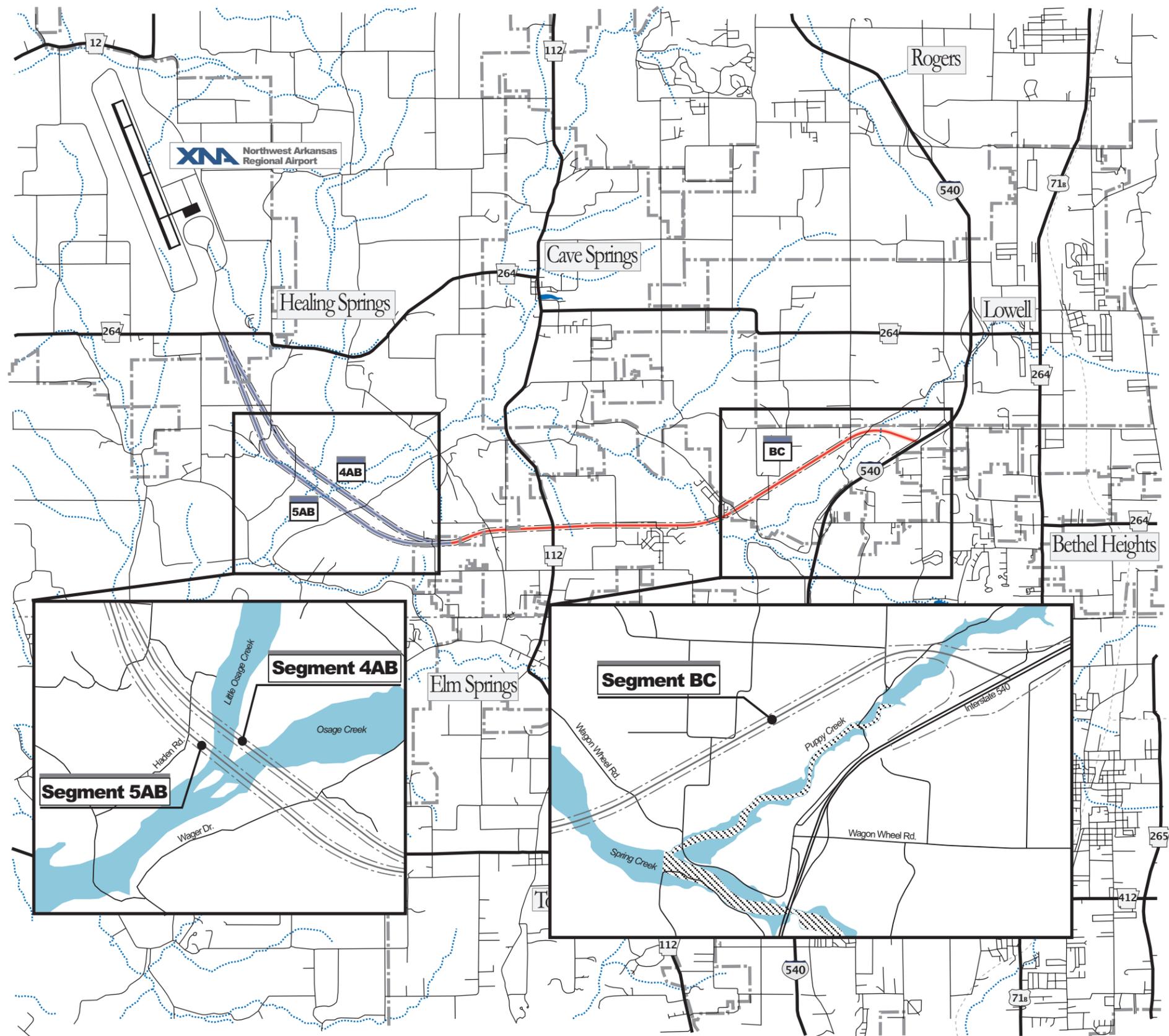


Figure C4 100-Year Floodplain/Floodway Map

-  Floodplain
-  Floodway
-  Section AB
-  Section BC
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  Intermodal Access Road Alternatives

**N**  
 Approximate Scale  
 1" = 6,000'

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 Regional Airport  
 Intermodal Access Road  
 Environmental Impact  
 Statement**



community. Stream bottoms are home to species requiring more moisture, including sycamore (*Plantanuse occidentalis*), silver maple (*Acer saccharinum*), willows (*Salis* spp.) and cottonwood (*Populus deltoids*).

