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U.S. Micromobility Law (Major Road Work Ahead)*

Peter W. Martin†

Over the past decade electrically powered bicycles, stand-up scooters, skateboards, and more have burst onto the nation’s streets and sidewalks. This blossoming of “micromobility” has taken place within physical and legal infrastructures ill-prepared for the change. Indisputably, most of the new types of individual motorized mobility fell outside established vehicle categories. The literal terms of existing law banned their use on all public rights of way, whether roadway, bicycle path, or sidewalk.

This paper surveys the ad hoc, largely industry-driven, and still-distressingly-incomplete adjustment of U.S. vehicle and traffic laws to accommodate and regulate the rapid spread of electrically-powered personal mobility devices. It also identifies some of the social costs of lawmakers’ ignoring the phenomenon.

I. Introduction

The invention and development of the lithium-ion battery not only enabled a radical redefinition of the phone and an explosion of portable electronic devices, it fueled enormous innovation in the field of personal transportation. Most conspicuously it led to a new generation of electrically-powered automobiles, hybrid and plug-in. But it also made possible a diversity of smaller electric vehicles, some completely novel, others of types previously propelled solely by human energy and gravity. Over the past decade electrically powered bicycles, stand-up scooters, skateboards, and more have found a ready market and eager riders. Not all those riders have needed to be owners. Embedded technology combined with widespread smartphone ownership enabled well-funded start-ups to distribute large numbers of these novel electric vehicles across urban spaces, offering them for on-demand, short-term rental.

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All of this has taken place within physical and legal infrastructures ill-prepared for such change. The country’s public thoroughfares and traffic laws entered the current era shaped around transportation flows consisting principally of: (1) automobiles and their relatives (smaller and larger), (2) bicycles, and (3) pedestrians. For each of those categories, the respective regulatory roles and rules of federal, state, and local governments were reasonably settled. Indisputably, the new types of individual motorized mobility did not fit. And since they did not fit, the literal terms of existing law banned their use on all public rights of way, whether roadway, bicycle path, or sidewalk.¹

This paper surveys the ad hoc, largely industry-driven, and still-distressingly-incomplete adjustment of U.S. vehicle and traffic laws to accommodate and regulate the rapid spread of electrically-powered personal mobility devices. To appropriate a term used by transportation planners and administrators, it offers an introduction to the evolving field of U.S. “micromobility” law. The paper begins with a sketch of the turn-of-the-century law regulating vehicles and vehicular movement on public ways. The following section traces the legal adjustments that have since made Segways, then electric bicycles, followed by electric stand-up scooters "street legal" in a majority of states; and autonomous delivery devices, in a growing number. Section IV considers some of the consequences for individual riders and the public, generally, of legislative or administrative failures to address the full range of mobility devices now in use. Section V explores the challenge of securing a reasonable level of compliance with any new regulations governing micromobility. Finally, the paper concludes with a few observations about the importance of developing a more comprehensive, less ad hoc, approach to the regulation of individual, electrically powered, low-speed vehicles and achieving broad adherence to the resulting rules of the road.

¹ Except as otherwise indicated the terms designating the different types and segments of public rights-of-way are employed throughout the paper as they are defined and used quite consistently in state and federal legislation. Importantly, the words “road,” “street,” and “highway” are used interchangeably. The term “roadway” is used to refer to the portion of a road, street, or highway that is designed for use by vehicles, “bicycle lane,” to refer to the portion designated for the primary or exclusive use of bicycles (and now in some places, micromobility devices), and “sidewalk” to refer to the portion of a road set aside for use by pedestrians. “Bicycle path” or “bikeway” indicates a public right-of-way that is separate from a road, street, or highway. See infra p. 14.
II. The Pre-Existing Legal Infrastructure: U.S. Vehicle and Traffic Law (circa 2000)

A. The Layers
As individuals move about on the country’s shared public ways (its roadways, bikeways, sidewalks, pedestrian plazas, and paths) they, their actions, and any vehicles involved are addressed by multiple layers of law. That holds whether they are traveling by foot, wheelchair, auto, bicycle, horse, sled, or electrically powered skateboard.

The thickest of those layers is a composite of the statutes, ordinances, court decisions, and regulations of the state and local governments with jurisdiction over the space where the movement takes place. Since the earliest days of motorized vehicles, regulation of their use has been understood to be, predominantly, a state and local matter. Federal regulation of vehicles and their movement expanded over the twentieth century, but its scope remained more focused on vehicle design and manufacture than use – except, of course, in national parks, military bases, and other federal enclaves.2 Under existing legislation, agencies of the federal government have ample authority to insert themselves at the point of import, sale, or further distribution of the recent wave of powered mobility devices. To date they have exhibited little inclination to do so.

Consequently, as innovative modes of electrically powered, individual locomotion emerged during the twenty-first century, the states have been forced into the role of first responders. They have had to decide which types to allow on public ways, what safety features to require of them, and, if allowed, exactly where and how those types might be ridden, plus other terms and conditions of use. Thrust upon state legislatures have been such questions as: whether a new type of powered vehicle may be ridden (and parked) on public roadways, bicycle paths, or sidewalks, how it should be maneuvered in proximity to other forms of vehicular and pedestrian travel, how fast it ought to be driven, what age and other qualifications to require of operators, and, not least, the initial legal response and ultimate consequences in the event of a collision. Most states have passed significant regulatory authority on some of these matters along to local units of government. Almost universally addressed at the municipal level is whether to permit commercial firms to distribute vehicles of any sort along public ways for short-term, on-demand rental

2 For an example of the exception, see the recent regulation governing the use of electric bicycles in National Parks, 36 C.F.R.§4.30(i).
and on what terms. Finally, the ultimate responsibility for enforcement of such laws as exist on any of these topics lies at the state and local level.

B. Federal Law – Focused Principally on Equipment Standards and Accessibility

1. Vehicle and Traffic Law Initially Left to the States

The impact of state-by-state motor vehicle regulation on interstate commerce could easily have supported any number of federal statutory measures, even during the earliest days of the automobile. Law enforcement concern over the interstate transportation of stolen vehicles stimulated a national response in 1919.³ Later federal enactments targeted the operation of “chop shops” – operations that facilitate the disposition of stolen cars⁴ – and the intentional destruction of vehicles employed in interstate commerce.⁵ Yet on such fundamental questions as whether an automobile driven from one state into another must be registered at once in the second or the degree to which a driver’s license issued by one state will allow the holder to drive in another, the states themselves have shaped nearly all the rules, first individually, and then through interstate compacts and other forms of coordinated action.⁶

Under the Interstate Compacts for Highway Safety Resolution of 1958,⁷ Congress gave states blanket permission to form compacts in the area of traffic safety. By the resolution’s terms, traffic safety compacts do not, like those on other topics, require submission to Congress for individual approval. Since 1958 two have obtained widespread, although not universal, adherence.⁸ Nearly all states plus the District

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⁶ At the international level, issues like these led to a series of twentieth century conventions and treaties. The 1949 Convention on Road Traffic, to which the U.S. is a party, allows licensed U.S. drivers to drive in other countries that adhere to it or the subsequent 1968 Vienna Convention and grants reciprocal rights within the U.S. to holders of International Drivers Permits. The Convention on the Regulation of Inter-American Automotive Traffic (1943) (to which the U.S., Mexico and other countries to the south are parties) does the same. See Mich. Att'y Gen. Op. No. 7181 (Oct. 6, 2005), https://www.ag.state.mi.us/opinion/datafiles/2000s/0p10157.htm.
of Columbia have entered into a Driver License Compact. It provides for notification of one participating state’s suspension of a driver’s license to authorities in the others. It also calls for communication of out-of-state traffic violations to the jurisdiction in which the driver is licensed. (This information exchange has been facilitated by a National Driver Register established by Congress in 1960, and later expanded.) Also widely adopted is the Nonresident Violator Compact. Its aim is to assure that out-of-state motorists receive non-discriminatory treatment in the enforcement of minor traffic violations. A third compact, the Vehicle Equipment Safety Compact, was eclipsed by the shift to federally imposed safety standards under the National Traffic and Motor Vehicle Safety Act of 1966.

2. Federal Motor Vehicle Standards

Pursuant to that legislation, a federal agency, the National Highway Traffic Safety Administration (NHTSA), has, for over half a century, set safety standards for most new motor vehicles sold in or imported into the U.S. By regulating the latest equipment offered for sale, over time this agency limits what can be driven on the nation’s roads. Tire-pressure monitoring, electronic stability control systems, substantial capacity to withstand impact from the side, and head restraints are among the features that its standards now require in new automobiles. Motorcycles and mopeds must also meet NHTSA standards. The same federal agency tests and rates new car models on how they fare in a crash and issues recalls following a

10 See id.
16 See 49 C.F.R. § 571.138.
17 See 49 C.F.R. § 571.126.
18 See 49 C.F.R. § 571.214.
19 See 49 C.F.R. § 571.202a.
20 See 49 C.F.R. §§ 571.122, 571.122a, 571.123.
determination that a particular vehicle type or component has defects posing safety risks.\(^\text{21}\)

In 1981 NHTSA standardized the previously haphazard system of assigning unique identification numbers to motor vehicles sold in the U.S.\(^\text{22}\) As standardized, the vehicle identification number or VIN not only supports the federal agency’s responsibility to identify and recall models and components involved in repeated crashes and stolen vehicle tracing,\(^\text{23}\) but it also furnishes the basis for state systems of vehicle titling and registration.\(^\text{24}\)

The agency’s regulatory authority extends to all “motor vehicles,” a phrase defined by statute to embrace any “vehicle driven or drawn by mechanical power and manufactured primarily for use on public streets, roads, and highways, but [not including] … a vehicle operated only on a rail line.”\(^\text{25}\) Embedded in that definition are two important limits (in addition to the exclusion of street railways). The first (“mechanical power”) removes human or animal propelled vehicles (such as bicycles or horse-drawn carts) from the scope of the agency’s authority. The second (“primarily for use on public streets …”) excludes motorized vehicles designed and marketed for off-road use (golf carts and dirt bikes, for example). They, along with bicycles and other non-motorized vehicles acquired and used by individual consumers are subject to the product safety jurisdiction of the Consumer Product Safety Commission (CPSC).\(^\text{26}\) Standards for fork-lifts and other powered vehicles used in industrial settings and for vehicles used in commercial agriculture are set


\(^{22}\) See 49 C.F.R. §§ 565.1 – 565.16.


\(^{26}\) The statutory division of authority between the Consumer Product Safety Commission and the National Highway Safety Administration draws this line. Specifically excluded from the spectrum of consumer products subject to regulation by the former are “motor vehicles” and “motor vehicle equipment” as defined in the statute setting out the mandate of the second. See 15 U.S.C. § 2052(a)(5)(C). For the unique history of the SPSC bicycle safety standards, see Bruce Epperson, *The Great Schism: Federal Bicycle Safety Regulation and the Unraveling of American Bicycle Planning*, 37 TRANSP. L. J. 73 (2010).
by the Occupational Safety and Health Administration (OSHA).27 The phrase “primarily for use on public streets, roads, and highways” has, however, allowed NHTSA to expand its regulatory authority without Congressional action as states have allowed new types of vehicles onto their roadways.28

In theory, at least, federal motor vehicle standards and recall authority concern the soundness and safety of vehicles and their equipment; state law governs use.29 Federal law sets detailed standards for the seat belts in new cars.30 State “buckle up” laws (induced by federal grant money used as a positive incentive31 and a series of earlier more coercive measures32) command their use.33

3. Use of Federal Highway Funds to Induce Changes in State Motor Vehicle Laws
Over the past century, federal grants to states and localities have had a powerful influence on the public infrastructure available for vehicular travel.34 In addition, from time to time Congress has used the threat of reducing or withholding federal highway money to pressure states into adopting and enforcing laws that bear on

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28 As the agency’s chief counsel explained in 1971: “We view a dune buggy as a ‘motor vehicle’ primarily because it is licensable for use on the public roads. Conversely all-terrain vehicles, snowmobiles, and some categories of mini-bikes are not considered ‘motor vehicles’ because of State statutory prohibitions forbidding their registration for on-road use.” Letter from Lawrence R. Schneider, Chief Counsel, NHTSA, to Messrs. Hill, Lewis, Adams, Goodrich & Tait, June 15, 1971, https://www.nhtsa.gov/interpretations/nht71-137.
29 With the Consumer Product Safety Commission’s standards for bicycles this distinction has allowed states to require lights on bicycles ridden at night even though they are not included in the CPSC’s bicycle standard. See Forester v. Consumer Product Safety Commission, 559 F.2d 774, 798 (D.C. Cir. 1977).
30 See 49 C.F.R. § 571.209. These standards and those for airbags were a target for Reagan era deregulation, an effort rebuffed by the U.S. Supreme Court in Motor Veh. Mfrs. Ass’n v. State Farm Ins., 463 U.S. 29 (1983).
33 All states except New Hampshire have some form of seat belt mandate. See IIHS/HLDI, Seat Belts, https://www.iiihs.org/topics/seat-belts#laws.
road safety. A 1966 act applied this technique to numerous features of state traffic law administration, ranging from driver education and licensing to highway design. It provided funding for state highway safety programs and required every state to implement one by the close of 1998, under penalty of losing federal support. Qualifying state programs had to meet federal standards, one of which focused very directly on the lack of uniformity in state codes. That standard required all states to work toward making “the State’s unified rules of the road consistent with similar unified plans of other States.” Over time those federal standards softened into guidelines, a shift that Congress acknowledged in a 1987 amendment. The current guideline contains no reference to interstate consistency.

