



AR KAN SAS

FUTURE
MOBILITY
REPORT

Presented by
Arkansas Future Mobility Council



ARKANSAS

FUTURE
MOBILITY
REPORT

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SECTION 1

Introduction

SECTION 1

Introduction

Executive Summary: Arkansas Council on Future Mobility



History has shown, as you increase a community's access to mobility, quality of life increases. From the horse, to the bicycle, to the automobile, to the boat, to the plane, and the spaceship — innovative mobility solutions allow us to connect, explore, learn, transact, and be of service to one another.

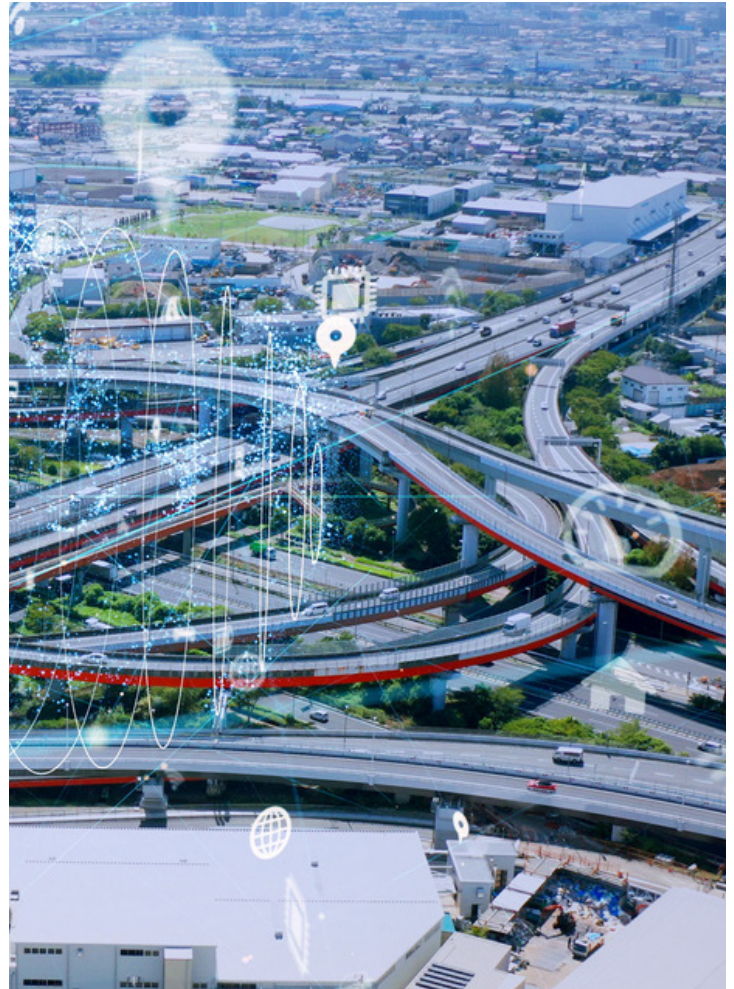
Mobility is the underlying fabric of society and represents one of the largest industries in the world — a \$10T annualized industry.

So why has the Governor of Arkansas asked for this Council to be formed to explore the world of future mobility?

In short, to ensure that the State takes advantage of this unique moment and capitalize on what may be one of the largest economic opportunities in the State's history.

Drones are now delivering our Walmart packages. Over 400 companies around the world are developing some sort of flying car. The move to autonomous and electric vehicles and trucks is getting closer by the day. In the next few years, more electric bicycles are expected to be sold than cars on an annual basis. Oceanliners and cargo ships will soon be powered by clean hydrogen. We'll soon be sending Americans back to the moon, and in the not-too-distant future, to Mars.

This is a future worth getting excited about.



Every facet of mobility is being disrupted by the convergence of exponential technologies. These technologies are helping humanity move people and goods cleaner, faster, safer, and at lower cost — on the ground, air, sea, and space.

The State of Arkansas and the companies based in the State collectively **control the movement of more things than any other State in the U.S.** Arkansas is home to some of the largest and most impactful transportation, retail, aerospace, and agricultural organizations in the world, including but not limited to Walmart, J.B. Hunt, Tyson, ArcBest, and Dassault Falcon Jet.

Additionally, many are surprised to learn that the State's largest export comes from the aerospace industry and aircraft related parts and services, largely driven by Dassault Falcon Jet, which manufactures business jets at their Little Rock manufacturing facility.

Introduction

Driven by the leadership and foresight of Governor Asa Hutchinson, the Arkansas Council on Future Mobility was created in February of 2022 by EO 22-06 to serve as an advisory body for the Governor.

Specifically, the council was asked to:

1. Identify State laws and administrative rules that create barriers to the development and enhancement of electrification and Advanced Air Mobility (AAM);
2. Make policy and program recommendations to support and facilitate the development of electrification and AAM;
3. Develop priorities and recommendations for the allocation of federal resources and grant programs in order to invest in critical components of an advanced mobility ecosystem, including energy, infrastructure, security, and transportation;
4. Identify future tasks and goals, including strategic goals in education, workforce training, and economic development;
5. Create incentives to develop opportunities, amplify economic activity, and create jobs.

The Council's work officially concludes upon submission of this final report. However, as is shown in the following sections, there is much work to be done for Arkansas to take advantage of this incredible opportunity.

The Council has summarized the six areas of concentration represented by the flywheel below.



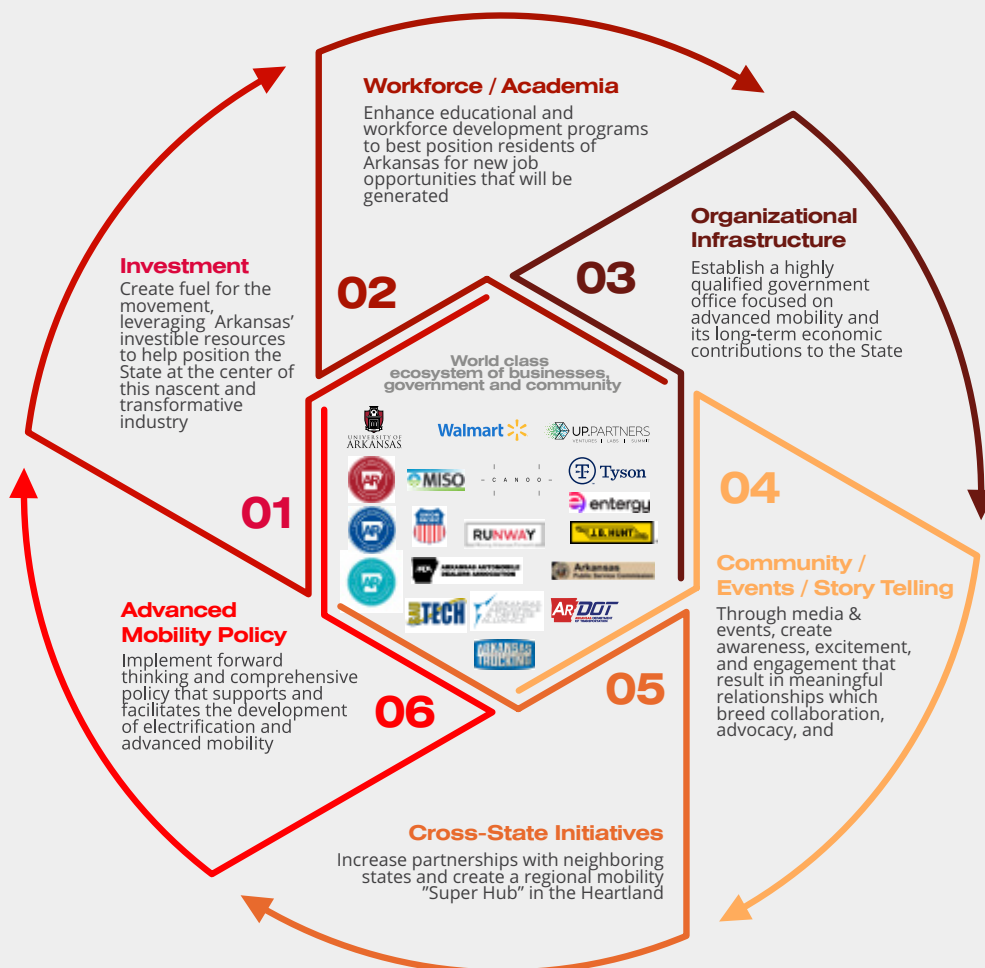
2) Workforce and Academic Development: Let's Get to Work

3) Organizational Infrastructure: The Playbook

4) Events, Community, and Storytelling: Keeping the Drumbeat Going

5) Cross-State Initiatives: Rising Tides Lifts All Boats

6) Crafting The Most Comprehensive Advanced Mobility Policy in the World: Let's Accelerate This Movement



Through the work of the Council, specific recommendations are being made for the State to consider implementing. Some of the select recommendations can be found below. These recommendations are being made with one mission, and one mission only: to give Arkansans a better life by creating economic prosperity and improved mobility solutions that can be enjoyed by all.

SECTION 1

Introduction



After months of research, meeting, deliberation, consideration, and report creation, as our Council concludes its work, we have one final word.

One of the greatest joys of the last 10 months has been the opportunity to see how many Arkansans wanted to help their home State through this project. This work attracted everyone from highschool students, to teachers, to engineers, to naturalists, to senior executives, to policy makers, to investors and leaders of other States, the list goes on.

To move is to be human. To be of service is to be human. There is an incredible sense of community within Arkansas that speaks to what makes this State so special. As we talk about community, it's helpful to remember where the word comes from — “common unity.” And the more projects and initiatives that can be spearheaded which work from a place of “common unity” the more we can, as a people, amplify what it means to be not only Arkansan, but more importantly, American.

With a tremendous amount of gratitude to all those that volunteered their time and energy in crafting this report, specifically Runway Economic Development lead Jordan Bearden whose efforts went above and beyond, the Council on Future Mobility presents its recommendations to the Governor of Arkansas.

Cyrus Sigari

Chairman

Arkansas Council on Future Mobility

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SECTION 1

Timeline

SECTION 1

Timeline



**FEB.
2022**

Governor establishes Future Mobility Advisory Council



**MAR.
2022**

AR, OK, LA announce Hydrogen Partnership



**JUN.
2022**

- UP.Summit brings 250+ global leaders to Bentonville
- UP.Community Day hosting 3,000 Arkansans & announcement of UP.Labs
- City of Bentonville Proclaims June 5 as Future Mobility Day
- Jun 17: Arkansas Mobility Council meeting
- Arkansas Signs MOU with Israel's National Technological Innovation Authority



**JUL.
2022**

- University of Arkansas announces SMART mobility alliance
- AR represented at Farnborough International Airshow
- NSF published all 700 concept outlines that met the established criteria on 7/28/22. 191 of those concepts are competing for Type 2 (which is what FLAME is going after). Full proposals due 1/18/23.
- Jul 28: Arkansas Mobility Council meeting

SECTION 1

Timeline



**APR.
2022**

- Thaden Field in Bentonville named 'Coolest Airport in America' - FLYING Magazine
- Apr 11: Arkansas Mobility Council meeting



**MAY
2022**

- National conferences draw attention on AR transportation: Freightwaves, Heartland Summit
- NWA & Tulsa establish partnership to compete for NSF Regional Innovation Engines Grant opportunity (up to \$160M/10 years) focused on the future of supply chain and logistics



**AUG.
2022**

- Governors Hutchinson & Stitt pen Advanced Mobility MOU to create super-region for advanced mobility
- Aug 19: Arkansas Mobility Council meeting



**SEP.
2022**

State approved plan to receive \$54 million dollars in federal grants over the next five years to improve EV infrastructure; State proclaims Drive Electric Week in AR



**OCT.
2022**

Oct. 26: Arkansas Mobility Council meeting

Summary of Recommendations



AREA	#	RECOMMENDATION
3 - Investment	3.1	Engage more deeply with the Israel Innovation Authority, and Israel more broadly, to learn their best practices from the last 25 years and implement them in Arkansas
	3.2	Council recommends that Arkansas based funds explore establishing a specific private equity allocation towards making direct investments in the Arkansas technology ecosystem and consider using other instruments – including debt and convertibles – to reduce risks and provide access to capital
	3.3	Creation of the Arkansas Innovation Fund to invest in emerging companies
	3.4	Set up a council to explore the creation of the Sovereign Wealth Fund
4 - Workforce and Academic Development	4.1	Encourage the University of Arkansas to launch an Institute for Advanced Mobility
	4.2	Have the State of Arkansas play a role in partnering with the UA Power Group and the MUSiC facility to support and grow opportunities in the State's advanced mobility startup ecosystem
	4.3	Legislation creating a State-wide Center of Excellence to leverage private and public sector resources and target federal grant opportunities to participating COE entities
	4.4	Implement the 20 listed K-12 recommendations as part of a larger comprehensive plan to expand STEM education and workforce development in the State of Arkansas
5 - Organizational Infrastructure	5.1	Elevate or create a dedicated position as Director of Science & Technology
	5.2	Appoint a non-government industry expert as Chief Futurist for the State
6 - Events, Community, and Storytelling	6.1	The State to retain a branding and storytelling consultancy to help ensure the State implements storytelling and communication best-practices
7 - Cross-State Initiatives	7.1	Strengthen relationships with Oklahoma and Louisiana and fund the HALO initiative to win IIJA funding
	7.2	Establish partnerships with Tennessee and Texas to form a regional mobility Super Hub
	7.3	Execute the FLAME Phase II proposal to win NSF Engines funding

Summary of Recommendations



AREA	#	RECOMMENDATION
8 - Crafting The Most Comprehensive Advanced Mobility Policy in the World	8.1	Space - Establish an Arkansas Space Authority
	8.2	Space - Execute a feasibility study on the development of an Arkansas Spaceport
	8.3	Micromobility - Consider separated/protected bike and pedestrian lanes
	8.4	Micromobility - Leverage federal funding for innovation and staff dedicated to cycling infrastructure
	8.5	Micromobility - Delegate micromobility regulation to localities
	8.6	Micromobility - Remove restrictive Statewide vehicle specifications and fees
	8.7	Micromobility - Implement suggested best-practices to increase competition and improve operational efficiency for Arkansas citizens
	8.8	Drone - Continue to support the acceleration of the growth and availability of drone delivery services across the State and beyond, including partnerships with drone companies to launch essential healthcare to rural communities
	8.9	Drone - Double down on the use of drone technology for smart infrastructure inspection
	8.10	Drone - Support the Drone Infrastructure Inspection Grant (DIIG) Act
	8.11	Advanced Air Mobility - Work with stakeholders inside and outside the State to express and build support for the FAA to implement their BVLOS ARC recommendations
	8.12	Advanced Air Mobility - Proactively support those seeking to develop ground infrastructure for AAM, including by facilitating expedited permitting for required electric infrastructure work
	8.13	Advanced Air Mobility - When AAM infrastructure is being developed, take on the role of liaising with, surveying concerns, and educating citizens about the benefits of AAM to ensure public acceptance
	8.14	Advanced Air Mobility - Implement the next steps identified in the NEXA report, sponsored by the Walton Family Foundation, <i>Advanced Air Mobility Comes to Arkansas</i>
	8.15	Advanced Air Mobility - Adopt guidelines restricting the use of State funds to purchase drones and other emerging transportation technologies with strong ties to China
	8.16	EV - Increase funding for existing state programs and consider tax credits that other states like Oklahoma have used successfully to build a large network of Level 3 fast chargers.
	8.17	Autonomous Vehicles - Build and maintain a real-time structured database of critical transportation data
	8.18	Autonomous Vehicles - Ensure strong cell coverage over Arkansas roads and create a path for private companies to integrate hardware into Arkansas' infrastructure
	8.19	Autonomous Vehicles - Prioritize road maintenance that advance AV perception testing
	8.20	Autonomous Vehicles - Authorize feasibility study on impact of dedicated AV highway lanes
	8.21	Autonomous Vehicles - Support legislative efforts to update Act 797 of 2017 to align with Act 468 of 2021, in effect removing specific language requiring human operators for steering and system control. Such a change will enhance commercial applications of on-road AV technologies

An aerial photograph of a vast, rolling landscape covered in dense forest. The foreground is a thick canopy of trees, with some areas showing autumnal colors. The middle ground features rolling hills and valleys, with some open fields visible. The background shows more distant hills under a sky with scattered clouds. The overall tone is warm and natural.

SECTION 2

Our Ecosystem:

Collectively Moving More
Things Than Any Other Region
In The World

ECOSYSTEM INGREDIENT A

World Class Businesses



Arkansas has always punched above its relative weight economically. Arkansas' business-friendly climate and entrepreneurial spirit have helped foster the growth of five Fortune 500 companies, including the world's largest company by revenue, Walmart; the largest protein manufacturer and cold chain transportation company in the world, Tyson Foods; and one of the largest trucking companies in the country, J.B. Hunt.

The ecosystem of established companies whose significant scale and reach, as well as their stated commitments to reducing carbon emissions, will play a key role in supporting the development of advanced mobility solutions.

Transportation, Distribution, and Logistics

The world's largest retailer, Walmart, is headquartered in Bentonville, Arkansas. Just as much a mobility and transportation company as it is a retailer, Walmart is responsible for the movement of tens of billions of items a year.

The sheer scale is practically impossible to comprehend.

To support its core business, Walmart is a key player in the development of advanced mobility solutions over land, air, sea and perhaps one day, space! Key partnerships include the agreement to purchase 4,500 Canoo electric delivery vehicles ([source](#)), the expansion of DroneUp and Zipline drone delivery services to reach four million households by the end of the year ([source](#)), the company's investment in autonomous driving company Cruise, and the achievement of the first fully driverless deliveries in the world with Gatik ([source](#)).

Having the largest customer of mobility related technologies based in the State provides a tremendous competitive advantage in supporting a burgeoning ecosystem.

Arkansas is home to more than 6,800 transportation, logistics, and distribution companies ([source](#)). Powerhouses such as J.B. Hunt and ArcBest are among the top logistics companies in the nation based in The Natural State. Currently, approximately 85,000 people work in more than 80 distribution centers around the State.



ECOSYSTEM INGREDIENT A

World Class Businesses



J.B. Hunt, one of the top five largest trucking companies in the country by revenue, will serve as a key partner, developer, and user of advanced mobility technology. In November of 2022, Craig Harper, Chief Sustainability Officer at J.B. Hunt, announced the company's new goal to reduce company-operated emissions by 32% by 2034 ([source](#)). Specifically, J.B. Hunt plans to focus on three key areas to reach this goal, including (1) Incorporating alternative powered equipment into its fleet, (2) Expanding the use of biogenic fuels and (3) Improving fuel economy (diesel powered miles-per-gallon "MPG"). This significant emissions goal will require innovation in electrification, alternative fuels, and other technologies in order to be achieved, and the Council believes J.B. Hunt will be eager to work with local entrepreneurs and researchers who can help.



ArcBest of Fort Smith will also serve as a key partner and customer of next generation mobility technology. The company recently released its third annual ESG report, detailing some of the initiatives the company has made, including purchasing electric Class 6 straight trucks from Lion Electric and electric yard tractors from Orange EV ([source](#)). With over 15,000 employees spread across 250 campuses and service centers across the country, ArcBest has an opportunity to work with an advanced mobility ecosystem in Arkansas and quickly scale new initiatives and technologies.

Aerospace & Defense

Arkansas is home to over 170 aerospace and defense companies, including Lockheed Martin, Dassault Falcon Jet, Raytheon, and Aerojet Rocketdyne ([source](#)). Aerospace products and parts are the State's leading export, bringing in approximately \$1.8 billion per year and employing more than 10,000 people in skilled technical jobs such as machinists, mechanics, engineers, and researchers.



Dassault Falcon Jet is one of Arkansas's largest private employers and drives the high volume of aviation exports out of the State. Dassault's largest facility in the world is located in Little Rock, Arkansas. The company also has a long history of innovation and creativity, having created many of the early FedEx cargo planes and then modifying those freighters to be used as target tows and simulators for the UK's Royal Air Force a decade later ([source](#)). A rich history of experience in aviation, and the talent, infrastructure, and institutional know-how associated with that history, are key assets that Dassault Falcon brings to the ecosystem, which entrepreneurs designing the next generation of aerial advanced mobility can leverage in the State.

Agriculture and Food Production

Agriculture is Arkansas's largest industry, contributing more than \$21 billion annually to the economy. Arkansas ranks 1st in the nation in rice production and 3rd in cotton production. There are approximately 14.5 million acres of farmland and nearly 19 million acres of forest land.



ECOSYSTEM INGREDIENT A

World Class Businesses



Tyson Foods, the largest poultry and meat processor in the U.S., is headquartered in Springdale, Arkansas, and numerous other food manufacturers including Riceland, Gerber, ConAgra, FritoLay, Simmons, Nestle, and Kraft Heinz — just to name a few — have operations in the State.



Tyson Foods is a critical player in the nation's economy as the country's largest processor of chicken, beef, and pork. The company is also the largest cold-chain transportation company in the world. The cold-chain supply chain Tyson Foods must maintain is absolutely critical for food quality and safety. Nevertheless, the company takes seriously a commitment to reducing its carbon footprint with a pledge to achieve net zero greenhouse gas emissions by 2050 ([source](#)). While the company plans to reduce emissions largely through agricultural methods such as expanding the acreage of land where sustainable beef practices are used and eliminating deforestation, there is also significant need for the advanced mobility technology being developed in Arkansas to help Tyson reach a net zero footprint in the transportation of its foods domestically and globally.



A Government That Is Ready To Get To Work



In addition to world class mobility companies, another competitive advantage the State has in becoming the epicenter of the advanced mobility industry is a supportive and forward-looking government.

The Council is deeply grateful to Governor Asa Hutchinson for his leadership in forming the Arkansas Council on Future Mobility. As Chairman of the National Governors Association, Governor Hutchinson served as a champion for K-12 Computer Science Education initiatives, which exemplifies Arkansas's dedication to preparing for next-generation technology ([source](#)).

Other governmental initiatives at the State level demonstrating Arkansas leadership include extensive and thoughtful work in economic development.

The Arkansas Economic Development Commission's (AEDC) most recent monthly update reported that 125,200 more people are employed in the State than when Governor

Hutchinson took office in January 2015. The AEDC has signed incentive agreements with 495 new and expanding companies, directly resulting in almost 26,000 new jobs for Arkansas and capital investment of over \$14B into the State ([source](#)).

