



SPRING 2024

Arkansas HIGHWAYS

A PUBLICATION OF THE ARKANSAS DEPARTMENT OF TRANSPORTATION | MAGAZINE

IN THE PATH OF TOTALITY 2024 Great North American Eclipse

**STAKEHOLDERS PLAN
for Growth of Arkansas
Lithium Industry**

**ADDITIONAL TOOLS
Help Avoid Wrong-way
Incidents**

**FEDERAL RECORD OF DECISION
Paves Way for Future
Interstate 57**

Dear ARDOT Family,

SPRING IS HERE! THIS IS ONE OF MY FAVORITE TIMES OF THE YEAR. It is a time of year that fosters hope and optimism. And that hope and optimism has been enhanced because we are well on our way to funding and constructing a new ARDOT Fallen Workers Memorial Monument.

This monument is so important. It emphasizes how thankful we are for ARDOT workers and that we acknowledge that their jobs can be dangerous. Our brave men and women work to keep the roads safe for all of Arkansas' road users. Some have lost their lives doing so. They deserve to be honored and remembered with dignity.

Thanks to everyone that submitted ideas for the monument. The selected concept used many of your wonderful ideas. The design is simple yet elegant and symbolic. It will truly memorialize our fallen workers in a manner that honors their sacrifice.

Our industry friends and partners have stepped up and provided such generous help, encouragement, support, and donations. Our ARDOT family is just getting started with our fundraising efforts, but I am hopeful and optimistic that by this fall, we will have all the funds we need to begin construction.

All my best,

Lorie H. Tudor, P.E., Director



FRONT & BACK COVER:
Many gathered to view the 2024 Great North American Eclipse from the Broadway Bridge in Little Rock.

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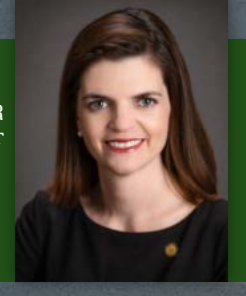
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IN THE PATH OF **TOTALITY**

BY RUTHIE BERRYHILL

ON MONDAY, APRIL 8, 2024, A 117-MILE-WIDE SHADOW CREPT ACROSS THE SKIES IN PORTIONS OF ARKANSAS.

The shadow quietly drifted across the skies of the state – arriving from the southwest, around DeQueen. It traveled in a diagonal line and gradually brought darkness everywhere it touched. The sun seemed to disappear and only the shadow was visible.

For a few minutes, mid-afternoon appeared to be early evening. City streetlights came on and drivers turned on vehicle headlights. Birds returned to their nests and were silent. Insects began chirping. The whole world seemed to pause and hold its breath in awe.

The shadow departed the state near Pocahontas at roughly 2 p.m., leaving just as quietly as it arrived. Suddenly, it was bright outside once again, gradually returning to normal daytime brightness.

This much-anticipated astronomical event, dubbed the “2024 Great North American Eclipse,” passed over Mexico, the U.S., and Canada, entering the U.S. in Texas. It traveled across Oklahoma, Arkansas, Missouri, and other states to the east.

Prior to the 2024 Eclipse, the last total solar eclipse to pass over the continental U.S. occurred in 2017 and resulted in millions of people traveling to the path of totality. Arkansas was not in “the path of totality” during the 2017 event.

A TOTAL SOLAR ECLIPSE

What is a total solar eclipse? What is the “path of totality?” During a total solar eclipse, the moon passes between the sun and earth, blocking the light from the sun. The process occurs gradually, starting with a partial eclipse, then moves into a total eclipse, and then moves back into a period of partial eclipse before the skies return to normal.

On April 8, two-thirds of Arkansas experienced this daytime period of darkness, similar to what is usually seen at dawn or dusk. Those areas of the state that experienced a total solar eclipse were in “the path of totality.”

Prior to the 2024 Great North American Eclipse, Arkansas has only been in the direct path of two Total Solar Eclipses – one in 1834 when Arkansas was still a territory and then in 1918. In 1834, reports tell us that the weather was clear, and the view of the eclipse was optimal. In 1918, most of the portions of Arkansas within the path of the eclipse experienced cloudy skies and rain, obscuring the view.

The next time Arkansas will be in the path of totality for a solar eclipse is 2045.

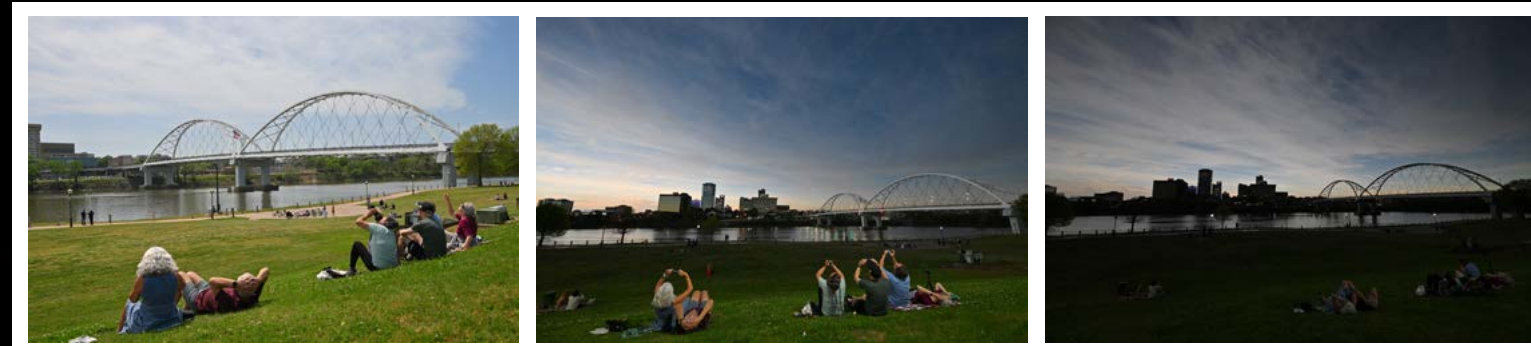
PREPARING FOR UP TO 1 MILLION VISITORS

A month before the eclipse, Governor Sarah Huckabee Sanders held a joint news conference with state officials at the ARDOT Central Office in Little Rock.

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TOP PHOTO: Total Solar Eclipse shot from Batesville, Arkansas. Photo by Dr. David J. Thomas, Lyon College.

BACKGROUND PHOTO: Arkansas residents utilizing their eclipse glasses to view the Eclipse. Photo courtesy of Arkansas Parks and Tourism.



"Next month's eclipse has the potential to be one of the largest events in our state history and we want to make sure that we were prepared for the influx of visitors that we expect to come here to the state," Governor Sanders said at the news conference.

Officials from the Governor's Office, ARDOT, Arkansas Department of Parks, Heritage and Tourism, Arkansas Department of Public Safety, Arkansas State Police, Arkansas National Guard, Arkansas Department of Emergency Management (ADEM), Arkansas Department of Human Services, Arkansas Department of Health, Arkansas Office of Preparedness and Emergency Response Systems, and the Arkansas Department of Education participated in the news conference.

"Many people will be coming to our state for the first time and we want to make sure they keep coming back time and time again," Sanders said.

The Governor said that she anticipated between approximately 300,000 to one million visitors to the state during the eclipse.

State officials began planning for the event at least two years prior in order to mitigate any significant issues with travel, lodging, emergency services, and more. With that in mind, a multi-agency effort worked together in advance to prepare for a large influx.

In the time leading up to the eclipse, ARDOT worked to

educate people about what to expect before, during, and after the eclipse, and to ask for the public's assistance in planning ahead.

"We just need to make the public aware of what traffic could be like that day and to manage those expectations so that everybody's prepared for that day," ARDOT Director Lorie Tudor said during the news conference.

As part of the planning process, ARDOT met with officials from other state departments of transportation that had been in the path of totality during previous eclipses.

"Based on prior experiences in other states during Eclipse events we know there's going to be delays and so, in collaboration with other state agencies and the Governor, we have developed a Traffic Management Plan to help address these anticipated traffic issues," Tudor said.

As part of the Traffic Management Plan, ARDOT asked people to reduce travel, especially on routes of concern, advised school districts to close on the day of the eclipse, encouraged employers to allow employees to work from home or adjust work schedules, and requested that truckers adjust their travel schedules. All highway construction projects that were let prior to the eclipse included a Total Solar Eclipse Special Provision (SP) that limited main lane road closures in the days immediately before, during, and after the eclipse.

Based on data from the 2017 Eclipse, 80% of those visiting the area of the eclipse were predicted to leave immediately

after the eclipse ended. A large part of ARDOT's preparation included plans to handle the extra volume of traffic, keeping our roadways from becoming overwhelmed. The many events and festivals planned around the eclipse also helped keep people in place longer, which spread out the volume of traffic over a longer period of time.

The day of the Eclipse, ARDOT employees joined other state officials at the Joint Information Center (JIC) to coordinate efforts and keep the public up to date on highway conditions within the state.

On Friday, April 5, Governor Sanders issued an executive order declaring a state of emergency prior to the Eclipse that remained in effect until Wednesday, April 10. The order released \$100,000 from the Governor's Disaster Response and Recovery Fund.

COUNTDOWN TO THE ECLIPSE

In the months and weeks leading up to the eclipse, many hotel and motel accommodations in the path of totality were completely booked. Rates for motels and hotels soared.

Colleges, universities, and other schools within the path conducted scientific experiments before, during, and after the eclipse. A NASA team of science and communications experts set up in Russellville days before the eclipse to "help viewers experience the April 8 total solar eclipse through the eyes of NASA." Russellville had been named one of the top 10 eclipse viewing sites in the country by astronomy.com and had a little over 4 minutes of totality.

Stadiums, amphitheatres, farms, parks, zoos, and other large venues planned eclipse watch parties and events. Merchandise from commemorative t-shirts to key chains to hats to eclipse glasses could be found throughout the state. Russellville was host to an "Elope at the Eclipse" mass wedding ceremony.

Some Arkansans rented out their homes, guest bedrooms, RVs, campers, and even farmland to people wanting a place to stay or camp during the days before and after the event. Many visitors made reservations for accommodations up to a year in advance.

