

# **Appendix I – Induced-Growth Effects and Cumulative Impact Assessments**

## Induced-Growth Effects

The Council of Environmental Quality (CEQ) and the Federal Highway Administration (FHWA) regulations require that potential indirect effects be considered during the National Environmental Policy Act (NEPA) process. Indirect effects are defined as impacts that are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable” according to the CEQ (40 Code of Federal Regulations (C.F.R.) 1508.8) and may “include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.” Indirect effects would occur outside of the existing or proposed right of way (ROW). As to the cause and effect relationship between the proposed improvements and the indirect effect, CEQ states that indirect effects may include induced changes to land use resulting in resource impacts (40 C.F.R. § 1508.8). This assessment focuses on indirect effects related to induced growth.

FHWA, in cooperation with the Arkansas Department of Transportation (ARDOT) and the Northwest Arkansas National Airport (XNA), are proposing to construct an approximately 4-mile long roadway that would connect XNA to Highway (Hwy) 612, which is also called the Springdale Northern Bypass (SNB). In compliance with FHWA regulations, this document has been prepared to assess the growth-related indirect effects of the proposed Northwest Arkansas National Airport Access project, which is hereafter simply referred to as the Project.

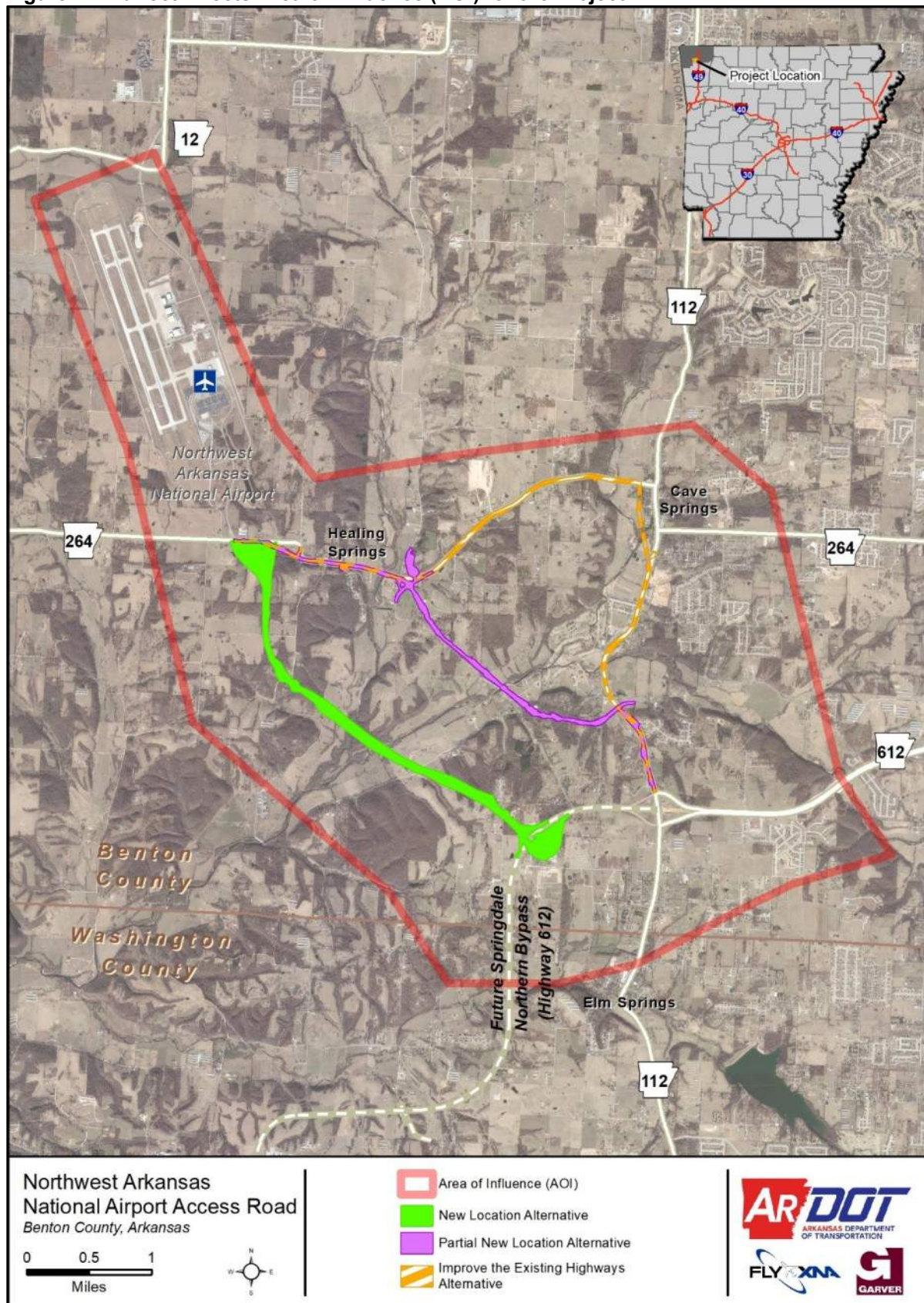
The time frame of the induced-growth effects analysis extends to 2040, the design year of the proposed project. A study area, or Area of Influence (AOI), was determined and used for the induced-growth analysis. The AOI was determined using major roadways, existing development areas, and natural features to ensure that potential developments and areas with a potential for indirect effects were encompassed within the AOI. Interviews with city and regional planners allowed for input on the resulting AOI boundary and provided feedback on the Project’s anticipated indirect effects. The indirect effects AOI, which is located in northwest Arkansas, is shown in **Figure 1**.

The four alternatives evaluated in this technical report are the No Action Alternative, New Location Alternative, Partial New Location Alternative, and the Improve the Existing Highways Alternative. These alternatives are described in detail in the Environmental Assessment prepared for the proposed project. Alternatives are discussed further in the following sections which are organized by the four-step approach<sup>1</sup> to evaluate induced-growth impacts for the Project. This analysis assumes the presence of the extension of the SNB/Hwy 612 to the west from Hwy 112 to US 412 (shown in **Figure 1**). The SNB extension is not currently constructed but is an independently planned project that will

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<sup>1</sup> The four-step approach is taken from the American Association of State Highway and Transportation Officials’ *Practitioner’s Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA*.

Figure 1: Indirect Effects Area of Influence (AOI) for the Project





connect the existing terminal end of Hwy 612 to US 412 to the southwest. The New Location Alternative has been designed to directly connect to the SNB extension. For each alternative, the below assessments of the potential for increased accessibility, induced growth, and impacts on sensitive resources all assume the presence of the future SNB extension/Hwy 612 improvements.

### Assess the Potential for Increased Accessibility

**Table 1** summarizes the access points and general assumptions determined for each build alternative. A discussion on the accessibility potential for each alternative is provided following the table.

**Table 1: Assumptions and Access Points for the Three Build Alternatives** (Source: Project Team, March)

Alternatives	Functional Class (FHWA Definition)	Number of Lanes	Posted Speed	Lane Width	Right Shoulder Width	Divided/Undivided	Access Point/Intersections
New Location	Rural Principal Arterial	2 lanes per direction	70 mph	12 feet	10 feet	Divided	1) New alignment, 2) Ramp access to Highway 264, and 3) Ramp access to Springdale Northern Bypass.
Partial New Location	Urban Principal Arterial	2 lanes per direction	45 mph	12 feet	1.5-foot curb and gutter (no shoulder)	Divided	1) New alignment between XNA and Brush Arbor Road, 2) Existing alignment (with improvement) of Highway 264 between Brush Arbor Road and Colonel Meyers Road, 3) New alignment between Highway 264 and Highway 112, and 4) At-grade intersections at Highway 112.
Improve Existing	Rural Principal Arterial	2 lanes per direction	50 mph	12 feet	6 feet	Divided	Widen Highway 264 and Highway 112.

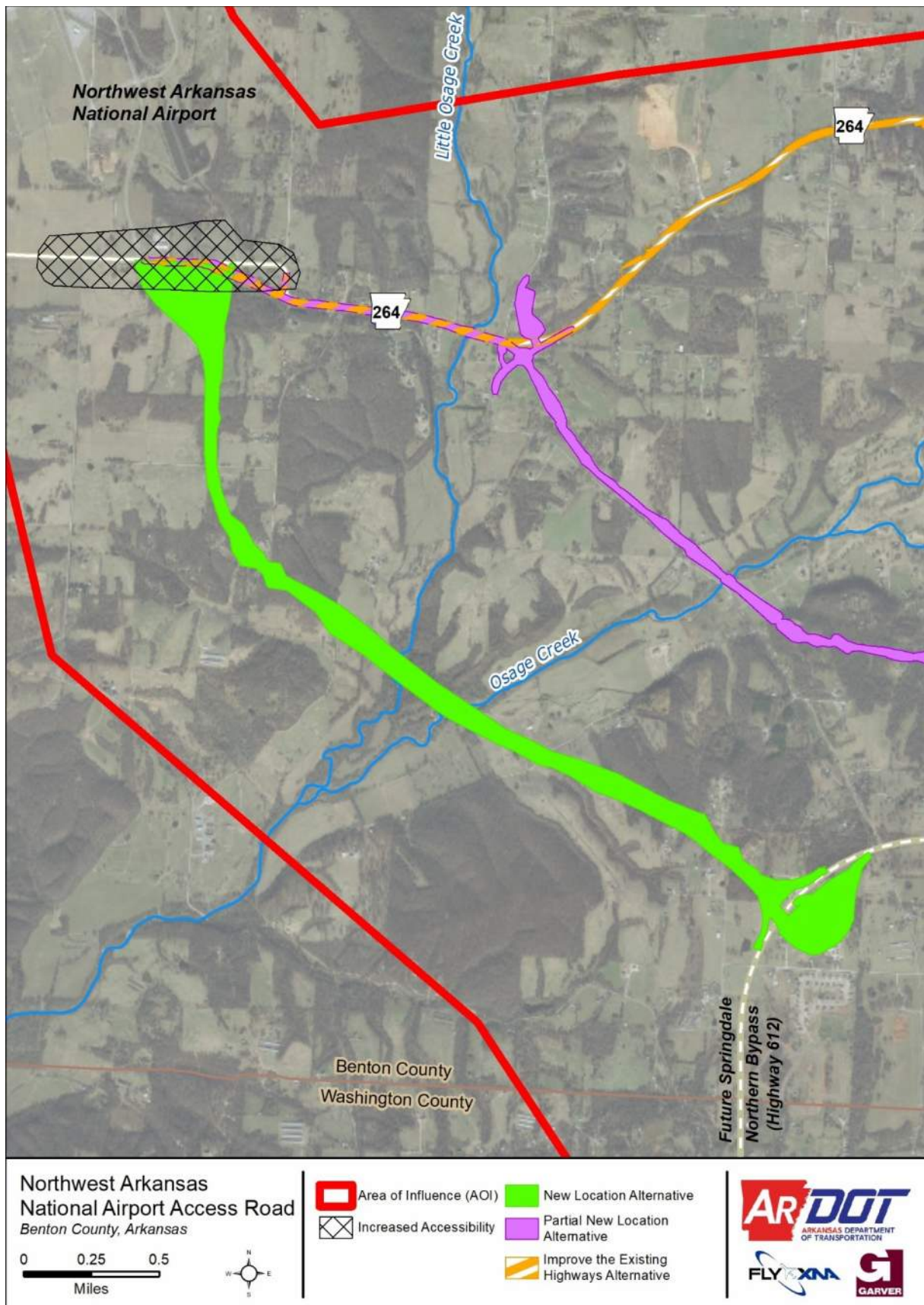
### No Action Alternative

For the No Action Alternative, no improvements would be constructed; therefore, increased accessibility would not occur as a result of this alternative. However, there are several planned projects in the vicinity (such as the SNB extension, widening of Hwy 112, and future development within the surrounding communities) that would be constructed regardless of the proposed project.

### New Location Alternative

This alternative, which is a fully controlled facility, will have only two points of egress/ingress, one at each of its terminal ends. The north access point is the proposed alignment's connection to Hwy 264, which occurs approximately 0.2 mile east of the intersection of Hwy 264 and Airport Blvd. Increased accessibility to this specific geographic area will occur but is expected to be limited to the north by Airport-owned property (**Figure 2**). The south access point is the proposed alignment's connection to Hwy 112 and the SNB extension/Hwy 612. Increased accessibility is not expected to occur in the area immediately surrounding this interchange as both the proposed roadway

**Figure 2: Areas of Increased Accessibility (shown by hatching) for the New Location Alternative**



and the SNB are fully controlled facilities and no exits to surrounding properties are proposed. Travelers currently utilizing Hwy 612 to reach the Airport will experience increased Airport accessibility and travel time savings through this alternative as it essentially provides a direct highway route from the I-49/Hwy 612 interchange to the Airport.

#### Partial New Location Alternative

Unlike the New Location Alternative, this alternative is only a fully controlled facility on the new alignment section between Hwy 264 and Hwy 112. Multiple points of egress/ingress already exist along the existing roadways (Hwy 264 and Hwy 112) and these would remain unchanged. While widening will occur along the portion of the route on existing highways and this action may increase mobility, improvements along the existing roadways do not substantially increase the overall accessibility of the areas along the existing highways as these routes are currently accessible to existing travelers and no additional access points are anticipated to be provided. However, the proposed alignment's connection to Hwy 264, which occurs at the intersection of Hwy 264 and Colonel Myers Rd, will result in increased accessibility to this specific geographic area as it provides a new access point from Hwy 112 to Hwy 264 and surrounding roadways (**Figure 3**). The proposed alignment's connection to Hwy 112 will also result in increased accessibility to the area immediately surrounding this intersection as it provides a new access point to Hwy 112 from Hwy 264 (**Figure 3**). Travelers currently utilizing Hwy 612 to reach the Airport are anticipated to experience some increased Airport accessibility and travel time savings through this alternative, but not as much time savings as the New Location Alternative provides.

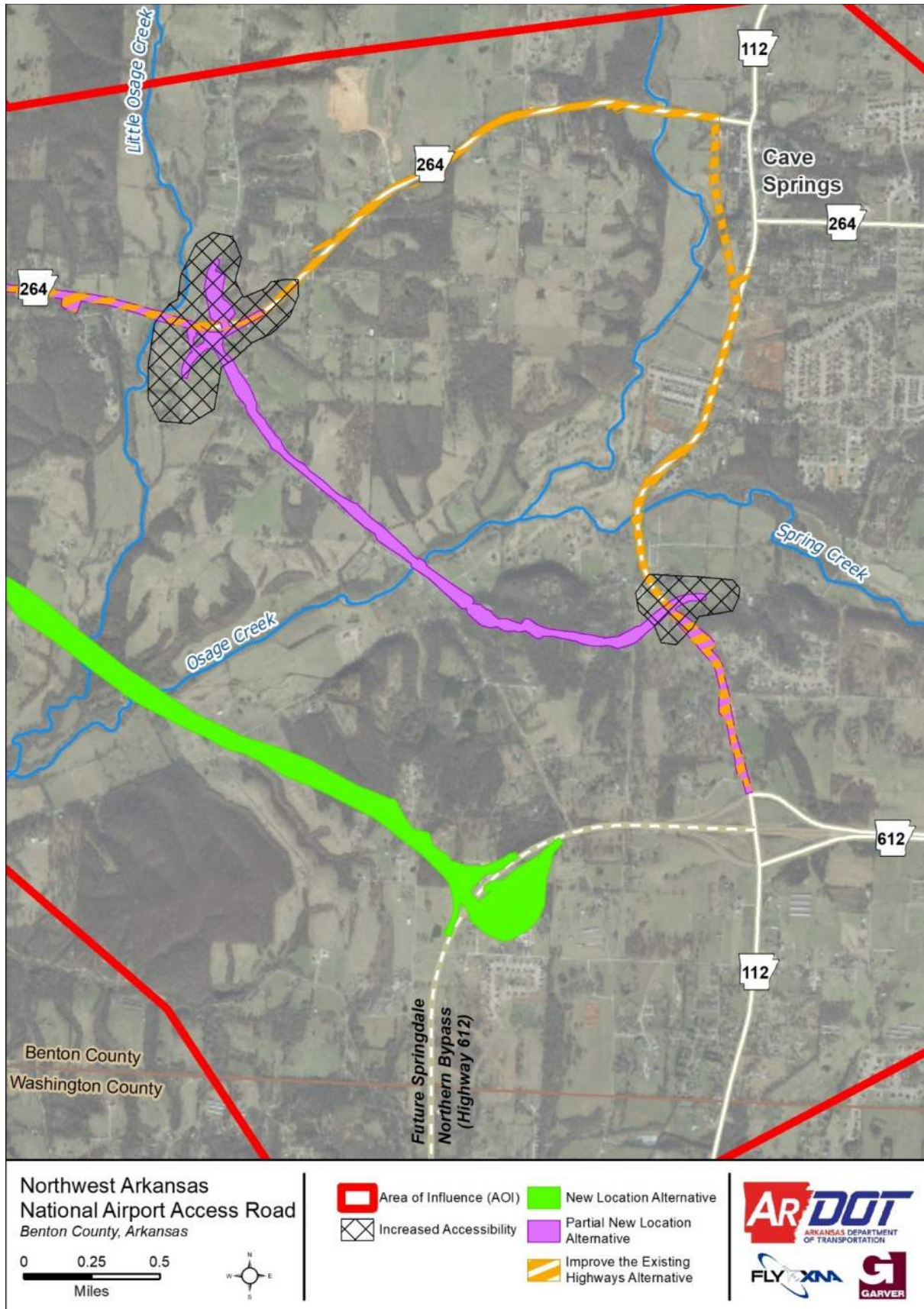
Changes in traffic, access, and mobility can result in changes in land use by influencing the rate and/or type of development in an area. Land use changes along the Partial New Location Alternative would be expected at the areas of increased accessibility described above as well as along the existing highways. These land use changes are described more in the next section.