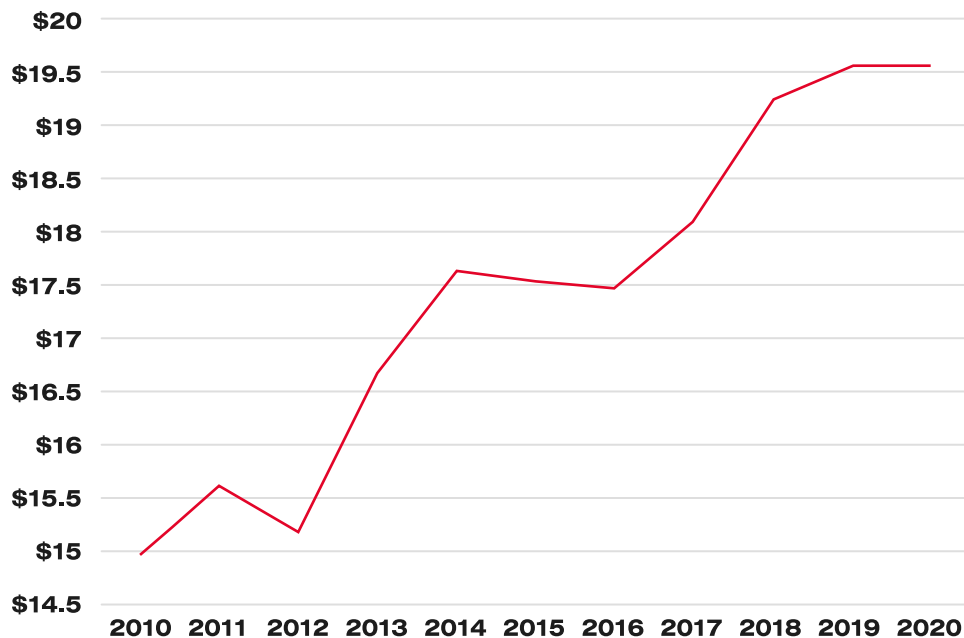
Last year, the Arkansas legislature passed significant legislation that supports economic development, improves the State's tax climate, and increases the State's competitiveness for creating and retaining jobs and a world class workforce ([source](#)). Governor Hutchinson signed into law the largest tax cut in Arkansas's history. The legislation will incrementally cut the top individual income tax rate from 5.9% to 4.9% by 2025. Corporate income tax rate will be further incrementally reduced from 5.7% to 5.3% by 2025.

The Council believes the State's government leaders and agencies will continue to be strong partners to support future aerospace and other advanced mobility business activity in the State.

A Community That Is Ready To Get To Work

The final key ingredient the State of Arkansas has to go after this opportunity in advanced mobility is a community that is energized and ready to get to work. One critical component of the State community, the workforce, has shown strength and an eagerness to step up and participate productively in the economy. The State has maintained an unemployment rate below that of the national average, at 3.4% in Arkansas relative to 3.7% nationwide. The State also has a significantly higher share of employees in manufacturing at 14.9% in 2021 relative to the overall national figure of 10.9%, and has increased its manufacturing output from under \$15B in 2010 to \$19.56B in 2019 ([source](#), [source](#)). Clearly, the community and workforce of Arkansas are particularly well positioned to create the new classes of advanced mobility vehicles.

Arkansas Manufacturing Output, in Billions of Dollars, 2010-2020



National Association of Manufacturers 2021 Arkansas Manufacturing Facts ([source](#))

SECTION 3

Investment

Fueling the Movement



The State of Arkansas has an enormous opportunity to invest in the future of advanced mobility.

However, it must strike while the iron is hot. Arkansas must leverage its investible resources today to make the most of the opportunity to be at the center of this nascent industry.

WICHITA A Learning Opportunity

Wichita, Kansas is known as “the Air Capital of the World.” Seven out of ten airplanes ever built in the history of humanity have been built in Wichita. Every major aircraft manufacturer has a physical presence in Wichita. The first commercially produced aircraft in the country, the Laird Swallow, was built in Wichita in 1920. Today, the city is home to McConnell Air Force Base, generates billions in economic impact, and is responsible for employing tens of thousands of people in the world of aviation.

So, the question is posed: How did Kansas become the Air Capital of the World?

Because of venture capital in the 1920s.

As the story goes, on the outskirts of Wichita, the “El Dorado” oil field provided 10% of the nation’s output by World War I — creating both local wealth and the dire need for advanced transportation. Early aviation entrepreneurs flocked to the region in search of willing financial backers. One backer in particular took a liking to the potential held within an exciting new vision for the future: Jake Moellendick, wealthy from the oil boom, became aviation’s first venture capitalist. He was the original backer that supported three of the most prolific names in aviation history — Clyde Cessna, Walter Beech, and Lloyd Stearman.

Then, in 1924, Wichita hosted the National Air Congress, which attracted over 100,000 people, allowing city planners to raise funds for a proposed Wichita Municipal Airport. In 1925, Clyde Cessna, Walter Beech, and Lloyd Stearman formed the Travel Air Manufacturing Company, which would eventually be split into Beech Aircraft, Cessna Aircraft, and Stearman Aircraft (later acquired by Boeing).

Read that again. One venture investor effectively jump started the ecosystem that created seven out of ten planes ever built.

The 1930s and 40s saw Kansas rise to claim the title of Air Capital of the World. At the height of World War II, Boeing, Beech, and Cessna employed 60,000 Wichita workers. A third of the U.S. B-25 Bombers and half of the U.S. B-29 Bombers were produced in Kansas during World War II. Today, Wichita is still known as the “Air Capital of the World” and remains home to five major aircraft manufacturers: Airbus, Bombardier, Beechcraft, Cessna, and Spirit.

This goes to show the power that one investment can have. It is almost impossible to measure the global economic and societal impact that followed from Moellendick’s investment decision — and the resulting ecosystem it created, which lives long and strong to this day.

The aerospace industry’s origin story in Wichita can be informative to Arkansas as the State looks to the future of advanced mobility. For an ecosystem to be truly effective it must have a vibrant venture capital community in place to help support both homegrown companies and attract companies to the region to build and grow in Arkansas.



ISRAEL

Another Learning Opportunity

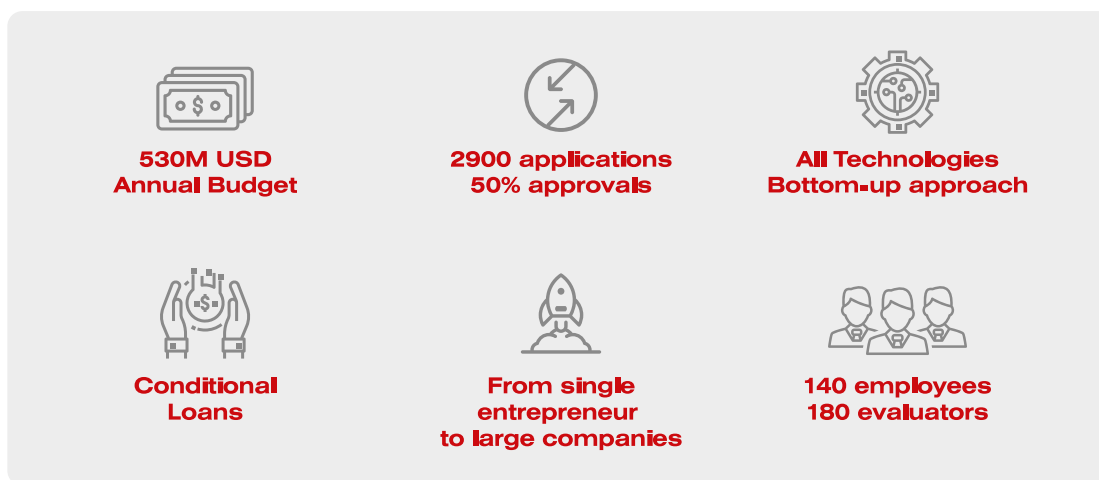


The State of Israel is highly regarded as a technology and startup powerhouse. With roughly three times the population of Arkansas, Israel is home to 9.3 million people. As of 2021, the country has over 6,000 active startups and is the world leader in startups per capita ([source](#)). While a highly educated workforce and strong corporate R&D investment are two drivers of this innovation, many do not know that it was government support starting in the early 1990s that was the genesis of, and continues to be, the key driver of Israel's reputation as the "startup nation."

The Israeli government founded the Technology Incubator program in the 1990s through the [Israel Innovation Authority \(IIA\)](#) to address elevated unemployment related to high levels of immigration the country was experiencing.

The IIA now has an annual budget of \$530 million. As a relative comparison, Israel's GDP of \$480 billion and population of 9.3 million represents a spending of .11% of GDP, and per capita spending of about \$57 per year. If Arkansas were to make the same investment of \$57 per year on a per capita basis, the State would be spending \$171 million per year for the 3 million residents of the State.

Israel Innovation Authority



The Israel Innovation Authority's incubation program has wide adoption within the country, with almost every Israeli startup partaking in the program at least once. The program gives grants to startups with nominal, inflation-adjusted interest rates to repay only once the venture starts to generate revenue, with repayments tied to revenue rather than a fixed payment. The IIA has a spreadsheet of 2021 recipients on its website, with 821 ventures receiving grants.



With an annual budget of \$530M, Israel directly and indirectly invested on average approximately \$700K into 821 startups in 2021 alone!

For high-priority innovation segments that are traditionally more difficult for VCs to underwrite, such as agriculture and climate tech, the country runs a matching program where it relies on trusted VCs to outsource this tricky due diligence. VCs in Israel can apply for a 5:1 matching grant on early stage investments they make on domestic projects that represent serious and high risk innovation. For example, a VC could write a check for \$350k, and the government will step in and provide a loan for \$1.75mm, allowing the startup to receive a full \$2.1mm investment.

The IIA is careful to ensure top talent is serving as the steward of this innovation juggernaut. A leader typically comes in for 3-5 years, typically a successful entrepreneur or fund manager well respected in the community. This position is a high honor and considered as a way of giving back to the ecosystem that made them successful. The rest of the staff supporting the group are more permanent, they are government employees that have served in the IIA for decades.

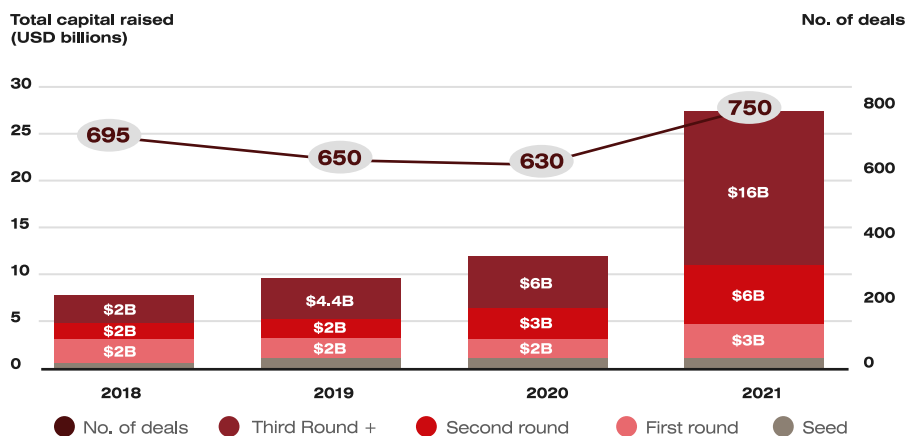
Research conducted by Prof. Shaul Lach of the Hebrew University in Jerusalem examined the impact of government support on innovative R&D in the business enterprise sector (source). This research indicates that the direct result of governmental support in R&D is the creation of new research of up to two or three times higher value than the amount of the initial governmental grant, even in the industrial and software markets. This research further indicated that governmental support creates an added value to the industry which is five to ten times higher than the governmental investments, and that these investments do not push private investors away, but rather create significant additional value for Israeli R&D.



Data from the IIA's [2022 innovation report](#) shows that startups incubated in Israel are able to attract additional investment well beyond the IIA's initial grant budget, with over \$25 billion USD raised across 750 deals in 2021.

Most Investments In Startups Are At Advanced Stages

Total investments in private Israeli high-tech companies per year, by funding round (USD billions)

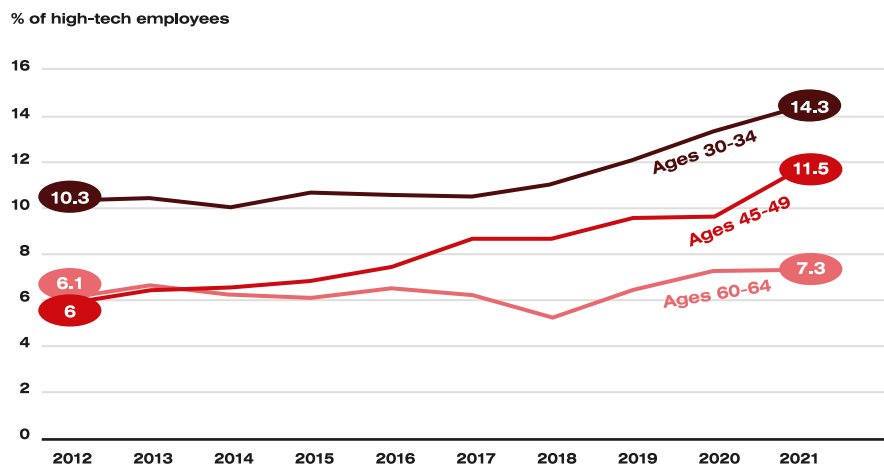


*As of April 2022, excluding loans and crypto currency IPOs.
Source: Innovation Authority adaptation of IVC data

Critically, the IIA tracks the success of its program not just in total companies and capital invested, but also in its impact on society across demographics. With its innovation, Israel has succeeded in creating well paying high-tech jobs for both young college graduates and also jobs that attract older professionals as well.

High-Tech Mainly Attracts The Young - But Employment Is Increasing In All Age Groups

Ratio of high-tech employees out of all workers, by age group







Source: Aaron Institute and Trump Foundation adaptations of Human Capital Survey

More broadly, the Council believes that highly specific strategic goals, with annual quantitative target-setting and collection of data to track progress against those goals, is one of the key organizational ingredients that makes the IAA so effective. The goals for 2022 are shown below:



Goals and Objectives at the Core of the Workplan

Strategic Goal	Goal for 2022
 Helping groundbreaking start-ups achieve a funding milestone	Measure: The volume of capital invested in seed rounds (according to the IVC) Goal: A 35% rise in capital volume (from 470 million dollars today to 630 million dollars in 2022).
 Expanding the pool of human capital with high-tech skills	Measure: The number of salaried high-tech positions (according to CBS data). Goal: A 12% increase (from 321,000 position today to 360,000 positions in 2022).
 The number of salaried high-tech positions (according to CBS data)	Measure: The number of companies operating in bio-convergence (according to the SNC). Goal: A 100% increase in the number of operational companies by 2022.
 Encouraging the growth of full technology companies in israel	Measure: The number of fast-growing high-tech growth companies (according the Central Bureau of Statistics). Goal: A 40% increase (from 322 today to 450 in 2022).

Source: Israel Innovation Authority

The creation of such an ecosystem has created an influx in multinational corporations in Israel. In an interview with InnovationAus, IIA CEO Dror Bin says, “There are three pivotal activities that attract an incredible number of multinational corporations to establish research facilities in Israel.

Firstly, the creation of a VC industry, the Yozma program. Originating from a government program (in 1993) aimed at prompting venture investment in Israel, Yozma jump started the Israeli VC industry. Between 1993 and 1998, the government offered to provide 40% of the money offered by private investors in combined funds, supporting more than 40 companies. The value of Yozma increased from \$100 million in 1993 to \$250 million by 1996, and the project is regarded as a rare example of government venture capital success.

Secondly, promoting an increase of R&D spending in the industry from 1970-2000, mainly through the operation of the Office of the Chief Scientist, which later in 2017 became the Innovation Authority.

Thirdly, investing in good research universities (1921-2021). The fruits of this effort are seen throughout the years where researchers from Israel’s nine universities have excelled in developing everything from sensors, solar power and robotics to 3D printing, artificial intelligence and cancer therapies — to name just a few of the many fields where Israeli breakthroughs have made an impact in recent years.”



Governor Asa Hutchinson and Arkansas Secretary of Commerce Mike Preston joined Chief Scientist and Chairman of the Israel Innovation Authority Dr. Ami Appelbaum and Consul General of Israel to the Southwest, Livia Link-Raviv, to sign a Memorandum of Understanding (MOU) between the State of Arkansas and the Israel Innovation Authority

Through its research and interviews with staff from the IIA, the Council has been deeply impressed with the impact they have achieved. The Council believes that the MOU Arkansas has signed with the IIA in June this year was a fantastic first step through what it projects to be a highly beneficial mutual partnership.



THE COUNCIL RECOMMENDS

that Arkansas engage more deeply with the Israel Innovation Authority, and Israel more broadly, to learn their best practices from the last 25 years and implement a first in the nation equivalent in Arkansas.

FEDEX

A Cautionary Tale

A cautionary tale can be seen in the case of FedEx, an enormously successful enterprise today worth over \$45 billion and that moves over 6 million packages a day ([source](#)). When people think of FedEx they usually think of Memphis, Tennessee where the company is based. However, it is less commonly known that the company was originally founded in Little Rock, Arkansas in 1973.

So, what prompted the move by FedEx out of the city where they were founded?

FedEx moved to Memphis because the Little Rock airport was not willing to extend the runway to handle the growing size of FedEx's operation.

It was an upgrade that would have cost approximately \$6 million.

The scale of economic impact that FedEx may have brought to Arkansas is enormous. In its U.S. Economic Impact Report, FedEx highlights its effects on Shelby County (where Memphis is located). The company has 33,000 employees in the county, and accounts for 56.5% of the county's employment in the transportation sector. Direct investment in the area include a \$1.5B modernization of the Memphis World Hub at the Memphis-Shelby County International Airport, \$50M renovation of the FedEx Global Headquarters, and \$42M between 2016-2018 donated to the greater Memphis community. FedEx also supports various development programs including the City Capital Connects program in Memphis to help 200 black entrepreneurs, and works with the Memphis-based 800 Initiative to help minority-owned businesses access capital.

The story of FedEx, one of the greatest entrepreneurial stories in American history, is a cautionary tale to remind both investors and policy makers about the possibilities of taking calculated risks to support economic growth through private/public partnerships.

The Opportunity for Arkansas

The key message from the Wichita and Israel stories above is that with the right investment and ecosystem strategy, Arkansas can significantly increase the odds that the next world-changing company brings its tens of thousands of jobs and billions of dollars of economic impact to the State's local markets. This kind of investment isn't simply about dollars changing hands from creditor to debtor; it involves a broad ecosystem of stakeholders, and in particular, leadership from State government to unlock opportunities.

The State of Venture Capital in Arkansas

Today, Arkansas is lagging behind other States in the prevalence of venture capital investment. In a similar situation, Oklahoma created the Oklahoma Center for Advancement of Science & Technology (OCAST) in 1987 in order to further economic progress through the development, transfer, and commercialization of technology.

The organization is self-critical and honest in its assessment of its performance in the previous decades. In fact, the 2021-2026 Science & Innovation Strategic Plan notes that: "While there are anecdotal success stories over the past three decades, OCAST

has been unable to lead the charge in creating large-scale high paying, high tech jobs for Oklahomans and in developing and commercializing research on a consistent and scalable basis.”



In this May 2021 report, the State of Oklahoma took a critical look at the problems OCAST has been facing and attempted to understand the root causes of these problems. The report found that venture capital in the State was and is severely lacking — and unfortunately, the picture is not much better for Arkansas.

The table below, from the National Science Foundation and Oklahoma’s 2021-2026 Science & Innovation Strategic Plan ([source](#)), demonstrates that while the U.S. State average is to have \$1,712 of VC funds dispersed per \$1 million of State GDP, Arkansas has only attracted \$343, which is roughly a fifth of the average.

Table 1: Average Venture Capital Disbursed per \$1 million of State GDP³

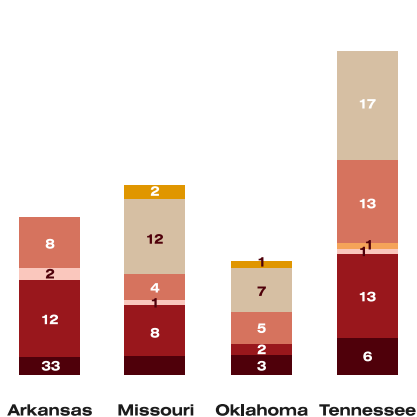
	1995-1999	2000-2009	2010-2018
Oklahoma	\$11	\$174	\$228
Arkansas	\$38	\$64	\$343
Kansas	\$26	\$230	\$526
Louisiana	\$99	\$69	\$395
Missouri	\$725	\$472	\$931
New Mexico	\$237	\$909	\$700
Texas	\$581	\$1,819	\$1,445
Oklahoma Rank	7 of 7	5 of 7	7 of 7
US Average	\$399	\$1,214	\$1,712

Source: National Science Foundation

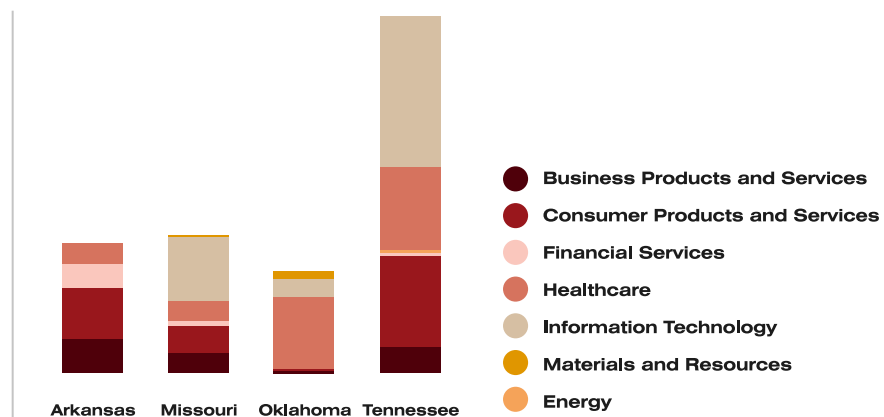
Oklahoma’s 2021-2026 Science & Innovation Strategic Plan ([source](#))

The University of Arkansas also put out a Capital Scan report in 2020 which includes detail and benchmarking on VC investment in Arkansas and peer States, including investment at the early seed and angel level. Angel investment is a critical leading indicator of innovation funding as this is the set of companies from which winners start to emerge and attract additional investment as they grow. Today, on both a deal count basis and dollars invested basis, Arkansas is not a leader among its peers.

