

MISSOURI'S AUTONOMOUS VEHICLE FUTURE

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A capstone project submitted to Johns Hopkins University in conformity with the requirements for the
degree of Master of Arts in Public Management

Baltimore, Maryland
May, 2019

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Abstract

In Missouri, existing laws prohibit the registration, testing, and deployment of autonomous vehicles. The absence of action on this issue creates three levels of problems for the state, which are: the state is missing out on opportunities to attract innovative developers and economic investment, the state is neglecting an impending public safety problem, and the state is putting itself at a policymaking time horizon disadvantage. Before offering a possible solution to the problem, the following report outlines the history of autonomous vehicle development and how states are attempting to responsibly bring autonomous vehicles (AVs) to market, including an analysis of AV policymaking in Arizona, California and Ohio. After explaining various approaches to state AV policy and looking at previous attempts to solve the problem in Missouri, the Show Me Safety Plan is proposed. The plan blends legislative and executive action, which would be implemented by the Missouri Departments of Revenue and Transportation, and to a lesser extent, other state agencies, to remove existing regulatory barriers to AV testing, establish a registration and reporting system, and prescribe vehicle operator requirements. The explicit goals of the plan are to attract more than \$20 million in economic investment and create more than 200 jobs in the state while preventing an AV-related fatality throughout the duration of the proposal. Following the description of the policy proposal, analysis of the policy and political tradeoffs of the proposal is conducted in order to make a recommendation to Missouri Governor Mike Parson on whether or not to pursue the Show Me Safety Plan in advance of his 2020 gubernatorial re-election race. The report concludes by recommending the Show Me Safety Plan be proposed by Governor Parson in order to garner a significant legislative achievement in a low-risk way that allows autonomous vehicles developers to invest in Missouri and test their technologies while establishing safety policymaking guardrails to protect members of the motoring public.

Advised by Paul Weinstein.

Table of Contents

- I. Action-Forcing event; page 1
- II. Statement of Problem; pages 1-6
- III. History and Background; pages 6-21
- IV. Policy Proposal; pages 22-26
- V. Policy Analysis; pages 27-33
- VI. Political Analysis; pages 33-42
- VII. Recommendation; pages 42-44

List of Figures

Figure 1.0: “States with Autonomous Vehicles Enacted Legislation and Executive Orders.” Page 15.

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Working Title: Missouri's Autonomous Vehicle Future

Memo to Missouri Governor Mike Parson

Action Forcing Event:

In October of 2018, Tech.co published a story titled "Mapping Every Driverless Car Crash in California So Far" in which reporter Tom Fogden analyzed where autonomous vehicles are crashing in the state, which companies are involved in the crashes, and why the accidents are occurring. On March 19, 2018, an Uber vehicle being tested in autonomous mode fatally crashed into a pedestrian in Tempe, Arizona¹, a state that just weeks earlier issued an executive order stating "fully driverless cars without anyone behind the wheel are allowed to operate on public roads."² Under California's stringent autonomous vehicle (AV) regulatory framework and Arizona's lax regulatory environment for AVs, crashes continue to happen, yet developers continue to test and invest in the technologies.³

Statement of the Problem:

Existing Missouri laws prohibit the registration, testing, and deployment of autonomous vehicles in the state.⁴ The absence of action on this issue creates three levels of problems for the state, which are: the state is missing out on opportunities to attract innovative developers and economic investment, the state is neglecting an impending public safety problem, and the state is putting itself at a

¹ Etherington, Daniel. "Uber self-driving test car involved in accident resulting in pedestrian death." TechCrunch.com (March 19, 2018). <https://techcrunch.com/story/uber-self-driving-car-strikes-and-kills-pedestrian-while-in-autonomous-mode/>

² Hawkins, Andrew. "The self-driving car war between Arizona and California is heating up." TheVerge.com (March 2, 2018). <https://www.theverge.com/2018/3/2/17071284/arizona-self-driving-car-governor-executive-order>

³ Ibid, Hawkins.

⁴ Toomey, Alyssa. "No laws in Missouri governing self-driving cars." KMIZ (March 19, 2018). <https://www.abc17news.com/news/no-laws-in-missouri-governing-self-driving-cars/718576188>

polymaking time horizon disadvantage despite warning from the Missouri Department of Transportation that “the technological changes are likely to happen faster than the ability of government to react to them, making it imperative that planning for those changes start now.”⁵

Why is a lack of regulatory framework on autonomous vehicles a public safety problem? One may suggest that, because AVs are not currently allowed on Missouri roads, there is no public safety risk and, as such, should be of no concern to Missouri policymakers; however, that assessment of the problem is shortsighted. The lack of regulatory framework for AVs in Missouri is an impending problem because the testing of these technologies is happening rapidly throughout the country with mixed results.⁶ More than 800 people die each year on Missouri’s roads, so vehicle manufacturers and technology developers will continue to seek solutions to road fatalities by investing in AV technologies.⁷ Despite setbacks like crashes, fatalities, and public disapproval, companies like Uber continue to invest in the autonomous vehicle development sector and actively seek out new testing locales as well as re-apply for testing permits in states in which they have previously halted operations, like Pennsylvania.⁸ Right now, the state does not face day-to-day public safety concerns regarding whether an autonomous vehicle will strike a pedestrian. But, as the technology continues to improve and comes closer to commercial deployment, pressure on Missouri lawmakers will mount and the state may be forced to make less thoughtful, reactive policy to keep up with technology, jeopardizing the safety of its citizens, its workforce and its economy. Promulgating poor policy is dangerous in this space. Additionally, allowing developers to map road conditions and test operations in Missouri now will prevent a rush of

⁵ “2018 Long Range Transportation Plan Update: Technical Memorandums.” Missouri Department of Transportation (June 2018). Page 46. http://www2.modot.org/LRTP/assets/files/TechMemo_MoDOT_053018.pdf

⁶ Ibid. Appendix E: State Activities.

⁷ Lindsay, Jazlyn. “Missouri State Highway Patrol announces number of fatalities.” KRCG (December 26, 2018). <https://krcgtv.com/news/local/missouri-state-highway-patrol-announces-number-of-fatalities>

⁸ Clark, Kate. “Uber to resume autonomous vehicle testing months after fatal accident.” TechCrunch.com (December 2018). <https://techcrunch.com/2018/12/18/uber-to-resume-autonomous-vehicle-testing-months-after-fatal-accident/>

less carefully considered testing – or even deployment – when federal legislation or federal mandates take effect in the future.

Though a lack of AV regulation is not an immediate public safety problem on Missouri’s roads, the state is failing to capitalize on potential economic development activity. Foregoing grant dollars, public-private partnerships, and private economic investment in the state simply because autonomous vehicles are not allowed to operate is a problem for Missourians who could benefit from the added employment opportunities, influx of spending in the state economy, and attracting highly-skilled laborers to the state. An example of this missed opportunity can be found in Ohio where “a collaborative project between Smart Columbus, ODOT’s DriveOhio, the state agency devoted to autonomous-vehicle research and Ohio State University” attracted a “\$40 million grant from the United States Department of Transportation and a \$10 million grant from Paul G. Allen Philanthropies.”⁹ Similarly, though the financial figures are undisclosed, Arizona is working with Intel to establish the Institute for Automated Mobility, “a public-private partnership that will form a research center and proving ground where companies can vet and improve the safety of self-driving vehicle systems.”¹⁰

To further drive home this point on missed economic development opportunities, one can look at a very specific case from Arizona. A Chinese company that specializes in self-driving commercial trucks, TuSimple, announced in September a plan to add 500 jobs to their Tucson, Arizona operations.¹¹ “TuSimple’s planned expansion has a projected total economic impact of \$1.1 billion over the next five

⁹ “ODOT to form public-private partnership for autonomous vehicle testing.” Gemini Global Group (July 13, 2018). <http://geminiglobalgroup.com/odot-to-form-public-private-partnership-for-autonomous-vehicle-testing/>

¹⁰ Bigelow, Pete. “Arizona plans public, private automated vehicle research hub.” Automotive News (October 11, 2018). <https://www.autonews.com/article/20181011/MOBILITY/181019836/arizona-plans-public-private-automated-vehicle-research-hub>

¹¹ Wichner, David. “Chinese self-driving semi truck developer plans to add 500 jobs in Tucson.” Arizona Daily Sun (September 12, 2018). https://tucson.com/business/chinese-self-driving-semi-truck-developer-plans-to-add-jobs/article_dbce782b-d08e-514f-b23d-d1c93e10861b.html

years, according to Sun Corridor Inc., the Tucson area’s main economic-development agency.”¹² The investment in Tucson will create new employment opportunities for engineers, truck drivers, office staff and technicians, which local officials say can be partially filled by students from the University of Arizona and Pima Community College, two institutions that have close ties to TuSimple.¹³ Importantly, TuSimple executive Chuck Price cited Arizona’s “friendly regulatory climate” as a reason why the company selected Tucson as its major research and development site.¹⁴ In an era when Missouri is restructuring its workforce development approach and reorganizing state government to better meet the labor market needs of the state¹⁵, conceding major investment opportunities in an emerging technology sector is a problem. There are federal and private dollars on the table that the state of Missouri is not currently attempting – or even allowed – to solicit.

Related to the missed economic investment opportunities are the state’s missed educational and skills training opportunities. In macroeconomic theory, technological knowledge is a critical input in the aggregate production function. Technological advancements multiply the other inputs needed to grow the economy. In its simplest terms, output (Y) is equal to technological knowledge (A) multiplied by the function (F) of physical capital (K), human capital (H), labor (L) and natural resources (N). When applied to autonomous vehicles, technological knowledge (A) is manifested as the AVs and complementary technologies, while human capital (H) is the ability for Missourians to skillfully use and maintain AVs. Under the current regulatory framework, Missouri laborers and students are unable to experience hands-on, in-state skills training using the latest AV developments, stifling labor market readiness for future employment opportunities and forcing laborers interested in the field to leave the

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ “Governor Parson Announces New Approach to Economic and Workforce Development, Calls for Reorganization of State Government.” Office of Governor Michael L. Parson (January 17, 2019). <https://governor.mo.gov/press-releases/archive/governor-parson-announces-new-approach-economic-and-workforce-development>

state in order to pursue those interests. Based on macroeconomic theory, Missouri is currently suppressing economic growth by putting artificial restraints on A by not allowing mapping of the state's road network – the 7th largest in the country¹⁶, H by not preparing its workforce to skillfully use and maintain AVs, and L if potential AV laborers are pursuing opportunities in other states.

To add some color to this issue, Michael Mandel's ongoing work analyzing the tech sector's growth in various states portrays Missouri as a tech-friendly, but lagging economic environment. Missouri was ranked 11th in the 2017 Progressive Policy Institutes Tech Job Index by states.¹⁷ On the surface, a high ranking on this statistic defined as "the increase in tech and tech-enabled jobs from 2010 to 2016, as a percentage of the total number of private sector jobs in that state or local area in 2010" is encouraging. As a percentage of total jobs in the state, tech jobs have risen 1.5%. In comparison, Tennessee, which has a similar population to Missouri, created 41,000 tech jobs compared to Missouri's 31,000.¹⁸ Colorado and South Carolina, both of which are smaller than Missouri, created 29,000 and 26,500 tech jobs respectively.¹⁹ Additionally, Missouri saw most of its tech sector growth in computer system design and programming – two industries closely related to AV that could see acceleration if Missouri became a viable testing ground for AV. Effectively, though Missouri has seen tech sector job growth, the state is starting from a disadvantage and using its 11th ranked growth rate to catch up to the field.

