

# Highway 112 Corridor Study

## Benton and Washington Counties



**July 2015**



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Prepared by  
Transportation Planning and Policy Division  
Arkansas State Highway and Transportation Department

In Cooperation with  
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## **Introduction**

Highway 112, part of the Arkansas Primary Highway Network (APHN), is a two-lane highway that parallels Interstate 49 on the west in the Northwest Arkansas Regional Transportations Study (NARTS) area. It traverses through or near several environmentally sensitive areas, including the Cave Springs Recharge Area. The posted speed limit ranges from 30 to 55 miles per hour, with several areas of reduced advisory speeds located throughout the corridor. It is the only continuous north-south route west of Interstate 49 in the NARTS area, serving local and regional traffic between Fayetteville and Bentonville.

Due to the rapid growth in the northwest Arkansas region, concerns have been raised by local officials that existing Highway 112 may not adequately handle increased traffic volumes. Highway 112 serves as the only major north-south route west of Interstate 49, making it crucial for regional mobility. At the request of the Northwest Arkansas Regional Planning Commission (NWARPC), the Arkansas State Highway Commission passed Minute Order 2012-027 which authorized a study of Highway 112 from Fayetteville to Bentonville, a total length of approximately 20 miles. The study area is shown in Figure 1.

## **Purpose and Need**

The purpose of this study is to determine the feasibility of improvements to Highway 112 from Fayetteville to Bentonville to address capacity and safety needs.

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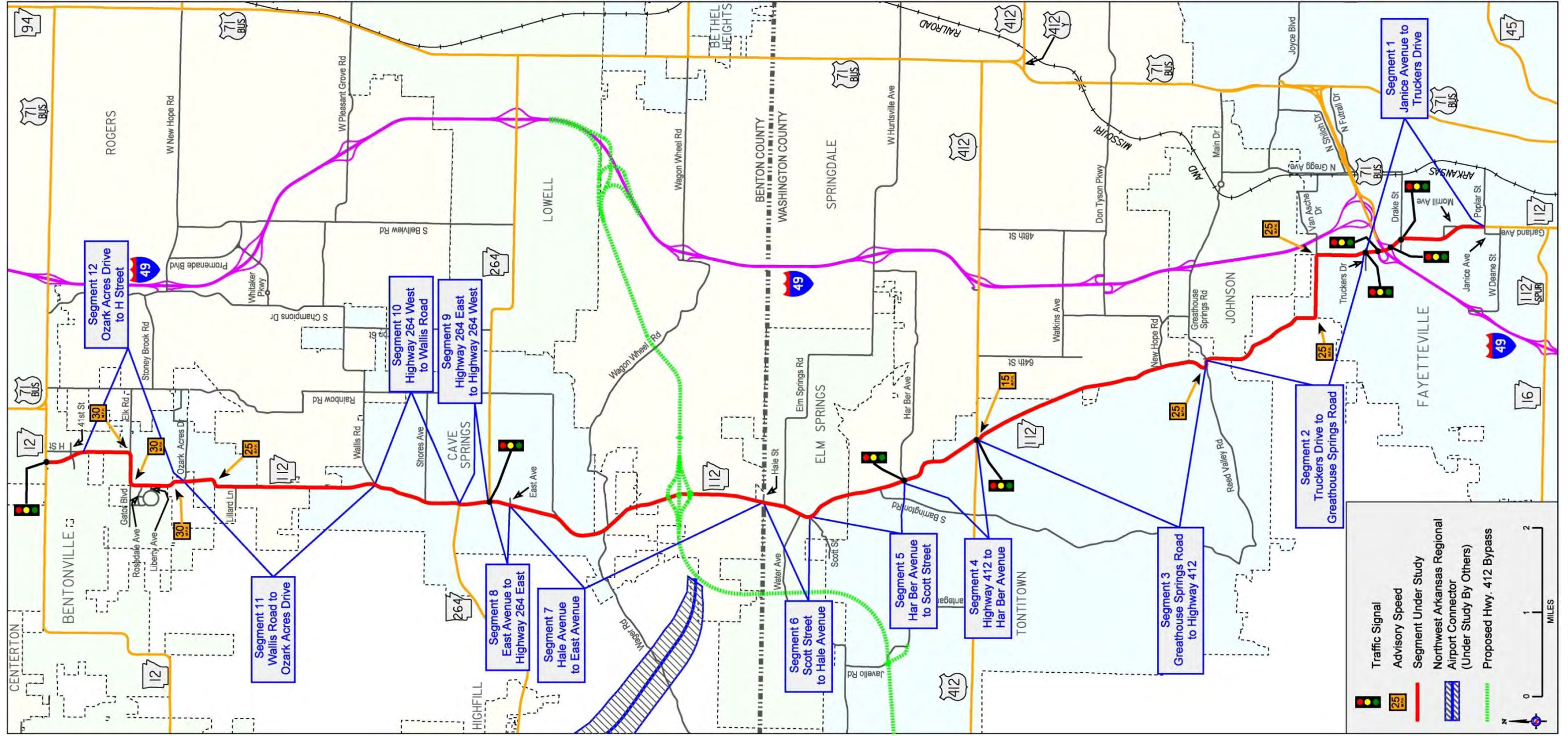


Figure 1 – Study Area

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## **Existing Street Network**

Highway 112 not only serves as a north-south route in the NARTS area, it also connects to other major routes, such as Highways 12, 264, 412, the future Highway 412 Bypass, and Interstate 49. Table 1 describes the current intersecting highways.

**Table 1 – Existing Highway Network**

<b>Interstate 49</b>	<ul style="list-style-type: none"> <li>• North-south, four-lane freeway through the NARTS area.</li> <li>• Primary arterial that provides access to major destinations in the area.</li> <li>• Connects Interstate 40 (Fort Smith area) to the NARTS area.</li> <li>• On the NHS, APHN, and Four-Lane Grid System.</li> </ul>
<b>Highway 412</b>	<ul style="list-style-type: none"> <li>• East-west, principal arterial with four travel lanes and a continuous, two-way, left turn lane through the NARTS area.</li> <li>• Accommodates major east-west travel and connects the NARTS area with Siloam Springs.</li> <li>• On the NHS, APHN, and Four-Lane Grid System.</li> </ul>
<b>Highway 264</b>	<ul style="list-style-type: none"> <li>• East-west, two-lane highway connecting Lowell to Interstate 49.</li> <li>• Connects Interstate 49 to the Airport.</li> <li>• The portion connecting to the Airport is on the APHN and the portion through Lowell is on the Four-Lane Grid System.</li> </ul>
<b>Highway 12</b>	<ul style="list-style-type: none"> <li>• Primarily an east-west, two-lane highway with four travel lanes in Bentonville and Rogers area.</li> <li>• A continuous, two-way left turn lane is provided in the four-lane portions.</li> <li>• Connects the northern portion of the NARTS area and Interstate 49 to the Airport.</li> <li>• Portions within Rogers, Bentonville, and Gentry areas are on the APHN and the Four-Lane Grid System.</li> </ul>

## **Existing Conditions**

Much of the Highway 112 corridor is transitioning from a rural to an urban setting as the area continues to develop, leading to an increase in traffic volumes. The following segments were identified for the purposes of traffic and safety analyses:

### **Segment 1: Janice Avenue – Truckers Drive (Fayetteville)**

Traffic volumes are heaviest on Highway 112 between Janice Avenue and Truckers Drive, ranging from 14,000 vehicles per day (vpd) south of Drake Street to 20,100 vpd at the Interstate 49 interchange. Much of the peak traffic is related to the University of Arkansas, which is located south of the study area. Highway 112 south of Drake Street is also a Razorback Transit bus route. Lengthy queues are typical at the Drake Street signal, particularly during the evening peak period. There are no turn bays (with the exception of left turn bays at signals), and no two-way, left turn lanes within this segment. There are minimal passing opportunities. Four traffic signals are located at or near the Interstate 49 interchange.

### **Segment 2: Truckers Drive – Greathouse Springs Road (Fayetteville to Johnson)**

Most of the trips within this segment are commuter trips since it is located on the outer limits of the urbanized boundary. This segment contains modest volumes ranging from 6,000 to 8,000 vpd. However, platooning is noticeable during peak traffic times due to the lack of passing opportunities. The rolling terrain and horizontal curvature diminishes the maneuverability of larger vehicles, which can contribute to platooning. These issues will only worsen for future traffic volumes, which are expected to increase to approximately 22,000 vpd by the year 2035. The growth for this segment will be induced in large part by the anticipated plans to make Van Asche Drive a major east-west route in northern Fayetteville. Although signals do not currently exist within this segment, signalization at Van Asche Drive, Howard Nickell Road, and Greathouse Springs Road may be validated in the future.

### **Segment 3: Greathouse Springs Road-Highway 412 (Johnson to Tontitown)**

This rural segment contains modest volumes ranging from 6,000 to 8,000 vpd. Platooning is not uncommon within this segment, but it does not reflect the more robust platooning that motorists experience within the Fayetteville area. The Highway 412 intersection is currently the only signalized intersection within this segment. Potential future development in this area, such as an extension of Don Tyson Parkway or Watkins Avenue, may validate signalization in the future.

### **Segments 4-7: Highway 412 – East Avenue (Tontitown to Cave Springs)**

The volumes range from 5,000 to 7,000 vpd for these segments. There are several public schools located just east of this portion of Highway 112. The proposed Springdale Northern Bypass (Highway 412) will intersect Highway 112 about half-way between Hale Street (Washington/Benton County Line) and Wagon Wheel Road. Har-Ber Avenue is currently the only signalized intersection within these segments, however future development may justify signalization at Barrington Road, Water Avenue, Elm Springs Road, and the future Springdale Northern Bypass ramps.

### **Segments 8-10: East Avenue – Wallis Road (Cave Springs)**

These segments of Highway 112 contain Cave Springs. The approximate volume is about 10,000 vpd. Highway 112 and Highway 264 share the same route through town. Highway 264 serves as a primary route to the Airport and connects Gentry, Highfill, and Cave Springs to the rest of the NARTS area. Because of this, Highway 112 experiences congestion in the Cave Springs area. The most notable problem is the queueing traffic turning left off of southbound Highway 112 onto Highway 264 East during the morning peak period. The Highway 112 and Highway 264 East intersection is currently signalized while the Highway 264 West intersection is a one-way stop with Highway 264 having to stop.

### **Segments 11-12: Wallis Road – H Street (Cave Springs to Bentonville)**

The volumes on these segments range from 5,000 to 6,000 vpd. Segment 11 (Wallis Road to Ozark Acres Drive) exhibits traffic characteristics similar to the other rural segments of Highway 112, with notable platooning due to limited passing opportunities. Segment 12 (Ozark Acres Drive to H Street) is located in Bentonville. This segment passes through an area containing residential subdivisions and schools. There is heavy directional volume in a short period of time. The heavy volumes and lack of turn bays lead to significant queuing during peak traffic times. Locals have expressed safety concerns citing sharp curves, lack of shoulders and an increase in traffic.