#### Improve the Existing Highways Alternative

As this alternative is almost entirely along existing highways and these routes are currently accessible by existing travelers, there is minimal potential to further increase accessibility along the existing roadways. There is one 0.69-mile long segment southwest of the intersection of Hwy 112 and Hwy 264 that will occur on a new alignment to avoid downtown Cave Springs. This segment will be a fully controlled facility with no on/off ramps and is, therefore, not anticipated to result in increased accessibility. While widening of existing highways will occur along the entire proposed route and this action may increase mobility, these widening improvements are not considered to cause a substantial increase in the overall accessibility of the area. However, as described in the next section, this alternative will cause changes in traffic and mobility along its existing highways that are expected to result in changes in land use by influencing the rate and/or type of development in the Project area.



**Figure 3: Areas of Increased Accessibility (shown by hatching) for the Partial New Location Alternative**



### Highway 112 Improvements

As this alternative is entirely along existing Hwy. 112 and this route is currently accessible by existing travelers, there is minimal potential to further increase accessibility along this existing roadway. While widening of the existing highway will occur along the entire proposed route (from Hwy. 612 to Hwy. 264) and this action may increase mobility, these widening improvements are not considered to cause a substantial increase in the overall accessibility of the area. However, as described in the next section, this alternative will cause changes in traffic and mobility along its length that are expected to result in changes in land use by influencing the rate and/or type of development in the Project area.

### **Assess the Potential for Induced Growth**

According to U.S. Census Bureau population data shown in **Table 2**, the cities within and surrounding the AOI are experiencing an increasing growth trend. The AOI is primarily located in Benton County but also includes a portion of Washington County. Benton and Washington Counties have shown substantial population growth in the last 20 years. This has resulted in an increase in traffic on the local highway system that provides access to XNA. According to a 2018 article published in the Northwest Arkansas Democrat Gazette, the Fayetteville-Springdale-Rogers area was the 14<sup>th</sup> fastest growing metropolitan area in the United States in 2017.

**Table 2: Population Growth within Project Area** (Source: Project Team, March 2020)

Location	2000	2010	Change	% Change
Arkansas	2,673,400	2,915,918	+242,518	9
Benton County	153,406	221,339	+67,933	44
Cave Springs	1,103	1,729	+626	56
Highfill	379	583	+204	54
Rogers	38,829	55,964	+17,135	44
Bentonville	19,730	35,301	+15,571	79
Washington County	157,715	203,065	+45,350	29
Elm Springs	1,004	1,535	+531	53
Fayetteville	58,047	73,580	+15,533	27
Springdale	45,798	69,797	+23,999	52

The AOI primarily consist of undeveloped land. Undeveloped areas represent approximately 75% of the entire AOI; however, approximately 13% of the undeveloped areas are within natural features such as floodplains, parks, and wetlands. These areas are less likely to be developed due to these regulated features.

### No Action Alternative

No improvements would be constructed under the No Action Alternative; therefore, induced growth and land use changes would not occur as a result of this alternative. As shown in **Table 3**, the 24-hour compound annual growth rate (CAGR) for the existing highways within the AOI will increase by 2.4% to 4.8% under the No Action Alternative. The count locations referenced in **Table 3** are shown in **Figure 4**.



**Table 3: 2010-2040 Compound Annual Growth Rate (CAGR) on Hwy 264 and Hwy 112 (2040 No Build)** (Source: Project Team, March 2020)

Count Station	Count Location	24-Hour CAGR	AM Period CAGR	PM Period CAGR	24-Hour Truck CAGR
040073	Hwy 264 E. of Airport Blvd.	2.4%	2.0%	1.8%	1.8%
040172	Hwy 264 W. of Hwy 112	2.8%	2.9%	2.8%	0.8%
040059	Hwy 112 S. of Hwy 264	3.3%	2.9%	2.6%	3.3%
040160	Hwy 112 N. of SNB	4.8%	4.3%	3.6%	5.3%

**New Location Alternative**

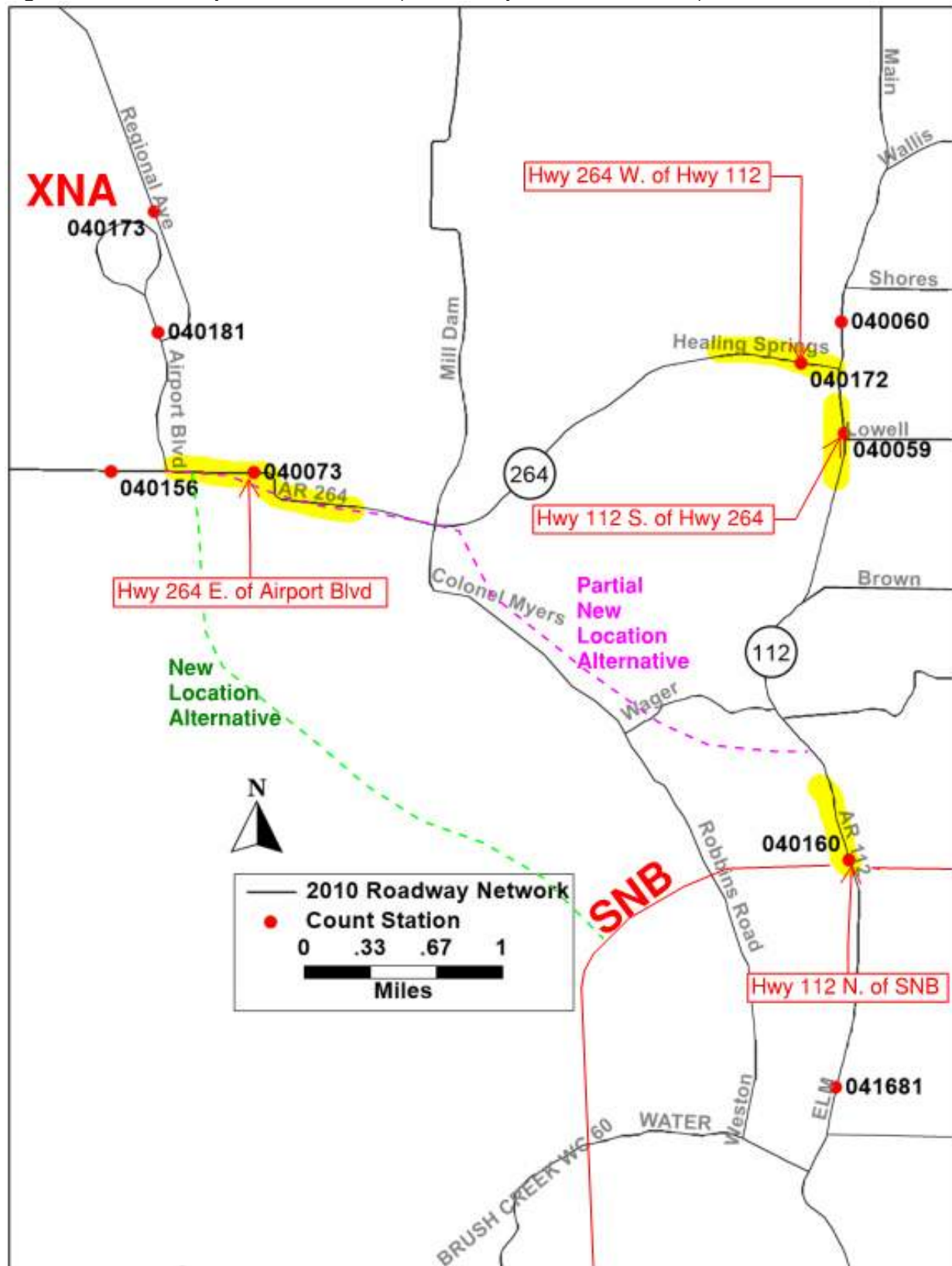
The New Location Alternative is expected to influence travel patterns by providing an alternate route to/from XNA and reducing traffic volumes on existing highways (as shown in **Tables 4** and **5**). The New Location Alternative, which is expected to have a future 24-hour traffic volume of approximately 7,200 (average of north and southbound) vehicles, will reduce the projected 24-hour CAGR on existing highways by 0.4% to 2.5% (as seen by comparing **Tables 3** and **5**).

**Table 4: 2040 Modeled Volumes on the New Location Alternative** (Source: Project Team, March 2020)

Direction	24-Hour Volume	AM Period Volume	PM Period Volume	24-Hour Truck Volume
Northbound	7,000	1,700	1,900	1,500
Southbound	7,400	1,300	2,300	1,600

**Table 5: 2010-2040 CAGR on Hwy 264 and Hwy 112 for the 2040 New Location Alternative** (Source: Project Team, March 2020)

Count Station	Count Location	24-Hour CAGR	AM Period CAGR	PM Period CAGR	24-Hour Truck CAGR
040073	Hwy 264 E. of Airport Blvd.	-0.1%	-0.3%	-0.4%	-2.9%
040172	Hwy 264 W. of Hwy 112	2.3%	2.6%	2.6%	-1.2%
040059	Hwy 112 S. of Hwy 264	2.9%	2.5%	2.2%	2.7%
040160	Hwy 112 N. of SNB	3.9%	3.3%	2.8%	3.9%

**Figure 4: Count Comparison Locations** (Source: Project Team, March 2020)

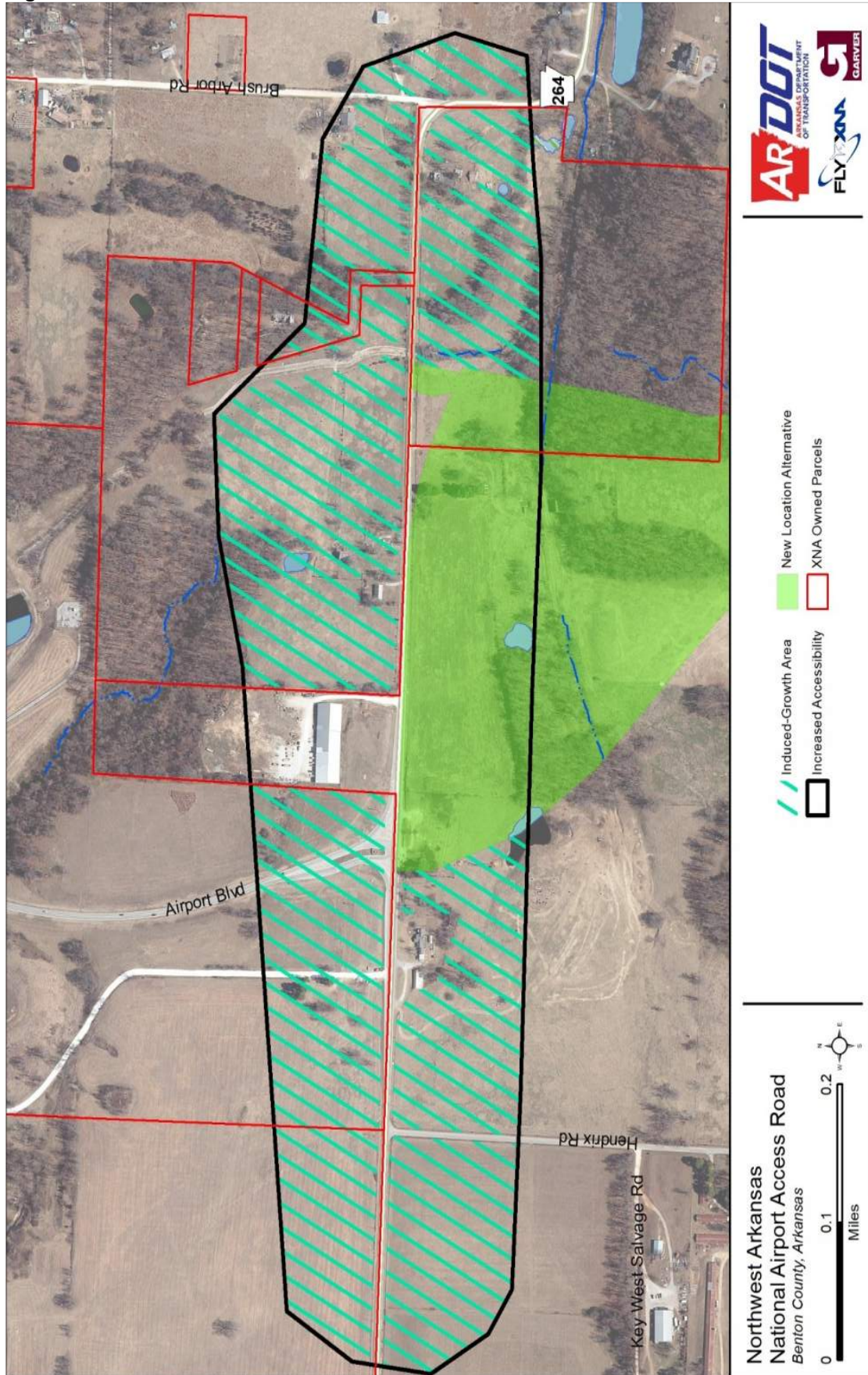
As population growth is already occurring within the AOI, it is likely that the current growth trends will continue regardless of whether the Project is implemented. According to feedback from most city planners of Bentonville, Cave Springs, Elm Springs, Lowell, and Rogers (copies of their responses are attached to this assessment), future developments within the surrounding communities are not believed to be induced/affected by the Project. Other planners, including the Airport, felt development in their jurisdiction would occur independent of the proposed project, but that the Project may affect the rate and intensity of development. According to feedback from the City of Springdale, the Project would induce development in the Springdale area, including redevelopment around the intersection of the proposed roadway with the SNB (Hwy 612), as well as the access road to the airport. Springdale also felt the Project would increase the likelihood of commercial development in and around intersections and affect the rate and intensity of these developments. According to feedback from the City of Highfill, the Project would induce development in the Highfill area, including possible land rezoning from rural residential to industrial along the path of the Project.

Thus, the New Location Alternative will result in changes in traffic and mobility that will increase the likelihood of land use changes. As detailed above, planners anticipate the Project will increase the rate and intensity of development in the area, particularly around intersections (i.e., around the proposed road's intersection with Hwy 264 and with the SNB interchange) where land use would be expected to change from rural/undeveloped to commercial or even industrial. Few, if any, land use changes would be anticipated along the existing Highways 112 or 264 as traffic rates will be reduced in these areas as a result of the Project.

For the area of increased accessibility at the proposed alignment's connection to Hwy 264, the majority of this area is currently undeveloped and, with one area of exception, has no apparent constraints that prohibit the probability of development in this immediate area assuming private landowners are willing to sell/develop their property. The only constrained area is the airport-owned property located in the northwest quadrant of this area (see **Figure 5**). Development on airport property is still likely to occur but will be controlled by XNA and regulated by FAA. Thus, as shown in **Figure 5**, the entire area of increased accessibility has a high potential for induced growth, and it is likely that facilities such as gasoline stations or travel-related services will be developed around the Hwy 264/Project intersection. The rest of the proposed corridor for the New Location Alternative has a very low potential for induced growth due to lack of access, lack of existing infrastructure, and development restrictions such as floodplains.



**Figure 5: Induced Growth Areas within the New Location Alternative**



### Partial New Location Alternative

The Partial New Location Alternative is expected to have some influence on travel patterns (as shown in **Tables 6** and **7**), by providing an alternate route to/from XNA. The Partial New Location Alternative, which is expected to have a future 24-hour traffic volume of approximately 5,500 (average of north and southbound) vehicles, will both reduce and increase the projected 24-hour CAGR on some segments of the existing highways (as seen by comparing **Tables 3** and **7**). Traffic models suggest a decrease in CAGR of 0.4% on existing highway near the Hwy 112/Hwy 264 intersection in Cave Springs, but an increase (0.4% to 0.5%) near the proposed route's terminal ends.

**Table 6: 2040 Modeled Volumes on the Partial New Location Alternative** (Source: Project Team, March 2020)

Direction	24-Hour Volume	AM Period Volume	PM Period Volume	24-Hour Truck Volume
Northbound	4,800	1,200	1,500	1,100
Southbound	5,300	900	1,800	1,200

**Table 7: 2010-2040 CAGR on Hwy 264 and Hwy 112 (2040 Partial New Location Alternative)** (Source: Project Team, March 2020)

Count Station	Count Location	24-Hour CAGR	AM Period CAGR	PM Period CAGR	24-Hour Truck CAGR
040073	Hwy 264 E. of Airport Blvd.	2.8%	2.4%	2.2%	3.0%
040172	Hwy 264 W. of Hwy 112	2.4%	2.5%	2.6%	-0.2%
040059	Hwy 112 S. of Hwy 264	2.9%	2.6%	2.1%	2.8%
040160	Hwy 112 N. of SNB	5.3%	4.5%	4.1%	6.3%

Based on census data trends, population growth within the AOI is likely to continue regardless of whether the Project is implemented. Feedback from city planners primarily indicated regional growth will occur regardless of the proposed project (see attached city planner interviews). However, planners also specifically indicated the Project will increase the rate and intensity of development in the area. This increase in the rate of development coupled with the project's changes in increased mobility suggests land use changes along the Partial New Location Alternative would be expected. In addition to the areas of increased accessibility described below, land use changes are likely along the existing highways. The Partial New Location Alternative increases the likelihood of redevelopment along the existing highways and land use would be expected to change from rural/undeveloped to commercial or even industrial. The greatest likelihood of land use changes would be expected along Hwy 112 and Hwy 264 of the proposed roadway.

