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KURT M. GOSSELIN

NAVIGATING THE POLICY LANDSCAPE TO BRING AUTONOMOUS VEHICLE LEGISLATION TO YOUR STATE

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Abstract: At an economic cost of nearly $300 billion, more than 5.5 million car accidents result in over 30,000 fatalities on American roadways each year. Advocates of automated vehicle ("AV") technology view self-driving cars as a solution for reducing both the number and severity of accidents. Using AV technology on public roadways currently exists in a legal gray area as there is no national consensus on the legality of AV technology. However, NHTSA recently published guidance on the topic, many states are considering legislation to authorize the operation of these vehicles, and a few states have already passed legislation permitting the testing of automated vehicles. Building from NHTSA guidance and current state legislative and regulatory activity, this Note analyzes the interests involved in state-based regulation of autonomous vehicle testing and proposes a model plan for enacting a regulatory regime for AV technology.

Author: J.D., New York University School of Law, 2015; B.A., University of Wisconsin–Madison, 2010; Managing Editor (2014–15), *N.Y.U. Journal of Legislation and Public Policy*.

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*Kurt M. Gosselin**

INTRODUCTION

In November of last year, Audi's CEO, Rupert Stadler, boldly proclaimed that the first generation of driverless cars will be roaming the roadways in the next two years.[1] Stadler knows something about self-driving cars, as his company recently secured California's first driverless-car permit and is one of the early leaders in automated vehicle ("AV") technology development.[2] In April of this year, Delphi Automotive—a company whose innovative track record includes, *inter alia*, the first in-dash car radio and the first electric starter—successfully executed the first cross-country road trip by an autonomous vehicle in a nine-day, 3400-mile trek from San Francisco to New York City.[3] Google, one of the early public movers on the automated vehicle

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[1] *Are Self-Driving Cars the Future?*, DEUTSCHE WELLE (Nov. 28, 2014), http://www.dw.de/are-self-driving-cars-the-future/a-18100781.

[2] *See* Matthew Debord, *Audi Jumps to the Front of the Line for Self-Driving Cars in California*, BUS. INSIDER (Sept. 17, 2014, 9:51 AM), http://www.businessinsider.com/audi-jumps-to-the-front-of-the-line-for-self-driving-cars-in-california-2014-9.

[3] Alex Davies, *This Is Big: A Robo-Car Just Drove Across the Country*, WIRED (Apr. 3, 2015, 7:00 AM), http://www.wired.com/2015/04/delphi-autonomous-car-cross-country/ ("Nine days after leaving San Francisco, a blue car . . . rolled into New York City after crossing 15 states and 3,400 miles to make history. The car did 99 percent of the driving on its own, yielding to the carbon-based life form behind the wheel only when it was time to leave the highway and hit city streets.").

development scene, first announced its efforts in developing driverless technology in October 2010, highlighting the potential for improving safety and increasing efficiency by "help[ing] prevent traffic accidents, free[ing] up people's time and reduc[ing] carbon emissions by fundamentally changing car use."[4] Assessments of the promise and problems of commercializing such vehicles have since spanned thousands of printed pages.

There are 5.5 million car crashes in the United States annually, and nearly ninety-three percent of those crashes are caused by driver error.[5] Approximately 30,000 of those crashes result in fatalities.[6] Further, the economic costs suffered in the United States as a result of such crashes totals upward of $300 billion per year.[7] Developers and advocates of AV technology view self-driving cars as a solution for reducing both the number and severity of accidents.[8] Precursor automation technology has already been incorporated into conventional automobiles for safety improvement, and fully autonomous vehicles represent next-generation development of these types of technology.[9]

Use of AV technology on public roadways currently exists in a legal grey area: current legislative schemes regulating driving have not considered the possibility of self-driving cars, but a review of current state laws suggests that there is no categorical prohibition in the status quo.[10] Responsive to car and technology companies' increasing interest in automated driving technology, a number of states have considered legislation expressly permitting their use.[11]

[4] Sabastian Thrun, *What We're Driving At*, GOOGLE OFFICIAL BLOG (Oct. 9, 2010), http://googleblog.blogspot.com/2010/10/what-were-driving-at.html.

[5] DANIEL J. FAGNANT & KARA M. KOCKELMAN, ENO CTR. FOR TRANSP., PREPARING A NATION FOR AUTONOMOUS VEHICLES: OPPORTUNITIES, BARRIERS AND POLICY RECOMMENDATIONS 4 tbl.1 (2013), https://www.enotrans.org/wp-content/uploads/wpsc/downloadables/AV-paper.pdf.

[6] *Fatality Analysis Reporting System (FARS) Encyclopedia*, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., http://www-fars.nhtsa.dot.gov/Main/index.aspx (last visited July 7, 2015).

[7] FAGNANT & KOCKELMAN, *supra* note 5, at 4 tbl.1.

[8] *See id.* at 3.

[9] For a discussion of various driver-assistive technologies incorporated into vehicles to improve passenger safety, *see generally* Andrew P. Garza, Note, *"Look Ma, No Hands!": Wrinkles and Wrecks in the Age of Autonomous Vehicles*, 46 NEW ENG. L. REV. 581 (2012) (focusing specifically on adaptive cruise control, lane departure warning systems, and collision mitigation braking systems).

[10] *See generally* Bryant Walker Smith, *Automated Vehicles are Probably Legal in the United States*, 1 TEX. A&M L. REV. 411, 463–508 (2014) (analyzing the general legal landscape of state laws regulating driving and their application to autonomous vehicles).

[11] The Center for Internet and Society at Stanford University maintains a Wiki to track legislative and regulatory development for self-driving cars. As of the time of publication, four states—California, Nevada, Michigan, and Florida—and Washington, D.C. had passed authorizing legislation. Sixteen states were considering authorizing legislation, and one state—Tennessee—passed legislation barring municipalities from restricting the use of AV on public roadways solely because of AV technology. *See* Gabriel Weiner & Bryant Walker Smith, *Automated Driving: Legislative and Regulatory Action*, CTR. FOR INTERNET & SOC'Y,

After extensive lobbying by Google, the State of Nevada passed the nation's first law to permit the operation of self-driving cars on public roads in March 2012.[12] Florida and California joined Nevada by year's end, and Michigan passed authorizing legislation in December 2013.[13] More recently, the State of Tennessee passed legislation prohibiting local governments from prohibiting the use of automated vehicles solely on the basis of the vehicles' incorporation of automated driving technology.[14] However, not all states that have considered pro-AV legislation have passed such bills. In fact, 18 states considered and either declined to act on or rejected such laws in the previous legislative session.[15]

In states that have passed authorizing legislation, regulations are in the process of development. In those states that have not passed authorizing legislation, the opportunity is ripe for new legislative action that can be pursued as technology improves and as interest in automation increases. In 2013, the National Highway Traffic Safety Administration (NHTSA) issued a guidance document for states considering regulating self-driving vehicles.[16] These guidelines provide a useful starting point for regulators and legislators to consider this innovative and evolving technology.

Building from NHTSA guidance and current state legislative and regulatory activity, this Note aims to analyze the interests involved in state-based regulation of autonomous vehicle testing and proposes a model plan for enacting this regulatory regime. Part I examines academic theories of how to influence regulatory activity generally. Part II presents in greater detail the current regulatory landscape for automated vehicles and likely future developments. Part III identifies the players in driverless vehicle regulation, presents a useable public interest story to be adopted by self-driving transportation advocates, and analyzes the tactical efforts necessary for achieving legislative and regulatory victory in a manner that is portable from state to state.

PART I: JUSTIFICATIONS FOR REGULATION AND THEORIES OF INFLUENCE

Long before his nomination to the Supreme Court, Justice Stephen Breyer—then Circuit Judge Breyer serving on the First Circuit Court of

http://cyberlaw.stanford.edu/wiki/index.php/Automated_Driving:_Legislative_and_Regulatory_Action (last visited July 29, 2015).

[12] John Markoff, *Google Lobbies Nevada to Allow Self-Driving Cars*, N.Y. TIMES (May 10, 2011), http://www.nytimes.com/2011/05/11/science/11drive.html.

[13] *See* Weiner & Smith, *supra* note 11.

[14] *See id.*

[15] *See id.*

[16] NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., PRELIMINARY STATEMENT OF POLICY CONCERNING AUTOMATED VEHICLES (May 30, 2013) [hereinafter NHTSA POLICY STATEMENT], http://www.nhtsa.gov/staticfiles/rulemaking/pdf/Automated_Vehicles_Policy.pdf.