A number of other past federal funding-backed mandates generated such strong resistance in the states that they were subsequently withdrawn. Many left some trace behind. In 1974 Congress passed a uniform national speed limit of 55 as an emergency energy-saving measure. It was widely disregarded by the public, under-enforced, and strongly opposed by some states. In the years that followed, Congress relaxed the condition twice, removing it completely in 1995. An earlier federal requirement that states direct motorcyclists to wear helmets met a similar fate. It was eliminated in 1975.

Most of the federal directives of this sort that have endured concern driving while impaired. The 1984 act which set a national drinking age of 21 took this form. A federal statute, dating from 1998, requires states to have and to enforce prohibitions on driving a motor vehicle (employing that phrase in its broad sense) in which there is an open container of alcohol. It also induces them to have laws addressing repeat DUI offenders. Failure to comply can lead to a reduction in a

37 Pub. L. No. 100-17. § 296(a)
38 See NHTSA, Highway Safety Program Guideline No. 6 (April 2014),
42 See 23 U.S.C. § 158.
state’s federal highway fund allocation. A similar incentive formula presses states to pass laws revoking or suspending drivers’ licenses upon conviction of a drug offense and setting a blood alcohol standard of .02 percent for drivers under the age of 21.

Other incursions by the U.S. Congress into state vehicle law have been episodic and limited. A provision tacked onto a federal highway bill in 2005, at the behest of the car rental industry, preempts any state law imposing liability on those renting or leasing “motor vehicles” solely on the basis of their customers’ negligence.

The National Highway Traffic Safety Administration has also influenced the states through non-coercive persuasion. That has been its approach to traffic law adjudication. Fifty years ago, violations of state and local traffic rules were commonly treated as crimes – misdemeanors mostly, but felonies in the case of more serious offenses. In the early 1970s, implementing a recommendation of a National Advisory Commission on Criminal Justice Standards and Goals and a task force of its own, NHTSA began encouraging states to decriminalize most traffic offenses and transfer their adjudication to administrative officials. Close to half the states have made this change. Even in those doing so, more serious offenses, such as DUI, driving an unregistered vehicle or without a valid driver's license, and reckless driving, remain crimes.

4. The ADA’s Accessibility Requirements

For individuals with mobility impairments and all others traveling along sidewalks, especially those pushing, pulling, or riding on wheeled devices, the most significant federal mobility legislation has been the Americans with Disabilities Act of 1990

50 Id. The 2000 Uniform Vehicle Code § 11-102 n. 72 provides optional language for states taking the decriminalization approach.
(ADA). While it had precursors, they were tied to federal funding. The ADA’s ban on discrimination against disabled individuals in the provision of public services contains no such limit and extends to the full range of activities carried out by states and local units of government. As interpreted by the federal courts and the Department of Justice, its mandate applies to the construction, alteration, and use of the public right of way, including, importantly, public sidewalks. The law propelled widespread introduction of curb ramps and the implementation of sidewalk standards facilitating the mobility of individuals with impairments, especially those using wheelchairs and alternative wheeled devices. The ADA’s private cause of action made it possible for individuals frustrated by failures in local implementation and federal enforcement to seek and obtain judicial relief.55 In recent decades, such actions have targeted the official authorization or acceptance of sidewalk conditions that unreasonably interfere with use by the visually or mobility impaired.56

As late as 1979, laws in only a handful of states addressed motorized wheelchairs, exempting them and those using them from requirements that applied to motor vehicles, generally. By the early part of this century that had changed.58 A 2010

51 42 U.S.C. §§ 12101-12213
53 See 42 U.S.C. § 12132; Frame v. City of Arlington, 575 F.3d 432 (5th Cir. 2009) (en banc) (holding that “a city’s curbs, sidewalks, and parking lots constitute a service, program, or activity” covered by the ADA).
54 See id. See also Hamer v. City of Trinidad, 441 F. Supp. 3d 1155 (D. Col. 2020); Mote v. City of Chelsea, 284 F. Supp. 3d 863 (E.D. Mich. 2018).
55 See Ability Ctr. of Greater Toledo v. City of Sandusky, 385 F.3d 901 (6th Cir. 2004).
57 Those states were New York (which excluded “electrically driven invalid chairs ... operated or driven by an invalid” from its “motor vehicle” definition) and Nebraska (which also excluded “self-propelled invalid chairs”). See National Committee on Uniform Traffic Laws and Ordinances, TRAFFIC LAWS ANNOTATED 12 (1979). A few years later New York substituted the term “wheelchair” and defined it expansively focusing not on the device itself but on the reason for its use. The new and still current definition extends to “any manual or electrically driven mobility assistance device, scooter, tricycle or similar device used by a person with a disability as a substitute for walking,” defining “electrically driven mobility assistance device” as “any wheeled, electrically powered device designed to enable a person with a disability to move from place to place.” N.Y. Veh. & Tr. § 130-a (added in 1985).
Department of Justice regulation interpreting the ADA explicitly directs state and local governments to allow the use of powered “wheelchairs and manually-powered mobility aids” in “areas open to pedestrian use.” The Department’s earlier insistence that a community’s alteration of sidewalks or streets required the installation of curb ramps at affected intersections rested on an understanding that wheelchairs, including those with motors belonged on sidewalks, not in the roadway.

C. State Vehicle and Traffic Laws

1. A Common Structure, Diversity in Detail

Because state and local vehicle and traffic laws figure so prominently today and federal efforts to induce interstate uniformity during the prior century were short-lived and of limited effect, the rules governing the means and methods of individual, non-automotive, mobility vary significantly across the country. Some of the differences are a consequence of geography and climate. Florida does not regulate the use of snowmobiles; Michigan does, quite extensively. Other differences can be attributed to demographic and cultural variables. Pennsylvania, home to significant Amish and Mennonite populations, provides clear legal guidance for those traveling in horse-drawn vehicles. Many states do not. Arizona law allows residents in some of the state’s numerous retirement communities to drive ordinary golf carts on public streets. New York bans them from public streets and

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59 20 C.F.R. § 35.137.
60 See 28 C.F.R. § 35.151(i).
61 Department of Justice/Department of Transportation Joint Technical Assistance1 on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads, or Highways are Altered through Resurfacing (July 8, 2013), https://www.ada.gov/doj-fhwa-ta.htm.
Even so, in early 2021, the Alabama Supreme Court counted eight states (including Alabama) that had neither removed powered wheelchairs from their “motor vehicle” category nor granted them the same status as pedestrians. Pruitt v. Oliver, 331 So.3d 99 (Ala. 2021). at notes 7, 9, 10. (In Alabama and elsewhere “motor vehicles” are denied use of sidewalks. See Ala. Code § 32-5A-52.)
highways altogether. Florida leaves the decision up to its municipalities. States with large scale agriculture are more likely than those that are predominantly urban to have detailed statutory provisions governing the movement of tractors, self-propelled farm equipment, and livestock across or along public roadways. The presence of major mining operations in a state will, in all likelihood, be reflected in its motor vehicle code.

Over most of the past century a non-profit membership organization worked to bring a measure of consistency, along with a sharing of “best practices,” to this legal diversity through the publication and periodic revision of a Uniform Vehicle Code (U.V.C.). Like other “uniform” state laws this one merely offered a model, provisions recommended to state legislatures for their consideration. The U.V.C. both drew upon and influenced the codes of individual states. For all their differences, portions of most state vehicle and traffic laws can still be mapped onto some version of that model. On questions of statutory interpretation, individual

restricted community located in an unincorporated area); Ariz. Rev. Stat. § 28-2153(D)(7) (exempt from registration).


69 The principal and most influential source of “uniform” laws recommended to the states for adoption is the National Conference of Commissioners on Uniform State Laws (the Uniform Law Commission or ULC), established in 1892. Until quite recently that body stayed away from vehicle and traffic law, leaving the field entirely to the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO). Since the demise of NCUTLO it has published two uniform laws in this field: a Uniform Certificate of Title Act in 2005 and a Uniform Automated Operation of Vehicles Act in 2019. See Uniform Law Commission, Certificate of Title Act, https://www.uniformlaws.org/committees/community-home?communitykey=ef602e46-b990-4405-b789-3a44c5149cd3&tab=groupdetails; Automated Operation of Vehicles Act, https://www.uniformlaws.org/committees/community-home?communitykey=4e70cf8e-a3f4-4c55-9d27-fb3e2ab241d6&tab=groupdetails. Neither has yet been adopted by a single state.
70 Due to the code’s periodic revision, state legislation based on successive versions can embody important points of difference. The definition of “bicycle” furnishes one example. A definition of "bicycle" was added to the Uniform Code in 1944. It was amended in 1968, and then again, significantly, in 1975. The 1979 annotated code counted two states that employed the then current version, eight states that used the 1968 version, nine that had stuck with the original, nineteen states with definitions following an altogether different pattern, and eleven with no comparable
state courts will, at times, turn to its provisions for guidance. The Federal Highway Administration’s Manual on Uniform Traffic Control Devices makes repeated reference to its terminology, and the twentieth century effort by the Department of Transportation to achieve greater uniformity in state rules of the road referred specifically to its provisions.

The original U.V.C. was prepared in response to a 1924 national conference convened by then-Secretary of Commerce, Herbert Hoover, and approved by a successor conference two years later. Burgeoning use of the automobile was the catalyst. Throughout the balance of the twentieth century, a National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) carried the project forward, issuing occasional revisions of the recommended code and publishing annotated versions that arrayed state vehicle laws against its framework. NCUTLO comprised representatives of federal, state and local governmental units, together with a diversity of private entities. The latter ranged from motor clubs and safety councils to automobile manufacturers and dealers.

In 2000, following publication of a “millennium edition” of the U.V.C., NCUTLO ceased operations. In the years since, the very years during which a growing and diverse population of wheeled, electrically powered mobility devices have sought room on the nation’s roadways, sidewalks, and bicycle paths, the states and their municipalities have largely been left to address the terms and conditions of their use individually. The only forces pressing for a common approach have been focused lobbying efforts by commercial interests, each promoting the use of a particular type of battery-powered device.

provision. National Committee on Uniform Traffic Laws and Ordinances, TRAFFIC LAWS ANNOTATED 1 – 3 (1979). Major consequences can flow from such differences.

71 See, e.g., Borelli v. Renaldi, 336 Conn. 1 (2020); State v. Montano, 2018-NMCA-047, 423 P.3d 1 (deputy sheriff’s display of badge was not the same as being in uniform); Epperson v. Utley, 191 Neb. 413 (1974) (whether traveling at excessive speed forfeits the right-of-way).


75 The same is true for post-2000 changes in road design that have implications for traffic rules. See Noble v. State, 357 P.3d 1201 (Alaska Ct. App. 2015) (whether turn signal requirements apply to roundabouts).
2. Principal Elements of a Typical Turn-of-the-Century Vehicle Code

The 2000 Uniform Vehicle Code and most of its contemporary state variants categorized all shared public thoroughfares and their components. Streets, roads, and highways (synonymous terms under the legislation of most states) had, at their core, the “roadway,” that portion designed and used for vehicular travel. Most roadways were divided into two or more lanes. Some had lanes “designated for the exclusive or preferential use of persons operating bicycles.” Divided highways had two roadways. Alongside some roadways, conceptually part of the street or road, were segments termed berm, shoulder, or sidewalk. The “sidewalk” portion was that area between the roadway and adjacent property “intended for use by pedestrians.”

Travelers were separated into two main categories: those using “vehicles” and “pedestrians.” “Motor vehicles” were a defined subclass of vehicles – namely, those that were self-propelled. Motor vehicles were subject to requirements that did not apply to vehicles propelled solely by muscular power (animal or human). With a few exceptions, motor vehicles driven on public roads had to be registered with a motor vehicle bureau or department and to be registered they had to meet a range of requirements. These included compliance with equipment standards (pertaining to brakes, headlights, tail lights, brake lights, vehicle identification number, and so on) and, in many states, the owner’s possession of liability insurance covering future harm caused to third parties. Those operating a motor vehicle on public roads had to be licensed by the same state agency. It screened prospective licensees for knowledge of the jurisdiction’s traffic laws, for adequate vision, and for demonstrated competence in operating a motor vehicle of the type covered by the license. Movement of non-motor vehicles along public roads was also regulated. Except in rare cases, however, they were not

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76 See U.V.C. § 1-186.
77 See U.V.C. § 1-147.
79 See U.V.C. § 1-186
80 U.V.C. § 1-193.
82 See U.V.C. § 1-156.
83 See U.V.C. §§ 3-301 - 3-812.
84 See U.V.C. §§ 7-101 - 7-105.
85 See U.V.C. §§ 6-101 - 6-215.
86 See U.V.C. § 6-105.
required to be registered or insured nor did their operators have to hold a state license.

