Advanced Analytics in Competitive Business Landscapes

C. Tad Bohannon, CEO
11 May 2022

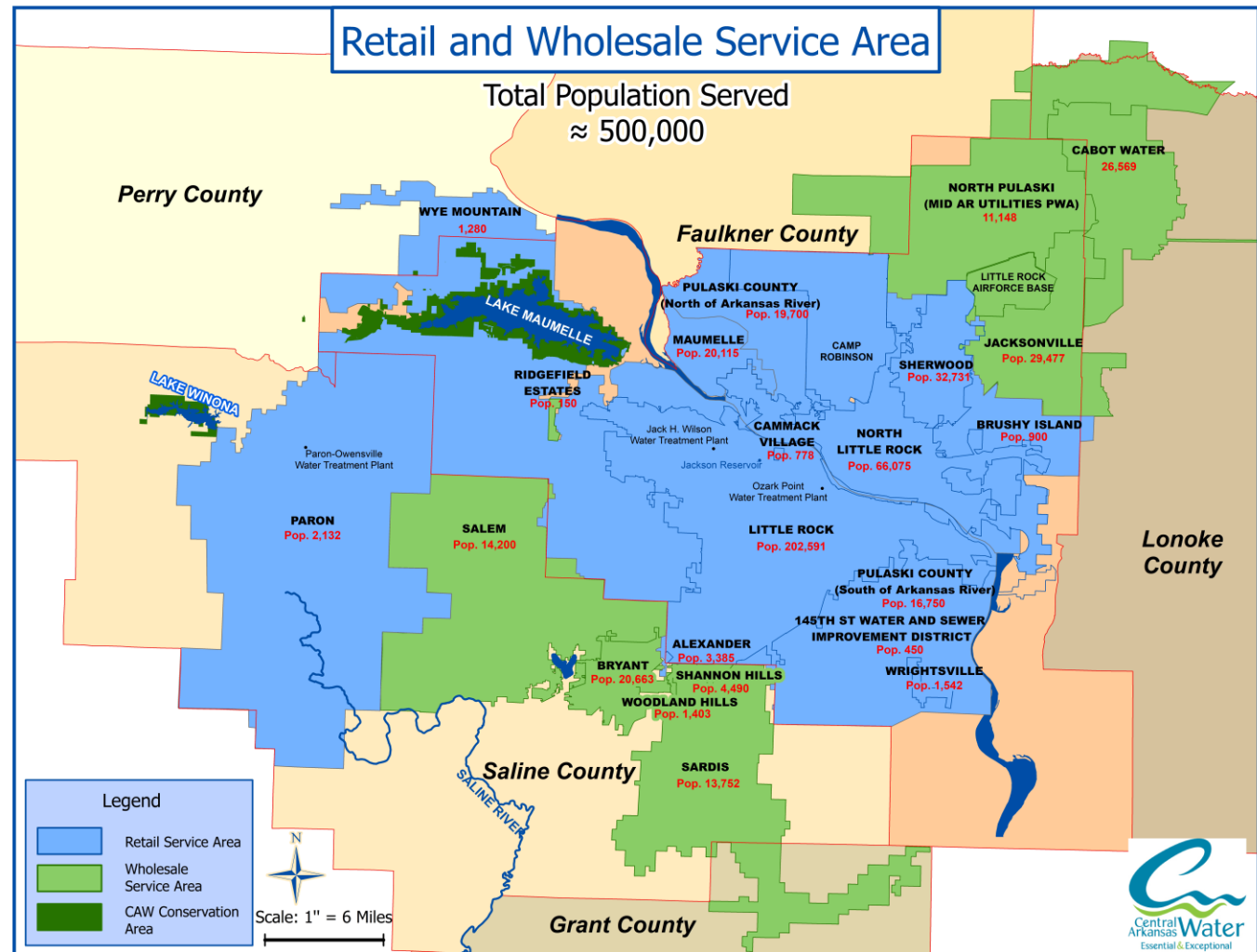# CAW BY THE NUMBERS:

Central Arkansas Water — Essential & Exceptional

- 2 Lakes & 1 Reservoir
- 3 Water Treatment Plants
- 35 Pump Stations / 120 Pumps
- 2,672 Miles of Pipe
- 39 Tanks / 75.5 Million Gallons
- 721.18 Sq. Miles of Service Area
- 18.2 Billion Gallons Sold in 2021
- 156,266 Meters / Services
- 490,280 Population Served
- 13,333 Fire Hydrants
- 23 Communities Served
- 40,485 Valves
- 7 Counties Served
- 323 HIVIP Employees

Service Area:

721 m^2 (1868 km^2)

Miles of Underground Pipe:

2672 m (4300 km)

Retail and Wholesale Service Area

Total Population Served ≈ 500,000

Business Drivers

☐ **Protect Public Health**

☐ Dependability

☐ Affordability

☐ Abundance

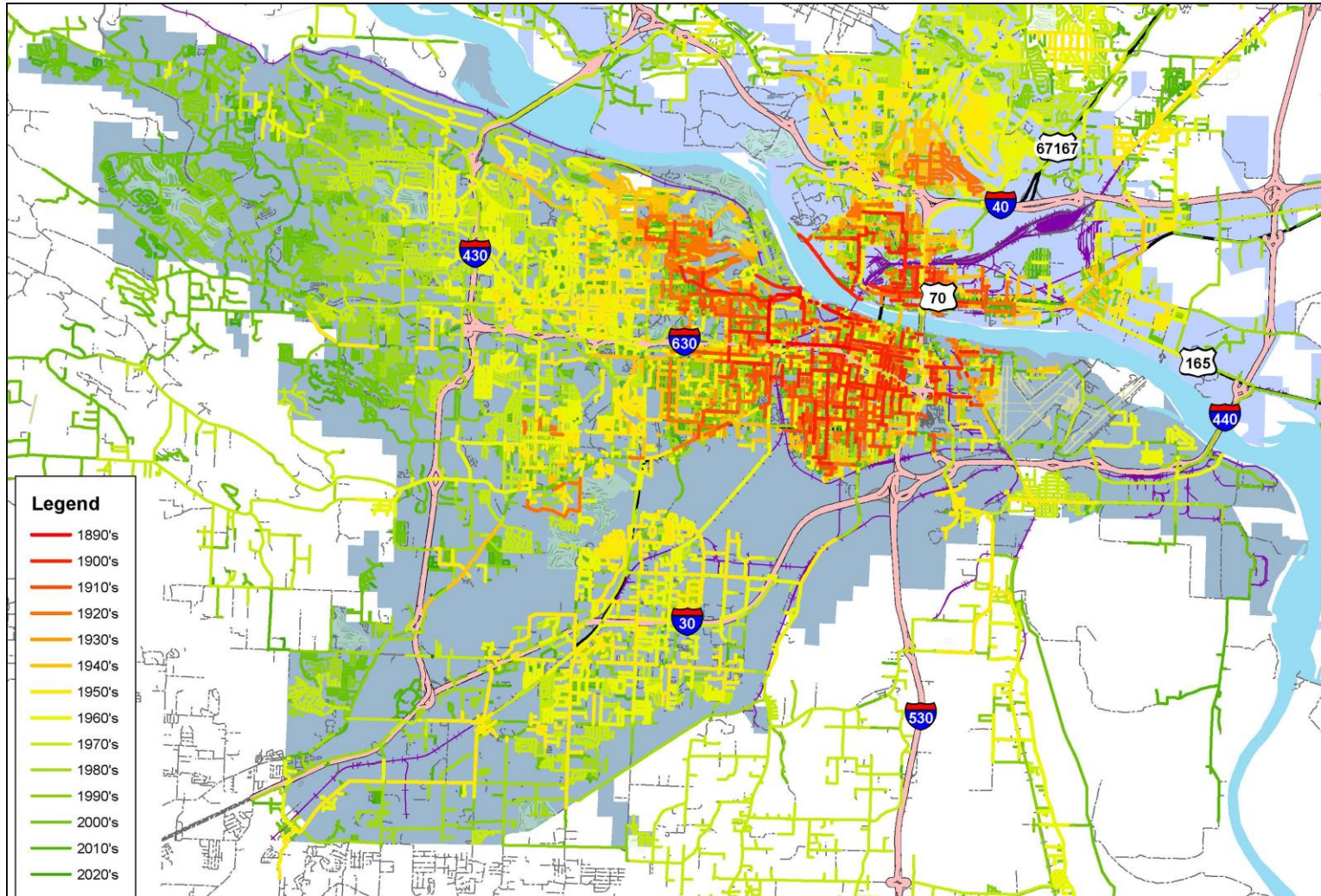Vision: *"Be a Resilient and Trusted Utility"*

Dependability

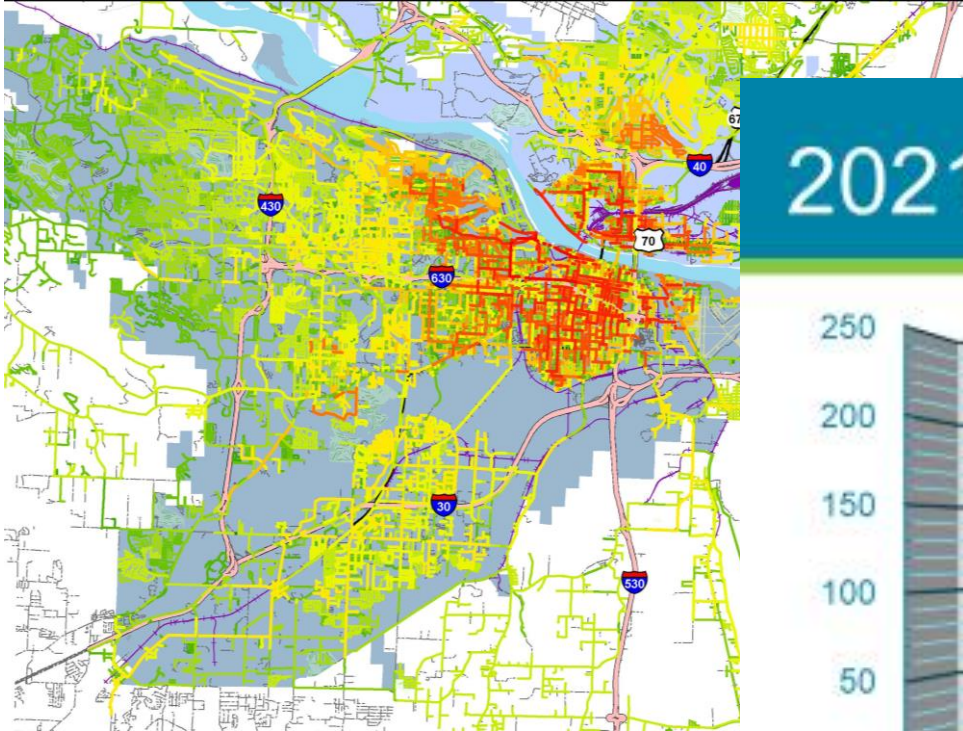

Affordability

Importance of Data Analytics . . .