## **Traffic Analysis**

Growth trends based on historical annual average daily traffic (ADT) as well as the 2035 NARTS Travel Demand Model (TDM) were used to develop traffic projections in the study area. In addition to considering potential road improvements, the TDM incorporates projected demographic and land use changes to aid in traffic forecasting. See Appendices B through E for assumed changes to population and employment growth in the NARTS TDM. Some of the assumptions are listed below.

- The Highway 412 Bypass from Interstate 49 to Highway 412 west of Tontitown was assumed to be completed. This portion of the Highway 412 Bypass encompasses Job CA0907 (Interstate 49 to Highway 112), which was assumed to be completed by 2035.
- Interstate 49 was assumed to be widened to six lanes from Exit 62 (Highway 62) in Fayetteville to an assumed interchange at J Street in Bentonville, approximately halfway between Exits 88 and 93. These assumptions encompass Jobs 090305, BB0414, BB0903, CA0401, CA0901, CA0902, and CA1101.
- Highway 549 (Bella Vista Bypass) was assumed to be completed. This includes Jobs CA0903 and CA0905.
- Highway 265 was assumed to be extended from McClure Avenue in Lowell to Highway 62 in Rogers. Highway 265 was also assumed to have four travel lanes throughout the entire corridor (from Highway 16 in Fayetteville to Highway 62). These assumptions encompass Jobs 012007 and 090373.

See Appendix F for more information on how the NARTS TDM was generated. Existing and projected traffic volumes for the area are shown on Figure 2.

The traffic operation performance of a roadway can be described by its level of service (LOS). The 2010 Highway Capacity Manual defines LOS as a quality measure to describe traffic conditions that may include speed, travel time, delay, freedom to maneuver, traffic interruptions, and comfort. Six levels of service, A through F, are defined and described in Appendices G and H. Generally, LOS C or better is considered acceptable for rural roadways while LOS D or better is considered acceptable for urban roadways. Because the Highway 112 corridor is located within an urbanized area, LOS D is considered acceptable.

Most of Highway 112 currently operates at LOS D and will worsen to LOS E or F for year 2035 traffic. This indicates that most of Highway 112 operates at an acceptable LOS, but will worsen to an unacceptable LOS for future traffic. Table 2 shows the LOS for current and future year traffic volumes.



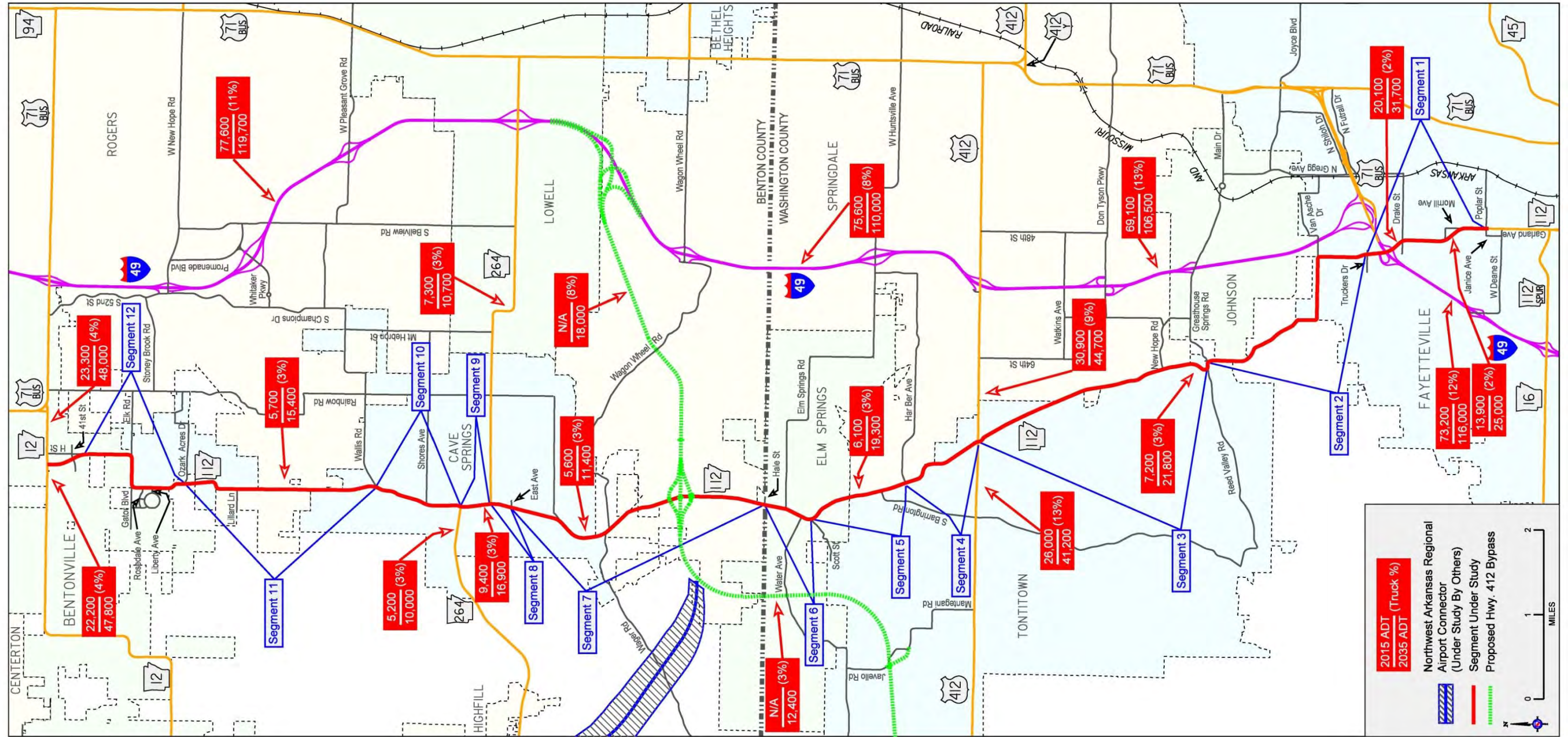


Figure 2 – Existing and Projected Traffic

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**Table 2 – Traffic Analysis Summary**

Segment	Description	Facility Type	2015 Weighted ADT	2035 Weighted ADT*	2015	2035
1	Janice Ave. to Truckers Dr. (LM 0.71 to LM 2.41)	Two 11-foot lanes, no shoulders	14,600	25,000	F	F
2	Truckers Dr. to Greathouse Springs Rd. (LM 2.41 to LM 5.01)	Two 10-foot lanes, no shoulders	7,700	25,400	D	F
3	Greathouse Springs Rd. to Hwy. 412 (LM 5.01 to LM 7.97)	Two 10-foot lanes, no shoulders	6,600	18,800	D	E
4	Hwy. 412 to Har-Ber Ave. (LM 7.97 to LM 9.11)	Two 10-foot lanes, no shoulders	5,000	15,100	C	E
5	Har-Ber Ave. to Scott St. (LM 9.11 to LM 10.38)	Two 10-foot lanes, no shoulders	6,700	19,400	D	E
6	Scott St. to Hale Ave. (LM 10.38 to LM 10.95)	Two 10-foot lanes, no shoulders	6,900	26,700	E	F
7	Hale Ave. to East Ave. (LM 0.00 to LM 3.26)	Two 10-foot lanes, no shoulders	5,800	14,000	D	E
8	East Ave. to Hwy. 264 East (LM 3.26 to LM 3.50)	Two 10-foot lanes, no shoulders	5,600	11,400	D	E
9	Hwy. 264 East to Hwy. 264 West (LM 3.50 to LM 3.85)	Two 10-foot lanes, two-foot shoulders	9,400	16,900	E	F
10	Hwy. 264 West to Wallis Rd. (LM 3.85 to LM 4.91)	Two 10-foot lanes, no shoulders	5,900	13,600	D	E
11	Wallis Rd. to Ozark Acres Dr. (LM 4.91 to LM 7.22)	Two 10-foot lanes, no shoulders	5,800	15,900	D	F
12	Ozark Acres Dr. to H St. (LM 7.22 to M 8.80)	Two 10-foot lanes, no shoulders	5,500	16,000	D	F

\*Traffic projections were estimated through an iterative process involving the NARTS TDM, vehicle count trends, and engineering judgment.

## **Safety Analysis**

A crash analysis in the study area was conducted using 2010, 2011 and 2012 data, the three most recent years for which data is available. Table 3 summarizes the crash analysis, and Figure 3 shows the crash locations.

Of the 274 crashes that occurred during the three-year period on Highway 112, none were fatal. There were seven serious injury crashes, 30 minor injury crashes, 42 possible injury crashes, and 195 property damage only (PDO) crashes. Of the 274 crashes, there were 105 rear-end crashes, 79 single vehicle crashes, 65 angle crashes, 18 sideswipe crashes, six head-on collisions, and one backing crash. Most of the single vehicle crashes occurred at curves.

Most of the segment crash rates were relatively close to the statewide averages for similar facilities. However, the crash rate and KA crash rate in Segment 1 was noticeably higher than the statewide averages. On all other segments, the KA crash rate was lower than the statewide averages. One-hundred forty-six (53 percent) crashes occurred in Segment 1, which included three of the seven KA crashes. The Drake Street intersection alone had 13 crashes during the study period.