In summary, Missouri's non-existent regulatory framework for autonomous vehicles creates an impending public safety problem for Missourians and an ongoing economic development problem. By

¹⁶ "Citizen's Guide to Transportation Funding in Missouri." Missouri Department of Transportation (November 2018).
<https://www.modot.org/sites/default/files/documents/Citizen%27s%20Guide%20to%20Transportation%20Funding%20in%20Missouri.pdf>

¹⁷ Mandel, Michael. "PPI Tech Jobs Index 2017: States." Progressive Policy Institute (January 3, 2018).
<https://www.progressivepolicy.org/blog/ppi-tech-job-index-2017-states/>

¹⁸ Ibid.

¹⁹ Ibid.

not addressing the emergence of AVs in the testing phase of development, Missouri is delaying the inevitable task of regulating a technology sector that has the potential to someday save lives but also contribute to accidents in the short term if regulated irresponsibly. Additionally, Missouri businesses, laborers, schools and communities are missing out on potentially attracting hundreds of millions of economic development dollars to the state.

History and Background

Technology Development

Since the 1920s, just decades after Henry Ford began operating the first assembly line to mass produce cars, American vehicle manufacturers have been interested in autonomous vehicles.²⁰ Fascination with the concept of “driverless cars” has been part of the American psyche for almost a century, though attempts to develop the types of autonomous vehicles being pursued today only gained traction as recently as 2004 with the first Grand Challenge hosted by the Defense Advanced Research Projects Agency, or DARPA, a research and development arm of the Pentagon.²¹ DARPA, in order to meet a mandate by Congress that one third of all military vehicles be autonomous by 2015, issued a challenge to engineers and offered a \$1 million prize.²² The challenge: build an autonomous vehicle that could complete a 150 mile desert course from Barstow, California to Primm, Nevada in under 10 hours.²³ Of the 106 teams that applied for the race, only 15 teams made it to the starting line and only the Carnegie Mellon team was able to navigate more than 7 miles along the course before going off course, getting caught on a berm and catching on fire.²⁴ As such, no team claimed the \$1 million prize in year

²⁰ “Science. Radio Auto.” Time Magazine (August 10, 1925).

<http://content.time.com/time/magazine/article/0,9171,720720,00.html>

²¹ Darter, Michael. “From Darpa Grand Challenge 2004DARPA’s Debacle in the Desert.” Popular Science (June 4, 2004). <https://www.popsci.com/scitech/article/2004-06/darpa-grand-challenge-2004darpas-debacle-desert>

²² Walton, Marsha. “Robots fail to complete Grand Challenge.” CNN (May 6, 2004).

<http://www.cnn.com/2004/TECH/ptech/03/14/darpa.race/index.html>

²³ Ibid.

²⁴ Ibid.

one but organizers remained optimistic, considering the competition a success at accomplishing its “primary mission of galvanizing engineers to get to work on a new generation of autonomous support and supply vehicles.”²⁵

As a sign of how rapidly autonomous vehicle technologies improve, the 2005 DARPA Grand Challenge featured five teams that successfully completed the 128 mile course.²⁶ The Stanford team, led by Sebastian Thrun – a 2004 member of the Carnegie Mellon team – claimed the \$2 million prize after completing the course in just under 7 hours and beating two vehicles operated by the Carnegie Mellon team. Using GPS data, video cameras, and lidar (laser range finder that scans the terrain 30 meters ahead of the vehicle 5 times every second) Stanley, the Stanford team vehicle, was able to identify objects with an error rate of 1 out of 50,000, far surpassing previous iterations of the technology that incorrectly identified objects (shadows, tumbleweeds, boulders) 12% of the time.²⁷ As Intel’s research and development director Justin Rattner put it, “This is a watershed moment - much more so than Deep Blue versus Kasparov. Deep Blue was just processing power. It didn't think. Stanley thinks. We've moved away from rule-based thinking in artificial intelligence. The new paradigm is based on probabilities. It's based on statistical analysis of patterns. It is a better reflection of how our minds work.”²⁸

Early DARPA challenges, including the third Grand Challenge, an urban course, paved the way for autonomous vehicle technology by allowing engineers to observe the technology’s shortcomings and experiment with solutions. The competitions also generated investment from the public and private sectors as well as academia. Partnerships were formed, for instance, between universities like Carnegie

²⁵ Ibid, Darter.

²⁶ Davis, Joshua. “Say Hello to Stanley.” Wired (January 1, 2006). <https://www.wired.com/2006/01/stanley/>

²⁷ Ibid.

²⁸ Ibid.

Mellon and public sector agencies like the U.S. Army, while the CMU team was later described as “one of corporate America's more assiduous shakedown artists.”²⁹

After DARPA, the world’s major motor vehicle manufacturers began ramping up their investment in AV development. BMW “began looking into” AVs in 2005,³⁰ Audi ran an autonomous vehicle up Pikes Peak in September of 2010,³¹ and Google, a new entrant to the space, began secretly developing AVs in 2009.³² As of 2018, there were at least 46 corporations – foreign and domestic car manufacturers and technology companies – developing autonomous vehicles, including: Amazon, Apple, Audi, Bosch (supplier), CISCO (infrastructure and data), Daimler AG (Mercedes-Benz, Freightliner), Ford, GM, Honda, Hyundai, Jaguar Land Rover, Lyft, Microsoft, Nissan, Tesla, Toyota, Uber, Volkswagen, Volvo, and Waymo (the Alphabet/Google Self-Driving Car Project).³³ Of course, every company is experiencing varying levels of success and attempting to produce autonomous vehicles using a range of technologies and approaches. The developers also have different end goals with some companies shooting for fully autonomous vehicles (SAE Level 5) without steering wheels or pedals (GM, Waymo)³⁴, and others attempting to produce partially automated vehicles (SAE Level 1) in the near term (Peloton).³⁵

²⁹ Ibid.

³⁰ Carfrae, Jack. “An automated adventure at the wheel of a driverless BMW.” The National (September 10, 2011). <https://www.thenational.ae/business/an-automated-adventure-at-the-wheel-of-a-driverless-bmw-1.371963>

³¹ Squatriglia, Chuck. “Audi’s Robotic Car Climbs Pikes Peak.” Wired (November 19, 2010). <https://www.wired.com/2010/11/audis-robotic-car-climbs-pikes-peak/>

³² Harris, Mark. “How Google’s Autonomous Car Passed the First U.S. State Self-Driving Test.” IEEE Spectrum (September 10, 2014). <https://spectrum.ieee.org/transportation/advanced-cars/how-googles-autonomous-car-passed-the-first-us-state-selfdriving-test>

³³ “46 Corporations Working On Autonomous Vehicles.” CB Insights (September 4, 2018). <https://www.cbinsights.com/research/autonomous-driverless-vehicles-corporations-list/>

³⁴ Welch, David and Elisabeth Behrmann. “Who’s Winning the Self-Driving Car Race?” Bloomberg (May 7, 2018). <https://www.bloomberg.com/news/features/2018-05-07/who-s-winning-the-self-driving-car-race>

³⁵ Hall-Geisler, Kristen. “Trucks will talk to each other using Peloton Technology.” TechCrunch (2017). <https://techcrunch.com/2017/02/16/trucks-will-talk-to-each-other-using-peloton-technology/>

For the purposes of public policymaking, assessing which company is leading the field in the pursuit of commercially deploying autonomous vehicles provides only minimal value. There will be winners and losers and whoever can deploy first and establish a name brand will likely have an advantage in creating market share. However, assessing where the field is in terms of testing and validation does provide policymakers insights into when this technology will come to market on a large scale and what regulations need to be in place to allow testing on the path to deployment. In terms of which company has completed the most test miles, Waymo is millions of miles ahead of its competitors.³⁶ Waymo announced in October the company's fleet of autonomous vehicles has test driven more than 10 million miles, exceeding its closest competitor, Uber, by 8 million miles.³⁷ Uber announced it had reached 2 million test miles in 2017 before suspending public testing due to its highly publicized fatality in Phoenix in March of 2018.³⁸ Test miles, while not the only measure of progress, indicate proximity to commercial launch, which Waymo achieved in early December 2018 with the deployment of its ride-sharing service on a limited scale in Phoenix.³⁹ Significant testing in specific urban environments on specific routes, like in Phoenix, enabled a limited release of Waymo One and is expected to be necessary in all future commercial deployments.

State Regulatory Actions

It should go without saying that Waymo, Uber and other developers select testing locations based on where they are allowed to test and how burdensome the regulations are in those testing environments. As is likely evident due to the repeated mentions of Phoenix, the state of Arizona was

³⁶ Lee, Timothy. "Waymo's driverless cars have driven way mo' miles than rivals'." Ars Technica (October 10, 2018). <https://arstechnica.com/cars/2018/10/waymo-has-driven-10-million-miles-on-public-roads-thats-a-big-deal/>

³⁷ Ibid.

³⁸ Ibid.

³⁹ Fingas, Jon. "Waymo launches its first commercial self-driving car service." Engadget (December 5, 2018). <https://www.engadget.com/2018/12/05/waymo-one-launches/>

particularly welcoming to autonomous vehicle developers prior to the March 2018 fatality.⁴⁰ What actions did Arizona take to become a hotbed for AV development and testing and what are the results of the state's choices?

Arizona Governor Doug Ducey, in his first year in office, signed "Executive Order 2015-09: Self-Driving Vehicle Testing and Piloting in the State of Arizona; Self-Driving Vehicle Oversight Committee," which directed state agencies to "undertake any necessary steps to support the testing and operation of self-driving vehicles on public roads within Arizona."⁴¹ With the stroke of a pen, Governor Ducey essentially instructed his state agencies to remove all regulatory barriers to autonomous vehicle development in the state while establishing three rules on the subject: the vehicle must be operated by a person "authorized by the entity developing the self-driving technology"; the vehicle must be monitored by someone who can "direct the vehicle's movement if assistance is required"; and the operator "shall be licensed to operate a motor vehicle in the United States."⁴² Notably, the order does not prescribe that the operator be physically inside the vehicle or in the driver's seat and gives the developers, not the state or a third-party organization, authority to authorize the operator so long as that person has a valid U.S. driver's license.

Opponents to the Arizona Governor's actions described the state's AV regulatory environment as the "wild west" of autonomous vehicles following the March 2018 Uber fatality.⁴³ The state's actions were meant to recruit Uber and other Silicon Valley developers across the California and Nevada

⁴⁰ Neuman, Scott. "Arizona Governor Helped Make State 'Wild West' For Driverless Cars." NPR (March 20, 2018). <https://www.npr.org/sections/thetwo-way/2018/03/20/595115055/arizona-governor-helped-make-state-wild-west-for-driverless-cars>

⁴¹ Ducey, Douglas. "Executive Order 2015-09: Self-Driving Vehicle Testing and Piloting in the State of Arizona; Self-Driving Vehicle Oversight Committee." Office of the Arizona Governor (August 25, 2015). <http://azmemory.azlibrary.gov/digital/collection/execorders/id/752/>

⁴² Ibid.