Appeals—published a book detailing a theory of regulation reform.[17] As Breyer notes in the preface, the framework he presents stems from his work on staff for Senator Edward Kennedy during the airline-deregulation efforts undertaken by the Senate Judiciary Committee in the early 1970s.[18] While traditional economic rationale supports the notion that regulation is necessary to correct market failures,[19] Breyer concludes that the important takeaway from traditional market-regulation theories is that the effectiveness of regulation depends on correctly identifying the problem that a given regulation seeks to address.[20]

Breyer also proposes a three-step process for transforming an issue in need of reform into actual policy.[21] The first step is to pursue a detailed inquiry into the target problem.[22] The goal of this in-depth investigation is to determine if related benefits have already accrued from existing regulations and if those benefits would be upset by a change to the regulatory frameworks.[23] This inquiry is also instrumental in determining if the potential target of the desired policy is truly impacting the root of the issue.[24] The second step instructs reformers to develop a "concrete alternative to existing regulation and a practical transition plan" to phase out old regulations and phase in new ones.[25] The third step instructs reformers to "organize and deal with political factors that ultimately determine whether a new law is passed or a new agency is given a reform mandate."[26] This third step—considering the political situation and how to address it—involves many facets. These considerations are: (1) the political visibility of the issue, (2) the characterization or presentation of the issue in a politically palatable way, and (3) the creation of a coalition to implement reform inside the government.[27] While Breyer built this model from his experience with airline deregulation, subsequent academics and legal scholars have taken Breyer's proposal and applied it to a wide array of regulatory topics.[28]

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[17] STEPHEN BREYER, REGULATION AND ITS REFORM (1982).

[18] *Id.* at vii–viii.

[19] *See id.* at 15–16.

[20] *Id.* at 191–96 ("Our examination . . . suggests that regulatory failure sometimes means a failure to correctly match the tool to the problem at hand . . . . Examining particular programs will help illustrate the value of a particular approach to reform: identify a program that likely embodies a mismatch; analyze that program in depth; and then change the underlying state or practices of the agency.").

[21] *Id.* at 318.

[22] *Id.* ("[T]o know that change is truly desirable and practical the problem must be investigated further—empirically and in depth.").

[23] *Id.*

[24] *Id.* at 318–19.

[25] *Id.* at 318.

[26] *Id.*

[27] *See id.* at 319–20.

[28] *See* Richard B. Stewart, *Tribute to Justice Steven G. Breyer*, 64 N.Y.U. ANN. SURV. AM. L. 19, 20 (2008) ("[Breyer's] analysis pointed the way to deregulation in many areas and the

In order to apply Breyer's framework, the reformer must consider the goals of the politicians and bureaucrats whose support is necessary to enact reform. For instance, the public choice model theorizes that elected politicians prefer to remain in office and that to remain in office, they must seek resources from interest groups to secure votes from the electorate.[29] If such assumptions are correct, self-interested politicians will adopt policy positions supported by interest groups to receive endorsements and funding.[30] Public choice theory can also apply to regulatory agencies. In addition to the elected-politician influence exerted upon agencies by legislative directive, agencies also find themselves directly influenced by well-organized interest groups.[31] There are myriad examples in which special interest groups have captured regulation.[32] Drawn to its eventual conclusion, public choice theory pits the outcomes of regulatory decision-making at the behest of special interests against market-based decision making.[33]

adoption of better regulatory tools . . . . The book is a widely acknowledged classic that has powerfully shaped both thought and action since it publication. It remains today the best work on the subject.").

[29] STEVEN P. CROLEY, REGULATION AND PUBLIC INTERESTS: THE POSSIBILITY OF GOOD REGULATORY GOVERNMENT 15 (2008) ("Interest groups possess the very resources politicians require for their political survival . . . . [I]nterest groups do not themselves contribute significant numbers of votes directly to politicians, but instead contribute financial support to political campaigns, which turn money into votes through campaign advertising and the like.").

[30] *See id.* at 16.

[31] *See id.* at 18–19 (discussing the advantage of well-organized special interests relative to their less-organized competitors).

[32] *See, e.g.*, George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3, 7–9 (1997) (discussing the American trucking industry); Bruce Kushnick, *Regulatory Capture of the FCC: Time to Clean House*, HUFFINGTON POST (Mar. 25, 2013, 5:12 AM), http://www.huffingtonpost.com/bruce-kushnick/regulatory-capture-of-the_b_2936693.html (calling out the FCC as beholden to the telecommunications industry and making policy decisions that favor the industry in lieu of benefiting the consumer public); Gretchen Morgenson, *From the Outside or Inside, the Deck Looks Stacked*, N.Y. TIMES (Apr. 26, 2014), http://www.nytimes.com/2014/04/27/business/from-outside-or-inside-the-deck-looks-stacked.html (discussing Senator Elizabeth Warren's concerns in reforming the banking industry).

[33] *See* CROLEY, *supra* note 29, at 22 ("Limiting regulators' power, and thus their ability to advance the interests of small groups at the greater expense of general interests, would enhance social welfare."). Proponents of interest groups pursuing policy outcomes argue that competition among such groups is merely the exercise of Madisonian Republicanism, while others argue that this is a gross distortion of the way the policymaking process should function, bemoaning that elected politicians are captured by various groups and industries. *See* THE FEDERALIST NO. 10 (James Madison) ("If a faction consists of less than a majority, relief is supplied by the republican principle, which enables the majority to defeat its sinister views by regular vote. . . . When a majority is included in a faction, the form of popular government, on the other hand, enables it to sacrifice to its ruling passion or interest both the public good and the rights of other citizens. To secure the public good and private rights against the danger of such a faction, and at the same time to preserve the spirit and the form of popular government, is then the great object to which our inquiries are directed."); *see* Stigler, *supra* note 32, at 10, 17 (discussing the coerciveness of political decision-making and rejecting the "idealistic view of public regulation").

The public choice model also posits a theory for how one group gains influence over competing groups. The spectrum on which this theory operates is bi-axial—the intensity of group interest runs along one axis from low to high, and the cost of organizing runs along the perpendicular axis from high cost to low cost.[34] Groups that have a high intensity of interest combined with a low cost of organizing often see better results in influence than their competition.[35]

An alternative to the public choice model is the public interest theory. Public interest theory holds that politicians act, when deciding a legislative or regulatory issue, in a manner that furthers the public interest.[36] However, it is generally impossible to separate public interests from private interests. Since an empirically precise definition of "public interest" is debatable,[37] "general interest" can serve as a useful alternative benchmark to evaluate regulator and legislator motivations.[38] Policies in the general interest are policies that will be supported by the citizenry if the information gap between policy enactors and the general public is eliminated.[39] The general interest may not be exclusive of private interests, as it is certainly conceivable that a policy that is in the private interest of an interest group or a regulator might also be in the general interest.[40]

The theories above are not presented with the purpose of resolving the debate as to which theory is universally correct; rather, they are included because they each inform part of the analysis as to how to pull the political levers necessary to pass automated vehicle regulation. The remainder of this Note

[34] *See generally* MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION (1965); Scott Gehlbach, *The Consequences of Collective Action: An Incomplete-Contracts Approach*, 50 AM. J. POLI. SCI. 802, 802 (2006) ("Applied to public policy, the theory of collective action implies that (1) organized groups benefit at the expense of unorganized groups, and (2) any policy bias in favor of small groups or large individual interests derives from their lesser susceptibility to collective-action problems.").

[35] *See* OLSON, *supra* note 34.

[36] *See* Michael E. Levine & Jennifer L. Forrence, *Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis*, 6 J.L. ECON. & ORG. 167, 168 (1990).

[37] *See* Michael E. Levine, *Regulatory Capture*, *in* THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 267, 268 (Peter Newman ed., 1998).

[38] *See* Levine & Forrence, *supra* note 36, at 176.

[39] *Id.* ("[General interest policies] would be adopted by a polity uninhibited by the problems identified by . . . modern agency theorists."). This information gap is also known as slack, a concept discussed in greater detail *infra* Part III.

[40] It should be noted that whether a policy is in the general interest, does not necessarily mean the policy will be adopted. Likewise, a policy that is in fact a special interest policy—one that would only be supported by an individual subset of a polity—may be adopted even though it fails to be in the general interest. *Id*. ("Special-interest policies or actions . . . would only be ratified by a self-interested subset of a polity. These policies or acts provide concentrated benefits to a subset of a polity at the expense of the general polity, but do not result from an other-regarding general-interest willingness to ratify a wealth transfer to the special beneficiaries.").

applies a modified framework of Breyer's model.[41] Part II of this Note examines in greater depth the first two steps of Breyer's approach and explains why AV regulation is a candidate for regulatory action. Part III tackles and refines Breyer's third step by incorporating the influences of public interest and public choice theories to present a working model for advocates of driverless vehicle regulation reform.

