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THE FUTURE OF LAW AND MOBILITY

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INTRODUCTION

With the launch of the new *Journal of Law and Mobility*, the University of Michigan is recognizing the transformative impact of new transportation and mobility technologies, from cars, to trucks, to pedestrians, to drones. The coming transition towards intelligent, automated, and connected mobility systems will transform not only the way people and goods move about, but also the way human safety, privacy, and security are protected, cities are organized, machines and people are connected, and the public and private spheres are defined.

Law will be at the center of these transformations, as it always is. There has already been a good deal of thinking about the ways that law must adapt to make connected and automated mobility feasible in areas like tort liability, insurance, federal preemption, and data privacy.¹ But it is also not too early to begin pondering the many implications for law and regulation arising from the technology's spillover effects as it begins to permeate society. For better or worse, connected and automated mobility will disrupt legal practices and concepts in a variety of ways additional to the obvious "regulation of the car." Policing practices and Fourth Amendment law, now so heavily centered on routine automobile stops, will of necessity require reconsideration. Notions of ownership of physical property (*i.e.*, an automobile) and data (*i.e.*, accident records) will be challenged by the automated sharing economy.

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1. See, e.g., Daniel A. Crane, Kyle D. Logue & Bryce Pilz, *A Survey of Legal Issues Arising from the Deployment of Autonomous and Connected Vehicles*, 23 Mich. Tel. & Tech. L. Rev. 191 (2017).

And the economic and regulatory structure of the transportation network will have to be reconsidered as mobility transitions from a largely individualistic model of drivers in their own cars pursuing their own ends within the confines of general rules of the road to a model in which shared and interconnected vehicles make collective decisions to optimize the system's performance. In these and many other ways, the coming mobility revolution will challenge existing legal concepts and practices with implications far beyond the "cool new gadget of driverless cars."

Despite the great importance of the coming mobility revolution, the case for a field of study in "law and mobility" is not obvious. In this inaugural essay for the *Journal of Law and Mobility*, I shall endeavor briefly to make that case.

I. DRIVERLESS CARS AND THE LAW OF THE HORSE

A technological phenomenon can be tremendously important to society without necessarily meriting its own field of legal study because of what Judge Frank Easterbrook has described as "the law of the horse" problem.² Writing against the burgeoning field of "Internet law" in the early 1990s, Easterbrook argued against organizing legal analysis around particular technologies:

[T]he best way to learn the law applicable to specialized endeavors is to study general rules. Lots of cases deal with sales of horses; others deal with people kicked by horses; still more deal with the licensing and racing of horses, or with the care veterinarians give to horses, or with prizes at horse shows. Any effort to collect these strands into a course on "The Law of the Horse" is doomed to be shallow and to miss unifying principles.³

Prominent advocates of "Internet law" as a field rebutted Easterbrook's concern, arguing that focusing on cyberlaw as a field could be productive to understanding aspects of this important human endeavor in ways that merely studying general principles might miss.⁴ Despite Easterbrook's protestation, a distinct field of cyberlaw has grown up in recent decades.

"The law of the horse" debate seems particularly apt to the question of law and mobility since the automobile is the lineal successor of the horse as society's key transportation technology. Without attempting to offer a general solution to the "law of the horse" question, it is worth drawing a distinction between two different kinds of disruptive technologies—those in which the technological change produces social changes indirectly and

2. Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. Chi. Legal F. 207, 207-16.

3. *Id.*

4. Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 Harv. L. Rev. 501 (1999).

without significant possibilities for legal intervention, and those in which law is central to the formation of the technology itself.

An example of the first species of technological change is air conditioning. The rise of air conditioning in the mid-twentieth century had tremendous effects on society, including dramatic increases in business productivity, changes in living patterns as people shifted indoors, and the extension of retail store hours and hence the growing commercialization of American culture.⁵ The South's share of U.S. population was in steady decline until the 1960s when, in lockstep with the growth of air conditioning and people's willingness to settle in hot places, the trend abruptly reversed and the South's share grew dramatically.⁶ The political consequences were enormous—from Richard Nixon through George W. Bush, every elected President hailed from warm climates.

One could say, without exaggeration, that the Willis Carrier's frigid contraption exerted a greater effect on American business, culture, and politics than almost any other invention in the twentieth century. And, yet, it would seem silly to launch a field of study in "law and air conditioning." Air conditioning's social, economic, and political effects were largely indirect—the result of human decisions in response to the new circumstances created by the new technology rather than an immediate consequence of the technology itself. Even if regulators had foreseen the dramatic demographic effects of air conditioning's spread, there is little they could have done (short of killing or limiting the technology) to mediate the process of change by regulating the technology.