**Table 3 – Crash Rates**

Segment	Description	Year	Weighted ADT	Crashes/ KA Crashes	Crash Rate <sup>1</sup>	Statewide Average Crash Rate	KA Crash Rate <sup>2</sup>	Statewide Average KA Crash Rate
1	Janice Ave. to Truckers Dr. <sup>3</sup> (LM 0.71 to LM 2.41)	2010	12,700	38/2	4.82	2.90	25.38	8.39
		2011	12,200	45/1	5.94	2.81	13.21	9.94
		2012	12,300	63/0	8.25	2.78	0.00	11.43
		Avg.	12,400	48.67/1.00	6.34	2.83	12.86	9.92
2	Truckers Dr. to Greathouse Springs Rd. <sup>3</sup> (LM 2.42 to LM 5.01)	2010	6,900	7/0	1.07	2.90	0.00	8.39
		2011	6,700	8/0	1.26	2.81	0.00	9.94
		2012	7,000	9/0	1.36	2.78	0.00	11.43
		Avg.	6,867	8.00/0.00	1.23	2.83	0.00	9.92
3	Greathouse Springs Rd. to Hwy. 412 <sup>4</sup> (LM 5.02 to LM 7.97)	2010	5,700	10/1	1.63	1.01	16.29	14.84
		2011	5,700	5/1	0.81	0.99	16.29	15.19
		2012	6,200	14/0	2.10	1.02	0.00	15.65
		Avg.	5,867	9.67/0.67	1.51	1.01	10.86	15.23
4-7	Hwy. 412 to East Ave. <sup>4</sup> (LM 7.98 to LM 10.95 and LM 0.00 to LM 3.26, Sec. 2)	2010	4,900	11/1	0.99	1.01	8.97	14.84
		2011	5,000	12/1	1.06	0.99	8.80	15.19
		2012	5,700	12/0	0.93	1.02	0.00	15.65
		Avg.	5,200	11.67/0.67	0.99	1.01	5.92	15.23
8-9	East Ave. to Hwy. 264 West <sup>4</sup> (LM 3.27 to LM 3.85)	2010	7,900	2/0	1.20	1.01	0.00	14.84
		2011	7,700	0/0	0.00	0.99	0.00	15.19
		2012	7,900	3/0	1.79	1.02	0.00	15.65
		Avg.	7,833	1.67/0.00	1.00	1.01	0.00	15.23
10	Hwy. 264 West to Wallis Rd. <sup>4</sup> (LM 3.86 to LM 4.91)	2010	4,300	1/0	0.61	1.01	0.00	14.84
		2011	5,000	1/0	0.52	0.99	0.00	15.19
		2012	5,800	1/0	0.45	1.02	0.00	15.65
		Avg.	5,033	1.00/0.00	0.53	1.01	0.00	15.23
11-12	Wallis to H St. <sup>4</sup> (LM 4.92 to LM 8.80)	2010	4,300	12/0	1.97	1.01	0.00	14.84
		2011	4,500	9/0	1.41	0.99	0.00	15.19
		2012	5,200	11/0	1.49	1.02	0.00	15.65
		Avg.	4,667	10.67/0.00	1.62	1.01	0.00	15.23

<sup>1</sup>Crash rates are expressed in the number of crashes per million vehicle miles (MVM) traveled.

<sup>2</sup>KA crash rates are expressed in the number of crashes per 100 MVM.

<sup>3</sup>Statewide average crash rate or KA crash rate for urban facilities.

<sup>4</sup>Statewide average crash rate or KA crash rate for rural facilities.

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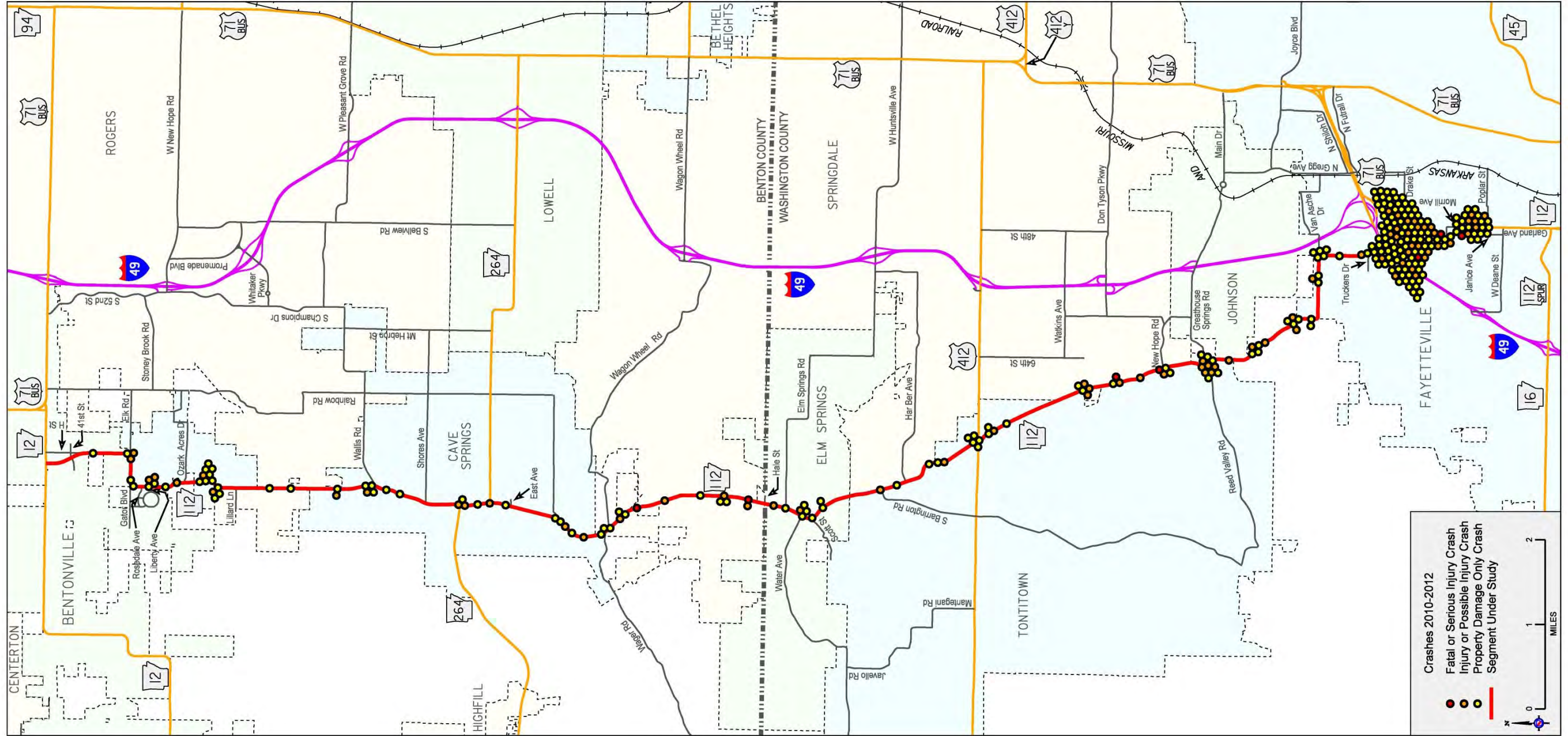


Figure 3 – Crash Locations

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## **Pavement Condition Analysis**

The average international roughness index (IRI), rutting, and unified crack index (UCI) were calculated for specified segments. The results are shown in Table 4.

**Table 4 – Pavement Condition**

<b>Segment</b>	<b>Description</b>	<b>Average IRI (in/mi)</b>	<b>Average Rutting (inches)</b>	<b>Average UCI</b>	<b>PCI</b>
1	Janice Ave. to Truckers Dr. (LM 0.71 to LM 2.41)	123 (Fair)	0.35 (Fair)	33 (Fair)	54 (Fair to Poor)
2	Truckers Dr. to Greathouse Springs Rd. (LM 2.42 to LM 5.01)	165 (Poor)	0.29 (Good)	27 (Fair)	55 (Fair to Poor)
3	Greathouse Springs Rd. to Hwy. 412 (LM 5.02 to LM 7.97)	145 (Poor)	0.38 (Fair)	36 (Fair)	59 (Fair to Poor)
4-5	Hwy. 412 to Scott Ave. (LM 7.98 to LM 10.38)	149 (Poor)	0.36 (Fair)	35 (Fair)	58 (Fair to Poor)
6-7	Scott Ave. to East Ave. (LM 10.39 to LM 10.95 and LM 0.00 to LM 3.26, Sec. 2)	106 (Fair)	0.21 (Good)	29 (Fair)	43 (Fair)
8-9	East Ave. to Hwy. 264 West (LM 3.27 to LM 3.85)	164 (Poor)	0.19 (Good)	25 (Good)	48 (Fair)
10	Hwy. 264 West to Wallis Rd. (LM 3.86 to LM 4.91)	88 (Fair)	0.13 (Good)	33 (Fair)	34 (Fair)
11	Wallis Rd. to Ozark Acres Dr. (LM 4.92 to LM 7.22)	79 (Fair)	0.12 (Good)	12 (Good)	26 (Fair)
12	Ozark Acres Dr. to H St. (LM 7.23 to LM 8.80)	112 (Fair)	0.26 (Good)	26 (Fair)	46 (Fair)

According to AHTD’s Preventive Maintenance Plan, Highway 112 qualifies for surface treatments from Greathouse Springs Road to Scott Avenue. Highway 112 also qualifies to receive a thin asphalt overlay from Scott Avenue to East Avenue and from Wallis Road to Ozark Acres Drive.

## Description of Alternatives

Based on an evaluation of the existing conditions and traffic and safety analyses, areas of need were identified and an improvement alternative was evaluated. The total estimated costs for the improvement alternative, in 2015 dollars, include preliminary engineering, right of way acquisition, utility relocation, construction, and construction engineering.

### **No-Action Alternative**

The No-Action Alternative includes no capacity or geometric improvements on the existing highway. Adverse impacts will occur due to increased traffic demand on the system resulting in more congestion, increased travels times, reduced speeds and increased safety concerns.

### **Improvement Alternative**

The Improvement Alternative would widen Highway 112 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. Highway 112 currently has four travel lanes with a raised median in the northernmost portion of the study area (from 41<sup>st</sup> Street to Highway 12). The portion south of the study area from Highway 112 Spur to Deane Street that was recently improved also has four travel lanes with a raised median. This alternative would also realign selected locations of Highway 112 to improve safety and mobility, as shown in Figure 4. The total estimated cost for this alternative ranges from \$108.8 million to \$134.0 million. The estimated construction cost ranges from \$85.7 million to \$107.6 million.

### ***Cave Springs Area Alignment Options***

There are three proposed options (see Figure 5) for the study area near Cave Springs.

- Option A involves widening Highway 112 to four travel lanes using the existing alignment within the Cave Springs area while realigning the Highway 264 West and Highway 112 intersection at a total estimated cost of \$9.7 million, of which \$7.4 million are construction costs.
- Option B and Option C would construct a bypass with four travel lanes around the Cave Springs area with a connection to existing Highway 264 East (Lowell Avenue).
  - Option B has a total estimated cost of \$16.0 million, of which \$13.2 million are construction costs.

- Option C has a total estimated cost of \$31.2 million, of which \$25.9 million are construction costs.

### ***Lillard Lane Alignment Options***

There are three proposed options (see Figure 6) for the Bentonville portion of the study area.

- Option A involves widening existing Highway 112 to four travel lanes, with realignments near Scoggins Road and Windmill Road, at a total estimated cost of \$11.1 million, of which \$8.8 million are construction costs.
- Option B would encompass the same improvements as Option A, but construct a new location route with four travel lanes from Gator Boulevard to just south of the Highway 12 intersection west. Option B has a total estimated cost of \$15.0 million, of which \$12.3 million are construction costs.
- Option C would construct a new location route with four travel lanes from Lillard Lane to just south of 41<sup>st</sup> Street. Option C has a total estimated cost of \$14.1 million, of which \$11.7 million are construction costs.