For the area of increased accessibility at the proposed alignment's connection to Hwy 264, much of this area is currently undeveloped. However, the area immediately west of

Colonel Myers Road is within a floodplain as Little Osage Creek runs parallel to this road. The floodplain and associated Little Osage Creek are significant constraints that decrease the probability of development immediately west of Colonel Myers Rd. However, the floodplain is still considered an area of induced growth (albeit a low likelihood compared to the other areas), while Little Osage Creek is not considered an area likely for induced growth to occur given the significant regulatory requirements for impacting such a large water resource. For the area east of Colonel Myers Road, some existing residential properties are present. A large (greater than 0.5 acre) wetland is present south of Hwy 264 within the increased accessibility area. Initial development within this wetland would be less likely due to permitting requirements. For the remaining undeveloped land, if landowners are willing to sell their property, this area (shown in **Figure 6**) has a moderate potential for induced growth, and it is likely that facilities such as gasoline stations or travel-related services will be developed around the Hwy 264/Project intersection. For the area of increased accessibility at the proposed alignment's connection to Hwy 112, some existing residential properties are present but much of this area is currently undeveloped. If landowners are willing to sell their property, this area (shown in **Figure 7**) has a moderate potential for induced growth, and it is likely that facilities such as gasoline stations or travel-related services will be developed around the Hwy 112/Project intersection. The potential for growth in this area may be constrained to the north by a large pond, further north by a floodplain, and to the west and northwest by existing residential development. The remainder of the proposed corridor has a much lower potential for induced growth due to lack of access, lack of existing infrastructure, and/or development restrictions such as floodplains.

#### Improve the Existing Highways Alternative

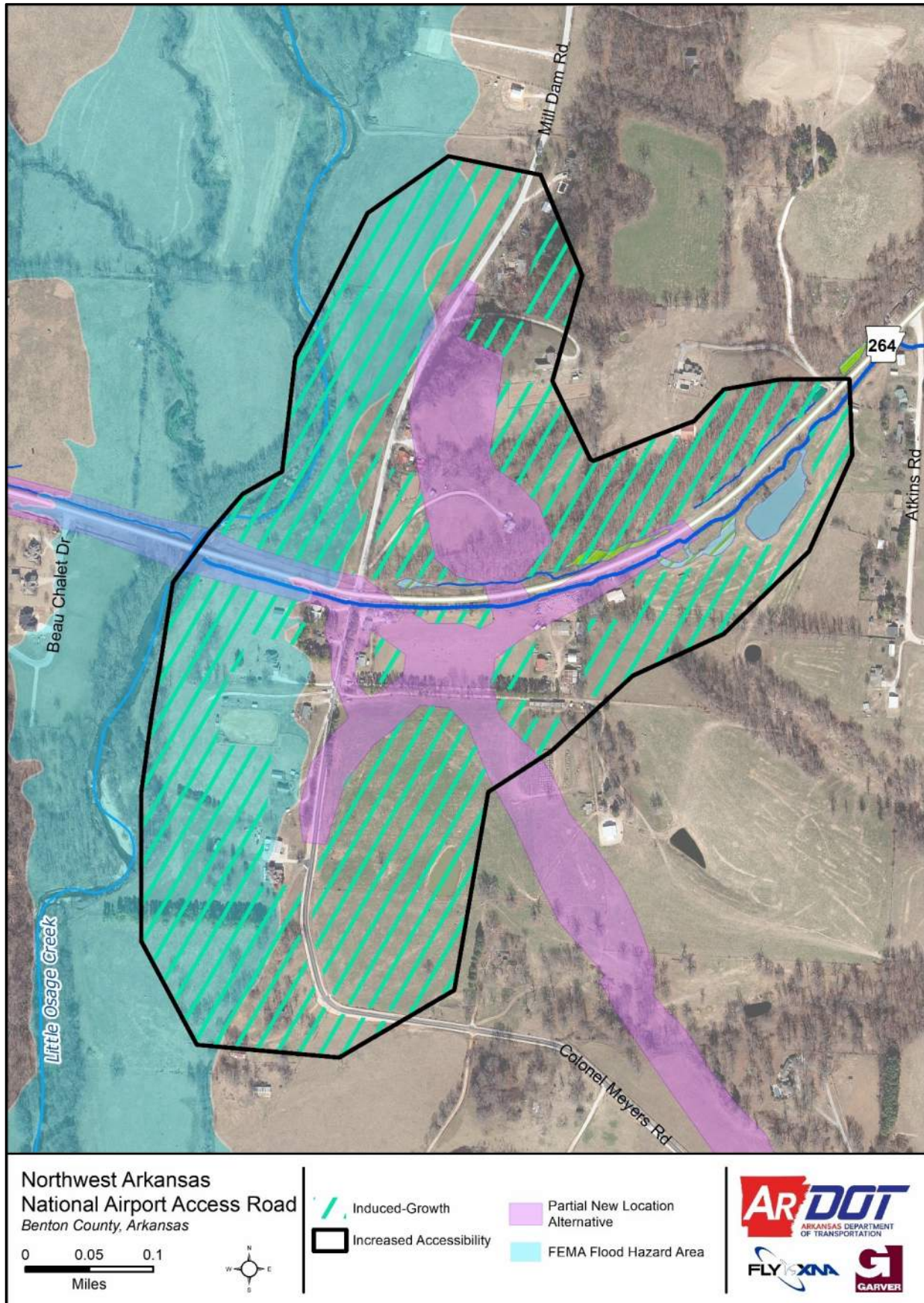
Besides the increase in anticipated traffic volumes, no substantial differences in the quantity or locations of the 24-hour CAGR is expected between the Improve the Existing Highways Alternative compared to the No Action Alternative. Thus, no changes in user's travel patterns are anticipated as this is likely the route already utilized to reach XNA.

Feedback from city planners primarily indicated regional growth will occur regardless of the proposed project (see attached city planner interviews). However, planners also specifically indicated the Project will increase the rate and intensity of development in the area. This increase in the intensity of development coupled with the project's changes in increased mobility due to road widening suggests a likelihood of land use changes along the Improve the Existing Highways Alternative. Expected land use changes primarily include redevelopment along the existing highways and may include more service-based businesses such as dining and lodging.

As there are no areas along this alignment expected to have a substantial increase in new accessibility, there are no areas anticipated to have induced growth as a result of the project.

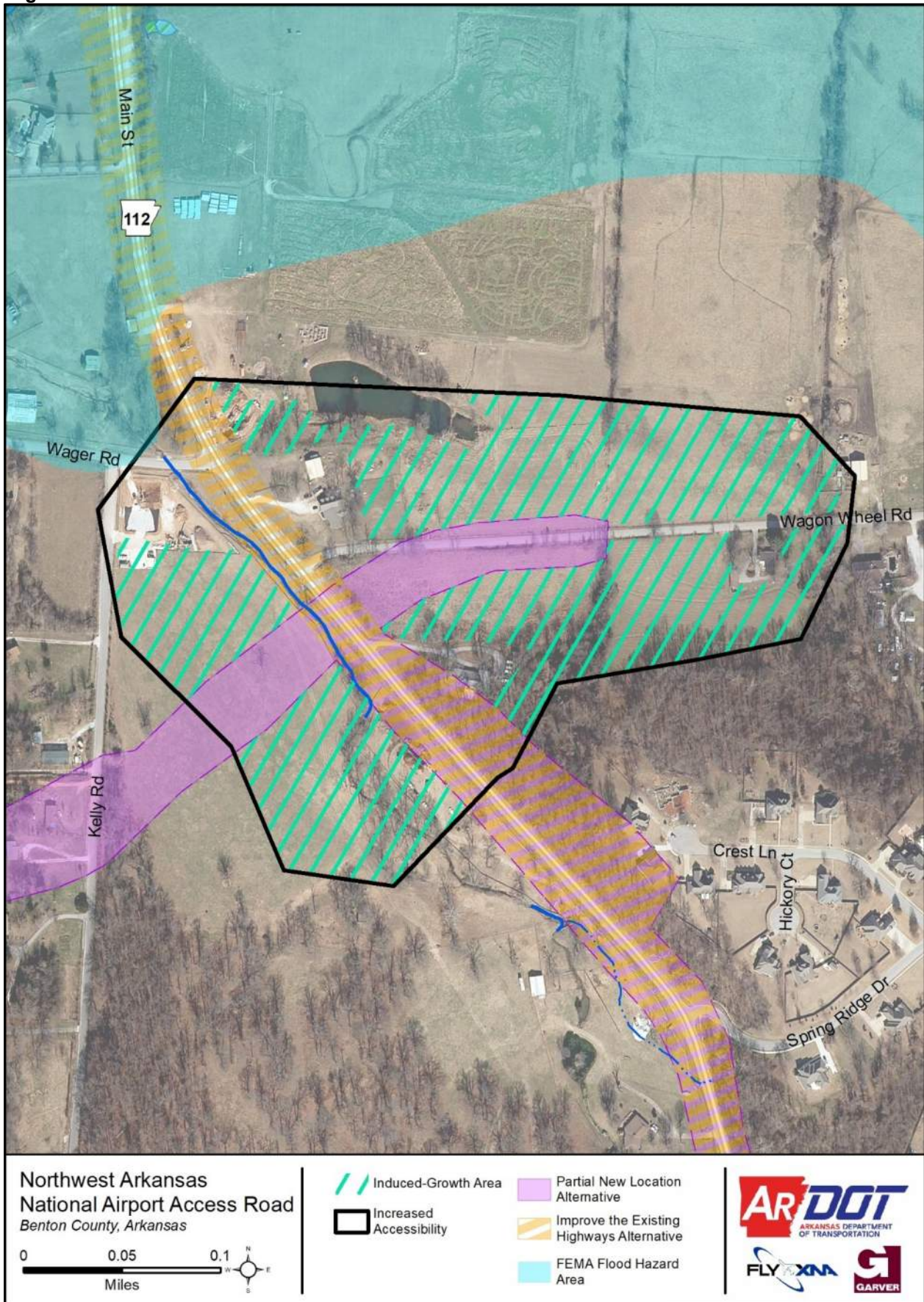


**Figure 6: Induced Growth Areas within the Partial New Location Alternative**





**Figure 7: Induced Growth Areas within the Partial New Location Alternative**



### Highway 112 Improvements

The potential for induced growth for these planned improvements are identical to those described above for the Improve the Existing Highways Alternative.

## **Assess the Potential for Impacts on Sensitive Resources**

### No Action Alternative

No improvements would be constructed under the No Action Alternative; thus, no potential for impacts on sensitive resources from this alternative are anticipated.

### New Location Alternative

Few sensitive resources are present within the induced-growth area surrounding the intersection of the proposed alternative's connection to Hwy 264. Some mature trees are present that could function as suitable habitat for the federally-listed northern long-eared bat (NLEB) and Indiana bat (IBat). Most of the wooded habitat within the induced-growth area are fragmented from existing development and roadways and no substantial riparian corridors are present. Induced growth in this area may affect (through removal) approximately 6 acres of potentially suitable roosting habitat for the NLEB and IBat. Additionally, this area contains one barn and one shed (both abandoned) that could function as NLEB summer roosting habitat. Any future tree clearing that may occur could comply with the 4(d) Rule established for the NLEB, and seasonal tree clearing restrictions would minimize impacts the NLEB and IBat. No potential habitat of other federally-protected species was observed within the induced-growth area for this alternative.

One stream (approximately 1,200 LF) and three ponds (totaling approximately 0.4 acre) are present within the induced-growth area associated with this alternative and could be impacted by induced growth through fill or culverting. The stream would likely be considered functionally impaired as approximately half of it is channelized and concrete-lined. The ponds are in fair to poor condition due to cattle disturbance. Any impacts to potentially jurisdictional waters and wetlands would require compliance with Section 404 of the Clean Water Act (CWA). These regulatory restrictions may discourage impacts to these resources. If any historic properties are determined to be present within the induced-growth area surrounding the intersection of the New Location Alternative's connection to Hwy 264, Section 106 consultation and clearance from the State Historic Preservation Office (SHPO) will have to occur prior to disturbing the resource.

Because the project occurs with a karst region, aquatic resources (including ponds) may be connected belowground or off-site to karst features and, therefore, the likelihood exists that impacts to karst features and/or groundwater could occur as a result of induced growth in this area. For example, the stream in this area converges with an unnamed tributary to Little Osage Creek that has been identified as a potential losing stream.

As detailed in the EA, sensitive noise receptors in the project vicinity are directly impacted by noise caused from the proposed action. Additionally, traffic patterns will change as a result of the proposed action and these changes could result in increased traffic noise



levels in some areas. However, induced-growth effects are not anticipated to result in substantial traffic noise. Other considerations include noise associated with the Airport, which is expected to increase in the future as the airport is more heavily utilized by aircraft. However, based on a recent noise analysis conducted for a separate project at XNA, these future aircraft noise impacts are not projected to expand beyond airport property. Thus, substantial induced-growth impacts related to traffic noise are not anticipated to occur as a result of the proposed action.

#### Partial New Location Alternative

Some sensitive resources are present within the induced-growth areas surrounding the intersections of the proposed alternative's connections to Hwy 264 and to Hwy 112. Several mature trees are present that could function as suitable habitat for the federally-listed NLEB and IBat. Most of the wooded habitat within the two induced-growth areas are fragmented from existing development and roadways and lack riparian corridors. Induced growth in these two areas may affect (through removal) a total of approximately 14 acres of potentially suitable roosting habitat for the NLEB and IBat. Additionally, this area appears to contain some barns/sheds that may be abandoned and could function as NLEB summer roosting habitat. Depending on the amount of required tree clearing that may occur, future projects could comply with the 4(d) Rule established for the NLEB, and seasonal tree clearing restrictions would minimize impacts the NLEB and IBat. Although both of these two induced-growth areas are outside of the Cave Springs Recharge Area boundary and have no known springs, the eastern portion of the area around the Hwy 264 intersection is within a moderate vulnerability zone of the Cave Springs Karst Region and the entire area around the Hwy 112 intersection is within either a moderate, high, or extremely high vulnerability zone of the Cave Springs Karst Region. The vulnerable regions coupled with the presence of streams increases the likelihood that these areas may contain suitable habitat for the Ozark Cavefish or the Benton County Cave Crayfish. Potential habitat of other federally-protected species was not observed within the induced-growth areas for this alternative.

Three streams (totaling approximately 2,800 LF), five wetlands (totaling approximately 0.9 acre), and two ponds (totaling approximately 1.4 acres) are present within the induced-growth area associated with this alternative and could be impacted by induced growth through fill or culverting. The streams would likely be considered functionally impaired as most of their reaches are immediately adjacent to the existing highways and numerous segments have been placed in culverts below driveway. The three wetlands adjacent to Hwy 264 are in poor condition due to construction and other human disturbance. The remaining two wetlands appear fully functional. Ponds appear to be in good condition based on aerial imagery but likely have some degree of disturbance due to livestock as they appear to function as stock ponds. As is the case for the New Location Alternative, CWA regulatory restrictions may discourage impacts to wetlands and streams, and Section 106 requirements may provide protections to cultural resources if historic properties are determined to be present.

Because the project occurs with a karst region, aquatic resources (including ponds) may be connected belowground or off-site to karst features and, therefore, the likelihood exists that impacts to karst features could occur as a result of induced growth in this area.

Although the floodplains located in the two areas of increased accessibility are considered constraints to development, they are still considered areas where induced-growth could occur. If both of the induced-growth areas were entirely developed, a total of approximately 33.6 acres of floodplains would be impacted. At this time (without hydraulic modeling or knowledge of what developments may occur), specific impacts to the region's flood storage capacity are unknown.

Similar to the New Location Alternative, some areas of the project could have increased noise levels because of traffic pattern changes caused by the proposed action. However, induced-growth effects are not anticipated to result in substantial traffic noise.

#### Improve the Existing Highways Alternative

There are no areas identified as having a potential for induced growth along this alignment.

#### Highway 112 Improvements

There are no areas identified as having a potential for induced growth along this alignment.

### **Assess Potential Minimization and Mitigation Measures**

For each of the build alternatives, general minimization and mitigation measures such as erosion and sedimentation best management practices (BMPs) as a part of the Stormwater Pollution Prevention Plan (SWPPP) would be required for developments and would be implemented by the developer or the contractor. These BMPs would help protect water quality within this important karst region and as a result, also help protect stream and/or spring habitats potentially utilized by threatened and endangered species. The Arkansas Department of Environmental Quality (ADEQ) is the agency responsible with authorizing General Construction Stormwater permits and their associated SWPPPs.

Rogers, Lowell, Springdale, and Cave Springs (cities within the AOI) have adopted the Cave Springs Area Karst Resource Conservation Regulations drafted in 2015. Although the AOI is almost entirely outside of the Cave Springs Direct and Indirect Recharge Area Boundary and there are no areas of anticipated induced-growth in the recharge area, other future impacts to the region may still be examined closely by regulatory or partner agencies. Many cities have implemented mitigation measures to protect karst regions in their drainage criteria manual. Minimization and mitigation measures protecting karst features will help protect both water quality and wildlife habitat for areas within the direct Cave Springs recharge zone. If required by USFWS, BMPs to protect karst features will be implemented for direct impacts of the proposed project.

