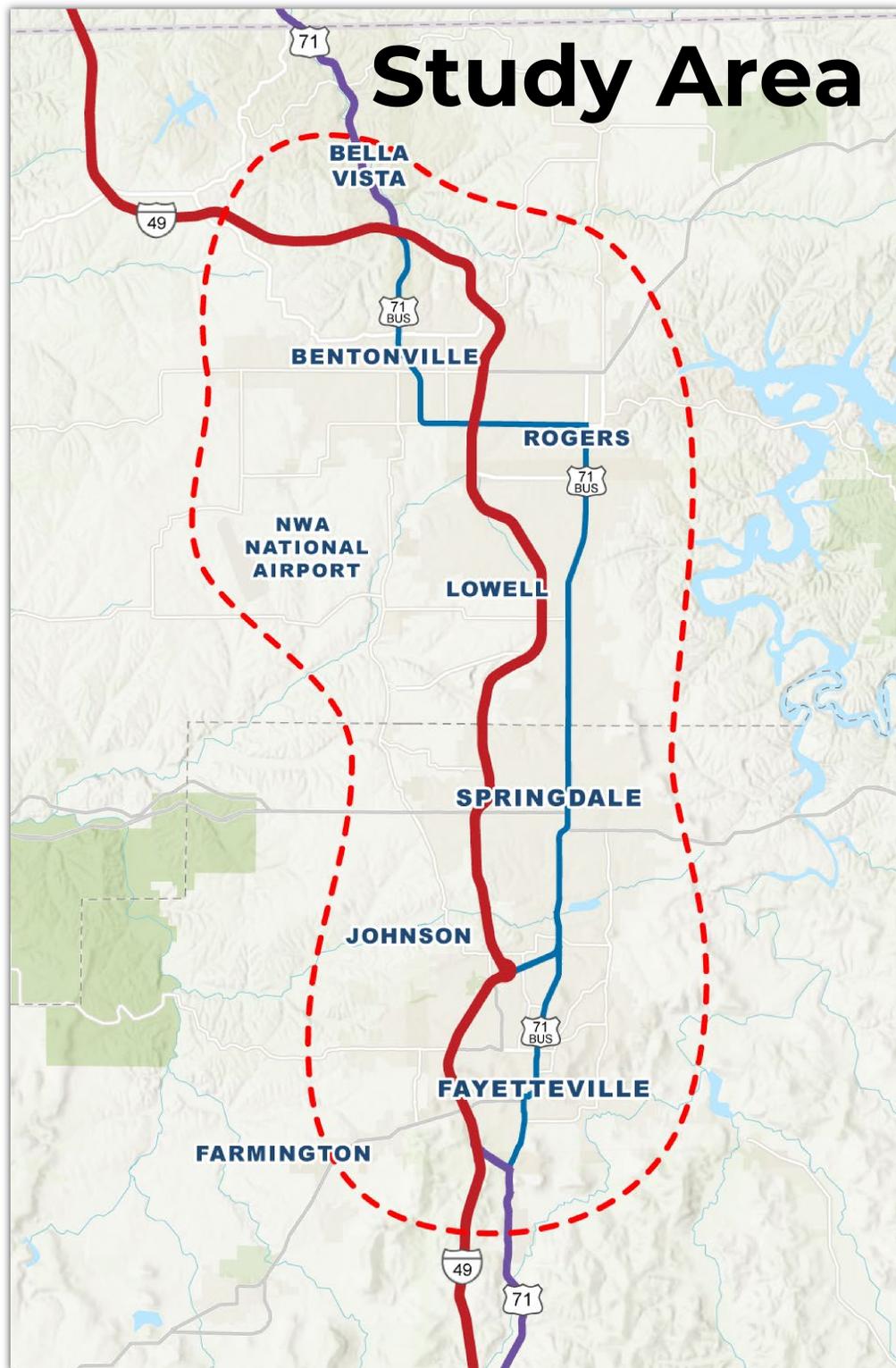


# Transit Alternatives Study



## Study Area



## Key Study Tasks:

- Existing conditions for regional transit
- Develop a rapid transit alternative in I-49/US71-B Corridor
- Transit modes to examine:
  - Bus Rapid Transit
  - Light Rail
  - Commuter Rail
- Recommendation for near/long-term transit improvement
- Public engagement