⁴³ Sindhu, Sahiba. "Consumer Watchdog Calls for National Moratorium on Robot Car Testing After Self-Driving Uber Kills Arizona Woman." Consumer Watchdog (March 2018). <https://www.consumerwatchdog.org/privacy-technology/consumer-watchdog-calls-national-moratorium-robot-car-testing-after-self-driving>

borders in hopes that “self-driving vehicle technology will promote economic growth, bring new jobs, provide research opportunities for the State’s academic institutions and their students and faculty, and allow the State to host the emergence of new technologies.”⁴⁴ On the spectrum of heavy to light regulations, Arizona was described as having “virtually no regulations in place,” which is why Uber, Waymo and other developers test in the state.⁴⁵

On the other end of the regulatory spectrum, California exists as Arizona’s greatest competitor in terms of attracting developers while also enjoying a robust level of testing in the state. While Arizona has thus far only pursued regulations in the form of executive orders (three to date), California has only used legislation.⁴⁶ As of the end of 2018, California has passed eight separate pieces of legislation.⁴⁷ The state’s first legislation on the subject required “the Department of the California Highway Patrol to adopt safety standards and performance requirements to ensure the safe operation and testing of autonomous vehicles, as defined, on the public roads in this state” including an application system for manufacturers, data collection rules and insurance minimums.⁴⁸ More recently, California’s legislature passed a law that authorized the City of San Francisco to apply a tax to autonomous vehicle trips originating in the City and County of San Francisco.⁴⁹ By welcoming autonomous vehicle deployment in the state, municipalities are now able to generate additional revenue for transportation operations and infrastructure projects.

⁴⁴ Ibid, Ducey.

⁴⁵ Ibid, Sindhu.

⁴⁶ Shinkle, Douglas. “Autonomous Vehicles | Self-Driving Vehicles Enacted Legislation.” National Conference of State Legislatures (November 7, 2018). <http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx>

⁴⁷ Ibid.

⁴⁸ “Senate Bill No. 1298.” The State of California (signed by the governor September 25, 2012). http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_1251-1300/sb_1298_bill_20120925_chaptered.pdf

⁴⁹ Ibid, Shinkle.

From the outset of California’s decision to regulate autonomous vehicles, the state has been derided as “too restrictive” by developers and manufacturers.⁵⁰ Critics point to early California regulations that required a human to be present in the vehicle and required steering wheels and pedals.⁵¹ The state also requires “disengagement reports” or reports from the developers on instances when human drivers (or remote operators) had to override the autonomous technology.⁵² The disengagement reports provide rich data on when and why AV systems had to be overridden, but can also be used to get a sense of how many miles AVs are traveling in the state. According to Grayson Bruite, a member of the Beverly Hills Mayor’s Autonomous Vehicle Task Force, California had no choice but to relax its AV rules in 2018⁵³ to allow for fully driverless testing because the disengagement reports were showing a severe decrease in AV miles driven in the state, with manufacturers moving testing operations to other, more welcoming regulatory environments.⁵⁴

A survey of state regulations would not be complete without the inclusion of Florida, the second state to legalize the operation of autonomous vehicles (after Nevada) and the first state to experience a high profile autonomous vehicle related fatality. The state passed House Bill 1207 in 2012, which defined “autonomous vehicle” and “autonomous technology,” declares legislative intent to allow for testing of AVs, found that AVs were not previously regulated by the state, and authorized persons with valid driver’s licenses to operate autonomous vehicles for testing purposes. The bill also required the Florida Department of Highway Safety and Motor Vehicles to prepare a report, due February 12, 2014, recommending additional regulatory or legislative action on the subject.

⁵⁰ Newcomb, Doug. “Robo Rules: The State of Autonomous Vehicle Legislation.” *Automobile Magazine* (May 18, 2018). <https://www.automobilemag.com/news/robo-rules-state-autonomous-vehicle-regulations-2018/>

⁵¹ Ibid.

⁵² Ibid.

⁵³ “Order to Adopt, Title 13, Division 1, Chapter 1, Article 3.7 – Testing of Autonomous Vehicles.” California Department of Motor Vehicles (February 26, 2018). https://www.dmv.ca.gov/portal/wcm/connect/a6ea01e0-072f-4f93-aa6c-e12b844443cc/DriverlessAV_Adopted_Regulatory_Text.pdf?MOD=AJPERES&CVID=

⁵⁴ Ibid, Newcomb.

In terms of regional action, of Missouri's eight neighboring states, Tennessee, Kentucky, Arkansas and Nebraska have passed legislation on AVs, and Illinois has issued an executive order and enacted legislation. Kentucky's legislation only relates to commercial truck platooning and includes notification and review provisions for the Kentucky Department of Vehicle Regulation and Kentucky State Police.⁵⁵ Arkansas' legislation is also limited to truck platoon testing in the state.⁵⁶ Illinois and Tennessee both enacted legislation to preempt local governments and other municipalities from banning the use of autonomous vehicles, while Tennessee later passed more comprehensive legislation called the Automated Vehicles Act that allows for conditional driverless operations, sets operating an AV without meeting the standards of the Act as a class A misdemeanor, and specifies that automated driving systems are considered drivers for liability purposes.⁵⁷

In 2018, Nebraska passed comprehensive legislation "that allows autonomous vehicles to operate on public roads as long as the vehicle includes safety features, follows state road rules and is properly insured."⁵⁸ Supporters of the legislation hoped to position "Nebraska among the leading contenders to serve as a testing ground for such vehicles." The new law also allowed the city of Lincoln to pursue the launch of a driverless shuttle system connecting passengers to downtown Lincoln, the Haymarket District, and the University of Nebraska-Lincoln.⁵⁹

Overall, 30 states have enacted legislation on autonomous vehicles and 11 states have issued executive orders, which includes 4 states that have done both (Figure 1.0).⁶⁰ Missouri is one of just 14

⁵⁵ Ibid, Shinkle.

⁵⁶ Representative Charlie Collins. "AN ACT TO REGULATE THE TESTING OF VEHICLES WITH 9 AUTONOMOUS TECHNOLOGY; AND FOR OTHER PURPOSES. TO REGULATE VEHICLES WITH DRIVER14 ASSISTIVE TRUCK PLATOONING SYSTEMS." State of Arkansas 91st General Assembly (2017). <http://www.arkleg.state.ar.us/assembly/2017/2017R/Acts/Act797.pdf>

⁵⁷ Ibid, Shinkle.

⁵⁸ Schulte, Grant. "Despite New Law, Nebraska Not Expected to See Self-Driving Cars Soon." Insurance Journal (June 18, 2018). <https://www.insurancejournal.com/news/midwest/2018/06/18/492562.htm>

⁵⁹ Ibid.

⁶⁰ Ibid, Shinkle.

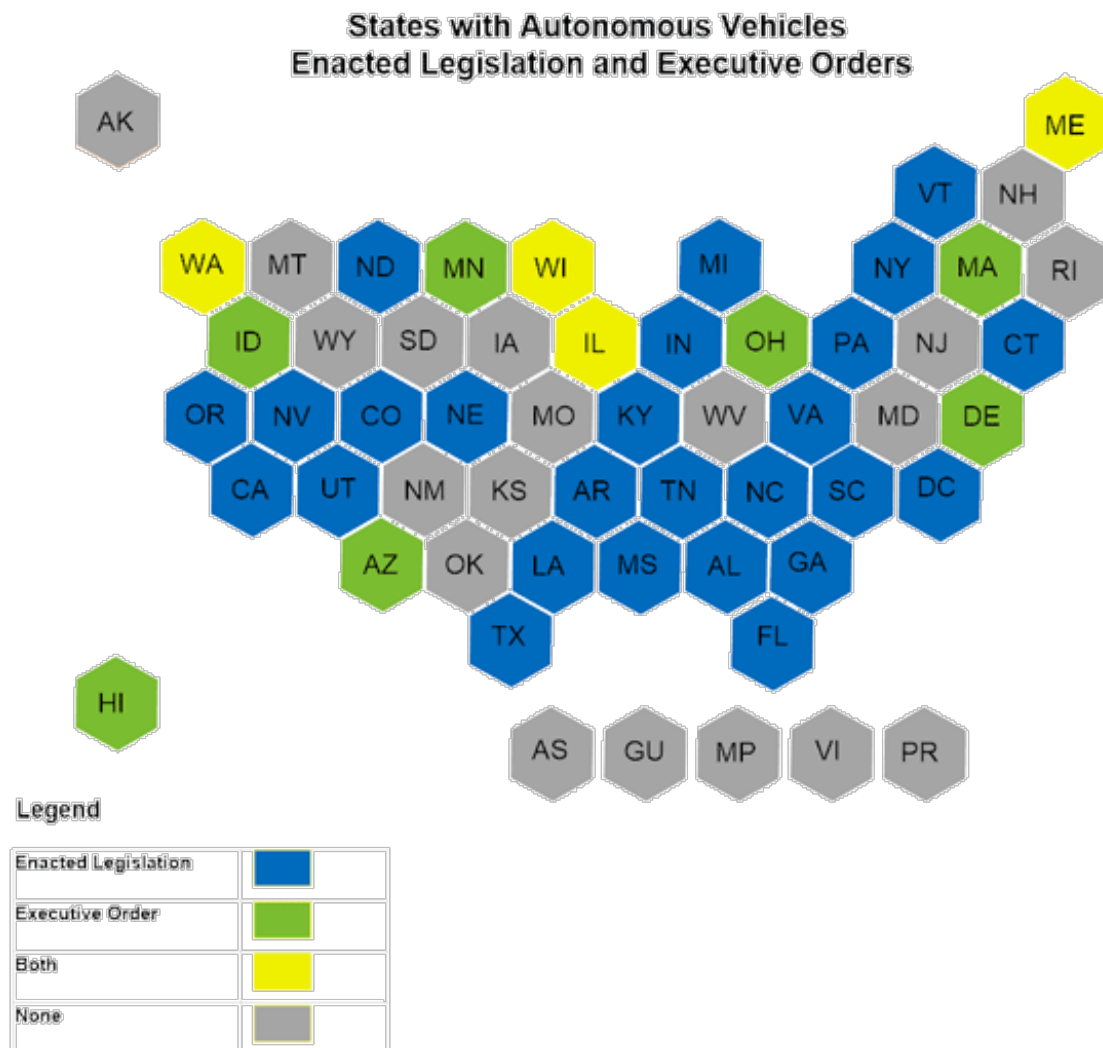
states that have taken no action on the issue, despite 10 separate bills being filed on the topic in the state since the beginning of 2017. Prior to 2017, Missouri Governor Jay Nixon vetoed a bill on July 8, 2016 that would have allowed truck platooning in the state. The veto happened just two months after the May 7, 2016 Tesla Autopilot crash in Florida, which was the first known death caused in part by autonomous vehicles.⁶¹ The bill had previously passed the Missouri House of Representatives by a vote of 107-42 and the Missouri Senate by a unanimous vote of 32-0.⁶² There have been no votes on subsequent autonomous vehicle bills introduced into either chamber, all of which have failed due to the adjournment of legislative sessions.⁶³

⁶¹ Elfin, David. "Missouri Governor Vetoes Pilot Truck Platooning Program." Transport Topics (July 11, 2016). <https://www.ttnews.com/articles/missouri-governor-vetoes-pilot-truck-platooning-program>

⁶² Ibid.

⁶³ Shinkle, Douglas. "AUTONOMOUS VEHICLES STATE BILL TRACKING DATABASE." National Conference of State Legislatures (March 1, 2019). <http://www.ncsl.org/research/transportation/autonomous-vehicles-legislative-database.aspx>

[Figure 1.0]



Federal Inaction

States are acting on this issue for two distinct reasons: states “manage after-sale rules regarding registration, licensing, and safety inspection”⁶⁴ of vehicles and drivers, and the federal government has thus far failed to enact legislation regarding autonomous vehicles and been confined to issuing three phases of voluntary guidance through the United State Department of Transportation.⁶⁵

⁶⁴ Ibid, Newcomb.

⁶⁵ Ibid.