In most states, bicycles were a defined subclass of non-motor vehicle,87 Motorcycles were a defined subclass of motor vehicle,88 as were buses, passenger cars, and trucks.89 Pedestrians and non-motor vehicles were permitted to use the sidewalk portion of a road, highway, or street. Indeed, pedestrians were directed to do so if there was one.90 In the absence of a sidewalk, pedestrians were directed to walk on a road’s shoulder or far edge and if the road was two-way, on the far left, moving against vehicular traffic.91 Specified portions of the roadway upon which pedestrians were permitted to move from one side to the other were termed “crosswalks.”92

In general, sidewalks were reserved for pedestrians; driving a vehicle on one was forbidden with three exceptions.93 The first allowed vehicles using a driveway to pass over a sidewalk on the way to a roadway,94 so long as pedestrians were given the right of way.95 A second allowed vehicles “moved exclusively by human power” (e.g., bicycles and tricycles, in-line skates, strollers, skateboards, and toy wagons) to travel along sidewalks.96 The third, for “any motorized wheelchair,”97 reflected the impact of the 1990 Americans with Disabilities Act, and the disability rights movement that culminated in its enactment. (Earlier versions of the Code contained only the first two exceptions,98 and to this day that remains true of a handful state statutes.99)

87 See U.V.C. § 1-109.
88 See U.V.C. § 1-157.
89 See U.V.C. §§ 1-110, 1-167, 1-211.
90 See U.V.C. § 11-506.
91 Id.
92 See U.V.C. § 1-118/
93 See U.V.C. § 11-1103.
94 Id.
95 See U.V.C. § 11-509.
96 See U.V.C. § 11-1103.
97 Id.
99 See infra p. 17 n. 308.
On the roadway, motor vehicle operators had to comply with codified “rules of the road,” with speed limits, and with traffic signs and signals – both human and automated. In addition, criminal penalties backed important public safety mandates, including prohibitions on operating a vehicle under the influence of alcohol or other drugs, on driving recklessly, and on leaving the scene of a collision. License revocation was employed in serious cases, alongside criminal penalties, serving both as a deterrent and a means of removing the hazard posed by repeat offenders.

3. Local Government Authority to Adjust or Add to the Statewide Rules

While the basic framework established by a motor vehicle code applied throughout the enacting state, most states granted municipalities significant authority to apply and adapt the code’s general provisions and to add their own (not inconsistent) regulations “with respect to streets and highways within their jurisdiction.”

4. Treatment of Smaller Modes of Motorized Transportation

Motorcycles and their less powerful relatives faced requirements similar and in many respects identical to those applied to automobiles and their operators. The Uniform Code arrayed these non-automotive vehicles in nested categories. “Motorcycle” was its all-inclusive term for motor vehicles with two or three wheels and a saddle for the rider.

5. Bicycles

The original 1926 Uniform Vehicle Code explicitly included bicycles (and “ridden animals”) within its vehicle definition. That subjected their riders to all generally applicable rules of the road except those limited to “motor vehicles.”

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100 See U.V.C. §§ 11-301 – 11-705.
102 See U.V.C. §§ 11-103, 11-201 – 11-201.
103 See U.V.C. §§ 11-901 – 11-908.
104 See U.V.C. § 11-909.
105 See U.V.C. §§ 10-101 – 10-109 (2000). Recent years have seen the use of mobile phones and other electronic devices added to the list in many states.
106 See generally U.V.C. §§ 6-201 – 6-215.
110 NCUTLO, TRAFFIC LAWS ANNOTATED 26 (1979).
the 1930 revision bicycles were removed from the “vehicle” category, along with all other devices “moved by human power.”

In 1975, perhaps in response to the resurgence of adult bicycle use, they and other human-powered devices were brought back into the U.V.C.’s “vehicle” definition. Simultaneously the code provision banning the driving of vehicles on sidewalks was revised to allow those propelled “by human power.” Throughout these revisions, persons operating bicycles (and other non-motorized vehicles) on public roadways were subject to the traffic rules that applied to other vehicles with one vague qualification. It excepted “those [rules] which by their very nature can have no application.”

In addition, the U.V.C. (and state codes following its model) set forth a number of rules focused solely on bicycle equipment and use: directing where and how bicycles should be ridden (“as far to the right as practicable” on roadways with further restrictions on sidewalks) requiring lights at night, prohibiting clinging to other vehicles, or carrying objects that prevent having both hands available for control, for example.

6. Other Human-Powered Vehicles

Kick scooters, in-line and traditional roller skates, skateboards, roller skis, hand pulled wagons, personal shopping carts, strollers and baby buggies – all are “vehicles” as that term is defined in the typical state code. Just as is true of bicycles, some can be propelled at speeds that substantially exceed the pace of most pedestrians, especially on a downward slope. What rules apply to them? Do they belong on a sidewalk? Can they be taken into the roadway whenever and wherever bicycles are permitted? Are those using them subject to the rules that apply to pedestrians?

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111 Id.
112 Id.
113 Id. at 299.
114 Id. at 316.
120 For a recent survey of bicycle law, see Ken McLeod, Bicycle Laws in the United States - Past, Present, and Future 42 FORDHAM URB. L.J. 869 (2015).
The common definition of “pedestrian” is limited to those “afoot.”\textsuperscript{121} Even though feet are unquestionably involved in the use of roller skates and skateboards there would seem little doubt that while traveling on them the skater or boarder is operating a vehicle and, therefore, is not subject to such requirements as one directing pedestrians to use the sidewalk where one is available.\textsuperscript{122} That makes the roadway an option; however, since these are human-powered vehicles their users are, in most states, not denied the sidewalk.\textsuperscript{123}

Acknowledgment of the immense variety of human-powered vehicles appeared in two U.V.C. provisions widely adopted by the states. The first is a broad prohibition on attaching oneself to a motor vehicle. Not limited to bicyclists, it typically applies as well to those riding a “coaster, roller skates, sled or toy vehicle.”\textsuperscript{124} The second authorizes municipal governments to add their own local regulations of “persons upon skates, coasters, sleds and other toy vehicles” to those that apply statewide.\textsuperscript{125}

7. How New Forms of Powered Mobility Were Fit into this Structure

By the middle of the twentieth century, the legislation organizing this multi-category matrix of space, travelers, and vehicles had grown sufficiently intricate that altering it to accommodate some fresh form of powered mobility that state lawmakers sought to allow onto roadways or sidewalks on appropriate terms called for clarity and precision.\textsuperscript{126} During the period of periodic Uniform Vehicle Code revision, three personal mobility innovations prompted such adjustment by large numbers of states, although not all of them nor in the same manner. These were the motorized bicycle or moped, the powered wheelchair, and the four-wheel low-

\textsuperscript{124} U.V.C. § 11-1204(a) (2000).
\textsuperscript{126} So complicated that some state legislatures attempting change amended the wrong portion of their motor vehicle code. \textit{See}, e.g., N.D. Cent. Code § 39-06.2-02(26) (adopted in 1989) which excludes “motorized wheelchairs” from the definition of “motor vehicle.” N.D.S.L. 1989, ch. 461, § 4. The exclusion appears a set of definitions that apply to the licensing of commercial drivers and not the definitions that apply to the motor vehicle title. As a consequence, its effect, if any, is unclear. \textit{Compare} N.D. Cent. Code § 39-06.2-02(47).
speed (neighborhood) vehicle. The first two were addressed in the Uniform Vehicle Code’s final edition. As with other matters, their U.V.C. treatment both tracked and influenced amendments to state motor vehicle legislation. The federal regulatory change that enabled the third occurred so close to the compilation of the U.V.C.’s final edition that no reference to four-wheeled low-speed or neighborhood electric vehicles appears in its provisions. Yet over a short span of years such a vehicle category was added to the motor vehicle codes and allowed onto some roadways in a majority of states.\footnote{See James J. Fazzalaro, Low Speed Electric Vehicles, Conn. Office of Legal Research Report (Aug. 8, 2009), https://www.cga.ct.gov/2008/rpt/2008-R-0432.htm.}

\textbf{a. Motorized Bicycles}

The earliest of these second-half-of-the-century new categories was the motorized bicycle or moped, originally a bicycle to which a small gasoline engine had been attached. Such powered low-speed vehicles became popular in the years immediately following World War II, as did a somewhat faster, more stylized, purpose-built form, during the oil crisis of the 1970s. Both types were brought under the Uniform Vehicle Code as distinct categories of motorcycle (initially, “motor-driven cycle” – added in 1948\footnote{U.V.C. § 1-158.} – and, later, “moped”\footnote{U.V.C. § 1-154.}). Under the U.V.C. these vehicle categories had scaled-down equipment requirements,\footnote{See U.V.C. § 12-506.} distinctive license plates that set them apart from other motorcycles,\footnote{See U.V.C. § 3-142(f).} and a separate class of operator’s license.\footnote{See U.V.C. § 6-104(a)(4).} Their operators were directed to ride as far to the right as possible when proceeding at less than the speed of traffic\footnote{See U.V.C. § 11-1205(a).} and to make left turns in the same cautious fashion as a cyclist.\footnote{See U.V.C. § 11-1208.} They were specifically authorized to use bicycle lanes.\footnote{See U.V.C. § 11-1212.} Altering a moped to increase its speed above 30 mph was specifically forbidden.\footnote{See U.V.C. § 12-508.} At least in the early years, a few states adopted a more radical approach and simply removed “motorized bicycles” (Indiana, Ohio, Louisiana, Massachusetts, New Jersey, Oklahoma), “bicycles equipped with an assisting motor” (Maryland), “bicycles with helper motors” (Connecticut, North
Carolina), or “mopeds” (Florida, New Hampshire) from the motor vehicle category altogether.\textsuperscript{137}

A majority of states entered the twenty-first century with provisions that addressed the use of at least one moped-like category of low-speed motorized cycles, sometimes with a definition requiring operable pedals.\textsuperscript{138} Typically, this vehicle class was subject to registration, but often not insurance, requirements.\textsuperscript{139} Moped riders had to possess a license.\textsuperscript{140} Especially with low-powered motorized bicycles, some states allowed riders as young as 14 to qualify for a license limited to this particular vehicle class.\textsuperscript{141} In terms of federal law, so long as the vehicle had a seat or saddle and two or three wheels, it fell under National Highway Traffic Safety Administration’s motorcycle definition and the associated standards for rearview mirrors, control positioning, and vehicle identification number.\textsuperscript{142} Those with motors producing 5 brake horse power or less, qualified as “motor-driven cycles,”\textsuperscript{143} a subcategory to which a separate braking system standard applied.\textsuperscript{144}

Under the terms of the NHTSA standards and many, if not most, state codes as they stood in 2000, electric bicycles in their contemporary form would fall under the moped or motor-driven cycle definition, subject to the same requirements.

b. Electrically Powered Wheelchairs and Mobility Scooters

The accommodation of electrically powered wheelchairs within state motor vehicle codes is a more complex and, with respect to the micromobility developments of the twenty-first century, a more influential story. So long as mobility impaired individuals traveled using wheelchairs or other vehicles propelled by human muscular power (the user’s or a third party’s) twentieth century motor vehicle codes

\textsuperscript{138} See. e.g., Del. Code tit. 21, § 101(26); Ohio Rev. Code Ann. § 4501.01(L); W. Va. Code § 17C-1-5a.
\textsuperscript{142} See 49 C.F.R. § 571.3. Lacking a seat stand-up scooters did not.
\textsuperscript{143} See id.
\textsuperscript{144} See 49 C.F.R. § 571.122a.
treated them as pedestrians. In the language of the Uniform Vehicle Code, persons in wheelchairs could use both sidewalks and crosswalks with “all the rights and duties applicable to a pedestrian under the same circumstances.”145 Electrically powered wheelchairs or mobility scooters, on the other hand, fell within the U.V.C.’s broad definition of “motor vehicle.” As of 1979 only a handful of state statutes excluded them from “motor vehicle” requirements. The terminology of the few that did took varying forms. Examples included: "electric battery-operated wheel chairs when operated by physically handicapped persons at speeds not exceeding fifteen miles per hour" (Colorado), "self-propelled invalid chairs" (Nebraska), and "electrically-driven invalid chairs being operated or driven by an invalid (New York)."146

By 2000 the disability rights movement, the Americans with Disabilities Act of 1990, and state analogs had induced a majority of states to create a special exception from motor vehicle regulations for powered wheelchairs and their equivalents.147 Section 1-159 of the U.V.C.’s millennium edition removed “motorized wheelchair[s]” from the otherwise comprehensive definition of “motor vehicle.” U.V.C. § 11-1103 allowed “motorized wheelchair[s]” to be ridden along sidewalks, defining the category as “[a]ny self-propelled vehicle designed for, and used by, a person with disabilities that is incapable of a speed in excess of eight miles per hour. A number of states followed this approach.148 The more common one (not necessarily inconsistent with the first) was to expand the longstanding definition of “pedestrian” (“any person afoot”149) to include individuals using wheelchairs, with or without motors.150 Under either approach, persons employing powered wheelchairs became lawful sidewalk and crosswalk users. An important difference between the two arose when and if wheelchair users found themselves

145 See U.V.C. § 11-1209(c).
147 A 2021 opinion of the Alabama Supreme Court counts
149 See U.V.C. § 1-168.
forced to travel in the roadway because of the absence or poor condition of a sidewalk.\textsuperscript{151}

While state vehicle codes define most vehicle categories by size, weight, power, and such other physical characteristics as number of wheels, they define wheelchairs principally by who is using them and why. New York’s paired statutory definitions illustrate that point at the extreme. Within the wheelchair category New York includes “any manual or electrically driven mobility assistance device, scooter, tricycle or similar device used by a person with a disability as a substitute for walking,” and defines “electrically driven mobility assistance device” as “any wheeled, electrically powered device designed to enable a person with a disability to move from place to place.”\textsuperscript{152} The 2000 U.V.C. employs similarly broad language but excludes devices capable of speeds in excess of eight miles per hour.\textsuperscript{153} Connecticut’s statute removes wheelchairs from the “motor vehicle” category so long as they are “operated by persons with physical disabilities at speeds not exceeding fifteen miles per hour.”\textsuperscript{154} Kansas includes in the “pedestrian” category anyone using a “low powered, mechanically propelled vehicle designed specifically for use by a physically disabled person.”\textsuperscript{155}

c. Electrically Powered Low-Speed Neighborhood Vehicles

As noted earlier,\textsuperscript{156} some states with warm climates and concentrations of retirees have allowed standard golf carts to be driven along low-speed-limit roadways. Nonetheless, since the dominant use of this vehicle type was off-road and its maximum speed fell below 20 mph, the National Highway Traffic Safety Administration did not treat golf carts as “motor vehicles” subject to its standards or other regulations.\textsuperscript{157} By the late 1990s the number of states allowing limited use of golf carts on public roadways had grown to over a dozen. A few had loosened

\textsuperscript{151} Classified as pedestrians wheelchair users would be required to proceed on the far left of the roadway (against the flow of vehicular traffic) under the typical vehicle and traffic code. Classified as vehicles their proper place is, together with bicycles and other slow vehicles, on the right. \textit{See generally Pruitt \textit{v. Oliver}, 331 So.3d 99, 104-06 (Ala. 2021).}

\textsuperscript{152} N.Y. Veh. & Tr. L. § 130-a (added in 1985).