PART II: THE CURRENT STATE OF AUTOMATED VEHICLE REGULATION

"Slowly moving vehicles shall keep to the right and as near the right hand curb as possible. . . . A vehicle meeting another shall pass on the right. . . . A vehicle turning into another street to the right shall turn the corner as near the right-hand curb as practicable."[42] These were among the rules included in the first formal traffic code adopted in the United States by the New York City Police Department in 1903. Prompted by the proliferation of motored vehicles and the need to establish moderated traffic conditions amongst the varied modes of ground transportation in operation at that time, William Phelps Eno successfully lobbied Police Commissioner Francis Vinton Greene to adopt these rules and other regulations in the infancy of transportation management.[43] Ultimately, these efforts led to New York City adopting regulations by ordinance in 1909, establishing the first city traffic code in the country.[44] Technology and vehicle regulation has advanced considerably in the hundred years after these initial regulations were developed, but the United States again finds itself nearing the precipice of a technological revolution in road-faring transportation.

A. Current Technology

New driver-assistive technologies have found their ways into modern vehicles in recent years.[45] Recent examples, however, barely scratch the surface

[41] Judge Richard Posner reminds us to be cautious in determining the best approach to a policy problem and modifies Breyer's model to reflect this advice. *See* Richard Posner, *The Nirvana Fallacy Revisited*, BECKER-POSNER BLOG (Sept. 18, 2011, 6:29 PM), http://www.becker-posner-blog.com/2011/09/the-nirvana-fallacy-revisitedposner.html (positing that although certain categories of public policy problems may benefit from legislative or regulatory tinkering, others would be better addressed by allowing the market to correct them as government intervention could lead to worsening the underlying problem or create adverse unanticipated consequences that are even less desirable).

[42] CITY OF N.Y., RULES FOR DRIVING art. 1 (1903), *reprinted in* WILLIAM PHELPS ENO, THE STORY OF HIGHWAY TRAFFIC CONTROL 11 (1939) These rules are part of the first traffic code written in the United States and were adopted by the New York City police department in 1903. *See* ENO, *supra*, at vii.

[43] ENO, *supra* note 42, at 7–14, 21.

[44] *See* FAGNANT & KOCKELMAN, *supra* note 5, at ii.

[45] *Id.* at 1 ("New car models increasingly include features such as adaptive cruise control and parking assist systems that allow cars to steer themselves into parking spaces.").

of computer-assistive vehicle technology. As of June 2015, Google's fleet surpassed the 1.8-million-mile mark—with over 1 million miles driven in automated mode—with only 12 minor accidents, none of which were attributable to the fault of the automated vehicle.[46] This new mode of transportation has been described as a "smartphone on wheels" and is a result of four emerging trends in vehicular technology.[47] These trends are: "(1) an increase in machine-to-machine communications, (2) the development of in-vehicle 'infotainment' systems, (3) the increased collection and use of vehicle data, especially geo-location data, and (4) vehicular automation."[48] Machine-to-machine communication encompasses a narrower subset referred to as vehicle-to-vehicle (V2V) communication, which NHTSA defines as "a system designed to transmit basic safety information between vehicles to facilitate warnings to drivers concerning impending crashes,"[49] and "infotainment systems," which "provide consumers access to both information and entertainment content."[50]

In its 2013 policy statement, NHTSA distinguished various classes of automation in vehicles to provide guidance to states considering legislation or regulation.[51] Level 0 and Level 1 automation include vehicles whose systems keep the driver in complete control of operation of the vehicle but provide information or warnings, such as blind-spot indicators (Level 0), or provide the option to temporarily cede control to an individual system, such as adaptive cruise control (Level 1).[52] Level 2 Combined Function Automation "involves automation of at least two primary control functions designed to work in unison to relieve the driver of control of those functions."[53] Level 2 technology allows

[46] *See* Luke Villapaz, *Google to Report Driverless Car Accidents on Dedicated Website*, INT'L BUS. TIMES (June 6, 2015, 8:14 PM), http://www.ibtimes.com/google-report-driverless-car-accidents-dedicated-website-1955717; *Google Self-Driving Car Project*, GOOGLE+ (June 3, 2015), https://plus.google.com/+SelfDrivingCar/posts/iMHEMH9crJb ("Our software has now self-driven the equivalent of 75 years of typical U.S. adult driving! Along the way, we've navigated more than 200,000 stop signs, 600,000 traffic lights, and seen 180 million vehicles—with several thousand traffic cones, some fluttering plastic shopping bags, and a rogue duck thrown in for good measure."); *On the Road*, GOOGLE SELF-DRIVING CAR PROJECT, http://www.google.com/selfdrivingcar/where/ (last visited July 29, 2015).

[47] DANIEL CASTRO, THE INFO. TECH. & INNOVATION FOUND., THE ROAD AHEAD: THE EMERGING POLICY DEBATES FOR IT IN VEHICLES 2 (2013), http://www2.itif.org/2013-road-ahead.pdf?_ga=1.199073964.2082228347.1438615830.

[48] *Id.*

[49] JOHN HARDING ET AL., U.S. DEP'T OF TRANSP., NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., DOT HS 812 014, VEHICLE-TO-VEHICLE COMMUNICATIONS: READINESS OF V2V TECHNOLOGY FOR APPLICATION, at xiii (2014).

[50] CASTRO, *supra* note 47, at 2 (referencing GPS navigation, vehicle safety information, traffic information, and mobile communication as examples of such information and content).

[51] *See* NHTSA POLICY STATEMENT, *supra* note 16, at 3–5.

[52] *Id.* at 4.

[53] *Id.* at 5 (identifying adaptive cruise control combined with lane-centering technology as Level 2 automation technology).

the driver to relinquish both pedal and steering-wheel control simultaneously while requiring the driver to monitor roadway conditions and assume manual control if necessary.[54] Level 3 technology—"Limited Self-Driving Automation"—permits the driver to relinquish "safety-critical functions" to the vehicle, but the driver remains available for periodic control given "sufficiently comfortable transition time."[55] Level 4 technology—"Full Self-Driving Automation"—encompasses vehicles that are "designed to perform all safety-critical driving functions and monitor roadway conditions for an entire trip."[56] Within this framework, NHTSA is currently undertaking a multi-year study into human behavior and electronic systems control safety for Level 2 and Level 3 systems.[57] Spurred by the consideration of legislation by some states in anticipation of Level 3 and Level 4 vehicles, NHTSA's goal is to develop guidance for states to ensure safe implementation of these advanced AV systems.[58]

NHTSA is responsible for maintaining safety standards, monitoring emissions and fuel-economy standards, and setting regulations for vehicles.[59] More than 30,000 traffic fatalities occur in the United States each year, and they are the leading cause of death for Americans aged 15–24.[60] With 2.2 million traffic crashes resulting in injury, the economic cost to the United States exceeds $300 billion annually.[61]

Advocates for self-driving vehicles argue that AV technology will reduce, and perhaps eliminate, these sad statistics. Promoting safety benefits is one of the most appealing aspects of an AV regime.[62] Advocates claim that automation could virtually eliminate all human error crashes, the current cause of

[54] *Id.*

[55] *Id.* ("An example would be an automated or self-driving car that can determine when the system is no longer able to support automation, such as from an oncoming construction area, and then signals to the driver to reengage in the driving task, providing the driver with an appropriate amount of transition time to safely regain manual control. The major distinction between level 2 and level 3 is that at level 3, the vehicle is designed so that the driver is not expected to constantly monitor the roadway while driving.").

[56] *Id.* ("By design, safe operation rests solely on the automated vehicle system.").

[57] *See id.* at 6 ("[T]he agency has identified three key areas where it has begun or plans to conduct research for these more advanced automated vehicle systems. These areas are human factors research, development of system performance requirements, and addressing electronic control system safety.").

[58] *Id.* at 10.

[59] *Id.* at 2.

[60] FAGNANT & KOCKELMAN, *supra* note 5, at 3.

[61] *Id.*

[62] *Id.* at 4 ("[M]otor-vehicle fatality rates (per person-mile traveled) could eventually approach those seen in aviation and rail, about 1 percent of current rates.").