The Department of Transportation, based on comments from Secretary Elaine Chao at the announcement of the AV 3.0 guidance document, appears to be strongly in favor of continuing to provide voluntary guidance to manufacturers because “The Department is not in the business of picking winners and losers” and “it reduces policy uncertainty and clarifies roles to help avoid a conflicting patchwork of regulations that hamper innovation.”⁶⁶ This is also a continuation of the policy approach of the Obama Administration’s Department of Transportation as the first version of voluntary guidance was published in September of 2016 by Transportation Secretary Anthony Foxx.⁶⁷ There is no indication that the U.S. Department of Transportation will issue any mandates or regulations regarding autonomous vehicles in the near future.

In Congress, the SELF DRIVE Act unanimously passed the House Energy and Commerce Committee before passing through the full House on September 6, 2017.⁶⁸ The bill received a two-thirds majority vote and would effectively give the National Highway Traffic Safety Administration (NHTSA) the authority to “regulate vehicle design, construction and performance the way it does with normal cars.”⁶⁹ States would maintain their authority over vehicle licensing and registration.⁷⁰ The SELF DRIVE Act also authorizes NHTSA to expand its exemptions to Federal Motor Vehicle Safety Standards from 2,500 per year to 100,000 per year, drastically increasing the number of autonomous vehicles testing on public roads.⁷¹

⁶⁶ Chao, Elaine. “AV 3.0 Roll Out.” U.S. Department of Transportation (October 4, 2018).

<https://www.transportation.gov/briefing-room/av-30-roll-out>

⁶⁷ Foxx, Anthony. “Federal Automated Vehicles Policy.” U.S. Department of Transportation (September 2016).

<https://www.transportation.gov/sites/dot.gov/files/docs/AV%20policy%20guidance%20PDF.pdf>

⁶⁸ Marshall, Aarian. “Congress Unites (Gasp) To Spread Self-Driving Cars Across America.” Wired (September 6, 2017). <https://www.wired.com/story/congress-self-driving-car-law-bill/>

⁶⁹ Ibid.

⁷⁰ Ibid.

⁷¹ Ibid.

The Senate, on the other hand, produced legislation called the AV START Act as a slightly modified companion bill to the SELF DRIVE Act. The AV START Act passed out of the Senate Commerce Committee on October 4, 2017 but was stymied by pressure from Democratic Senators who cited safety concerns,⁷² and the Teamsters who cited job loss concerns.⁷³ In early 2019, Senator Thune, chairman of the Senate Commerce Committee, reportedly expressed renewed interest in negotiating the AV START Act,⁷⁴ but in a divided Congress, the bill faces a “different dynamic” and would have to be moved through an “evolutionary process.”⁷⁵

Stakeholders

The stakeholders at the state of Missouri level closely mirror the stakeholders involved in this policymaking at the federal level. From the state agency perspective, the three agencies most interested in autonomous vehicle policy are the Missouri Department of Transportation, the Missouri Department of Revenue and the Missouri Department of Public Safety, which includes the Missouri State Highway Patrol. As was noted in the Statement of the Problem section, the Missouri DOT dedicated significant attention to AV policy and its effects in the agency’s 2018 Long Range Transportation Plan.⁷⁶ Section 5 of the memo is entitled Autonomous and Connect Vehicle Technology and stretches from pages 46 to 73 of this 83-page report, accounting for almost one third of the content. The Missouri DOT makes recommendations for planning priorities for state policymakers to consider in Section 5.5.1 *Preparation and Planning Efforts*, which include: establishing a steering committee of major policy actors, monitoring

⁷² Halsey, Ashley. “Senate Democrats fight push to pass driverless-car bill during lame duck Congress.” Washington Post (December 10, 2018). https://www.washingtonpost.com/local/trafficandcommuting/senate-democrats-fight-push-to-pass-driverless-car-bill-during-lame-duck-congress/2018/12/10/92cdc7a4-f7f6-11e8-8d64-4e79db33382f_story.html?noredirect=on&utm_term=.497d4b9188fb

⁷³ Gotsch, Ted. “Hoffa: Senate Committee Right in Reining in Push to Include Trucks in Legislation.” Teamsters (October 4, 2017).

⁷⁴ Teal, Chris. “Congress to try again on federal AV regulations.” Smart Cities Dive (February 14, 2019). <https://www.smartcitiesdive.com/news/federal-av-start-regulation-thune/548449/>

⁷⁵ Ibid.

⁷⁶ “2018 Long Range Transportation Plan Update: Technical Memorandums.” Missouri Department of Transportation (June 2018). http://www2.modot.org/LRTP/assets/files/TechMemo_MoDOT_053018.pdf

ongoing activities and developments, considering the use of congestion pricing, leveraging technology to enhance mobility (using open data to connect private and public transit options into comprehensive systems), prioritizing and modernizing modern transit, planning for mixed-use, car-light neighborhoods (potentially changing zoning and parking requirements), and encouraging adaptable parking.

The Missouri Department of Revenue is responsible for vehicle registration and drivers' licensing in the state through its Motor Vehicle and Driver Licensing Division. If Missouri were to adopt a vehicle registration policy for autonomous vehicles, the Missouri Department of Revenue would likely implement the policy and collect registration fees, manage the registration database and potentially manage a disengagement reporting system. California's DMV, for instance, is responsible for disengagement report management. The Missouri Department of Public Safety, which houses the Missouri State Highway Patrol, would be responsible for enforcing any new or modified driving rules such as changes to the state's vehicle following distance laws, seat belt laws and so on, while also serving as first responders in case of AV malfunctions or accidents.

One set of major players in this policy environment is industry. The Missouri DOT's Long Range Plan Update splits industry stakeholders into two subsections, which are a helpful framework for the purposes of this analysis: manufacturers and non-traditional entrants. Manufacturers are described as having "established distribution channels, dealership networks and service programs" as well as "brand loyalty," "market dominance," and "a large incentive to maintain market dominance."⁷⁷ The Missouri DOT specifically cites Chrysler, General Motors, Ford and their Japanese and European competitors as members of the manufacturers subgroup.⁷⁸ The non-traditional entrants are "technology companies...exploring production and operation of driverless vehicles, including Waymo, Apple and

⁷⁷ "2018 Long Range Transportation Plan Update: Technical Memorandums." Missouri Department of Transportation (June 2018). Page 49. http://www2.modot.org/LRTP/assets/files/TechMemo_MoDOT_053018.pdf

⁷⁸ Ibid.

Baidu.⁷⁹ The Long Range Transportation Plan also lists Lyft and Uber as non-traditional entrants but notes those service providers are establishing partnerships with manufacturers.⁸⁰ Non-traditional entrants and manufacturers have overlapping and mostly congruent interests at this stage in the policymaking process as many efforts focus on the ability to test within states and municipalities, the public acceptance of automated driving technologies, and the creation of regulatory environments that are conducive to innovation and not overly burdensome. An example of the parallel interests between non-traditional entrants and manufacturers can be seen in the Self-Driving Coalition for Safer Streets' membership list, which includes manufacturers Ford and Volvo as well as non-traditional entrants Waymo, Lyft, and Uber.⁸¹ The Self-Driving Coalition for Safer Streets is a national advocacy group whose mission is "to promote the benefits of fully self-driving vehicles and support the most safe and rapid deployment possible of these innovative and potentially life-saving technologies."⁸² Interestingly, the coalition's partner list includes non-industry advocacy groups like Mothers Against Drunk Driving, the United Spinal Association, and the National Federation of the Blind.⁸³ Increasing mobility options among persons with disabilities while also reducing instances of drunk or unsafe driving are seen as potential benefits of autonomous vehicle technologies and were cited by Secretary Chao in her remarks on the rollout of AV 3.0.⁸⁴

The other notable industry-side advocacy group is the Partnership for Transportation Innovation and Opportunity (PTIO), which includes American Trucking Associations, Daimler, FedEx, Ford, Lyft, Toyota, Uber and Waymo as members. The partnership, unlike the Self-Driving Coalition for Safer Streets, is principally focused on the workforce issues related to automated driving. PTIO aims to

⁷⁹ Ibid.

⁸⁰ Ibid.

⁸¹ "Our Mission and Members." Self-Driving Coalition for Safer Streets (accessed March 3, 2019). <https://www.selfdrivingcoalition.org/about/mission>

⁸² Ibid.

⁸³ Ibid.

⁸⁴ Ibid, Chao.

“maximize the opportunities autonomous vehicles create for our workforce and facilitate transitions into new and meaningful career pathways and toward the occupations that will flourish in the new economy” through dialogue, research and policy.⁸⁵

Disruption to the professional driver labor market was, as mentioned previously, one of the key hindrances to the passage of autonomous vehicle legislation at the federal level. As such, organized labor is keenly interested in AV policy, particularly the Teamsters Union representing professional truck drivers, taxi drivers, and school bus drivers.⁸⁶ The Teamsters successfully lobbied for commercial vehicles, specifically tractor-trailers, to be excluded from both the AV START Act and the DRIVE SAFE Act. In an explanation of their positions, Teamster lobbyist Sean Loesche said “This could be a population in size and scope that could... have jobs eliminated... have the wages and structures, and benefits and structure of their day completely eroded, in a way we haven't seen in the history of the country. It needs to be done correctly, it needs to be examined, and it needs to be done right.”⁸⁷ Following the fatal Uber crash in Arizona, the Teamsters released a statement saying, in part, “Driverless technology is still in a testing phase and there are enormous risks inherent to testing unproven technologies on public roads” and “The Teamsters Union is deeply concerned with safety and the testing of vehicles in autonomous mode on public roads and highways.”⁸⁸ Missouri policymakers should expect the Teamsters Union to weigh in on AV policy proposals and the union could potentially allocate significant resources and energy to opposing proposals that do not align with its positions.

⁸⁵ “About Us.” Partnership for Transportation Innovation and Opportunity (accessed March 3, 2019). <https://ouravfuture.org/about-us/>

⁸⁶ Denton, Jack. “ARE THE TEAMSTERS TRYING TO KILL DRIVERLESS TECH, OR SAVE THE TRUCK DRIVERS?” Pacific Standard (April 26, 2018). <https://psmag.com/economics/trucking-teamsters-driverless-tech>

⁸⁷ Ibid.

⁸⁸ Deniz, Kara. “Teamster Statement on Fatal Uber ‘Driverless’ Vehicle Collision.” Teamsters Union (March 19, 2018). <https://teamster.org/news/2018/03/teamsters-statement-fatal-uber-driverless-vehicle-collision>

There are a number of additional stakeholders interested in potential regulatory action on autonomous vehicles in the state of Missouri. Other road users, and their advocacy representatives like AAA, will be affected by sharing public roads with automated driving systems during the testing phase, and if safety benefits are verified, could benefit from safer road use. AAA is skeptical of testing AVs on public roads and believes in “thorough testing” but “not at the expense of safety.”⁸⁹ Insurance providers are also a player in this space as some states, including Nevada, have mandated or attempted to mandate higher insurance minimums for automated trucks.⁹⁰ The American Association of Justice and state trial attorneys have taken an intense interest in federal legislation on the issue, including opposition to initial versions of the AV START Act, citing arbitration and liability issues as one of the group’s major pain points.⁹¹ Lastly, big city mayors are joining the policymaking process as many analysts expect autonomous vehicles to be tested and deployed within limited geofenced urban areas in the technology’s early stages, a scenario already being observed in Phoenix, Pittsburgh, and San Francisco. Mayors cite increased investment potential, mobility benefits, and improved public safety outcomes as reasons to welcome autonomous vehicle developers into the city,⁹² but also face public pressure and media scrutiny when autonomous vehicle-involved crashes and fatalities happen on their city streets.⁹³

⁸⁹ Edmonds, Ellen. “American Trust in Autonomous Vehicles Slips.” AAA (May 22, 2018).