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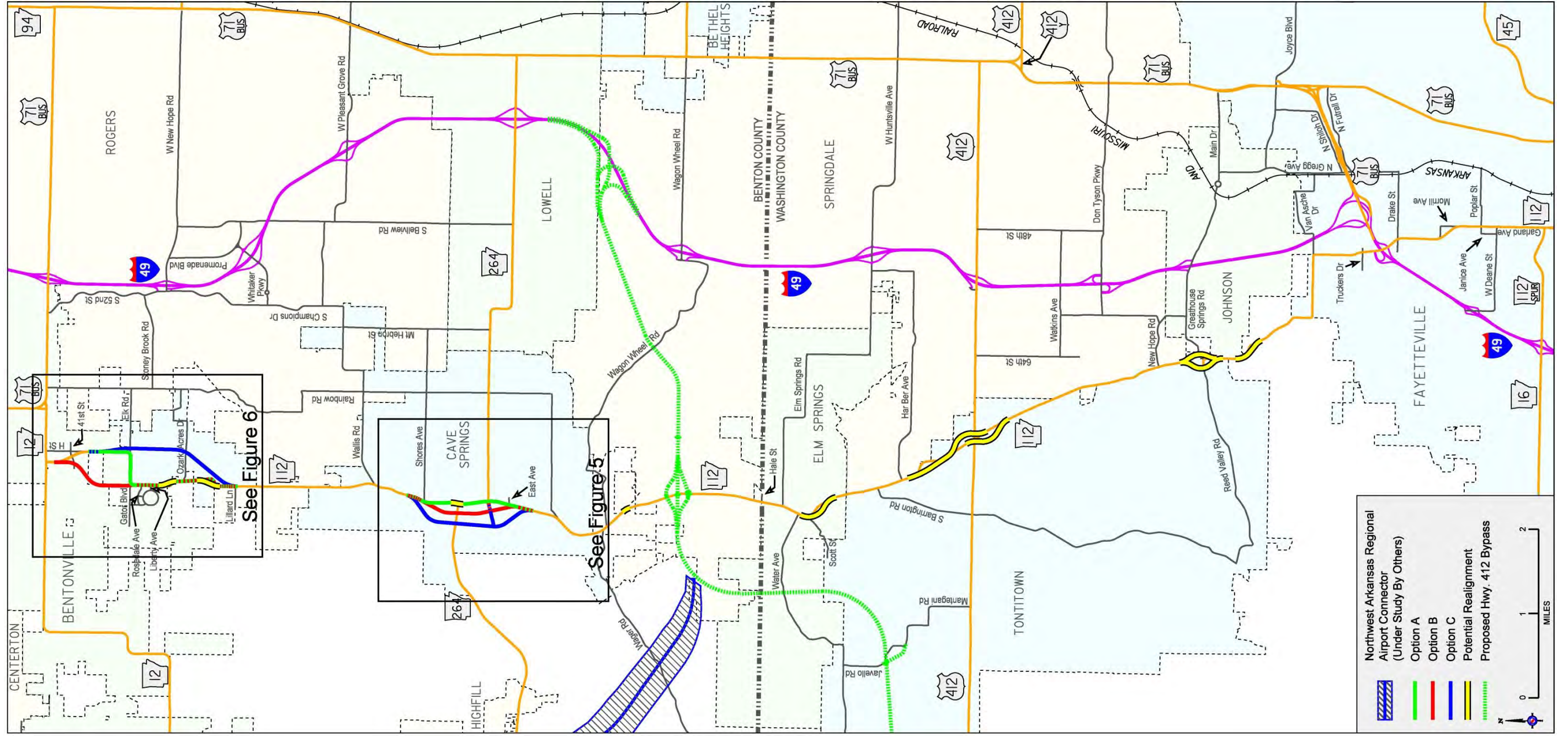
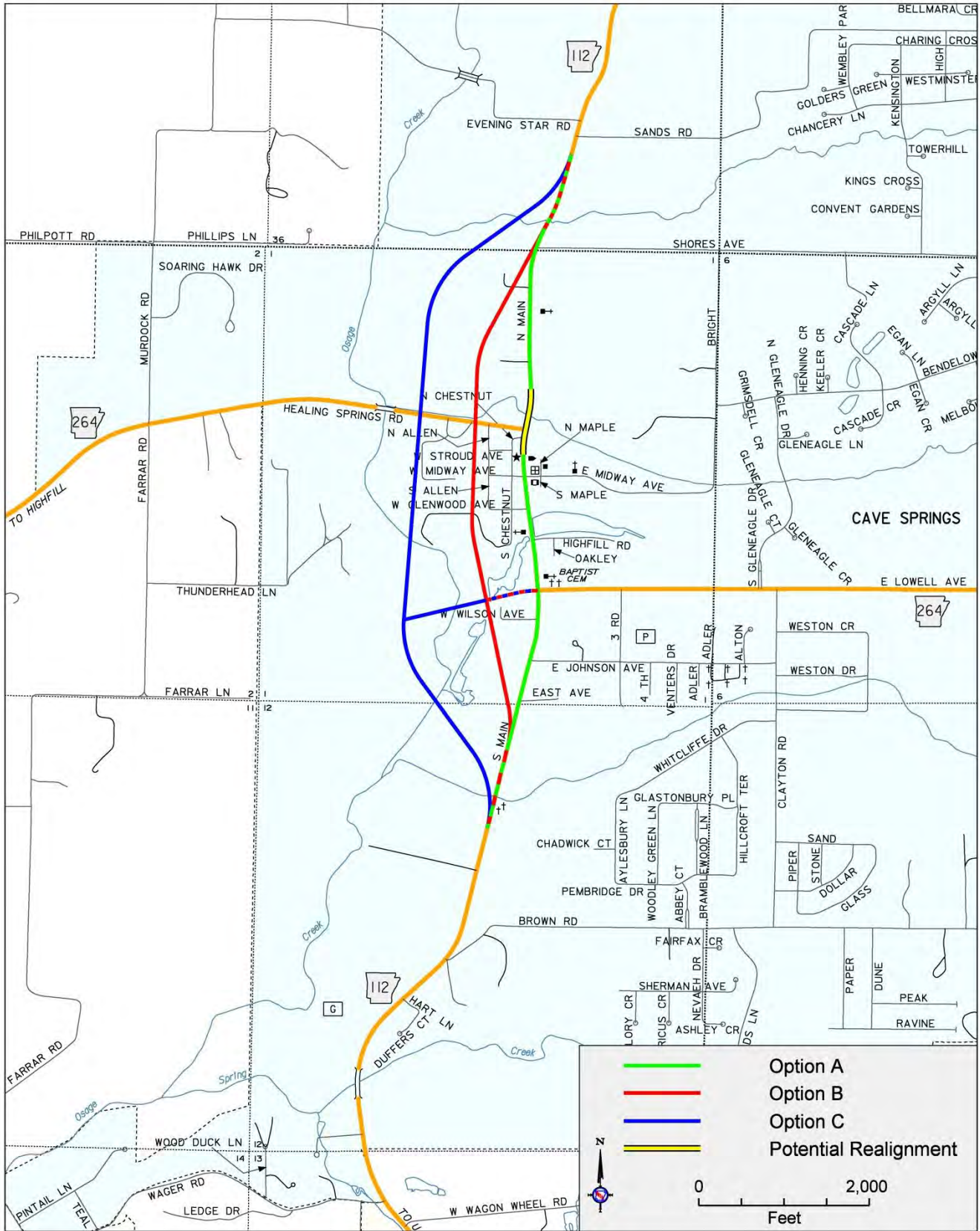


Figure 4 – Improvement Alternative

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**Figure 5 – Cave Springs Area Alignment Options**

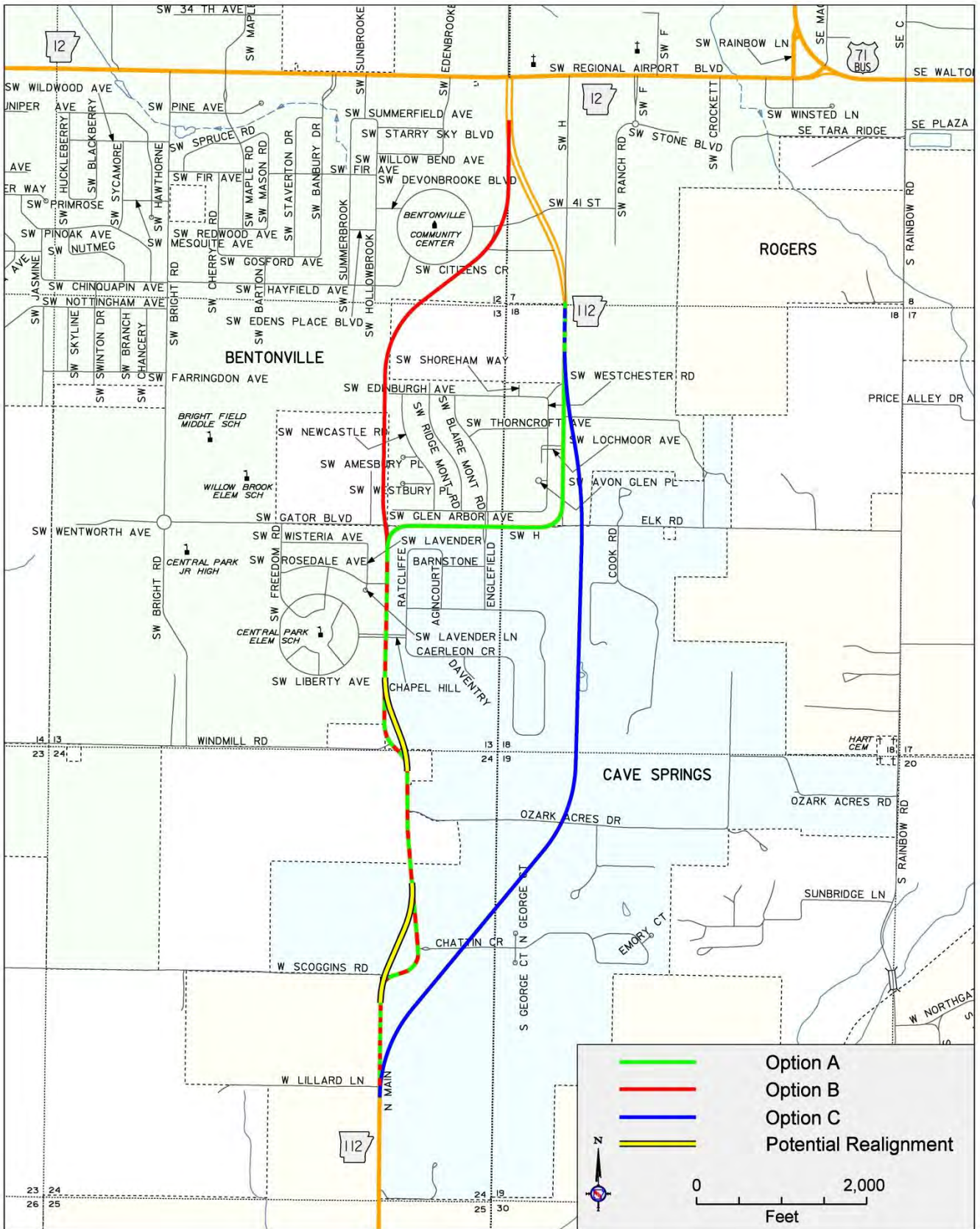


Figure 6 – Lillard Lane to Highway 12 Alignment Options



# Analysis of Alternatives

Widening Highway 112 to four travel lanes would improve the traffic operations to an acceptable LOS for current and future traffic volumes. Table 5 shows the LOS for the No-Action Alternative and Improvement Alternative.

