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LOOPHOLES, LICENSING, AND LEGISLATION: CONSIDERING THE NEEDS OF PEOPLE WITH DISABILITIES IN THE AUTONOMOUS VEHICLE REVOLUTION

*Caroline Glennie-Smith**

Self-driving vehicles have the potential to revolutionize transportation for all Americans and will be especially beneficial for the more than fifty-seven million Americans with a disability. This Note offers a primer on a rapidly-developing area of law and policy that will permanently alter how Americans interact with transportation. While public availability of autonomous vehicles is anticipated as early as next year, widespread use of these vehicles is likely at least a decade away. The lag between current-day prototypes and future widespread public availability provides lawmakers, self-driving vehicle manufacturers, and the disability community an important opportunity to work together to shape policy, vehicle design, and public opinion about the autonomous vehicle revolution.

The Americans with Disabilities Act of 1990 (ADA) “assure[s] equality of opportunity, full participation, independent living, and economic self-sufficiency for” people with disabilities. Almost three decades later, however, inaccessible transportation and lack of transportation options still remain significant barriers to full, equal access to and enjoyment of educational, employment, civic, social, and community opportunities by people with disabilities. This Note begins by describing the basics of autonomous vehicle technologies, how these technologies are progressing, and how they can be utilized by people with disabilities. Considering the needs of people with disabilities at every step of the way to full vehicle autonomy is crucial to ensuring an accessible transportation future. This Note explores some of the barriers to access of autonomous vehicles, such as the reluctance of transportation network companies Uber and Lyft to offer

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accessible transportation to riders with disabilities, as well as potentially discriminatory state licensing schemes for autonomous vehicle operation. The Note concludes by outlining the ways that state and federal regulation of autonomous vehicles could affect people with disabilities, assesses the impact of these regulations, and discusses proposed federal legislation and agency regulations that could reduce barriers to access considerably. Implicated in each of these issues and opportunities is the ADA, since it is the bedrock of disability civil rights in the United States and the primary means of enforcement against discrimination and exclusion.

As the United States enters a new age of transportation with the autonomous vehicle revolution, it is imperative that stakeholders in the disability community, the manufacturing sector, and the government work together to create a transportation future accessible to all Americans. The current U.S. transportation infrastructure is premised on an able-bodied, human driver approach to mobility, and laws and design standards reflect this. Autonomous vehicles, which require no human monitoring, can break away from this normative approach and offer accessible transportation options for the many Americans with disabilities unable to fully access the current transportation system and the opportunities it facilitates, but not without the concerted efforts of relevant stakeholders. Therefore, in order to enable access for Americans with disabilities, the laws and standards created within the next decade must be intentionally devised to ensure that self-driving vehicles are available to as many people as possible and accommodate the widest range of abilities possible. Though it is impossible to predict what America's autonomous transportation future will look like, with intentional, inclusive collaboration by the government, manufacturers, and people with disabilities, this future can and should be accessible to all Americans.

I. INTRODUCTION

In the 1940s, blind inventor and engineer Ralph Teetor began developing cruise control after riding in the car with his lawyer, whose habit of speeding up and slowing down resulted in a lurching ride that annoyed Teetor.¹ Teetor was awarded a patent for his cruise control device in 1950, and the technology began to be implemented in American cars within the decade.² Teetor's automated speed control device laid the foundation for further automation of automobiles, and more than half a century later, automated vehicle technologies have changed the way drivers interact with their cars. Fully autonomous vehicles, once a futuristic fantasy, are now poised to permanently alter how Americans use and interact with automobiles. One in five Americans—more than fifty-seven million people—has a disability,³ and self-driving vehicles stand to revolutionize transportation options for people with disabilities.⁴

Currently, self-driving vehicles remain in the prototype and testing stages of development, and predictions about the future availability of autonomous vehicles to the general public vary from several years to several decades.⁵ The lag between current-day prototypes and future widespread public availability provides lawmakers and manufacturers ample opportunity to consider and plan for the needs of the widest range of potential users of

1. See Alanis King, *The Blind Origins of Cruise Control*, JALOPNIK (Feb. 7, 2016, 9:00 AM), <http://jalopnik.com/the-blind-origins-of-cruise-control-1757009266> [https://perma.cc/4YCK-MKQV]; see also David Phillips, *U.S. Patent Issued for First Modern Cruise Control Device*, AUTONEWS (Aug. 22, 2017, 12:40 PM), <http://www.autonews.com/article/20170822/CCHISTORY/170829910> [https://perma.cc/G3CY-U4AZ].

2. *Id.*

3. HENRY CLAYPOOL ET AL., RUDERMAN FAMILY FOUNDATION AND SECURING AMERICA'S FUTURE ENERGY, THE RUDERMAN WHITE PAPER: SELF-DRIVING CARS: THE IMPACT ON PEOPLE WITH DISABILITIES 1, 7 (2017), http://rudermanfoundation.org/white_papers/self-driving-cars-the-impact-on-people-with-disabilities [https://perma.cc/L3V4-5GDP].

4. This Note uses people-first language when discussing individuals with disabilities. "People-[f]irst [l]anguage is an objective way of acknowledging, communicating, and reporting on disabilities. It eliminates generalizations and stereotypes, by focusing on the person rather than the disability." *What is People First Language?*, THE ARC, <https://www.thearc.org/who-we-are/media-center/people-first-language> [https://perma.cc/JNQ5-5S9Z]. For further discussion, see CLAYPOOL ET AL., *supra* note 3 at 3.

5. Sarah Kessler, *A Timeline of When Self-Driving Cars Will Be on the Road, According to the People Making Them*, QUARTZ (Mar. 29, 2017), <https://qz.com/943899/a-timeline-of-when-self-driving-cars-will-be-on-the-road-according-to-the-people-making-them> [http://perma.cc/J4F8-QD5S].

autonomous vehicles. The Americans with Disabilities Act (ADA), enacted in 1990, “assure[s] equality of opportunity, full participation, independent living, and economic self-sufficiency for” people with disabilities.⁶ Almost three decades later, however, inaccessible transportation and lack of transportation options still remain significant barriers to full, equal access to and enjoyment of educational, employment, civic, social, and community opportunities by people with disabilities.⁷ Reducing transportation obstacles experienced by people with disabilities is projected to “enable new employment opportunities for approximately 2 million individuals with disabilities,” which would in turn provide other cost-saving benefits for individuals, states, and the federal government.⁸

As the United States enters a new age of transportation with the autonomous vehicle revolution, it is crucial that stakeholders in the disability community, the manufacturing sector, and the government work together to create a transportation future accessible to all Americans. The current U.S. transportation infrastructure is premised on an able-bodied, human driver approach to mobility, and thus, laws and design standards reflect this premise.⁹ Autonomous vehicles can break away from this normative approach and offer accessible transportation options for the many Americans with disabilities unable to fully access the current transportation system, but not without concerted efforts from the relevant stakeholders. The policies and laws regulating self-driving vehicles enacted today will shape the development of autonomous technologies for decades, and the design standards implemented by autonomous vehicle manufactures will influence standards throughout the industry. Therefore, in order to ensure access for Americans with disabilities, these laws and standards must be intentionally devised to ensure that self-driving vehicles are available to as many people as possible and accommodate the widest range of abilities possible.

6. 42 U.S.C. § 12101(a)(7) (2017).

7. CLAYPOOLE ET AL., *supra* note 3, at 9.

8. *Id.* at 4.

9. See Greg Rogers, *USDOT Moving Forward with AV Policy 3.0, Including Truck and Bus Automation*, ENO CENTER FOR TRANSP. (Jan. 12, 2018), <https://www.enotrans.org/article/usdot-moving-forward-av-policy-3-0-including-truck-bus-automation> [<https://perma.cc/2B95-QB5L>]; see also Greg Rogers, *5 Federal AV Policy Developments to Watch in 2018*, ENO CENTER FOR TRANSP. (Jan. 11, 2018), <https://www.enotrans.org/article/5-federal-av-policy-developments-watch-2018/> [<https://perma.cc/YV7K-DQUX>].

This Note aims to offer a primer on a rapidly-developing area of law and policy that will permanently alter how Americans interact with transportation. Specifically, this Note posits that autonomous vehicles and the laws that govern their implementation and use must comprehensively consider and include the needs and preferences of people with disabilities. Part II of this Note will describe the basics of autonomous vehicle technologies, how these technologies are progressing, and how they can be utilized by people with disabilities. Part III introduces three potential ways state and federal regulation of autonomous vehicles could affect people with disabilities and assesses the impact of these regulations. Part IV proposes next steps and suggests the most viable paths forward for ensuring that the development, regulation, and implementation of autonomous vehicle technologies provide equal access and opportunities for use by Americans with disabilities.

II. GETTING ON THE ROAD: AUTONOMOUS VEHICLE TECHNOLOGIES AND USE BY PEOPLE WITH DISABILITIES

A. *Overview of Automated Vehicle Technologies*

Automated vehicle technologies assist drivers with a variety of driving tasks but, today, generally are confined to a distinct aspect of vehicle operation, like Teetor's cruise control.¹⁰ Therefore, to achieve full vehicle autonomy, discrete automated functions must be integrated with one another so that they may work in concert to automate the entire operation of the vehicle.¹¹ The National Highway Traffic Safety Administration (NHTSA), using the Society of Automotive Engineers' (SAE) levels of automation framework, has defined the various levels of automation for autonomous vehicles.¹² As the levels increase, so does the amount of automation in the vehicle, from absolutely no automation in Level 0 to fully autonomous in Level 5.¹³

10. See *Automated Driving Systems 2.0: A Vision for Safety*, NHTSA 1, 4, https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf [<https://perma.cc/8NDL-G9NN>].

11. *Id.*

12. *Id.*

13. *Id.*

A Level 0 vehicle has no automated driving technologies and the human driver performs all functions necessary to operate the vehicle.¹⁴ Level 1 and Level 2 vehicles are equipped with advanced driver assistance systems (ADAS), which automate some parts of the driving process.¹⁵ In a Level 1 vehicle, the ADAS “can sometimes assist the human driver with either steering or braking/accelerating, but not both simultaneously.”¹⁶ Most cars on American roads today have some type of ADAS technology, such as adaptive cruise control or automatic emergency braking, which aids drivers by automating specific aspects of the driving experience.¹⁷ In a Level 2 vehicle, the ADAS “can itself actually control both steering and braking/accelerating simultaneously under some circumstances. The human driver must continue to pay full attention (‘monitor the driving environment’) at all times and perform the rest of the driving task.”¹⁸ The most well-known example of Level 2 automated technology is Tesla’s “Autopilot” feature, which makes the vehicle “capable of steering within a lane, changing lanes, managing the speed of the car, and controlling braking while driving on the highway.”¹⁹

Automation Levels 3, 4, and 5 describe automated driving systems (ADS), which can “perform all aspects of the driving task,” in some circumstances, as in Level 3, to all circumstances, as in Level 5, thereby making the vehicle fully autonomous, or self-driving.²⁰ Level 3 automation

14. *Id.*

15. *Automated Vehicles for Safety*, NHTSA, <https://www.nhtsa.gov/technology-innovation/automated-vehicles> [<https://perma.cc/4LGQ-GV6S>].

16. *Id.*

17. *Id.*; see also Aaron Cole, *What Are the Different Levels of Self-Driving Cars?*, WASH. POST (Feb. 21, 2017), https://www.washingtonpost.com/cars/what-are-the-different-levels-of-self-driving-cars/2017/02/21/444a2a80-f877-11e6-aa1e-5f735ee31334_story.html [<https://perma.cc/EDU2-3JLP>].

18. *Automated Vehicles for Safety*, *supra* note 15.

19. Cadie Thompson, *Here’s How Tesla’s Autopilot Works*, BUS. INSIDER (July 1, 2016, 12:01 PM), <http://www.businessinsider.com/how-teslas-autopilot-works-2016-7> (last visited Mar. 16, 2018); see also *Autopilot*, TESLA, <https://www.tesla.com/autopilot> [<https://perma.cc/K3C8-3BUE>].