<https://newsroom.aaa.com/2018/05/aaa-american-trust-autonomous-vehicles-slips/>

⁹⁰ Zwahlen, Cindy. “Advanced Tech No Guarantee of Lower Insurance Rates.” Trucks.com (October 29, 2018).

<https://www.trucks.com/2018/10/29/tech-lower-truck-insurance-rates/>

⁹¹ Ibid, Teale.

⁹² O’Toole, Bill. “Mayor Peduto signs executive order creating new rules for self-driving cars.” Next Pittsburgh (March 4, 2019). <https://www.nextpittsburgh.com/latest-news/mayor-peduto-signs-executive-order-for-new-rules-for-self-driving-cars/>

⁹³ Ibid.

Policy Proposal

The “Show Me Safety Plan” is the proposed solution to Missouri’s aforementioned policy problem. The goal of the Show Me Safety Plan policy proposal is to safely and responsibly allow for the testing and deployment of autonomous vehicles in Missouri in order to determine the viability of autonomous vehicles as a transportation solution, prevent future public safety problems, and capture economic development gains from investors and developers. The Show Me Safety Plan, led by the Governor’s Office, uses both legislative and executive action to accomplish its comprehensive three-prong approach to (1) eliminating regulatory barriers to testing and deploying AVs, while (2) ensuring the safety of the motoring public, and (3) attracting investors and developers to the state. The plan will be considered successful if, from implementation to program reauthorization in 2025, there are zero AV-related driving fatalities in the state and there is more than \$20 million of economic development combined with more than 200 new jobs.

The core components of the Show Me Safety Plan will be authorized through legislation and are three-fold: registration and reporting, regulatory exemptions for registered testers, and vehicle operator requirements. The proposed legislation will establish a registration and reporting system within the Missouri Department of Revenue’s Motor Vehicles and Driver’s Licensing Division. The AV developer will register with the Missouri DOR and provide company name and address, vehicle make, model, and license number, contact information and driver’s license number for the vehicle operator(s), proof of insurance, proposed testing locations, information on the conditions under which the vehicle can operate in fully autonomous (but supervised) driving mode, and safety certifications.⁹⁴ The registration

⁹⁴ Hawkins, Erica. “DriveOhio: Autonomous Vehicle Operation in Ohio.” The Office of Ohio Governor John Kasich (January 2018). <http://drive.ohio.gov/news/Gov-Kasich-Signs-Executive-Order-Authorizing-Autonomous-Vehicle-Testing-in-Ohio/Autonomous%20Vehicles%20in%20Ohio.pdf>

proposal is modeled after former Ohio Governor John Kasich’s DriveOhio program, though it has the modified feature of being included in an existing state agency and will be accomplished through legislation to increase the program’s legal sustainability. To register the autonomous vehicle for testing in the state of Missouri, the registrant must pay a \$3,000 registration fee that permits operations for two years from the date of registration issuance. The fee will go to the Missouri Department of Revenue’s operating budget.

As part of the registration process, developers must also demonstrate that the vehicle can comply with all traffic laws or be immediately overtaken by a licensed operator. As such, the plan takes the additional measure of requiring a licensed, designated vehicle operator to be present in the driver’s seat at all times. The designated operator must be able to safely shut down the vehicle in case of a malfunction and monitor that the vehicle is safely complying with all traffic laws.

In the event of an accident or traffic violation, the operator must immediately report the violation to the Motor Vehicles and Driver’s Licensing Division. Additionally, per California’s reporting model, developers must submit an annual autonomous technology disengagement report covering the time period from December 1 through November 30 by January 1 of the following year.⁹⁵ The disengagement report must list each disengagement and explain the cause of the disengagement, the location, the total number of miles each vehicle tested in autonomous driving mode, and the period of time elapsed from when the vehicle operator was alerted of a technology failure and how long it took the operator to take control of the vehicle.⁹⁶ The Governor’s Office has the right to end AV testing for a

⁹⁵ “Autonomous Vehicle Disengagement Reports 2018.” State of California Department of Motor Vehicles (January 1, 2019). https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/disengagement_report_2018

⁹⁶ Aguiar, Thiago. “Nissan Autonomous Vehicle Disengagement Report 2018.” Nissan (December 14, 2018). <https://www.dmv.ca.gov/portal/wcm/connect/d9c629ac-4896-43e5-a0c3-3aefa90eff42/Nissan.pdf?MOD=AJPERES&CVID=>

specific developer if it determines the vehicle or technology is not working properly and is jeopardizing the safety of the public.

The final prong of the legislation is to provide regulatory exemptions – specific to AV operations – to all registered and qualified AV developers and testers in the state. The exemptions include, but are not limited to following distance laws and hands on the wheel laws. As developers use innovative approaches to operating AVs, the regulatory exemptions are meant to encompass all types of (federally legal through NHTSA) vehicle designs and unforeseen operational capacities.

In addition to the legislative action on the subject, the Governor will take executive action to form an Advisory Committee on Autonomous Vehicles (ACAV) run by the Missouri Department of Transportation. The ACAV will be comprised of volunteer committee members from the public sector, private sector, associations and labor groups interested in AV policy in the state. The Governor will assign the Director of the Missouri Department of Transportation to chair the committee, solicit membership applications from key stakeholders and hold regular, public meetings. The ACAV will be chartered for the purpose of identifying Missouri's strengths as an attractive place for AV developers, putting together a plan for attracting developers to the state, and proactively seeking out developers to test in the state and invest in Missouri's communities. The ACAV will also be responsible for defining economic development gains from the Show Me Safety Plan and measuring the amount of new investment and jobs created in the state. This should be done by commissioning the Missouri Department of Transportation, which does annual economic impact analyses and is led by the chair of the ACAV, to conduct an economic impact analysis on the Show Me Safety Plan. Mayors, agency executives, elected officials and private sector executives will be invited and encouraged to submit their names for the committee, but the Missouri Department of Transportation Director will be responsible for determining the final committee membership. The ACAV will be announced in June 1, 2020, a few weeks after the expected passage of the legislation. Committee members will be announced July 1, 2020

and the ACAV's first public meeting will be held August 1, 2020, the same day that the Show Me Safety Plan's legislative policy on registration, regulatory exemptions and testing begins.

Authorization

To authorize the legislative portion of the Show Me Safety Plan, the Governor's Office will work with a member of the Missouri House of Representatives and a member of the Missouri Senate to introduce companion bills in January of 2020. The current Missouri legislative session ends May 17, 2019, which does not allow requisite time to introduce the legislation, whip votes and run a sufficient public relations campaign. The 2020 legislative session will end in mid-May and, as such, the program will begin August 1, 2020 in order to allow ample time for the Missouri Department of Revenue and the Missouri State Highway Patrol, as well as other law enforcement agencies and relevant agencies, to prepare for AV registration and deployment on Missouri streets.

The Show Me Safety Plan uses the legislative process to authorize the policy for both political and policymaking reasons. Legislation has the benefit of offering lasting, nearly permanent authorization for the program that will be difficult to undo should the Governor's party lose a legislative chamber or the Governor's seat. Legislation is also, in this case, more impervious to legal action should a safety group, labor union or attention-seeking politician attempt to challenge the legality of the plan by bringing forth a lawsuit. Some enterprising up-and-coming Missouri politicians have used legal action against public officials in recent years to advance their interests, which could potentially bog down the policy proposal in the court system.⁹⁷ From 2015 to 2019, twelve individual pieces of legislation on AV

⁹⁷ "Attorney seeks to quash subpoena seeking Hawley's testimony." The Associated Press (February 15, 2019). https://www.joplinglobe.com/news/attorney-seeks-to-quash-subpoena-seeking-hawley-s-testimony/article_dacec64c-314a-11e9-855f-7fa06cff2512.html

were introduced in the Missouri state legislature, eleven of which were introduced by Republicans, so there is evidence of some appetite for legislative action on the issue.⁹⁸

Implementation

To implement the policy, the Governor will task the Missouri Department of Revenue to produce a registration and reporting webpage, registration and reporting materials and guidelines, and assign two staff members the job responsibilities for overseeing the registration program and managing its day to day operations. Their responsibilities include reviewing registration applications, posting reporting materials to the website, liaising with law enforcement and the Missouri Department of Transportation when and if AVs are involved in crashes, and reporting the registration program's status to the Director of the Missouri Department of Revenue. In order to visibly make other road users and law enforcement officers aware of AVs on the roads, the agency will issue special licenses to AVs.

The Missouri Department of Transportation has jurisdiction over highway and road safety in the state and dedicates resources towards road safety programs. While the department is not responsible for implementing AV registrations or enforcing (or permitting) vehicle following distance or hands on the wheel laws, the department is the public's resource for highway and traffic safety information. As such, MODOT will disseminate information about the Show Me Safety Plan on its website and in its facilities. The department will also be responsible, as described above, for managing the ACAV meetings and coordinating communication among committee members, ensuring that the advisory committee is executing its charter.

The final implementing agency will be the Missouri Department of Public Safety through the Missouri State Highway Patrol and local law enforcement agencies. Law enforcement must be made

⁹⁸ Shinkle, Doug. "Autonomous Vehicle State Bill Tracking Database." National Conference of State Legislatures (March 15, 2019). <http://www.ncsl.org/research/transportation/autonomous-vehicles-legislative-database.aspx>

aware of regulatory exemptions through the MO DOR registration system so that officers respond appropriately to vehicles being operated in untraditional manners. Law enforcement officers will also serve as first responders if crashes were to occur and can intervene with AVs when they fail to comply with basic traffic laws. Law enforcement, specifically the Missouri State Highway Patrol, will advise the Missouri Department of Revenue on decisions regarding the termination of AV testing for specific companies or under certain road conditions.

Policy Analysis

To understand the efficacy and efficiency of this proposal in relation to its ability to meet its prescribed goals, one must analyze the proposal using multiple approaches and weigh the positive and negative features of the plan. Again, the proposal aims “to safely and responsibly allow for the testing and deployment of autonomous vehicles in Missouri in order to determine the viability of autonomous vehicles as a transportation solution, prevent future public safety problems, and capture economic development gains from investors and developers” and is measured in its ability to prevent any AV-related driving fatalities throughout the life of the proposal and attract more than \$20 million in economic development to the state as well as 200 new jobs.