Angel Investments (#) by Industry and Region



Angel Investments (\$) by Industry and Region



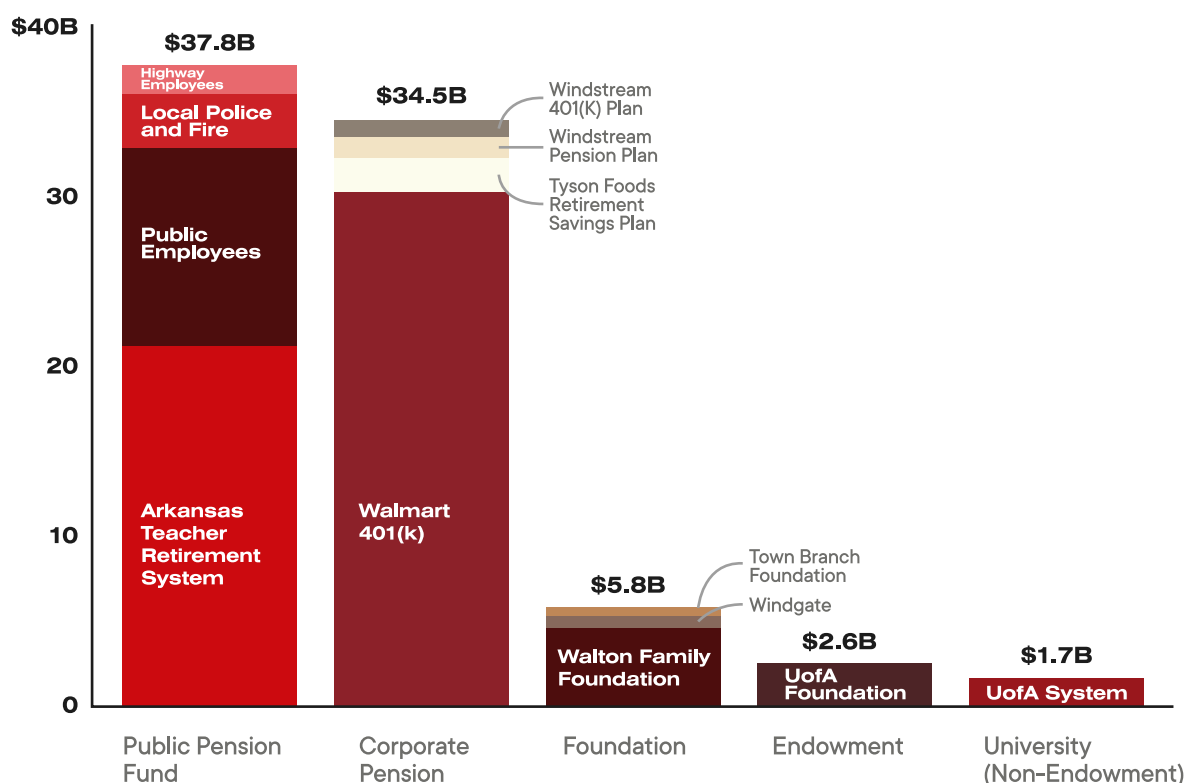
University of Arkansas 2020 Capital Scan ([source](#))

However, the Council believes that venture capital investment has the flywheel effect of drawing in and growing ideas, entrepreneurs, and infrastructure to best leverage that VC investment. This is what propelled Wichita to claim, build, and continue to retain the title of Air Capital of the World. The flywheel accelerates the talent attracted to the initial set of opportunities and they are inspired to go off and start their own companies — bringing further VC funding and perpetuating the growth of the ecosystem.

To see what's possible, just take as an example Louisiana's 470%+ growth from the 2000-2009 average of \$69 to \$395 per \$1 million in State GDP in 2010-2018. Similar growth applied to the Arkansas average of \$343 would imply \$1,961 in VC investment per \$1 million of State GDP in the new decade, which is well above the US national average. With State leadership in private investment — both through indirect support and by direct investment — the Council believes this picture can be vastly improved over the next decade.

At the broadest level, there is significant capital that resides inside Arkansas that could be directed towards investing into the State's own backyard. The below figure presents a breakdown of funds controlled by various stakeholders in the State.

Capital controlled by key Arkansas stakeholders (\$B)



Total = \$82.3B; total excluding Public Pension Fund = \$44.6B

Data source: Pitchbook

With \$82B in collective funds controlled by both public and private entities in the State,



THE COUNCIL RECOMMENDS

that Arkansas based funds, pensions, foundations, and endowments, explore establishing a specific private equity allocation towards making direct investments in the Arkansas technology ecosystem and consider using other instruments – including debt and convertibles – to reduce risks and provide access to capital.

In addition, similar to the example of what has been done in Israel, the Council recommends the creation of the Arkansas Innovation Fund (AIF) to invest in emerging companies. The Council believes a target fund size of \$250 million, with \$125 million to be funded from the government surplus and the other \$125 million to be funded as a dollar-for-dollar match from the State controlled pensions and/or from the balance sheets of the largest companies in the State. This fund should focus on investing in tech companies that are in Arkansas, especially in emerging technology and advanced mobility. To maximize the impact of this fund, the Council recommends the creation of a formal investment committee to steer the funds, with a professional manager who has nexus in Arkansas. Lessons should be learned from the successes of the Israeli Innovation Authority in how best to implement such a vehicle.

Sovereign Wealth Fund



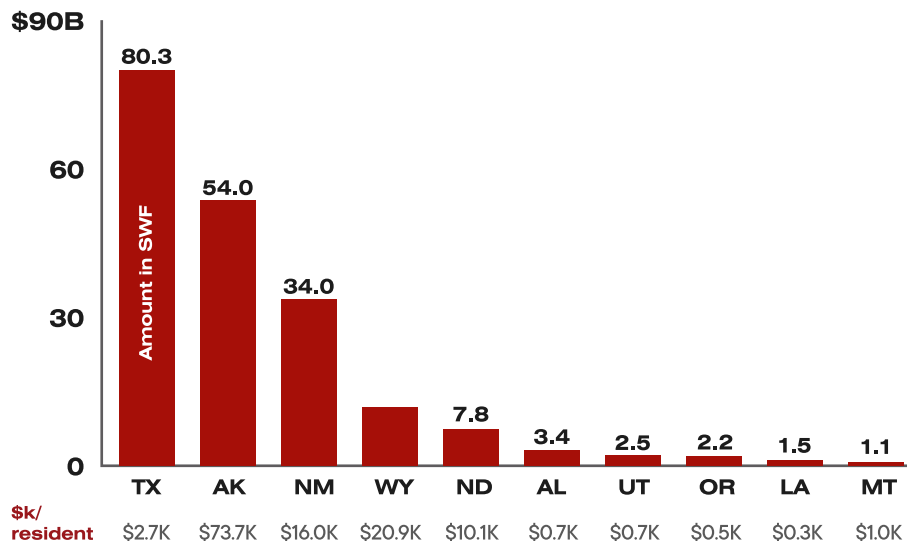
Sovereign Wealth Funds, which are State-owned investment funds composed of money generated by the government, are controlled by sovereign nations, such as Singapore's GIC with \$690B in assets under management or the Abu Dhabi Investment Authority with \$790B in assets. However, several US States also have their own funds.

The State of North Dakota created the North Dakota Legacy Fund through a thirty percent tax on oil extraction and production. This fund was established by ballot initiative in 2010 and modeled after the Norwegian Sovereign Wealth Fund. The State Investment Board is responsible for investing the fund, which has a balance of about \$7.8B, or about \$10,000 for each of the 775,000 people in North Dakota ([source](#)). By law, the fund returns its earnings to the State's general fund every two years and has so far earned income of over \$2B for the State.

In addition to North Dakota, nine other States in the U.S. have created Sovereign Wealth Funds, largely from energy, commodities, and public lands. The names and sources of these funds are outlined below, as well as a comparison of the size of funds on an absolute and per-capita basis.

State	Funds	Origin
Texas	Permanent School Fund & Permanent University Fund	Commodity / Oil & Gas
Alaska	Alaska Permanent Fund	Oil
New Mexico	New Mexico State Investment Council Permanent Funds	Oil & Gas
Wyoming	Wyoming Permanent Land and Mineral Trust Funds	Minerals
North Dakota	North Dakota Legacy Fund	Oil & Gas
Alabama	Alabama Trust Fund	Oil & Gas
Utah	State School Fund	Public Lands
Oregon	Oregon Common School Fund	Public Lands
Louisiana	Louisiana Education Quality Trust Fund	Oil & Gas
Montana	Coal Severance Tax Trust Fund & Public School Trust	Fossil Fuels / Public Lands

Capital held in sovereign wealth funds by state (\$B)



THE COUNCIL RECOMMENDS

that the State setup a council to explore the creation of the Sovereign Wealth Fund.

The Council believes that this fund can be created as a one-time fund that will generate sufficient investment returns to keep the principal balance in perpetuity.

In addition to the Arkansas Innovation Fund (AIF), which would focus on investing in emerging companies, the creation of a Sovereign Wealth Fund for Arkansas would enrich the people of the State by allowing them to become stakeholders in their community's business success.



To allow the people of Arkansas, through their elected government, to share part in this future investment into mobility, Constitutional amendments have to be approved by the general electorate in a full election cycle. Proposed amendments

3.1	Engage more deeply with the Israel Innovation Authority, and Israel more broadly, to learn their best practices from the last 25 years and implement them in Arkansas
3.2	Council recommends that Arkansas based funds explore establishing a specific private equity allocation towards making direct investments in the Arkansas technology ecosystem and consider using other instruments – including debt and convertibles – to reduce risks and provide access to capital
3.3	Creation of the Arkansas Innovation Fund to invest in emerging companies
3.4	Set up a council to explore the creation of the Sovereign Wealth Fund



A photograph of two students working on a complex robotics project. The student in the foreground is a young man with dark hair, wearing a red and white striped shirt, focused on adjusting a component with a screwdriver. Behind him, a young woman with long blonde hair is also working on the same project. The project itself is a sophisticated assembly of metal beams, gears, and electronic components. In the background, other students are visible, suggesting a classroom or workshop setting. The entire image has a warm, reddish-orange tint.

SECTION 4

Workforce and Academic Development

Let's Get to Work

SECTION 4



Workforce and Academic Development

Any experienced venture capital investor maintains that it's the people most of all that make or break the success of any new project or company. The State's leadership in making capital available to budding and seasoned entrepreneurs will be the first necessary, but not sufficient, step to developing the advanced mobility economy in Arkansas. Educational opportunities and workforce development will be critical components of ensuring the residents in Arkansas can capitalize on all the opportunities presented in this report.

Establishing an Institute for Advanced Mobility

Programs at the collegiate level for any new set of technologies can serve as a center of gravity for a nascent industry. The most prominent example of this might be Stanford, whose community fueled the rise of Silicon Valley over the later part of the 20th century of the semiconductor and then early information age revolution in the earliest decades of the 21st century. One study estimated that the total economic impact of Stanford University's ecosystem is in the neighborhood of over 5 million jobs created and \$2.7T in revenue generated by associated companies ([source](#)).

Other examples of highly impactful workforce development and research drivers are the Georgia Tech Institute for Robotics and Intelligent Machines (IRIM) ([source](#)) and the Massachusetts Institute of Technology (MIT) Institute for Data, Systems, and Society (IDSS) ([source](#)). Georgia Tech's IRIM "breaks through disciplinary boundaries and allows for transformative research that transitions from theory to robustly deployed systems" through strategic and fundamental research programs. In addition, IRIM offers an interdisciplinary path to fully integrated, multidisciplinary academic programs that include both coursework and research with faculty members in various units across its campus. Last but not far from least, IRIM supports and facilitates the operation of multiple core research facilities, executes an Industry Affiliates Program that allows members to explore opportunities for research collaboration, facilities and services, consulting, and student hiring, and participates in numerous K-12 STEM and community outreach activities related to its mission. Similarly, MIT's Institute for Data, Systems, and Society advances education and research in state-of-the-art analytical methods and applies these methods to address complex societal challenges in a diverse set of areas related to data, systems, and society. MIT's IDSS spans all five MIT schools and offers graduate degree programs, an undergraduate minor, a micromasters program, and professional and online educational opportunities.

By creating a focused hub for activity in the field of advanced mobility that is rapidly growing in prominence, the University of Arkansas can inspire and educate students of all levels, host professors working on the most impactful research, and attract working professionals seeking to upskill in the specific areas of advanced mobility including next generation vehicles, unmanned aerial mobility, and artificial intelligence in smart mobility.

The Council believes that advanced mobility benefits from physical-world and colocation "network effects" that will draw people into the area. Even a field like computer science, which by definition can be largely researched online and on a computer, continues to concentrate in specific physical areas largely due to talent centers of gravity. One can imagine how much stronger the draw into the State would be in a field like advanced mobility, which requires real-world resources like manufacturing know-how and capability, infrastructure like airports and testing ground, and supportive local government that understands the importance of this development.

The University of Arkansas has an opportunity to be a fast follower of the GA Tech and MIT models to accelerate and sustain a world class research and education institution that specializes in advanced mobility.



THE COUNCIL RECOMMENDS

that the government and other stakeholders in Arkansas encourage the University of Arkansas to launch an Institute for Advanced Mobility.

There is tremendous opportunity to align university talent, new resources, and focused programs with workforce development needs, targeted research opportunities, and strategic asset acquisition to drive advanced mobility education and innovation in Arkansas. **To that end, the Council also recommends this new Institute for Advanced Mobility include focused degree and other workforce development programs around areas of advanced mobility, including UAS (Unmanned Aircraft Systems).**

AN EXAMPLE OF PHILANTHROPIC WORK IN EDUCATION:

University of Arkansas Walton Family Foundation Grants

The Council would be remiss without specifically acknowledging the work the Walton family has done in helping the University of Arkansas chart its path into the future. The Walton Family Charitable Support Foundation made a significant \$194.7 million grant to establish the University of Arkansas Institute for Integrative and Innovative Research. The Institute, known as I3R, is envisioned as a unique approach to research that will distinguish the University of Arkansas by creating a flexible, State-of-the-art collaborative framework designed to facilitate the integration of research across five overlapping clusters of innovation including data science, food and technology, materials science, bioscience, and integrative systems neuroscience ([source](#)).

Another key contribution the Walton Family Charitable Support Foundation has made specifically in the field of smart mobility and education is a \$412,000 planning grant to support the development of the University of Arkansas's roadmap for smart mobility initiatives ([source](#)). Specifically targeted areas of innovation include next-generation vehicles, unmanned aerial mobility, and artificial intelligence for smart mobility. This grant will be a key enabler in charting the path forward for the University of Arkansas to lead in this domain and both the Council on Future Mobility and the State's citizens are appreciative of the Walton family for this forward-looking gift.

Leveraging Local Research Expertise: An Electrification Center of Excellence

In addition to starting up new programs, the Council recommends that the State find ways to best leverage the groundbreaking research that the University of Arkansas is already host to and harness the massive economic impact potential it holds.

One specific example of this is the work done by the University of Arkansas' electrical engineering professor Alan Mantooth. Dr. Mantooth, who has been with the university for 24 years, leads the UA Power Group, which currently consists of 16 faculty across four departments and two colleges. The UA Power Group supports over 100 graduate students through externally-funded research from the National Science Foundation, the U.S. Department of Energy, the Department of Defense, and industry collaborators. Under Dr. Mantooth's direction, four startup companies have emerged from the UA Power Group in the past 20 years — with one being acquired in 2015 and currently employing over 75 people in the Arkansas Research and Technology Park (ARTP). Another startup which emerged from the UA Power Group is still growing at ARTP with over 20 employees is about to release its first products. This is the sort of real world impact that lies within universities when their economic potential is successfully tapped.

To explain how this has been accomplished with the UA Power Group, today it is organized to include unique core facilities and federally-funded centers of excellence. These include the GRId-connected Advanced Power Electronic Systems (GRAPES), the Center for Power Optimization of Electro-Thermal Systems (POETS), and the Cybersecurity Center for Secure Evolvable Energy Delivery Systems (SEEDS). The economic impact of the work being done in these groups has been estimated by one power electronics expert to be in the neighborhood of \$200 million annually ([source](#)). Furthermore, the UA Power Group collaborates with a substantial number of mobility companies ranging from OEMs to Tier 1 and component suppliers.



The impact and reach of this critical work being done in Arkansas is only set to expand greatly. In April 2022, Alan Mantooth presented a new Multi-User Silicon Carbide Research and Fabrication Facility (MUSiC) to the Arkansas Legislative Council. This facility has already received nearly \$19 million from the NSF and \$10 million from the Army Research Laboratory to acquire the equipment that the facility will need.

As Dr. Mantooth put it, while the United States was the pioneer that invented circuits and technologies, we are no longer as well positioned as we once were to stay at the leading edge of this field; currently, only one in five semiconductors is produced in the U.S. ([source](#)). But now, a new generation of semiconductor technology is in development — one with critical advantages over traditional silicon processors, especially in advanced mobility applications. In his presentation, Dr. Mantooth explained that while traditional silicon semiconductors are used in many areas, they cannot be used in high-temperature applications, as silicon carbide is heat resistant beyond 500 degrees Celsius. However, the next generation of silicon carbide semiconductors solve some of these problems, and today are being used in hybrid electric bulldozers, which reduce fuel costs by 25 percent and help with employee physical health, as the machinery is easier to operate. Additionally, the Federal Aviation Administration is currently qualifying a U of A designed and built electric drive that contains silicon carbide semiconductors for Ampaire, which is producing twin engine hybrid planes.

Given the economic benefit that research can have when its potential is fully tapped,



THE COUNCIL RECOMMENDS

that Arkansas play a role in partnering with the UA Power Group and the MUSiC facility to support and grow opportunities in the State's advanced mobility startup ecosystem.

Proactively Recruit Arkansan Technologists to Return Home

People tend to have an innate inclination to return to the place they're from. Unfortunately, sometimes this intrinsic love of place must be balanced with the human desire to seek out opportunity. Today, many of the most innovative Arkansan entrepreneurs are building their companies outside the State. As the State continues its push to become a more desirable place to build impactful technology businesses, it should put in place a strategy to proactively recruit Arkansas' born and bred technologists to return home.

Other elements proposed in this report are meant to promote awareness of the State's initiatives. In addition to this, the Council recommends going a step further by identifying and targeting specific individuals for direct outreach by the State. An executive search firm should be retained to conduct research and identify a list of 100 or more Arkansas-native "All-Stars" residing outside the State who have demonstrated the knowledge, skill, and courage to lead innovative teams in building technology-enabled products and services. The executive search firm can help with establishing contact with these individuals to arrange conversations with the State during which the Governor and the AEDC can build relationships, share information about the programs being designed to help entrepreneurs build new businesses in Arkansas, and encourage these all-stars to re-engage with their home State.

Arkansas Center of Excellence for Aerospace, Defense and Future Mobility

Aerospace and Defense (A&D) is a mainstay to the economy of Arkansas. It is the State's top export, supported by more than 14,000 employees and nearly 200 companies — including global leaders like Lockheed Martin, Raytheon, Aerojet Rocketdyne, and more. It is also a perfect incubator for Arkansas' growing future mobility industry.

Arkansas' in-place A&D economy is laser-focused on becoming a hub for emerging transportation technologies such as future mobility. But like all sectors, it must overcome a persistent barrier to continued growth: workforce recruitment, readiness, and retention.

The race to secure and maintain talent is a steep challenge, especially with the present record-low labor force participation. Fortunately, the A&D industry has a leg up on the competition. Currently, it boasts average wages above \$100,000, which is 41% higher than the comparable national average. However, it also has a steadily aging employee base and needs accelerated attention.



To meet these challenges, the A&D industry and the State's higher education system should foster existing collaborative relationships to attract and develop new workers. These strengthened and focused partnerships will create a talent pipeline between highly-motivated candidates and the industry that awaits them after graduation.

The Council proposes the creation of a Center of Excellence (COE) for Aerospace, Defense, and Advanced Mobility, which will serve as a broker between the education sector and the mobility industry to bring more job opportunities to Arkansas and ensure a ready A&D workforce. In addition, higher education and industry will develop a Statewide curriculum with tailored education and training in the three focus areas of aerospace, defense, and advanced mobility. Southern Arkansas University Tech (SAU Tech) is already doing excellent work to strengthen training and education tailored to the defense industry. The addition of a Center of Excellence will expand efforts like that of SAU Tech to encompass participating schools in Arkansas with a focus on aerospace and future mobility workforce training and education.

The COE should focus on the following:

- Streamlining the State's A&D educational system, encouraging Arkansans to consider career opportunities in the A&D and advanced mobility fields, thus bolstering the connectivity between active duty, guard and reserves, and employers.
- Promoting the State's workforce to outside employers to encourage future job growth.
- Reinforcing Arkansas as a global leader in A&D and advanced mobility.
- In partnership with the Career Education and Workforce Development Board, the Arkansas Center of Excellence on Aerospace, Defense, and Advanced Mobility will develop a plan to align the State's workforce education with current and future career opportunities.

Legislation creating a State-wide COE will leverage private and public sector resources and target federal grant opportunities to participating COE entities. The COE will consolidate, strengthen, and market Arkansas as the State for aerospace, defense, and advanced mobility industries.

K-12 + Community Colleges: Recommendations to Prepare the Next Generation to Develop Advanced Mobility in Arkansas

The Council strongly believes that the education — and, critically — the inspiration of children throughout their development is crucial for preparing them to be leaders and entrepreneurs in a rapidly changing future. The Council believes that the State of Arkansas must give students the tools and vision to take part in this new economy — whether they go on to study in a university, follow another educational pathway, or decide to make a direct impact in the workforce and/or with post-secondary education.

There is a vital need for STEM workforce development, and the future mobility sector will demand a significant focus on the fields of engineering, computer science, robotics, data science, artificial intelligence/machine learning, cybersecurity, programming, and software development. The U.S. Bureau of Labor Statistics projects that STEM occupations will increase at a rate more than twice that of non-STEM occupations over the next decade.

Employment in STEM occupations, 2021 and projected 2031
(Numbers in thousands)

Occupation category	Employment 2021	Employment 2031	Employment change, 2021-31	Percent employment change, 2021-31	Median annual wage, 2021 ⁽¹⁾
Total, all occupations	158,134.7	166,452.1	8,317.4	5.3	\$45,760
STEM occupations ⁽²⁾	9,880.2	10,944.2	1,064.0	10.8	\$95,420
Non-STEM occupations	148,254.5	155,508.0	7,253.5	4.9	\$40,120

⁽¹⁾ Data are from the Occupational Employment and Wage Statistics program, U.S. Bureau of Labor Statistics. Wage data cover non-farm wage and salary workers and do not cover the self-employed, owners and partners in unincorporated firms, or household workers.

⁽²⁾ Science, technology, engineering, and math (STEM) occupations include computer and mathematical, architecture and engineering, and life and physical science occupations, as well as managerial and postsecondary teaching occupations related to these functional areas and sales occupations requiring scientific or technical knowledge at the postsecondary level.

Source: Employment Projections program, U.S. Bureau of Labor Statistics

In order to make sure there are multiple pathways into STEM careers, the Council on Future Mobility has developed the following set of K-12 + Community College recommendations as part of a larger comprehensive plan to expand STEM education and workforce development in the State of Arkansas.



Governor Hutchinson already counts “leading the nation in computer science” among his highest priorities ([source](#)).

K-12 + CC Recommendation 1: Establish a STEM Education and Workforce Development department, division, or Council through the governor’s office with dedicated funding and staff committed to unite stakeholder efforts across sectors.

- [Design and Modeling](#)
- [Automation and Robotics](#)

K-12 + CC Recommendation 2: Build a strong foundation in mathematics and science required for success in STEM by supporting and expanding existing DESE initiatives to improve STEM teaching and learning.