20. *Automated Vehicles for Safety*, *supra* note 15.

is “conditional autonomy,”²¹ meaning that the vehicle is fully autonomous but in some driving scenarios the system will alert the driver to take back control.²² A Level 4 vehicle can “perform all driving tasks and monitor the driving environment,”²³ so that “no driver interaction is needed and the car will stop itself if the systems fail.”²⁴ At Level 5, the vehicle is totally autonomous in all circumstances, and passengers have no involvement with driving.²⁵

It is important to note that the NHTSA’s levels of automation are merely parameters for the development of automated technologies and are not mandatory benchmarks that must be achieved before obtaining the next level of automation.²⁶ Indeed, several automakers, such as Volvo,²⁷ Ford, and Google’s Waymo, are skipping Level 3 altogether in pursuit of Level 4, and eventually, Level 5 automation.²⁸ These automakers found that drivers testing Level 3 vehicles soon forgot about the vehicle’s conditional autonomy and were unprepared to engage with driving when the system required the driver to take over at a moment’s notice.²⁹ This “handoff problem” potentially makes Level 3 autonomous vehicles less safe due to human distraction at the most critical moment—when the vehicle asks the human to retake control to maneuver a situation the vehicle cannot handle.³⁰

21. Cole, *supra* note 17.

22. *Automated Vehicles for Safety*, *supra* note 15.

23. *Id.*

24. Cole, *supra* note 17.

25. *Automated Vehicles for Safety*, *supra* note 15.

26. *Automated Driving Systems 2.0: A Vision for Safety*, *supra* note 11, at 2.

27. Alex Davies, *The Very Human Problem Blocking the Path to Self-Driving Cars*, WIRED (Jan. 1, 2017, 7:00 AM), <https://www.wired.com/2017/01/human-problem-blocking-path-self-driving-cars> [<https://perma.cc/WL6U-WMH8>].

28. Keith Naughton, *Ford’s Dozing Engineers Side with Google in Full Autonomy Push*, BLOOMBERG TECH. (Feb. 17, 2017, 3:00 AM), <https://www.bloomberg.com/news/articles/2017-02-17/ford-s-dozing-engineers-side-with-google-in-full-autonomy-push> [<https://perma.cc/WG2E-Y5U2>]; *see also* Davies, *supra* note 27.

29. *Id.*

30. Naughton, *supra* note 28.

People whose disabilities prevent them from operating a vehicle benefit from the handoff problem in two interconnected ways. First, the handoff problem could help Level 4 technologies become available sooner, since many companies developing autonomous vehicles are skipping Level 3 altogether in favor of focusing on attaining higher levels of automation.³¹ For autonomous vehicles to be usable by people whose disabilities prevent them from operating a motor vehicle, automation must be at Level 4 or higher, since human monitoring or intervention is not necessary in highly automated vehicles.³² Though “not all individuals with disabilities face transportation challenges, many of them do, particularly those with severe cognitive, mobility, or vision impairments.”³³ For individuals with these types of disabilities, operating a motor vehicle is generally not an option, and “[m]ore than one third of individuals with a disability report that they are not active drivers.”³⁴ An individual who is blind cannot obtain a driver’s license, and while “an individual with paraplegia might be able to drive with a retrofit that allows for arms-only control of the car,” the cost of retrofitting can be prohibitive.³⁵ Hence, Level 4 automation is the point at which self-driving cars will become usable to most people with disabilities since human monitoring of the vehicle is not required.³⁶

Working within the constraints of the handoff problem, manufactures of autonomous vehicles are trending towards removing traditional, able-bodied controls from self-driving vehicles. Since 2012, Google’s Waymo³⁷

31. Davies, *supra* note 27 (“[Like Google,] [a]lmost everyone else has embraced this way of thinking, abandoning the step-by-step approach and promising to begin launching fully robotic cars within a few years.”).

32. *Automated Vehicles for Safety*, *supra* note 15.

33. HENRY CLAYPOOL ET AL., RUDERMAN FAMILY FOUNDATION AND SECURING AMERICA’S FUTURE ENERGY, THE RUDERMAN WHITE PAPER: SELF-DRIVING CARS: THE IMPACT ON PEOPLE WITH DISABILITIES 1, 11 (2017), http://rudermanfoundation.org/white_papers/self-driving-cars-the-impact-on-people-with-disabilities [<https://perma.cc/L3V4-5GDP>].

34. *Id.*

35. *Id.*

36. *Automated Vehicles for Safety*, *supra* note 15.

37. Waymo, a subsidiary of Google’s parent company, Alphabet Inc., was “created to commercialize Google’s automated driving technology.” Sam Abuelsamid, *Waymo Launches Early Rider Program, Expands Self-Driving Fleet with Fiat Chrysler*, FORBES (April 25, 2017, 8:34 AM), <https://www.forbes.com/sites/samabuelsamid/2017/04/25/waymo-launches-early-rider->

has been creating and testing autonomous vehicles without steering wheels, pedals, or the need for human monitoring of the automated driving system.³⁸ In early 2018, General Motors announced that it would release a modified, self-driving version of its all-electric Chevrolet Bolt³⁹ without a “steering wheel, pedals, or other manual controls” in 2019.⁴⁰ In 2017, General Motors deployed a fleet of forty-six self-driving Bolts in San Francisco for testing use by select General Motors employees, and the company plans to deploy the modified, driverless Bolts, rebranded as the Cruise,⁴¹ as part of a similar taxi-like ride-hailing service in cities across the United States in 2019.⁴²

These design innovations take self-driving technologies from the normative, able-bodied approach of standard vehicle design into an inclusive design accessible to all. This is the second benefit of the handoff problem for people whose disabilities prevent them from operating a motor vehicle—it forces makers of autonomous vehicles to design in an accessible way. While inaccessible design and licensing issues could still pose barriers to the use of autonomous vehicles by people with disabilities, proposed federal and state legislation, discussed in Part III, offers solutions to ensure full and equal access to autonomous vehicles for people with disabilities.

B. Private Autonomous Vehicle Ownership and Transportation Networks

Once highly-autonomous Level 4 functionality is achieved and available to the public, Americans will be able to use self-driving vehicles in

program-expands-self-driving-fleet-with-fiat-chrysler/#42323c6ad1a [https://perma.cc/HB5Y-QTXD].

38. Alex Davies, *Lyft is Launching a Fleet of Self-Driving Cars in San Francisco*, WIRED (Sept. 7, 2017, 9:00 AM), <https://www.wired.com/story/lyft-self-driving-cars-san-francisco-bay-area> [https://perma.cc/5END-S52L].

39. *Id.*

40. General Motors, *Meet the Cruise AV Self-Driving Car*, YOUTUBE (Jan. 11, 2018), <https://www.youtube.com/watch?v=MvP82IsGqNc> [https://perma.cc/W5PC-XPCQ].

41. *Id.*

42. Alex Davies, *GM’s Robocar Service Drives Employees Around SF for Free*, WIRED (Aug. 9, 2017, 7:02 PM), <https://www.wired.com/story/gm-cruise-anywhere-self-driving-san-francisco> [http://archive.today/7O1Sm]; see also Andrew J. Hawkins, *GM Will Make an Autonomous Car Without Steering Wheel or Pedals by 2019*, THE VERGE (Jan. 12, 2018, 12:01 AM), <https://www.theverge.com/2018/1/12/16880978/gm-autonomous-car-2019-detroit-auto-show-2018> [https://perma.cc/2PS5-METC].

two ways.⁴³ People can buy their own autonomous vehicle for private use, and they can use autonomous vehicles deployed as part of a transportation network.⁴⁴ Transportation networks could be public, like a self-driving city bus, or private, like transportation network companies (TNCs) Uber, Lyft, and Waymo. Ridesharing companies Uber and Lyft have both entered the self-driving space,⁴⁵ and Waymo's Early Rider Program, launched in Phoenix, Arizona, places vehicles using their automated driving system into the ridesharing space.⁴⁶

However, people with disabilities face several barriers to access of self-driving vehicles that must be resolved. First, state driver's licensing issues could prevent people with disabilities from utilizing a self-driving vehicle. If states or the federal government require that a licensed driver be present in the autonomous vehicle, this would exclude many people whose disabilities prevent them from obtaining a license under existing licensing regulations.⁴⁷ Recent developments in proposed state and federal regulations of self-driving vehicles, discussed in Part III, offer promising solutions to this potential barrier to access for people with disabilities.

Second, personal ownership of an autonomous vehicle may be out of reach for many people with disabilities due to the cost of purchasing and maintaining a new vehicle with a state-of-the-art automated driving system. Americans with disabilities "are more likely to be unemployed and live in poverty."⁴⁸ Furthermore, the median individual income for people with disabilities is \$20,250, compared to people with no disability, whose median

43. Daniel A. Crane et al., *A Survey of Legal Issues Arising from the Deployment of Autonomous and Connected Vehicles*, 23 MICH. TELECOMM. & TECH. L. REV. 191, 199–202 (2017).

44. *Id.*

45. Marco della Cava, *Lyft Ups Ante on Uber, Starts Self-Driving Car Division*, USA TODAY (July 21, 2017, 10:43 AM), <https://www.usatoday.com/story/tech/2017/07/21/lyft-ups-ante-uber-starts-self-driving-car-division/498233001> [<https://perma.cc/8SSL-7XE2>].

46. Abeulsamid, *supra* note 37.

47. CLAYPOOLE ET AL., *supra* note 33, at 23.

48. *Disability & Socioeconomic Status*, AMERICAN PSYCHOLOGICAL ASS'N, <http://www.apa.org/pi/ses/resources/publications/disability.aspx> [<https://perma.cc/9NHW-H2CM>].

individual income is \$30,469.⁴⁹ If self-driving vehicles are not designed to be accessible to people with disabilities, the vehicles may need to be modified to be accessible to the user after the vehicle is purchased.⁵⁰ For conventional, non-autonomous vehicles available on the market today, the cost of aftermarket modification can range from \$20,000 to \$80,000.⁵¹

Relatedly, inaccessible design of autonomous vehicles is a third potential barrier to access for people with disabilities. This obstacle presents itself in both the use of autonomous vehicles for private ownership as well as vehicles used as part of a transportation network. If autonomous vehicles are designed without consideration of and input from people with disabilities, their inaccessibility will render the vehicles useless for most users with disabilities. Some design specifications needed in autonomous vehicles include space for a wheelchair, a service animal, an aide, and family members.⁵² Self-driving vehicles also need to be accessible to drivers with various types of disabilities, such as visual impairments, ambulatory difficulties, cognitive difficulties, and auditory impairments.⁵³

If inaccessible self-driving vehicles are used as part of a transportation network, legal obligations could arise for the operator of the network. Autonomous city buses, paid for by the local government, would need to be accessible to comply with Title II of the ADA, which mandates access to “services, programs, or activities of a public entity” for people with disabilities.⁵⁴ The legal accessibility obligations for private TNCs are less

49. ADA Participation Action Research Consortium, *Median Individual Income of People with and without Disabilities with Earnings, Age 16 and Above, 2014*, CTR. ON DISABILITY, http://centerondisability.org/ada_parcc/utills/indicators.php?id=30 [<https://perma.cc/S3SK-3ZAD>].

50. *Adapting Motor Vehicles for People with Disabilities*, NHTSA, <https://one.nhtsa.gov/cars/rules/adaptive/brochure/brochure.html> [<https://perma.cc/RAP8-RNPD>].

51. *Id.*; see also Patrick Sisson, *How Driverless Cars Can Empower Americans with Disabilities*, CURBED (Jan. 28, 2017, 9:32 AM), <https://www.curbed.com/2017/1/18/14309082/driverless-cars-disabled-transportation-access> [<https://perma.cc/655T-NRTD>].

