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Robocar Risks

Michael Lewyn



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Zoning and Land Use Planning

Michael Lewyn*

ROBOCAR RISKS

Google has been testing driverless cars since 2009, and other companies such as Tesla are following suit.¹ Waymo (a company affiliated with Google) is giving hundreds of Phoenix residents free access to autonomous vehicles (or "AVs") in order to learn what features customers prefer in such vehicles.² Although Waymo will have a "safety driver" present to monitor rides,³ fully autonomous vehicles will become more common over the next couple of decades.

Many commentators view autonomous vehicles as a public good; because most car crashes occur as a result of human error, the rise of autonomous vehicles may make American roads far safer.⁴ Thus, cities and states will be tempted to adopt a variety of rules in order to facilitate the growth of such vehicles, much as 20th-century policymakers privileged automobile users over nondrivers.

This article shows how 20th-century policymakers put cars first, and discusses the costs of these pro-car policies; the article further shows how policymakers might be tempted to

*Associate Professor, Touro Law Center, Wesleyan University, B.A.; University of Pennsylvania, J.D.; University of Toronto, L.L.M.

¹See Chasel Lee, *Grabbing the Wheel Early: Moving Forward on Cybersecurity and Privacy Protections for Driverless Cars*, 69 Fed. Comm. L.J. 25, 27-28 (2017).

²See Michael Laris and Steven Overly, Waymo is giving hundreds of people access to their own self-driving cars, Washington Post, April 25, 2017, at https://www.washingtonpost.com/news/dr-gridlock/wp/2017/04/25/googles-waymo-offers-everyday-access-to-self-driving-cars-for-select-families/?utm_term=.0e0e3ccc2d58.

³*Id.*

⁴See Andrew R. Swanon, "Somebody Grab the Wheel!," State Autonomous Vehicle Legislation and the Road to a National Regime, 97 Marq. L. Rev. 1085, 1088-89 (2017).

adopt similar policies to facilitate the growth of autonomous vehicles. The article focuses on highway construction, street design, and jaywalking laws. The purpose of this article is to assert that cities should learn from their 20th century mistakes; in short, this article is about what *not* to do.

I. Highways

A. 20th-Century Policy

As early as the 1920s, states accommodated the growth of the automobile by adopting motor fuel taxes and earmarking the revenue from these taxes to fund highway construction.⁵ In addition, states received highway grants from the federal government; after 1956, the federal government subsidized 90% of the cost of interstate highways, even though planning decisions were left to states.⁶ Today, the federal government alone spends \$45 billion per year on highways,⁷ while state and local governments spend roughly \$120 billion.⁸

By making suburbs more accessible, these highways facilitated post-World War II suburbanization.⁹ Nathaniel Baum-Snow of Brown University has calculated that each new regional highway reduces central city population by about 18%,¹⁰ and that had the interstate highway system not

⁵See Richard Briffault, *Our Localism: Part II-Localism and Legal Theory*, 90 Colum. L. Rev. 346, 380 n. 149 (1990).

⁶See Benjamin K. Olson, *The Transportation Equity Act for the 21st Century: the Failure of Metropolitan Planning Organizations to Reform Federal Transportation Policy in Metropolitan Areas*, 28 Transp. L. J. 147, 151 (2000).

⁷See Office of Management and Budget, *Fiscal Year 2016 Historical Tables: Budget of the United States Government*, Table 9.6, at <https://www.whitehouse.gov/sites/default/files/omb/budget/fy2016/assets/hist.pdf>.

⁸See Congressional Budget Office, *Public Spending on Transportation and Water Infrastructure, 1956 to 2014*, at 8, at <https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/49910-Infrastructure.pdf> (total government highway spending is \$165 billion; thus, if federal government spends \$40 billion per year, state and local spending is \$125 billion).

⁹See Olson, *supra* note 6, at 151.

¹⁰See Nathaniel Baum-Snow, *Did Highways Cause Suburbanization?*, 122 Quarterly J. Econ. 775, 776 (2007) Baum-Snow.

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been built, American central city population would have grown by 8% (rather than declining by 17%).¹¹

Consumer surveys also suggest that highways affect housing choices. A 2013 survey by the National Association of Realtors asked Americans about a variety of factors related to housing choices. Out of 19 factors listed, “easy access to the highway” was fourth: 67% said that this factor was either “very important” or “somewhat important.”¹² Thus, highways clearly make suburbs more attractive to commuters.