# Transit Alternatives Study



## Bus Rapid Transit (BRT)

- Enhanced bus service emulating fixed-rail transit more cost-efficiently
- Dedicated bus-only lanes or mixed traffic
- High frequency – bus every 15 minutes or less in peak service
- Station spacing approx. ½ mile
- Distinctive stations and passenger amenities
- Technology
  - Transit Signal Priority
  - Next bus arrival time signage
  - Off-board fare collection
- System branding and unique identity



# Transit Alternatives Study



## Light Rail Transit (LRT)

- Fixed rail transit service
- Operate as a single LRT vehicle or multiple cars for higher passenger capacity
- Powered by overhead electric system
- Generally, in dedicated lanes, but can operate in mixed traffic
- Peak frequency approx. 15 minutes
- Station spacing ½ - 1 mile
- High amenity passenger stations with level-boarding
- Off-board fare collection
- Transit Signal Priority
- Signal system and communications



# Transit Alternatives Study

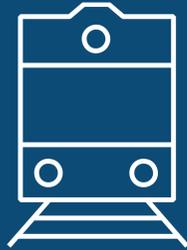


## Commuter Rail

- Train sets operating in freight rail environments
- Diesel or electric-powered trains
- Traditional trains or Diesel Multiple Unit (DMU)
- Higher passenger capacity
- Large stations with platforms
- Off-board fare collection
- Station spacing approximately 2 - 10 miles
- Longer trips with lower frequency
- Generally focused on peak travel times
- Safety and communications technology required (Positive Train Control, Communications, and signals)