52. Sisson, *supra* note 51; see also CLAYPOOL ET AL., *supra* note 33, at 6.

53. #AccessibleOlli, LOCAL MOTORS LABS, <https://launchforth.io/localmotors/accessibleolli/explore> [<https://perma.cc/UW5D-D4F4>]; see also CLAYPOOL ET AL., *supra* note 33, at 9.

54. 42 U.S.C. § 12132 (2017); see also PETER BLANCK ET AL., *DISABILITY CIVIL RIGHTS LAW AND POLICY* 333, 334 (3d ed. 2014).

clear. Recent cases, such as *Cotter v. Lyft, Inc.*,⁵⁵ *O'Connor v. Uber Technologies, Inc.*,⁵⁶ and *National Federation of the Blind of California v. Uber Technologies, Inc.*,⁵⁷ suggest that TNCs must adhere to the ADA, but no ruling specifically mandating this has yet been made.⁵⁸

III. OVERCOMING ROADBLOCKS: FEDERAL AND STATE REGULATION OF AUTONOMOUS VEHICLES

As discussed above, state and federal regulations could either help or hinder access to self-driving vehicles for people with disabilities. This Part will explore three potential ways federal and California state regulation of self-driving vehicles could affect people with disabilities. Section A discusses the ADA, which contains the existing law regulating accessible transportation for people with disabilities. Next, Section B outlines current and proposed licensing regulations in California. Lastly, Section C provides an overview of federal agency guidelines regarding autonomous vehicles, as well as proposed federal laws presently under consideration in the House and Senate.

A. *Liability for Transportation Network Companies Under the ADA*

Over the past several years, dozens of plaintiffs have sued ride-sharing services Uber and Lyft, alleging the TNCs violated the ADA for failing to fulfill “their statutory obligation to ensure that their drivers do not deny service to customers on the basis of a disability.”⁵⁹ Passengers with disabilities assert that TNC drivers have mishandled their service animals, harassed them for putting their service animal into the vehicle, and denied them rides upon discovering that the rider has a disability or uses a wheelchair.⁶⁰ Under the ADA, these actions could constitute a denial of “full

55. See generally *Cotter v. Lyft, Inc.*, 60 F. Supp. 3d 1067 (N.D. Cal. 2015).

56. See generally *O'Connor v. Uber Techs., Inc.*, 82 F. Supp. 3d 1133 (N.D. Cal. 2015).

57. See generally *Nat'l Fed'n of the Blind of Cal. v. Uber Techs., Inc.*, 103 F. Supp. 3d 1073 (N.D. Cal. 2015).

58. Bryan Casey, Note, *Uber's Dilemma: How the ADA May End the on Demand Economy*, 12 U. MASS. L. REV. 126 (2017).

59. *Id.* at 148.

60. *Id.* at 151–54.

and equal enjoyment” of the TNC’s services, since the drivers denied individuals with disabilities service “on the basis of [a] disability.”⁶¹ Title III, section 12184(a) of the ADA states that “[n]o individual shall be discriminated against on the basis of disability in the full and equal enjoyment of specified public transportation services provided by a private entity that is primarily engaged in the business of transporting people.”⁶² Denial of full and equal enjoyment is a multi-factor assessment involving considerations of the service provider as well as “interpretations of functional equality by policymakers and courts, and, of course, by the users of services themselves.”⁶³ Equal enjoyment of a public service “implies the autonomous, meaningful, and comparable opportunity to engage in [the service] . . . as people without disabilities enjoy.”⁶⁴

Section 12184 of the ADA, which prohibits “discrimination in specified public transportation services provided by private entities,” can be implicated in lawsuits against TNCs in two ways.⁶⁵ First, private TNCs providing a public transportation service could be held liable for denying passengers with disabilities “full and equal enjoyment” of their services.⁶⁶ Second, private TNCs that purchase new vans for use in their autonomous vehicle transportation network could be liable under section 12184(b)(5), which requires all new vans purchased by transportation providers to be accessible for people with disabilities.⁶⁷

In response to the accessibility lawsuits, Uber and Lyft asserted that they are technology companies, not transportation companies, and as such,

61. 42 U.S.C. § 12182(a) (2017).

62. *Id.*

63. Legal scholar Peter Blanck writes that, in the context of online services, “[d]eterminations about the full and equal enjoyment of online services – web equality, comparable use with reasonable modification – involve multi-factor considerations involving web content owners and designers, providers of public and private online services, interpretations of functional equality by policymakers and courts, and, of course, by the users of services themselves. The calculus requires consideration of what inclusion and integration implies for people with disabilities in general.” PETER BLANCK, *EQUALITY: THE STRUGGLE FOR WEB ACCESSIBILITY BY PERSONS WITH COGNITIVE DISABILITIES* 38 (2014).

64. *Id.*

65. 42 U.S.C. § 12184 (2018).

66. 42 U.S.C. § 12182(a).

67. 42 U.S.C. § 12184(b)(5).

the ADA does not apply to them.⁶⁸ Courts rejected this argument, noting that Title III of the ADA applies to private companies providing transportation, and thus Uber and Lyft would be bound by it if they are determined to be transportation companies.⁶⁹ No court has yet ruled on whether Uber and Lyft are transportation companies, but a class action lawsuit filed in New York Supreme Court in July 2017, *Brooklyn Center for Independence of the Disabled (BCID) v. Uber Technologies, Inc.*, could provide a clear ruling on the issue.⁷⁰ The suit alleges that 99.9% of the approximately 58,000 Ubers in New York City cannot be used by riders in wheelchairs, and “as a result, Uber riders who require wheelchair-accessible vehicles regularly face significantly longer wait times to get a vehicle than individuals who do not require wheelchair-accessible vehicles.”⁷¹

If TNCs are determined to be private entities performing a public service under Title III of the ADA, their services would thereby need to be accessible so that riders with disabilities can experience “full and equal enjoyment of the . . . service.”⁷² Title III of the ADA would require TNCs to “make reasonable modifications”⁷³ to their “‘policies, practices, and procedures,’ [provide] auxiliary aids to ensure effective communication with the disabled, and [remove] . . . architectural and communications barriers” to ensure “full and equal enjoyment.”⁷⁴ Such a rule could help counter seemingly insurmountable barriers to accessible transportation like those alleged in *BCID v. Uber* and could increase the number of accessible

68. Casey, *supra* note 58, at 161–62.

69. *Id.* at 162–64.

70. Complaint, *Brooklyn Ctr. for Indep. for the Disabled v. Uber Techs., Inc.*, No. 17-cv-6399-NRB (N.Y.S. July 18, 2017); see also *Brooklyn Ctr. for Indep. of the Disabled (BCID), et al. v. Uber Techs., Inc., et al.*, DISABILITY RIGHTS ADVOCATES, <http://dralegal.org/case/brooklyn-center-independence-disabled-bcid-et-al-v-uber-technologies-inc-et-al> [<https://perma.cc/S5UZ-ZU4P>]; Jonathan Stempel, *Uber is Sued Over Lack of Wheelchair-Accessible Cars in NYC*, REUTERS (July 18, 2017, 8:30 AM), <https://www.reuters.com/article/us-uber-lawsuit/uber-is-sued-over-lack-of-wheelchair-accessible-cars-in-nyc-idUSKBN1A31QU>.

71. Complaint, *supra* note 70, ¶ 109; see also *Brooklyn Ctr. for Indep. of the Disabled (BCID), et al. v. Uber Techs., Inc., et al.*, *supra* note 70; Stempel, *supra* note 70.

72. 42 U.S.C. § 12182(a).

73. 42 U.S.C. § 12182(b)(2)(A)–(C).

74. Nat’l Fed’n of the Blind v. Target Corp., 452 F. Supp. 2d 946, 951 (N.D. Cal. 2006) (citing 42 U.S.C. § 12182(b)(2)(A)–(C)).

vehicles in TNCs' fleets.⁷⁵ In the future, the application of such a holding could also be extended to autonomous vehicles operated within the TNCs' fleets, meaning that people with disabilities could access the revolutionary self-driving transportation technologies provided by TNCs.

TNCs could face another form of liability under the ADA for any new van added to their fleet. Title III prohibits a private entity performing a public service from

purchas[ing] or leas[ing] . . . a new van with a seating capacity of less than 8 passengers, including the driver, which is to be used to provide specified public transportation . . . that is not readily accessible to or usable by individuals with disabilities, including individuals who use wheelchairs; except that the new van need not be readily accessible to and usable by such individuals if the entity can demonstrate that the system for which the van is being purchased or leased, when viewed in its entirety, provides a level of service to such individuals equivalent to the level of service provided to the general public.⁷⁶

Since the passage of the ADA, many private taxi companies operating as public services have circumvented this requirement by only purchasing used vans to add to their fleets, significantly harming people with disabilities seeking accessible taxi transportation.⁷⁷ Uber, "the first company in United States history to offer ordinary consumers rides in self-driving taxis," waded into this issue when it purchased approximately one hundred new Volvo sport utility vehicles (SUVs) for its fleet and outfitted them with self-driving technology.⁷⁸ Waymo, which maintains a fleet of 600 Chrysler Pacifica Hybrid minivans equipped with its automated driving system as part of its Early Rider Program in Phoenix, also is affected by this issue.⁷⁹ In contrast,

75. See generally Complaint, *supra* note 70; *Brooklyn Ctr. for Indep. of the Disabled (BCID), et al. v. Uber Techs., Inc., et al.*, *supra* note 70; Stempel, *supra* note 70.

76. 42 U.S.C. § 12184(b)(5).

77. Bryan Casey, Essay, *A Loophole Large Enough to Drive an Autonomous Vehicle Through*, 69 STAN. L. REV. ONLINE 73, 73–77 (2016) (citation omitted).

78. *Id.* at 73.

79. John Krafcik, *Apply to Be Part of Waymo's Early Rider Program*, MEDIUM: WAYMO BLOG (Apr. 24, 2017), <https://medium.com/waymo/apply-to-be-part-of-waymos-early-rider-program-5fd996c7a86f> [<https://perma.cc/XJM8-7EAK>].

Lyft has acquired only about a dozen Lincoln and Audi sedans for its forthcoming self-driving fleet pilot in San Francisco.⁸⁰

At present, the autonomous fleets deployed by Uber, Waymo, and Lyft are still in the experimental testing phase and have not yet been deployed for widespread use.⁸¹ The question of whether vans with automated driving systems deployed by TNCs must be accessible under section 12184(b)(5) has not yet come before a court, but this decision could have major, costly implications for TNCs purchasing vehicles for their self-driving fleets.⁸² The outcome of a recent settlement in Northern California with Chariot, a private commuter shuttle van service, indicates that federal regulators will not wait until a case is filed to enforce the anti-discrimination protections guaranteed to people with disabilities under Title III of the ADA.⁸³

Chariot, a start-up TNC based in San Francisco and acquired by Ford Motors in 2016,⁸⁴ operates nearly 300 passenger vans as part of its operations in San Francisco, Austin, Seattle, New York City,⁸⁵ San Antonio, and Columbus.⁸⁶ The start-up recently reached a settlement with the United States Attorney's Office of the Northern District of California over

80. Alex Davies, *Lyft is Launching a Fleet of Self-Driving Cars in San Francisco*, WIRED (Sept. 7, 2017, 9:00 AM), <https://www.wired.com/story/lyft-self-driving-cars-san-francisco-bay-area> [<https://perma.cc/5END-S52L>].

81. *Id.*

82. Casey, *supra* note 77, at 80.

83. Press Release, U.S. Att'y's Office N. Dist. of Cal., *Chariot Transit Inc. Enters Agreement to Ensure Full Accessibility of Commuter Vehicles*, U.S. DEP'T OF JUSTICE (Nov. 6, 2017), <https://www.justice.gov/usao-ndca/pr/chariot-transit-inc-enters-agreement-ensure-full-accessibility-commuter-vehicles> [<https://perma.cc/739N-2KTN>]; see also Adam Brinklow, *Chariot Fined for Discriminating Against Wheelchair Users*, CURBED S.F. (Nov. 7, 2017, 9:21 AM), <https://sf.curbed.com/2017/11/7/16618232/chariot-justice-department-disabled-fine-san-francisco> [<https://perma.cc/R9SY-AE4E>].