\textsuperscript{153} U.V.C. § 1-159 (2000).


\textsuperscript{156} \textit{See supra} pp. 11-12.

their definitions of the category to include golf carts that had been modified so that
they could travel as fast as 25 mph. Pressed by a Canadian company, eager to enter
the U.S. market with a 25 mph “neighborhood electric vehicle,” NHTSA launched
a formal rulemaking proceeding in 1996. Two years later, that yielded a new motor
vehicle standard applicable to four-wheeled vehicles (electric or gasoline-powered)
capable of a maximum speed between 20 and 25 mph. Its set of requirements
rather than the far more demanding ones for passenger cars applies to qualifying
“low speed vehicles.” (The agency’s longstanding interpretation excusing “golf
carts” from its regulations still applies to those with a maximum speed no greater
than 20 mph.)

States were quick to adopt the new category. In most, use is limited to roadways
with low speed limits (35 mph being the norm); but, in other respects, low-speed
vehicles are governed by the same package of legal requirements as automobiles.
To be driven on public roads, they must to be registered and insured, their drivers,
licensed.

III. Twenty-First Century Battery-Powered Disruption

A. First Up: The Segway

With the disappearance of the National Committee on Uniform Traffic Laws and
Ordinances, nation-wide legislative initiative in this domain passed largely to
commercial interests. Model laws dealing with several of this century’s new forms
of powered mobility exist, but they have been drafted on behalf of the companies
that make, sell, or rent the vehicles they cover, not by a consortium of state officials

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158 The company described this as a “two-passenger vehicle, closed at the top but open at the sides,
intended for use on city streets at speeds up to 25 miles per hour.” National Highway Traffic Safety
159 See 49 C.F.R. §§ 571.3, 571.500.
161 By 2010 they were “street legal” in 46 states. See Insurance Institute for Highway Safety, Low-
speed vehicles and minitrucks shouldn’t share busy public roads with regular traffic (May 20, 2010),
roads-with-regular-traffic.
162 See, e.g., Delaware, Dept. of Transportation, Low-Speed Vehicles - Customer Handout (April
Maryland Motor Vehicle Administration, Low Speed Vehicle Application (VR-324 (03-14),
and others broadly concerned with transportation planning or traffic safety. This pattern was first established in the early 2000s by the company responsible for the Segway. Although that novel vehicle never achieved market success to match the media excitement preceding its introduction, the lobbying effort by the Segway legal team succeeded in creating a template that has since been adapted to cover other forms of powered micromobility. Rejecting the approaches employed to achieve “street legal” status for the twentieth century’s neighborhood electric vehicle and motorized bicycle, the Segway team took powered wheelchairs as its model.

The strategy contained two key elements: (1) the interpretation of a key federal statutory definition and (2) the amendment of two or three interrelated state statutory definitions.

1. An Initial Hurdle: The Federal Definition of “Motor Vehicle”

The National Highway Traffic Safety Administration’s responsibility for setting vehicle safety standards and mandating the national system of vehicle identification numbers is limited to “motor vehicles” as defined in 49 U.S.C. § 30102(a)(7). As previously noted, a critical phrase in that definition confines the category to vehicles “manufactured primarily for use on public streets, roads, and highways.” The agency does not set standards for power mowers, construction equipment, or off-road recreational vehicles.163 The Segway’s inventor, Dean Kamen, envisioned his powered two-wheeled platform being used in pedestrian space alongside motorized wheelchairs, including the gyro-stabilized wheelchair from which the Segway was derived.164 Early in 2001, the company’s law firm secured an advisory opinion from NHTSA’s chief counsel. It concurred in the firm’s conclusion that the Segway was not a “motor vehicle” subject to the agency’s regulatory authority. The interpretation rested on the location of Segway’s

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164 See Bob Metcalfe, More than a wheelchair, the IBOT is on the move (Nov. 26, 1999), http://www.cnn.com/TECH/computing/9911/26/ibot.idg/.
intended use (sidewalks, not the roadway), its limited speed (“less than 20 mph”),
and its unusual configuration.\footnote{165}

The importance of the latter two factors had already been articulated in prior
NHTSA interpretive opinions involving other powered vehicles with two or three
wheels. A foundational agency interpretation, issued in 1969, had concluded that
powered “mini-bikes” were not “motor vehicles.”\footnote{166} In doing so, it set out a multi-
factor test. Under that test neither the manufacturer’s intent that mini-bikes be
used off-road nor the fact that they possessed the operational capability of being
ridden on public thoroughfares was determinative. Mini-bikes were, NHTSA ruled,
not motor vehicles so long as they failed to meet the requirements of nearly all
states for lawful operation on “public streets, roads, and highways”\footnote{167} and were not,
in fact, being operated on them in significant numbers.\footnote{168} Subsequent, advisory
opinions concerning motorized kick scooters qualified the second factor, taking the
position that even if such vehicles “regularly use the public roads” they would “not
be considered ‘motor vehicles’ if [they] have a maximum attainable speed of 20 miles
per hour (mph) or less and an abnormal configuration which readily distinguishes
them from other vehicles.”\footnote{169} These are analogous to grounds on which the agency
decided to regulate golf carts as motor vehicles despite their being allowed on
public roads by a fair number of states. (In the agency’s view, such a low speed
would keep the vehicle “from being operated in normal moving traffic.”)\footnote{170} Add a
seat to a powered scooter, however, and, in NHTSA’s view, it became a “motor
vehicle” subject to its standards, no matter its top speed. The reason?

\begin{quote}
[A seat makes the scooter] indistinguishable from a moped, which is an
on-street vehicle that we have long interpreted as a motor vehicle.
\end{quote}

Although most mopeds have chain drives, pedal starters, and lower-

\footnote{165 See Letter from John Womack, Acting Chief Counsel, NHTSA to Eric Rubel, Arnold & Porter,
NAME GINGER 302 (2003).}
\footnote{166 See Appendix A - Interpretations, 34 Fed. Reg. 15416 (Oct. 3, 1969).}
\footnote{167 In this and subsequent NHTSA invocations of the statutory phrase “public streets, roads, and
highways” it appears to be viewing it as limited to the roadway portion and not extending to the
sidewalk.}
\footnote{168 See id.}
\footnote{169 See Letter from John Womack, Acting Chief Counsel, NHTSA to Mr. Andrew Grubb Steve’s
\footnote{170 See Letter from Jacqueline Glassman, Chief Counsel, NHTSA to Mr. Amir Ambar, Winbel, Inc.,
mounted engines, we do not think that these distinctions are important. The seated rider on the power scooter appears to other traffic to be riding a moped.\footnote{See id.}

The Segway raised no concern about such confusion.

2. The Second: 50 State Motor Vehicle Codes

Building on its federal regulatory success, the Segway team launched a nationwide lobbying campaign targeting state vehicle codes. There, a critical challenge for the company arose from the comprehensive definitions of “vehicle” and “motor vehicle” found in the laws of all fifty states. The Uniform Vehicle Code defined a “vehicle” as “[e]very device in, upon or by which any person or property is or may be transported or drawn upon a highway, excepting devices used exclusively upon stationary rails or tracks.”\footnote{U.V.C. § 1-215 (2000).} It defined “motor vehicle” as “[e]very vehicle which is self-propelled, and every vehicle which is propelled by electric power obtained from overhead trolley wires but not operated upon rails, except vehicles moved solely by human power and motorized wheelchairs.”\footnote{U.V.C. § 1-156 (2000).} With a degree of variation already described, most states followed that basic model. For a company that wanted to sell Segways for use on public sidewalks and roadways, the breadth of those definitions posed two problems. First, the typical state statute, like the U.V.C., banned “motor vehicles” or even all “vehicles” not moved “exclusively by human power” (motorized wheelchairs excepted) from public sidewalks. Second, the types of motor vehicles that could be driven on public roadways were, typically, subject to registration, driver’s license, and insurance requirements. The vehicle code amendment proposed by the Segway team sought to shield the invention from all the above restrictions, employing the very method the U.V.C. had used with powered wheelchairs. Their proposed legislative text excluded the Segway quite specifically from the statutory “motor vehicle” definition. While the name it gave the proposed excluded category, “electric personal assistive mobility device” (EPAMD) encouraged association with that established one, the definition was not limited to use by disabled persons. Ultimately, forty-five states plus the District of Columbia amended their traffic laws to remove EPAMDS from their statutory definitions of
“motor vehicle.” Some did so directly; others accomplished the same result through the underlying definition of “vehicle.” Concern about use on roadways with heavy traffic did prompt a number to attach restrictions on where EPAMDs could be ridden and on a rider’s age. In most cases the statutory changes allowed Segways onto sidewalks, sometimes with the proviso that their riders yield the right-of-way to pedestrians. The Segway motor vehicle carve-out, the critical definition of “electric personal assistive mobility device,” was tightly drawn. While there were slight variations from state to state in other details, to qualify as an EPAMD a device had to have “two non-tandem wheels” and be “self-balancing.” The requirements had one clear purpose and effect, to limit the exception to this singular patent-protected product while keeping other electrically powered personal mobility devices, importantly electric bicycles and electric scooters, within state “motor vehicle” statutory definitions. (Although the original Segway had a handlebar, that was not a component of the EPAMD definition. This had the unforeseen consequence, over a decade later, of allowing the popular consumer product colloquially known as a hoverboard to qualify. As a consequence, hoverboards had a clear legal path onto the sidewalks of most states)

B. Close Behind: Electric Bicycles

In 2002 the manufacturers of electrically powered bicycles sought and obtained passage of a federal statute that secured, for a defined set of their products, the same regulatory treatment that a NHTSA interpretation had granted the Segway, but the agency had consistently withheld from vehicles that resembled mopeds.\footnote{See Letter from John Womack, Acting Chief Counsel, NHTSA to Mr. Andrew Grubb Steve's Moped & Bicycle World, dated June 12, 1995, https://www.nhtsa.gov/interpretations/aiam5561}

Public Law No. 107-319, codified at 15 U.S.C. § 2085, removed “low-speed electric bicycles” from the comprehensive definition of “motor vehicle” in 49 U.S.C. § 30102(a)(7) and brought them within the regulatory authority of the Consumer Product Safety Commission, subject to that agency’s standards for conventional, human-powered bicycles. The act preempted inconsistent state product safety requirements,\footnote{See 15 U.S.C. § 2085(d).} but left all regulation of electric bicycle use with the states.\footnote{See Electric Bicycle Law Basics, https://peopleforbikes.cdn.prismic.io/peopleforbikes/29e81dec-5c0b-4b61-a41d-864384d3aeec_E-Bike-Law-Primer_June_2021.pdf.} To qualify (and avoid classification as a motorcycle or motor-driven cycle subject to NHTSA standards\footnote{See Letter from Anthony M. Cooke, Chief Counsel, NHTSA to Darby Crow, Crow Cycle Co., dated April 17, 2008, https://www.nhtsa.gov/interpretations/07-007541as.}) a device had to have two or three wheels and fully operable pedals, be powered by an electric motor of less than 750 watts, and be incapable of a speed greater than 20 mph “when powered solely by such a motor” (on a paved level surface with a rider weighing 170 pounds).\footnote{15 U.S.C. § 2085(b). The statute’s definition of maximum speed was drawn verbatim from the 2001 NHTSA interpretation concluding that EPAMDs were not “motor vehicles.” See Letter from John Womack, Acting Chief Counsel, NHTSA to Eric Rubel, Arnold & Porter, dated Aug. 3, 2001, https://www.nhtsa.gov/interpretations/07-26-01rubelltrspw.}

Although it blocked more stringent state equipment standards, the federal statute did not by itself achieve any change of status under state vehicle and traffic codes. Under state statutes, low-speed electric bicycles remained “motor vehicles,” typically, in the same category as mopeds, motor scooters, and motor-driven cycles. Without registration and license plates and unless ridden by a licensed operator they could not lawfully be operated on public roadways. As motor vehicles, they were also barred from sidewalks.

To address the state law impediment, an industry group prepared a model law and proceeded to press for its adoption by state legislatures. Pushed by the growth in
consumer interest, more and more states have adopted that model’s framework, some with modification.188 Employing the EPAMD template, the industry statute removes qualifying electric bicycles from a state code’s “motor vehicle” category and all associated statutory provisions. It specifically exempts them from the state’s financial responsibility, driver’s license, registration, certificate of title, off-highway vehicle, and license plate requirements.189 Instead, its provisions treat electric bicycles as equivalent, in terms of a rider’s rights and duties, to conventional bicycles.190 For equipment requirements, the model simply incorporates those established by the Consumer Product Safety Commission.191 The statute subdivides covered electric bicycles into three classes. The first two have a maximum power-assisted speed of 20 mph, being differentiated according to whether the rider must pedal to engage the motor. The third class has a higher power-assisted maximum (28 mph when powered by both pedal and motor) and is subject to additional restrictions.192 These include a minimum age,193 the mandatory wearing of a helmet,194 and possible local government limitation of use.