However, government failed to expand public transit to the same extent that it expanded highways; as a result, many highway-created suburbs have minimal or nonexistent public transit.¹³ And in many postwar suburbs, walking is equally impractical for a variety of reasons: streets are too wide to be safely crossed on foot, and population densities are so low that many neighborhoods have few shops or jobs within walking distance.¹⁴ Thus, American suburbs tend to be highly automobile-dependent.

The automobile-dependent nature of suburbia has a variety of negative side effects. First, the poor are especially disadvantaged by car-dependent development, because people too poor to afford cars are more likely to be shut out of labor markets. Even poor people who are able to drive to suburban jobs suffer from having to drive to work, because people who live or work in automobile-dependent suburbs have higher transportation costs than residents of cities with plentiful public transit. For example, in Manhattan and Brooklyn, transportation costs are less than 10% of household

¹¹*Id.* See also Nathaniel Baum-Snow, *Reply to Cox, Gordon and Redfearn's Comment on "Did Highways Cause Suburbanization?"*, *Econ J.* Watch 5(1) 46 (2008) (responding to critique of article).

¹²National Association of Realtors and American Strategies, National Community Preference Survey October 2013, Slide 35, at <http://www.realtor.org/sites/default/files/reports/2013/2013-community-preference-analysis-slides.pdf>.

¹³See Adie Tomer et. al, *Missed Opportunity: Transit and Jobs in Metropolitan America* 9, 12, 17 at https://www.brookings.edu/wp-content/uploads/2016/06/0512_jobs_transit.pdf (suburbanites less likely to be near frequent transit service; as a result, suburbanites can reach fewer jobs by transit than city residents).

¹⁴See generally Part II *infra*.

income, while residents of suburban Suffolk County pay 21% of their income for transportation.¹⁵ Similarly, households in the city of Atlanta pay 14% of household income for transportation, while households in suburban Cherokee County pay 25%.¹⁶

Second, suburban vehicle dependence harms human health by reducing walking. If people must drive to every conceivable destination, they will obviously walk less and engage in less physical activity, all else being equal. So it should not be surprising that people in less walkable areas are more likely to be obese and to suffer from diabetes and other obesity-related diseases.¹⁷ For example, one study created a "walkability index" (measuring the distance of churches, schools, and entertainment from the neighborhoods studied)¹⁸ and found that a "1 percent increase in the walkability index of a neighborhood is associated with a 50 percent reduction in the likelihood that it will belong to a high disease as opposed to a low disease cluster for obesity . . . 49 percent lower likelihood for diabetes, 39 percent lower likelihood for hypertension, and 40 percent lower likelihood for heart disease."¹⁹

Third, more driving means more pollution. As Americans have moved to automobile-dependent suburbs, automobile

¹⁵Data are from the Center for Neighborhood Technology, *H & T Fact Sheet*, <http://htaindex.cnt.org/fact-sheets/>. For information on each city or county, place the city's name in the search engine.

¹⁶*Id.*

¹⁷See, e.g., Vanessa Russell-Evans & Carl S. Hacker, *Expanding Waistlines and Expanding Cities: How the Adoption of Smart Growth Statutes can Help Build Healthier and More Active Communities*, 29 VA. ENVTL. L.J. 63, 75-88 (2011); Falk Muller-Riemenschneider et. al., *Neighborhood Walkability and Cardiometabolic Risk Factors in Australian Adults*, 13 BMC PUB. HEALTH 755 (2013), <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3844350/>; Vasudha Lathey et. al., *The Impact of Subregional Variations in Urban Sprawl on the Prevalence of Obesity and Related Morbidity*, 29 J. PLANNING EDUCATION & RESEARCH 127, 137, 139-41 (2009) <http://jpe.sagepub.com/content/29/2/127.full.pdf+html> (finding that "walkability . . . is the strongest predictor of disease prevalence" and citing numerous other studies).

¹⁸*Id.* at 132.

¹⁹*Id.* at 134.