- Set Priorities
- Allocate Resources
- Understand Customers & Impact on Water Demand
  - Growth/Decline Patterns
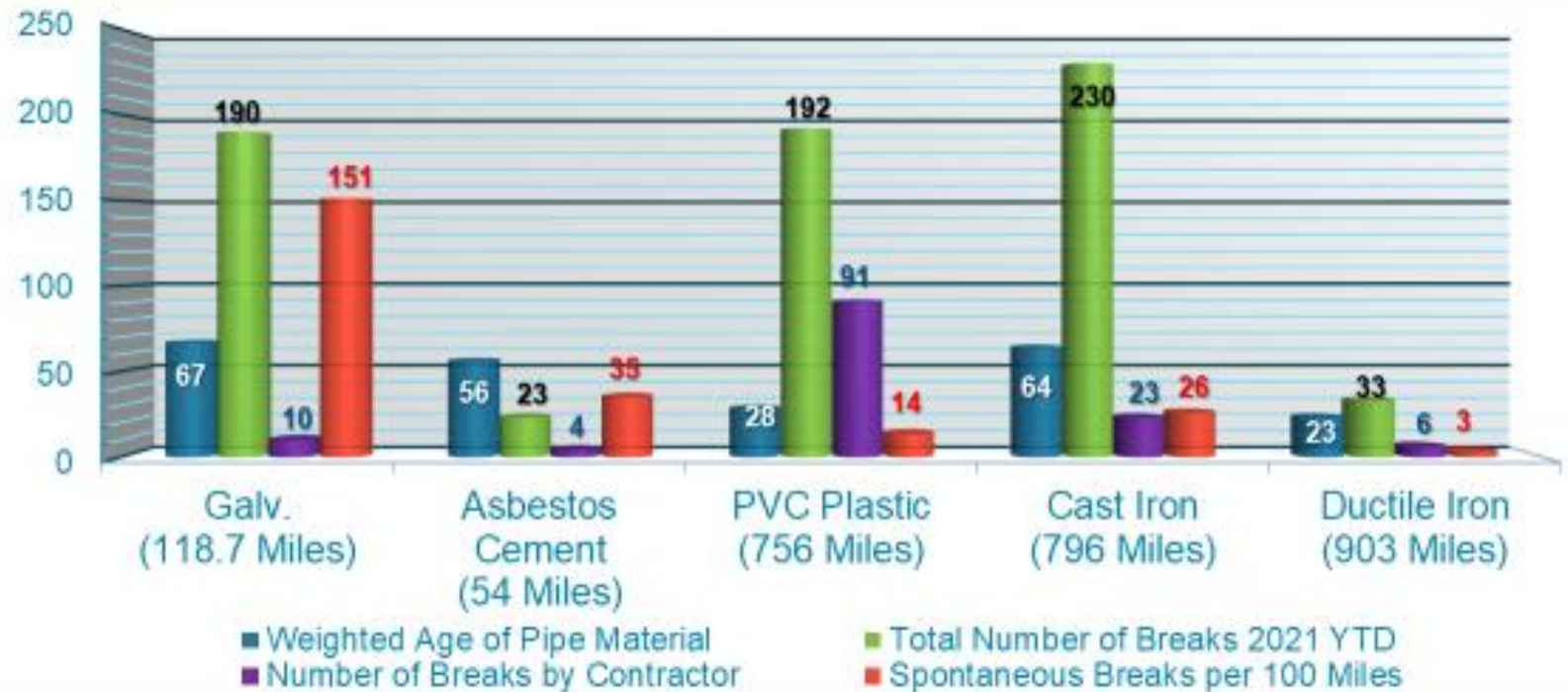 - Demographics
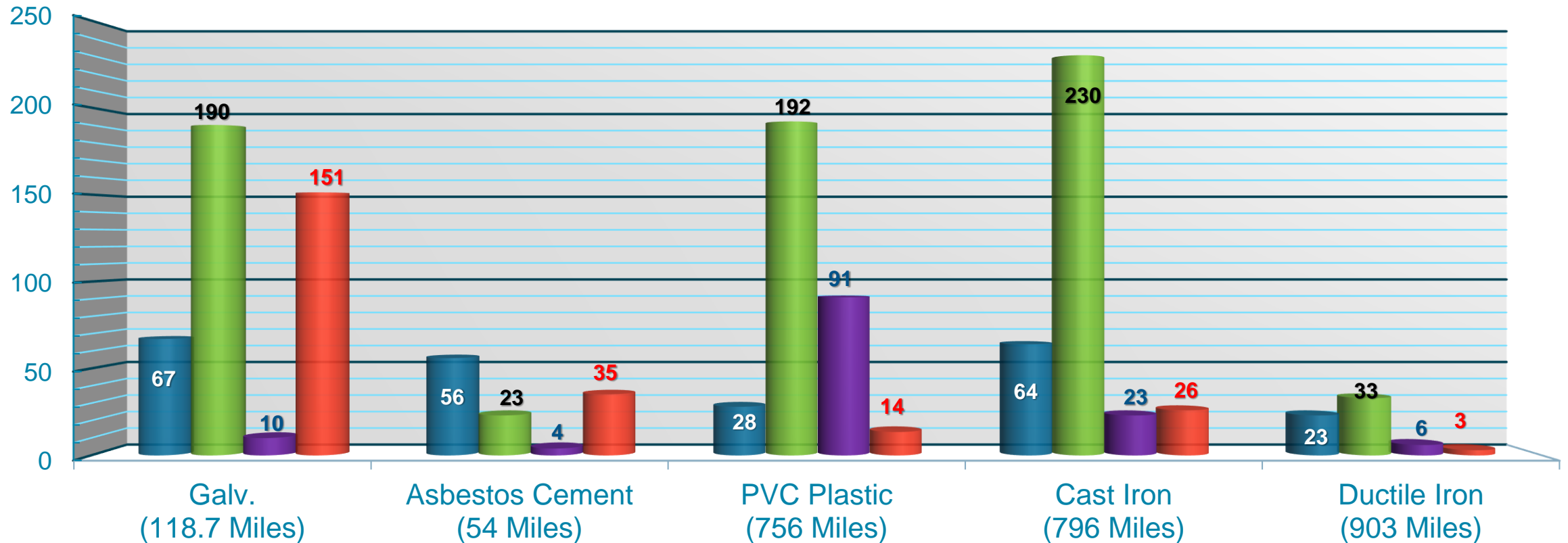 - Behavioral
- 50 Year (or more) Horizon

Simple . . .

Legend
- 1890's
- 1900's
- 1910's
- 1920's
- 1930's
- 1940's
- 1950's
- 1960's
- 1970's
- 1980's
- 1990's
- 2000's
- 2010's
- 2020's

Simple . . . or is it?

2021 Breaks by Material

Galv. (118.7 Miles)	Asbestos Cement (54 Miles)	PVC Plastic (756 Miles)	Cast Iron (796 Miles)	Ductile Iron (903 Miles)
67, 190, 10, 151	56, 23, 4, 35	28, 192, 91, 14	64, 230, 23, 26	23, 33, 6, 3

- Weighted Age of Pipe Material
- Total Number of Breaks 2021 YTD
- Number of Breaks by Contractor
- Spontaneous Breaks per 100 Miles

2021 Breaks by Material

Spontaneous Breaks on Galvanize

30 breaks on Galv. From Feb. 2021 Extreme Winter Event

Legend:
- Spontaneous Breaks per 100 miles of Galvanize Pipe
- Spontaneous Breaks and Leaks for Galvanize

