



Autonomous Vehicles Thrive in Arizona's Free-Market Fast Lane

*State's Model Sets Course for Future of
Transportation Innovation*

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Take a drive through greater Phoenix, and you will likely encounter autonomous vehicles effortlessly and safely making their way without assistance around Arizona's metropolitan center. Driverless vehicles are a common sight in the area, providing residents with reliable, on-demand access to ride-hailing services like Waymo.

Welcome to the Arizona Model: A Framework for Freedom and Innovation

When new technologies or industries emerge, they can succumb to the whims of state government rulemaking or a patchwork of regulations emanating from cities and towns. For example, in California, the wait time from proposal for deploying AVs to hitting the road, driven by the requirement that multiple government agencies negotiate with each other, has been over two years.¹

Arizonans, on the other hand, have reaped the benefits of a state-based framework for autonomous vehicles rooted in promoting freedom over burdensome red tape. Indeed, Arizona has pioneered a freedom-based environment for AV testing and deployment that has unleashed innovation in the marketplace and made the state a national leader in autonomous vehicles.

AVs have traveled on Arizona roads since 2015, after Gov. Doug Ducey signed Executive Order 2015-09, which outlined the development and testing requirements for AV technology.² Gov. Ducey subsequently issued an additional order in 2018 to modernize his prior action to reflect advancements in AV technology and testing.³ In 2021, the state legislature enshrined Gov. Ducey's innovative model into law.⁴ To date, 13 companies have obtained permission from the state of Arizona for AV testing and operation.⁵

Under the executive order and subsequent leg-

islation, autonomous vehicles must comply with federal motor vehicle safety standards, mitigate risk in the event of a system failure, adhere to all traffic and motor safety laws, and maintain valid certification, registration, licensing, and insurance.

The order also directed law enforcement agencies to work with the Arizona Department of Transportation (ADOT) to develop a framework for seamless interactions between law enforcement and AVs. Under the law, data reporting requirements remain minimal, and ADOT possesses only the powers granted explicitly by the statute to restrict the operations of AVs, ensuring regulatory certainty for cutting-edge companies. ADOT is allowed to intervene to protect public safety and demand data when AVs are performing in an unsafe manner.

The widespread adoption of autonomous vehicle technology presents a unique opportunity to drastically enhance road safety, provide better transportation options for elderly or disabled individuals, reduce traffic, and improve air quality, all while creating vast economic gains from improving efficiency in the shipping industry. Policymakers should adopt the freedom-oriented principles of "permissionless innovation" as their default and avoid erecting needless regulatory barriers to reap the full benefits of this game-changing AV technology. As Adam Thierer, an expert in technology policy and innovation, explained: "Permissionless innovation is not an absolutist position that rejects any role for government. Rather, it is an aspirational goal that stresses the benefit of 'innovation allowed' as the default position to begin policy debates. It switches the burden of proof to those who favor preemptive regulation and asks them to explain why ongoing trial-and-error experimentation with new technologies or business models should be disallowed."⁶

As the technology progresses, Arizonans will continue to benefit from the increased adop-



tion of AVs across their economy while finding themselves on the front line of a mobility revolution. The leaders of other states should consider the Arizona Model as an example of commonsense regulation that ensures safety while nurturing a technological innovation that will arrive whether they like it or not.

Driverless Autonomous Vehicles Can Improve Road Safety

By avoiding unnecessary regulatory obstacles to transportation innovation, policymakers can mitigate the staggering number of deaths and injuries sustained on our nation's roadways every year. According to data from the National Highway Traffic Safety Administration, 42,514 individuals died in motor vehicle crashes in 2022 and another estimated 2.38 million suffered injury.⁷ The NHTSA estimates the economic impact of motor vehicle crashes to be roughly \$340 billion every year.⁸

Driverless AVs often integrate a combination of LiDAR ("light detection and ranging" technology to measure distances), cameras, radar, and artificial intelligence to safely navigate driverless vehicles through traffic. The combination of systems feeds data into powerful computers using incredibly sophisticated software and machine learning to send signals to the vehicle to quickly react to its surroundings, such as lane markings, pedestrians, and other motorists. Companies painstakingly map entire cities before their driverless AVs operate among the public, and their cars are programmed to follow all traffic safety laws. This technology runs through millions upon millions of traffic simulations to train the cars on various situations that could occur in real time, creating a system designed to eliminate the most unpredictable variable on the road: human error.

Unlike human-driven counterparts, driverless AVs never get drowsy, drunk, or distracted.

Their programming requires the vehicle to follow all traffic safety laws, and the technology can react to dangerous obstacles much quicker than people ever could.

The latest peer-reviewed data from Waymo, a driverless ride-hailing company that has operated in Arizona since 2016, supports this conclusion. Waymo passengers have ridden over 20 million miles in the Phoenix area alone through September 2024. Compared to the average human driver, the company's driverless cars experienced 81% fewer airbag deployment crashes, 78% fewer injury-causing crashes, and 62% fewer police-reported crashes.⁹

As AV technology progresses, these numbers will only improve, especially after more and more vehicles become autonomous rather than human operated.