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travel exploded.²⁰ Other things being equal, more auto travel means more greenhouse gas emissions and other forms of pollution. A study by Harvard economist Edward Glaeser and UCLA economist Matthew Kahn found in every single one of 66 cities surveyed, transportation-related carbon dioxide emissions (including both emissions from automobiles and emissions from transit) were higher in suburbs than in cities. For example, in New York, the city's per-household transportation emissions were 3783 pounds fewer than those of the suburbs.²¹

The growth of suburbia also led to environmental harms unrelated to air pollution. For example, as farmland and forests are turned into suburbia, wetlands are destroyed to create suburban houses and businesses. Suburbanization causes 51% of wetland losses in the United States.²² Wetlands mitigate flooding and make water less polluted; thus, filling in wetlands may increase flooding and water pollution.²³ Because wetlands include 50% of the animals and 33% of the plant species listed as endangered or threatened by the U.S. government,²⁴ wetland destruction endangers these species by reducing wildlife habitat.

In addition, sprawl may affect water quality. Rain falling on land is usually absorbed into the ground.²⁵ By contrast, parking lots and roadways are "impervious"—that is, rain falling on such surfaces does not stay on the ground.²⁶ Instead, the rain runs off into rivers and streams, causing

²⁰See U.S. Environmental Protection Agency, *Our Built and Natural Environments: A Technical Review of the Interactions Among Land Use, Transportation, and Environmental Quality* 26 (2d ed. 2013), <http://www2.epa.gov/sites/production/files/2014-03/documents/our-built-and-natural-environments.pdf> ("While the population roughly doubled between 1950 and 2011 . . . vehicle travel during this same period increased nearly sixfold") ("Built and Natural").

²¹See Edward L. Glaeser and Matthew Kahn, *The Greenness of Cities*, http://www.hks.harvard.edu/var/ezp_site/storage/fckeditor/file/pdfs/centers-programs/centers/taubman/working_papers/glaeser_08_greencities.pdf.

²²See Oliver Gillham, *The Limitless City* 90 (2002).

²³See Built and Natural, *supra* note 20, at 36.

²⁴See Gillham, *supra* note 22, at 90.

²⁵*Id.*

²⁶*Id.* at 115 (describing runoff as "rainfall or snowmelt moving over and through the ground [that] can carry pollutants").

rubbish from impervious surfaces to flow into those waters,²⁷ thus increasing bacterial contamination of water and other forms of pollution.²⁸ A one-inch rainstorm on a meadow creates 218 cubic feet of runoff, while the same amount of runoff on a one-acre impervious surface creates 3,450 cubic feet of runoff.²⁹ It logically follows that by increasing the number of parking lots, roads and other impervious surfaces in a region, suburbanization increases the amount of runoff.

In sum, the highway-building frenzy of the 20th century led to more poverty, more obesity and diabetes, and more pollution.

B. 21st-Century Policy

How is the growth of suburbia relevant to 21st-century policy? 20th-century policymakers built highways to accommodate rising demand for cars, causing people to relocate to suburbs, causing people to drive even more, causing the negative side effects discussed above.

Similarly, 21st-century policymakers might look at the growth of the AV industry and reason as follows: AVs will make driving more convenient, causing rising demand for vehicle use. To accommodate this rising demand, government should build more highways (including suburban highways) in order to prevent traffic congestion. But the experience of 20th-century America shows that this reasoning is likely to be a self-fulfilling prophecy: new city-to-suburb highways will make driving and suburbanization even easier, causing demand for vehicle use to rise even more. If this occurs, new highways will create the same negative side effects as 20th-century highways: they will encourage people and jobs to move to suburbs, thus shutting people too poor to

²⁷ See Douglas A. Mittenberger, *Development on the Banks of the Letort Spring Run: What Can Be Done to Save Pennsylvania's Waterways from Post Construction Stormwater Runoff?*, 11 Penn St. Env'tl. L. Rev. 127, 127 (2002).

²⁸ *Id.* at 128 ("Studies of pollution in urban stormwater runoff, conducted by the United States Environmental Protection Agency (EPA) and others, have consistently identified stormwater runoff as one of the nation's largest remaining sources of water impairment."), 130 ("untreated stormwater runoff transports 40 to 80 percent of nutrient pollution into receiving waters, and bacterial contamination may be 10 to 100 percent greater in concentration than acceptable safe drinking water levels.").

²⁹ *Id.* at 129.

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II. Street Design

A. 20th-Century

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³⁰ See Stephen for Communities (traffic engineer).

³¹ Michael I. 257, 265 (2006).

³² See Emily 162 (2012).

³³ See Michael and the Shaping Association 65, pdf.