Data values by year:
- 2011: 234, 261
- 2012: 187, 225
- 2013: 168, 246
- 2014: 178, 221
- 2015: 167, 246
- 2016: 142, 182
- 2017: 136, 173
- 2018: 134, 169
- 2019: 124, 151
- 2020: 142, 169
- 2021: 151, 180
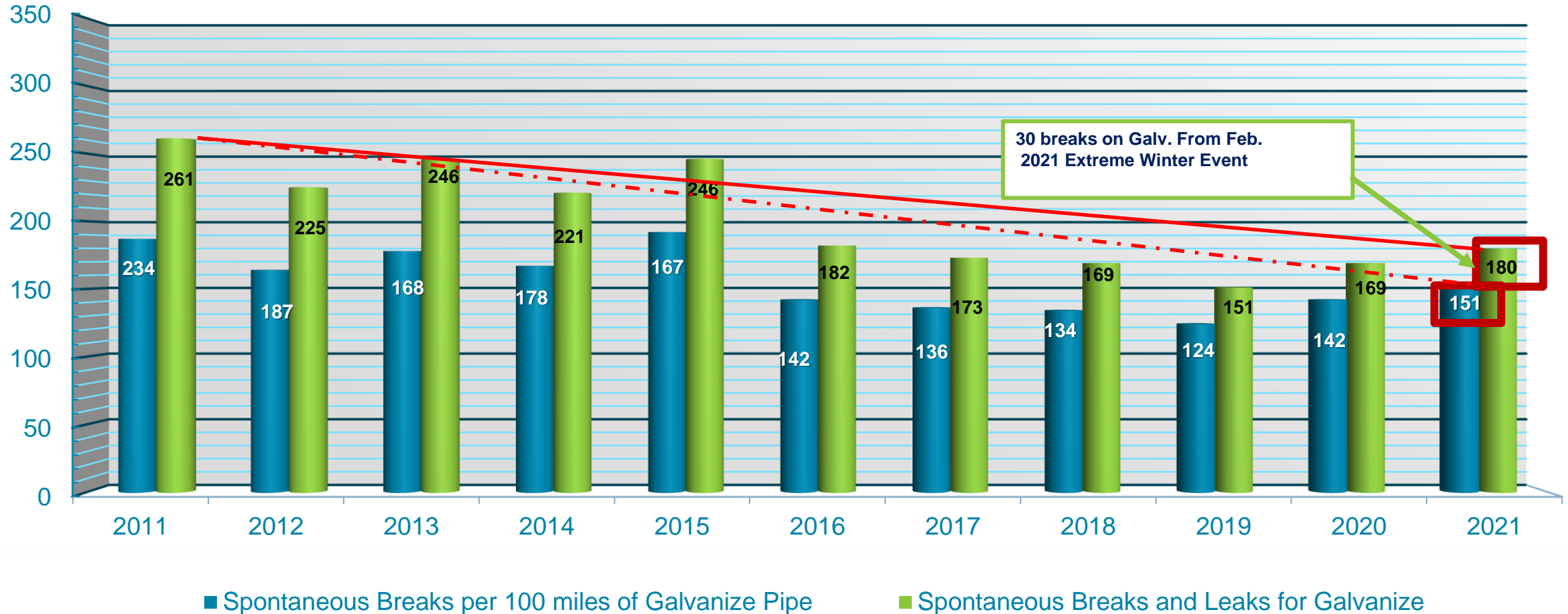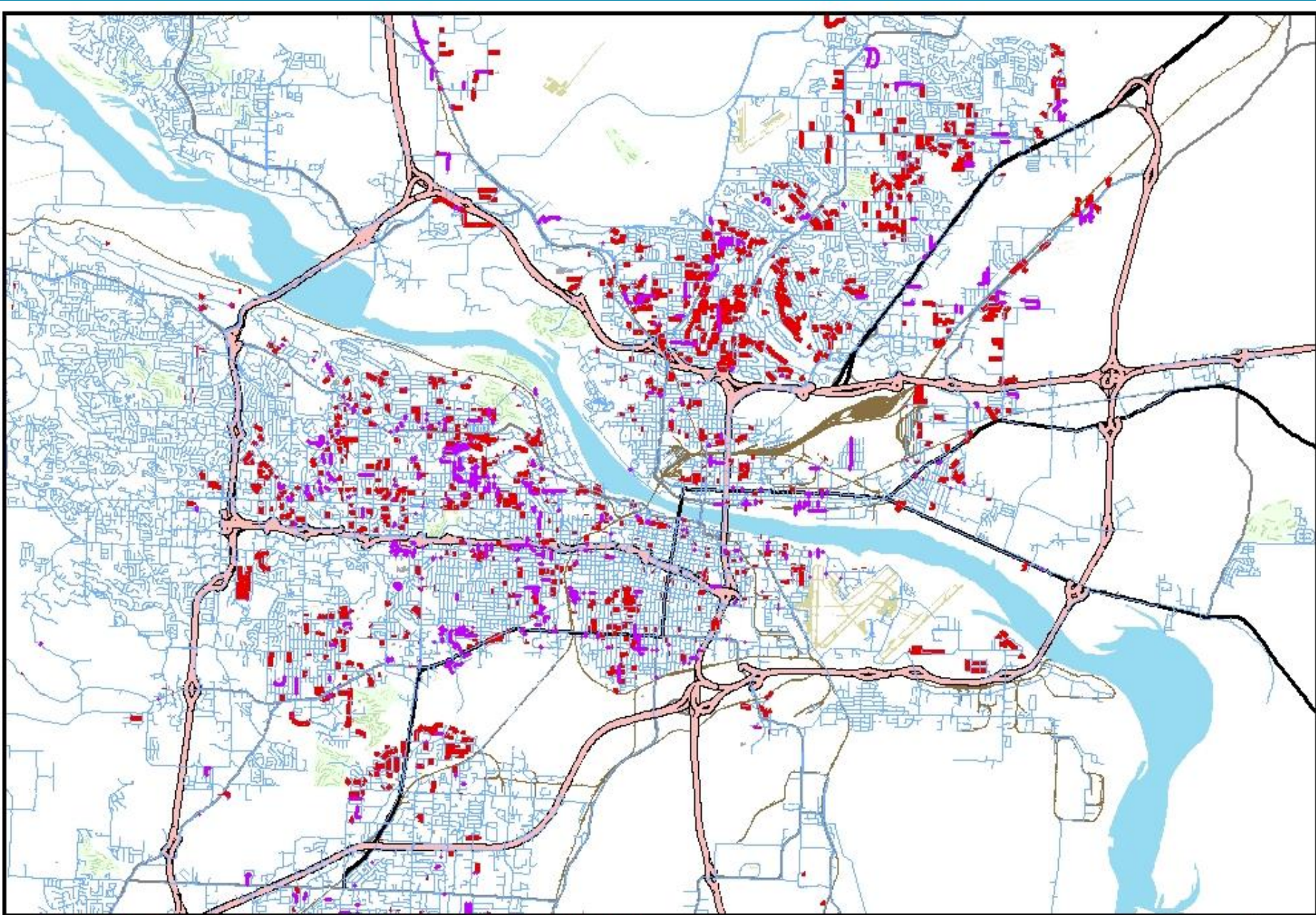
GALVANIZED PIPE IN SERVICE - CURRENT 2022

GALVANIZED PIPE REPLACED 2007 - 2021

CAW LSL Inventory

Next Steps

- Records and Resources:
  - Historical Inspection Records
  - Historical Plumbing Codes
    - Documentation for 1950 LSL Cutoff Date
- Parcel and Census Data
  - Identify Areas of Underserved or Disadvantaged Communities
    - Prioritization of Replacement
    - Funding Application
- Dashboard for Program Tracking
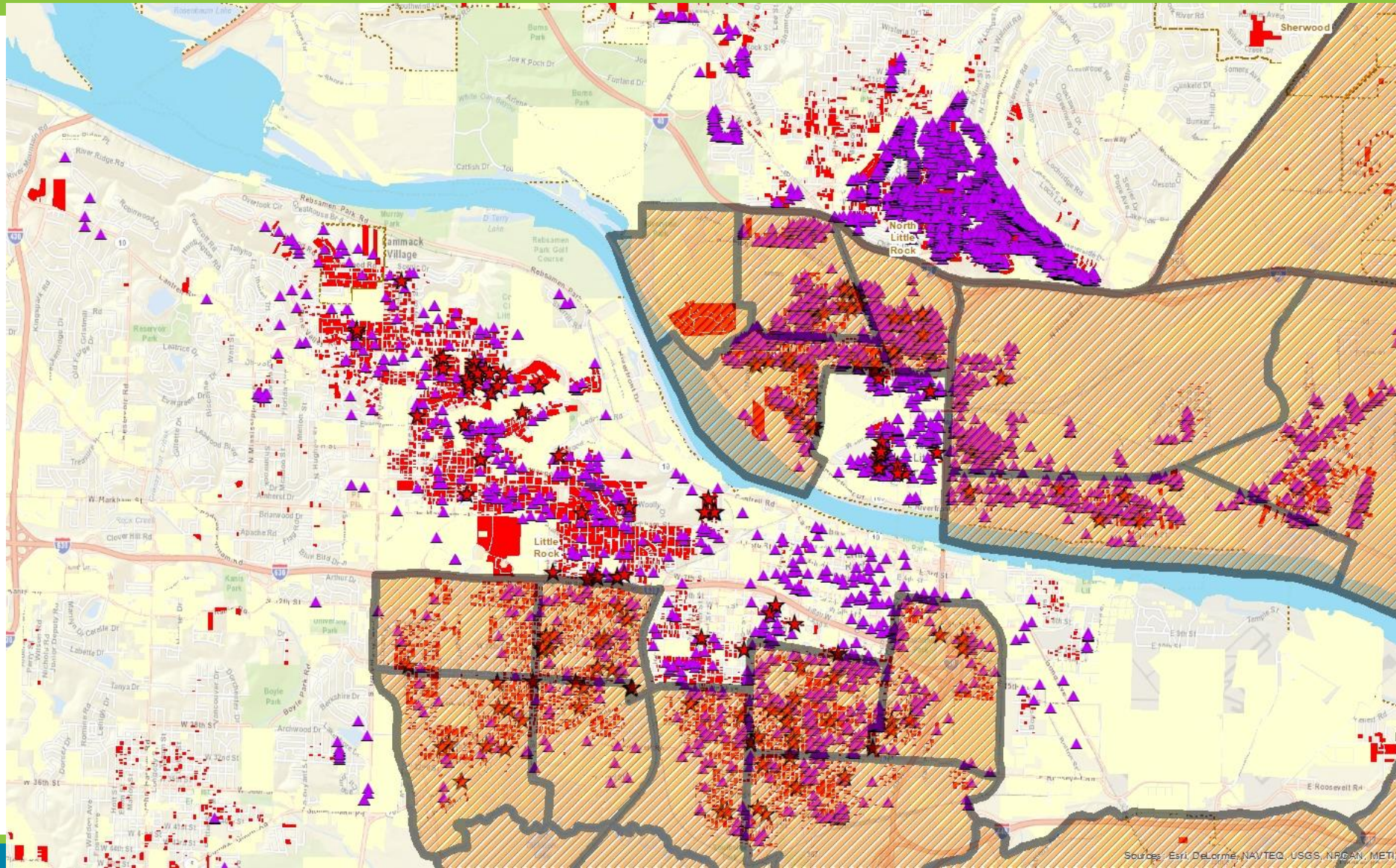- Online Interactive Map – Coming Late 2022

Historical Inspection Results:

Justice 40 Area's:
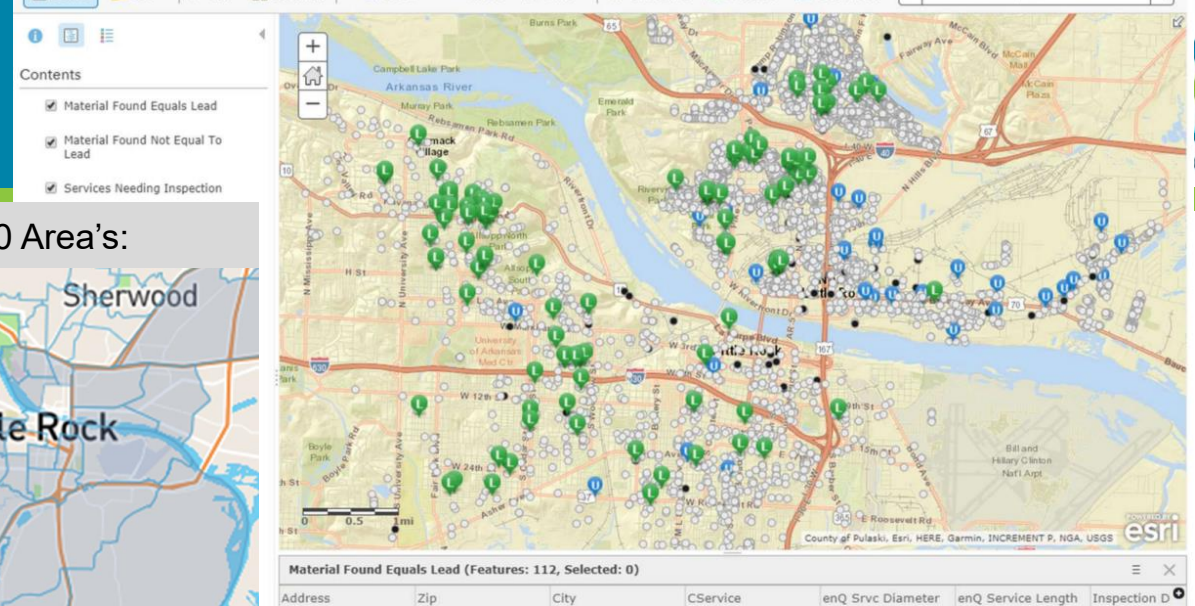
Preliminary area of galvanized requiring replacement (private):
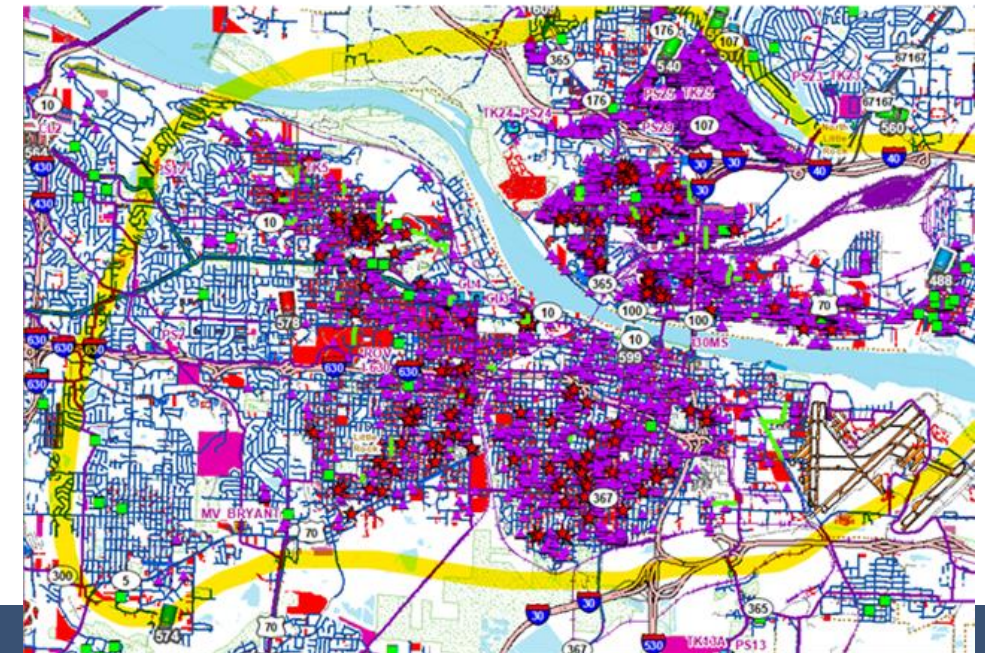
LSL & Low Income Areas

Lead Service Line Inventory
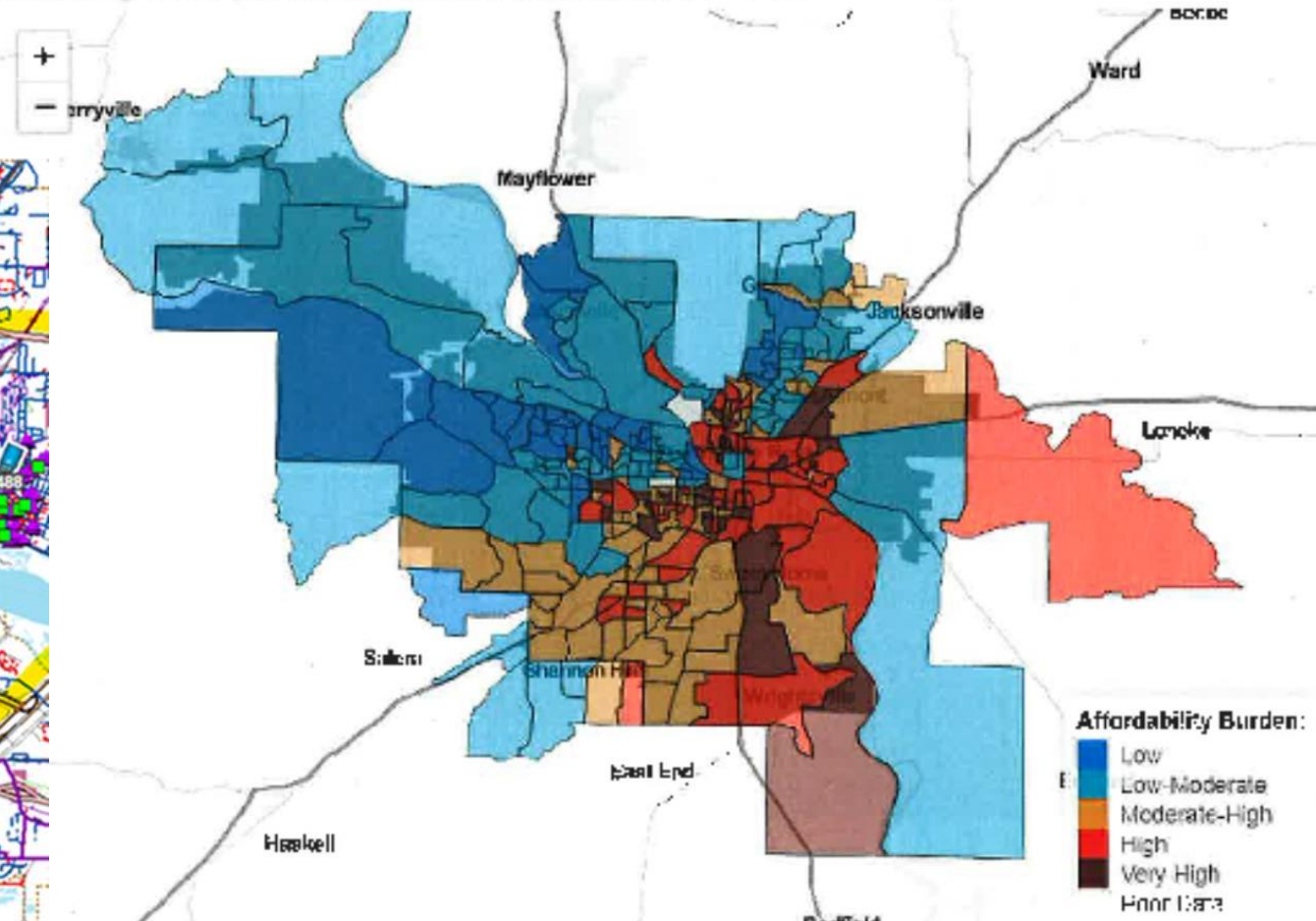- ★ Replaced LSL
- ▲ Investigated - Not Lead
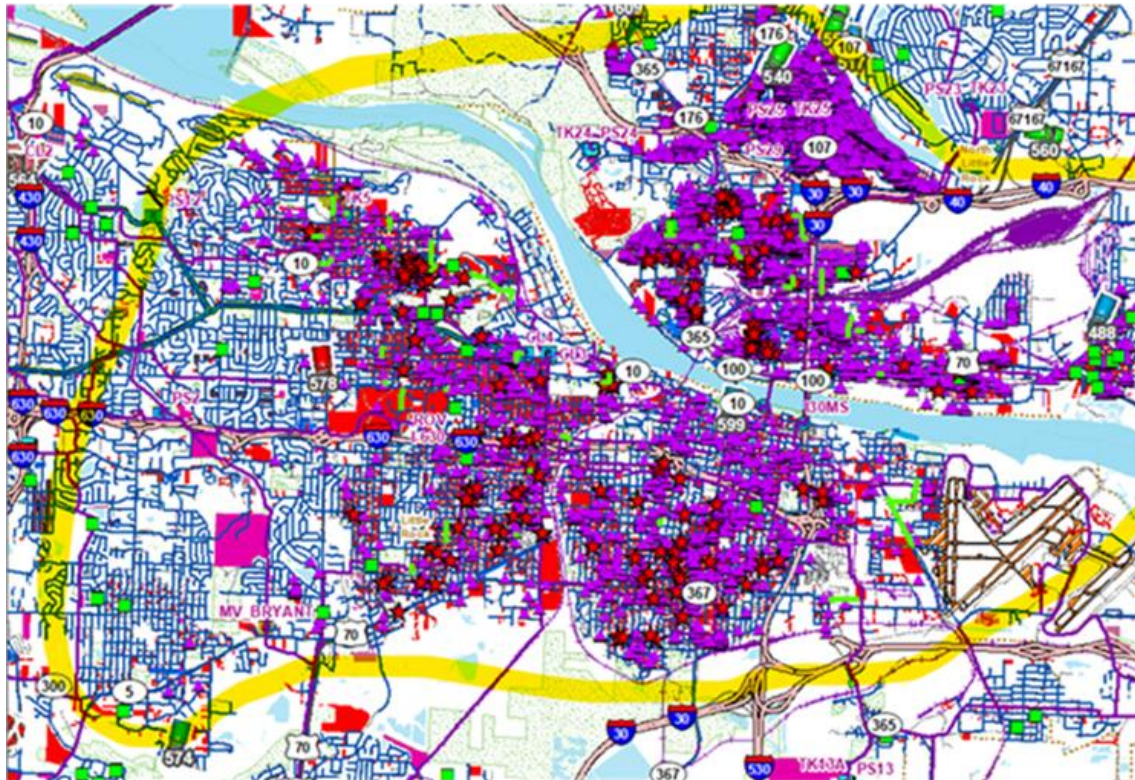
Parcel Data Year