**Table 5 – Levels of Service (No-Action and Improvement Alternatives)**

Segment	Description	No-Action		Improvement Alternative			
		2015	2035	2015	2035		
1	Janice Ave. to Truckers Dr. (LM 0.71 to LM 2.41)	F	F	B	C		
2	Truckers Dr. to Greathouse Springs Rd. (LM 2.41 to LM 5.01)	D	F	B	C		
3	Greathouse Springs Rd. to Hwy. 412 (LM 5.01 to LM 7.97)	D	E	A	B		
4	Hwy. 412 to Har-Ber Ave. (LM 7.97 to LM 9.11)	C	E	B	C		
5	Har-Ber Ave. to Scott St. (LM 9.11 to LM 10.38)	D	E	B	C		
6	Scott St. to Hale Ave. (LM 10.38 to LM 10.95)	E	F	B	D		
7	Hale Ave. to East Ave. (LM 0.00 to LM 3.26)	D	E	A	C		
8	East Ave. to Hwy. 264 East (LM 3.26 to LM 3.50)	D	E	B <sup>1,2,3</sup>	D <sup>1</sup>	C <sup>2</sup>	B <sup>3</sup>
9	Hwy. 264 East to Hwy. 264 West (LM 3.50 to LM 3.85)	E	F	B <sup>1,2,3</sup>	D <sup>1</sup>	C <sup>2</sup>	B <sup>3</sup>
10	Hwy. 264 West to Wallis Rd. (LM 3.85 to LM 4.91)	D	E	B <sup>1,2,3</sup>	D <sup>1</sup>	C <sup>2</sup>	B <sup>3</sup>
11	Wallis Rd. to Ozark Acres Dr. (LM 4.91 to LM 7.22)	D	F	A	B		
12	Ozark Acres Dr. to H St. (LM 7.22 to LM 8.80)	D	F	A	C		
<p>Note: LOS analyses were not performed for individual intersections. Further analyses will be performed if individual improvement projects are identified. This is particularly the case for the current Highway 412 intersection, which may have significant impacts on future traffic operations.</p> <p><sup>1</sup>LOS for Option A.</p> <p><sup>2</sup>LOS for Option B and C on existing alignment.</p> <p><sup>3</sup>LOS for Option B and C on bypass.</p>							

Based on the analysis, Highway 112 would operate at an acceptable LOS for current and future traffic volumes under all build options.

## **Environmental Constraints**

The environmental constraints for this study include historical structures, cemeteries, springs, and habitats for several federally listed endangered species which are shown in Figure 7. The study area also crosses nine regulated floodplains. Impacts to these features should be minimized.

One significant environmentally sensitive area near the Highway 112 corridor is the Cave Springs Recharge Area. Due to the karst topography and continued development in the area, the Cave Springs Area Karst Resource Conservation Study (CSAKRC), led by the NWARPC, is underway to determine what conservation efforts are appropriate to protect threatened and endangered species in the area. Any further studies or potential projects to Highway 112 should consider recommendations from the CSAKRC study once it is complete.

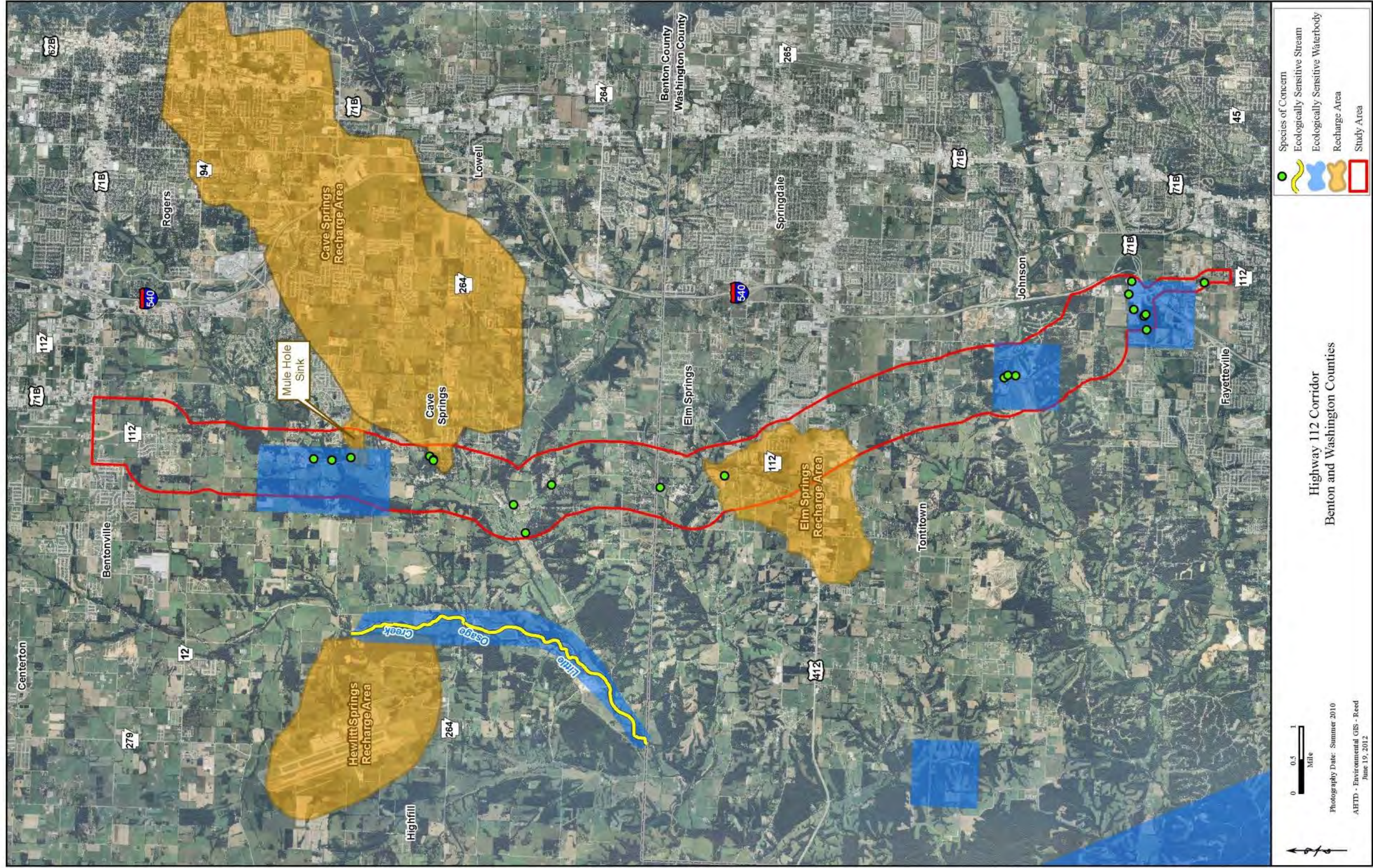


Figure 7 – Environmental Constraints

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# Planning Considerations

## **Metropolitan Transportation Plan**

The study area is located in the NARTS planning region. The 2035 Northwest Arkansas Regional Transportation Plan identified various improvement projects along Highway 112 from Fayetteville to Bentonville. The 2014 Northwest Arkansas Regional Bicycle and Pedestrian Master Plan included most of Highway 112 in the study area as a bicycle route.

## **Land Use and Transportation**

Local land use and access management policies have a significant impact on sustainability and reliability of the transportation system. An efficient local roadway network that provides an adequate system of minor arterial and connector streets would relieve traffic demands on the State Highway System. This type of local connectivity mostly benefits the local population by allowing them to avoid congestion as well as accommodating other road users.

## **Bike/Pedestrian**

Northwest Arkansas is proactive in accommodating bicycles and pedestrians. For instance, the Razorback Regional Greenway is a bike/pedestrian facility intended to promote recreational activity and the use of alternate travel mode choices. Highway 112 is a bicycle/pedestrian route according to the Northwest Arkansas Regional Bike/Pedestrian Plan (see Appendix J). Improvements to the corridor should accommodate bicycles and pedestrians.

## **Access Management**

The 2035 Northwest Arkansas Regional Transportation Plan identifies access management as one of its primary objectives. Access management policies along Highway 112 will be critical to minimize access points and control left-turn movements through the use of a divided median. These policies, if properly executed, will protect the investments by creating a safe and efficient highway corridor.

## **Planned Improvements**

Highway 112 is on the Bentonville, Rogers, Springdale, and Fayetteville Master Street Plans (MSP). Fayetteville has plans to make Ruppel Road, which becomes Howard Nickell Road and Van Asche Drive when intersecting Highway 112, a four lane principal arterial to bypass northwest Fayetteville. The Fayetteville Master Street Plan

is shown in Appendix K. Improvements to Van Asche Drive are currently underway. It was determined that a signal or roundabout will be needed at the Howard Nickell and Van Asche intersections by 2035. Therefore, the existing “T” geometry at both intersections can be retained.

- As part of the improvements to Van Asche Drive by Fayetteville, signal and roundabout concepts were analyzed. It was determined that a signal would operate at an adequate LOS by 2035, while the roundabout would operate adequately to 2027, assuming a linear growth trend.

There are a number of jobs that are under construction or programmed that will improve north/south mobility:

- 012007 – Hwy. 265 [Randall Wobbe Lane-Hwy. 264 (Springdale) (S)]
- 090305 – I-49 [New Hope Rd.-Hwy. 62/102 Widening (Rogers) (S)]
- 090373 – Hwy. 265 [Hwy 264-Pleasant Grove Rd. (S)]
- BB0414 – I-49 [Porter Rd.-Hwy. 112/71B Widening & Intchnng. Impvts. (F)]
- BB0903 – I-49 [Hwy. 71B Intchnng. Impvts. (F)]
- CA0401 – I-49 [Hwy. 71B-Hwy. 412 (Widening) (S)]
- CA0901 – I-49 [Hwy. 264-New Hope Rd. (Widening) (S)]
- CA0902 – I-49 [Hwy. 62/102-Hwy. 72 Widening & Intchnng. Impvts (S)]
- CA0903 – Hwy. 549 [Hwy. 71 Interchange (B. V. Bypass) (S)]
- CA0905 – Hwy. 549 [Co. Rd. 34-MO St. Line (B. V. Bypass) (S)]
- CA0907 – Hwy. 412 Bypass [Hwy. 112-I-49 (S)]
- CA1101 – I-49 [Hwy. 412-Wagon Wheel Rd. (Widening) (S)]

## Conclusions

Highway 112 is the only major north-south route in the NARTS area west of Interstate 49. When combined with other major corridors, it is an important part of the regional mobility network. Development in the area is causing congestion at various locations now that will continue to worsen in future years. Based on the traffic and safety analyses, improvements to Highway 112 are needed to better accommodate anticipated traffic growth and improve safety. This study identified one feasible improvement alternative, which includes various options along the route. The estimated costs for the improvement alternative are shown in Table 6.