³⁴ *Id.* at 77 tence on such streets

³⁵ See Talen

own cars out of labor markets, and imposing heavy financial costs on those who can barely afford cars. And just as dependence on traditional automobiles made exercise difficult and thus spread disease, dependence on AVs will have similar effects. Finally, it is not clear whether AVs will be any less polluting than traditional cars. Thus, the rise of AVs is no reason to expand roads and highways.

II. Street Design

A. 20th-Century Policy

While government was building new highways, it was also widening existing streets in order to facilitate fast driving.³⁰ In the 1950s, the American Association of State Highway and Transportation Officials (AASHTO) recommended that major streets have six to eight 12-foot lanes,³¹ and some municipalities followed this recommendation. For example, in Tuscon, Arizona, major "collector" streets must be 90-120 feet wide, and "arterial" streets (the most heavily traveled streets other than limited-access highways) must be six lanes and 150 feet wide.³² In addition, minor streets have become wider as well: for example, the FHA recommended residential streets with 24 feet of pavement in 1936,³³ while 1950s local regulations often mandated 36-40 foot streets.³⁴ Municipalities have also subtly widened streets by expanding curb radii — that is, by curving intersections to allow cars to turn corners without slowing down.³⁵ For example,

³⁰See Stephen H. Bunting, *Restoring the Rule of Law and Respect for Communities in Transportation*, 5 N.Y.U. Envtl. L.J. 691, 701 (1996) (traffic engineers build wide streets out of "solicitude towards fast traffic").

³¹Michael Lewyn, *New Urbanist Zoning for Dummies*, 58 Ala. L. Rev. 257, 265 (2006).

³²See Emily Talen, *City Rules: How Regulations Affect Urban Form* 162 (2012).

³³See Michael Southworth and Eran Ben-Joseph, *Street Standards and the Shaping of Suburbia*, 61 Journal of the American Planning Association 65, 74 (1995), at <http://web.mit.edu/eji/www/doc/JAPAv61n1.pdf>.

³⁴*Id.* at 77 (citing homebuilders' publication criticizing local insistence on such street widths).

³⁵See Talen, *supra* note 32, at 164, 276.

1920s streets often ended blocks at right angles, while some modern suburbs require 30-50 foot radii.³⁶

These "reforms," like interstate highways, made it easier for people to drive faster and farther, and thus probably facilitated migration to suburbia. In addition, wide streets have eroded pedestrian comfort and safety: the wider the street, the longer it takes for pedestrians to cross the street. And the more seconds pedestrians spend crossing a street, the more seconds they spend being exposed to automobile traffic. Supersized streets also endanger walkers less directly, by encouraging motorists to drive more rapidly. High-speed auto traffic increases the likelihood of serious walker/driver collisions,³⁷ for three reasons. First, the fastest drivers have the narrowest field of vision, and are thus least likely to notice pedestrians or other road users: a motorist driving 30 miles an hour has a 150-degree field, while one driving 60 miles per hour has only a 50-degree field.³⁸ Second, the fastest drivers, even if they notice a pedestrian, are less likely than other drivers to be able to stop in time to avoid a crash. A motorist who is driving 20 miles per hour will be able to stop 40 feet after seeing a pedestrian, while one who is driving 40 miles per hour will not be able to stop until after he has driven 120 more feet.³⁹ Third, should a crash occur, the fastest drivers are more likely to kill a pedestrian than slower drivers. A pedestrian has a 5% chance of death if she is hit by a car traveling 20 miles per hour, and a 90% chance of death if she is hit by a car traveling 40 miles per hour.⁴⁰

Huge streets also have negative consequences unrelated to

³⁶ *Id.* at 168-69.

³⁷ As well as other types of collisions. See Peter Swift, *Residential Street Typology and Injury Accident Frequency*, at www.sierraclub.org/sprawl/articles/narrow.asp (in one community studied, "a typical 36 foot wide residential street has 1.21 [accidents per mile per year] as opposed to 0.32 for a 24 foot wide street").

³⁸ See Burrington, *supra* note 30, at 704 n. 50.

³⁹ See Joey Ledford, *Speeding Cars Terrify Neighborhoods*, *Atl. J. and Const.*, Aug. 27, 1997, at B, 1997 WLNR 3173969 ("At 20 mph, it takes you 20 feet to react [to a pedestrian or vehicle in the street] and another 20 feet to stop. At 40 mph, it's 40 feet to think and another 80 feet to stop.").