189 Model Electric Bicycle Law with Classes § 202.
190 Id. § 201.
191 Id. § 201.
192 As NHTSA has interpreted the 2002 statute placing low-speed electric bicycles under the regulatory authority of the Consumer Products Safety Commission, these faster electric bicycles are still not “motor vehicles” because the rider must continue to pedal. See Letter from Anthony M. Cooke, Chief Counsel, NHTSA to Howard Seligman, Velosolex America, LLC, dated Sept. 17, 2007, https://www.nhtsa.gov/interpretations/07-001825as. The federal statute’s cap of 20 mph applies to electric bicycles “when powered solely by ... a motor.” 15 U.S.C. § 2085(b) (emphasis added). On the other hand, NHTSA considers electric bicycles or scooters with greater potential speed that are held to the 20 mph cap by means of a governor or an adjustable setting as failing to meet the statutory criterion. See Letter from Anthony M. Cooke, Chief Counsel, NHTSA to Damian J. Pelegrino, President, Top Cargo Inc., dated Jan. 16, 2009, https://www.nhtsa.gov/interpretations/07-26-01rubelltrspw.
193 Model Electric Bicycle Law with Classes § 301 (sixteen).
194 Id. § 302.
on bicycle paths.\textsuperscript{195} In addition, the model statute requires that these faster electric bicycles be equipped with a speedometer.\textsuperscript{196}

C. 2018: Electrically-Powered Standup Scooters (Available for On-Demand Rental)

1. Federal Highway Traffic Safety Administration Motor Vehicle Standards No Longer a Concern

The Congressional decision to remove low speed electric bicycles from the class of motor vehicles subject to NHTSA regulation, prompted that agency to revise its approach to all small vehicles with two or three wheels. It moved to a simple speed threshold. Under a "tentative interpretation" that has guided NHTSA's exercise of its statutory mandate since 2005, two- or three-wheeled vehicles with "a maximum speed capability of less than 20 mph" are not consider motor vehicles "regardless of on-road capabilities."\textsuperscript{197}

NHTSA's adoption of this “bright line rule” left all low-speed scooter equipment safety issues to the Consumer Products Safety Commission. While the CPSC had a set of existing bicycle standards to which electric bicycles were subjected by the 2002 legislation placing them under that agency’s jurisdiction,\textsuperscript{198} it had (and still has) no regulations governing scooters.

2. A Different Approach to State Law: On-Demand Rental, Build the Market, Force Law to Follow

While powered standup scooters had been on the U.S. market and a limited unsanctioned presence on U.S. roadways for over a decade, 2018 brought electric scooters to the streets of the nation’s urban areas in numbers that could not be ignored. Moreover, their distribution in public space for on demand, short term rental, represented a very different approach to legal impediments. Following the Uber, Lyft, and Airbnb strategy, Bird, Lime, and their early “scooter-share” competitors endeavored to build consumer demand without pausing over the legal issues, trusting that popular success would force lawmakers to respond.\textsuperscript{199} It

\textsuperscript{195} Id. § 208.
\textsuperscript{196} Id. § 303.
helped that the first two companies pursuing this business model, Bird and Lime, were based in California where the vehicle code already contained a “motorized scooter” category,200 to which the state’s “financial responsibility, registration, and license plate requirements” did not apply.201 However, the scooter-share companies did not limit themselves to California. Bird’s founder hailed from Wisconsin and in late June 2018, his company placed a hundred or more of its rental, powered scooters on Milwaukee sidewalks.202 The city threatened to impound them and fine riders. Bird persisted; the city sued.203 Milwaukee’s legal position rested on two points. First, any commercial activity occupying public sidewalks (restaurant tables, newspaper vending machines, and so on) required a city license. Bird did not have one. Second, under state law, electric scooters fell within the motor vehicle category. Wisconsin law prohibited driving motor vehicles on sidewalks. Nor were roadways an option since these vehicles failed to meet state requirements for motor vehicle registration. The parties settled. Bird withdrew.204 The following year, Wisconsin amended the state’s motor vehicle law to allow electric scooters to use its streets and roads, subject to additional local regulation. The legislation specifically authorized local governments to regulate or prohibit the short-term rental of electric scooters and the use of electric scooters on sidewalks or bicycle paths within their jurisdiction.205 In the summer of 2019, electric scooters from Bird, Lime and others returned to Milwaukee, licensed by the city under a pilot program.206 Later, a similar scenario played out in Honolulu, where the city resisted the introduction of

201 Cal. Veh. Code § 21224. The California statute did require (as it still does) that those operating scooters have a driver’s license or learner’s permit. Cal. Veh. Code § 21235(d).
rental electric scooters in the absence of state legislation granting them legal status on state thoroughfares. The necessary law did not pass until 2021.

In other states with vehicle codes no less forbidding, cities yielded to company persuasion and consumer demand and allowed the introduction of rental scooters anyway. The Atlanta, Georgia, city council adopted an ordinance in 2019 providing for the operation of “shareable dockless mobility devices” in the city. The category is defined as including “e-scooters” (although not “e-bicycles”). No state legislation recognizes such devices. Under Georgia law they remain “motor vehicles.” An amendment that would have added “electric scooters” to a list of exclusions from the “motor vehicle” category, alongside “electric bicycles” and “electric personal assistive mobility devices,” while subjecting them to local government regulation, passed the Georgia Senate in February 2020, only to fail of enactment in the Georgia Assembly. Chicago has an electric scooter share program. Yet, unlike EPAMDs and electric bicycles, powered scooters remain unregistered “motor vehicles” under Illinois law. Numerous cities in Ohio including Cincinnati, Cleveland and the capital, Columbus, allowed scooter

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209 While doctrines of “home rule” give localities substantial autonomy in some states, even where they are quite strong, municipal traffic ordinances that conflict with state law have been struck down. See, e.g., Webb v. City of Black Hawk, 2013 CO 9, 295 P.3d 480; Hansen v. Eyre, 2005 UT 29, 116 P.3d 290.  
210 Atlanta, Georgia, Code of Ordinances Article X.  
211 Id. § 150-400.  
215 See 625 Ill. Comp. Stat. § 5/1-146; People v. Frazier, 2016 IL App (1st) 140911, 62 N.E.3d 1081 (holding that a powered scooter is a “motor vehicle” under Illinois law). A bill seeking to remove them from that category was introduced in the Illinois Senate in October 2021. See Ill. Sen. Bill 2930 (2021).  
216 See Cincinnati, Ohio, Code of Ordinances §§ 501-1-E3, 506-4; City issues interim guidelines for electric scooter companies and riders, WCPO (Aug. 8, 2018),
rental companies to put electric scooters on their streets during 2018, 2019, and 2020. Yet it was not until April of 2021 that an act of the state legislature authorizing use of “low speed micromobility devices” on Ohio roadways took effect.219 Before that change, no matter what an Ohio city’s ordinances provided, electric scooters met the state definition of “motor vehicle” and did not belong on its streets or sidewalks.220 Brookline, Massachusetts, authorized a shared electric scooter program in 2019 in the face of unchanged state law.221

While share operations brought this new type of mobility device to the attention of city and state law makers, the scooters, in a range of configurations, had for some years been available for individual purchase, long-term rental, and short-term rental from fixed facility shops focused on recreational use and the tourist market. The pandemic and rising gasoline prices have only increased the demand. Comprehensive legislation at state and local levels must, as a consequence, address

217 See Cleveland, Ohio, Code of Ordinances, Chapt. 517; Robert Higgs, Cleveland to allow electric scooter rentals this summer, targeting key parts of the city for pilot program (Dec. 6, 2019), https://www.cleveland.com/cityhall/2019/06/cleveland-to-allow-electric-scooter-rentals-this-summer-targeting-key-in-parts-of-the-city-for-pilot-program.html.
219 Ohio Rev. Code Ann. §§ 4501.01, 4511.514 (added by 2019 Ohio HB 295). Despite the “home rule” authority of Ohio’s municipalities, prior to passage of that law, local ordinances or agreements authorizing use of electric scooters on a city’s streets would almost certainly have been struck down. See generally Mendenhall v. Akron, 117 Ohio St.3d 33, 2008-Ohio-270.
individual rider use as well as the terms on which public spaces (sidewalks and roadways) may be used by enterprises offering them for on demand rental.222

3. The Threshold Challenge: Defining the Category
Pressed by constituents, share-system lobbyists, and municipalities to sort out the legal status of electric scooters, legislatures have lacked federal regulatory guidance. The typical scooter wheel configuration, front and back rather than “nontandem,” disqualified them as “electric personal assistive mobility devices.” The course the Federal Highway Traffic Safety Administration had taken after Congress stripped it of jurisdiction over electric bicycles pointed toward the Consumer Product Safety Commission as the pertinent federal agency. But whatever these new devices were, their lack of operable pedals prevented them from qualifying as electric bicycles, subject to and in compliance with CPSC standards which state legislation could incorporate by reference.

State EPAMD and electric bicycle statutes did, however, suggest a successful strategy. Adapting their approach to this new category of mobility device required, first, a definition – one that could be added to the list of exceptions to the broad definition of “motor vehicle,” thereby, shielding electric scooters, like EPAMDs and qualifying electric bicycles from registration, equipment, license, insurance and any other “motor vehicle” requirements that lawmakers judged inappropriate. A definition was also needed to provide the scope for equipment and operating regulations suited to the characteristics of the new category.

Clarity was essential. The common name for the devices, “scooter,” permitted easy confusion for it had long been used to identify vehicles in the style of the Italian Vespa, which state vehicle laws commonly include within the moped class of the motorcycle category. Some ride-on devices used by individuals with mobility impairments are also commonly referred to as “scooters.” Typically state codes treat those as the equivalent of electric wheelchairs. The vehicles in question were neither. Nor were they the subject of a model statute. One potential concern in framing any definition was that it might include mobility devices raising significantly different issues. Already on the road in California (legally under its

222 A recent amendment of the Alabama Code fails on this score. It adds “scooters and hoverboards” to the state’s Motor Vehicle and Traffic Laws, but only when they are part of a “shared micromobility device system.” See Ala. Code §§ 32-1-1.1(65) & (66), 32-19-2.
vehicle code)\textsuperscript{223} were electrically powered skateboards, controlled by hand-held remote. Should these be lumped together with electric scooters or, following California’s approach, should electric scooters be defined in terms that excluded skateboards?\textsuperscript{224} Most states limited their new electric scooter category to devices that had two (or at most three) wheels and handlebars.\textsuperscript{225} Having four wheels with no handlebar, electric skateboards did not qualify, nor did electrically powered unicycles which appeared on the market and California roads and sidewalks as early as 2011.\textsuperscript{226} In 2015, the California legislature gathered those together with electric skateboards under a separate “electrically motorized board” definition, with accompanying regulatory provisions.\textsuperscript{227}

The first electric scooters offered by shared-system companies had no seat, but the market evolved. Later entrants, sensing an important niche, introduced scooters designed to allow the rider to sit. For them, definitions that required a “platform designed to be stood upon when riding” posed a potential challenge. This led some states (and localities) to make it clear that while a platform was required, the presence of a seat did not exclude a device from the new electric scooter category\textsuperscript{228} or even that a device designed solely for a seated rider could qualify.\textsuperscript{229} Were scooters with the capacity to carry both operator and a passenger to be included or should the definition limit scooters to single-rider devices? There were also questions of speed and size – maximum weight, length, and width. Should the definition include a top speed below the 20 mph cap set by the FHTSA and, if so, measured how? Should lights be required? Turn signals? Brakes? Of what capability? There was no national consensus on any of these points, and the representatives of the major share-system companies were satisfied so long as their inventory was covered. As new entrants in the rental or retail sales market sought

\textsuperscript{227} See Cal. Veh. Code § 313.5.
\textsuperscript{228} See, e.g., Fla. Stat. § 316.003(44).
competitive advantage with different features – a seat or a third wheel – their vehicles often failed to fit comfortably within early statutory definitions.\textsuperscript{230}

4. State Equipment and Operational Capability Requirements

The Consumer Product Safety Commission regulations for bicycles and qualifying electric bicycles impose an important set of safety standards. They require brakes shown by testing to be capable of bringing the device and a 170 pound rider to a full stop in fifteen feet,\textsuperscript{231} reflectors of specified placement, color, and capability,\textsuperscript{232} and key components that can withstand defined levels of force or stress.\textsuperscript{233} Anyone selling, distributing, or importing bicycles that fail to comply with those standards violates federal law and is potentially subject to civil and criminal penalties.\textsuperscript{234} For motorcycles, including mopeds and motor-driven cycles, detailed equipment safety standards are set by the National Highway Traffic Safety Administration (NHTSA).\textsuperscript{235} No comparable federal product safety standards exist for electric scooters, however defined.\textsuperscript{236} (Although the CPSC has not issued standards, the hazards posed by the lithium ion batteries, in general, and electrical systems powering and controlling mobility devices have received the agency’s attention and led to some recalls,\textsuperscript{237} cautionary guidance to consumers,\textsuperscript{238} and participation in the development of voluntary industry standards.)\textsuperscript{239}

\textsuperscript{231} See 16 C.F.R. § 1512.5(b)(1).
\textsuperscript{232} See 16 C.F.R. § 1512.16.
\textsuperscript{233} See 16 C.F.R. §§ 1512.11-1512.14
\textsuperscript{235} See, e.g., 49 CFR § 571.122a (motorcycle breaking systems); 49 CFR § 571.123 (motorcycle controls and displays). Like the federal bicycle standards these focus on the point of manufacture, sale, or import and are backed by civil penalties. See 49 U.S.C. §§ 30112, 30165.
\textsuperscript{236} This is not because of lack of statutory authority. The definition of “motor vehicle” that underlies the National Traffic Safety Administration’s authority to set standards is amply broad: “a vehicle driven or drawn by mechanical power and manufactured primarily for use on public streets, roads, and highways.” 49 U.S.C. § 30102(a)(7). The American Society for Testing and Materials reports work on a “voluntary” standard. See ASTM, New Specification for Commercial Electric-Powered Scooters for Adults, https://www.astm.org/DATABASE.CART/WORKITEMS/WK70724.htm.