# Transit Alternatives Study

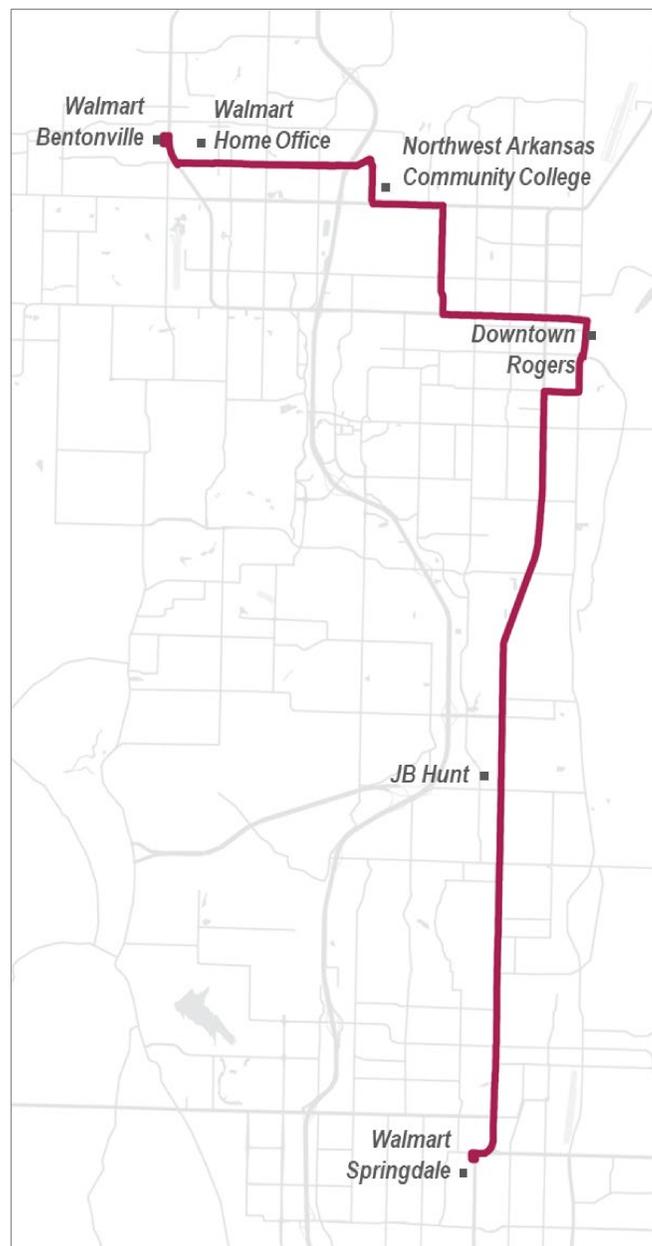
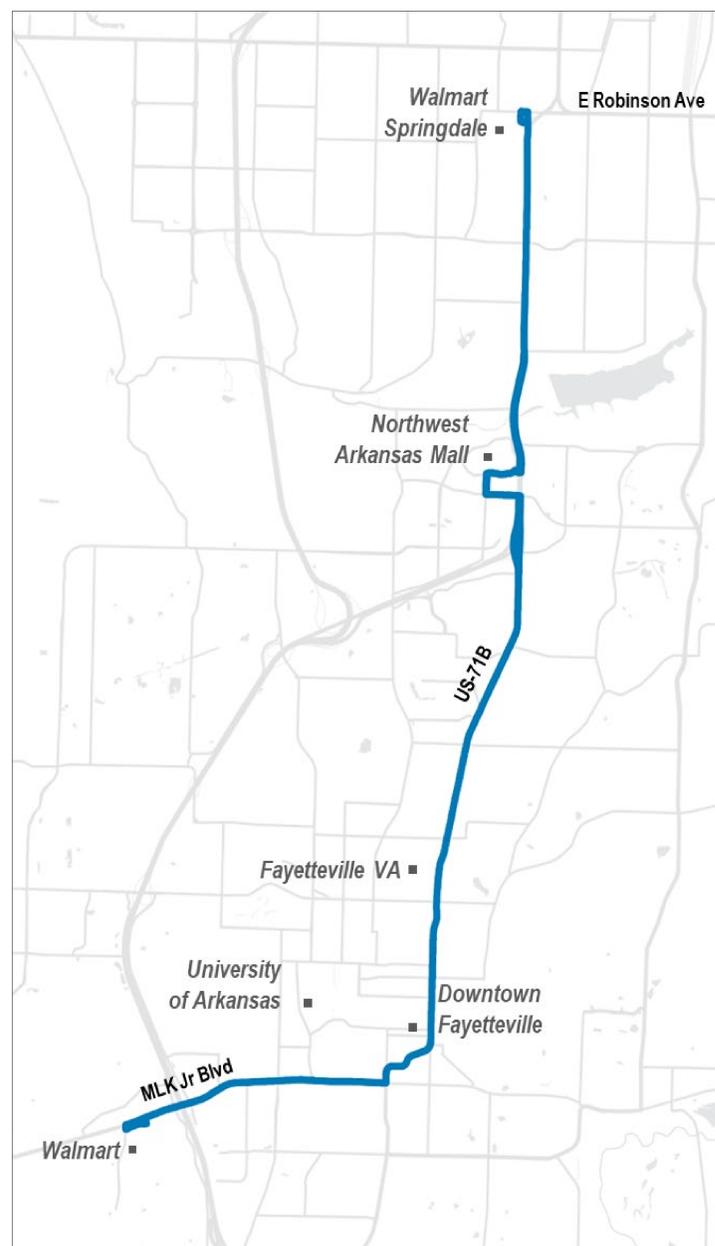


## BRT: Fayetteville - Springdale

## BRT: Bentonville - Springdale

## LRT: Bentonville - Fayetteville

## Commuter Rail: Bentonville - Fayetteville



# Transit Alternatives Study



## Transit Mode Comparison

	Commuter Rail	Light Rail	Bus Rapid Transit
<b>Right-of-way</b>	Active or inactive freight rail lines	New ROW, inactive rail lines, or in-street	New ROW, inactive rail corridors, or in-street
<b>Stop Spacing</b>	2-10 miles	½ to 2 miles, less in CBD	½ to 2 miles, less in CBD
<b>Typical Corridor Length</b>	20-100 Miles	Under 30 Miles	Under 30 Miles
<b>Typical Headway (Pk/Off Pk)</b>	10-30 mins/ 30-60 mins	5-15 mins/ 15-30 mins.	5-15 mins/ 15-30 mins.
<b>Hours of Operation</b>	Sometimes Peak Only	Usually All Day, Eves, Weekends	Usually All Day, Eves, Weekends
<b>Approximate Capital Cost Per Mile</b>			