⁴⁰ *Id.*

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⁴¹ See Lewyn width reduces ho

⁴² See Author Traffic Congestion

⁴³ *Id.* See al Communities: D ("Ten units per ac cally supplied at

⁴⁴ *Id.*

⁴⁵ See Sharo Change with Sus

safety: every inch of land devoted to streets is land that could be devoted to housing or commerce.⁴¹ Thus, six- and eight-lane streets reduce the housing supply in cities and inner suburbs, and thus may force people to move to automobile-dependent outer suburbs in search of housing.

By redistributing land from housing to automobiles, such policies reduce population density by reducing the number of housing units in a neighborhood. In turn, policies that decrease density increase vehicle dependence, for two reasons. First, in thinly populated places, very few people can easily walk to shops and other destinations. For example, suppose that a grocery store is in a neighborhood with only five homes or apartments per block. If most people will walk no more than five blocks to the store, that means that only 25 households in each direction will walk to the store. By contrast, if the same store is surrounded by 30 dwellings per block, 150 households in each direction can walk to the store.

Second, low density also means low public transit ridership, for the same reason: if very few people live within walking distance of a bus or train stop, very few people will take the bus or train to work. Generally, public transit use is minimal in places with fewer than seven houses per acre.⁴² At a minimum, densities of seven to 15 units per acre are required for economically efficient regular bus service.⁴³ Densities of at least 20 units per acre are sufficient to support streetcars.⁴⁴ By contrast, in places with over 60 units per acre, most trips are made by public transit (assuming adequate transit service).⁴⁵ Thus, it appears that wider streets discourage walking, both by artificially spreading out the population and by encouraging dangerously fast vehicle traffic.

⁴¹See Lewyn, *supra* note 31, at 286 n. 291 (each 10 feet of street width reduces housing supply by 3–4%) (citation omitted).

⁴²See Anthony Downs, *Still Stuck in Traffic: Coping with Peak-Hour Traffic Congestion* 210 (2005).

⁴³*Id.* See also Patrick M. Condon, *Seven Rules for Sustainable Communities: Design Strategies for the Post Carbon World* 74 (2012) (“Ten units per acre is the accepted figure at which buses can be economically supplied at short headways”).

⁴⁴*Id.*

⁴⁵See Sharon Feigon et. al., *Travel Matters: Mitigating Climate Change with Sustainable Surface Transportation* 18 (2003).

B. 21st-Century Policy

20th-century street design policies are relevant to AV regulation because 21st-century policymakers might be tempted to accommodate AVs in the same ways that 20th-century policymakers accommodated traditional automobiles: by widening streets. But as explained above, widened streets facilitate suburban sprawl, reduce the amount of urban land available for housing, and reduce density (thus making public transit and walking difficult). So even if a new generation of wider streets do not make traffic deadlier, they will still make society more automobile-dependent, thus increasing the above-mentioned social ills that go along with automobile dependency: more poverty, more pollution, and less health.

And as explained above, wider streets will also be more dangerous and uncomfortable for pedestrians. It could be argued that because this argument does not apply to our AV-dominated future, because AVs will be immune from human error and thus able to travel 20-lane streets without crashing into a pedestrian. But even if this is so, wider streets will increase traffic danger as long as AVs share the streets with conventional cars. Conventional cars and trucks, unlike AVs, are not immune from human error. So if a street is widened to accommodate AVs, these cars will travel even faster than before, creating even more danger to pedestrians and to each other.

III. Jaywalking

A. 20th-Century Policy

Before the rise of the automobile, streets were for walkers; children routinely played in streets.⁴⁶ But during the 1920s, over 150,000 pedestrians were killed by automobiles.⁴⁷ Some public officials responded with lower speed limits,⁴⁸ and many American police chiefs even favored laws requiring automobile manufacturers to limit vehicle speed through speed

⁴⁶ See Peter D. Norton, *Street Rivals: Jaywalking and the Creation of the Motor Age Street*, 48 *Technology and Culture* 331, 331-32 (2007), http://muse.jhu.edu/journals/technology_and_culture/v048/48.2norton.pdf.

⁴⁷ *Id.* at 332 n. 6 ("over 210,000 Americans were killed in traffic accidents" and three-fourths of them were walkers).