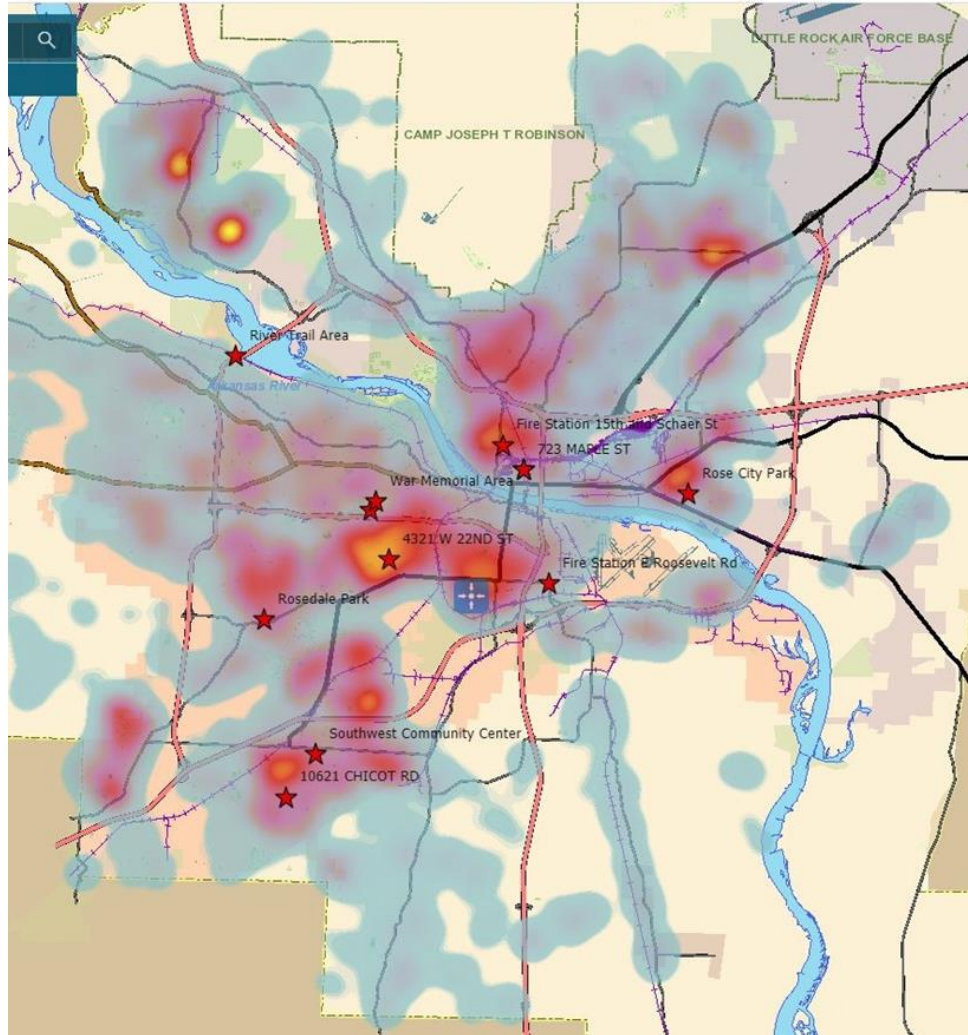**YearBuilt**
- Unknown
- Pre-1950

Disadvantaged Areas

Affordability
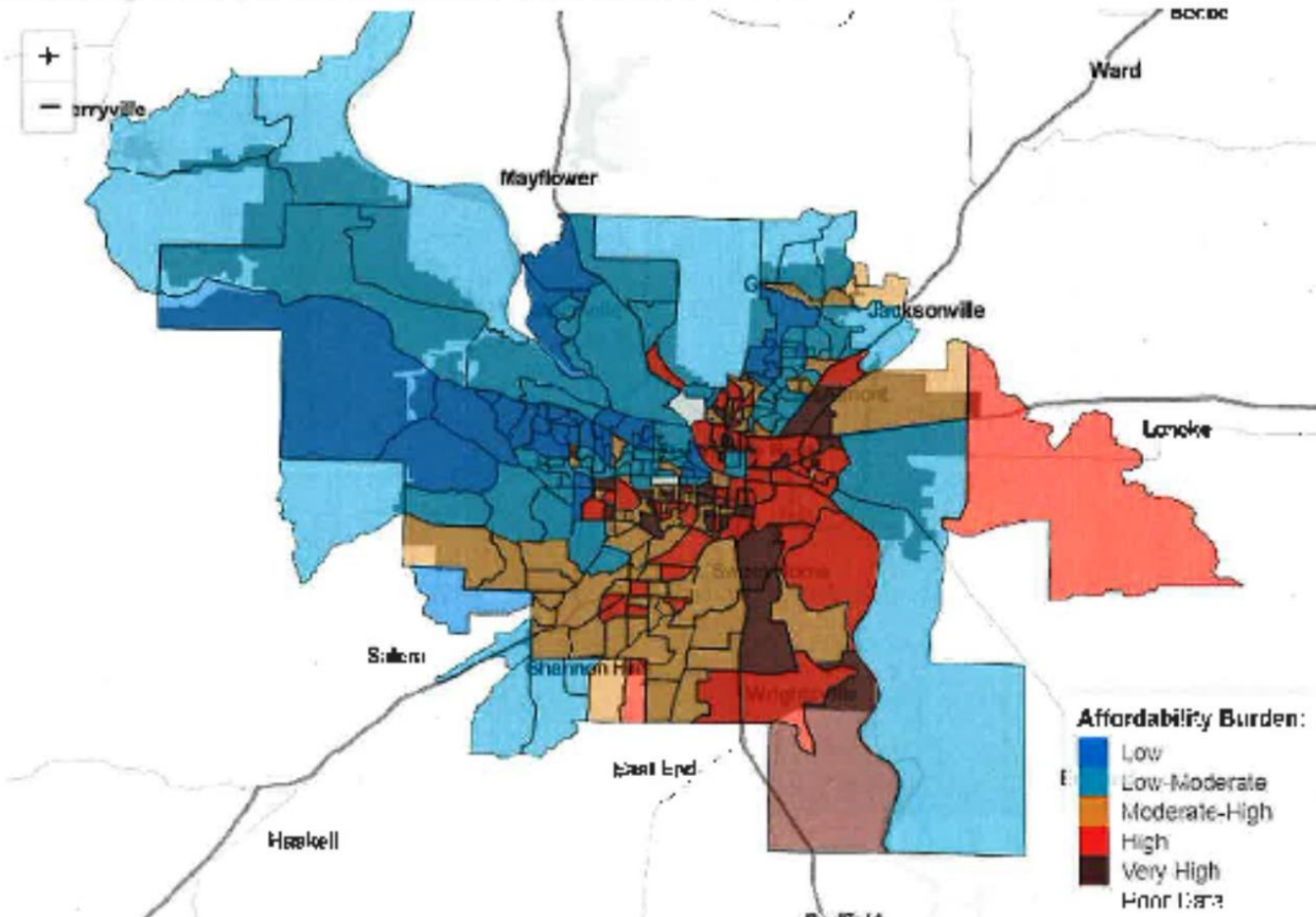

Central Arkansas at 6,000 gallons per month (water, wastewater, and stormwater)

Affordability Burden:
- Low
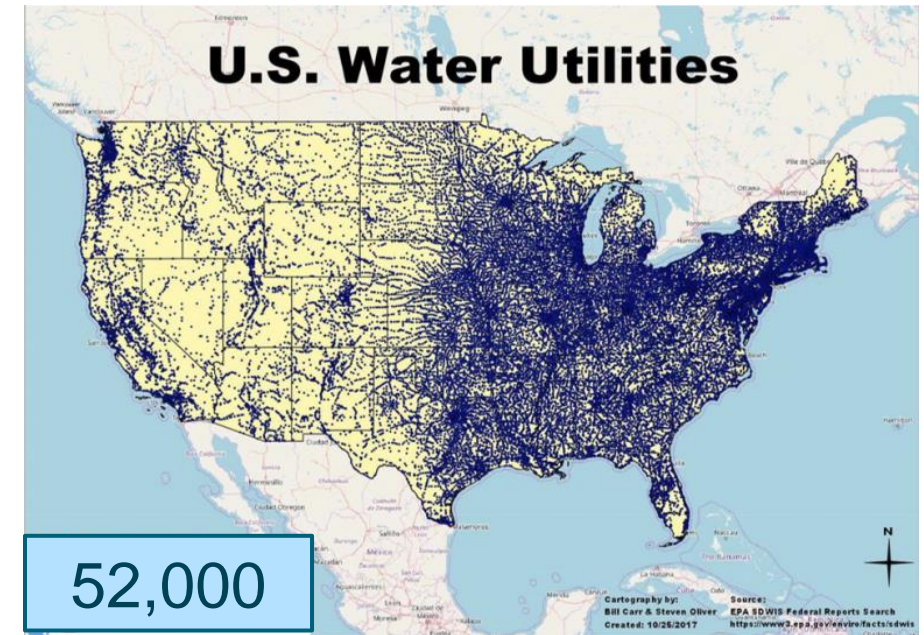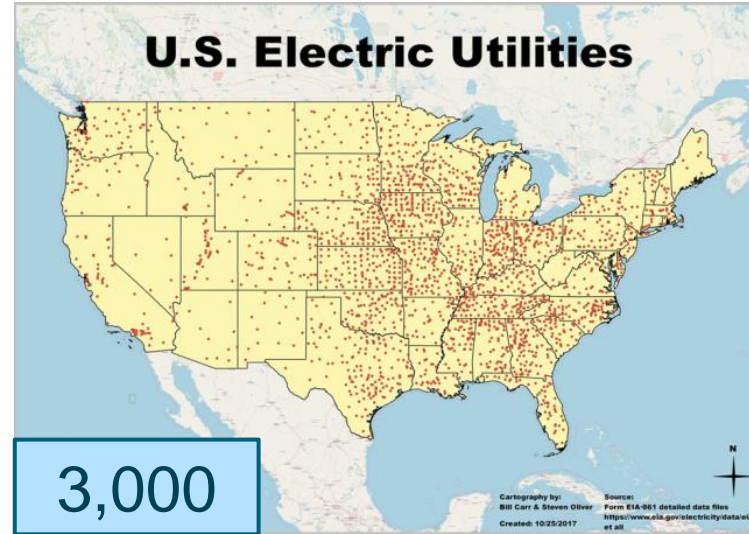- Low-Moderate
- Moderate-High
- High
- Very High
- Poor Data

Affordability

Arkansas at 6,000 gallons per month (water, wastewater, and stormwater)