Furthermore, development projects within the AOI will be required to comply with the Clean Water Act (CWA). Section 404 of the CWA is regulated by the US Army Corps of

Engineers (USACE) and protects Waters of the United States, such as streams and wetlands. For any project requiring a Section 404 permit, Section 401 of the CWA will also be required, as will Section 7 of the Endangered Species Act (ESA) if federal funding is utilized. Section 401 requires water quality certification and is regulated by ADEQ. Section 7 of the ESA requires an assessment of impacts to federally-listed species and consultation with USFWS. Federally-funded project, or those with a federal nexus, also require Section 106 consultation with the State Historic Preservation Office with regards to impacts to cultural resources.

For threatened and endangered species specifically, minimized could be implemented by simply avoiding impacts to protected-species habitat. For potential loss of habitat and species potentially affected from increased magnitude of growth, BMPs could be implemented to minimize impacts to these resources. Local entities and developers could be responsible for incorporating BMPs for potential development activities. Examples of BMPs would be requirements for contractors to avoid harming species if encountered, seeding, replanting, and landscaping with specifications that would minimize soil disturbance where possible. Unfortunately, unless specifically required by federal or state regulations, developments often only utilize the minimum BMPs required. For the NLEB and IBat, seasonal tree clearing restrictions could be followed as one available mitigation measure.

Land use planning and regulatory guidelines would help manage any indirect impacts within the AOI, including impacts related to an accelerated rate of development and/or redevelopment. Examples of regulatory guidelines and planning techniques include subdivision regulations, zoning ordinances, land development regulations, and ordinances. However, it does not appear that any of the previously listed management strategies are currently in place within, or would be applicable for, the induced-growth areas. The responsibility of transportation providers, such as ARDOT, local and regional transit agencies, and local municipalities, would be to implement a transportation system to complement land use or development management techniques currently in place.

## **Summary and Conclusion**

In conclusion, the improved mobility and accessibility within the project limits could indirectly alter traffic operations and growth patterns on existing highways. Increased accessibility in the three specific areas described above is anticipated by some city planners to increase the rate of future development within the AOI. These anticipated induced growth effects are expected to occur at three locations: the New Location Alternative's connection to Hwy 264 (**Figure 5**), the Partial New Location Alternative's connections to Hwy 264 (**Figure 6**), and the Partial New Location Alternative's connections to Hwy 112 (**Figure 7**). Although no specific projects have been identified and no "reasonably foreseeable" projects are planned at these locations, the increased rate of development for residential, commercial, and mixed-use purposes in these three areas could potentially impact sensitive biological resources. However, measures such as BMPs, permitting guidelines, agency coordination, and regulatory requirements in



cooperation with appropriate stakeholders and entities would help to mitigate or minimize some potential adverse induced-growth impacts for these sensitive resources. The increased rate of development resulting from the proposed project could also result in positive economic impacts due to increased property taxes and sales tax revenues.

## Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.7) defines cumulative impacts (i.e., effects) as “the impact on the environment which results from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions.” The purpose of a cumulative impacts analysis is to assess the direct and indirect impacts of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future. This approach evaluates the incremental impacts of the proposed project in respect to the overall health and abundance of selected resources.

FHWA, in cooperation with the Arkansas Department of Transportation (ARDOT) and the Northwest Arkansas National Airport (XNA), are proposing to construct an approximately 4-mile long roadway that would connect XNA to Highway (Hwy) 612, which is also called the Springdale Northern Bypass (SNB). In compliance with FHWA regulations, this document has been prepared to assess the cumulative impacts of the proposed Northwest Arkansas National Airport Access project.

Four alternatives are described in detail in the Environmental Assessment prepared for the proposed project: the No Action Alternative, New Location Alternative, Partial New Location Alternative, and the Improve the Existing Highways Alternative. For the No Action Alternative, no improvements would be constructed; therefore, cumulative impacts would not result from this alternative. Cumulative impacts associated with the three action alternatives are discussed further in the following sections.

The following five-step approach<sup>1</sup> was utilized to assess the potential cumulative impacts of the past, present, and reasonably foreseeable actions to the resources in the study area:

1. Resource Study Area, Conditions, and Trends;
2. Direct and Indirect Effects on Each Resource from the Proposed Project;
3. Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on Each Resource;
4. The Overall Effects of the Proposed Project Combined with Other Actions; and
5. Mitigation of Cumulative Impacts.

Cumulative impacts are analyzed in terms of the specific resource being affected. The key resources of the analysis are identified using resources discussed in the Environmental Assessment. FHWA’s Guidance states: “If a project will not cause direct or indirect impacts on a resource, it will not contribute to a cumulative impact on that resource.” CEQ guidance recommends focusing on key resource issues of national, regional, or local significance. To identify potential issues, the resource is considered whether it is protected by legislation or resource management plans; ecologically important; culturally important; economically important; or important to the well-being of a

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<sup>1</sup> The five-step approach is based on American Association of State Highway and Transportation Officials’ *Practitioner’s Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA*.

human community.

Applying the above criteria, the resources or environmental issues considered for the cumulative impacts analysis are listed in **Table 1**. As recommended by CEQ guidance, specific indicators of each resource's condition are identified and shown. The use of indicators of a resource's health, abundance, and/or integrity are helpful tools in formulating quantitative or qualitative metrics for characterizing overall impacts to resources. These indicators are also key aspects of each resource that have already been evaluated in terms of the project's direct and indirect impacts and facilitate greater consistency and objectivity in the analysis of cumulative impacts.

**Table 1: Resources and Topics Considered for the Cumulative Impacts Analysis**

<b>Resource</b>	<b>Are there Substantial Adverse Direct or Indirect Impacts?</b>	<b>Is Resource/ Issue at Risk or in Poor or Declining Health?</b>	<b>Is Resource/ Issue Included in Cumulative Impacts Analysis?</b>	<b>Reason for Including or Excluding Key Issues for Cumulative Impacts Analysis</b>
Water Resources	Yes	Yes. The total area/quantity of water resources is in decline or at risk from development.	Yes	The potential direct and indirect impacts to water resources (i.e., wetlands, springs, streams, and floodplains) would warrant a cumulative impacts analysis.
Ecological Resources	Yes	Yes. The populations of certain federally-listed species and their habitats are in decline or at risk.	Yes	The direct and indirect impacts to some federally-listed species would warrant a cumulative impacts analysis.
Land Resources and Uses	Yes	Yes. While undeveloped land is not in short supply within the project area, it is a resource in decline.	Yes	Since both direct and indirect land use impacts are anticipated, and undeveloped land would be considered a declining resource, a cumulative impacts analysis is warranted.
Community Resources	No	No. Most neighborhoods are currently stable but could experience conflict from development. No parks or recreation areas are present in the project area.	No	No direct or indirect impacts are anticipated from the proposed project. Resources not directly or indirectly affected are not included in the cumulative impacts analysis.
Air Quality	No	No. The area is in attainment for air quality standards under the Clean Air Act.	No	No direct or indirect impacts are anticipated from the proposed project. Resources not directly or indirectly affected are not included in the cumulative impacts analysis.

<b>Resource</b>	<b>Are there Substantial Adverse Direct or Indirect Impacts?</b>	<b>Is Resource/ Issue at Risk or in Poor or Declining Health?</b>	<b>Is Resource/ Issue Included in Cumulative Impacts Analysis?</b>	<b>Reason for Including or Excluding Key Issues for Cumulative Impacts Analysis</b>
Traffic Noise	Potentially	No. Traffic noise is not considered a declining or at-risk resource. However, sensitive noise receptors are present and are directly impacted by noise caused from the proposed action.	No full analysis conducted.	Traffic patterns will change as a result of the proposed action and could result in increased traffic noise levels in some areas. Induced-growth effects are not anticipated to result in substantial traffic noise. Noise associated with the Airport is expected to increase in the future as the airport is more heavily utilized by aircraft. However, these impacts are not projected to expand beyond airport property. A full cumulative analysis of traffic noise is not conducted as substantial cumulative impacts related to traffic noise are not anticipated to occur as a result of the proposed action.
Historic Resources	No	No NRHP listed or eligible for listing sites are at risk and may be present within the project area.	No	While historic properties are considered a declining resource and may be impacted by the proposed project, impacts are not expected to be significant and will, therefore, not be included in the cumulative impacts analysis. Furthermore, no induced growth effects to these resources are anticipated.

Source: Project Team, May 2020.

Resources eligible for a cumulative impacts analysis are water resources, habitat for some federally-listed species, and land use. Traffic noise is assessed in the EA document. Each of the following sections discuss these eligible resources using the five-step approach applied for the cumulative impacts analysis.



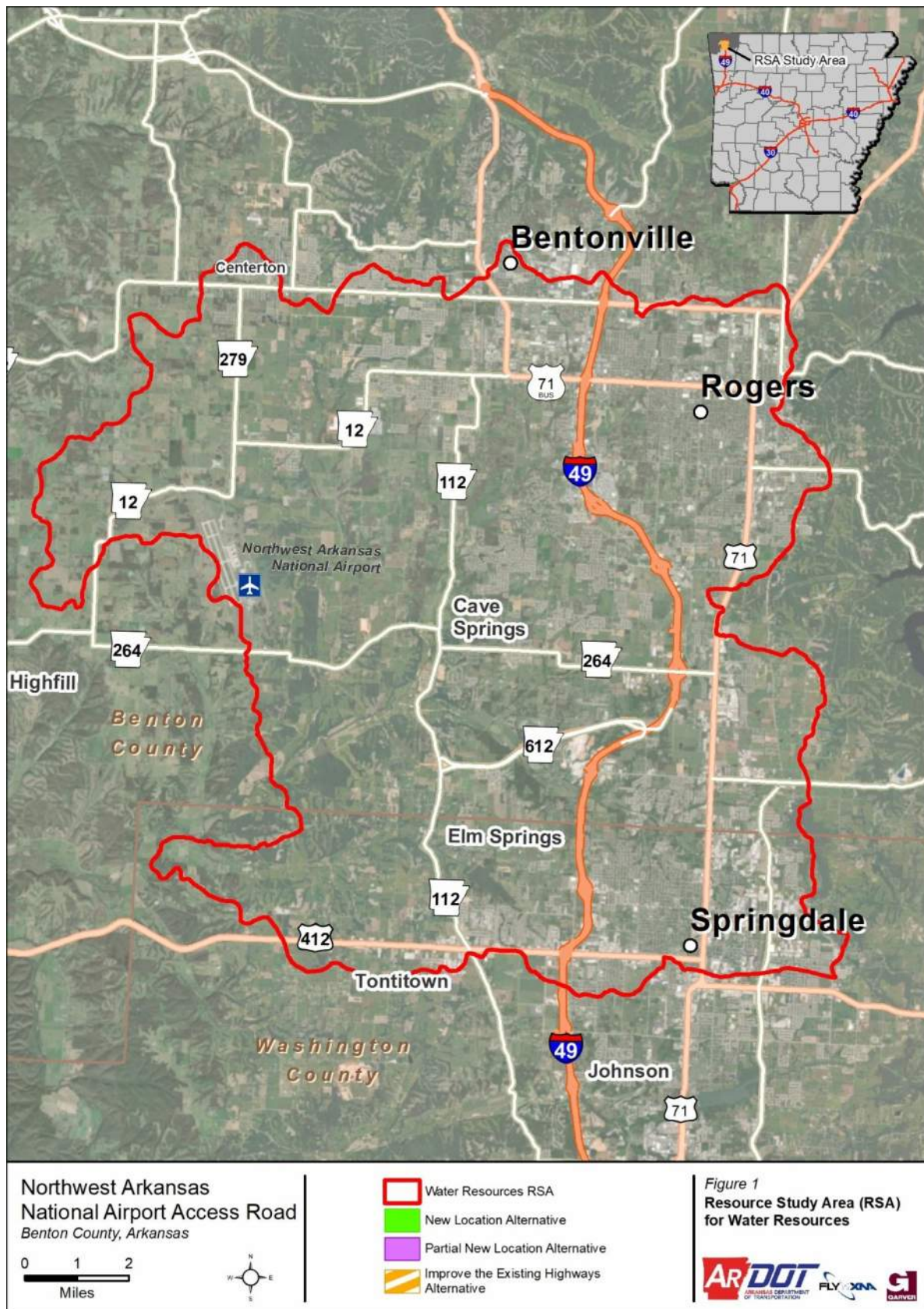
## Water Resources

### *1. Resource Study Area, Conditions, and Trends*

The resource study area (RSA) for the cumulative analysis for water resources was delineated using the HUC12 watershed units (**Figure 1**). This watershed is used as the boundary for the RSA because it is the watershed in which the proposed project is located and encompasses water resources that would be potentially affected by the proposed project. The temporal study period is from 1998 to 2040. The temporal start date of 1998 was selected to follow the year when the construction of XNA was completed and open to the public. The ending temporal boundary of 2040 is selected to correlate with the design year of the proposed project.

The RSA, which encompasses approximately 154 square miles (98,327 acres), includes numerous streams including Spring Branch, Spring Creek, Brush Creek, Little Osage Creek, and Osage Creek, the latter two occurring within the immediate project vicinity. None of the watercourses within the RSA are classified as impaired or have established Total Maximum Daily Loads (TMDLs). Water resources identified within the RSA are shown in **Figures 2 and 3**. These aquatic features within the RSA were identified using a variety of methods, including field identification, reviews of aerial imagery, topographic maps, the National Hydrology Dataset, and the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, and Federal Emergency Management Agency (FEMA) flood hazard zone data. With the exception of field identification, none of the above-listed resources are field verified due to the size of the RSA. However, these data sources showed similar attributes in relation to water features and the NWI data was specifically used to determine the approximate acreage of wetland and riparian/stream features within the RSA. Using the NWI data, approximately 2,617 acres of water features are within the RSA. This constitutes approximately 3% of the entire RSA. Based on Federal Emergency Management Agency (FEMA) data, the RSA contains approximately 3,908 acres of Zone A floodplain and 3,556 acres of Zone AE floodplain. These areas constitute approximately 8% of the entire RSA. The majority of the floodplains are located in the southwest quadrant of the RSA as they are associated with the major watercourses draining to the southwest. All floodplains within the proposed action areas are Zone A floodplain.

Based on field data collected in the immediate vicinity of the proposed alignments, approximately 25 wetlands (totalling roughly 6 acres), 10 springs, and 50 streams (totalling roughly 61,000 linear feet [LF]) are present within the alternative corridors. The majority of the wetlands are emergent and the majority of the streams are ephemeral. Existing wetlands and streams appeared to range from good to fair condition, with condition relative to the feature's proximity to existing development. Those aquatic features near existing highways (such as along Hwy 264 and Hwy 112) or homesteads often appeared in poorer condition than those features isolated from existing development. This was especially true along Hwy 264 where on-going construction is occurring, including the replacement of the existing bridge over Little Osage Creek. Osage Creek and Little Osage Creek are both perennial watercourses classified as

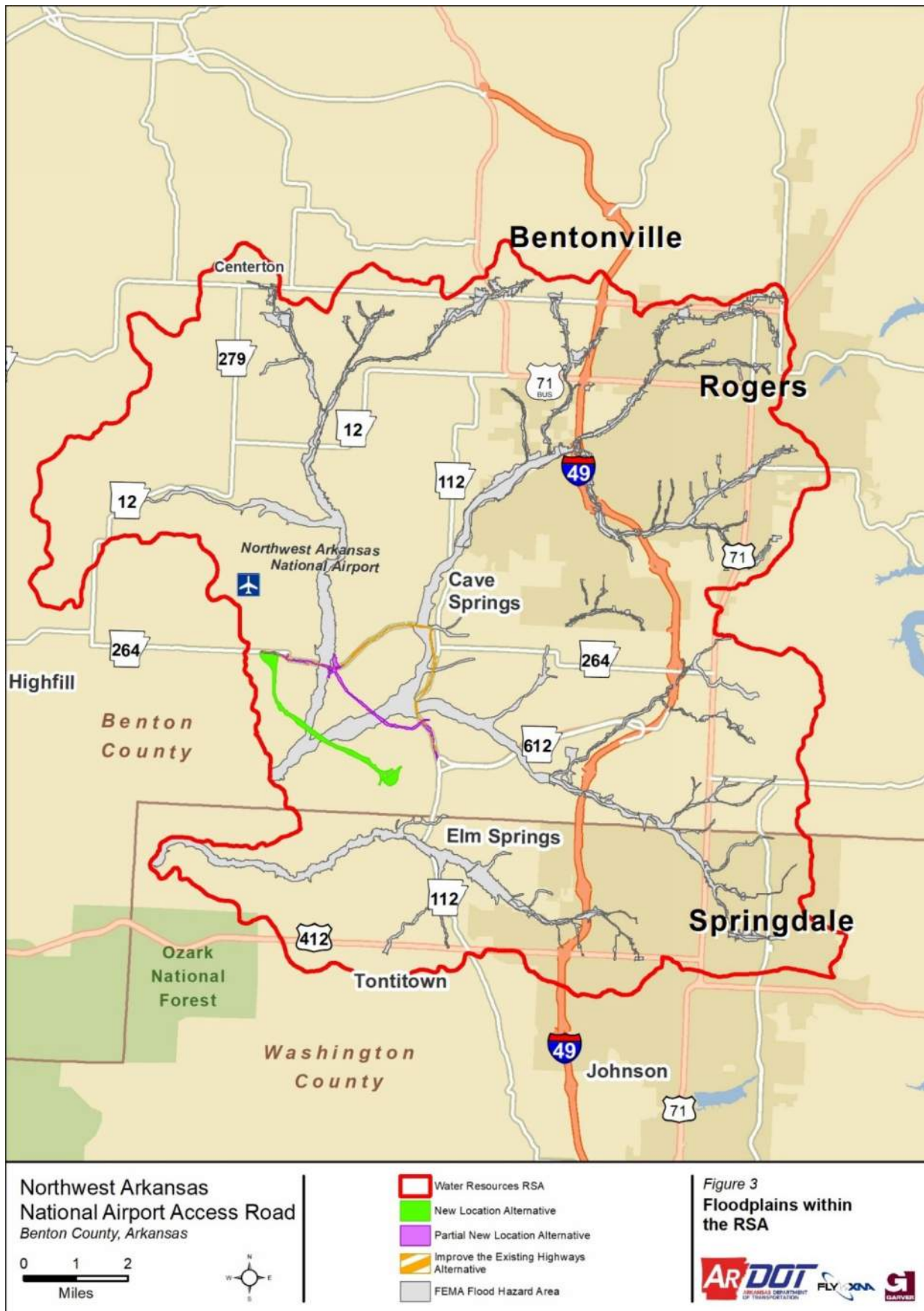
**Figure 1: Resource Study Area (RSA) for Water Resources**



**Figure 2: Water, Wetland, and Spring Features Within the RSA**





**Figure 3: Floodplains Within the Water Resource RSA**

Ecologically Sensitive Waterbodies by ADEQ due to the habitat they provide to protected species. Additionally, four of the springs within the project area were located in the same vicinity and all appeared in fair condition due to their immediate proximity to existing development. Two of the four were in a gravel road (Farrar Rd), one was adjacent to a residential property with the resulting stream channelized, and the fourth flowed through a field heavily disturbed by cattle. Floodplain health is not known but based on the historical trend of continued development in the floodplain (based on comparing 1989 and 2017 aerial imagery), additional floodplain develop is an anticipated trend. However, both Benton and Washington Counties participate in FEMA's National Flood Insurance Program and require floodplain development permits.