93 percent of accidents.[63] Further benefits from automation could be witnessed in reduced road congestion and better overall traffic conditions, including reduced fuel consumption. Various technologies already included in vehicles that improve anticipatory braking and acceleration will also be augmented by increased use of V2V technology.[64] These elements of AV technology improve traffic flow and reduce road congestion, and will likely result in increased fuel economy by 23 to 39 percent.[65] Benefits might also accrue in non-personal driving situations such as commercial trucking or ports where vehicles can be programed with a specific repeated route for ferrying products or other materials.[66]

B. Current Legislation and Regulatory Scheme

NHTSA noted in its policy statement that its guidance was prompted by the emergence of state-based legislation and regulation concerning self-driving vehicles.[67] The current legal landscape is constrained primarily to only four states that have passed affirmative legislation authorizing use of autonomous vehicles on public roads. The first state to pass such authorization was Nevada, which permits the operation of autonomous vehicles on public roadways where the driver must be available for emergency control but need not actively drive the vehicle.[68] Further, Nevada immunizes the manufacturer of a vehicle from liability in situations in which a third party has installed self-driving technology.[69] Laws

[63] KPMG & CTR. FOR AUTO. RESEARCH, SELF-DRIVING CARS: THE NEXT REVOLUTION 7 (2012) [hereinafter KPMG Report], http://www.kpmg.com/US/en/IssuesAndInsights/ArticlesPublications/Documents/self-driving-cars-next-revolution.pdf.

[64] FAGNANT & KOCKELMAN, *supra* note 5, at 4–5 (noting also that reduced accidents will further reduce traffic congestion by up to 25 percent).

[65] *Id.* at 5 ("If vehicles are enabled to travel closer together, the system's fuel and congestion savings rise further, and some expect a significant increase in highway capacity on existing lanes. Shladover et al. estimate that cooperative adaptive cruise control (CACC) deployed at 10 percent, 50 percent, and 90 percent market-penetration levels will increase lanes' effective capacities by around 1 percent, 21 percent and 80 percent, respectively." (citing STEVEN SHLADOVER ET AL., IMPACTS OF COOPERATIVE ADAPTIVE CRUISE CONTROL ON FREEWAY TRAFFIC FLOW (2012))).

[66] Maggie Clark, *States Take the Wheel on Driverless Cars*, STATELINE (July 29, 2013), http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2013/07/29/states-take-the-wheel-on-driverless-cars ("In the future, it won't just be passenger cars that will be driverless. Expect to see driverless commercial trucks, buses or taxis. Soriano said the technology might also be useful at large ports, which are controlled areas with well-defined routes for shipping containers to be unloaded from cargo ships and taken to storage locations.").

[67] NHTSA POLICY STATEMENT, *supra* note 16, at 10 ("Several states have enacted legislation expressly authorizing operation of 'autonomous' vehicles within their borders under certain conditions. Generally, these laws seem to contemplate vehicle automation at Levels 3 and 4, as discussed above, i.e., some form of self-driving operation. Accordingly, these recommendations are tailored to Levels 3 and 4 automation.").

[68] *See* S. 313, 77th Leg., Reg. Sess. (Nev. 2013) (enacted); Aseemb. 511, 76th Leg., Reg. Sess. (Nev. 2011) (enacted); *see also* Weiner & Smith, *supra* note 11.

[69] *See* Nev. S. 313 § 5.

in California, Florida, Michigan, and the District of Columbia likewise address the same issues, permitting automated vehicles on roads with a driver present, calling upon the division of motor vehicles or an equivalent agency to develop and recommend regulations while also limiting manufacturer liability where third-party self-driving technology has been installed.[70]

As of the time of this writing, 16 states are considering legislation related to autonomous vehicles.[71] The proposals in Georgia,[72] Hawaii,[73] Idaho,[74] Massachusetts,[75] Missouri,[76] New York,[77] and Oregon[78] are similar to the legislation adopted in other states, authorizing the operation or testing of autonomous vehicles under specific conditions such as complying with federal safety requirements, operation by a human driver-occupant, and limiting manufacturer liability. Proposed legislation in Illinois and New Jersey would delegate responsibility to the Illinois Secretary of State and New Jersey Motor Vehicle Commission to develop regulations while limiting the specifics included in the bill.[79] Bills in Maryland, North Carolina, and North Dakota direct various state actors to conduct studies about the potential implementation of self-driving vehicle regulations.[80] Laws in Utah and Washington have attempted to establish small, distinct boundaries in which the states can operate automated vehicle testing programs,[81] and a Connecticut proposal simply states, "Be it enacted . . . [t]hat the general statutes be amended to allow the use of autonomous vehicles for testing purposes, and directing the Department of Motor Vehicles to promulgate regulations concerning the use of such vehicles."[82] The Texas

[70] CAL. VEH. CODE § 38750 (Deering 2015); FLA. STAT. ANN. § 316.85 (LexisNexis 2015); MICH. COMP. LAWS SERV. § 257.665 (LexisNexis 2015); D.C. CODE § 50-2352 (2015); *see also* Weiner & Smith, *supra* note 11.

[71] *See* Weiner & Smith, *supra* note 11.

[72] S. 113, 153d Gen. Assemb., Reg. Sess. (Ga. 2015).

[73] H.R. 1458, 28th Leg., Reg. Sess. (Haw. 2015) (allowing for the use of "autonomous or 'driverless' motor vehicles").

[74] S. 1108, 63d. Leg., 1st Reg. Sess. (Idaho 2015).

[75] S. 1841, 189th Gen. Court, Reg. Sess. (Mass. 2015); H.R. 2977, 189th Gen. Court, Reg. Sess. (Mass. 2015).

[76] H.R. 924, 98th Gen. Assemb., Reg. Sess. (Mo. 2015).

[77] Assemb. 31, 2015–2016 Leg., Reg. Sess. (N.Y. 2015).

[78] S. 620, 78th Leg. Assemb., Reg. Sess. (Or. 2015).

[79] H.R. 3136, 99th Gen. Assemb., Reg. Sess. (Ill. 2015); S. 734, 216th Leg., 2014 Reg. Sess. (N.J. 2014); Assemb. 1326, 216th Leg., 2014 Reg. Sess. (N.J. 2014).

[80] H.D. 172, 435th Gen. Assemb., 2015 Reg. Sess. (Md. 2015); S. 778, 435th Gen. Assemb., 2015 Reg. Sess. (Md. 2015); S. 600, 2015–2016 Gen. Assemb., Reg. Sess. (N.C. 2015); H.R. 782, 2015–2016 Gen. Assemb., Reg. Sess. (N.C. 2015); H.R. 1065, 64th Leg. Assemb., Reg. Sess. (N.D. 2015).

[81] H.R. 373, 61st Leg., 2015 Gen. Sess. (Utah 2015) (assigning the designation of the testing area to the state Department of Transportation); H.R. 2106, 64th Leg., Reg. Sess. (Wash. 2015) (establishing the automated vehicle testing zone within the confines of the Lewis-McChord military base).

[82] H.R. 6344, 2015 Gen. Assemb., Reg. Sess. (Conn. 2015).

legislature is currently considering four different bills relating to autonomous vehicles, three of which are focused on permitting the use of these vehicles by various local and state administrative agencies—including a border-patrol pilot program.[83] In those states that have considered but have not passed legislation, most have not rejected the bills outright. Further, in states that have not explicitly authorized driverless vehicles, they likely are not illegal, as states do not typically specify a driver requirement for a vehicle to operate on the roadway.[84]

Regulations to date concerning automated vehicles are geared primarily toward licensing, liability, and insurance requirements for testing self-driving cars. A report by the Florida Department of Highway Safety and Motor Vehicles required under Florida's authorizing legislation presents a useful comparison of the regulations considered in California, Nevada, and Michigan.[85] Nevada and Michigan legislation require that automated vehicles possess special license plates to signal to other drivers that they are automated cars.[86] California and Nevada regulations both require data collection and reporting of crashes,[87] and all four states require proof of insurance by legislation.[88] One major difference between the regulations in Nevada and California is geographic; Nevada restricts the territory and roads on which automated vehicles can operate, but California does not restrict such use.[89] Both California and Nevada require annual permit applications in order to operate the vehicles, and Nevada additionally requires a 10,000-mile minimum testing requirement.[90]

Part II of this Note covered the problems of driving in the United States today and identified a potential solution for curbing the issue with autonomous vehicles. Although numerous technical hurdles remain before this solution can

[83] S. 1167, 84th Leg., Reg. Sess. (Tex. 2015) (authorizing a program permitting Texas Department of Transportation and Department of Safety employees to operate autonomous vehicles); H.R. 3690, 84th Leg. Reg. Sess. (Tex. 2015) (authorizing the Texas Department of Transportation to operate autonomous vehicles on Texas roadways); H.R. 4194, 84th Leg., Reg. Sess. (Tex. 2015) (authorizing the LaSalle Municipal Utility Districts to operate autonomous vehicles within the boundaries of the district); H.R. 933, 84th Leg., Reg. Sess. (Tex. 2015) (authorizing the use of autonomous vehicles in the creation and executive of a pilot border-security program).