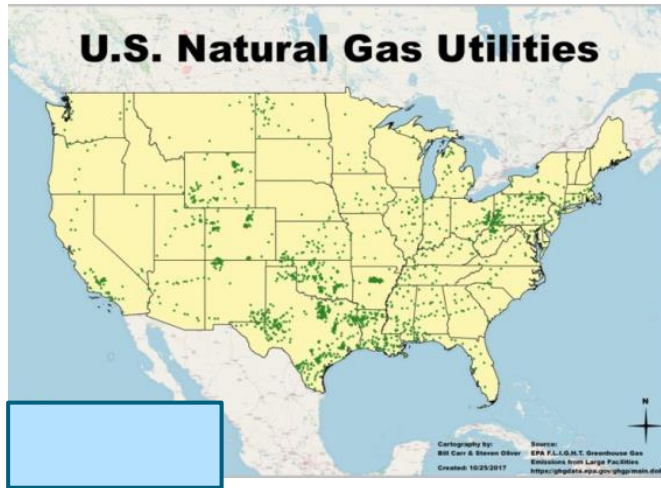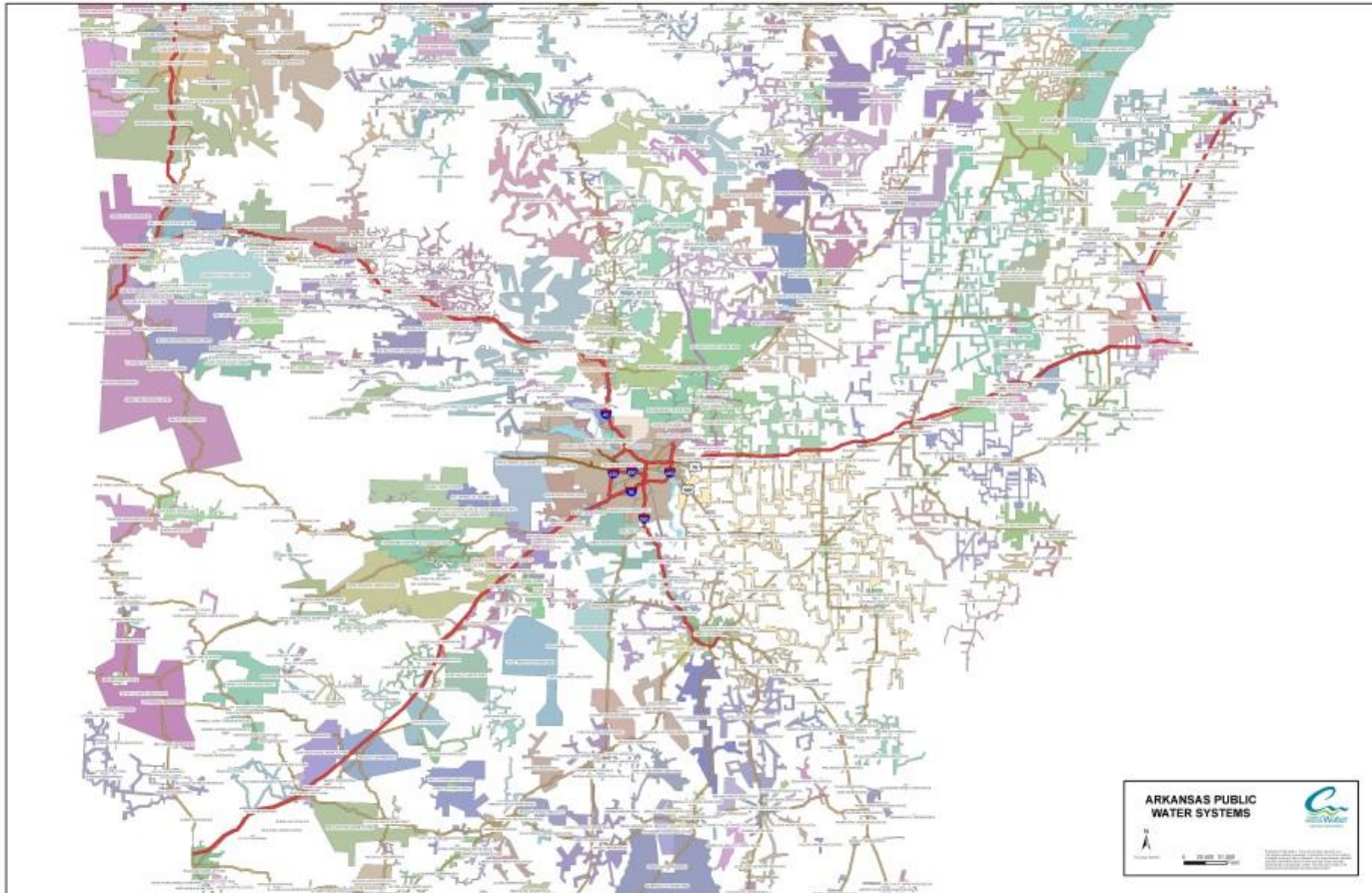**Affordability Burden:**
- Low
- Low-Moderate
- Moderate-High
- High
- Very High
- Poor Data

Future Needs . . .

U.S. Natural Gas Utilities

U.S. Electric Utilities
3,000

U.S. Water Utilities
52,000

83% serve pop. less than 3,300 people
55% serve pop. Less than 500 people

Future Needs . . .

ARKANSAS PUBLIC
WATER SYSTEMS
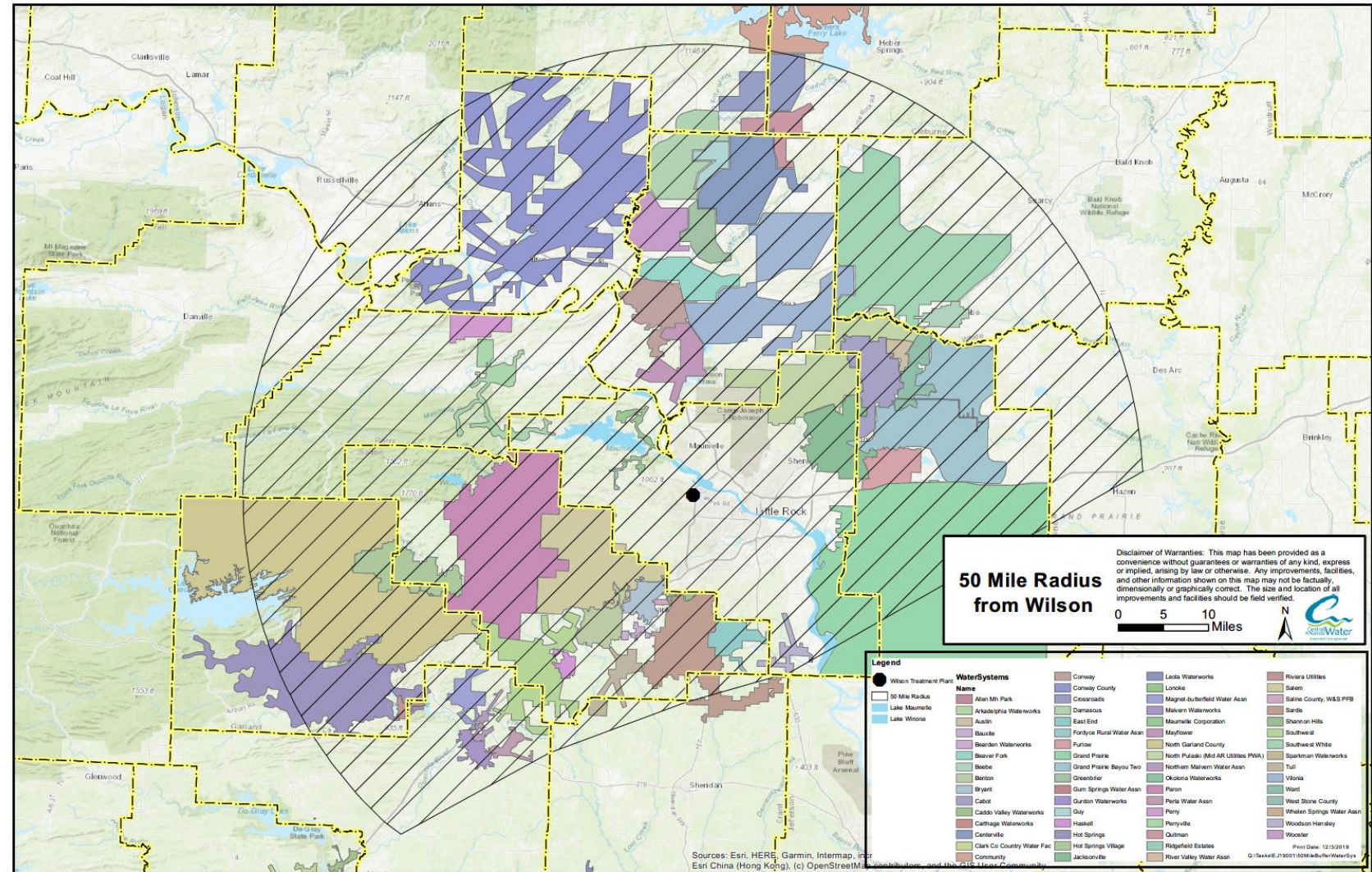
~ 740 retail PWSs

- 708 (96%) serve < 10,000
- 643 (87%) serve < 5,000
- 523 (71%) serve < 2,500
- 6 serve more than 50,000
- 1 serves more than 100,000 (CAW)

50 Mile Map

Why 50 miles?