Data is not available from previous to current conditions to quantify changes in floodplain, acreage of wetlands or lengths of undisturbed streams; however, it is likely to assume that the amount of wetland acreage and lengths of undisturbed streams has steadily decreased over time due to increased development and changes in land use. Similarly, development within the floodplain has increased when comparing available 1989 imagery and 2017 imagery. According to U.S. Census Bureau population data, the cities within and surrounding the project vicinity are experiencing an increasing growth trend. Historical trends include additional infrastructure, additional subdivisions, and land clearing for cattle or hay production. However, the ecological importance of the area and the benefits of this karst region is becoming more apparent as more and more regulations to protect these features have been established within the past couple years (e.g., the Cave Springs Karst Regulations which has been adopted by several cities). Future trends in development within the Cave Springs Direct Recharge Area will be less impactful on natural resources than were historical developments. However, for developments outside the Direct Recharge Area, slow minor declines in water resources, including floodplains, are anticipated.

## *2. Direct and Indirect Effects on Each Resource from the Proposed Project*

Permanent fill impacts to wetlands from the proposed project (direct effects) are approximately 3.3 acres for the New Location Alternative, 0.8 acre for the Partial New Location Alternative, and 1.5 acres for the Improve Existing Highways Alternative. Fill material would be placed in the wetlands for the construction of items such as roads, embankments, bridge abutments, and bridge columns. Depending on the grading necessary for construction, impacts to some forested wetlands (such as at bridge crossings) would be permanently altered with the removal of trees, but these areas may return as herbaceous wetlands. Other areas would be filled and would result in a complete loss of wetland areas.

Two springs near the New Location Alternative would be directly impacted by construction. Impacts to on-site springs are currently anticipated for three springs along the Partial New Location Alternative and two springs along the Improve Existing Highways Alternative. Cave Springs Cave and the recharge zone will not be impacted by the project.

Permanent fill impacts to streams from the proposed project are approximately 6,618 LF

of streams for the New Location Alternative, 6,705 LF for the Partial New Location Alternative, and 14,849 LF for the Improve Existing Highways Alternative. Fill material would be placed in streams for the construction of items such as culvert extensions, bridge columns, and roadway widening.

The stream and wetland impacts would require Section 404 permitting through the U.S. Army Corps of Engineers (USACE). Mitigation would be required for the impacts and it is possible that a permanent loss of function and services associated with the aquatic features within the proposed project limits may occur. Additional coordination with USACE and the USFWS will occur prior to construction.

Direct impacts to floodplain are not currently known, but the amount of floodplains in the proposed ROW is reported. The New Location Alternative would cross 15.6 acres of floodplain while the Partial New Location Alternative would impact 11.0 acres. The Improve the Existing Highways Alternative would cross 24.4 acres of floodplain. Floodplain impacts would require that a Floodplain Development permit from Benton County be obtained.

Minimal indirect impacts were determined from the proposed project. Three areas with the potential for induced growth were identified in the indirect effects analysis: the intersection of the New Location Alternative with Hwy 264, the intersection of the Partial New Location Alternative with Hwy 264, and the intersection of the Partial New Location Alternative with Hwy 112. Based on input from city planners, it is possible that developments within these areas may occur independent of the proposed project; however, the proposed project would likely affect the rate of the development. For the New Location Alternative, one stream (approximately 1,200 LF) and three ponds (totaling approximately 0.4 acre) would be impacted through fill or culverting by induced growth in the developable area. For the Partial New Location Alternative, three streams (totaling approximately 2,800 LF), five wetlands (totaling approximately 0.9 acre), two ponds (totaling approximately 1.4 acres), and 33.6 acres of floodplains could be impacted through fill or culverting by induced development in the two induced-growth areas.

### *3. Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on Each Resource*

Numerous past actions have occurred in the immediate project vicinity within the past 22 years, few of which have been significant in scale. The most notable past development is the construction of the SNB which connected I-49 and Hwy 112. Currently, only a portion of this project has been built. However, the full project will extend from Hwy 412 in Tontitown to Hwy 412 east of Sonora. Based on the Final Environmental Impact Statement (FEIS) prepared for the project, the preferred alignment for the entire project will impacted 2,600 LF of Special Flood Hazard Area (SFHA), 600 LF of floodway, one spring, and a total of 21 stream crossings. Other past actions include construction of low-density residential properties near the south end of the New Location Alternative (impacts unknown), construction of a subdivision along the east side of Hwy 112 (few apparent impacts), construction of several low-density residential properties located northwest of



the intersection of Wager Drive and Hwy 112 (nearly all of these properties are in the floodplain and may have also result in wetland impacts), construction of an RV park and an additional subdivision along the west side of Hwy 112 (a portion of the subdivision is in the floodplain and also appears to have impacted a stream and wetlands), replacement of the bridge on Hwy 264 over Osage Creek (temporarily stream impacts likely), construction of several low-density residential properties along Hwy 264 and associated sideroads (stream and wetland impacts possible), and construction of a subdivision along the south side of Hwy 264 (few apparent impacts). Past actions within the RSA beyond the immediate project vicinity have been much more sizable and include the development (primarily residential but includes commercial as well as a large quarry) of very large areas. Areas developed since 1998 occur primarily east of Hwy 112 as the larger cities of Springdale, Lowell, Rogers and Bentonville expand their boundaries. Historical data was not available to determine specific areas of potentially affected wetlands and streams from past actions. However, based on aerial imagery and topographic maps, some developments may have filled existing wetlands or culverted/filled existing streams. For the replacement of the bridge on Hwy 264 over Osage Creek, the bridge was constructed on an offset alignment to the south and water quality impacts were presumably primarily temporary.

Present actions identified in the immediate project vicinity include the replacement of the existing Hwy 264 bridge over Little Osage Creek on an offset alignment to the north. Construction appears to have impacted approximately 1,200 LF of one unnamed tributary that flows east along the north side of Hwy 264 as well as approximately 0.2 acre of one wetland-stream complex located northeast of the intersection of Colonel Myers Road and Hwy 264. Other construction impacts in the immediate area (associated with an unknown project) are present along the south side of Hwy 264 approximately 0.2 mile west of the Hwy 264/Haden Road intersection and include what appears to be visible disturbance of approximately 300 LF of the stream and roughly 0.2 acre of a wetland.

Other present and future actions include the developments or expansions of several subdivisions within Cave Springs and Lowell as well as roadway improvement projects. Some of these projects were described by City Planners and copies of their responses are located within this appendix. However, many of the city planners failed to provide specific details regarding proposed development. Of those projects with specific enough details to locate the project, a total estimated 3,230 LF of stream impacts and 0.4 acre of wetland impacts may have occurred as a result of the site grading conducted. No apparent floodplain impacts resulted from the site grading associated with the locatable city projects. During the interview process, the Airport indicated that a future industrial park was planned adjacent to the airport though the specific location was not provided. Based on available planning documents, this development did not appear reasonable foreseeable or financially constrained. Additionally, based on recent aerial imagery, three large areas appear to have been recently disturbed, one of which is for residential development and the other two appear to be for surface mining and/or commercial developments. These three areas collectively appear to have impacted approximately 1,950 LF of streams and 0.4 acre of wetlands. One of these areas is within a floodplain but no currently structures or roadways appear to have been constructed.

The City of Cave Springs plans to build a wastewater line from Cave Springs to the Northwest Arkansas Conservation Authority (NACA). The proposed improvements to the city's wastewater treatment and disposal system currently have three alternatives under consideration. Implementation of this project would incur wetland and/or stream impacts but the quantity of these impacts would depend on which alternative was chosen. Further development of this project is required before quantitative impact analysis can occur with regards to its cumulative effects on the Northwest Arkansas National Airport Access project with regard to wetlands and streams.

As a result of the rapid population growth in northwest Arkansas, many new transportation infrastructure projects have been proposed in the region to keep pace with the residential and commercial developments. Some of these transportation projects are reasonably foreseeable actions and are shown in Figure 3 of the EA document. Based on the 2019-2022 Statewide Transportation Improvement Plan (STIP) and interviews with the Northwest Arkansas Regional Planning Commission (NWARPC), five foreseeable projects are planned within the RSA. The first project is the Hwy 112 Corridor Improvements project which plans construction to be completed in 2022. NWARPC mentioned in a phone interview that while there is money in the STIP for the Hwy 112 improvements, the entire section identified for improvements will not necessarily get built. Hwy 112 traverses through or near several environmentally sensitive areas, including the Cave Springs Recharge Area. It is the only continuous North-South route west of I-49, serving local and regional traffic between Fayetteville and Bentonville, making it crucial for regional mobility. The proposed improvements will widen 17.9 miles of the highway (beginning at the Benton/Washington County line extending north) from two to four travel lanes, improve geometry, and provide access management. Strategies to manage access such as adequate driveway spacing, a raised median, and deceleration lanes will be necessary to maximize operations and safety through this corridor. Hwy 112 crosses an estimated 17 streams (impacting an estimated 1,891 LF within the project area) and numerous floodplains. Widening of this facility will likely impact these resources. Additionally, an estimated 0.3 acres of wetlands may be associated with some of those streams and/or floodplains. However, these impacts will be smaller in scale than a new-alignment project as improvements would presumably stay within existing right of way. The second foreseeable project is the approximately six-mile extension of the SNB (Hwy 612) for which construction is planned to be completed in 2021. This project is considered an essential east-west corridor improvement to the highway system in the metropolitan area and will continue to improve reliability and safety for freight and commuters by providing a four-lane fully controlled access freeway through the urbanized area and relieving traffic congestion and improving safety on the existing US 412 through Springdale. Water resource impacts associated with this project (both past and future work) were previously described and are anticipated to be greater in quantity compared to other projects since the SNB will be constructed on entirely new alignment. The third project is an intersection improvement project in Lowell at Hwy 264 and Bellview Street. Minimal to no water resource impacts are anticipated. The fourth project is a capacity project in Rogers on Hwy 12 just west of 8<sup>th</sup> Street. Water resource impacts are anticipated to be minimal as the area is in a highly developed area. The fifth project is a capital project in Centerton on Hwy 102 just east of Hwy 279. Water resource impacts

may include two stream impacts as well as floodplain impacts. According to an interview with NWARPC, other identified projects in the vicinity of the proposed improvements (notably the Hwy 279 Corridor, Hwy 264 west of I-49, and Hwy 264 within Cave Springs) are environmentally constrained by sensitive areas and not likely to occur in the foreseeable future.

Delineation of past and future impacts to water resources are difficult to quantify for the above-described actions and especially so for those city projects that were not locatable. However, types of impacts could include stream or wetland fill, culvert extensions, bridge widening and/or development within the floodplain. For those other projects that wetland and stream impacts are able to be estimated, a total of 4,730 LF of stream impacts and 2.8 acres of wetland impacts could be anticipated in total. With all future projects, analysis of impacts to water resources would be individually evaluated during project implementation.

To conservatively estimate “worst case” impacts from future actions, trends from USFWS studies<sup>2</sup> were used to calculate the potential areas of wetlands that would be present by 2040. Using the five-year 2004-2009 study from USFWS, a two percent decline was determined for that time period. If this trend continues, the amount of wetlands would decline by approximately eight percent. Although this percentage does not seem staggering, if applied to the amount of water and wetland features within the RSA, this eight percent represents approximately 209 acres which can be a substantial amount of habitat loss for species that depend on these areas. The cumulative effects of losses in freshwater systems can have consequences for hydrologic and ecosystem connectivity. Substantial reductions in wetland extent can result in habitat loss and fragmentation, and may limit the ability to reconstruct and repair wetlands (Dahl 2011). However, this wetland reduction is again, simply a worst case scenario of wetland decline within the entire RSA.

#### *4. The Overall Effects of the Proposed Project Combined with Other Actions*

As stated in the previous section, cumulative effects of freshwater system reductions can have hydrologic and ecological consequences. The direct impacts of up to 3.3 acres of wetland impacts and up to 14,849 LF of stream impacts is a relatively small reduction of total acreage for water resources found within the RSA. The indirect impacts of up to 2.3 acres of wetland impacts and up to 2,800 LF of stream impacts is also a relatively small reduction of water resources. The direct and indirect impacts to wetlands equate to approximately 0.1 percent of the total acreage for water resources (approximately 2,617 acres) found within the RSA. This reduction combined with the other actions where impacts are able to be estimated would produce a cumulative impact of 23,420 LF for streams and 7.3 acres for wetlands. However, this only represents a subset of the impacts resulting from other actions. Therefore, the cumulative impacts resulting from the worst case scenario are also considered and these total to an 8.1 percent reduction in aquatic resources, which would mean a loss of approximately 213 acres of aquatic resources throughout the entire RSA. Likely the true cumulative impact to the acreages of wetlands

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<sup>2</sup> Dahl, T.E. 2011. Status and Trends of Wetlands in the Conterminous United States 2004 to 2009. U.S. Department of the Interior; Fish and Wildlife Service, Washington, D.C. 108 pp.

and streams will be somewhere between these two values (i.e., between 7 and 213 acres). Overall, given the relatively minor percentage of wetland reduction, the proposed project is not expected to contribute substantial cumulative impacts to water resources in the project vicinity. Cumulative impacts to floodplains related to other past and reasonably foreseeable future actions combined with the proposed project are also possible. However, as with the proposed project, floodplain impacts will be minimized on other projects through location and design considerations.

### *5. Mitigation of Cumulative Impacts*

For the proposed action, several standards and regulations are in place to mitigate for water resource impacts. General minimization and mitigation measures such as erosion and sedimentation best management practices (BMPs) as a part of the Stormwater Pollution Prevention Plan (SWPPP) would be required for roadway construction and would be implemented by the Developer or the Contractor. These BMPs would help protect water quality within this important karst region and as a result, also help protect stream and/or spring habitats potentially utilized by threatened and endangered species. The Arkansas Department of Environmental Quality (ADEQ) is the agency responsible with authorizing General Construction Stormwater permits and their associated SWPPPs. Additionally, BMPs identified by USFSW (2007)<sup>3</sup> will be used for the proposed action as a guide to ensure that any sedimentation is kept to a minimum and to avoid impacts to groundwater and sensitive or endangered species. BMP measures employed can include the use of filter fences, straw bales, interceptor dikes and swales, sediment traps, detention basins, seeding and revegetation where appropriate. Additionally, the Cities of Rogers, Cave Springs, Lowell, and Springdale have adopted the Cave Springs Area Karst Resource Conservation Regulations drafted in 2015. Although the proposed action is outside of the Cave Springs Direct Recharge Area, impacts of other actions within the direct recharge area in these cities will be closely examined. These cities have implemented specific mitigation measures to protect karst regions in their drainage criteria manual or in their city ordinances and any other actions will be required to abide by these standards. Impacts from the proposed action will also be required to comply with the Clean Water Act (CWA). Section 404 of the CWA is regulated by the US Army Corps of Engineers (USACE) and protects Waters of the United States (i.e., streams and wetlands). The proposed action will also require water quality certification for stream impacts as it will be subject to Section 401 of the CWA. For floodplains, a Floodplain Development permit from Benton County will be obtained and per the permit requirements, the Flood Damage Prevention Ordinance will be applied to minimize flood damages to the proposed development and to adjacent properties as well. As for other actions, both Benton and Washington Counties participate in FEMA's National Flood Insurance Program and Benton County (which is where the proposed action occurs and most of the RSA is located) participates in the Community Rating System. Participation in the Community Rating System program mitigates home and business damage by flooding.