“Traditionally, training for careers in science, technology, engineering, and math (STEM) has focused on college students. But if our goal is to encourage more students to pursue STEM-related careers, research shows that STEM career training should start much earlier — ideally in middle school.” Alex Cohen, [5 Reasons Why STEM Career Training Should Start in Middle School](#)

According to the Science and Engineering Indicators from the National Science Board by the National Center for Science and Engineering Statistics, “Elementary and secondary education in mathematics and science is the foundation for student entry into postsecondary STEM majors as well as a wide variety of STEM-related occupations” ([source](#)).

K-12 + CC Recommendation 3: Provide teacher stipends for high need STEM content areas of secondary mathematics, secondary science, and computer science, as well as scholarship incentives to major in these fields.

The U.S. Department of Education has identified the STEM content areas of secondary mathematics, secondary science, and computer science as teacher shortage areas ([source](#)).

K-12 + CC Recommendation 4: Provide middle school funding for [Project Lead the Way \(PLTW\)](#) Gateway courses to spark interest in STEM learning and careers.

K-12 + CC Recommendation 5: Increase investments in two-year college curricula.

Recruiting and retaining faculty is a struggle and the State is missing out on opportunities to improve the most evolutionary unit of higher education — the faculty — who can pivot on a dime to address workforce needs. Much is being directed in the K-12 arena and this should extend to faculty at two-year colleges, as the need for training is going to be enormous — especially in rural areas and at institutions with a large student body of first-generation students and/or students of diversity. The sharing of faculty and resources between community colleges and K-12 institutions should be encouraged.

K-12 + CC Recommendation 6: Ensure high school students have access to at least one of these high school [Computer Science](#) three-year Pathways: [Artificial Intelligence and Machine Learning](#), [Computer Engineering](#), [Cybersecurity](#), [Data Science](#), [Networking](#), [Programming](#), and [Robotics](#).



Robust, three-year programs of study are established for high school computer science, but many students only have access to one computer science course, as required by current legislation. [The Computer Science Education Advancement Act of 2021 - Act 414 of the 93rd General Assembly](#) (Act 414), was signed into law on March 23, 2021. This legislation is an extension of Act 187 of 2015, which established the requirement that every high school must make a computer science course available to students. Act 414 created the following additional legislative requirements:

- Every student, beginning with the 9th grade class of 2022-2023, must earn one full high school computer science credit to graduate,
- At least four computer science courses will be approved by ADE for instruction to 8th grade students (in addition to 9-12 students),
- Digital course content aligned to State standards will be made available to schools, and
- Each high school must employ a computer science certified teacher by the 2023-2024 school year.

Although only one course is required, to prepare the STEM workforce needed for the future of mobility, a comprehensive three-year program of study would be advantageous. [Virtual AR](#) offers Programming and Cybersecurity pathways for schools who may lack the capacity to offer a 3-year pathway.

Additionally, Arkansas will not progress in this area or grow economically if the State ignores the role of two-year colleges in education infrastructure investment made in students. Between traditional and non-traditional students, these programs are housed at the majority of the two-year colleges across the State and are access points for investment and education expansion.

The State needs to further explore recognition and promotion of these programs. The State has to give validity to these programs and population through increased funds, coverage, and support.

K-12 + CC Recommendation 7: Provide competitive grant funding for K-12 FIRST robotics programs, similar to what has been done by Michigan ([source](#)).

FIRST is a not-for-profit organization with a mission to inspire and excite young people to build their science, engineering and technology skills through cooperative robotics championships. FIRST has three programs that span the K-12 continuum:

1. FIRST Lego League ®
2. FIRST Tech Challenge ®
3. FIRST Robotics Competition ®

A Ford Foundation funded study by Brandeis University demonstrated that compared to their matched peers, FIRST Alumni are:

- 50% more likely to attend college
- 9x more likely to have an internship in freshman year
- 4x more likely to pursue a career in engineering
- 2.5x more likely to volunteer in the community
- Female alumni are 4x more likely to pursue technology & engineering majors in college
- For all FIRST program impact studies please refer to additional data [here](#).

The illustrated tangible benefits, including the impact to minority groups, support sustained funding for this program.

K-12 + CC Recommendation 8: Expand high school student access to DCTE Engineering and Technology Unmanned Aerial Systems Program of Study (in conjunction with AOPA plans).

- [UAS I](#)
- [UAS II](#)
- [UAS III](#)
- [UAS Flex](#)

K-12 + CC Recommendation 9: Expand high school student access to DCTE Engineering and Technology Pre-Engineering Program of Study and partner with the State's two year colleges that have curricula in each of the areas of focus below.

- Project Lead the Way
 - [Introduction to Engineering](#)
 - [Principles of Engineering](#)
 - [Aerospace Engineering](#)
 - [Engineering Design and Development](#)
- Pre-Engineering Curriculum Agnostic
 - [Engineering I](#)
 - [Engineering II](#)
 - [Engineering III](#)

K-12 + CC Recommendation 10: Create a high school CTE EV (and/or AV Tech) Program of Study and align to community college certificate program(s). (Existing Electronics or Industrial Technologies courses may serve well for this program of study.)

- Year 1: Electronics I (494800), Credit: 1, Grade Levels: 9-12
- Electronics I is an applied course in the manufacturing cluster for students interested in learning more about careers as an electronic technician, maintenance technician, electromechanical technician, and manufacturing engineer. This course covers basic electrical and mechanical components of electronic systems with instrument controls and embedded software designs.



- Year 2: Electronics II (494820), Credit: 1, Grade Levels: 9-12
- Electronics II is a multi-disciplinary study to develop specialized and highly trained technicians dealing with the integration of mechanical devices, actuators, sensors, intelligent controllers and computers.
- Year 3: Electronics Lab (494810), Credit: 1, Grade Levels: 9-12
- Simulated experiences of theory-based content from courses 494800 and 494820. (Using EV Tech simulations)

OR

Year 1: Industrial Technologies I, (495150), Credit: 1. Grade Levels: 9-12

This is an intermediate level course to prepare students for electronics, manufacturing, and technical programs designed to develop skilled installation, maintenance and repair technicians in cross-disciplinary systems.

Year 2: Industrial Technologies II, (495170), Credit: 1, Grade Levels: 10-12

The student will be trained to perform a variety of advanced troubleshooting and diagnostic skills to aid in the repair, installation, fabrication, set up, adjustment, of industrial machinery and equipment. This course is designed to ease the transition into a post-secondary program or entry level employment.

Year 3: Industrial Equipment Technologies Lab (495160), Credit: 1. Grade Levels: 9-12

This production-based program is designed to allow for the development of skills and knowledge needed to execute comprehensive industrial equipment maintenance.

K-12 + CC Recommendation 11: Promote EV Tech Registered Apprenticeship and make the high school EV Tech program an aligned pre-apprenticeship. (EV Tech RA

currently under development by Bill Allison at National Park in collaboration with the Office of Skills Development, pending approval from U.S. DOL).

K-12 + CC Recommendation 12: Create regional hubs for high school cyber/drones/robotics programs (NW, NE, SW, SE, and Central) in partnership with secondary career centers and community colleges. (Similar to the <https://www.neisd.net/icsi> model)

K-12 + CC Recommendation 13: Provide business/industry incentives for Career Practicum and Internship opportunities, including virtual options for rural areas lacking economic opportunity.

K-12 + CC Recommendation 14: Provide funding for Arkansas Center for Data Sciences to expand IT Registered Apprenticeships aligned to mobility workforce needs, including cybersecurity.

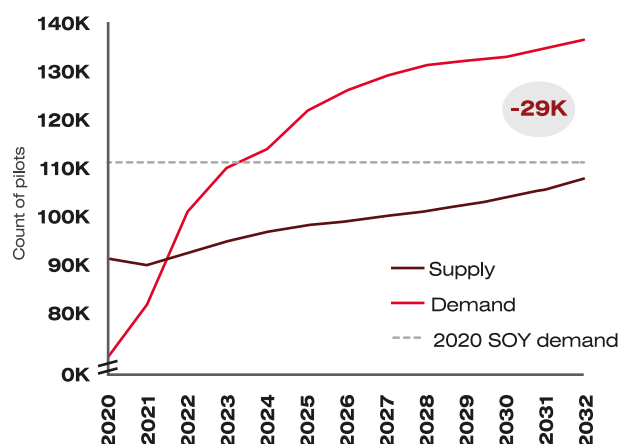
K-12 + CC Recommendation 15: Provide funding for K-12 STEM educator paid summer internships like <https://ualr.edu/strive/>.

K-12 + CC Recommendation 16: Education to ameliorate the ongoing and accelerating massive pilot shortage.

One key field of education in which the State of Arkansas should consider investment in order to be a leader in advanced mobility is pilot training. The world right now is experiencing an acute shortage of pilots, which is only projected to grow far worse in the coming years.

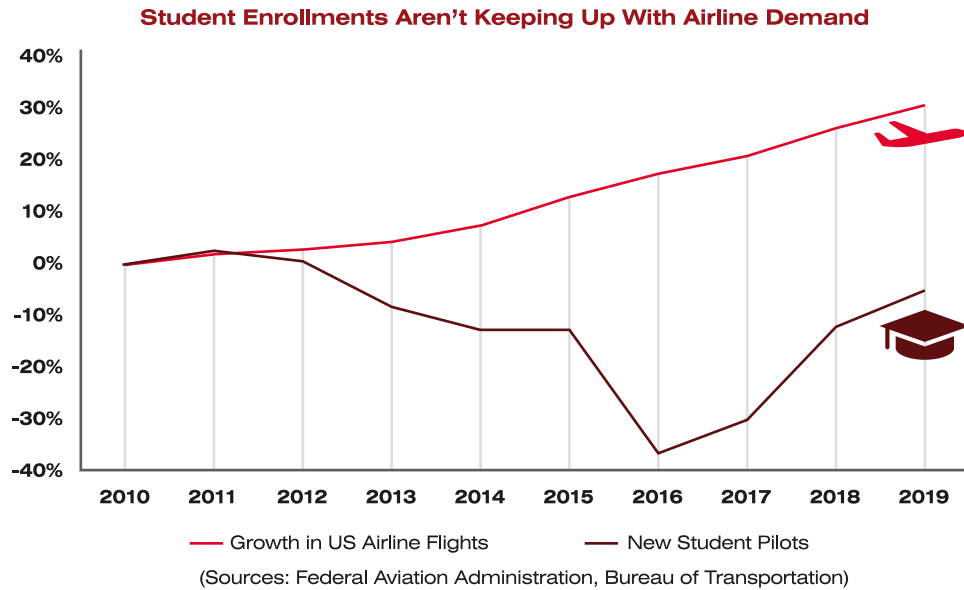
Pilot demand versus supply: North America

2020-2032, end of year



Source: Marsh McLennan

A significant driver of this problem is that aviation student enrollments haven't been keeping up with airline demand for years.



Source: FlexAir

As a part of its global leadership in mobility, Arkansas has the opportunity to serve the world as a training ground for the sorely needed aviators. After all, what good are next-generation aircraft and eVTOLs if they are stuck on the ground, pilotless? The Council recommends that Arkansas find ways to invest in both inspiring children to become aviators and in creating more student pilot education opportunities by partnering with related organizations.

K-12 Recommendation 17: Provide support for groups like the AOPA Foundation *You Can Fly* initiative to create local chapters across Arkansas (<https://youcanfly.aopa.org/>)

K-12 Recommendation 18: Help the Arkansas Department of Career Education to support programs like the Ignite Professional Studies program, which is already in effect in the Bentonville School District; this program provides high school students the opportunity to earn a certificate as a Uncrewed Aviation Systems (UAS) pilot, setting them up with the technical skills and job readiness for a job with UAS companies operating in Arkansas ([source](#)).

K-12 Recommendation 19: Similar to the current pilot shortage, there is an equally challenging aircraft technician shortage. There are currently four airframe and powerplant training schools in the State, but the largest struggle is getting students educated about the schools, as the K-12 system pushes heavily away from these sort of trade schools post graduation. **The Council recommends incentivizing career and technical education and/or the promotion of career and technical education at the K-12 level matriculating to community college to advance their skill set in these areas.**

K-12 Recommendation 20: A final recommendation in the education and workforce development area is a **general media campaign regarding the adoption of these initiatives** to increase public awareness of the opportunities in the mobility sector that are emerging in Arkansas at all levels. This provides messaging that can permeate the general population in a variety of ways — particularly in partnership with mobility-centric companies. Through this storytelling method, children in Arkansas can become part of this talent pipeline with encouragement from their families, friends, and teachers.

4.1	Encourage the University of Arkansas to launch an Institute for Advanced Mobility
4.2	Have the State of Arkansas play a role in partnering with the UA Power Group and the MUSiC facility to support and grow opportunities in the State's advanced mobility startup ecosystem.
4.3	Legislation creating a State-wide Center of Excellence to leverage private and public sector resources and target federal grant opportunities to participating COE entities
4.4	Implement the 20 listed K-12 recommendations as part of a larger comprehensive plan to expand STEM education and workforce development in the State of Arkansas





SECTION 5

Organizational Infrastructure

The Playbook

SECTION 5

Organizational Infrastructure



Over the last few decades, the modern global transportation network has grown increasingly complex and interconnected — and so too has the network of government organizations and policy makers that help it all run smoothly.

Our mobility system will change more in the next decade than it has in the last century. Not only are these changes happening fast, but they will have immediate impacts in almost every corner of the State government.

For Arkansas to become a leader in Advanced Mobility, the State must act now with a comprehensive strategy and surgical execution. If it does, Arkansas can leverage its unique competitive advantages to create an environment that drives investment and fosters innovation, talent, and entrepreneurship.

Achieving these goals will require a concerted, coordinated, and sustained effort across numerous departments and agencies of the State government, as well as productive partnerships with stakeholders in the public and private sectors. Therefore it's critical to establish a highly qualified government office that will focus efforts on advanced mobility, with the mission to ultimately strengthen the State's economic and workforce development.

To identify best practices, the Council examined the organizational structure of similar mobility-focused government agencies in Ohio, Oklahoma, & Michigan. A summary of each agency's leadership, oversight, output, and funding can be found in the Appendix.

After evaluating several comparable organizational structures,



THE COUNCIL RECOMMENDS

the Governor elevate or create a dedicated position as Director of Science & Technology to leverage federal funding for innovation, have staff dedicated to advanced mobility and ultimately grow and diversify the state's economy through mobility-focused technology development, transfer, and commercialization.

Additional options to consider:

1. Codify a Director-level position in the Governor's Office
2. Elevate existing AEDC Division of Science & Technology Director to report directly to the Secretary of Commerce.

The Governor should establish clear and discrete goals for the Division Director, which should serve as the focal point of all State activity in the pursuit and support of advanced mobility, with the underlying mission being to drive long-term economic growth for the State of Arkansas.

Finally,



THE COUNCIL RECOMMENDS

that the Governor appoint a non-government industry expert as "Chief Futurist" that also reports to the Governor.

Together with the Director, the two leaders should staff out boards which represent the interests of local government and local business, respectively. The division should recommend policy changes to the Governor that support the mission outlined upon its creation.

One of the first suggested calls to action for the future Director of Science and Technology is to retain the services of a professional firm to help create a strategic plan for the future office. For example, the State recently partnered with an American industrial engineering firm to assist in the creation of the State electric vehicle infrastructure plan (source), which has been nationally recognized as one of the most comprehensive and thoughtful plans.

-
- 5.1** Elevate or create a dedicated position as Director of Science and Technology
 - 5.2** Appoint a non-government industry expert as "Chief Futurist" of the State



SECTION 6

Events, Community, and Storytelling

Keeping the Drumbeat Going

SECTION 4

Events, Community, and Storytelling



Communication and direct engagement are key pillars of a thriving advanced mobility ecosystem. Activating opportunities for consistent collaboration and network building throughout Arkansas will continue to be an essential element for expediting ecosystem-building, local buy-in and public adoption. Public community forums, conferences and collaborative events that generate buzzworthy news create a platform for stakeholder engagement, education about the advantages of emerging technologies, and an opportunity to generate advocacy.

This past year, Arkansas hosted and participated in several notable events, including:

UP.Summit & UP.Community Day



The UP.Summit, hosted in Bentonville, AR, brought over 250 global leaders together over three days to discuss and demonstrate the future of mobility. Leaders of the most impactful companies moving people and goods gather at the summit each year with the goal of making mobility cleaner, faster, safer, and at lower-cost — on the ground, in the air, on the sea, and in space.

Founded in 2017, the UP.Summit is jointly organized by UP.Partners, Tom and Steuart Walton, and Ross Perot Jr. The event offers a window into the future of transportation and mobility, featuring innovators participating in deeply-engaging conversations, mind-bending technological demonstrations, and relationship-building adventures.

Event recap by the numbers:

- \$1T worth of investable capital in attendance
- \$60M worth of earned media, 999 articles on the event
- 3000 people at community day

- 300 flight operations, 75 aircraft, 3 airshows
- 30 vehicles on display
- 250 VIP guests, 50 speakers, with 40 countries represented
- 20 press releases/announcements
- 1 goal: “Transform the Moving World”

Prior to the UP.Summit, Runway hosted the inaugural “UP. Community Day” at Thaden Field, opening tech demos to 3,000+ members of the public to see firsthand next-generation vehicles, interactive technology, demonstrations, and more.

During the event, Bentonville Mayor Stephanie Orman proclaimed June 5 Future Mobility Day, sharing excitement for the “opportunity to highlight the investment in technology and innovation to our area as we build the foundation for continued and long-term growth around all areas of future mobility — on the ground, air, sea, and space” ([source](#)).

HEARTLAND SUMMIT

MEET IN THE MIDDLE



Heartland Summit

In May 2022, more than 350 of the nation's leading thinkers, innovators and investors gathered in Bentonville, Ark. for the Heartland Summit to bring 21st century ideas to the Heartland. Among the many topics, advanced mobility was a highlighting theme featuring thought-provoking conversations and showcasing emerging technology demonstrations.

"Arkansas has always led in transportation," said Arkansas Gov. Asa Hutchinson. "We've got entrepreneurs here. We've got logistics experts. If we continue to lead, which we intend to do, what you are seeing will be [Arkansas'] future."

Steuart Walton, co-founder of Runway Group, stated that the region was "poised to become a hub for some of these technologies to be tested, scaled, and ultimately successful over the next 10 to 20 years."

The objective of the summit is to collectively elevate local and regional economies and promote action by convening decision-makers and influencers playing a role in the success stories of thriving areas of America's heartland.



FreightWaves: The Future of Supply Chain

In May, FreightWaves — a trusted provider of global supply chain market intelligence — hosted a new experiential conference in Rogers, Arkansas. This conference brought together the greatest minds in transportation, logistics, and supply chain industries to share insights, predict future trends and showcase emerging technology at The Future of Supply Chain. The conference highlighted speakers ranging from the Governor of Arkansas to c-suite executives from J.B. Hunt, Trucker Tools, TriumphPay, Gatik, Uber Freight, HP, ArcBest, and many more.

The two-day summit brought over 1,400 vendors and companies and featured a fireside chat titled “Northwest Arkansas: Creating the Silicon Valley of Transportation and Logistics.”

“Even though there are dramatic changes going on in the buying and selling of goods, I think the most dramatic transformation is about what is going on in the moving of goods,” [Steuart] Walton said.

“There really isn’t a region in the world that moves more things than this region,” said [Cyrus] Sigari. “If you take the average center mass of all the humans in the United States, it is almost right on top of Bentonville. It also speaks to the story of why Walmart was perhaps so successful; it was in this perfect nexus where you can get to the entire country with relative ease.”
([source](#))



Mid America Aerospace and Defense Summit

In June, the Arkansas Aerospace and Defense Alliance, a trade association of public and private aerospace companies, government agencies, and educational institutions, hosted the annual Mid America Aerospace and Defense Summit in Rogers, Arkansas. Hundreds of companies from across the U.S. convened to meet and grow their businesses. Companies participated in B2B meetings, showcased new technologies on the exhibit floor and heard from a number of speakers on topics such as cybersecurity and the outlook for growth in the commercial aviation sector. With a keynote address from Governor Asa Hutchinson, the Summit was focused on how Arkansas can capitalize on early investment in future mobility.

“The commercial and defense industry impacts of AAM cannot be ignored and the market is pushing for thoughtful and rapid deployment,” said Chad Causey, Executive Director, Arkansas Aerospace & Defense Alliance (AADA). “With a highly skilled aerospace and defense workforce and a burgeoning entrepreneurial spirit, Arkansas can and will capitalize on this future growth. AAM is a natural fit for the Natural State. Arkansas’ aerospace and defense industries appreciate Governor Hutchinson’s leadership on this issue.”



Farnborough International Air Show (FIA)

The Farnborough Air Show is an international trade exhibition for the aerospace, defense, and advanced air mobility industries. The 2022 show boasted 1,500 exhibits from 48 countries, 80,000 visitors from 96 countries and \$192 billion in deals.

This year's theme at FIA, "Pioneers of Tomorrow," set the stage for the future of flight and advanced mobility — an area that Arkansas is uniquely positioned to lead. A delegation from Arkansas included the Governor, World Trade Center, Secretary of Commerce, Runway, and industry representatives.

Many were surprised to learn that aircraft and related services are the State's top export, with over \$1 billion in goods exported making up 20% of Arkansas' total exports ([source](#)). Trade shows like FIA provide a collaborative platform to promote the State's leadership in the future of aerospace and defense and explore new business targets and industry trends. For Arkansas, this is an opportunity to promote the State as a hub for talent, technology, and innovation in aerospace and advanced air mobility.

STORYTELLING

Arkansas' Moment



As described in this report, every aspect of the mobility sector is experiencing momentous growth and change. The opportunity for Arkansas to take the lead in driving this revolution forward is here, and the time is now. The State is fortunate to boast many advantages over others: urban-rural airspace, a strong aerospace legacy, logistics and retail industries, a robust manufacturing workforce, university research, and military facilities. Yet, if nobody knows about these advantages or the positive impacts of the State government's mobility initiatives, then the public won't know why they should care. For Arkansas to reach its full potential as a future mobility leader, it must obtain the widespread public support of the State.

This is the moment for Arkansas to create its own story and establish itself as a national and global leader in the sector. To do this, the State needs to work together to formalize what Arkansas' mobility sector stands for, why it exists, who it caters to, and how it benefits the State and beyond. Arkansas must develop a compelling brand and craft a meaningful narrative that positions Arkansas at the forefront of advanced mobility.

The Value of Storytelling

The term "brand" isn't simply associated with goods and services: it also includes locations and experiences and how they're marketed to audiences to create relevance and preference. A brand is an asset that represents the sum total of all the associations that influence this preference — and it must be carefully developed and managed. Much like products and services, geographical areas like cities, States, and countries are known for their brands. They've become synonymous with specific, unique experiences and expertise: Silicon Valley (tech), New York (finance), Tel Aviv (startups), Singapore (global business), Las Vegas (good times) and the list goes on.