[84] Claire Cain Miller & Matthew L. Wald, *Self-Driving Cars for Testing Are Supported by U.S.*, N.Y. TIMES (May 30, 2013), http://www.nytimes.com/2013/05/31/technology/self-driving-cars-for-testing-are-supported-by-us.html; *see also* Smith, *supra* note 10, at 463–508 (discussing the current state driving laws and their application to autonomous vehicles).

[85] FLA. DEP'T OF HIGHWAY SAFETY & MOTOR VEHICLES, AUTONOMOUS VEHICLE REPORT NO. 13-008 (2014), http://www.flhsmv.gov/html/HSMVAutonomousVehicleReport2014.pdf.

[86] *See id*. at 4.

[87] *Id.*

[88] *Id.* at 5.

[89] *Id.* at 4.

[90] *Id.* at 5–6 (describing the Nevada law as requiring "proof that the vehicle has been driven in autonomous mode for at least 10,000 miles and demonstrate the technology to the state").

gain widespread traction, a handful of states have started down this road with a series of laws and regulations necessary for testing and ultimately bringing driverless cars to the forefront of transportation infrastructure. Through this discussion, this Note has completed the first two prongs of the Breyer analytical model.

PART III: A PORTABLE MODEL FOR IMPLEMENTING REFORM

Part III of this Note builds upon the laws and regulations already passed as a template for future AV legal frameworks in those states that have either (a) not considered automated vehicle legislation or (b) considered such legislation but failed to enact it. By applying the lessons from the theories discussed in Part I, Part III supplies the tactical *modus operandi* for implementing critical changes for future rules of the road. This Part presents an advocacy plan to encourage states that have not yet pursued or completed the pursuit of authorizing AV testing to adopt legislation and regulations similar to those in California and Nevada.[91] Drawing from Breyer's third prong, this plan requires identifying the actors critical to implementing AV regulatory reform, defining the public interest story, and coordinating the political coalition necessary to implement reform.[92]

A. Interests at Play

1. Private Sector Interests

The first set of actors—those at the forefront of automated driving technology—are found in the private sector. An obvious private actor is Google, a current leader in automated driving technology, which focuses on software development for automated driving.[93] Google, in addition to being the first major player to publicly roll out automated driving, is already active on the lobby scene.[94] Other technology companies that can compete with or supplement Google include those that focus on mapping technology and V2V system

[91] For the purpose of maintaining a more reasonable scope in this section and to avoid distracting from the intent of this Note, I have constrained the recommendation section to focus primarily on the laws and regulations used in California and Nevada.

[92] *See supra* notes 26–30 and accompanying text.

[93] *See* Carl Franzen, *Google's Self-Driving Cars and Others Get Permits to Drive in California*, VERGE (Sept. 22, 2014, 2:44 PM), http://www.theverge.com/2014/9/22/6828161/california-permits-self-driving-cars-google-audi-mercedes-benz ("Last week, the state Department of Motor Vehicles (DMV) handed out its first 29 permits for testing autonomous cars. Google won 25 of the 29 total permits, which will allow the company to test 25 modified, self-driving Lexus SUVs . . . .").

[94] *See* Markoff, *supra* note 12 ("Last year, in response to a reporter's query about its then-secret research and development program, Google said it had test-driven robotic hybrid vehicles more than 140,000 miles on California roads . . . . The company confirmed on Tuesday that it has lobbied on behalf of the legislation, though executives declined to say why they want the robotic cars' maiden state to be Nevada.").

software. Furthermore, Internet-service providers and telecommunications companies will have an interest in automated vehicle proliferation, as the technology required to run such a system would rely on Internet and telephone providers for data transmission and inter-vehicle communication.[95] Moreover, since much of the long-term success of automated vehicles relies upon data collection and information sharing, groups concerned with the security of data and privacy of information will also be interested in promoting legislation.[96]

Traditional car companies—Audi, BMW, Ford, General Motors, Nissan, Tesla, Toyota, Volkswagen, Volvo—are also exploring the autonomous vehicle market. These companies have considerable expertise in vehicle design and are preemptively preparing for shifts in consumer demand and disruptions to the traditional automobile industry.[97] Each of these companies has already engaged in research, development, and design of AV technology at various stages, with road testing to commence in the coming years.[98]

Another private sector interest is the insurance industry, which stands to potentially gain from the crash-reduction benefits of self-driving cars, resulting in lower and fewer payouts on claims.[99] Despite reductions in the need for individual coverage, insurance companies may not lose out in the long run, as insurance coverage is anticipated to shift in scheme rather than be eliminated

[95] *See supra* Part II.A (discussing the state of current AV technology).

[96] *See supra* Part II.A (discussing the state of current AV technology and the necessary systems for implementing full AV integration).

[97] *See* Matthew Debord, *Audi Jumps to the Front of the Line For Self-Driving Cars in California*, BUS. INSIDER (Sept. 17, 2014), http://www.businessinsider.com/audi-jumps-to-the-front-of-the-line-for-self-driving-cars-in-california-2014-9 ("Audi of course isn't alone . . . . General Motors and Ford are also testing vehicles, and Tesla CEO Elon Musk has indicated th[at] his company's cars will have self-driving capability in less than a decade.").

[98] Adam Fisher, *Inside Google's Quest to Popularize Self-Driving Cars*, POPULAR SCI. (Sept. 18, 2013), http://www.popsci.com/cars/article/2013-09/google-self-driving-car ("It's not just Google that's developing the technology, but also most of the major car manufacturers: Audi, Volkswagen, Toyota, GM, Volvo, BMW, Nissan."); *see also* Samuel Gibbs, *Volvo to Test Autonomous Cars with Ordinary Drivers on Public Roads by 2017*, GUARDIAN (Feb. 24, 2015, 6:23 AM), http://www.theguardian.com/technology/2015/feb/24/volvo-test-autonomous-cars-ordinary-drivers-public-roads-by-2017; Jean Baptiste Su, *Exclusive Interview: Ford CEO Expects Fully Autonomous Cars In 5 Years*, FORBES (Feb. 5, 2015, 9:20 PM), http://www.forbes.com/sites/jeanbaptiste/2015/02/05/exclusive-interview-ford-ceo-expects-fully-autonomous-cars-in-5-years/.

[99] *Self-Driving Cars and Insurance*, INS. INFO. INST. (Feb. 2015), http://www.iii.org/issue-update/self-driving-cars-and-insurance ("Coverage for physical damage due to a crash and for losses not caused by crashes but by wind, floods and other natural elements and by theft (comprehensive coverage) is less likely to change but may become cheaper if the potentially higher costs to repair or replace damaged vehicles is more than offset by the lower accident frequency rate.").

entirely.[100] Similar to the auto-insurance industry, the American Automobile Association—a motorist advocacy network and services provider—also is an interested party and has supported autonomous vehicle testing legislation in Michigan.[101]

Most of the above-listed interests are broadly in support of AV developments. There are, however, a handful of private interests likely to oppose legislation that would increase the availability of AV testing. One such group is the taxicab industry. Already facing increased competition in its traditionally insulated industry from the encroachment of new app-based ride-hailing services,[102] the prospect of an automated taxi vehicle fleet poses a new threat to traditional taxi services.[103] Likewise, proponents of increasing rail technology might find the increased availability of AV technology and the prospect of fleet-based automated vehicle options threatening to the long-term sustainability of rail transportation, particularly where passenger travel and light rail are concerned.[104] Other potential private sector opponents include industries in which workers could be displaced by a disruption to the driving infrastructure. Dockworkers and truck drivers are two such groups. With 90 percent of accidents involving large trucks being the result of driver error, many trucking companies have already begun incorporating semi-autonomous features into their vehicles. For instance, in May of this year, Daimler, a German automobile manufacturer, unveiled with

[100] *Id.* ("There will still be a need for liability coverage, but over time the coverage could change, as suggested by the 2014 RAND study on autonomous vehicles, as manufacturers and suppliers and possibly even municipalities are called upon to take responsibility for what went wrong.").

[101] *See* Clark, *supra* note 66 (noting AAA's support for the legislation that at the time was under consideration in Michigan, which has since been passed into law).

[102] *See* Michael J. de la Merced, *Uber Attains Eye-Popping New Levels of Funding*, N.Y. TIMES: DEALBOOK (June 6, 2014, 1:24 PM), http://dealbook.nytimes.com/2014/06/06/uber-raises-new-funds-at-17-billion-valuation/ ("In a potential recognition that it had many more battles to fight, [Uber] hired a top official from New York City's Taxi and Limousine Commission two weeks ago as its first head of policy development and community creation.").