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<sup>3</sup> United States Fish and Wildlife Service, 2007. Community Growth Best Management Practices for Conservation of Karst Recharge Areas, 14 pp.



Minimization and mitigation for impacts of other future actions (assuming they are federally funded or involve federal permitting) should require the same standards and adhere to the same regulations as described above for the proposed action. Efforts should be taken through local, state, and federal regulations to avoid and minimize any adverse effects from development or future activities. Any impacts associated with future developments would be the responsibility of developers in coordination with the local municipalities and local agencies.

## Federally-Listed Species Habitat

### *1. Resource Study Area, Conditions, and Trends*

The proposed project has the potential for a “may affect not likely to adversely affect” determination for seven federally-listed species: the gray bat, Indiana bat (IBat), northern long-eared bat (NLEB), Ozark big-eared bat, eastern black rail, Ozark cavefish, and the Benton County cave crayfish. Resources associated with these species include wooded habitat and riparian corridors (for bat roosting/foraging), caves (for bat roosting), emergent wetlands (for the rail), and cave streams and springs caves (for the Ozark cavefish and the Benton County cave crayfish). The RSA for the cumulative analysis of federally-listed species habitat was delineated using a combination of natural species-based boundaries for bats and the mapped vulnerability areas of the Cave Springs Recharge Area with regards to the two karst species (the Ozark cavefish and the Benton County cave crayfish). First, a 2.5 buffer was placed around the project extents. This distance is based on a reasonable bat foraging distance of 2.5 miles<sup>4</sup>. Next, any area identified as a vulnerability zone was included in the RSA, which is labelled as the T&E RSA in **Figure 4**. By design and as shown in **Figure 4**, the resulting RSA includes both the direct and indirect Cave Springs recharge areas and encompasses a total of approximately 66,474 acres. The same temporal limits (1998 to 2040) used for the cumulative analysis on water resources is applied for this analysis for the same reasons as discussed in the water resources section. The boundary of the direct and indirect recharge areas can be seen in Appendix F of the EA document. Exhibits showing mapped wooded areas (representing bat habitat) and identified emergent wetlands (representing rail habitat) are provided in Appendix H and G, respectively, of the EA document.

Karst features including caves, sinkholes, and solution valleys are known to occur in the ecological region encompassing the RSA. Springs are common and contribute substantially to streamflow in the summer and fall. Losing streams can be direct conduits to groundwater resources and in this specific area are those that allow discrete recharge into the Cave Springs Recharge Area. The region is noted to be mostly cleared for pastureland, hay land, or expanding residential development.

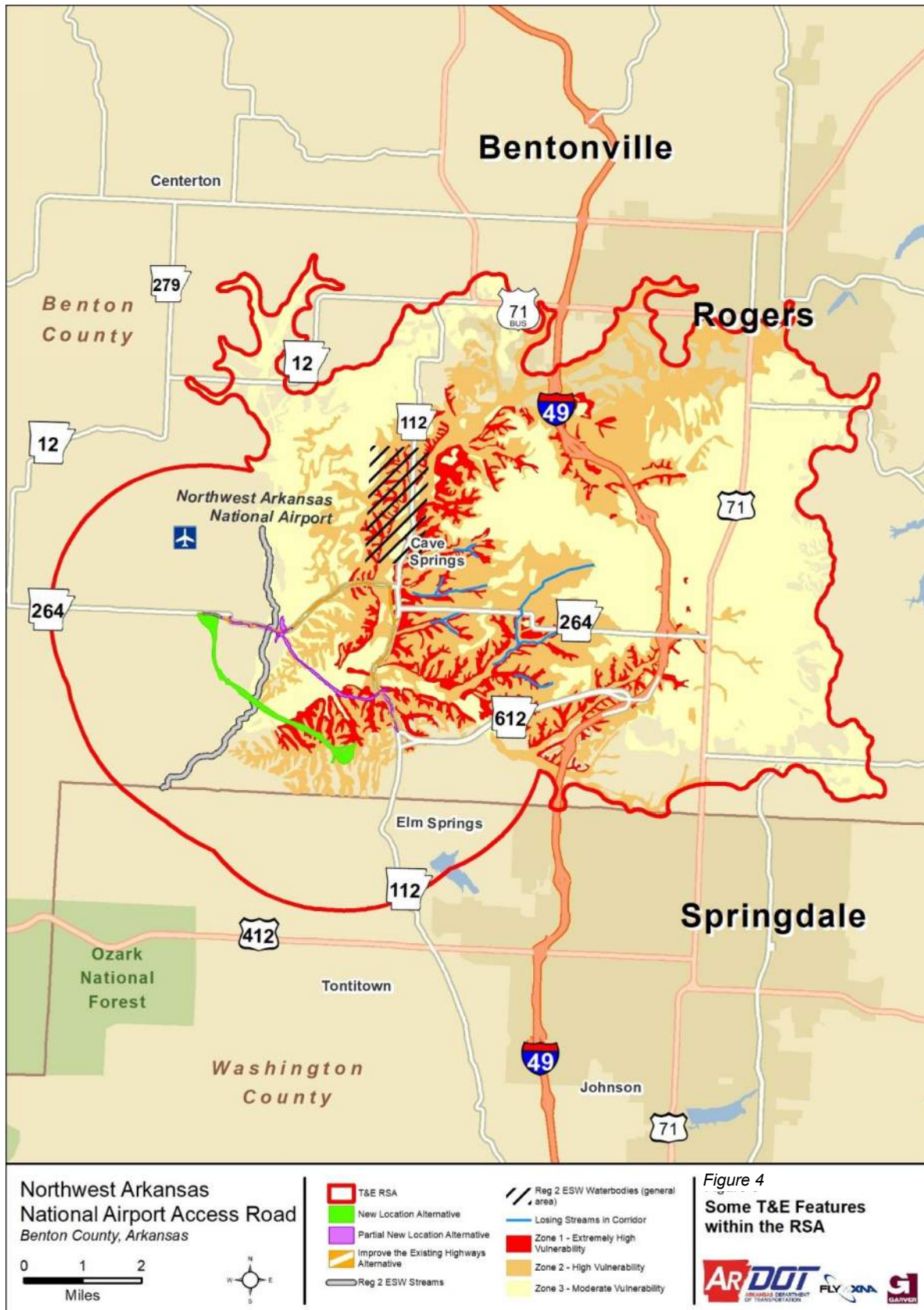
Northwest Arkansas is an area of the state that has experienced unprecedented periods of growth over the last decade, most notably from 2003 to 2007. As a result, the Northwest Arkansas Regional Planning Commission funded a study to identify efforts that would help prevent future adverse effects to threatened and endangered species, and their habitats within the sensitive karst landscapes of northwest Arkansas<sup>5</sup>. Recommendations from the study included endangered species surveys and recharge delineation studies for caves associated with endangered and threatened species and avoiding water quality degradation, among many others. The study concluded that without such efforts, it was

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<sup>4</sup> USFWS. 2019. Section 7 Technical Assistance, Summary of Indiana Bat Ecology. Available at: <https://www.fws.gov/midwest/endangered/section7/s7process/mammals/inba/INBAEcologySummary.html>

<sup>5</sup> Aley, T. and C. Aley. 1979. Prevention of adverse impacts on endangered, threatened, and rare animal species in Benton and Washington Counties, Arkansas. Northwest Arkansas Regional Planning Commission, Springdale, Arkansas. 35p.

**Figure 4: Federally-Listed Species Habitat RSA Map and Select Features within the RSA for Listed Species**



likely that adverse effects to groundwater and other ecologically important resources could occur over time.

The RSA contains approximately 12,231 acres of forested habitat and riparian corridors (suitable for bat roosting/foraging; based on the 2016 National Land Cover Database; NLCD), 1,218 acres of presumptive habitat for the Ozark cavefish (as identified by the Cave Springs Area Karst Resource Conservation Study), and 479 miles of streams mapped by the National Hydrology Databases (potentially connected to suitable habitat for cavefish and crayfish), and less than 1 acre of emergent wetland habitat (suitable rail habitat; based on the 2016 NLCD). Osage Creek and Little Osage Creek are both perennial watercourses classified as Ecologically Sensitive Waterbodies (ESW) by ADEQ. ESAs are known to provide habitat within the existing range of threatened, endangered or endemic species of aquatic or semi-aquatic life forms (<https://www.adeg.state.ar.us/water/resources/definitions.aspx>). Of the stream habitats, approximately 43,137 LF are identified by the Cave Springs Area Karst Resource Conservation Study as being losing streams. As previously described, losing streams are karst features that can be direct conduits to groundwater resources and in this specific area are those that allow discrete recharge into the Cave Springs Recharge Area. Much of the wooded habitats within the RSW are fragmented from existing development and roadways. However, large sections of woodlands and riparian corridors are still present along streams, particularly in the southwest quadrant of the RSA.

Precise data is not available previous to current conditions to quantify historical trends in habitat quality/quantify for these federally-protected species. However, based on historically aerial photography, the overall amount of forested habitat has steadily decreased over time due to increased development and changes in land use. Given current aforementioned water quality trends for Cave Springs Cave and the rapidly changing use and development of the area, the condition of threatened and endangered species in the area remains uncertain. Historical trends include additional infrastructure, additional subdivisions, and land clearing for cattle or hay production. However, the ecological importance of the area and the benefits of this karst region is becoming more apparent as more and more regulations to protect these features have been established within the past couple years (e.g., the Cave Springs Karst Regulations which has been adopted by several cities). Thus, it is believed that future trends in development will be less impactful on natural resources than was historical development.

## *2. Direct and Indirect Effects on Each Resource from the Proposed Project*

Clearing and grading activities within the proposed right of way (ROW) will directly impact approximately 75.5 acres of forested habitat by the New Location Alternative, 26.4 acres by the Partial New Location Alternative, and 18.9 acres by the Improve Existing Highways Alternative. Removal of these trees could permanently convert potentially suitable bat habitat to maintained ROW.

Clearing and grading activities within the proposed right of way (ROW) will also directly impact approximately 0.7 acre of emergent wetlands within the Partial New Location



Alternative and 0.08 acre of emergent wetlands within the Improve Existing Highways Alternative. No emergent wetlands will be directly impacted by the New Location Alternative. Removal of these emergent wetlands could permanently convert potentially suitable rail habitat to maintained ROW.

While none of the proposed alternatives directly impact presumptive habitat (as identified by the Cave Springs Area Karst Study) for the Ozark Cavefish or occur within the delineated recharge zone, the proposed project does occur within several vulnerability zones. Of the 242 acres of proposed ROW for the New Location Alternative, approximately 123 acres (51 percent) occurs within vulnerability zones 1, 2, or 3. Of the 101 acres of proposed ROW for the Partial New Location Alternative, approximately 86 acres (85 percent) occurs within vulnerability zones 1, 2, or 3. Of the 75 acres of proposed ROW for the Improve Existing Highways Alternative, approximately 49 acres (65 percent) occurs within vulnerability zones 1, 2, or 3. Construction activities in these areas will result in land disturbance and increased rates of erosion and sedimentation. Additionally, as discussed in the water resources section, each alternative will directly impact (through grading and/or fill) springs identified during the wetland delineation. Two springs near the New Location Alternative would be directly impacted by construction, three springs would be impacted by the Partial New Location Alternative, and two springs would be impacted by the Improve Existing Highways Alternative. Moreover, because the project occurs with a karst region, aquatic resources (including ponds) may be connected belowground or off-site to karst features and, therefore, the likelihood exists that impacts to karst features and/or habitat for cave-obligate species could occur as a result of direct or indirect impacts.

Portions of Osage Creek and Little Osage Creek, which are classified as ESWs by ADEQ due to the important habitat they provide to wildlife including federally-protected species, are present in the project extents. The New Location Alternative will construct two span bridges, one over each of the two creeks and substantial direct impacts to these watercourse will be avoided. Further north, a portion of Little Osage Creek will be impacted along Hwy 264 by the proposed crossing of both the Partial New Location Alternative and the Improve Existing Highways Alternative. Impacts to these streams or to any adjoining wetlands would require Section 404 permitting through the USACE. Mitigation would be required for any impacts and it is likely that a permanent loss of all function and services associated with the aquatic features can be avoided through minimization and mitigation measures. Additional coordination with the USFWS will occur prior to construction.

Minimal indirect impacts were determined from the proposed project. Three areas with the potential for induced growth were identified in the indirect effects analysis: the intersection of the New Location Alternative with Hwy 264, the intersection of the Partial New Location Alternative with Hwy 264, and the intersection of the Partial New Location Alternative with Hwy 112. Based on input from city planners, it is possible that developments within these areas may occur independent of the proposed project; however, the proposed project would likely affect the rate of the development. For the New Location Alternative, induced growth in this area may affect (through removal) 6

acres of potentially suitable roosting habitat for the NLEB and IBat. Additionally, this area contains one barn and one shed (both abandoned) that could function as NLEB summer roosting habitat. Any future tree clearing that may occur could comply with the 4(d) rule established for the NLEB, and seasonal tree clearing restrictions would minimize impacts the NLEB and IBat.

For the Partial New Location Alternative, induced growth in these two areas may affect (through removal) a total of 14 acres of potentially suitable roosting habitat for the NLEB and IBat and approximately 0.7 acre of potentially suitable emergent wetland habitat for the rail. Additionally, this area appears to contain some barns/sheds that may be abandoned and could function as NLEB summer roosting habitat. Depending on the amount of required tree clearing that may occur, future projects could comply with the 4(d) rule established for the NLEB, and seasonal tree clearing restrictions would minimize impacts the NLEB and IBat. Although both of these two developable areas are outside of the Cave Springs Recharge Area boundary, the eastern portion of the area around the Hwy 264 intersection is within a moderate vulnerability zone of the Cave Springs Karst Region and the entire area around the Hwy 112 intersection is within either a moderate, high, or extremely high vulnerability zone of the Cave Springs Karst Region. The vulnerable regions coupled with the presence of streams increases the likelihood that these areas may contain suitable habitat for the Ozark Cavefish or the Benton County Cave Crayfish, resulting in a may affect determination for the species.

No areas of induced growth were identified for the Improve the Existing Highways Alternative.

### *3. Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on Each Resource*

As documented in the water resources section, numerous past, present, and reasonably foreseeable actions have occurred in the water resource RSA. The RSA established for federally-listed species habitat is slightly smaller and almost entirely contained within the RSA established for water resources. No additional “other actions” were documented within the T&E RSA. However, two of the five reasonably foreseeable transportation projects listed for the waters RSA occur outside of the habitat RSA. The two future projects beyond the habitat/T&E RSA that are not evaluated for this resource are the capacity project in Rogers on Hwy 12 just west of 8<sup>th</sup> Street and the capital project in Centerton on Hwy 102 just east of Hwy 279.

As mentioned in the water resources section, the City of Cave Springs plans to build a wastewater line from Cave Springs to the NACA. The proposed improvement to the city’s wastewater treatment and disposal system currently has three alternatives under consideration. Regardless of which alternative is chosen, this project will cross through areas having karst features, such as springs, caves, and losing streams. This project, combined with the Highway 112 widening (including the Cave Springs Bypass) and the proposed Northwest Arkansas National Airport Access project is expected by USFWS to have cumulative effects for karst species such as the Ozark cavefish and the Benton

County cave crayfish. In correspondence dated October 8, 2020, USFWS recommends that in order to minimize impacts to listed species, ARDOT should coordinate the paths of the Cave Springs Bypass, widening of Highway 112, and construction of the Northwest Arkansas National Airport Access road to overlap as much as possible and follow alignments being proposed for other actions, such as NACA. In addition, USFWS recommends following karst best management practices consistent with those previously developed for the Cave Springs Cave Recharge area.

Little historical data was available to determine specific areas of potentially affected habitat from past actions. However, based on aerial imagery, it is estimated that roughly 71 acres of wooded habitat within the RSA was removed as a result of the past construction of the SNB. The impact this project had on cave-obligate species is unknown, but the selected alignment did not allow access at the I-49/bypass directional interchange near the recharge area in order to limit induced development. Additionally, according to the Environmental Impact Statement and Record of Decision prepared for the project, drainage and stormwater runoff from the selected alternative would not discharge into the Cave Springs recharge area. Moreover, commitments for the selected alternative were established that limited access, additional interchanges, and the construction of frontage roads between Hwy 112 and I-49. For other past projects, the effects of past low-density residential development would have only minor impacts to species habitat (tree clearing is likely and potentially impacts to rail habitat could have occurred) compared with construction of large subdivisions which typically clear cut and grade entire areas during site preparation. Based on NWI data, none of the locatable subdivisions currently under construction impacted emergent wetlands. Large scale past developments (primarily residential but include commercial) have contributed to an overall decline in the amount of forested habitat. Establishment of the quarry located immediately south of the SNB appears to have removed approximately 46 acres of forested habitat and is located within both extremely high and high vulnerability zones for karst habitat. Based on historical aerial imagery, the three large recently disturbed areas (one intended for residential development and the other two appearing to be for surface mining and/or commercial developments) may have collectively impacted approximately 19 acres of woodlands.