Multiple Water Sources:

- ❑ Lake Maumelle

- ❑ Lake Winona

- ❑ Ouachita Lake

- ❑ Ouachita River

- ❑ Greer's Ferry Lake

- ❑ DeGray Lake

- ❑ Lake Catherine

Asterra – Intelligent Satellite Imagery

ASTERRA TECHNOLOGY BY UTILIS

IMPACT SINCE 2017

OVER **450 PROJECTS** COMPLETED IN **59 COUNTRIES**

CARBON DIOXIDE EMISSIONS REDUCED BY **108,339 METRIC TONS** equivalent to 91M pounds of coal burned

423,200 MWH of **ENERGY SAVED**

More than **46,000 LEAKS VERIFIED**

3.5 LEAKS FOUND PER CREW DAY VS. 1.3 found using traditional acoustic methods (on average)

169,280 M GALLONS (770 million m³) WATER SAVED

(EQUIVALENT TO THE AMOUNT USED BY A CITY OF 3 MILLION PEOPLE)

Values used for the volume of a leak were taken from AWWA M36 manual for the typical water lost from a service main over 12 months. Values for electricity and CO2 vary based on volume of water estimated and the power usage plus the fuel source. The value used was from California Energy Commission report CEC-500-2021-036 for Duarte, CA USA.
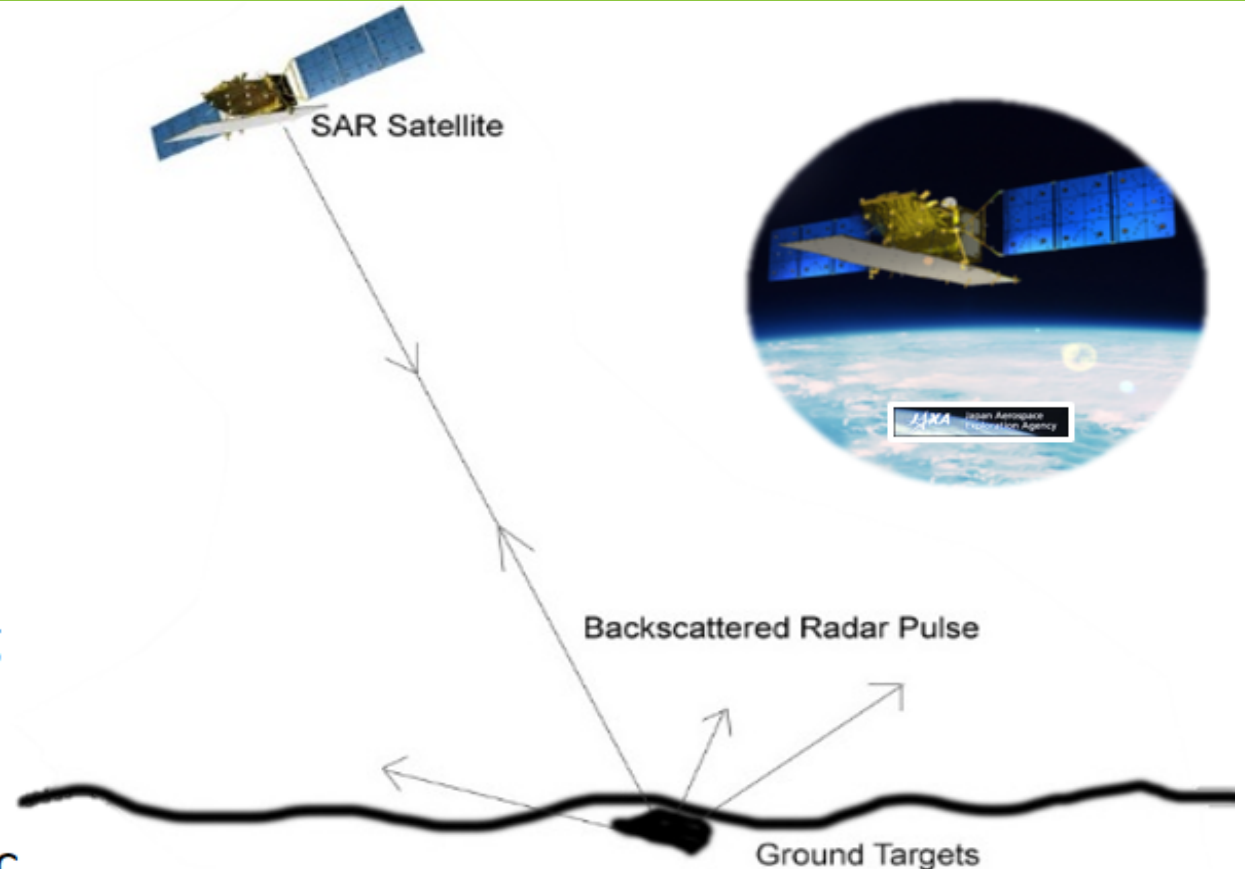
2017-2021

Central Arkansas Water — Essential & Exceptional
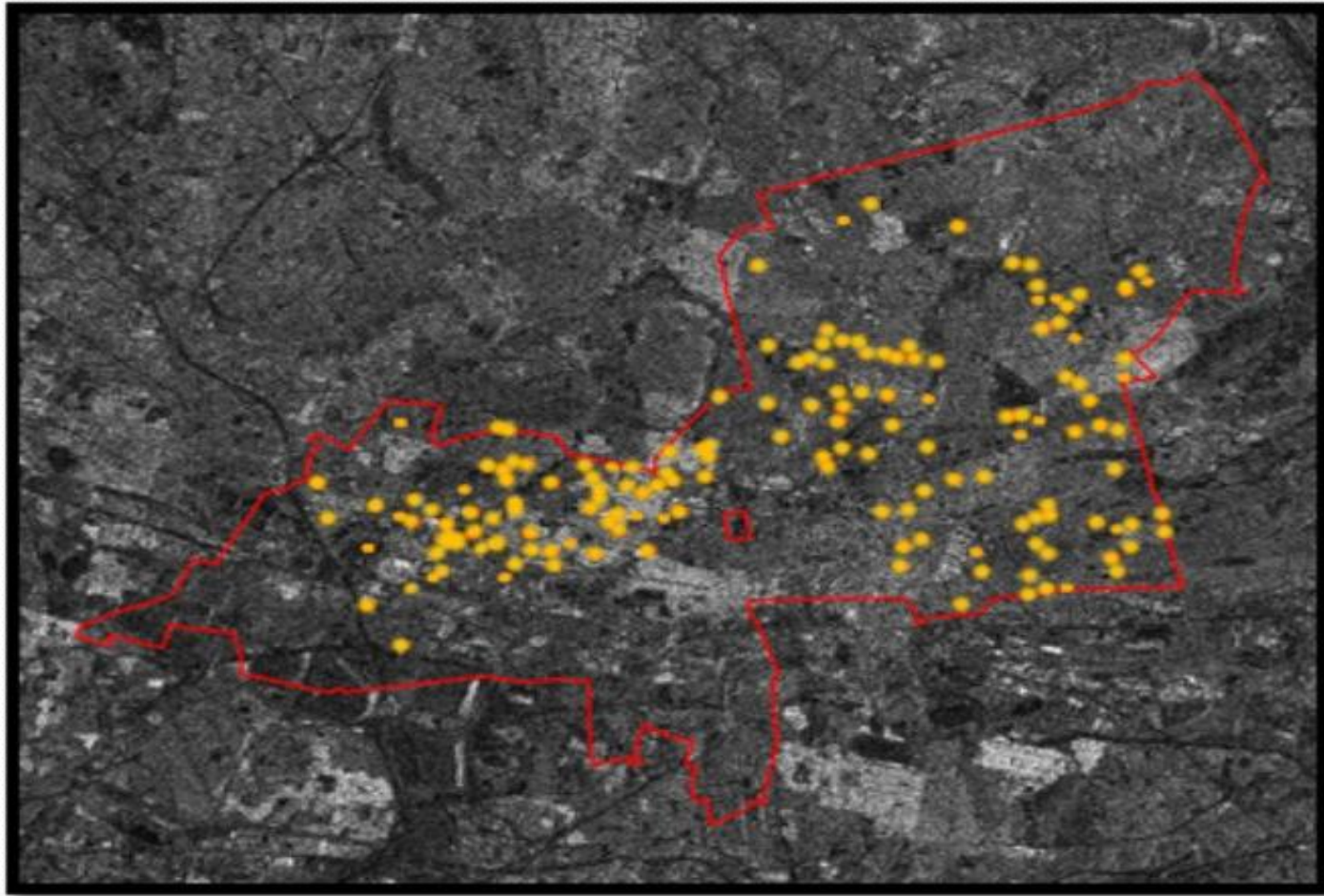
SAR Imagery Intelligence

SAR Capabilities

- Day and night 24/7 imaging
- Independent of weather / clouds
- Use of L-band: long wavelength, penetrates earth surface
- Detects materials and objects – extremely sensitive to water

ASTERRA Analytics

- Overcomes the limitations of SAR using advanced algorithms
  - Interference and noise
  - Geometry, curvature, & topographic distortions
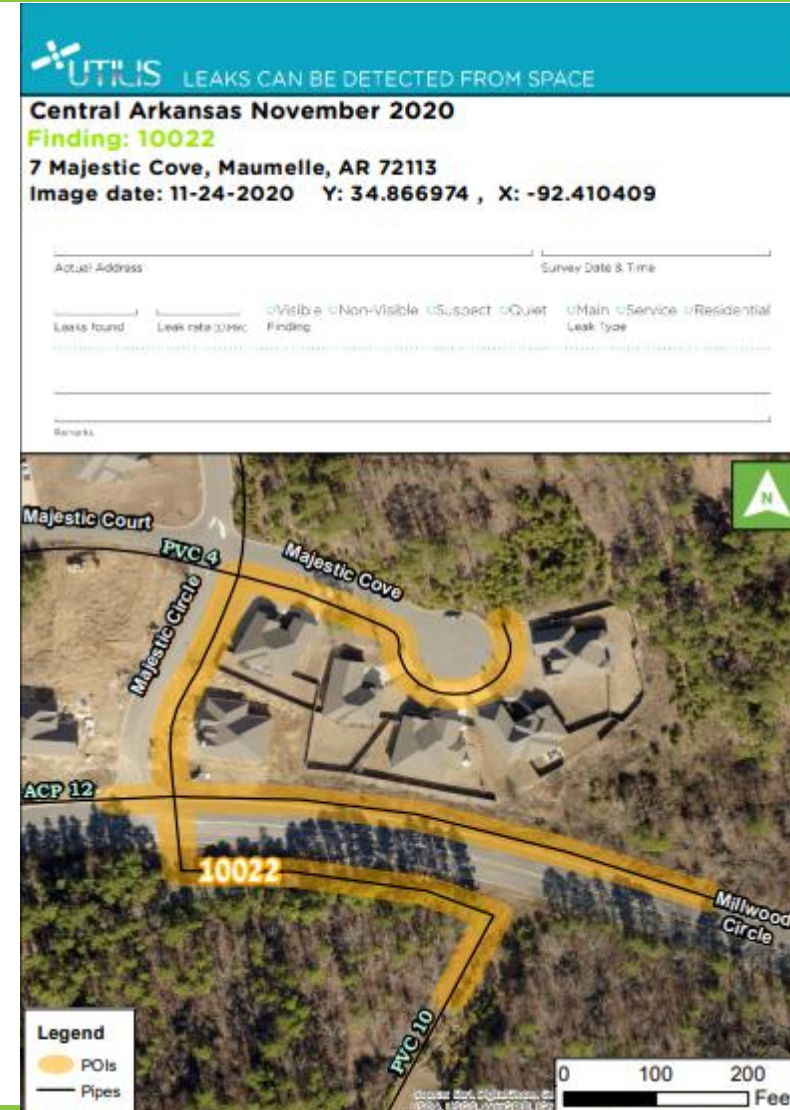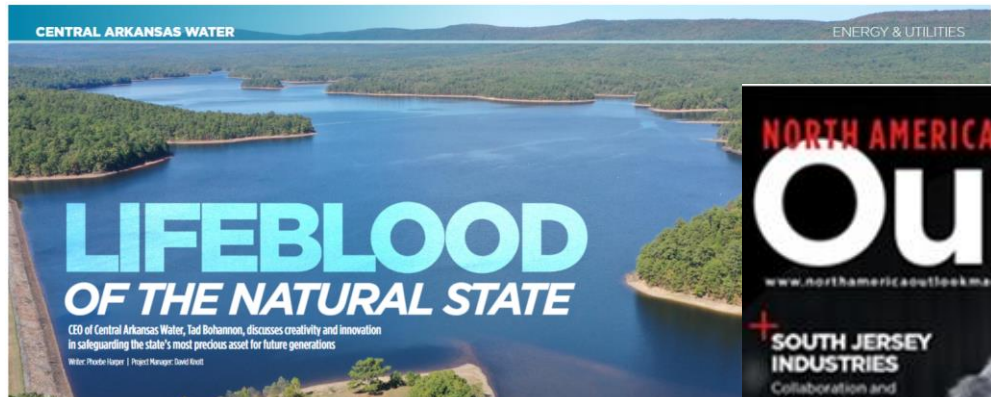 - Geo-referencing (making it all align)