[103] LAWRENCE D. BURNS ET AL., EARTH INST., TRANSFORMING PERSONAL MOBILITY 6 (rev. ed. 2013), http://sustainablemobility.ei.columbia.edu/files/2012/12/Transforming-Personal-Mobility-Jan-27-20132.pdf ("[I]n Manhattan, the new mobility system could operate as an alternative mode of transportation, competing with both yellow taxicabs and public transportation. Yellow taxicab fares are about $5 per mile, with the cost of providing the service about $4 per mile. Initial estimates indicate that a fleet of shared, driverless, conventional vehicles would cost about $0.50 per mile to operate.").

[104] One of the major benefits of train travel, particularly in the light passenger rail context—Metro North in New York or Metra in Chicago as examples—is that a traveler can work while commuting. If a driver no longer needs to pay active attention to the road and can gain productivity while commuting, an individual car might be a more appealing option, as it also offers the benefits of increased privacy. *See e.g.*, David Z. Morris, *Trains and Self-Driving Cars, Headed for a (Political) Collision*, FORTUNE (Nov. 2, 2014, 8:04 PM), http://fortune.com/2014/11/02/trains-autonomous-vehicles-politics/.

great fanfare Freightliner Inspiration, the world's first self-driving semi.[105] However, current concerns of job cannibalization in the truck-driving industry might be less prevalent than expected moving forward, as the American Trucking Association predicts that by 2022 the industry will be short a quarter-million drivers relative to demand.[106] Further, the incorporation of wide-scale automated vehicles without drivers on board remains a distant prospect, and thus organizing these groups to oppose AV testing is unlikely at present.

2. Public Sector Interests

Beyond the private interests involved, a number of public sector elements are likely to influence self-driving vehicle laws. The first public sector actor to consider is NHTSA. As an agency responsible for traffic safety and vehicle standards, NHTSA has already staked out a public position on this issue. Other federal agencies that could have an interest in the legislative and regulatory developments are primarily located within the Department of Transportation alongside NHTSA—Federal Motor Carrier Safety Administration (FMCSA) and Research and Innovative Technology Administration (RITA). FMCSA, the agency responsible for regulating the trucking industry,[107] likely will not have an extraordinary interest in the testing of automated vehicles, but as the prospect of driverless trucking edges closer to reality, FMCSA's interest and role might increase. RITA is focused on the collection of data and use of technology for efforts undertaken by the Department of Transportation.[108] As such, RITA will likely play a larger role from the onset of self-driving technology movements and regulation.

At the state level, many public sector agencies will have an interest in developing a regulatory regime. Most authorizing legislation states have already assigned responsibility for developing regulations to state Divisions of Motor Vehicles (DMVs) or an equivalent agency.[109] State Departments of Transportation (DOTs) in many instances will also have vested interests, and those interests will typically mirror the interests of the DMVs (in those states

[105] *See* Alex Davies, *The World's First Self-Driving Semi-Truck Hits the Road*, WIRED (May 5, 2015, 7:41 PM), http://www.wired.com/2015/05/worlds-first-self-driving-semi-truck-hits-road/; *World Premiere on Hoover Dam, USA*, DAIMLER (May 5, 2015), http://www.daimler.com/dccom/0-5-1809607-1-1809608-1-0-0-0-0-0-8-7163-0-0-0-0-0-0-0.html; AUTOGEFÜHL, *Autonomous Driving Freightliner Inspiration Truck on US Road—Daimler Future Truck for Real*, YOUTUBE (May 6, 2015), https://www.youtube.com/watch?v=oVk7xQNM5V0 (video of the Daimler reveal event for Freightliner Inspiration).

[106] *See* Davies, *supra* note 105.

[107] *About Us*, FED. MOTOR CARRIER SAFETY ADMIN., http://www.fmcsa.dot.gov/mission/about-us (last visited July 29, 2015).

[108] *About OST-R*, OFF. ASST. SEC'Y FOR RES. & TECH., http://www.rita.dot.gov/about_rita (last visited July 29, 2014).

[109] *See supra* Part II.B.

where traditional DMV responsibilities are not already incorporated into the DOT). One final agency that might have an interest is the Department of Justice and affiliated law enforcement agencies, as these agencies are responsible for handling enforcement of the new laws and regulations.

Beyond agencies, other state actors also must be considered. Broadly speaking, elected officials in state legislatures looking to promote growth in the technology sector or looking to stake out positions on consumer-safety improvements will likely be in favor of proposed legislation. However, legislators concerned about the potential hazards of untested new technology on public roads, especially legislators in districts with constituencies that are particularly susceptible to concerns about new-age technology, could be hesitant to consider these proposals. Governors are also interested parties, and their interests mirror the spectrum of motivational influences on legislators. Since autonomous vehicles are not inherently tied to a Republican or Democratic political agenda, party dynamics that affect legislators' and governors' positions on regulatory reform in this industry will be tied to general political concerns instead of ideology.

B. The Public Interest Story

Since the issue of testing self-driving cars is not speculative, but has already been considered in a handful of states and has been the subject of some literature, much of the public interest story is already available. A successful public interest story is one that also relates to or can influence the general interest.[110] For advocates to gain support among likely supporters and limit the potential interference of detractors, they should present the issue with a simple threefold message: safety, efficiency, and economic growth.

Out of 5.5 million car crashes each year, 30,000 of which result in fatalities,[111] nearly 93 percent are caused by driver error,[112] resulting in the loss of $300 billion per year.[113] Increasing levels of driver automation technology have already been incorporated into conventional automobiles for safety improvement, and fully autonomous vehicles represent next-generation development of this technology. Self-driving cars tested by Google in California have exceeded the one-million-miles mark for road testing,[114] can steer clear of cyclists and stop at

[110] *See* Levine & Forrence, *supra* note 36, at 168 (discussing how the public interest account of regulation relies largely on the outward presentation of a public interest rationale for regulatory intervention).

[111] *See* FAGNANT & KOCKELMAN, *supra* note 5, at 3.

[112] *Id*.

[113] *Id.* at 4 tbl.1.

[114] *See* Villapaz, *supra* note 46.

railroad crossings,[115] and have already been deemed roadworthy for testing in four states and the District of Columba.[116] Further, an autonomous vehicle has already safely traversed the United States highway system on a 3400-mile trek from San Francisco to New York.[117] Automated driving technology implemented on a large scale has the potential to virtually eliminate automobile crashes, increasing safety for families on long trips, parents on their commutes home from work, and teenagers who are just learning to navigate the roadway. Further benefits will accrue in that this technology will help eliminate conditions that are currently very dangerous for drivers and other roadway users alike, such as drunk driving[118] and drowsy driving.[119]

Statistics reveal the extraordinary amount of productivity lost to commute time in the United States. "The average American commuter now spends 250 hours a year behind the wheel of a vehicle . . . [and in urban areas] about 40 percent of total gasoline use is in cars looking for parking."[120] Beyond the daily commute benefits for those who currently own or drive cars, the prospect of driverless cars also would provide greater mobility for people otherwise unable to leave their homes.[121] Beyond these initial benefits, market-saturation-level adoption of this new technology presents the prospect of company fleets, taxi fleets, and an entire industry of shareable self-driving vehicles, reducing overall roadway congestion,[122] as well as the need for massive parking lots[123] and garages to house personal vehicles.[124]

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[115] Sebastian Anthony, *Google's Self-Driving Car Passes 700,000 Accident-Free Miles, Can Now Avoid Cyclists, Stop at Railroad Crossings*, EXTREMETECH (Apr. 29, 2014, 11:11 AM), http://www.extremetech.com/extreme/181508-googles-self-driving-car-passes-700000-accident-free-miles-can-now-avoid-cyclists-stop-for-trains.

[116] *See supra* Part II.

[117] *See* Davies, *supra* note 3.

[118] Drunk driving is responsible for approximately 40 percent of all car-related injuries. *See Types of Accidents and Injuries*, DUI FOUND., http://www.duifoundation.org/drunkdriving/accidents/types/ (last visited July 9, 2015).

[119] *Facts and Stats*, DROWSYDRIVING.ORG, http://drowsydriving.org/about/facts-and-stats/ (last visited July 9, 2014).

[120] KPMG REPORT, *supra* note 63, at 7.