84. Darrell Etherington, *Ford Smart Mobility Acquires Chariot to Boost Its Smart City Transit Plans*, TECHCRUNCH (Sept. 9, 2016), <https://techcrunch.com/2016/09/09/ford-mobility-solutions-acquires-chariot> [<https://perma.cc/CJD9-8SPP>].

85. "As of the time of this Agreement, Chariot has 278 10-passenger and 14-passenger vehicles in San Francisco, New York, and in Austin, and 10 8-passenger vehicles with wheelchair lifts in San Francisco, New York, and Austin." *Settlement Agreement Under the Americans with Disabilities Act Between the United States of America and Chariot Transportation, Inc.*, USAO # 2016V00666, DJ # 202-11-362, <https://www.justice.gov/usao-ndca/press-release/file/1009126/download> [<https://perma.cc/GVB6-BSBF>] [hereinafter *Settlement Agreement*].

86. *About*, CHARIOT, <https://www.chariot.com/about> [<http://archive.today/FFazD>].

allegations that the service failed to provide accessible transportation for people with disabilities.⁸⁷ Under the agreement, made public on November 6, 2017, Chariot admits no liability for the fact that between July 2015 and November 2016, none of the “at least 161 new 14-passenger vehicles” in its service “were readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.”⁸⁸ The settlement states that

[d]uring this time, Chariot’s website and individual responses to customer inquiries indicated that Chariot only provided service to individuals who use wheelchairs if they could transfer to a seat and if there was space for their wheelchair that did not take the seat of another passenger; those who required an accessible vehicle would only be provided “accessible resources in the region.”⁸⁹

The agreement, effective for three years, includes nine “[a]ctions to be taken by Chariot” in order to comply with Title III of the ADA and to rectify its alleged discriminatory business practices.⁹⁰ These actions include payment of a \$50,000 civil penalty, social media and website posts advertising that all of Chariot’s transportation services are accessible, and comprehensive ADA compliance and disability accommodation training for all employees “who interact with commuter customers, commuter vehicles, or the commuter customer-facing App.”⁹¹ The United States Attorney’s Office can review Chariot’s compliance with Title III of the ADA or the agreement at any time, and if Chariot fails to comply, the United States can take civil action against the company.⁹²

The settlement indicates that the United States Attorney’s Office is serious about rectifying TNCs’ blatant violations of Title III. Though the SUVs and minivans deployed by Uber and Waymo, respectively, remain in

87. Press Release, U.S. Att’y’s Office N. Dist. of Cal., *supra* note 83.

88. *Settlement Agreement*, *supra* note 85.

89. *Id.*

90. *Id.*

91. *Id.*

92. *Id.*

the experimental testing phase, the Chariot settlement signals that any vans operated by TNCs will need to comply with Title III section 12184(b)(5) of the ADA, and that the United States government will step in to enforce the rights of people with disabilities guaranteed under federal law.

B. California State Regulation: Licensing

Driver's licensing requirements pose another potential barrier to access to Level 4 autonomous vehicles for people with disabilities. The NHTSA delineates the regulatory roles of the federal government and states in regulating motor vehicle operation.⁹³ The "NHTSA is responsible for regulating motor vehicles and motor vehicle equipment, and [s]tates are responsible for regulating the human driver and most other aspects of motor vehicle operation," such as licensing and registration requirements.⁹⁴ For regulation of self-driving vehicles, "[t]hese general areas of responsibility should remain largely unchanged."⁹⁵ Hence, states will be responsible for determining the licensing requirements for autonomous vehicles. Accordingly, state regulations and licensing requirements could vary widely from state-to-state, potentially to the detriment of people with disabilities.⁹⁶ State licensing regulations currently prevent many people with disabilities from obtaining a driver's license to operate a motor vehicle, and if similar licensing requirements are enacted for autonomous vehicles, private use of these vehicles by people with disabilities would be significantly restricted.⁹⁷

93. *Automated Driving Systems 2.0: A Vision for Safety*, NHTSA 1, 20, https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf [<https://perma.cc/8NDL-G9NN>].

94. *Id.*

95. *Id.*

96. The possibility of federal preemption of state licensing regulations is discussed in Section C.

97. HENRY CLAYPOOL ET AL., RUDERMAN FAMILY FOUNDATION AND SECURING AMERICA'S FUTURE ENERGY, THE RUDERMAN WHITE PAPER: SELF-DRIVING CARS: THE IMPACT ON PEOPLE WITH DISABILITIES 1, 23 (2017), http://rudermanfoundation.org/white_papers/self-driving-cars-the-impact-on-people-with-disabilities [<https://perma.cc/L3V4-5GDP>].

California was the third state to pass legislation of self-driving vehicles, after Florida and Nevada.⁹⁸ Senate Bill (SB) 1298, passed in 2012,⁹⁹ was codified as Vehicle Code Division 16.6, section 38750 and regulates the testing of autonomous vehicles on public roads.¹⁰⁰ Section (a) of the statute defines autonomous technology as “technology that has the capability to drive a vehicle without the active physical control or monitoring by a human operator,” which means the technology is at Level 4 capability or higher.¹⁰¹ The section defines “[a]n ‘operator’ of an autonomous vehicle [as] the person who is seated in the driver’s seat, or, if there is no person in the driver’s seat, causes the autonomous technology to engage.”¹⁰² The language of the statute indicates an understanding and acknowledgment that autonomous vehicles will progress to the point where human drivers are no longer necessary for operation; in other words, Level 4 or higher automation. The statutory language shows a potential opportunity for individuals who normally might be precluded from operating a vehicle to gain the ability to operate an autonomous vehicle.

Section (b) of the statute details California’s licensing requirements, which specify that a driver of an autonomous vehicle must possess a driver’s license and “shall be seated in the driver’s seat, monitoring the safe operation of the autonomous vehicle, and capable of taking over immediate manual control of the autonomous vehicle in the event of an autonomous technology failure or other emergency.”¹⁰³ This requirement is appropriate for the current state of autonomous vehicle technology, as it has not yet reached Level 4 autonomy. However, this section of the statute could negatively impact people with disabilities in the future if the provision remains unchanged and Level 4 autonomous driving technologies are available for public use.

Section (d) of the statute tasks the California Department of Motor Vehicles (DMV) with establishing regulations for testing and public use of

98. Danielle Lenth, *Chapter 570: Paving the Way for Autonomous Vehicles*, 44 MCGEORGE L. REV. 787, 789 (2013).

99. S.B. 1298, ch. 570, Reg. Sess. (Cal. 2012).

100. CAL. VEH. CODE, § 38750 (Deering 2018).

101. CAL. VEH. CODE § 38750(a)(1).

102. CAL. VEH. CODE § 38750(a)(4).

103. CAL. VEH. CODE § 38750(b)(2).

autonomous vehicles, and the DMV put such regulations into effect on September 16, 2014.¹⁰⁴ Under these regulations, fifty-two companies have obtained Autonomous Vehicle Testing Permits from the DMV,¹⁰⁵ which enable them to test their autonomous vehicle prototypes on California public roads with a driver present in the vehicle.¹⁰⁶ In February 2018, California's Office of Administrative Law approved and adopted revised DMV regulations that allow for the testing of autonomous vehicles on California public roads without a driver present.¹⁰⁷ The regulations require companies testing autonomous vehicles without a driver to "have a remote operator monitoring at all times, ready to take over as needed," and companies still must obtain a permit from the DMV.¹⁰⁸ Three types of permits will be available for "testing with a safety driver, driverless testing, and deployment,"¹⁰⁹ and the new regulations "create the framework under which consumers can eventually buy driverless cars."¹¹⁰

This change in DMV regulations is in line with the approach that companies such as Waymo, Ford, General Motors, and Volvo are taking by opting to skip Level 3 automation altogether in favor of Level 4 driverless technologies.¹¹¹ This shift in policy opens a new possibility for future access to and ownership of autonomous vehicles by people with disabilities, many of whom would not be able to act as a driver of a self-driving vehicle in the traditional driver sense. The DMV's allowance of the testing, deployment,

104. See generally CAL. VEH. CODE § 38750(d); *Testing of Autonomous Vehicles with a Driver*, CA DMV, <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous+/testing> [<https://perma.cc/YBU4-PYVV>].

105. As of April 1, 2018. *Testing of Autonomous Vehicles with a Driver*, *supra* note 104.

106. Correction: *Driverless Cars-California Story*, U.S. NEWS & WORLD REPORT (Feb. 27, 2018, 4:06 PM), <https://www.usnews.com/news/business/articles/2018-02-26/california-oks-driverless-car-testing-without-backup-drivers> [<http://archive.is/RecSS>].

107. *Driverless Testing of Autonomous Vehicles*, CA DMV, <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/auto> [<http://perma.cc/PZ9T-94K2>].

108. Correction: *Driverless Cars-California Story*, *supra* note 106.

109. Andrew Hawkins, *California Green Lights Fully Driverless Cars for Testing on Public Roads*, THE VERGE (Feb. 26, 2018), <https://www.theverge.com/2018/2/26/17054000/self-driving-car-california-dmv-regulations> [<https://perma.cc/G4M5-WW4Z>].

110. Correction: *Driverless Cars-California Story*, *supra* note 106.

111. See *supra*, Part II, Section A.

and eventual sale of self-driving vehicles without steering wheels, pedals, or a driver behind the wheel on California public roads lays the groundwork for future use by people with disabilities and sets forth a forward-thinking approach for other states to emulate.

Section (g) of California's autonomous vehicle testing statute contains a federal preemption clause that states "[f]ederal regulations promulgated by the [NHTSA] shall supersede the provisions of this division when found to be in conflict with any other state law or regulation."¹¹² The inclusion of this provision signals California's recognition that federal regulations can take supremacy over state regulations.¹¹³ People with disabilities could benefit significantly from this provision in the state statute if, for example, California decided to prohibit people whose disability prevents them from obtaining a driver's license from operating a Level 4 or higher autonomous vehicle, or if the state failed to establish a clear rule regarding use of autonomous vehicles by people with disabilities. If the federal government enacted a national standard inclusive of people with disabilities—one that does not restrict use of Level 4 autonomous vehicles to licensed drivers, or one that prohibits discrimination against drivers on the basis of a disability—the California state law would be preempted and people with disabilities would be able to use an autonomous vehicle with Level 4 or higher technology.