**Table 6 – Cost Estimates**

Segment	Description <sup>1</sup>	Construction Cost (million dollars)	Total Cost <sup>2</sup> (million dollars)	
1	Janice Ave. to Truckers Dr. (LM 0.71 to LM 2.41)	\$7.1	\$9.4	
2	Truckers Dr. to Greathouse Springs Rd. (LM 2.41 to LM 5.01)	\$17.3	\$21.2	
3	Greathouse Springs Rd. to Hwy. 412 (LM 5.01 to LM 7.97)	\$8.5	\$11.1	
4-5	Hwy. 412 to Scott St. (LM 7.97 LM 10.38)	\$13.1	\$16.1	
6	Scott St. to Hale St. (LM 10.38 to LM 10.95)	\$4.5	\$5.6	
7-10	Hale St. to Wallis Rd. (LM 0.00 to LM 4.91)	Option A	\$19.2 (\$7.4) <sup>4</sup>	\$25.0 (\$9.7) <sup>4</sup>
		Option B	\$25.0 (\$16.0) <sup>4</sup>	\$31.3 (\$13.2) <sup>4</sup>
		Option C	\$37.6 (\$25.9) <sup>4</sup>	\$46.4 (\$31.2) <sup>4</sup>
11-12	Wallis Rd. to Hwy. 12 (LM 4.91 to LM 8.80)	Option A	\$16.0 (\$8.8) <sup>4</sup>	\$20.4 <sup>3</sup> (\$11.1 <sup>3</sup> ) <sup>4</sup>
		Option B	\$19.5 (\$12.3) <sup>4</sup>	\$24.2 (\$15.0) <sup>4</sup>
		Option C	\$18.9 (\$11.7) <sup>4</sup>	\$23.3 (\$14.1) <sup>4</sup>
<b>Notes:</b> <sup>1</sup> All improvements consist of widening Highway 112 to four travel lanes with either a flush paved or raised median. <sup>2</sup> Total Cost includes construction, right-of-way, utility relocation, preliminary and construction engineering (2015 dollars). <sup>3</sup> Total cost will likely be higher due to right-of-way constraints in highly developed area. <sup>4</sup> Costs within parentheses represent the Cave Springs area and Lillard Lane to Highway 12 alignment costs.				

Due to the potential impacts to the Cave Springs Recharge Area, any potential improvement projects along Highway 112 should consider recommendations from the CSAKRC study once it is complete. In addition, consideration should be given for implementing access management strategies along Highway 112 in order to preserve corridor capacity and protect transportation investments.

Furthermore, due to the high costs associated with improving Highway 112, cost sharing arrangements with local jurisdictions should be explored. At a minimum, possible removal of existing highways from the State Highway System should be considered.



# APPENDIX A

## ARKANSAS STATE HIGHWAY COMMISSION

### MINUTE ORDER

District: Four and Nine

Page 1 of 1 Page

County: Washington and Benton

Category: Improvement Project-Arkansas Primary Highway Network (APHN)

**WHEREAS, IN WASHINGTON AND BENTON COUNTIES,** on Highway 112 between Fayetteville and Bentonville, the Northwest Arkansas Regional Planning Commission's Transportation Policy Committee has requested a study to determine the need for and feasibility of improvements.

**NOW THEREFORE,** the Director is authorized to conduct a study to determine the need for and feasibility of improvements to Highway 112 from Fayetteville to Bentonville.

Approved:  Chairman  
 Vice-Chairman  
 Member  
 Member  
 Member

Submitted By:  Assistant Chief Engineer - Planning  
Approved:  Director  
Minute Order No. **2012 027**  
Date Passed **MAR 20 2012**

P&R.SP.PS.2/24/12

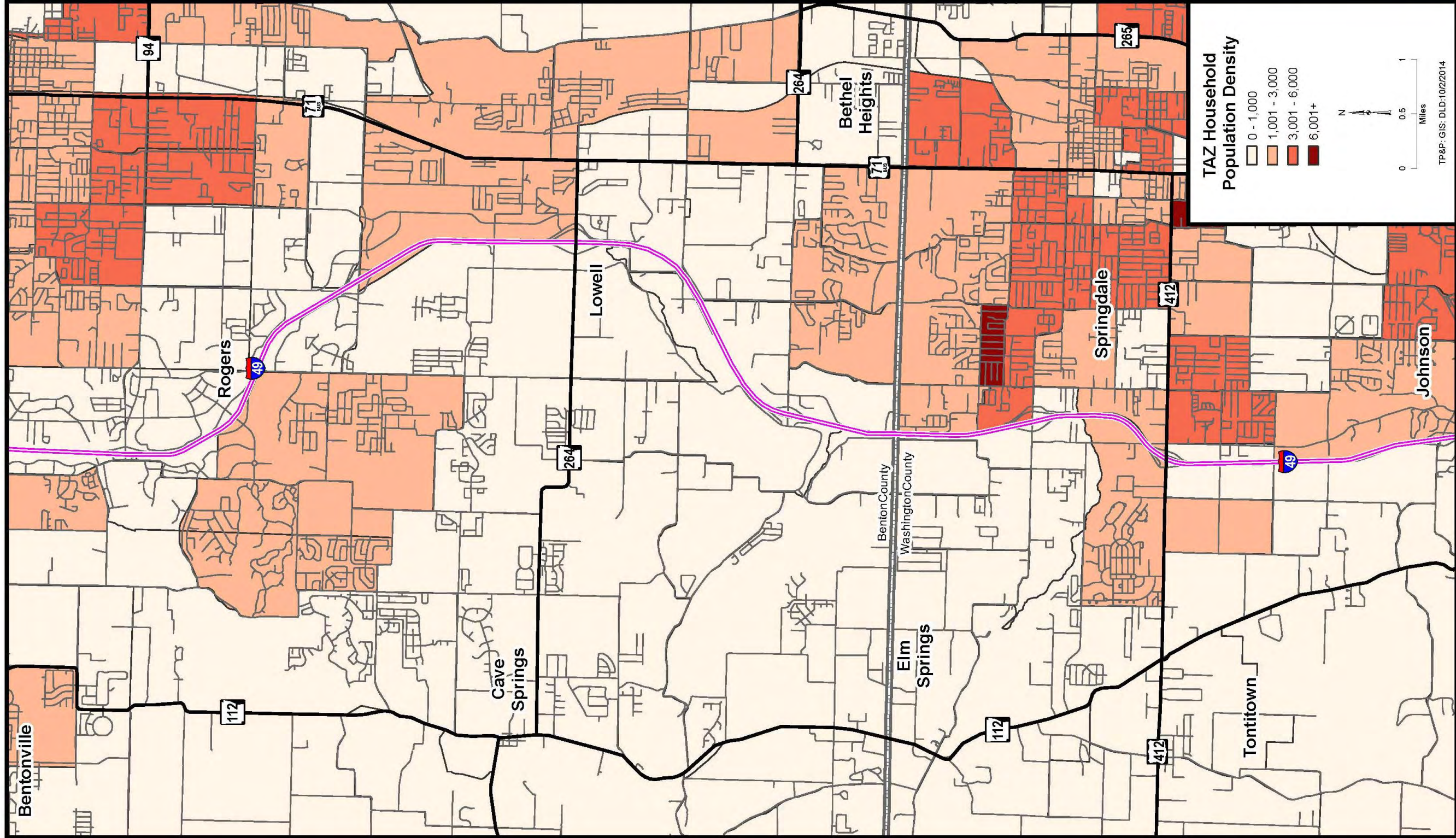
Form 19-456  
Rev. 9/13/2002

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# APPENDIX B

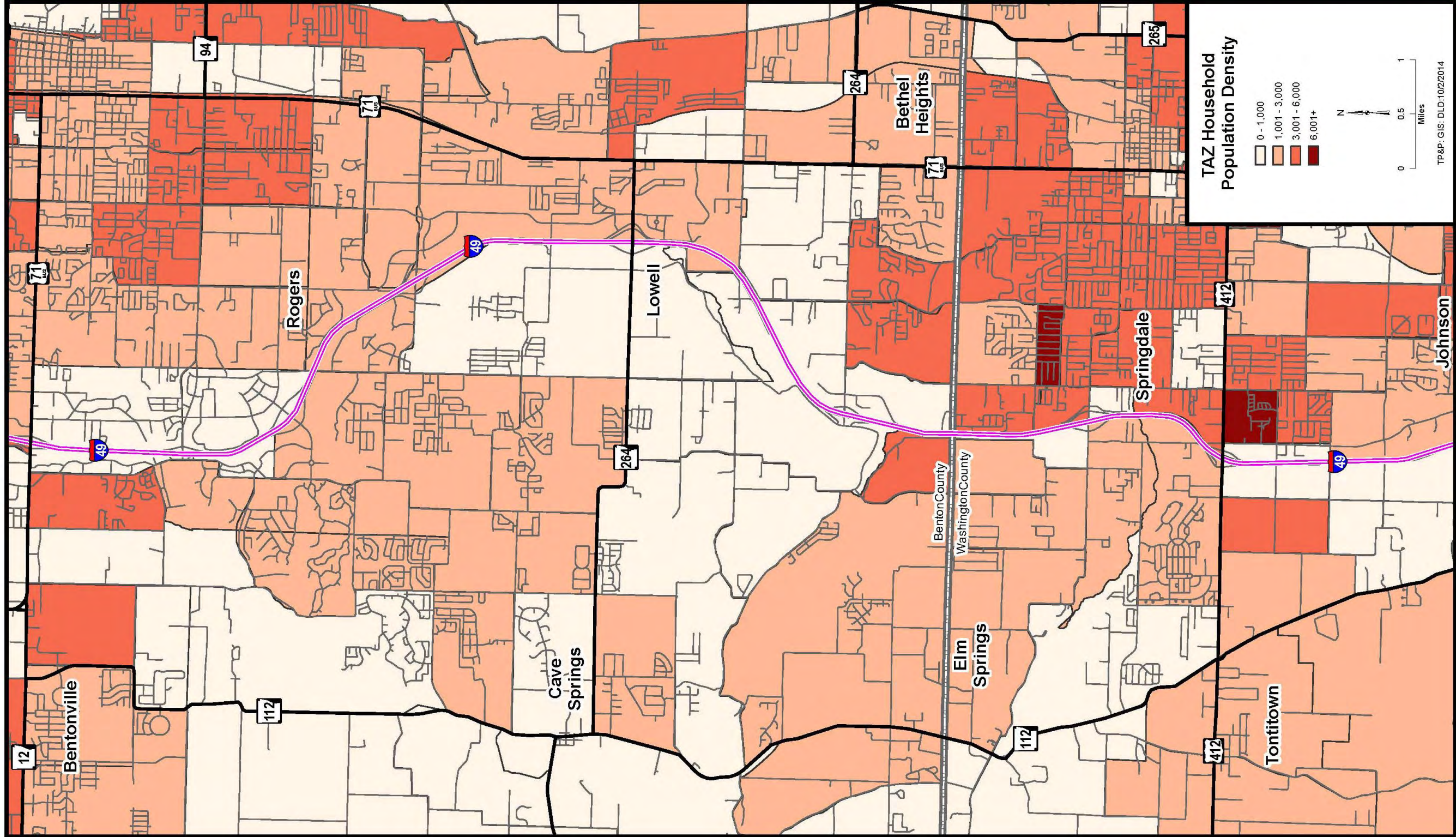
## 2010 NARTS Travel Demand Model: Population Density