Contrast the Internet. Like air conditioning, the Internet has had tremendous implications for culture, business, and politics, but unlike air conditioning, many of these effects were artifacts of design decisions regarding the legal architecture of cyberspace. From questions of taxation of online commercial transactions,⁷ to circumvention of digital rights management technologies,⁸ to personal jurisdiction over geographically remote online interlocutors,⁹ and in countless other ways, a complex of legal and regulatory decisions created the modern Internet. From the beginning,

5. Stan Cox, *Losing Our Cool: Uncomfortable Truths About Our Air-Conditioned World (and Finding New Ways to Get Through the Summer)* (2012).

6. Paul Krugman, *Air Conditioning and the Rise of the South*, New York Times March 28, 2015, <https://krugman.blogs.nytimes.com/2015/03/28/air-conditioning-and-the-rise-of-the-south/>.

7. See, e.g., John E. Sununu, *The Taxation of Internet Commerce*, 39 Harv. J. Leg. 325 (2002).

8. See, e.g., David Nimmer, *A Riff on Fair Use in the Digital Millennium Copyright Act*, 148 U. Pa. L. Rev. 673 (2000).

9. Note, *No Bad Puns: A Different Approach to the Problem of Personal Jurisdiction and the Internet*, 116 Harv. L. Rev. 1821 (2003).

law was hovering over the face of cyberspace. Al Gore may not have created the Internet, but lawyers had as much to do with it as did engineers.

The Internet's legal architecture was not established at a single point in time, by a single set of actors, or with a single set of ideological commitments or policy considerations. Copyright structures were born of the contestation among one set of stakeholders, which was distinct from the sets of stakeholders contesting over tax policy, net neutrality, or revenge porn. And yet, the decisions made in separate regulatory spheres often interact in underappreciated ways to lend the Internet its social and economic character. Tax policy made Amazon dominant in retail, copyright policy made Google dominant in search, and data protection law (or its absence) made Facebook dominant in social media—with the result that all three have become antitrust problems.

Whether or not law students should be encouraged to study “Internet law” in a discrete course, it seems evident with the benefit of thirty years of hindsight that the role of law in mediating cyberspace cannot be adequately comprehended without a systemic inquiry. Mobility, I would argue, will be much the same. While the individual components of the coming shift toward connectivity and automation—*i.e.*, insurance, tort liability, indemnification, intellectual property, federal preemption, municipal traffic law, etc.—will have analogues in known circumstances and hence will benefit from consideration as general questions of insurance, torts, and so forth, the interaction of the many moving parts will produce a novel, complex ecosystem. Given the potential of that ecosystem to transform human life in many significant ways, it is well worth investing some effort in studying “law and mobility” as a comprehensive field.

II. AN ILLUSTRATION FROM THREE CONNECTED TOPICS

It would be foolish to attempt a description of mobility's future legal architecture at this early stage in the mobility revolution. However, in an effort to provide some further motivation for the field of “law and mobility,” let me offer an illustration from three areas in which legal practices and doctrines may be affected in complex ways by the shift toward connected and automated vehicles. Although these three topics entail consideration of separate fields of law, the technological and legal decisions made with respect to them could well have system-wide implications, which shows the value of keeping the entire system in perspective as discrete problems are addressed.

A. *Policing and Public Security*

For better or for worse, the advent of automated vehicles will redefine the way that policing and law enforcement are conducted. Routine traffic stops

are fraught, but potentially strategically significant, moments for police-citizen interactions. Half of all citizen-police interactions,¹⁰ more than forty percent of all drug arrests,¹¹ and over 30% of police shootings¹² occur in the context of traffic stops. Much of the social tension over racial profiling and enforcement inequality has arisen in the context of police practices with respect to minority motorists.¹³ The traffic stop is central to modern policing, including both its successes and pathologies.

Will there continue to be routine police stops in a world of automated vehicles? Surely traffic stops will not disappear altogether, since driverless cars may still have broken taillights or lapsed registrations.¹⁴ But with the advent of cars programmed to follow the rules of the road, the number of occasions for the police to stop cars will decline significantly. As a general matter, the police need probable cause to stop a vehicle on a roadway.¹⁵ A world of predominantly automated vehicles will mean many fewer traffic violations and hence many fewer police stops and many fewer police-citizen interactions and arrests for evidence of crime discovered during those stops.

On the positive side, that could mean a significant reduction in some of the abuses and racial tensions around policing. But it could also deprive the police of a crime detection dragnet, with the consequence either that the crime rate will increase due to the lower detection rate or that the police will deploy new crime detection strategies that could create new problems of their own.