A strong brand has a clear point-of-view on the world and a set of values it stands by. It demonstrates that the organization (or location) has a meaningful role to play in people's lives; a noble purpose that is built from its beliefs, grounded in its strengths, and driven by a vision of how it can create a better world. It's this purpose that moves the organization forward and which attracts like-minded people and businesses. In the case of a location, the difference between a relevant, well defined, easily understood brand and a weaker, less differentiated brand can have a significant impact on investment attractiveness, talent and corporate migration, education programming, innovation velocity, public confidence and social unity. These are particularly relevant for the State of Arkansas and what it aims to achieve through this new mobility initiative.

A close-up photograph of a typewriter. The words "Stories matter" are typed in a dark, serif font on a piece of white paper. The typewriter's keyboard, with its green and red keys, is visible in the foreground, partially obscuring the bottom of the paper. The lighting is soft, highlighting the texture of the paper and the metallic parts of the typewriter.

Stories matter

When it comes to promoting the brand, creating a compelling narrative is essential. Storytelling has been a cornerstone of human development from the moment we began communicating with one another. It connects us with powerful emotions and taps into our deeply ingrained wants, needs, desires, hopes, and fears. Stories also have the incredible ability to condense complex ideas into something understandable and relatable. They allow us to make sense of the world we live in, teach us valuable lessons, and inspire new thinking.



THE COUNCIL RECOMMENDS

that the State retain a branding and storytelling consultancy to help ensure the State implements the following best-practices:

- Define Arkansas' ambition and establish measurable success metrics.
- Understand the desired audiences, their behaviors, and what motivates them.
- Develop a relevant, compelling, and differentiated mobility brand for Arkansas.
- Create an Arkansas mobility story and demonstrate how it will integrate across mediums.
- Design owned assets, including a brand website, press releases, social media pages, and initial social posts.
- Build a communications plan that brings the brand story to the market through owned channels (e.g. website, PR, social media).
- Deploy, measure, report on, and improve the performance of the in-market plan.

The Council recommends a budget of \$500,000 to achieve the above and approximates that it will take 10-12 months to complete all the activities. Future consideration and additional budget should be reserved for paid media initiatives, which will be essential to drive national and global awareness of Arkansas as an advanced mobility leader.

6.1

State to retain a branding and storytelling consultancy to help ensure the State implements storytelling and communication best-practices



A long-exposure photograph of a city skyline at dusk. The sky is a mix of deep blue and purple. In the background, several skyscrapers are lit up, their lights reflecting in the water. A large bridge with a complex steel truss structure spans the water. The bridge's lights and the city's lights create a series of horizontal streaks in the water, indicating a long exposure. The overall mood is serene and urban.

SECTION 7

Cross-State Initiatives

Rising Tides Lifts All Boats

SECTION 7

Cross-State Initiatives



As history continues to demonstrate, the impact of transportation knows no borders. Our nation's most visionary infrastructure undertakings, by definition, span coast to coast. These momentous projects required wide-reaching interstate collaboration, and as a result, have unlocked economic impacts which are just as wide-reaching.

The interstate highway system is the epitome of such progress. President Eisenhower's bold vision required deep partnership between each contiguous State and culminated in the Federal Aid Highway Act of 1956. The resulting highway network had a profound effect on the American economy and contributed significantly to improved economic efficiency and productivity. Every dollar invested in the project returned \$6 in economic productivity and reduced the average cost of products to the consumer by 23 cents.



To put this in perspective, from 1950 to 1989 approximately one-quarter of the nation's productivity increase can be attributed to the highway system.

Similarly, the transcontinental railroad system is a powerful example of the value generated when States multilaterally collaborate with private enterprise. When President Jimmy Carter deregulated the railroads in 1980 by signing the Staggers Rail Act, he revitalized the stagnant industry and stimulated enormous economic activity. Since the deregulation in 1980, private railroads have invested more than \$635 billion in capital expenditure, and the industry has grown to support over 1.5 million American jobs. Critically, the continued cross-State support of this pivotal infrastructure has positioned the industry to grow by an anticipated 41% by 2040.

Today, our nation once again stands at the precipice of a mobility revolution. Importantly, the modern transportation transformation reaches across modalities (land, air, sea, and space) and therefore carries even greater economic implications than did its predecessors. However, achieving positive economic outcomes will require an even deeper level of cross-State collaboration than previous initiatives did. Research shows that building coalitions of mission-aligned stakeholders is the most effective method of influencing enduring public policy. Coalitions establish credibility and form an Aristotelian dynamic where "the whole is greater than the sum of its parts" in terms of resources, reach, and resiliency.

No singular State can usher in this revolution alone; however, Arkansas is well-positioned to serve as a regional coalition leader. Thanks to the leadership of Governor Hutchinson, the State of Arkansas has already laid the foundation for several enduring bipartisan multi-State partnerships.

In August 2022, Governor Hutchinson and Governor Kevin Stitt of Oklahoma signed a landmark MOU to develop the Oklahoma-Arkansas region into a national hub for advanced mobility. The agreement narrowly preceded a \$38.2M award from the U.S. Economic Development Administration, aimed at creating the "Tulsa Regional Advanced Mobility Corridor." The two States will jointly develop a new research and testing space to support local mobility startups, as well as attract new companies to the region.



FLAME

Just months after its formation, the AR-OK partnership is already engaging in high-impact initiatives. The Future Logistics Advanced Mobility Engine (FLAME) is a joint proposal to the National Science Foundation in response to the recently announced NSF Engines program. The goal of NSF Engines is to accelerate emerging technologies, drive economic growth, address key societal challenges, and sustain regional innovation. The opportunity could bring up to \$160M into the region over a 10 year timeframe. A collaboration between the Northwest Arkansas Council (NWA) and Tulsa Innovation Labs has highlighted the unique and complementary strengths of the region, leveraging the power of private-public partnerships.



PHILANTROPIC PARTNERS:



CORPORATE PARTNERS:



VCS & ACCELERATORS:



EDUCATIONAL INSTITUTIONS:



HALO

In March 2022, Governor Hutchinson entered into a three-State partnership with Louisiana and Oklahoma to establish a regional hub for the development, production, and utilization of clean hydrogen energy. The trio (dubbed “HALO”) will compete for a share of the \$7 billion of funds earmarked for hydrogen infrastructure within the DOE’s Infrastructure, Investment, and Jobs Act (IIJA) of 2021.

Governor Asa Hutchinson explained, “In Arkansas, we have a growing and diverse energy portfolio and natural resources vital to any successful regional hub. We are the proud home of prominent partners and companies critical to U.S. commerce with a strong history of environmental leadership and track records of reducing emissions. We are excited to partner with our neighbors in Louisiana and Oklahoma to put forward a winning application.”

This could impact Arkansas transportation emissions significantly because \$226 billion in goods are shipped across Arkansas each year, mostly by truck, according to The Road Information Project, a national nonprofit research group (TRIP 2020). That represents over 219 million tons of goods transported per year according to the Arkansas Department of Transportation. The HALO Initiative would allow Arkansas to build critical infrastructure needed to support the decarbonization of the commercial freight industry, thereby lowering the State’s overall CO2 emissions. It will take many technologies to decarbonize, and hydrogen will likely be a key component as Arkansas expands its transportation fuels portfolio.

While Arkansas has demonstrated strong momentum in incubating cross-State coalitions over the past several years, it’s important to realize that fundamental technologies like mobility change over the course of **decades**. Longevity, commitment, and perseverance are key.



THE COUNCIL RECOMMENDS

that Arkansas double down on its existing mobility partnerships with Oklahoma and Louisiana.

Given that analysis on historic infrastructure development projects has consistently proven a positive return on investment, Arkansas should commit sufficient capital to the HALO proposal to ensure its success in securing IIJA funding. Capital commitments tranching over multi-year, milestone-based deployment schedules help instill long-lasting discipline and increase capital efficiency.

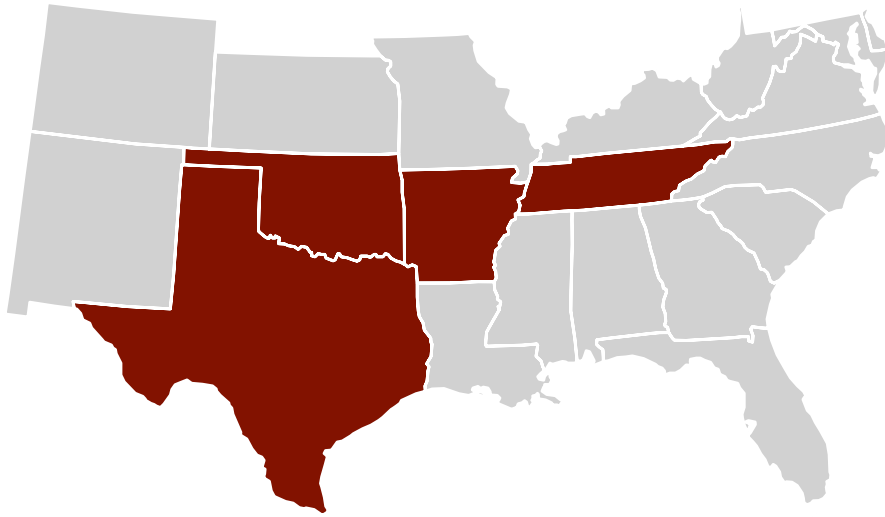
In addition to existing cross-State partnerships,



THE COUNCIL RECOMMENDS

the Council recommends launching new mobility partnerships with neighboring States Texas and Tennessee.

United by geography, culture, politics, and complementary natural resources, the combined entity (AR-OK-TN-TX) is primed to serve as a mobility “Super Hub” on the national level. While sweeping federal legislation continues to pit State against State for enormous economic packages (e.g. IIJA, IRA), the combined entity will increase the chances of success for all its members. Again, the whole is greater than the sum of its parts.



Lastly,



THE COUNCIL RECOMMENDS

executing on the FLAME proposal to compete for the NSF Engines program.

The proposal outlines strong alignment between corporate partners, capital providers, and educational institutions. The \$160M funding opportunity will accelerate the region's technological development by pairing utility-inspired R&D with real world testing to promote global competitiveness. In addition, a winning bid would generate new, resilient, high paying jobs for economically vulnerable populations — particularly in rural areas.

- | | |
|------------|---|
| 7.1 | Strengthen relationships with Oklahoma and Louisiana and fund the HALO initiative to win IIJA funding |
| 7.2 | Establish partnerships with Tennessee and Texas to form a regional mobility Super Hub |
| 7.3 | Execute the FLAME Phase II proposal to win NSF Engines funding |



SECTION 8

Crafting The Most Comprehensive Advanced Mobility Policy in the World

Let's Accelerate This Movement

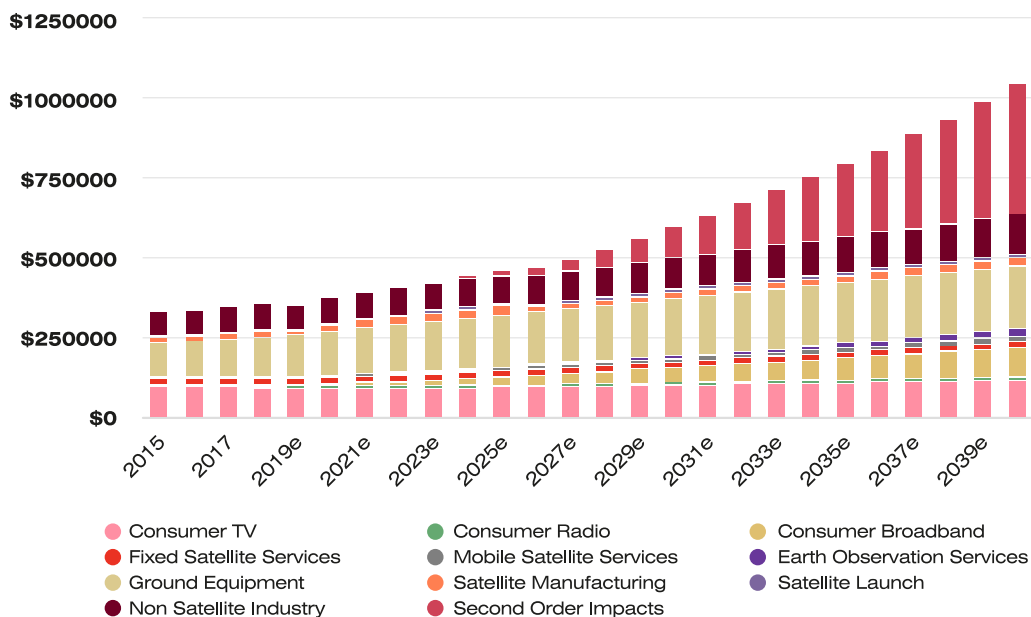
The New Space Economy

Let's Go To Space!

The last decade has witnessed a renaissance within the space industry. Advances in material science, computing power, and design efficiency have commoditized what were once herculean feats of engineering. Billions of dollars have flowed into the industry from both the private and public sector, which have revitalized an enthusiasm in the sector last felt in the 1970s. Launch costs have plummeted and therefore space is more accessible than ever. The explosion of telecommunication and the ubiquity of data have kickstarted and sustained commercial interest. Highly public success stories like SpaceX and the lofty visions that fuel them have captured the hearts and minds of our nation's smartest scientists, engineers, and leaders.

The confluence of these tailwinds has sparked unprecedented market growth. The U.S Chamber of Commerce estimates the industry will reach \$1.5 trillion by 2040. Private sector analysts at Goldman Sachs and Morgan Stanley reach similar conclusions, while Merrill Lynch predicts a more bullish \$2.7 trillion industry over the same period. This growth has significant impacts on entrepreneurship and job creation. Between 2012 and 2021, total annual investment in space startups grew to more than \$10 billion, up from \$300 million. The industry supports more than 140,000 jobs in the U.S. alone.

The Global Space Economy (\$t)



Public Policy as Rocket Fuel



While technological and macroeconomic advancements have each played a major role in ushering in this era of the “New Space Economy,” many experts agree that NASA and a relatively simple policy change are responsible for the majority of the momentum.

The Space Race of the 1960s created a golden era of innovation, talent, and technological advancement that cemented the United States as a global superpower and provided its citizens with technologies as diverse as GPS, CAT scanners, and memory foam mattresses. Yet as astronaut [Buzz Aldrin](#) told the Financial Times, “After the Apollo lunar missions, America lost its love of space — there was no concentrated follow-up and we didn’t have any clear objectives.” Indeed, NASA funding as a share of the U.S. federal budget peaked in 1966 at 4.4% and gradually shrank to less than 0.5% by 2020.

Representative Dana Rohrabacher [R-CA-46] sought to reverse this trend by sponsoring the [Commercial Space Launch Amendments Act of 2004](#) (CSLA). For nearly the entire post-Apollo era, the vast majority of NASA contractual relationships were governed by a set of rules called Federal Acquisition Regulation (FAR). These rules defined commercial contracts on a cost-plus basis.

Harvard Business School professor [Matthew Weinzierl](#) explains that “in an effort to stimulate commercial development, NASA moved to replace FAR with a system that emphasized the power of the agency’s *insight* rather than *oversight*. In particular, CSLA employed fixed-price funded ‘Space Act Agreements’ (SAAs) rather than conventional FAR contracts.”

It’s impossible to overstate the implications of this one simple policy change.

The fixed-price contract was first employed in the Commercial Orbital Transportation Services (COTS) program that would deliver crew and cargo to the International Space Station. A small and struggling startup named SpaceX won this \$278M contract in 2006 and went on to spark the commercial space renaissance that today is valued at over \$400B.



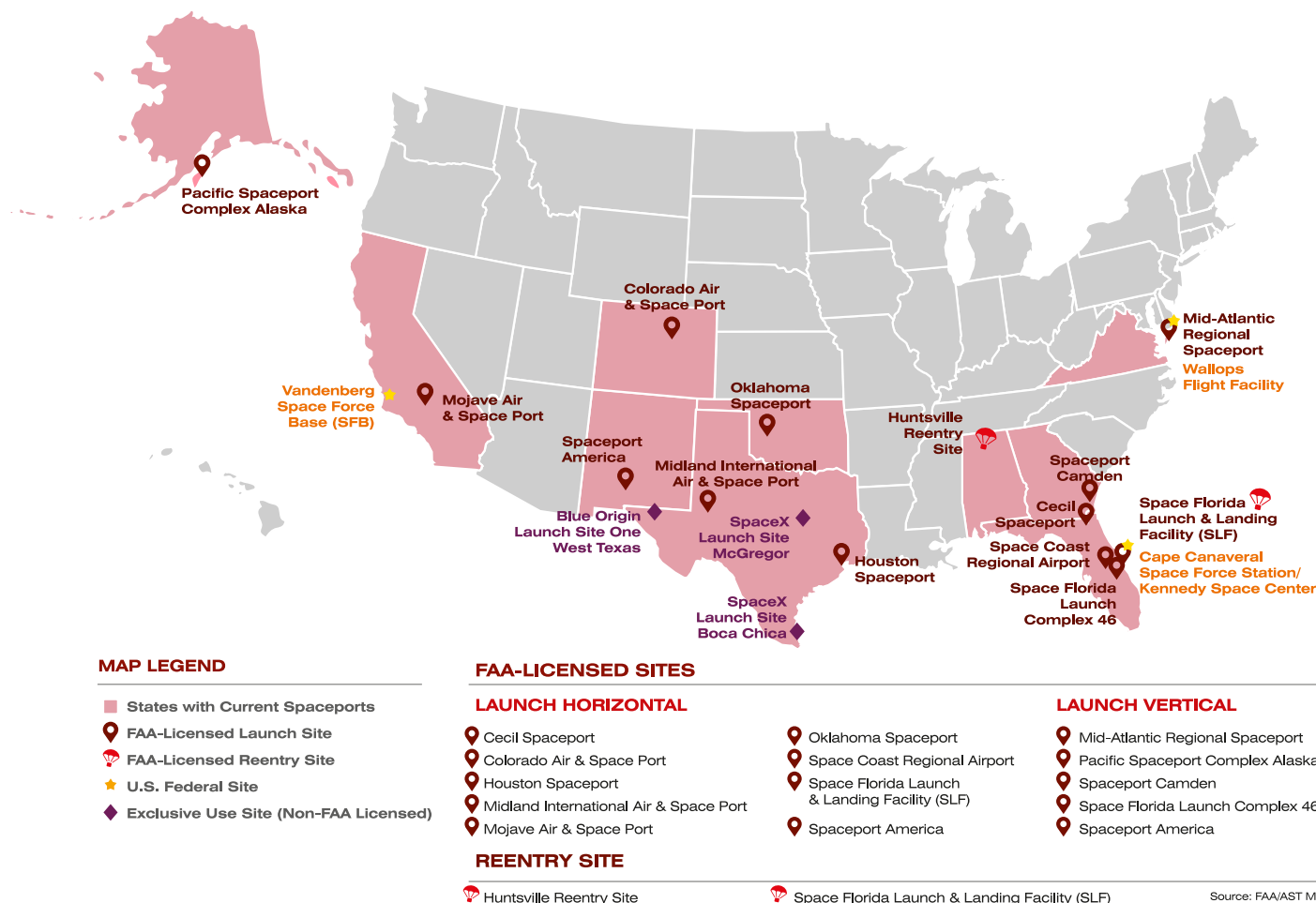
Arkansas Looks to the Stars



This inspiring example of how strategic federal policy can create generational economic impact can and should be replicated at the state-level. Today, space activity is geographically concentrated within just a handful of states, but it need not be.

Since 2015, two-thirds of the 58 commercial launches licensed by the FAA have taken off from Florida. A fifth of the national space industry revenue flows into California alone, creating over 500,000 jobs for the State. Only seven States provide specific incentives that target space-related businesses, such as tax exemptions or grant programs. In fact, as of today, only ten states have developed a FAA-certified “Spaceport” that can support launch activities.

U.S. SPACEPORTS COMMERCIAL, GOVERNMENT, AND ACTIVE PRIVATE SPACEPORTS



In order to capture a share of the skyrocketing economic activity within the burgeoning New Space Economy,



THE COUNCIL RECOMMENDS

that the Governor establish a State-wide Arkansas Space Authority.

The FAA asserts that the space authority is “one of the strongest tools available to States to encourage the further development of a local space transportation industry.” Generally, Space Authorities are established and supported through the State government executive branch and are staffed by personnel knowledgeable in the field. Space Authorities develop and manage Spaceports, and then advocate for and attract space-related businesses to the Spaceports. In addition, the State typically grants space authorities with unique assets or powers, including bonding authority, which allow them to support projects requiring large infrastructure investments.

The Council closely examined the organizational structure, capabilities, and data-driven outcomes of two Space Authorities from very different States: Florida and Oklahoma. A summary of that evaluation can be found in the Appendix.

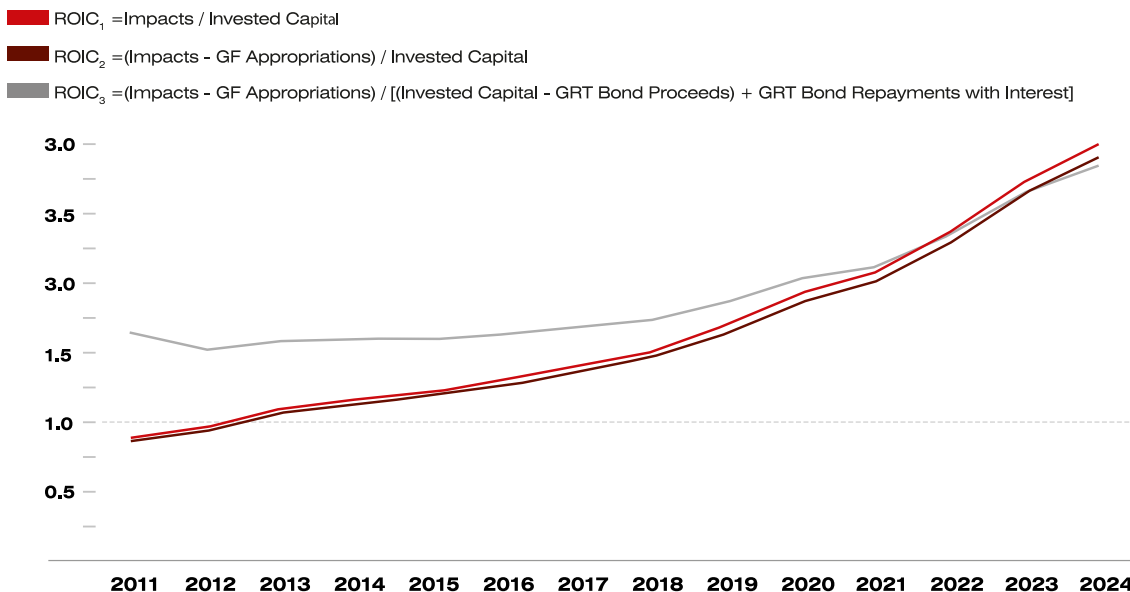
Space as an Investment



That evaluation helped the Council identify best-practices and reinforced the notion that the development of a Space Authority will provide a positive return on investment for the State of Arkansas.