Residents within the path watched from their homes. Many not in the path traveled to other areas of the state to view

the eclipse. Even staff members at ARDOT's Central Office participated in this historic event, heading outside to watch the Eclipse from the campus. While viewing the Eclipse, we caught up with Assistant Chief Engineer for Maintenance, Steve Frisbee, to get his thoughts. We asked him how he felt after having spent almost two years planning for the day. "I'm happy that it's almost over (laughing). Traffic has been great so far aside from a few backups. But we're looking forward to moving on to normal operations after this."

Many of the ARDOT Central Office staff also were thinking of their coworkers who were out on the state's highways and at rest stops to make sure that traffic continued to move safely. "This is history. It's such a great opportunity to watch this in real-time. We have a lot of crews out there, so I'm glad everyone is safe," Shaun Addison, Executive Assistant to the Chief Engineer of Operations, said.

IF YOU DON'T LIKE THE WEATHER . . .

About a week out, weather forecasters began to caution about possible cloud cover and rain during the time of the eclipse. Luckily the predicted clouds and rain delayed until later

(continued on page 8)

TOP LEFT PHOTO: Governor Sarah Huckabee Sanders hosted a news conference from ARDOT's Central Office to discuss the state's Eclipse preparations. • TOP RIGHT PHOTO: Russellville was named one of the top 10 eclipse viewing sites in the country by astronomy.com and had a little over 4 minutes of totality.

TOP PHOTOS: The progression of the Eclipse over the Broadway Bridge in Little Rock. • LOWER RIGHT PHOTO: ARDOT Central Office employees took a few minutes to view the Eclipse.



Photo credit: Arkansas Democrat Gazette

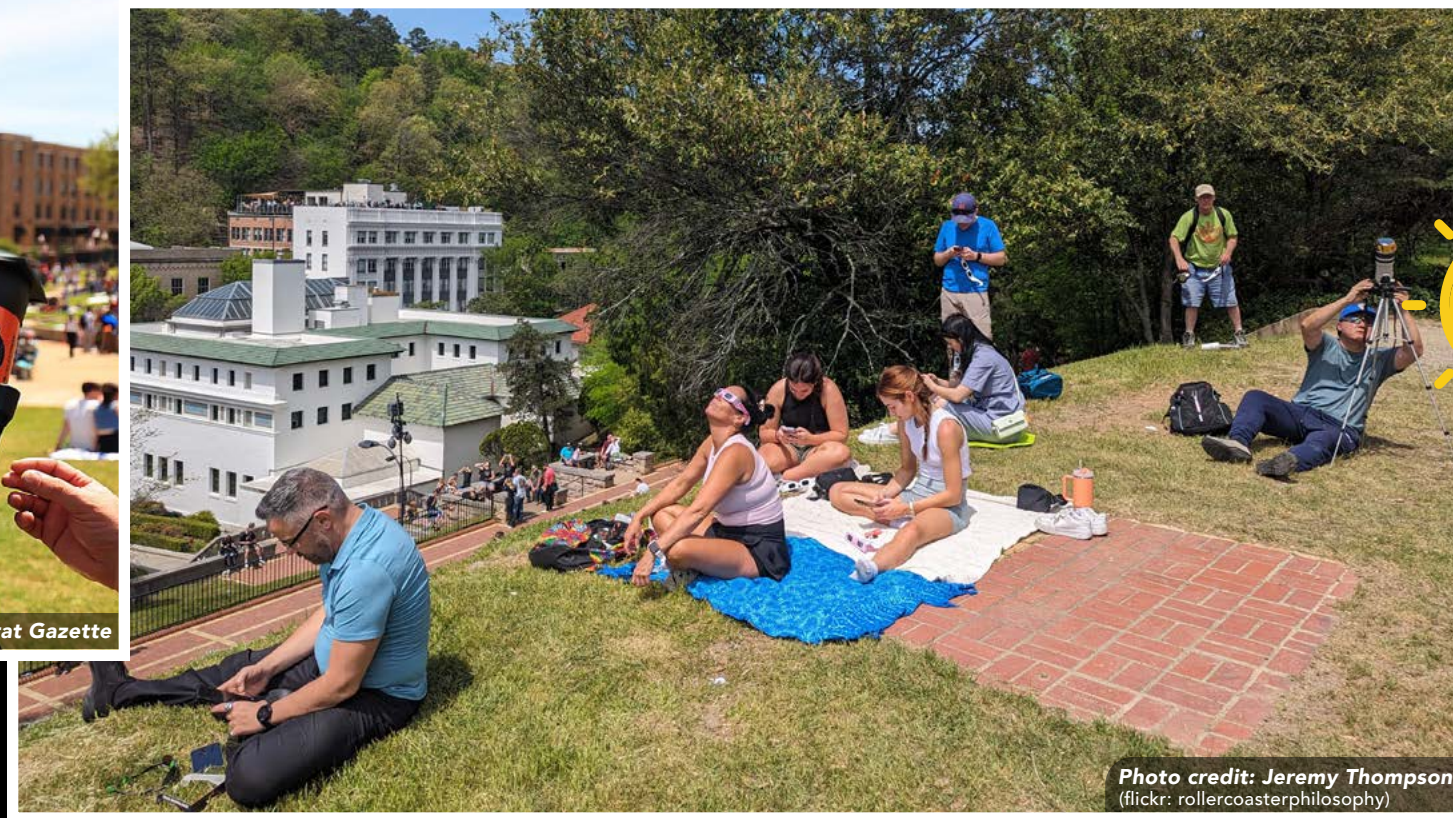


Photo credit: Jeremy Thompson (flickr: rollercoasterphilosophy)

“It is an experience that I hope everybody gets to see, once in their lifetime. It’s really neat – as you can tell I wasn’t going to miss it.”

- Luis Vargis, of San Luis Obispo, California

in the day and Arkansas experienced mostly clear to clear skies for the duration of the eclipse. Some parts of southwest and southeast Arkansas saw low clouds, but nothing like forecasters had feared.

The same didn’t hold true for other states in the path of totality, including Texas.

“Originally, we were going to watch the eclipse in Texas, but we were in McKinney and the thunderstorms were coming in,” Mike Rottler, a visitor from California, said.

As parts of Texas reported heavy cloud cover and storms in the hours before the eclipse, travelers were sent scrambling to other nearby states for a clear view. Many headed into Arkansas.

“We were going to head into to Texas to see the eclipse. Well, then the clouds happened, and rain happened,” Kathy Smith, a visitor from Pearl River, Louisiana, said. “So we were watching the news and said well, maybe we could go into Arkansas toward Little Rock and it will be clearer. We’ve been watching the tv news and weather and the Weather Channel on our Apps to make sure that we could get to whatever it’s going to be like. And this morning it was 3% rain, so Little Rock it’s going to be.”

TRAVELING TO TOTALITY

Luis Vargis of San Luis Obispo, California flew to Houston with hopes of seeing the Eclipse in Austin, Texas with friends there. “But then the weather said no and I did the research and came through Sulphur Springs,” Vargis said.

He drove for several hours to get to a place with better weather.

“It is an experience that I hope everybody gets to see, once in their lifetime. It’s really neat – as you can tell I wasn’t going to miss it.”

Chris Beard from Bellingham, Washington traveled from Albuquerque where she met up with her lifelong friend so they could travel together to see the eclipse.

She kept watching the weather as she traveled, adjusting her route based on the best place to view the eclipse.

“I didn’t come all the way from Bellingham to have clouds or to not have totality.”

The Social Hill Rest Stop on I-30 turned out to be a perfect place for her to stop and wake up the next morning to see the eclipse. She was traveling in a camper van. “We ended up discovering that Arkansas rest stops allow you to stay overnight, so here we are.”

Tim Austin, of Peoria, Illinois planned to view the eclipse in Dallas, but the weather changed his plans and left him checking the forecast for a better location..

“We were on the countdown clock, looking for where the clouds would open up.”

Joe Niddermeyer from Brookfield, Connecticut had also planned to view the eclipse from Texas.

“We planned to go to Sulphur Springs, Texas,” Niddermeyer said. “But then the weather got crummy in Texas. We started checking maps and weather and said it looks like it is better close to Little Rock. We spotted this rest stop on Google Maps.”

Benjamin Janik, from Atlanta, traveled to Arkansas to view and photograph the eclipse. He is an astrophotographer and celestial cartographer. “We made our way north, just kinda

watched the weather. Got very lucky when we pulled into this rest stop which we found very convenient that you can access from both directions safely.”

THE NUMBERS

The Arkansas Department of Parks, Heritage and Tourism reported that more than 200,000 visitors from 48 states and several countries visited Arkansas State Parks for the eclipse. Arkansas Welcome Centers reported having more than 41,000 visitors from dozens of states and 14 countries.

ARDOT’s Continuous Count Stations (CCS) around the state show that most of Arkansas’ traffic increases were from day trippers. Overall, Sunday traffic numbers had no change or a decrease from an average Sunday.

Vehicle traffic resulting from the eclipse on Monday was heaviest in western and northern Arkansas, but not in Central Arkansas. At Interstate 49 in Alma, traffic counters recorded a 50% increase in traffic with approximately 15,000 more vehicles than usual on the road. On U.S. 65 in north Arkansas, north of Marshall, there was an 80% increase in traffic counts, but only 5,200 vehicles above the average weekday. However, these numbers could include vehicles that came in for the eclipse and then left the same day.

The day of the Eclipse, Arkansas Highway Patrol Chief, Jeff Holmes was prepared for the extra traffic in the state. “It’s a once-in-a-lifetime thing to be able to see. We have a lot of people out helping motorists and we’re on top of it. We have officers all over the state helping drivers,” Holmes said.



Numbers show that Central Arkansas did not see an increase in traffic and in fact, counting stations in the Little Rock area saw a dramatic decrease. Interstate 430 north of the Arkansas River saw a 30% decrease or 28,000 fewer vehicles below average. Interstate 30 at the Pulaski County/Saline County line saw a 25% decrease or 30,000 fewer vehicles. Most likely, this can be attributed to ARDOT’s advance planning.