# Transit Alternatives Study



## Alternative Selection Criteria

<b>Mobility Improvements/ Impacts</b>	Number/stops/stations
	Percentage of stops/stations with safety-security improvements, including lighting, shelters, raised curbs/platforms
	Percentage of stops/stations with safety-security improvements, including lighting, shelters, raised curbs/platforms
	Transit running on exclusive lane
<b>Congestion Benefits/Impacts</b>	Miles of guideway on new roadway or right-of-way
	Miles of existing roadway converted to transit use
<b>Environmental Benefits/Impacts</b>	Potential environmental impacts (undeveloped areas)
	Potential Construction Impacts (developed areas)
<b>Land Use Benefits</b>	Number of Parks
	Number of Cemeteries
	Number of Underground Gas/Diesel Storage Tanks

# Transit Alternatives Study



## Alternative Selection Criteria (Continued)

Demographics & Socioeconomics Benefits	Cost-Effectiveness
Key Regional Attractions	Total Capital Cost (project feasibility)
Population	Annualized capital cost
Jobs	Capital cost per mile
Population Density (persons per square mile)	Total Annual Operating Cost (project feasibility)
Employment Density	Operating cost per hour of service
Population in poverty	Operating cost per mile of service
Potential to encourage transit-oriented development form	Potential to attract discretionary funding (Federal and Walton Family Foundation; equates to various measures above).
Population with Disability	Potential to attract regional and local political support
Zero-car households	Economic Development
Potential to attract development	
Minority Population	

# Transit Alternatives Study



## Cost Comparison (Capital and Operations/Maintenance)

	Bus Rapid Transit	Light Rail	Commuter Rail
<b>Total Capital Costs</b>	\$ 209,960,685	\$5,787,797,658	\$1,130,021,188
<b>Annualized Capital Costs</b>	\$ 7,292,563	\$211,577,371	\$44,920,041
<b>Total Annual Operating &amp; Maintenance Costs</b>	\$ 6,429,677	\$11,797,877	\$46,905,222
<b>Operating &amp; Maintenance Costs per Vehicle Revenue Hour</b>	\$ 136.59	\$390.65	\$1,532.55
<b>Operating &amp; Maintenance Costs per Vehicle Revenue Mile</b>	\$ 10.69	\$19.53	\$62.48

# Transit Alternatives Study



## Phase 1 and Phase 2 BRT Cost (Capital and O&M)

	US71-B Bus Rapid Transit – Phase 1	US71-B Bus Rapid Transit – Phase 2
<b>Total Capital Costs</b>	\$177,000,000	\$33,300,000
<b>Annualized Capital Costs</b>	\$6,200,000	\$1,100,000
<b>Total Annual Operating &amp; Maintenance Costs</b>	\$6,100,000	\$350,000
<b>Operating &amp; Maintenance Costs per Vehicle Revenue Hour</b>	\$133	\$4
<b>Operating &amp; Maintenance Costs per Vehicle Revenue Mile</b>	\$13	-\$2

# Transit Alternatives Study



## Alternative Scoring Results

Scoring Criteria	Total Points Per Criteria	Bus Rapid Transit	Light Rail	Commuter Rail
Mobility Improvements/Impacts	20	14	14	12
Congestion Benefits/Impacts	10	6	2	10
Environmental Benefits/Impacts	10	6	6	6
Land Use Benefits	15	11	7	9
Demographics & Socioeconomics Benefits	55	47	51	40
Cost-Effectiveness	45	37	27	25
<b>Total Score</b>	<b>155</b>	<b>121</b>	<b>107</b>	<b>102</b>