The consulting firm Moss Adams performed a thorough economic impact analysis on New Mexico's "Spaceport America," which received its FAA certification in 2008. The report shows that the Spaceport has generated a positive ROI since 2013, and has created 516 jobs and \$118M in direct economic impact. Spaceport America's CFO Zach De Gregorio estimated that "every dollar invested from the New Mexico General Fund had seen a 20-fold return."

FIGURE 39: Alternative Return on Invested Capital Including GRT Revenue Bond Repayments
FY2016-FY2029



The figures presented above illustrates the ROIC measured three different ways. The first formula only analyzes the relationship between the economic and fiscal impacts and the capital assets. This approach reveals a ROIC ratio of 1.08 in FY2013. This Year became the first in which the benefits equaled the capital investments from the two types of bond proceeds. In the years after FY2013, the ROIC ratio exceeded one consistently into the forecast period.

In addition to the pure economic impact of the Spaceport, a sliver of the tax-funds were also dedicated to STEM education, resulting in a \$2.4M investment in the Doña Ana and Sierra County school districts neighboring the Spaceport. The proximity of cutting-edge science and engineering has reached more than 1,200 sixth grade students through classroom visits and field trips, and the school district has seen a doubling in the number of students participating in AP (Advanced Placement) classes.

Another study from the Puget Sound Regional Council revealed that many space-related economic clusters have developed around existing launch and manufacturing facilities for space and defense, which has encouraged new growth in commercial space companies through access to supporting infrastructure and talent. Influential economist and Harvard Business School professor Michael Porter underscores the importance of "techno clusters" in creating sustainable competitive advantages for large economies.

In addition to the potential upsides of investing in space, Alaska and Oklahoma demonstrate that Spaceports need not be a permanent tax burden on constituents. The Alaska Aerospace Spaceport has transformed into a fully self-sustaining business that generates operating profits without government assistance. At the same time, the Alaska Spaceport annually generates \$3.5M in positive impacts to its home city of Kodiak, with an additional \$2.7M generated in its hospitality industry for each rocket launch. The Oklahoma Space Industry Development Authority (OSIDA) has sustained its operating budget for years, primarily with a standing \$1.3M contract with the US Air Force.

Recommendation & Best-Practices



In recognition of the economic impact of the Spaceports and the untapped potential of the New Space Economy,



THE COUNCIL RECOMMENDS

that the newly formed Arkansas Space Authority execute a feasibility study on the development of an Arkansas Spaceport.

To provide scope, in 1995 NASA performed a \$950k Spaceport feasibility study that estimated \$320M in new revenue to New Mexico for its Spaceport.

After evaluating the approach of Space Authorities from Florida, Oklahoma, California, New Mexico, and Texas, **the Council advises the Arkansas Space Authority to treat the Spaceport like any other startup business in a competitive industry.** The Authority should identify the competitive advantages that would be unique to the Arkansas Spaceport, and reinforce them through a strong marketing strategy (i.e. product-market fit). The Authority should build a top-notch team and de-risk technology development early in the process. It should determine financing needs early and secure sustainable funding.

Securing flashy “anchor customers” early in the development cycle helps build political will, but Arkansas should be wary of over-reliance on private partners with uncertain timelines. This exact mistake has plagued New Mexico (Virgin Galactic), Texas (Sierra Nevada), and Oklahoma (Rocketplane).

Lastly, Arkansas should refer to the Space Florida Authority as a model for using pragmatic executive powers that help accelerate business development. Particularly, its ability to issue “conduit financing” to quickly deploy capital for infrastructure development has been instrumental in placing Florida at the forefront of the space industry. See further details in the Appendix.

8.1	Space - Establish an Arkansas Space Authority
8.2	Space - Execute a feasibility study on the development of an Arkansas Spaceport

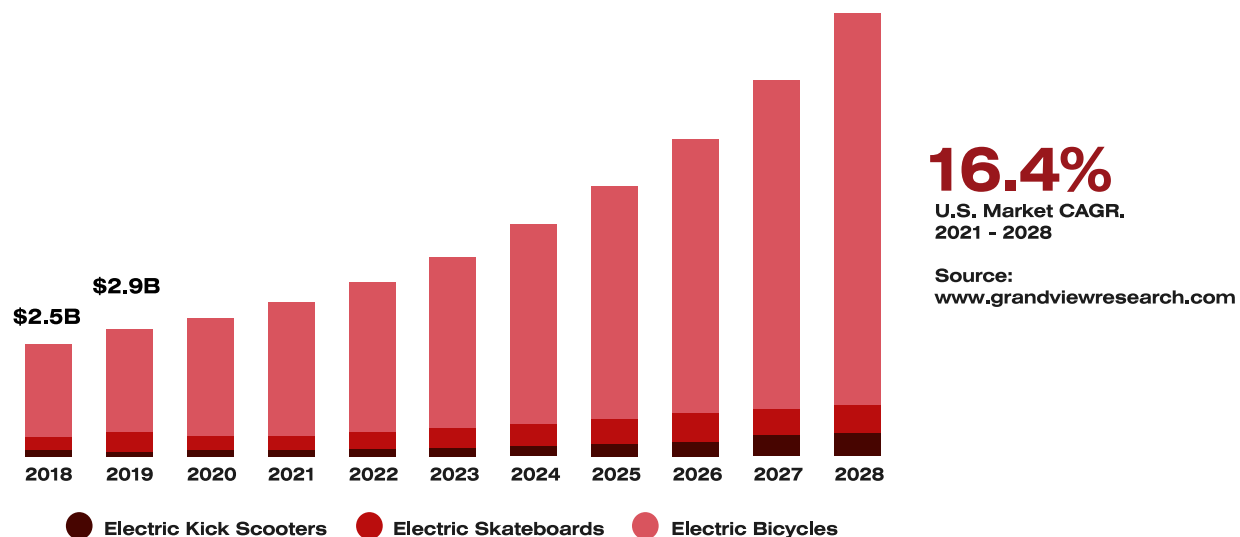
Micromobility and Cycling Readiness



The Department of Transportation defines micromobility as the use of any light-electric or human-powered vehicle, typically covering trips less than five miles long. As measured by the National Household Travel Survey, 35% of all U.S. car trips are under two miles. Thus, building or supporting robust shared micromobility options can help Arkansans make these trips without relying on personal cars or taxis that create congestion and pollution.

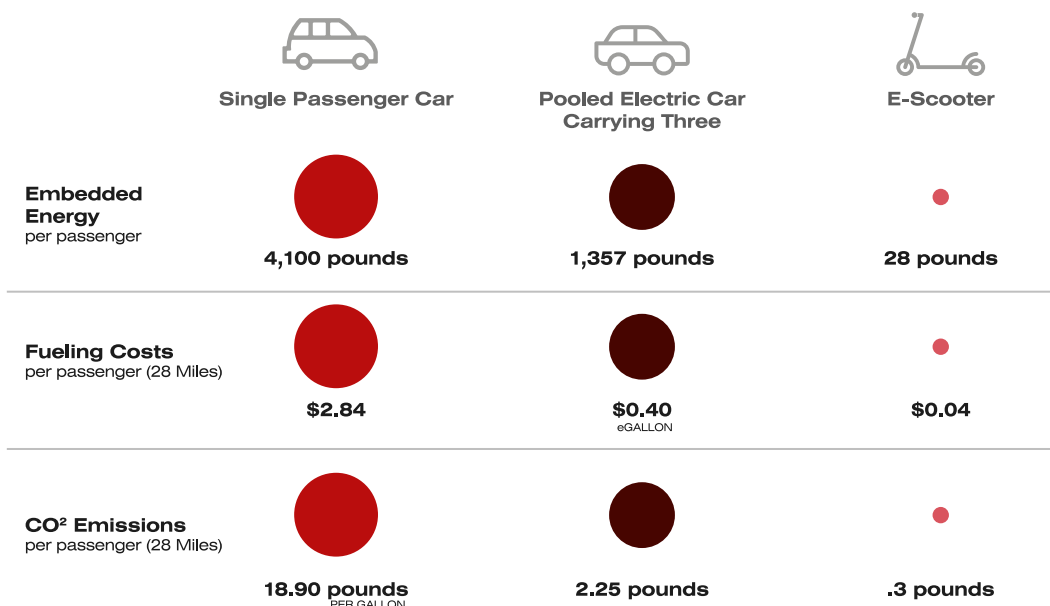
After years of explosive growth, McKinsey estimated that the micromobility market will continue ballooning to over \$300 billion by 2030. The coronavirus pandemic temporarily halted growth, but the sector is expected to make a strong post-pandemic recovery. This recovery demonstrates that consumer sentiment and behavior have permanently shifted to consider micromobility as an alternative to other modes of transport. Cities play an important role in shaping this consumer behavior by continuing to invest in infrastructure such as bike lanes and partnering with micromobility providers in efforts to supplant car use and ultimately reduce carbon emissions.


U.S. Micro-mobility Market
size, by vehicle type, 2018 - 2028 (USD Billion)



Green, Efficient, Cheap:

MICROMOBILITY IS PART OF THE SOLUTION





Micromobility

A Case Study on Cycling

Arkansas has invested considerable resources in planning and building a world-class network of biking trails that span the State with hundreds of miles of diverse routes through cities, mountains, and beautiful backwoods. The epicenter of this network is Bentonville, which has earned its claim as the “Mountain Biking Capital of the World” due in large part to the centerpiece 36-mile Razorback Regional Greenway trail that links the major cities in the region. The Razorback Greenway was a \$38 million endeavor supported by grants from the Walton Family Foundation and the U.S. Department of Transportation — a powerful example of the power of private/public partnerships.

Importantly, it has been proven that micromobility options and cycling programs can stimulate significant positive benefits in the communities that adopt them. A 2018 study of the economic and health benefits of bicycling in Northwest Arkansas showed \$137 million in economic benefits annually, with approximately 63% (\$86 million) stemming from health-related benefits ([source](#)).

Arkansas can and should continue to be a leader in the research, development, and deployment of micromobility and cycling infrastructure and programs. Fortunately, the Arkansas Department of Transportation holds the key to unlocking the State’s potential as a leader in micromobility. The Federal Highway Administration has cleared the way for State departments of transportation to incorporate safe, attractive, sustainable, accessible, and convenient cycling and walking networks ([source](#)).



THE COUNCIL RECOMMENDS

the Council on Future Mobility recommends the following to ArDOT:

- **Consider separated/protected bike and pedestrian lanes** when building, repairing, and retrofitting the State’s roadways.
- **Leverage federal funding for innovation and staff dedicated to cycling infrastructure** ([source](#)).

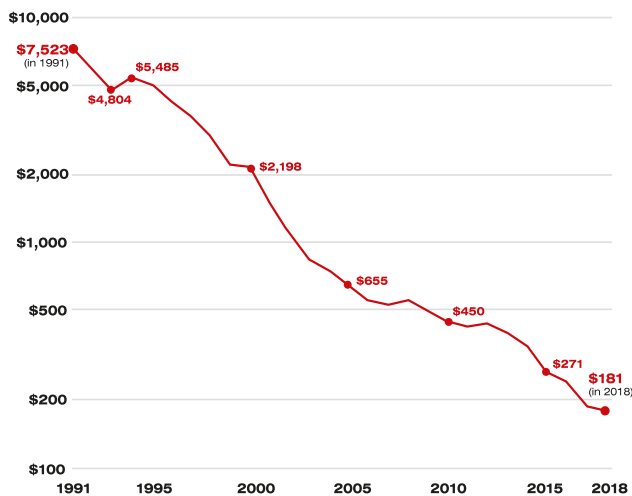
Light-Electric

The commoditization of lithium-ion batteries over the last two decades has paved the way for new forms of electric micromobility to emerge (e.g. e-scooters, e-bikes, and e-mopeds). Incredibly, by 2021 the cost of e-bikes had fallen so precipitously that there were more electric bicycles sold in the USA than electric automobiles. At the same time, cities across the country are seeing a proliferation of shared micromobility startups like Bird and Veo, which have attracted millions of venture capital dollars and created thousands of new, flexible jobs.



The price of lithium-ion batteries fell by 97%

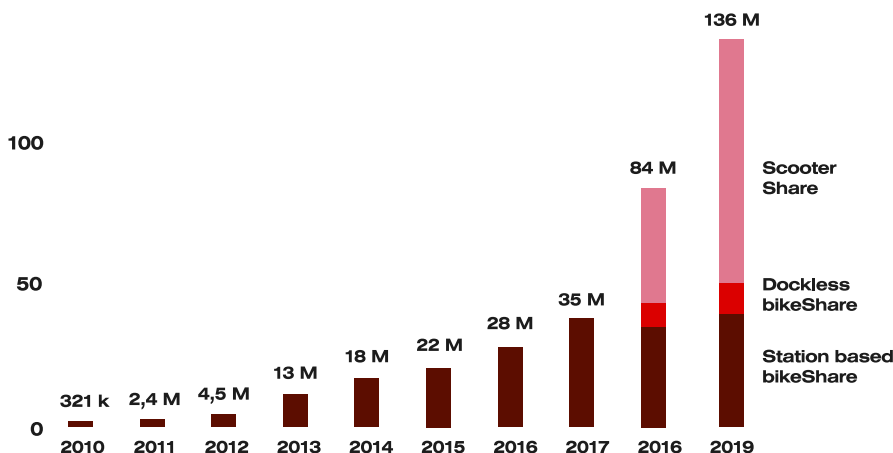
Price of lithium-ion battery cells per kWh (logarithmic axis)



Prices are adjusted for inflation and given in 2018 US-\$ per kilowatt-hour (kWh).
Source: Michael Ziegler and Jessica Trancik (2021). Re-examining rates of lithium-ion battery technology improvement and cost decline. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.

The Council closely examined various local ordinances that regulate light-electric micromobility vehicles throughout Arkansas and the United States. The following best-practices are recommended as a result of that evaluation.

Shared micromobility ridership growth from 2010-2019, in millions of trips





THE COUNCIL RECOMMENDS

that localities, rather than States, be the primary regulators of micromobility programs.

States typically set device requirements and can — but rarely — impose limits to fees charged to private providers. States should not dictate the minutiae of local ordinances. Device requirements should err as expansive and should limit exclusions, while asking more of the industry with respect to safety, efficiency, and inclusivity. Fees should be limited to cost recovery only.

- **Device specifications:** Arkansas has sensible definitions for electric scooters; however, it does not appear to define specific requirements for e-bikes in its State vehicle code. The Council believes specifying Class II e-bikes (throttle assisted rather than pedal assisted) as an unambiguously permitted shared device is necessary. Additionally, Arkansas and other States should explicitly permit seated scooters as part of shared micromobility fleets, though Arkansas' allowance of a floorboard that "can be used to stand on" is workable for this purpose.
- **Fee limitation:** In Arkansas and around the country, fees are a critical subject. Any increase in fees must be offset by a reduction in cost elsewhere. The State should limit localities to recover staff time and other direct expenses. A micromobility program should not be a net-positive revenue generator for a regulating jurisdiction.

The Council recommends the following best-practices for local jurisdictions:

- **Improved device specifications:** In addition to details noted above, localities can and should *require* upgraded safety and operational features on shared micromobility devices, including turn signals, 100% field-swappable batteries, dual suspensions, a mixed fleet (e.g. standing and seated scooters and/or e-bikes), and accessible devices.
- **Staffing requirements:** Local jurisdictions should require micromobility companies to employ predominantly W2 workers rather than contractors or gig workers. Only W2 workers are accountable to their company rather than their own bottom line.
- **Zoning authority:** Localities should ban companies from charging scooters at homes or any facility that does not meet electrical code requirements. Additionally, local authorities should provide zoning flexibility for permitted operators to choose a warehouse location close to the densest riding area to limit VMT and maximize operational efficiency.
- **Maximize rider flexibility and joy:** The most successful micromobility programs across the country optimize for rider experience and operational efficiency. Allow riders to ride point-to-point, avoid locks or ID scans, and limit no-ride or slow-ride zones other than when required for safety. Commuting should not be prioritized at the expense of joy.
- **Limit insurance obligations:** The Council supports reasonable insurance obligations, but too often limits are set unreasonably high and/or obscure coverages are required. This increases costs which must be accounted for elsewhere.

The Council recommends the following updates to the Little Rock micromobility authorizing ordinance specifically:

1. Fees should be predicated on ridership, not flat.

- a. Operators are required to pay \$10,000 annually plus \$75 per permitted device. Beyond the high annual amount, this structure is problematic. Device fees do not account for seasonal variation in deployment and/or ridership. Fees should always be predicated on ridership (e.g. \$.10/trip).

2. Little Rock should not limit device form factors.

- b. The Little Rock program explicitly forbids e-bikes. A strong market will encourage diverse form factors to account for varied personal preference, trip types, accessibility needs, and culture.

8.3	Micromobility - Consider separated/protected bike and pedestrian lanes
8.4	Micromobility - Leverage federal funding for innovation and staff dedicated to cycling infrastructure
8.5	Micromobility - Delegate micromobility regulation to localities
8.6	Micromobility - Remove restrictive Statewide vehicle specifications and fees
8.7	Micromobility - Implement suggested best-practices to increase competition and improve operational efficiency for Arkansas citizens

Electric Vehicle Readiness

Electric Vehicles (EVs) currently only account for a small proportion of passenger vehicles in Arkansas. In June 2022, the Arkansas Department of Finance and Administration reported that 2,997 EVs and 27,441 hybrid vehicles were registered in Arkansas. While these numbers are modest at present, EVs are growing in popularity and as a share of motor vehicles in Arkansas. Between 2019 and June 2022, the number of EVs registered in Arkansas increased nearly 300%. Recent federal legislation has provided significant financial support to EV infrastructure. Macroeconomic market conditions, such as a wider array of EV companies coming to market, high gasoline prices, and the falling cost of EVs, indicate that rapid adoption of EVs are likely to continue in the short term and accelerate in the middle and long terms.



Arkansas EV and Hybrid Registration by Year

	2019	2020	2021	2022 (as of June 1)	% Increase
EVs	781	1,303	2,094	2,997	283.74%
Hybrids	13,861	18,242	22,818	27,441	97.97

Source: <https://talkbusiness.net/2022/06/electric-vehicles-registered-in-arkansas-up-43-through-may-up-almost-300-since-2019/>

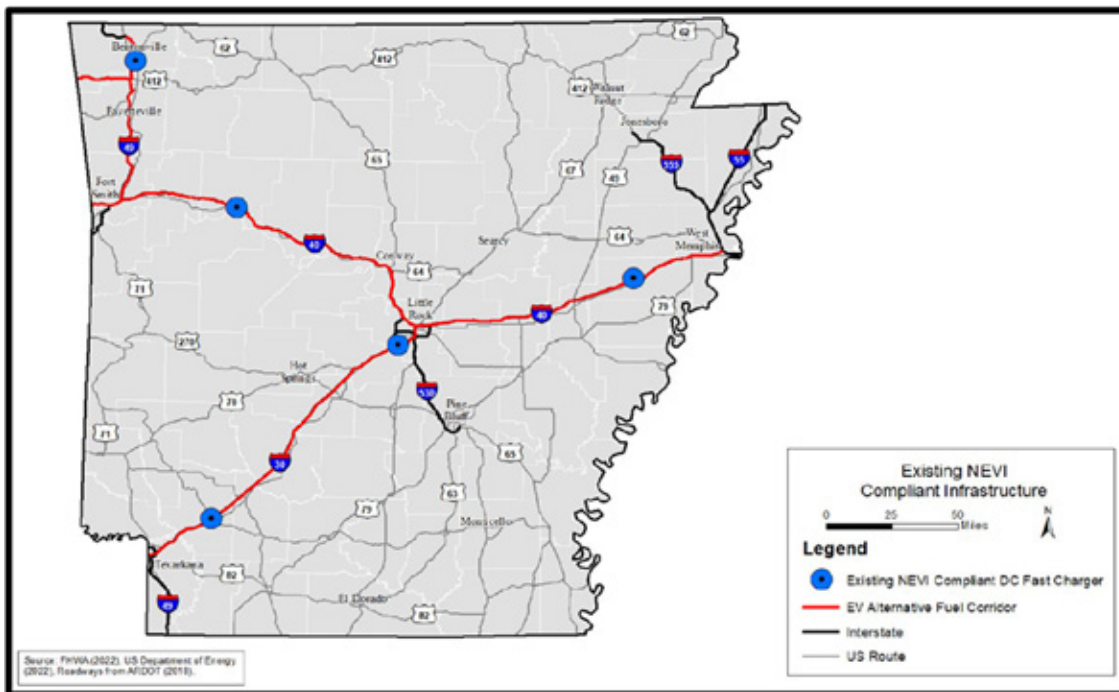
Currently, Arkansas has two State programs in place to support electric vehicle infrastructure development. These grant programs function to reimburse developers or other organizations who install EV charging infrastructure and are funded through the Volkswagen Mitigation Trust fund. Arkansas' programs have relatively few restrictions compared to similar federal programs. However, they are poorly funded (~\$2-3 million annually) and have already exhausted funds available for the current and immediate future fiscal years. In late 2021, Congress passed, and President Biden signed, the Infrastructure Investment and Jobs Act (IIJA, Bipartisan Infrastructure Act, BIL). This \$1.2 trillion law funded, re-funded, or created a number of formula programs to overhaul American infrastructure.

The IIJA created the National Electric Vehicle Infrastructure (NEVI) Formula Program. The NEVI program is a \$5 billion formula grant program that provides funds directly to states to build out their electric vehicle infrastructure. Through NEVI, Arkansas will receive \$54.1 million in federal funds across the next five fiscal years.

Federal Priority Fiscal Year/Priority	Federal Funding	Non-Federal Match	Total
FY22 EV AFC Interstates	\$8,010,850	\$1,602,170	\$9,613,020
FY23 Remaining Interstates & AFC	\$11,527,774	\$2,305,555	\$13,833,329
FY24 Routes of Significance	\$11,527,774	\$2,305,555	\$13,833,329
FY25 Routes of Significance	\$11,527,774	\$2,305,555	\$13,833,329
FY26 Additional EVSE Priorities	\$11,527,774	\$2,305,555	\$13,833,329
Total	\$54,121,947	\$10,824,389	\$64,946,336

*NEVI Formula Program total for Arkansas and FY22 funding amounts sourced from "IIJA Highway Apportionment Estimates" - additional estimates derived based on IIJA preliminary amounts provided.

In October 2022, Arkansas' Electric Vehicle Infrastructure Deployment Plan was reviewed and accepted by the United States Department of Transportation, allowing Arkansas to begin to deploy NEVI funds. Per the requirements of the NEVI program, EV Infrastructure installation will initially be focused on building out DC fast charging stations along existing federally designated Alternative Fuel Corridors (AFCs). Currently Interstate 40, Interstate 49, Interstate 30, and a portion of US-412 in northwest Arkansas are designated Alternate Fuel Corridors.