Delineation of future impacted habitat for federally-listed species are difficult to quantify for these actions given the extensive size of the RSA. However, types of impacts expected to occur include tree removal which permanently converts wooded habitat to maintained ROW or residential/commercial development. Land disturbance associated with present and foreseeable project increases rates of erosion and sedimentation and can threaten water quality in this sensitive karst region in appropriate BMPs are not implemented. It is anticipated that the on-alignment portion of the future Hwy 112 widening project would not significantly impact species habitat compared to other new alignment projects because improvements would generally stay within existing right of way. Regardless, it is estimated that the Hwy. 112 project would impact 5 acres of suitable foraging habitat for bats, one spring, and 0.1 acre of emergent wetlands (for the Rail). However, the Cave Springs Bypass project would cross through areas having karst features, such as springs, caves, and losing streams. As previously mentioned, this project, combined with the

Highway 112 widening and the proposed Northwest Arkansas National Airport Access project is expected by USFWS to have cumulative effects for karst species such as the Ozark cavefish and the Benton County cave crayfish. The SNB extension will occur on entirely new alignment and may result in the clearing of approximately 10 acres of wooded habitat with the RSA. For the entire SBN project, the FEIS document reported a total of approximately 344 acres of woodland to be converted to highway ROW by the project. Additionally, as previously mentioned, because the SNB, the Hwy 112 widening, and the intersection improvements in Lowell all occur with a karst region, aquatic resources (including ponds) may be connected belowground or off-site to karst features and, therefore, the likelihood exists that impacts to these features could result in impacts to habitat for cave-obligate species. Yet, with each of these three future projects, analysis of impacts to each resource would be individually evaluated during project implementation.

To conservatively estimate “worst case” impacts from future actions, present (2016) tree cover quantities from the National Land Cover Database (NLCD) were compared to past (2001) quantities. In 2001, the NLCD shows approximately 13,357 acres of forested area in the T&E RSA, compared to 12,231 acres of forested area in 2016. This is an eight percent reduction for that 15-year period. If this trend continues, the amount of forested areas would decline by approximately 11 percent by 2040. Although this percentage does not seem staggering, if applied to the amount of forested areas within the RSA, this 11 percent represents approximately 1,305 acres, which can be a substantial amount of habitat loss for species that depend on these woodlands. However, this woodland reduction is, again, simply a worst-case scenario of woodland decline within the entire RSA and does not represent other types of habitat decline or reflect quality.

#### *4. The Overall Effects of the Proposed Project Combined with Other Actions*

As discussed in the water resources analysis, cumulative effects of freshwater system reductions can have hydrologic and ecological consequences. Moreover, adverse effects within the karst landscapes of the RSA (which coincides with habitat for some threatened and endangered species) can be pronounced in that these landscapes contain caves, sinkholes, springs, and losing streams (all of which can be direct conduits to groundwater resources).

The direct impacts of up to 75.5 acres of tree clearing (for the New Location Alternative) is a relatively small reduction of total wooded habitat found within the RSA. The indirect impacts of up to 6 acres of wooded habitat is a very small reduction of resources. The direct and indirect impacts (for the New location Alternative which would represent the largest combination of direct and indirect impacts to wooded areas) equates to an estimated maximum of 82 acres of tree clearing, which is approximately 0.7 percent of wooded area within the RSA. This reduction combined with the other actions where impacts are able to be estimated would produce a cumulative impact of 508 acres of tree clearing. However, this only represents a subset of the impacts resulting from other actions. Therefore, the cumulative impacts resulting from the worst-case scenario are also considered and these total to a loss of 11.7 percent (1,431 acres) of potential bat



habitat throughout the entire RSA. However, not all of these wooded areas may be suitable roosting habitat. Likely the true cumulative impact for the acreages of tree removal will be somewhere between these two values (i.e., between 508 and 1,431 acres).

Overall, given the relatively low percentage of woodland reduction, considering the future trend in development being less impactful on natural resources than historical development has been due to increased protections to karst regions, and assuming appropriate implementation of regulatory control strategies and policies, the proposed project is not expected to contribute substantial cumulative impacts to bat habitat for in the project vicinity. Cumulative impacts to aquatic cave-obligate and/or karst species is generally unknown given the subterranean and indirect nature of these potential impacts. However, given the proposed project, the Highway 112 widening project (including the Cave Springs Bypass), and the Cave Spring's wastewater improvements project will all cross through areas having karst features, such as springs, caves, and losing streams, cumulative effects of these developments and the supporting infrastructure is a concern for conservation and protection of at-risk species. Therefore, the USFWS recommends that in order to minimize impacts to listed species, ARDOT should coordinate the paths of the Cave Springs Bypass, widening of Highway 112, and construction of the XNA connector road to overlap as much as possible and follow alignments being proposed for other actions, such as NACA. Cumulative impacts to rail habitat (i.e. emergent wetlands) are not considered substantial given the very minimal impacts anticipated from direct, indirect, and other project actions.

### *5. Mitigation of Cumulative Impacts*

For the proposed action, several standards and regulations can be applied to mitigate for cumulative impacts to habitat of federally-listed species. General minimization and mitigation measures such as erosion and sedimentation BMPs as a part of the SWPPP would be required for construction and would be implemented by the Developer/Contractor. These BMPs would help protect water quality within this important karst region and help to protect stream and/or spring habitats potentially utilized by threatened/endangered species. The ADEQ is the agency responsible with authorizing General Construction Stormwater permits and their associated SWPPPs. Development of a SWPPP and ADEQ approval will also be required for any of the other actions disturbing greater than 5 acres; which in this case will be most of the locatable projects previously described. Additionally, BMPs identified by USFSW (2007)<sup>6</sup> will be used for the proposed action as a guide to ensure that any sedimentation is minimized and to help avoid impacts to groundwater and sensitive or endangered species. BMP measures employed can include the use of filter fences, straw bales, interceptor dikes and swales, sediment traps, detention basis, seeding and revegetation where appropriate. These USFWS BMPs may be required or utilized for some of the other actions as well. USFWS specifically recommended in their October 8, 2020 letter that the proposed project follow karst best management practices consistent with those previously developed for the Cave

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<sup>6</sup> United States Fish and Wildlife Service, 2007. Community Growth Best Management Practices for Conservation of Karst Recharge Areas, 14 pp.

Springs Cave Recharge area. Moreover, in sensitive areas such as karst areas, precautionary measures should be taken during construction of the proposed action to avoid impacts to groundwater and the aquatic habitat of sensitive species. In the event of cave discovery during construction, work will halt and the ARDOT Environmental Division shall be contacted.

Additionally, the cities of Rogers, Cave Springs, Lowell, and Springdale have adopted the Cave Springs Area Karst Resource Conservation Regulations drafted in 2015. These regulations apply to any development within the Cave Springs Direct Recharge Area in the city limits of the four above-listed cities. This conservation initiative was proposed to mitigate for any potentially adverse effects to sensitive resources resulting from possible secondary and cumulative development. Although the proposed action limits, as well as the areas of induced growth, are outside of the Cave Springs Direct Recharge Area, impacts to the region are still closely examined and the above-mentioned cities have implemented mitigation measures to protect karst regions in their drainage criteria manual or in their city ordinances. Thus, some of the other actions identified (e.g. the Lakewood and Timber Ridge Subdivisions in Lowell), will be required to comply with the Cave Springs Area Karst Resource Conservation Regulations. Impacts from the proposed action will be required to comply with Section 7 of the Endangered Species Act, as will any other federally-funded or permitted project.

Code tools such as a tree ordinance, a riparian buffer ordinance, or a conservation subdivision ordinance are other options to help minimize cumulative impacts. Land use planning can begin with community goals and, over time, be followed by zoning ordinances to minimize cumulative impacts resulting from development in sensitive areas.

Minimization and mitigation for impacts of other future actions utilizing federal funds should require the same standards and adhere to the same regulations as described above for the proposed action. Efforts should be taken through local, state, and federal regulations to avoid and minimize any adverse effects from development or future activities and include these considerations. Any impacts associated with future developments would be the responsibility of developers in coordination with the local municipalities and local agencies.

## Land Use

### *1. Resource Study Area, Conditions, and Trends*

The proposed project has the potential to impact land use. The RSA for the cumulative analysis of land use was delineated using the same Area of Interest (AOI) that was utilized for the induced-growth effects analysis. This RSA was determined using major roadways, existing development areas, and natural features. The land use RSA is shown in Figure 1 of the Induced-Growth Effects analysis and is approximately 13,710 acres in size. The same temporal limits (1998 to 2040) used for the cumulative analysis on other resources is applied for this analysis for the same reasons as discussed in the water resources section.

While undeveloped land is not in short supply within the RSA, it is considered a resource in decline. According to U.S. Census Bureau population data, the cities within and surrounding the RSA are experiencing an increasing growth trend. The RSA is primarily located in Benton County but also includes a portion of Washington County. Benton and Washington Counties have shown substantial population growth in the last 20 years. According to a 2018 article published in the Northwest Arkansas Democrat Gazette, the Fayetteville-Springdale-Rogers area was the 14<sup>th</sup> fastest growing metropolitan area in the United States in 2017. Based on the 2016 (most recent year available) National Land Cover Database (NLCD), approximately 18% of the RSA consists of developed land. Based on the NLCD only 15% of the area was developed in 2001. The region is noted to be mostly cleared for pastureland, hay land, or expanding residential development. Additionally, as discussed in the previous section on federally-protected species, the overall amount of forested habitat has steadily decreased over time due to increased development and changes in land use. Historical trends include additional infrastructure, additional residential developments, and land clearing for cattle or hay production.

### *2. Direct and Indirect Effects on Each Resource from the Proposed Project*

Direct land use changes require the acquisition of approximately 242 acres of primarily pasture and forested land for the New Location Alternative, 101 acres for the Partial New Location Alternative, and 75 acres for the Improve Existing Highways Alternative. These impacts will permanently convert land to maintained highway ROW. Figure 15 in the wildlife impacts section of the EA document shows the direct land use impacts in relation to the 2016 NLCD.

Land use impacts resulting from induced-growth were determined from the proposed project. Three areas with the potential for induced growth were identified in the indirect effects analysis: an approximately 87-acre area at the intersection of the New Location Alternative with Hwy 264, an approximately 84-acre area at the intersection of the Partial New Location Alternative with Hwy 264, and an approximately 25-acre area at the intersection of the Partial New Location Alternative with Hwy 112. Based on input from city planners and the increased accessibility occurring at these three locations, land use changes from rural/undeveloped to commercial or even industrial are anticipated in these areas. Induced growth is expected to occur within these three areas and it is likely that

facilities such as gasoline stations or travel-related services will be developed around these intersections. While redevelopment along Highways 112 and 264 may occur as a result of the Improve the Existing Highways Alternative, and increased mobility is expected, areas of induced growth were not identified for this alternative as it will not cause increased accessibility (since the area is already accessible to existing users).

### *3. Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on Each Resource*

As documented in the water resources analysis, numerous past, present, and reasonably foreseeable actions have occurred in the project vicinity. As the RSA established for land use changes is dramatically smaller than the water resources RSA, it only contains a subset of the previously-identified other actions, which include the two bridge improvement projects on Hwy 264, a portion of the Hwy 112 widening project, and portions of the past and future sections of the SNB. Permanent land use conversions are not anticipated to occur for either of the two bridge projects as little to no additional permanent ROW appears to be required. For the Hwy 112 widening project, an estimated 75 acres of land may be converted to highway and/or maintained ROW from the project. However, because the improvements are located immediately adjacent to the existing facility and several of the areas are already developed, no substantial change in direct land use would occur since the area is already utilized as a transportation corridor. For the past and future sections of the SNB in the RSA, an estimated 209 acres of rural land was converted to maintained ROW. Additionally, based on recent aerial imagery, three large areas appear to have been recently disturbed, resulting in conversion of rural/undeveloped areas to a total of 138 acres of residential, surface mining, and/or commercial developments.

### *4. The Overall Effects of the Proposed Project Combined with Other Actions*

The direct and indirect acreages of rural/undeveloped lands converted to maintained ROW, combined with the conversion of 422 acres of undeveloped land to developed land use by other actions, results in a cumulative impact of 751 acres of converted lands. This cumulative value of converted land would represent approximately 6 percent of undeveloped land within the RSA based on the 2016 NLCD, which is a relatively minor reduction and not likely to contribute substantial cumulative impacts to land use changes in the project vicinity.

### *5. Mitigation of Cumulative Impacts*

Based on the 2040 Metropolitan Transportation Plan developed for the project area, minimization and mitigation for some land use impacts may occur through the work on the Northwest Arkansas Regional Open Space Plan. Work on this Open Space Plan began in late 2014, with the public process to develop the Plan being carried out throughout 2015, and adopted in early 2016. The Plan identifies the natural landscapes and open spaces that make Northwest Arkansas an attractive place to live, and includes a comprehensive strategy for the conservation of these natural assets. Though focused



on conservation, this Plan is consistent with the regional goal of continued growth and development. Landowner participation in conservation programs is welcome and encouraged, but strictly voluntary. To this end, the Plan features a detailed mapping inventory of regional resources, and a 'toolbox' of strategies that landowners, developers, and governments can draw upon to balance regionally important goals of land conservation and development. Small park and publicly owned undeveloped lands are located in the Land Use RSA and include the area surrounding Cave Springs Cave (in Cave Springs) as well as two small areas in Elm Springs between Hwy 112 and I-49. Neither of these areas are proposed to be impacted by the proposed action or appear to be impacted by identified other actions. Thus, this Open Space Plan appears to offer little direct mitigation for cumulative impacts to land use.

**Indirect and Cumulative Impacts Questionnaire**

XNA Connector Road Project  
Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
(Hwy. 612)  
Benton County, Arkansas

**Respondent Information**

Date: 2/26/2020  
Name: Taylor Reamer  
Organization/Title: Planning Director, Planning Department, Benton County  
Address: 2113 W Walnut Street, Rogers AR 72756  
Phone and Email: taylor.reamer@bentoncountyar.gov

**Questions & Discussion Topics**

- 1) What are the new major developments in your jurisdiction or planning area?  
Subdivision and single family residential construction
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? Development is continual in the County's jurisdiction. The addition of an infrastructure project this size may produce more development potential in the project area.
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where?  
Yes, throughout the project area.
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? No
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? Development and redevelopment in the County's jurisdiction. The addition of an infrastructure project this size may produce more development and redevelopment potential in the project area.
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable?  
Yes
- 7) What future development would you expect independent of the proposed project?  
Subdivision, single family residential, commercial, and industrial
- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence).

## Schmidt, Cassie P.

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**From:** Shelli Kerr <skerr@bentonvillear.com>  
**Sent:** Monday, February 24, 2020 1:03 PM  
**To:** Schmidt, Cassie P.  
**Subject:** RE: XNA Connector Road Project - Information Request  
**Attachments:** IndirectCumulative Impacts Questionnaire 2020-02-17\_Bentonville comments.docx

Cassie,

Here's our response. Since we are outside of the study area, we don't anticipate it having a major impact on development activity in Bentonville.

Thanks,  
Shelli

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**From:** Schmidt, Cassie P. <CPSchmidt@GarverUSA.com>  
**Sent:** Monday, February 17, 2020 4:34 PM  
**To:** Planning@BentonCountyAR.gov; community.development@rogersar.gov; randall.noblett@cavespringsar.gov; mcasey@fayetteville-ar.gov; Shelli Kerr <skerr@bentonvillear.com>; kdavis@lowellarkansas.gov  
**Subject:** XNA Connector Road Project - Information Request

Good Afternoon,

On behalf of ARDOT, we are preparing a Environmental Assessment (EA) for the proposed XNA Connector Road project, which proposes a connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass (Hwy. 612); see attached exhibit showing proposed corridors. Specifically, I am working on an assessment of indirect and cumulative impacts for the proposed project. To assist with the assessment, please fill out the attached questionnaire and return to me at your earliest convenience. I have attached both a PDF and a word document. Please feel free to use which ever format makes your life easiest. 😊

Please call or email me if you have any questions. Thank you in advance for your time and assistance!

Sincerely,



**Cassie Schmidt**  
Environmental Scientist/Environmental Specialist  
*Transportation Team*

📞 479-287-4673

**Indirect and Cumulative Impacts Questionnaire**

XNA Connector Road Project  
Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
(Hwy. 612)  
Benton County, Arkansas

**Respondent Information**

Date: 02/24/2020  
Name: Shelli Kerr, Comprehensive Planning Manager  
Organization/Title: City of Bentonville  
Address: 305 SW A St  
Phone and Email: 479-271-6822, [skerr@bentonvillear.com](mailto:skerr@bentonvillear.com)

**Questions & Discussion Topics**

- 1) What are the new major developments in your jurisdiction or planning area? [The new Walmart home office campus.](#)
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? [No, due to its location, we don't see it have a major impact on encouraging new development.](#)
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? [No. Our redevelopment opportunity and activity is downtown and is too far from the project site to have a major impact.](#)
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? [No.](#)
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? [No.](#)
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable? [No.](#)
- 7) What future development would you expect independent of the proposed project? [Residential development in the southwest and redevelopment in the downtown.](#)
- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). [1](#)



## Schmidt, Cassie P.

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**From:** Randall Noblett <randall.noblett@cavespringsar.gov>  
**Sent:** Tuesday, February 18, 2020 10:01 AM  
**To:** Schmidt, Cassie P.; Planning@BentonCountyAR.gov; community.development@rogersar.gov; mcasey@fayetteville-ar.gov; skerr@bentonvillear.com; kdavis@lowellarkansas.gov  
**Subject:** RE: XNA Connector Road Project - Information Request  
**Attachments:** IndirectCumulative Impacts Questionnaire 2020-02-17.pdf

Ms. Schmidt,

I have attached the completed questionnaire. With experience from former employment, I feel that I have additional insight as to the impact of the airport traffic. I probably see this impact differently than most and my opinion has definitely changed over the past few years. If you would like to discuss it briefly, feel free to call my cell phone.