C. Federal Guidelines and Legislation

While a federal law regulating autonomous vehicles does not yet exist, several recent developments, as well as significant federal attention from Congress and federal agencies, indicate that law and policy focusing on autonomous vehicles will be a key topic of national concern in 2018 and beyond. There are two main sources of federal policy and law regarding autonomous vehicles: Congress and the Department of Transportation (DOT), which is the federal agency that regulates transportation in the United States and oversees other transportation-related administrations, such as the NHTSA. In September 2016, the DOT, in conjunction with the NHTSA, released for the first time a "Federal Automated Vehicles Policy" ("2016 Policy"), which outlined the then-present state of automated vehicle technology, development, and regulatory tools available to federal and state

112. CAL. VEH. CODE § 38750(g).

113. *Automated Driving Systems 2.0: A Vision for Safety*, *supra* note 93, at 18–20.

governments.¹¹⁴ The DOT introduced the 2016 Policy as permissive, nonbinding agency guidance rather than binding agency rulemaking.¹¹⁵ This was done “in order to speed the delivery of an initial regulatory framework and best practices to guide manufacturers and other entities in the safe design, development, testing, and deployment of” automated vehicles.¹¹⁶ Accordingly, the model policy for states, as well as the recommendations for stakeholders involved in automated vehicle technologies, were permissive and did not establish any rules or regulations for autonomous vehicles at the local, state, or federal level. The 2016 Policy focused on four areas: “1. Vehicle Performance Guidance for Automated Vehicles,” which “outline[d] best practices for the safe pre-deployment design, development and testing” of autonomous vehicles; “2. Model State Policy,” which provided guidance for states creating autonomous vehicle laws “to ensure the establishment of a consistent national framework rather than a patchwork of incompatible laws;” “3. NHTSA’s Current Regulatory Tools,” which described the NHTSA’s power to regulate self-driving vehicles; and “4. New Tools and Authorities,” which detailed potential tools, authorities, and regulatory structures the NHTSA could implement to “aid the safe and appropriately expeditious deployment of new technologies.”¹¹⁷

Announcing the release of the Policy, the White House Office of the Press Secretary highlighted the potential impact that autonomous vehicles could have on “[t]ransforming personal mobility for millions of Americans who lack it today, including the elderly and those with disabilities.”¹¹⁸ The 2016 Policy included two recommendations regarding people with disabilities. First, it “encourage[d] manufacturers and other entities to consider the full array of users and their specific needs during the development process,” with a special focus on people “who may not be

114. *Federal Automated Vehicles Policy*, NHTSA 1, 6 (Sept. 2016), https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/federal_automated_vehicles_policy.pdf [<https://perma.cc/KAQ6-ZJ9G>].

115. *Id.*

116. *Id.*

117. *Id.* at 6–8.

118. *Fact Sheet: Encouraging the Safe and Responsible Deployment of Automated Vehicles*, WHITE HOUSE OFFICE OF THE PRESS SEC’Y (Sept. 19, 2016), <https://obamawhitehouse.archives.gov/the-press-office/2016/09/19/fact-sheet-encouraging-safe-and-responsible-deployment-automated> [<https://perma.cc/K2J5-3UK4>].

considered in conventional design programs.”¹¹⁹ Specifically, the 2016 Policy recommended that “[e]ntities . . . seek technical and engineering advice from members of the disabled community and otherwise engage with that community to develop designs informed by its needs and experiences,”¹²⁰ and instructed that “manufacturers and other entities should design their HMI [human machine interface] to accommodate people with disabilities (e.g., through visual, auditory, and haptic displays).”¹²¹

Second, the 2016 Policy recommended the inclusion of “[s]tate office(s) representing the aging and disabled communities”¹²² on state committees addressing autonomous vehicles, and stated that, at the federal level, the NHTSA would “explore potential activities . . . to convene relevant stakeholders” such as disability advocacy groups.¹²³ Thus, the 2016 Policy established the foundational recommendations of designing while keeping people with disabilities in mind and including them in policymaking at the state and federal level. Similar recommendations appear in Congress’s 2017 self-driving bills (discussed *infra*).

The following year, on September 12, 2017, with a new administration in the White House, the DOT and NHTSA released an updated version of the 2016 Policy, titled “Automated Driving Systems 2.0” (“2017 Policy”).¹²⁴ Intended to provide “clearer, more streamlined, less burdensome” guidance as well as “additional, more helpful information for States,”¹²⁵ the 2017 Policy is significantly shorter, abridged to 36 pages from the 2016 Policy’s 116 pages. The 2017 Policy removes mention of SAE Level 2 automation, instead focusing on Levels 3–5,¹²⁶ thereby following the trend exhibited by

119. *Federal Automated Vehicles Policy*, *supra* note 114, at 12.

120. *Id.* at 105.

121. *Id.* at 23.

122. *Id.* at 40.

123. *Id.* at 47.

124. *See generally Automated Driving Systems 2.0: A Vision for Safety*, *supra* note 93.

125. *Automated Driving Systems: The Topic*, NHTSA, <https://www.nhtsa.gov/manufacturers/automated-driving-systems#automated-driving-systems-topic> [<https://perma.cc/U5KY-73XF>].

126. *Automated Driving Systems: FAQ*, NHTSA, <https://www.nhtsa.gov/manufacturers/automated-driving-systems#automated-driving-systems-faq> [<https://perma.cc/8GJS-FCBH>].

major players in the autonomous vehicle development and manufacturing space to eschew lower levels of automation in favor of Level 4 automation or higher.¹²⁷ The 2016 Policy's recommendations for inclusion of people with disabilities in the autonomous vehicle design and policy process survived in the 2017 update.¹²⁸ However, the NHTSA added nothing further in regard to the needs of people with disabilities and merely recited the 2016 Policy's recommendations verbatim.¹²⁹

Most notably, the 2017 Policy trimmed "certain elements . . . that were speculative in nature and outside of NHTSA's authorities pertaining to privacy, registration and certification, and ethical considerations."¹³⁰ Omitted from the 2017 Policy are the sections included in the 2016 Policy detailing the NHTSA's existing and potential regulatory power over autonomous vehicles. The 2017 Policy consists of only two sections: "Voluntary Guidance for Automated Driving Systems (Voluntary Guidance)," which "offers a nonregulatory [sic] approach to automated vehicle technology safety," and "Technical Assistance to States, Best Practices for Legislatures Regarding Automated Driving Systems (Best Practices)."¹³¹ The Best Practices section broadly outlines the federal and state regulatory roles pertaining to autonomous vehicles (discussed in Part III, Section B regarding state licensing regulations), but omits the substantive examination of federal regulatory capabilities included in the 2016 Policy. Further evincing the NHTSA's intention to back away from asserting any sort of comprehensive federal regulatory policy for autonomous vehicles, the 2017 Policy also emphasizes the permissiveness of the recommendations by referring to an entire section of its contents as "Voluntary Guidance."¹³²

There are several theories as to why the Trump administration has taken a deregulatory approach with its 2017 Policy. First, analysts note that like the 2017 Policy, the Obama-era 2016 Policy was nonbinding because "Obama regulators worried that premature regulation could stifle innovation in self-driving technology," and thus the 2017 Policy "represents a

127. For complete discussion, see Part III, Section B, *supra*.

128. *See generally Automated Driving Systems 2.0: A Vision for Safety*, *supra* note 93.

129. *See Federal Automated Vehicles Policy*, *supra* note 114, at 10, 22, 27.

130. *Automated Driving Systems: FAQ*, *supra* note 126.

131. *Automated Driving Systems 2.0: A Vision for Safety*, *supra* note 93, at ii.

132. *Id.* at iv.

continuation of the approach taken by the Obama administration.”¹³³ Second, the DOT and the NHTSA’s step back from federal regulation also allows Congress more latitude to regulate the self-driving vehicle space. One week before the DOT and NHTSA released the 2017 Policy, the House passed the first-ever federal legislation of autonomous vehicles by unanimous voice vote.¹³⁴ A few weeks later, the Senate Committee on Commerce, Science, and Transportation introduced its own legislation of autonomous vehicles.¹³⁵ Hence, “Trump administration officials may be waiting to see if Congress changes the rules [the] NHTSA is enforcing before [the] NHTSA puts too much effort into tweaking its implementation of those rules.”¹³⁶

In early January 2018, United States Transportation Secretary Elaine Chao indicated that the DOT will not wait long for Congress when she announced the DOT’s plans for “the next generation of federal automated vehicle . . . policies in 2018.”¹³⁷ Chao stated that, in addition to the NHTSA, the forthcoming 2018 Policy will incorporate input from other administrations within the DOT, including the “Federal Motor Carrier Safety Administration (FMCSA), which oversees the operation of heavy-duty trucks and buses”; the “Federal Transit Administration (FTA), which oversees transit operations across the U.S.”; and the “Federal Highway Administration (FHWA), which will assess the infrastructure needs for AV implementation.”¹³⁸ Accordingly, the 2018 Policy “will expand the department’s role in the technology’s development from the pure regulation of AV components and into the implementation of automation across all modes of on-road transportation.”¹³⁹

133. Timothy B. Lee, *Trump’s Self-Driving Car Strategy: Don’t Regulate Self-Driving Cars*, ARSTECHNICA (Sep. 13, 2017, 4:30 AM), <https://arstechnica.com/tech-policy/2017/09/trumps-self-driving-car-strategy-dont-regulate-self-driving-cars> [<https://perma.cc/SQE5-FXMX>].

134. *Id.*

135. S. 1885, 115th Cong. (2017).

136. Lee, *supra* note 133.

137. Greg Rogers, *USDOT Moving Forward with AV Policy 3.0, Including Truck and Bus Automation*, ENO CENTER FOR TRANSP. (Jan. 12, 2018), <https://www.enotrans.org/article/usdot-moving-forward-av-policy-3-0-including-truck-bus-automation> [<https://perma.cc/2B95-QB5L>].

138. *Id.*

139. *Id.*

In order to gather information for the 2018 Policy, the DOT initiated a request for comments from the public on objectives related to implementing automated vehicle technologies in various transit sectors.¹⁴⁰ Several of these objectives are particularly relevant to the issue of accessibility of autonomous vehicles for people with disabilities. The DOT seeks comments about removing regulatory barriers for autonomous vehicles as well as about automating public transit, which could help increase transportation options for people with disabilities, provided the transit is accessible.¹⁴¹ The FTA is proactively examining “the implications of [autonomous vehicles] for other issues including ADA compliance” in preparation for the 2018 Policy.¹⁴² Since the NHTSA’s Federal Motor Vehicle Safety Standards (FMVSS), which regulate “the design, construction, and performance of motor vehicles in the United States,” were written for able-bodied human drivers, FMVSS will need to be revised “in order to allow for the manufacturing and operation of fully autonomous vehicles without human-facing controls (e.g., steering wheels and brake pedals).”¹⁴³ In her keynote speech at the annual North American International Auto Show in Detroit on January 14, 2018, Chao stated that the NHTSA will release “Automated Driving Systems 3.0” in the summer of 2018.¹⁴⁴ By that time, it is possible that the United States could have its first-ever autonomous vehicle statutory law from Congress.

Before that can happen, however, the Senate must pass its proposed legislation, called the American Vision for Safer Transportation Through Advancement of Revolutionary Technologies (the “AV START Act”), which would then need to be reconciled with a similar bill passed by the

140. *Id.*

141. *Id.*

142. Greg Rogers, *USDOT Preparing Sweeping AV Policy Update, 3.0, Including Trucks and Buses*, ENO CENTER FOR TRANSPORTATION (Nov. 3, 2017), <https://www.enotrans.org/article/usdot-preparing-sweeping-av-policy-update-3-0-including-trucks-buses> [https://perma.cc/XU4M-3QLQ].

143. Rogers, *supra* note 137; see also Greg Rogers, *5 Federal AV Policy Developments to Watch in 2018*, ENO CENTER FOR TRANSP. (Jan. 11, 2018), <https://www.enotrans.org/article/5-federal-av-policy-developments-watch-2018/> [https://perma.cc/YV7K-DQUX].

144. Paula Gardner, *U.S. ‘Looking for More Insight’ into Self-Driving Cars*, M. LIVE (Jan. 14, 2018), http://www.mlive.com/auto/index.ssf/2018/01/us_looking_for_more_insight_in.html [http://archive.is/8pG1U]; see also Greg Rogers, *Chao Reflects on Challenges for AVs at Detroit Auto Show*, ENO CENTER FOR TRANSP. (Jan. 19, 2018), <https://www.enotrans.org/article/chao-reflects-challenges-avs-detroit-auto-show> [http://perma.cc/3PU5-JGRZ].