Pastures are mostly converted from native to introduced grass species, usually tall fescue (*Festuca arundinacea*) or bermuda grass (*Cynodon dactylon*). It is common to find small wood lots or scattered trees providing shade for animals. Abandoned pastures usually transition to upland forest types if not converted to development. Transition species include ragweed (*Ambrosia* spp.), golden rods (*Solidago* spp.), asters (*Aster* spp.) and foxtail (*Setaria geniculata*).

The area is home to a diverse family of wildlife species that have been well documented (SNB FEIS, AHTD 2005). These species include those typically found in rural non-urban and urban fringe areas ranging from some big game species such as white tailed deer (*Odocoileus virginianus*) and black bear (*Ursus americanus*) to smaller fur bearing animals such as squirrels (*Sciurus niger* and *S. carolinensis*) and fox (*Vulpes vulpes* and *Urocyon cinerioargenteus*). Additional species include wild turkey (*Meleagris gallopova*), coyote (*Canis latrans*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), eastern cottontail rabbit (*Sylvilagus floridanus*), bobcat (*Felis rufus*) and mink (*Mustela vison*).

Various birds inhabit the area including types of wrens, warblers, thrushes, woodpeckers, robins, dove, and hawks. The great horned owl (*Bubo virginianus*), barred owl (*Stryx caria*), Cooper's Hawk (*Accipiter cooperii*), sharp-skinned hawk (*Accipiter striatus*) and red-shouldered hawk (*Buteo lineatus*) are found in the area. Typical songbirds such as sparrows, cardinals (*Cardinalis cardinalis*), meadow lark (*Sturnella magna*), and blackbirds inhabit the more open areas and urban fringes. In addition, there are various turtles, salamanders, and snakes throughout the area.

The numerous creeks and springs are home to several aquatic species ranging from macroinvertebrates to fish. The AHTD SNB FEIS references several sources that have identified such species in the study area. These include approximately 20 species identified by one study and over 60 by another. Typical species include catfish (*Ictalurus* sp.), bass (*Micropterus* sp.), sunfish (*Lepomis* sp.), darters (*Etheostoma* sp.), carp (*Cyprinus* sp.), and bullheads (*Ameiurus* sp.).

According to the U.S. Fish and Wildlife Service, there are a number of federally listed threatened or endangered species located within the study area. These include the threatened Ozark Cavefish (*Amblyopsis rosae*), and an endangered cave crayfish (*Cambarus aculabrum*) which are associated with the karst geology of the region, and three endangered bat species, the Ozark big-eared bat (*Plecotus townsendii ingens*), the Indiana bat (*Myotis sodalis*), and the gray bat (*Myotis grisescens*). A candidate species, the Arkansas darter (*Etheostoma cragini*) is known from Clabber Creek and Wilson Spring (see letters

from U.S. Fish and Wildlife Service, University of Arkansas, Arkansas Department of Environmental Quality, and Nature Conservancy, Appendix C2). The University of Arkansas letter and the Nature Conservancy letter both indicate that the study area for the Intermodal Access Road is within the recharge area of Cave Springs Cave, home to the endangered species. A smaller recharge area for Cave Springs Cave was identified in the Final Environmental Impact Statement for Highway 71 Relocation, Fayetteville-McKissick Creek; in 1979.

During the Scoping meetings, the Arkansas Nature Conservancy and representatives of the University of Arkansas Department of Biological Sciences noted that the recharge area for Cave Springs Cave was larger than previously documented in the 71 Relocation Final EIS and that Corridors 2 and 3 were located within the recharge area. In an effort to conclusively determine the southern boundary of the recharge area, an extensive groundwater tracing investigation was performed to determine the potential for adverse impact from the proposed project.

The main objective of the evaluation was to identify the recharge area of Cave Springs, which provides habitat to the largest known population of the Ozark Cavefish, a federally listed threatened species. Extensive dye tracing was completed as part of this study effort. The dyes were introduced in or near proposed alternative corridors to determine which groundwater systems might be impacted by a highway constructed in a particular corridor. The results have delineated the recharge area in which groundwater flows to Cave Springs plus all lands which contribute surface water runoff to areas where groundwater recharge contributes water to Cave Springs. This is indicated on Figure C3.

The issues of direct and indirect impacts on threatened or endangered species have been identified in previous FHWA/AHTD documents and studies. For example, the Highway 71 Relocation Fayetteville-McKissick Creek Final EIS addressed the recharge area of Cave Springs and the endangered species associated with the cave and recharge area. The FEIS states on page III-13 “Almost 4.5 miles (7.2 kilometers) of Arkansas Route 264 already exists within the recharge area for Cave Springs. Leaks and spills from accidents on the highway segment represent an existing hazard to the endangered species found in the Cave Springs Cave. Actions which increase the amount of hazardous materials transported on this highway segment will increase the hazard to the endangered species”. The highway segment identified in the referenced FEIS is located on an alignment that is identical to the alignment of a segment of Corridor 1. In addition, page III-16 of the same document states “Aley and the Fish and Wildlife Service Office of Endangered Species state that if the interchange at Highway 264 near Lowell is built, potential development in the recharge area of Cave Springs could precipitate secondary adverse impacts to the cave system. These secondary impacts would be significant only if the development exceeded 10% of the drainage area and continued to rely on septic tanks

for sewage disposal.” The recharge area of Cave Springs continues to be served by septic tank systems.