# APPENDIX C

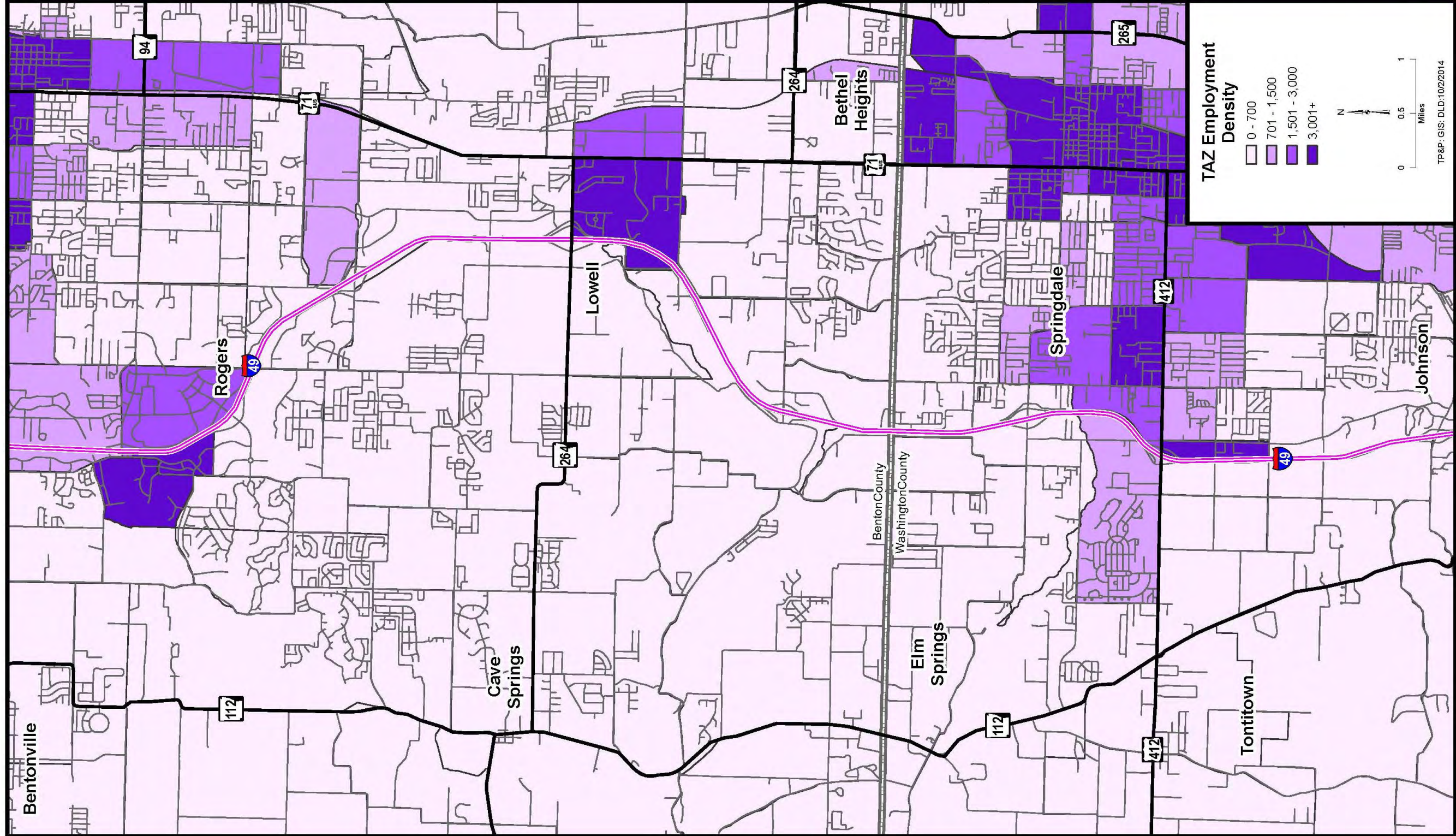
## 2035 NARTS Travel Demand Model: Population Density





APPENDIX D

# 2010 NARTS Travel Demand Model: Employment Density

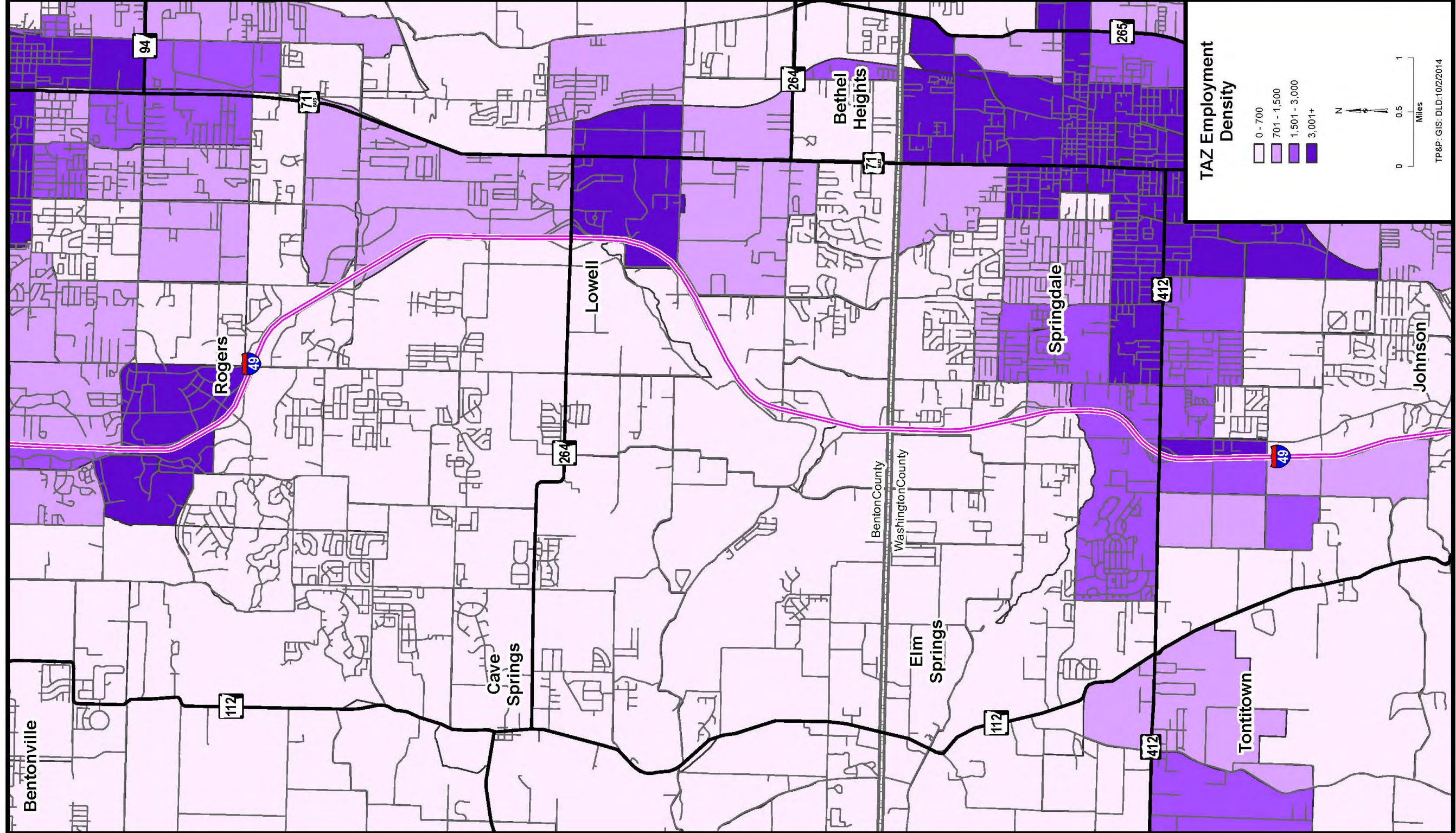






# APPENDIX E

## 2035 NARTS Travel Demand Model: Employment Density





# APPENDIX F

## Description of the 2035 NARTS Travel Demand Model

- The model generated trips based on demographical characteristics such as the number of residents or vehicles per household, employment, and age within each transportation analysis zone (TAZ). Special generators, such as the University of Arkansas and major shopping areas, were factors in the model.
- Accessibility variables were used to determine trip generation and destination choices. For instance, someone living in close proximity to shopping areas is more likely to make more shopping trips than someone living out in the countryside.
- Household surveys were performed to determine trip rates, attractions, mode choice, and the time-of-day for the different trip types. These trip types include home-based work, home-based school, home-based university, home-based shop/personal business, home-based other, non-home-based work, and non-home-based other.
- Zonal trip productions and attractions were distributed using the gravity model. This model assumes that trips are gravitated to attractions based on the size of the attraction and the distance between the origin/destination zones. Changes made to the transportation network, such as capacity and connectivity, alters the gravity model because it is reflective of the travel time.
- Trip productions and attractions were balanced as inputs for the gravity model.
- Friction factors, or impedances, used in the gravity model were calibrated with the 2004 NW Arkansas Household Travel Behavior Survey.
- Trips originating and/or ending outside of the study area were derived from a separate survey where 24-hour vehicle classification counts were taken at six external stations.
- A truck model was implemented with a similar four-step process: trip generation, distribution, choice of time of day and trip assignment.
- The travel demand model was calibrated by comparing the percent difference between observed traffic counts and model link volumes.



# APPENDIX G

## Descriptions of Level of Service

### Two-Lane Highway

**LOS A** - At LOS A, motorists experience high operating speeds and little difficulty in passing. A small amount of platooning would be expected. Drivers should be able to maintain operating speeds close or equal to the free-flow speed (FFS) of the facility.

**LOS B** - At LOS B, passing demand and passing capacity are balanced. Platooning becomes noticeable. It becomes difficult to maintain FFS operation, but the speed reduction is still relatively small.