House, called the SELF DRIVE Act.¹⁴⁵ On September 6, 2017, the House passed H.R. 3388, the Safely Ensuring Lives Future Development and Research in Vehicle Evolution (SELF DRIVE) Act, by unanimous vote.¹⁴⁶ The bill, created by the House's Energy and Commerce Committee, focuses on improving safety standards for autonomous vehicles as well as clarifying the roles of the federal government and states in the regulation of self-driving vehicles.¹⁴⁷ The division of duties described in the SELF DRIVE Act parallels those established by the NHTSA and listed in the 2016 and 2017 NHTSA Policies, with states responsible for licensing and registration, and the NHTSA responsible "for regulating . . . design, construction, and performance of self-driving cars."¹⁴⁸

Disability advocates met with the Energy and Commerce Committee when they developed the legislation, and the Committee's website highlights ways that the bill "supports greater mobility for all Americans."¹⁴⁹ Section 9 of the SELF DRIVE Act, titled "Highly Automated Vehicle Advisory Council," directs the Secretary of Transportation to establish such a Council within the NHTSA, and states that

[t]he Council may form subcommittees as needed to undertake information gathering activities, develop technical advice, and present best practices or recommendations to the Secretary regarding—(1) advancing mobility access for the disabled community with respect to the deployment of automated driving systems to identify impediments to their use and ensure an

145. Jon Fingas, *Senate Committee Sends Self-Driving Car Bill to Floor for a Vote*, ENGADGET (Oct. 4, 2017), <https://www.engadget.com/2017/10/04/senate-panel-approves-self-driving-car-bill> [<https://perma.cc/7VZ6-GQUL>].

146. SELF DRIVE Act, H.R. 3388, 115th Cong. (2017–2018), <https://www.congress.gov/bill/115th-congress/house-bill/3388/text> [<https://perma.cc/TV2S-EA98>]; see also *H.R. 3388–SELF DRIVE Act*, ENERGY AND COMMERCE COMM., <https://energycommerce.house.gov/wp-content/uploads/2017/08/08-30-17-SELF-DRIVE-Act-DCCP-One-Pager.pdf> [<https://perma.cc/2VQA-7F6N>].

147. *H.R. 3388–SELF DRIVE Act*, *supra* note 146.

148. *The SELF-DRIVE Act*, ENERGY AND COMMERCE COMM., <https://energycommerce.house.gov/selfdrive> [<https://perma.cc/2STP-5XTG>].

149. "The committee held over 250 meetings to develop this legislation with a wide range of stakeholders including manufacturers, suppliers, tech companies, insurance providers, state government officials, seniors groups, and disability advocates." *Id.*

awareness of the needs of the disabled community as these vehicles are being designed for distribution in commerce.¹⁵⁰

The permissive language of the section—“may form . . . as needed”—indicates that the establishment of such subcommittees will not be required by law, which could mean that though the needs of the disability community are considered on paper, they may not be provided for in practice.¹⁵¹

The AV START Act, in contrast, addresses the needs and concerns of people with disabilities more comprehensively and forcefully. On October 4, 2017, the Senate Commerce Committee passed S. 1885, AV START Act,¹⁵² which advanced the Act to the Senate floor for a full vote sometime in 2018.¹⁵³ If the Act passes in the Senate, it will need to be synthesized and reconciled with the House’s SELF DRIVE Act before being sent to the President to be signed into law.¹⁵⁴ The Act explicitly references the needs of people with disabilities several times and ameliorates, and even resolves, some potential licensing and design barriers to use by people with disabilities.¹⁵⁵

Section 3 of the Act deals with the Act’s relationship to other laws, with section 3(b)(1) specifically addressing federal preemption of state laws regarding design standards. The state and federal regulatory roles outlined in the AV START Act parallel the delineations included in both the 2016 and 2017 NHTSA Policies, as well as in the SELF DRIVE Act.¹⁵⁶ For example, section 3(b)(1) prohibits any state from regulating “the design,

150. H.R. 3388.

151. *Id.*

152. S. 1885.

153. The AV START Act stalled on the Senate floor after widespread speculation that it would be passed by the end of 2017, and the bill’s lead, Senate Commerce, Science, and Transportation Committee Chairman John Thune (R-S.D.), stated that the Senate would not vote on the Act until 2018. Shaun Courtney, *Senate Won’t Vote on Self-Driving Car Bill in 2017: Thune*, BLOOMBERG NEWS (Dec. 20, 2017), <https://www.bna.com/senate-wont-vote-n73014473452> [https://perma.cc/KP3G-PPDY].

154. Fingas, *supra* note 145.

155. *See* S. 1885 at §§ 3.9, 10, 12.

156. *Id.* at § 3.

construction, or performance of” autonomous vehicles.¹⁵⁷ This section serves the interests of people with disabilities because it helps ensure that the design of self-driving vehicles is consistent across the U.S. and that people with disabilities are not precluded from accessing self-driving technologies due to incompatible design regulations across states.

Section 3 of the AV START Act goes further than the SELF DRIVE Act to secure the rights of Americans with disabilities to use self-driving vehicles by explicitly “preempt[ing] any state regulation governing operator’s licenses for HAVs [highly automated vehicles] that discriminates on the basis of disability.”¹⁵⁸ Section 3(b) states that “a State may not issue a motor vehicle operator’s license for the operation or use of a dedicated highly automated vehicle in a manner that discriminates on the basis of disability (as defined in section 3 of the Americans with Disabilities Act of 1990 (42 U.S.C. 12102)).”¹⁵⁹ If the AV START Act becomes law, the potential licensing problem for people with disabilities would be solved before becoming an issue. Under section 3(b)’s preemption clause, states would not be able to enact licensing schemes that discriminate on the basis of disability, which would be an excellent step forward in ensuring equal access to self-driving vehicles for people whose disabilities preclude them from operating a motor vehicle.¹⁶⁰

Section 9 of the Act requires manufacturers of automated vehicles to “provide a safety evaluation report . . . that describes how the manufacturer is addressing the safety of such vehicle or system” across several subject areas.¹⁶¹ Per section 9(b)(4), manufacturers must report information regarding the use of the vehicle’s HMI, which informs “the human driver or operator about whether the automated driving system is functioning properly.”¹⁶² Specifically, manufacturers must report on the usability of the vehicle’s HMI “by people with disabilities through visual, auditory, or haptic

157. *Id.* at § 3(a)(1).

158. S. Rep. No. 115-187, at 6 (2017).

159. S. 1885 at § 3(b).

160. *Id.*

161. *Id.* at § 9.

162. *Id.* at § 9(b)(4).

displays, or other methods.”¹⁶³ This single, short sentence describing the requirement obscures its potentially monumental implications. In order to comply with the law, manufacturers must take into consideration the needs of users with disabilities while interacting with the HMI. Considering these needs will encourage manufacturers to design their HMIs to accommodate and adapt to users with various types of disabilities.

Section 10 of the Act further demonstrates the Senate’s intent to facilitate equal access to self-driving technologies for all Americans. The section requires the Secretary of Transportation to establish a “Highly Automated Vehicles Technical Committee . . . to provide a forum for stakeholders to discuss, prioritize, and make technical recommendations for highly automated vehicle and automated driving system safety.”¹⁶⁴ The committee must study issues related to accessibility for people with disabilities,¹⁶⁵ and section 10 emphasizes that the committee

shall establish a working group to develop voluntary best practices regarding highly automated vehicle accessibility for people with physical, sensory, or other disabilities, including for those who rely on mobility devices. Such best practices shall address the physical accessibility of highly automated vehicles and human-machine interface accessibility through visual, auditory, or haptic displays or other methods. The working group shall include representatives from national organizations representing individuals with disabilities.¹⁶⁶

Section 12 also requires that the Secretary of Transportation establish another working group focused on educating the public about automated driving systems, which must include representatives from “national cross disability organizations.”¹⁶⁷ Together, the two working groups will help ensure that the interests of people with disabilities are represented while self-driving technologies, designs, and standards are developed and that members

163. *Id.*

164. *Id.* at § 10.

165. *Id.* at § 10(c)(2)(F).

166. *Id.* at § 10(c)(5)(B).

167. *Id.* at § 12(d)(1)(A)(xii).

of the disability community are aware of the progress being made and challenges encountered.

IV. THE ROAD AHEAD: IMPACT ANALYSIS AND RECOMMENDATIONS

Estimates of when self-driving vehicles will be available to the public range from several years to several decades.¹⁶⁸ This lag from current-day prototypes to widespread implementation presents an opportunity for the government, autonomous vehicle manufacturers, and the public to ensure that the development of autonomous technologies is inclusive of the widest array of abilities possible.¹⁶⁹ It will take comprehensive planning and cooperation from these stakeholders to ensure that the needs of people with disabilities are represented and incorporated into the development of autonomous vehicle technologies during these formative years. The potential barriers to access of self-driving vehicles by people with disabilities can be ameliorated, and in some cases resolved, by intentional policy, mindful and inclusive design, and involvement of members of the disability community.

A. *AV START Act Paves the Way*

The sooner that individuals with disabilities can access safe, Level 4 or higher self-driving technologies, the sooner they can participate more fully in employment, social, travel, and community opportunities. The current administration's deregulatory stance on autonomous vehicles could be a boon for people with disabilities, as it allows companies working in the self-driving technologies space greater freedom to test their autonomous vehicles and to expedite their availability to the public. Further, Congress's inclusive approach to autonomous vehicle legislation provides an excellent foundation for people with disabilities seeking access to self-driving technologies. The House's SELF DRIVE Act contains a baseline consideration of the needs of people with disabilities, and the Senate's AV START Act more holistically addresses the varied needs of this population. The AV START Act, with its comprehensive consideration of the needs of people with disabilities, is the most viable path forward for federal autonomous vehicle policy. If the AV

168. Sarah Kessler, *A Timeline of When Self-Driving Cars Will Be on the Road, According to the People Making Them*, QUARTZ (Mar. 29, 2017), <https://qz.com/943899/a-timeline-of-when-self-driving-cars-will-be-on-the-road-according-to-the-people-making-them> [http://perma.cc/J4F8-QD5S].

169. *Id.*

START Act passes, its provisions mitigate potential barriers to access for people with disabilities, such as cost, licensing issues, and design inaccessibility. The AV START Act, with its prohibition on discrimination against people with disabilities in state autonomous vehicle licensing schemes, effectively removes the licensing issue from the equation. If passed, people with disabilities will not have to fight state laws barring them from access and can instead focus their advocacy efforts on other aspects of self-driving vehicle policy and implementation.

The AV START Act also has a promising application to public and private transportation networks and their use of self-driving vehicles. Per the AV START Act, the design and construction of self-driving vehicles would need to meet federal standards, the requirements of which include consideration of the user experience of individuals with disabilities.¹⁷⁰ As seen in the Uber and Lyft accessibility cases and the Chariot van settlement, the law is trending towards requiring that private TNCs comply with Title III of the ADA as private entities performing a public service¹⁷¹ or if they purchase any new vans for their fleets.¹⁷² Decrees from courts and demands from the Department of Justice that TNCs comply with the ADA will make it less likely that TNCs would be able to exploit ADA loopholes, such as claiming to be a technology company instead of a transportation company¹⁷³ or buying inaccessible used vans.¹⁷⁴ TNCs' compliance with the ADA would thereby enable people with disabilities to access TNC services more readily and with greater ease, which would increase transportation opportunities for people with disabilities.

Additionally, any autonomous public transportation networks paid for by state governments would need to deploy accessible vehicles under Title

170. See S. 1885 115th Cong. §§ 9(b)(4), 10(c)(5)(B) (2017).

171. See Bryan Casey, Note, *Uber's Dilemma: How the ADA May End the on Demand Economy*, 12 U. MASS. L. REV. 126 (2017).

172. See Bryan Casey, Essay, *A Loophole Large Enough to Drive an Autonomous Vehicle Through*, 69 STAN. L. REV. ONLINE 73, 80 (2016); see also *Settlement Agreement Under the Americans with Disabilities Act Between the United States of America and Chariot Transportation, Inc.*, USAO # 2016V00666, DJ # 202-11-362, <https://www.justice.gov/usao-ndca/press-release/file/1009126/download> [<https://perma.cc/GVB6-BSBF>] [hereinafter *Settlement Agreement*].