Economic Development and Financial Concerns

To begin this discussion, a very simple pseudo-breakeven analysis can inform decision makers about the number of developers, vehicles, and new jobs needed to reach \$20 million in economic development gains. According to Paysa.com, the average salary for autonomous vehicle engineers is \$238,018.⁹⁹ As such, it would take 84 engineers to reach the \$20 million threshold in engineer salaries alone. The average salary of a Waymo *employee* is \$144,019, which includes engineers, administrative

⁹⁹ “Self Driving Car Engineer Salaries.” Paysa.com (accessed March 29, 2019).
<https://www.paysa.com/salaries/self-driving-car-engineer--t>

staff, vehicle operators, and other jobs, so it would take 139 AV employees to reach the \$20 million threshold in employee salaries.¹⁰⁰ Craft.co estimates that TuSimple, the previously discussed autonomous truck developer, has 179 employees¹⁰¹ who make an average of \$85,518 per year¹⁰² and operate a fleet of 11 trucks.¹⁰³ Attracting one developer the size of TuSimple would create approximately \$15 million in direct salary gains and achieve 89% of the job creation goal. Taking into account the indirect economic activity of 179 middle class employees working in Missouri, adding one company the size of TuSimple would surpass the Show Me Safety Plan's goal of \$20 million in economic development. How likely is it that the state would attract a company of that size under the Show Me Safety Plan? It is difficult to forecast that number. But, the state would need to attract 3 companies that are half the size of TuSimple operating for one fiscal year to achieve its economic development and job creation goals. Considering the need for developers to map all new driving routes and in challenging driving conditions, the 5-year time horizon of the Show Me Safety Plan, and the central location of Missouri in the contiguous 48 states, the state should achieve its economic development and job creation goals. When considering the economic impacts of such a proposal on the broader economy of a state though, adding \$20 million to a state gross domestic product of \$303 billion is less than one hundred thousandth of a percent.¹⁰⁴

In addition to economic development gains, the proposal also comes with financial costs and other sources of revenue for the state. The proposal calls for two state employees to have the administration of the program added to their existing job descriptions, as the state has to oversee the

¹⁰⁰ "Waymo Salaries." Payso.com (accessed March 29, 2019). <https://www.paysa.com/salaries/waymo>

¹⁰¹ "TuSimple." Craft.co (accessed March 29, 2019). <https://craft.co/tusimple>

¹⁰² "TuSimple Salaries." Payso.com (accessed March 29, 2019). <https://www.paysa.com/salaries/tusimple>

¹⁰³ Ohnsman, Alan. "Robot Trucks Enter the Fast Lane as Daimler, TuSimple and Udelv Ramp Up Plans." Forbes (January 8, 2019). <https://www.forbes.com/sites/alanohnsman/2019/01/08/robot-trucks-enter-the-fast-lane-as-daimler-tusimple-and-udelv-ramp-up-plans/#29e318b92b4f>

¹⁰⁴ "Total Gross Domestic Product for Missouri [MONGSP]." U.S. Bureau of Economic Analysis (retrieved from the Federal Reserve Bank of St. Louis March 29, 2019) <https://fred.stlouisfed.org/series/MONGSP>.

registration and reporting system, develop educational materials about the proposal, and execute the Advisory Committee on Autonomous Vehicles meetings. While the costs of operating the plan are small, they have an impact on the Department of Revenue's budget that will likely not be recouped by the \$3,000 registration fee for autonomous vehicles if the job responsibilities are more arduous than expected and the number of testing vehicles is less than 100. The policy is designed to incur low administrative costs but also fails to recover those costs through robust vehicle registration fees, which will be a challenge for the affected departments. The legislation does not call for new funding for the DOR, DOT or law enforcement agencies, so while the economic development will be felt by the state, the agencies will be forced to carry out a new program under existing budget constraints.

Having low registration fees, a problem for the Department of Revenue, is a benefit for prospective developers and should be viewed as promoting testing and innovation. Charging higher registration fees could recoup agency costs more quickly while also disincentivizing testing. The proposed policy promotes testing at the expense of agency operations, a contestable tradeoff.

While the low registration fee system is a benefit to developers, the same developers are forced to accept a tradeoff in the form of accountability and transparency through the reporting system. Private companies, especially in the technology space, have a record of keeping their operations as opaque as possible.¹⁰⁵ The disengagement reporting feature of the policy creates accountability for developers in order to promote the "safely and responsibly" clause in the plan's goal. The reporting system, though, should not be considered a silver bullet for fully ensuring the safety of AVs on Missouri streets.

¹⁰⁵ "2018 Corporate Accountability Index." Ranking Digital Rights (April 2018).
<https://rankingdigitalrights.org/index2018/assets/static/download/RDRindex2018report.pdf>

The more impactful policy provision for promoting safety is including a mandatory, licensed in-vehicle operator. Having an in-vehicle operator is an additional accountability mechanism for developers, an additional economic development tool as it creates mandatory jobs, and makes autonomous vehicle testing more palatable for the motoring public. The mandate also holds political benefits, to be addressed in the political analysis section. One major policy disadvantage prompted by the inclusion of an in-vehicle operator mandate is the fact that developers prefer flexibility when testing higher levels of automation. Several states, including the previously restrictive California and the “wild west” Arizona¹⁰⁶ both allow remote operators to test autonomous vehicles, but concerns about safety and worker displacement are among the concerns cited by stakeholders in autonomous vehicle policymaking at the federal level.¹⁰⁷ From a policy perspective, the inclusion of an in-vehicle operator could deter some developers from pursuing testing in the state, especially when other states allow remote testing, but the proposed policy is more inviting than the existing policy which bans all AV testing.

The implementing and authorizing tools of the Show Me Safety Plan also contain both positive and negative components. As was previously described, many states elect to authorize AV policy through just the power of executive order. The policy benefits of using an executive order only approach would be: the policy is not exposed to any steps in which it could be adjusted, there is a more flexible timeline for rollout and implementation, and the plan has a 100% chance of authorization. The Show Me Safety Plan, however, uses the legislative process instead of relying entirely on executive action in order to create a policy that will outlast the Governor’s first and potentially second term (if reelected) and not be overturned by the succeeding Governor. In terms of policy, this legislation, as proposed, allows the

¹⁰⁶ Karsten, Jack and Darrell West. “The state of self-driving car laws across the U.S.” Brookings (May 1, 2018). <https://www.brookings.edu/blog/techtank/2018/05/01/the-state-of-self-driving-car-laws-across-the-u-s/>

¹⁰⁷ Spangler, Todd. “U.S. Senate Committee Considers Impact Self-Driving Tech Could Have on Workers.” Government Technology (September 14, 2017). <https://www.govtech.com/fs/US-Senate-Committee-Considers-Impact-Self-Driving-Tech-Could-Have-on-Workers.html>

Governor to retain the power to pause testing by a specific entity at any time. On the other hand, if the policy proves to be a failure, the legislative body will have to take action to fix the plan or terminate the policy, which could be a burdensome task.

Additionally, some states have passed legislation forbidding municipalities from passing their own bans on autonomous vehicle testing. The Show Me Safety Plan does not include such a policy proposal, leaving it exposed to potential interference from smaller governmental entities. If Kansas City or St. Louis enact a ban on autonomous vehicles, the opportunity to attract investment would be significantly altered. Similarly, federal legislation, if enacted with certain, specific language, could supersede the Show Me Safety Plan tenets of regulatory exemptions on vehicle following distance or other state laws as well as the plan's in-vehicle operator requirement. Taking state action that could be quickly or unexpectedly reversed by federal action could make the entire policymaking process superfluous, ineffective and inefficient. The longer the state waits to act, the more exposed the policy is to being superseded by federal legislation and the longer the state delays developer investment.

The Advisory Committee on Autonomous Vehicles task force is authorized through executive action and could be subject to termination by the next governor. The benefit of authorizing the task force through executive order is that the Governor retains control over the membership of the group, can work directly with the Department of Transportation Director without interference from the legislative process, and begin conducting task force business if there are delays in the legislative process on the larger plan. Authorizing and implementing the ACAV also satisfies the Department of Transportation's suggestion in the DOT's 2018 Long Range Transportation Plan document that "planning for [policy] changes start now."

Implementation of the Show Me Safety Plan is done principally through the Missouri Department of Revenue and the Missouri Department of Transportation. Having two state agencies

implement a policy that would be better-served by implementing under one department is a downfall of the proposal and could cause the doubling of work, the creation of silos, and confusion for developers and the motoring public. Because the agencies involved are currently tasked with vehicle registration (DOR) and road safety (DOT), it is efficient to implement the specific facets of the Show Me Safety Plan under their existing implementing agencies, especially in the program's early stages. Creating a new AV-focused agency or delegating one agency the task of implementing the entire policy would take a restructuring of state government, a legislative mechanism to increase funding (which would have political implications), cause division between the selected agency and unselected agency (if all implementation was done through one shop), and potentially create confusion for users while requiring agency employees to conduct actions outside their fields of specialization.

One final approach to considering the policy through a cost-benefit lens is to approach the problem using the United States Department of Transportation's Value of a Statistical Life (VSL). As of 2016, the USDOT uses departmental guidance to value one human life at \$9.6 million.¹⁰⁸ This figure is relevant when the department conducts rulemaking on new safety technologies, of which many building blocks of AV would qualify.¹⁰⁹ Essentially, the department compares the cost of mandating the technology on all vehicles included in the specific regulation against the VSL multiplied by the number of lives the department expects the technology will save. For instance, if the department determined that it would cost industry \$200 million to implement a new safety technology, in order for the mandate to

¹⁰⁸ Moran, Molly. "Guidance on Treatment of the Economic Value of a Statistical Life." U.S. Department of Transportation (August 8, 2016). <https://www.transportation.gov/sites/dot.gov/files/docs/2016%20Revised%20Value%20of%20a%20Statistical%20Life%20Guidance.pdf>

¹⁰⁹ Morrison, Jon. "Building Blocks to the Autonomous Vehicles of the Future." OEM Off Highway (October 18, 2018). <https://www.oemoffhighway.com/trends/article/21026895/building-blocks-to-the-autonomous-vehicles-of-the-future>

make economic sense through a cost-benefit analysis (when only looking at these two numbers) the new rule would have to save at least 21 lives.

From the reverse perspective, when applied to Missouri, if the Show Me Safety Plan directly resulted in the deaths of two or more people, it would nullify the goal for economic gains (\$20 million). Because AVs are built using safety technologies that are not currently mandatory, like automatic emergency braking, lane departure assistance, forward collision mitigation, blind spot detection sensors, etc., it should be expected that adopting these technologies among AVs being tested in Missouri would increase safety and reduce fatalities. But, even with these technologies in place and with an in-vehicle operator in the driver's seat, there was a fatality in Arizona, which is why it's important to look at the economic value of a statistical life when analyzing the policy.

The Show Me Safety Plan is replete with policy tradeoffs. In some instances, developers are exposed to additional costs and burdens as compared to other state frameworks, but the proposed plan allows developers to test their vehicles in Missouri, which is a net gain from the developer perspective. On the agency side, the policy sticks to traditional agency responsibilities for vehicle registration and highway safety, which balances cost-efficiency against creating a new institution to conduct all AV-related efforts. The plan also elects to use legislation for the core tenets of the policy in order to add stability to the program, though that decision exposes the policy to both beneficial and costly political pressures to be discussed in the following section.

Political Analysis

Missouri Legislature

The Republican Party in Missouri, led by Governor Parson, controls all branches of state government, including supermajorities in the Missouri Senate and Missouri House of Representatives.¹¹⁰ Republicans control the Governor, Lieutenant Governor, Secretary of State, Attorney General, and Treasurer's offices.¹¹¹ The only statewide office not controlled by Republicans is the State Auditor's office.¹¹² With this context in mind, the state is fertile ground for any Republican-led efforts to advance through the legislature and to the Governor's desk. The initial question to consider, though, is whether or not the Republican state legislature would support the Show Me Safety Plan if it were to be proposed by Governor Parson.

As was previously discussed, opponents to AV legislation at the federal level are typically Democrats and Democratic Party-aligned groups, including organized labor and trial attorneys. At the state level, this dynamic also applies. Recently, the Missouri legislature had a lengthy floor discussion on autonomous vehicles¹¹³ in the context of a proposed amendment, House Amendment 03 on HB 606, to forbid autonomous school buses.¹¹⁴ The amendment was proposed by House Democrat Lyle Rowland of Jackson County and received most of its support from Democrats. The vote, which was a tough vote for moderate Republicans because of its school safety implications and optics, passed 75-69. HA 03 is exemplary of the political pros and cons of the Show Me Safety Plan. In one sense, opponents will have an opportunity to propose and potentially pass very narrow, specific legislation preventing certain applications of AV because the plan is intended to go through the legislative process. Opponents will be able to rally substantive and *show* votes to demonstrate their safety-mindedness and pro-labor views,

¹¹⁰ "Missouri General Assembly." Ballotpedia (Accessed April 10, 2019).

https://ballotpedia.org/Missouri_General_Assembly

¹¹¹ "Missouri state executive offices." Ballotpedia (Accessed April 10, 2019)

https://ballotpedia.org/Missouri_state_executive_offices

¹¹² Ibid.