⁴⁸ *Id.*

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⁴⁹ *Id.* at 33

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⁵⁴ *Id.* at 3

⁵⁵ *Id.* at 3

⁵⁶ *Id.*

⁵⁷ *Id.* at 3

⁵⁸ *Id.* at 3

governors.⁴⁹ The auto industry's alternative was to drive pedestrians off the streets. For example, Charles M. Hayes, President of the Chicago Motor Club (a local chapter of the American Automobile Association, which promoted automobile ownership),⁵⁰ wrote that bad publicity over traffic deaths might lead to "almost unbearable restrictions upon automobiles,"⁵¹ and that the auto lobby should prevent such restrictions by arguing that "streets are made for vehicles to run upon."⁵² Similarly, one car dealer wrote that "[t]he streets are for vehicle traffic, the sidewalks for pedestrians."⁵³

As part of this propaganda campaign, the automobile lobby used the term "jaywalker."⁵⁴ The term "jay" originally meant "a country hayseed out of place in the city."⁵⁵ Thus, a jaywalker was a pedestrian out of place in the city, one oblivious to the dangers of motor traffic.⁵⁶ Automobile lobbyists and lobbyist-influenced "safety groups" used this term to stigmatize walkers. For example:

- In 1920, self-styled safety advocates dragged San Francisco pedestrians into mock courtrooms to lecture them on the perils of jaywalking.⁵⁷
- In Los Angeles, an automobile club posted signs warning that "jay walking" was prohibited, even though at the time this term was not in the city's traffic code.⁵⁸
- In 1923 the Chicago Motor Club bought space in the *Chicago Tribune* for advertisements claiming that

⁴⁹*Id.* at 339.

⁵⁰See City of Chicago, Landmark Designation Report: Chicago Motor Club Building 3, 11, [http://www.cityofchicago.org/dam/city/depts/zlup/Historic Preservation/Publications/Chicago Motor Club Bldg.pdf](http://www.cityofchicago.org/dam/city/depts/zlup/Historic%20Preservation/Publications/Chicago%20Motor%20Club%20Bldg.pdf) (describing Hayes and Motor Club).

⁵¹See Norton, *supra* note 46, at 340.

⁵²*Id.* (citation omitted).

⁵³*Id.* at 343 (citation omitted).

⁵⁴*Id.* at 343-45.

⁵⁵*Id.* at 342.

⁵⁶*Id.*

⁵⁷*Id.* at 345.

⁵⁸*Id.* at 350.

pedestrians caused 90% of auto collisions.⁵⁹ The National Automobile Chamber of Commerce, another industry group,⁶⁰ created a "accident news service" designed to show that most accidents were caused by careless pedestrians.⁶¹

Ultimately, government followed suit. In Los Angeles, the automobile club created a coalition called the Los Angeles Traffic Commission, which drafted a model traffic ordinance that included anti-jaywalking provisions.⁶² The city council passed the ordinance in 1925,⁶³ and other cities quickly enacted similar laws.⁶⁴

Today, jaywalking is almost universally prohibited in the United States.⁶⁵ Jaywalking laws generally require pedestrians to obey traffic lights (such as "Walk/Don't Walk" signs)⁶⁶ and to cross streets only at marked crosswalks or other

⁵⁹*Id.* at 356.

⁶⁰*Id.* at 354 (describing organization).

⁶¹*Id.* at 356.

⁶²*See* Norton, *supra* note 45, at 350–52.

⁶³*Id.* at 351.

⁶⁴*Id.* at 357–58.

⁶⁵*See* Philip M. Nichols, *Are Facilitating Payments Legal?*, 54 Va. J. Int'l L. 127, 140 (2013) ("Most states and municipalities prohibit jaywalking"). I note that jaywalking is not technically a crime in every jurisdiction. *See* State v. Tyler, 168 Or. App. 600, 605, 7 P.3d 624, 628 (2000) (in Oregon, jaywalking is a "violation" rather than a "crime" and thus not subject to imprisonment). *But see* State v. Barton, 2007-Ohio-2348, 2007 WL 1429625 (Ohio Ct. App. 2d Dist. Montgomery County 2007) (jaywalking a misdemeanor).