Source: [here](#)

The current AFCs do not capture all of Arkansas' population centers and building out fast charging infrastructure along these routes will barely allow for long-distance commercial and leisure EV travel through and across Arkansas. By federal fiscal year 2024, AFC build out is expected to be completed. As such, NEVI funds are expected to become eligible to use for deployment of EV infrastructure along additional routes of significance. Between the \$54.1 million and the 20% non-federal match requirements, a robust build out of Arkansas' public EV infrastructure is expected to be in place within the next five years.

The above being said, Arkansas is behind most other U.S. states in charging station deployment – with less than half as many charging stations as Kansas and Oklahoma and less than a quarter of Missouri's total. To catch up,



THE COUNCIL RECOMMENDS

the State to increase funding for existing state programs and consider tax credits that other states like Oklahoma have used successfully to build a large network of Level 3 fast chargers.

Areas of Future Focus:

Currently in Arkansas, EV owners pay an annual \$200 registration fee, while hybrid drivers pay a \$50 fee. These fees support road maintenance projects throughout the State and were created to ameliorate the loss of revenue from the gasoline fuel excise tax. Currently, EV adoption is well under one percent of total vehicles. As EVs grow as a proportion of Arkansas' passenger vehicles, this fee may need to be adjusted by policy makers to ensure parity between EV and internal combustion engine vehicle owners.

The NEVI program focuses solely on public EV infrastructure. As EV adoption grows, home charging will also grow in importance. This places occupants of multifamily housing, who are less likely to have a personal garage, at a disadvantage. NEVI and other State programs can be leveraged to ensure public charging is reliable and accessible. However, policymakers may need to adjust policy in the future to ensure that Arkansas residents have easy access to charging regardless of the type of residence they occupy.

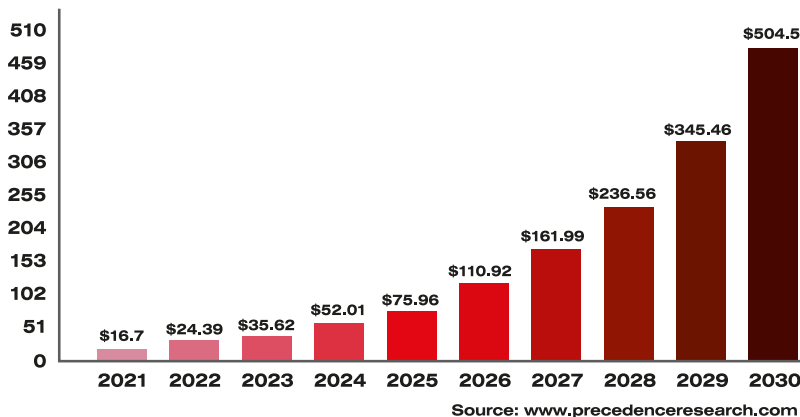
Drone and Advance Air Mobility Readiness

Market Background: Rapidly Growing Market Segment



The backdrop for any recommendations around drones, Advanced Air Mobility (AAM) and Urban Air Mobility (UAM) is that these markets are projected by analysts to explode in size over the course of the decade. The drone market alone is expected to grow at a compound annual growth rate of ~45%, reaching from \$17 billion today to over \$500 billion in 2030.

Commercial Drone Market Size, 2021 to 2030 (USD billion)



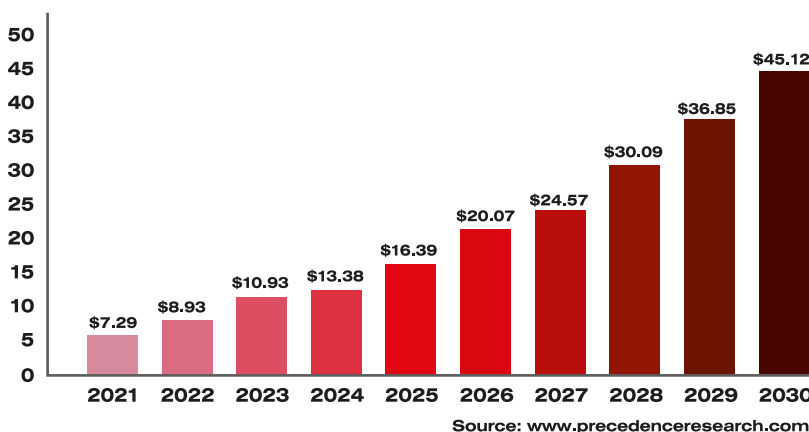
Source: Precedence Research, Commercial Drone Market Size

Region	Share of commercial drone revenue ('21, %)
North America	38%
Europe	27%
Asia Pacific	21%
Latin America	10%
Middle East and Africa	4%

Source: Precedence Research, Commercial Drone Market Size

The AAM market is similarly growing at an extremely high rate, with forecasts of over 20% growth from \$7 billion today to over \$45 billion by 2030.

Advanced Aerial Mobility Market Size, 2021 to 2030 (USD Billion)



Source: Precedence Research, Advanced Aerial Mobility Market Size

The majority of both the commercial drone and advanced aerial mobility markets remain in the United States. If the U.S. share stays consistent in each of these markets, the domestic opportunity will be worth over \$190 billion in drones and over \$17 billion in AAM. Arkansas is primed to host a significant share of this opportunity.

Similarly, the UAM market is estimated to grow at an extremely fast pace over the course of the decade, from \$2.6 billion today to over \$28 billion in 2030, with a compound annual growth rate of over 34% ([source](#)).

Drone Technology Isn't Just the Future of Arkansas It's Here Today

Due to the foresight and work of the Arkansas community already, Arkansas is nationally recognized as one of the States most ready for drone commerce. Specifically, the Mercatus Center of George Mason University ranks Arkansas as the second most ready State for drone commerce in the nation ([source](#)). **However, this report did not take into account the formation of the Arkansas Council on Future Mobility; if it had done so, by the criteria used to rank the States, Arkansas would have claimed the number one spot on the list**

Not only is the State of Arkansas prepared for the future of drone commerce, but the State is already an active user of drone technology. Today, the Arkansas Department of Transportation works with drones in order to perform bridge inspections. The advanced drone technology allows for inspection and documentation of critical components of bridge support and truss structures safely with 360 degree obstacle avoidance ([source](#), [source](#)).

The Arkansas Department of Energy & Environment (ADEE) launched its Unmanned Aerial Vehicle (UAV) Program in Fall 2019 to provide UAV data gathering capabilities to assist the Departments energy and environmental programs. The UAV flights have assisted in algal bloom mapping, landslide investigations, oil and gas inspections and mine reclamation studies. The Departments UAV program is also investing in heavy lift UAV platforms to add ground penetrating radar, LIDAR, magnetometer and gas detection equipment packages to further enhance the Departments scientific data gathering capabilities, compliance inspections and emergency response capabilities.

Drones in Arkansas are being put to work in commercial applications as well. Late last year Drone delivery company DroneUp delivered packages out of a Walmart Neighborhood Market in Farmington, Arkansas ([source](#)). DroneUp, is one of the companies that Walmart announced will seek to offer drone delivery services to 4 million U.S. households by the end of this year ([source](#)).

Walmart also launched a 2021 program which resulted in another drone company's first commercial deliveries in the U.S. ([source](#)), Zipline. Zipline has operations in Africa, where it is a leader in drone delivery of blood, vaccines, and other medical equipment in Ghana, Rwanda, and Nigeria; in Ghana alone, its drones distributed 1.8 million doses of the Covid-19 vaccine ([source](#)). Several scientific studies have shown the impact of drone delivery services, including studies showing that these services resulted in a 67% reduction in blood wastage across Rwanda, and that vaccine stockouts were 60% shorter at drone-served facilities than those without drone service. This just goes to show the potential growth in drone services and the benefit it can provide in medical deliveries overseas and in the U.S. ([source](#), [source](#)).

Zipline is already a proud participant in the Arkansas Future Mobility Council and has seen in Pea Ridge, AR how excited communities are about the benefits of autonomous mobility technology. Safe, efficient, on-demand delivery is convenient and affordable and can increase access to all kinds of products.



THE COUNCIL RECOMMENDS

that the State of Arkansas continue to support the acceleration of the growth and availability of drone delivery services across the State and beyond

This support could include engaging with federal agencies, such as the FAA, and detailing the positive economic impact that results from enabling autonomous technologies in communities in Arkansas. It could also include working with State agencies to ensure that the statewide regulatory environment remains encouraging of alternatives to traditional transportation solutions.

The delivery of medical care via drone could be enormously beneficial to healthcare outcomes in rural Arkansas through fast and efficient care, as well as continue to build the State's leadership in drone technology and policy. Commercial drone companies would welcome the opportunity to collaborate with the State and the University of Arkansas Medical Center to explore opportunities to extend their infrastructure and reach into rural Arkansas communities to improve access to medical and nutritional products.



THE COUNCIL RECOMMENDS

that Arkansas pursue a partnership with commercial drone companies on launching essential healthcare to rural communities.



Drone Readiness

There are several policy steps that Arkansas can take to maintain its leadership position on leading the nation in drone readiness.

According to the American Association of State Highway and Transportation Officials, drone-based inspections reduce the cost of infrastructure inspections by 74% and the time needed to conduct the inspection by 88%(source). The Arkansas Department of Transportation (ArDOT) is already a national leader in the use of drones for bridge inspection, having developed a strong program in the wake of the I-40 bridge maintenance issue. However,



THE COUNCIL RECOMMENDS

that Arkansas increase its use of drone technology for smart infrastructure inspection with the following specific actions:

- **Funding ArDOT's use of drones:** ArDOT's drone program does not have direct legislative funding. In order to achieve the DOT's objectives in developing a world-class, leading-edge drone program, it may be useful to consider ways to secure appropriate, programmatic funding for ArDOT's drone program in the next legislative session.
- **Sharing lessons learned:** ArDOT's early success in adopting drones for inspection contains lessons that should be studied and shared with other public agencies and private companies in Arkansas. The State could lead an effort to review ArDOT's work and share lessons learned across the State.
- **Developing a strategic action plan:** To capitalize on these benefits, the governor's office could work with ArDOT, other State agencies, municipalities, and private companies to develop a strategic action plan designed to accelerate smart inspection solutions statewide. Arkansas would be the first State to develop such a plan, which could serve as a template for other States.

It will also be critical for Arkansas to show leadership in BVLOS (Beyond Visual Line of Sight) policy. The FAA has a BVLOS Aviation Rulemaking Committee that has created a [set of five recommendations](#) around: (1) establishing risk levels, (2) determine right of way, (3) new pilot training requirements, (4) new BVLOS qualification rules, and (5) regulation for third-party service providers. The Council recommends that Arkansas work with stakeholders inside and outside the State to express and build support for the FAA to implement their BVLOS ARC recommendations.



THE COUNCIL RECOMMENDS

that Arkansas increase its use of drone technology for smart infrastructure inspection with the following specific actions:

Supporting the DIIG Act

Arkansas own US Senator Boozeman recently introduced the bipartisan Drone Infrastructure Inspection Grant (DIIG) Act in the U.S. Senate. The DIIG Act, which passed the House in September, would provide (1) \$100M in grants for cities, States, and tribes to use American-made drones for critical infrastructure inspection and (2) \$100M in grants for community colleges and four-year institutions to host workforce development programs on drones.

As Senator Boozeman recognized in sponsoring the legislation, the DIIG Act would uniquely benefit Arkansas. The Arkansas Department of Transportation and other agencies using drones would be especially well positioned to capitalize on the first-of-a-kind \$100M grant program for State and local drone infrastructure inspection programs. Arkansas' rich educational ecosystem would also stand to benefit from grants for workforce development programs. In fact, the University of Arkansas at Fort Smith already hosts an FAA-approved workforce development program for drones. That school and others would be very competitive in seeking funding under the DIIG Act. Moreover, this line of funding presents opportunities to expand on Arkansas' Ready for Life program by offering upskilling and reskilling opportunities that would enable workers to find valuable positions in the growing drone economy.



THE COUNCIL RECOMMENDS

that Arkansas support the Drone Infrastructure Inspection Grant (DIIG) Act.



Advanced Air Mobility Readiness

In order to achieve Advanced Air Mobility readiness, the United States Government Accountability Office (GAO) released a report in May 2022 entitled Transforming Aviation: Stakeholders Identified Issues to Address for Advanced Air Mobility ([source](#)).

The GAO explains they commissioned this report to weigh the advantages and promises of AAM against the realities of implementation. Proponents of AAM have said that services using small electrically powered aircraft that can take off and land vertically could reduce urban congestion, speed cargo delivery, and provide lifesaving medical transportation. AAM would do so by using aircraft that are intended to be simpler to design and construct, easier to fly, quieter, and less expensive to operate than traditional aircraft. However, industry stakeholders and Members of Congress have raised questions about realizing AAM's implementation, particularly in an aerospace sector that already struggles to attract and retain personnel.

Specific issues raised by the group include the approval of new aircraft design, fostering public acceptance of AAM, and developing new ground infrastructure. The report also stresses workforce readiness for AAM — the pilots, maintenance technicians, and engineers who will make the development of this industry possible.

While approval for new aircraft designs will remain at the federal level with the FAA, the Council believes these other three issues of public acceptance, ground infrastructure, and workforce readiness can and should be addressed at the State level by States such as Arkansas that endeavor to be leaders in the field. The recommendations in the Education and Workforce Development section of this report apply to AAM readiness as well. On the issue of public acceptance, safety and noise are likely to be chief concerns for citizens. And in order to develop new ground infrastructure, significant electrification infrastructure work is likely to be required to support the large quantities of electricity needed to charge aircraft batteries.



THE COUNCIL RECOMMENDS

that Arkansas proactively support those organizations seeking to develop ground infrastructure for AAM, including by facilitating expedited permitting for required electric infrastructure work. The Council also recommends that as such work to develop infrastructure for AAM is being carried out, the State takes on the role of liaising with, surveying concerns, and educating citizens about the benefits of AAM to ensure public acceptance.



Sources: Beta Technologies and Wisk Aero, GAO-22-105020

The Walton Family Foundation and NEXA Advisors have put together a comprehensive report entitled *Advanced Air Mobility Comes to Arkansas* in October of 2021. Recommendations from this report include: (1) Assembling a Business Consortium using Public-Private Partnership Constructs, (2) Energize the Arkansas Aerospace Supply Chain to Lead AAM Advocacy, (3) Pursue a Promising OEM to Relocate to Northwest Arkansas, (4) Beginning Legislative Advocacy, (5) Form a Center for Advanced Air Mobility at the Flagship University of Arkansas and (6) Research Catalytic Benefits of AAM-Supported Healthcare Outcomes for Arkansas Residents. The Council is strongly aligned with the findings of this report and **recommends that Arkansas implement these six next steps to advance the AAM infrastructure in the State.**

Countering the Chinese Threat Domestically

The drone sector is arguably unlike any other advanced technology sector in that companies based in the Peoples' Republic of China control 70% to 90% of the market ([source](#)). DJI, whose products are widely used by Arkansas State and municipal agencies, is funded by the Chinese government and was recently added to a list of “Chinese military companies” by the U.S. Defense Department ([source](#)). Some States are looking to curtail the use of Chinese technology that may pose a threat to domestic security, with Florida having proposed a bill ([SB 2512](#)) that was prompted by the prevalent use of DJI drones by both Russia and Ukraine, through which China has been accused of leaking Ukrainian information to Russia.

In light of the national security threat presented by the Chinese government and companies beholden to Chinese government laws, bipartisan lawmakers at the State and federal level are increasingly considering policy measures designed to ensure taxpayer funds support technology, including drones, made by U.S. or allied-nation companies.



THE COUNCIL RECOMMENDS

Arkansas adopt reasonable guidelines on restricting the use of State funds to purchase drones and other emerging transportation technologies with strong ties to China

Any such proposal should include reasonable transition timelines and waivers.

There is precedent for such policy at the State level as well, as in the case of the aforementioned bill SB 2512 in Florida.

8.8	Drone - Continue to support the acceleration of the growth and availability of drone delivery services across the State and beyond, including partnerships with drone companies to launch essential healthcare to rural communities
8.9	Drone - Double down on the use of drone technology for smart infrastructure inspection
8.10	Drone - Support the Drone Infrastructure Inspection Grant (DIIG) Act
8.11	Advanced Air Mobility - Work with stakeholders inside and outside the State to express and build support for the FAA to implement their BVLOS ARC recommendations
8.12	Advanced Air Mobility - Proactively support those seeking to develop ground infrastructure for AAM, including by facilitating expedited permitting for required electric infrastructure work
8.13	Advanced Air Mobility - When AAM infrastructure is being developed, take on the role of liaising with, surveying concerns, and educating citizens about the benefits of AAM to ensure public acceptance
8.14	Advanced Air Mobility - Implement the next steps identified in the NEXA report, sponsored by the Walton Family Foundation, <i>Advanced Air Mobility Comes to Arkansas</i>
8.15	Advanced Air Mobility - Adopt guidelines restricting the use of State funds to purchase drones and other emerging transportation technologies with strong ties to China
8.16	EV - Increase funding for existing state programs and consider tax credits that other states like Oklahoma have used successfully to build a large network of Level 3 fast chargers

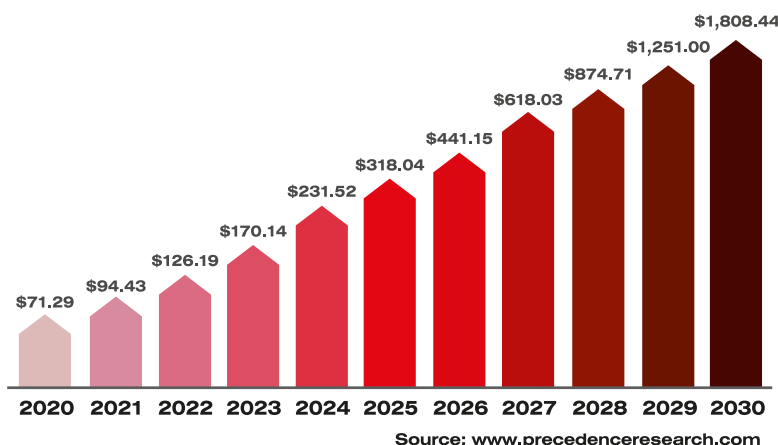
Autonomous Vehicle Readiness-Regulators Pave The Way for AV



The growth from gasoline-powered to electric-powered vehicles will give way to another natural transition: the Autonomous Vehicle (AV). The deployment of autonomous vehicles will likely lead to a once-in-a-century transformation of our transportation system and our communities. Arkansas has the opportunity to exercise proactive leadership to steer this transformation towards the public benefit. With a clear policy framework to guide deployment, AVs could create a transportation system that gets people to destinations more quickly and provides better travel options, decreases greenhouse gas emissions, improves safety for all road users, encourages efficient land use, enhances public health, and improves transportation equity and economic opportunity.

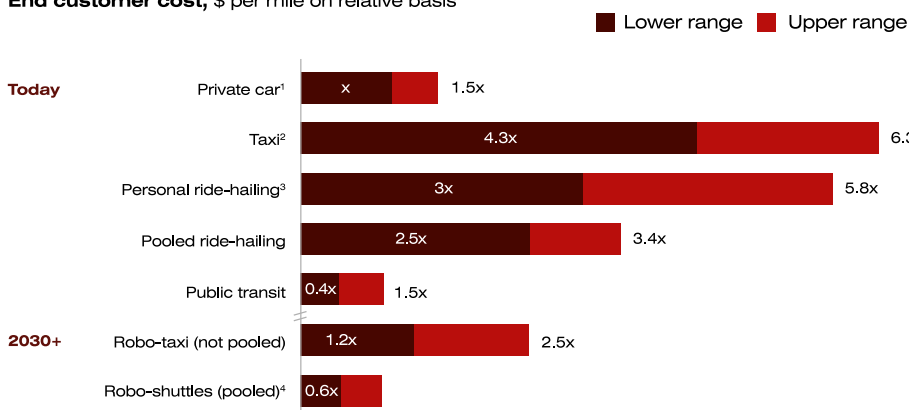
The AV market today is already a \$126 billion market, yet a report from Bain & Company estimates that the true inflection point for AVs is yet to come in 2028, after which adoption will rapidly gain momentum. Today, the very high fully-burdened cost of autonomous vehicles is slowing growth, but costs are expected to decline significantly in the coming decade. Services like robo-taxis could become price competitive with private non-autonomous cars and even transit services.

Autonomous Vehicle Market Size, 2020 to 2030 (USD Billion)



Mobility costs could decline in the coming decade as robo-taxi services emerge at scale.

End customer cost, \$ per mile on relative basis



¹Depending on car type for 10,000 miles per year.
²Estimation based on a five-mile trip with a five-minute waiting time in Dallas and Los Angeles.
³Estimation based on a five-mile, 15-minute trip in New York and Dallas.
⁴Assuming three passengers on average and 10 percent additional miles.
 Source: McKinsey Center for Future Mobility; Uber fare data; US Department of Transportation mileage data

Regulations will play a substantial role in the timeline and the impact of autonomous vehicles. Each year since Nevada became the first State to authorize the operation of autonomous vehicles in 2011, the number of States considering AV legislation has gradually increased. In total, 22 States have passed legislation and 10 governors have issued executive orders related to autonomous vehicles, exemplifying how States can permit and enable AV operation on public roads. Municipalities can also influence pricing via subsidies or license costs, and integrate transit systems into emerging autonomous networks. Such private-public partnerships could simultaneously reduce the number of empty miles driven (eliminating wasted carbon emissions) and reduce the cost of service to riders.

The Benefits of AV

Preparing for autonomous vehicles is not just an investment for the future, it's a commitment to the local economy and to the people today. U.S. companies are expected to spend \$61 billion in R&D and capital investments on autonomous vehicles by 2023, according to the U.S. Department of Transportation. States who develop an AV-friendly regulatory environment are best positioned to capture this economic activity. Alphabet's self-driving car division Waymo proved this by choosing Phoenix, Arizona as the pilot city to launch its robo-taxi service in 2020. Governor Doug Ducey of Arizona signed an executive order in 2015 supporting the testing of self-driving vehicles and established an Arizona Institute of Automated Mobility in 2018.

This partnership helped the Phoenix Valley Metro Regional Public Transportation Authority win a grant from the Federal Transit Authority (FTA) Sandbox program in 2016. A federal evaluation of the program showed that the autonomous vehicles were able to offer subsidized curb-to-curb paratransit service for disabled or retired Arizonans. Importantly, not a single Waymo vehicle has been involved in a serious incident.

Kevin Hartke, mayor of Phoenix suburb Chandler, spoke highly of the Waymo partnership: "Beyond the direct impact of their being an employer — Waymo hired hundreds of employees in the area — they have put Chandler on the map around the world as a location for autonomous vehicles."

Arkansas Is Already at the AV Forefront

In 2017, Arkansas took the bold measure and stepped into the advanced mobility space by being one of the first states in the country to pass platoon-enabling legislation (Arkansas Act 797). The application of this technology allowed for two or more trucks to use connectivity technology and automated driving support to operate as one for certain parts of a journey. Designed for fuel economy and safety benefits, this application still requires an individual present in each vehicle.