# *Transit Alternatives Study*



## **Preferred Alternative: Bus Rapid Transit**

### ***Bus Rapid Transit Service in the US 71B Corridor***

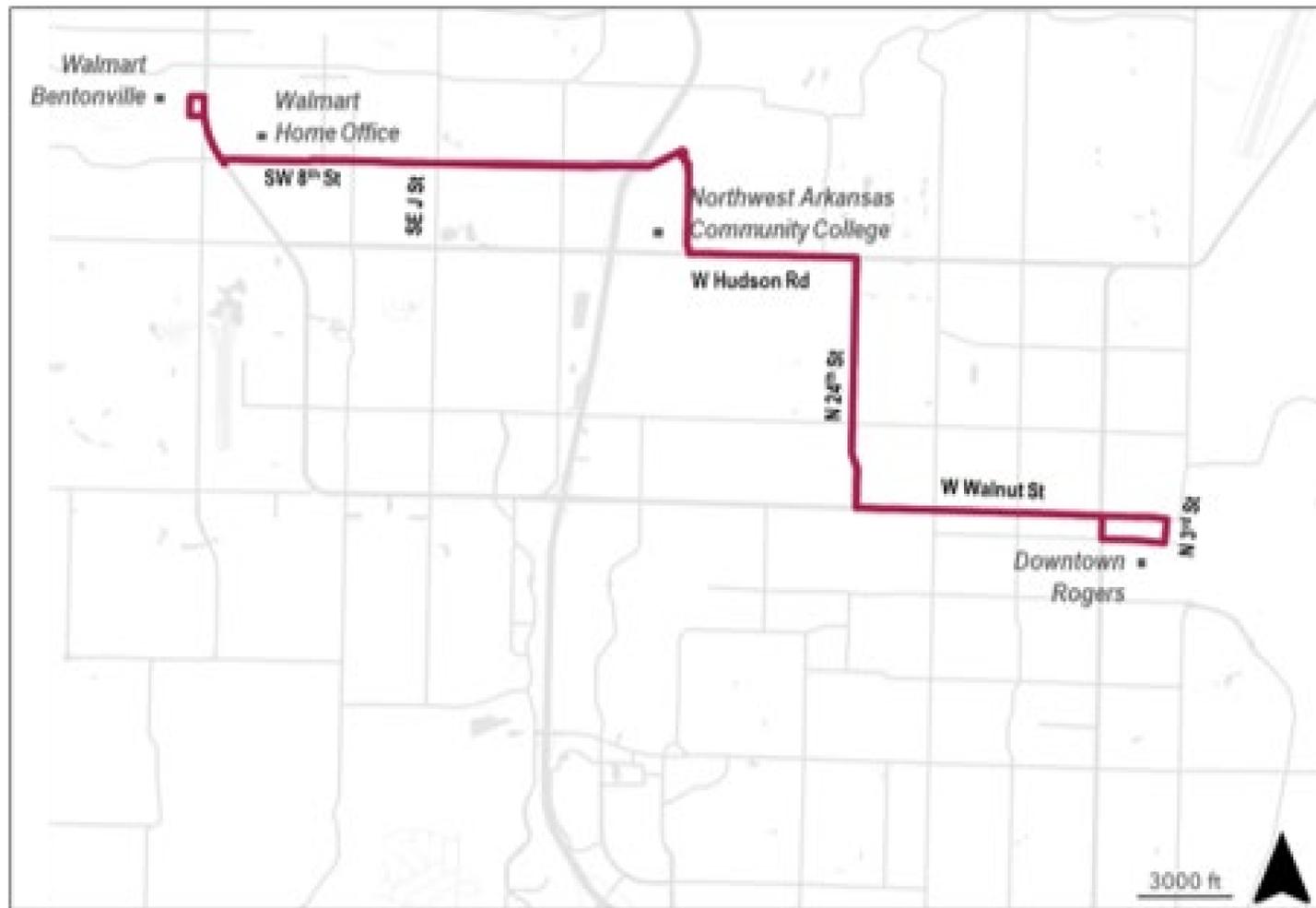
- Operating in mixed traffic (i.e., limited dedicated bus lanes as needed)
- Uniquely branded service on vehicles and stations
- High amenity stations spaced approximately  $\frac{1}{4}$  to  $\frac{1}{2}$  mile apart
  - › Shelters with lighting
  - › Real-time next bus arrival signage
  - › Raised level-boarding platform
  - › Station marker with route and wayfinding information
  - › Accessible sidewalks/trails to stations
- Intelligent Transportation Systems (ITS) for bus priority at traffic signals
- Targeted queue-jump lanes at highly congested intersections