Innovation and Independence: How Autonomous Vehicles Empower the Disabled, Elderly, and Non-Drivers

Autonomous vehicles offer a solution to one of society's biggest problems in healthcare: transportation barriers. According to the American Hospital Association, millions of Americans are unable to obtain medical care because they lack a way to get to appointments. One researcher found about 3.6 million people in the United States miss or delay medical care annually due to transportation issues. Disabled individuals are disproportionately affected. For example, a recent national survey found that 17% of adults with a disability had to forgo needed healthcare because they couldn't get transportation, over three times the rate of the general adult population.¹⁰

Missed appointments act as a costly burden on an already overextended healthcare system. Current estimates show that missed appointments cost the U.S. healthcare industry around \$150 billion each year.¹¹ The consequences



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extend beyond financial losses. Missed doctor visits also drive up emergency and hospital utilization. When routine care is inaccessible, patients are more likely to require urgent or emergent care later. Research shows that individuals with unmet transportation needs are 2.6 times more likely to have multiple emergency room visits in a year compared to those with adequate transportation. Likewise, patients who cannot get a ride to post-hospital follow-up appointments have higher odds of preventable rehospitalizations—foregoing follow-up can mean complications worsen, further escalating overall healthcare costs.¹²

Autonomous vehicles help solve the problem of missed doctor appointments through the promise of a revolutionary way to empower the disabled and elderly, granting them an unprecedented level of independence and accessibility previously considered unimaginable. Ride-hailing AVs can be designed with accessibility features to include voice-activated controls or wheelchair accommodation, dramatically expanding personal freedom.

These advancements are not hypothetical. Driverless ride-sharing company Waymo, for example, has partnered with the National Federation of the Blind to help design accessibility features and provide feedback from blind individuals in the development of Waymo's technology. These features provide blind individuals the ability to hail a ride from their phone, identify the location of the vehicle through sound features and easily enter the car, thanks to the vehicle's ability to identify safe areas for pickup.

As policymakers contemplate how to best integrate autonomous vehicles into their societies, they should keep disabled and elderly individuals in the forefront of their minds and avoid any regulatory barriers to this industry, providing more transportation options for these populations.

Potential Economic Gains from Mass AV Adoption

The widespread incorporation of AVs on American roadways could yield substantial benefits as the world moves into an AI-oriented economy. AV technology can optimize shipping routes, minimize accident-related costs and delays, and reduce labor costs, all of which translates into savings for consumers. Further, the auto industry employs millions of Americans across the country. The U.S. Chamber of Commerce estimates that motor vehicle and parts manufacturers and dealers employ nearly 3 million individuals. Over time, as AV adoption rates increase, many of these jobs will shift toward more highly paid technology jobs related to creating and maintaining the systems that operate autonomous vehicles.¹³

Why Arizona Outpaces Other States

Multiple states have enacted or are considering legislation related to the testing and deployment of autonomous-vehicle technology. As policymakers deliberate on how to best integrate AVs into the public transportation infrastructure, they should look to Arizona's success story as a blueprint for how a freedom-first regulatory framework allows the AV industry to blossom, driving investment and innovation.

Unfortunately, certain special interest groups seek to stifle innovation by imposing unnecessary and burdensome requirements on the industry based on hypothetical problems rather than empirical evidence. Some have expressed concerns over safety and continue to promote "driver in" bills that would require all commercial AV vehicles to have a driver behind the wheel.¹⁴

Enacting such policies would be a mistake. "Driver in" requirements would add unneces-

sary and burdensome requirements on the industry based on hypothetical problems rather than empirical evidence. Some have expressed concerns over safety and continue to promote “driver in” bills that would require all commercial AV vehicles to have a driver behind the wheel.

A State-Based Approach

Innovation rarely comes from multiple government entities negotiating ways to regulate new companies and technology. Arizona’s success demonstrates that jurisdictional authority is integral to creating a predictable environment that feeds innovators. States should resist the temptation to allow local governments to impose a patchwork of conflicting safety regulations, certification processes, and permitting requirements on AV companies. Last year, for example, the California Senate advanced a bill to allow cities with at least 250,000 residents to create permitting requirements and restrict AVs’ hours of operations on city roads.¹⁵ Such a bill could devastate the nascent AV industry because a fragmented regulatory and permitting environment is unworkable and adds massive compliance costs to any AV company. In order for AV companies to grow and improve, companies need predictable and uniform regulations within states.

Given the immense potential economic, safety, and societal benefits that AV technology offers, lawmakers should take a cautious approach to regulation. Arizona’s success offers a lesson on how best to foster innovation while balancing oversight and safety regulations. States that embrace this model will position themselves to join the Grand Canyon State at the forefront of transportation’s next revolution.

END NOTES

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[2] Exec. Order No. 2015-09, "Self-Driving Vehicle Testing in the State of Arizona," Arizona Governor Doug Ducey, August 25, 2015.

[3] Exec. Order No. 2018-04, "Advanced Autonomous Vehicle Testing and Operating," Arizona Governor Doug Ducey, March 1, 2018.

[4] H.B. 2813, 55th Legislature, First Regular Session, AZ, 2021.

[5] "Autonomous Vehicles Testing and Operating in the State of Arizona," ADOT Motor Vehicle Division.

[6] Adam D. Thierer, "Embracing a Culture of Permissionless Innovation," Cato Institute, November 17, 2014.

[7] "Overview of Motor Vehicle Traffic Crashes in 2022," Traffic Safety Facts, NHTSA, June 2024.

[8] "NHTSA: Traffic Crashes Cost America \$340 Billion in 2019," news release, January 10, 2023.

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[12] "Addressing Transportation Barriers," Centers for Medicare & Medicaid Services, 2023.

[13] "Unlocking the Social and Economic Benefits of Autonomous Vehicles," U.S. Chamber of Commerce, July 19, 2023.

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[15] S.B. 915, 2023-2024 Regular Session, CA, 2024.



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