Electronic copy available at: https://ssrn.com/abstract=4037752
It has, therefore, fallen to the states or their local governments, to impose any requirements focused on braking ability, visibility, stability, the durability of structural elements, or safety of the electrical components. To date, most state electric scooter statutes have failed to address these issues. Along with safety standards, NHTSA also prescribes the attachment of unique vehicle identification to covered “motor vehicles.” State motor vehicle titling and registration requirements build on that system. Nothing like it applies to either electric bicycles or electric scooters, and few states have established an alternative. A handful have authorized local governments to impose registration requirements.

5. Relationship of the Regulations Governing Electric Scooters to Those that Apply to Electric Bicycles

The industry’s model electric bicycle legislation seeks to achieve equivalence with conventional bicycles on a state’s roadways and sidewalks (same “rights and duties”). Arizona’s “electric standup scooter” statute follows that basic pattern. Most of the other early scooter statutes do as well, but add further restrictions. Commonly, these include operator age limits. Arkansas and Kentucky set a
minimum age of sixteen;\textsuperscript{246} Hawaii, fifteen;\textsuperscript{247} Minnesota, twelve;\textsuperscript{248} Utah, eight\textsuperscript{249} California requires that operators have a driver’s license or learner’s permit.\textsuperscript{250} A few states impose a requirement that riders wear helmets.\textsuperscript{251} Some impose speed limits lower than the maximum speed of the device.\textsuperscript{252}

Common are limits on where electric scooters may be ridden. A few state statutes prohibit their operation on sidewalks, at least in the absence of a local ordinance to the contrary.\textsuperscript{253} Many do not. The majority simply impose the same rules of the road on electric scooters that they apply to bicycles (and electric bicycles). In a majority of states this permits operation on sidewalks unless a local ordinance provides otherwise.\textsuperscript{254} It also amounts to a requirement that when in the roadway, scooters be ridden in a bicycle lane where one is available and otherwise along the side. California directs riders making a left turn from that position to stop, dismount, and cross as a pedestrian.\textsuperscript{255} Most states allow electric scooters to turn left following the same pattern as bicycles and other vehicles.\textsuperscript{256} Some exclude scooters from particular categories of roads, defined by speed limit, the lack of a bicycle lane, or limited access.\textsuperscript{257} Many authorize local governments to adjust some of these parameters. Commonly, permission to ride scooters on bicycle and multi-use paths rests upon decisions by the public bodies or agencies with jurisdiction.\textsuperscript{258}

\begin{footnotesize}
\begin{enumerate}
\item[246] See Ark. Code § 27-51-1903.
\item[248] See Minn. Stat. § 169.225.
\item[249] Utah Code Ann. § 41-6a-1115(2).
\item[252] See Ark. Code § 27-51-1903 (15 mph).
\end{enumerate}
\end{footnotesize}
6 Relationship of Regulations Governing Electric Scooter and Electric Bicycle Use to Those that Apply to Mopeds and Vespa-style Scooters

Under New York law, a two-wheeled powered vehicle with a seat, capable of no more than 20 mph can, potentially, be treated as a “limited use motorcycle,” a "bicycle with electric assist,” or an “electric scooter.” The category into which it is placed carries major consequences. Neither overall size and weight nor wheel diameter are factors. To be categorized by New York as a motorcycle, a device must be certified by the manufacturer as meeting NHTSA standards. As a motorcycle, albeit one with limited speed, the vehicle must be registered and display plates. Its rider must hold a license. With greater speed (and in other states, even at this speed)\textsuperscript{259} insurance is required. In New York, so long as the vehicle is a “limited use motorcycle” capped at 20 mph, it is not.\textsuperscript{260} However, all of New York’s general “motor vehicle” laws including its DUI and driving while texting statutes apply.\textsuperscript{261} If the vehicle has operable pedals, it can qualify as a bicycle with electric assist so long as it meets the Consumer Product Safety Commission’s standard. If it fits this category, no license or registration is required, although a rider must be at least sixteen.\textsuperscript{262} As a bicycle with electric assist, its operation is subject to a more restrictive set of rules of the road.\textsuperscript{263} With or without pedals, a device can qualify as an electric scooter. If it does, no license or registration is required, although the rider must be at least sixteen.\textsuperscript{264} No Consumer Product Safety Commission requirements apply.

7. The Applicability of DUI, Reckless Driving, Phoning-while-Driving, Leaving-the Scene of a Crash Statutes to Electric Bicycles, Electric Scooters (and EPAMDS)

Important state prohibitions, some induced by federal funding incentives, apply to “motor vehicles” but, typically, not to bicycles. These include DUI statutes and more recent laws focused on distracted driving (driving while phoning, texting, or operating any handheld electronic device). DUI statutes typically make it unlawful

\textsuperscript{260} See N.Y. Dept. of Motor Vehicles, Register a Moped, https://dmv.ny.gov/registration/register-moped.
\textsuperscript{261} See N.Y. Veh. & Traf. L. §§ 1176, 1225-c, 1225-d.
\textsuperscript{262} See N.Y. Veh. & Traf. L. § 1242(2).
\textsuperscript{263} See N.Y. Veh. & Traf. L. §§ 1242 –1243.
\textsuperscript{264} See N.Y. Veh. & Traf. L. §§ 1280 –1289.
to “operate a motor vehicle”\textsuperscript{265} or more expansively to “operate or be in actual physical control of a motor vehicle”\textsuperscript{266} while intoxicated. Provisions prohibiting reckless driving or requiring drivers involved in an accident to remain at the scene, often take the same form.\textsuperscript{267} New York’s prohibitions on driving while using a handheld phone, texting, or having both ears covered with earphones connected to an audio device, are, similarly, limited to those “operating a motor vehicle.”\textsuperscript{268} Removal of electric bicycles, electric scooters, and other micromobility devices from the statutory definition of “motor vehicle” places them outside such provisions.\textsuperscript{269}

In states where prohibitions like these are framed in terms of all “vehicles” and micromobility devices are removed only from the “motor vehicle” category but not that more comprehensive one, this result need not follow.\textsuperscript{270} Provisions that turn around and explicitly subject individuals employing mobility devices to “all the provisions applicable to the driver of a vehicle” have been interpreted in some states as subjecting them to all laws that are not explicitly limited to “motor vehicles.”\textsuperscript{271}

8. Share Systems, Local Regulation versus Uniform State-Wide Rules

When the ride-share companies, Uber and Lyft, muscled onto the nation’s urban scene, their dependence on state-licensed and regulated automobiles and the insurance issues they posed led many, if not most, states to respond with legislation that removed nearly all regulatory authority over the activity from municipalities. The Texas law on ride-share operations leaves no space for additional local oversight or control.\textsuperscript{272} New York’s grants more populous communities the option of

\textsuperscript{267} See, e.g., Conn. Gen. Stat. § 14-224(a); Mass. Ann. Laws ch. 90, §§ 24(2)(a), 24(2)(a½)
\textsuperscript{268} See N.Y. Veh. & Tr. L. §§ 1225-c, 1225-d, 375(24-a).
\textsuperscript{272} See Tex. Occ. Code § 2402.003.
banning ride-share operations altogether, but does not permit them to layer requirements on top of those imposed by the state.273

By contrast, state statutes addressing bicycle, electric bicycle, and electric scooter share operations have, in general, left local governments in full control. Beyond the basic parameters set by state law for the type of vehicle (who can ride, characteristics of the devices, where, in general terms, they may be ridden), core questions are left to cities, villages, towns, and, in some cases, counties. In nearly all states local governments have the authority to add restrictions to those imposed by state law on these devices (sometimes with specified exceptions).274 New York’s statute authorizes local governments to be more permissive as well. It allows them to permit operation of electric bicycles and electric scooters on roadways with speed limits in excess of 30 mph and on sidewalks (from which they would otherwise be barred).275

D. Next Up: Micro Delivery Devices

In early 2019 delivery robots debuted at a U.S. university. Traveling along campus sidewalks at around 4 mph without an operator onboard these vehicles brought pizzas, salads, and sodas to hungry students.276 As separate enclaves with their own regulatory regimes, universities provided an attractive test environment. Over the next two years, autonomous delivery devices weighing less than 100 pounds when fully loaded spread to at least twelve other campuses.277 In December 2019, California’s Department of Motor Vehicles approved their use, as well as the use of larger and faster autonomous delivery vehicles, along public roadways.278 By February 2022, legislation in 19 states and the District of Columbia permitted

275 See N.Y. Veh. & Tr. L. § 1282.
276 See Mary Lee Clark, There are robots on campus—here’s what you need to know (Jan. 22, 20190, George Mason University, https://www.gmu.edu/news/2019-01/there-are-robots-campus-heres-what-you-need-know.
“personal delivery devices” to travel along sidewalks on roughly the same terms as pedestrians. The larger vehicles approved by California for roadway use do not qualify, but the maximum weight of the devices permitted under recent state statutes range up to 550 pounds unloaded.\textsuperscript{279} Width, length, and height are not specified. Typically, “personal delivery devices” are allowed to move at up to 10 mph on sidewalks and in other pedestrian spaces,\textsuperscript{280} up to 20 mph where they are allowed on public roadways.\textsuperscript{281}

Although the National Highway Traffic Safety Administration has been involved in the regulation of autonomous vehicles designed for highway use, it has neither monitored nor regulated the development of these special-purpose vehicles designed for low speed operation as robotic load-carrying pedestrians. The Consumer Product Safety Commission, to which NHTSA has deferred on regulation of electric scooters and similar forms of personal mobility, has little ground to assert regulatory authority over a device that is neither bought nor rented by a consumer but instead deployed by commercial entities to make deliveries. To date, the states have been totally on their own in setting safety standards for these devices and regulations, if any, aimed at minimizing the risk to those who must share public rights-of-way, whether roadways, sidewalks or bike lanes, with them. Some have passed that responsibility on to their municipalities.\textsuperscript{282}

E. The Status of Other Electrically Powered Personal Mobility Devices
Currently navigating the roadways and sidewalks of many U.S. cities are a variety of battery-powered personal mobility devices that do not belong there according to the provisions of the state’s vehicle and traffic code. In some states, still, these include electric scooters; in a few, electric bicycles. In states that allow electric bicycles and electric scooters on public roadways, devices of those general types that fail to meet the relevant statutory definitions – whether due to their maximum speed,\textsuperscript{283} number of wheels (too few or too many), lack of handlebars, or some other feature – also fall in this category. In nearly all states that is true of electrically

\textsuperscript{280} See, e.g., N.C. Gen. Stat. § 20-175.16(b)(2).
\textsuperscript{281} See, e.g., Utah Code § 41-6a-1119(2)(a)(ii).
\textsuperscript{282} See, e.g., N.C. Gen. Stat. § 20-175.17; Utah Code § 41-6a-1119(8)(a).
\textsuperscript{283} Growing numbers of electric bicycles and electric scooters of great power and speed that have escaped NHTSA regulation by being marketed for “off road” use can be spotted moving along public roadways of all kinds.
powered skateboards and single-wheeled devices, with or without gyro stabilization. There are exceptions. Both are encompassed by California’s “electrically motorized board”\(^{284}\) and Michigan’s “electric skateboard”\(^{285}\) categories. Arizona and Virginia also authorize use of motorized skateboards on public ways. The Arizona statute requires at least two wheels, thereby excluding single-wheeled devices.\(^{286}\) Virginia’s definition, which combines electric skateboards and scooters, does not.\(^{287}\)

IV. Inevitable Consequences of Lawmakers’ Failing to Address Widespread Use of Devices that Are not “Street Legal”

A. Confusion, Inconsistent, Discriminatory, and, Very Likely, Pretextual Enforcement

The demand for personal powered mobility devices has moved far more rapidly than federal and state lawmakers or public understanding. In growing numbers, small electrically powered vehicles that fall under a jurisdiction’s “motor vehicle” definition, but are neither registered nor eligible for registration, are being ridden on public roadways and sidewalks of every state and major municipality. To many members of the general public, including some riders of those devices, and to many law enforcement personnel, the non “street legal” vehicles appear indistinguishable from recently legalized electric bicycles and electric scooters.

Under the typical vehicle and traffic code, driving an unregistered vehicle on a public roadway is a punishable offense.\(^{288}\) The same is true of operating any motor vehicle on a sidewalk.\(^{289}\) For the rider of an unsanctioned device, fines and impoundment, even arrest and search, are potential threats.\(^{290}\) Since other laws

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\(^{284}\) Cal. Veh. Code § 313.5


\(^{287}\) Va. Code Ann. § 46.2-100.


\(^{290}\) In 2001, the U.S. Supreme Court rejected a claim that to arrest and jail an individual for commission of a minor traffic violation (failure to wear a seat belt, punishable by a fine of not more than $50) violated the "right to be free from unreasonable seizure" established by the Fourth Amendment. Atwater v. City of Lago Vista, 532 U.S. 318 (2001). And in Virginia v. Moore, 553 U.S. 164 (2008) the Court held that arresting an individual for a traffic violation (driving without a valid license) committed in the presence of law enforcement (even when arrest was not supported by state law) did not violate the Fourth Amendment nor did the subsequent search.
are likely to command higher priority for state and local police, enforcement is almost certain to be inconsistent and uncertain. There is a high risk that it will be biased, even pretextual. The record of traffic law enforcement, in general, and police interactions with bicycle and electric bicycle riders, in particular, furnishes ample grounds for concern on that score.