“There were some backups later in the evening from Jonesboro towards Memphis and Russellville towards Fort Smith. Traffic was moving, but it was extremely heavy,” Holmes said.

According to Denise Powell, ARDOT Digital Content Coordinator, on eclipse day, ARDOT’s IDriveArkansas.com was accessed by more than 112,000 users, including 78,000 new users. On an average Monday, the site usually sees closer to approximately 13,700 users and 7,700 new users. On April 8, IDrive’s traffic cameras were streaming at 8.76 terabytes (TB), up almost 2 ½ times that of a typical Monday’s 2.39TB.

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TOP LEFT PHOTO: Little Rock’s River Market saw large crowds to view the Eclipse. • MIDDLE PHOTO: Some eclipse viewers watched the event from a hill above many of the historic buildings in downtown Hot Springs. Photo by Jeremy Thompson, used with permission, CC BY 2.0 DEED, <https://creativecommons.org/licenses/by/2.0/>.

PHOTO: Christie Heidelberg, Administrative Officer to the ARDOT Director, is pictured setting up her camera to photograph the Eclipse from the ARDOT Central Office campus.

IDriveArkansas.com is ARDOT's website platform and mobile App that travelers can use to check road conditions and view live traffic cameras.

NASA reported that their live eclipse broadcast from Russellville had more than 13 million views. Also in Russellville, the "Elope at the Eclipse" mass wedding ceremony had more than 250 couples from 24 states participating.

A TOTAL ECLIPSE OF ARKANSAS

Reactions to the Eclipse varied from person to person, but everyone we spoke to had a positive experience.

"Videos don't do it justice, the partial eclipse doesn't do it justice – you need the full view," John Fries, who traveled to Arkansas from Philadelphia, said.

Janik traveled with his wife, Whitney Gregory, and young daughter, Nova. Even though he was here to get photography of the eclipse for his work, he also wanted to enjoy the experience because "It's just elation. It's like 3 minutes of bliss. There's really nothing like it." However, Janik said that the best part was viewing the eclipse with his daughter.

"I try to make sure to enjoy a moment with my daughter. We've got all this equipment, and you get so focused on the process of getting ready and taking photos," Janik said. "I'll remember that moment with Nova, that's spectacular. I hope she gets to see many more."

Robert Austin, from Mansfield, Texas traveled the morning of the eclipse with his brother, Tim to view the eclipse together. "For me, I've seen Niagara Falls, I've seen the Grand Canyon – it ranks right up there with that. One of those unforgettable experiences." ■

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Interstate 555 Nestle (Exit 36)



Interstate 40 Highway 7 (Exit 81)

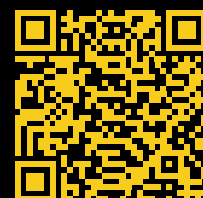


On the day of the Eclipse, IDrive Arkansas provided users with maps and camera views of Arkansas' roadways. To give you an idea of what some areas of the state looked like after the Eclipse, we took screenshots of the view from two of our traffic cameras, located in different parts of the state. The top photo shows Interstate 555 in Nestle, at Exit 36, between Jonesboro and Bay. The camera is pointed toward the south and shows the lines of traffic leaving the area. The bottom photo is from Interstate 40 and Highway 7 at Exit 81. It also shows traffic leaving the area after the Eclipse.



Arkansas Eclipse Travelers were interviewed at the Social Hill rest stop. Check out the video by scanning the QR Code!

Scan to see more photos from April 8, 2024



The drilling rig at ExxonMobil's first lithium well, in southwest Arkansas. Source: EXXONMOBIL



STAKEHOLDERS PLAN FOR GROWTH OF ARKANSAS LITHIUM INDUSTRY

BY RUTHIE BERRYHILL

ON FEBRUARY 15 AND 16, BUSINESS LEADERS, POLICYMAKERS, AND OTHER KEY STAKEHOLDERS GATHERED IN LITTLE ROCK FOR THE INAUGURAL ARKANSAS LITHIUM INNOVATION SUMMIT (ALIS). The summit was organized by Jesse Edmondson, an Arkansas native, geologist, and director of government relations for Standard Lithium.

According to Edmondson, he wanted to create awareness about Arkansas' lithium resources, calling attention to Arkansas as a top state for building out the lithium industry. He also wanted to get Arkansas' government, academic, industry, and infrastructure leaders working together to take advantage of this time of growth and opportunity in the global lithium market.

The ALIS seems to be off to a good start in that direction. Organizers hoped for strong interest in the summit but had no idea that it would garner so much interest nor sell out in its first year. Approximately 700 energy sector executives, policymakers, and key stakeholders attended the conference!

Arkansas Governor Sarah Huckabee Sanders, Arkansas

Secretary of Commerce Hugh McDonald, and U.S. Senator John Boozman kicked off the summit with keynote remarks.

"I'm fully aware that this industry is just getting its footing and that there are plenty of hurdles to jump before we cross the finish line," Governor Sarah Huckabee Sanders said. "As with anything new, there are still a few things that have to be worked out, but Arkansas is ahead of the curve."

Several panel discussions continued through the two-day conference, including talks on specific topics such as "Arkansas: The Lithium State," "Direct Lithium Extraction," "Investing in America's Energy Future," "Arkansas Infrastructure," and "Arkansas Innovation and Workforce."

Arkansas Department of Transportation (ARDOT) Director, Lorie Tudor, served as moderator for the Arkansas Infrastructure Panel. Panelists included Michael Considine, vice-president of Power Delivery Operations at Entergy; Bryan Day, executive director of the Little Rock Port Authority; Drew Tessier, senior director of Public Affairs for Union Pacific Railroad; Jerrod Mounce, vice president of Energy and Sustainability for J.B. Hunt; and David Elrod, developer of the West Memphis Logistics Park.

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LITHIUM & ARKANSAS

What makes Arkansas so interesting to the lithium industry? Southwest Arkansas sits on top of a geological feature called the Smackover Formation. This underground limestone aquifer occurs about 10,000 feet below several southern states, including Arkansas. Much of the land in the Smackover Formation has been drilled previously for oil and gas and is also a good source of bromine and lithium, both found in the brine present in the aquifer.

According to Standard Lithium, some of the highest reported levels of lithium in brine in North America have been found in the Smackover Formation.² In Arkansas, the Smackover Formation occurs in Lafayette, Columbia, and Union counties.

BRINE

Brine is a concentrated solution of salt in water.³ Brine found within the Smackover formation is rich in minerals, including bromine and lithium. To access the lithium, the brine is pumped out of the aquifer where the lithium is then extracted from it. The lithium-free brine is then returned to the aquifer.

Lithium is the main component used to make rechargeable batteries, including those that power electric vehicles, laptop computers, and cellphones. Demand for lithium batteries is predicted to grow vigorously due to global demand for electric vehicles and energy storage systems for the electrical grid. Global demand is expected to increase by more than five times and U.S. demand by nearly six times by 2030.⁴

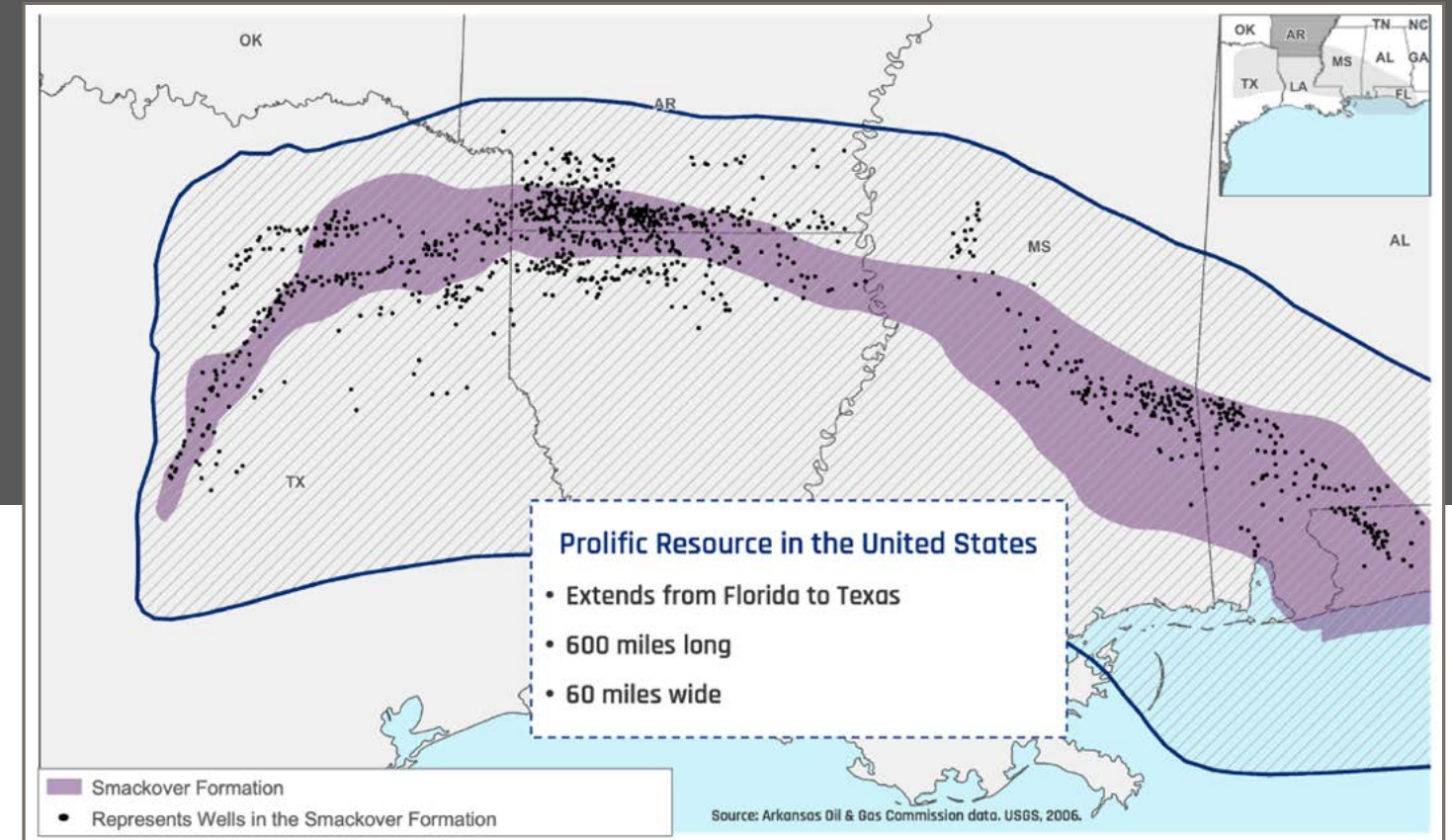
ARKANSAS' INFRASTRUCTURE AND THE LITHIUM INDUSTRY

A large part of the Arkansas Infrastructure Panel discussion at the summit centered around whether Arkansas' infrastructure will be prepared for the expected growth of the lithium extraction industry in our state.