# Transit Alternatives Study



## Preferred Alternative- Phase 1

### Phase 1 – Bentonville/Rogers



### Phase 1 – Fayetteville/Springdale

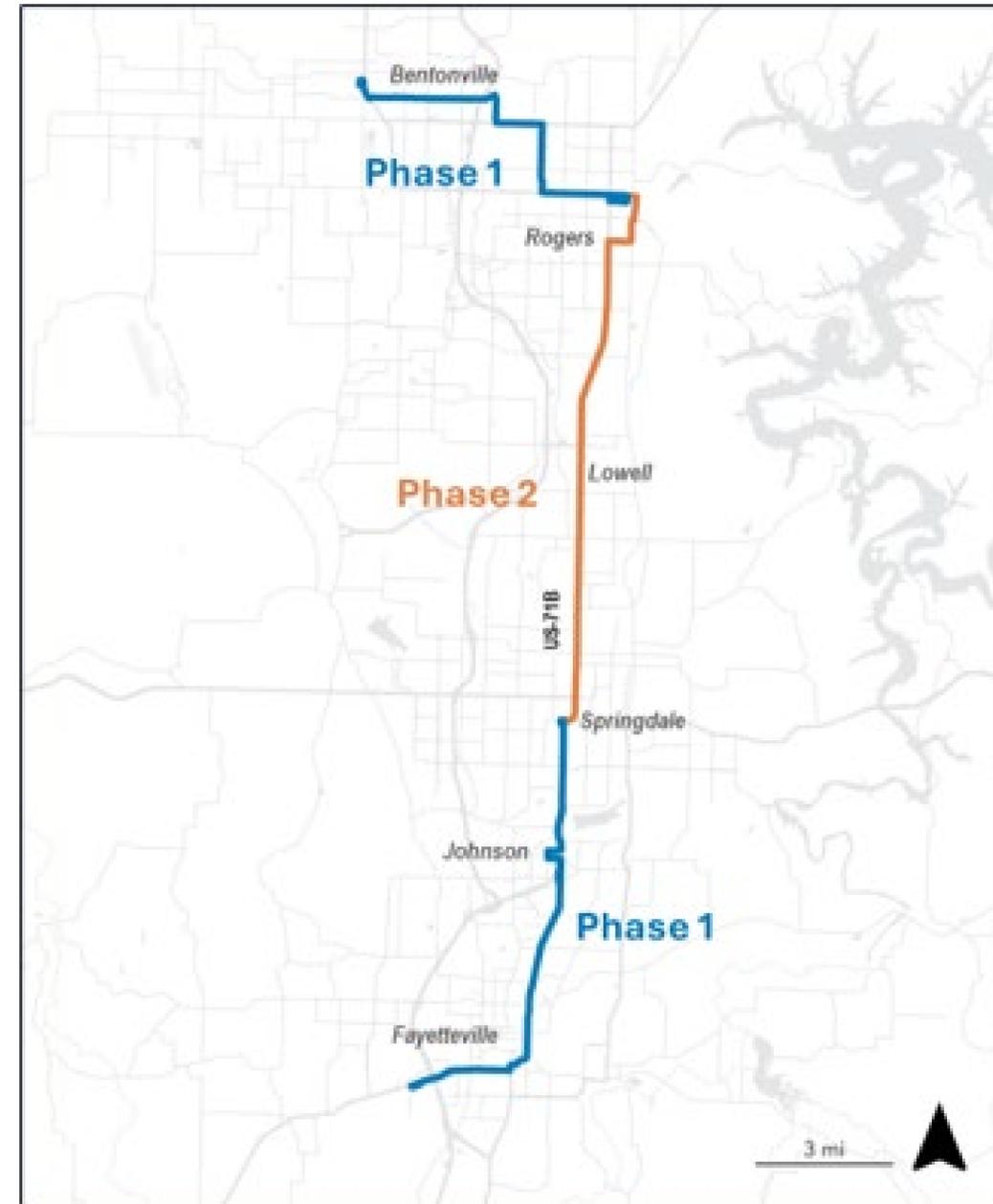


# Transit Alternatives Study



## Preferred Alternative- Phase 2

Phase 2 (Long Term) – Connections to Phase 1 Segments



# Transit Alternatives Study



## Similar BRT Examples