**LOS C** - At LOS C, most vehicles are traveling in platoons. Speeds are noticeably reduced on all three classes of highway. This is the lowest acceptable LOS for rural roadways.

**LOS D** - At LOS D, platooning increases significantly. Passing demand is high but passing capacity approaches zero. A high percentage of vehicles are now traveling in platoons, and percent time-spent-following (PTSF) is quite noticeable. The fall-off from FFS is now significant. This is the lowest acceptable LOS for urban roadways.

**LOS E** - At LOS E, demand is approaching capacity. Passing is virtually impossible, and PTSF is more than 80%. Speeds are significantly reduced. Speed is less than two-thirds the FFS. The lower limit of this LOS represents capacity.

**LOS F** - LOS F exists whenever demand flow in one or both directions exceeds the capacity of the segment. Operating conditions are unstable, and heavy congestion exists on all two-lane highways.



# APPENDIX H

## Descriptions of Level of Service

### Multi-Lane Highway

**LOS A** - LOS A describes free-flow operations where FFS prevails and vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents or point breakdowns are easily absorbed.

**LOS B** - LOS B represents reasonably free-flow operations where FFS is maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical psychological comfort provided to drivers is still high. The effects of minor incidents and point breakdowns are still easily absorbed.

**LOS C** - LOS C provides for flow with speeds near the FFS. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service quality will be significant. Queues may be expected to form behind any significant blockages. This is the lowest acceptable LOS for rural roadways.

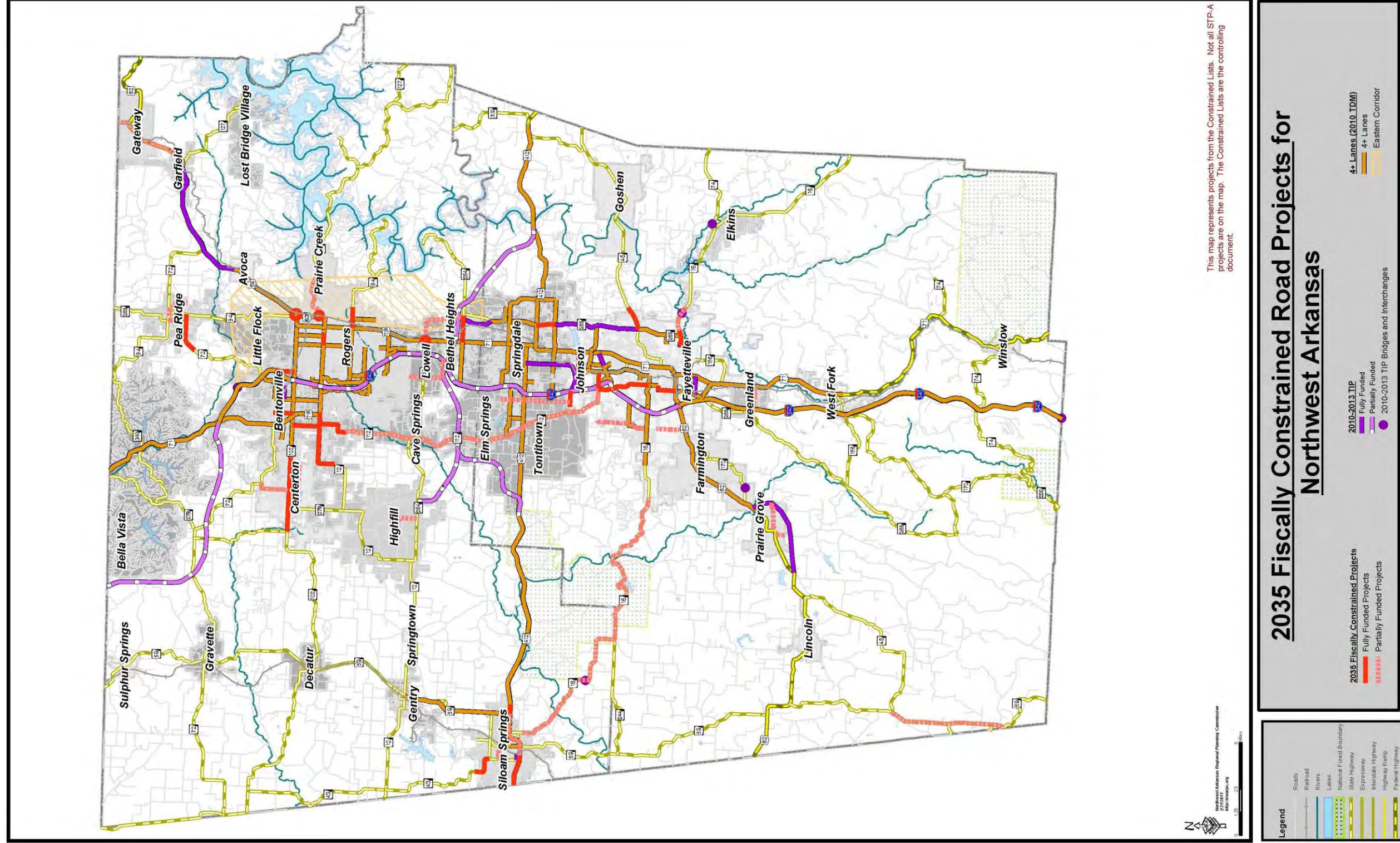
**LOS D** - LOS D is the level at which speeds begin to decline with increasing flows, with density increasing more quickly. Freedom to maneuver within the traffic stream is significantly limited and drivers experience reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions. This is the lowest acceptable LOS for urban roadways.

**LOS E** - LOS E describes operation at capacity. Operations at this level are highly volatile because there are virtually no usable gaps within the traffic stream, leaving little room to maneuver within the traffic stream. Any disruption to the traffic stream can establish a disruption wave that propagates throughout the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate even the most minor disruption, and any incident can be expected to produce a serious breakdown and substantial queuing. The physical and psychological comfort afforded to drivers is poor.

**LOS F** - LOS F is determined when the demand flow rate exceeds capacity. At this level, traffic flow has broken down. Whenever queues due to a breakdown exist, they have the potential to extend upstream for considerable distances.

# APPENDIX I

## Northwest Arkansas Financially Constrained Plan



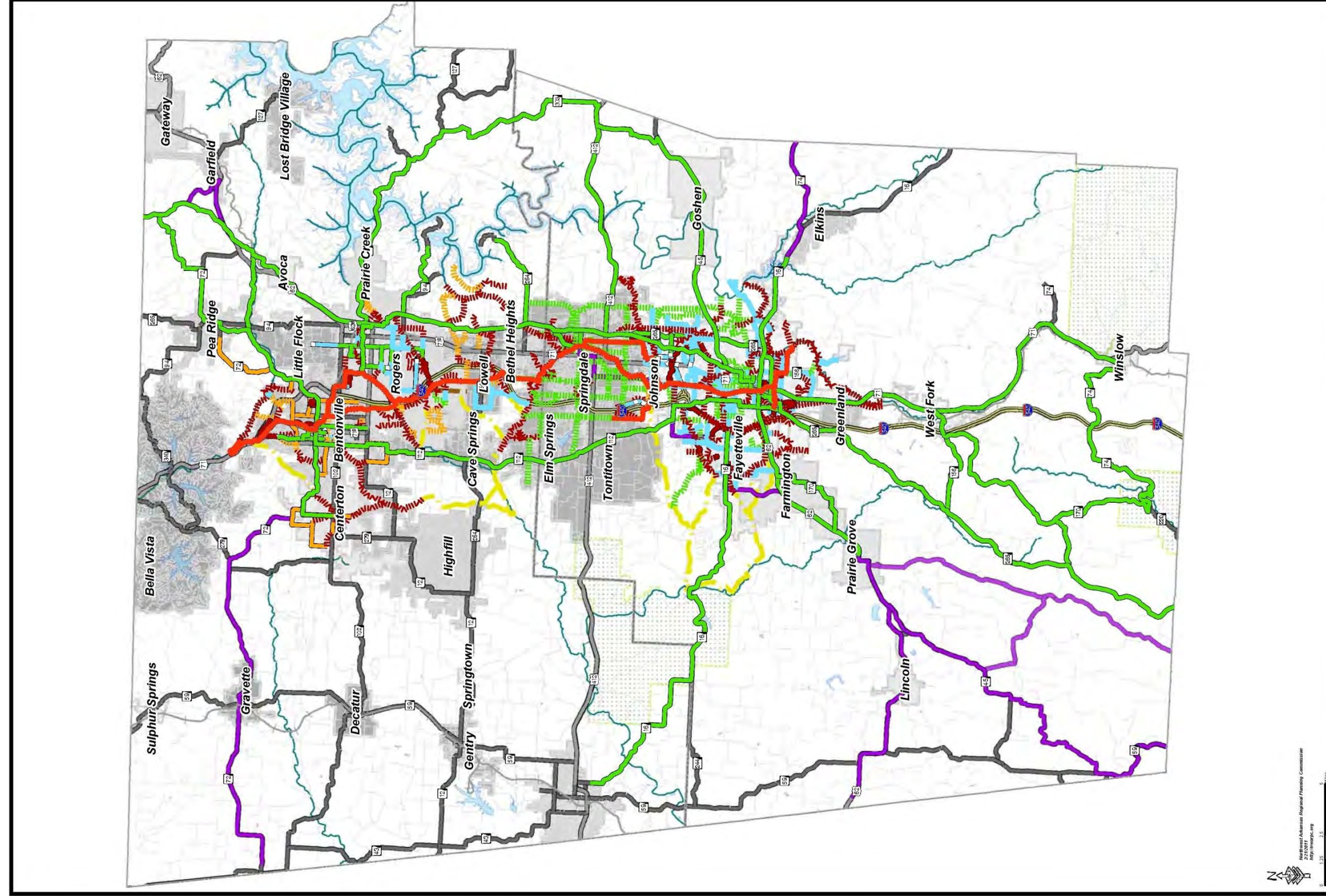
### 2035 Fiscally Constrained Road Projects for Northwest Arkansas





# APPENDIX J

## Northwest Arkansas Regional Bike/Pedestrian Plan



Northwest Arkansas Regional Planning Commission  
 2016  
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### Northwest Arkansas Regional Trail Plan

<b>Roads and Natural Features</b> Interstate Highways US Highways AR State Highways Roads Railroad Rivers Lakes National Forest Boundary	<b>NWA Trail System</b> Off Road, Multi-Use Trail, Existing Off Road, Multi-Use Trail, Proposed With Road, Multi-Use Trail, Existing With Road, Multi-Use Trail, Proposed With Road, Ped Bike Lane, Existing With Road, Ped Bike Lane, Proposed With Road, Ped Bike Route, Existing With Road, Ped Bike Route, Proposed Heritage Trail Plan	NWA Razorback Regional Greenway <b>Potential Connectors</b> Potential Regional Off Road Connectors Potential Regional Bike Routes
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# Appendix K

## Fayetteville Master Street Plan