¹¹³ "2019 Legislative Session Day Forty-nine." Missouri House of Representatives (April 9, 2019).

http://mohouse.granicus.com/MediaPlayer.php?view_id=1&clip_id=1009

¹¹⁴ Ibid.

which could appeal to moderate Republicans in the state. It is unlikely, however, that Republicans will peel away from the larger Show Me Safety Plan especially if the plan is proposed as a signature legislative goal for the Parson administration. In regards to HA 03, lobbyists in the state believe the Missouri Senate will strip the amendment from HB 606 when they take up the bill for a vote.¹¹⁵

The legislative authorization process is politically a blessing and a curse for the Show Me Safety Plan. Based on the recent floor discussion, one can observe that Republicans overwhelmingly support the business and technology development communities in their pursuit of AV. The Show Me Safety Plan in general will not be jeopardized by the legislative process, but it opens the door to political posturing by members of both parties. The governor should be aware that Republican legislators will vote for Democratic-proposed amendments that are limited in scope, like the school bus ban or other specific applications. Some Republican legislators, after all, want to appeal to constituents who are rightfully concerned about potential job losses due to media hype and uncertainty about the technology.¹¹⁶ The legislative process for the Show Me Safety Plan will be an opportunity for Republican legislators to demonstrate their thoughtfulness on the issue and even bipartisanship by supporting Democratic amendments. Because the Governor is up for reelection in 2020, it would be surprising for significant factions of his own party to diverge from one of his major efforts. For instance, Missouri's recent vote on ___ demonstrates this dynamic of the Republican legislature falling in line behind one of the Governor's proposals.

For Governor Parson, the optics of the proposal also have political implications. Governor Parson's image and background is that of an older rural farmer who lucked into the governorship

¹¹⁵ Nittler, Stephen (April 10, 2019). Personal interview.

¹¹⁶ Citation needed.

because the previous Governor resigned amid scandal.¹¹⁷ He did not win statewide election for governor, but won statewide election for Lieutenant Governor, which is a significant but different accomplishment as he shared the ticket with someone who, prior to the scandals, was seen as a rising star in the national Republican Party.¹¹⁸ Parson has been recently accused of not working closely enough with the legislature¹¹⁹ and Missouri media reported that party insiders are hoping a younger candidate will run against Parson in the Republican primary.¹²⁰ The Show Me Safety Plan ameliorates some concerns that Governor Parson does not want to work with the legislature, demonstrates his support for technology investment in the state, which is a stark contrast from his image and appeals to business stakeholders, and would provide a legislative achievement heading into the 2020 Republican primary and general election. With that said, support for this proposal would allow for a primary or general election opponent to create a wedge issue, gin up positive attention from the organized labor or safety organizations, generate both positive and negative media attention, be described as an urban-centric effort, potentially create minor division within his own party, and exposes the governor to reputational risk if a crash were to occur. The proposal also brings attention to an issue about which Missouri voters do not have strong feelings unless Parson can convince voters the policy is a major economic development solution.¹²¹ According to Brookings, the key issues for Missourians in the 2018 US Senate race between Sen. Claire McCaskill and Missouri Attorney General Josh Hawley, the eventual winner, were healthcare, the economy, tariffs, and Brett Kavanaugh. Authorization through legislation also

¹¹⁷ Klay, Phil. "The Lesson of Eric Greitens and the Navy Seals Who Tried to Warn Us." *The New Yorker* (May 17, 2018). <https://www.newyorker.com/news/news-desk/the-lesson-of-eric-greitens-and-the-navy-seals-who-tried-to-warn-us>

¹¹⁸ Ibid.

¹¹⁹ Hancock, Jason and Lindsey Wise. "Parson faces unrest among Missouri conservatives as he heads into 2020." *The Kansas City Star* (April 1, 2019). <https://www.kansascity.com/news/politics-government/article228566039.html>

¹²⁰ Ibid.

¹²¹ Stegmaier, Mary and Lincoln Brown. "Race for the Senate 2018: Key Issues in Missouri." Brookings Institution (October 31, 2018). <https://www.brookings.edu/blog/fixgov/2018/10/31/race-for-the-senate-2018-key-issues-in-missouri/>

means the governor cannot take full credit for the plan as he would be able to if the proposal was authorized through executive action.

Fiscally, the proposal demonstrates conservative values as it does not call for new appropriations. This will be an appealing argument for Governor Parson as he attempts to whip votes among Republican and Democratic legislators. The proposal would attempt to attract new investment in the state without adding financial costs to state government. Opponents will say that this puts a burden on state employees and agencies who are already operating with budget constraints. They could also suggest that a lack of significant funding jeopardizes the efficacy of the registration, monitoring and law enforcement components and, as such, leads to safety risks.

Notably, state legislation on autonomous vehicles has been enacted in both traditionally conservative and liberal states. California, which has been discussed at length as an exemplary framework for AV legislation, currently has a 61-19 Democratic majority in the House and a 28-10 Democratic majority in the Senate.¹²² The state is prolific at passing autonomous vehicle legislation that is friendly enough for developers to want to continue testing in the state, as evidenced by the disengagement reports, and has a registration and reporting system to ensure some accountability and public safety. Oregon, another Democratic controlled state, enacted OR H 4063 in 2018, which permits “operation of autonomous vehicles on highways in this state under certain circumstances, directs owners of commercial autonomous vehicles to obtain additional motor vehicle liability insurance policies, and directs Department of Transportation to adopt rules for operation of autonomous vehicles on highways in this state.”¹²³ The state is also considering a bill from Democratic Representative McLain that “prescribes testing permit application requirements,” another one of the Show Me Safety Plan

¹²² “California State Legislature.” Ballotpedia (accessed April 15, 2019).

https://ballotpedia.org/California_State_Legislature

¹²³ “Autonomous Vehicle State Bill Tracking Database.” National Conference of State Legislatures (updated April 14, 2019). <http://www.ncsl.org/research/transportation/autonomous-vehicles-legislative-database.aspx>

policy provisions. While Democrats are among the leading opponents on the federal level, and certainly oppose some AV policies on the state level, it is evident that states can reach bipartisan solutions to allowing AV operations in their jurisdictions under certain conditions.

The takeaway of the above discussion, however, should not be that Democrats are the primary champions of AV legislation. Missouri's neighbor to the south, Arkansas, is a strong example of a Republican-controlled legislature and Republican governor working together to pass meaningful AV legislation. In 2019, the state passed a bill proposed by Rep. McCollum, AR H 1561, that established an AV pilot program to allow the "operation of autonomous vehicles and fully autonomous vehicles on the streets and highways" of Arkansas.¹²⁴ Additionally, in 2017, the state passed a bill allowing for truck platooning operations in the state.¹²⁵ Similar policies have been enacted through the legislative process in Missouri's neighboring Republican-controlled states Kentucky, Tennessee, and Nebraska.

Missouri's Republican-led state government will likely follow the process of similar neighboring states, though some members will likely vote in support of narrow, secondary amendments meant to demonstrate safety-consciousness and indicate bipartisanship. One of the principal reasons the Show Me Safety Plan advocates for authorizing through the legislature is to garner political talking points for Governor Parson's impending reelection campaign. By being the leader on this issue in the state, Governor Parson can show bipartisanship and legislative outreach, while presenting an image of himself that is tech-friendly and trendy. Additionally, the legislative process is much more visible and incremental than a one-time rollout of an executive action. The Governor can use the slower process to constantly appear in the news, provide soundbites to interested members of the media, and exhibit a mastery of the legislative process, all which will be helpful in his reelection effort. The tradeoff, however, is that though the legislation makes for stronger law, the process will nick away at some

¹²⁴ [Ibid.](#)

¹²⁵ [Ibid.](#)

elements of the policy as Democratic opponents will cater to union and safety groups by adding amendments that prevent certain applications of AV. Because the primary reason for Governor Parson to be interested in this policy is to score a politically interesting messaging point for his reelection campaign while attracting moderate levels of new investment to the state, having minor parts of his proposal trumped by narrow safety or Democratic-optic amendments, is worth the tradeoff.

Major Political Risks

Politically, there are two major risks to the Show Me Safety Plan, one of which takes place in the authorization and implementation stages – public opinion –, and one of which exists while the policy framework is being executed – a fatal crash. Alienating Democratic-leaning advocacy groups who have limited influence in a Republican-controlled state is not a major political risk for Governor Parson. Alienating a skeptical general public is a significant risk as the election comes near.

Public polling on autonomous vehicles is fairly consistent on the issues; the general public is mostly skeptical of AVs, see them as a safety threat, and say they are unlikely to own an autonomous vehicle.¹²⁶ Here are some notable results from recent polls compiled by Advocates for Highway and Auto Safety¹²⁷:

- 53% of respondents said they would feel somewhat or very unsafe riding in an autonomous car.
- 67% of Americans polled said they were uncomfortable with the idea of riding in self-driving cars.
- 64% of respondents said they were concerned about sharing the road with driverless cars.
- 61% of respondents said they aren't likely to buy self-driving cars once they become available.

¹²⁶ "Public Opinion Polls Show Skepticism About Autonomous Vehicles." Advocates for Highway and Auto Safety (April 2018). <https://saferoads.org/wp-content/uploads/2018/04/AV-Public-Opinion-Polls-4-26-18.pdf>

¹²⁷ Ibid.

And here are some encouraging statistic from that same compilation of polls when considered in the context of the Show Me Safety Plan's requirement that a human operator be in the driver's seat:

- 87% of respondents said they would favor a requirement that all driverless vehicles have a human in the driver's seat who can take control of the vehicle in case of an emergency.
- 84% of Americans said they support uniform U.S. Department of Transportation rules to ensure that the human driver is alert in order to safely take control from the computer.

Voters feel strongly that a human operator should be in the vehicle, which is a concession for Governor Parson and technology developers included in the Show Me Safety Plan in an attempt to make the plan more appealing for voters. While voters might currently believe the technologies are unsafe, introducing AVs to the motoring public by having a human operator in the driver's seat is a significant concession, as some developers prefer having the option to test with a remote operator. In order to mitigate political risks on the public's concern surrounding AVs, the Governor must (1) strike the right tone when introducing the proposal by explaining it as a pro-technology, pro-workforce development, pro-investment effort, (2) effectively leverage the bipartisanship and legislative outreach talking points during the reelection campaign and (3) push hard for one or two developers to immediately announce investment in the state so that voters quickly realize the workforce and investment benefits.