The U.S. Fish and Wildlife Service issued a Biological Opinion pursuant to Section 7 consultation on the Highway 71 EIS. The Service stated that the “project is not likely to jeopardize the continued existence of the gray bat. This opinion is based primarily on two key considerations: 1) The new highway will be located outside the Cave Springs recharge area, and 2) Information provided by FH(W)A setting forth the position that completion of the State Highway 264 interchange will not significantly increase the probability of ground water pollution within the Cave Springs recharge area.”

In 2005, a single cave crayfish (*Cambarus aculabrum*, no common name) discharged from an intermittent spring on private property during a storm flow period. This particular cave crayfish is known from only three other sites, and is federally listed as an endangered species. An investigation in 2005 and 2006 used ground water tracing methods to delineate the recharge area for springs hydrologically associated with the site, known as the Farris Site. Tom Aley of the Ozark Underground Laboratory conducted the testing and concluded that:

“One of the initial concerns that prompted this study was the possibility that the recharge area for the Farris Cave Crayfish Site would be crossed by the new Highway 412 Bypass and/or new Intermodal Access Roads to the Northwest Arkansas Regional Airport. The tracing work demonstrated that these highway corridors would not impact this population site.”

Therefore, the Elm Springs Recharge Area/Farris Site and the cave crayfish population (*Cambarus aculabrum*) are not of concern during the preparation of this DEIS.

The Arkansas Natural Heritage Commission indicates, in addition to the species listed by the U.S. Fish and Wildlife Service, that there are four species of state concern within the study area. These include the Ozark least trillium (*Trillium pusillum* var. *ozarkanum*), the ringed salamander (*Ambystoma annulatum*), the least darter (*Etheostoma microperca*), and the Ozark cave amphipod (*Stygobromus ozarkensis*). Additionally, the Arkansas Natural Heritage Commission indicates that the Cave Springs Cave Natural Area is located within the study area. This area is owned and managed by the Arkansas Natural Heritage Commission to protect its sensitive resources (see letter in Appendix C2).

## Historic and Archaeological Resources

Using data previously gathered from other studies (Northwest Arkansas Regional Airport EIS, VistaInfo NEPA Screen), there are nine historic sites and ten cemeteries located within the study area, although there are several grave sites in the area. The

historic sites are structures listed in the National Register of Historic Places. In addition, known archeological sites from these same sources were utilized, along with the historic sites and cemeteries, as avoidance control points during alternative development. Beyond the sites included here, other cultural resources that could be located within the study area are possible traditional sites recognized by Native American groups. Consultation with potentially affected Native American groups has been conducted by the Federal Highway Administration (see correspondence with the Cherokee and Osage tribes in Appendix C2).

Within the study area, there is a high potential for both prehistoric Native American, as well as historic Euroamerican, archeological sites. The numerous springs identified within the study area undoubtedly attracted considerable numbers of prehistoric and historic people, as did Osage Creek and its tributaries. There is a relatively high probability that wherever a proposed alternative crosses a stream, or is in close proximity to a spring, archeological resources will be present, although this does not mean that sites do not, or will not, occur away from water resources.

The Arkansas Ozarks have been inhabited for over 10,000 years, and based on recent archeological studies within this region, it is likely that the entire span of human occupation is represented. Several fairly large prehistoric archeological sites have been recorded within the study area, and local informants have reported other sites that have not yet been visited by the Arkansas Archeological Survey (AAS). Moreover, there is probably a fairly rich historic archeological record (including cemeteries) within the study area. The portion of the Ozarks within the study area attracted early nineteenth century Euroamerican settlers, and communities such as Healing Springs were more populous in the late nineteenth and early twentieth centuries than they are today. Many former buildings are now represented only as archeological sites.

A qualified archeologist conducted a Phase I survey of the final proposed corridor alignments to identify any such resources. The findings are presented in the *Environmental Consequences* chapter and the archeological references from the Archeology Report can be found in Appendix D2.