In 2019, Arkansas passed legislation allowing companies to enact autonomous vehicle pilot programs within the State. Arkansas Act 468 was designed to foster innovation and the increased use of technology in Arkansas' transportation system. The law allowed entities to operate up to three self-driving vehicles on the roads at the same time, after receiving approval from the State Highway Commission. Act 468 made possible a landmark AV partnership between Walmart and Gatik.

In 2021, both the Arkansas Senate and House of Representatives unanimously voted to pass House Bill 1562, which expanded Act 468 beyond just pilot programs and clarified legal concerns about liability. The Council is pleased to report that the Governor signed the bill into law in late 2021.



In 2019, Gatik began testing its self-driving trucks with Walmart, and in 2021 they made history by completing the world's first fully driverless delivery on a commercial route.



THE COUNCIL RECOMMENDS

supporting legislative efforts to update Act 797 of 2017 to align with Act 468 of 2021, in effect removing specific language requiring human operators for steering and system control. Such a change will enhance commercial applications of on-road AV technologies.

The Future of AV in AR



In addition to providing operational freedom for private research and development, State governments must collaborate with the private sector to develop infrastructure that will advance the potential of autonomous vehicles in Arkansas.

The most critical infrastructure underlying autonomous development will be data.



THE COUNCIL RECOMMENDS

that the Arkansas Department of Transportation build and maintain a structured database of the following data to be made available in real-time:

- Timing information of traffic lights to be broadcast or published over programmatic APIs or wireless frequency (kept current at all times).
- Information on any lane closures (i.e. some lanes are double duty on highways, and open/close to one side of traffic depending on the time of the day).
- V2X technology to be added to emergency vehicles and other public vehicles (such as school buses) to help companies locate and respond appropriately.
- All construction zone information.
- Any roadway changes (i.e. new signs, new lane painting).

Collecting and providing data is only half the equation; maintaining two-way connectivity between infrastructure and vehicles is equally as important. To that end,



THE COUNCIL RECOMMENDS

that Arkansas ensure there is strong cell network coverage over all routes and create a path for private entities to integrate their own sensors into public areas (e.g. bridges, construction zones).

Many autonomous systems rely on visual perception that use cameras to interpret road conditions and make decisions in real-time. Certain public services have the dual benefits of improving quality-of-life for constituents today and improving safety and efficiency of autonomous vehicle development.



THE COUNCIL RECOMMENDS

that the following dual-benefit efforts be prioritized to advance AV perception testing:

- Improved maintenance of public roads, for example around curves and corners (i.e. foliage, shrubbery).
- Consistent lights and traffic signals (one standard type), so that perception modules are not required to recognize a vast range.
- Consistently spacious highway/roadside shoulders for recovery maneuvers in the event they are required.
- Consistently clear road markings (i.e. lane lines, road edges).
- Information on problematic road conditions (i.e. a heavy pothole area).
- Standard marking for construction zones or temporary work zones (i.e. companies currently use very different types of markers, such as cones, signs, or concrete barriers).

Lastly, some policy experts have suggested that creating dedicated trucking lanes on highways with strict maximum/minimum speed requirements, or even creating AV-only lanes, might be the safest and quickest path toward full autonomy.



THE COUNCIL RECOMMENDS

that the State authorize a feasibility study that analyzes the impact of dedicating lanes for AVs and paves the way for future legislation if results are optimistic.

8.17	Autonomous Vehicles - Build and maintain a real-time structured database of critical transportation data
8.18	Autonomous Vehicles - Ensure strong cell coverage over Arkansas roads and create a path for private companies to integrate hardware into Arkansas' infrastructure
8.19	Autonomous Vehicles - Prioritize road maintenance that advance AV perception testing
8.20	Autonomous Vehicles - Authorize feasibility study on impact of dedicated AV highway lanes
8.21	Autonomous Vehicles - Support legislative efforts to update Act 797 of 2017 to align with Act 468 of 2021, in effect removing specific language requiring human operators for steering and system control. Such a change will enhance commercial applications of on-road AV technologies



APPENDIX

Organization Examples

Organization Examples

To identify best practices, the Council closely examined the organizational structure, capabilities, and data-driven outcomes of the following mobility-focused government agencies/organizations and state authorities from different states. A summary of these evaluations is detailed below.

Ohio

Governor John Kasich established DriveOhio ([Executive Order 2019-26D](#)) in 2019. DriveOhio is an initiative within the Ohio Department of Transportation with the mission to serve as a central hub for “smart mobility” as well as attract investments and jobs to Ohio.

Leadership

The “Executive Director” of the organization is appointed by and reports to the current Director of the Ohio Department of Transportation (ODOT). The Executive Director oversees all DriveOhio activities and is responsible for staffing the rest of the organization as necessary.

Oversight Boards

In addition, there are two all-volunteer boards: the DriveOhio Government Advisory Board and the DriveOhio Expert Advisory Board.

- The Government board represents a liaison from the following local government organizations:
- Department of Transportation
- Department of Insurance
- Department of Education
- Department of Higher Education
- Department of Public Safety
- Department of Administrative Services
- Governor’s Office of Workforce Transformation
- InnovateOhio
- JobsOhio
- Ohio Turnpike Infrastructure Commission
- Adjutant General
- Chair of the Public Utilities Commission of Ohio

The Expert Advisory Board members are appointed by the Governor. Members represent business and industries including telecommunications, applications, insurance, data, cyber security, automotive, research and testing, local governments including smart mobility programs, municipal planning organizations, Councils of government, other government entities responsible for infrastructure, and at least one member that represents a public facing industry.

Output

- DriveOhio is responsible for submitting an annual report to the Governor providing policy recommendations on the following:
- Data, Analytics, and Security
- Infrastructure
- Education and Workforce Development
- Unmanned Aerial Systems
- Telecommunications and Right-of-Way
- First Mile/Last Mile
- Vehicle Deployment
- Budget and Partnerships
- Communications and Public Education
- Policy and Regulations
- Economic Development

Funding

DriveOhio receives ~\$5M per year from the ODOT budget. They have roughly eight staff members, between an Executive Director, Communications, Outreach, Workforce, an ITS/AV/CV lead, and project managers.

FlyOhio is a subcommittee of DriveOhio. They receive \$1.5M per year and also have eight staff. They are looking to increase funding to \$5M per year over the next two years.

Oklahoma

Governor Kevin Stitt established the Oklahoma Office of Science and Innovation ([Executive Order 2019-38](#)) in 2019. The Office of Science and Innovation is responsible for advising the Governor on strategic initiatives to stimulate economic growth and high paying job creation by partnering with academia, industry, and research institutions. There are two Councils within the Office:

- Science and Innovation Council
- Aerospace and Autonomous Systems Council

Leadership

The Governor designates the “Secretary of Science and Innovation” to lead the development of innovation-friendly policies and statewide strategies that drive innovation and economic growth. The Secretary may pick a vice-chair,

The ten Council members are chosen by the Governor.

Output

The Office continuously reviews all aspects of science and technology in the State of Oklahoma, and periodically creates and presents a Science & Innovation Strategic Plan for the Governor.

Funding

The Chief Mobility Officer is given a small operating budget, but the MDOT and DOE are expected to provide most of the staff support.

Funding

The proposed budget is \$800K (\$475K for staffing, \$125K for programming, and \$200K for marketing.)

Michigan

Governor Gretchen Whitmer established the Office of Future Mobility and Electrification ([Executive Order 2020-2](#)) in 2020. The Office is housed in the Michigan Department of Labor and Economic Opportunity and was formed to recommend public policy changes to ensure that Michigan continues to be an epicenter of future transportation solutions around mobility and electrification.

The Michigan Council on Future Mobility and Electrification is created as an advisory body within the Office.

Leadership

The Michigan Department of Labor and Economic Opportunity (LEO) appoints a “Chief Mobility Officer” to lead the Office.

The Council operations are supported by staff of the Michigan Department of Transportation, LEO, and the Michigan Department of the Environment.

The Council voting members include Directors from the following Michigan Departments:

- Department of LEO
- Department of Environment
- Department of Insurance
- Department of State Police
- Department of Transportation
- Department of Treasury
- Department of Michigan Public Service Commission

The Council also includes nine voting individuals appointed by the Governor who represent the interests of local government, local business, or technology leaders in future mobility.

Output

The Office of Future Mobility and Electrification provides an annual report of recommendations of policy changes to the governor.





APPENDIX

Space Authority Examples

APPENDIX

Space Authority Examples

Florida

Organization & Process

Space Florida was established by the legislature on Sept 1, 2006. Created as an independent special district (“and subdivision of the State of Florida”), Space Florida uniquely serves as the single point of contact for all space-related functions of the State of Florida. Florida’s Legislature has defined and designated five geographic areas of the State as spaceport territories.

At the same time, the government published an extensive Governance Policy “that complements the Space Florida Act,” formalizing the governance policies both internally and externally as they relate to State and federal law. This codified the intent of the organization, legally constituted a Board of stakeholders, established a president, and set the bylaws, as well as the process to change both.

The Florida Spaceport system is predominantly owned and managed by five different partners:

1. The National Aeronautics and Space Administration (NASA)
2. The United States Department of Defense (DOD)
3. The Federal Aviation Administration (FAA)
4. Space Florida
5. The Florida Department of Transportation (FDOT)

After approval, Florida created a “Florida Spaceport System Plan” to outline the goals and efforts of the Spaceport. This plan was created first in 2013 and received an update in 2018, as the space economy progressed and milestones were developed internally within the Florida spaceport.

In a 2013 amendment to U.S. Code Title 10, Florida also changed the law to allow the the United States Air Force (USAF) to accept non-federal contributions in order for Space Florida to do business with the U.S. Space Force (source).

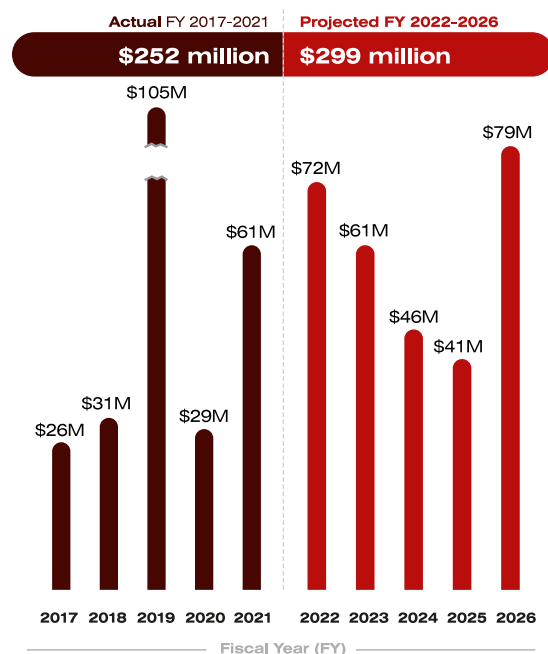
Funding

Space Florida receives annual operations funding from the Florida Legislature to foster the growth and development of the aerospace industry in Florida and capital funding for spaceport infrastructure improvements from FDOT.

From 2017 to 2021, FDOT provided \$252M and is projecting to add an additional \$299M between 2022-2026. So far, 93% of the funds have been deployed to actual capital expenditure (e.g. launch complexes, facilities, manufacturing) and 7% has gone to overhead (e.g. planning, financial analysis, etc).

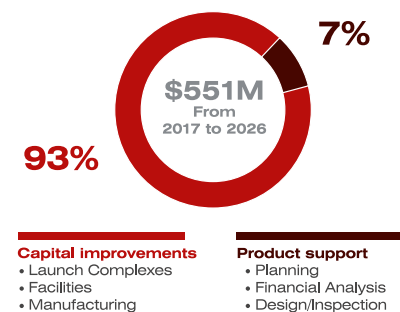
Investments

How much does FDOT fund each year?



Improvements

Where does the funding go?



Space Florida's tax-exempt status enables the organization to negotiate optimal terms on loans and reduce the overall tax burden associated with the construction of facilities. Since its inception, the Florida Spaceport has secured over \$600M from NASA, USAF, and commercial partners like Boeing and Blue Origin.



The FDOT work program is updated annually, so funding may change depending on shifting priorities. In accordance with the requirements of Section 215.97(2)(a), Florida Statutes, all project records are public and audited.

Space Florida Changes In Net Position

	For the year ended September 30, 2020	For the year ended September 30, 2019	For the year ended September 30, 2018
Operating revenues:			
Fees and charges for services	\$ 9,808,691	\$ 8,316,887	\$ 5,735,020
State appropriated funding	17,961,732	17,776,028	21,126,767
Grant revenue-operating	39,593,121	22,127,636	46,823,593
Total operating revenue	67,363,544	48,220,551	73,685,380
Non-operating revenues:			
Other	413,893	221,554	119,913
Grant revenue-capital	-	2,173,755	12,880,636
Capital contributions	999,000	11,996,674	20,457,307
Total non-operating revenue	1,412,893	14,391,983	33,457,856
Total revenues	68,776,437	62,612,534	107,143,236
Operating expenses:			
Business development activities	49,419,052	32,562,600	66,020,093
General, administrative, and depreciation	20,776,493	19,553,579	7,894,446
Total operating expenses	70,195,545	52,116,179	73,914,539
Non-operating expenses:			
Total non-operating expenses	2,346,706	626,147	1,014,502
Total expenses	72,542,251	52,742,326	74,929,041
Change in net position	(3,765,814)	9,870,208	32,214,195
Net position - beginning	152,267,803	142,397,595	110,183,400
Net position - ending	\$ 148,501,989	\$ 152,267,803	\$ 142,397,595

After reviewing the aerospace economic development agency's model, the Council has identified the following ways that Space Florida helps stimulate business:

- One of the most frequently used tools in the Space Florida toolbox is called conduit financing, which is a way to get quick funding to pay for property or infrastructure that is repaid as a long-term loan or lease. This allows a company to access cash quickly and defer payment while using existing capital more strategically.
- Space Florida can provide financial efficiencies for business by constructing deals that lower overhead and operating cost on an annual basis. One way to do this is with a synthetic lease, or a kind of operating lease structured in such a way that it's not recorded as an asset or liability on a balance sheet. Instead, it's an expense. The biggest benefit to a synthetic lease is that it enables businesses to defer large expenditures or spread them out over multiple years.
- Space Florida has the ability to secure property and rights to infrastructure from federal, state and local governments for commercial use on behalf of the business.
- Equipment financing
- Access to additional financing and workforce recruiting and training support in coordination with partners at Enterprise Florida, Workforce Florida, and Visit Florida, plus local economic development organizations around the State

Oklahoma

Organization & Process



On May 17, 1999, Governor Frank Keating signed the Space Industry Development Act, which created the Oklahoma Space Industry Development Authority (OSIDA). On May 24, 1999, the Space Industry Tax Incentive Act was signed by the Governor. In June 2006, FAA's Office of Commercial Space Transportation awarded OSIDA a Launch Site License.

OSIDA operates the Oklahoma Air & Spaceport and Industrial Park, which is a 2,700-acre aerospace complex that includes the FAA licensed spaceport and general aviation public use airport. The spaceport provides a significant polar trajectory ideal for commercial and Department of Defense launch purposes as it provides the most strategic and efficient way to view, or deploy to, virtually every part of the Earth in under an hour as the Earth rotates underneath it.

OSIDA maintains a decade-long partnership with the U.S. Air Force through a Joint Use Agreement (JUA) serving in support of Altus, Vance, Tinker, and Sheppard AFBs for military training and flight operations. JUA provides \$1.3M annually to safely and efficiently support 90% of all airfield maintenance (runways, taxiways and ramp, 100% of Air Traffic Services and Crash and Rescue Operations, and 30% of OSIDA staff salary).

Oklahoma has one of a few spaceports in the United States; while it has been used numerous times for aviation-related purposes, it has been a decade since it was used for space flight testing.

Funding

OSIDA receives \$368,256 of the State's \$7.7 billion State budget (.00005%) to operate a nearly half billion 2700-acre national and State asset.

OSIDA has five FTE and directly supports more than 70 local jobs.

Sources and Uses of Funds for FY 2020 and FY 2021

	2020	2021
Sources:		
Licenses, Permits & Fees	\$ 1,562,400	\$ 893,800
Net Appropriations	383,599	368,255
Income from Money and Property	248,005	301,343
Sales & Services	39,955	60,962
Grants, Refunds & Reimbursements	10,277	39,528
Non-Revenue Receipts	4,641	1,321
Total Sources	\$ 2,248,877	\$ 1,665,209
Uses:		
Professional Services	\$ 788,298	\$ 752,963
Personnel Services	451,233	447,309
Administrative Expenses	396,209	281,755
Property, Furniture, Equipment & Related Debt	98,100	480,722
Travel Expenses	8,900	7,680
Total Uses	\$ 1,742,740	\$ 1,970,429

Source: Oklahoma statewide accounting system (unaudited, for informational purposes only)

How OSIDA Helps Business Stimulate Business



The State of Oklahoma offers several space industry related sales tax exemptions, which are meant to stimulate development within the industry.

The governor signed the Space Industry Tax Incentive Act in 1999.

In order to incentivize space industry development in Oklahoma, State law (68 O.S. § 1356 [32-37]) provides that the following are exempt from sales tax:

1. Sales of tangible personal property or services to any spaceport user;
2. The purchase or lease of machinery and equipment used at a fixed location in Oklahoma exclusively in the manufacturing, processing, compounding, or producing of any space facility, space propulsion system, space vehicle, satellite, or station of any kind possessing space flight capacity;
3. The sale, lease, use, storage, consumption, or distribution in Oklahoma of the following:
 - a. Any satellite or any associated launch vehicle (including its components, parts and motors) imported into Oklahoma to be launched into space;
 - b. Any space facility, space propulsion system, space vehicle, satellite or station of any kind possessing space flight capacity (including its components);
 - c. Tangible personal property placed on any space facility, space propulsion system, space vehicle, satellite or station possessing space flight capacity which is launched into space; and
 - d. Tangible personal property meeting the IRS definition of “section 38 property” (i.e., depreciable tangible personal property with an estimated useful life of three or more years) used primarily in support of space flight.

The Oklahoma Space Industry Development Act (74 O.S. § 5202(18)) defines a “spaceport user” as “any person that uses the facilities or services of any spaceport. For purposes of any exemptions or rights granted thereafter, the spaceport user shall be deemed a spaceport user only during the time period in which the person actually uses any spaceport, and such rights and exemptions shall be granted with respect to transactions relating to spaceport projects only.”

The law specifically provides that exemption 3a is not affected by (1) the destruction in whole or in part of the satellite or launch vehicle; (2) the failure of a launch to occur or be successful; or (3) the absence of any transfer or title to, or possession of, the satellite or launch vehicle after launch.

However, an evaluation on the incentive shows that it has yet to be used and therefore does not generate positive nor negative economic impact.



STATE OF ARKANSAS
EXECUTIVE DEPARTMENT

PROCLAMATION

EO 22-06

TO ALL TO WHOM THESE PRESENTS COME – GREETINGS:

**EXECUTIVE ORDER TO ESTABLISH THE ARKANSAS COUNCIL ON
FUTURE MOBILITY**

WHEREAS: The mobility sector is undergoing a period of revolutionary advancements that will lead to the utilization of more sustainable, reliable, and cost-efficient modes of transportation; and

WHEREAS: To remain competitive, the State of Arkansas must keep pace with this change by accelerating operational readiness through necessary infrastructure investments and an effective framework to bolster economic opportunities; and

WHEREAS: A concerted effort is necessary to create an environment to safely integrate electrification, autonomous vehicles, and advanced air mobility into existing land and airspace, to streamline vehicle testing and certification policies, and to eliminate regulatory barriers;

NOW, THEREFORE, I, ASA HUTCHINSON, acting under the authority vested in me as the Governor of the State of Arkansas, do hereby order the following:

- (1) There is hereby created the Arkansas Council on Future Mobility, which shall serve as an advisory body of the Governor.
- (2) The Council shall be composed of members appointed by the Governor and shall serve at the pleasure of the Governor. Cyrus Sigari shall serve as Chairman of the Council. The Council shall be composed of the following members or their individual designees:
 - a) Cyrus Sigari, Co-Founder/Managing Partner, UP Partners;
 - b) Dean Banks, former President and Chief Executive Officer, Tyson Foods, former Leadership Team Member and Project Lead, Google X;
 - c) Tom Ward, Executive Vice-President/Chief eCommerce Officer, Walmart;
 - d) Craig Harper, Executive Vice-President/Chief Sustainability Officer, J.B. Hunt;
 - e) Alan Mantooth Ph.D., Distinguished Professor, University of Arkansas;
 - f) Tony Aquila, Chief Executive Officer and Executive Chairman of Canoo;
 - g) Chad Causey, Executive Director, Arkansas Aerospace and Defense Alliance;
 - h) John Bethel, Director of Public Affairs, Entergy Arkansas;
 - i) Daryl Brown, Executive Director, External Affairs South Region, MISO;
 - j) Becky Keogh, Secretary of the Arkansas Department of Energy and Environment;
 - k) Lorie Tudor, Director of the Arkansas Department of Transportation;
 - l) Jami Cook, Secretary of the Arkansas Department of Public Safety;
 - m) Mike Preston, Secretary of the Arkansas Department of Commerce;
 - n) Ted Thomas, Chairman of the Arkansas Public Service Commission;

- o) Jason Morrison, Ed. D., Chancellor, Southern Arkansas University Tech;
 - p) Shannon Newton, President, Arkansas Trucking Association;
 - q) Hunter Bale, Past Chairman and Member of the Arkansas Auto Dealers Association, Vice President of Bale Chevrolet;
 - r) A representative of a ground transportation company with a significant presence in Arkansas;
 - s) A representative of the Railroad Industry with a significant presence in Arkansas; and
 - t) Additional members as the Governor deems necessary.
- (3) The Council shall have the following duties:
- a) Identify state laws and administrative rules that create barriers to the development and enhancement of electrification and advanced air mobility in Arkansas;
 - b) Make policy and program recommendations to support and facilitate the development of electrification and advanced air mobility in Arkansas;
 - c) Develop priorities and recommendations for the allocation of federal resources and grant programs in order to invest in critical components of an ecosystem that will enable the maturation and growth of advanced air mobility, autonomous vehicles, and electrification in Arkansas, including energy, infrastructure, security, and transportation;
 - d) Identify future tasks and goals including, but not limited to, strategic goals in education, workforce training, and economic development;
 - e) Create incentives to develop opportunities, amplify economic activity, and create jobs; and
 - f) Submit a final report of the Council's findings and recommendations to the Governor no later than November 30, 2022.
 - g) The work of the Council shall be concluded upon submission of the final report.
- (4) Upon request, the Arkansas Economic Development Commission or the Governor's Office may provide staff to support the work of the Council.
- (5) The Council is encouraged to engage private sector representatives when appropriate.

IN TESTIMONY WHEREOF, I have hereunto set my hand and cause the Great Seal of the State of Arkansas to be affixed this 22nd day of February, in the year of our Lord 2022.




Asa Hutchinson, Governor


John Thurston, Secretary of State



AR KAN SAS

FUTURE
MOBILITY
REPORT