As vehicle electrification demand increases, so does demand for lithium-based batteries to power electric vehicles. According to Li-Bridge, a public-private alliance committed to accelerating the development of a strong domestic supply chain for lithium-based batteries, this demand requires as much as a 20-fold increase in manufacturing capacity.¹

With the 12th largest highway system in the U.S. and more than 16,000 miles of road, ARDOT has the infrastructure in place to serve economic and industrial growth in Arkansas.

According to Tudor, ARDOT began discussions last year with legislators from southwest Arkansas about the status of the roads in their area, looking forward to what would be needed in the



future. Based on these discussions, ARDOT created a baseline road condition analysis for the state highways within the area.

"This analysis is underway, and we have made good progress," Tudor said. "As part of this exercise, we have been meeting with industry stakeholders individually to discuss their anticipated road and bridge needs."

Not unlike ARDOT, Union Pacific Railroad (UP) provides transportation in and out of south Arkansas, which will be important for carrying lithium to other parts of the nation and world. UP is also a source for bringing other goods in and out of the state, as well as equipment needed in the extraction and production of lithium.

According to Drew Tessier, senior director of Public Affairs for Union Pacific Railroad, UP has a large presence in Arkansas.

"Our 2024 budget is \$3.4 billion, and Arkansas has been receiving a large portion of that," Tessier said. "For the last 10 years you've seen \$1.3 billion in capital improvements here in Arkansas."

According to Tessier, UP has 32,000 miles of track between three states west of the Mississippi River, and operates the six major access points into Mexico, the west coast ports, and all the gulf ports. He says that UP conveys freight cars from other companies over their lines into Canada and is connected to all the Class 1 Railroads in the U.S. rail infrastructure.

"We're connected to over 200 shorelines. We're business partners with the trucking industry," Tessier said. "We can ship anything anywhere."

A big piece of Arkansas' infrastructure is the Little Rock Port Authority. The Port works with other pieces of Arkansas' infrastructure puzzle – the Arkansas river, the railroad, highway system, and the Bill and Hillary Clinton National Airport.

"We are Arkansas' largest industrial park and Arkansas' largest public port that is home to 52 businesses from seven countries," Bryan Day, executive director of the Little Rock Port Authority, said. "The port as an entity, not the port itself, but the port as a whole, contributes just shy of \$1 billion a year to the local economy," Day said.

Day compared the growth of the lithium industry in southern Arkansas to the growth of the Little Rock Port Authority from its early beginnings.

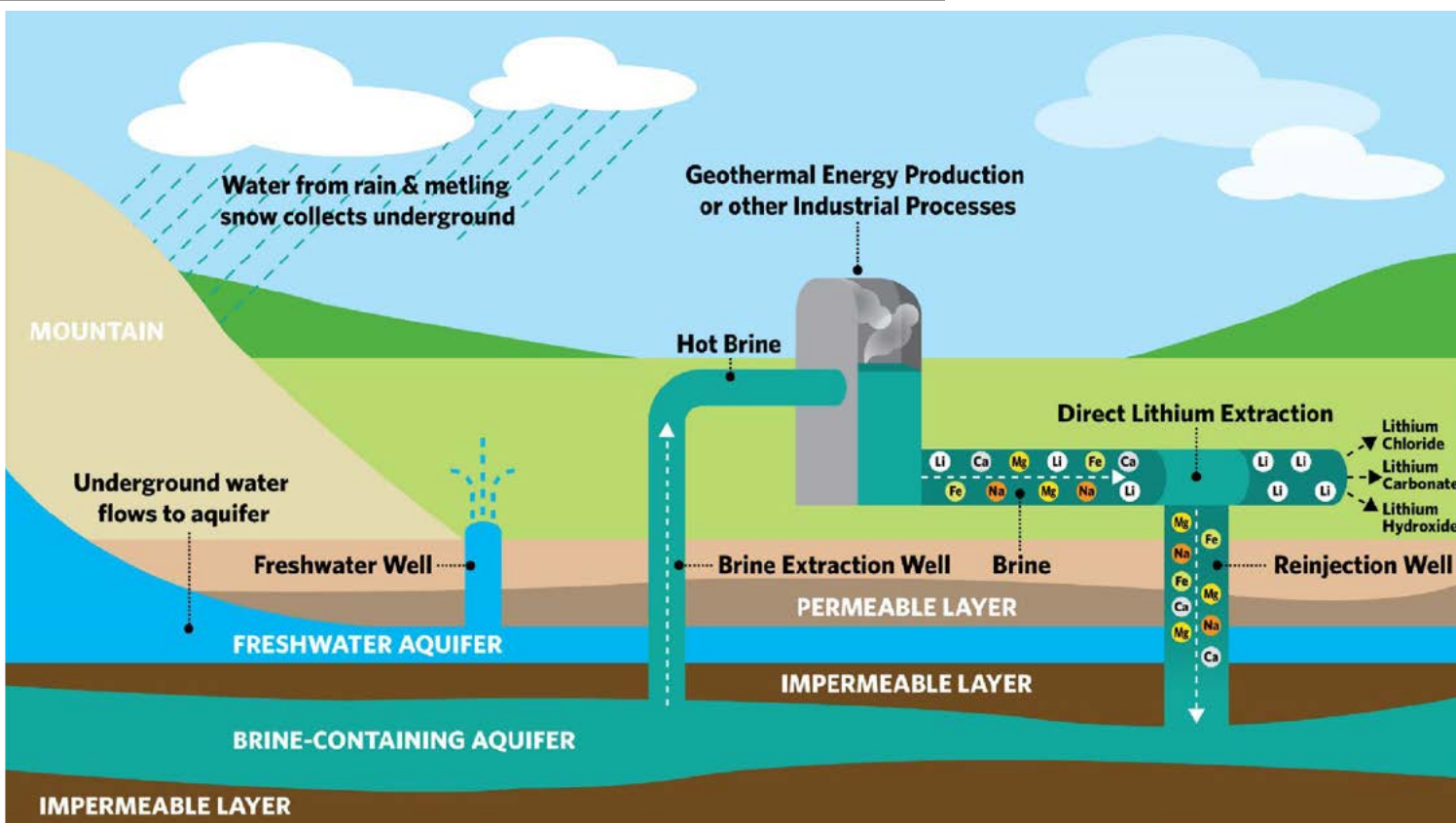
"If we stick true to our vision, think what it might look like in 50 or 60 years," Day said "And that's what has happened at the Port of Little Rock. It's been a huge success – because people took a chance, took those risks, and had that vision to move forward."

Another infrastructure need for the growing lithium industry is access to reliable utility services and charging stations. This is also a priority as more electric vehicles are on Arkansas roads.

According to Michael Considine, vice-president of Power Delivery Operations at Entergy, Arkansas has some of the cheapest electric rates in the country. He says that for economic development purposes, Entergy recognizes that these rates are important for prospective customers looking at the state of Arkansas.

According to Considine, Entergy serves 730,000 customers and operates about 34,000 miles of transmission and distribution lines. Entergy is working with the businesses that are considering lithium in the area and "we look forward to supporting their growth" and economic development.

The potential growth of the lithium industry in south Arkansas



Source: Direct lithium extraction (DLE) from brine. The Nature Conservancy, 2022.⁵



is partially fueled by the global demand for transitioning to more widespread use of electric vehicles or electrification. However, the demand is not led just by individuals wanting to transition to electric passenger vehicles, it is also driven by industry that is reliant on a fleet of vehicles, like J.B. Hunt.

J.B. Hunt has set a target for a 32% greenhouse gas intensity reduction by 2034. "It'll rely on a variety of contributing factors, one of which is expected to be battery electric vehicles," Mounce said.

The lithium battery industry is faced with the challenge of providing enough lithium for batteries to supply 80,000-pound trucks that need to travel 400 to 500 miles. For perspective, J.B. Hunt has 22,000 trucks in its fleet.

According to Mounce, the amount of lithium needed for a battery to equip a truck that size is hundreds of thousands of times more than what is needed for a passenger vehicle.

He explained it with an analogy "Charging electric cars at the house, that's like a . . . dripping faucet of electricity to do that. If I need to go charge an 80,000-pound vehicle within an hour or so . . . and put enough energy in that truck to go two, or three, four hundred miles, it is not a dripping faucet of electricity, it's not a firehose of electricity, it's a bundle of firehoses of electricity. That's the difference in sort of the scale of power that's required."

As a real estate developer, David Elrod, developer of the West Memphis Logistics Park, stressed the importance of all stakeholders working together to be ready for the level of growth that the lithium industry could bring to Arkansas.

"I think south Arkansas is gonna grow and prosper," Elrod said. "It's had better days in the past. I think they're coming back and it will be a long journey, but 20 years from now it's going to be pretty amazing."

LITHIUM AND VEHICLE ELECTRIFICATION

As discussed by the panel, an important aspect that is driving infrastructure needs and the demand for lithium comes from vehicle electrification efforts. The Federal Infrastructure Investment and Jobs Act (IIJA) established the National Electric Vehicle Infrastructure (NEVI) program. The NEVI program provides federal funding to every state department of transportation to install electric vehicle charging stations in a network along each state's identified alternative fuel corridors. In Arkansas, this corridor is basically our interstate system.