Additionally, there are several known cemeteries and individual grave sites that have been identified through previous studies, field investigations, public input, and consultation with the Rogers Cemetery and Benton County Preservation Group. These are shown on the Environmental Constraints Map. Known cemeteries within the immediate project area include the Elm Springs Cemetery, the Spring Creek Cemetery, and the Sharp Cemetery.

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## Infrastructure

### Water & Wastewater

Potable water supply systems within the study area consist of water distribution pipe systems of the cities and communities that are either within the study area, or join the study area. Springdale has a water intake structure located at the confluence of Osage Creek and Little Osage Creek that is a water intake that may be used in an emergency condition if required. Currently, no water treatment facilities are located within the study area. Most of the rural area is served by individual water wells for potable use and agricultural use. However, there is a rural water tower, owned by Washington Water Authority, which serves approximately 211 residents. The tower is located in the west central portion of the study area, west of Highway 112 in Benton County. No designated sole source aquifers are located within the study area.

The Safe Drinking Water Act of 1986 requires identification and protection of sole source aquifers and the establishment of wellhead protection areas. Wellhead protection areas are defined in the Arkansas Well Head Protection Program and can vary depending on specific well conditions and source water. The current Rules and Regulations Pertaining to Public Water Systems issued by the Arkansas Department of Health and Human Services require a horizontal distance (measured radially from the wellhead) ranging from 100 feet (30.5 meters) to one-half mile (0.8 kilometer) to be maintained between any public water supply well and any possible source of contamination or storm water runoff.

The proposed corridors will not impact any public water supply wells or associated wellhead protection areas. Three private water wells may be impacted in Corridor 5. If necessary, these wells will be plugged and abandoned in accordance with all applicable regulations. New wells will be installed on the same property, or the property will be connected to the nearest public water supply, whichever is more feasible.

The Beaver Water District, a surface water distribution system, provides domestic water to the cities of Bentonville, Fayetteville, Rogers, and Springdale. Some of these cities, in turn, supply treated water to adjoining small towns and communities, such as Lowell, Cave Springs, Tontitown, Farmington and Greenland. The Two Ton Water System, operated by Benton County/Washington County Rural Development Authority, provides domestic water through a surface water distribution system to Decatur, Gentry, Siloam Springs, Lincoln, and Prairie Grove, as well as several rural water districts in Benton and Washington Counties.

Most of the rural area is served by septic systems, with more urbanized areas utilizing a few sanitary sewer collection systems. There are currently no wastewater treatment facilities located within the study area. However, in 2002, the communities of Rogers and Springdale formed the Northwest Arkansas Conservation Authority (NACA). NACA is currently composed of the communities of Rogers, Springdale, Bentonville, Centerton, Tontitown, Lowell, Bethel Heights, Highfill, Cave Springs, and Elm Springs. NACA was formed to provide regional solutions for wastewater treatment and currently owns 500 acres west of the Airport where an 80 million gallons per day (302 million liters per day) wastewater treatment facility is planned with transmission lines extending to each community.

## Transportation

There are several highways and county roads located within the Study Area in addition to Highway 412 and I-540, as have been described earlier in this Section. Highway 112 and Highway 264 are two highways that will be crossed by this project. In both cases the highways will continue to function as they do now. Grade separation structures will be constructed where the alignment crosses Highway 112 and at the interchange with the SNB. An at-grade intersection will be established at Highway 264 in the initial phase for the Intermodal Access Road, and a grade separation structure placed in the ultimate phase at Highway 264. I-540 and Highway 412 will be the existing primary highway systems that the Intermodal Access Road will ultimately connect to from the Airport through a connection with the SNB.

The county roads will be maintained, through the use of a grade separation structure, where continued vehicle access is required for local traffic. In some instances where alternate routes of equal quality are available or continued vehicle access is not required, the local county road will be closed where it intersects the right-of-way of the Intermodal Access Road.

## Private Utilities

Several private utilities exist in the study area consisting of electrical distribution and transmission lines, natural gas distribution and transmission lines and communication lines, as well as cable television. The corridors under consideration cross many of these facilities. Those facilities that will be affected by the selected alignment will be relocated, raised, or lowered as is required to continue service while allowing the Intermodal Access Road to be completed.

## Hazardous Waste

There are no known hazardous waste sites within the study area. There are no sanitary landfill sites within the study area that are still operational. There is one closed site that was associated with the community of Cave Springs. There are several small “farm” dump sites and individual dump sites on private property. At this point it is unknown if any of those sites contain any hazardous materials. Generally these types of individual dump sites may contain discarded appliances or other farm or household articles that may contain very small amounts of petroleum products or refrigerants. Also there may be some structures that will be required to be removed that may contain construction and building materials that include asbestos, such as floor tile or ceiling tile. These will be identified when the final corridor and alignment is selected.