[121] *Id.* at 8 ("Older adults, the 47 million Americans aged 66 and over, face different mobility challenges. While they still cherish their autonomy, they are prone to develop age-related impairments to their driving ability. . . . Self-driving cars open up new possibilities and new markets, and not just for those who are legally eligible to drive, but also for younger people, older people, and those with disabilities. For them self-driving promises greater freedom and mobility and greater control over their lives."); *see also* Robert D. Atkinson, *The Coming Transportation Revolution*, MILKEN INST. REV. 79, 84 (2014), http:// http://assets1c.milkeninstitute.org/assets/Publication/MIReview/PDF/78-87-MR64.pdf ("Autonomous vehicles could significantly enhance personal mobility and convenience, particularly for the elderly, disabled and, of course, children.").

[122] Atkinson, *supra* note 121, at 84 ("A recent study calculated that a fleet of autonomous vehicles acting as a personalized public transportation system would be cheaper and more efficient

Beyond benefits to safety and individual productivity, further testing of self-driving cars could spur economic growth and development. Aside from the potential $300 billion in annual savings from eliminating crashes[125] and the reduced roadway-maintenance costs as a result of congestion reduction, self-driving vehicle technology has the potential to create numerous employment opportunities in the automotive and information technology fields.[126] A 2008 IBM survey of leaders in automotive and affiliated industries identified growth trends in workforce development geared toward intelligent vehicles and twenty-first-century knowledge economy skills.[127] These developments will result in a new "interdependent ecosystem" of high-tech, high-skill jobs with higher wages, and an increased need for workers with STEM field education.[128]

The first step in creating this safer, more efficient, high-wage job future is introducing and passing legislation that allows autonomous vehicle testing on state roads. By following the example of states that have already taken this step toward progress, other states can set themselves at the forefront of human advancement in transportation.

C. Political Theatre

After identifying the primary actors needed for reform and the factors to consider when enlisting their support, the Breyer model calls for the scripting of political theatre—the strategy for bringing the constituencies together to implement reform. The testing of driverless vehicles is not currently at the

than taxis, using half the fuel and a fifth the road space of ordinary cars. Another study showed that a single shared AV could replace between 9 and 13 privately owned vehicles without impeding travel behavior.").

[123] KPMG REPORT, *supra* note 63, at 8.

[124] *See* Atkinson, *supra* note 121, at 83 ("[T]he average American vehicle sits idle 95 percent of the time.").

[125] *See* FAGNANT & KOCKELMAN, *supra* note 5, at 4 tbl.1.

[126] SANJAY RISHI ET AL., IBM GLOB. BUS. SERVS., AUTOMOTIVE 2020: CLARITY BEYOND THE CHAOS 3 (2008), http://www-07.ibm.com/shared_downloads/6/IBM_Automotive_2020_Study_Clarity_beyond_the_Chaos.pdf ("Technological progress--the development of products and services that perform better, last longer, offer more convenience, safety, entertainment and economy—will continue to lead the list of [auto] industry priorities in 2020.").

[127] *See id.* at 14–16 ("This new workforce will have important new attributes, such as the ability to work across diverse cultures and will likely be conversant in multiple languages. The new global worker will also be effective working virtually. Traditional organizational models will be transformed. . . . The skills required for this new workforce tilt heavily toward the intelligent vehicle of the future. . . . [T]he highest rated skills for 2020 focus around engineering, management, product planning and software development. The industry will need to bring all of these skills into play.").

[128] *See id.* at 18.

forefront of the public agenda.[129] Thus, implementing legislation for automated vehicle testing is an issue that enjoys considerable slack. Slack is essentially the information gap between a legislator or regulator and its electoral constituency that might allow the official to act in favor of a special interest.[130] One measure of slack is the existence of an issue on the public agenda, a mechanism for gauging the populace's knowledge and receptiveness on an issue, which will impact tactical considerations. Recognizing the existence and extent of slack is critical to influencing political decision-making, as slack "allows policy discretion which can be used to favor special-interest groups."[131]

The high amount of slack present for AV regulation is advantageous to the advocate who is comfortable working beneath the radar or will require the advocate to drum up public support—an option that appears fairly unlikely, since the issue does not currently have a direct impact on a large bloc of the voting public and does not occupy a particular focal point on the political spectrum. In working below the public agenda, the advocate must either (a) seek out a policymaker who shares views favorable to AV proliferation[132] or (b) target actors who stand to personally gain from supporting legislation.

An advocate should begin by identifying legislators whose voting records indicate support of self-driving car legislation in the past (if in a state where the legislation has been considered) or who have supported issues related to new-age technology. Potential examples of related technological initiatives

[129] In public opinion surveys issued since January 2014 by Quinnipiac, CNN, CBS, the *New York Times*, George Washington University, *USA Today*, NBC, and the *Wall Street Journal* on the most pressing priorities and problems facing America today, none included among the options anything about self-driving cars or automated vehicle technology. *See Problems and Priorities*, POLLINGREPORT.COM, http://www.pollingreport.com/prioriti.htm (last visited Aug. 14, 2015). Polling Report also maintains a regular listing of issues-based polls, and a search of the website's cache of polls dating back for the past three years shows no mention of "self-driving," "automated vehicle," or similar terms. In fact, even the word "vehicle" only appears nine times on the site, with nearly all questions using the word in the context of vehicle safety standards, comparing specific brands of automobile, or in questions concerning the use of military vehicles by domestic police forces. *See* POLLINGREPORT.COM, http://www.pollingreport.com/index.html. (last visited Aug. 14, 2015).

[130] *See* Levine & Forrence, *supra* note 36, at 176–77.

[131] *See id.* at 179–80. "Slack allows a regulator to function without being perfectly observed by the polity. . . . She can adopt policies that are designed to maximize her own private utility [captured]. . . . Alternatively, she could adopt policies designed to further her own conception of the public good [Burkean]." *See id.* at 179–80.

[132] This type of policy maker has been described by some in the academic literature as a "Burkean." A Burkean operates from a particular ideological vantage point and does so either (a) in a manner that is in support of the general interest but would not be recognized as such at the time or (b) in a manner that can be referred to as other-regarding. The Burkean takes advantage of slack on an issue to push a particular ideological policy preference. *See id.* at 177–80.

include support for STEM education initiatives,[133] open-data policies for state and municipal governments,[134] and financial incentives for initiatives in the health, science, or startup sectors.[135] Other considerations that might aid in identifying a pro-autonomous vehicle testing policymaker are, perhaps somewhat paradoxically, age—younger legislators may be more interested and supportive of disruptive technologies—and seniority within the majority party. Members of the majority party will face fewer roadblocks than those in the minority, and members with greater seniority tend to have more connections who might be helpful as co-sponsors or supporters.

To identify a legislator who could personally gain from supporting autonomous vehicle legislation, one key factor is whether the legislator lives in a district with a research university or a well-educated, high-skills workforce—which would allow the legislator to gain good favor, and consequently, votes within his district. Likewise, a legislator with ties to the auto industry could also benefit from sponsoring or voting in favor of this legislation. More cynically, perhaps, a potential legislator without these direct electoral ties could be coaxed into sponsoring legislation by the prospect of eventually entering the industry in an executive or consultancy capacity once the field develops more broadly. However, a promise like this—explicit or implied—might be difficult to follow through on in an industry that is many years from maturation.

Once the legislative champion and his supporters are identified, the advocate should seek longtime employees of the various state-level agencies who will play a role in either regulation development or regulatory enforcement. In particular, an alliance at the state DMV, DOT, or equivalent agency will be helpful in both convincing legislators to support the measure and in ensuring that rollout of the legislation and future regulations flow smoothly. Civil servant regulators at the state level are not swayed by votes or the need to raise campaign dollars like legislators are, so a different lever may need to be activated to appeal to these persons. However, since agencies often have to battle for resources in the state budgetary process, new commitments without a guarantee of additional resources might result in resistance.[136] Thus, an advocate should present testing

[133] *See generally* Kyle Zinth, *Recent State STEM Initiatives*, EDUC. COMM'N STATES STATENOTES (Educ. Comm'n of the States, Denver, Colo.), Mar. 2007, http://www.ecs.org/clearinghouse/70/72/7072.pdf (summarizing various state-level STEM initiatives).

[134] *See generally Open Data Policies at Work*, SUNLIGHT FOUND., http://sunlightfoundation.com/policy/opendatamap/ (last visited July 29, 2015).

[135] *See generally* STEVE OLSON, STATE SCIENCE AND TECHNOLOGY POLICY ADVICE 17–19 (Jay B. Labov ed., 2008), http://www.nap.edu/openbook.php?record_id=12160.

[136] *Cf. Funding*, TRANSP. FIN. CLEARINGHOUSE, http://www.transportation-finance.org/funding_financing/funding/ (last visited July 29, 2015) (providing data indicating that

regulation as a crucial improvement that, with proper guidance and legislation, will pay off in the long term without burdening the agency in the short run.