Once Arkansas has reached fully built-out status, ARDOT intends to use the remaining federal funds from NEVI to build out charging stations along other routes of significance. Fully built-out status means that there is an electric charging station every 50 miles along the alternative fuel corridor (Arkansas' interstate system).

To reach the goals of the NEVI program, ARDOT has launched a competitive procurement program to identify potential owner-operators of NEVI-funded charging stations.

"We hope to see these charging stations being installed beginning sometime next year," Tudor said. ■

1. "Li-Bridge: Bridging the U.S. Lithium Battery Supply Chain Gap." Li-Bridge website. Accessed February 26, 2024. <https://energystorage.lbl.gov/li-bridge/>

2. "Arkansas Smackover Projects." Standard Lithium.com. Accessed February 6, 2024. <https://www.standardlithium.com/>

3. "Brine Deposits." Geology Science. November 18, 2023. <https://geologyscience.com/>

4. "Building a Robust and Resilient U.S. Lithium Battery Supply Chain." Li-Bridge Industry Report. Energy Storage Center, Berkeley Lab. February 2023. <https://energystorage.lbl.gov>

5. "Potential Lithium Extraction in the United States: Environmental, Economic, and Policy Implications." The Nature Conservancy. Accessed March 27, 2024. <https://www.scienceforconservation.org/products/lithium>

TOP PHOTO: Arkansas Department of Transportation Director Lorie Tudor speaks at the Arkansas Lithium Innovation Summit.

SPECIAL EVENTS AROUND THE STATE



ARDOT Breaks Ground on Future Greenwood Bypass Highway Named in Honor of Trey Burgess

Members of the Arkansas Highway Commission, Arkansas Department of Transportation (ARDOT) officials, and local dignitaries gathered in Greenwood on Friday, March 1 to break ground on the first phase of construction of the new Greenwood Bypass.

This project will improve existing Highway 10 through town. It will add a center turn lane, reconstruct two bridges, rehabilitate the existing pavement, add sidewalks and a shared use path, and install a traffic signal at Highway 96.

The new location bypass portion will provide five lanes with sidewalks. It will construct three new bridges – one of which is over the Vash Grass Creek – a much needed alternate way across. There is also a connection between the bypass and Main Street that will enhance traffic flow through town.

"The idea of having a Greenwood Bypass has been around for 25 to 30 years. It won't fix every problem there is



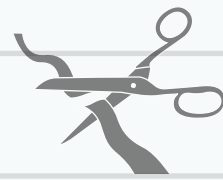
Trey Burgess

regarding traffic, but this is huge from a safety perspective," said Doug Kinslow, Greenwood Mayor.

The project was made possible because of the generous donation of 11 tracts of land given by the James and Myra Burgess family. Dane Burgess attended the event and spoke on behalf of the family.

"It's very emotional. This was my dad's farm and my brother, Trey worked on the farm, which is the main reason this was

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10



named after him. We're excited about how it will help the city of Greenwood and we're just glad to be a part of what's happening in the community," said Burgess.

The project will significantly relieve traffic in the early morning and afternoon, which will alleviate congestion at East Pointe Elementary and East Hills Middle schools. Both are located on the east side of the city.

"One of the biggest problems we've had in the city of Greenwood has been the bottleneck of traffic, which has been present for as long as I can remember," said Greenwood City Clerk Sharla Derry. "All communities east of us have to travel through Greenwood to get to Ft. Smith, and it becomes very frustrating, so this will improve that situation a great deal."

"I'm delighted to celebrate this project with you today. This is something that has been happily anticipated by many, and I'm looking forward to returning to Greenwood for the ribbon-cutting ceremony when the project is finished," said ARDOT Director Lorie Tudor.

ARDOT will share in the cost of this \$58 million project with a combination of 80% of federal funding, 20% in state funds,



and \$5 million from the city of Greenwood. Congressman Womack was able to secure \$5 million in Federal Community project funding.

This project was jointly awarded to Forsgren, Inc., Mobley Contractors, and Manhattan Road & Bridge. Work is scheduled to be completed in late 2026.

The project's second [western] phase will widen Arkansas 10 from U.S. 71 to Fowler Street from two lanes to five with a curb, gutter, and sidewalks. Phase II of the project will be scheduled as funds become available. ■



Additional Tools Help **AVOID WRONG-WAY INCIDENTS**

BY MARK WOODALL

AT THE BEGINNING OF EACH DAY, JOSEPH HAWKINS ENTERS HIS OFFICE AT ARDOT'S INTELLIGENT TRANSPORTATION SYSTEM (ITS) MANAGEMENT SECTION WITH A SINGLE GOAL IN MIND – TO SAVE LIVES. HAWKINS, ARDOT ITS ENGINEER, BEGINS THE DAY BY WRITING A SOMBER NUMBER ON HIS OFFICE DRY-ERASE BOARD – THE NUMBER OF DEATHS ON ARKANSAS ROADWAYS.

A daily email is sent out from ARDOT's Traffic Safety Division listing the latest number of deaths around the state, which serves as a reminder that our work is crucial to the safety of everyone.

"We take it personally here. Every time the fatality number changes, I get up and change it on the board. It's not to be morbid – it's because I want to be reminded of why we are doing this," Hawkins said.

According to the ARDOT Crash Data Report, there were a total of 566 fatalities on Arkansas roadways in 2023. This number is a total of all streets, not just interstates or highways, and encompasses all fatalities, even those from simple crashes or negligent driving.

"We just want to improve safety and efficiency. That's our mission," Hawkins added.

It's estimated that 49% of crashes on interstates and highways result in death or serious injuries. ARDOT has identified 17 trouble areas around the state that have high rates of crashes, and safety managers have implemented immediate measures to prevent them.

As part of this effort, the Maintenance Division recommended adding plastic delineator posts, also known as snapbacks, in these areas to prevent drivers from accidentally entering a highway ramp going the wrong direction. For example, drivers making a left turn to enter a highway ramp sometimes turn early, which puts them in the wrong direction of travel. Such a mistake can cause a head-on collision with drivers exiting the interstate. The snapback poles guide drivers in the correct lane until they reach the ramp entrance.

To make wrong-way warnings more visible, ARDOT made a major push in 2018 to upgrade signage on Arkansas Highways. Reflector tape was added to the signs, and some were enlarged.

Another report, known as the Statewide System Analysis, looks at the entire highway network utilizing crash data. The report helped identify known or suspected areas where wrong-way crashes occurred.

According to ARDOT Division Head for Planning, Brad

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**THERMAL IMAGING CAMERAS
ACTIVATE AN ALERT AND
NOTIFY ARDOT THAT A DRIVER
HAS ENTERED THE HIGHWAY
IN THE WRONG DIRECTION.**

**THE CAMERAS PROVIDE REAL-
TIME DATA THAT ALLOWS
FIRST RESPONDERS TO BE
NOTIFIED IMMEDIATELY.**

McCaleb, the data collected provided additional insight into trouble spots around the entire state. "A follow-up study revealed that we were still having problems in some areas. The challenge is knowing how long a driver has been traveling in the wrong direction following a crash."

Additionally, the Maintenance Division will conduct a follow-up investigation after a crash to try to determine where the driver entered the highway. "Maintenance will often go back two or three interchanges in each direction to try and identify trouble spots," McCaleb added.

The information for the Statewide System Analysis comes from crash data submitted by law enforcement agencies. Sometimes the details are provided by witnesses or even the drivers involved in the incident. Having this additional information helps ARDOT make immediate changes or recommendations to improve safety.

ARDOT has also set up a wrong-way detection system test site at Interstate 440 and Highway 165. At this site, the entrance ramp location has thermal imaging cameras that activate an alert and notify ARDOT that a driver has entered the highway in the wrong direction. The cameras provide real-time data that allows first responders to be notified immediately.

ARDOT's Traffic Management Center (TMC) personnel routinely monitor cameras around the state to check road conditions. The wrong-way detection system is an added tool that helps them quickly notify Arkansas State Police and dispatchers that a driver is in danger. The system also serves to research and identify why drivers are getting confused when entering highway ramps. Don't expect to see video from the wrong-way cameras on the iDrive website – they are only a tool to help identify possible traffic incidents and notify authorities in real-time.

"We developed this research project to help develop countermeasures," Advanced Research Study Engineer Kim

Romano said. "Overall, the department has a goal of zero deaths. The wrong-way component is one of many we use to have a safer system," she added.

Plans are also in the works to install 156 wrong-way detection systems along Interstate 40 to Memphis as an added layer of safety monitoring. ARDOT will install 10 at a time. Each location must be individually calibrated and pointed in the right direction so that the whole field of view can capture complete images of vehicles. Each wrong-way detection system will be connected to the TMC.

The new wrong-way detection systems are funded by Congress through the Highway Safety Improvement Program (HSIP). This program provides money to state transportation departments around the country to help prevent crashes. Funded projects are required to have a data-driven, strategic approach to highway safety improvements on all public roads with a focus on performance. This year, ARDOT received approximately \$33 million in funding for the safety program.

More information regarding ARDOT's innovative countermeasures to deter wrong-way driving can be found by scanning the QR Code below. 



Scan here to find out more about ARDOT's countermeasures to deter wrong-way driving.



**SLOW DOWN
PHONE DOWN**
in work zones



SLOW DOWN, PHONE DOWN CAMPAIGN ENTERS THIRD YEAR AT ARDOT

BY MARK WOODALL

WHILE THERE IS AN ANNUAL NATIONAL WORK ZONE AWARENESS WEEK IN APRIL, IN REALITY, WORK ZONE AWARENESS IS PRACTICED BY ARDOT EMPLOYEES 365 DAYS A YEAR.

To address a concerning sharp increase in the number of injuries, fatalities, and crashes in work zones, ARDOT launched a statewide safety campaign called "Slow Down, Phone Down" in 2022.