B. Spillover into the Tort System

1. Civil Actions Arising Out of Collisions

High stakes consequences are likely to follow in the event of injury or death. If the operator of a device is riding, unlawfully, on a sidewalk and collides with a pedestrian or unlawfully within a bike lane and collides with a cyclist, causing harm to the other, the violation is likely to be treated as evidence of negligence. The same will likely to be true when harm results from a shared-system vehicle’s being parked in violation of state or local law. Should a collision occur on a roadway and the operator of the electric scooter or electric skateboard be injured or killed, any claim against the driver of the automobile, bus, or truck involved will be compromised if the micromobility device was being operated unlawfully.

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293 See Emma Pierson et al., A Large-scale Analysis of Racial Disparities in Police Stops Across the United States, 4 NATURE HUM. BEHAV. 736, 736 (2020).

According to the *Restatement of Torts (3d)* and courts in a majority of states, when an injury is caused by conduct that violates a statute and is of the sort the statute was passed to prevent that conduct is "negligent per se." 295 Under most circumstances, in most jurisdictions, the violation does not compel a finding of liability but merely establishes a breach of the relevant standard of care. 296 The fact-finder (judge or jury) must still determine whether the violation was a cause of the collision. 297 Whatever form the doctrine takes, a finding that the individual operating or parking a micromobility device on a public way (roadway, sidewalk, park path) was in violation of state or local law can work to the disadvantage of the rider in one of two ways. If the injury has been suffered by another (pedestrian, cyclist, operator of a “street legal” powered device of any sort) the finding of negligence can lead directly to personal liability for large sums. If the rider is injured, it can block or reduce the amount of recovery from the other party. 298

A recent appeal decided by the Alabama Supreme Court illustrates the point. The issue arose from a motorist’s defense of contributory negligence to a claim for damages caused by his collision with an electrically-powered wheelchair. The plaintiff was struck from behind by the defendant’s automobile while operating his six wheeled motorized chair (maximum speed – 5 mph). The crash occurred as the plaintiff prepared to make a left turn into his apartment complex from a road that had no sidewalk or crosswalk. The plaintiff, forced to this form of mobility because of cerebral palsy, was on his way home from a church supper in mid-April between 8 and 9 p.m. According to the court:

> [His] wheelchair was equipped with a seat belt, two six-beam flashlights on the footrest, two flashing red bicycle lights on the back of

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296 See, e.g., *Anderson v. State Dept. of Natural Resources*, 693 N.W.2d 181, 189 (Minn. 2005).


298 Tort litigation arising out of traffic accidents generated a late twentieth century shift in many states from “contributory negligence,” the liability approach in which a plaintiff’s negligence precludes any recovery, to “comparative negligence,” in which recovery is reduced according to the parties’ respective culpability. See Nora Freeman Engstrom, *The Automobile’s Tort Legacy* 53 Wake Forest L. Rev. 303 (2018); Gary T. Schwartz, *Contributory and Comparative Negligence: A Reappraisal*, 87 Yale L.J. 697 (1978).
his arm rests, some red reflectors on the back of the wheelchair, and an orange vest with reflective yellow tape that was draped over the back.299

Had the plaintiff been riding a bicycle or using a manually propelled wheelchair his suit would not have faced the obstacle posed by Alabama’s vehicle code. It defined “motor vehicle” in the typical sweeping terms. Unlike the codes of a vast majority of states, however, it did not (and still does not) exclude motorized wheelchairs and their equivalents from that definition nor include those using one within its definition of “pedestrian.”300 (At the time, it also contained no electric bicycle or electric scooter exception so that the plaintiff’s legal situation would have been no different had the case involved one of them.) Then and now Alabama law requires “motor vehicles” operated on its roadways to have “a rearview mirror, a horn, brakes, [and] brake lights.”301 The plaintiff’s chair lacked all four. Alabama also requires that a reflective triangle of a specified size and shape be displayed by slow-moving vehicles.302

Because the Alabama statute defined pedestrians as persons traveling “afoot,” the appellate court, rejected the defendant’s argument, which had been accepted by the trial court, that the plaintiff should be found contributorily negligent for his failure to follow “pedestrian” rules of the road. (Alabama directs pedestrians to travel in the left lane against traffic when they are on roads with no sidewalk or shoulder.303 Had the plaintiff been in the left lane, the trial court reasoned, the collision could not have occurred.)

The plaintiff sought to have the wheelchair considered an “electric personal assistive mobility device” or EPAMD. So viewed the state’s “motor vehicle” requirements would not apply, and the plaintiff’s actions would be consistent with the associated operating rules. But the Alabama Code’s definition of the EPAMD

300 Ala. Code § 32-1-1.1(15.1).
301 *Pruitt v. Oliver*, 331 So.3d 99, 113 (Ala. 2021).
302 Ala. Code § 32-5-246. Bicycles and other “devices moved by human power” are excluded from the statutory definition of vehicle and consequently do not carry this requirement. Ala. Code § 32-1-1.1(87).
category like those elsewhere effectively limited the category to Segways (and hoverboards).\textsuperscript{304}

The Alabama Supreme Court considered itself compelled to conclude that the plaintiff was injured while operating a “motor vehicle,” one that failed to meet state requirements. Fortunately for the plaintiff, that conclusion did not translate directly into a finding of contributory negligence. The question the court sent back for a determination at trial was whether the lack of any or all of the required “motor vehicle” safety features on the plaintiff’s wheelchair “proximately caused the accident.”\textsuperscript{305} Nonetheless, because the plaintiff’s device was not “street legal” his liability claim faced a major obstacle that would not have been there had he been operating an EPAMD or bicycle. (While most U.S. jurisdictions have replaced Alabama’s contributory negligence approach in which a plaintiff’s negligence bars recovery, with one providing for a partial reduction,\textsuperscript{306} such comparative negligence states also require a causal connection or finding.\textsuperscript{307})

The Alabama vehicle and traffic code was, and still is, an outlier in its failure to address the distinctive legal issues faced by users of electric wheelchairs and other powered mobility assistance devices.\textsuperscript{308} Arguably, its vehicle code violates the Americans with Disabilities Act. However, the state’s categorical approach to regulating the use of its roadways and sidewalks is utterly typical. The challenge of applying existing traffic laws to the many new types of electrically-powered vehicles in the context of a tort action is no different from that faced by the Alabama Supreme Court in this case. Collisions and subsequent attempts to recover for injuries or fatalities will force attention to the discrepancy between existing vehicle categories and the devices now moving about the nation’s streets and sidewalks, even if law enforcement and city officials ignore it.

\textsuperscript{304} Ala. Code § 32-1-1.1(15.1).
\textsuperscript{305} Pruitt v. Oliver, 331 So.3d 99, 110-111 (Ala. 2021).
\textsuperscript{306} See Ellen M. Bublick, Comparative Fault to the Limits, 56 VAND. L. REV. 977, 978 n. 4 (2003).
\textsuperscript{308} Justice Mendheim’s decision presents a detailed survey of all fifty states. He concludes that the vehicle codes of only seven other states both fail to contain specific provisions addressing wheelchair use and define “pedestrian” in terms that exclude wheelchair users. By his count, the vast majority of states include individuals in wheelchairs in their definitions of “pedestrian.” Others have specially tailored provisions that apply to wheelchairs or exclude them from their definition of “motor vehicle.” Pruitt v. Oliver, 331 So.3d 99, 110-11 (Ala. 2021).
In 2018 the Alabama legislature added electrically powered scooters and “shared micromobility devices” to the defined terms in its motor vehicle code, specifying the terms of their use. In 2021 it added electric bicycles, removing them from the “motor vehicle” category. But it has yet to address the legal status of powered wheelchairs. Under Alabama law as interpreted by the state’s highest court they remain subject to all the statutory requirements imposed on “motor vehicles.” Worse yet, as “vehicles” they would appear to be banned from Alabama’s sidewalks.

2. Reduced Likelihood of Municipal Liability for Street Defects or Failures to Warn

Irregularities in a public thoroughfare that pose little hazard to automobiles can prove disastrous to those riding on vehicles with two or three wheels. A spectrum of doctrines stand between injured non-automotive travelers and recovery from the public bodies responsible for road design and maintenance. Actions by cyclists or their survivors point toward a conclusion that many states will deny recovery on facts likely to yield a favorable outcome for the driver of an automobile. A 1998 decision by the Illinois Supreme Court distinguished between intended users of a roadway (those driving automobiles) and permitted users (in the case it faced, a cyclist). Those who are injured after running into a pothole or an unmarked repair site while riding a device that state law has not authorized for use on public streets in general or streets of the particular type involved will confront a far greater challenge. If, however, the device is part of a shared system that the municipality has licensed to operate within its boundaries, without regard to its

309 See Alabama Act 2019–437, adding new definitions to Ala. Code § 32-1-1.1 and a new § 32–19–2 governing the operation of shared micromobility devices and systems. It contains no provision for scooters not part of a shared system.

310 See Alabama Act 2021–134, adding “electric bicycle” to Ala. Code § 32-1-1.1’s roster of defined terms and a new § 32–5A–267 setting out the rules for their lawful use.

311 See Alabama Code § 32-5A-52.

312 See generally Franklyn P. Salimbene, Seeking Peaceful Coexistence: Streetcars and Bicycles in the New Urban Environment, 7 WAKE FOREST J.L. & POL’Y 365 (2017) (examining case law holding that there is no public duty to maintain every street so that it is suitable for cyclists);


status under state law, the argument that the use was neither intended nor permitted will be difficult to maintain.

C. Uninsured Liability

Whether operating an electrically-powered micromobility device of a type and in a jurisdiction and place where the law allows it or under prohibited conditions, any mishap resulting in injury to the rider or another will, in all likelihood, expose an insurance gap. If the operator of the device is covered by an automobile insurance policy, the scope of coverage will almost certainly not reach loss or liability arising from the use of such smaller powered vehicles. States with “no fault” regimes typically allow personal injury recovery by individuals covered by an automobile policy who are struck by an automobile while they are traveling as pedestrians or cyclists. However, that coverage does not apply, while the covered individual is using another “motor vehicle.” Although there is no assurance that state motor vehicle code definitions will be read into insurance legislation or policies, if the mobility device falls in a category that has been removed from a state’s “motor vehicle” definition and the operator is covered by an automobile policy, there is, at least, some possibility of recovery under the same conditions as a cyclist or pedestrian. The liability coverage of the typical automobile policy would almost certainly not extend to injuries caused by a covered individual while riding an electric bicycle, electric scooter, or similar micromobility device, whether or not “street legal.”

A bicycle rider or skate-boarder who causes harm to another may have liability coverage under a homeowner’s or renter’s policy. Both types of insurance frequently cover not only loss or damage to a residence and personal property but also provide liability insurance for some, although not all, claims and lawsuits brought against the insured seeking compensation for accidental bodily injury or damage to property. The primary focus is on damage suffered on the insured premises, but

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314 See supra pp. 22-23.
316 See Underwriters Ratings Board, New York Mandatory Personal Injury Protection, Form No. BA 12, Other Definitions (c), at 3 (2001).
317 Hawaii has made this inclusion explicit. See Hi. Rev. Stat. § 431:10C-304.
318 A common personal auto policy form refers throughout to “autos.” While it extends that term to include pickups and vans, it explicitly excludes “Any vehicle … [w]hich has fewer than four wheels.” See Insurance Services Office, Inc., Form No. PP 00 01 01 05, EXCLUSIONS, at 4 (2003).
many such policies extend coverage to liability arising out of the insured’s personal 
(as opposed to business or commercial) activities that take place elsewhere. The 
availability of coverage of this sort for a micromobility device mishap is, needless to 
say, contingent on: (1) the rider’s being covered by a homeowner’s or renter’s policy 
and (2) the use of the device falling within the policy’s definition of covered personal 
activities. In any event, the fact that the device fits within a broad definition of 
“motor vehicle” is, once again, likely to pose a problem. Typically, policies of this 
type exclude liability arising out of the use of a “motor vehicle.” As to electric 
bicycles or electric scooters that a state has removed from its vehicle code’s “motor 
vehicle” category it would be possible to contend that the exclusion does not apply. 
Depending on the policy’s exact language, however, the insurer could plausibly 
contend that its use of the term “motor vehicle” in this context is broader than, and 
independent of, the statutory definition of the same phrase. A provision recently 
added to the California motorized scooter statute requires that contracts for scooter 
sales warn the buyer, in large type, that existing insurance policies “may not 
provide coverage for accidents involving use of the scooter.”

Those injured or causing injury while riding a device rented from a shared-system 
company are in no better position. Under the terms and conditions that the major 
companies impose on their customers, renters assume all risks, agree to hold the 
company harmless, and commit to binding arbitration of all disputes with the 
company.

V. Securing Reasonable Levels of Compliance with Any Regulations in this Area

A. Achieving Compliance with Traffic Laws: A More General Problem

The public’s relationship with traffic laws is complex. Many individuals who are 
otherwise law-observant take posted speed limits to be conservative suggestions, 
and stop signs, prompts to slow down and proceed with caution, rather than strict

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320 See generally Insurance Information Institute, Spotlight on: e-scooters and insurance (Feb. 20, 
322 See Bird Rental Agreement, Waiver of Liability and Release (July 6, 2020), 
https://www.bird.co/agreement/; Lime User Agreement, https://www.li.me/user-agreement (last 
visited Feb. 14, 2022); Lyft Rideable Rental, Waiver of Liability and Release Addendum (Sept. 9, 
commands. For most, the degree of compliance will be a function of the perceived likelihood of enforcement and a personal assessment of the risk of collision or other mishap. And under many circumstances, the likelihood of enforcement is low. Police officers do not, as a class, view enforcement of the traffic code as high priority work. As a consequence, their approach to it tends to be highly discretionary.