173. Casey, *supra* note 171, at 161–62.

174. *Settlement Agreement*, *supra* note 172.

II of the ADA.¹⁷⁵ In the future, as public and private transportation networks begin widespread use of autonomous vehicles in their fleets,¹⁷⁶ the ADA could be used in tandem with the AV START Act to enforce the right of people with disabilities to experience “full and equal enjoyment” of transportation network services.¹⁷⁷

The design specifications and reporting requirements included in the AV START Act would directly influence design decisions made by autonomous vehicle manufacturers. Since the Act requires autonomous vehicle manufacturers to provide reports on the usability of their vehicles’ physical environment as well as its HMI by people with disabilities, manufacturers will be forced to design with people with disabilities in mind.¹⁷⁸ Manufacturers could use principles of universal design to accommodate the broadest scope of users and thereby fulfill the requirements of the law as well as the needs of people with disabilities.¹⁷⁹ Universal design is “the design of products, environments, . . . and services to be usable by all people, to the greatest extent possible, without the need

175. Title II of the ADA mandates that people with disabilities cannot “be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity.” 42 U.S.C. § 12132 (2017); *see also* PETER BLANCK ET AL., *DISABILITY CIVIL RIGHTS LAW AND POLICY* 333–34 (3d ed. 2014).

176. General Motors, Waymo, Lyft, and Uber have all introduced self-driving vehicles into their transportation networks for testing by way of limited public use. *See* Alex Davies, *Google’s Self-Driving Car Company Is Finally Here*, WIRED (Dec. 13, 2016, 12:30 PM), <https://www.wired.com/2016/12/google-self-driving-car-waymo> [<https://perma.cc/D46N-PPJN>]; *see also* Sam Abuelsamid, *Waymo Launches Early Rider Program, Expands Self-Driving Fleet with Fiat Chrysler*, FORBES (April 25, 2017, 8:34 AM) <https://www.forbes.com/sites/samabuelsamid/2017/04/25/waymo-launches-early-rider-program-expands-self-driving-fleet-with-fiat-chrysler/#42323c6ad1a> [<https://perma.cc/HB5Y-QTXD>]; Marco della Cava, *Lyft Ups Ante on Uber, Starts Self-Driving Car Division*, USA TODAY (July 21, 2017, 10:43 AM), <https://www.usatoday.com/story/tech/2017/07/21/lyft-ups-ante-uber-starts-self-driving-car-division/498233001> [<https://perma.cc/8SSL-7XE2>].

177. 42 U.S.C. § 12184(a) (2017).

178. S. 1885 § 9(b)(4).

179. “Many disability advocates promote a universal design philosophy and suggest this standard remain the guiding principle for developers of autonomous vehicle technology to the greatest extent possible.” HENRY CLAYPOOL ET AL., *RUDERMAN FAMILY FOUNDATION AND SECURING AMERICA’S FUTURE ENERGY, THE RUDERMAN WHITE PAPER: SELF-DRIVING CARS: THE IMPACT ON PEOPLE WITH DISABILITIES* 1, 26–27 (2017), http://rudermanfoundation.org/white_papers/self-driving-cars-the-impact-on-people-with-disabilities [<https://perma.cc/L3V4-5GDPJ>].

for adaptation or specialized design.”¹⁸⁰ The language of the AV START Act reflects this intention since it accounts for the design of both the physical environment inside of the vehicle as well as the HMI technology that passengers use to interact with the vehicle.¹⁸¹

If courts determine that Title III of the ADA applies to TNCs as private entities performing a public service, the ADA could be applied to reinforce the design standards outlined in the AV START Act. Title III would require TNCs to “make reasonable modifications”¹⁸² to their “policies, practices, and procedures” so that their autonomous vehicles do not have any barriers to “effective communication with the disabled” or any “architectural and communications barriers” that would hinder “full and equal enjoyment” by people with disabilities.¹⁸³ Autonomous public transportation networks would be subject to similar requirements under Title II of the ADA.¹⁸⁴ Accordingly, both public and private transportation networks would need to deploy self-driving vehicles accessible to people with various types of disabilities so that individuals with mobility, visual, cognitive, or other impairments could have a “meaningful[] and comparable opportunity to engage in [ridership] . . . as people without disabilities [would] enjoy.”¹⁸⁵

In a self-driving vehicle deployed as part of a transportation network, this could mean an interior environment that is adaptable to the needs of a variety of riders, such as having a hideaway built-in ramp and seats that fold down flat so that a rider who uses a wheelchair can roll directly into the

180. *Article 2—Definitions*, U.N., <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-2-definitions.html> [<https://perma.cc/48DV-H7ZL>].

181. S. 1885 § 10(c)(5)(B).

182. 42 U.S.C. § 12182(b)(2)(A)–(C) (2017).

183. *Nat’l Fed’n of the Blind v. Target Corp.*, 452 F. Supp. 2d 946, 951 (N.D. Cal. 2006) (citing 42 U.S.C. § 12182(b)(2)(A)–(C)).

184. 42 U.S.C. § 12132; *see also* BLANCK ET AL., *supra* note 175, at 333–34.

185. Legal scholar Peter Blanck writes that, in the context of online services, “[d]eterminations about the full and equal enjoyment of online services – web equality, comparable use with reasonable modification – involve multi-factor considerations involving web content owners and designers, providers of public and private online services, interpretations of functional equality by policymakers and courts, and, of course, by the users of services themselves. The calculus requires consideration of what inclusion and integration implies for people with disabilities in general.” *Cf.* PETER BLANCK, *EQUALITY: THE STRUGGLE FOR WEB ACCESSIBILITY BY PERSONS WITH COGNITIVE DISABILITIES* 38 (2014).

vehicle.¹⁸⁶ An adaptable interior environment could also mean that the HMI passengers interact with when inside the vehicle could be controlled using voice commands for someone with a visual disability, or by touchscreens and text for an individual with an auditory or speech impairment.¹⁸⁷ All the user would need to do is to communicate with the HMI before or upon entering the vehicle, tell it what kind of interface the user requires, and the vehicle would initiate the interface required by the user.¹⁸⁸ Ideally, these modifiable interfaces would be built into all autonomous vehicles, existing within the native software of the vehicle and capable of being implemented on demand whenever a user needed.¹⁸⁹ “By incorporating accessibility in the front end of development, the [disability] community will not be forced to fight for accessibility on the back-end,” and such an integrated standard would also help eliminate the need for costly retrofitting, thereby reducing expenses for consumers with disabilities.¹⁹⁰ Since autonomous vehicles are still in the prototyping and testing stages of development, the possibilities for creating a flexible riding experience “usable by all people, to the greatest extent possible, without the need for adaptation or specialized design,” are virtually unlimited.¹⁹¹

Though the handoff problem led to an initial reassessment of the design of self-driving cars, manufacturers will also need to think beyond the no steering wheel or pedals models pioneered by Waymo and General Motors.¹⁹² One secretive Silicon Valley startup, Zoox, is doing just that by

186. See CLAYPOOL ET AL., *supra* note 179, at 24.

187. See *id.* at 24–25.

188. See *id.*

189. “A universally designed vehicle would encompass the needs of all individuals, including those with any type of disability. Under such a design, vehicles would have alterable user interfaces to accommodate its rider with the touch of a button or a voice command.” *Id.* at 26.

190. *Id.*

191. Article 2—Definitions, *supra* note 180.

192. Alex Davies, *The Very Human Problem Blocking the Path to Self-Driving Cars*, WIRED (Jan. 1, 2017, 7:00 AM), <https://www.wired.com/2017/01/human-problem-blocking-path-self-driving-cars> [<https://perma.cc/WL6U-WMH8>].

designing an autonomous vehicle that reconsiders car design altogether.¹⁹³ Zoox's prototype "assumes self-driving abilities from the get-go," meaning that the vehicle will have at least Level 4 automation and, accordingly, no steering wheel or pedals inside of the vehicle.¹⁹⁴ The seats of the prototype face one another, as in a limousine, and its doors are rear-hinged and open outwards to allow access to the entire interior of the vehicle.¹⁹⁵ Unencumbered by rows of interior seating or front-hinge doors that provide narrow entry, a person who uses a wheelchair could easily enter the vehicle using a retractable ramp. This sort of open vehicle environment provides a flexible space that could be adapted for use by people with different types of disabilities.

In order to transform the prototypes of today into the accessible autonomous vehicles of the future, people with disabilities will need to be involved in the conception, testing, and implementation of self-driving vehicles. The AV START Act mandates the involvement of people with disabilities and autonomous vehicle manufacturers in policymaking decisions at the federal level.¹⁹⁶ The working group presents an opportunity for legislators, manufacturers, and people with disabilities to collaborate in establishing best practices for the physical and HMI accessibility of self-driving vehicles. Input from individuals representing different segments of the disability community will be crucial in ensuring that the proposed best practices take into account the diverse needs of the disability community. Working together with lawmakers and manufactures on a federal committee makes it more likely this will be the case.¹⁹⁷ Per the AV START Act, representatives from "national cross disability organizations" must also be appointed to the Secretary's educational working group, along with

193. Ashlee Vance, *The First Look Inside Zoox's Mysterious Robo-Taxi*, BLOOMBERG (Nov. 29, 2017, 5:23 AM), <https://www.bloomberg.com/news/articles/2017-11-29/the-first-look-inside-zoox-s-mysterious-robo-taxi> [<https://perma.cc/U7L5-KFMU>].

194. *Id.*

195. *Id.*

196. The Act requires that the Secretary of Transportation establish a working group comprised of "representatives from national organizations representing individuals with disabilities" as well as manufacturers, as part of the Secretary's Highly Automated Vehicles Technical Committee. *See* S. 1885.

197. Section 10 of the Act requires the "working group to develop voluntary best practices regarding highly automated vehicle accessibility for people with physical, sensory, or other disabilities, including for those who rely on mobility devices." *Id.* at § 10(c)(5)(B).

representatives from TNCs and autonomous vehicle manufacturers, thereby creating another opportunity for these stakeholders to work together to create inclusive policies and educate one another and the public.¹⁹⁸ The working groups mandated by the AV START Act will help “the broader disability community coalesce[] around a constrained set of policy recommendations,” which is crucial “to ensure hurdles to both accessibility and social inclusion are overcome when deploying autonomous vehicles.”¹⁹⁹

Additionally, the DOT’s request for public comment in preparation for the 2018 NHTSA Policy calls for input from anyone who wishes to contribute, which provides individuals with disabilities an opportunity to make their voices heard, regardless of whether they are part of a national disability organization.²⁰⁰ In particular, the disability community, in response to the FTA’s request for comment, could offer vital insights regarding how the FMVSS should be updated. Since the standards, which regulate “the design, construction, and performance of” traditional motor vehicles, were created for able-bodied human drivers, people with disabilities can share their perspectives on how FMVSS should be rewritten for an accessible, inclusive, and fully autonomous future.²⁰¹ The disability community could also offer valuable perspectives regarding the DOT’s announcement that it will increase its regulatory involvement in autonomous vehicle technology development in infrastructure and mass transit.²⁰² People with disabilities still routinely encounter barriers when accessing public transportation options and engaging in the transportation infrastructure.²⁰³

198. *Id.* at § 12(d)(1)(A)(i–xii).

199. CLAYPOOL ET AL., *supra* note 179, at 24.

200. *NHTSA Request for Comments on Removing Regulatory Barriers for Automated Vehicles*, U.S. DEP’T OF TRANSP. (Jan. 10, 2018), https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/303136/nhtsa-2018-0009_0.pdf [<https://perma.cc/4C3C-L25D>].

201. Greg Rogers, *5 Federal AV Policy Developments to Watch in 2018*, ENO CENTER FOR TRANSP. (Jan. 11, 2018), <https://www.enotrans.org/article/5-federal-av-policy-developments-watch-2018/> [<https://perma.cc/YV7K-DQUX>].