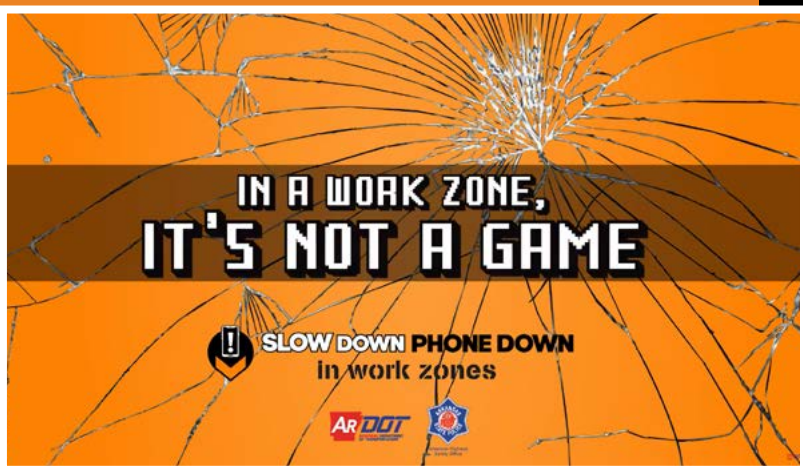
"Arkansas crash data showed an alarming rise in work zone crashes, especially in the years 2018 through 2021," Ellen Coulter, Media Communication Manager said. "We knew we had to do something to reverse that trend to keep our construction workers and the traveling public safe."

(continued on page 20)



“THIS YEAR, ARDOT HAS SHIFTED ITS FOCUS TO REACH A YOUNGER AUDIENCE IN THE 18 TO 24-YEAR-OLD AGE GROUP, MANY OF WHOM ARE MORE PRONE TO DISTRACTED DRIVING.”

— Ellen Coulter, Media Communication Manager



Funding for the campaign was provided by the Arkansas Highway Safety Office (AHSO), a division of the Arkansas State Police. The AHSO administers those funds through grants for highway safety projects. The grants are funded through the National Highway Traffic Safety Administration (NHTSA) and are distributed to each state to use for transportation education and awareness initiatives.

The annual process for deciding what projects will receive funding from NHTSA begins with an analysis of the most recent Arkansas crash data. An emphasis is placed on the highest priority traffic safety measures for each state.

During the first two years of Slow Down, Phone Down the goal was to get the message out to anyone and everyone who would listen. ARDOT created three television commercials and one radio advertisement to reach a wide audience.

The impact of the commercials proved to be a tremendous success. For example, in 2021 there were 84 work zone injuries and fatalities. That number dropped to 53 in 2022 and 50 in 2023.

“If we can save one life or prevent a single injury then this whole campaign will have been worth it,” ARDOT Director Lorie Tudor said. “One death on Arkansas’ roadways is too many, and we must all work together to bring the annual number of roadway deaths to zero.”

Funding from the NHTSA grant has increased to \$626 thousand for 2024, up from the original 2022 grant of \$480 thousand.

This year, ARDOT has shifted its focus to reach a younger audience in the 18 to 24-year-old age group, many of whom are more prone to distracted driving.

Brock Thompson, owner, and CEO of the Thompson Driving School in Little Rock, places a high priority on safety among new drivers. “As a parent and certified driving instructor, my goal is to equip new drivers with the skills they need to be alert, aware, and confident when they get behind the wheel.”

The Thompson school, a family-owned and operated business, has been teaching drivers for more than 70 years to apply safe driving techniques, learn Arkansas traffic laws, be good defensive drivers, and avoid hazards.

Instead of using traditional methods such as television and radio, Coulter said the Communications Division hopes to reach younger audiences through media they visit, which is on digital platforms. “We want our videos to pop up on music apps, streaming services, and gaming sites.”

More information about the future I-57 plans and an interactive map can be found at FUTURE57.TRANSPORTATIONPLANROOM.COM



Federal Record of Decision Paves the Way for FUTURE INTERSTATE 57

BY MARK WOODALL

IN NORTHEAST ARKANSAS, THERE IS A GAP IN THE HIGHWAY SYSTEM, WHICH REDUCES MOBILITY AND RELIABLE CONNECTIVITY TO THE NATIONAL HIGHWAY SYSTEM IN THE REGION. The area known as the Highway 67 Corridor is crucial for commerce, transportation, and access to emergency responders from rural areas to medical centers in larger cities.

Federal legislation has designated the area as a high-priority route, named Future Interstate 57 or I-57. In Arkansas, the future I-57 corridor shall follow United States Route 67 in North Little Rock, Arkansas, from I-40 to United States Route 412, then continuing generally northeast to the State line, and in Missouri, the corridor shall continue generally north from the Arkansas State line to Poplar Bluff, Missouri, and then follow United States Route 60 to connect with existing I-57. A Record of Decision (ROD) was issued in October 2023 by the Federal Highway Administration that identified the chosen route for the Future I-57 corridor in Arkansas. The ROD concludes the National Environmental Policy Act process and begins the final design and right-of-way acquisition phases for the project.

(continued on page 22)



Scan the QR code to check out the *Slow Down, Phone Down* campaign video ads.





“Future I-57 will enhance commerce and connectivity in Arkansas and all along this interstate corridor,” Alec Farmer, chairman of the Arkansas Highway Commission said. “This route will also provide another important Mississippi River interstate bridge crossing, better connecting major east-west interstate corridors such as Interstate 70 in the Midwest United States to Interstates 30 and 40 to the southwestern and western U.S.”

Over the past decade, the area has experienced road closures due to extreme weather events and flooding, which has disrupted access throughout the region. The Future I-57 corridor will help enhance transportation resiliency during extreme weather events.

The construction plans include several projects involving multiple phases. “The first project, a bypass around Corning, is scheduled to be ready to go to construction in late 2024. This project will require the acquisition of 11 different tracts of land and that acquisition will be complete by the end of the year. The next piece, from Corning north

to the Missouri State Line, is currently scheduled to be ready for construction in late 2026.

With a total of 42 miles of new interstate to be constructed, the remaining portions of this corridor from Corning down to Walnut Ridge will be split into several different construction projects and will be constructed as schedules, funding, and priorities warrant.

The current estimated cost of construction for Future I-57 between Walnut Ridge and the Missouri State Line is \$712 million. Federal and state construction funding has been allocated for the two scheduled projects, including more than \$11 million in Federal Community Project Funding.

“Arkansas’ congressional delegation has been very active and successful in getting additional funding allocated to this corridor,” Farmer stated.

Based on unavoidable impacts to wetlands and streams, the Department has purchased property that will be used to meet its mitigation needs for the project. ■

TOP PHOTO

Front row (L. to R.): Federal Highway Administration Division Administrator Vivien Hoang, Arkansas Highway Commission Chairman Alec Farmer, and Arkansas Department of Transportation Director Lorie Tudor. • Back row (L. to R.): Jimmy Harris with U.S. Senator John Boozman’s Office, Gene Higginbotham with U.S. Representative Rick Crawford’s Office, and Jeff Pitchford with U.S. Representative French Hill’s Office.

WALNUT RIDGE - MISSOURI STATE LINE (FUTURE I-57) PROJECT HISTORY

1993

Walnut Ridge – Pocahontas (Hwy. 67)

Proposed action to widen Highway 67 from Walnut Ridge to Pocahontas from two lanes to a four-lane highway, transitioning into a five-lane section inside the city limits of Pocahontas.

1996

U.S. 67 Corridor Study: Walnut Ridge – Missouri State Line

Recommended a new-location, four-lane freeway from Walnut Ridge to the Missouri state line.

2012

Minute Order 2012-025

Arkansas Highway Commission authorized a study to re-evaluate the long-term improvement needs for the Highway 67 corridor from Walnut Ridge to the Missouri state line.

2015

Highway 67 Improvement Study

Alternatives retained for further study include improving existing Highway 67 with bypasses, a central new location route, and a northern new location route.

2018

H.R. 1625-Consolidated Appropriations Act of 2018 SEC. 128

Section 1105(c)(89) of Public Law 102-240, as amended. This legislation directed the Arkansas Highway Commission to improve the Highway 67 corridor with a freeway-type facility from I-40 to the AR/MO state line to be renamed I-57.



Photo: USFWS



Photo: Bryan E. Reynolds



Stock photo

BIRDS, BEES, AND BATS

How ARDOT Strives to Protect the Environment

BY MARK WOODALL

MOST DRIVERS TRAVEL THROUGH CONSTRUCTION ZONES WITHOUT GIVING MUCH THOUGHT TO THE AMOUNT OF PLANNING THAT GOES INTO EACH PROJECT. EVEN BEFORE DESIGNS ARE DRAWN UP OR CONCRETE IS POURED, CAREFUL CONSIDERATION IS GIVEN TO HOW NEW ROAD CONSTRUCTION WILL IMPACT THE ENVIRONMENT.

Thankfully, there is a group of botanists at ARDOT who are dedicated to protecting wildlife in Arkansas. They’re considered experts in the scientific study of plants and wildlife, which serves to protect endangered species and insects.

(continued on page 24)

ARKANSAS' ENDANGERED SPECIES

AMPHIBIANS

Ozark Hellbender (*Cryptobranchus alleganiensis bishopi*)

BIRDS

Red-cockaded Woodpecker (*Dryobates borealis*)

CRAYFISH

Benton County Cave Crayfish (*Cambarus aculabrum*)

Hell Creek Cave Crayfish (*Cambarus zophonastes*)

FISH

Leopard Darter (*Percina pantherina*)

Ozark Cavefish (*Troglichthys rosae*)

Pallid Sturgeon (*Scaphirhynchus albus*)

Yellowcheek Darter (*Etheostoma moorei*)

INSECTS

American Burying Beetle (*Nicrophorus americanus*)

MAMMALS

Gray Bat (*Myotis grisescens*)

Indiana Bat (*Myotis sodalis*)

Northern Long-eared Bat (*Myotis septentrionalis*)

Ozark Big-eared Bat (*Corynorhinus townsendii ingens*)

MOLLUSKS

Arkansas Fatmucket (*Lampsilis powellii*)

Fat Pocketbook (*Potamilus capax*)

Neosho Mucket (*Lampsilis rafinesqueana*)

Ouachita Fanshell (*Cyprogenia sp. cf. aberti*)

Ouachita Rock Pocketbook (*Arcidens wheeleri*)

Ozark Fanshell (*Cyprogenia aberti*)

Pink Mucket (*Lampsilis abrupta*)

Rabbitsfoot (*Theiladerma cylindrica*)

Scaleshell (*Potamilus leptodon*)

Speckled Pocketbook (*Lampsilis streckeri*)

Spectaclecase (*Margaritifera monodonta*)

Snuffbox (*Epioblasma triquetra*)

Winged Mapleleaf (*Quadrula fragosa*)

PLANTS

Geocarpon (*Geocarpon minimum*)

Harperella (*Ptilimnium nodosum*)

Missouri Bladderpod (*Physaria filiformis*)

Pondberry (*Lindera melissifolia*)

*Includes resident species only. Migratory, historic occurrences/ extirpated, similarity of appearance species, and proposed listings are not included. Information provided by the Arkansas Natural Heritage Commission, February 28, 2024.