The approach to engaging the DOJ or law enforcement is a little less clear. In all likelihood, an advocate will have minimal interactions with the DOJ or law enforcement prior to legislative or agency action. Nevertheless, automated vehicle testing does raise tort and criminal liability concerns that the DOJ or the state Attorney General might want to address. Working with an independent personal injury attorney to address liability laws would provide advocates with the ability to consider such sensitive legal issues without looping in another government actor.

Once legislative sponsors and an approving agency representative are identified, the next step is to procure support for the plan from NHTSA.[137] Since NHTSA has already issued a policy statement on the matter, lining someone up from the federal agency to lend support either publicly or in a closed-door meeting should not pose great difficulty. Beyond the support that can be gained with NHTSA backing, the advocate can tap into the expertise gained by those similarly situated in California, Nevada, Florida, or Michigan to further flesh out a strategy for working with various legislators or gubernatorial staff. Depending on the particular political dynamics of the individual state in which the reformer is operating, experience from one state might provide a more effective template over another.[138]

The advocate likely already has connections within the automotive industry, with advocacy groups, or with manufacturers and developers of automated driving technology if she is undertaking this effort. However, if the advocate has made it to the point of having a supportive legislator and agency representatives without tapping into the network of invested private sector individuals, the advocate should consider the public and private levers that can be

state and local funding sources provide over 80 percent of all revenue and resources for transportation initiatives).

[137]Although states can implement automobile regulation without NHTSA support or approval, the agency has considerable influence in developing regulations because of the scope of the national transportation infrastructure. *See Who We Are and What We Do*, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., http://www.nhtsa.gov/About+NHTSA/Who+We+Are+and+What+We+Do (last visited Aug. 14, 2015). Thus, it follows that NHTSA support can lend considerable credibility to regulatory efforts in this policy sphere.

[138] For example, in a state with Republican control of both houses and the governor's office, the advocate would want to consider relying on the legislation passed in a state with a strong Republican presence and vice versa for a Democrat-controlled state. In a state with divided government, borrowing as an example expertise from a state that also had divided government during passage could provide a model for how to work together on this otherwise non-partisan issue.

pulled to advance the issue to the top of a legislature's agenda. Many factors influence this decision. If the advocate senses that there is likely little opposition to the idea, then public agenda movement might not be necessary, so long as the legislative-agenda–setting officials can be influenced either via party strings or as supporters on the issue. In full-time state legislatures, this tack likely would work without the need for public attention; however, in part-time legislatures that convene only for a few months each year, there may be greater competition among bills to be considered. In this instance, favorable representatives from the auto industry, the local and national technology sectors, and automobile advocacy groups such as AAA would add greatly to promoting self-driving cars to the agenda.

One approach for effectively increasing public awareness on AV technology regulatory development relies on a two-pronged attack. The first prong involves the tech and auto industry working through their networks to spur local coverage of the national stories concerning developments in the auto industry. News articles help personalize the advantages that voters in the state might see from autonomous vehicles. The KPMG report highlights the fact that news outreach strategies can be necessary to engage consumers and convince them to purchase self-driving cars once they become commercially available.[139]

The first part of this model can be adopted as a framework for influencing the public to care about and support self-driving vehicle testing. By focusing on the benefits outlined in the public interest story, auto manufacturers and self-driving technology developers can build trust in the new technology.[140] Comparisons to previous advancements in vehicle safety will be helpful in demonstrating the benefits. Specifically targeting demographics likely to appreciate these benefits, such as tech-savvy millennials and middle-class workers with families, is also important.[141] Videos and graphics that visualize the technology within autonomous vehicles will also aid in growing public interest and acceptance.[142] This battle to create public support might be challenging: a

[139] *See* KPMG REPORT, *supra* note 63, at 19.

[140] *See id.*

[141] *See id.* ("The 'Digital Natives' and 'Gen Now' generations are likely to be the most receptive to self-driving vehicles and become the early adopters because their identity is less likely to be attached to the 'driving experience.'"); *Californians Are OK with Google Self-Driving Cars and Are Ready to Ban Non-Self-Driving Cars*, EMERGING TECHS. BLOG (May 31, 2015), http://www.wearobo.com/2015/05/californians-are-ok-with-google-self.html (arguing that California residents are already accustomed to seeing self-driving cars on the roadways and are likely to support their widespread commercial availability).

[142] *See, e.g.*, Google, *Google Self-Driving Car on City Streets*, YOUTUBE (Apr. 28, 2014), https://www.youtube.com/watch?v=dk3oc1Hr62g (depicting Google's self-driving car functioning on public roadways); Google, *Self-Driving Car Test: Steve Mahan*, YOUTUBE (Mar. 28, 2014), https://www.youtube.com/watch?v=cdgQpa1pUUE (showing a visually disabled elderly man taking a test ride in a Google self-driving car); Google, *A First Drive*, YOUTUBE (May 27, 2014),

2012 survey by Kelley Blue Book indicated that 63 percent of respondents would not purchase a self-driving vehicle,[143] and a 2015 NerdWallet survey found that only 37 percent of women expressed interest in owning such a car.[144] However, an information campaign focused on providing more information to the public about the increased safety and efficiency benefits of self-driving cars is likely to shift this perception.[145] The second prong involves a public advocacy campaign by AAA to inform members about the benefits of self-driving cars and the importance of being able to test them on more roadways in more locations. This tactic is designed to reach members of the association internally as well as put pressure on the public agenda outwardly.

With the supportive coalition assembled, the advocate can then turn to the necessary backroom and legislative floor tactics for getting legislation passed. The state-specific strategy will vary slightly depending on many of the variables discussed *supra*, but the standard template will involve the corralling of support through private conversations with legislators and a supportive representative in the governor's office. This can be done via the staff of the sponsoring legislator, by the advocate herself, by a separate lobby organization, or by some combination of those three entities depending upon the on-the-ground dynamics in each individual state scenario. The efforts on the legislative side will necessarily begin in committee and ultimately move to the chamber as a whole if the bill is able to leave the committee. Since the legislation is relatively minimal and defers substantially to the state agency, it is possible that the bill will see very little attention and even avoid a hearing at the committee altogether. However, if the bill does face a hearing for additional information, the advocate—having constructed her advocacy foundation in advance—will be able to produce supporters from AAA, the technology industry, and the auto industry, and if necessary can also parade before the committee a few sympathetic supporters whose lives could be improved by self-driving cars.[146] Once out of

https://www.youtube.com/watch?v=CqSDWoAhvLU (showing a handful of people experiencing and reflecting upon their first rides in a prototype Google self-driving car); Google Self-Driving Car Project, *Why Design a Self-Driving Vehicle from the Ground Up?*, YOUTUBE (June 30, 2014), https://www.youtube.com/watch?v=bOdHf2qiPoc&src_vid=CqSDWoAhvLU&feature=iv&annotation_id=annotation_1570177763 (featuring a Google technician explaining the development of Google's self-driving car).

[143] *See* AON RISK SOLUTIONS, AUTONOMOUS VEHICLES—THE RISKS AND REWARDS OF THE FUTURE OF PERSONAL TRANSPORTATION 3 (2014), http://www.aon.com/attachments/risk-services/Automotive-Practice-Autonomous-Vehicles.pdf.

[144] *See* Phil LeBeau, *Who's Afraid of Self-Driving Cars? Women Over Men: Survey*, CNBC (June 9, 2015, 9:00 AM), http://www.cnbc.com/id/102742521.

[145] In fact, the same NerdWallet survey showed that only 49% of respondents would not purchase a self-driving car. *Id.*

[146] Examples of sympathetic public supporters might be disabled persons who can no longer drive, persons suffering from diseases such as epilepsy that render them unable to drive, and elderly

committee with a recommendation, the bill should experience smooth sailing all the way to the governor, who the advocate has already established as a supporter via an in-office ally. Finally, the advocate should continue to monitor activity once the legislation is passed, both to ensure the agency follows through on the regulatory regime and because the field will evolve and likely require additional legislation or regulation in the future.

CONCLUSION

Self-driving cars represent the next evolution in land-based transportation. Their potential for improving safety, increasing productivity, and spurring economic and technological advancement are significant motivators to those in private industry pursuing this technology and have led to the early adoption of legislation and regulation to permit the exploration of how this technology can one day become commercially available. This Note examines some of the groundwork that has already been laid on this issue and presents a model by which other states can help propel this technological revolution even further. Through strategic coalition building and by understanding what influences legislators and regulators, an advocate for autonomous vehicles can rewrite the rules of the road.

persons who can no longer safely navigate the roadways but who also represent a significant voting population.