Political Tactics

Representative Travis Fitzwater, a Republican from Callaway County, immediately jumped into the discussion of the autonomous school bus amendment and said "I think this is a ridiculous amendment."¹²⁸ He went on to say "the states that are setting up opportunities to test are going to become some of the most innovative states in the country." Rep. Phil Cristofanelli also engaged in the

¹²⁸ "2019 Legislative Session Day Forty-nine." State of Missouri House of Representatives (April 9, 2019). http://mohouse.granicus.com/MediaPlayer.php?view_id=1&clip_id=1009

pre-planned discussion of the merits on autonomous vehicles. Both members are young, emerging leaders in the state who the Governor could enlist to introduce and advocate for the Show Me Safety Plan in the legislature. It would give them a high-profile issue to champion, keep them in the news, garner favoritism from the state party leaders, generate campaign contributions from the business community and large technology developers, and provide a legislative accomplishment for them to reference in the future. They are already on the record as supportive of autonomous vehicles through their discussion and vote on Rowland's amendment.¹²⁹ For Governor Parson, having legislators voice their support for the policy will also provide some political cover. Though one of the reasons for proposing this policy is to take credit for its passage, sharing credit will not hurt the Governor's message and, if the policy fails or is significantly altered in the legislative process, he can point to his legislative champions as sharing blame for its failure. In essence, he will not be able to take full credit, but will also not bear the full blame if the policy becomes unpopular. In Missouri, members of the House of Representatives are term-limited to four terms, so Fitzwater, who was elected in 2014¹³⁰, and Cristofanelli, who was elected in 2016¹³¹, will have to soon seek election to the Missouri Senate or a higher office, or seek employment in the private sector. Pointing to a signature pro-business achievement and currying favor with the Governor will be beneficial to any of their future pursuits.

Additionally, Governor Parson can generate support for the plan among key stakeholders by pre-announcing members of the Advisory Committee on Autonomous Vehicles prior to the introduction of the legislation. Appointments to the advisory committee can both crystalize support among influential likely supporters and also appease likely opponents. By announcing advisory committee

¹²⁹ "HB 606 *HA 3 Rowland (029) School Bus Drivers." State of Missouri House of Representatives (April 9, 2019). <https://house.mo.gov/billtracking/bills191/rollcalls/049.013.pdf>

¹³⁰ "Representative Travis Fitzwater." Missouri House of Representatives. <https://www.house.mo.gov/MemberDetails.aspx?district=49>

¹³¹ "Representative Phil Cristofanelli." Missouri House of Representatives. <https://house.mo.gov/MemberDetails.aspx?year=2018&district=105&code=R>

members from labor and safety groups, Governor Parson provides the policy opponents a chance to withhold opposition. Being on the advisory committee gives them a stake in the policymaking process and allows them to make statements like “We thank the Governor for his leadership on this issue and look forward to ensuring workforce and safety concerns are addressed during this process.” It is also difficult for interest groups, even those that are not politically aligned with the Governor, to reject the appointment to an advisory committee. If opponents do reject the appointment, the supporters will know exactly how “dug in” the opposition is on the issue and react accordingly. Pre-appointing committee members forces lines to be drawn in the sand at the early stages of the policymaking process, which should benefit the more powerful majority party in this process.

Interestingly, Governor Parson is attempting similar tactics and using the party’s majority status to enact his infrastructure plan, a 2019 legislative priority, through the Missouri legislature.¹³² The below quote from a recent press release regarding the infrastructure plan demonstrates the Governor’s strategy (italicized for emphasis):

“We are thrilled to see the Senate take significant action today on our *shared* priority of infrastructure. Today’s strong *bi-partisan* vote is a result of focused efforts by the Legislature as we *work together* on an infrastructure plan to move Missouri forward. I am encouraged by the Legislature’s progress and look forward to *continuing to work with* members of the House to pass an infrastructure plan that works for all of Missouri.”¹³³

Governor Parson and his team are clearly trying to accentuate the bi-partisan nature of the infrastructure proposal while making sure to show deference to the Missouri Senate during the process.

¹³² “Today, the Missouri Senate, in a 26-7 vote, passed one of Governor Parson’s top legislative priorities.” Office of Missouri Governor Mike Parson via Rolla Daily News (April 15, 2019).

<https://www.therolladailynews.com/news/20190415/governor-parsons-infrastructure-priority-passes-missouri-senate>

¹³³ Ibid.

The statement also leaves open the possibility that the Missouri House will fail to pass the proposal and, as such, take some blame for the lack of a solution to infrastructure funding. The same dynamic will and should be at play when the Show Me Safety Plan is considered.

Recommendations

The Show Me Safety Plan is undeniably layered with negative policy and political consequences. There is a possibility that some elements of state policy will be trumped by federal legislation in the coming years. There might be pushback on the policy provision requiring an operator in the vehicle by the developers and, on the other side, pushback from labor for attempting this policymaking in the first place. The authorizing process has the potential to be optically difficult if opponents to the policy feel strongly enough and want to paint the plan as anti-jobs and unsafe. And ultimately, if the policy is enacted and a major vehicle fatality involving an autonomous vehicle occurs, Governor Parson will be partially blamed for the accident.

Despite all the possible downfalls, the risk for this policy being a failure is extremely low. The goals of (1) not having a fatality and (2) attracting \$20 million in investment and 200 jobs are framed in a way that makes them achievable, but also impactful and appealing to members of the public. Attracting one major startup to build its headquarters or a significant operation in Missouri while bringing in a handful of the traditional players to test should be the main focus of the Governor's workforce agenda for the state and for his political team if the Governor decides to move forward with this proposal. The risk of a fatality is a little more difficult to grapple with politically, as it would make national headlines and intensify scrutiny on the policy. With that said, the policy is proposed to be enacted in August of 2020. The 2020 Missouri Gubernatorial election is three months later on November 3, 2020. That means if developers can avoid a fatal accident for three months, Governor Parson will be exposed to zero negative electoral consequences because of a fatal crash. In other words, the chances of him losing

votes due to a crash is extremely small. It could take several weeks for developers to set up shop, bring vehicles to the state, hire or move staff, and even then, most developers start with a small fleet of test vehicles.

On the reverse side of the timing equation, are the benefits of having a tech-friendly, hip policy rolled out in the middle of election season. Such a rollout will keep the Governor's pro-business agenda in the news and burnish an image of innovation and modernity. The Governor's rural, agricultural roots are appealing to a large subset of Missouri voters, but demonstrating outreach to the tech industry will help him appeal to urban voters.

Because of the narrow impact of the actual policy, all considerations of this proposal should be viewed with one question in mind: will the policy help or hurt the Governor's chances of reelection? It is evident that, due to the opportunity to improve the Governor's public image, appeal to his supportive constituency of business stakeholders, work alongside members of the legislature while providing visibility to emerging state party leaders, and undertake a newsworthy policymaking process under low-risk conditions, one must conclude that Governor Parson should propose the Show Me Safety Plan.

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EDUCATION:

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Department of Governmental Studies

- Capstone: “Missouri’s Autonomous Vehicle Future” policy proposal and analysis addressing the state’s absence of action on autonomous vehicle policy.
- Capstone Supervisor: Paul Weinstein
- Courses: Poverty, Inequality, Opportunity: Theoretical Foundations and Policy Implications; Fundamentals of Quantitative Methods; Financial Management & Analysis in the Public Sector; Economics for Public Decision Making; Proseminar: Essentials of Public and Private Management; Public Policy Evaluation & the Policy Process; Congress and the Making of Foreign Policy; The Midterm Elections and the Media in the Trump Era;
- Johns Hopkins School of Advanced International Studies: Completed elective course “Organization and Regulation of Infrastructure” taught by Michael Klein.

B.A., Political Science and Communication

May 2014

William Jewell College, Liberty, Missouri

GPA: 3.4/4.0

WORK & LEADERSHIP EXPERIENCE:

American Trucking Associations, Manager, Industry Affairs

January 2017 – present

- **Program Management:** Oversee a team of two employees and run ATA’s Image and Outreach department as supervisor of 100+ truck drivers and two nationally touring tractor-trailers. Responsible for the department’s external relations as liaison to media, industry partners, and program sponsors.

- **Press Secretary:** Serve as press secretary for ATA's councils, conferences, and image programs, including the National Truck Driving Championships, National Truck Driver Appreciation Week and more. Placed earned media hits in The Ringer, Fox News, Washington Post, NPR, Bloomberg, and local and trade media.
- **Public Affairs:** Distilling ATA's policy positions into simple, effective messages for congressional, White House and private sector coalition meetings, with a focus on infrastructure, workforce development and automated vehicle policies. Articulating ATA President and CEO's vision as ghostwriter of print pieces and contributor to national public addresses, videos, and media talking points. Prepared ATA executive testimony for congressional hearings.
- **Government Affairs:** Experience conducting congressional meetings with Members of Congress and staff alongside trucking officials, truck drivers and members of ATA's emerging leaders program. Primary ATA's representative in the Our Roads, Our Safety partnership with the Federal Motor Carriers Safety Administration (Department of Transportation), AAA, and the American Bus Association. Advising partners on outreach opportunities, content creation, and events.
- **Social Media:** Managing ATA's primary and secondary social media sites while using targeted social media ads to promote ATA legislative efforts and outreach programs. Overseeing accounts totaling 70,000 followers and responsible for 88% growth on image Twitter accounts and 117% growth on image Facebook accounts. Project manager of 25+ videos produced by internal and external sources as well as the industry's first high-engagement Facebook Live broadcasts.
- **Event Management:** Experience coordinating Cabinet-level and federal agency principal-level events and meetings, including meetings with FMCSA Administrator Martinez and events with Transportation Secretary Chao, Labor Secretary Acosta and EPA Acting Administrator Wheeler. Consulting with ATA Leadership on event planning, content offerings, and brand visibility for ATA's premier events, which annually attract 2,500+ management-level trucking industry attendees. Responsible for writing or editing on-stage scripts and stage movements for ATA's major events, meetings and conferences.
- **Special Assignments:** Co-produced ATA's annual reports for 2017 and 2018. Launched and managed two online autographed guitar auctions. Advised COO, EVP of Industry Affairs on relationship opportunities including JUUL Labs (e-cigarettes), Future Farmers of America, Washington Nationals, and more.

American Trucking Associations, Communications Specialist

August 2015 – December 2016

- Supported ATA's legislative efforts by creating the trucking industry's **first-ever** targeted social media campaigns and creative materials directed at Congressional offices regarding pending industry issues such as state preemption (F4A), hours of service reform, and state tolling efforts.
- Improving public perception of the trucking industry by managing media relations for ATA's Image and Outreach programs to national and local news outlets and running social media accounts.
- Collaborating on publishing duties of monthly Inside ATA: responsible for writing content, headlines, capturing and selecting pictures, editing and distribution.

City Year Washington DC, AmeriCorps Corps Member

Summer 2014 – Spring 2015

- Served 53 Leckie Elementary 4th grade students in a high-poverty neighborhood in SE Washington, DC through data-driven targeted interventions. Worked with staff and parents to identify and target specific student needs with demonstrated 37% achievement growth for focus list students
- Launched partnership between City Year DC and Capital Bikeshare using effective proposal writing, reducing transportation costs by an estimated \$5,000 and promoting City Year's dedication to corps member health. Partnership provides corps members with year-long bikeshare membership
- Managed after school club, City Kids, by developing engaging city-themed lessons, introducing students to various global cities and monitoring 25 students in order to combat absence of social studies curriculum at Leckie Elementary

BOARD MEMBERSHIPS:*Trucker Buddy International*August 2016 – present

- Providing strategic direction and representing ATA's interests as the trucking industry's leading trade association as part of organization's board of directors
- Served on search committee tasked with finding organization's current executive director. Formulated position description and salary offer and vetted chosen candidate

*City Year Alumni Association of Washington, DC*September 2016 – August 2017

- Engaged City Year alumni based in Washington, DC in volunteer projects, civic engagement initiatives and corps networking opportunities
- Organized 18-Minute Networking program, bringing fellow alumni face to face with current corps members for career advice and relationship building

AWARDS AND HONORS:

New Politics, Answering the Call Leadership Academy Program Alumnus

2017

William Jewell College Male Athlete of the Year (Baseball)

2013, 2014