"Whenever a job is planned one of us will be assigned to look at the map and go out to visit each location to look at the stream and wetland impact," ARDOT Botanist, Joe Ledvina, said.

ARDOT works closely with the U.S. Fish and Wildlife Service to protect natural habitats in Arkansas. And there is plenty to be found in The Natural State. There are currently many different species listed as threatened or endangered in Arkansas.

The impact of construction can indirectly or directly impact wildlife and the environment. For example, bats and birds can pollinate a small number of plants in Arkansas but most of the heavy lifting is done by insects such as bees, wasps, ants, and butterflies.

The pollination of flowers is essential to our ecosystem. Ignoring its importance could upset our food chain.

According to the Defenders of Wildlife website, a world without bees is a world without plants and animals. That may sound scary, but that's exactly why our Environmental Division takes the lead when it comes to protecting our surroundings.

"We also reach out to the public to communicate our plans – especially if it may impact the environment," ARDOT Botanist, Nicholas Dial, said. "Our Public Involvement Team holds regular community meetings to listen to any questions or concerns," he added.

ARDOT State Maintenance Engineer, Deric Wyatt, takes additional steps to notify district personnel who oversee existing places. "We put up signs in areas that require protection when it comes to ongoing mowing operations that will say 'fall mowing only,' and we limit the use of herbicides in some areas to ensure that we protect endangered plants and wildlife."

Our team also ensures compliance and enforcement of the federal Clean Water Act which establishes quality standards for America's surface waters.

"We will look at satellite imagery and maps to look for streams and wetlands and we have data from the Arkansas Natural Heritage Commission with records of rare plants and species," Ledvina said.

There is a symbiotic relationship between living organisms and knowing how the absence of them impacts our surroundings is crucial. Equally impressive is how our team of experts works hand-in-hand with multiple agencies to protect our quality of life in Arkansas. ■

A full list of threatened or endangered species in Arkansas can be found on the U.S. Fish and Wildlife website.

ROCKIN' DOWN THE TRAIL

BY RUTHIE BERRYHILL

TO SAY THAT ARKANSAS HAS AN ABUNDANCE OF ROCKS IS NOT AN EXAGGERATION – IT IS A ROCKHOUND'S DELIGHT. We also have an abundance of places to dig for rocks, crystals, gems, and more – even a public diamond mine. It comes as no surprise then that the Arkansas Legislature established the Arkansas Rocks! Mining and Mineral Trail in 2023 to recognize the state's mineral wealth, unique geology, and related recreational opportunities.

The trail's route passes through two of the state's well-known geological regions – the Ouachita Mountains and the Gulf Coastal Plain, located within the southwest region of the state. Some of the geological attractions along the trail's path include Crater of Diamonds State Park in Murfreesboro, where the public can search for diamonds in their original volcanic source; Hot Springs National Park in Hot Springs, long-recognized for its geothermal springs; Mount Ida, the "Quartz Capital of the World;" Jessieville, known for quartz deposits and rock shops; Malvern, nicknamed the "Brick Capital of the World," after its many clay deposits and

brick industry; Arkadelphia, a historic salt-mining community; the Ouachita Mountains, where "Arkansas Stones," can be found; and more stops with gems, crystals, and metals.

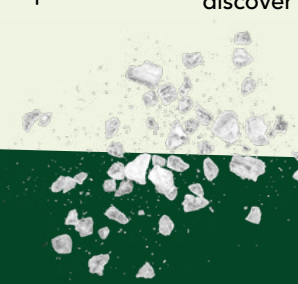
The trail also honors the impact the state's geology and natural beauty have had on famous sons and daughters, like music and television talent, Glen Campbell; the 42nd American president and former Arkansas governor, President Bill Clinton; the folk singing favorite and songwriter, Emma Dusenbury; and country western music and gospel star, T. Texas Tyler. The trail route passes by five state parks, three International Mountain Biking Association Epic Trails, the Eagle Rock Loop, and the Ouachita National Recreation Trail.

The Murfreesboro Advertising and Tourism Commission created the design for the signs and submitted it to ARDOT. Based on that design, ARDOT has produced 111 signs to mark the trail. Crews are installing them across five districts: Districts 3, 4, 6, 7, and 8. Keep an eye out for them along the trail route on Highways 301, Highway 27, U.S. Highway 70, U.S. Highway 270, Highway 298, Highway 7, Highway 192, Highway 227, Highway 51, U.S. Highway 67, Highway 53, Highway 26, Highway 88, and U.S. Highway 71.

Spring is an ideal time of year to hit the road, rock on down the trail, and discover Arkansas' geologic treasures. ■



▲ Quartz Mining



▲ Salt Mining



▲ Diamond Mining



▲ Brick Making



THE ART OF BONSAI

ARDOT's Steve Frisbee
Has Been at it for 30 Years

BY DAVID NILLES

BONSAI IS THE JAPANESE AND EAST ASIAN ART OF GROWING AND TRAINING MINIATURE TREES IN SHALLOW CONTAINERS. IT WAS DEVELOPED FROM THE TRADITIONAL CHINESE ART FORM OF PENJING.

Steve Frisbee, ARDOT's Assistant Chief Engineer of Maintenance, is something of an expert at growing bonsai trees. He has been working with them for 30 years.

"My parents owned a plant nursery and landscaping business in Gravel Ridge called Kay's Nursery," Frisbee shared. "I grew up working with my mom growing indoor and outdoor plants, so it was natural for me. She didn't initially sell bonsai, so I bought my first one while off for college. There was a bonsai shop on Highway 71 near Mountainburg where I got my first tree. My hobby grew from that to working with plants from our nursery."

Anyone that has visited Frisbee's office in Little Rock has probably seen some of his trees.

"I love the outdoors, being in the woods or swamp. Having bonsai is like bringing the beauty of God's nature into your home."



Frisbee has had three of his current bonsai trees since he began the hobby. Today, the trees are 40- to 50-plus years old.

A HISTORY OF BONSAI

Bonsai dating back to the 17th century have survived to the present. One of the oldest-known living bonsai trees, considered one of the National Treasures of Japan, can be seen in the Tokyo Imperial Palace collection. A five-needle pine known as Sandai Shogun is thought to be at least 500 years old and was trained as a bonsai by the year 1610. The traditional bonsai tree is typically an evergreen, such as a juniper or pine. But almost anything that makes a woody branch will work.

Frisbee currently has six trees that he has worked with over the years.

"Right now, I have hibiscus, ficus, bougainvillea, elephant bush, holly, and juniper trees. Crepe Myrtles are good for Arkansas, I have a couple of them that I am starting to shape."

FIRST STEPS TO GROWING BONSAI

For anyone interested in taking up bonsai as a hobby, finding that first plant is easy.

"I have some plants from bonsai nurseries, others are from my mom's nursery," Frisbee shared. "There are certain species that work better than others. Some of my trees were found at various plant nurseries. For example, my bougainvillea tree was

just a hanging basket from a local nursery in Texarkana, and I shaped it as a bonsai. There are also junipers from Lowe's or Home Depot that work well."

Once you have selected a plant, there are many sources to help guide you in the art of bonsai. Frisbee discussed the way that he learned.

"I began by reading books and practicing. There are many books on the techniques and care of the plants. There are many online resources available now as well. You will find lots of helpful YouTube videos that show you how to start a bonsai quickly from an aged tree or from a bush at a nursery."

Tools of the trade are easy to obtain as well. There are various clippers, rakes, soil sieves, and wires that can be used, but they aren't really needed. Just good scissors will get you started.

With tools in hand, hobbyists can begin the task of perfecting the tree's appearance.

"It is definitely ongoing, and takes lots of patience," Frisbee shared. "It depends on what plant you start with. For example, a 3- to 5-year-old juniper or pine in a pot from a nursery can be trimmed and will look good instantly if it has the right characteristics."

(continued on page 28)

ACHIEVING THE PERFECT LOOK

"The goal is to make the tree look like a full-grown tree, but miniature in size," Frisbee added. "There are various styles or shapes that you work towards such as cascading, windswept, broom, or traditional upright. You work to expose the base and upper roots over time to get the trunk shape to look like an aged tree and the limbs sagging downward."

Bending and shaping limbs is a slow process that involves using wire and can take years.

"It is like braces on teeth; they have to slowly be bent as they grow to stay in place. I have broken plenty of limbs by bending too quickly."

As for soils to use Frisbee stated, "The type of soil needed varies by the plant, whether it needs to be well draining or not. But in general, just good potting soil is all that is needed."

According to Frisbee, selecting a proper display pot to put the plant in is an important part of the art of bonsai.

"Bonsai simply means 'tree in a tray.' Similar to landscape or interior design, the shape and size of the pot needs to fit the design, or the look you are seeking. Larger or deeper pots allow the plant to grow better and help retain moisture. But the concept generally is to have as small of a pot as can be managed while keeping the tree healthy, which is one of the biggest challenges. I have lost several trees due to pots being too thin. The trees dry out if not watched closely, or just don't have enough soil to grow well. I've also broken plenty of pots when they fall off of a stand in the wind. You can even grow bonsai on a flat rock, but it is challenging."

Bonsai benefit from being grown outdoors. The dry air indoors is not good for them.