SAR Satellite

Backscattered Radar Pulse

Ground Targets

Asterra Identifies Potential Leaks

Asterra Survey Method

2020 Asterra Survey

2018

UTILIS LEAKS CAN BE DETECTED FROM SPACE

Central Arkansas November 2020
Finding: 10022
7 Majestic Cove, Maumelle, AR 72113
Image date: 11-24-2020   Y: 34.866974 , X: -92.410409
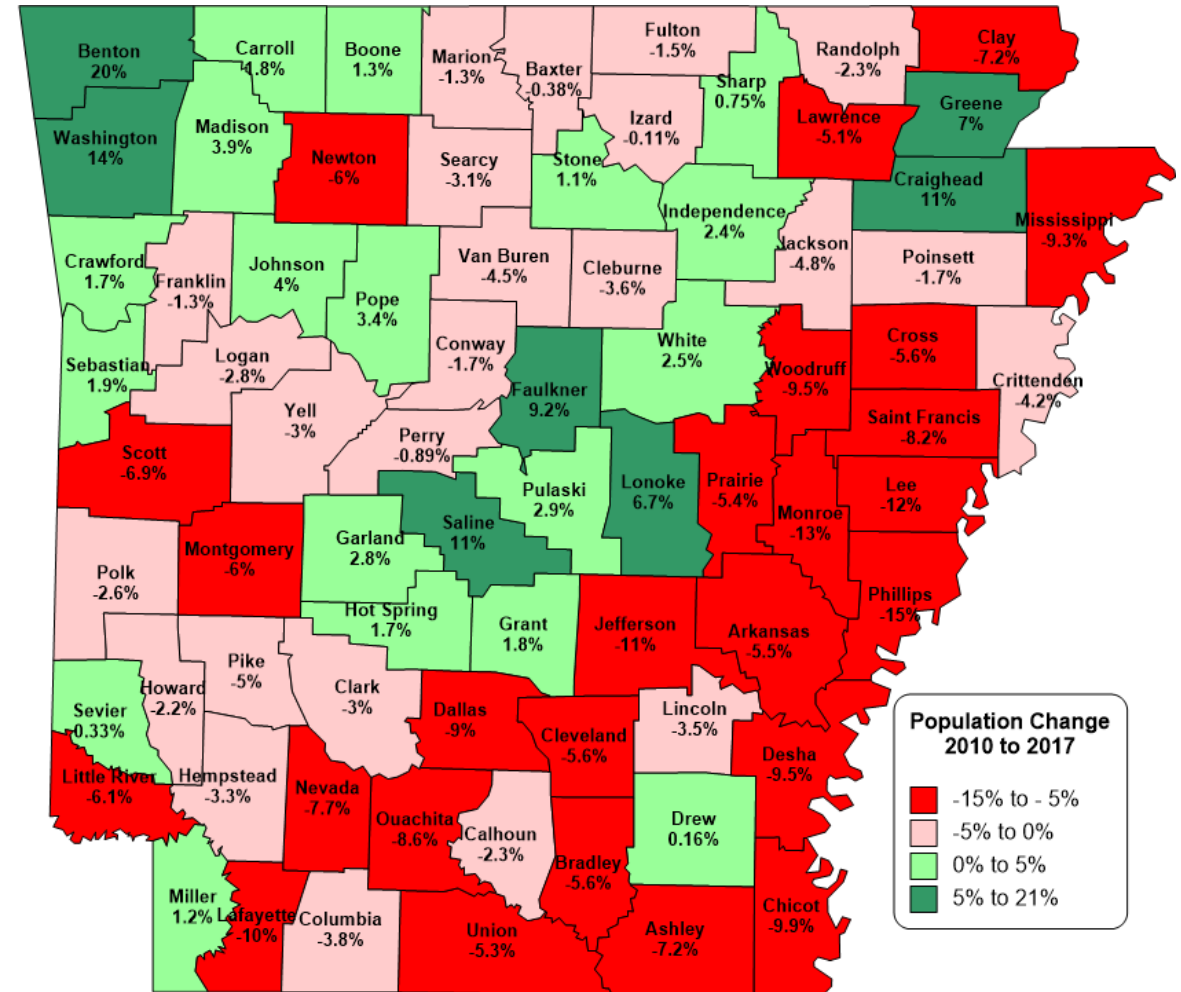
Resilient & Trusted Utility

Nose to the Ground

Future Needs . . .

- Can we use data analytics to define and predict the long-term viability of systems?

- Can we find solutions?

Source: Population Estimates, U.S. Census Bureau.

REGIONAL STUDIES

Regional Studies

- 19 Study Regions
  - ⭐ 10 Studies in 2020 Grant
    - October 2022 Deadline
  - ⭐ 4 Studies in 2021 Grant
    - October 2023 Deadline
  - ⭐ 5 Unfunded Studies
- ≈125 Water Providers
- 60 Utilities of Concern
  - Repeat Violations
  - Economic Concern
- Studies Filed at NRD and Used as Guidance Documents when Funding is Requested
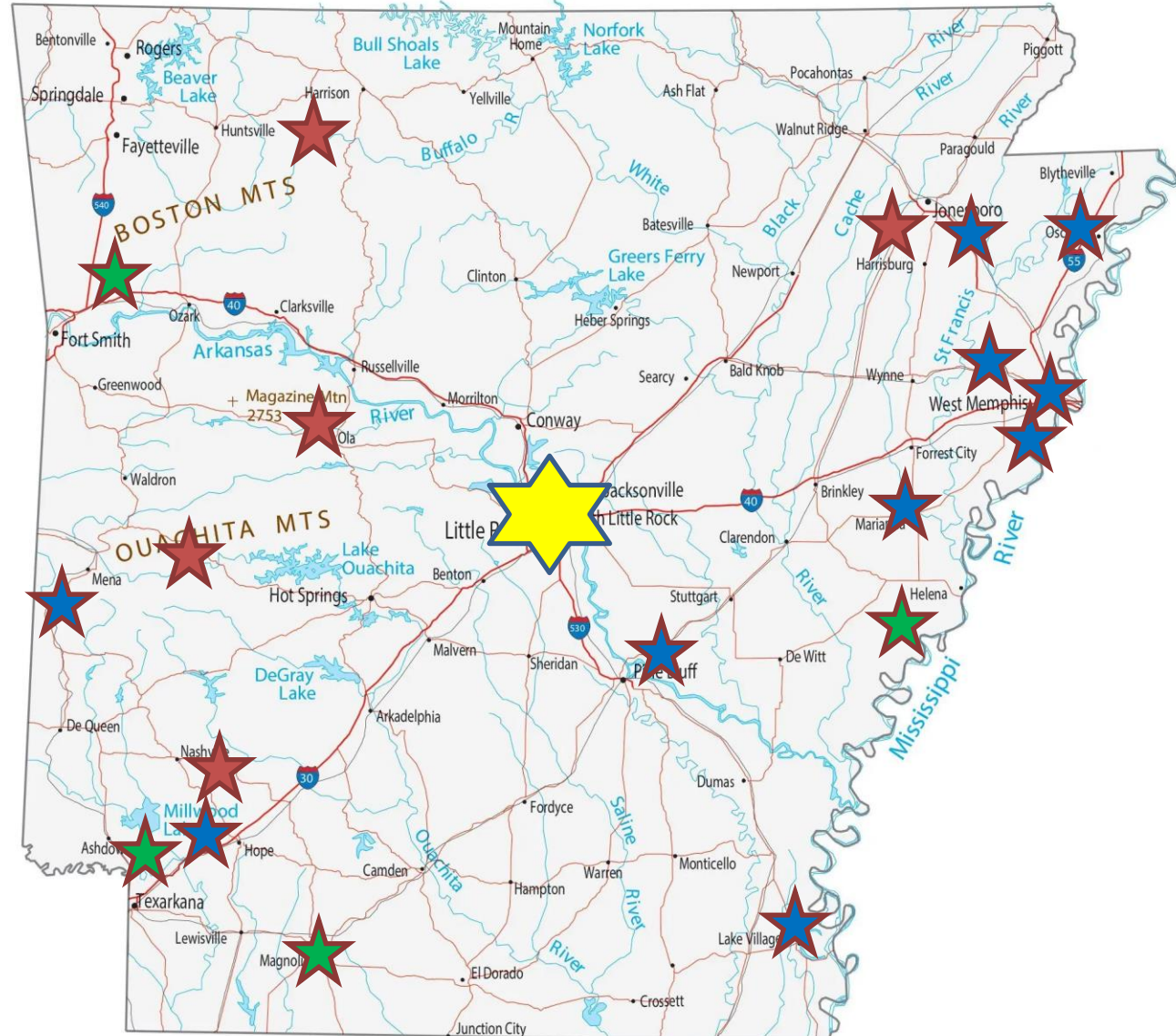
Sustainable H$_2$0 = Sustainable Communities

Central Arkansas Water
is leading the way!

Arkansas leads the way on consolidation as fragmented US water sector faces reality,
Global Water Intelligence, September 2019.

Thank you for your attention!