Thank you,



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**From:** Schmidt, Cassie P. <CPSchmidt@GarverUSA.com>  
**Sent:** Monday, February 17, 2020 4:34 PM  
**To:** Planning@BentonCountyAR.gov; community.development@rogersar.gov; Randall Noblett <randall.noblett@cavespringsar.gov>; mcasey@fayetteville-ar.gov; skerr@bentonvillear.com; kdavis@lowellarkansas.gov  
**Subject:** XNA Connector Road Project - Information Request

Good Afternoon,

On behalf of ARDOT, we are preparing a Environmental Assessment (EA) for the proposed XNA Connector Road project, which proposes a connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass (Hwy. 612); see attached exhibit showing proposed corridors. Specifically, I am working on an assessment of indirect and cumulative impacts for the proposed project. To assist with the assessment, please fill out the attached questionnaire and return to me at your earliest convenience. I have attached both a PDF and a word document. Please feel free to use which ever format makes your life easiest. 😊

Please call or email me if you have any questions. Thank you in advance for your time and assistance!

Sincerely,

**Indirect and Cumulative Impacts Questionnaire**

XNA Connector Road Project  
Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
(Hwy. 612)  
Benton County, Arkansas

**Respondent Information**

Date: 02-18-2020  
Name: Randall J. Noblett  
Organization/Title: City of Cave Springs Mayor  
Address: 134 North Main Street, Cave Springs Ar. 72718  
Phone and Email: (479) 248-1040 randall.noblett@cavespringsar.gov

**Questions & Discussion Topics**

- 1) What are the new major developments in your jurisdiction or planning area? We currently have residential subdivisions and commercial development, some proposed and some under construction.
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? Probably not. We are currently experiencing a great deal of development independent of road routes.
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? No
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? I don't believe that project will have an impact on our development.
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? I don't believe that project will have an impact on our development.
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable? Yes
- 7) What future development would you expect independent of the proposed project? Downtown Historic restoration and conforming new retail and multi-use
- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). 1

**Indirect and Cumulative Impacts Questionnaire**

XNA Connector Road Project  
Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
(Hwy. 612)  
Benton County, Arkansas

**Respondent Information**

Date: 2/24/20  
Name: MATT CASEY  
Organization/Title: CITY OF ELM SPRINGS / PLANNING COMMISSION CHAIR  
Address: \_\_\_\_\_  
Phone and Email: mcasey@fayetteville-ar.gov

**Questions & Discussion Topics**

- 1) What are the new major developments in your jurisdiction or planning area? THERE ARE SOME RESIDENTIAL SUBDIVISIONS WITHIN THE CITY LIMITS
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? NO
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? NO
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? NO
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? NO
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable? MORE SUBDIVISIONS
- 7) What future development would you expect independent of the proposed project? MORE SUBDIVISIONS
- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). 1

## Schmidt, Cassie P.

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**From:** Catrina Mills <cmills@highfillar.com>  
**Sent:** Friday, February 28, 2020 1:41 PM  
**To:** Schmidt, Cassie P.  
**Cc:** Michelle Rieff  
**Subject:** RE: XNA Connector Road Project - Information Request  
**Attachments:** IndirectCumulative Impacts Questionnaire.docx

Good Afternoon Cassie,

Attached you will find the completed survey. Please let Mayor Michelle Rieff know if you have any questions.

Thank you!

Catrina Mills  
Interim Admin  
City of Highfill  
479-736-5711

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**From:** Schmidt, Cassie P. <CPSchmidt@GarverUSA.com>  
**Sent:** Wednesday, February 26, 2020 9:03 AM  
**To:** admin1 <admin@highfillar.com>  
**Subject:** XNA Connector Road Project - Information Request

Good Morning Katrina,

I just received your voice message. Attached is the questionnaire I was referring to and below is a quick explanation of my request 😊

On behalf of ARDOT, we are preparing a Environmental Assessment (EA) for the proposed XNA Connector Road project, which proposes a connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass (Hwy. 612); see attached exhibit showing proposed corridors. Specifically, I am working on an assessment of indirect and cumulative impacts for the proposed project. To assist with the assessment, please fill out the attached questionnaire and return to me at your earliest convenience (if it's at all possible to get this to me by the end of the week that would be wonderful!). I have attached both a PDF and a word document; feel free to use which ever format makes your life easiest. 😊

Please call or email me if you have any questions. Thank you in advance for your time and assistance!

Sincerely,



**Cassie Schmidt**  
Environmental Scientist/Environmental Specialist  
*Transportation Team*

📞 479-287-4673



### Indirect and Cumulative Impacts Questionnaire

XNA Connector Road Project  
Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
(Hwy. 612)  
Benton County, Arkansas

#### **Respondent Information**

Date: 02/28/2020  
Name: Michelle Rieff  
Organization/Title: City of Highfill / Mayor  
Address: 15036 W. Hwy 12, Gentry, AR 72734  
Phone and Email: 479-736-5711

#### **Questions & Discussion Topics**

- 1) What are the new major developments in your jurisdiction or planning area? **None in the proposed new location.**
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? **Yes.**
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? **Yes, possible land rezoning from rural residential to industrial along the path of the connector road.**
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? **Yes, the proposed project could prohibit some commercial and residential development.**
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? **Yes, there will be an increase in commercial and industrial development.**
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable? **Normal residential construction growth.**
- 7) What future development would you expect independent of the proposed project? **Normal residential construction growth.**
- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). **3**

## Indirect and Cumulative Impacts Questionnaire

XNA Connector Road Project  
 Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
 (Hwy. 612)  
 Benton County, Arkansas

**Respondent Information**

Date: 02-24-2020

Name: Karen Davis

Organization/Title: City of Lowell / Community Development Director

Address: 216 N Lincoln St

Phone and Email: 479-770-2185 ext. 224

**Questions & Discussion Topics**

What are the new major developments in your jurisdiction or planning area?

Timber Ridge Subdivision, located on Bellview Street, is expanding to Phase 2 and adding 46 additional single-family housing units to their development. Lakewood Subdivision located on West Monroe Avenue is currently constructing Phases 5 and 6 of their 329 single-family housing development. Park View Subdivision is under construction and will develop a 171 lot subdivision located off East Apple Blossom Avenue. Lincoln Place Subdivision is under construction and will develop a 60 lot subdivision located off McClure Avenue.

Business development includes Matrix Racquet Club, located on Mills Lane and future Zion Church Road, an indoor/outdoor tennis facility which recently expanded to include indoor batting cages and an indoor infield for baseball, Matrix is scheduled to open in 2020. IDO is another new business in the area, located on North Goad Springs Road, the development offers over 185,000 sq. ft. of both warehouse and office spaces. Harps Grocery Store recently opened at the corner of North Goad Springs Road and West Monroe Avenue, bringing a much-needed business to the Lowell area. New developments in the Monroe Business Park, located on West Monroe Avenue, include Flip Side Ninja Park, a ninja warrior experience for all ages. Mr. Sparky, also located in Monroe Business Park, is relocating their home office to the centrally located area of Lowell. Both Grant Flex and Oelke Construction, located in Monroe Business Park, offer warehouse and office spaces to potential businesses. Dillard Commercial Park, located at the Southeast corner of South Goad Springs Road and West Monroe Avenue, is a new 33-acre development which is currently in the design phase, will offer spaces for commercial/retail, hotel and multiple office buildings. Arkansas State Police recently opened their doors to their new location on West Monroe Avenue.

North Goad Springs Road is in the construction phase of expanding to a three-lane road. The intersection of Bellview and West Monroe Avenue is currently being reviewed for a roundabout. Zion Church Road will expand from Bellview to Goad Springs Road.

The Kathleen Johnson Memorial Park, located along Bellview, is a 100-acre park in the preliminary stages of development. The conceptual plan for the park includes a walking trail, splash pad, disc golf, playground area, farmer's market, trailhead, Razorback Greenway connecting trail, Project Red Friday, NWA Space, Office of Human Concern, the new Fire Station and an amphitheater. The walking trail, disc golf area and fire station have already been constructed. The trailhead and the Razorback Greenway connecting trail and farmer's market have been designed and are awaiting design approval and will soon go out to bid for construction. NWA Space

will build a planetarium observatory and science center within the park. Office of Human Concern will locate their home office to the park location and offer programs to the public such as meals on wheels.

- 1) In your opinion, would the proposed project induce development in your area that would otherwise not occur? It is my opinion that the proposed project would not increase development in the Lowell area as the project would be located outside of Lowell's proximity.
- 2) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? It is of my opinion that redevelopment would not occur in the Lowell area as a result of the proposed project.
- 3) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? The development would deter traffic from entering Lowell by highway 264, which currently crosses through the City of Lowell to access I-49.
- 4) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? Being along the I-49 corridor, I do not foresee the development impacting the type of developments in our area. Although, the traffic count for the western side of Lowell, west of I-49, may be impacted by the development, thus effecting the potential of new businesses locating to that area.
- 5) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable? The City of Lowell is currently growing at a rapid rate. The developments within the 20 to 30 year range are anticipated to be density housing and commercial development since Lowell has prime commercial spaces available for development.
- 6) What future development would you expect independent of the proposed project? Future development is anticipating to be a downtown revitalization, commercial growth and additional rooftops.
- 7) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). 3

## Schmidt, Cassie P.

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**From:** McCurdy, John <jmccurdy@rogersar.gov>  
**Sent:** Friday, February 21, 2020 8:58 AM  
**To:** Schmidt, Cassie P.  
**Subject:** RE: XNA Connector Road Project - Information Request

Due to the alignment of the improvements well south of Rogers, these improvements don't impact Rogers. Although Rogers is the closest city to XNA, there is still unfortunately no direct route to the airport.



**John McCurdy, CNU-A** | Director  
Dept. of Community Development  
City of Rogers | [www.rogersar.gov](http://www.rogersar.gov)  
301 W Chestnut St, Rogers, AR 72756  
(479) 621-1186



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**From:** Schmidt, Cassie P. [mailto:CPSchmidt@GarverUSA.com]  
**Sent:** Monday, February 17, 2020 4:34 PM  
**To:** Planning@BentonCountyAR.gov; Community Development <community.development@rogersar.gov>;  
randall.noblett@cavespringsar.gov; mcasey@fayetteville-ar.gov; skerr@bentonvillear.com; kdavis@lowellarkansas.gov  
**Subject:** XNA Connector Road Project - Information Request

Good Afternoon,

On behalf of ARDOT, we are preparing a Environmental Assessment (EA) for the proposed XNA Connector Road project, which proposes a connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass (Hwy. 612); see attached exhibit showing proposed corridors. Specifically, I am working on an assessment of indirect and cumulative impacts for the proposed project. To assist with the assessment, please fill out the attached questionnaire and return to me at your earliest convenience. I have attached both a PDF and a word document. Please feel free to use which ever format makes your life easiest. 😊

Please call or email me if you have any questions. Thank you in advance for your time and assistance!

Sincerely,



**Cassie Schmidt**  
Environmental Scientist/Environmental Specialist  
*Transportation Team*

📞 479-287-4673



**Indirect and Cumulative Impacts Questionnaire**

XNA Connector Road Project  
 Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
 (Hwy. 612)  
 Benton County, Arkansas

**Respondent Information**

Date: 2/26/20  
 Name: Patsy Christie  
 Organization/Title: Planning and Community Development Director  
 Address: 201 Spring Street, Springdale AR 72764  
 Phone and Email: 479-750-8588 pchristie@springdalear.gov

For #3, follow up correspondence clarified that the two intersections Ms. Christie is referring to are the proposed roadway's connection with the future SNB (Hwy 612).

**Questions & Discussion Topics**

- 1) What are the new major developments in your jurisdiction or planning area? **Redevelopment projects in downtown town that includes mixed use multifamily; multifamily projects on both the east and west sides of Thompson Ave; construction of new 5 story office buildings in the southwest quadrant of the City; retail and services facilities throughout the city.**
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? **yes**
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? **Yes, area around the intersection of Highway 412 and 112 and the access road to the airport**
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? **no**
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? **Yes, the proposed project would increase the likelihood of commercial development in and around intersections**
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable?
- 7) What future development would you expect independent of the proposed project?
- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). **4**

### Indirect and Cumulative Impacts Questionnaire

XNA Connector Road Project  
Connection between the Northwest Arkansas Regional Airport (XNA) and the Springdale Northern Bypass  
(Hwy. 612)  
Benton County, Arkansas

#### Respondent Information

Date: 3/2/20  
Name: Tim House  
Organization/Title: Northwest Arkansas National Airport, Director of Engineering  
Address: One Airport Blvd, Suite 100 Bentonville, AR 72713  
Phone and Email: (479) 205-1420 tim.house@flyxna.com

#### Questions & Discussion Topics

- 1) What are the new major developments in your jurisdiction or planning area? **Master planned industrial park adjacent to the airport.**
- 2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? **No, the development would likely occur adjacent to the airport but the timeline may be expedited.**
- 3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? **Yes, but only on the Hwy 112/Hwy 264 route option. That option is not limited/partially controlled access. The likelihood of redevelopment along Hwy 264 is very high. The other options would not likely be redeveloped.**
- 4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? **No, I do not foresee the project prohibiting development.**
- 5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? **Yes, but only the time frame of the development. Truck traffic will be easier. Freight/warehousing would have better access to large parcels of land adjacent to the airport.**
- 6) Any additional developments in the future (out to 20-30 years) that are reasonably foreseeable? **Housing of all densities will likely utilize the route and fill in the outer limits of the areas. Support industries for the housing will also likely follow.**
- 7) What future development would you expect independent of the proposed project? **Continued growth of the airport, additional hangars, increased terminal and parking facilities. Commercial developments including warehousing and industrial facilities. Residential development along the existing rural highways.**

- 8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). Yes, the easier access to and from the airport will increase differential travel time between our airport and other regional airports. Simply put, if it is quicker and easier to get to our airport more local passenger will use our airport. That will have a small influence so a rating of 2. For corporate traffic this will be slightly higher influence, so a rating of 3. Commercial development that utilize intermodal transportation have routinely developed around airports. With easier truck traffic they will be more likely to establish new businesses in the area. I would rate this as an influence level of 3. The residential development of the area will lag behind the industrial and aviation developments. They will not be profitable if they have to build all of the utility infrastructure. As infill projects they will likely occur. This is basically the same as the commercial development influence, level 3.

## TERMINOLOGY

**Direct Impacts** are caused by the action and occur at the same time and place (40 C.F.R. 1508.8).

**Comparison of Direct and Indirect Impacts**

Type of Effect	Direct Impacts	Indirect Impacts
Nature of Effect	Typical/Inevitable/Predictable	Reasonably Foreseeable/ Probable
Cause of Effect	Project Only	Project's Direct and Indirect Effects
Timing of Effect	Project Construction and Implementation	At Some Future Time other than Direct Effects
Location of Effect	At the Project Location	Within Boundaries of Systems Affected by the Proposed Project

Source: NCHRP Report 403, *Guidance for Estimating the Indirect Effects of Proposed Transportation Projects* (1989).

**Indirect Impacts** are caused by the action and are later in time and farther removed in distance, but are still reasonably foreseeable. Impacts may include growth-inducing effects and other effects related to induced changes in pattern of land use, population density or growth rate and related effects on air and water and other natural systems, including ecosystems (40 Code of Federal Regulations (C.F.R.) 1508.8).

**Induced Growth Impacts** are changes in the location, magnitude, or pace of future development that result from changes in accessibility caused by the project. An example of an induced growth effect is commercial development occurring around a new interchange and the environmental impacts associated with this development.

**Reasonably foreseeable** is an action that is probable, sufficiently likely to occur (excludes effects that are possible but not probable [e.g. "tabled" plans]). Impacts that are merely possible, or that are considered "speculative," are not reasonably foreseeable.

**Cumulative Impacts** are the impacts on the environment which results from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions (40 C.F.R. 1508.7). The purpose of a cumulative effects analysis is to view the direct and indirect impacts of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future.



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## TELEPHONE MEMORANDUM

**Date:** 2/10/2020

**Participants:** Jeff Hawkins (NWARPC) & Cassie Schmidt (Garver)

**Attn:** [File\\garverinc.local\gdata\Projects\2017\17017600 - XNA Access - NEPA\Environmental\EA Studies\Indirect and Cumulative\Research\Phone Memo \(CPS & Jeff Hawkins\) 2020-02-10.docm](file://garverinc.local/gdata/Projects/2017/17017600 - XNA Access - NEPA/Environmental/EA Studies/Indirect and Cumulative/Research/Phone Memo (CPS & Jeff Hawkins) 2020-02-10.docm)

**RE:** XNA Connector Road (Future Projects for Indirect/Cumulative Impacts)

According to Mr. Hawkins, the 279 Corridor study (i.e., the North-South Connector Study) is not funded, is not likely to be built, and is definitely not likely to get build south of the Airport.

Jeff also stated that while there is money in the STIP for the 112 improvements, the whole thing will not necessarily get build.

Additionally, 264 west of I-49 is not likely to be constructed either as it's "not in the cards" that it's built due to all the environmental constraints. Hwy 264 over to Cave Springs is unlikely due to env. constraints and sensitive areas.

Jeff went on to mention that north of Healing Springs the Nature Conservancy has identified habitat and specific parcels as "open space acquisition", which is why 264 isn't feasible from that direction.