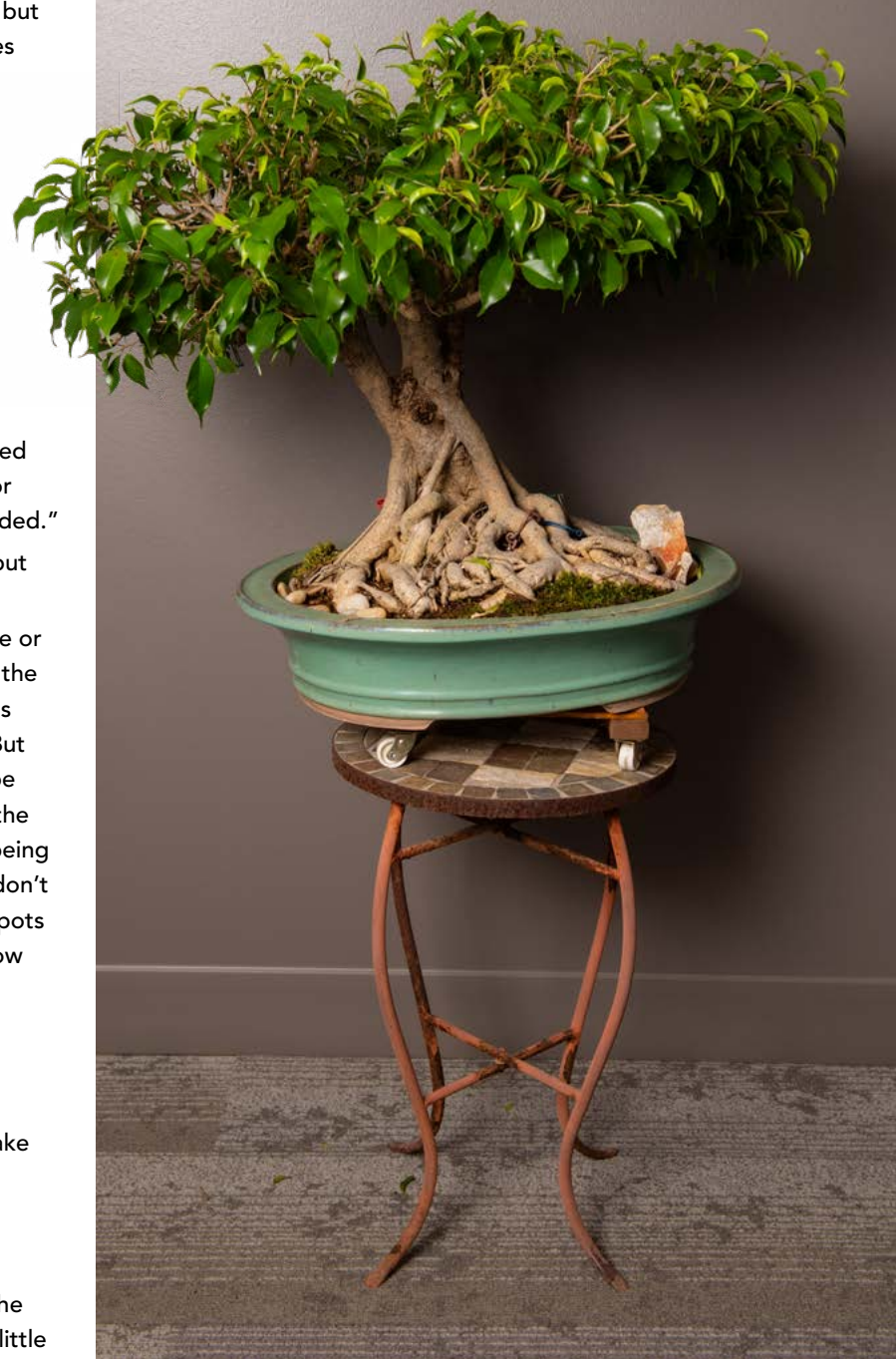
"There is never enough light indoors to keep the foliage dense," Frisbee warned. "The biggest mistake people make with growing bonsai is putting them inside with a lack of adequate light."

TENDING THE GARDEN

Working on the trees is similar to working in a garden. The amount of time invested varies and can be as much or as little as you want.

"Just like with potted plants, more time is spent in the spring repotting, trimming, and shaping," Frisbee stated. "During the main growing season, the trees need to be checked biweekly to clip and trim growth to keep them dense and properly shaped, but this just takes a few minutes.

Watering is the most important part, so it takes regular checking. I have an auto-drip system that waters them twice daily in the summer. That saves a lot of time and lets them flourish outdoors. In the fall, they are more heavily pruned, and most of the wiring and shaping is done in the winter. Many of mine are tropical plants that cannot stay outside in the cold. So,



it is a little time-consuming taking them outside to get some sun when the temperatures are up. I am constantly bringing them inside and outside through the winter to give them sun, rain and fresh air when weather is above 45 degrees or so."

All of the care Frisbee puts into his trees is time well spent. And each tree has a story. His hibiscus is 30 years old and was originally clipped from the top part of a full-size tree his Mom owned.

Today, that hibiscus and all of his other trees share a story of how hard Frisbee has worked at Bonsai and the success that he has enjoyed. ■

Dear ARDOT

I'd like to recognize and acknowledge your team members that were working in Madison County this morning along Highway 74. I was in a funeral procession, bringing up the rear, and every one of the ARDOT team paused, took their hats off, and bowed their heads in a showing of respect, even the ones sitting atop a tractor! In today's world, that is very commendable! I personally appreciated their gesture and knew right then, those are good people! They work a thankless job and I just wanted to recognize them.

Sincerely,
Stephen Triplett

MESSAGES FROM FACEBOOK

Winter Weather Remarks

"Thank you all for working so hard to clear our roads and keep us safe. Y'all did an amazing job during this event."

— George Schaefer

"Y'all have done an amazing job this winter. Keeping the highways as clear as possible. Great work."

— Brian Hughes

"Thank you to the ARDOT crews working Highway 10 in Sebastian County! They knocked it out of the park. Followed a plow two of my days into work"

— Rebecca McCartney

"I worked at the hospital Sunday and was nervous about driving home 45 minutes after 7:30pm — but y'all had cleared a lane on the interstate! Thank you all so much, my commute home was a lot quicker than it would've been. Nobody when I went through was stuck or had slid thanks to y'all's hard work. Thank you!"

— Sarah Kelley

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OUT & ABOUT

CALENDAR OF EVENTS AROUND THE STATE

Leah M., Reilly, oil pastel, 10th Grade, Little Rock Central High, 62nd Young Arkansas Artists Exhibition.
© Arkansas Museum of Fine Arts

As you travel Arkansas over the next few months, consider checking out some of these listed events. Our state is full of interesting things to do, no matter what highway you take. For additional event listings, check out [Arkansas.com/events](https://arkansas.com/events)

- * **HOMECOMING HOOTENANNY:** Enjoy two nights of old-time mountain music and dance at the Ozark Folk Center State Park's indoor music venue, the Ozark Highlands Theater. Performers will include Roy Pilgrim & Seth Shumate, Love Holler, George Hulsey, The Parker Unit, Stringfellows and more. • MAY 24 - 25
- * **63RD YOUNG ARKANSAS ARTISTS EXHIBITION:** For over 60 years, the Arkansas Museum of Fine Arts has highlighted the remarkable talent, creativity, and perspective of Arkansas students through the Young Arkansas Artists exhibition. This legacy program showcases artwork from kindergarten through high school in a wide range of media and technique. • MAY 11 - JULY 7
- * **WORLD CHAMPIONSHIP RUNNING OF THE TUBS:** What happens when you take a bathtub and put it on wheels? Watch as costumed teams push customized bathtubs on wheels down Hot Springs' Historic Bathhouse Row in hopes of becoming The World Champion Tub Runners. • JUNE 1
- * **66TH ANNUAL PETIT JEAN SWAP MEET & CAR SHOW:** Fueled by a love of automobiles, this annual event features more than 900 spaces of antique cars, parts, crafts, and more for sale and trade at The Museum of Automobiles, atop Petit Jean Mountain in Morrilton. If you love anything automobile-related, especially antique or classic cars, then this is the place to be. Be sure to stick around on the last day for two car shows – antique/classic and open shows. • JUNE 12 - JUNE 15
- * **BRADLEY COUNTY PINK TOMATO FESTIVAL:** One of the oldest continuous running festivals in the state of Arkansas, the Bradley County Pink Tomato Festival is held every year on the second full weekend in June. Events include a parade, beauty contests, an arts and crafts show, 5K race, tomato eating contest, an all-tomato luncheon, and live entertainment. • JUNE 14 - 15

- MAY 24 - 25**
HOMECOMING HOOTENANNY
Ozark Folk Center State Park
Mountain View, AR
- MAY 11 - JULY 7**
63RD YOUNG ARKANSAS ARTISTS EXHIBITION
Arkansas Museum of Fine Arts
Little Rock, AR
- JUNE 1**
WORLD CHAMPIONSHIP RUNNING OF THE TUBS
Bathhouse Row
Hot Springs, AR
- JUNE 12 - JUNE 15**
66TH ANNUAL PETIT JEAN SWAP MEET & CAR SHOW
8 Jones Lane
Morrilton, AR
- JUNE 14-15**
BRADLEY COUNTY PINK TOMATO FESTIVAL
Downtown
Warren, AR



DISTRICT 4

CONSTRUCTION

CORNER



CREWS IN WASHINGTON COUNTY HAVE BEEN WORKING ON IMPROVEMENTS TO THE WEDINGTON INTERCHANGE ON INTERSTATE 49 (I-49) IN FAYETTEVILLE. Manhattan Road & Bridge Company was awarded the project for \$37.6 million.

The existing five-lane overpass is being replaced with a new eight-lane structure that includes a raised median and 14-foot side path for pedestrians and bicycles. In addition to improvements to the overpass, a new partial cloverleaf interchange will be constructed.

According to District Four Construction Engineer Marcus Rainwater, traffic flow will be greatly improved by the partial cloverleaf interchange. The interchange will allow eastbound traffic to merge onto I-49 northbound on a two-lane loop ramp.

Improvements are expected to be completed in September 2024. ■





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