Traffic rule compliance is particularly problematic among travelers who – often with good cause – view existing highway infrastructure, traffic laws, and control systems as auto-centric to the point of disregarding their presence or legitimate needs. Pedestrians and cyclists tend to fit in this class. Those riding micromobility devices appear to be joining them.

That is a problem. The risk of injury or death for both rider and others is sufficiently large, and the micromobility phenomenon, sufficiently novel that an appropriate legal response requires more than enactment of distinct traffic rules for limited classes of these powered vehicles, in the expectation of high levels of public familiarity and compliance encouraged by widespread and consistent police enforcement. That approach will not only prove ineffectual but miss an opportunity to test new methods of securing greater levels of traffic law compliance more generally.

B. The Threshold Challenge: Keeping Non-Street-Legal Devices off the Streets

NHTSA’s attention to configuration, abandoned in 2008, reflected a concern with enforcement. The agency’s insistence that slow speed vehicles resembling motorcycles comply with federal motorcycle equipment and VIN standards, facilitated state registration and the issuance of license plates. In most states, the

327 See p. 30 supra.
absence of plates on any powered two-wheeled vehicle traveling along a public highway was, by itself, presumptive evidence of a traffic violation.

No longer. The core characteristic distinguishing “street legal” electric scooters and electric bicycles from those that cannot lawfully be operated on a public roadway is maximum speed. The current electric bicycle and electric scooter market includes many models that exceed the 20 mph boundary set by NHTSA’s 2008 tentative interpretation and the upper limits set by state motor vehicle laws, some by a large margin.\(^{328}\) Advertised for “off road” use in order to avoid NHTSA standards, such vehicles are hard to distinguish from “street legal” look-alikes except when they unleash their full power. Past NHTSA rulings hold that bringing a vehicle’s top speed down to 20 mph by means of a governor or other adjustable mechanism does not avoid “motor vehicle” characterization.\(^{329}\) A fair reading of state electric bicycle and electric scooter legislation yields the same conclusion. Under this view, an electric bicycle capable of speeds in excess of 20 mph that is held to that speed by the rider’s selection of an “on road” setting falls within the federal “motor vehicle” definition and outside the “street legal” classes of electric bicycles of the typical state statute.

NHTSA could and should be more vigilant in scrutinizing electrically powered bicycles, scooters, and unicycles that purport to be designed for off-road use. Further, as a condition for permitting the manufacture or import of any higher speed electric micromobility device, NHTSA might reasonably require the attachment of a permanent, highly visible label, of specified format, identifying the vehicle as “for off-road use only.” The agency has long treated “a warning label

\(^{328}\) For example, the ONYX RCR can be set to electric bicycle power and speeds but can also travel at up to 60 mph. See Micah Toll, ONYX RCR First ride: Flying fast on this 60 mph electric moped, electrek (March 5, 2020), https://electrek.co/2020/03/06/onyx-rcr-first-ride-60-mph-electric-moped/. The Fiido Beast is an electric scooter that can travel at up to 30 mph. See Micah Toll, Fiido Beast seated & standing 30 mph electric scooter launches, offers choose-your-own ride style, electrek (March 23, 2022), https://electrek.co/2022/03/23/fiido-beast-seated-standing-30-mph-electric-scooter-launches-offers-choose-your-own-ride-style/. The Segway Company has begun selling an electric scooter capable of 43 mph. See Kate Kozuch, Segway's new scooters are alarmingly fast — and there's a new electric skateboard, tom's guide (March 03, 2022), https://www.tomsguide.com/news/segways-new-scooters-are-alarmingly-fast-and-theres-a-new-electric-skateboard.

stating that the vehicle is not intended for use on the public roads” to be a significant factor bearing on whether it is subject to NHTSA standards.330

In the absence of federal action, states could do the same. There are several reasons, however, for states to focus instead on requiring micromobility devices, of the types they do permit on public roadways, to display distinctive indicia.

C. Vehicle Registration with Assignment of a Unique ID

Historically, state registration, evidenced by license plates readable at a distance, has signaled compliance with state motor vehicle requirements. It has also furnished a means of assigning responsibility for traffic and parking infractions. If small electrically powered vehicles are to become as significant a presence on the nation’s streets and highways as they seem destined to be, at least in some regions, they warrant administrative oversight comparable to that currently given neighborhood electric vehicles and mopeds. Registration accompanied by mandatory display of a unique identifier is the place to begin.

D. Use of Administrative Procedures and Personnel. Automated Systems, and Citizen Reports to Hold Micromobility Users Accountable

In recent years, the ways in which police, state and local, enforce traffic laws have come under increased scrutiny and criticism.331 The dominant model of micromobility legislation has simply added a large number of vehicles, divided into multiple categories, each with a distinct set of regulations, onto existing police traffic responsibilities. The introduction of micromobility devices might instead be viewed as an opportunity to explore alternative enforcement methods. Many communities have begun to rely on technology built into share-system devices and monitoring systems to secure compliance with restrictions on where those devices may be ridden, at what speed, and where they may be parked.332 Although the

approach holds great promise, it fails to reach the operation of the rapidly growing number of micromobility devices that are individually owned.

Automated systems capable of reading vehicle tags have, in some localities, become an accepted tool of traffic law enforcement. Properly deployed they could be used to monitor the use of micromobility devices. Even more sophisticated options exist. On many of the nation’s toll roads and bridges, vehicles are identified and charges assessed through the use of RFID transponders and readers. Micromobility devices offer an opportunity to expand the use of this technology.

A state-enforced requirement of registration tags legible at a distance to the human eye or camera and recordable by an RFID reader could facilitate enforcement of traffic rules against all “street legal” micromobility devices and provide useful data on the performance of share-system operators. It might also enable municipal jurisdictions that have already shifted parking law enforcement from police officers to administrative personnel to do the same with this new category of street users and to introduce automated enforcement to a less firmly entrenched set of vehicle operators. Some might even enlist citizen volunteers.


335 At present both roadways and sidewalks are contested space. Some members of the public view non-compliance with the rules governing their use with a high level of personal grievance. This is true of pedestrians inconvenienced or endangered by the unlawful operation or parking of a micromobility device on a sidewalk. It is true, as well, of cyclists and micromobility users who encounter automobiles or trucks stopped (with or without hazard lights on) in the bicycle lane designated for their exclusive use. Models of traffic law enforcement have begun to appear that enlist the upset citizen armed with a smart phone as agent. Some add the encouragement of a financial payoff, by returning a fraction of any resulting fine to the individual reporting the offense. See, e.g., Samuel Stark, Car Blocking a Bike Lane? You Might Be Able to Report it and Make Some Money Soon, AUSTIN MONITOR (June 9, 2022), https://www.austinmonitor.com/stories/2022/06/car-blocking-a-bike-lane-you-might-be-able-to-report-it-and-make-some-money-soon/; New York City, Citizens Air Complaint Program, https://www1.nyc.gov/site/dep/environment/idling-citizens-air-complaint-program.page.
VI. A Few Concluding Observations

The sale and rental of a growing variety of electrically powered personal mobility devices is a major national phenomenon. Despite their differences, these vehicles share characteristics that are attractive to users, and to public officials responsible for metropolitan transportation planning. They do not burn fossil fuel. In terms of energy use and space required, they are a far more efficient way to move individual travelers over short distances than even the smallest automobile or neighborhood electric vehicle. When parked, they require less space. Offered through shared systems, they can be positioned to fill gaps between public transit and a traveler’s starting point, destination, or both.

On the other hand, except for the intrepid, their usefulness is limited to fair weather. The cold temperatures, snow, and ice experienced during winter in some parts of the country render their use unpleasant and, in varying degrees, unsafe. Extreme heat and heavy summer storms also curb their use. Lastly, because of the physical demands and risks they place on the operator, electric bicycles, scooters, skateboards, and unicycles are neither attractive nor suitable transportation alternatives for a sizable portion of the population.

The safety risks these vehicles pose for the operator and other members of the public sharing the same space warrant serious attention from the federal agencies charged with setting standards for all vehicles destined for roadway use. Between them, the National Highway Traffic Safety Administration and Consumer Product Safety Commission have ample statutory authority to regulate the design, construction, and identification of these new devices. They, not the states individually, need to address such fundamental questions as whether all micromobility devices should be required to emit a warning sound, as even new slow-speed electric vehicles with four wheels must now. Issues of that sort call for a national rather than a state-by-state answer. Although NHTSA backed away

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336 See supra pp. 5-7.
337 See 49 C.F.R. § 571.141. This requirement is the product of the Pedestrian Safety Enhancement Act of 2010, Pub. L. No. 111–373. While the statute’s mandate extended to the full range of motor vehicles as defined by 49 U.S.C. § 30102(a)(6), the standard is limited to those with four-wheels. NHTSA explained, in 2016, it didn’t have “enough information ... to apply the minimum acoustic requirements of this final rule to [motorcycles].” 89 Fed. Reg. 90416, 90417 (Dec. 14, 2016). Six years later, the regulatory question calls for a standard that would apply consistently to all electric “motor vehicles,” broadly defined, that move materially faster than the average pedestrians.
from vehicles of this sort during an era when its enthusiasm for standard-setting was low and small, slow speed devices seemed a distraction, electrically powered vehicles capable of speeds no greater than 20 mph have, over the last decade, become “street legal” on many of the nation’s roadways. They are, as a result, squarely within the U.S. Code’s “motor vehicle” definition upon which NHTSA’s regulatory authority is grounded. Whether autonomous delivery robots operate on roadway or sidewalk, they too properly fall within its purview and not that of the CPSC. NHTSA’s parent, the Department of Transportation, has awakened to the importance of “walking, biking, … [and] rolling” as modes of individual mobility. Able to offer states funding for infrastructure changes and improvements, it is in an ideal position to guide and coordinate state micromobility regulation.

Like the public infrastructure designed to facilitate movement around and between the nation’s cities, towns, and villages, the state laws governing that movement still remain largely configured around automobiles and their larger relatives, on the one hand, and pedestrians on the other, with limited accommodation of bicycles. Fitting motorized delivery robots, skateboards, standup scooters, bicycles into this framework has largely been accomplished by following the path of the nearly extinct Segway and creating arbitrarily defined exceptions to state motor vehicle statutes, each with its own set of operating rules, while largely ignoring the challenges of securing compliance.

Both equipment standards and regulation of use should apply with reasonable consistency across device types, without distinctions based on features that have little or no bearing on functional capability or safety while attending to those like wheel size, stability, braking, electrical and control systems that do. In the absence of the National Uniform Committee on Uniform Traffic Laws and Ordinances, there is a need for some other entity to take on the role that organization fulfilled during the twentieth century – drafting model traffic and vehicle provisions that encourage greater consistency across the country and sharing best practices among the fifty states.

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states. Plausible candidates include the Uniform Law Commission\textsuperscript{342} and the Governors Highway Safety Association.\textsuperscript{343} Climate, degree of urbanization, quality of existing infrastructure for bicycles and other forms of low-speed individual vehicular mobility, along with other factors will inevitably lead to differences in how states regulate the use of these devices. They argue powerfully, as well, for states granting local governments substantial authority to add their own requirements.

To date, the established pattern of state automobile, motorcycle, and moped legislation has largely been rejected for this twenty-first century wave of individualized mobility. Yet the underlying public safety concerns that earlier pattern addressed remain largely unanswered. These include the need for some means of screening the individuals who are allowed to control the vehicles and for facilitating the identification of sellers and buyers, owners and renters, who violate the rules that govern their sale, rental, and use. The practice of licensing automobile, motorcycle, and moped drivers provides an accepted means of assuring that the operators of such vehicles have sufficient age, visual and physical capacity, knowledge of the applicable rules, and operational skill to be entrusted with their use in public space. It also furnishes a mechanism for taking hazardous operators off the road. Registration of individual vehicles, reflected in a publicly displayed tag, is a universally employed means of enabling law enforcement personnel to distinguish “street legal” vehicles from those that are not and to identify the owners accountable for their use. Concededly, those moving about on a vehicle propelled solely by their own muscular power (whether bicycle, skates, or skateboard) are, typically, neither screened nor tagged. It is far from obvious, though, that powered devices, capable of speeds of 20 mph or more, most of which must be balanced, should be allowed in shared public space without any operator vetting or a ready means by which those violating the applicable rules of the road can readily be identified. That becomes increasingly clear as nominally “off road” counterparts with way too much power and speed to be “street legal,” but visually indistinguishable from those that are, become available. Already the record is clear; even “street legal” electric bicycles and electric scooters can pose a serious risk to their riders and others.\textsuperscript{344}

\textsuperscript{343} See GHSA, https://www.ghsa.org/.
\textsuperscript{344} See, e.g., U.S. Consumer Product Safety Commission, Micromobility Products-Related Deaths Injuries and Hazard Patterns 2017-2020 (2021), https://www.cpsc.gov/content/Micromobility-
Every state has an agency with personnel, systems, and expertise focused on screening and regulating the vehicles permitted to move along the jurisdiction’s roadways and the individuals authorized to operate them. The indicia of authorization they issue – vehicle tags and operators’ licenses – make it possible for state and local law enforcement personnel to identify authorized devices and drivers and distinguish them from those that don’t belong. Just as fresh technology has made these new forms of mobility possible, technology offers ways to provide more effective enforcement of the rules governing their use. If the laws governing micromobility devices are to be widely understood, followed, and effectively enforced, comparable institutional means must be found.

Major legislative and regulatory catch-up is needed. It will require focused and ongoing attention at federal, state, and municipal levels.