202. Greg Rogers, *USDOT Moving Forward with AV Policy 3.0, Including Truck and Bus Automation*, ENO CENTER FOR TRANSP. (Jan. 12, 2018), <https://www.enotrans.org/article/usdot-moving-forward-av-policy-3-0-including-truck-bus-automation> [<https://perma.cc/2B95-QB5L>].

203. “For those in our society that cannot drive a car, the current transportation infrastructure makes it almost impossible for these individuals to realize the full promise of the ADA.” CLAYPOOL ET AL., *supra* note 179, at 7, 11–14.

Therefore, the DOT's request for comment presents an opportunity for members of the disability community affected by inaccessible transportation to encourage federal agencies to consider how to incorporate accessible technology into the nation's public transportation infrastructure.

On the state level, people with disabilities can advocate for representation and involvement in creating state autonomous vehicle policy. In 2016, a citizen-organized initiative called Self-Driving MN drafted legislation that "promote[d] the development of autonomous vehicle technology to provide equitable, accessible, and affordable transportation independence for Minnesotans with disabilities and older Minnesotans who are currently unable to drive."²⁰⁴ The bill, which would have established "a task force and technology demonstration project to promote and support the development of autonomous vehicle technology" within the state, had bipartisan support²⁰⁵ and survived several committees before ultimately being rejected.²⁰⁶ In California, where there is a more established autonomous vehicle policy than most other states, disability advocates could adopt a similar tactic and draft a bill mandating the inclusion of people with disabilities in state autonomous vehicle policy decisions.²⁰⁷ There are almost 300 autonomous vehicles with DMV permits currently being tested on California roads by over fifty companies, and California provides "a prime proving ground" for autonomous vehicle testing "given its size as the most populous state, its clout as the nation's biggest car market and its longtime role as a cultural trendsetter."²⁰⁸ Under the CA DMV's 2018 regulations, TNCs Uber, Lyft, and Waymo will be able to offer rides in driverless

204. *TIM's Bill (Transportation Independence for Many) S.F. 2569/H.F. 3325, SELF-DRIVING MN*, http://www.senate.mn/committees/2015-2016/3067_Committee_on_Transportation_and_Public_Safety/TIM's%20Bill%20Briefing%20Memo.pdf [https://perma.cc/7ZHS-VZ5M]; see also CLAYPOOL ET AL., *supra* note 179, at 28.

205. *Id.*

206. CLAYPOOL ET AL., *supra* note 179, at 28.

207. Danielle Lenth, *Chapter 570: Paving the Way for Autonomous Vehicles*, 44 MCGEORGE L. REV. 787, 789 (2013).

208. Andrew Hawkins, *California Green Lights Fully Driverless Cars for Testing on Public Roads*, THE VERGE (Feb. 26, 2018), <https://www.theverge.com/2018/2/26/17054000/self-driving-car-california-dmv-regulations> [https://perma.cc/G4M5-WW4Z]. Fifty-two companies have obtained DMV permits as of April 1, 2018. *Testing of Autonomous Vehicles with a Driver*, CA DMV, <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous+/testing> [https://perma.cc/YBU4-PYVV].

autonomous vehicles,²⁰⁹ and manufacturers like General Motors can begin preparing for the future sale of self-driving vehicles.²¹⁰

B. “*The Future is Accessible*” with Universal Design²¹¹

In order to fulfill the inclusive, universal design-oriented requirements of the AV START Act, manufacturers should involve people with disabilities in their design prototyping, testing, and implementation. Including the perspectives of individuals with a range of abilities will be essential to creating autonomous vehicles usable by the widest range of people. Some manufacturers already include people with disabilities in the development process.²¹² When Google introduced its self-driving car to the public in 2012, it did so with a video of Steve Mahan, who is blind, enjoying an afternoon out in the driver’s seat.²¹³ Mahan used the self-driving vehicle to collect his dry cleaning and pick up a meal from Taco Bell.²¹⁴ About the experience, Mahan stated that “where this would change my life is to give me the independence and the flexibility to go to the places I both want to go and need to go when I need to do those things,”²¹⁵ and “highlighted that the most important benefit a self-driving car could offer him was the possibility—and the dignity—to perform his daily errands on his own

209. Russ Mitchell, *California Loosens Rules for Driverless Cars, Clearing the Way for Robot Taxis*, L.A. TIMES (Feb. 28, 2018, 5:00 AM), <http://www.latimes.com/business/autos/la-fi-hy-new-california-driverless-regulations-20180228-story.html> [<https://perma.cc/Z5M6-R3YM>].

210. *Correction: Driverless Cars-California Story*, U.S. NEWS & WORLD REPORT (Feb. 27, 2018, 4:06 PM), <https://www.usnews.com/news/business/articles/2018-02-26/california-oks-driverless-car-testing-without-backup-drivers> [<http://archive.is/RecSS>].

211. “The Future is Accessible,” an online disability movement created by disability activist Annie Segarra, is known for its slogan t-shirts and its hashtag, #TheFutureisAccessible. Segarra says that “‘The Future is Accessible’ is a call to prioritize equity and accessibility, to remember the disabled people in our communities, to integrate them, [and] to uplift them and their narratives.” Bonfire Blog, *Interview: Annie Segarra, The Future is Accessible*, BONFIRE (May 30, 2017), <https://blog.bonfire.com/interview-annie-segarra-future-accessible> [<https://perma.cc/K4V7-QWNA>].

212. Google, *Self-Driving Car Test: Steve Mahan*, YOUTUBE (Mar. 28, 2012), <https://www.youtube.com/watch?v=cdgQpa1pUUE>.

213. *Id.*

214. *Id.*

215. *Id.*

schedule.”²¹⁶ When Google formally introduced Waymo in late 2016, it revealed that in October 2015, Mahan was the first member of the public to ride in its “self-driving pod-like prototype, alone and on public roads” with no steering wheel or pedals.²¹⁷ Mahan’s multi-year involvement with Google’s testing of its self-driving vehicles shows the company’s desire to understand the needs of riders with disabilities and its commitment to working with individuals with different abilities to create inclusive autonomous technology.

Ralph Teetor used his experience as a person with a disability to create cruise control, a revolutionary technology that streamlined the mundane task of driving, even though he did not operate a vehicle.²¹⁸ Manufacturers like Waymo can utilize the input of individuals like Mahan and Teetor to better understand the needs and preferences of people with disabilities as well as to incorporate their perspectives on transportation into technology. When society “design[s] for disability first, we often stumble upon solutions that are not only inclusive, but also are often better than when we design for the norm.”²¹⁹ This in turn “means that the energy it takes to accommodate someone with a disability can be leveraged, molded and played with as a force for creativity and innovation.”²²⁰

The able-bodied, inaccessible vehicle designs of today have blocked access to transportation for many people with disabilities for over a

216. CLAYPOOL ET AL., *supra* note 179, at 20.

217. “After eight years and 2 million miles, the tech giant is taking its self-driving car project out of X, its division dedicated to moonshots like internet-slinging balloons and delivery drones. Starting today, the drive for autonomy is called Waymo, a standalone company under the Alphabet corporate umbrella.” Davies, *supra* note 176.

218. See Alanis King, *The Blind Origins of Cruise Control*, JALOPNIK (Feb. 7, 2016, 9:00 AM), <http://jalopnik.com/the-blind-origins-of-cruise-control-1757009266> [<https://perma.cc/4YCK-MKQV>]; see also David Phillips, *U.S. Patent Issued for First Modern Cruise Control Device*, AUTO NEWS (Aug. 22, 2017, 12:40 PM), <http://www.autonews.com/article/20170822/CCHISTORY/170829910> [<https://perma.cc/G3CY-U4AZ>].

219. Elise Roy, *When We Design for Disability, We All Benefit*, TEDxMIDATLANTIC (Sept., 2015), https://www.ted.com/talks/elise_roy_when_we_design_for_disability_we_all_benefit/transcript [<https://perma.cc/6VBG-C6KJ>]. Elise Roy is a deaf human-centered designer, former attorney, and human rights advocate who work focuses on applying the principles of universal design and design thinking to achieve inclusive design for people with a range of abilities. See *Elise Roy*, TED, https://www.ted.com/speakers/elise_roy [<https://perma.cc/8YT7-A68M>]; see also *About Elise*, ELISE ROY, <https://www.eliseroy.org/about-elise> [<https://perma.cc/5RHD-FQRW>].

220. Roy, *supra* note 218.

century,²²¹ and “there is no guarantee that autonomous vehicles will be accessible to the broader disability community when they are deployed.”²²² “In the first automobile revolution, the technology drove the decisions made by policymakers, manufacturers, and the general public,” but now, in the autonomous vehicle revolution, these stakeholders can work together to create policies and technologies that address the diverse, complex transportation needs of all Americans before self-driving vehicles are widely deployed.²²³

The AV START Act recognizes the importance of including people with disabilities in this transportation revolution, and the disability community can further promote the initial recommendations and requirements for inclusion contained within the Act by use of grassroots organization and unified advocacy at the state and federal levels.²²⁴ Autonomous vehicle manufacturers should follow Waymo’s lead and collaborate with “a diverse range of members of the disability community” during the prototyping and testing stage of development and should continue to dialogue with the community during and after widespread deployment of self-driving technologies and systems.²²⁵ The House and Senate must work together to pass the AV START Act during 2018 but cannot stop there. Members of Congress and federal agencies such as the NHTSA need to continue to proactively seek out accessible design, policies, and solutions to address the diverse transportation needs of all Americans and ensure that autonomous transportation “products, environments, . . . and services [will] be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”²²⁶ The journey to fully autonomous transportation in America will be arduous, but the government, manufacturers, and people with disabilities can work together to make

221. “In the first automobile revolution . . . cars were designed primarily for able-bodied people – designing vehicles to accommodate people with disabilities was an afterthought.” Rogers, *supra* note 201.

222. CLAYPOOL ET AL., *supra* note 179, at 23.

223. Rogers, *supra* note 201.

224. CLAYPOOL ET AL., *supra* note 179, at 28–29.

225. CLAYPOOL ET AL., *supra* note 179, at 30–31.

226. *Article 2—Definitions*, *supra* note 180.

intentional and inclusive choices today that will pave the way for an accessible future for all.

V. CONCLUSION

Due to inaccessible transportation and lack of transportation options, many of the more than fifty-seven million Americans with disabilities still experience significant barriers to full and equal access to and enjoyment of educational, employment, civic, social, and community opportunities guaranteed under the ADA.²²⁷ Though autonomous vehicle technologies remain primarily in the prototyping and testing phase, autonomous transportation has the potential to facilitate monumental opportunities for individuals with disabilities for whom America's current transportation infrastructure is inaccessible. However, many aspects of this rapidly developing area of law remain unclear, especially regarding the rights of people with disabilities to participate in America's autonomous vehicle future. The ADA will continue to remain implicated in legal and policy decisions about America's transportation future and can help ensure that the rights of Americans with disabilities are enforced so that all Americans can avail themselves of accessible transportation, regardless of disability. Lawmakers, private companies, and the disability community all play a role in creating and implementing an accessible autonomous vehicle future. It is crucial that these stakeholders work together to design vehicles, infrastructure, and regulations that enable access to autonomous technologies for as many Americans as possible. Although many aspects of America's forthcoming autonomous vehicle revolution remain uncertain, it is possible, and indeed, imperative, that the future of transportation be accessible to all Americans.

227. See HENRY CLAYPOOL ET AL., RUDERMAN FAMILY FOUNDATION AND SECURING AMERICA'S FUTURE ENERGY, THE RUDERMAN WHITE PAPER: SELF-DRIVING CARS: THE IMPACT ON PEOPLE WITH DISABILITIES 1, 24 (2017), http://rudermanfoundation.org/white_papers/self-driving-cars-the-impact-on-people-with-disabilities [<https://perma.cc/L3V4-5GDP>].