⁶⁶*See, e.g.*, Fla. Stat. Ann. § 316.130(1) (Thomson/Reuters 2014) (a "pedestrian shall obey the instructions of any official traffic control device specifically applicable to the pedestrian"); 625 Ill. Comp. Stat. § 5/11-1001 (similarly worded) (Matthew Bender 2008); Or. Rev. Stat. § 814.010 (State of Oregon, 2013) (pedestrians may generally cross streets where they are facing traffic control devices with green lights, but not when they are facing traffic control devices with yellow or red lights); Alliance v. Bush, 2008-Ohio-3750, 2008 WL 2878321, *3 (Ohio Ct. App. 5th Dist. Stark County 2008) (citing Alliance, Ohio traffic ordinance providing that no pedestrian or driver "shall disobey the instructions of any traffic control device").

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intersections⁶⁷ rather than crossing in the middle of a block.⁶⁸ In Los Angeles, walkers are ticketed even when flashing "countdown clocks" list the number of seconds left before a light change and thus suggest that there is still time to cross the street.⁶⁹ Jaywalkers can be fined hundreds of dollars,⁷⁰ and are sometimes arrested⁷¹ and even jailed.⁷² Penalties for

⁶⁷ See, e.g., 75 Pa. Cons. St. Ann. § 3543(c) (Thomson/West 2006) ("Between adjacent intersections in urban districts at which traffic-control signals are in operation pedestrians shall not cross at any place except in a marked crosswalk."); Cal. Veh. Code § 21955 (West 2000) ("Between adjacent intersections controlled by traffic control signal devices or by police officers, pedestrians shall not cross the roadway at any place except in a crosswalk."); State v. Shorts, 2011-Ohio-6202, 2011 WL 6016525, *7 (Ohio Ct. App. 9th Dist. Lorain County 2011) (citing Akron, Ohio ordinance providing that "Between adjacent intersections at which traffic control signals are in operation, pedestrians shall not cross at any place except marked crosswalk[s].") (citation omitted). A more moderate version of this statute provides that pedestrians crossing outside crosswalks shall yield the right of way to vehicles. See, e.g., 625 Ill. Comp. Stat. § 5/11-1003(a) (Matthew Bender 2008); code of Ga. Ann. 40-6-92(a) and (c) (Thomson/West 2008) (where adjacent intersections not signalized, a pedestrian outside a crosswalk need only "yield the right of way to all vehicles upon the roadway unless he has already, and under safe conditions, entered the roadway"; however, "Between adjacent intersections at which traffic-control signals are in operation, pedestrians shall not cross at any place except in a marked crosswalk.").

⁶⁸ See Jones v. Continental Elec. Co., 75 N.J. Super. 76, 182 A.2d 168, 170 (App. Div. 1962) ("crossing in the middle of the block [is] jaywalking").

⁶⁹ See Adrian Glick Cudler, Los Angeles Might Finally Do Something About the Dumbest Jaywalking Tickets, CURBED (May 5, 2015), <http://la.curbed.com/archives/2015/05/los-angeles-might-finally-do-something-about-the-dumbest-jaywalking-tickets.php>. Cf. Jon Hilkevitch, More Pedestrians to be Put on Clock, Chicago Tribune, Mar. 20, 2006, http://articles.chicagotribune.com/2006-03-20/news/0603200209_1_countdown-signals-intersections-walk (describing "countdown clock" concept).

⁷⁰ See Cudler, *supra* note 69 (Los Angeles tickets cost between \$190 and \$250); Joe Linton, Interview with Luke Klipp of Jaydancing, Streetsblog (June 16, 2015), <http://la.streetsblog.org/2015/06/16/interview-with-luke-klipp-of-jaydancing> (in same city, parking tickets only \$70).

⁷¹ See Wayne Logan, *After The Cheering Stopped: Decriminalization and Legalism's Limits*, 24 Cornell J.L. & Pub. Pol'y 319, 338 (2015) (citing case upholding warrantless arrest for jaywalking).

⁷² Dave Huddleston, Jailed for Jaywalking: Pedestrian crime lands some behind bars, WSB-TV (Nov. 3, 2015, 3:14 PM), <http://www.wsbtv.com>

jaywalking are sometimes set by state governments⁷³ and sometimes set by city ordinance.⁷⁴

In fact, jaywalking can even lead to more serious charges. In 2010, Raquel Nelson of Cobb County, Georgia watched as her son was killed by a hit-and-run driver.⁷⁵ Because the nearest crosswalk was half a mile away, Nelson and her children had crossed in midblock.⁷⁶ Rather than merely ticketing her for jaywalking, the county government chose to prosecute Nelson for her child's death.⁷⁷

The results of these policies are unclear. It might be the case that (at least where jaywalking laws are vigorously enforced) the risk of being harassed by police discourages walking; if so, jaywalking laws discourage walking and increase car dependency. If so, jaywalking laws, like the street and highway policies discussed above, increase poverty and pollution while degrading public health.