Addressing these potentially sweeping changes to the practices of policing brought about by automated vehicle technologies requires considering both the structure of the relevant technology and the law itself. On the technological side, connected and automated vehicles could be designed for easy monitoring and controlling by the police. That could entail a decline in privacy for vehicle occupants, but also potentially reduce the need for

10. Samuel Walker, *Science and Politics in Police Research: Reflections on their Tangled Relationship*, 593 *Annals Am. Acad. Pol. & Soc. Sci.* 137, 142 (2004); ATTHEW R. DUROSE ET. AL., U.S. DEP'T OF JUSTICE, OFFICE OF JUSTICE PROGRAMS, BUREAU OF JUSTICE STATISTICS, CONTACTS BETWEEN POLICE AND THE PUBLIC, 2005, 1 (2007), available at <https://www.bjs.gov/index.cfm?ty=pbdetail&iid=653>.

11. David A. Sklansky, *Traffic Stops, Minority Motorists, and the Future of the Fourth Amendment*, 1997 *SUP. CT. REV.* 271, 299.

12. *Adams v. Williams*, 407 U.S. 143, 148 n.3 (1972).

13. Ronnie A. Dunn, *Racial Profiling: A Persistent Civil Rights Challenge Even in the Twenty-First Century*, 66 *Case W. Res. L. Rev.* 957, 979 (2016) (reporting statistics on disproportionate effects on racial minorities of routine traffic stops).

14. See John Frank Weaver, *Robot, Do You Know Why I Stopped You?*, http://www.slate.com/articles/technology/future_tense/2016/06/why_police_might_pull_over_self_driving_cars.html.

15. *Whren v. U.S.*, 517 U.S. 806 (1996).

physical stops by the police (cars that can be remotely monitored can be remotely ticketed) and hence some of the police-citizen roadside friction that has dominated recent troubles.

On the legal side, the advent of connected and automated vehicles will require rethinking the structure of Fourth Amendment law as required to automobiles. At present, individual rights as against searches and seizures often rely on distinctions between drivers and passengers, or owners and occupants. For example, a passenger in a car may challenge the legality of the police stop of a car,¹⁶ but have diminished expectations of privacy in the search of the vehicle's interior if they are not the vehicle's owners or bailees.¹⁷ In a mobility fleet without drivers and (as discussed momentarily) perhaps without many individual owners, these conceptions of the relationship of people to cars will require reconsideration.

B. *Ownership, Sharing, and the Public/Private Divide*

In American culture, the individually owned automobile has historically been far more than a transportation device—it has been an icon of freedom, mobility, and personal identity. As Ted McAllister has written concerning the growth of automobile culture in the early twentieth century:

The automobile squared perfectly with a distinctive American ideal of freedom—freedom of mobility. Always a restless nation, with complex migratory patterns throughout the 17th, 18th, and 19th centuries, the car came just as a certain kind of mobility had reached an end with the closing of the frontier. But the restlessness had not ended, and the car allowed control of space like no other form of transportation.¹⁸

Individual car ownership has long been central to conceptions of property and economic status. The average American adult currently spends about ten percent of his or her income on an automobile,¹⁹ making it by far his or her most expensive item of personal property. The social costs of individual automobile ownership are far higher.²⁰

The automobile's run as an icon of social status through ownership may

16. *Brendlin v. California*, 551 U.S. 249 (2007).

17. *U.S. v. Jones*, 565 U.S. 400 (2012).

18. Ted v. McAllister, *Cars, Individualism, and the Paradox of Freedom in a Mass Society*, <https://www.frontporchrepublic.com/2011/10/cars-individualism-and-the-paradox-of-freedom-in-a-mass-society/>.

19. Máté Petrány, *This Is How Much Americans Spend on their Cars*, <https://jalopnik.com/this-is-how-much-americans-spend-on-their-cars-1596515156>.

20. Edward Humes, *The Absurd Primacy of the Automobile in American Life*, <https://www.theatlantic.com/business/archive/2016/04/absurd-primacy-of-the-car-in-american-life/476346/>; Robert Moor, *What Happens to the American Myth When You Take the Driver Out of It?*, <http://nymag.com/selectall/2016/10/is-the-self-driving-car-un-american.html>.

be ending. Futurists expect that the availability of on-demand automated vehicle service will complete the transition from mobility as personal property to mobility as a service, as more and more households stop buying cars and rely instead on ride sharing services.²¹ Ride sharing companies like Uber and Lyft have long been on this case, and now automobile manufacturers are scrambling to market their vehicles as shared services.²² With the decline of individual ownership, what will happen to conceptions of property in the physical space of the automobile, in the contractual right to use a particular car or fleet of automobiles, and in the data generated about occupants and vehicles?

The coming transition from individual ownership to shared service will also raise important questions about the line between the public and private domains. At present, the “public sphere” is defined by mass transit whereas the individually owned automobile constitutes the “private sphere.” The public sphere operates according to ancient common carrier rules of universal access and non-discrimination, whereas a car is not quite “a man’s castle on wheels” for constitutional purposes,²³ but still a non-public space dominated by individual rights as against the state rather than public obligations.²⁴ As more and more vehicles are held and used in shared fleets rather than individual hands, the traditional line between publicly minded “mass transit” and individually minded vehicle ownership will come under pressure, with significant consequences for both efficiency and equality.