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⁷³See, e.g., Judicial Council of California, Uniform Bail and Penalty Schedules 16, <http://www.courts.ca.gov/documents/Final-2012-JC-BAIL.pdf> (listing fines for various pedestrian offenses; for example, \$194 fine for violation of "Don't Walk" sign); N.J.S.A. 39:4-36 (setting forth \$200 fine for variety of offenses, including a pedestrian's failure to yield to automobiles when former not in crosswalk); H.R.S. § 291C-73(d) (\$100 fine for various violations of traffic code by pedestrians, including crossing outside crosswalk).

⁷⁴See Arizona Bikelaw, *Jaywalking in Arizona*, <http://azbikelaw.org/blog/jaywalking-in-arizona/> ("In Arizona, cities are authorized to enact their own pedestrian regulations"); Kiera Hay, Committee Kills Jaywalking Ordinance, Albuquerque J., Jan. 23, 2013, <http://www.abqjournal.com/162568/north/committee-kills-jaywalking-ordinance.html> (describing city council's rejection of proposal to increase jaywalking fines).

⁷⁵See Marcus K. Garner, The Atlanta Journal-Constitution, *Jaywalking Mom's Appeal Denied* (Sept. 7, 2012, 8:28 AM), <http://www.ajc.com/news/news/local/jaywalking-moms-appeal-denied/nR5Sq/>.

⁷⁶*Id.*

⁷⁷See *Nelson v. State*, 317 Ga. App. 527, 731 S.E.2d 770 (2012) (upholding lower court's decision to grant trial rather than dismissing charges). Ultimately, the county reversed itself and dropped the charges, settling for a \$200 fine. See *Jaywalking mom avoids retrial for son's death*, 11 atlanta (June 13, 2013, 11:59 AM), <http://www.11alive.com/story/news/crime/2014/03/05/1938418/>.

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IV. Conclusion

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⁷⁸See *Ac* 3, at <https://www.azbikelaw.org/blog/jaywalking-in-arizona/>

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B. 21st-Century Policies

Ideally, AVs will be programmed to obey the rules of the road, and to stop for pedestrians rather than carelessly crushing their bodies.⁷⁸ If this is the case (and if AVs are virtually universal), pedestrians will retake control of streets, secure in the knowledge that AVs will not crush them. If pedestrian activity slows down AVs enough, they may start to avoid urban cores, thus making those places safer and less polluted. And as car traffic declines, the necessity for parking spaces would decline, thus allowing additional urban development.⁷⁹ Under this laissez-faire scenario, jaywalking laws would become both unnecessary and unenforceable-unnecessary because mid-block crossings would become safer as risk-averse AVs became more common, and unenforceable as walkers responded by crossing mid-block more frequently.

But government officials infuriated by slow AV traffic might seek to prevent this scenario. Rather than allowing walkers to stop AV traffic, they might seek to increase vehicle traffic flow by once again driving walkers off the streets. For example, regulators might eliminate unmarked crosswalks at intersections, by requiring pedestrians to cross streets only where there are traffic lights or marked crosswalks.⁸⁰ Alternatively, enforcement action against jaywalkers might be stepped up; fines and imprisonment might increase. This menu of policies would be a return to 20th-century anti-pedestrian policies; like those policies, they would create less walking and more driving, which means more pollution, more obesity and diabetes, and more poverty.

IV. Conclusion

In the 20th century, government responded to the rise of the automobile by building roads, widening existing streets, and using jaywalking laws to drive walkers off the streets. Today, policymakers will be tempted to enact the same policies in order to accommodate AVs. But if they do, they will create the same negative side effects as did 20th-century

⁷⁸See Adam Millard-Ball, Pedestrians, autonomous vehicles and cities 3, at https://people.ucsc.edu/~adammb/publications/Millard-Ball_2017_Autonomous_vehicles_pedestrians_cities_preprint.pdf.

⁷⁹*Id.* at 11.

⁸⁰*Id.*

policies: more car traffic, more pollution, a more sedentary public, and more poverty as Americans are forced to spend money on vehicles.