C. Platform Mobility, Competition, and Regulation

The coming transition toward ride sharing fleets rather than individual vehicle ownership described in the previous section will have additional important implications for the economic structure of mobility—which of course will raise important regulatory questions as well. At present, the private transportation system is highly atomistic. In the United States alone, there are 264 million individually owned motor vehicles in operation.²⁵ For

21. *Smart Cities and the Vehicle Ownership Shift*, <https://www.automotiveworld.com/analysis/smart-cities-vehicle-ownership-shift/>.

22. Ryan Felton, *GM Aims to Get Ahead of Everyone with Autonomous Ride-Sharing Service in Multiple Cities by 2019*, <https://jalopnik.com/gm-aims-to-get-ahead-of-everyone-with-autonomous-ride-s-1820886131>.

23. See *Illinois v. Lidster*, 540 U.S. 419, 424 (2004) (“The Fourth Amendment does not treat a motorist’s car as his castle.”).

24. *E.g.*, *Byrne v. Rutledge*, 623 F.3d 46 (2d Cir. 2010) (holding the motor vehicle license plates were nonpublic fora and that state’s ban on vanity plates referencing religious topic violated First Amendment).

25. U.S. Dep’t of Energy, *Transportation Energy Data Book*, Chapter 8, Household Vehicles and Characteristics, Table 8.1, Population and Vehicle Profile, <https://cta.ornl.gov/data/chapter8.shtml> (last visited May 29, 2018).

the reasons previously identified, expect many of these vehicles to shift toward corporate-owned fleets in coming years. The question then will be how many such fleets will operate—whether we will see robust fleet-to-fleet competition or instead the convergence toward a few dominant providers as we are seeing in other important areas of the “platform economy.”

There is every reason to believe that, before too long, mobility will tend in the direction of other monopoly or oligopoly platforms because it will share their economic structure. The key economic facts behind the rise of dominant platforms like Amazon, Twitter, Google, Facebook, Microsoft, and Apple are the presence of scale economies and network effects—system attributes that make the system more desirable for others users as new users join.²⁶ In the case of the mobility revolution, a number of features are suggestive of future scale economies and network effects. The more cars in a fleet, the more likely it is that one will be available when summoned by a user.²⁷ The more cars connected to other cars in a fleet, the higher the quality of the information (on such topics as road and weather conditions and vehicle performance) available within the fleet and the steeper the machine learning curve.

As is true with other platforms, the mere presence of scale economic and network effects does not have to lead inexorably to market concentration or monopoly. Law and regulation may intervene to mitigate these effects, for example by requiring information sharing or interconnection among rival platforms. But such mandatory information sharing or interconnection obligations are not always advisable, as they can diminish a platform’s incentives to invest in its own infrastructure or otherwise impair incentives to compete.

Circling back to the “law of the horse” point raised at the outset, these issues are not, of course, unique to law and mobility. But this brief examination of these three topics—policing, ownership, and competition—shows the value of considering law and mobility as a distinct topic. Technological, legal, and regulatory decisions we make with respect to one particular set of problems will have implications for distinct problems perhaps not under consideration at that moment. For example, law and technology will operate conjunctively to define the bounds of privacy expectations in connected and automated vehicles, with implications for search and seizure law, property and data privacy norms, and sharing

26. See generally David S. Evans & Richard Schmalensee, *A Guide to the Antitrust Economics of Networks*, Antitrust, Spring 1996, at 36; Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. Econ. Persp. 93 (1994).

27. This should hold even though a larger fleet would also mean more subscribers, since the average distance between a user and an available vehicle should decline with an increase in the fleet’s market penetration.

obligations to promote competition. Pulling a “privacy lever” in one context—say to safeguard against excessive police searches—could have spillover effects in another context, for example by bolstering a dominant mobility platform’s arguments against mandatory data sharing. Although the interactions between the different technological decisions and related legal norms are surely impossible to predict or manage with exactitude, consideration of law and mobility as a system will permit a holistic view of this complex, evolving ecosystem.

CONCLUSION

Law and regulation will be at the center of the coming mobility revolution. Many of the patterns we will observe at the intersection of law and the new technologies will be familiar—at least if we spend the time to study past technological revolutions—and general principles will be sufficient to answer many of the rising questions. At the same time, there is a benefit to considering the field of law and mobility comprehensively with an eye to understanding the often subtle interactions between discrete technological and legal decisions. The *Journal of Law and Mobility* aims to play an important role in this fast-moving space.